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The European Fauna of Annelida Polychaeta

(I)

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(ESPECIALIDADE: BIODIVERSIDADE)

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Aos meus pais

À minha família

Aos meus amigos

Time is
Time was
Time is past

Robert Green, 1594
The Honorable Historie of Frier Bacon and Frier Bongay

Carpe diem

Horatii, 23 a.C.
Carminum liber primus

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FOREWORD

(and final words of this thesis...)

Just a few lines before so many thousand of them dedicated to a single subject, the Polychaeta of the European waters. The pages you are about to read (or more probably, to consult) are the result of the cumulative work conducted during fifteen years, in very diverse circumstances, sometimes far from ideal and with few resources, and with quite different states of mind, from enthusiastic to be just a step away from dropping everything and give up. In fact, if this work arrived to its end, it was in great part due to all the support and encouragement that my family, friends and colleagues have instilled to me during these years, very especially in the last ones, when my self motivation was almost gone.

It was not an easy process, especially after the end of the scholarship and during all the time I had to joggle in order to conciliate work, thesis, and extra-jobs to pay the PhD taxes. In spite of this, it was worth to finish it. After all, and as my brother Pedro philosophically said to me once, '*The world is a place full of unfinished things*'. At least this one is finished. Besides, I have always felt a debt to all those that gave me their support and confidence concerning this thesis from the very beginning, from my family, friends and colleagues, to the JNICT (now FCT), who decided to finance my PhD proposal.

The final scheme of the monograph was developed along these years and has evolved with base on the trial and error method, always looking for the best way to include the information considered to be important or relevant. Due to this way of working, without a strict scheme, the chapters are not always homogeneous in their contents. The quality of the chapters is not uniform as well, and some are quite more polished than others. In spite of the revisions done, numerous errors and fails still persist, from which I am the sole responsible. Hopefully they will be detected and corrected with the use of this monograph. My advice is to contact me whenever an error is found, so it can be corrected and future versions of the work improved. Regardless of all its problems, I think it can be a useful publication for everybody interested in the identification of polychaetes collected in Europe and its surrounding waters.

The main body of the work (and in my opinion, the most important part of it), including the chapters on the families, was finished more than one year ago. Since then, and in addition to many other works not related with the thesis, the time has been spent dealing with corrections, updates, the writing of the introduction, material and methods, conclusions, the editing process, and so on. The main feeling during this time, with the thesis nearly concluded, was of an infinite tiredness, and the anxious sensation that it just could never be finished. Finally, here it is, after a long process that in the last months was close to a long agony. I do not know which will be the future of this work, but I like the idea that it can be useful and improved. What I am sure about is that the end of this dissertation closes an important period of my life, and opens another one, as thrilling as the last one (and I hope less frustrating in many aspects).

Personally, this is the work I would have liked to find when I first started identifying polychaetes, almost two decades ago, after my military service. I really hope it can be useful and that it can fit at least part of the needs of those that are starting today with the identification of the polychaetes present in the European waters.

João Gil
Blanes, 3 June 2011

RESUMO

FAUNA EUROPEIA DE ANNELIDA POLYCHAETA

A importância da Taxonomia como ciência é particularmente evidente no actual cenário de *Crise da Biodiversidade*, em que a destruição progressiva de habitats devido a causas antropogénicas é acompanhada por uma taxa de extinção de espécies sem precedentes na história da Terra (*Extinção Holocénica*). Os estudos taxonómicos, nomeadamente os morfológicos e descritivos, permitem não só quantificar a biodiversidade, ameaçada ou não, como também (e sobretudo) qualificar-la, de maneira a melhor conhecer e reconhecer os organismos em perigo. Estes estudos permitem conhecer os organismos e os seus atributos, incluindo o seu potencial para a Humanidade, e adoptar as medidas necessárias para a sua protecção, sendo em muitos casos os únicos dados científicos que se recompilaram dessas espécies antes do seu desaparecimento. Ironicamente, no momento em que mais necessidade há deste tipo de estudos, regista-se uma diminuição do número de especialistas capazes de os elaborar, os taxonomistas, assim como dos recursos que tradicionalmente lhes eram destinados. Estes são cancelados, congelados, ou desviados para outro tipo de trabalhos considerados com melhor projecção académica e impacto científico, como são os estudos filogenéticos e moleculares. A progressiva diminuição da mão de obra especializada em Taxonomia descriptiva e dos productos da sua actividade (descrições de espécies, monografias, guias de campo, Faunas e Floras, chaves de identificação, inventários, bases de dados, páginas web especializadas...), é conhecida como *Crise Taxonómica*, e deixa muitos outros campos da ciência sem as necessárias ferramentas de trabalho, nomeadamente no âmbito conservação. É neste contexto que se insere o presente trabalho.

Os Annelida Polychaeta são um grupo de invertebrados vermiformes particularmente interessante, já que habitam quase todos os tipos de substratos marinhos, do intermareal à zona abissal, e das águas salobras às hipersalinas, ocorrendo também em determinados habitats de água doce ou mesmo terrestres. Outros grupos são holopelágicos, ou habitam ambientes peculiares, como fontes hidrotermais, vulcões de lama, depósitos de clatrato de metano, ossadas de grandes mamíferos marinhos, ou vivem como parasitas externos ou internos de outros organismos, incluindo outras espécies de poliquetas. Os Polychaeta estão entre os organismos mais abundantes que povoam os fundos marinhos, desde substratos rochosos a zonas argilosas, sendo frequentemente os invertebrados dominantes, tanto em abundância como em biomassa. Sendo tão abundantes e ubiquistas, os poliquetas desempenham um importante papel no funcionamento dos ecosistemas marinhos, e são por isso usados em muitos tipos de investigação, desde estudos de impacto ambiental e monitorização, a trabalhos faunísticos e taxonómicos, passando pela biomedicina e farmacologia.

Neste trabalho analizam-se os Annelida Polychaeta da plataforma continental do sudoeste da Península Ibérica, recolhidos durante as campanhas SEPLAT 6 e 7 (Sudoeste de Portugal), e Fauna 1

(plataforma espanhola do Golfo de Cádiz, Estreito de Gibraltar e Mar de Alborán), duas áreas nas quais os trabalhos sobre o grupo são ainda escassos e fragmentários. A seguinte tabela resume as características das duas campanhas:

	SEPLAT 6 e 7 (1ª e 2ª parte)	**FAUNA 1**
Organizado por:	Instituto Hidrográfico, Marinha Portuguesa	Museo Nacional de Ciencias Naturales (CSIC, Espanha)
Navios utilizados:	*N.R.P. Almeida Carvalho* (1972-2001)	*B.O. García del Cid* (1977-actualidade)
Principal objectivo:	geológico	biológico
Datas:	SEPLAT 6 – Abril e Maio 1981; SEPLAT 7 (1ª parte) – Outubro e Dezembro 1981; SEPLAT 7 (2ª parte) – Outubro 1983	Julho 1989
Aparelhos de amostragem:	dragas (Van Veen; Shipeck)	arrastos (arrasto de vara; arrasto italiano; IKMT)
Área geográfica:	plataforma continental do Sudoeste de Portugal	plataforma continental do Sul de Espanha (Golfo de Cádiz, Estreito de Gibraltar, Mar de Alborán)
Batimetria amostrada:	15 a 440 metros	14 a 541 metros
Tipo de substrato amostrados:	sobretudo substratos móveis (de cascalho a lodo)	todos os tipos de substratos

As zonas amostradas nas duas campanhas estão interconectadas através da porção portuguesa do Golfo de Cádiz (Sul do Algarve), sendo toda essa área particularmente interessante do ponto de vista biogeográfico das espécies que habitam as suas costas e plataforma continental. A área encontra-se na confluência de duas bacias hidrográficas com características diferentes, o Oceano Atlântico e o Mar Mediterrâneo, este último com um alto nível de endemismos. As duas bacias estão separadas pelo Estreito de Gibraltar e o Mar de Alborán, que funcionam não só como barreiras físicas, mas também ecológicas e fisiológicas para a dispersão das espécies de ambos os lados. Esta zona é também interessante por encontrar-se no limite sul da distribuição de muitas espécies marinhas de origem boreal, e no limite norte de outras espécies de origem africana.

O estudo do material recolhido forneceu até ao momento um número provisório de 259 espécies de Polychaeta, distribuídas por 158 géneros e 46 famílias. O número de taxa identificados foi muito semelhante entre as duas campanhas (ver seguinte tabela):

	Famílias	**Géneros**	**Espécies e subespécies**
Número total de taxa identificados	46	158	259
Campanhas SEPLAT	40	111	175
Campanha Fauna 1	37	108	161
Taxa partilhados	31 (67.4%)	57 (36.1%)	77 (29.7%)

Apenas 29.7% das espécies identificadas é comum às duas campanhas. Este reduzido número é possivelmente uma consequência dos distintos tipos de substratos prospectados, assim como dos diferentes aparelhos de amostragem utilizados (dragas *versus* arrastos). Não parece provável que as diferenças faunísticas se devam a questões biogeográficas, já que a campanha Fauna 1 decorreu em parte no Estreito de Gibraltar e Mar de Alborán, zonas com forte influência atlântica, e em parte no Golfo de Cádiz, aberto ao Atlântico e adjacente ao Sudoeste de Portugal, onde se realizaram as campanhas SEPLAT estudadas.

Seis novas espécies foram detectadas entre o material recolhido e o material adicional analizado: *Acoetes* sp. nov. (Acoetidae), *Magelona* sp. nov. (Magelonidae), e *Scalibregma* sp. nov. (Scalibregmatidae), das campanhas SEPLAT, *Prosphaerosyllis* sp. nov. (Syllidae) e *Sphaerosyllis* sp. nov. (Syllidae), da campanha Fauna 1, e *Onuphis* sp. nov. (Onuphidae), de material adicional do Algarve. A descrição de *Magelona* sp. nov. está já em processo de publicação, enquanto que a das restantes espécies está practicamente finalizada.

O estudo do material recolhido durante as campanhas não foi ainda finalizado, devido à sua grande quantidade e diversidade, mas sabe-se no entanto que o número total dos taxa presentes é superior ao registado até ao momento, incluindo outras espécies novas para a ciência. Por outro lado, algumas das identificações realizadas permanecem como sendo dúbias, devido não só ao mau estado de alguns exemplares, mas também à necessidade de que alguns grupos taxonómicos sejam objecto de uma profunda revisão.

Com base nos trabalhos anteriormente publicados e no material aqui analizado, foi elaborada uma lista dos Annelida Polychaeta de Portugal Continental, tanto marinhos como terrestres (excluindo portanto os Açores, Madeira, e Selvagens) (ver seguinte tabela):

	Famílias	**Géneros**	**Espécies e subespécies**
Número total de taxa de Polychaeta identificados em Portugal Continental	59	322	605

O número definitivo de espécies está sujeito a flutuações, dado que alguns dos registos são claramente duvidosos e resultam muito possivelmente de erros de identificação. Alguns destes poderiam dever-se a espécies novas semelhantes às citadas, já que é pouco provável que as espécies citadas ocorram em Portugal, pois apresentariam uma distribuição disjunta pouco crível com base nos actuais conhecimentos do grupo. É de prever que o estudo de mais material e em melhores condições, assim como a revisão taxonómica de alguns grupos, e a prospecção de habitats ou zonas geográficas pouco estudadas até ao momento, aumente significativamente o número de espécies registadas em Portugal.

Dada a actual ausência de uma obra abrangente e com informação actualizada sobre os Annelida Polychaeta presentes em águas europeias, e a necessidae actual de uma obra desse tipo, foi considerado que esta seria a ocasião apropriada para elaborar uma monografia com essas características, integrando igualmente os dados do material recolhido durante as campanhas e aqui analizado. Foi também decidido que uma monografia deste tipo deveria fornecer não só um registo de todas as famílias, géneros e espécies registadas até ao momento, como também informação relevante sobre cada uma delas e chaves dicotómicas que permitissem a sua identificação.

Para elaborar esta *Fauna Europeia de Annelida Polychaeta* foi inicialmente delimitada a área geográfica a considerar. Esta abrange do norte da Noruega à Mauritânia, e dos Açores aos mares de Azov e Cáspio, incluindo ainda a Groenlândia Oriental, e os arquipélagos da Madeira, Selvagens e Canárias, assim como as plataformas continentais, taludes e planícies abissais adjacentes à zona definida. Em alguns casos foram também consideradas espécies de áreas adjacentes, como Groenlândia Ocidental, costa oriental dos Estados Unidos, Mar Vermelho ou África Ocidental.

A recompilação das espécies citadas na área considerada foi efectuada com base nos trabalhos publicados entre 1758 e 2011, e complementada com o material agora identificado. Os registos de algumas espécies só foram localizados após a conclusão dos trabalhos, pelo que estas (cerca de 35) não foram incluídas. As espécies foram agrupadas por famílias e géneros, seguindo a sua classificação actual. Por questões prácticas as famílias estão dispostas por ordem alfabética, assim como os géneros de cada família, e finalmente as espécies de cada género. Todos os grupos taxonómicos são acompanhados de chaves dicotómicas.

Cada espécie é acompanhada da referência bibliográfica com a sua descrição original, localidade tipo, sinonímias, referências bibliográficas seleccionadas, distribuição geográfica e batimétria, ecologia, e observações taxonómicas ou de outro tipo consideradas relevantes. Não foram incluídas ilustrações das espécies por restrições de espaço, mas estas podem ser encontradas nas referências seleccionadas que são fornecidas. No entanto, para cada família são fornecidos desenhos representativos, de maneira a facilitar a utilização das chaves. Os taxa a nível de família e género são também acompanhados da referência bibliográfica original, taxon tipo, sinonímias e comentários. Por último, é também fornecido um glossário de termos relacionados com os poliquetas.

O trabalho foi especialmente centrado nos grupos bentónicos marinhos de Polychaeta, pelo que as seguintes famílias, quase todas pelágicas e Aphanoneura, foram excluídas: Aeolosomatidae, Iospilidae, Lopadorrhynchidae, Myzostomidae, Parergodrilidae, Potamodrilidae, Tomopteridae, e Typhloscolecidae. As espécies de alciopídeos (antiga família pelágica Alciopidae, actualmente sinonimizada com Phyllodocidae), também foram excluídas. Por outro lado não se conhecem representantes europeus das famílias Alvinellidae e Hartmaniellidae.

Um total de 1937 espécies e subespécies são assim consideradas e discutidas nesta monografia, das quais 1831 estão consideradas como válidas (espécies formalmente descritas e não sinonimizadas). Das restantes espécies, 6 são novas para a ciência e aguardam descrição, 17 necessitam ser confirmadas e são aqui designadas como *confer* (cf.), 32 são apenas identificadas a nível genérico e são designadas como *species* (sp.), sendo provável que na sua maioria representem espécies novas, 1 é um *nomen nudum*, 1 uma variedade, e 49 são inválidas ou indetermináveis, mas foi considerado importante referir-las aqui. As chaves dicotómicas abrangem um total de 1840 espécies e subespécies, tenham sido já formalmente descritas ou não, enquanto que as restantes espécies não foram incluídas nas chaves devido a informação insuficiente ou por serem consideradas como inválidas ou indetermináveis.

Das espécies discutidas, 1898 foram descritas ou registadas na área geográfica definida, enquanto que as restantes 39 não pertencem à fauna europeia, mas tendo sido na sua maioria registadas anteriormente na Europa são aqui incluídas para facilitar a sua distinção das espécies autóctones.

Se consideramos apenas as espécies válidas (espécies descritas formalmente) que ocorrem em águas europeias e que são discutidas neste trabalho (1794), juntamente com as espécies cujo registo na área de trabalho só foi encontrado depois da elaboração da monografia (35), e as que pertencem aos grupos excluídos (91), obtem-se um total de 1920 espécies válidas de Annelida Polychaeta que são actualmente conhecidas em Europa e águas adjacentes. Tendo em conta o actual ritmo de descrição de espécies novas de águas europeias (10.6 espécies por ano durante a última década), este número parece estar ainda longe de estabilizar-se.

Durante a elaboração desta *Fauna Europeia de Annelida Polychaeta* foram também estabelecidas algumas novas sinonímias, tanto com base no estudo directo de exemplares como na revisão bibliográfica efectuada. Os seguintes taxa são considerados como sinónimos:

Taxon:	**Sinonimizado com:**
Axiokebuita Pocklington & Fournier 1986	*Speleobregma* Bertelsen 1986
Branchiocapitella Fauvel 1932	*Capitella* Blainville 1828
Goniadella bobrezkii Annenkova 1929	*Goniadella galaica* (Rioja 1923)
Lumbrineriopsis Orensanz 1973	*Aotearia* Benham 1927
Lumbrineris emandibulata mabiti Ramos 1976	*Abyssoninoe hibernica* (McIntosh 1903)
Paracapitella Carrasco & Gallardo 1987	*Capitella* Blainville 1828
Parasthenelais Amoureux 1972	*Eusthenelais* McIntosh 1876
Poecilochaetus fauchaldi Pilato & Cantone 1976	*Poecilochaetus mirabilis* (Laubier & Ramos 1973)
Polybranchia Potts 1928	*Dasybranchus* Grube 1850
Pseudomastus Capaccioni-Azzati & Martin 1992	*Leiochrides* Augener 1914
Pseudomastus deltaicus Capaccioni-Azzati & Martin 1992	*Leiochrides fauveli* (Harmelin 1964)
Unanereis zghali Ben Amor 1980	*Composetia costae* (Grube 1840)

Quanto às seguintes sinonímias, são consideradas como prováveis, necessitando ainda ser confirmadas:

Taxon:	**Possível sinonímia de:**
Amphicteis ninonae Jirkov 1985	*Amphicteis midas* (Gosse 1855)
Aponuphis fauveli Rioja 1918	*Aponuphis brementi* (Fauvel 1916)
Bylgides acutisetis Loshamn 1981	*Antinoë finmarchica* Malmgren 1867
Euarche cristata Núñez in Palmero, Martínez, Brito & Núñez 2008	*Euarche tubifex* Ehlers 1887
Fauvelia Gravier 1900	*Odontosyllis* Claparède 1863
Fauvelia martinensis Gravier 1900	*Odontosyllis ctenostoma* Claparède 1868
Flabelligena Gillet 2001	*Flabelligella* Hartman 1965
Hydroides pseudouncinatus Zibrowius 1968	*Hydroides uncinatus* (Phillipi 1844)
Nothria maremontana André & Pleijel 1989	*Nothria britannica* (McIntosh 1903)
Polybranchia foxi Potts 1928	*Dasybranchus carneus* Ehrenberg in Grube 1870
Swima Osborn, Haddock, Pleijel, Madin & Rouse 2009	*Chauvinelia* Laubier 1974
Syllides articulocirratus Gillandt 1979	*Eusyllis blomstrandi* Marenzeller 1867

Por último, com base na lista de espécies de Polychaeta presentes em águas marinhas europeias e na informação disponível sobre a sua distribuição, pretendeu-se fazer um esboço da sua diversidade nas distintas áreas geográficas abrangidas pelo estudo. Para esse efeito dividiu-se a área em três grandes zonas: o Mar Mediterrâneo (incluindo os mares de Azov e Cáspio), o Noroeste Atlântico (da Mauritânia ao Mar Céltico e Canal da Mancha, incluindo os arquipélagos dos Açores, Madeira, Selvagens e Canárias), e a região septentrional e boreal (das Ilhas Britânicas ao Árctico). Para cada uma destas regiões foi calculado o número total de espécies presentes, sendo respectivamente de 1078, 1114, e 850 espécies. Apenas 21.6% das espécies estão presentes simultaneamente nas três regiões, reforçando a idéia de que a maioria das espécies de Polychaeta têm uma distribuição limitada. O Mediterrâneo e a região adjacente do Atlântico partilham 48.5% das suas espécies, o noroeste Atlântico e a região septentrional da Europa 33.8%, e o Mediterrâneo e a região boreal apenas têm 27.8% das espécies em comum. Estes resultados podem ser apurados através da subdivisão de cada uma das três regiões consideradas em unidades biogeográficas mais pequenas, mas de momento parecem evidenciar uma mudança drástica da fauna de

poliquetas de cada vez que uma barreira geográfica importante é cruzada. O Canal da Mancha e as Ilhas Britânicas parecem representar uma barreira biogeográfia tão importante como é o Estreito de Gibraltar.

O presente trabalho integra pela primeira vez chaves dicotómicas para a identificação de todas as espécies bentónicas de Polychaeta citadas na Europa, juntamente com informação taxonómica e ecológica para cada uma dessas espécies. Constitui assim uma ferramenta taxonómica actualizada para o estudo deste grupo animal na Europa e em águas adjacentes de África e Ásia. No momento actual, o reduzido número de taxonomistas e dos productos taxonómicos que generam tornam ainda mais necessária a elaboração deste tipo de ferramentas para responder às necessidades de um número crescente de usuários que, sem ser taxonomistas mas tendo alguma formação taxonómica, necessitam identificar os organismos com os quais trabalham, muitas vezes sem poder recorrer à ajuda de um especialista.

A natureza dinâmica da Taxonomia, com a descrição constante de novas espécies e a revisão de muitas outras, assim como a introdução de alterações na classificação e nomenclatura dos organismos devido a novos estudos de sistemática baseados em técnicas inovadoras, fazem com que o período de vida das monografias como a presente seja limitado. O seu processo de desactualização começa no preciso momento em que são finalizadas. Para evitar que este tipo de monografias fiquem ancoradas no passado e que possam ser actualizadas e melhoradas constantemente, é necessário efectuar revisões periódicas das mesmas. No presente caso, isto permitiria não só introduzir os taxa actualmente excluídos e omitidos, como também os novos taxa e as alterações nomenclaturais entretanto publicadas. Por outro lado, seria assim possível incorporar também o feedback dos usuários e as suas correcções e sugestões, de modo a melhorar a qualidade e a funcionalidade da monografia com base nas necessidades dos seus utilizadores.

Estas actualizações podem (e devem) ser editadas periodicamente em distintos suportes, papel ou digital, seja como CD-Rom, seja on-line. A edição digital tem as vantagens de ser menos onerosa e de possibilitar a inclusão de ferramentas tão práticas como o *Optical Character Recognition* (*OCR*), ou enlaces a outras fontes de informação (bases de dados, referências bibliográficas, colecções museológicas... as possibilidades são infinitas), assim como aumentar a quantidade de informação fornecida, através por exemplo da inclusão de imagens, que já poderiam ser em 3D.

Seja qual for a opção escolhida para o futuro desenvolvimento deste trabalho, o importante é que ele possa continuar a evoluir de maneira a melhor adaptar-se às necessidades dos usuários aos quais se destina, e que são todos aqueles que necessitam identificar os Polychaeta da região europeia, até que seja finalmente substituído por uma nova ferramenta, mais completa e mais práctica, e por isso, mais útil.

PALAVRAS CHAVE: Polychaeta, Taxonomia, Faunística, Biodiversidade Marinha, Fauna Europeia

ABSTRACT

In the actual scenario of biodiversity and taxonomic crisis, it is essential not only to increase the taxonomic research, but also to provide taxonomic tools that enable and support accurate identifications. The present study analyses the Polychaeta of the Southwestern Iberian Peninsula continental shelf collected during the campaigns SEPLAT 6 and 7 (Southwestern Portugal) and Fauna 1 (Gulf of Cádiz, Gibraltar Strait and Alborán Sea). This region is biogeographically very interesting, marking the distribution limit of many septentrional and tropical marine species, and being continuous with the Mediterranean, a region considered to have a high level of endemisms. The study of the collected material yielded a total of 259 species, distributed by 46 families. The number of identified taxa was similar between the two campaigns, but only 29.7% of the species were shared between the two. Six new species were identified among the collected and additional material. A checklist of the Portuguese Polychaeta was also compiled, with a total of 605 species being recorded so far. An European Fauna of the benthic Polychaeta was elaborated, with the main purpose of providing, in a single comprehensive work, information on the species occurring in the region, as well as a much needed taxonomic tool for their identification. This Fauna was based on the works published from 1758 to 2011, and complemented with the studied material from the southwestern Iberian Peninsula. The considered geographical area ranges from northern Norway and eastern Greenland to Madeira, Selvagens, Canarias, and Mauritania, and from Azores to the Caspian Sea, including the adjacent continental shelves, slopes and abyssal plains. Each of the 1937 discussed species is provided with the original reference, synonymies, selected references, geographical distribution, depth range, ecology, and taxonomic remarks, whenever considered necessary, based on bibliography and studied material. A total of 1840 species are keyed.

KEYWORDS: Polychaeta, Taxonomy, Faunistics, Marine Biodiversity, European Fauna

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A todos, todos vocês, **MUITO OBRIGADO!!!**

INTRODUCTION

GENERAL INTRODUCTION

Cada cavadela uma minhoca
(Portuguese proverb)

The geographical location of Portugal, almost at the confluence of the Atlantic Ocean with the Mediterranean Sea, is particularly interesting in what concerns the biogeography of the marine species inhabiting its shores and continental shelf. The biogeographically diversified fauna that coexists in this area seems to have origin in three different biogeographic regions (MONTEIRO-MARQUES, 1987). First, there is a community of Atlanto-Mediterranean origin, quite abundant and including the biggest part of the species. Second, a community of Atlantic origin with boreal affinities. Finally, a third group of species with African affinities, which is the most reduced of the three. The Portuguese coast seems to be also the southern limit of a series of boreal species, and the northern limit of tropical species, being this way a very rich region in what concerns its biodiversity.

Another point of interest concerning the benthic fauna of the Portuguese continental shelf is its relative proximity to the Strait of Gibraltar. This strait is a physical barrier between two basins with different hydrologies, being on one side the Atlantic Ocean with less saline, colder and more oxygenated waters, and on the other side the Mediterranean Sea, with more saline, warmer, and less oxygenated waters (EKMAN, 1953). Due to its geographic and topographical features, as well as the hydrographic phenomena generated by them, the Strait of Gibraltar forms a genuine ecological barrier in the region of the Alborán Sea, an ecological barrier that faunas of both basins have to cross (CEBRIÁN & BALLESTEROS, 2004). The comparison of the zoobenthos from the continental shelves of both sides of the Strait has a particular interest, as it enables to establish which species are affected by this barrier and in which way it acts on their dispersion, very especially in relation with species considered to be Mediterranean endemisms. Thus, and according to the species and their life cycles, the Strait of Gibraltar and Alborán Sea can operate either as a physiological barrier (as a species can transpose the barrier but be unable to survive or to reproduce on the other side, due to the different qualities of the water bodies) or as a topographical barrier (the barrier can obstruct the dispersion of the species due, for instance, the lack of a planktonic phase in their life cycle) (BHAUD, 1983). The Strait can also act as an ecological barrier for different populations of the same species, which are immersed in basins with different conditions, causing their genetic isolation and increase of variability, which can finally lead to speciation (*e.g.* PANNACCIULLI, BISHOP & HAWKINS, 1997).

The Strait of Gibraltar makes the connection between the Atlantic Ocean and the Mediterranean Sea, a semi-closed sea that acts as a concentration basin. Due to the nature of the Mediterranean Sea, there is a permanent circulation of water masses through the Strait of Gibraltar, with the Atlantic water entering in surface and the Mediterranean water being washed out in depth. This outcoming saltier Mediterranean water follows its route northwestwards, due to its higher density and the Coriolis effect, flowing along the contours of the northwestern continental slope of the Gulf of Cádiz first, and later of the Western Portuguese slope, at depths between 600-900 m, or even deeper. Under certain circumstances, like during upwelling episodes, this Mediterranean water can approach the Portuguese coast, so it can constitute a carrier for marine species of Mediterranean origin (AMBAR, 1982). This flux of water follows its way farther north, through the Galician coast and reaching latitudes as high as 60ºN (AMBAR, 1982). One example of the possible influence of this Mediterranean flow of water in the distribution of certain species, could be the case of the polychaete *Haplosyllis chamaeleon* Laubier 1960. This species, a symbiotic polychaete associated to the gorgonian *Paramuricea clavata* and normally considered a Mediterranean endemism, was recently found in the Galician Rias, living in association with *Paramuricea grayii* (LATTIG & MARTIN, 2009). The presence of this species in such high latitude could be result of the influence of this continuous flow of Mediterranean water along the western slope of Europe, associated with other local phenomena that approach that water to the coast.

Upwelling phenomena are also present along the western coasts of Portugal, mainly during the months of July, August, and September, when the southward winds in the region are stronger and create the adequate conditions to the occurrence of this phenomenon (WOOSTER, BAKUN & MCLAIN, 1976; FIÚZA, 1982; FIÚZA, MACEDO & GUERREIRO, 1982). Under the effect of these northerly winds on the western coast of Portugal, the superficial coastal waters are driven off the coast, due to Ekman transport, and are replaced by deeper and cooler waters, richer in nutrients. The enrichment of the euphotic zone in nutrients raises the productivity of the ocean in the regions influenced by the upwelling, as the primary productivity is greatly increased, in which is followed by the increase in the secondary and tertiary productivities. The direct influence of upwelling and associated phenomena in the productivity of the ocean in the Western Iberian coasts, especially in small pelagic fish with planktonic larval growth, has been thoroughly studied (*e.g.*: PIRES & ANTUNES, 2000; SANTOS *et al.*, 2007, and references therein). Finally, the continental shelves benefit from the sedimentation of part of this organic matter produced in the above layers of water, very often supporting a very rich benthic biomass (COSTE, FIÚZA & MINAS, 1986). Upwelling is particularly intense in the southern half of the western coast of Portugal (FIÚZA, MACEDO & GUERREIRO, 1982), where the Portuguese material examined in the present study was collected. However, there are also increasing evidences that upwelling events are decreasing of intensity in the Portuguese west coast (PIRES & ANTUNES, 2000; LEMOS & PIRES, 2004) and also that anomalous upwelling events in winter are affecting the productivity of certain key species (SANTOS *et al.*, 2007). It is not known if such occurrences can affect the benthic species and ecosystems underneath the upwelling areas. The detection of eventual changes requires the increasing of benthic taxonomic studies in the continental shelves and upper slopes beneath such areas, and the establishment of time series studies with the necessary funding to enable the identification of such material in a reasonable period of time.

Another important aspect of the region is the progressive raise in water and air temperatures, registered through the last decades, with subsequent changes in planktonic and fish species composition in several North Atlantic ecosystems (NEHRING, 1998; EDWARDS & RICHARDSON, 2004; HAYS, RICHARDSON & ROBINSON, 2005; SANTOS *et al.*, 2007). This is also true for the Portuguese region, where it was detected an increase of tropical fishes and a decrease of boreal fish species from 1980s to 2000s, with species with their range previously limited to the Mediterranean and/or Northwest Africa undergoing a northern expansion (SANTOS *et al.*, 2007, and references therein). Such regional raise of temperatures and subsequent changes in water chemistry and circulation probably can also affect the distribution of other faunistic groups and composition of communities, and it can be expected to affect also the benthic communities. So far it was not found a direct relationship between the progressive raise of sea and air temperatures and changes in the composition of the marine benthic communities (REISE, 1993; HARLEY *et al.*, 2006), but there are increasing evidences that such relationship could exist, at least for intertidal communities (BEUKEMA, 1992; SCHIEL, STEINBECK & FOSTER, 2004).

The relevance of the study of the marine communities in this region of Portugal is also supported by its proximity (and in part, integration) to the adjacent Southwest Alentejo and Vicentine Coast Natural Park (*Parque Natural do Sudoeste Alentejano e Costa Vicentina*). This Natural Park had its origin in 1988, when was established the Southwest Alentejo and Vicentine Coast Protected Landscape (*Área de Paisagem Protegida do Sudoeste Alentejano e Costa Vicentina*), which was raised to Natural Park in 1995.

This Natural Park extends along 110 km of coast, from São Torpes in the north to Burgau Beach, in the south, and incorporates the adjacent marine region in a strip of 2 km wide from the coast, reaching a maximum depth of 32 meters, 2 km off Pontal da Carrapateira (Aljezur). The Natural Park covers a total area of 74 414.89 ha, being 56 952.79 ha terrestrial and 17 461.21 ha maritime. The coastal line includes sandy beaches, rocky cliffs, coastal lagoons, salt marshes, the estuary of the Mira River, and important capes, as the Sardão, São Vicente, and Sagres. The presence of this Natural Park increases the interest of studies on the fauna and flora of the adjacent continental shelf, not only because part of it is integrated in the Natural Park (and protected by it), but also because the rest of the shelf and its communities are the natural continuity of the communities integrated in the Natural Park.

In spite of the big interest revealed by the Portuguese continental shelf for studies of zoobenthos, few works have been performed there, some of which done in an erratic way. This is particularly true for the Annelida Polychaeta. The Polychaeta are normally the most abundant group of benthic macrofauna, both in number of individuals and in number of species, in soft bottom communities (KNOX, 1977). These communities are present in the biggest part of the Portuguese continental shelf. In the monograph by MONTEIRO-MARQUES (1987), on the soft bottom benthic communities of the southern Portuguese continental shelf (Algarve), the Polychaeta were the most important taxon in almost all biocenoses, with exception of the Infralittoral Sands, where the Crustacea surpassed them. In the same work, from 577 identified taxa, 31% were polychaetes, being followed by the Crustacea and the Mollusca, with 24% and 14%, respectively.

A great deal of the publications concerning the Portuguese polychaetes refers to specimens collected at shore or in costal waters (see complete list of publications and checklist of polychaetes from Portuguese waters in *ANNEX 5*). Polychaetes and other marine benthos from the Portuguese continental shelf and adjacent continental slope (nearby seamounts excluded) have been sampled occasionally by different oceanographic expeditions, such as the ones performed by the *H.M.S. Porcupine* (1869-1870), the *H.M.S. Challenger* (1872-1876), the *Travailleur* (1880-1882), the *Talisman* (1883), or the *Hirondelle*, the *Princesse Alice*, the *Hirondelle II*, and the *Princesse Alice II* (1885-1914). More recently, specimens of Polychaeta from the Portuguese continental shelves and slopes were sampled by the *N.R.P Faial*

(1957), the *F.S. Meteor* (1967), the *N.O. Thalassa* (1972), the *N.O. Jean Charcot* (1976), the *N.R.P Almeida Carvalho* (1977, 1979, 1980), the *F.S. Poseidon* (1992), and finally the *N.O. Côte d'Aquitaine* (1994, 1995). From the campaign of the *F.S. Poseidon* apparently only part of the material from one single station (off Cape Espichel) seems to have been studied, with the description of a new species of Pogonophora (FLÜGEL & CALLSEN-CENCIC, 1993).

The first campaign sampling the macrobenthos of the Portuguese continental shelf in a systematic way and following an established methodology was performed by the *N.R.P. Faial* in 1957 (PÉRÈS, 1959). The purpose of this campaign was to characterize the benthic communities of the southern coasts of Portugal. In this study were sampled 76 stations, in great part positioned along eight radials, from off Cape Roca to off Cape Santa Maria. Some of the sampled stations were pelagic, but 58 of them were benthic. Polychaeta were present in 48 of the stations, and their study was performed by BELLAN (1960*a*) and ZIBROWIUS (1970*a*), who identified 100 species. Other studied groups from this campaign include the Madreporaria (ROSSI, 1960), and the Crustacea Galatheidea and Brachyura (NUNES-RUIVO, 1961).

The Portuguese Polychaeta collected by the *F.S. Meteor* were studied by HARTMANN-SCHRÖDER (1977*a*, 1979*a*, 1981), who reported 61 species, collected at eight stations. All stations were located in the southwestern coast of Portugal, namely in the Bay of Setúbal, off Cape Sardão, and off Arrifana.

AMOUREUX (1974*b*, 1987) studied the material collected by the *N.O. Thalassa*. The benthic samples of the Portuguese continental shelf and slope were clustered in two different regions. The first one, with 35 benthic samples with polychaetes, between latitudes 41º16.6'N and 41º34.6'N, and from 140 to 1300 meters, covered the margins of the Porto Canyon, located northwestern Porto. The second region, with 13 samples with polychaetes, between latitudes 40º33'N and 40º46'N, and from 220 to 1170 meters, covered the margins of Aveiro Canyon, just off Aveiro. A total of 159 species was identified from these samples.

The *N.O. Jean Charcot* sampled the rocky bathyal zone along the Iberian coasts. Seven stations were sampled in Portuguese waters, but only two species of Polychaeta, from two different stations, were found in these samples (MONTEIRO-MARQUES & ANDRADE, 1981).

The samples collected by the *N.R.P. Almeida Carvalho* in 1977, 1979, and 1980, during the cruises SEPLAT 3 and 4, were studied by MONTEIRO-MARQUES (1987), in which is still the most complete study on the benthic communities of soft substrates of the Portuguese continental shelf. The study was carried out in the southern continental shelf of Algarve, between Cape Santa Maria and the western coast off Vila do Bispo. A total of 301 samples were collected, including two sampled by scuba diving, providing a list of 181 species of polychaetes distributed by 141 stations.

Finally, RAVARA (1997) studied the polychaete fauna of the continental shelf off Aveiro collected in 1994 and 1995 by the *N.O. Côte d'Aquitaine*. The number of sampled stations was 31, with a total of 89 replicas, and placed along 4 transects, from the coast to the continental break, between 40º30'N and 40º50'N, and 8º40'W and 9º20'W, and ranging from 8.4 to 185.9 meters. A total of 139 species were identified, being this number further increased to 148 by following works based on the collected material (SAN MARTÍN, 2004*c*; RAVARA, SAN MARTÍN & MOREIRA, 2004; AGUIRREZABALAGA & GIL, 2008).

The present work appears in a context of biodiversity and taxonomic crisis. Nowadays there is an increasing need to study the biodiversity in a changing world, mainly due to an increasing anthropogenic action upon the natural communities. This need occurs at the same time that there is a growing lack of taxonomists to perform such kind of studies, as well as a lack of adequate taxonomic products and tools for non-taxonomists.

The main purpose of the present study was to study the Polychaeta of the southwestern continental shelf of Portugal, between Cape São Vicente and off Lagoa de Santo André, collected by the *N.R.P. Almeida Carvalho* during the SEPLAT 6 and 7 cruises (1981, 1983), and compare them with the polychaetes from the continental shelves of both sides of the Strait of Gibraltar, collected during the FAUNA 1 cruise (1989). This comparison would allow to determine if (and how) the Strait of Gibraltar affects the distribution of the polychaete fauna in the region. The results of this work are presented in the frame of a commented key for all the benthic polychaete species present in the European and nearby waters. The intention of this key is to supply an updated taxonomic tool to work with polychaetes collected in Europe, integrating all the published data in a single workable publication. This key can be further improved in the future using the new information technologies, and could sove partially some of the problems addressed above.

TAXONOMY AND THE BIODIVERSITY AND TAXONOMIC CRISES

"*Most of the earth's species remain undescribed and are going extinct at an alarming rate. Our understanding of these species will be based largely on morphological studies, because resource-intensive molecular evaluations will only be directed at a few charismatic (often vertebrate) forms. However, the scientists most needed during this biodiversity bottleneck – 'traditional' taxonomists – are themselves disappearing. This loss of biological expertise will be irreplaceable.*" (LEE, 2000).

The Biodiversity Crisis and the Holocene Extinction

In recent times the extinction rate of species has been highly increased by the growing human population and its use of the world's resources in a unsustainable way. This is causing habitat degradation, deforestation, pollution, overexploitation of marine and terrestrial resources, introduction of alien or genetically manipulated species, and climate change, to name but a few consequences. The rhythm at which species are going extinct and the threat to many more has increased so much that WILSON (1985, 1992) described the present situation as a *Biological Diversity Crisis*, nowadays commonly known as *Biodiversity Crisis*.

According to the fossil record, the natural background extinction rate (defined as the number of species that go extinct, *E*, per one million species a year, *MSY*), without the human interference, was of 0.1-1 *E*/*MSY* (PIMM *et al.*, 1995). However, due to human activities, this extinction rate is estimated to have increased between 1,000 to 10,000 times (WILSON, 1992; PIMM *et al.*, 1995; PIMM & BROOKS, 2000), and it is anticipated to continue to accelerate rather than hold constant (WHEELER, 1995). Patterns of deforestation are normally used as indirect estimations of species extinctions, as rain forests include a great number of endemic species (WHEELER, 1995). This way, WILSON (1992) made a conservative estimation of the number of species lost yearly only by reduction of the rain forest area, obtaining a total number of 27,000 species per year, 76 each day, 3 species each hour. HUGHES, DAILY & EHRLICH (2000) estimated a similar loss of species in tropical forests, calculated to range between 9,000-26,000 species per year, 1-3 species per hour. Being these numbers conservative estimations, and only for tropical forests, the number of species lost each year is probably much higher, with estimates varying between 50 and 150 species per day (MYERS, 2001), with the number of species that should have been extinguished by the year of 2000 due to human activities ranging between 500,000 and 600,000 (LOVEJOY, 1980). However, it is difficult to have even an approximate value of the current extinction rate, being the present values based on the species-area theory. The estimated number of existing species fluctuates enormously, the biggest part of them being unknown, so the error introduced in calculating the current extinction rate can be also great. It is difficult to know what is being lost when it is not even known.

LEAKEY & LEWIN (1995) made a parallelism between the actual scenario of species impoverishment with the previous major mass extinction events in the geological past of Earth (the *Big Five* mass extinctions, identified by RAUP & SEPKOSKI, 1982), coining the term *Sixth Extinction* to the present episode. However, the fact that the *Big Five* theory is not fully supported by data and probably the massive extinctions were fewer (ALROY, 2008), and that it is not clear who first established the parallelism between the current and the previous mass extinctions (WARD, 1994), makes the term *Sixth Extinction* somehow problematic. Still, the fact that the *Big Five* theory is not fully founded by evidence, does not challenge the idea that we are in the midst of a mass extinction on par with all but a handful of such events in geological times (ALROY, 2008). To designate the current mass extinction events driven by humans, the term *Holocene Extinction* is here preferred, following other authors (*e.g.*, TURVEY, 2009).

The actual Biodiversity Crisis can be divided in two phases: phase one started 100,000 years ago, at the end of the Pleistocene, when the first modern humans began to disperse from Africa, where they originally evolved, to different parts of the world; phase two began about 10,000 years ago, with the Holocene, when humans invented agriculture (ELDREDGE, 2001). When modern humans started migrating out of Africa, everywhere they arrived many native species, especially megafauna, typically became extinct. This was due to overhunting game species which never had experienced contact with humans before and were unaware of the danger, and probably also due to the spread of microbial disease-organisms as well (MACPHEE & MARX, 1997; ELDREDGE, 2001). This scenario has repeated over and over again through the whole Holocene up to today, when almost all macrofauna has disappeared from the wild, or has simply disappeared at all. Phase two started with the invention of agriculture and the possibility of humans to manipulate other species for their own survival. This meant that humans no longer had to adapt to the carrying capacity of the ecosystem, and started to live outside local ecosystems and overpopulate. With overpopulation, and especially after the Industrial Revolution and its technological and economic development, the growing need of energy and lands to produce more food (and wealth) required an increasing surface of the Earth to be manipulated, exploited, spoiled or simply destroyed by human activities, with the consequent loss of natural habitats and species, the spread of plagues, alien and invasive organisms, and with relatively few species with interest for humans being artificially selected and farmed to the detriment of a great majority of others, or simply being exploited to extinction.

The present day Biodiversity Crisis is especially hard to assume because, in a society that is increasingly based in technology, science and the value of knowledge, many of the species that are going extinct are being so without being even known. As expressed by WILSON (1986), "*each species is unique, intrinsically valuable, and the potential source of new knowledge still difficult or impossible to imagine*". To assume the lost of such capital without even trying to study it (not to say to stop it), is a negligence that will be hardly understandable for the future generations.

It is estimated that only a small fraction of the total amount of species on Earth has been so far inventoried (*e.g.*: RAVEN, 2004; TEYSSÈDRE, 2004). In fact, it isn't even known with certainty, to the order of magnitude, how many species are there in the world (WILSON, 1985), and estimations on such number can be associated with very large margins of error, strongly influenced by unpredictable variations (BEBBER *et al.*, 2007). There are about 1.9 million described species (roughly 1 million being insects; CHAPMAN, 2009), and the most recent estimation of the actual number points to around 5.5 million species of eukaryotes (UNIVERSITY OF MELBOURNE, 2010). Other evaluations range from 3.6 million or fewer to anywhere from 10 million (the commonest order-of-magnitude guess; WILSON, 2003, 2004) to several tens of million. At the same time, no more than a single 5% of the total named organisms are understood in any biological detail (RAVEN, 2004; also WHEELER, 2008; BOERO, 2010). Only some small groups of current organisms, like vertebrates, vascular plants, some marine phyla, and a few insect groups, have been inventoried for the most part, but even in these cases, much important work remains to be done to establish evolutionary relationships (SOULÉ, 1990; BLACKMORE, 1996). In other groups the species waiting to be described can be counted by hundreds of thousands: just about one million of insects of probably 2.5 to 3.7 million (HAMILTON *et al.*, 2010, and the most recent estimation), 8 to 15 million (BLACKMORE, 1996; TEYSSÈDRE, 2004), or even 30 million (WILSON, 1985), are known, and the same pattern repeats for the biggest part of invertebrates. Even if we consider the lowest estimations of the total number of insects, this means that more than 60% of the extant species remains undescribed. Many of the considered to be the most threatened animals are mammals and birds, which are also among the better studied ones, but there is evidence that sights and the distribution area of many species of marine and terrestrial invertebrates (like some Lepidoptera or Mollusca) has decreased. Being invertebrates the vast majority of the existing fauna, and many of its groups among the most poorly studied and understood, it is difficult to evaluate the impact of the actual habitat loss and other pressures in such groups, and to act in consequence. The situation in even worst when we take into account that many of these threatened species represent the last vestiges of nearly extinct clades, with unusual morphological and biological traits.

Besides the problems with biological diversity impoverishment with the present crisis, in the long term there is also the problem of the alteration, disrupt and deplete of certain basic evolutionary processes by which diversity is generated, for a period difficult to estimate but that most surely will persist for millions of years (MYERS & KNOLL, 2001). According to these authors the biodiversity crisis has some first order effects: (1) a major extinction of species within the foreseeable future, estimated by some to remove between one-third and two-thirds of all species now extant; (2) a mega-mass extinction of populations, proportionately greater than the mass extinction of species, within the foreseeable future; (3) alien invasions and other mixings of biotas; (4) progressive depletion and homogenization of biotas, with potential threshold effects in ecosystems; (5) biotic impoverishment generally, possibly including a decline of global biomass; and (6) great reduction, if not virtual elimination of entire sectors of some biomes, especially tropical forests, coral reefs, and wetlands, all of which centers of diversification in the past. A series of consequences would be engender by these first effects, like (a) fragmentation of species' ranges, with disruption of gene flow; (b) decline in the effective population sizes, with depletion of gene reservoirs/pools; (c) biotic interchanges introducing species and even biotas into new areas, with multiple founder effects and novel competitive and other ecological interactions. These consequences, in turn, might disrupt food chains/webs, symbioses, or other biological associations, and can lead to further repercussions, such as: (I) an outbreak of speciation, due to a large number of empty niches, albeit not remotely on a scale to match with the extinction rates; (II) proliferation of opportunistic species; (III) depletion of "evolutionary powerhouses" in the tropics, as well as in wetlands, estuaries, coral reefs, and other biomes with their great biodiversity and ecological complexity; (IV) decline of biodisparity, the biota's manifest morphological and physiological variety, with the loss of species-poor genera, for instance; (V) an end to speciation of large vertebrates; and (VI) emergent novelties, difficult to predict, like explosive radiations within certain higher taxa. This way, for MYERS & KNOLL (2001) and from the standpoint of future evolution, it would be more appropriate to safeguard the main potential for diversity generation, like functional groups that increase the potential for evolutionary recovery, than to emphasize the primary focus of many current conservation programs, which envisage protecting individual taxa and, especially, endemic taxa. However, the protection of some of these emblematic taxa helps to preserve great extensions of otherwise threatened ecosystems, and maintain this way the safeguard of some of those less mediatic groups with great potential for diversity generation.

Taxonomy and the Taxonomic Crisis

The study of organisms and their diversity is the subject of two related disciplines: *Taxonomy* and *Systematics*. The two were formerly treated as synonyms, until SIMPSON (1961) first, and MAYR (1968, 1969) later, considered them as closely related but different disciplines (WHITEHEAD, 1972). This way, ***Taxonomy*** is considered today as the theory and practice of classifying organisms with base on their diversity and phylogenetic relationships, while ***Systematics*** is defined as the science that studies the diversification of organisms and the relationships among them. As illustrated by MAY (2004), "*Taxonomy provides the bricks, and systematics the plan, with which the house of the biological sciences is built*". Taxonomy is often considered to be a subsidiary discipline of Systematics, but it must be considered to be a science by itself that advances through testing hypotheses about taxon status and phylogenetic relationships (GODFRAY & KNAPP, 2004). Taxonomy is typically best performed when carried out for its own sake, and must not be seen as an identification service for other scientists, although the need for reliable identifications is a good justification for supporting this science (WHEELER, 2004, 2007, 2008). Taxonomists are motivated to explore species, character diversity and phylogenetic relationships within monophyletic groups at and above species level and their ultimate goal is a phylogenetic classification with associated scientific names (WHEELER, 2007, 2008).

Systematics and Taxonomy have enjoyed an enthusiastic recent boom, consequence of the Convention on Biological Diversity and the posterior establishment of the Global Taxonomy Initiative (for more details and the implications of the implementations of these policies see SAMPER, 2004). As a result, the number of scholars working on their various fields is much bigger today than it has ever been in the past. However, this sudden increase has been mainly molecular and phylogenetic, with growing amounts of financial support sustaining both, as well as funding the informatization of biodiversity information (*e.g.*: WHEELER & VALDECASAS, 2007; BOERO, 2010). On the other hand, morphological and descriptive taxonomy (alpha-taxonomy) is judged as being old-fashioned and of little relevance (FROESE, 1999; WHEELER, 2004; WHEELER, RAVEN & WILSON, 2004; GODFRAY & KNAPP, 2004; WHEELER & VALDECASAS, 2007), and many times is excluded from research funding and doctoral grants (GODFRAY & KNAPP, 2004; WHEELER, 2004), rejected from scientific journals that previously used to publish morphological papers, as it is felt that such papers are negative for journal impact factors (LEE, 2000; MARTENS & SEGERS, 2005), and is disappearing from university curricula and faculty positions in favour of new and rapidly expanding biological disciplines, leaving without training the numerous taxonomists the world needs today (GASTON & MAY, 1992; WINSTON, 1992; BLACKMORE, 1996; RAVEN, 2004; WHEELER, 2004; BOERO, 2010). The fact that basic taxonomy can be a "cheap" science that can be done with few and cheap resources (as a dissecting microscope, some glass jars and a couple of tweezers, against all the technological paraphernalia used in molecular biology), probably acts against it, leading to the view that it doesn't need the same support and even doesn't have the same scientific quality than some of the newer well-funded biological disciplines (GODFRAY & KNAPP, 2004; WHEELER & VALDECASAS, 2007).

Taxonomy has a poor reputation for many biologists, who see it as being merely descriptive and without using the "hypothesis-testing" scientific process and, therefore, do not consider it as a science. Anyway, even if it was simply descriptive, taxonomy would be fully justifiable as a science, as in the case of mapping stars or plotting ocean floors (WHEELER & VALDECASAS, 2005; WHEELER, 2007). However, taxonomy is a science based in such hypothesis-testing process, as pointed by many authors (*e.g.*: MAWATARI, 2004; WHEELER, 2004, 2007; WHEELER & VALDECASAS, 2005). A hypothesis is established each time a taxonomist has a specimen in front of him, and questions to which species it belongs, described or not. His hypothesis is tested using comparative morphology, species distribution data, molecular analysis, or any other available tool, and by comparing his specimen with other related organisms. If it is stated that the specimen belongs to an undescribed species, it is described, named and published, and to stabilize nomenclature, a type specimen is selected, assuring that the name reflects an adopted standard within a range of variation. The validity of the established hypothesis (in this case, the validity of the species identification, being it new or not) can be tested by other taxonomists, as it is possible to predict that other specimens sharing the same characters belong to the same species.

Whenever the observation of other organisms is done, the hypothesis can be either corroborated or refuted. Each time a new specimen is observed, species are tested, and the confidence one has in a species hypothesis is directly proportionate to the extent to which that species has been tested. This way, the taxonomic study at the species level (alpha-taxonomy) is as scientific as any other biological discipline, representing each species description a hypothesis about the discontinuous distribution of unique combination of characters (MAWATARI, 2004; WHEELER, 2004).

In spite of the explained above, attacks on taxonomy and morphology include misunderstandings that stem from this supposed non-experimental nature of taxonomy, as well as from the preferential support for new technologies, competition for limited resources, and a cynical equation of success with money (WHEELER, 2004; WHEELER & VALDECASAS, 2005; WHEELER & VALDECASAS, 2007). Therefore, the origin of the problems related with the poor reputation of taxonomy seems be more of the sociological and political forum than of a real scientific nature.

The shortage of specialists and funding for taxonomy is not new, and was already felt more than fifty years ago (*e.g.*: HEDGPETH, 1955; BARNARD, 1958; WHEELER, 2004), affecting especially the smaller or less popular groups of organisms (CHACE, 1955). The same problems diagnosed then are repeated today, the situation just has gone worse. LEE (2000) summarized perfectly the actual drama affecting taxonomy and taxonomists: taxonomists are disappearing just when they are most needed, in the present context of Biodiversity Crisis, in which humans are driving a bigger proportion of the world's species to extinction than they have ever done before, with the extinction pace still increasing. This means that it is necessary to accelerate and make more efficient the whole process of taxonomic exploration, discovery and description of organisms, but not only the necessary scholars to make this acceleration possible do not exist today, but also they are not being trained for the future (RAVEN, 2004).

According to COTTERILL & DANGERFIELD (1997), no more than 2,000 taxonomists worked full time worldwide, with perhaps another 5,000 with some taxonomic expertise, while other authors estimated this number to oscillate between less than 6,000 (WILSON, 2003) to about 7,000 (BLACKMORE, 1996). Besides, this number of taxonomists is biased, with some small groups of organisms with expected few undescribed species (like mammals) being covered by many taxonomists, while other groups formed by vast numbers of species, many of which still undescribed (like the biggest part of invertebrate groups), receive proportionally little or no attention at all (GASTON & MAY, 1992; SIMONETTI, 1997; MACE, 2004). For instance, in 1992 the USA had about 50 mammal specialists to cover the approximately 4,000 known mammal species, while for marine groups with similar number of species – like corals (4,000) or bryozoans (5,000) – there was probably half that number of taxonomists in the entire world (WINSTON, 1992). Besides, the geographical distribution of taxonomists presents a mismatch between geographical location of researchers and of biological diversity, with taxonomists being located mainly in North America and Europe, while biodiversity is higher in the tropical regions (GASTON & MAY, 1992; MACE, 2004).

Molecular studies are being presented as an alternative to the present lack of morphological taxonomic experts. Such works are important and necessary, but so are morphological studies, as they generate the biggest part of the existing knowledge on the anatomy, biology and distribution of species, and produce almost entirely the necessary information to generate the biodiversity patterns on which conservation decisions rest (LEE, 2000; MACE, 2004). This information is lacking for a great amount of invertebrates, many of which belonging to new taxa and with potential interest for human activities, but the actual shortage of taxonomists does not enable their study and description. Besides, to be of use to most biologists and general public, descriptions and diagnoses of most species need to state outstanding morphological features, rather than molecular sequences, and only the morphological taxonomists that are lacking today have the expertise to generate such information.

This problem is usually known as the *Taxonomic Crisis*, and it is the culminate result of many factors, some of which interrelated:

(1) **Uniqueness of taxonomic knowledge** – Morphological taxonomists are unique specialists. Normally they are dedicated to a single or a reduced number of groups, as the morphological complexity of a particular group of organisms is hardly applied to a very different one (the morphological knowledge of nematodes can be hardly applied to beetles, for instance). There are few courses that explicitly teach how to collect and interpret morphological data, and knowledge is generally acquired with accumulated experience (LEE, 2000), or by working directly with an experienced specialist.

(2) **Lack of taxonomic expertise** – There is an increasing shortage of taxonomic experts in all fields of taxonomic research, as many are retiring, aged or moving from taxonomy to other activities, and are not replaced by new taxonomists (*e.g.*: GASTON & MAY, 1992; PARNELL, 1993; WHEELER, 1995, 2004, 2008; VECCHIONE & COLLETTE, 1996; BARBOSA & GALDEAN, 1997; COTTERILL & DANGERFIELD, 1997;

SIMONETTI, 1997; JARVIE & STEVENS, 1998; RAVEN, 2004; WINSTON, 2007). Some taxonomical groups are so poorly represented in terms of specialists that a few deaths or retirements, or the appearance of a few enthusiastic new specialists, can change drastically the number of described species in those groups (WINSTON, 1992). When a specialist retires, many times it is impossible to find someone to continue his work, as the narrow specialist skills of such workers discourage new recruits to do taxonomy. In general, young taxonomists understandably favour disciplines with better job prospects, such as molecular biology, where skills are generic and flexible, and funding easily available. For instance, in molecular biology, protocols for sequencing a particular gene in one organism can be often applied, with minor variations and effort, to different genes and species, while in morphological taxonomy specialization does not enable such versatility (LEE, 2000). Without special programs and funding to support the formation and future employment of new taxonomists with a particular training in morphology, molecular taxonomy and systematics are naturally preferred.

(3) **Taxonomists as overworked and underpayed specialists** – Taxonomists remaining on work face increasing workloads and vast backlogs of specimens (BEATTIE & OLIVER, 1994), being also among the most overworked, underpaid and under-appreciated scientists in biology, having permanent demands for computerized data, taxonomic keys, identification services, specimen loans, destructive sampling for molecular analysis, museum displays and information for reporters and public (GOTELLI, 2004; WINSTON, 2007).

(4) **Taxonomists long training period and career instability** – It is difficult, expensive, and time consuming to train new taxonomists (see WHEELER, 2008). The training period of a taxonomist is long, and such a specialist is hardly skilled after only 4-5 years of undergraduate/graduate courses, or the typical three-year project grants. This discriminates them against scientists with short specialist training. Besides, there is a shortage of faculty to train new taxonomists, and training is often weighted and biased towards molecular rather than morphology, and ignores expertise in other important fields, like field identification (basic in numerous studies, like community ecology and many monitoring programs), collecting and collection management (BLACKMORE, 1996; BARBOSA & GALDEAN, 1997; JARVIE & STEVENS, 1998). The only way to provide the career stability necessary to produce good taxonomists is to support long-term positions in museums and universities (LEE, 2000), something hard to achieve without a special program.

(5) **Unsuitable funding of taxonomy** – It is difficult to obtain resources for taxonomy (basically funding), and such resources, when existing, have suffered severe cutbacks, from both public and private funding institutions (SOULÉ, 1990; PARNELL, 1993; WHEELER, 1995; BLACKMORE, 1996; FROESE, 2000; GODFRAY, 2002, 2007; MALLET & WILLMOTT, 2003; WHEELER, RAVEN & WILSON, 2004; MARTENS & SEGERS, 2005). Besides, taxonomists have a long tradition of being poorly competitive for resources dedicated to the exploitation of biodiversity, in spite of being eager to contribute, many times almost for free, to wealthy projects that exploit their knowledge (BOERO, 2010). At the same time, laboratory space and jobs go to those who can bring the largest grants and projects to research institutions and centers, those that result in the greatest amount of overhead or profit brought to such centers (SCHMIDLY, 2005; WINSTON, 2007). For this reason many recognized taxonomists derive their careers to other disciplines and abandon taxonomy, due to their need to provide funds for their research, studentscx and institutions.

(6) **Limited spread of taxonomic outputs and achievements** – Information generated by taxonomists is many times difficult to reach, understand and use by non-taxonomists, being usually too technical and with a very specific jargon that makes it hard to employ by a wider public (VECCHIONE & COLLETTE, 1996; BARBOSA & GALDEAN, 1997; JARVIE & STEVENS, 1998; GODFRAY, 2002; GODFRAY & KNAPP, 2004; WINSTON, 2007). Examples of this problem is the difficulty that non-taxonomists have to find, for a given species, the currently valid scientific name and spelling, as well as synonymies (FROESE, 1999) or existing bibliography for that same species.

(7) **Overweight of morphological taxonomy** – It has been a common practice by many taxonomists to understand species only morphologically, without consideration of any ecological aspects, and most invertebrate taxa has been described solely based upon preserved material with little or no associated ecological information. This information is an important aspect to characterize species and a fundamental data resource for non-taxonomist users, like conservationists (BARBOSA & GALDEAN, 1997).

(8) **Taxonomy's poor image** – There is the image of taxonomy as a tedious and dusty discipline, just engaged in describing as many species as possible, and contributing very little to other scientific

disciplines in their effort to solve problems, both of fundamental and applied nature. Besides, many taxonomists do very little to reverse this image, and often see the description of organisms as the endpoint of their research, regardless of why their activity is necessary (MARTENS & SEGERS, 2005), or what the society that pays them (and is reducing the funding for their activity) expects and needs in return. Taxonomists need to explain why what they do is exciting, relevant, and important, stating clearly both the rigorously testable and the purely descriptive aspects of their science. They also need to elucidate that even if the immediate needs to solve current problems drive some basic taxonomic research, it is also important to assure the increase of taxonomic knowledge just by following curiosity (WHEELER & VALDECASAS, 2005). Finally, taxonomists need to recognize and promote the importance and uniqueness of their work (LEE, 2000; BOERO, 2001), instead of locking themselves in their labour and cabinets, mourning about their bad luck and how misunderstood they and their work can be.

(9) **The molecular harassment** – As a consequence of the anterior point, morphological taxonomy is many times viewed as something old fashioned and out of date, that should be replaced by new approaches, ignoring or minimizing the costs that such a replacement could cause. More specifically, there is an increasing pressure from molecular taxonomy to replace morphological taxonomy and seize in exclusivity its already limited resources, spreading the erroneous idea that molecular data is more complete and reliable than morphological data ("*molecular good, phenotypic bad*"). Morphological data is increasingly regarded as an optional accessory to molecular phylogeny, rather than an essential component of our understanding of species and their relationships and diversification (WHEELER, 2008). Moreover, it is alleged that morphology provides few characters by comparison with molecular sources, and that its complex characters are inconveniently difficult to interpret and unacceptably subjective in their analysis, forgetting that most molecular phylogenies are published without characters at all (WHEELER, 2008). The main reason for such statements against morphology seems to be the fact that molecular data can be readily obtained for any group of organisms with little effort, time and cash, after an initial investment in technology, whereas good morphological data cannot be so easily obtained, requiring more time to get. This way, molecular data is favoured and encouraged in a progressively frantic scientific world that praises speed and fashion in publication, independently of the quality and relevance of the final work.

As stated by LEE (2004), "*Instead of training biologists who can identify, observe and study organisms in the field, it* [molecular taxonomy] *could instead train technicians who can only identify organisms after grinding them up and feeding them into a machine*". It is essential that biologists can relate gene sequences to the anatomy and biology of the pertinent organisms, using species descriptions compiled by trained whole-organism biologists, like morphological taxonomists (LEE, 2004). The reduction of morphological work means that existing morphological hypotheses remain untested, erroneous homology assessments are perpetuated, and new morphological characters are undiscovered (WHEELER, 1995, 2008). As pointed by BOERO (2010), it is necessary to know both genotypes and phenotypes, and to make sure that the obtained molecular sequences can be referred to a species that was correctly identified.

(10) **The species concept and the nomenclatural turmoil** – The endless debate and numerous definitions concerning the species concept (*e.g.*: REGAN, 1926; CLARK, 1956; MAYR, 1969; MALLET, 1995; WILSON, 1999; MALLET, 2000; SITES & MARSHALL, 2003; FITZHUGH, 2005; WHEELER, 2007; WHEELER & VALDECASAS, 2007), together with the numerous nomenclatural changes in the taxonomic classification of species, consequence of the increasing knowledge of organisms' diversity (see KNAPP *et al*, 2004 for an overview of the evolution of international codes of nomenclature), promote the general feeling that taxonomy is very volatile, unstable, and even unpredictable.

Nowadays there is a general consensus that the 250 years old Linnean taxonomic system shows many limitations and is not suitable to display the whole phylogenetic relationships between organisms and reflect the evolutionary processes as known today. Alternative proposals to the Linnean system that aim to reflect these phylogenetic relationships and increase nomenclatural stability have been presented. Among these are the phylogenetic nomenclature (PLEIJEL & ROUSE, 2003; PLEIJEL & HÄRLIN, 2004), with its own PhyloCode (DE QUEIROZ & GAUTHIER, 1990, 1992, 1994; DONOGHUE & GAUTHIER, 2004), the Least-inclusive taxonomic unit, or LITU (PLEIJEL & ROUSE, 2000*a*; PLEIJEL & ROUSE, 2000*b*), or the use of uninomials instead of binomial species names, in order to reflect only monophyletic groups (PLEIJEL, 1999).

As expected, and in spite of being theoretically well supported, such proposals have provoked a wave of criticism and no consensus has been reached on which of the proposed alternatives (if any) is the best solution for each of the existing problems. Part of this criticism is concerned with the possibility (and in fact reality, already) of two (or more) nomenclatural codes existing and competing together to govern the rules of naming organisms and their relationships (SLUYS, MARTENS & SCHRAM, 2004). Besides, many authors do not agree on the necessity of an alternative to the present binomial nomenclature. However, the biggest criticism to the new proposals, not only by taxonomists but also by taxonomy users, is the general feeling that all the existing taxonomic names and ranks, that are well established for a long time, will have to be replaced by new ones, increasing the confusion and the difficulty in using taxonomic information just in a moment when such problems could be lighten with the use of informatics, open online resources and databases (*e.g.*: GODFRAY & KNAPP, 2004; KNAPP *et al.*, 2004; WHEELER, 2004). This would be an unfounded fear according to DONOGHUE & GAUTHIER (2004), as all the names that currently refer to valid clades should remain on use. In what concerns uninomials, the great advantage of their use, in spite of the lost of phylogenetic information present in binomials, is precisely to separate them from those phylogenetic hypotheses, so nomenclature should become more stable. However, criticism to the adoption of uninomials and the PhyloCode states that even if Linnean ranks are not 100% perfect, they enable to recognize natural groups of taxa, as they nest some hierarchical structure of the phylogeny, and this helps humans to organize their understanding of the diversity (GODFRAY & KNAPP, 2004; WHEELER, 2004).

Concerning nomenclature stability, some authors argued against the PhyloCode, defending that changes in classifications and names are desirable reflections of the growing phylogenetic knowledge, that categorical ranks are useful to express the degree of inclusivity of particular taxon names, and that nomenclatural stability would be achieved at the expense of information content on cladistic relationships (DOMINGUEZ & WHEELER, 1997; WHEELER, 2004). In spite of these arguments, and of the fact that nomenclatural changes are the necessary consequence of taxonomy being a living and progressing science, they are seen by many taxonomy users as inconveniences that probably could be avoided or greatly reduced. In some cases, they are right.

A close problem many taxonomists find is the necessity to understand the taxonomic concept behind each name when reviewing alternative taxonomic treatments in literature (SCOBLE, 2004), especially when no type or voucher material from each of the revised works is available. The cause of such problem is that the same name can be applied to different taxa.

(11) **The bibliographic impediment** – The dual legal and scientific status of taxonomic papers (MINELLI, 2003), as well as some other peculiarities of the taxonomic bibliography also act as impediments for taxonomy. Taxonomic bibliography has a special idiosyncrasy. Normally, the use of older literature in science becomes increasingly selective with the cumulative progress of knowledge. One major exception to this common-sense use of scientific literature is taxonomy, due to the Principle of Priority, the main purpose of which is to resolve problems of synonymy and homonymy. Consequently, taxonomic papers have a legal value, being printed vouchers for internationally recognized nomenclatural acts whose relevance depends on the rules of the distinct codes. While the variable survival rate of the average scientific paper is expected to depend on the quality of its content and intrinsic scientific value, taxonomic papers last virtually for ever, with independence of quality, due to this legal value. The life of taxonomic papers can be calculated in decades, even centuries.

Thus, the relevance of old taxonomic papers remains the same over the time and they cannot be ignored in posterior works. Literature including original descriptions or nomenclatural changes affecting a certain taxon has to be considered, discussed, and referred, no matter the quality of the paper itself, whenever that taxon is studied in the future (unless a recent detailed revision of the group establishing the synonymies exists). Normally, reports on organisms need to be debated in further studies before being accepted or rejected, and even if rejected the paper where they were originally published cannot be ignored and has to be cited anyway, due to that Principle of Priority. This way, quality and relevance of taxonomic papers can be independent factors, and the quality of the journal does not constrains the number of citations, as it has to be cited, anyway (KRELL, 2000).

Another problem with zoological taxonomic literature comes from the fact that it is scattered by a countless number of works, published from 1758 to today, and edited in a myriad of places. Sometimes it is physically difficult or impossible to obtain access to one of the few existing copies of many old (and even not so old) works (MINELLI, 2003). The lack of official comprehensive listings of all these works for many taxonomic groups just worsens the situation, and the Zoological Record, in spite of covering the biggest part of the actual publications on taxonomy, does not cover all of them. Finally, the fact that these papers are written in a diversity of languages, using different alphabets, can make them intangible to many of its potential users.

In spite of all these problems, taxonomists are still reluctant in adopting a universally agreed framework for description and registration of new taxa, and it is possible to publish descriptions in any language without attaching a short diagnosis or justification of the new taxa or nomenclatural changes in an alternative idiom. Much worst, a small but significant number of publications are not peer reviewed at all, or have a very poor taxonomic quality (MINELLI, 2003; GODFRAY & KNAPP, 2004).

(12) **Harmful impact of unsuitable taxonomic research evaluations** – Normally, basic taxonomic work is not highly cited. The current methods for evaluating the research output and quality of publications and curricula are often based in counting the number of citations and measuring the short-term citation impact of publications (Impact Factor), through the Science Citation Index (SCI). This discourages the preparation of time-consuming detailed taxonomic treatises or works, which are not widely cited immediately after publication, but can become long-lived classics (LEE, 2000). Career development and peer recognition accrue more from papers in *Science*, *Nature* and other peer-reviewed journals scoring high in the rank of the SCI than from field guides, web pages, or identification handbooks (LYAL & WEITZMAN, 2004).

The number of authors that cite a taxonomic paper during the short period of time that the SCI uses for its statistics is relatively low. That number of citations depends largely on the number of taxonomists working in the same field, and whether these workers publish in taxonomic journals covered by the SCI. As for many groups of organisms there are at best a handful of extant specialists, the chance to be cited by colleagues soon after publishing a work is relatively low compared with other fields (KRELL, 2002; WHEELER & VALDECASAS, 2007). The most important impact of taxonomy is the use of monographs, identification keys and synoptic tables that enable non-taxonomists to identify and work with a certain group of organisms, but this use is generally omitted in the reference lists with the excuse of space restrictions, and hence a crucial impact of taxonomy is missed by citation analysis (KRELL, 2002; WHEELER & VALDECASAS, 2007). For all this, most of the taxonomic papers and monographs fail to reach the SCI, and by convention their impact is 0.00, though some exceptions do exist. As impact factors are used to evaluate scientific production and to assign resources, taxonomy is clearly in disadvantage (MINELLI, 2003; BOERO, 2010).

However, in spite of having a short-term low impact (or no impact at all), taxonomic works do have a long life time, and keep being cited for more than a century after their original publication, as old descriptions cannot be ignored just because they are old, due to the Principle of Priority (BOERO, 2001; see also the previous point). Sometimes taxonomists have to wait a whole generation in order to be heavily cited, which is not reflected in the SCI (KRELL, 2002). It has no sense to judge taxonomy according to the SCI method of analysing the citations made during the preceding two years, as in taxonomic papers only a reduced percentage of the bibliographic references has less than two years (KRELL, 2002). Moreover, as covering all scientific papers is expensive, journals that receive almost no citations within two years after publication have no or very low impact factor, and are considered not worth to be covered (BOERO, 2010). Therefore, papers resulting from taxonomy are rated low in the SCI, even when published in high-quality specialist journals, and are unlikely to impress managers or funding agencies (VALDECASAS, CASTROVIEJO & MARCUS, 2000). Because of low citations, there is reluctance to fund such kind of work, as many funding organizations expect in return high-impact outputs of cutting-edge science being published in key journals (LYAL & WEITZMAN, 2004). Fewer journals are also willing to publish taxonomy, as a short-term low impact of the journal can represent less advertisement funds, and this worsens the situation.

Briefly, the main problem is that the SCI is not an appropriate index to judge taxonomy, as it does not meet the requirements of the SCI for a meaningful judgement. Other methods to evaluate the relevance of taxonomic publications are necessary, and should be found and used.

(13) **The lack of expert journals** – There are a limited number of journals in which taxonomists can publish monographs or describe new species, as they require many pages for descriptions, illustrations, keys, and exhaustive bibliographic listings (MINELLI, 2003; GODFRAY & KNAPP, 2004). Therefore, it is not rare that important and even fundamental taxonomic works are published as a book, instead as a journal paper, but some of these books are not covered by the Zoological Record.

Besides, there is a lack of core journals for general taxonomy, species descriptions, revisions of genera, identification keys or inventories (KRELL, 2002). The number of journals accepting morphological taxonomy in their pages is reducing. Many others that used to do it are now accepting mainly molecular taxonomy, relegating morphological taxonomy to electronic supplements, or covering only the most mediatic cases from extreme or unusual environments, and peculiar or bizarre taxa, especially when accompanied by supporting material as photos and films of the specimens in the wild.

The shortage of trained professional taxonomists and the lack of taxonomic information generated by them (field guides, web pages, identification handbooks, monographs, faunas or floras) are seen with great concern in other fields of research, such as population biology, ecology, evolution, conservation, or molecular genetics. One of the affected fields is community ecology, where it is necessary to identify hundreds of specimens at a single study site. According to GOTELLI (2004), in community ecology research the most pressing needs for taxonomic information (which are shared with other research fields) include: (1) ***usable taxonomic keys*** – taxonomic keys based on morphological characters, needed for species-level identifications; such keys should be copiously illustrated, with diagnostic characters, and the illustrations should be physically adjacent to the text descriptions; interactive keys, like the generated by DELTA programs, are preferred, but dichotomic keys can also be largely and usefully used; (2) ***current nomenclature*** – it is needed an updated and comprehensive database with species names, including a historical record of previously used nomenclature, so that present lists can be easily compared with those generated in the past; (3) ***species occurrence records*** – there is a need to access collections in order to compile species occurrence records with spatial and temporal data physically associated with the specimens or collections; and (4) ***resolved phylogenies*** – there is a need to know the current classification of species and have a resolved phylogeny illustrating sister taxa and the phylogenetic status and species relationships.

As stated previously, the needs for taxonomic information are shared by numerous research areas, like species conservation (MACE, 2004) or biomonitoring (CRANSTON, 1990). However, the shortage or lack of professional taxonomists is being seen as a threat to this effort (GOTELLI, 2004; MACE, 2004). Community ecologists, conservationists and researchers in other fields are the first to benefit directly from investigation in systematics and taxonomy, and by actively seeking training, information and collaborations with taxonomic specialists.

Morphological versus Molecular Taxonomy?

The recent boom on molecular systematics has been accompanied by a plea to replace morphological taxonomy by molecular taxonomy, or at minimum to give a greater weight to methodologies like DNA barcoding for species identification, in detriment or as an alternative to morphological taxonomy (HEBERT, RATNASINGHAM & DEWAARD, 2003; HEBERT *et al.*, 2003; TAUTZ *et al.*, 2003; BLAXTER, 2004; JANZEN, 2004*b*; HEBERT & BARRETT, 2005; HEBERT & GREGORY, 2005; GODFRAY, 2007). This plea generated a wave of criticism defending that the two are not necessarily exclusive, and could and should perfectly complement each other instead (SEBERG *et al.*, 2003; LIPSCOMB, PLATNICK & WHEELER, 2003; DUNN, 2003; KNAPP *et al.*, 2004; LEE, 2004; WHEELER, 2004, 2005, 2008; WHEELER, RAVEN & WILSON, 2004; WILL & RUBINOFF, 2004; EBACH & HOLDREGE, 2005*a*, 2005*b*; WILL, MISHLER & WHEELER, 2005; BOERO, 2010). In fact, taxonomists have long preferred a multi-character integrative approach combining, synthesizing, interpreting and summarizing all useful sources of information in their classifications and descriptions, using as much data as possible (WHEELER, 2004, 2005, 2008; WHEELER & VALDECASAS, 2007), in what is now called ***Integrative Taxonomy*** (DAYRAT, 2005; WILL, MISHLER & WHEELER, 2005; WHEELER, 2008). The most important point is to integrate towards a common goal, which is to make high level taxonomy, all the relevant data generated by many different sources of taxonomy and biodiversity, taking advantage of the expertise, passion, skills, diligence or knowledge of everybody involved in the process, without the necessity of the full range of data being generated by each taxonomist (WHEELER, 2008).

The two systems of identification and classification (morphological and molecular) should not be seen as competing against each other or exclusive, but rather as approaches to the same goal which simply differ in the characters they consider (DAYRAT, 2005). One system or the other can be the best solution for particular cases, depending on the needed or possible approach and the results it provides. For instance, molecular taxonomy may provide a workable method of identifying taxa that just did not existed, in such groups as prokaryotes and some eukaryotes, like nematodes (BLAXTER, 2004; GODFRAY & KNAPP, 2004). However, morphological and molecular data should be used concurrently for identification. This way, instead of being replaced by it, morphological taxonomy can be (and in fact has always been) greatly improved by the use of molecular data in general, not only by DNA barcoding or other DNA techniques, but also by karyotypes, fatty acid profiles, RNA profiling, protein structures and so on. In fact, it is becoming routine to complement the traditional comparison of form and structure with DNA sequences and other molecular data to discover natural groups that share a common ancestor, and this way to enable predictions about the occurrence of shared properties, as can be the drought tolerance or toxicity, in species with interest for humans (BLACKMORE, 1996).

In the case of DNA barcoding, it can be a useful and quick taxonomic tool (HEBERT & GREGORY, 2005; SCHINDEL & MILLER, 2005), but it has also theoretical and practical limitations (*e.g.*, LEE, 2004; WILL, MISHLER & WHEELER, 2005; WHEELER & VALDECASAS, 2007; BOERO, 2010). In the same way that a single morphological criterion cannot be used to define or identify a species, and many characters must be used, a species identification cannot (or should not) rely in a single gene sequence (MALLET & WILLMOTT, 2003). When standardized by the number of phylogenetically informative characters, morphological data uses to provide equal or greater support than does molecular data (BAKER, YU & DESALLE, 1998). This result, combined with the fact that morphological characters generally exhibit higher consistency, indicates that such source of character information continues to be useful in systematic and taxonomic studies despite the increasing volume of molecular data available (BAKER, YU & DESALLE, 1998; WHEELER, 2008). Even when phylogeny alone is considered, and in spite that major changes in phylogenetic relationships among the main lineages of metazoans have been suggested by comparative molecular data, a careful assessment of comparative developmental data has been sometimes important in generating, or supporting, new phylogenetic hypotheses (MINELLI, 2007), in such a way that comparative morphology must not be overlooked.

Molecular techniques have overthrown only occasionally the existing taxonomies based exclusively on morphological analysis, confirming normally those taxonomies. However, the most progress is achieved by comparing and combining morphological and molecular data (GODFRAY & KNAPP, 2004). In addition, a pure molecular taxonomy risks to disaffect or disenfranchise a great amount of amateur taxonomists, an increasingly important working force in taxonomy, especially in groups such as vertebrates, flowering plants and the more charismatic insects, groups that are popular due to their morphology (GODFRAY & KNAPP, 2004). The same applies to many experts in developing (and on developed) countries that will not have access to large-scale molecular facilities or expertise in the near future (GODFRAY & KNAPP, 2004). This way, more than speaking about morphological or molecular taxonomy, it is advisable to speak only in taxonomy that uses different methods in order to attain its main purpose, the identification and knowledge of organisms. It is beyond question that molecular techniques will be central to understand evolutionary relationships, but taxonomy is more than phylogeny, it also includes description and identification facets, and they should be seen to compliment rather than to compete with each other (GODFRAY & KNAPP, 2004).

Theoretical advances in taxonomy have made classifications predictive, hypotheses of species and characters testable, and names highly informative (WHEELER, 2004, 2005; WHEELER & VALDECASAS, 2007). Nothing of these can be replaced by the single application of arbitrary genetic distances as an identification tool, which is merely applying knowledge derived from other fields of taxonomy and systematics, and generating very little new knowledge *per se* about the identified taxa. As stated by WHEELER (2004, 2008), DNA, as well as morphology, is simply data. At the end, this information has to be complemented by an integrated study of that taxa and their properties, with a great component of ecology, physiology, ethology and, obviously, morphology and comparative zoology. In a hypothetical future world where fundamental taxonomy has been largely completed through integrative methods, molecular identification could provide cost-effective tools for the identification of known species and a clue as to additional species level units, but still it would not be a serious approach to species discovery, hypothesis-testing, phylogeny, or classification (WHEELER, 2004; WILL, MISHLER & WHEELER, 2005). DNA barcodes can only work if all species have their ‘diagnosis’ sequence(s) present in the database. An incomplete database will simply allow users to determine whether a given sequence is different or close from others already stored, but will not identify the specimen in question alone, nor will automatically imply that a different specimen is a member of a new species (DAYRAT, 2005). Morphological taxonomists will still be needed to describe and name the new species, to clear the synonymies, or to improve existing descriptions, so in spite of being a very helpful technique for identification, without integration with traditional taxonomy, DNA barcoding will be probably a poor tool (BOERO, 2010). Finally, there are some fields where it will be not possible to use molecular techniques, and where morphology is fundamental. For example, morphological features enable field biologists to observe organisms in the nature without the need of destructive sampling, morphological characters are the only bridge to link fossils to recent species, and morphological characters are frequently the object of natural selection (WHEELER, 2008).

Still, molecular techniques are a very helpful and powerful complementary taxonomic toll, not only to identify species and to investigate phylogenetic relationships between taxa, but also to elucidate particular cases that can hardly be solved by the sole use of morphological methods. This way, they are very useful in detecting if a particular species is introduced from a certain alien population, unveiling the complexity of sibling or synonymous species, verifying the cosmopolitan status of particular species, establishing if two different morphotypes are hiding a sexual dimorphism, identifying fragments of specimens, or setting up the correspondence between larval and juvenile stages, and between these and adult specimens, to cite just a few examples (*e.g.*: PROUDLOVE & WOOD, 2003; MILLER *et al.*, 2005; WHEELER & VALDECASAS, 2005). Besides, molecular techniques can be used in numerous applications with implications for biodiversity conservation. DNA barcodes, for instance, can be a valuable technique to fight the illegal trade of endangered species.

An integrative approach to taxonomy is thus necessary, as the complexity of species biology requires the study of species boundaries from multiple, complementary perspectives (DAYRAT, 2005). As stated by DAYRAT (*op. cit.*), "*Collaboration between disciplines such as phylogeography, comparative anatomy, population genetics, ecology and behavioural biology should become standard practice in taxonomy. All biologists who produce data that help delimit species boundaries are taxonomists, or at least 'integrative taxonomists'*." Due to the recent decline in morphological taxonomy, overwhelmed by the recent progresses and developments of molecular taxonomy, it is necessary to make an effort and start educating the next generation of morphological taxonomists, in pair with the new molecular techniques, before much of the previously known knowledge of morphology is lost to science. Besides the new molecular advances, new morphological characters must be explored and documented, and existing ones revisited and tested under a new light, as the vast majority of morphological hypotheses are but rarely tested (WHEELER, 2008).

Natural History Institutions and their Role in the Study of Biodiversity

The role of Natural History Institutions (NHI), including museums, botanical gardens and zoos, is vital in the preservation of the Earth's biodiversity and its knowledge, playing a central leadership position in future research and perspectives, as centers of taxonomic excellence (ALBERCH, 1993; MORIN & GOMON, 1993; WHEELER, 1995, 2004, 2007; LANE, 1996; BROOKE, 2000*a*; MIKKELSEN & CRACRAFT, 2001; GRAHAM *et al.*, 2004; SUAREZ & TSUTSUI, 2004; WINKER, 2004; WINSTON, 2007). Besides, NHI were traditionally the place where the best and most extensive descriptive taxonomy was completed (WHEELER, 2004). They are also the depositary of large natural history collections of preserved and living life forms, representing both the existing and the extinct diversity of organisms. It is vital that these specimens and samples, often collected at much effort and financial cost, are conserved, maintained and made available for future research by NHI (MACKIE, 2001*a*). These preserved materials are unique, representing situations at a particular time and place, and thus irreplaceable (MACKIE, 2001*a*).

The perception that natural history museums are institutions intellectually stagnant and even anachronistic is very common (ALBERCH, 1993). However, this perception is far from reality. As highlighted by MIKKELSEN & CRACRAFT (2001), collections hold by NHI and generated by simple and routinely systematic inventories or biodiversity surveys enable the discovery and description of new species that have medicinal, agricultural, or other economic uses, and also provide a permanent scientific record for documenting patterns of diversity and endemism across habitats and ecosystems, an essential information for identifying and establishing conservation priorities (*e.g.*, MACE, 2004). They also provide baselines for monitoring programs and can identify indicator species of environmental changes in habitats and ecosystems (MIKKELSEN & CRACRAFT, 2001; COTTERILL, HUSTLER & BROADLEY, 1994). Furthermore, collections of frozen or liquid nitrogen preserved material are increasing, being a safeguard of the biochemical and molecular value of specimens, taking advantage from the technological progresses in the preservation of such material for future uses. The Svalbard Global Seed Vault is a good example of a natural history collection adapted to the present day necessities and concerns, preserving the actual plant diversity for future applications.

Due to the present rate of extinctions, NHI collections are our only insurance policy against biological ignorance in the future. Samples of species that do become extinct will be the equivalent to perfectly preserved 'fossils', with an enormous interest for biology and its various research fields in the future (WHEELER, 1995). They will also preserve unique specimens of the surviving species, as NHI's collections hold the only permanent and verifiable records of species-level biodiversity (what it is, where it was found, when it was recorded, why it was there, when it was collected for the first or last time) (COTTERILL, HUSTLER & BROADLEY, 1994; WHEELER, 1995; MIKKELSEN & CRACRAFT, 2001). Without these records, there would simply be no prospect of assessing historical changes in the distribution of organisms (BROOKE, 2000*a*). With base on the existing collections, like time series collections, it is possible to document events such as the spread of introduced taxa or the decline of native species, and relate such events with other phenomena. In addition, many specimens preserved in NHI's collections would be impossible to collect again due to the destruction of sites and habitats, and many more are unique today due to restrictions on collecting certain groups or in certain places, restrictions that did not exist when the specimens were originally collected (WHEELER, 2004; WINSTON, 2007). Besides, in cases where the specimens could be recollected whenever necessary to support research, the cost would be huge compared to the price of maintaining them and increasing the existing collection over time (WINSTON, 2007). Finally, botanical gardens and zoos maintain in captivity living specimens of species gone extinct from the wild, and act as reservoirs of genetic diversity for other species with wild extant populations.

Preserved natural history collections may represent an inadequate sample of past and present biota, but many times they are the only identified and authenticated sample available (BLACKMORE (2002).

This way, NHI's collections store and preserve for future research type material of newly described taxa, voucher specimens associated with published taxonomic papers, drawings and detailed photographs of specimens, and large amounts of curated material, collected by the staff of NHI or donated by external workers and institutions, dried, fixed, frozen or alive (like cell lines or living cultures), identified or not, from such distinct sources as scientific expeditions, monitoring studies, systematic inventories, exchanges with other NHI, accidental findings, or from seizures of illegal trade. Examination of type material deposited in NHI is the only reliable way to avoid the superfluous redescription of taxa already known to science and the misapplication of names (KNAPP *et al.*, 2004). NHI collections are also the place where any and all specimens or tissues used in generating molecular data for publication, like in phylogenetic studies, should be deposited, to enable the repeatability of the obtained results through the review or reexamination of specimens, should any question arise regarding their nature, provenance, taxonomic identification, or other (RUEDAS *et al.*, 2000; PLEIJEL *et al.*, 2008*b*).

Voucher specimens deposited in NHI's collections are important, as they are the essential basis of revisionary studies, and enable the application of new technologies to their analysis in the future. Many taxonomists, when revising material, prefer to see directly the identified specimens than rely solely in their published descriptions. So, NHI also harbour the necessary collections for comparative purposes, as basic descriptions always require reference to other type material, especially when new characters are tested against traditional data sets (MARTENS & SEGERS, 2005). Only a small portion of the stored collections in NHI is studied prior to their deposition, but even in these cases, and as seen above, their potential is enormous, and not only in what concerns the possible description of new forms of life. Non-studied collections can be stored for future identification and research, whenever the conditions for their investigation are more favourable or possible. Hence, records of the biodiversity patterns and life forms existing at the collecting date and locality are preserved for future applications, some of which not conceivable today. The use of techniques such as scanning electron microscopy was not even imaginable when many specimens that are studied today using these techniques were first deposited in NHI back in the 18th, 19th, or even 20th century.

This way, and according to COTTERILL, HUSTLER & BROADLEY (1994), voucher specimens maintain biological knowledge, as accuracy and applications of specific facts ultimately depend on preserved specimens, taxonomically classified to communicate verifiable information. Thus, more voucher specimens are needed for taxonomical and systematic investigations. Insufficient specimens, even of widespread common taxa, hinder research to understand biological variation in space, time and form. Besides, it is also important to fill in the gaps in the existing collections (WINSTON, 2007), in order to cover all the areas of the biological diversity and evolution. On the other hand, the recognition and description of some particularly rare species is only possible through the reunion of the reduced number of available specimens that were deposited and curated in scattered collections of NHI in the course of the years. Collecting and identifying specimens are the foundation of the methodology of systematics and taxonomy, and fundamental to all biology (COTTERILL, HUSTLER & BROADLEY, 1994). Natural history collections play a unique role in the whole process, by preserving the material generated by and necessary to systematics and taxonomy.

Material deposited in natural history collections can also play a basic role in the detection of recent extinctions (CARLTON *et al.*, 1999). Many species were inadequately described according to the present day standard levels, as originally it was not necessary to distinguish them from many similar forms. In the absence of type material or voucher specimens, many of these inadequate described species (especially those not collected since the nineteenth century or earlier, and for which no museum material exists) are usually assumed to be: (a) completely unrecognizable taxa not assignable to a known species (but which, it is further assumed, could probably be so assigned if the description had been better); or (b) barely or questionably recognizable taxa that are placed in synonymy with extant taxa based upon the best judgement of a taxonomist (CARLTON *et al.*, 1999). Museum material is a very valuable and fundamental resource to elucidate such cases, and to evaluate if the absence of records of a certain species may be due to a poor original description or to extinction.

The particular case of large donations derived from environmental survey programs was discussed by MACKIE (2001*a*, 2001*b*), concerning studies carried out in the marine benthos mainly for the oil and gas industry, but that can be extended to other studies. These surveys are important, as they produce a great amount of information concerning biotic assemblages, their species compositions, abundance, distributions, and so on. Many times this material stems from previously unstudied areas, which increases its value. Besides, the generated volume of material can be very important, but many times these specimens are not readily available to specialist taxonomists, who may not even be aware of their existence. Many of the contractors that perform such kind of surveys store the material only for a certain time after the completion of a contract (*e.g.*, 5 years), after which it is generally discarded. It is desirable that such collections are deposited, whenever possible, in suitable institutions like Natural History Museums, even if they consist in bulk samples. However, this material can have also some associated problems that should be taken into account and discussed between the donator and receptor before being deposited, like ownership, scale, value (monetary and scientific), storage, maintenance, accessibility, and subsequent use (see further details and proposal example in MACKIE, 2001*b*).

Besides the intrinsic value of the deposited material, NHI collections offer huge possibilities due to all the information that normally is (or at least should be; RUEDAS *et al.*, 2000) associated with the deposited specimens and their collecting: geographical location of collection, date and season of the year, environmental information, habitat, host, behaviour, and so on (SNOW & KEATING, 1999; WHEELER, 2004). SOBERÓN & PETERSON (2004) showed that specimens with accurate geographical data are an important resource for many user groups in answering a wide range of biological questions, including issues in conservation biology as the discussed by MACE (2004). The application of a number of algorithms to the existing data enables the estimation of niches and distributional areas of species, with an increasing resolution, in a research field known nowadays as ***Biodiversity Informatics***. There are some limitations resulting from erroneous identifications, faulty georeferencing, and outdated taxonomy, but the availability of that data enables the detection and correction of such limitations through the participation of an active community of taxonomists (SOBERÓN & PETERSON, 2004).

As seen, NHI own large databases compiling taxonomic, systematic and ecological information on species and their habitats (NATURE, 1998). These and other data associated with specimens and collections, such as photos, videos, sound records, genetic information, and many more, can be also deposited in NHI collections and linked to voucher specimens. NHI also hold historical archives involving field biologists and staff from the NHI themselves. These archives may include collector's field notebooks, reports or journals (containing from simple lists of collected specimens, with date, site, and collection number, to pertinent comments such as ecological situation, weather, species abundance, observed behaviour, invasive and threatened species, comparisons with earlier studies and other areas, evolutionary and biogeographical conclusions, local land disturbances – fire, landslides, earthquakes, floods... – successional notations, and so on), catalogues, correspondence (before the digital era, letters used to be lengthy, with in-depth discussions), photographs (historic photographs are becoming increasingly valuable, as they reflect ecological patterns resulting from natural and manmade impacts), sketches and illustrations (many times made from living species in the wild, with indication of colour patterns), and field maps (often indicating collecting routes and specific sites) (BEIDLEMAN, 2004; RODMAN, 2007). Fisheries agencies, for instance, without being strictly a NHI, do have large databases on the occurrence of species, many of which economically important, that are being made more easily available for other users, through digitization (VECCHIONE & COLLETTE, 1996). Such databases can provide a current and retrospective picture of biodiversity to detect any occurring changes, in the same way they provide information for resource management.

In addition to research, museums and other NHI also have an important educational task, showing the richness of biodiversity, and the relevance of maintaining it, in either NHI locations or taken directly into schools or other educational centers by NHI staff. For children and adults, exhibits using collections help to promote awareness of taxonomy, natural history diversity and conservation, while for graduate and post-doctoral level students working with museum specimens is an important part of their training as new taxonomists (WHEELER, 2004; WINSTON, 2007).

Museums and NHI also employ many of the present day taxonomists on work, playing this way a key role in solving the current lack of taxonomists, by being training centers of new specialists. NHI also publish, or have published, many of the journals and monographic-series that have shown to be excellent vehicles for the publication and propagation of taxonomic results for centuries (MARTENS & SEGERS, 2005), and have greatly contributed to a significant amount of the actual knowledge of the biodiversity on Earth. Finally, NHI archives have a great historical and biographical value.

WINSTON (2007) resumed in ten arguments the value to science and society of the collections holded by NHI: 1) they support research in many disciplines; 2) they are non-renewable resources; 3) they are cost-effective; 4) they play an important role in human medicine, public health, and security; 5) they can be used to monitor climate change and predict its effects on species success; 6) they can be used to demonstrate biological differences and/or changes in genetic diversity; 7) they can be used for research on the history of a discipline; 8) they can educate new generations of students; 9) they have aesthetic importance (note that NHI also include botanical gardens, zoos, and aquariums); 10) they are the foundation for taxonomic research and the study of biodiversity.

In spite of their central and irreplaceable role in biodiversity studies, there is a lack of resources to expand, or even to maintain the over 3 billion specimens estimated to be preserved worldwide in natural history collections and representing the records of yesterday and today's World known biodiversity, which are deteriorating due to lack of funding to hire curators and buy curating material, with irreplaceable specimens being lost every day (WINSTON, 1992; COTTERILL, HUSTLER & BROADLEY, 1994; WHEELER, 1995; COTTERILL & DANGERFIELD, 1997; NATURE, 1998; SUAREZ & TSUTSUI, 2004). This lack of funding also affects the digitization of the existing collections, to help their preservation and to increase their accessibility to a wider public of users (BLACKMORE, 1996).

According to ALBERCH (1993), the main causes why natural history collections have not been properly appreciated and are consequently underfunded are loose compilation criteria, absence of unified data standards, and failure to identify new potential users. Nevertheless, other reasons are also present, such as the lack of a reliable quality control of the information holded in NHI collections, with many of it being redundant, incomplete or duplicated, and with many NHI focusing only on their own collections and working in isolation (NATURE, 1998). NHI are also being pushed away from their leadership position in taxonomy by two other reasons (WHEELER, 2007): first, funding to do molecular genetics, ecology or conservation is much more easier to get than funding to do taxonomy; and second, many museum directors, who often have little or no background in collections-based taxonomic research, have as a primary job fund raising, so there is another tendency to go for non-taxonomy funds. This way, NHI are not doing what they can do better than any other institutions: taxonomy and species exploration, based on their unique resources, their collections (WHEELER, 1995, 2007).

Holders of natural history collections need to play a more dynamic role in education and development of research leading towards the understanding, conservation and sustainable use of biodiversity (ALBERCH, 1993), giving to society the products it needs, and attracting this way the funding NHI need. However, museums must remain museums, without abdicating of their main *raison d'être*, to investigate and educate with base on their great collections, instead of turning into biological theme parks and give what the public thinks it wants in order to be entertained (WHEELER, 1995, 2004). As defended by WHEELER (1995), museums should initiate, and not follow, research trends, and use exhibits to educate the public about why systematics and taxonomy is exciting, relevant and worthwhile. Besides, they should also hire excellent taxonomists instead of experimentalists, and meet this way the responsibility of leadership that comes with custodianship of collections. The international biodiversity funding should also give high priority to the maintenance and further development of museums and other NHI, and their research and publication activities (MARTENS & SEGERS, 2005), as well as to the digital organization of their resources, to guarantee the preservation and easy accessibility to such rich collections and data.

All the pointed problems are receiving appropriate responses from NHI worldwide, which are promoting their unique and essential contributions to document biological diversity, organizing digitally their collections, becoming more dynamic in their expositions and activities in order to promote public interest, providing unique services for an outside community of users increasingly aware of the great potential relying in NHI collections, and turning into centers of scientific excellence based on their own research. Finally, NHI are more aware of the problem of how to fund taxonomy, and are organizing into working networks and consortiums to reach a consensus on priorities and to devise appropriate strategies to lobby international funding agencies.

As seen, NHI's collections play a vital role for science and society, in areas as different as homeland security, public health and safety, monitoring of habitat loss and environmental changes (affecting both distribution and biology of species), biological invasions, and traditional taxonomy and systematics, and their existence save governments and taxpayers a huge amount of money by guiding government spending, preventing catastrophic events in public health and safety, eliminating redundancy, and securing natural and agricultural resources (SUAREZ & TSUTSUI, 2004). Many of these researches are best performed at the NHI themselves, illustrating the great vitality of such institutions. The large number of yearly loans of specimens deposited in NHI collections, as well as the many papers in the most prestigious journals in the fields of ecology and evolutionary biology that rely on museums for data and reference material (SUAREZ & TSUTSUI, 2004) are also a good indicator of the dynamism of natural history museums and institutions.

The Future of Taxonomy

"*Taxonomists generally support the continuance of discovering, briefly describing, and naming new forms on four bases* [...]. *These are (1) that it contributes to the advance of other biological disciplines such as zoogeography, (2) that it may uncover or contribute to our understanding of economically or medically important organisms, (3) that it contributes to our understanding of evolutionary phenomena, and (4) that it adds generally to our picture of organic diversity and therefore has intrinsic merit*" (EHRLICH, 1964).

As commented above, only a small fraction of Earth's life (about 1.9 species of eukaryotes) has been so far described, from an estimation ranging from 3.6 to several tens of million. However, only about 10,000 distinct new species are described each year (MAY, 2004; 15,000-20,000, according to BUTLER, GEE & MACILWAIN, 1998), from which it is necessary to discount the posterior recognized synonymies (which attain levels as high as 20% or more among some groups of insects; GASTON & MOUND, 1993). If we consider the total number of existing species of eukaryotes as being 7 million, at the current rate of description it would be necessary an additional 510 years to describe the rest of the species (in fact, maybe less, as many of these species will be extinct by then, given the current extinction rates). The rate of new species discovery can be greatly accelerated in the future by using new technological and molecular advances, but still there is the work of describing and picturing the new species. However, even if the time necessary for the identification of a collection is greatly reduced, the rate-limiting step in the task of completing the catalogue of life on Earth will remain the skill of collecting specimens in the field, increased by the fact that it will be gradually more difficult to find new species once the catalogue is closer to be complete (MAY, 2004).

In reality, it seems almost impossible to describe all the remaining taxa. For this reason SOULÉ (1990) suggested the establishment of research priorities. This way, (1) for relatively unknown groups, research should be concentrate on a few taxa that could represent the phyletic, morphological, biogeographic, and ecological patterns of the whole group; (2) focus should be made on ecologically keystone and indicator taxa and their mutualists; (3) systematic work should focus on phylogenetic relicts or other evolutionary outliers (like oligotypic marine phyla or the last representatives of genera and families that are about to disappear); (4) systematic work should focus also on local endemic taxa inhabiting vulnerable environments (like estuaries, coral reefs, boreal mountain tops in low altitudes, or tropical forests); (5) finally, it is necessary to develop new approaches for describing and classifying species. GASTON & MOUND (1993) also stated that much of the available taxonomic resources are employed to support studies in fields such as agriculture and medicine, so that the remaining taxonomic descriptive effort in the field of conservation of biodiversity should be targeted (1) upon a few selected groups, (2) on a few selected areas, or (3) on a few selected systems.

As it will be seen in the following pages, the future of taxonomy relies not only in some important decisions on defining research priorities, but also on the application of new developing technologies to achieve those priorities. More than the current trend concerning the application of molecular techniques to taxonomic research, the new technological advance that probably will contribute more for those achievements is internet. Internet supplies a fast evolving medium to provide access to information currently distributed across published paper-based or digital literature, unpublished archives, curated collections, and personal or institution databases (SCOBLE, 2004). Besides, access to such information can be very easy and cheap, accessible from anywhere there is a connection to the web (or downloaded and used whenever there is no permanent connection), and new information can be consulted as soon as it is generated, at the same time that old information can be updated on real time. Not only all this information will be permanently available online, but also it can be easily searched, located and used, by an increasingly connected community of taxonomists and non-taxonomists, who at the same time can provide feedback to improve the already available resources.

In order to promote a wider appreciation of the value of taxonomy and to avoid duplication of efforts in some areas, some authors defend the necessity of the taxonomic community to come together and define and prioritize a series of big and conspicuous taxonomic projects that are achievable over the next decade or so, with a clear research agenda and using the resources available now, no matter if new or old (GODFRAY & KNAPP, 2004; SCOBLE, 2004; WHEELER, 2004, 2007; WHEELER & VALDECASAS, 2005; GODFRAY, 2007), transforming taxonomy into Big Science (WHEELER, 2004). These projects should be neither too big and ambitious, to avoid failure in progressing, nor too specific and only relevant for the taxonomic community, so other taxonomy user communities can also appreciate the final achievements of such projects (GODFRAY, 2007). WHEELER (2004) proposed a 5 year set of attainable goals, integrating individual taxonomists, museum collections, and cutting edge technology into a research platform that is comprehensive and resilient. This 5 year plan could be revisited with fanfare annually, with successes highlighted and a rolling set of goals, driving the attention of other research communities, funding agencies, politicians and public in general to taxonomy.

Possible approaches to the solution of the taxonomic crisis are numerous, and many times, they complement each other. Some of these approaches include the use of parataxonomists (people lacking formal high-level education but trained to undertake taxonomic tasks; GASTON & MAY, 1992; ALBERCH, 1993; WHEELER, 1995; JANZEN, 2004*a*; SHEIL & LAWRENCE, 2004, and references therein), or new technological advances, such as digital resources with all the information on previously and newly recorded species, or interactive keys based on DELTA programs, that enable "keying-out" species against a coherently organized database (GASTON & MAY, 1992). The term ***Taxonomic Minimalism*** was proposed by BEATTIE & OLIVER (1994) to designate a series of methodologies that enable to allocate taxonomic resources more efficiently in biodiversity assessment, environmental monitoring and ecological research, especially including (1) the use of higher taxonomic ranks, (2) the use of morphospecies (OTUs – Operational Taxonomic Units – or RTUs – Recognizable Taxonomic Units) rather than formal species, and (3) the involvement of taxonomic specialists only for training and verification of the work done by parataxonomists. Taxonomic minimalism accepts that a formal identification of the species may never be completed or it may even be impossible, and for this reason it looks for taxonomic alternatives for a series of research and monitoring activities (BEATTIE & OLIVER, 1994). However, it also states the necessity to store voucher specimens, so a morphospecies can be later verified and identified by a specialist, enabling that the specialist concentrates his efforts in a more reduced amount of material, and focusing this effort in rare or endemic morphospecies, for instance.

The automated species identification is also being presently developed to provide a valid tool for routine identification of specimens of previously described species, so the main taxonomic effort can be focused in more fundamental revisionary and descriptive activities (GASTON & O'NEILL, 2004). This automated species identification is based in the digitization of images of specimens and on special software that is able to distinguish among different known species. At present the techniques work better with two-dimensional structures such as wing patterns and venation of insects, but in principle they could use three-dimensional images, as has been recently employed with considerable success in paleontology (GASTON & O'NEILL, 2004; GODFRAY & KNAPP, 2004). In spite of some technical and practical obstacles yet to overcome, and some vision and enterprise constraints, the present progress in automated species identification is very encouraging and such an approach has the potential to become in the near future a valid and valuable contribution to routine identifications (GASTON & O'NEILL, 2004).

Other technological advances are taking place that will enable to study, document, analyse, visualize and communicate findings in comparative morphology. Digital microscopy, computer-assisted tomography, databases such as MorphBank (www.morphbank.net; see below) and MorphoBank (www.morphobank.org), visualization tools, and many other advances are developing very quickly, and will help morphology and morphological taxonomy to increase their information content and to test more rigorously their hypotheses (WHEELER, 2008).

ERWIN & JOHNSON (2000) proposed a new paradigm that provides for rapid validation of new taxonomic names through minimal publication space, with additional extensive use of internet to store and transmit more complete details and images. This would shorten the period of 9 to 12 months that a typical paper has to spend in order to receive the appropriate peer review and to be published. According to this paradigm, descriptions of new taxa should be as short as possible, being kept to the most salient characters such as autapomorphies and recognition traits, and highlighting the most important diagnostic traits that will enable recognition and discrimination of a new taxon from its nearest relatives. At the same time, illustrations should be restricted to the salient structures essential for recognizing the new taxon. A complete and detailed description of all the anatomical, morphological, and other traits, as well as additional illustrations, should be published on internet, as accessory material.

Other proposal to relieve the situation is ***Unitary Taxonomy*** (UT) (GODFRAY *in* GODFRAY & KNAPP, 2004; SCOBLE, 2004). In Unitary Taxonomy, a first web revision of a taxonomic group would list and describe a series of accepted and unaccepted taxa, explicitly linked to type specimens, and these would become the set of names available for that group. Nomenclature would essentially begin again for that group, as happened for the prokaryotes in 1980 (GODFRAY & KNAPP, 2004). Thus, a single authoritative classification, to which the relevant specialist taxonomic community subscribes, is established, being widely and freely accessible in internet and promoting a stable nomenclature, associated to type specimens. Whenever an older name is identified afterwards to the accepted version of the web publication for any taxon (or the then current *n*th version of the web revision), it would fall into disuse, being considered as unavailable, at the same time that it would be mandatory to register any new name. The decision on what names should be accepted would lie on the taxonomic community and its peer review system, but the natural administrative bodies of such unitary systems would be large museums and herbariums, institutions associated with holding big collections (SCOBLE, 2004). The advantages of the UT were discussed by SCOBLE (2004), and would include a better, more dynamic and free access to a bigger amount of better quality information using internet, information that would be centralized in a single peer reviewed site. At the same time the gathering and adoption of lists of species names is expected to liberate taxonomists from endless and purposeless issues on nomenclature, allowing them to concentrate on more important subjects concerning the identification, description and classification of organisms, the still most demanding necessity of taxonomists. Such sorts of revisions are the kind of projects able to attract funding and to be achievable in relatively short periods of time. Even if there were a lack of consensus by the taxonomic community to adopt lists of names or on which names to adopt, this would not undermine the idea of providing web-based revisions on a single internet site (SCOBLE, 2004). As possible disadvantages, SCOBLE (2004) points the extra costs associated with administration of Unitarian Taxonomies, the necessity to produce special software to handle them, the risk of cliques of taxonomists imposing their collective will on the broader community, and the disenfranchisement of those without access to computers and internet. With the adequate funding, the increasingly spread of internet, and the adequate establishment of authoritative rather than authoritarian controls of such revisions, through taxonomic coordinators, UT can be a step forward in relieving the present taxonomic crisis, and give a reply to the needs of other communities of researchers, as expressed by MACE (2004) for conservationists.

Besides the problem of the great number of species awaiting description, taxonomists have to reply to numerous other tasks and problems, as seen above, from giving response to the increasing demands from other fields of research, to training new taxonomists and parataxonomists in order to keep taxonomic expertise in pace with the necessities (or at least to avoid a collapse of the situation). This way, the work and responsibilities of present day taxonomists can be divided in three main tasks:

1) ***Investigation***: through the description of new taxa, cataloguing of the diversity of life on Earth, the identification of available or newly collected material, creation of inventories, establishment of research or conservation priorities (protection of endangered habitats or key species), preservation of large samples drawn from the field in various types of collections (as voucher specimens labelled properly and deposited in recognized repositories, forming a permanent record of the identification and occurrence of species in a particular region and providing material for future research), etc.

2) ***Teaching***: train new taxonomists, give support to scientists in other research fields with their identification doubts, organization of identification workshops, seminars or symposia, peer review activities, etc.

3) ***Divulgation***: make the results of taxonomic investigation easily accessible to a wider public, through the publication of peer-reviewed journals, monographies, Faunas and Floras, identification guides, by the creation of user-friendly tools for non-specialists, like interactive keys or databases, etc.

Alarmed with the recent threats to taxonomy and their work, taxonomists have started to look for ways to demonstrate the broader value of their discipline, notably to ecology, evolution and conservation of biodiversity. Furthermore, many have responded by making taxonomic data available in a more appropriate way to users other than taxonomists, including keys or synoptic tables in their papers, or by creating and collaborating on online taxonomic resources, like WoRMS (www.marinespecies.org), or ERMS (www.marbef.org/data/erms.php), just to cite two examples applied to marine fauna. Some authors support that taxonomy, and especially alpha taxonomy, should be primarily focused on taxonomic groups important for including endemic or endangered species, as well as on those of ecological and economic value (GOLDING & TIMBERLAKE, 2003), but in a general way the choice of the group to work on still relies more on emotional factors, like personal likes and dislikes, on the guidance of a taxonomic adviser or teacher (when there was one), or simply chance, than on an objective or rational choice or purpose.

It is also being assumed that the important task of taxonomists includes not only the description of the variety of extant and extinct organisms, but also that this investigation must be focused in such a way that society and institutions that are funding that investigation are aware of its results and of the interest in keep financing it. One of the most direct ways to do this has been by showing the relevance of taxonomy for humans and human activities, as well as for the maintenance of biodiversity, and why this is important, as illustrated by numerous examples (*e.g.*: WHEELER, 1995; OLIVER, 1996; ROSSMAN & MILLER, 1996; VANE-WRIGHT, 1996; NOVACEK, 2001; GODFRAY & KNAPP, 2004). The fact that taxonomy helps to identify the vector of a disease, to find a biological control for a plague, or to recognize species that produce compounds with applications in human health or nourishment, are just a few examples that can be given on the big relevance of taxonomy for humanity.

The need for taxonomy to reinvent itself, taking advantage of the new information technologies to gain a new and bigger projection and occupy a place as a leading science, has been largely discussed and defended in recent years (*e.g.*: EDWARDS & MORSE, 1995; GODFRAY, 2002, 2007; WHEELER, 2004, 2007). This has resulted in an emerging new field, named ***Cybertaxonomy***. Cybertaxonomy embraces the traditional purposes of taxonomy, adding the missions to network specimens, experts, instruments, data, literature, and other research resources into the same virtual locality (on internet), and also to organize experts into coordinated international taxonomic communities, to share and to expand our knowledge on biodiversity (WHEELER, 2007). It is being taken into practice with the production of an increasing number of user-friendly digital resources, many of which freely available on internet, as well as the creation and development of interactive identification tools and expert systems. There is a current effort to digitize both bibliography and collections, and to make them more easily accessible for a wider public. “Virtual herbaria”, with digital good quality photographs of type specimens already exist (WILSON, 2003), and the same is expected to happen shortly with other collections of animals and plants, and very especially with type specimens, making them available to a wider range of users in an easier and safer way (KNAPP *et al.*, 2004). GODFRAY (2007) proposed the creation of a new form of type specimen, a cybertype, to be displayed on the web using the best current methods, often superior to normal examination, and for which appropriate molecular sequence data would be available. With the new technologies these cybertypes could be even easily observed in 3D high resolution screens, providing all types of details to the observer. Besides, computer-aided techniques could be expected to cut substantially the effort and cost of describing and picturing the Earth’s diversity (WILSON, 1986).

However, one important aspect that must be taken into consideration is that such resources require funding, both to create and to maintain. The desire of cheap and freely available taxonomic resources must not hide the fact that such resources must be created and maintained by taxonomists, who are highly specialized biologists, and that their work needs to be paid, like the work of specialists in any other branch of the scientific knowledge. Besides, expenses in taxonomic work are numerous: researcher’s time, supplies, maintenance, amortization of equipment, charges for use of specialized equipment (SEM, TEM, molecular sequencing), page and publication charges, shipping of specimens, curation, assistant’s salaries, training for students and postdoctorals, development of websites for databases, descriptions, keys, classification, etc., salary of a webmaster to produce them, and so on (SCHELTEMA *in* WINSTON, 2007).

Besides these initiatives, other schemes have been (or should be) taken in order to counteract the actual situation, and to fight some of the causes of the actual taxonomic crisis commented above. Without following any particular order, some of these proposals are commented below:

(1) **New taxonomic platforms** – Several formation schemes have been created to stop the decline in taxonomic expertise and reverse the situation, with the formation of new taxonomists, and the search of new ways to increase funding for taxonomy. It has been already shown how quickly taxonomic expertise can be generated even in groups where it was scarce with such formation schemes, and strategic plans with networks to implement them have been established in many regions of the globe (BLACKMORE, 1996, 2002). The current growth of taxonomic and systematic capacity in tropical countries, where the biodiversity in bigger, is compensating the observed decline of specialists in the industrial countries (BLACKMORE, 1996). Besides, many of these new formation schemes are prioritising (and in fact many of them are doing it) the neglected taxa, taxa with few or no specialists at all worldwide (WHEELER, 1995). Some of these initiatives are here shortly discussed.

The National Science Foundation (NSF, www.nsf.gov) of the USA launched in 1995 the program Partnership for Enhancing Expertise in Taxonomy (PEET), to form new taxonomists, to conduct monographic research, and to build computer infrastructure in biodiversity science, especially in groups of poorly known organisms or with a reduced number of specialists (RODMAN, 2007). A PEET taxonomist is a blend of a traditional morphological systematist and a molecular specialist, that works in projects that are detailed revisions of taxa, and include the study of existing literature, type specimens, and newly collected material, the molecular analysis of specimens belonging to as many nominal taxa as possible, the solution of synonymies, and the production of phylogenetic analysis based both on morphological and molecular data (BOERO, 2001).

More recently (in 2004) the NSF called for proposals for Revisionary Syntheses in Systematics (REVSYS), including strictly morphology-based revisions (WHEELER, 2004, 2007), using modern information technology at all stages, from data capture and analysis to electronic presentation and dissemination of results. In addition, the Biodiversity Surveys and Inventories programme, the programme specifically charged with supporting the discovery of new species, had an increase in its budget (WHEELER, 2004).

Alternative initiatives include funded national or local inventories (listings of all the organisms in a defined area) and surveys (methodological explorations of an area in order to discover the species that live there) that promote taxonomical and biodiversity studies in a guided way, in order to fill gaps and avoid duplication of efforts (MINELLI, 1994; WHEELER, 1995; MIKKELSEN & CRACRAFT, 2001; WHEELER & VALDECASAS, 2005), and which results are expected to spread to neighbouring countries. This case includes the Swedish Taxonomy Initiative (www.artdata.slu.se), which aims to produce illustrated keys and basic facts concerning the distribution and biology of all the near 50,000 multicellular species present in Sweden, broading the knowledge base for the identification and monitoring of diversity, providing a rich source for schools, and significantly increasing the public awareness of local faunal and floral biodiversity and its conservation (RONQUIST & GÄRDENFORS, 2003). The initiative

Fauna Iberica (www.fauna-iberica.mncn.csic.es; see also RAMOS, 2007) aims to study the whole fauna present in the Iberian Peninsula, with a special emphasis on the Spanish geographic region, country financing the project and origin of the biggest part of the authors involved. However, monographs so far produced under the scope of this project are being also largely used in the neighbouring countries to identify their own faunas. It is clear that any initiative to promote taxonomical studies in a area have an application not only in its area of origin, but also in the bordering countries of the same biogeographic region, which share a great portion of the fauna and flora.

A curious initiative to fund systematics and taxonomy is BIOPAT, a German non profit organization led by the Federal Agency for Technical Co-operation. Against a minimal donation that ranges actually (October 2010) from 2.600 to 3.000 Euros, a patron or sponsor, that can be an individual or a multinational corporation, can name a new species at his choice, from a gallery of unnamed species available at BIOPAT's website (www.biopat.de). Half of the money of each donation goes to the institution where the species was studied, and the rest is to be spent on protecting biodiversity in its country of origin. To avoid that money can pressure researchers to describe as new species that have already been described before, BIOPAT does not offer an unnamed species to be financed unless the description of the species is already accepted for publication in a peer-reviewed journal or approved by a BIOPAT advisory committee (STEGHAUS-KOVAC, 2000).

One more programme that also envisages to overcome the actual biodiversity and taxonomic crisis is the Catalogue of Life (www.catalogueoflife.org). It aims to organize the available information on existing species into an electronic global framework, to accelerate the discovery of unknown life forms, to make usage of new technologies like Internet or genomic data for the dissemination of knowledge and investigation, and to elaborate the electronic Encyclopedia of Life (www.eol.org) (WILSON, 2003).

Other initiatives include SYNTHESYS (http://www.synthesys.info/home.htm), designed by the European Union to finance the management, preservation and access to the collections of 20 leading European natural history museums, universities and botanic gardens, housing 337,204,000 specimens, 4,058,500 of which type specimens; the EDIT (European Distributed Institute of Taxonomy; http://www.e-taxonomy.eu), a consortium of 29 European, North American and Russian institutions that form a network in "*Taxonomy for Biodiversity and Ecosystem Research*", and which overall objective is to integrate the European taxonomic effort and to built a world leading capacity, with a virtual centre of excellence to increase both the scientific basis and capacity for biodiversity conservation; or the LINNE (Legacy Infrastructure Network for Natural Environments; http://www.flmnh.ufl.edu/linne/), the goal of which is to accelerate taxonomic research and improve biological collection infrastructure so that reliable information on biological diversity is available to all branches of science and society.

Besides all these initiatives (and many others), it is important that taxonomists work with students, to assure the training of the next generation of specialists, and volunteer to teach a class or at least give some lectures in introductory classes, and also that university curricula incorporate and expand once more taxonomic studies, including joint programmes with museums where complementary taxonomic expertise exists (WHEELER, 1995; WHEELER & VALDECASAS, 2005).

(2) **Innovative taxonomic tools** – The need of updated taxonomic tools has become increasingly evident in the actual scenario of taxonomic crisis, and as stated above there is a general outcry that this taxonomic information should be made easily available to a wider public, and preferably obtained from online phylogenetic and taxonomic resources. There are increasing pleas for more user-friendly illustration-based keys or identification guides, handbooks and monographic revisions, a greater use of CD-ROM or other digital outputs and, notably, use of Internet to make pictures and other data more widely accessible (VECCHIONE & COLLETTE, 1996; SCOBLE, 1997; GODFRAY & KNAPP, 2004; WHEELER, 2004).

Taxonomy is ideal to include a large amount of illustrations (in fact, it needs them), to support and complement the text descriptions, and these illustrations are a basic tool in morphological taxonomy and comparative zoology. Emphasis on illustrations is wholly in line with the recognition that society is adopting an increasing image-based system of communication, and images are also the best way to communicate diversity and to grab most people attention to taxonomy (RODMAN, 2007). However, due to space limitations, speed in publication and other reasons, few illustrations are normally used in the works been published currently (like the present one). On the other hand, in what concerns the identification tools, the conventional dichotomous keys can have a limited application, presenting characters in a predefined order, with users having a reduced or no control at all over what character to use at any point of the identification process (JARVIE & STEVENS, 1998).

As explained by JARVIE & STEVENS (1998), the answer to all these questions comes with an increasing use of informatics as a taxonomic tool, the cybertaxonomy commented above (WHEELER, 2007). Computerized identification tools are in essence lists of characters for all the taxa they include. The characters can be accompanied by pictures and explanatory notes to help the user to understand what characters are. Interactive keys are an appropriate tool for the identification of organisms, and have important advantages over dichotomous keys that counteract the biggest effort needed for their preparation. A package of programs called DELTA is on the basis of most of these interactive keys. They allow the user to exploit any character in the key in any order, according to the traits that can be recognized in the specimen at hand, no matter how incomplete they are, and the key automatically eliminates taxa according to the entered traits. Even if the user runs out of characters, the key already has filtered out some possibilities, generating a subset of possible taxa (JARVIE & STEVENS, 1998). Most of these keys are complemented with illustrations of important features and representative species for each genus, as well as descriptions of the genera (derived from the database underlying the key). Finally, they can be linked to full illustrations and descriptions of each species, type of habitat, conservation status, georeferenced information on the occurrence of the species, museum collections where types and other material are deposited, databases like GenBank or MarinLit, bibliographical references (as in the Biodiversity Heritage Library), and so on, being the possibilities numerous. Besides acting as identification tools, interactive keys can also function as important research, educational and environmental tools.

Another important problem is that existing publications become out of date whenever classifications or nomenclature change, new species are described or old ones are synonymised or reinstalled. It is then necessary to wait for updated publications (in case they appear), but it is costly either to edit and to buy them when published. Sometimes it is difficult for non-specialists to follow and integrate changes and additions into works already published, and specialists rarely have the time or support to do so (JARVIE & STEVENS, 1998). Computerized or digital interactive keys provide a solution also to this problem, as they can be easily updated. Moreover, it is possible to receive feedback from the users of such keys, suggesting modifications and pointing out errors or overlooked and missing taxa or bibliography. This way, keys and descriptions can be easily and quickly corrected, almost on real time, and new digital versions prepared for distribution, either on internet or on physical support, as unlike a book, computerized keys are not static. As pointed by JARVIE & STEVENS (1998), interactive keys are not only scientifically appropriate, but where basic equipment is available, affordable.

As perfectly explained by MARTENS & SEGERS (2005), taxonomists and funding agencies should recognize that identification aids and tools for use in applied studies, whether published classically on paper or as web-based or digital resources, present an essential (and highly searched) product of taxonomic research. On the other hand, users (like ecologists) should be aware that these aids and tools are not necessarily the essence of taxonomic research but are produced specifically to answer to their needs and, if they want to make use of these products, should be willing to reward taxonomists for their work both scientifically (by citing them properly) and financially (MARTENS & SEGERS, 2005).

As discussed by WHEELER (2004, 2007), electronic publication or cybertaxonomy can be the answer to some of today's taxonomic problems. With mechanisms for peer review and quality control in place, electronic publication will allow a new kind of taxonomic publication. It will be possible to create monographs in which species, after peer reviewed and accepted, are instantly accessible in diagnostic keys and checklists, with exhaustive information associated (WHEELER, 2004). Besides, users may access either to the full up-to-date version or to design a virtual publication according to his needs (WHEELER, 2004).

(3) **Updated and easily accessible taxonomic databases** – On the line with the anterior point, there is an increasing emphasis in the elaboration of taxonomic inventory databases, which has lead to a steady rise in the number of large taxonomic datasets and, less well appreciated, efforts to organize and make available taxonomic data on a global basis (WHEELER, 1995; SCOBLE, 1997; WHEELER & VALDECASAS, 2005). According to SCOBLE (1997), to gather such large datasets is time-consuming, not only because of the magnitude of the task, but also because taxonomic collation is not simply an exercise in keyboarding, demanding much validation and nomenclatural research. One particular type of inventory was proposed by WHEELER (1995), the All-Biota Taxon Inventory (ABTI), which selects a taxon and explores it whenever it occurs on Earth, with numerous benefits both for the study of that particular taxon and to the whole taxonomic community and taxonomy users.

GOLDING & TIMBERLAKE (2003) pointed the necessity that taxonomists translate and package taxonomic information into a format that is meaningful to other users, as conservationists (see also MACE, 2004), and to ensure that this information is updated regularly, as discussed above. This can and is being done in several ways. Data on species distribution is being gathered with base on collections and the collecting data associated with specimens, and such information enables, for instance, to predict the occurrence of certain species in still unexplored regions, and to protect such areas in accordance. Some of this data refers to misidentified specimens, which can lead to false portrayals of distribution (SCOBLE, 2000; SÓBERON & PETERSON, 2004; WHEELER, RAVEN & WILOSN, 2004), but on the other hand the availability of that data will make easier for the next researcher to track down those records, have access to the actual specimen, and correct its identification (BROOKE, 2000*b*). In cases related with species specially vulnerable or rare, like species that can be submitted to illegal trade, there is a general agreement in that such information should have a restricted distribution in order to protect the species, instead of making it of public domain (BROOKE, 2000*a*, 2000*b*; GRAVES, 2000; MACKIE, 2001*a*). Similar restrictions can be applied in cases like the related with the privacy of the collector or donator, with intellectual property rights, or others. In these cases data would be obtained only by direct application to the appropriate curator (MACKIE, 2001*a*; SOBERÓN & PETERSON, 2004). Many NHI accept to establish restrictions to the loan or access of donated collections by third parties, for agreed limited periods of time that can be extended to additional ones. This way, the material in preserved for future research, and the privacy or confidentiality of the donator respected.

Many museums and other NHI are cataloguing and digitizing their collections, in general making them available online and complemented with further information on the deposited specimens, collecting data and illustrations. Due to the huge size of this task, GODFRAY & KNAPP (2004) suggest the need to establish priorities, with emphasis placed on certain categories of specimens (*e.g.*, types or extremely fragile historical but still relevant specimens), and on taxa where information is particularly useful. Checklists and inventories are being compiled at several levels, from local or regional to whole geographical regions, basins, seas or continents. This is done with base not only on published and unpublished data, but also on deposited and newly collected material. Catalogues, checklists, and inventories are useful tools, as they enable researchers and managers to compile information on the distribution and ecology of selected species. If the information is supported by the deposition of voucher specimens in collections, the study of such material gives the opportunity to verify dubious distributions or records, to detect variations or clines in the distribution area of certain species, or to notice the presence of sibling species. A regional inventory is also a powerful tool to conduct new sampling in the region, by covering poorly known habitats or geographic areas in order to gather new information to complete and correct the previous knowledge, and to keep a register of the short and long term temporal changes in the faunal diversity of the area.

All these information can be updated almost on real time, whenever a correction or change in databases is done, or complemented by further data, and all the changes can be easily traced back, if necessary. Specimen collections and their databases are unavoidably imperfect, and require taxonomic and geospatial updating and verification. However, these improvements are in progress and at the same time the verified collections' data are being used for analyses of environmental and societal phenomena, such as the spread of invasive and disease species, biosecurity, and the effect of climate change on species distributions and conservation (CAUSEY *et al.*, 2004; MACE, 2004; SOBERÓN & PETERSON, 2004).

(4) **Appropriate taxonomic outlets and publishing funding** – Morphological taxonomy needs its classical outlets for publication, due to the great numbers of pages necessary to include both relevant illustrations and lengthy bibliographic lists (MARTENS & SEGERS, 2005). This has been succeeded by some journals that maintained the publication of taxonomic works, and by the creation of new ones, like *Zootaxa*, that use the digital format as the basic way of edition and distribution, reducing greatly the costs of publication. There are also pleas to produce open access online taxonomic revisions and monographs publishing high quality descriptive taxonomy (WHEELER & VALDECASAS, 2005). It has also been shown that a relatively small injection of money aimed at publishing completed manuscripts can produce immediate results, increasing dramatically the rates of publication of monographs. Such an effort should be considered as a priority for research funding (PARNELL, 1993).

(5) **Taxonomic networks** – More collaborative work is needed, between teams of taxonomists, to elaborate monographs, revisions, and knowledge bases (WHEELER & VALDECASAS, 2005). The pool of taxonomic expertise and resources can speed up the elaboration of monographs or revisions with no concession in quality, and also can ease the gathering of a well curated collection of the targeted taxa.

(6) **The usefulness of a taxonomic *lingua franca*** – MINELLI (2003) proposed the adoption of English as the *lingua franca* in taxonomy, together with the use of the electronic forms of communication. English as the taxonomical *lingua franca* was also proposed by MCNEILL (1997) in botany, as an alternative to the mandatory necessity to give Latin diagnoses for the establishment of new taxa names. MCNEILL (1997) defended that the use of English was not a matter of chauvinism but a simple reflection of the reality that it is the dominant language of science at the end of the 20th and beginning of the 21st century. In fact, the predominant role of English as the *lingua franca* in zoological taxonomy has not stopped to increase in the last two decades, and at present more than 85% of the published works describing new taxa covered by the Zoological Record are written in English (personal observations). This denotes that

English has become *de facto* the *lingua franca* of zoological taxonomy. If other languages are preferred to publish, at least a short diagnosis or justification of the new taxa or of the nomenclatural changes present in the work should be attached in English.

(7) **The nomenclatural debate: alternatives and stability** – It is difficult to reach a consensus on species concepts, a fundamental question in the core of biology as a discipline. However, attempts should be made to achieve more taxonomic and nomenclatural stability and consistency, so that names are not continually changing, always an unpopular event for taxonomy users. At least some unnecessary new combinations can be avoided. For instance, whenever there are reasonable doubts concerning a new combination, it should be avoided (but the possibility commented) until more evidence exists in order to confirm or reject it.

Alternatives to the Linnean system have been proposed in order to reach nomenclatural stability, as the previously referred PhyloCode and uninomials, but they may have also some undesirable consequences, such as the loss of information content on cladistic relationships between taxa. For now, and in spite of the momentum that the PhyloCode and other proposals are gaining, at the users level the essential of the Linnean system is still being used. This way, the binomial species nomenclature is still retained over uninomials. As stated by WHITEHEAD (1972), binomial nomenclature implies an evolutionary statement, and epitomises this link in nomenclatural terms. It still fulfils a useful role in taxonomic and systematic communication and is preferred to other linguistic or numerical 'labels'.

The pragmatic, authoritative, regularly updated, widely available, and user-friendly systems where the many users of scientific names can quickly verify status and spelling, which necessity was supported by FROESE (1999), are becoming freely available online for an increasing number of taxonomic groups (like through WoRMS website). As claimed by GOLDING & TIMBERLAKE (2003), these lists are being updated on a regular basis, in order to take account of nomenclatural changes, new information, and users' feedback.

Finally, an effort must be made in explaining to taxonomy users that the complete absence of nomenclatural changes is artificial and unavoidable. These changes result from the ongoing growing knowledge about species and their relationships. New distinctive traits are uncovered with research, and changes reflect this new information, by transferring a taxon from a clade where it was originally described to another one where phylogenetically it is more correctly placed. Besides, the unveiling of synonymies and homonymies require name changes, according to the Principle of Priority, in both cases with the resulting nomenclatural adjustments (KNAPP *et al.*, 2004).

(8) **Use of standard terminology** – The language used in texts and other taxonomic supports for non-specialists must be carefully chosen. This language should be simple and avoid very technical terms and argot, which should be replaced, for instance, by the actual definition of those terms (JARVIE & STEVENS, 1998).

(9) **Compilation of expert databases** – Worldwide databases of taxonomists are being compiled, with research interests and taxonomic expertise, as well as addresses, as suggested by ALBERCH (1993). The main purpose of such databases (like the European EditExpertNet, www.editexpertnet.org) is to ease the access to taxonomic expertise worldwide, to identify areas in which training of new taxonomists is needed, and to create a network of local, national, and international collaborations, assistance and education.

(10) **Development of Image Banks** – The creation of a visual database similar to GenBank, was suggested (WHEELER, 2004; WHEELER & VALDECASAS, 2005). It would be formed by a library of high quality digital images of type or voucher specimens, which would be remotely accessible. It could be a basic research tool for routine observations and identifications, in order to compare specimens of a taxon throughout its geographical and ecological ranges. The travel to NHI to study their collections or the borrowing of that material would still be necessary at some level, but the purpose of many of such travels and borrowings could be achieved by remotely accessing images of the needed material. Publications or other taxonomic tools could be linked to this image database, which would provide an unlimited space to picture structure information. One database of this type is already available, named MorphBank (www.morphbank.net), but it still needs to grow to fulfil the expectations. Future possibilities in the virtual use of collection samples include the mounting of a specimen in a remote microscope, to be manipulated and studied virtually (WHEELER, 2004).

(11) **Increase taxonomic literature standards** – A workable electronic system for registration of taxonomic publications and data has been proposed, accessing all nomenclatural information, and giving

taxonomic literature higher standards of content and quality of presentation (MINELLI, 2003). For the moment, such a proposal has not been materialized, but it can be a powerful device in order to raise the quality of taxonomic work, and give taxonomy full recognition as high quality science.

(12) **Creation of suitable taxonomic Impact Factors and Citation Indexes** – It is needed a system assuring the appropriate citation of taxonomy and its products (WHEELER & VALDECASAS, 2005; WHEELER & VALDECASAS, 2007), and which is able to register the use of such products. Many taxonomy users employ taxonomic works to determine or verify the identity of species, quite often without citing the used bibliography. The online publication or availability of taxonomic resources makes easier to track, verify and count taxonomic use under all its aspects. With such a system available, it would be possible to detect how many visitors access and use web-based keys, monographs, or other resources, and even to know how many time spend in each of them (WHEELER & VALDECASAS, 2005). Such system could be also the base for a good alternative to the current SCI, which discriminates taxonomy in its present form, to calculate the impact of taxonomic products and publications.

An Index of Taxonomic Performance (ITP) was proposed by WHEELER & VALDECASAS (2007) to help measure numerically the value of taxonomic works, and to indicate the relative merit of one paper, besides its number of citations by other authors. This way, it could count the number of species studied (comprehensiveness), the inclusion of diagnostic and identification sections (utility), and so on. According to this method, a comprehensive monograph would obtain a high ITP, while isolated species descriptions would achieve a lower value, no matter if the work is published in a journal scoring high at the SCI or if it doesn't even have an Impact Factor. With the electronic publishing, it would be also possible to link taxa names to electronic publications through ZooBank, and to track the uses of such names in any biological publication, no matter if the author is cited or not (WHEELER & VALDECASAS, 2007).

(13) **Better communication with the media** – The communication with the media (newspapers, radio, TV, internet) must increase, to ensure a good coverage of important taxonomic achievements, as the discovery of new species that sometimes fill extremely important gaps in our knowledge of phylogenetic diversity, or the availability of important taxonomic resources. When news of new species are published, they are often received with enthusiasm by journalists and readers (WHEELER & VALDECASAS, 2005), from local to worldwide press.

(14) **Improve taxonomy partnership and corporate nature** – At last, and as highlighted by BOERO (2010), taxonomists must stop working for free, or almost. Taxonomists should organize into an international federation of societies, to promote, lobby, and educate, as a way to defend their interests and to compete for resources to do high quality science, and at the same time to denounce the faults in current scientific policies, and propose better ways to judge their work and use the resources dedicated to study biological diversity (WHEELER & VALDECASAS, 2005; BOERO, 2010). Such international federation of societies could also create a general commission to make an annual evaluation of the progresses attained in taxonomy, reporting data such as known species and clade diversity on a world level, progresses in exploration and discovery, and so on (WHEELER & VALDECASAS, 2005). As a way to further promote the relevance of the discipline, WHEELER & VALDECASAS (2005) proposed the establishment of a prize recognizing meritorious life time contributions to taxonomy, a kind of international Nobel Prize for taxonomy. Armed with the new generation of tools, spirit of collaboration, and sense of purpose, taxonomists can overcome many of the present problems and opposition, showing what taxonomy is able to achieve (WHEELER, 2007).

THE STUDY SUBJECT: THE POLYCHAETA

Polychaeta are truly segmented worms belonging to the phylum Annelida, which can be morphologically distinguished from the Clitellata by having a head with sensory appendages, segmental parapodia normally bearing numerous chaetae, and ciliated pits or patches on the back of the prostomium, with sensorial functions, designated as nuchal organs (GLASBY *et al.*, 2000; ROUSE & PLEIJEL, 2001). Like in other annelids, the basic shape of the body consists in two presegmental regions, namely the prostomium and the peristomium, followed by a segmented trunk (metastomium), and finally a postsegmental pygidium. In a general way, the anterior region of the body concentrates several appendages with sensorial functions, such as antennae, palps, or tentacular cirri, which can be highly derived or reduced. Each segment of the metastomium usually bears a pair of parapodia with chaetae, besides several internal organs arranged segmentally. Finally, the pygidium also carries anal cirri, with sensorial functions. The great number of forms in Polychaeta derives from the modification of this basic shape of the body.

Polychaetes have a wide size range, from small meiofaunal (less than 1 mm long) to big megafaunal organisms (reaching about 3 m long), and are among the most common inhabitants of marine benthic bottoms, from shallow waters to deep-sea, and from brackish to hypersaline waters, with some groups being holopelagic, while others inhabit continental environments (GLASBY & TIMM, 2008; GLASBY *et al.*, 2009), or peculiar habitats like hydrothermal vents, mud volcanoes, methane clathrate deposits or whale bones (*e.g.*: DESBRUYÈRES & TOULMOND, 1998; ROUSE, GOFFREDI & VRIJENHOEK, 2004; DESBRUYÈRES, SEGONZAC & BRIGHT, 2006; RAVARA, CUNHA & RODRIGUES, 2007; HILÁRIO & CUNHA, 2008). Polychaetes inhabit virtually all types of substrata, from rocky bottoms to muddy sediments, where they may be among the most dominant organisms, both in terms of abundance and biomass, but also often in diversity (KNOX, 1977). Most of them are free-living, showing a variety of feeding strategies (FAUCHALD & JUMARS, 1979; GASTON, 1987), but there are also numerous cases of more or less specialized internal and external symbionts, from parasites to mutualists, living in association with many different marine taxa, including other polychaetes (MARTIN & BRITAYEV, 1998). Accordingly, they have developed a huge variety of reproductive and life cycle strategies (GIANGRANDE, GERACI & BELMONTE, 1994; GIANGRANDE, 1997).

Polychaetes play a relevant role in ecosystem functioning, being commonly used as a target group in a wide range of scientific studies. Being so ubiquitous, they are common constituents of species lists in all kind of ecological studies, from basic assessment of benthic assemblages to applied environmental approaches, and are commonly used as biological indicators of the health of the ecosystems (GIAGRANDE, LICCIANO & MUSCO, 2005). From a more applied point of view, some polychaetes are used in human nourishment, mainly those known as “palolo” worms, which include several species in different parts of the World (THORPE, SOLÉ-CAVA & WATTS, 2000), while others have been traditionally used in local pharmacopoeia (*e.g.*, TABRAH, KASHIWAGI & NORTON, 1970). The presence of toxins or venom glands in some groups (*e.g*, Amphionomidae, *Glycera*, *Metaxypsamma*) and the fact that other groups are chemically defended (*e.g.*: Terebellidae, Cirratulidae, Phyllodocidae; GLATZER, 1983; MARTIN *et al.*, 2000; YOSHIYAMA & DARLING, 1982) opens the possibility of new investigations and applications in pharmacology and medicine. Polychaetes have also a significant economical relevance, as shown by the growing commercial activities and the international market for polychaete species that are dug up or farmed, mainly for being used as fishing bait and as a food item in aquaculture (GAMBI *et al.*, 1994; OLIVE, 1994), with the implied risk of introducing foreign species and associated pathogens or other non-native organisms in the wild (FIDALGO E COSTA *et al.*, 2006). The harmful role that polychaetes play as fouling organisms in ship-hulls, harbours and other marine facilities, as pests in natural and cultured oyster populations, or as introduced species, with the subsequent economical losses, cannot also be neglected (*e.g.*: LUNZ, 1940; KOÇAK, ERGEN & ÇINAR, 1999; FITZHUGH & ROUSE, 1999; KURIS & CULVER, 1999; MOORE *et al.*, 2007).

Polychaetes are thus highly diverse. More than 13,000 species have been described to date, but only 8,000 of these are considered to be “reasonable” (HUTCHINGS & FAUCHALD, 2000). However, SNELGROVE *et al.* (1997) suggested that the polychaete diversity could be as high as 25,000 to 30,000 species. In fact, the number of newly described species has not stopped to increase, but so has the number of synonymized taxa, at a lower rate. This way, it is difficult to have an exact number of the valid described species. One thousand species had been already described in the mid 19th century. Since then, about 70 new species were described per year up to the mid 20th century, and then about 100 per year up to now. In Europe, around 1900 species are known. About 300 were already known before the mid 19th century, and the newly described species progressed at a more or less constant rhythm of 10 new species per year, with two significant impulses in the mid 19th and 20th centuries (see *CONCLUSIONS* for graph and further comments on the evolution of the number of polychaetes described from Europe).

More developed accounts on the Polychaeta, covering all aspects of the group, including phylogeny, which is not discussed here, can be found in FAUCHALD & ROUSE (1997), ROUSE & FAUCHALD (1997), BLAKE (1994*a*), GLASBY *et al.* (2000), ROUSE & PLEIJEL (2001), or ROUSSET *et al.* (2007).

METHODS OF STUDY OF POLYCHAETA

A wide panoply of sampling methods can be used for the study of Polychaetes. Most pelagic sampling gears, from plankton nets to sucking pumps, may be adequate. However, holoplanktonic polychaetes are not as abundant as their benthic relatives are, so the sampling gears must have nets with relatively large pore sizes (e.g. 250-500 µm). In turn, small pore sizes may be adequate to collect the numerous larvae that are usual components of the meroplankton (MARTIN *et al.*, 1997), which may be complemented with the use of light traps to capture other reproductive phases showing positive phototactism (*e.g.* stolons, epitokous forms). Modern techniques may also be applied, and the uses of research submarines or ROVs have recently demonstrated their usefulness in finding new holoplanktonic species in deep sea environments (OSBORN *et al.*, 2007; OSBORN *et al.*, 2009). Less spectacular but also effective, the classical sediment traps used in geological and oceanographic studies may produce relatively similar results as the by-product of studies of sediment fluxes, as they can capture "swimmers" (*i.e.* over floating organisms retained in the trap sediment tubes), which are an excellent source of unexpected polychaete diverse material (SARDÁ *et al.*, 2009).

As for the benthic polychaetes, two main sampling approaches can be highlighted, depending on the type of substrate. Soft bottom species are better collected, together with many other infaunal organisms, by means of corers, box-corers, grabs, sledges, trawls and virtually any other tool able to gather bottom sediments. Usually, these samples are processed through filtering devices, to retain the target organisms, which are then identified, counted and referred to standard surface or volume units. On the other hand, hard bottom species are most often collected by scrapping the substrate all over the studied surface areas (usually 20 per 20 cm^2), with a sucker being often used to prevent looses while scrapping, introducing all materials into hermetic plastic bags. Finally, the sample is processed in a similar way to the soft bottom ones.

Samples are most often fixed with formalin (4 to 10% solution with seawater, usually buffered with borax or a similar product) and the sorted organisms are finally preserved in 70% alcohol in distilled water. Alternatively, samples may be directly preserved in 100% alcohol (for molecular studies) or frozen (*e.g.*, for biochemical studies). Some species live inside very tough or tightly closed tubes, in such a way that the worm can be degraded partially or totally before the fixation fluid can enter completely in the tube. In such cases it is advisable to remove previously the worms from the tubes. In the case of *Spiochaetopterus* (Chaetopteridae), this can be normally achieved by injecting seawater in the tube with a syringe.

For a more precise descriptive analysis of target species, specimens can be initially anaesthetised (with MS222, thymol, cold temperatures, etc.; a synopsis of methods for the narcotisation of marine invertebrates, including polychaetes, can be found in SMALDON & LEE, 1979). Alternative information, often relevant, may be obtained from describing the colour patterns of living organisms (*e.g.*, NYGREN, 2004). These may be particularly relevant for symbiotic organisms (MARTIN & BRITAYEV, 1998), but in other cases colour patterns are very variable and may have no taxonomic value in order to separate species, like in the case of the polynoid *Harmothoe imbricata* (Linnaeus 1767) (NYGREN *et al.*, 2011). In both cases, photographs or films of living specimens can provide a vary valuable information about the species and its variability.

Classical approaches (histology for internal, and light and scanning electron microscopy for external morphology) are still basic techniques. In addition, new approaches are currently allowing the detection of a hidden diversity. One of these is the use of the Methyl Green pattern colouration to show taxonomically relevant morphological differences (*e.g.* differences in the distribution of glandular tissues) (*e.g.*, WILLIAMS, 1984; WARREN, 1992). This technique has repeatedly proved to be useful to solve even classical taxonomic controversial problems like the redefinition of the types of one of the most cited and studied polychaete species, *Capitella capitata* (BLAKE, 2009). However, major insights in revealing cryptic species have been obtained, and more are still expected, from the use of molecular techniques (*e.g.*: BLANK *et al.*, 2008; NYGREN, EKLÖF & PLEIJEL, 2009; VIRGILIO *et al.*, 2009).

PHYSIOGRAPHY OF THE STUDIED AREAS

a) The Portuguese Southwestern Continental Shelf and coast

The Portuguese Southwestern Continental Shelf was studied in detail by VANNEY & MOUGENOT (1981), naming it *Plate-forme Continentale du Baixo Alentejo*. The main character of this continental shelf is its poor differentiation of shapes, with a smooth face devoided of canyons. However, canyons delimit in both sides this portion of the Portuguese continental shelf, with the Canyon of Setúbal in the north, and the Canyon of São Vicente in the south. This shelf can be decomposed in a series of surfaces so weakly uneven that they form a huge plan gently inclined from the coast to depths of about 1000 meters or deeper, without finding a clear delimitation, and practically without a shelf break. A defined edge is only found near the NW and SW borders of the shelf, with the Príncipes de Avis Hills in the NW (Infante Dom Pedro Hill, Infante Santo Hill and Infante Dom Henrique Hill), and the Descobridores Hills in the SW (Pero Escobar Hill, Estêvão Gomes Hill and Fernão Mendes Hill), which are the only clear topographic accidents in the region.

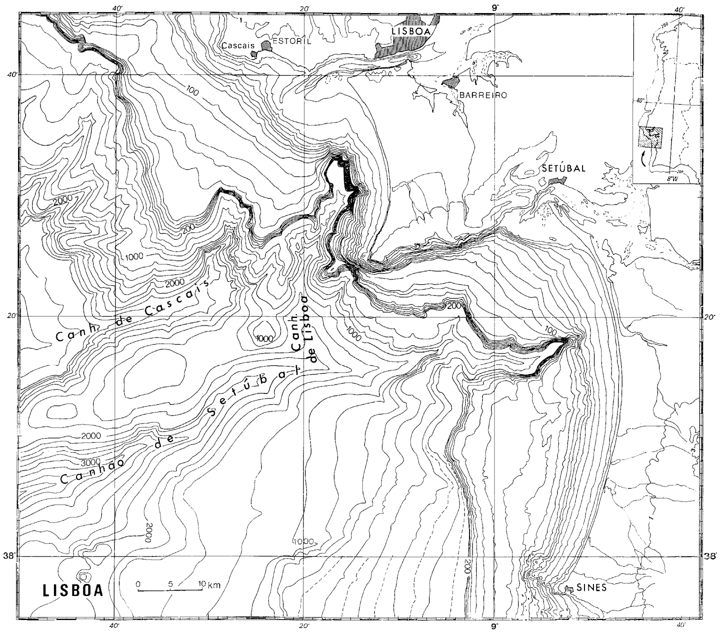

Figure legend: Bathymetric chart of Lisboa, showing the northern region of the Southwestern Continental Shelf, delimited by the Canyon of Setúbal (*Canhão de Setúbal*) in the north (Adapted from VANNEY & MOUGENOT, 1981).

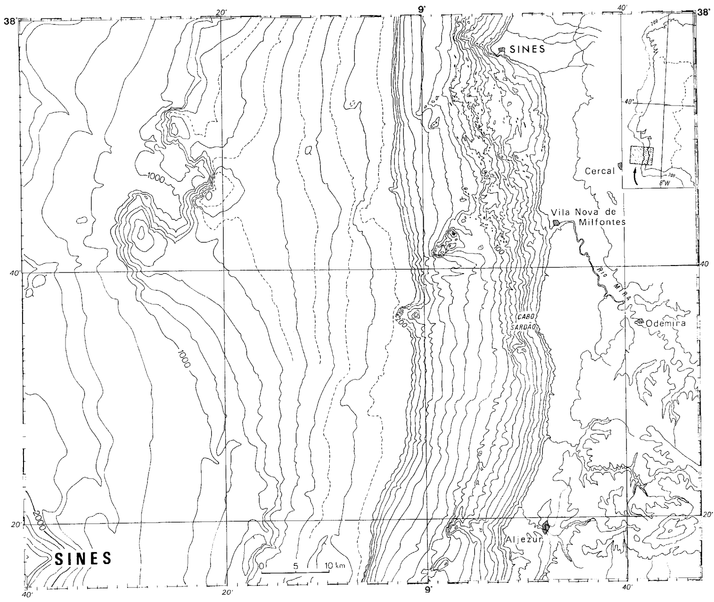

Figure legend: Bathymetric chart of Sines, showing the central region of the Southwestern Continental Shelf, delimited by the Príncipes de Avis Hills in the NW. The *Haute Plate-forme* can be here clearly distinguished from the *Basse Plate-forme*. (Adapted from VANNEY & MOUGENOT, 1981).

This shelf can be divided in two parts, always according to VANNEY & MOUGENOT (1981):

1 – the higher shelf (*haute plate-forme*), formed by a strip about 20 km wide, except in front of Cape São Vincente, where the width is reduced to about the half. The higher shelf is subdivided in two regions, one internal, which descends to about 120 meters, and one external, that extends to about 200 meters deep;

2- the lower shelf (*basse plate-forme*), that embraces from 200 to about 700 meters deep, and includes a ramp with a very weak slope (about 20 m/km), that extends for about 40 km offshore.

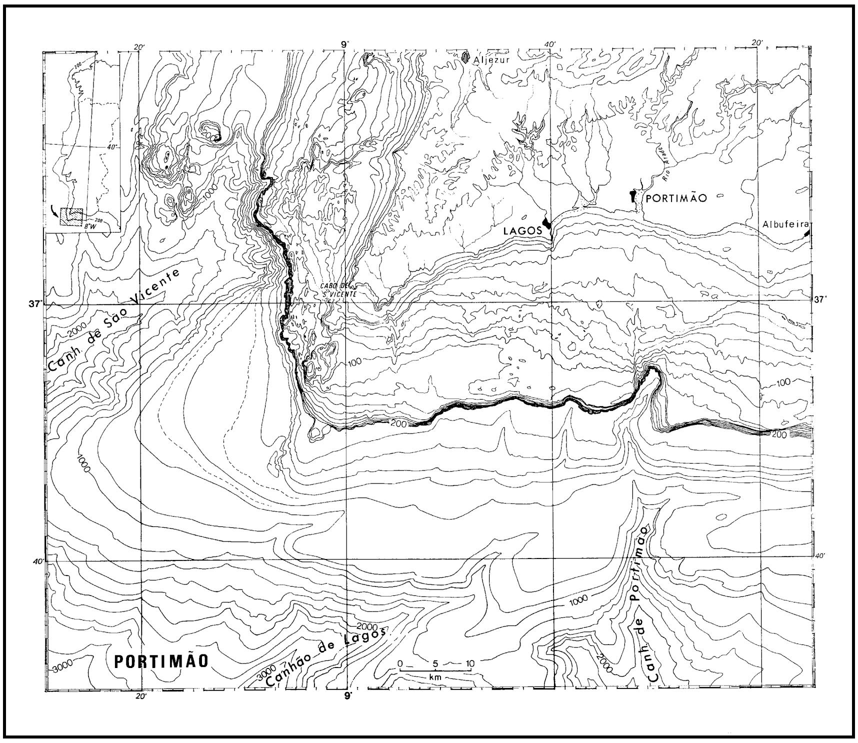

Figure legend: Bathymetric chart of Portimão, showing the southern region of the Southwestern Continental Shelf, delimited by the Descobridores Hills in the SW and the Canyon of São Vicente in the south (*Canh. de São Vicente*). (Adapted from VANNEY & MOUGENOT, 1981).

The Southwestern Continental Shelf is mainly covered by soft bottoms, that range from coarse sand to mud, with occasional rocky spots (MOITA, 1988). Near the coast the sediments are mainly composed by sands and coarse sand, an effect of the higher hydrodinamism, being replaced by muddy sand, sandy mud and finally pure mud, with increasing depths. An important area of muddy sediments is also present from off the mouth of the Mira River northwards (MOITA, 1988). This river is the most important contribution of fine sediments to the region, flowing into the sea at Vila Nova de Milfontes, through an estuary. However, numerous smaller rivers and creeks are also present in the region, with the small rivers of Seixe, Aljezur, and Bordeira forming estuarine-lagoonal systems. Northwards to Sines exist also the coastal lagoons of Sancha, Santo André and Melides.

The coastal line includes sandy beaches, rocky cliffs, the estuary of the Mira River, estuarine-coastal lagoons, coastal lagoons, salt marshes, and important capes, as capes Sines, Sardão, São Vicente, and Sagres.

b) The Continental Shelves of South Spain and Gulf of Cádiz

The studied area corresponding to the Spanish continental shelf includes the Strait of Gibraltar, as well as the adjacent areas, the Iberian-Moroccan Gulf (especially the Gulf of Cádiz) in the Atlantic side, and the Alborán Sea, in the Mediterranean side.

The Iberian sector of the Iberian-Moroccan Gulf is formed by the Gulf of Cádiz, which ranges from Cape São Vicente, in the west, to Cape Trafalgar, in the east, being bounded by the isoline of 100 m depth. Off Cape Santa Maria the continental shelf is very narrow (less than 5 km wide), ending in a continental slope that descends abruptly to more than 600 m in less than 4 km, dividing the continental shelf of the Gulf of Cádiz in two halves, making the water circulation in each half being usually independent from the other (GARCÍA-LAFUENTE *et al.*, 2006). Westwards, between Cape São Vicente and Cape Santa Maria, the shelf follows a W-E direction, and is 15-20 km wide, being cutted by the canyon of Portimão, that extends down to about 2000 meters. The shelf bottom surface is covered mainly by soft sediments of different textures, with some scattered rocky bottoms, especially present off Armação de Pêra. The shore presents high cliffs in the western region, which are progressively lower eastwards and finally replaced by low sandy coasts. Eastwards Cape Santa Maria, the continental shelf follows a NW-SE orientation, widening to more than 40 km off Guadalquivir River mouth (GARCÍA-LAFUENTE *et al.*, 2006), being sometimes considered to reach an isobath of 1000 m, at about 60 miles off Cádiz (TEMPLADO *et al.*, 1993). In this region, the continental shelf is normally very flat, and the superficial sediments mainly formed by muddy substrates, due to the contribution of the rivers Guadiana and Guadalquivir, together with other small rivers, like the Odiel, Tinto, and Guadalete, but a shallow rocky region (20 meters deep) is present just in front of the Strait of Gibraltar. The coast is mainly low and sandy, with some rocky regions.

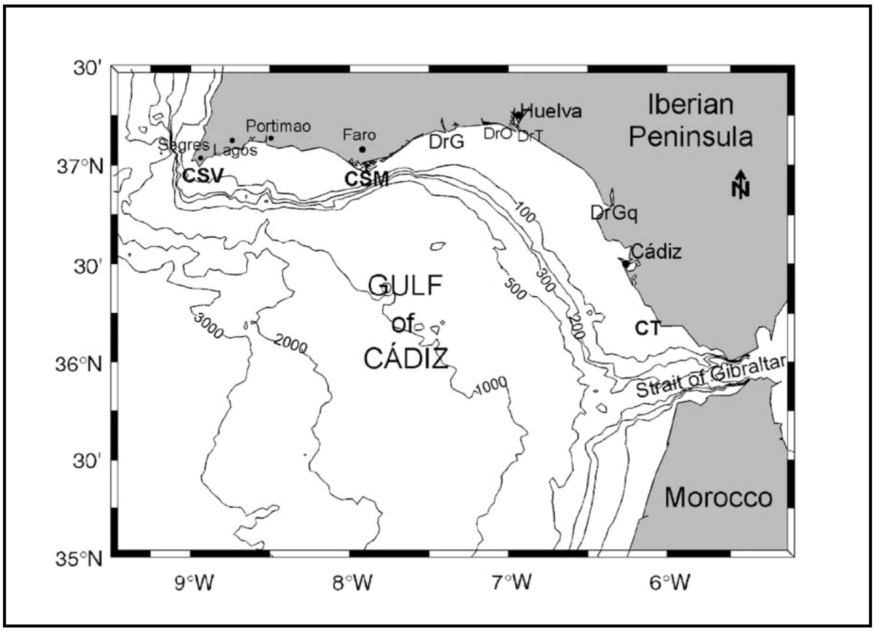

Figure legend: Map of the Gulf of Cádiz showing the main geographical and topographical features of the region. **CSM**, Cape Santa Maria; **CSV**, Cape São Vicente; **CT**, Cape Trafalgar; **DrG**, mouth of Guadiana River; **DrGq**, mouth of Guadalquivir River; **DrTO**, mouth of Rivers Tinto and Odiel. (Adapted from GARCÍA-LAFUENTE *et al.*, 2006).

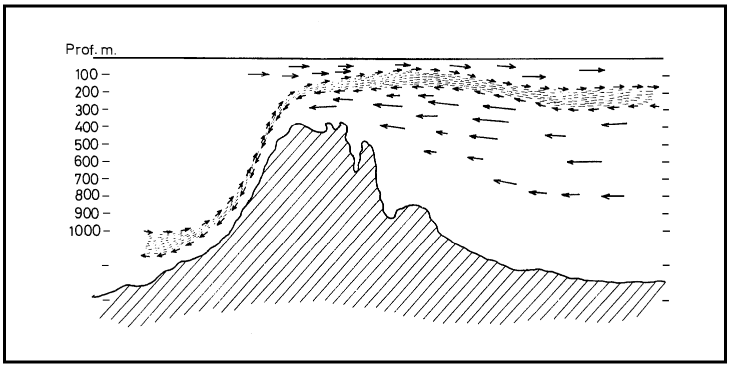

Figure legend: Cross section of the Strait of Gibraltar, showing the main water movements in the region. The Atlantic water, less dense, flows in the Mediterranean Sea in surface, while the Mediterranean water, more dense, is washed-out in depth. (Adapted from ESTRADA, VIVES & ALCARAZ, 1985).

The Strait of Gibraltar is a narrow strait that separates Europe from Africa. It is about 60 km long and only 14.24 km wide is its narrowest point. Its limits are defined by a line joining Cape Trafalgar to Cape Spartel in the west, and Punta Europa to Almina Peninsula in the east. Its depth ranges between 400-900 m, being its shallowest point within the strait the Camarinal Sill, located at the far western end of the strait, at a depth of 280 m. The Camarinal Sill prevents the mixing between the cold and less saline Atlantic waters and the warm and more dense Mediterranean waters that are located at the same depth. In the Strait of Gibraltar, the continental shelves narrow considerably, reducing to a width of only 2-3 km between Tarifa and Punta Carnero, widening then in the direction of the Bay of Algeciras. Its bottoms are very rough and mainly covered by rocky and detritic substrates.

The Alborán Sea is the western sector of the Mediterranean Sea, being limited by the Strait of Gibraltar in the west and a line joining Cape of Gata, in the north, to Cape Fegalo, in the south. It has a surface of about 54,000 km^2, and a maximum depth of about 1500 m in the western basin, and more than 2000 meters in the eastern basin. The Iberian continental shelf oscillates here between 2 km wide in front of Cape Sacratif to 10 km off Málaga, with an average of about 5 km, and a limit at a depth between 100 and 150 meters, while it is more wide in the African side, oscillating between 3 and 8 km from the Strait of Gibraltar to Ras Tarf Cape (= Cape Kilati or Quilates), widening up to 15 km eastwards.

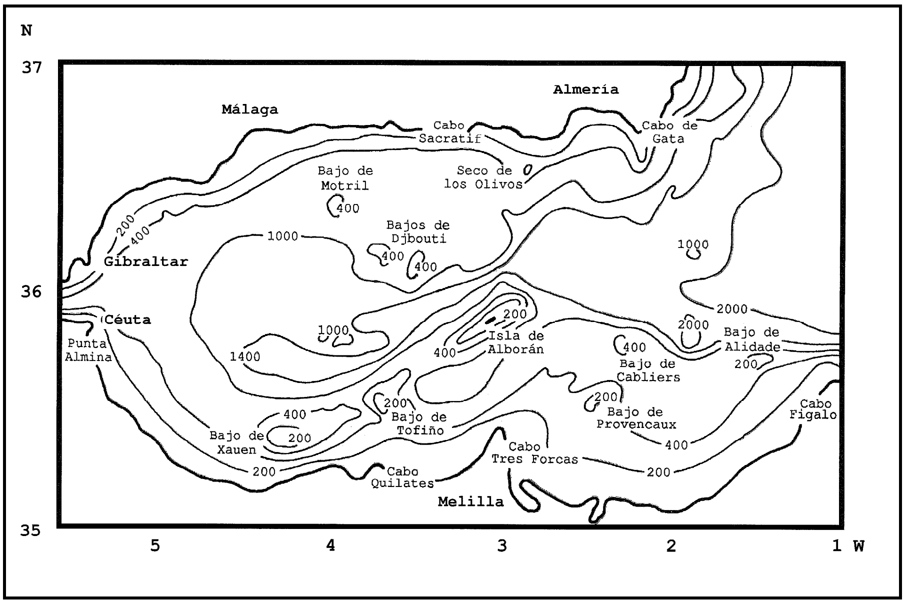

Figure legend: Bathymetric chart of Alborán Sea, showing the most important geographical and topographical features of the region. Bajo = Bank; Cabo = Cape; Punta = Point. (Adapted from TEMPLADO *et.al.*, 1993).

The bottom of the Alborán Sea is very complex, with many topographical elements, like banks, ridges, seamounts, troughs or canyons. From the north of Africa, off Peñon de Vélez de la Gomera, to the Island of Alborán, there is a ridge of submarine mountains, the Alborán Ridge, about 160 km long and oriented NE-SW, to which belong the banks of Xauen and Tofiño, as well as the plateau on which stands the Island of Alborán, in the middle of Alborán Sea. This island is of volcanic origin, and is about 600 m long for 250 m wide, reaching 15-20 meters high.

The Alborán Ridge divides the Alborán Sea in two basins at about 3ºW: a western one, of about 40 km for 22 km, shallower (reaching depths of about 1500 meters), and including the banks of Motril and Djibouti on its northern side, and a eastern one, of about 13 km for 6 km, deeper (more than 2000 meters in some points), connected with the Big Mediterranean Deep Basin, and including the banks Provençaux, Cabliers, and Alidade in its southern region. The northern continental shelf of the Alborán Sea also includes a steep rise 2 miles off Punta de Baños (Almería), named Seco de los Olivos, and an extense submarine prolongation of Cape of Gata.

More details on the Strait of Gibraltar and the Alborán Sea can be found in PARRILLA & KINDER (1987) and TEMPLADO *et al.* (1993), on which were mainly based these lines.

SOME NOTIONS ON THE HYDROGRAPHY OF THE STUDIED REGIONS

1) Mediterranean Sea: The Mediterranean Sea is a semi-closed sea, with a natural opening in its western limit, the Strait of Gibraltar, through which connects with the Atlantic Ocean, and an artificial connection with the Red Sea in its eastern region, the Suez Canal, opened in 1869. Its average depth is close to 1500 m, with a salinity close to 38.5‰ in the deep, and a little less closer to the surface, and a deep water temperature relatively constant, with an average near to 13ºC, while the temperature of the superficial water varies between approximately 13ºC in Winter, and about 26ºC in Summer (MARGALEFF, 1985), although more extreme values are common.

The Mediterranean Sea is characterized by its relatively high salinity, resulting from being a concentration basin with a negative water budget, with the evaporation rates exceeding both the weak rates of precipitation and run-off from rivers that, in general, drain rather arid regions of Europe, Asia and Africa (CRUZADO, 1985). The high evaporation rates in the Mediterranean Sea are caused by the strong heating of the surface water and the dryness of the continental winds that flow across the basin from the neighbouring continental masses. To balance the negative water budget due to evaporation, approximately 15 times this amount of Atlantic surface water has to flow in the basin, and nearly the same amount of Mediterranean deep water with a relatively high salinity has to flow out, in order to maintain a salt mass balance (CRUZADO, 1985). This way, the incoming Atlantic surface water, with a salinity slightly above 36‰, is transformed in about 100 years into outgoing deep Mediterranean water, with a salinity of 38.4‰ or more, and which, being more dense, is displaced in depth in relation with the incoming surface Atlantic water. The more saline water formed by evaporation, being denser, sinks to the bottom and cascades across the Gibraltar sill into the Atlantic, at a level where the Atlantic water has a lower density. For this reason, the Mediterranean water pouring into the Atlantic sinks to the level where it finally finds an equal density, and is carried northwards, along the Portuguese coast, where it can interfere with upwelling of deep water along the western coast of the Iberian Peninsula (MARGALEFF, 1985).

Another important feature of the Mediterranean Sea is the relatively low concentration, even in the deeper waters, of some biologically important chemical components. These low concentrations are caused by the continuous washout of these components through the Strait of Gibraltar, which receives poor surface Atlantic water and exports relatively rich deep Mediterranean water. In the roughly 100 years of residence time that the entering Atlantic surface water spends in this basin, almost all the substances dissolved in it increase their concentrations in about 4.7%, before flowing back to the Atlantic at depth (CRUZADO, 1985). Land run-off, sewers or aquaculture exploitations can create important enrichments in some areas, but cannot balance the net loss of such important chemical constituents as nutrients (CRUZADO, 1985).

These features of the Mediterranean Sea, and the circulation of water masses that permanently enter it in surface and are washed-out in depth by the Strait of Gibraltar, affect not only the water movements in the Strait, but also in the whole Alborán Sea and northern margin of the Gulf of Cádiz, reaching its influence the western continental shelf of Portugal and farther northwards. Due to differences in concentrations, high salinity and different temperatures, the circulation of the Mediterranean waters that have been washed-out through the Strait of Gibraltar (the Mediterranean Outflow) can be easily traced in the Atlantic to thousands of kilometers of distance (CRUZADO, 1985).

2) Alborán Sea: The hydrography of the Alborán Sea is explained in PARRILLA & KINDER (1987), and resumed in TEMPLADO *et al.* (1993). The main feature of the water circulation in the Alborán Sea is a big anticyclonic gyre (in the same way than the hands of a watch) that the incoming superficial Atlantic water makes in the western Alborán basin. This superficial Atlantic water, that extends to about 200 m deep and has a low salinity (36‰ or less), flows eastwards in the northern region of the western basin to about 3º30'W, where it turns southwards. This gyre is very stable and energetic (its speed may exceed 100 cm/s in its northern branch; PARRILLA & KINDER, 1987), with stational variations of position and shape, and occupies the biggest part of the western basin. At the center of this gyre, which nucleus is located around 4ºW and 4º30'W, and 35º30'N and 36ºN, the waters accumulate and sink posteriorly. When flowing southwards the water makes a bifurcation southern of Alborán Island, at about 36ºN, and while one branch turns westwards, closing the anticyclonic gyre, the other branch, carrying the main volume of the Atlantic water, goes eastwards, entering the eastern basin close to the coast of Algeria. It seems that part of the waters of Atlantic origin of the first anticyclonic gyre and this second branch, after passing Cape Tres Forcas, in Morocco, originates another gyre, this time cyclonic, which would occupy the biggest part of the eastern basin of the Alborán Sea.

The incoming waters that escape the western Alborán anticyclonic gyre can follow different ways, according to the season of the year. The biggest part of these waters follows its way eastwards, close to the southern coasts of Spain, reaching Cape of Gata. Here they change their direction to SE, due in part to this geographic accident, and in part to its encounter with a Mediterranean current that flows SW, following the levantine coast of Spain. This way, the current flows SE in the direction of Oran, forming the Almeria-Oran Front. Close to the Algerian coast the Almeria-Oran Front splits in two, one part directs westwards, forming a second anticyclonic gyre, this time in the eastern basin of the Alborán Sea, and the other part goes eastwards, in direction of Algeria, forming part of the Algerian Current. The nucleus of this second anticyclonic gyre is around 2ºW and between 36ºN and the African coasts.

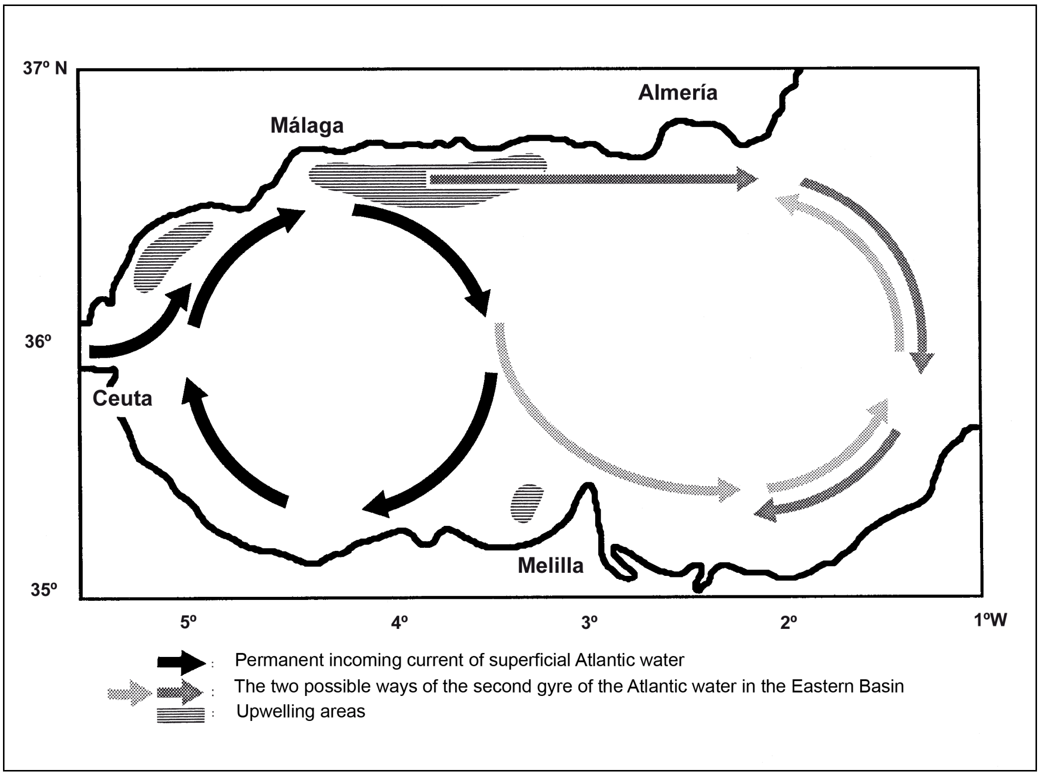

Figure legend: Main marine currents and upwelling areas in the Alborán Sea. (Adapted from TEMPLADO *et.al.*, 1993).

Beneath this superficial layer of the eastward-flowing surface Atlantic layer occur two Mediterranean deeper masses of water, flowing westwards. One is the Levantine Intermediate Water (LIW), which extends from about 200 to 600 m deep, is originated in the Eastern Mediterranean Sea, and has both temperature and salinity relatively high (around 15ºC and 38.45 to 39.1‰). The LIW moves westwards with a velocity of about 1-3 cm/s (STOMMEL, BRYDEN & MANGELSDORF, 1973), in a broad flow that is concentrated in the northern region of the basin (PARRILLA & KINDER, 1987). Below the LIW is the Western Mediterranean Deep Water (WMDW), originating off the French coasts. The WMDW has steadily decreasing salinity and temperatures (about 38.5‰ and less than 12.9ºC, respectively), and flows westwards concentrated in a narrow boundary current near the North African slope, with a speed of 5-10 cm/s (TEMPLADO *et al.*, 1993). The Mediterranean Outflow Water is a mixture of these two water masses, together with other Mediterranean water masses, like the Tyrrhenian Dense Water, mainly composed of Eastern Overflow Water, formed in the Aegean and Adriatic Seas, and which apparently is replacing the WMDW in the composition of the Mediterranean Outflow Water (MILLOT *et al.*, 2006).

The interaction between all these water masses in movement, together with the action of certain winds and the Coriolis effect, originates zones of upwelling, mainly in the northern region of the basin (coasts of Málaga and Granada), but also NW Cape Tres Forcas, in Northern Africa, around 35º25'N and 35º40'N, and 3º10'W and 3º30'W, with increased sea productivity and presence of deep water species at shallower depths (TEMPLADO *et al.*, 1993).

All this general circulation pattern in the Alborán Sea, with gyres, currents and upwelling phenomena, can be affected by superficial currents originated by the dominant winds in the region (East and West winds), as well as by the tidal wave that enters in the Alborán Sea through the Strait of Gibraltar, which can counteract or accentuate the superficial Atlantic current.

3) Gulf of Cádiz: In the Gulf of Cádiz the outcoming Mediterranean water shows values of salinity and temperature as high as 38.12‰ and 13.41ºC, and geostrophic velocities as great as 180 cm/s in a westward direction, at a depth of 345 m, just off the Strait of Gibraltar (AMBAR, 1982). This Mediterranean water sinks progressively, due to its bigger density, consequence of its high salinity, and flows in contact with the submarine floor. As soon as this outflow of Mediterranean water leaves the Strait of Gibraltar, it experiences a northwestwards deflection in its way, due to the Coriolis effect, and owing to its higher density, it continues to sink while progressing westwards, until a level of equilibrium is reached with the surrounding Atlantic water, at the same time that its salinity decreases progressively due to gradual mixing with this surrounding Atlantic water (AMBAR, 1982). The Mediterranean Outflow in the Gulf of Cádiz flows mainly along the contours of the northern continental slope, with some local deviations, channelling effects, and branching, due to the presence of canyons, ridges and terraces (see AMBAR, 1982).

After leaving the Strait of Gibraltar and already at the Gulf of Cádiz, the Mediterranean water flow divides in two distinct water masses, a deeper one (750 m deep), characterized by its higher salinity (S = 37.4‰ and T = 13.16ºC, moving westwards at 30-40 cm/s), and a shallower one (600 m deep), closer to the upper continental slope and identified by its higher temperature (S = 37.0‰ and T = 13.5ºC, moving westwards at 46 cm/s) (AMBAR, 1982). The existence of these two distinct water masses could be related with the bottom features of the region between 7ºW and 7º30'W, which would deflect the Mediterranean Outflow in several veins with distinct paths, affecting characters of the water masses like temperature. A third shallower vein seems to be formed, being detected along the western upper slope of Portugal (AMBAR, 1982).

In the upper levels, the coast of the Gulf of Cádiz is bathed exclusively by Atlantic water, and there is no mixing with the Mediterranean Outflow. The open-sea superficial current in this region of the Gulf of Cádiz flows more or less permanently in the direction of southeast, increasing its velocity when approaching the Strait of Gibraltar. This current is in general stronger in Summer, under the wind regime of the westerlies, but it can be affected by other factors.

The open-sea surface circulation in the Gulf of Cádiz (depths greater than 200 m) is anticyclonic, with short-term meteorologically induced variability. There is a branch of the Portuguese-Canary eastern boundary current that turns eastward into the Gulf of Cádiz, and flows permanently over the continental shelf break and slope in the eastern half of the basin, in spite of some fluctuations. This current is the northeastern boundary of the ocean side circulation of the Gulf of Cádiz and the southern boundary of the continental shelf circulation. This current moves eastwards towards the Strait of Gibraltar and feeds in part the Atlantic inflow into the Mediterranean Sea, turning then southwards, to re-join the Canary current (GARCÍA-LAFUENTE *et al.*, 2006). This current is located above the Mediterranean Outflow, with which it does not interact.

The water circulation on the continental shelf of the Gulf of Cádiz was discussed by GARCÍA-LAFUENTE *et al.* (2006), a publication in which the following paragraphs are based and that should be consulted for further details. This water circulation reflects the division of the continental shelf in two halves by Cape Santa Maria, as explained above. The surface circulation in the near shore area of the Gulf of Cádiz is dominated by the presence of two cells of cyclonic circulation located over the eastern and western shelves, being separated from each other by Cape Santa Maria.

The western continental shelf and slope is occupied by a larger-scale cyclonic eddy (a current flowing in a direction opposite to the main stream), namely the São Vicente Eddy (SVE), that extends into the deep ocean. This eddy has a vertical length greater than 300 meters, being linked to the general wind force in the area and the permanent upwelling phenomenon off Cape São Vicente.

The eastern shelf seems to be dominated by a cyclonic circulation bounded by a shelf-break front at the south, and a warmer coastal counter-current (CCC) in the north. Cape Santa Maria would close the cyclonic cell at the west, forcing the CCC to recirculate towards the east, feeding the shelf-break front (GARCÍA-LAFUENTE *et al.*, 2006). Under westerly winds, the CCC recirculates towards the east, while recent upwelled water near Cape Santa Maria is advected downstream by the shelf-break jet, leaving a cold signature at the surface. Under easterly winds, part of the CCC is forced to pass the Cape Santa Maria and invades the western continental shelf, with its volume flow being diminished when passing the Cape, as part of the flow recirculates eastward to close the cyclonic cell. When the CCC passes the Cape Santa Maria, it meets the west-going part of SVE, and displaces this cold eddy southwards. If easterlies persist long enough, the warm counterflow goes around the Cape São Vicente and northwards along the western Portuguese coast for some tens of kilometers.

This way, besides the permanent anticyclonic circulation at the open sea, a more or less complex circulation on the shelves is present, with the wind driving forces playing an important rule in its dynamics. While the cyclonic eddy (SVE) present in the western part of the basin would be related to open-sea processes, especially response of the sea to wind, the cyclonic process in the eastern shelf seems to be linked to coastal processes, such as the presence of an important pool of warm water off the Guadalquivir River mouth and Cádiz embayment. Here, the tide progresses inland through the different arms of the Guadalquivir River around 100 km, flooding a few km² of salt-marshes, happening the same in the neighbourhood of Cádiz embayment. The vertical mixing driven by tidal propagation, the shallowness of the river, the increased length of daylight during spring/summer and, especially, the flooding of marshes that have been heated by sun radiation during the previous low tide (at least one low tide taking place in daylight), lead to a greater absorption of energy per mass unit in the river than offshore during spring-summer daylight. Most of this energy is brought back to the sea during ebb tide. Therefore, a daily average gives a positive neat heat export from the land to the sea during spring-summer. This accumulation of warmer water in this part of the shelf creates an east-to-west along-shore sea-surface slope that, if not baroclinically compensated, produces a pressure gradient in the interior.

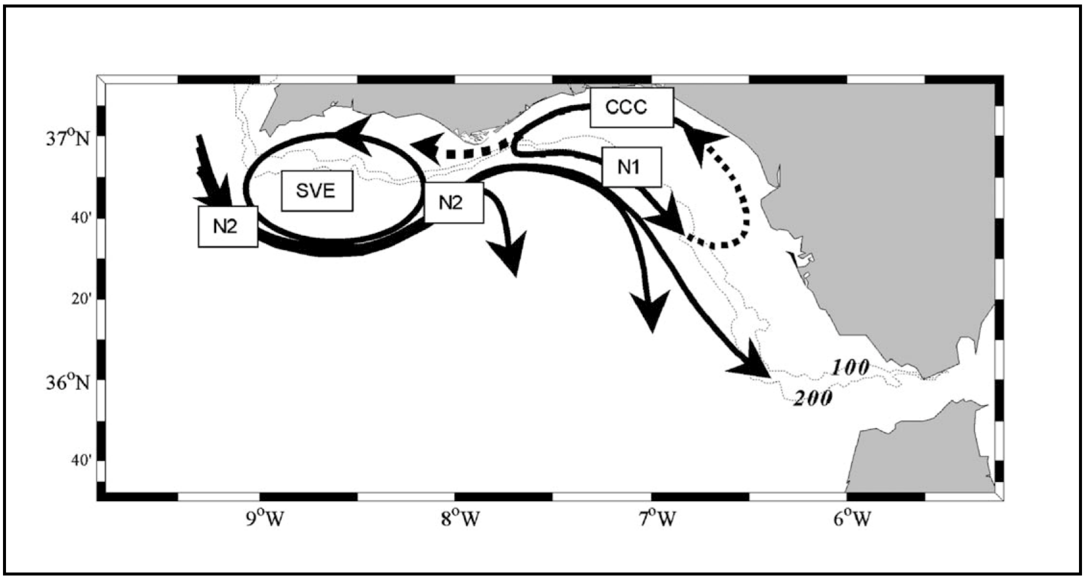

Figure legend: Scheme of the surface circulation in the Gulf of Cádiz, according to García-Lafuente *et al.* (2006). Core **N2** is a branch of the larger scale Portuguese-Canary eastern boundary current that veers eastward into the Gulf of Cádiz. It moves around a cyclonic eddy off Cape São Vicente (**SVE**), which is a quasi-permanent feature of the circulation in the Gulf associated with a positive wind-stress curl. The core moves further east towards the Strait of Gibraltar to feed in part the Atlantic inflow into the Mediterranean and turns southwards to re-join the Canary current. The eastern shelf is dominated by a cyclonic circulation bounded by a shelf-break front (core **N1**) at the south and a (warmer) coastal counter-current (**CCC**). Cape Santa Maria closes the cyclonic cell at the west. The dashed line at the southeast indicates the likely closure of the cell. With easterlies, the coastal counter current bifurcates off Cape Santa Maria and a branch invades the western shelf (dashed arrow), making the SVE drif to the south. The spatial extension of SVE is variable and is exaggerated in the sketch. (Adapted from García-Lafuente *et al.*, 2006).

Finally, westerly winds (or westerlies) that favour upwelling near Cape São Vicente, bring cold water to the surface near Cape Santa Maria, either by vertical advection from the depth in the proximity of the Cape, or by horizontal advection from the Cape São Vicente upwelling area, at the same time that accumulate the warm water from the region of the Guadalquivir River mouth and Cádiz embayment against the eastern coast of the Gulf of Cádiz. Under the easterly winds (easterlies), the cold-water supply near Cape Santa Maria stops, the warm water pool is no longer retained near the Guadalquivir River mouth, and it is released westwards, invading most of the upper layer of the eastern and (partially) western continental shelves. The large cyclonic eddy (SVE) on the western shelf is then displaced seawards, off the Cape São Vicente, by the warm tongue of water coming from the east, whereas this one remains attached to the shore while progressing westwards. Under these circumstances, the Atlantic inflow of water through the Strait of Gibraltar decreases.

The upwelling phenomena in the Gulf of Cádiz's coast of Algarve only takes place when induced by westerly winds, without which the Algarve coastal circulation is predominantly westwards

(FIÚZA, 1983; GARCÍA-LAFUENTE *et al.*, 2006). When northerly and westerly winds blow along the west and south coasts of Algarve, respectively, upwelling occurs, approaching cold waters to the coast. Along the west coast the upwelling is more intensive south of all capes, from where they extend southwards as cold plumes. In Cape São Vicente (a strong upwelling center itself, under local north winds), these cold waters turn anticlockwise around it, and upwelling starts to occur also along the shore of eastern Algarve, eastwards Cape Santa Maria (FIÚZA, 1983). However, as stated by FIÚZA (1983), during north wind cycles, which may not even reach the meridional region of Algarve, upwelled waters are carried over the Algarve shelf break probably by an easterly extension of an apparent equatorward coastal upwelling current flowing along the west coast. During wind events comprising a moderate to strong northerly component at the west coast and a westerly component at the south coast, this cold flow merges into waters upwelled locally along the Algarve coastline and reaches up to the Spanish-Portuguese border, the Guadiana River, from where it can leave the coast and extend as a cold front to the southeast, over the Spanish shelf break of the Gulf of Cádiz for more than 100 km. When the upwelling period is over, the Guadiana front disappears quickly, while the CCC carries warmer waters westwards, over the Algarve shelf, being able to reach Cape São Vicente and even turn clockwise around it, flowing northwards along part of the west coast when winds calm down completely or reverse to southerly (FIÚZA, 1983). When this happens, the upwelled waters are moved off Cape São Vicente, while a tongue of these cold waters tends to remain offshore over the shelf break off Southwest Algarve (FIÚZA, 1983).

4) Southwestern Portugal: The Portuguese west coast current system was well resumed by BISCHOF, MARIANO & RYAN (2003). There are three main superficial currents in the area, two of which seasonal: **1)** The Portugal Current (PC) defines the classic strictly southerly flow regime as typically depicted in marine atlases and pilot charts. It is broad, slow, generally southward-flowing, extending from about 10ºW to about 24ºW longitude. **2)** The Portugal Coastal Countercurrent (PCCC) or Iberian Poleward Current (IPC) is a poleward flowing surface current along the coast that occurs during the downwelling season (mostly in fall, winter, and beginning of spring), mainly over the continental shelf to about 10-11ºW. **3)** Finally, the Portugal Coastal Current (PCC), a southward current that dominates over the PCCC during periods of upwelling (mainly in summer), and like the PCCC, extending from shore to about 10-11ºW. Below these currents, the Mediterranean Outflow Water flows northwards along the continental slope, between 600-1200 m deep. The occurrence of upwelling along the west coast of Portugal (including the southwestern coast) during the months of July, August, and September, is related with the presence of fairly strong and steady northerly winds, and is also an important phenomenon in the region. The influence of run-off water in the southwestern coast of Portugal is almost negligible, being the main river present the Mira, but in turn, shelf water is strongly affected by mixing with warmer and saltier surface waters or cold and deep waters of offshore origin that can greatly increase the planktonic, nektonic and benthic productivity in the region.

As stated above, when the Mediterranean water leaves the Strait of Gibraltar, it experiences a northwards deflection in its way due to the Coriolis effect, sinking continuously until a level of equilibrium is reached with the surrounding Atlantic water. After passing the Gulf of Cádiz, this flow of water progresses up to the north, close to the coasts of Portugal. In the vicinities of Cape São Vicente, the Mediterranean water turns northwards along the continental slope of Portugal, while a part extends westwards and southwards as a result of combined processes of advection and diffusion. The northward flow continues along the European continental slope, and has been detected as far north as between 44ºN and 60ºN (AMBAR, 1982).

In the western coast of Portugal is possible to detect the presence of the upper and lower cores of the Mediterranean water stated above, centered respectively at depths of 600-900 m and of 1100-1200 m deep, with northward geostrophic current fields with values reaching 29.6 cm/s for the upper core, and 17.9 cm/s for the lower one, at about 37º40'N and 9º30'W, and salinities and temperatures lower than in the Gulf of Cádiz (AMBAR, 1982). FIÚZA (1982) also stated that the effect of the Mediterranean Outflow is felt strongly at depths of less than 600 m along the Portuguese slope. Besides, all direct current measurements conducted in the continental margin waters off the west coast of the Iberian Peninsula in depths from 200 to 1500 meters indicate a mean flow (residual current after a few tidal cycles) to the north (FIÚZA, 1982). So, the circulation in the subsurface layers (deeper than 100-200 m) off Portugal is directed northwards, perhaps in association with the dynamic regime of an eastern boundary layer, and transports water with Mediterranean influence in the layers between 500 and 1500 m at least, and water of subtropical origin in the upper layers. In winter this current seems to reach the surface (PCCC), but in the other seasons it has the configuration of a northward undercurrent bellow the upper 100-200 m where the wind driven shallow Portugal Coastal Current flows to the south (FIÚZA, 1982).

The presence of the shallower core of Mediterranean water has been repeatedly detected at the continental shelf of Portugal at depths as low as 300 to 400 m at the Setúbal Canyon, where it extends its influence inshorewards till about 5 miles from the coast, as the result of the strong bathymetric control exerted by the canyon (AMBAR, 1982). AMBAR (1982) also pointed the possibility that this mass of shallow Mediterranean water, characterized by high salinity and temperature and low nutrient contents, could be an important factor for the biology of the Portuguese coastal waters, and that it could even constitute a carrier for some marine species of Mediterranean origin to reach the western Portuguese shelf, in a similar way than the hypothetical case of *Haplosyllis chamaeleon* stated above (which, however, could have its origin outside the Mediterranean, instead of being a Mediterranean endemism, as normally stated).

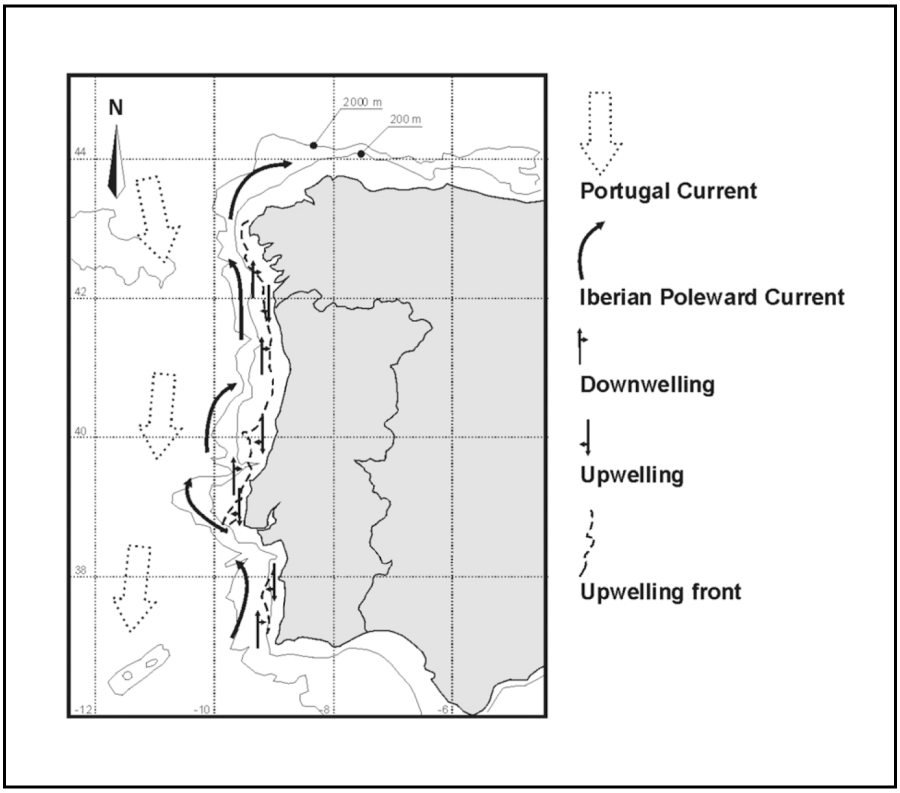

Figure legend: Simplified diagram of the major components of the upper circulation in the western Iberian coast, during spring and early summer. The upwelling front starts developing after the spring transition, when thermal stratification of the water column sets in, in response to northerly, upwelling favourable winds. As summer proceeds, northerly wind events increase in intensity and length, the upwelling front migrates seaward and extensive upwelling filaments develop. Upwelling alternated with downwelling episodes driven by southerly winds. (Adapted from QUEIROGA *et al.*, 2007).

Upwelling of cold and less saline waters is observed along the western Portuguese continental shelf mainly during summer and early autumn. In south Portugal upwelling can be particularly strong between cape Espichel and Cape São Vicente, and off the western shelf of Algarve, but under west and northwest winds also occurs in the eastern shelf of Algarve (see above). Upwelling in the west coast is directly induced by persistent locally favourable winds from the north, that blow during summer, driving off the coast the superficial waters, due to Ekman transport, and bringing to the surface slope waters (between 60 and 120 m, according to FIÚZA, 1982), cooler and richer in nutrients. Off the southwestern coast, to the south of Cape Sines, the pattern of upwelled waters in regular, with the compression of the thermal gradients towards the shore, probably due to a smooth submarine topography, with virtually no shelf break (FIÚZA, 1983).

The presence of the upwelled nutrients in the euphotic zone increases the primary productivity, which is followed, after a delay in time, by the secondary and tertiary productivity. This increase of productivity in the above water column is also accompanied by a raise in the benthic productivity, with a very high biomass, due to the sedimentation of part of the organic matter produced above (COSTE, FIÚZA & MINAS, 1986). However, there is increasing evidence that the Portuguese upwelling regime is decreasing in intensity, and has weakened since the 1940s (PIRES & ANTUNES, 2000; LEMOS & PIRES, 2004). Besides, the increased frequency and intensity of upwelling events during winter, the spawning season of several species of small pelagic fishes, is producing a decline in the productivity of these species, as it promotes the dispersal of eggs and larvae away from the favourable coastal habitat (the shelf), diminishing their survival and recruitment (SANTOS *et al.*, 2007). In which way (or if) these trends will affect and change the present populations and communities of benthic fauna is still not known, but they can only be detected with the continuous study of the benthos of the region, and the establishment of time series studies.

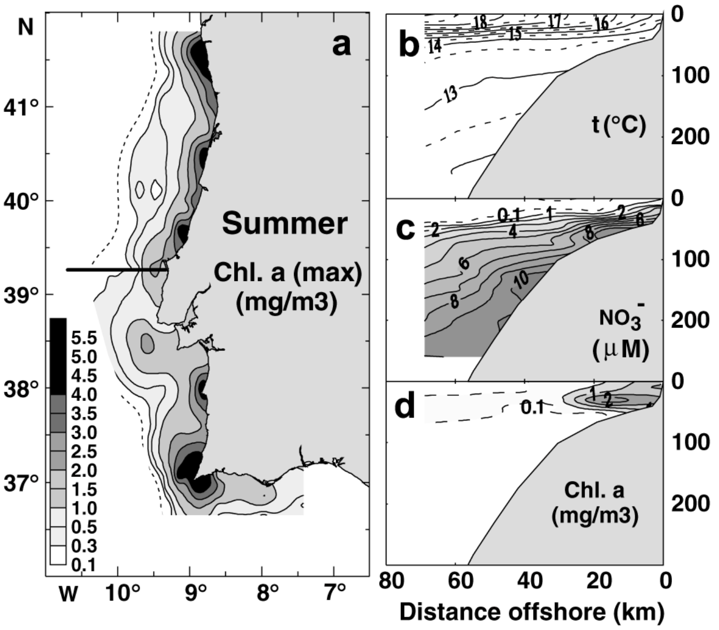

Figure legend: Horizontal distribution of maximum concentration of chlorophyll-*a* (**a**) along the Portuguese coast, and vertical distributions of temperature (**b**), nitrate (**c**) and clorophyll-*a* (**d**) off Cape Carvoeiro during summer, as a consequence of upwelling. (Adapted from SANTOS *et al.*, 2007).

THE PRESENT WORK: ORIGINAL PROJECT AND FINAL VERSION

The present work results from the evolution and adaptation of the original PhD project to some new questions and ideas, as well as to some problems found during the course of the works. This way, the initial idea underwent several changes in order to better adapt the original purpose and goals to these new questions and provide a final project for a wider audience and, above all, with a bigger practical application.

Many of the problems found were of methodological nature or resulted from an original project too ambitious in what concerns the huge quantity of samples to study. The modifications introduced afterwards pursued the solution of these problems in the best attainable way possible, and included the reduction of the quantity and size of goals, focusing the works in a lower number of more compact targets. In spite of reducing the main purposes of the study, the remaining points were quite laborious, requiring many hours of hard work. This explains the length of the whole process.

In what concerns the new introduced questions, they refer mainly to the present situation of biodiversity and taxonomic crises and the way they can conditionate taxonomic studies, namely of Polychaeta. There was a special care in providing a useful taxonomic tool for the study of Polychaeta from the European and nearby waters. The intention is to balance the shortage of taxonomic specialists in a moment that taxonomy is increasingly needed to detect, evaluate and mitigate the human impact on

Earth. It is expected that the final version of this work is, not a full reply to such new big questions, which would be impossible, but at least a step forward in the right direction.

The original project

For a better understanding of the structure of the present work, the original project and its main goals are here resumed.

The original purpose of the work was to study the polychaete fauna of the southwestern continental shelf of Portugal, and to compare them with the fauna from the continental shelves of both sides of the Strait of Gibraltar. One of the main goals was to have a better knowledge of the polychaete fauna of the region, especially of the southwestern continental shelf of Portugal, but it was also intended to determine if (and how) the Strait of Gibraltar affects the distribution of the polychaete fauna in the region, using the polychaete specimens collected during the SEPLAT campaigns, in Portugal (between Cape São Vicente and Cape Sines), and Fauna 1 cruise, in Spain (between Gulf of Cádiz and Alborán Sea, including the Strait of Gibraltar).

The project would comprise the following points:

1 – Elaboration of a bibliographic checklist of the polychaetes inhabiting the Portuguese continental shelf, stating relevant ecological features.

2 – Identification of the polychaetes collected during the SEPLAT campaigns at the Portuguese continental shelf, between Cape São Vicente and Cape Sines.

3 – Identification of the polychaetes collected at the Spanish continental shelves (Gulf of Cádiz, Strait of Gibraltar, and Alborán Sea), and at the Alborán Island (Alborán Sea).

4 – Analysis of taxonomic aspects of the identified polychaetes, including intraspecific variations (clines, polymorphisms), and new taxa, if existing.

5 – Study of the ecological factors determining the distribution of the identified species of polychaetes (depth, substrate, etc.), and possible influence of such ecological factors in the variability of the species.

6 – Distribution of the polychaete species by the different habitats and their characterization, with a comparison between habitats from Southwestern Portugal and Southern Spain.

7 – And finally, zoogeographical study of the identified species of polychaetes, with a comparison between the fauna from Southwestern Portugal with the fauna from the Strait of Gibraltar (Alborán Sea, Strait of Gibraltar itself, and Gulf of Cádiz), with the determination of the affinities between the two regions and their origins.

However, some practical questions were unveiled in an early stage of the project, conditioning the subsequent phases of the work and the final version of the thesis. These problems were mainly three:

a) **The great amount and diversity of material to identify**: the number of samples with polychaetes from the two campaigns was very high, containing some of the samples numerous specimens (especially the samples collected by trawling, which increases greatly the volume of collected material): 504 samples from the SEPLAT campaigns, and 58 from the FAUNA 1 campaign. On the other hand, many specimens were too damaged or poorly preserved in order to enable the identification, even to generic level, and their classification was discarded.

b) **The lack of relevant bibliography**: the lack of a supporting solid library on annelid polychaetes was a significant problem. As commented above, the pertinent bibliography on polychaete taxonomy is dispersed by hundreds of publications and titles, some of which very old, rare, or with restricted distribution. Some Faunas exist for different regions of Europe, but a recent work integrating all these publications and information is a long time need. For this reason, it was difficult to access many important publications to identify the material from the campaigns. Finally, there is a desperate need of revisions for some groups of polychaetes.

c) **The samples from the two campaigns were not equivalent**: the comparison of the polychaete fauna from the two regions was difficult to do with base on the available material, as the collecting methods and the sampled sediments and habitats were very distinct between the two regions and campaigns.

At last, the ongoing discussions concerning the biodiversity and taxonomic crises had a decisive influence in the course that the works took in order to confront the problems found. As partially commented above, it was clear that in the study of polychaetes, like in the biggest part of other zoological groups, there is a need of new taxonomic tools that can balance the lack of specialists. Moreover, in the course of the works, it became evident the necessity of a comprehensive and integrative work on the polychaetes of the studied region, recording not only how many and which taxa are present in the area, but also providing information concerning that taxa, such as distribution, ecology, bibliographic references, or synonymies.

The final version

Thus, the necessity to give an adequate reply to the problems referred above, as well as to incorporate the new relevant questions in the work in progress, generated the final version of the project presented here.

a) The impossibility to identify in a suitable way all the available material was evident. Thus, it was decided to stop at a number of identifications similar to the obtained in other comparable studies performed in the Iberian Peninsula. To have an idea on which such number could be, five works were considered: CAMPOY (1982), on polychaetes of the Spanish coasts of the Mediterranean Sea, Santander, and the Basque Country; SARDÁ (1984*c*), on polychaetes from the mediolittoral and infralittoral of the Strait of Gibraltar; ALÓS (1988), on polychaetes from the Cape of Creus (Catalonia); PARAPAR (1991), on polychaetes from the Ria de Ferrol (Galicia); and LÓPEZ (1995), on polychaetes from the rocky bottoms of Chafarinas Islands. The number of taxa identified in all these works is given in the table below.

	Species and subspecies	Genera	Families
CAMPOY (1982)	328	180	46
SARDÁ (1984c)	253	151	42
ALÓS (1988)	233	137	37
PARAPAR (1991)	255	158	46
LÓPEZ (1995)	226	124	37
Present study	259	158	46

This way, the identification process was performed until a number of taxa similar to the achieved in the comparable works was reached, with the exception of CAMPOY (1982), in which the number is higher. Therefore, the number of the identified taxa is of 259 species, belonging to 158 genera and 46 families. Five of the species were new to science, and will be described in the future, appearing in this work as *sp. nov.*, while a sixth new species was described by RAVARA, CUNHA & PLEIJEL (2010). Two other species were only considered as *cf.* and two more were identified only at the generic level.

Almost no family has had the total amount of material identified, in spite of the fact that some of them were thoroughly worked (particularly the Magelonidae, Glyceridae, Paraonidae, Nephtyidae, Oweniidae, Spionidae, and Onuphidae). The diversity of other families, like the Maldanidae, Terebellidae, Chaetopteridae, Cirratulidae, Lumbrineridae, Phyllodocidae, or Sabellidae is much higher than the presented here, as the biggest part of the material remains unidentified. Finally, in spite of being present among the available material, no specimen of Sabellariidae and Fauveliopsidae has been so far identified. So, the total number of species and genera present in the material collected during the SEPLAT and Fauna 1 campaigns is much higher than the so far obtained and considered here, with the exception of very few families (Nephtyidae, Glyceridae, Sternaspidae, or Paralacydoniidae, for instance). For some families there are species already detected that have not been included in the present work (as in Amphinomidae, Chrysopetalidae, Orbiniidae, or Flabelligeridae). This material will be studied in the future, and the results published elsewhere.

b) The problem of the available bibliography was greatly reduced with the increasing number of titles available online, subject to subscription or with free access through projects as the Biodiversity Heritage Library (www.biodiversitylibrary.org). Basic information, such as updated lists of described species, or tools to search further information on them was also missing until recently, when initiatives such as ERMS (www.marbef.org/data/erms.php) or WoRMS (www.marinespecies.org) have partially filled this gap. Finally, a great effort was made in order to gather the biggest number possible of pertinent publications, using numerous sources of information (see *Material and Methods* section).

c) The third of the main problems pointed above was more difficult to skirt, and finally it was decided to focus the work in a different way. To do this, the referred ongoing discussions on the taxonomic and biodiversity crises were considered and brought to reflection.

This way, it was considered important to seize the present opportunity to elaborate the much needed comprehensive work on the European polychaetes, making an updated taxonomic tool for a wider public than the polychaete community of workers and specialists. The study presented here is the result of the identification process of the material collected during the SEPLAT and Fauna 1 cruises and the questions and needs raised by that process, complemented by a bibliographic research on the European polychaetes. The data from both exercises is integrated in a commented scheme that presents information on how many species, and which, are present in the considered area. For each species are included the original reference, synonymies, selected references, geographical distribution, depth range, ecology, and taxonomic remarks, whenever considered necessary, based both on the studied material and bibliography. Dichotomic keys are also furnished for the biggest part of the taxa included, from families to genera and species. The detailed structure of the work in explained in the *Material and Methods* section. It was not possible to include the totality of the species present in European and nearby waters, but by far the biggest part of the benthic marine species is here (about 98% of the valid benthic species that occur in the European waters).

It is not the intention of the present work to give a definitive tool for the identification of the Polychaeta from the European and nearby waters. Many problems still remain unsolved, and need to be further investigate and the solutions sought. The own dynamism of taxonomic science, with new discoveries been made daily, make the elaboration of a definitive tool just impossible. However, the present study gives for the first time ever a comprehensive work on the benthic polychaetes of the whole European waters. In spite of the species that are still lacking, the unsolved synonymies, the need to add more figures, or the incomplete keys, it is definitely a step forward in proving a taxonomic tool where to find pertinent information concerning the European fauna of polychaetes. It is a *state of the art* of the European benthic polychaetes. It should be used as so, keeping the mind open to new discoveries.

MATERIAL & METHODS

MATERIAL AND METHODS

THE CAMPAIGNS

a) THE SEPLAT CRUISES

In 1974 the *Instituto Hidrográfico* (Hydrographic Institute), the Laboratory of Ocean Sciences of the Portuguese Navy, started the program SEPLAT, in charge of the *Laboratório de Sedimentologia* (Sedimentology Laboratory) of the *Divisão de Dinâmica de Costas e Estuários* (Division of Coastal and Estuarine Dynamics). The program SEPLAT (*SEdimentos da PLATaforma*, Continental Shelf Sediments, in Portuguese) was designed to make the systematic survey and cartography of the superficial sediments of the Portuguese continental shelf and superior slope, in order to publish, in a series of 8 sheets, the "*Carta dos Sedimentos Superficiais da Plataforma Continental*" (Chart of the Superficial Sediments of the Continental Shelf), at the scale of 1:150,000.

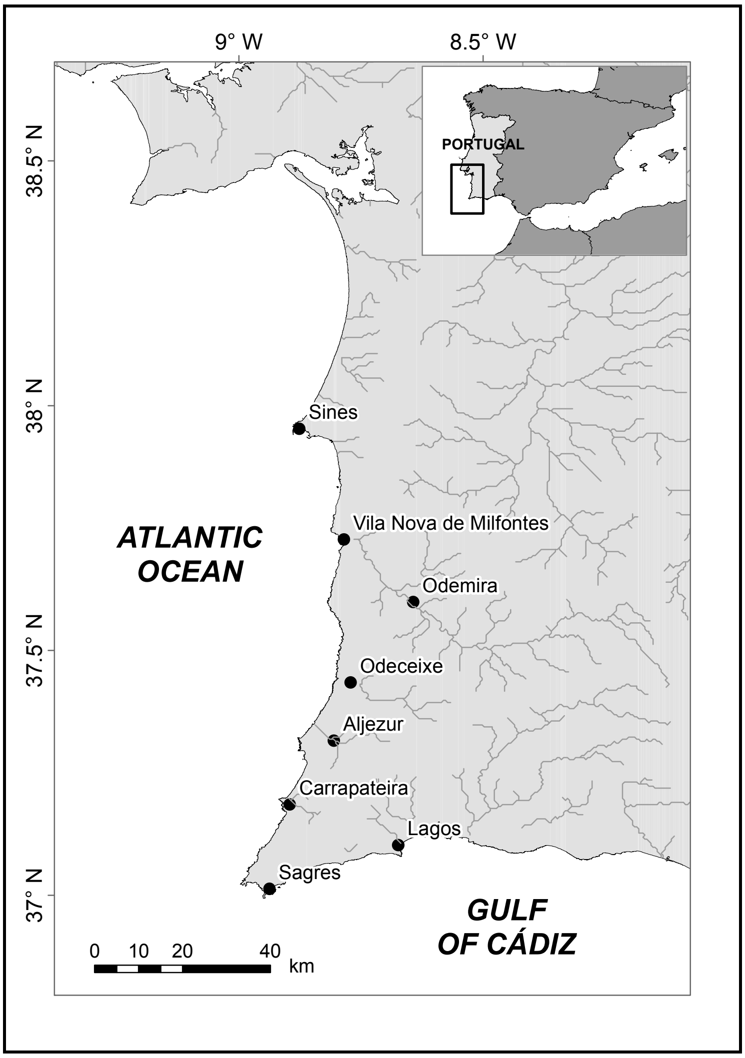

Figure legend: Southwestern coast of Portugal sampled during the SEPLAT 6 and 7 Cruises, between 1979 and 1983. For more details on the stations and their locations, see ANNEXES 1 and 2. (Map by Aitana Oltra).

The SEPLAT campaigns, whish finished in 1999, were performed along the whole Portuguese continental coast, from Minho to Algarve, from the coastal line to a depth of about 500 meters, and following a more or less rectangular sampling grid, spaced by an average of one nautical mile. The samples obtained this way were processed at the Sedimentology Laboratory of the Hydrographic Institute, mainly for their dimensional analysis (granulometry) and carbonate contents. This data was posteriorly used for the design and construction of the Charts of the Superficial Sediments of the Continental Shelf. Up to date, four of the programmed eight sheets have been published: SED 5 (from Cape Roca to Cape Sines), SED 6 (from Cape Sines to Cape São Vicente), and SED 7-8 (from Cape São Vincente to Guadiana River).

The scientific supervisor of the SEPLAT program during its first phase, Dr. Isabel Moita, addressed an invitation to the *Laboratório Marítimo da Guia* (Guia Maritime Laboratory), of the University of Lisbon, which allowed the participation of researchers and students of the Faculty of Sciences of the University of Lisbon in some of the cruises. This enabled the collection of numerous biological samples of the prospected zones. Part of this material, collected in the southern coast of Portugal during the cruises SEPLAT 3 and 4, was examined by MONTEIRO-MARQUES (1987), in his study of characterization of the soft bottom biocenosis of the continental shelf of Algarve. All the other material, with the exception of some Amphipoda (MARQUES & BELLAN-SANTINI, 1985, 1991; MARQUES, 1989) and Echinodermata (JESUS & CANCELA DA FONSECA, 1999), remains unstudied.

The biological material examined in the present study from the SEPLAT cruises was collected along the southwestern Portuguese continental coast (from a little northern of Cape Sines to Cape São Vicente), during the cruises SEPLAT 6 (April/May 1981), SEPLAT 7 – 1st part (October and December 1981) and SEPLAT 7 – 2nd part (October 1983). The sediment samples were collected by the ship of the Portuguese Navy *N.R.P. Almeida Carvalho*. In the stations closer to the coast, with depths shallower than 20 meters, this ship was not used due to its draft, and smaller vessels were used instead, in order to prospect those areas (*N.R.P. D. Jeremias* and *U.A.M. Sete Estrelas*). The sediment samples were collected by grabs (Van Veen and Shipeck).

The cruises SEPLAT were designed to collect samples of the superficial sediments of the continental shelf for sedimentological purposes, and for this reason, the recollection of biological material was subject to the existing conditions, mainly as a by-product, and was qualitative.

b) THE FAUNA 1 CAMPAIGN

The Fauna 1 campaign was performed under the scope of the program *Fauna Ibérica*, of the *Consejo Superior de Investigaciones Científicas* (Spanish National Research Council, CSIC) being its coordination center the *Museo Nacional de Ciencias Naturales de Madrid* (National Museum of Natural Sciences, Madrid). The main purpose of the program *Fauna Ibérica* is to complete and broaden the existing knowledge of the fauna of the Iberian Peninsula, in order to obtain a global idea of the same. Besides, it also aims to organize the available information concerning this fauna on a database, and gather collections the most complete possible of the different groups that constitute it.

The objective of Fauna 1 Campaign was to complete, as far as possible, the knowledge of the marine fauna of the southern Iberian Peninsula, especially from regions not explored in anterior campaigns and not accessible by scuba diving. During this campaign it was intended to obtain as much information as possible on the fauna of the area, both pelagic and benthic. This way, and besides the faunistic list, it was intended to know the abundance of the different species (in specimens number and biomass) according to depth, kind of substrate, and other variables, to determine the type of marine communities present in the region and their distribution, to estimate the conservation state of these communities and the incidence of factors such as the industrial and urban pollution or overfishing over them, to make the biggest number possible of graphic registers of the species (photographs and films of the species still alive), and to obtain individuals of particular species for biochemical studies. Finally, it was intended to obtain a well documented and complete representation of the fauna of the whole region, in order to improve the collections of the *Museo Nacional de Ciencias Naturales*, and to enable the study of its taxonomy, biology, ecology, and other aspects.

The Fauna 1 campaign was performed in July 1989, exploring the southern waters of the Iberian Peninsula (mainly Strait of Gibraltar, the continental shelves of western Alborán Sea and eastern Gulf of Cádiz, and around Alborán Island), and sampling mostly between 30 and 300 meters deep (but oscillating between 20 and 500 meters).

The samples were collected by the Spanish oceanographic ship *B.O. García del Cid*, managed by the *Institut de Ciències del Mar* (ICM), presently the Centre Mediterrani d'Investigacions Marines i Ambientals (CMIMA), and belonging to the CSIC. The sediment samples were collected by trawls, both benthonic (beam trawl and Italian trawl) and pelagic (ISAACS-KIDD midwater trawl, also known as IKMT). As a result of Fauna 1 campaign about 25,000 specimens were collected, mostly invertebrates, comprising an estimated number of 800 species, with at least 96 being new for science (M.A. RAMOS, pers. com. *in* ALBERCH, 1993).

A more extensive explanation of the Fauna 1 campaign can be found in TEMPLADO *et al.* (1993).

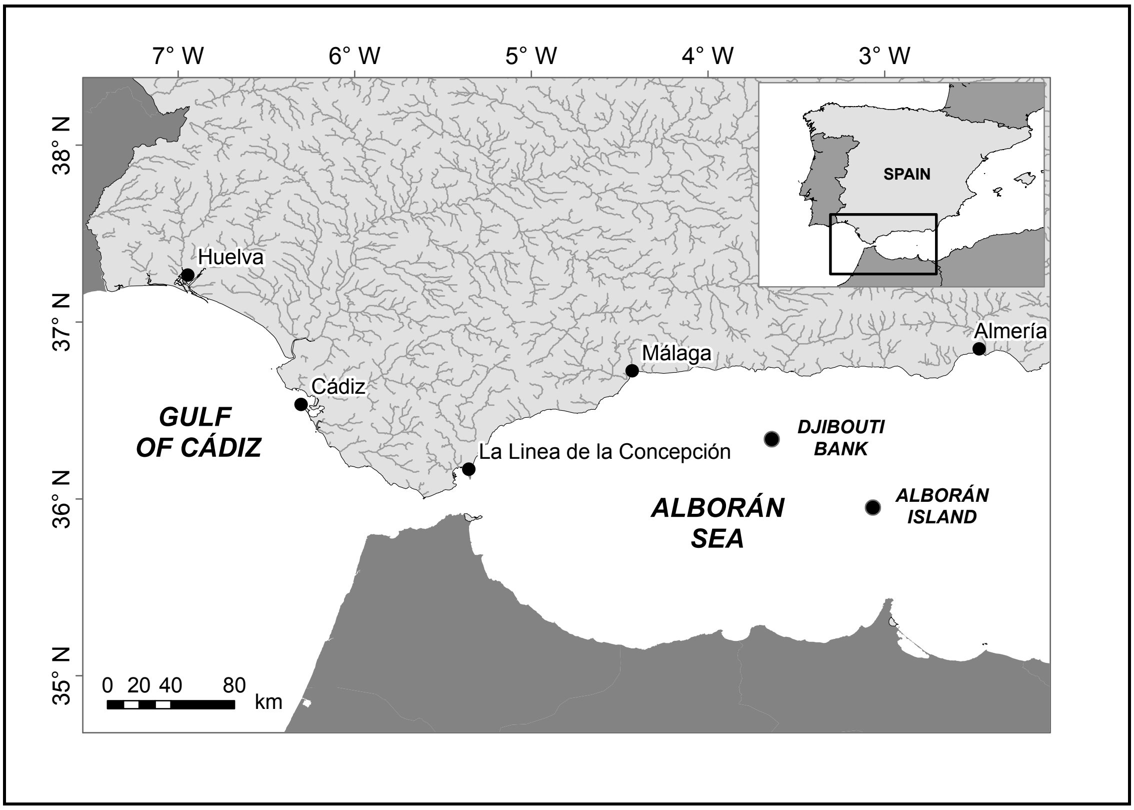

Figure legend: Southern coast of Spain sampled during the Fauna 1 Campaign, in 1989. For more details on the stations and their locations, see ANNEXES 1 and 2. (Map by Aitana Oltra).

c) USED SAMPLING GEARS

Several different gears were used to collect the samples for the present study. During the SEPLAT campaigns, the sampling was done with grabs (Van Veen and Shipeck grabs), while in the Fauna 1 campaign, the used sampling gears were benthic and pelagic trawls (beam trawl, small Italian trawl, and IKMT). The grabs are normally used for quantitative samples of animals inhabiting sediments, being usually lowered vertically from a stationary ship, capturing slow-moving and sedentary members of the epifauna, and infauna to the excavated depth. Benthic trawls are designed to glide over the bottom surface, and as they cover a large area, they are useful for collecting scarcer members of the epifauna, and benthic species of fish, cephalopods and crustaceans. It is possible to obtain estimations of the population density when using trawls, by standardizing conditions and duration of tows, but as normally only a fraction of the benthic fauna is sampled, they are generally used only for qualitative benthic studies.

SHIPECK GRAB – Is formed by a single semi-circular scoop actuated by powerful springs when it hits the marine floor. It can be used down to depths of about 200 meters, whenever the conditions of the sea are favourable. The fact of covering a relatively small area (0.02 to 0.04 m^2) and of being a light sampler (about 15 Kg) makes it inadequate to sample macrofauna, and is mainly used by geologists to obtain a small sample of bottom sediment. The design of its closing system avoids the washing of fine sediments (silt and clay) when it is raised from the bottom to the surface. (ELEFTHERIOU & HOLME, 1984; MONTEIRO-MARQUES, 1987).

VAN VEEN GRAB – Is formed by two buckets shaped like 1/4 of cylinder, and two long arms that give a better leverage for closing, and which also include the trigger system. This one is operated when the grab hits the bottom, joining the two buckets and closing the collected sediment. The arms also tend to prevent the grab being pulled off the bottom it the ship rolls up as the grab is closing. On the other hand, the arms may pull the grab to one side if, through drift of the ship, the upward pull for closing is oblique. It can be heavier than the Shipeck grab (up to 35 Kg) and covers a bigger surface (0.1 m^2 or more, according to the adaptations). As the anterior one, it can be used down to about 200 meters or more, if the conditions of the sea are favourable. It is seldom used in geological studies, as it enables the washing of the fraction of fine sediments, being preferably used for collecting biological material (ELEFTHERIOU & HOLME, 1984; MONTEIRO-MARQUES, 1987). However, during the SEPLAT campaigns it was used for the collection of geological material.

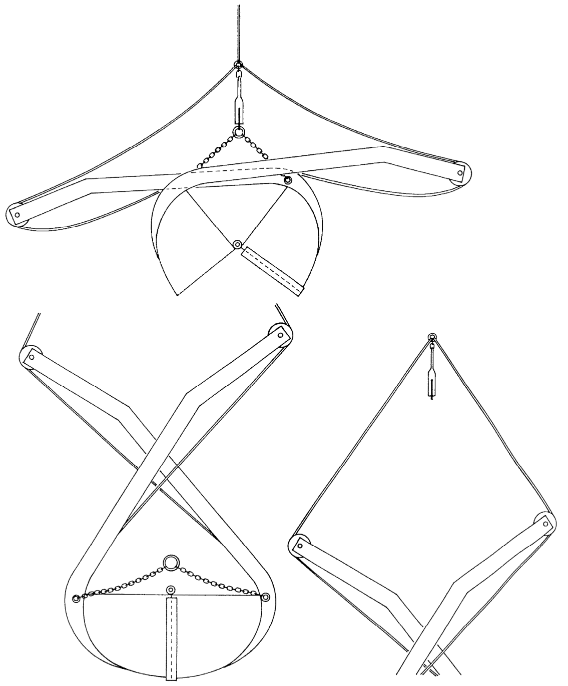

Figure legend: Van Veen grab, open and closed. (Adapted from ELEFTHERIOU & HOLME, 1984; after DYBERN, ACKEFORS & ELMGREN, 1976).

ITALIAN TRAWL – Is a benthic trawl. It is used normally for commercial fishing, especially for benthic species, but it can also capture members of the invertebrate epifauna. Italian trawls are characterized by close bottom contact, so not only the footrope but also the whole lower panel is towed in close contact with the sea bed. The Italian-trawl body consists of two asymmetric panels, being the upper panel (or "*cielo*") wider and shorter than the lower one (or "*tassello*"); the lower panel has a great amount of slack (20–30%) to maximize bottom contact. Besides the upper and lower panels, the Italian trawl includes the wings, and the upper and lower wedge, or "*scaglietti*". All these parts are common to all trawl nets of the Italian type, and the differences rely on their dimensions, cutting and hanging, depending on the local experience and requirements. The Italian trawl used in Fauna 1 Campaign was small, toothed, with a mouth opening of 85 x 55 cm, and a posterior nylon collecting bucket 130 cm long, with a mesh size of 10 mm knot-to-knot. (FIORENTINI & COSIMI, 1981; TEMPLADO *et al.*, 1993; LEONORI, PALLADINO & COSIMI, 2006).

BEAM TRAWL – In the beam trawl the mouth of the net is held open by a horizontal bar of wood or steel of 2-10 meters length, with metal runners at either end. The net is a fairly long bag, and can have different mesh sizes from knot-to-knot. The lower leading edge of the net is attached to a weighted chain, forming a ground rope, which curves back behind the top of the net attached to the horizontal bar. At the superior region it can have floating devices attached. The beam trawl used at the Fauna 1 Campaign had a horizontal bar of 350 cm length, ending in metal runners 60 cm high. The length of the net was of about 10 meters, of a mesh size of about 35 mm knot-to-knot at the posterior region, at the collecting bucket. Inside the collecting bucket was placed an additional bag, of a mesh size of 10 mm knot-to-knot. Three beam trawls were used for the campaign. In rocky or coralligenous bottoms, there is the danger that the trawl is trapped and lost, due to the break of the cable that connects it to the ship. (TEMPLADO *et al.*, 1993).

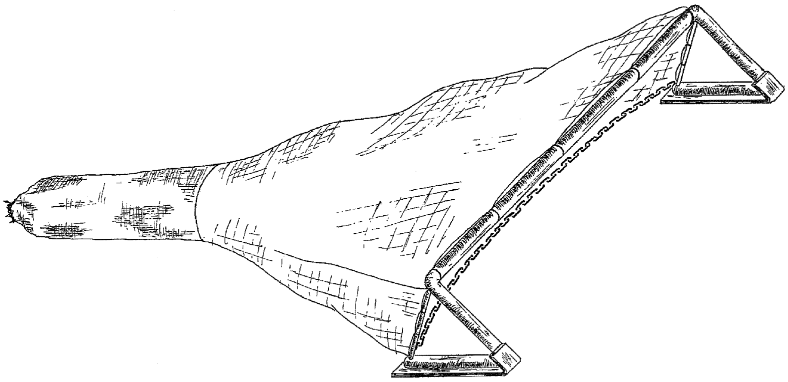

Figure legend: Beam trawl. (Adapted from TEMPLADO *et al.*, 1993).

IKMT – Is a trawl specially designed to collect biological material (macroplankton and nekton) in the midwater zone, at moderate speed. Its designation comes from "*ISAACS-KIDD midwater trawl*". It is a round net, about 6 m long, with a series of hoops that decrease in size from the mouth of the net to the rear end. The rear end measures an additional 1.5 m in length and has a mesh size of 10 mm knot-to-knot, endin in a PVC cylinder that collects the sample. The hoops maintain the shape of the net during towing. The mouth of the net is approximately 1 x 1 m, and is attached to a wide, V-shaped, rigid diving vane, sometimes called a depressor. The vane keeps the mouth of the net open during towing and exerts a depressing force. This force maintains the trawl at a designated depth for the duration of the sampling period. (TEMPLADO *et al.*, 1993).

d) RESUME OF SEPLAT AND FAUNA 1 CAMPAIGNS

	SEPLAT 6 and 7	**FAUNA 1**
Organized by:	Instituto Hidrográfico, Marinha Portuguesa (Hydrographic Institute, Portuguese Navy)	Museo Nacional de Ciencias Naturales, Consejo Superior de Investigaciones Científicas (MNCN, CSIC)
Research vessel:	*N.R.P. Almeida Carvalho* (1972-2001)	*B.O. García del Cid* (1977-present)
Purpose:	Geological	Biological
Dates:	SEPLAT 6 – April and May 1981; SEPLAT 7 (1st part) – October and December 1981; SEPLAT 7 (2nd part) – October 1983	July 1989
Collecting gears:	grabs (Van Veen; Shipeck)	trawls (beam trawl; Italian trawl; IKMT)
Geographical region	Portuguese southwestern continental shelf	Spanish southern continental shelf (Gulf of Cádiz, Strait of Gibraltar, Alborán Sea and Alborán Island)
Depth range:	15 to 440 meters	14 to 541 meters
Ground:	mainly soft bottoms (from gravel to silt)	all kinds of bottoms

TREATMENT OF THE SAMPLES

Samples were collected during two different campaigns, for which reason the process and treatment of the samples was done in a slightly different way. The treatment of the samples is explained in detail by MONTEIRO-MARQUES (1987), for the SEPLAT cruises, and by TEMPLADO *et al.* (1993), for the Fauna 1 Cruise.

a) SEPLAT cruises – After its collection, samples were quickly sorted on board of the *N.R.P. Almeida Carvalho*, in a humid laboratory. Big macrofaunal specimens were sorted macroscopically and placed in plastic bags and in plastic or glass vials, all of them labelled. Sediment samples were sorted using sieves with a diameter of 30 cm and meshes of 1950 µm and 1000 µm, and rinsed with current seawater at moderate strength, in order to avoid damage to the more fragile specimens, as polychaetes. The sediment remaining in the sieves was transferred to labelled plastic bags and vials, and kept for a posterior and more detailed sorting at the dry laboratory. Bags and vials with specimens and sediment were stored in big containers. All the material was fixed with 10% formalin in filtered sea water and neutralized with borax, where it remained until its sorting at the dry laboratory. Some of this material remains unsorted and kept in formalin for more than 30 years, in good condition. Other samples were lost during the same period, due to several reasons and constraints.

At the dry laboratory, at the Laboratório Marítimo da Guia, Faculdade de Ciências da Universidade de Lisboa (IMAR, Cascais, Portugal), the samples were sorted under the binocular microscope, and the macrobenthos divided by different taxonomic groups, each one placed in a different plastic vial. Each vial was labelled with the name of the taxonomic group and the data of the collection station and cruise. Some of the samples were stained with Bengal Rose, in order to ease the sorting of the benthic specimens from the sediment.

The SEPLAT material was conserved at the Laboratório Marítimo da Guia by Vasco Monteiro Marques, who also studied part of it (MONTEIRO-MARQUES, 1987), until his death in 1985. Afterwards, it was conserved by Dr. Luís Cancela da Fonseca. The sorting of the material of the SEPLAT cruises studied here was carried out under the project "*Estudos de Caracterização dos Povoamentos Marinhos do Litoral Sudoeste: Comunidades Bentónicas da Plataforma Continental (Substratos Móveis)*", financed by ENVIREG/ICN.

Data on the SEPLAT cruises and sampled stations was furnished by the Instituto Hidrográfico, of the Portuguese Navy (see *ANNEX 1*, for stations with material examined in this study). This data included the location of the stations, date of sampling, used gear, depth, and type of substrate according to the classification of SHEPARD (1954).

Some labelling errors were detected during the study of the material. Some of them were committed when labelling the samples on board, while others were introduced at the dry laboratory, when sorting the material. Whenever possible, these errors were corrected by comparison of the data on the labels with the data furnished by the Instituto Hidrográfico. Whenever doubts subsisted or it was not possible to clarify the error, a question mark precedes the station number. This refers particularly to the material collected on the stations only labelled as "SEPLAT 7, Est. 186, 159 m", "SEPLAT 7, Est. 187, 350 m, 3.12.81" and "SEPLAT 7, Est. 188, 149 m". The only date present on these three labels was 3.12.81, which points to stations sampled during the cruise SEPLAT 7 (1st part). However, it was not possible to find stations with the remaining data corresponding to the known information on these three stations. For this reason, these stations are here considered as having been sampled during the first part of SEPLAT 7, but a question mark precedes the station number.

There were 504 stations with Polychaeta available from the cruises SEPLAT 6 and 7. From these, it was identified material (not necessarily all) from 377 stations (see *ANNEX 1*).

b) Fauna 1 campaign – After its collection, when the sample was already on board of the *B.O. García del Cid*, the procedure was to make a first sorting of the macrofauna by taxonomic groups, which were placed in different labelled plastic trays. All the macrofauna was washed and the sediment sieved, using a set of aluminium sieves with decreasing mesh diameters (10 mm, 5 mm, 2 mm, 1000 µm). Fractions of the samples, as algae, rhizomes, stones with organic cover, and sediment, were placed in plastic trays at dark, and let to repose, so the mobile organisms could move out from those fractions due to the depletion of oxygen. The smaller organisms were then picked under binocular microscopes. In some cases, the sediment was fixed directly with formalin, and the fauna sorted only later.

At the humid laboratory of the research vessel, the specimens were identified to the lowest taxonomic level possible, counted, and weighted. Finally, this material was labelled, and placed in plastic bags or vials with conservation fluid (70% ethyl alcohol in distilled water for organisms with calcareous structures, and formalin at 6% in filtered sea water for those lacking them). Material belonging to the same taxonomic group was stored together, in containers of 25 litres of capacity. Plastic bags with sediment of the different sieves were also kept together in the same containers, to make the sorting of the microfauna later, at the dry laboratory.

Some material was frozen, for biochemical studies (mainly specimens of Opistobranchia). Other particular specimens were kept alive in seawater at low temperature, for their posterior description in detail, to be drawn, photographed or filmed. This procedure was done mainly for the study of sponges and opistobranch molluscs, as their coloration, very useful for their identification, is lost with the fixation process. For this purpose, the dry laboratory of the research vessel was equipped with an aquarium and a photographic system. The same dry laboratory included stereo microscopes and bibliography for identifications.

After the campaign, all material was transferred to the Museo Nacional de Ciencias Naturales. Here, the fixative or conservative fluids were replaced by new fluids, as the water content of the organisms can dilute their concentration, leading to the decay of the stored material. Finally, the organisms were sorted by taxonomic groups, and stored in labelled plastic and glass vials, with the indication of the taxonomic group and station.

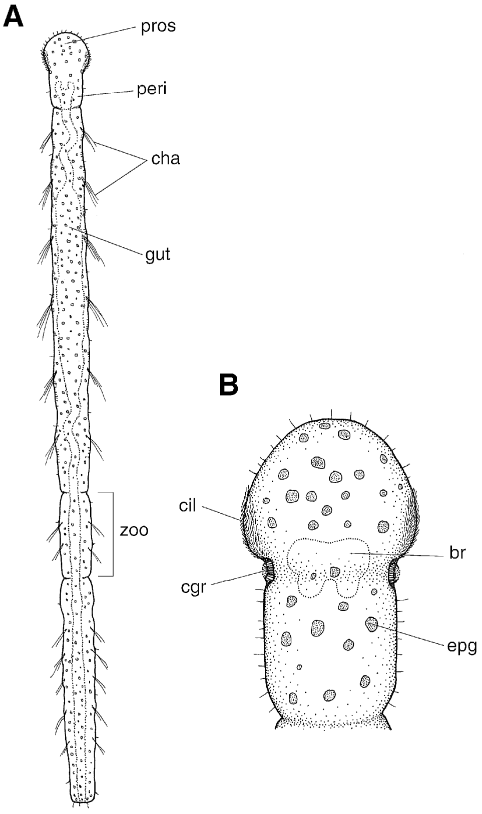

Figure legend: Excluded families. Family Aeolosomatidae. *Aeolosoma* specimen. **A**, entire animal with three zooids, dorsal view. **B**, anterior end, dorsal view. **br**, brain; **cgr**, ciliary groove; **cha**, chaetae; **cil**, cilia; **epg**, epidermal gland cell; **gut**, gut; **peri**, peristomium; **pros**, prostomium; **zoo**, zooid. (Adapted from BEESLEY, ROSS & GLASBY, 2000; after BUNKE, 1967).

Some problems with labelling were stated at this level, but it was not possible to solve them. This way, the label of one of the samples was destroyed during the whole process, and so far, it was not possible to attribute the collected material to one single sampled station, being this material labelled as "Estiqueta destruída" (Label destroyed). Another sample's label stated "64A? Posiblemente 63A" (64A? Possibly 63A). Station 64A (which should be correctly designated as 64P) was collected with a pelagic IKTM trawl, while a beam trawl was used in station 63A. The material present in the vials labelled as "64A? Posiblemente 63A" corresponds to benthic species, which seems to point to the possibility that it was collected with a beam trawl. However, station 47P, stated as having been collected with an IKTM trawl, also presents typical benthic species, which raises some doubts on how this material was collected and processed, or the trawl used. For all this, and as some reasonable doubts remained, the material previously labelled as "64A? Posiblemente 63A" is here dubiously considered as belonging to "[?] St. 63A". Finally, the collection data of some material is not completely known, and the collection site is here designated as referred in the original labels.

The taxonomic groups were finally distributed by different specialists, being the Polychaeta sent to Dr. Rafael Sardá, at the Centre d'Estudis Avançats de Blanes (CEAB-CSIC, Spain).

Data on the Fauna 1 cruise and sampled stations was obtained from TEMPLADO *et al.* (1993) (see *ANNEX 1*, for stations with material examined in this study).

There were 58 stations with Polychaeta available from the cruise Fauna 1. From these, it was identified material (not necessarily all) from 55 stations (see *ANNEX 1*).

IDENTIFICATION OF THE SPECIMENS

For the specimens' identification, some basic optical instruments are required. These include a stereo microscope equipped with a good illuminator, if possible with fibber optics, and a compound microscope equipped with an oil immersion objective and a camera lucida for the drawings. A graduate ocular may be required for measurements, otherwise they can be made using the camera lucida. The ideal situation is that both stereo and compound microscopes are personal, and placed together in a quiet room, but in a general way, these conditions were seldom achieved during the present study. Besides the optic material, a good bibliographical base referent to the studied group is also necessary, as well as a basic knowledge of both the group and the bibliography.

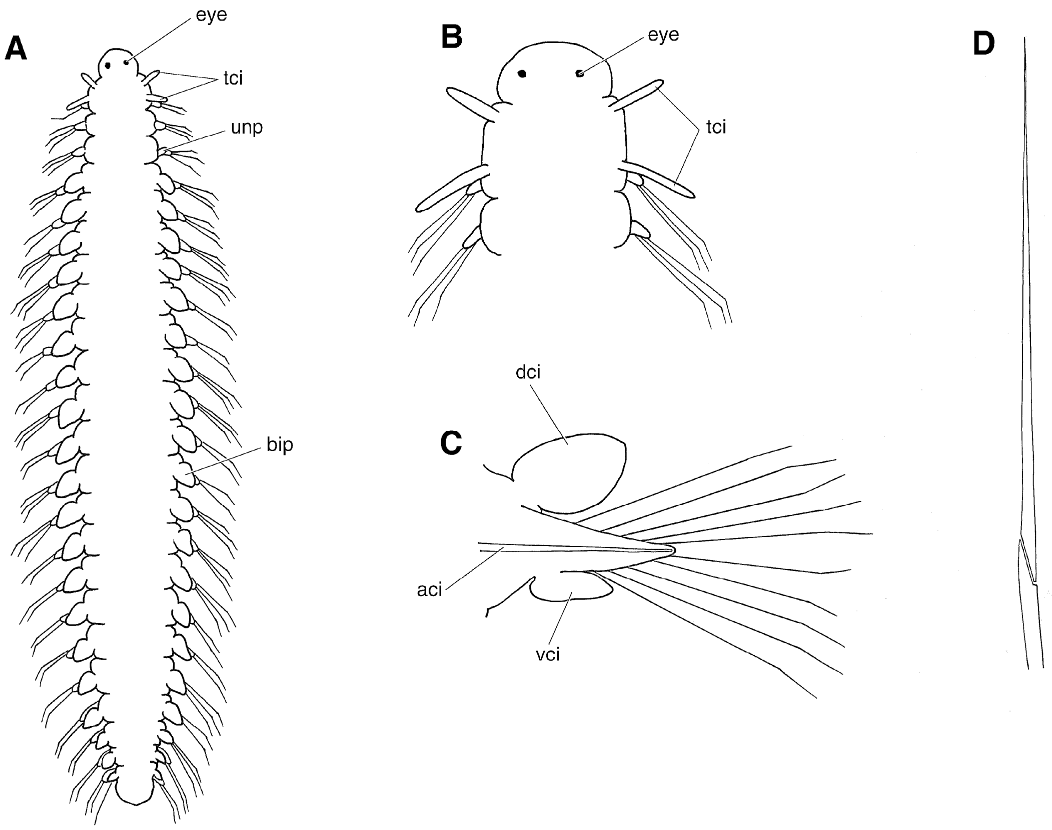

Figure legend: Excluded families. Family Iospilidae. **A**-**C**, *Iospilus phalacroides*: **A**, entire animal, dorsal view; **B**, head, dorsal view (palps not visible); **C**, parapodium. **D**, *Phalacrophorus uniformis*, compound chaeta. **aci**, acicula; **bip**, biramous parapodium; **dci**, dorsal cirrus; **eye**, eye; **tci**, tentacular cirrus; **unp**, uniramous parapodium; **vci**, ventral cirrus. (Adapted from BEESLEY, ROSS & GLASBY, 2000; drawings by K. Nolan, after DAY, 1967).

All specimens were first sorted to the family level, under a stereo microscope. This was done as it was considered to be more efficient to identify polychaetes by families, being much easier to compare specimens from different samples and to reduce this way the number of dubious identifications. Specimens were sorted in filtered water or on 70% ethyl alcohol in distilled water, and transferred to glass or plastic containers completely filled with 70% ethyl alcohol in distilled water, a medium in which the specimens were always stored from this point onwards. The type of recipient was determined by the size and shape of the specimens it should contain. Specimens must enter or be removed easily from the recipient, and not to be forced to fit in it or to be deformed by it. This way, the vial should always adapt to the specimen, and not the specimen to the vial. Whenever possible, small 3 ml glass tubes were used, capped with cotton plugs, and stored in bigger glass vials with plastic caps, filled with alcohol. In other cases, glass or plastic vials were used to store big specimens. In the ideal situation, only glass vials would have been used, and these should have been stored within larger glass jars, but these were not available. As it was found that some plastic caps had cracked during the storage of the vials with the subsequent drying of the contents, the closing of the caps was reinforced with Parafilm®. All material was stored in 70% ethyl alcohol, but it must be highlighted that all of it had been previously fixed with formalin, as ethyl alcohol should never be used as a fixative.

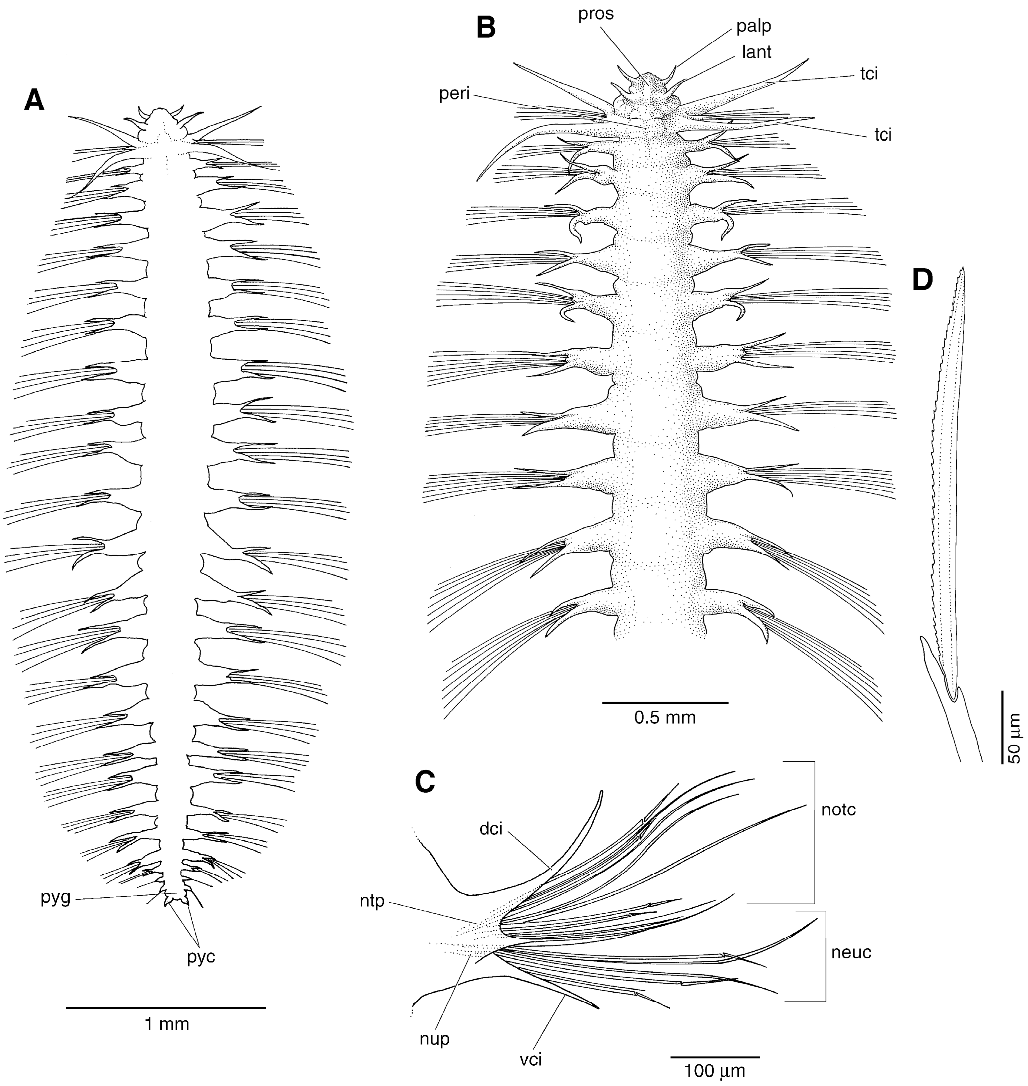

Figure legend: Excluded families. Family Lopadorrhynchidae. *Pelagobia* specimen. **A**, entire animal, ventral view. **B**, anterior end, ventral view. **C**, parapodium from chaetiger 2. **D**, compound neurochaeta from parapodium of chaetiger 2. **dci**, dorsal cirrus; **lant**, lateral antenna; **neuc**, neurochaetae; **notc**, notochaetae; **ntp**, notopodium; **nup**, neuropodium; **palp**, palp; **peri**; peristomium; **pros**, prostomium; **pyc**, pygidial cirri; **pyg**, pygidium; **tci**, tentacular cirrus; **vci**, ventral cirrus. (Adapted from BEESLEY, ROSS & GLASBY, 2000; drawings by K. Nolan).

Every vial received a label with the designation of the family and the reference of the collection cruise and station. The labels were done in tracing paper, and their dimensions were planned to be always completely immersed in the preservation fluid (alcohol) contained in the vial. Whenever possible, the labels were placed in a position to enable its easy reading, but also to allow seeing the contents of the vial. The labels were written using Pelikan Indian-ink 523 number 17 (black), with a Rotring Isograph 0.25.

At this level, special care must be taken with labelling. Each vial must receive its own label as soon as the specimen or specimens are placed inside it. Labels should be always placed inside the vials, together with the specimens, even if the vials are also identified in the exterior. External identifications are more exposed to be damaged or lost than internal tags. It is also advisable to keep the label with the respective specimen or specimens in the Petri dishes, whenever they are being studied, in order to avoid label interchanging. If possible, whenever relabelling a vial with a correction, the old label should be kept.

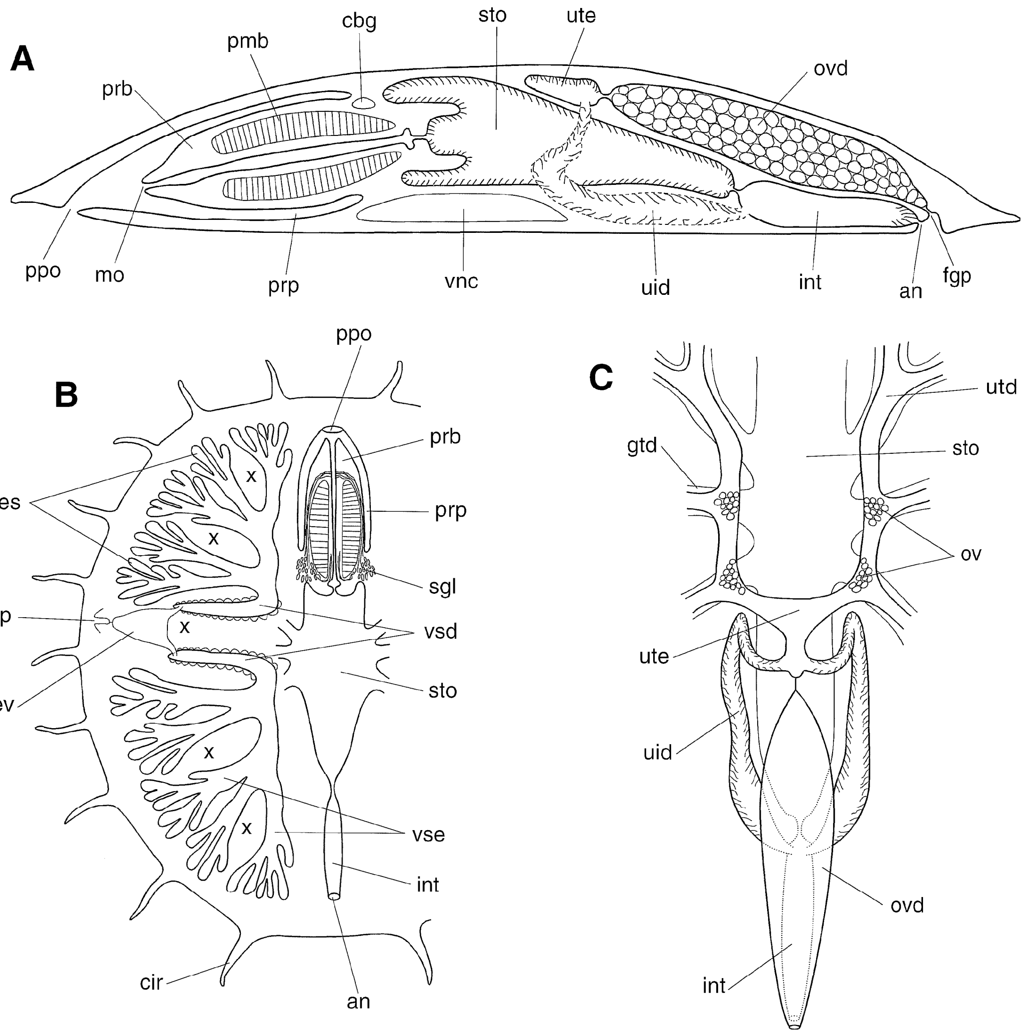

Figure legend: Family Myzostomidae. Anatomy of *Myzostoma cirriferum*. **A**, internal organs of a female, sagittal view. **B**, digestive tract and male reproductive system, ventral view. **C**, digestive tract and female reproductive system, dorsal view. **an**, anus; **cbg**, cerebral ganglion; **cir**, marginal cirrus; **fgp**, female genital pore; **gtd**, gut diverticula; **int**, intestine; **mgp**, male genital pore; **mo**, mouth; **ov**, ovaries; **ovd**, oviduct; **pmb**, pharyngeal muscle bulb; **ppo**, proboscis pocket opening; **prb**, proboscis; **prp**, proboscis pocket; **sev**, seminal vesicle; **sgl**, salivary gland; **sto**, stomach; **tes**, testes; **uid**, utero-intestinal duct; **utd**, uterine diverticula; **ute**, uterus; **vnc**, ventral nerve chord (or mass); **vsd**, vas deferens; **vse**, vas efferens; **X**, sites of parapodia. (Adapted from BEESLEY, ROSS & GLASBY, 2000; drawings by I. Hallam, after JÄGERSTEN, 1939).

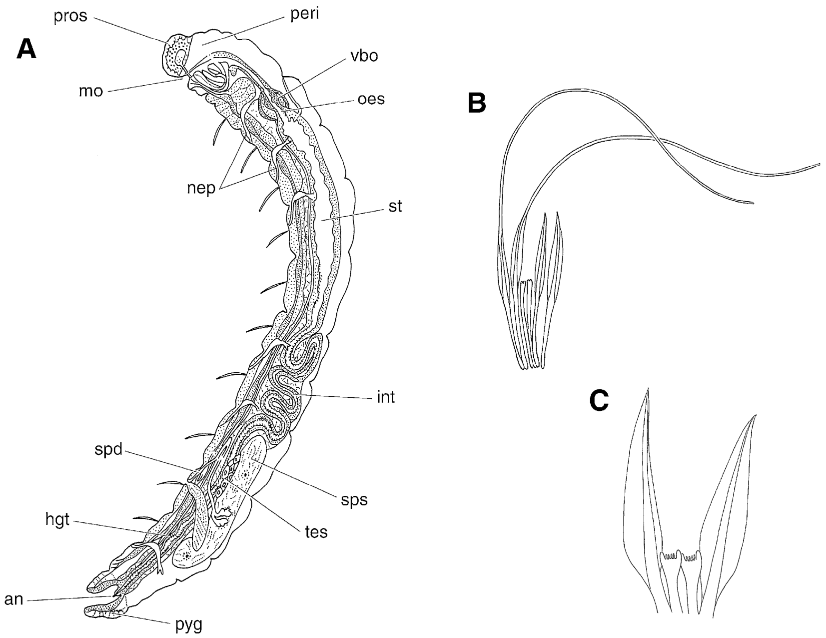

Figure legend: Excluded families. Family Parergodrilidae. *Stygocapitella subterranea*: **A**, entire animal, sagittal view of a male; **B**, chaetae from parapodium of chaetiger 1. **C**, *Stygocapitella* specimen, chaetae from parapodium of chaetiger 2. **an**, anus; **hgt**, hindgut; **int**, intestine; **mo**, mouth; **nep**, nephridia; **oes**, oesophagus; **peri**, peristomium; **pros**, prostomium; **pyg**, pygidium; **spd**, sperm duct; **sps**, sperm sac; **st**, stomach; **tes**, testis; **vbo**, ventral buccal organ. (Adapted from Beesley, Ross & Glasby, 2000; drawings by K. Nolan; A-B, after Karling, 1958; C, after Hartmann-Schröder, 1983*a*).

Each family was studied separately. Specimens were identified under stereo and compound microscopes, and following dicothomic keys, whenever available. Several Petri dishes of different sizes were used to place the specimens while studying them. The specimens were handled using a pair of fine-pointed forceps or tweezers (normally number 5) and a tweezer Moria MC40. One forceps with stronger tips was used to remove specimens from hard substrates, such as some serpulids from their tubes, and longer forceps were used to remove some specimens from vials, or to handle big specimens. One horse hair was used to pull specimens of *Ditrupa arietina* off their tubes, and a Winsor & Newton miniature sable brush (Series 12, number 1) was used to remove the excess of dirt from some specimens, whenever necessary. For the study of certain groups, it was necessary to dissect the specimens in order to observe internal structures such as maxillaries, mandibles or proboscideal papillae, or to remove parts of them, like parapodia (generally always necessary). Slits and cuts were made using iris scissors Moria MC19.

For the identification of specimens to genus and species level, a careful examination has to be done. It is advisable to make a study of the family previously to the identification of its specimens, to determine which characters are more important, and which parts should be dissected for identification. Not always is necessary to dissect the specimens to observe their pharyngeal structure, if retracted, but it is usually necessary to remove one or various parapodia, at least to study their chaetae.

The followed methodology was to observe big specimens before smaller ones, specimens in good condition before damaged ones, and complete specimens before incomplete ones. Whenever necessary to dissect a specimen, the priority was to use an incomplete or damaged one of the same species before a specimen in good condition, and always to work only in one side of the specimen, when removing parapodia.

Many characters of medium to big size specimens were observed under the stereo microscope, while for small specimens, and whenever possible, the whole specimen was mounted for observation under a compound microscope. However, small details of all specimens, as chaetae, and in many cases parapodia, must be observed under a compound microscope. To observe specimens or dissected parts under a compound microscope, they must be mounted on a slide. Larger samples can be mounted on depression slides, but flat slides were normally employed, as at high magnifications the depression slides cannot be used, or make observations more difficult. The mounting medium normally used was water, but sometimes glycerine was also employed, especially when stiff specimens were present, in order to make them softer. Glycerine was also used to observe some internal structures, as it increases the transparency of the specimen or structure, or whenever the sample had to stay under the compound microscope for a long period (like when drawings or measurements were made). Other authors (*e.g.* FAUCHALD, 1977*a*) recommend a mixture of glycerine-alcohol at 70%, in the proportion of 1:1, to make these mounts. No permanent mounts were performed. Some specimens were mounted in gelatinized glycerine, but it was observed that this procedure damaged severely the specimens, and was abandoned. The sample to be studied was placed in the slide, dipped in the mounting fluid, and carefully covered with a cover slip, in order to avoid the formation of air bubbles. The position in which the sample was mounted depended on whatever was necessary to observe, but normally it is better to mount it under the stereo microscope, to verify that the sample is mounted in the desired position.

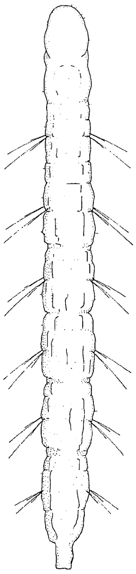

Figure legend: Family Potamodrilidae. *Potamodrilidus* specimen. (Adapted from BEESLEY, ROSS & GLASBY, 2000; after BUNKE, 1988).

Parapodia and chaetae are almost always necessary to observe in detail, to enable the identification of the specimen. Before removing parapodia, it is best to check appropriate illustrations, to know which features have to be observed, and from which region of the body the parapodium or parapodia must be removed. The body of the specimen must also be previously scanned to make sure that the removed parapodia is as complete as possible, both for structures and chaetae. Usually, a median parapodium from a long series of similar-looking parapodia is a good choice, but in some cases the anterior-most or a specific parapodium has to be removed in order to study a specific detail of taxonomic relevance. Generally, the parapodium is mounted with the anterior side facing the observer, but in some cases a posterior view is also necessary. When several parapodia had to be removed, this was always done from the same side of the body of the worm. This procedure eases the determination of which of the sides of the parapodia is the anterior one, and maintains one of the sides of the specimen undamaged. Under any circumstance should the two parapodia from the same segment be removed.

To remove parapodia, the iris scissors were used, to assure a clean cut, and special care was placed in that all the associated structures (cirri, branchiae, etc.) were removed together with the parapodium. Some details were only seen with 100x objectives, using immersion oil (it was used Immersol® 518N, of Zeiss). Some details are normally best seen with phase contrast microscopy or differential interference contrast (= Nomarski interference contrast), but no microscope with these equipments was available. The scanning electron microscope (SEM) is also a powerful tool for the observation of small details, but once again, it was not possible to use one during the present study.

In some cases, it was necessary to dissect the anterior end of the specimen to observe the eversible pharynx or the jaw structures. Before dissecting a specimen, it is necessary to know which particular structures might be present and where, to avoid damaging them. In some groups (*e.g.*, Nephtyidae, Phyllodocidae, Goniadidae, Glyceridae, Nereididae), the eversible pharynx is generally retracted inside the preserved specimen like a sock, and it is necessary to dissect it in order to observe its structure, papillae or distribution and shape of jaws or paragnaths. In these cases, a midventral longitudinal slit was made, as long as necessary, in such a way that the surface of the retracted pharynx could be observed by pulling both sides of the slit aside. When counting structures, like paragnaths in Nereididae, it must be taken into consideration that the distal region of the pharynx is the one more deeply retracted inside the worm, and that we are observing the dorsal region of the pharynx, while the ventral region is splitted in two parts. In other groups (Eunicida), the eversible pharynx has a complex jaw apparatus composed by ventral mandibles and dorsal maxillae formed by a number of different elements, all surrounded by a muscular structure, the pharyngeal bulbous.

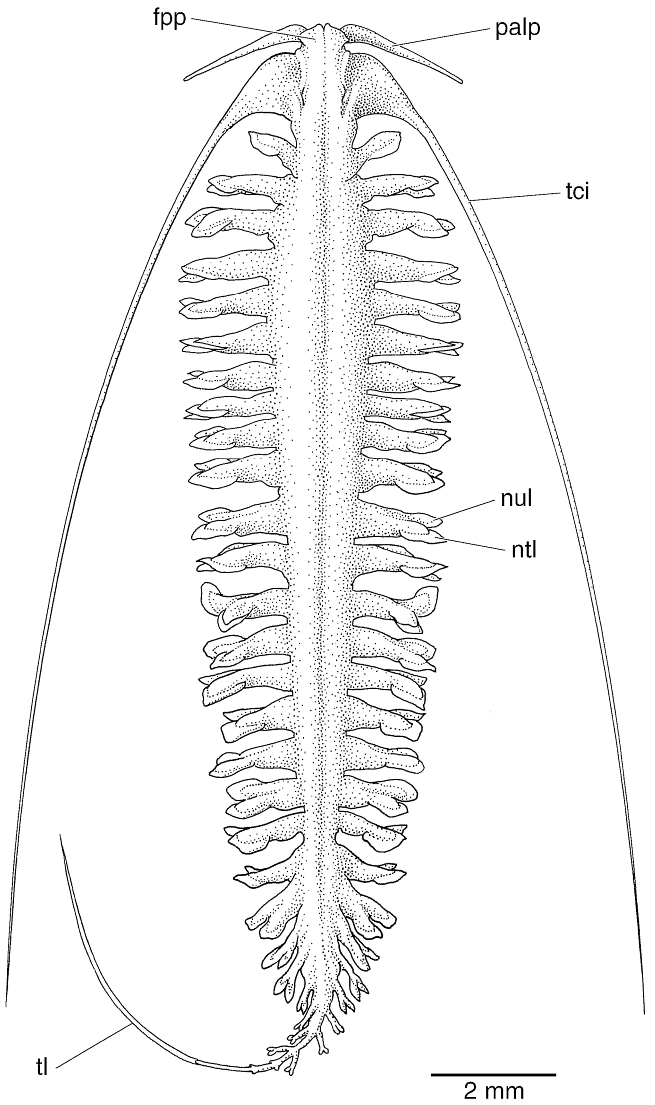

Figure legend: Excluded families. Family Tomopteridae. *Tomopteris* specimen, dorsal view of entire animal. **fpp**, fused prostomium and peristomium; **ntl**, notopodial lobe; **nul**, neuropodial lobe; **palp**, palp; **tci**, tentacular cirrus; **tl**, tail. (Adapted from BEESLEY, ROSS & GLASBY, 2000; drawings by K. Nolan).

In eunicideans and scale worms the eversible pharynx is not withdrawn like a sock, but the whole structure moves forward and backwards as a whole. In this case, important structures are located in the midline, dorsally, ventrally, or both, and thus a dissection must avoid cuts into the midlines of the specimens. In fact, according to FAUCHALD (1977*a*) and BLAKE (1994*a*), the following process should be used for all specimens, including the ones on which the pharynx withdraws like a sock. In this case, a longitudinal slit is made on the dorsal side of the specimen, well lateral to the midline. Transverse slits are made at both ends of the longitudinal one, which makes possible to lift a flap of tissue containing the body wall, and to see the jaws located beneath it. It is recommended to keep the pharynx and jaws *in situ* as much as possible, as normally they are lost when removed. The jaws are observed from the dorsal side, and the jaw formulae are given from the posterior to the anterior end, the left jaw being mentioned first in each formula.

In some cases, methyl blue was used to stain the specimens, in order to increase the contrast between different structures and enable the observation of small details in the worms, as small structures stain more strongly that big structures. The worms were placed in an alcoholic solution of methyl blue for a few seconds. As soon as the worms were stained, specimens were transferred to clean alcohol, and left there until the desired contrast was achieved. Larger specimens were placed first on filter paper for a few seconds to remove excess stain. Methyl blue is not a specific stain of particular tissues, but it darkens temporarily protruding or rugose structures, making them easier to see. It fades and disappears in alcohol.

Methyl green staining and the colour patterns revealed by this technique were only used in a couple of cases, in Capitellidae, in order to elucidate differences between very similar forms. The methyl green staining patterns seem to be the result of differences in the distribution of glandular tissues, which stain unequally, and appear to be species-specific. This technique is quite useful in providing a quick recognition when sorting large amounts of material, and has been particularly useful with ampharetids, capitellids, cirratulids, cossurids, maldanids, onuphids, sabellids, sphaerodorids, and terebellids. To use this technique, a saturated solution of methyl green is prepared using 70% ethyl alcohol. A few drops of this solution are added to a small watch glass or vials containing the specimen or specimens. These are left to stain for a few minutes, and then are placed in clean alcohol for a few minutes more, to remove the excess of stain and to enable the differentiation of the pattern.

Some additional techniques, that were not used in the present study, may reveal to be of special interest, and are herein referred, following BLAKE (1994*a*). Specimens may be cleared with Amman's lactophenol as a temporary mounting medium. The mixture is made with 100 g phenol, 100 ml lactic acid, 200 ml glycerine, and 100 ml water. The specimen is mounted in this mixture in a slide and covered with a coverslip. The slide is then carefully heated, always avoiding bubbling. This technique enables to clear the tissues, making internal sclerotized structures (such as jaws, acicula, or chevrons) more visible. Another procedure to prepare specimens to see small jaw pieces is to clear them in potassium hydroxide (KOH). In this case, a 10% solution of KOH is prepared, and the worms are placed in it for 2-3 hours.

Specimens are checked periodically until they appear to be clear enough for the observation of the jaws. The worms can be washed from the solution and transferred back to alcohol. Permanent mounts can be made using Euparal® or Permamount®, which also clear the specimens. In these cases, specimens must be dehydrate in 100% alcohol, followed by a brief immersion in a clearing agent such as toluene or xylene, prior to applying the mounting media. Permanent slides are particularly useful to store removed parapodia, jaw pieces, chaetae, or other dissected parts, as they are normally lost when placed loose in the same vial that contains the dissected specimen. They can also be placed in a small, separate vial, within the larger vial with the specimens.

The achieved identifications were always confirmed by checking the specimen against a recent description of the species, whenever possible based on type or topotype material, or from a geographical region close to the type locality.

When identified, the number of specimens belonging to the same taxon and sample were counted, and specimens placed in a vial as described above, labelled with the name of the species, number of specimens present, cruise, and number of station. Vials with specimens belonging to the same taxon were kept together. Some of the identified specimens were already deposited (or are awaiting deposition) at the following museums: Museu Nacional de História Natural – Museu Bocage, Lisbon (MB), National Museum of Wales (NMW), and Senckenberg Museum, Frankfurt (SMF).

The biggest part of the material from the SEPLAT cruises will be deposited at the Museu Nacional de História Natural – Museu Bocage, Lisbon (MB), while the biggest part of the material from the FAUNA 1 cruise will be deposited at the Museo Nacional de Ciencias Naturales, Madrid (MNCN).

Additional material was studied in some cases, from the following museums and institutions: Department of Biology, University of Aveiro, Aveiro (DBUA); Museu Nacional de História Natural – Museu Bocage, Lisbon (MB); Museo Nacional de Ciencias Naturales, Madrid (MNCN); Muséum National d'Histoire Naturelle, Paris (MNHN); Museo de Zoologia, Universidad de Navarra, Pamplona

(MZNA); Natural History Museum of London, London (NHM); Centre d'Estudis Avançats de Blanes, Blanes; Faculdade de Ciências e Tecnologia, Universidade do Algarve, Faro; IPIMAR, Olhão; Laboratório Marítimo da Guia, Faculdade de Ciências da Universidade de Lisboa, Cascais; Observatoire Océanologique de Banyuls-sur-Mer, Banyuls-sur-Mer.

A more detailed discussion of the techniques used in this section, together with others, can be found in FAUCHALD (1977*a*), HOBSON & BANSE (1981), and BLAKE (1994*a*).

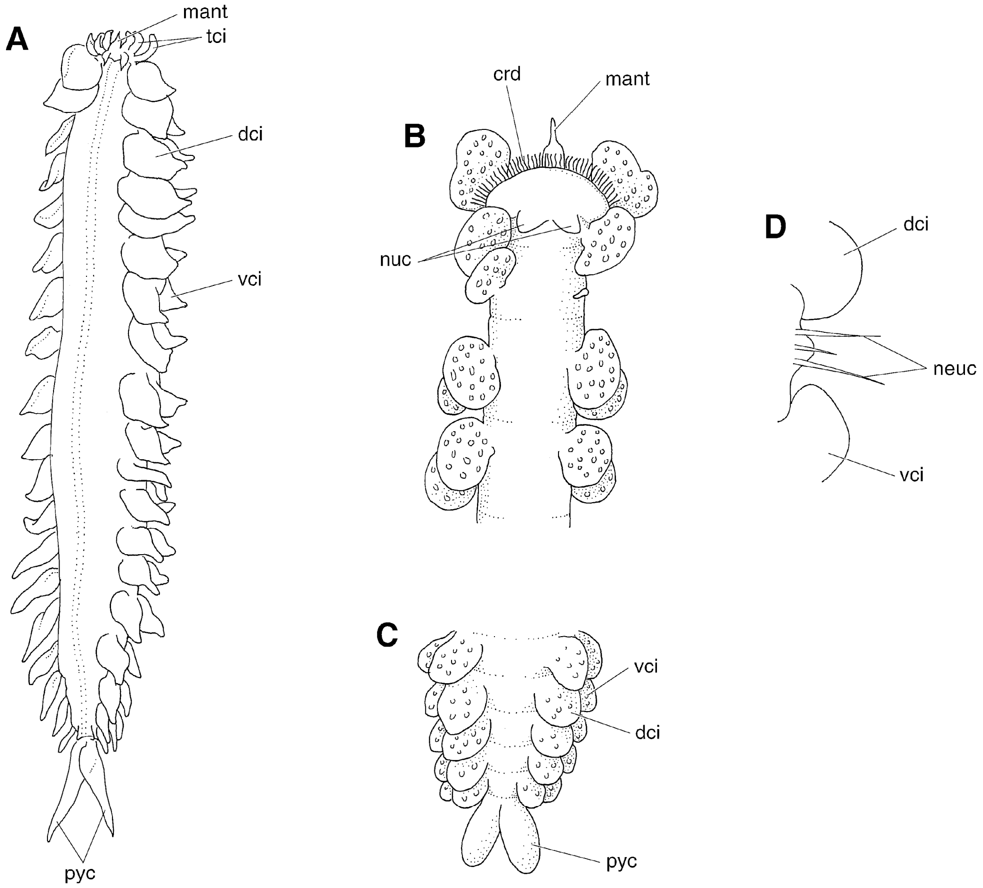

Figure legend: Excluded families. Family Typhloscolecidae. **A**, *Travisiopsis lanceolata*, dorso-lateral view of entire animal. **B**, anterior and **C**, posterior end of *Typhloscolex muelleri*, dorsal view. **D**, parapodial lobes of *Travisiopsis lobifera*. **crd**, ciliated ridge; **dci**, dorsal cirrus; **mant**, median antenna; **neuc**, neurochaeta; **nuc**, nuchal organs; **pyc**, pygidial cirrus; **tci**, tentacular cirri; **vci**, ventral cirrus. (Adapted from BEESLEY, ROSS & GLASBY, 2000; drawings by K. Nolan, after USCHAKOV, 1972).

BIBLIOGRAPHICAL RESEARCH AND RESOURCES

In order to do the present work, it was necessary to consult a great amount of bibliography on polychaetes. As no big public Natural History library was easily accessible, it was necessary to gather all the possible references from different sources, to elaborate a private library on polychaetes that could give support to this work.

This way, a big effort was made in photocopying as much papers on polychaete taxonomy as possible. At this stage, particularly important were the book stocks of the scientific libraries of the Laboratório Marítimo da Guia (Cascais), Museu Nacional de Ciência Naturais – Museu Bocage (Lisboa), and Instituto de Investigação das Pescas e do Mar – IPIMAR (Algés). Important sources were also the private libraries of the Doctors Luís Cancela da Fonseca, Rafael Sardà, Daniel Martín, Guillermo San Martín, and Dieter Fiege.

Many papers were obtained directly from the authors or their websites, of through the Lybrary Network of the Consejo Superior de Investigaciones Científicas (CSIC). Important gifts of duplicates were also received from Mary Petersen, Helmut Zibrowius, Harry ten Hove, Dieter Fiege, Vasily Radashevsky and Linda Ward. Moreover, some key publications were obtained through the help of Jean-Michel Amouroux.

A great amount of publications was obtained by purchase. Whenever possible, publications were bought directly to the publishers. Old and out of print publications, together with numerous offprints, were purchased to antiquarians, using internet. Sites that showed to be particularly useful were Backhuys Publishers (www.euronet.nl/users/backhuys/), Antiqbook (www.antiqbook.com), Abebooks (www.abebooks.com), Zentrales Verzeichnis Antiquarischer Bücher (www.zvab.com) and its English version (www.choosebooks.com), the Scandinavian Antikvariat.net (www.antikvariat.net), Librairie Tournefeuille (www.galaxidion.com/tournefeuille/), Hermann L. Strack Antiquarian Bookdealer (www.strackbooks.nl), and Herbert Breuer Antiquariat-Versand (already retired), among others.

More recently, a series of publications were made available as open access on internet through numerous sites, which makes possible to consult publications that otherwise would be very hard to obtain. The most representative of these sites is Biodiversity Heritage Library, also known as BHL (www.biodiversitylibrary.org), a consortium of 12 major natural history museum libraries, botanical libraries, and research institutions, which organized in order to "*digitize, serve, and preserve the legacy literature of biodiversity*", making them available as open access on internet. The BHL is closely linked to the Internet Archive (www.archive.org), where the scanned books are also accessible. Another important source of books in open access is Google Books (http://books.google.com).

Besides, a great number of institutions have made their publications available online in the meantime, also as open access. Sites that have been used for the present work include: 19th Century Fisheries Section, Penobscot Bay Watch site (http://www.penbay.org/history.html), American Museum of Natural History Research Library (http://digitallibrary.amnh.org), Archimer (http://archimer.ifremer.fr), Archives of the Journal of Cell Science, The Company of Biologists (http://jcs.biologists.org/contents-by-date.0.dtl), Australian Museum Journals (http://australianmuseum.net.au/journalfinder), BioStor (http://biostor.org), CiNii, NII Scholary and Academic Information Navigator (http://ci.nii.ac.jp/en), Digital Bibliothek of the Berlin-Brandenburgische Akademie der Wissenschaften, Akademiebibliothek (http://bibliothek.bbaw.de), Digital Library of the Real Jardín Botánico of Madrid (http://bibdigital.rjb.csic.es), DSpace of the Tartu University Library (http://dspace.utlib.ee), Gallica, Bibliothèque Numérique (http://gallica.bnf.fr), Göttinger Digitalisierungszentrum (http://gdz.sub.uni-goettingen.de), H.M.S. Challenger Library (http://19thcenturyscience.org/HMSC/HMSC-INDEX/index-linked.htm), Homepage of the Scientific Results of the Danish Deep-Sea Expedition Galathea (http://www.zmuc.dk/InverWeb/Galathea/), Journals Search, South Australian Museum (www.samuseum.sa.gov.au), National Marine Biological Library, Marine & Ocean Sciences ePrints @ Plymouth (http://sabella.mba.ac.uk), Sabinet, African Journal Archive (www.sabinet.co.za/?page=african-journal-archive), Scholarspace at University of Hawai'i at Mānoa (http://scholarspace.manoa.hawaii.edu), and Smithsonian Institution Libraries, Smithsonian Research Online (http://si-pddr.si.edu/dspace/), among others.

Finally, additional bibliographic information was obtained from HARTMAN (1951*c*), from the Polychaete Bibliography Database CD-ROM, by Linda Ward, Kristian Fauchald and Geoff Kell, released in 2004, and from Zoological Record® (ISI Web of Knowledge^{SM}).

An effort was made to consult directly as many publications as possible, but in some cases this was not possible. Whenever a publication was not consulted directly, and the used information was obtained from other sources, it is preceded by an asterisk (*) in the Bibliography.

STRUCTURE OF THE PRESENT WORK

In this work is presented a Fauna of the polychaetes occurring in the European and adjacent waters, with the main purpose of providing, in a single comprehensive work, information on the species occurring in the region and otherwise dispersed through a myriad of publications. This Fauna of European Polychaeta was based on works published from 1758 to 2008, and complemented with the studied material from southwestern Europe (Portugal and Spain), which was integrated in the general scheme of the work. The considered geographical area ranges from northern Norway to Mauritania, and from the Strait of Gibraltar to the Azov and Caspian seas, including eastern Greenland, the archipelagos of Azores, Madeira, Selvagens and Canarias, and the adjacent continental shelves, slopes and abyssal plains. Selected species from nearby areas, as western Greenland, Barents and White seas, and western Africa, were also included, as well as some species from other regions of the world that have been doubtfully recorded to be present in Europe.

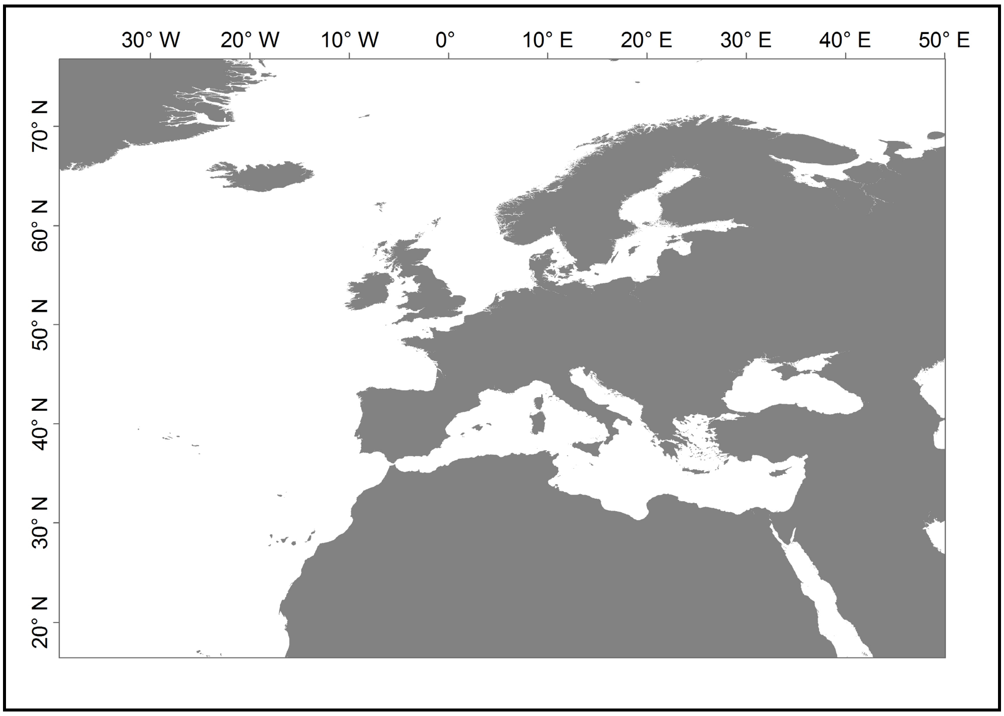

Figure legend: Geografical area considered to determine the European Fauna of Annelida Polychaeta, with base on the records published between 1758 and 2011, and the material herein studied (Red Sea and Persian Gulf, seen in the map, not considered). (Map by Aitana Oltra).

Records of species present in the area were searched in all available published sources, including faunas, checklists, and taxonomic, faunistic, systematic and ecological publications. Some trusted internet resources were also consulted, such as the North East Atlantic Taxa (NEAT) (http://www.tmbl.gu.se/libdb/taxon/taxa.html). The list of records was complemented by personal observations, based in the material from the SEPLAT and Fauna 1 campaigns and other sources.

The species were ordered by families and genera, and all of them (families, genera and species) displayed alphabetically, as it was found that from a pragmatic point of view this is the easiest way to locate the searched taxon. All families were included, with some exceptions, due to lack of bibliography and the poor taxonomic expertise of the author concerning some groups. This way, the excluded families are the biggest part of the holopelagic families, namely Iospilidae Bergström 1914, Lopadorrhynchidae Claparède 1868, Tomopteridae Johnston 1865, and Typhloscolecidae Uljanin 1878, but the family Pontodoridae Bergström 1914, which comprises a single species, was included. Other excluded families are the Myzostomidae Benham 1896, and the oligochaete-like families Aeolosomatidae Beddard 1895, Parergodrilidae Reisinger 1925 and Potamodrilidae Bunke 1967. So far, the families Alvinellidae Desbruyères & Laubier 1986, and Hartmaniellidae Imajima 1977, are not known to occur in European waters, but a short account on each of these benthic families is included. The family Uncispionidae Green 1982 was found in the European waters very recently, being represented by a new species of the genus *Uncispio* collected from west of Anglesey (Wales). The species is presently being described by Teresa Darbyshire and Andrew Mackie, from the National Museum of Wales, and the family is here already considered as being present in Europe. It was estimated that the excluded families and the former Alciopidae (now in the Phyllodocidae) were represented in the European waters by about 32 genera and 91 species or subspecies (4.7% of the total number of species considered to be valid that occur in the European waters). They are distributed according to the following table:

Family	number of genera	number of species and subspecies
Aeolosomatidae	1	5
Alciopidae (now Phyllodocidae)	8	15
Iospilidae	3	5
Lopadorrhynchidae	4	12
Myzostomidae	5	13
Parergodrilidae	3	3
Potamodrilidae	3	3
Tomopteridae	2	27
Typhloscolecidae	3	8

As already stated, the bibliographic research for species recorded to be present in European and nearby waters intended to be as complete as possible, but it was not exhaustive. To do this bibliographic research, published Faunas were particularly useful. In this case are the *Faune de France* (FAUVEL, 1923*c*, 1927*a*), *Die Tierwelt Deutschlands* (HARTMANN-SCHRÖDER, 1971*a*, 1996), *Fauna Bulgarica* (MARINOV, 1977), *Fauna de España* (CAMPOY, 1982), *Synopses of the British Fauna* (GEORGE & HARTMANN-SCHRÖDER, 1985; WESTHEIDE, 1990, 2008; PLEIJEL & DALES, 1991; CHAMBERS & MUIR, 1997), *Danmarks Fauna* (KIRKEGAARD, 1992, 1996), or *Fauna Ibérica* (SAN MARTÍN, 2003; VIÉITEZ *et al.*, 2004). Regional checklists of Polychaeta were also largely consulted, including areas like the Adriatic Sea (POŽAR-DOMAC, 1994), Aegean Sea (ARVANITIDIS, 2000), Black Sea (RULLIER, 1963*b*), Iberian Peninsula (CAMPOY, 1979, 1982; ARIÑO, 1987), Italian waters (CASTELLI *et al.*, 1995), Madeira Island (NÚÑEZ & TALAVERA, 1995), or Portugal (DEXTER, 1992). Other studies on more restricted regions inside the considered area gave also an important contribution, like BÖGGEMANN (1997), on the German Bight, or FAUVEL (1936*c*), on the Moroccan Atlantic coast. Many recent major monographies were also used, covering certain families or groups of families, such as the Acoetidae (PETTIBONE, 1989), Ampharetidae (HOLTHE, 1986*b*), Glyceridae (BÖGGEMANN, 2002), Goniadidae (BÖGGEMANN, 2005), Hesionidae (PLEIJEL, 1998), Pectinariidae (HOLTHE, 1986*b*), Phyllodocidae (PLEIJEL, 1993*a*), Sabellariidae (KIRTLEY, 1994), Syllidae (NYGREN, 2004, on Autolytinae; LICHER, 1999, on *Typosyllis*; SAN MARTÍN, 2003), Terebellidae (HOLTHE, 1986*b*), or Trichobranchidae (HOLTHE, 1986*b*), among others. Finally, a big number of papers describing or redescribing new and old taxa, revising genera or groups of species, or simply presenting data on identified specimens, provided information for the work. For some older species, valid or synonymised, information was taken from HARTMAN (1959*a*, 1965*a*).

The bibliographic research covered mainly the period ranging from 1758 to 2008 (250 years), but most of the relevant papers published afterwards have been already included in this work. Many new combinations, synonymies or nomenclatural changes published after 2008 were also considered here as well.

As explained above, the bibliographic research was done as completely as possible, but it wasn't exhaustive. For this reason, some species were posteriorly found to be missing in the present work. With the exception of *Manayunkia caspica danubialis* Bacescu *in* Dumitrescu 1957, from the Danube River in Roumania, the biggest part of the missing taxa were recorded from deep waters in the northeastern Atlantic, mainly by ELIASON (1951), KIRKEGAARD (1980*b*), AVERINTSEV (1989), and DETINOVA (1985*a*). These missing records include the species *Aglaophamus circinata* (Verrill 1874), *Aglaophamus groenlandiae* Hartman 1967, *Ammotrypane aulogastrella* Hartman & Fauchald 1971, *Ammotrypane nybelini* Eliason 1951, *Aphroditella hastata* (Moore 1905), *Aponuphis chistikovi* Detinova 1985, *Asychis amphiglypta* var. *abyssicola* Eliason 1951, *Boguella ornata* Hartman & Fauchald 1971, *Bradabyssa papillata* Hartman 1967, *Branchamphinome islandica* Detinova 1985, *Composetia versipedata* (Ehlers 1887), *Cossura rostrata* Fauchald 1972, *Dorvillea rudolphi anoculata* Hartman 1965, *Eteone rarica* (Uschakov 1958), *Eunice collini* Augener 1906, *Euphrosine keldyshi* Detinova 1985, *Euphrosinella paucibranchiata* (Hartman 1960), *Eupistella darwini* (McIntosh 1885), *Eusyllis kerguelensis* McIntosh 1867, *Fauveliopsis scabra* Hartman & Fauchald 1971, *Kinbergonuphis atlantisa* (Hartman 1965), *Melinnampharete eoa* Annenkova 1937, *Monticellina annulosa* (Hartman 1965), *Nothria solenotecton* (Chamberlin 1919), *Notoproctus scutiferus* Wesenberg-Lund 1948, *Onuphis ehlersi* (McIntosh 1885), *Ophryotrocha minuta* Averintsev 1989, *Ophryotrocha scarlatoi* Averintsev 1989, *Paradoneis abranchiata* Hartman 1965, *Paronuphis abyssorum* (Chamberlin 1919), *Potamethus dubius* (Eliason 1951), *Protomystides orientalis* Uschakov 1972, *Robertianella platychaeta* Detinova 1985, or *Syllis parateinopterona* (Licher 1999). All these missing taxa will be included in a future revised version of the present work.

Keys were provided for the biggest number of taxa possible. The biggest part of these keys were adapted or copied from published works, being the authorship of the original key or keys always referred.

Generally, original keys were adapted in order to remove taxa that were not known from Europe, or to introduce taxa that do occur in European waters and were not present in the original key (generally being these taxa posterior to the original key). When no published keys were available, a new key was created in order to include all the species recorded in Europe. If this new key was done with base on a published synoptic table, the authorship of the table is also acknowledged under the key. In some cases, it was not possible to include all the recorded species is the keys due to lack of information, mainly due to poor descriptions. Whenever this happened, it is stated in the key which species of the group are missing. Some keys present multiple entries for the same taxon. In these cases, after the name of the taxon it is stated "*[in part]*", making this way reference to the fact that there is another alternative route to the taxon in the same key. All keys are artificial and they do not imply any phylogenetic relationships.

For each family is provided a plate with representative drawings of specimens, or illustrating particular features of the group. These drawings are not meant to represent particular species present in European waters, and their only purpose is to serve as supporting illustrations to the keys. The biggest part of these illustrations was taken from GLASBY *et al.* (2000), but other sources were used as well. Authorship is always referred in the figure captions.

A key for all families is supplied at the beginning of the taxonomic section of this work. All families were included, even if they were not found in European and nearby waters, or if they are not covered in this work.

For each family is provided the original name and spelling, and the reference of the paper where the family was named for the first time, as well as the type genus of the family, synonymies (whenever existing), and remarks found to be interesting or important to the better knowledge of the group and following keys, as well as information on genera and species. The remarks include, whenever possible, the estimated number of worldwide valid described genera and species. It is difficult to know exactly how many taxa have been described, and above all, how many of these are to be considered as valid. Taxa, mainly genera and species, are described, revised and synonymised continuously, and sometimes either the synonymies or the validity of some species is not unanimous between all authors. For each family the given number of valid genera and species is mainly based on the information presented by HUTCHINGS *et al.* (2000), complemented by information taken from the Zoological Record® (ISI Web of Knowledge^{SM}), and on the personal research of the author. A good source for the number of described taxa (but not necessarily of the valid taxa) is the World Register of Marine Species, also known as WoRMS (www.marinespecies.org). Besides, for each family the number of genera and species found to be present in the European waters is also referred, as well as the number of genera and species that were present among the material studied here.

For each family a key is furnished including all the genera present in Europe. Genera are displayed by alphabetical order, just after the generic key. The structure of the information given for each genus follows closely the model used for family. This way, for each genus is given the original spelling and reference of the publication where the genus was named for the first time, the type species, synonymies (whenever existing), and remarks, if found necessary. After this information, a key for the species so far recorded in European and nearby waters of that genus is provided. A useful resource for information concerning genera, their synonymies, original publications and dates, was Nomenclator Zoologicus (http://www.ubio.org/NomenclatorZoologicus/index.php).

For each species is provided the original reference, synonymies, selected references, references for Portugal and studied material (if existing), geographical distribution, depth range, ecology, and taxonomic remarks, whenever considered necessary, based both on the bibliography and the studied material. In order to integrate all this information in a coherent form and maintain a uniform structure through all the work, it was created (in fact, adapted from other works), a scheme that showed to be very useful. This scheme is here designated as a ***Species Card***, and a typical one would be as follows:

***Genus species* Author year**

Genus species AUTHOR, year: reference pages, figures.
TYPE LOCALITY:
SYNONYMS:
SELECTED REFERENCES:
REFERENCES FOR PORTUGAL:
MATERIAL:
DISTRIBUTION:
REMARKS:

Each section of these *Species Cards* is structured as follows:

TYPE LOCALITY: Whenever possible, the data on the type locality was obtained from the original publication or from publications where type material was studied and data concerning the type locality given. In the cases where these publications could not be consulted, direct or indirectly, the data on the type locality was obtained from the *Catalogue of the Polychaetous Annelids of the World*, by HARTMAN (1959*a*, 1965*a*).

SYNONYMS: The considered synonymies follow the publish data by other authors and personal observations. Whenever the synonymy is doubtful or not unanimous, the name of the synonymised species is preceded by a question mark [?].

SELECTED REFERENCES: The selected references include publications that were found to be important for the knowledge of the species. They include publications with drawings or pictures illustrating the species, papers where the main synonymies are described or established, revisionary works that include the species, works considered important in order to justify the distribution of the species, and others. This section follows the authors' opinion. It was attempted to make it as complete as possible, but it is not exhaustive, as that was not the intention. This way, while for some readers some important works may be missing, others may find that some of the works that are here cited are irrelevant. Anyway, additional references can be found in the publications cited in this section.

REFERENCES FOR PORTUGAL: This section presents the data of ANNEX 5, with the checklist of the Portuguese polychaetes. All papers that recorded species in Portuguese waters are here cited.

MATERIAL: This section only appears when material from the species was found among the material studied for the present work, from the SEPLAT and Fauna 1 Campaigns. In this case, the reference of the station where the material was found is given, together with a short description of the main features of that station, according to *Annex 2*, and followed by the number of specimens found and short comments on them.

DISTRIBUTION: This section includes the known distribution of the species, geographical, ecological, and bathymetrical. The data was mainly collected from the consulted bibliography, sometimes complemented by the material studied here. The bathymetry of the species is given in meters. Whenever depths or depth ranges were given in feet or fathoms, they were converted to meters using the Nautical Depth Converter from CSGNetwork.com (http://www.csgnetwork.com/nauticaldepthconv.html).

REMARKS: This section refers everything considered important or relevant for the better knowledge of the species. Comments given in the *Remarks* section are based in the revised bibliography and on the personal observations and opinions.

While elaborating this work it was found that some species belonged probably to a distinct genus from the one where they are actually placed. However, as the biggest part of these cases were detected while studying the published bibliography, and without studying type or topotype material, it was favoured to keep the species under the old combination, instead of creating a new combination that could be proven to be unnecessary, after studying that material. Still, and with some exceptions, these species are normally listed under the genus where it is though they should be correctly placed, but are keyed and referred with the present (or old) combination.

Publication dates of the works are particularly important in order to establish synonymies and valid names, due to the use of the Principle of Priority. In the biggest number of cases, there are no doubts concerning the date when the work was published, but some incongruences were found while elaborating the present work.

In some cases, the date that is normally used for the taxon precedes the date when the journal where that taxon was published was available (a case found in several occasions in relation with the journal *Vie et Milieu*). If no information was available pointing to the possibility that the paper was already available as a reprint before being published in the journal, the publication date of the journal was the one considered as valid. Other situation was found is which the publication date refers more than one year (*e.g.*, 1972-73). In these cases, the publication date was considered to be the most recent date (in this case, 1973).

An opposite case was when there were available reprints with publication dates previous to the date of the publication of the journal which included the paper (case of LEVINSEN, 1886). In these cases, the date considered as valid was the older one. There are also some cases where the same work was published several times, in which case the publication date considered to be valid is also the oldest one available (case of ARWIDSSON, 1906).

Normally, all these cases are referred in the Bibliography, after the reference of the work with the problematic publication date. However, there is a case that deserves to be mentioned here, due to its complexity:

Malmgren 1867 was published three times in the same year, with some differences between each publication. BANSE (1977*b*: 613-614) made some comments on the double publication of the work in the same year, as a book (MALMGREN, 1867*a*), and in a journal (MALMGREN, 1867*b*), being the later the usually quoted publication. As noted by BANSE (1977*b*), the two publications differ in some spellings (*e.g.*, *Ceratocephale* in the first publication, against *Ceratocephala*, in the second), pagination and other details, like the units in the text for length measurements. Quoting directly BANSE (1977*b*), "*The second publication appeared in the* Reports of the Proceedings of the Academy in Stockholm*; the title page of the Proceedings for 1867 states that they were issued in 1868 but the last page of Malmgren's article was printed in 1867. An indication of the priority is the date, 5 April 1867, of the foreword of the book, whereas the paper was read at the Academy meeting of 10 April 1867.* (...) *We assume that the book became available first and was hence also printed first* (...)." This way, Malmgren's book should be quoted when citing the first date of publication of the taxa therein described. Finally, there is also a third publication available, differing from the book only by its cover, which is written in Swedish, instead of Latin. The consulted copy of this publication lacked the plates, but it is impossible to know if they were lacking originally or if they were removed posteriorly, in some occasion of its long history.

Concerning the authorship of the papers, due to the great number of bibliographic references it was decided in the present work to use *et al.* only for papers with more than three authors, to ease the identification of a certain publication in the text. Besides, when a publication is cited, the name of the author or authors appears always in small capital letters (McIntosh as MCINTOSH), and a comma separates the author from the publication date, whenever necessary. On the other side, every time the authorship of a taxon is referred, there is no comma separating the name of the author from the publication date, and the name of the author always appears in lower case or minuscule letters, not in small capital letters (as McIntosh, not MCINTOSH). This way it will be easier to distinguish when a taxon is being referred from when a publication is being cited.

Finally, one important notice. Every time material from a taxon was studied in the present work, the name of this taxon (family, genus, or species) is preceded (in the keys followed) by an asterisk, *.

POLYCHAETE FAMILIES

WORLDWIDE KEY TO THE FAMILIES OF POLYCHAETA:

(adapted from GLASBY *et al.*, 2000)

REMARKS: All described families of Polychaeta are included in the key below, but some of them are not discussed in the posterior pages, either because they are not known from the European waters, or because it was decided not to include them in the present study, for different reasons. The following families are not known to occur in European waters: ALVINELLIDAE Desbruyères & Laubier 1986; HARTMANIELLIDAE Imajima 1977. The following families do occur in European waters, but for several reasons (mainly lack of bibliography and poor expertise of the author concerning these groups), were not included in the taxonomic section: AEOLOSOMATIDAE Beddard 1895, IOSPILIDAE Bergström 1914, LOPADORRHYNCHIDAE Claparède 1868, MYZOSTOMIDAE Benham 1896, PARERGODRILIDAE Reisinger 1925, POTAMODRILIDAE Bunke 1967, TOMOPTERIDAE Johnston 1865, and TYPHLOSCOLECIDAE Uljanin 1878. The taxa previously included in the ALCIOPIDAE Ehlers 1864, now integrated in the Phyllodocidae Ørsted 1843, were also excluded.

IMPORTANT NOTICE: Throughout this publication, whenever material from a taxon was available and studied, the name of this taxon (family, genus, or species) is preceded by an asterisk, (*).

1a. Segmentation present, 15 or more; macrobenthic and pelagic forms (includes most families)..............**2**
1b. Segments present, 13 or fewer; minute interstitial forms...**55**
1c. Segments present, 13 or fewer (segmentation may be internal); slender, elongate interstitial forms...**61**
1d. Segments present, 13 or fewer; parasitic or commensal forms..**64**
1e. Segmentation absent; pelagic form; body encased in gelatinous sheath with protuding papillae...**FLABELLIGERIDAE** [in part; formerly **"POEOBIIDAE"**]*

2a (1a). Prostomium without paired slender antero-lateral antennae (antennae on mid- or posterior prostomium may be present; the globular antero-lateral projections of onuphids are not antennae)...........**3**
2b (1a). Prostomium with paired slender antero-lateral antennae (rarely in addition to a pair of similar antero-lateral palps)..**38**

3a (2a). Tentacular cirri present, two pairs; parapodial lobes not foliaceous, some dorsal cirri modified as elytra (= scales); silk-like chaetae may form felt on dorsum; mainly benthic forms..........**APHRODITIDAE***
3b (2a). Tentacular cirri present, one, two or four pairs; parapodial lobes or dorsal cirri foliaceous; pelagic forms..**4**
3c (2a). Tentacular cirri absent; parapodial lobes and dorsal cirri not foliaceous; pelagic or benthic forms..**5**

4a (3b). Tentacular cirri, one pair, very long with internal aciculae; notopodia similar in size to neuropodia, elongate and ending in foliaceous lappets distally, dorsal cirri and chaetae absent...**TOMOPTERIDAE**
4b (3b). Tentacular cirri, two pairs; notopodia extremely reduced; dorsal cirri foliaceous; chaetae present..**IOSPILIDAE**
4c (3b). Tentacular cirri, four pairs (two pairs foliaceous, anteriorly directed); notopodia present, but smaller than neuropodia, dorsal cirri foliaceous; chaetae present..............................**TYPHLOSCOLECIDAE**

5a (3c). Prostomium shovel-shaped; palps paired, heavily papillated subdistally; chaetiger 4 or 5 unmodified...**MAGELONIDAE***
5b (3c). Prostomium shape otherwise; one pair of extremely reduced palps, or palps absent; chaetiger 4 or 5 unmodified...**PILARGIDAE** [in part]*
5c (3c). Prostomium shape otherwise; palps paired, grooved; chaetiger 4 or 5 modified, usually enlarged, and carrying specialised chaetae, including spines...**6**
5d (3c). Prostomium shape otherwise; palps absent or present in various arrangements and forms including a tentacular crown; chaetiger 4 or 5 unmodified...**7**

6a (5c). Three distinct body regions; prostomium not posteriorly prolonged; branchiae absent; uncini present...**CHAETOPTERIDAE***

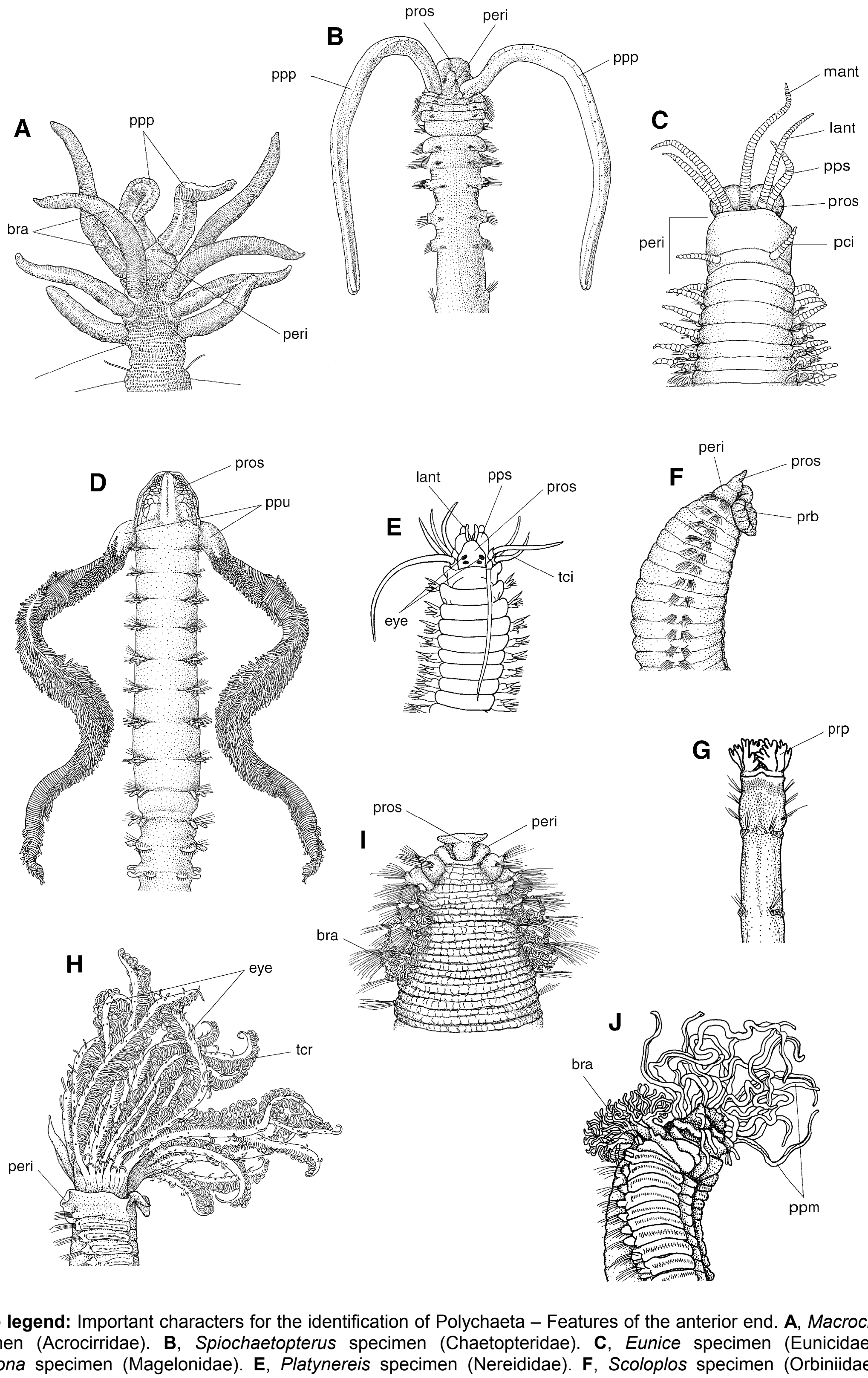

Figure legend: Important characters for the identification of Polychaeta – Features of the anterior end. **A**, *Macrochaeta* specimen (Acrocirridae). **B**, *Spiochaetopterus* specimen (Chaetopteridae). **C**, *Eunice* specimen (Eunicidae). **D**, *Magelona* specimen (Magelonidae). **E**, *Platynereis* specimen (Nereididae). **F**, *Scoloplos* specimen (Orbiniidae). **G**, *Owenia* specimen (Oweniidae). **H**, *Branchiomma* specimen (Sabellidae). **I**, *Scalibregma* specimen (Scalibregmatidae). **J**, *Longicarpus* specimen (Terebellidae). **bra**, branchiae; **eye**, eyes; **lant**, lateral antenna; **mant**, median antenna; **pci**, peristomial cirrus; **peri**, peristomium; **ppm**, multiple grooved peristomial palps; **ppp**, paired peristomial grooved palps; **pps**, palps, sensory ; **ppu**, palps, ungrooved, paired, peristomial and papillated; **prb**, proboscis; **pros**, prostomium; **prp**, prostomial grooved palps; **tci**, tentacular cirrus; **tcr**, tentacular crown formed by prostomial groove palps. (Adapted from BEESLEY, ROSS & GLASBY, 2000; drawings A-B, D-E, by K. Nolan, C, F-J, by A. Murray).

6b (5c). Body regionation present or absent; prostomium posteriorly prolonged; branchiae present; uncini absent........**SPIONIDAE** [in part]*

7a (5d). Body regionation present; gut occluded by expanded endoderm, or apparently not present, nutrition based on the presence of endosymbiontic chemoautotrophic or heterotrophic bacteria; chaetae present (absent in females of *Osedax*), not inverted, distributed otherwise; sexual dimorphism may be present, with paedomorphic males (*Osedax*)........**SIBOGLINIDAE**
7b (5d). Body regionation present or absent; gut not occluded, present and functional; chaetae present or absent, chaetal inversion may be present; sexual dimorphism may be present, with paedomorphic males (*Dinophilus*)........**8**

8a (7b). Body with distinct thorax and abdomen; thoracic uncini in neuropodial position, abdominal ones notopodial (i.e. chaetal inversion)........**9**
8b (7b). Body regionation present or absent; chaetae, if present, not inverted........**11**

9a (8a). Palps paired, grooved; chaetae of first two parapodia thickened (paleae), forming an operculum........**SABELLARIIDAE**
9b (8a). Palps in form of tentacular crown; chaetae of first parapodia similar in form to those following (operculum, if present, a modified tentacle)........**10**

10a (9b). Thoracic membrane present; tube calcareous........**SERPULIDAE***
10b (9b). Thoracic membrane absent; tube otherwise........**SABELLIDAE***

11a (8b). Posterior (abdominal) parapodia shifted dorsally; aciculae present only in posterior notopodia........**ORBINIIDAE***
11b (8b). Posterior parapodia not shifted dorsally; aciculae absent........**12**
11c (8b). Posterior parapodia not shifted dorsally; aciculae present throughout........**32**

12a (11b). Parapodia of chaetiger 1 anteriorly directed and wrapping around head; elongate postchaetal lobes present........**13**
12b (11b). Parapodia of chaetiger 1 more or less laterally directed and free from head; postchaetal lobes, if present, not elongate........**14**

13a (12a). Chaetae of first parapodium elongate, forming a cage around head; parapodia biramous throughout; postchaetal lobes flask- or spindle shaped........**POECILOCHAETIDAE***
13b (12a). Chaetae of first parapodium similar in form to other chaetae; parapodia biramous, except for a series of midbody segments which lack notopodia; postchaetal lobes of various shapes........**TROCHOCHAETIDAE**

14a (12b). Uncini absent; paleae absent in first parapodia........**15**
14b (12b). Uncini present, usually pectinate; paleae usually present in first parapodia........**29**
14c (12b). Uncini present, usually crested; paleae absent in first parapodia........**30**

15a (14a). Branchiae present, attached to peristomium, digitiform or tapering, four or more pairs (may be retractable); body papillate and/or with gelatinous sheath........**FLABELLIGERIDAE** [in part] *
15b (14a). Branchiae absent (though functionally similar abdominal vascullar lamellae may be present); body surface otherwise........**16**
15c (14a). Branchiae present, emerging from parapodia; body surface otherwise........**19**
15d (14a). Branchiae present, emerging from dorsum (may be restricted to anterior or posterior region; rarely fused basally to notopodia); body surface otherwise........**21**

16a (15b). Parapodial lobes absent or papillar; body surface often smooth and shiny........**17**
16b (15b). Neuropodia at least represented by low ridges (tori); body surface otherwise........**18**

17a (16a). Body fusiform with deep mid-ventral groove; inter-ramal papilla absent........**OPHELIIDAE** [in part]*
17b (16a). Body usually more or less cylindrical, without mid-ventral groove; inter-ramal papilla present........**FAUVELIOPSIDAE**

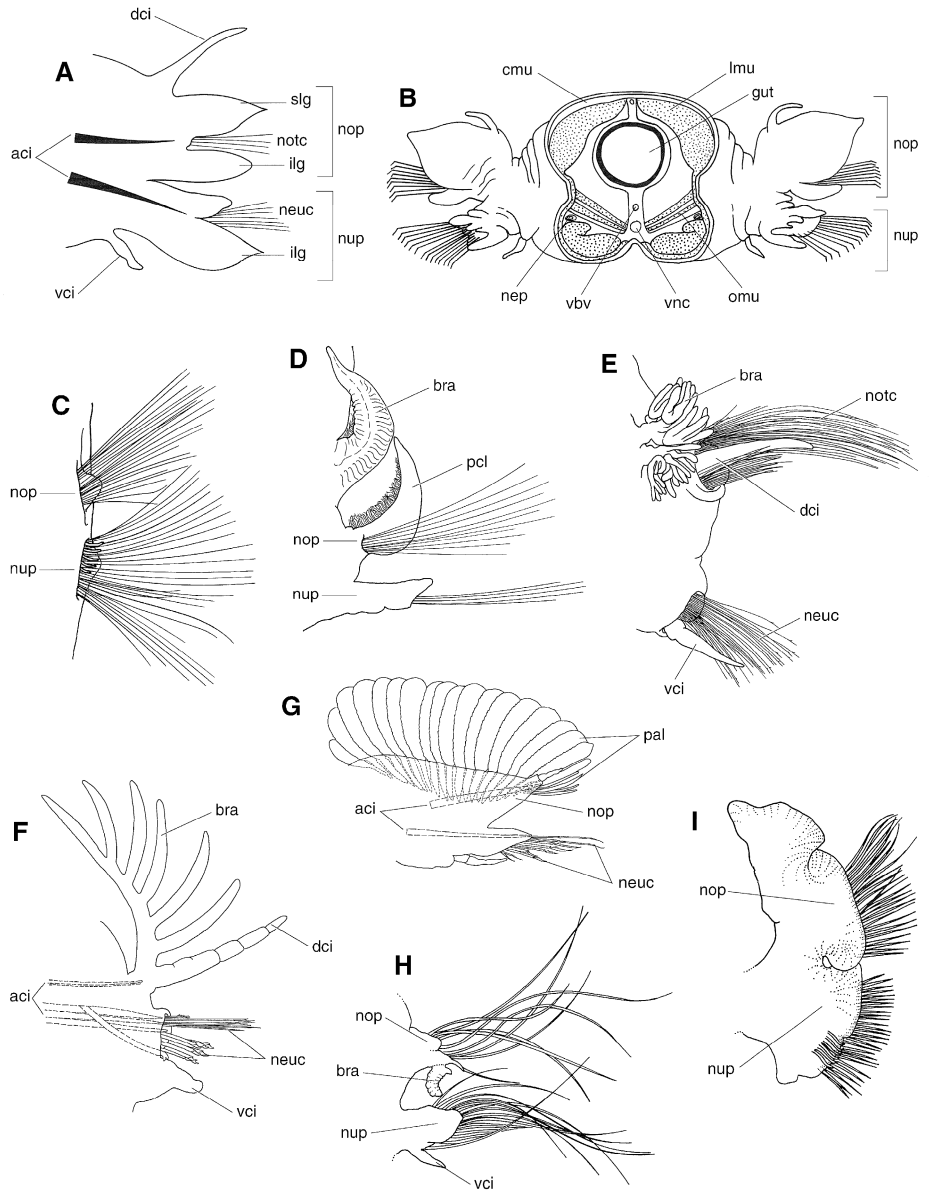

Figure legend: Important characters for the identification of Polychaeta – Parapodia. **A**, stylised nereidid parapodium. **B**, transverse section of a nereidid showing parapodia, body wall and coelom. **C**-**I**, parapodia from various polychaetes: **C**, *Scoloplos* specimen (Orbiniidae), anterior thoracic parapodium from chaetiger 4; **D**, *Scoloplos* specimen (Orbiniidae), mid-abdominal parapodium from chaetiger 28; **E**, *Eurythoe* specimen (Amphinomidae), parapodium of chaetiger 13; **F**, *Eunice* specimen (Eunicidae); **G**, *Paleaquor* specimen (Chrysopetalidae); **H**, *Nephtys* specimen (Nephtyidae); **I**, *Scolelepis* specimen (Spionidae). **aci**, aciculae; **bra**, branchia; **cmu**, circular muscle; **dci**, dorsal cirrus; **gut**, gut; **ilg**, inferior ligule; **lmu**, longitudinal muscle; **nep**, nephridium; **neuc**, neurochaetae; **nop**, notopodium; **notc**, notochaetae; **nup**, neuropodium; **omu**, oblique muscle; **pal**, paleae; **pcl**, postchaetal lobe; **slg**, superior ligule; **vbv**, ventral blood vessel; **vci**, ventral cirrus; **vnc**, ventral nerve chord. (Adapted from Beesley, Ross & Glasby, 2000; drawings C-G, by A. Murray, H-I, by K. Nolan; A, after Meglitsch, 1972; B, after Barnes, 1974).

18a (16b). Prostomium bluntly conical; median chaetigers not elongate; multidentate hooded hooks in single rows in posterior neuropodia (and notopodia)..**CAPITELLIDAE***
18b (16b). Prostomium part of complex fused unit; median chaetigers not elongate; small, non-hooded hooks arranged in dense irregular fields in neuropodia..**OWENIIDAE***
18c (16b). Prostomium narrow, keel- or ridged-shaped; median chaetigers elongate, with prominent tori encircling body (bamboo-shaped); hooks with subdistal beard (non-hooded), arranged in single rows in neuropodia...**MALDANIDAE***

19a (15c). First trunk segment with both notopodia and neuropodia, though smaller than those following; neuropodial short, more-or-less conical lobes, hooks absent..**20**
19b (15c). First trunk segment a smooth ring, lacking parapodia; neuropodia low ridges (tori); dentate hooks present..**ARENICOLIDAE***

20a (19a). Dorsal and ventral cirri present; short tufted parapodial branchiae; body fusiform or with long tapered abdomen, never grooved mid-ventrally...**SCALIBREGMATIDAE***
20b (19a). Dorsal and ventral cirri absent; single, tapering parapodial branchiae; body fusiform, usually with deep mid-ventral groove...**OPHELIIDAE** [in part]*

21a (15d). Palps present, grooved, usually paired (palps may be lost, in which case palpal scars always present)...**22**
21b (15d). Palps absent...**26**

22a (21a). Branchiae flattened slightly, more or less triangular; hook chaetae present.............................**23**
22b (21a). Branchiae digitiform, slender; hooks absent...**24**

23a (22a). Prostomium posteriorly prolonged; capillary chaetae with smooth margins; all hooded hooks slender with shaft more or less straight...**SPIONIDAE** [in part]*
23b (22a). Prostomium not posteriorly prolonged; capillary chaetae include smooth and/or hirsute types; some hooded hooks enlarged and strongly curved...**UNCISPIONIDAE**

24a (22b). Body divided into three regions; strongly elongate median chaetigers with nearly complete circlets of simple spines..**LONGOSOMATIDAE**
24b (22b). Body regionation absent, median chaetigers not elongate, circlets of spines absent................**25**

25a (24b). Body covered with epidermal papillae; compound falcate chaetae present........**ACROCIRRIDAE**
25b (24b). Body surface smooth; compound chaetae absent...**CIRRATULIDAE***

26a (21b). Branchiae paired, filifom; capillary chaetae serrated ; hooks bidentate, hooded.......**QUESTIDAE**
26b (21b). Branchiae, if present, paired, filiform; capillary chaetae smooth; hooks distally dentate, unprotected...**CIRRATULIDAE** [in part; formerly **"CTENODRILIDAE"**]*
26c (21b). Branchiae present, otherwise; capillary chaetae smooth or serrated; hooks absent..................**27**

27a (26c). Body ovoid or dumbbell-shaped; body surface with epidermal papillae; cuticularised shield covering venter of posterior end...**STERNASPIDAE***
27b (26c). Body longer than wide, more or less cylindrical; body surface smooth; cuticularised shield absent...**28**

28a (27b). Dorsal branchiae paired, flattened, on anterior segments; peristomial ring absent (peristomium around mouth only)...**PARAONIDAE***
28b (27b). Single dorsomedial branchial filament arising from anterior chaetiger; peristomium a single ring...**COSSURIDAE**

29a (14b). Tentacles outside buccal cavity; capillary chaetae with finely serrated margins; tube cone-shaped, made of cemented sand grains...**PECTINARIIDAE***
29b (14b). Tentacles within buccal cavity; capillary chaetae with smooth margins; tube otherwise...**AMPHARETIDAE***

30a (14c). Sharply curved spines present in anterior neuropodia; capillary chaetae with smooth margins; thoracic uncini long-shafted (acicular)..**TRICHOBRANCHIDAE***
30b (14c). Anterior curved spines if present not neuropodial; capillary chaetae with smooth or serrated margins; thoracic uncini usually without shafts (avicular)..**31**

31a (30b). Body regionation absent, parapodia similar in position and basic structure throughout; spines present in anteriormost notopodia..**ALVINELLIDAE**
31b (30b). Body usually differentiated into swollen thorax and tapering abdomen; anterior notopodial spines absent...**TEREBELLIDAE***

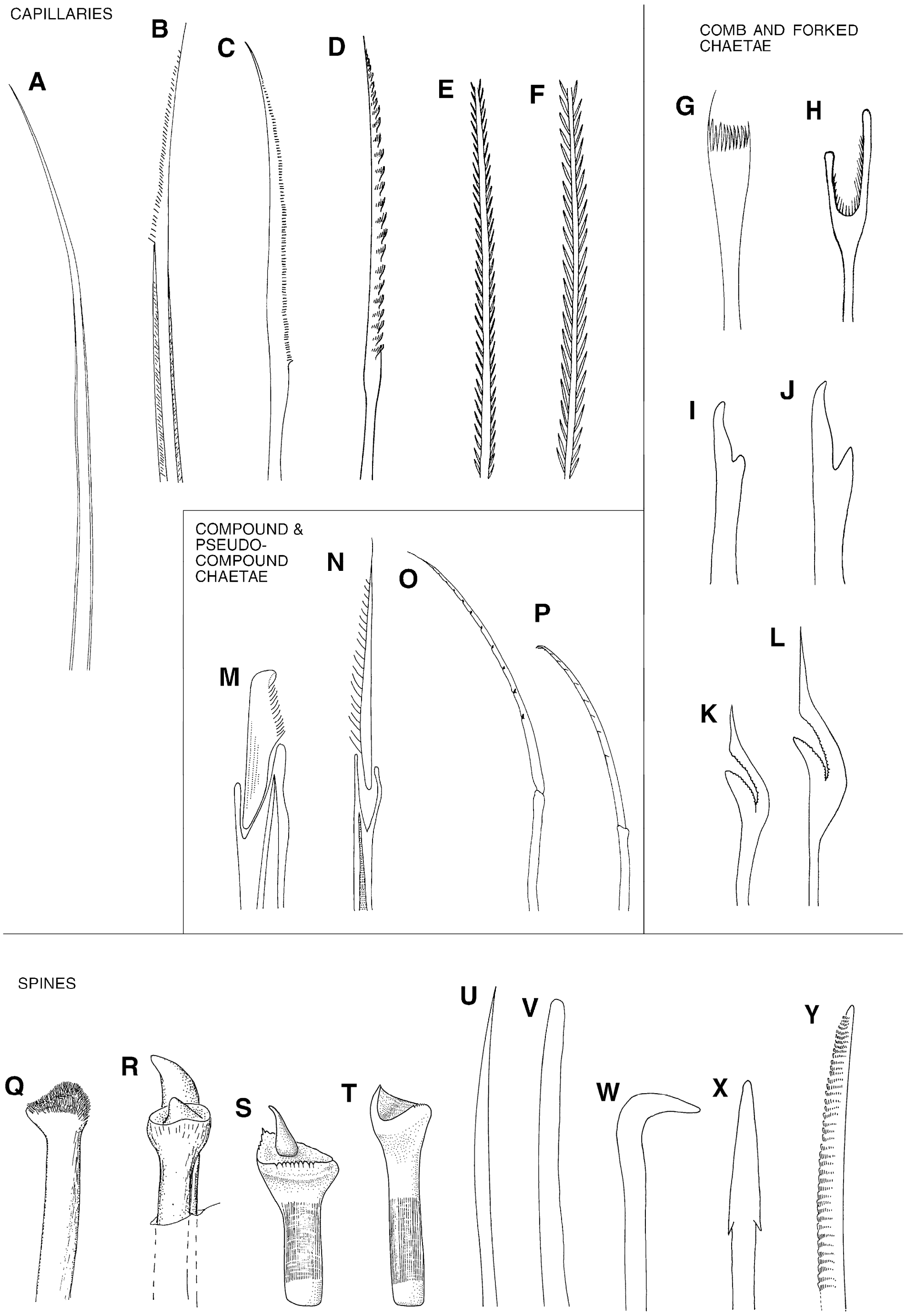

Figure legend: Important characters for the identification of Polychaeta – Chaetae. **A**-**F**, capillaries: **A**, smooth capillary; **B**, **C**, hirsute capillaries; **D**, spinose capillary; **E**, **F**, pinnate capillaries. **G**-**L**, comb and furcate (forked) chaetae: **G**, comb chaeta; **H**, lyrate chaeta; **I**, **J**, furcate chaetae; **K**, **L**, ringent chaetae. **M**, **N**, compound chaetae: **M**, falciger; **N**, spiniger. **O**, **P**, pseudocompound chaetae: **O**, spiniger; **P**, falciger. **Q**-**Y**, spines: **Q**, **R**, spionid-type spines; **S**, **T**, chaetopterid-type spines; **U**, **V**, weakly curved spines; **W**, sharply bent or curved spine; **X**, harpoon-shaped spine; **Y**, spine with series of subdistal spinelets. **A**, *Reteterebella* specimen (Terebellidae); **B**, **C**, *Lanassa* specimen (Terebellidae); **D**, **Y**, *Harmothoe* specimen (Polynoidae); **E**-**F**, *Poecilochaetus* specimen (Poecilochaetidae); **G**, *Eunice* specimen (Eunicidae); **H**, *Scoloplos* specimen (Orbiniidae); **I**-**L**, *Euphrosine* specimen (Euphrosinidae); **M**-**N**, generalised chaetae (Nereididae); **O**, **P**, *Sthenelais* specimen (Sigalionidae); **Q**, *Boccardia* specimen (Spionidae); **R**, *Boccardia* specimen (Spionidae); **S**-**T**, *Spiochaetopterus* specimen (Chaetopteridae); **U**-**V**, *Scolecolepides* specimen (Spionidae); **W**, *Terebellides* specimen (Trichobranchidae); **X**, *Phylo* specimen (Orbiniidae). (Adapted from Beesley, Ross & Glasby, 2000; A-C, after Hutchings & Glasby, 1988; D, O, P, Y, after Hutchings & Murray, 1984; E, F, after Read, 1986; G, after Fauchald, 1986; H, X, after Day, 1977; I-L, after Kudenov, 1993*a*; M, N, after Hutchings & Reid, 1990; Q, R, U, V, after Blake & Kudenov, 1978; S, T, after Bhaud, 1972; W, after Hutchings & Peart, 2000).

32a (11c). Ventral cirri absent; ctenognath jaw apparatus with many small dentate maxillae (jaws may be reduced to varying degrees)..**DORVILLEIDAE** [in part]*
32b (11c). Ventral cirri absent; jaws absent..**33**
32c (11c). Ventral cirri present, cirriform or tapering; jaws absent or present (but sructure otherwise)....**34**
32d (11c). Ventral cirri absent (though inflated pads may be present); jaws present, structure otherwise...**37**

33a (32b). Body disc-shaped, flattened; palps absent; long transverse notopodial ridges carrying notochaetal spines; median antenna present...**SPINTHERIDAE**
33b (32b). Body shape otherwise; palps present; notopodial lobes slender lacking chaetae (but with aciculae); median antenna absent...**APISTOBRANCHIDAE**

34a (32c). Hook chaetae absent; comb chaetae absent; jaws otherwise..**35**
34b (32c). Hooks present (in neuropodia), falcate or dentate; comb chaetae present; labidognath jaw apparatus...**36**

35a (34a). Prionognath jaws with four pairs of maxillae; maxillary carriers paddle-shaped, loosely attached to base of Mx I..**HARTMANIELLIDAE**
35b (34a). Single pair of lateral scissor-shaped jaws; maxillary carriers slender...........**ICHTHYOTOMIDAE**
35c (34a). Ctenognath jaw apparatus with many small dentate jaw maxillae (jaws may be reduced to varying degrees); maxillary carriers absent or if present, short and often fused to base of Mx I as baseplate...**DORVILLEIDAE** [in part]*

36a (34b). Paired ventro-lateral palps comprising short, ringed basal palpophore and distal palpostyle (resemble antennae); single peristomial ring, carrying or not paired cirri...............................**ONUPHIDAE***
36b (34b). Paired ventro-lateral sensory palps more-or-less smooth, or beaded (resemble antennae); two peristomial rings, cirri present or absent...**EUNICIDAE***

37a (32d). Dorsal cirri present, represented by button-like to lamellate lobes; prionognath jaw apparatus with variable number of maxillae (may be symmetrical or asymmetrical)..............................**OENONIDAE***
37b (32d). Dorsal cirri absent; labidognath jaw apparatus with 4 pairs of maxillae........**LUMBRINERIDAE***

38a (2b). Large fusiform postchaetal lobe adorned with sensory hairs; ventral cirri absent; aciculae absent...**ABERRANTIDAE**
38b (2b). Postchaetal lobes not enlarged; ventral cirri present; aciculae present.......................................**39**

39a (38b). Some dorsal cirri modified as elytra (= scales); benthic forms..**40**
39b (38b). Dorsal cirri foliose throughout; pelagic and benthic forms...**43**
39c (38b). Dorsal cirri otherwise; benthic forms...**47**

40a (39a). Elytra alternating throughout body; silky fibre-like notochaetae used to line tube; facial tubercle present...**ACOETIDAE***
40b (39a). Elytra alternating anteriorly, present on all chaetigers or absent posteriorly; notopodial silk chaetae absent; facial tubercle absent...**41**

41a (40b). Compound chaetae with appendages distally falcate...**PHOLOIDAE***
41b (40b). Compound chaetae with appendages both falcate and spinigerous....................**SIGALIONIDAE***
41c (40b). Compound chaetae absent...**42**

42a (41c). Neuropodia distally truncate, with sclerotinised ridges; neuroaciculae elongate, axehead-shaped distally; capillary chaetae smooth...**EULEPETHIDAE**
42b (41c). Neuropodia distally tapered, without sclerotinised ridges; neuroaciculae distally tapered; capillary chaetae spinose...**POLYNOIDAE***

43a (39b). Notopodia represented by dorsal cirri only..**44**
43b (39b). Notopodia represented by at least one chaetal lobe and/or chaetae....................**LACYDONIIDAE**

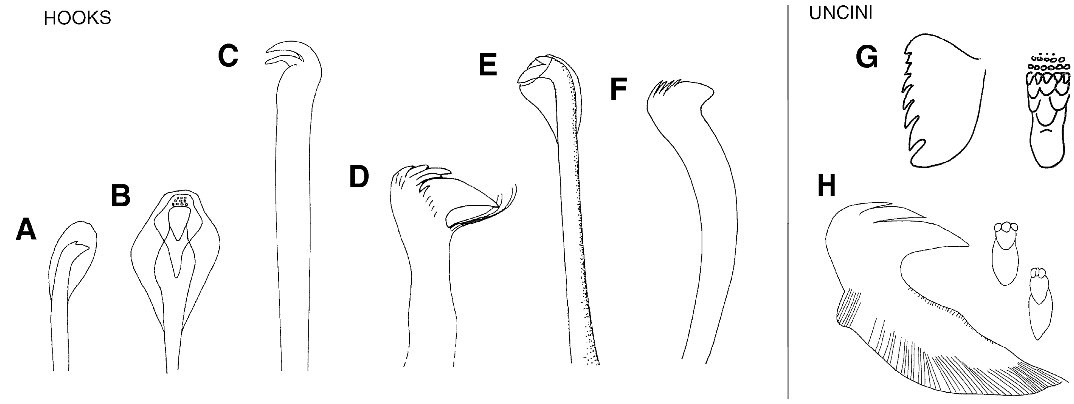

Figure legend: Important characters for the identification of Polychaeta – Chaetae. **A**-**F**, hooks: **A**, **B**, hooded multidentate hook in lateral (**A**) and frontal (**B**) view; **C**, unprotected bidentate hook; **D**, hook with subdistal beard; **E**, hooded bidentate hook; **F**, unprotected multidentate hook. **G**, **H**, uncini: **G**, pectinate uncinus, lateral and frontal views; **H**, crested uncinus, lateral and frontal views. **A**, **B**, *Mediomastus* specimen (Capitellidae); **C**, *Myriochele* specimen (Oweniidae); **D**, *Maldane* specimen (Maldanidae); **E**, *Boccardia* specimen (Spionidae); **F**, *Terebellides* specimen (Trichobranchidae); **G**, *Amythasides* specimen (Ampharetidae); **H**, *Reteterebella* specimen (Terebellidae). (Adapted from Beesley, Ross & Glasby, 2000; A, B, after Warren, Hutchings & Doyle, 1994; C, after Blake, 1984; D, after Green, 1991; E, after Blake & Kudenov, 1978; F, after Hutchings & Peart, 2000; G, after Holthe, 1986*b*; H, after Hutchings & Glasby, 1988).

44a (43a). Benthic forms; all chaetae compound spinigers with shafts distally spinose and inflated..**PHYLLODOCIDAE** [in part]*
44b (43a). Pelagic forms; compound spinigers with shafts not inflated/spinose distally..........................**45**

45a (44b). Median antenna present; eyes with large camera-type lenses; capillary chaetae present...**PHYLLODOCIDAE** [in part; formerly **"ALCIOPIDAE"**]*
45b (44b). Median antenna absent; eyes otherwise; capillary chaetae absent...**46**

46a (45b). Pharynx with terminal papillae only; compound chaetae with oar-shaped or slender (spinigerous) appendages..**LOPADORHYNCHIDAE**
46b (45b). Pharynx densely covered with vey long papillae; compound chaetae all spinigerous...**PONTODORIDAE**

47a (39c). Caruncle present, conspicuous, bordered by ciliary nuchal band; chaetae calcified, hollow....**48**
47b (39c). Caruncle absent, nuchal organs usually indistinct ciliated grooves or eversible cones (rarely paired posterior loops); chaetae chitinous with core...**49**

48a (47a). Notopodia short, cylindrical or conical; single tufted notopodia branchiae; furcate chaetae not ringed..**AMPHINOMIDAE***
48b (47a). Notopodia elongated crests, many small, branching branchiae along notopodial crests; furcate chaetae include ringent and non-ringent types..**EUPHROSINIDAE***

49a (47b). Four jaws in a cross, each supported basally by an aileron.................................**GLYCERIDAE***
49b (47b). Two pairs dorsoventral jaws, not in a cross or supported basally...........................**PISIONIDAE***
49c (47b). One pair lateral jaws (macrognaths), dorsal and ventral arc accessory jaws pieces (micrognaths) and sometimes also chevrons..**GONIADIDAE***
49d (47b). Jaws absent, or one pair lateral jaws...**50**

50a (49d). Prostomium shape quadrangular to pentagonal; inter-ramal cirrus (branchiae) present in anterior parapodia (rarely cirrus absent)...**NEPHTYIDAE***
50b (49d). Prostomium shape otherwise; inter-ramal cirrus absent...**51**

51a (50b). Notochaetal paleae present, arranged in fans across dorsum.....................**CHRYSOPETALIDAE***
51b (50b). Notochaetal paleae absent..**52**

52a (51b). Dorsal body surface with large spherical epidermal papillae arranged in two or more rows; proventricle present, but inconspicuous..**SPHAERODORIDAE***
52b (51b). Body surface usually smooth (rarely papillated, if so, not in rows); proventricle with radiating muscle fibres present (visible through body wall)...**SYLLIDAE***
52c (51b). Body surface smooth; proventricle absent...**53**

53a (52c). Four to eight pairs of tentacular cirri on at least two reduced achaetous segments; compound chaetae present...**HESIONIDAE***
53b (52c). Three or four pairs of tentacular cirri on collar-like segment; compound chaetae present...**NEREIDIDAE***
53c (52c). Two pairs of tentacular cirri; compound chaetae absent...........................**PILARGIDAE** [in part]*
53d (52c). Tentacular cirri absent; compound chaetae present or absent..**54**

54a (53d). Notopodia with lobes and chaetae; chaetae include spinose capillaries and compound spinigers...**PARALACYDONIIDAE***
54b (53d). Notopodia without lobes (only dorsal cirrus, which may be enlarged) or chaetae; all chaetae simple, distally curved spines...**NAUTILINIELLIDAE**

55a (1b). Prostomium with paired antero-lateral appendages; parapodia represented only by an "inter-ramal" parapodial cirrus; hooks absent...**NERILLIDAE**
55b (1b). Prostomium without antero-lateral appendages; parapodia represented by notopodial cirri and low ridge-like neuropodia (tori); chaetae include multidentate, unprotected hooks with slender shafts...**PSAMMODRILIDAE** [in part]
55c (1b). Prostomium without paired antero-lateral appendages; parapodia absent.................................**56**

56a (55c). Chaetae present...**57**
56b (55c). Chaetae absent...**60**

57a (56a). Peristomial ring absent (peristomium only around mouth)...**58**
57b (56a). Peristomial ring present...**PARERGODRILIDAE**

58a (57a). Dentate hooks present.........................**CIRRATULIDAE** [in part; formerly **"CTENODRILIDAE"**]*
58b (57a). Hooks absent (capillary chaetae only)...**59**

59a (58b). Epidermal coloured glands absent...**POTAMODRILIDAE**
59b (58b). Epidermal coloured glands present...**AELOSOMATIDAE**

60a (56b). Pygidial cirri enlarged, toe-like, adhesive appendages..
....**DORVILLEIDAE** [in part; formerly **"DIURODRILIDAE"**]*
60b (56b). Pygidial cirri, if present not toe-like, adhesive...................................**DORVILLEIDAE** [in part]*

61a (1c). Parapodia absent..**62**
61b (1c). Parapodia uniramous throughout...**SACCOCIRRIDAE**
61c (1c). Both notopodia and neuropodia present over part of body; chaetae include multidentate, unprotected hooks with slender shafts...**PSAMMODRILIDAE** [in part]

62a (61a). Pygidium bilobed (deeply furcate resembling toes) with adhesive glands, pygidial cirri absent; buccal organ present..**63**
62b (61a). Pygidium not bilobed, inflated, with adhesive glands and sometimes two or three pygidial cirri; buccal organ absent...**POLYGORDIIDAE***

63a (62a). Paired palps distinct from prostomium, with internal cavities connected behind brain...**PROTODRILIDAE**
63b (62a). Paired palps extensions of prostomium, without internal cavities..............**PROTODRILOIDIDAE**

64a (1d). Body disc-shaped; posterior end not cleft; jaws absent; symbiont of echinoderms..**MYZOSTOMATIDAE**
64b (1d). Body longer than wide; deeply cleft posterior end forming two large "feet"; jaws present, prionognath type; symbiont of decapod crustaceans...**HISTRIOBDELLIDAE**

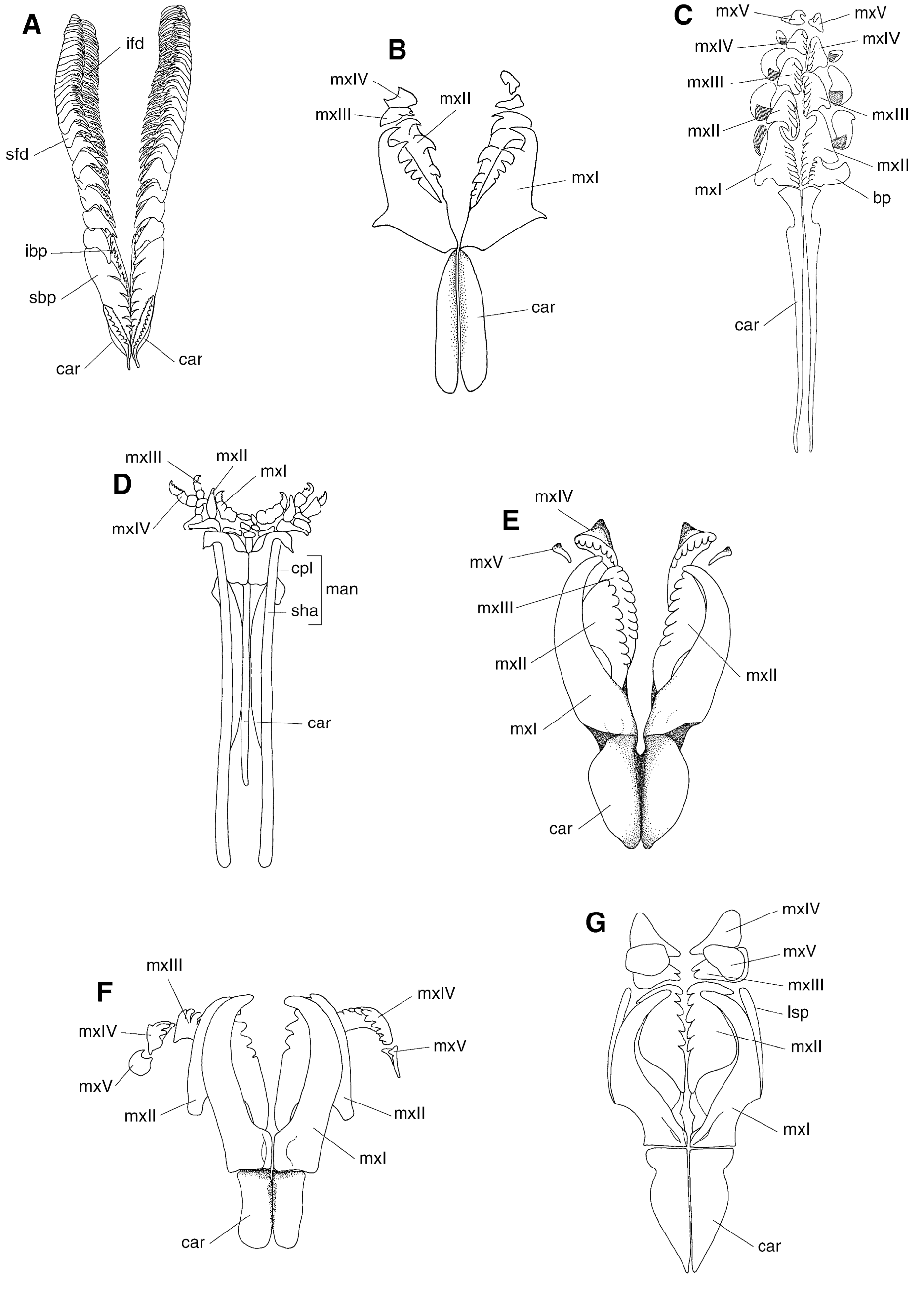

Figure legend: Important characters for the identification of Polychaeta – Jaws and arrangement of maxillae of Eunicida *sensu stricto*. **A**, Ctenognath type. Dorvilleidae, *Schistomeringos* specimen. **B**-**D**, Priognath type: **B**, Hartmaniellidae, *Hartmaniella* specimen; **C**, Oenonidae, *Oenone* specimen; **D**, Histriobdellidae, *Stratiodrilus* specimen. **E**-**G**, Labidognath type: **E**, Onuphidae, *Hirsutonuphis* specimen; **F**, Eunicidae, *Eunice* specimen; **G**, Lumbrineridae, *Lumbrineris* specimen. **bp**, basal plate; **car**, carrier; **cpl**, cutting plate; **ibp**, inferior basal plate; **ifd**, inferior free denticle; **lsp**, lateral support; **mxI-V**, maxillary plates I-V; **man**, mandible; **sbp**, superior basal plate; **sfd**, superior free denticle; **sha**, shaft. (Adapted from Beesley, Ross & Glasby, 2000; drawings A, C-G, by A. Murray, B by K. Nolan; B, after Imajima, 1977*a*; D, after Haswell, 1900).

FAMILY **ABERRANTIDAE** Wolf 1987

AS: *ABERRANTIDAE* WOLF, 1987: 50.

TYPE GENUS: *Aberranta* Hartman 1965.

REMARKS: The first species of this family was described by HARTMAN (1965*b*), as *Aberranta enigmatica*, and considered as belonging to an unknown family, close to Spionidae. The family Aberrantidae was created by WOLF (1987) to include *Aberranta palpata* Hartman 1965, and a new species, *A. palpata*. The family was revised recently by MACKIE, PLEIJEL & ROUSE (2005), and two new species were added, *A. banyulensis* and *A. sulcata*. This way, the Aberrantidae includes at present a single genus, *Aberranta*, and four species, as follows:

Aberranta enigmatica Hartman 1965 — East of Block Canyon, New England, 300 meters [type species];
Aberranta palpata Wolf 1987 — off Apalachicola River, Florida, Gulf of Mexico, medium sand, 36 meters;
Aberranta banyulensis Mackie, Pleijel & Rouse 2005 — Banyuls-sur-Mer, France, Mediterranean Sea, mud with detritus, 40 meters;
Aberranta sulcata Mackie, Pleijel & Rouse 2005 — SW Flynn Point, Hoi Ha Wan, Hong Kong, China, silty sand, 9 meters.

The bibliography concerning the group is scarce. The most important work is the above mentioned paper by MACKIE, PLEIJEL & ROUSE (2005), where the four species are revised and/or described, and the relationships among them examined using a morphology-based cladistic analysis. Other works include HOBSON (1971), WOLF (1984*f*, 1987), and PLEIJEL (2001*k*).

Only one species is known to occur in Europe, in the Northwestern Mediterranean Sea. Specimens of *Aberranta* were also recorded from muddy sediments in the NW Irish Sea and in the Clyde Sea area, which might represent an additional species, but the currently available material is too fragmentary to allow a description (MACKIE, PLEIJEL & ROUSE, 2005).

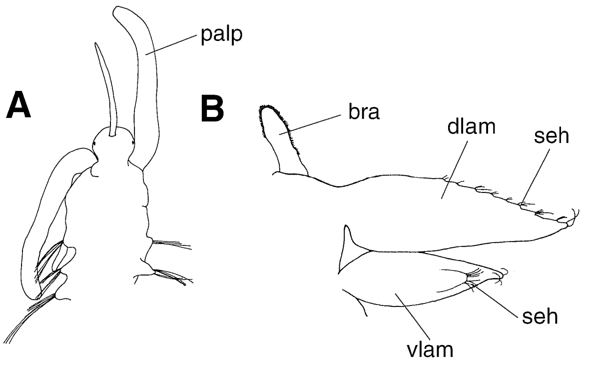

Figure legend: Family Aberrantidae. *Aberranta* specimen. **A**, anterior end with most dorsal and ventral lamellae missing, dorsal view; **B**, middle parapodium with chaetae omitted; posterior view. **bra**, branchia; **dlam**, dorsal lamella; **palp**, palp; **seh**, sensory hairs; **vlam**, ventral lamella. (Adapted from BEESLEY, ROSS & GLASBY, 2000; after WOLF, 1987).

GENUS *Aberranta* Hartman 1965

Aberranta HARTMAN, 1965*b*: 155.

TYPE SPECIES: *Aberranta enigmatica* Hartman 1965.

Aberranta banyulensis Mackie, Pleijel & Rouse 2005

Aberranta banyulensis MACKIE, PLEIJEL & ROUSE, 2005: 203-204, figs. 2, 5-8, table 2.

TYPE LOCALITY: Banyuls-sur-Mer (France, Mediterranean Sea): 42˚30.17"N, 03˚09.48"E, mud with detritus, 40 meters.

SELECTED REFERENCES: *Aberranta* sp.n. — MACKIE & PLEIJEL (ms. *in* MACKIE, 1996, PAPER VII): 11-15, figs. 3, 5-6. *Aberranta* — PLEIJEL, 2001*k*: 175-176, fig. 44.1.

DISTRIBUTION: Mediterranean Sea: Banyuls-sur-Mer (France), 32-80 meters, on mud and sandy mud with detritus; coast of Catalonia (Spain), not distant from its type locality (SERGI TABOADA, personal. communication, July 2006); coast of Murcia (Spain), in maërl (personal observation).

*FAMILY **ACOETIDAE** Kinberg 1856

AS: *ACOËTEA* KINBERG, 1856: 386.

TYPE GENUS: *Acoetes* Audouin & Milne Edwards 1832.

SYNONYMS: *POLYODONTIDAE* Augener 1918 [not Bonaparte 1837 (Pisces, based on *Polydon* Schneider 1801); see PETTIBONE (1989: 6)].

REMARKS: The family Acoetidae Kinberg 1856 gathers a group of polychaetes with long bodies partially covered by elytra and slightly flattened dorsoventrally. They occur generally at low densities, but when present they are very conspicuous, due both to their big size (they can reach lengths of up to 1 meter and widths of 40 mm), and to their tubes. They live in tough tubes deeply embedded in the substrata, made of long silk-like chitinous fibers (modified chaetae produced from the notopodia), woven into a criss-cross spiral, and normally mixed with mud, clay or sand.

The family Acoetidae is at present considered to be formed by 8 genera, 48 species (one of which doubtful), and one doubtful subspecies, while 3 other genera and 19 described species are considered to be synonymies, and 3 species indeterminate or catalogued as *incertae sedis* (PETTIBONE, 1989; SHEN & WU, 1993; BEN-ELIAHU & FIEGE, 1994; NISHI, 1996*b*; IMAJIMA, 1997; WU *et al.*, 1997; FIEGE & BARNICH, 1998; BARNICH & FIEGE, 2003; BARNICH & STEENE, 2003; PALMERO *et al.*, 2008). The list of the valid genera, species and subspecies is as follows:

Acoetes Audouin & Milne Edwards 1832 — 12 species: *A. bataensis* Pettibone 1989 [off Bata, Equatorial Guinea]; *A. bicolor* (Grube 1877) [Mouth of Congo River, West Africa]; *A. congoensis* Pettibone 1989 [off Congo, West Africa]; *A. flagelliformis* (Wesenberg-Lund 1949) [off Bustani, Iran, Persian Gulf, 65 meters]; *A. grubei* (Kinberg 1856) [Guajaquil, Ecuador, 46 meters]; *A. jogasimae* (Izuka 1912) [Sagami Bay, Japan, 530 meters]; *A. melanonota* (Grube 1876) [Philippine Islands]; *A. mohammadi* Pettibone 1989 [Hawalli, Kuwait, Persian Gulf, near low tide mark]; *A. mortenseni* (Monro 1928) [Taboga, Panama (Pacific)]; *A. pacifica* (Treadwell 1914) [off San Diego, Southern California, 91-163 meters]; *A. pleei* Audouin & Milne Edwards 1832 [type species; Martinique Island]; *A. southcarolinensis* Pettibone 1989 [off South Carolina, North Atlantic, 37 meters].

Euarche Ehlers 1887 — 4 species: *E. cristata* Núñez *in* Palmero, Martínez, Brito & Núñez 2008 [Caniço Baixo, Madeira Island, 75 meters]; *E. maculosa* (Treadwell 1931) [Marinduque Island, Philippine Islands, 194 meters]; *E. mexicana* Pettibone 1989 [Gulf of Mexico, 604 meters]; *E. tubifex* Ehlers 1887 [type species; Gulf of Mexico, 216 meters].

Eupanthalis McIntosh 1876 — 5 species: *E. aena* (Moore 1903) [Suruga Bay, Honshu Island, Japan, 115-137 meters]; *E. edriophthalma* (Potts 1910) [Saya de Malha, Maldives, Western Indian Ocean, 86 meters]; *E. elongata* (Treadwell 1931) [Marinduque Island, Philippines Islands, 52-291 meters]; *E. kinbergi* McIntosh 1876 [type species; Adventure Bank, SW Sardinia, 168 meters]; *E. lepidus* (Shen & Wu 1993) [Nansha Islands, 95-147 meters].

Eupolyodontes Buchanan 1894 — 5 species: *E. amboinensis* Malaquin & Dehorne 1907 [Ambon Bay, Indonesia, shallow water]; *E. batabanoensis* Ibarzábal 1988 [Gulf of Batabanó, SW Cuba, 2 meters]; *E. hartmanae* Pettibone 1989 [Gulf of Oman, Arabian coast, 79 meters]; *E. gulo* (Grube 1855) [includes *E. cornishii* Buchanan 1894, the type species of the genus; Red Sea, near Suez]; *E. thomassini* Pettibone 1989 [Grand Récif de Tuléar, Madagascar, low intertidal].

Neopanthalis Strelzov 1968 — 2 species: *N. muricatus* Shen & Wu 1993 [Nansha Islands, 97 meters]; *N. pelamida* Strelzov 1968 [type species; Gulf of Tonkin, 86-113 meters].

Panthalis Kinberg 1856 — 6 species, 1 subspecies: *P. alaminosae* Pettibone 1989 [Gulf of Mexico, 512 meters]; *P. fauveli* Pettibone 1989 [Arabian Sea, 897 meters]; *P. mutilata* (Treadwell 1906) [Kauai Island, Hawaiian Islands, 584 meters]; *P. novaezealandiae* Knox 1960 [Chatham Rise, New Zealand, 229 meters]; *P. oerstedi* Kinberg 1856 [type species; Bohuslän, Western Sweden]; *P. oerstedi capensis* McIntosh 1924 [Eastern Cape, South Africa, 46 meters]; *P. zanzibarensis* Pettibone 1989 [Zanzibar, 183-194 meters].

Polyodontes Renieri *in* Blainville 1828 — 13 species: *P. atromarginatus* Horst 1917 [Indonesia, 9-45 meters]; *P. australiensis* (McIntosh 1885) [Wednesday Island, NW Cape York, West Australia, 15 meters]; *P. frankenbergi* Pettibone 1989 [off Georgia, North Atlantic, 18 meters]; *P. frons* Hartman 1939 [Piñas Bay, Panama (Pacific), 37 meters]; *P. jolli* Pettibone 1989 [North of Du Roma, Moluccas, 27-37 meters]; *P. lupinus* (Stimpson 1856) [Charleston Harbour, South Carolina]; *P. oculeus* (Treadwell 1901) [Puerto Rico, 13 meters]; *P. maxillosus* (Ranzani 1817) [type species; Adriatic Sea]; *P. panamensis* (Chamberlin 1919) [Panama (Pacific), shore]; *P. sibogae* Horst 1917 [West New Guinea and Aru Islands, Indonesia, 57 meters]; *P. texanus* Pettibone 1989 [Northwestern part of the Gulf of Mexico, 183 meters]; *P. tidemani* Pflugfelder

1932 [Moluccas Islands, Indonesia, low water]; *P. vanderloosi* Barnich & Steene 2003 [D'Entrecasteaux Islands, Papua New Guinea, 7 meters].

Zachsiella Buzhinskaja 1982 — 1 species: *Z. nigromaculata* (Grube 1878) [type species; Pandanon, Philippine Islands].

The most important work on the Acoetidae was published by PETTIBONE (1989), consisting of a world-wide revision of the group based on the re-examination of type material (whenever possible), and published records, as well as on the study of a large amount of new material deposited in museums and other scientific institutions. However, HUTCHINGS (2000*b*) considered the total number of species obtained by Pettibone (46 on 8 genera) as being probably conservative, as in her revision Pettibone did not accept some of the described species as valid, due to damaged type material. Other recent publications on the taxonomy of Acoetidae, published posteriorly to PETTIBONE (1989), are cited above.

In European and nearby waters 6 genera are known to occur, represented by seven species, one of which is new and is presently being described.

KEY TO GENERA

(adapted from PETTIBONE, 1989)

1a. Prostomium oval or bilobed, with 2 pairs of sessile eyes or eyes lacking; lateral antennae anterior, not hidden by ocular peduncles or ommatophores; acicular neurochaetae from segment 3; upper neurochaetae (type *a*) from segment 9 long, lanceolate, with lateral spines; without parapodial branchiae; pharynx with up to 15 pairs of border papillae, none especially long; jaws each one with up to 8 lateral teeth......**2**

1b. Protomium bilobed, with pair of enlarged ocular peduncles or ommatophores......**3**

2a (1a). With well-developed occipital median antenna; parapodia of segment 2 biramous, with notoaciculum and numerous capillary notochaetae......***Euarche****

2b (1a). Without median antennae; parapodia of segment 2 subbiramous, with notoaciculum, without or with few notochaetae......***Eupanthalis****

3a (1b). Lateral prostomial antennae located medial to the large, colored ommatophores, and clearly visible dorsally; bilobed nuchal organ with or without minute median antennae; palps smooth, short, scarcely surpassing prostomium; with or without fleshy prostomial branchiae; tentaculophores ventral to prostomium; acicular neurochaetae from segment 2; upper neurochaetae (type *a*) from segment 9 with double brush-shaped tips; with parapodial branchiae; pharynx with up to 39 pairs of border papillae, middorsal and midventral papillae very long and tapered; jaws each one with up to 17 lateral teeth......***Eupolyodontes***

3b (1b). Lateral prostomial antennae attached ventrally on ommatophores, with only tips visible dorsally; well developed median antennae with ceratophore near middle of prostomium; palps long, extending far beyond prostomium; pharynx with up to 19 pairs of border papillae, middorsal and sometimes midventral ones longer; jaws with up to 12 lateral teeth......**4**

4a (3b). Ommatophores light colored or colorless, not set off by narrow neck or short-stalked, without a pair of small lateral sessile eyes; acicular neurochaetae from segment 3; upper neurochaetae of type *a* from segment 9, long, distally plumose; type *b* neurochaetae very short and hidden by notopodium......***Panthalis***

4b (3b). Ommatophores bulbous, heavily colored, clearly stalked, with pair of small lateral sessile eyes; acicular neurochaetae from segment 3 or later......**5**

5a (4b). Upper neurochaetae of type *a* from segment 9 long, abruptly tapering to slender tips, plumose either distally or subdistally and with short spinous rows basally; type *b* neurochaetae very short, usually hidden by notopodium; acicular neurochaetae from segment 3......***Acoetes****

5b (4b). Upper neurochaetae of type *a* from segment 9 long, tapering to fine tips, thickly spinous, not plumose; type *b* neurochaetae shorter than type *a* but not completely hidden by notopodia; acicular neurochaetae from segment 3 or later......***Polyodontes***

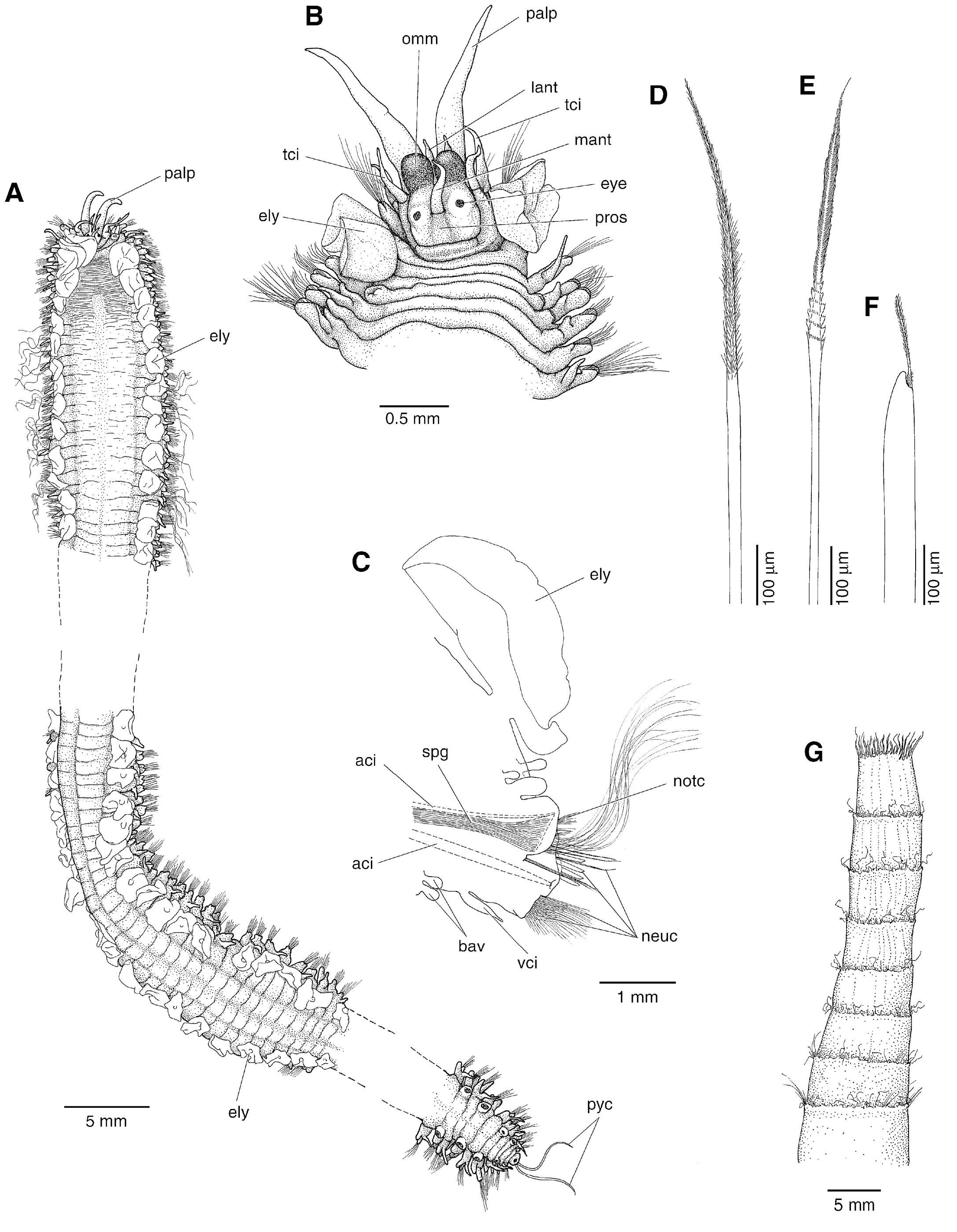

Figure legend: Family Acoetidae. **A**, *Eupanthalis* specimen, animal with details of anterior, middle and posterior segments, dorsal view. **B**-**F**, *Polyodontes* specimen: **B**, anterior end, dorsal view; **C**, parapodium of chaetiger 26, anterior view; **D**, superior neurochaetae from parapodium of chaetiger 26; **E**, spinose neurochaetae from parapodium of chaetiger 27; **F**, stout aristate neurochaeta from parapodium of chaetiger 27. **G**, anterior section of tube of Acoetidae. **aci**, acicula; **bav**, basal vesicles; **ely**, elytron; **eye**, eye; **lant**, lateral antenna; **mant**, median antenna; **neuc**, neurochaeta; **notc**, notochaeta; **omm**, ommatophore; **palp**, palp; **pros**, prostomium; **pyc**, pygidial cirri; **spg**, spinning gland; **tci**, tentacular cirrus; **vci**, ventral cirrus. (Adapted from BEESLEY, ROSS & GLASBY, 2000; drawings by A. Murray).

*GENUS *Acoetes* Audouin & Milne Edwards 1832

Acoetes AUDOUIN & MILNE EDWARDS, 1832: 435-437.

TYPE SPECIES: *Acoetes pleei* Audouin & Milne Edwards 1832.

SYNONYMS: *Eupompe* Kinberg 1856.

REMARKS: The genus *Acoetes* has been recorded worldwide, in circumtropical regions, with the exception of *Acoetes jogasimae* (Izuka 1912), from Sagami Bay, in Japan. So far it had not been recorded in European or North African waters. During this study, several acoetids from an undescribed species were collected at the region of the Gulf of Cádiz, Gibraltar Strait, and Alborán Sea. This collection was complemented by another series of specimens from Algarve (Southern Portugal).

These specimens are being described as a new taxon in collaboration with Dr. Ruth Barnich, but the justification for erecting a new taxon and some comments on the species are given below.

**Acoetes* sp. nov.

MATERIAL: FAUNA 1 — St. 5*A*, Alborán Sea, off Veléz-Málaga, 67-68 m, mud: 1 specimen. **St. 66*A***, Gulf of Cádiz, off Cádiz, 25-28 m, muddy sand: 1 specimen. **St. 67*A***, Gulf of Cádiz, off Chipiona, 55-56 m, mud: 12 specimens. **St. 70*A***, Gulf of Cádiz, off Isla Cristina, 22 m, muddy sand: 1 specimen. **Projecto Recifes — St. ALV-G-37**, March 2000, Alvor (Algarve, South Portugal), Leg. Paula Pereira, 7 specimens. **St. ALV-G-63**, March 2000, Alvor (Algarve, South Portugal), Leg. Paula Pereira, 5 specimens.

JUSTIFICATION OF THE NEW SPECIES: The new species is readily differentiated form all the other known species of *Acoetes* by the presence of 11 pairs of proboscideal papillae, an odd number for the genus, where the normal status is of 13-15 pairs of proboscideal papillae. This number remains constant in all the studied specimens, indicating that it is a fixed character with taxonomic value, rather than subject to variation. Besides, the midventral papilla is of about the same size than all the remain papillae, with exception of the middorsal one, which is much longer. Finally, the occurrence of the following characters together makes this species unique: ommatophores with long necks; tentacular cirri tapered, not bulbous; parapodia of segment 2 not extra large, with neuropodia with prominent ventral bracts; parapodial branchiae present, well developed; acicular neurochaetae with distal hairs.

REFERENCES FOR PORTUGAL: Present work (off Alvor, Algarve).

DISTRIBUTION: Alvor (near Portimão, Algarve, South Portugal); Alborán Sea (near Málaga); Gulf of Cádiz (off Huelva and off Cádiz). In mud and muddy sand. Between 22-68 meters.

REMARKS: Although the Acoetidae worms can reach big sizes, little is known concerning their reproduction. Sexes are separate, and sperm and yolky eggs have been observed in the body cavities (MCINTOSH, 1900*a*; CHAMBERS, 1985; PETTIBONE, 1989), but the development and growth of the worms have not been observed, and are unknown (GIANGRANDE, 1997).

Supposed juveniles of three species were described by PETTIBONE (1989): *Acoetes pleei* Audouin & Milne-Edwards 1832, *Polyodontes lupinus* (Stimpson 1856), and *Panthalis alaminosae* Pettibone 1989. The genera to which the above three species belong (*Acoetes*, *Panthalis*, and *Polyodontes*) are normally separated from the other Acoetidae and grouped together, mainly due to the presence of a bilobed prostomium supporting a pair of large ocular peduncles or ommatophores, to which the lateral prostomial antennae are attached ventrally, and by the presence of a well-developed median antenna with ceratophore near the middle of the prostomium (see the above generic key). These genera separate from each other mainly by having stalked colored (*Acoetes* and *Polyodontes*) versus colorless and sessile or poorly stalked ommatophores (*Panthalis*), and plumose type *a* upper neurochaetae, either distally or subdistally (*Acoetes* and *Panthalis*) versus type *a* upper neurochaetae tapering to fine tips, thickly spinous and not plumose (*Polyodontes*). Features like papillate palps, or parapodial branchiae are stated to vary inside the genera *Acoetes* and *Polyodontes*, and to be absent in *Panthalis*.

Both juveniles of *Acoetes pleei* and *Polyodontes lupinus* show the general features of the adults, except for the fact that the parapodial branchiae, present in the adults, is absent in the small juveniles. In the case of *Panthalis alaminosae*, the described juveniles present important differences in relation to the adults. Despite those differences, PETTIBONE (1989) referred "*provisionally*" [sic] three specimens obtained from the Gulf of Mexico and Puerto Rico to this species, as juveniles. It is possible that this decision was based on the geographic proximity between the so-called juveniles and the adults, as well as on the morphology of the chaetae (especially type *a* neurochaetae with brush-like tips), and the absence of branchiae. However, this identification seems to be quite dubious, as already stressed by Pettibone herself, by "*provisionally*" referring them to *P. alaminosae*. If they were *Panthalis* specimens, they would be the only known specimens of this genus to present conspicuous colored ommatophores and pigmented sessile eyes, and the ontogeny of the species would require the loss of both types of eyes and their replacement by the colorless ommatophores of the adults, which seems improbable. The number of the proboscideal papillae is also described as different, being 13 pairs in the "juveniles" against the 15 pairs in the putative adults.

The interest in these presumed juveniles comes from the fact that Pettibone included some of their characters in her generic dichotomic key, under the genus *Panthalis* (but not in the diagnosis of the genus itself) (PETTIBONE, 1989). This way, it is stated the possibility that *Panthalis* specimens present colored ommatophores, besides colorless, and that small lateral sessile eyes can be present in some specimens. On the other hand, in the same key, in the dichotomy leading to *Acoetes*, this genus is referred as having the upper neurochaetae (type *a*) abruptly tapering to slender tips, plumose subdistally and with short spinous rows basally, against being distally plumose or with brush-like tips as in *Panthalis* (and as in the ommatophore-colored "juveniles" of *P. alaminosae*). However, some *Acoetes* species, like *A. pacifica*, do present such brush-like tipped chaetae. Those statements can raise some confusion while using Pettibone's key for the generic identification of adult acoetids with colored ommatophores and brush-like tipped chaetae, which would seem to be transitional forms between *Acoetes* and *Panthalis*. Under this situation is the undescribed new species of *Acoetes* from the Southern Iberian Peninsula.

Finally, in the same key by PETTIBONE (1989), the genus *Panthalis* is referred as having smooth palps, but papillated palps have been described at least in the type species of the genus, *P. oerstedi* (e.g. MCINTOSH, 1900*a*; CHAMBERS, 1985; CHAMBERS & MUIR, 1997; and were also observed in the specimens collected at the Gulf of Cádiz in the present study).

The commented above created the necessity to correct the key in the dichotomies that separate the genera *Panthalis*, *Acoetes*, and *Polyodontes* (see the above key for genera), with a previous revision of the status of the three "juveniles" attributed to *Panthalis alaminosae*. This revision resulted in the ascription of these "juvenile" specimens to a new species of *Acoetes*, which will be published elsewhere (GIL, RÉ & SARDÁ, *in. prep.*).

*GENUS ***Euarche*** Ehlers 1887

Euarche EHLERS, 1887: 53.

TYPE SPECIES: *Euarche tubifex* Ehlers 1887.

REMARKS: The placement of the species *Euarche cristata* NÚÑEZ *in* PALMERO *et al.* (2008) in the genus *Euarche*, raises the question of the definition of the genus itself. The genus *Euarche* is generally defined as having 3 antennae, with two lateral and symmetrical antennae, inserted subdistally near the anterior margin of the prostomium, and the third being a well developed occipital median antenna, inserted near the posterior margin of the prostomium (*e.g.*: PETTIBONE, 1989; BARNICH & FIEGE, 2003). In fact, the presence of the occipital antenna, together with the presence of biramous parapodia in segment 2, with numerous notochaetae, are the main diagnostic characters that separate *Euarche* from the genus *Eupanthalis*, which doesn't have an occipital antennae, and presents the parapodia of segment 2 subbiramous, without or with few notochaetae. This way, the inclusion of *E. cristata* in the genus *Euarche* would require to emend the diagnosis of the genus, in order to include species with or without a median antenna, basing the separation between *Euarche* and *Eupanthalis* mainly in the presence of a biramous or a subbiramous parapodia in the second segment, respectivelly. However, such emendation does not seem to be justified to include a species that so far is only known from a single specimen, moreover when this single specimen seems to be defective.

The main characters used by NÚÑEZ *in* PALMERO *et al.* (2008) in order to justify the validity of *E. cristata*, and separate it from the close *E. tubifex*, as defined today, are the presence of a prostomium with a cristate posterior margin (against smooth and curved), the absence of an occipital median antenna (against presence), and the presence of small dorsal papillae in the second segment (against absence). The first two characters could be related, and additionally associated to a defective specimen, while the third one seems to have little, if any, taxonomic weight in order to separate the two species. A specimen identified as *E. tubifex* from the Gulf of Cádiz (see below), also presents small dorsal papillae in the second segment.

For the above reasons, a key for the genus *Euarche* is not provided here, and *E. cristata* is, for the moment, considered as a dubious species, quite probably synonymous with *E. tubifex*, as defined today.

Euarche cristata Núñez *in* Palmero, Martínez, Brito & Núñez 2008

Euarche cristata NÚÑEZ *in* PALMERO, MARTÍNEZ, BRITO & NÚÑEZ, 2008: 52, fig. 2.

TYPE LOCALITY: Caniço Baixo, Madeira Island, 32º38'11"N, 16º48'92"[*sic*, maybe 9.2"]W, 75 m, coarse sand.
DISTRIBUTION: The species is known from a single specimen, collected at the type locality.
REMARKS: See the *REMARKS* section under the genus *Euarche*.

****Euarche tubifex*** Ehlers 1887

Euarche tubifex EHLERS, 1887: 54-56, pl. 12 figs. 1-7, pl. 13 fig. 1.
TYPE LOCALITY: Off Florida (U.S.A.), 28º51'N, 89º01'W, 118 fathoms (215.8 meters).
SYNONYMS: *Eupanthalis perlae* Fauchald 1977; *Eupanthalis rudipalpa* Amaral & Nonato 1984; [?] *Euarche cristata* Núñez *in* Palmero, Martínez, Brito & Núñez 2008 [see comments above, under the *REMARKS* section of the genus *Euarche*].
SELECTED REFERENCES: *Euarche tubifex* — PETTIBONE, 1989: 14-18, figs. 1-5; BEN-ELIAHU & FIEGE, 1994: 154, figs. 6, 8*e*; IMAJIMA, 1997: 117-121, figs. 57-59; BARNICH & FIEGE, 2003: 95-97, fig. 49; PALMERO *et al.*, 2008: 50, fig. 1. *Eupanthalis Kinbergi* [not McIntosh 1876] — FAUVEL, 1923*c*: 100-101, figs. 38*i-q*; PARIS, 1955: 501-503, figs. 8, 9*b-d*. *Eupanthalis kinbergi* [not McIntosh 1876] — PETTIBONE, 1989: 24-27 [in part], fig. 11*a*. *Eupanthalis perlae* — FAUCHALD, 1977*b*: 7-8, fig. 2. *Eupanthalis rudipalpa* — AMARAL & NONATO, 1984: 14, figs. 1-11. *Eupanthalis* sp. A — WOLF, 1984*c*: 22.10, figs. 5-6.
MATERIAL: **FAUNA 1 — St. 50*A***, Gulf of Cádiz, off Rota, 108-122 m, mud: 1 incomplete specimen, with 94 chaetigers for 15 cm long; tube thick, formed by interwoven chaetae covered with mud; the worm was withdrew inside the tube, being at about 21 cm from the mouth of the tube.
DISTRIBUTION: Northwest Atlantic, from Florida to North Carolina; Gulf of Mexico; Caribbean Sea; Panama (Pacific); Southwest Atlantic to South Brazil; Northeast Atlantic, from Western Spain to Northwest Africa; Mediterranean Sea; Aegean Sea; Arabian Sea; Madeira and Canary Islands; Japan. Muddy and sandy bottoms. Between 13-450 meters.

*GENUS ***Eupanthalis*** McIntosh 1876

Eupanthalis MCINTOSH, 1876*c*: 404-405.
TYPE SPECIES: *Eupanthalis kinbergi* McIntosh 1876.
SYNONYMS: *Restio* Moore 1903.

****Eupanthalis kinbergi*** McIntosh 1876

Eupanthalis kinbergi MCINTOSH, 1876*c*: 404-405, pl. 72 figs. 12-15.
TYPE LOCALITY: Adventure Bank, SW of Sardinia, approximately 37º20'N, 12º10'E, 168 meters.
SYNONYMS: *Eupanthalis glabra* Ben-Eliahu & Fiege 1994.
SELECTED REFERENCES: *Eupanthalis kinbergi* — PETTIBONE, 1989: 24-27, figs. 11*b-j*, 12 [in part; not specimen from Naples = *Euarche tubifex* Ehlers 1887]; BARNICH & FIEGE, 2003: 97-99, fig. 50; PALMERO *et al.*, 2008: 53-54, figs. 3, 7*A-B*. *Eupanthalis glabra* — BEN-ELIAHU & FIEGE, 1994: 149-154, figs. 2-5. *Polyodontes maxillosus* [not Ranzani 1817] — PARIS, 1955: 503, fig. 9*e*.
REFERENCES FOR PORTUGAL: [?] MONTEIRO-MARQUES, 1979 (as *Eupanthalis* cf. *kinbergi*; southern continental shelf of Algarve); MONTEIRO-MARQUES, 1987 (continental shelf of Algarve); DEXTER, 1992 (previous records: continental shelf of Algarve; Sado Estuary).
MATERIAL: **FAUNA 1 — St. 3*A***, Gulf of Cádiz, off Cádiz, 114-116 m, detritic: 1 incomplete specimen, with 27 chaetigers for about 15 mm long and 5 mm wide; elytra missing; proboscis everted, with 13 pairs of papillae; jaws honey-coloured, with 4 secondary teeth; tentacular cirri as long as the palps; palps without papillae; it seems to have a nuchal fold; medium parapodia as described; parapodia from segment 2.
DISTRIBUTION: Western and Eastern Mediterranean Sea; Adriatic Sea; Aegean Sea; Portugal; Madeira and Canary Islands. In sandy and detritic bottoms. Between 42-195 meters.
REMARKS: MCINTOSH (1876*c*) created the new genus *Eupanthalis* to include *E. kinbergi* from the Adventure Bank (Mediterranean Sea). However, this species was confused with *Euarche tubifex* Ehlers 1887, first by MARENZELLER (1904*a*: 300), who pointed to the similarity between both genera, and later by FAUVEL (1914*f*: 73), who synonymized both species. All the posterior records of *Eupanthalis kinbergi* were referred to *Euarche tubifex* by PETTIBONE (1989), with base on the re-examination of the material. The two species are easily separated by the presence of an occipital antenna and anteriormost biramous

parapodia with numerous notochaetae in *E. tubifex*, against the absence of an occipital antenna and presence of anteriormost subbiramous parapodia, usually without or with few notochaetae.

For the redescription of *Eupanthalis kinbergi*, and due to the fact that the holotype had no palps or jaws, PETTIBONE (1989) used an additional specimen from Naples, near the type locality, which showed papillate palps and dark jaws. With base in this redescription, BEN-ELIAHU & FIEGE (1994) described a new species from the Eastern Mediterranean, *Eupanthalis glabra*, characterized by its smooth palps and honey-colored jaws. However, the re-examination of this specimen by BARNICH & FIEGE (2003) showed that it was a specimen of *Euarche tubifex* that had losted its median antenna, having also the anteriormost parapodia clearly biramous and with numerous notochaetae. The study of numerous specimens from the Mediterranean Sea by BARNICH & FIEGE (2003) showed that *Eupanthalis glabra* was a junior synonym of *E. kinbergi*, and also that the description of *E. kinbergi* given by PETTIBONE (1989) was a mixture of the characters of *Eupanthalis kinbergi* and *Euarche tubifex*. For this reason, I advise the use of the descriptions of *E. kinbergi* given by BEN-ELIAHU & FIEGE (1994, as *Eupanthalis glabra*) and BARNICH & FIEGE (2003), in order to confirm the identification of specimens belonging to this species.

GENUS ***Eupolyodontes*** Buchanan 1894

Eupolyodontes BUCHANAN, 1894: 438.
TYPE SPECIES: *Eupolyodontes Cornishii* Buchanan 1894.

Eupolyodontes gulo (Grube 1855)

Polyodontes gulo GRUBE, 1855: 83, pl. 3 fig. 2.
TYPE LOCALITY: Vicinity of Suez (Red Sea).
SYNONYMS: *Eupolyodontes cornishii* Buchanan 1894; *Panthalis mitsukurii* Izuka 1904.
SELECTED REFERENCES: *Eupolyodontes gulo* — FAUVEL, 1947: 21-22, fig. 17; FIEGE & BARNICH, 1998: 84-87, figs. 1-3, tables 1-2; BARNICH & FIEGE, 2003: 99-101, fig. 51; PALMERO *et al.*, 2008: 54, figs. 4, *7D*, *F*. *Eupolyodontes Cornishii* — BUCHANAN, 1894: 438-441, pl. 27 figs. 1-8. *Eupolyodontes cornishii* — PETTIBONE, 1989: 36-39, figs. 20-22; BEN-ELIAHU & FIEGE, 1994: 155-156, figs. 7, 8*a-c*. *Panthalis mitsukurii* — IZUKA, 1912: 66-68, pl. 8 figs. 7-9. *Eupolyodontes mitsukurii* — PETTIBONE, 1989: 51; NISHI, 1996*b*: 33-37, figs. 2-5.
DISTRIBUTION: Red Sea; Eastern Mediterranean Sea, off Israel; Canary Islands; West Coast of Africa; New Caledonia; Japan. On muddy bottoms, and associated with the deep coral community of *Dendrophyllia ramea*. Between 55-183 meters.

*GENUS ***Panthalis*** Kinberg 1856

Panthalis KINBERG, 1856: 386.
TYPE SPECIES: *Panthalis oerstedi* Kinberg 1856.

****Panthalis oerstedi*** Kinberg 1856

Panthalis Oerstedi KINBERG, 1856: 387.
TYPE LOCALITY: Bohuslän, western Sweden.
SYNONYMS: *Panthalis Marenzelleri* Pruvot & Racovitza 1895.
SELECTED REFERENCES: *Panthalis Oerstedi* — KINBERG, 1857*a*: pl. 7 fig. 34; KINBERG, 1858: 25-26; KINBERG, 1910: 25-26, pl. 7 fig. 34, pl. 10 fig. 60. *Panthalis Ørstedii* — M. SARS, 1863: 298-302 *Panthalis Œrstedi* — MCINTOSH, 1900*a*: 400-406, pl. 28 figs. 16, pl. 30 fig. 8, pl. 34 figs. 3-5, pl. 41, figs. 15-18; FAUVEL, 1923*c*: 98-100, fig. 38*a-h*. *Panthalis oerstedi* — CHAMBERS, 1985: 34-36, figs. 1*c*, 3*c*, 24-25; PETTIBONE, 1989: 53-56, figs. 32-34; BEN-ELIAHU & FIEGE, 1994: 156-157, figs. 8*f*, 9*a-c*; CHAMBERS & MUIR, 1997: 138-139, fig. 43; BARNICH & FIEGE, 2003: 101-103, fig. 52; PALMERO *et al.*, 2008: 54-58, fig. 5. *Panthalis Marenzelleri* — PRUVOT & RACOVITZA, 1895: 442-452, text-fig. 9, pl. 19 fig. 105, pl. 20 figs. 106-110.
REFERENCES FOR PORTUGAL: FAUVEL, 1913*a* (as *Panthalis Œrstedi*; off Lagos); FAUVEL, 1914*f* (as *Panthalis Œrstedi*; off Lagos); BELLAN, 1960*a* (NW Cape Sardão); AMOUREUX, 1974*b* (as *Panthalis oerstedii*; off Porto); CAMPOY, 1982 (previous records: Porto; Portuguese coast); MONTEIRO-MARQUES,

1987 (continental shelf of Algarve); DEXTER, 1992 (as *Panthalis oerstedii*; previous records: continental shelf of Algarve; Sado Estuary).

MATERIAL: FAUNA 1 — St. 1*A*, Gulf of Cádiz, off Huelva, 190 m, mud: 1 incomplete specimen, with 55 chaetigers; colour reddish; flattened dorsoventrally; elytra from chetiger 9, with lateral pockets; probably a sexually mature male, as the notopodial lobes are swollen and orange coloured. **St. 49*A***, Gulf of Cádiz, off Chipiona, 238-240 m, mud: 1 incomplete specimen, with about 46 chaetigers; prostomium with two faint orange spots, ressembling sessile eyes; proboscis everted; mandibles orange, with 7 lateral teeth.

DISTRIBUTION: Sweden; Norway; North Atlantic to Mediterranean Sea; Adriatic Sea; Aegean Sea; Black Sea; Northwest Africa. Between 11-1470 meters.

*GENUS ***Polyodontes*** Renieri *in* Blainville 1828

Polyodontes RENIERI *in* BLAINVILLE, 1828: 461.

TYPE SPECIES: *Phyllodoce maxillosa* Ranzani 1817 [= *Polyodontes maxillosus* (Ranzani 1817)].

SYNONYMS: *Phyllodoce* Ranzani 1817 [not *Phyllodoce* Savigny in Lamarck 1818; name conserved, according to Opinion 1692 of the ICZN (1992)].

****Polyodontes maxillosus*** (Ranzani 1817)

Phyllodoce Maxillosa RANZANI, 1817*a*: 1452-1456, pl. 11 figs. 2-5.

TYPE LOCALITY: Adriatic Sea.

SYNONYMS: *Eumolpe maxima* Oken 1817; *Panthalis Lacazii* Pruvot & Racovitza 1895.

SELECTED REFERENCES: *Polyodontes maxillosus* — PETTIBONE, 1989: 101-103, figs. 70-72; BEN-ELIAHU & FIEGE, 1994: 157-158, figs. 8*d*, 9*d*; BARNICH & FIEGE, 2003: 103-105, fig. 53, pl. 2 figs. 3-4; PALMERO *et al.*, 2008: 58, figs. 6, 7*C*, *E*. *Panthalis Lacazii* — PRUVOT & RACOVITZA, 1895: 428-441, pl. 19 figs. 84-104.

REFERENCES FOR PORTUGAL: BELLAN, 1964*b* (off Portugal); MONTEIRO-MARQUES, 1979 (southern continental shelf of Algarve); CAMPOY, 1982 (previous records: Portuguese coast); MONTEIRO-MARQUES, 1987 (continental shelf of Algarve); DEXTER, 1992 (previous records: continental shelf of Algarve).

MATERIAL: Blanes Harbour, Catalonian coast of Spain (Collection of Rafael Sardà), Summer 1991, collected by angling.

DISTRIBUTION: North Atlantic, off Spain; Mediterranean Sea; Adriatic Sea; Aegean Sea; Red Sea; Canary Islands. In several kinds of substrata. From low water to 280 meters.

FAMILY **ACROCIRRIDAE** Banse 1969

AS: *ACROCIRRIDAE* BANSE, 1969: 2596-2599.
TYPE GENUS: *Acrocirrus* Grube 1872.
SYNONYMS: *HELMETOPHORIDAE* Hartman 1978.
REMARKS: The diagnosis of the family was emended by OSBORN & ROUSE (2011).

GILLET (2001) created the genus *Flabelligena* to include those species of *Flabelligella* Hartman 1965 which presented both a pair of palps and serrated notochaetae, instead of absence of palps and cross-barred notochaetae. This new genus would include three species: *Flabelligella cirrata* Hartman & Fauchald 1971, *Flabelligella erratica* Orensanz 1974, and *Flagelligena amoureuxi* Gillet 2001. GILLET (*op.cit.*) did not include the species described by KOLMER (1985), apparently unaware of the existence of that work. AGUIRREZABALAGA & CEBERIO (2006) described a fourth species in the genus, *Flabelligena gascognensis*, from the Bay of Biscay, and also moved into the genus the species *Flabelligella biscayensis* and *Flabelligella mediterranea*, both described previously by KOLMER (1985).

The genus *Flabelligena* Gillet 2001, however, will be included in the key below under *Flabelligella* Hartman 1965, for the following reasons:

a) First, the origin of the "palps" *sensu* GILLET (2001) is not clear, and probably not the same than the palps of the other Acrocirridae. FAUCHALD & ROUSE (1997) and ROUSE & FAUCHALD (1997) considered the palps on the Acrocirridae to be peristomial grooved palps, and the peristomium to be limited to the buccal region. However, what is often referred to as the first segment of the *Acrocirrus*, forming a narrow ring dorsally and projecting ventrally under the prostomium, could be in fact the peristomium (ROUSE, 2001*f*). In this case, the palps would originate from the anterior part of the peristomium, where it projects forward under the prostomium (ROUSE, 2001*f*). Anyway, the palps would lie always immediately in front of, and dorsal to the buccal opening. They are said to be absent in some species of *Flabelligella sensu lato*, but they may have been lost (ROUSE, *op.cit.*).

The "palps" referred by GILLET (2001) to create the genus *Flabelligena* are apparently dorsal in *Flabelligena amoureuxi* Gillet 2001, and are dorsal in *Flabelligella cirrata* Hartman & Fauchald 1971, the type species of the genus *Flabelligena*. In both cases the "palps" are located between the prostomium and the first chaetiger, and in *F. cirrata* they are "*easily lost, as shown by most specimens which retain only their scars of attachment*" (HARTMAN & FAUCHALD, 1971: 118). By the location of these appendages, they seem to be branchiae, instead of the described peristomial palps present in the Acrocirridae. The same is also stated by AGUIRREZABALAGA & CEBERIO (2006), who described *Flabelligena gascognensis* as having 3 pairs of branchiae, and SALAZAR-VALLEJO, GILLET & CARRERA-PARRA (2007), and had previously been referred by ORENSANZ (1974*a*), who also referred the fact that such branchiae are very deciduous, and KOLMER (1985).

In the genera *Acrocirrus* and *Macrochaeta* there is a pair of branchiae on each of the first 4 segments (with exception of *Macrochaeta sexoculata*, which presents branchiae on the first 6 segments). In the genus *Chauvinelia* there is a pair of branchiae on each of the first 3 segments, while in the genera *Flabelligella*/*Flabelligena* they are present on the first 1-3 segments (BANSE, 1969; KOLMER, 1985; ROUSE, 2001*f*; AGUIRREZABALAGA & CEBERIO, 2006). Some *Flabelligella* have also been described as lacking branchiae, but in other Acrocirridae these structures are shed easily, and the same is true for these taxa (SALAZAR-VALLEJO, GILLET & CARRERA-PARRA, 2007). For the moment, the type material of *Flabelligella papillata* Hartman 1965, the type species of the genus *Flabelligella*, which is state to lack branchiae, has not been revised for scars of branchiae in the anterior region of the body, but such a revision could reveal, eventually, that these scars are present, and that the branchiae were lost.

The true palps are also considered to be very deciduous (AGUIRREZABALAGA & CEBERIO, 2006; SALAZAR-VALLEJO, GILLET & CARRERA-PARRA, 2007), and the absence (*Flabelligella*) versus presence (*Flabelligena*) of these structures to differenciate both genera seems also to be a dubious taxonomic character. Palps can be described as lacking due to their lost and the no detection of their scars, or simply for being overlooked.

b) Second, the notochaetae cannot be easily separated between serrated and cross-barred. KOLMER (1985) described the notochaetae of the four species studied by him as being capillary, apparently annulated, being these annulations marked by transversal rows of very small denticles. Basally, this seems to be the same structure than the pictured by LAUBIER (1974*a*), in the description of *Chauvinelia biscayensis* (LAUBIER, 1974*a*: fig. 1*B*-*C*). I think that the stated differences between "serrated" and "cross-barred" notochaetae result from the size of the denticles and the concentration of the rows of these denticles along the axis of the notochaetae. At low magnifications these rows can give the decribed cross-barred appearance, when the denticles are big, or spinous appearance, when such denticles are small.

AGUIRREZABALAGA & CEBERIO (2006) defended the convenience of maintaining both genera as separated and valid, with *Flabelligella* Hartman 1965 including the species lacking branchiae and provided with cross-barred notochaetae [*F. macrochaeta* (Fauchald 1972), *F. mexicana* Fauchald 1972, *F. minuta* Hartman 1965, and *F. papillata* Hartman 1965 (type species)], and *Flabelligena* Gillet 2001 including species with branchiae and spinulose or serrated notochaetae [*F. amoureuxi* Gillet 2001, *F. biscayensis* (Kolmer 1985), *F. cirrata* (Hartman & Fauchald 1971) (type species), *F. erratica* (Orensanz 1974), *F. gascognensis* Aguirrezabalaga & Ceberio 2006, and *F. mediterranea* (Kolmer 1985)].

SALAZAR-VALLEJO, GILLET & CARRERA-PARRA (2007), stated that palps and branchiae are often lost, and that this means that the distinction between *Flabelligella* and *Flabelligena* requires reassessment on the basis of a revision of both genera.

For all that has been explained above, it is here considered that the genus *Flabelligena* Gillet 2001 is probably a junior synonym of *Flabelligella* Hartman 1965. A final statement on this synonymy will not be made here, as it requires a deeper study on the explained above, with the revision of type material, and this is not the purpose of the present work. To avoid the creation of needless new combinations, in the case that this possible synonymy is shown to be wrong, *Flabelligena gascognensis* will be keyed and considered under *Flabelligella*, but always under the combination *Flabelligena gascognensis*. All the other species recorded in the European waters will be considered as *Flabelligella*, in spite of some of them having been included in the genus *Flabelligena* by AGUIRREZABALAGA & CEBERIO (2006).

One of the most important publications on the family is BANSE (1969), with the creation of the family and the revision and keys for all the species of the two genera included by then in the family, *Acrocirrus* Grube 1873, and *Macrochaeta* Grube 1851. New taxa and keys of species of both genera can also be found in KUDENOV (1976), while a key for *Acrocirrus* can be found in BANSE (1979*b*), and another one for *Macrochaeta* in SANTOS & SILVA (1993). Recent publications on the family include the revision of the genus *Chauvinelia* Laubier 1974 by SALAZAR-VALLEJO, GILLET & CARRERA-PARRA (2007), with the redescription and a key of species, the redescription of the types and only species of the genera *Flabelliseta* Hartman 1978, and *Helmetophorus* Hartman 1978, and a key of all the genera in the family. However, there is a small lapsus in this key of genera of Acrocirridae, as *Flabelligella* is keyed as having branchiae and *Flabelligena* as lacking it, when it should be the other way.

KOLMER (1985) described four species of *Flabelligella* Hartman 1965, two of which as new, and presented a key for all the known taxa in the genus. GILLET (2001) created the genus *Flabelligena* for a new species, made some new combinations in the new genus with species previously in *Flabelligella*, and presented comparative tables for species included in both genera. AGUIRREZABALAGA & CEBERIO (2006) named a new species of *Flabelligena*, discussed the genera *Flabelligella* and *Flabelligena*, and presented a comparative table and key for species in *Flabelligena*. OSBORN *et al.* (2009) raised the new genus *Swima* for holopelagic Acrocirridae, and finally OSBORN & ROUSE (2011) analysed the phylogenetics of Acrocirridae.

Nowadays, the family Acrocirridae includes 7 genera (or 8, depending on if considering *Flabelligena* as a valid genus), and 38 valid species worldwide. Of these, 4 (or 5) genera are present in European waters, with 10 species considered as valid. Three additional species have been described but not named: *Flabelligella* cf. *cirrata* sensu KOLMER (1985); *Flabelligella* cf. *papillata* sensu KOLMER (1985); and *Macrochaeta* sp. sensu NÚÑEZ, OCAÑA & BRITO (1997).

KEY TO GENERA:

1a. Body with a well-developed anterior achaetous region, forming a cephalic hood; numerous notochaetae, always more than 5; neurochaetae terminally straight; chaetae longer than the body width; body wall diaphanous; clavate parapodial papillae present; three pairs of branchiae (may be lost); palps long; possibility of inverting the prostomium with the peristomium amongst the anterior segments..........***Chauvinelia***

1b. Body without a cephalic hood; small number of notochaetae, normally 5 at most; neurochaetae terminally hooked; chaetae shorter than the body width; body wall opaque; clavate parapodial papillae abent..........**2**

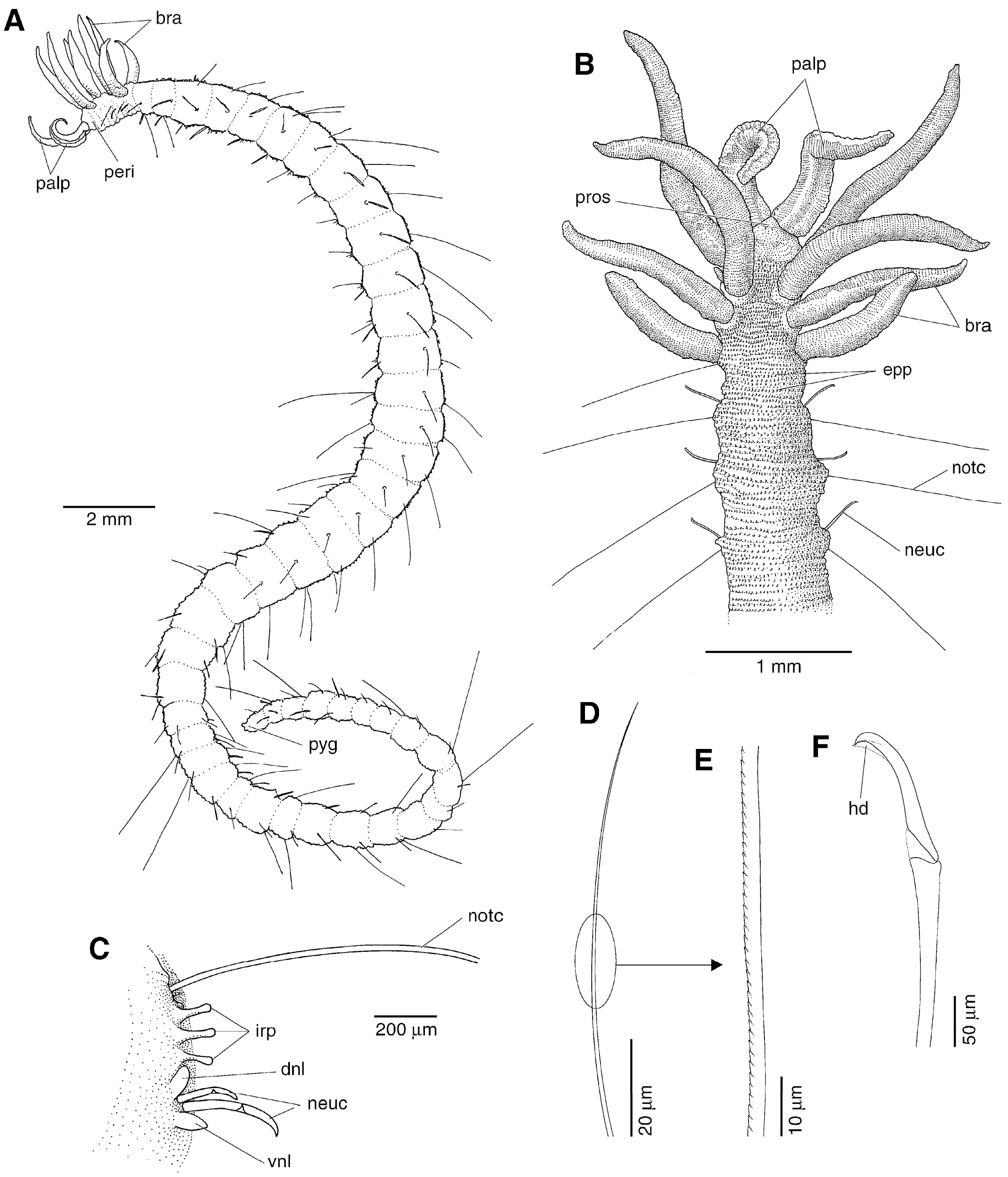

Figure legend: Family Acrocirridae. *Macrochaeta* specimen. **A**, entire animal, lateral view. **B**, anterior end, dorsal view. **C**, parapodium of chaetiger 30, antero-ventral view. **D**, capillary from parapodium of chaetiger 10. **E**, details of ornamentation of chaeta shown in **D**. **F**, compound falciger from parapodium of chaetiger 35. **bra**, branchiae; **dnl**, dorsal neuropodial lobe; **epp**, epidermal papillae; **hd**, hood; **irp**, inter-ramal papillae, **neuc**, neurochaeta; **notc**, notochaeta; **palp**, palps; **peri**, peristomium; **pros**, prostomium; **pyg**, pygidium; **vnl**, ventral neuropodial lobe. (Adapted from BEESLEY, ROSS & GLASBY, 2000; drawings by K. Nolan).

2a (1b). None to three pairs of branchiae (may be lost, very deciduous); palps short, globular; possibility of inverting the prostomium with the peristomium amongst the anterior segments..................***Flabelligella***
2b (1b). Palps long or short; 4-6 pairs of branchiae..**3**

3a (2b). Palps long, with bases separated by less than the palpal width; body with epithelium nearly smooth; thorax always with 12 segments; 4 pairs of branchiae; complete adult specimens usually greater than 25 mm long and 0.75 mm wide..***Acrocirrus***
3b (2b). Palps short, with bases separated by at least the palpal width; body with epithelium usually densely papillated; thorax with variable number of segments; 4 or 6 pairs of branchiae; complete adult specimens with less than 15 mm long and 0.75 mm wide...***Macrochaeta***

GENUS ***Acrocirrus*** Grube 1873

Acrocirrus GRUBE, 1873*b*: 60.
TYPE SPECIES: *Heterocirrus frontifilis* Grube 1860.

Acrocirrus frontifilis (Grube 1860)

Heterocirrus frontifilis GRUBE, 1860: 89, pl. 4 fig. 1.
TYPE LOCALITY: Near the town of Cres (= Cherso), Croatia, on stones, among *Melobesia*, at 4 meters.
SELECTED REFERENCES: *Heterocirrus frontifilis* — MARION & BOBRETZKY, 1875: 64-67, pl. 8 figs. 18, 18*B*-18*F*, pl. 9 fig. 18*A*. *Acrocirrus frontifilis* — FAUVEL, 1927*a*: 104, fig. 37*d-k*; BANSE, 1969: 2600-2602, figs. 1*a*, 2; SARDÁ, 1982: 27-30, fig. 2; WOLF, 1984: 13.3-13.5, figs. 13.1-13.2.
DISTRIBUTION: Mediterranean Sea; Adriatic Sea; Aegean Sea; Atlantic Ocean off Morocco; northern Arabian Sea; Gulf of Mexico. In sand, stones, rocks, or calcareous algae. Between 1-124 meters.

GENUS ***Chauvinelia*** Laubier 1974

Chauvinelia LAUBIER, 1974: 392.
TYPE SPECIES: *Chauvinelia biscayensis* Laubier 1974.
SYNONYMS: [?] *Swima* Osborn, Haddock, Pleijel, Madin & Rouse 2009.
REMARKS: The genus *Swima* was created by OSBORN *et al.* (2009) to include *Swima bombiviridis* Osborn, Haddock, Pleijel, Madin & Rouse 2009, a swimming Acrocirridae collected off Monterey Bay (California), between 2734-3497 meters. Six other undescribed swimming species were also originally attributed to the genus by OSBORN *et al.* (2009), having been collected between 1863-3744 meters from Monterey Canyon (NE Pacific), Juan de Fuca Ridge (NE Pacific), Astoria Canyon (NE Pacific), and Celebes Sea (Philippines). However, with the posterior restriction of the genus to species with a thick gelatinous sheath, transparent body, simple nuchal organs, a single medial subulate branchia, and four pairs of small segmental branchiae modified as elliptical, bioluminescent sacs (OSBORN & ROUSE, 2011), only two of the undescribed species remained in the genus, while the other four were determined to belong to three new different genera (OSBORN & ROUSE, 2011). Emphasis was given to the fact that *Swima* was a previously unknown monophyletic group of acrocirrids, with unique morphology (OSBORN *et al.*, 2009), but it was obviate that two previously known genera of acrocirrids were morphologically very close to the newly found forms, and that they could even be synonymous. In spite fo this, the similarity between *Swima* and these two genera, *Helmetophorus* Hartman 1978 and, especially, *Chauvinelia* Laubier 1974, both suspected to be pelagic, was analyzed in the supporting online material accompanying the paper by OSBORN *et al.* (2009).

LAUBIER (1974*a*) created the genus *Chauvinelia* to include *C. biscayensis*, a new species based on three specimens collected at the Bay of Biscay, at 4455 meters, with an epibenthic sledge. The genus was included in the family Flabelligeridae by LAUBIER (1974*a*), but with many reticences, as it lacked many of the typical characters of the family. Later on, AVERINCEV (1980) described a second species of *Chauvinelia*, namely *C. arctica*, with base on 17 specimens collected at the Canadian Plain (Polar Sea), at 3370 meters. AVERINCEV (1980) included the genus in the family Acrocirridae, in which was followed by KIRKEGAARD (1982), who reported another specimen of *C. arctica* from NE Greenland, collected with a beam-trawl between 2300-3370 meters. Furthermore KIRKEGAARD (1982) stated that species belonging to *Chauvinelia* seemed to be bathypelagic or epibenthic.

The genus *Helmetophorus* was erected by HARTMAN (1978) to include the new species *H. rankini*, collected at the Weddell Sea (Antarctica), at 3111 meters. *Helmetophorus* was placed into a new family, the Helmetophoridae, but it was also stated to resemble Hesionidae (HARTMAN, 1978). GLASBY & FAUCHALD (1991) revised the type material of *H. rankini*, plus one additional specimen collected near the type locality, and transferred the species to the family Flabelligeridae. Finally, SALAZAR-VALLEJO, GILLET & CARRERA-PARRA (2007) revised *H. rankini* once more, and attributed the species to the familly Acrocirridae, at the same time that considered the species as being probably pelagic. SALAZAR-VALLEJO, GILLET & CARRERA-PARRA (2007) also revised the two species belonging to the genus *Chauvinelia*, confirming them as acrocirrids, and considering them to be bathypelagic.

As stated above *Swima* was briefly compared with the two close genera *Helmetophorus* and *Chauvinelia* by OSBORN *et al.* (2009), in the supporting online material that accompanied the description of the genus. It was stated that the three genera shared the nature of their buccal organ and possibly the ability to swim, although this one was not confirmed in *Chauvinelia* and *Helmetophorus*. However, *Swima* would differ from *Chauvinelia* and *Helmetophorus* by lacking a retractable head, and *Swima* and *Chauvinelia* would further differ from *Helmetophorus* by possessing lollipop-shaped interramal papillae, much larger body size, and more than 30 chaetae per parapodium (OSBORN *et al.*, 2009). This way, the distinctive characters between *Swima* and *Chauvinelia* would be the unconfirmed ability to swim in *Chauvinelia* and the presence of a retractable head in the same. In the first case, the lack of knowledge about a certain character cannot be used as a distinctive character per si, while the presence of a retractable head in *Chauvinelia* could be the result of an artifact occurring during the process of collecting and fixation of the specimens. LAUBIER (1974*a*) stated that the dimensions of the specimens of *C. biscayensis* could vary according to the contraction of the worms, and even in the case of the specimens of *Swimia*, collected at near ideal conditions with a remote operated vehicle and relaxed prior to preservation, it was observed that contraction and shrinking occurred during preservation, giving the worms the appearance of having a slightly eversible head (OSBORN *et al.*, 2009). This way, it can be easily assumed that a strong contraction of the specimens could have occurred when they were collected with sledges or grabs and fixed directly in formaline without being previously relaxed, probably mixed with other biological material and sediment. However, a cephalic hood was described as being present in both genera by different authors (GLASBY & FAUCHALD, 1991; SALAZAR-VALLEJO, GILLET & CARRERA-PARRA, 2007).

No material of *Chauvinelia* and *Helmetophorus* was available for genetic analysis, and for this reason the distinction between these genera and *Swima* was justified by OSBORN *et al.* (2009) only with base on the differences referred above. In spite of the striking morphological similarities between the three genera, and in particular between *Chauvinelia* and *Swima* (compare description and figures 1 and 2 in LAUBIER, 1974*a* with description and figure S1 in OSBORN *et al.*, 2009) a detailed comparative morphological study based on type and other material deposited in natural history collections was not performed, and the pertinent published bibliography on the genera was not used to justify the distinctive aspects of the new genus.

The situation was amended in OSBORN & ROUSE (2011), with the phylogenetic analysis of the Acrocirridae and Flabelligeridae with base on both molecular (18S, 28S, 16S, COI and CytB) and morphological data. The occurrence of contraction artifacts was also analysed, and contraction of the body was found to occur to some degree in all specimens belonging to the seven recently discovered species, but also that even unanaesthetized specimens did not retract their heads to the point that they appeared to have a cephalic hood, as in *Chauvinelia* and *Helmetophorus*. All the newly found taxa, *Swima bombiviridis* and the six yet unnamed species were analysed, together with species in the genera *Chauvinelia* and *Helmetophorus* and a range of benthic representatives of cirratuliforms, including species belonging to the Flabelligeridae, Acrocirridae and Cirratulidae. The analyses performed included sequence and morphological data of most of the studied species, with the exception of four, for which sequence data could not be obtained, namely *Chauvinelia arctica*, *Helmetophorus rankini*, *Flabelliseta incrusta* Hartman 1978, and *Flabelligella* sp. As a result of the analysis, it was found that *Chauvinelia* and *Helmetophorus* were certainly related with the new groups of swimming acrocirrids, but in the absence of genetic data and a clear understanding of the nature and morphology of the anterior region in *Chauvinelia* and *Helmatophorus*, it was not possible to relate them with the new taxa, and the two were retained as separate genera.

The present case raises the question about if there is a breaking point between the traditional morphological taxonomy and the molecular taxonomy, and on what to do if such point in found. It seems obvious that the seven taxa of swimming acrocirrids analysed by OSBORN & ROUSE (2011) represent different species, and that presently it is not possible to determine if they are representatives of the previously described genera *Chauvinelia* and *Helmetophorus*, due to the lack of genetic and appropriate morphological material of these genera. A more conservative position could be adopted, waiting for the availability of suitable material of the older taxa in order to clarify the situation of the new taxa before naming them, or an alternative position can be taken, with the new taxa being analysed and named, assuming that a posterior synonymy with the older names is possible to occur whenever, and if, newly suitable material of the older taxa becomes available. In spite of the risk of increasing the taxonomical noise, in cases like the present one, the second alternative seems to be the best one, in spite of not being ideal.

For the moment, and as a consequence of the above explanations, *Swima* is here considered to be a possible junior synonym of *Chauvinelia*.

KEY TO SPECIES:
(adapted from SALAZAR-VALLEJO, GILLET & CARRERA-PARRA, 2007)

1a. Palps fusiform, or basally foliose; cephalic hood with ventral margin entire, smooth; two gonopodial lobes present in chaetigers 4-5, besides the parapodial clavate papillae..***C. arctica***
1b. Palps cirriform, or basally cylindrical; cephalic hood with a midventral rounded lobe; besides the clavate parapodial papillae, in chaetigers 4-5 no gonopodial lobes are present in holotype...***C. biscayensis***

Chauvinelia arctica Averincev 1980

Chauvinelia arctica AVERINCEV, 1980: 57-60, figs. 1-8.
TYPE LOCALITY: Canadian Basin, North of Canada (Polar Sea), at 3370 meters.
SELECTED REFERENCES: *Chauvinelia arctica* — KIRKEGAARD, 1982: 254-257, fig. 1; JIRKOV, 2001: 346-347, 1 figure; SALAZAR-VALLEJO, GILLET & CARRERA-PARRA, 2007: 469-471, fig. 2.
DISTRIBUTION: Polar Sea: Canadian Basin, at 3370 meters (AVERINCEV, 1980); Pole Abyssal Plain of the Eurasian Basin due NE Greenland, 83º40.08'N, 6º49.21'W, at 2300 meters (KIRKEGAARD, 1982).

Chauvinelia biscayensis Laubier 1974

Chauvinelia biscayensis LAUBIER, 1974*a*: 392-396, figs. 1-2.
TYPE LOCALITY: Bay of Biscay, 44º24'N, 4º49'W, at 4455 meters.
SELECTED REFERENCES: SALAZAR-VALLEJO, GILLET & CARRERA-PARRA, 2007: 471-473, fig. 3.
DISTRIBUTION: Known from the original record.

GENUS ***Flabelligella*** Hartman 1965

Flabelligella HARTMAN, 1965*b*: 176.
TYPE SPECIES: *Flabelligella papillata* Hartman 1965.
SYNONYMS: [?] *Flabelligena* Gillet 2001.
REMARKS: As stated above, and in order to avoid the possibility of creating a new combination in vain, the species *Flabelligena gascognensis* Aguirrezabalaga & Ceberio 2006 is here considered only under its original combination.

The key includes one species not known in European waters, *Flabelligella cirrata*, due to the fact that KOLMER (1985) described, but did not name, forms close to this stem species.

KEY TO SPECIES:
(adapted from KOLMER, 1985)

REMARKS: Due to the fact that the branchiae are easily lost, it is possible that the number of branchiae present in a specimen does not reflect the real number present in the species. It is possible that the described number of none, one or two pairs or branchiae for several species is in fact an artefact. Specimens should be carefully checked for the presence of scars in the places where branchiae could be attached.

1a. Species with branchiae; notochaetae with weak transversal rows of very small denticles, giving the appearence of being serrated or spinulose...**2**
1b. Species without branchiae (?); notochaetae with strong transversal rows of very small denticles, giving the appearence of being cross-barred...**6**

2a (1a). With one pair of branchiae (?)..**3**
2b (1a). With more than one pair of branchiae...**4**

3a (2a). With one or two chaetae per notopodium in the anterior region of the body; body inflated anteriorly.. ***F. cirrata***
3b (2a). With four or five chaetae per parapodium in the anterior region of the body; body cylindrical.. ***F.* cf. *cirrata***

4a (2b). With two pairs of branchiae (?)... **5**
4b (2b). With three pairs of branchiae; one pair of large ventral papillae (gonopodial lobes) between chaetigers 6-7.. ***Flabelligena gascognensis***

5a (4a). One pair of big ventral papillae (gonopodial lobes) between the fourth and the fifth chaetiger; epithelial papillae small and disperse.. ***F. mediterranea***
5b (4a). Large ventral papillae (gonopodial lobes) absent; epithelium densely covered with papillae.. ***F. biscayensis***

6a (1b). Appendage of neurochaetae with cutting edge denticulate... ***F. papillata***
6b (1b). Appendage of neurochaetae with cutting edge smooth... ***F.* cf. *papillata***

Flabelligella biscayensis Kolmer 1985

Flabelligella biscayensis KOLMER, 1985: 359-361, fig. 2.
TYPE LOCALITY: Bay of Biscay: 47º27'N, 8º22'W, at 2210 meters.
SELECTED REFERENCES: *Flabelligena biscayensis* — AGUIRREZABALAGA & CEBERIO, 2006: table 1.
DISTRIBUTION: Known from the type locality.

Flabelligella cirrata Hartman & Fauchald 1971

Flabelligella cirrata HARTMAN & FAUCHALD, 1971: 118-119, pl. 18 figs. *a-c*.
TYPE LOCALITY: West Atlantic, 39º56.6'N, 71º03.6'W, at 530 meters.
SELECTED REFERENCES: *Flabelligena cirrata* — GILLET, 2001: table 2; AGUIRREZABALAGA & CEBERIO, 2006: table 1.
DISTRIBUTION: West Atlantic, off U.S.A., at 466-530 meters.

Flabelligella* cf. *cirrata Hartman 1971

Flabelligella cf. *cirrata* — KOLMER, 1985: 359-361, fig. 3.
DISTRIBUTION: Bay of Biscay: 47º34.1'N, 9º38.4'E, at 4144 meters.

Flabelligella mediterranea Kolmer 1985

Flabelligella mediterranea KOLMER, 1985: 357-359, fig. 1.
TYPE LOCALITY: Eastern Mediterranean Sea: 35º49.8'N, 22º20.7'E, at 4690 meters.
SELECTED REFERENCES: *Flabelligena mediterranea* — AGUIRREZABALAGA & CEBERIO, 2006: table 1.
DISTRIBUTION: Known from the type locality.

Flabelligella papillata Hartman 1965

Flabelligella papillata HARTMAN, 1965*b*: 177, pl. 3.
TYPE LOCALITY: Off Bermuda, 32º11'24"N, 64º41'36"W, in 2000 meters.
SELECTED REFERENCES: *Flabelligella papillata* — DETINOVA, 1985*a*: 121.
DISTRIBUTION: Off Bermuda, at 2000 meters; West Atlantic off U.S.A., 1135-3806 meters; off Pernambuco (Brazil), 770-805 meters, and 3730-3783 meters; off Iceland, 1535-2951 meters.

Flabelligella* cf. *papillata Hartman 1965

Flabelligella cf. *papillata* — KOLMER, 1985: 361, fig. 4.
DISTRIBUTION: Bay of Biscay: 47º26.8'N, 9º7.2'E, at 3742 meters.

Flabelligena gascognensis Aguirrezabalaga & Ceberio 2006

Flabelligena gascognensis AGUIRREZABALAGA & CEBERIO, 2006: 142-144, figs. 1-6, table 1.
TYPE LOCALITY: Capbreton Canyon (Bay of Biscay, Atlantic Ocean), 43º50.09'N, 2º03.23'W to 43º49.14'N, 2º02.64'W, between 572-545 meters, in soft bottom.

DISTRIBUTION: Capbreton Canyon (Bay of Biscay, Atlantic Ocean). In soft bottoms. Between 545-1113 meters.

GENUS *Macrochaeta* Grube 1851

Macrochaeta GRUBE, 1850: 312.
TYPE SPECIES: *Nais? clavicornis* Sars 1835.
SYNONYMS: *Ledon* Webster & Benedict 1887.

KEY TO SPECIES:

1a. More than 2 neuropodial hooks per ramus, at least in the anterior region of the body..........................**2**
1b. One or two neuropodial hooks per ramus; four pairs of gills..**3**

2a (1a). Neuropodia with 5-10 neuropodial hooks per ramus along the whole body; two pairs of gills; epithelium with relatively big papillae scattered..***M. polyonyx***
2b (1a). Neuropodia with 3 neuropodial hooks per ramus on chaetigers 1-5, in chaetigers 6-10 the compound neurochaetae is replaced by two capillary neurochaetae, and chaetigers 11-22 with one single neuropodial hook; at least one pair of branchiae; epithelium nearly smooth.....................***Macrochaeta* sp.**

3a (1b). Eyes present; peristomium visible dorsally; all neurochaetae compound................***M. clavicornis***
3b (1b). Eyes absent; peristomium not visible dorsally; Some neurochaetae pseudocompound or simple..**4**

4a (3b). All neurochaetae compound; epithelium nearly smooth..***M. bansei***
4b (3b). Some neurochaetae simple or pseudocompound; epithelium covered with scattered papillae ....***M. helgolandica***

Macrochaeta bansei Hartmann-Schröder 1974

Macrochaeta bansei HARTMANN-SCHRÖDER, 1974*d*: 237-239, figs. 47-50.
TYPE LOCALITY: Northern North Sea (59º05'N, 2º21'W), at 76 meters, in middle to coarse sand with mud.
SYNONYMS: *Macrochaeta caroli* Westheide 1981.
SELECTED REFERENCES: *Macrochaeta bansei* — HARTMANN-SCHRÖDER, 1996: 411. *Macrochaeta caroli* — WESTHEIDE, 1981: 16. Not *Macrochata* [sic] sp. — HARTMANN-SCHRÖDER, 1974*a*: 182-183. Not *Macrochaeta bansei* — HARTMANN-SCHRÖDER, 1974*b*: 67-69, figs. 64-71 [HOMONYM = *Macrochaeta natalensis* Hartmann-Schröder 1996].
DISTRIBUTION: Northern North Sea, at 76 meters.
REMARKS: *Macrochaeta bansei* from the North Sea was an older homonym of *Macrochaeta bansei* described from Natal (South Africa) by the same author in the same year (HARTMANN-SCHRÖDER, 1974*b*), but which description was published three months later. For this reason, the same author introduced later a *nomen novum* for the South African species, namely *Macrochaeta natalensis* Hartmann-Schröder 1996 (HARTMANN-SCHRÖDER, 1996: 411).

Macrochaeta clavicornis (M. Sars 1835)

Nais? clavicornis SARS, 1835: 64-65, pl. 9 fig. 24.
TYPE LOCALITY: Near the city of Florö (Norway), at approximately 61º40'N, 5º00'E, in a muddy bottom.
SELECTED REFERENCES: *Macrochaeta clavicornis* — CAULLERY & MESNIL, 1898: 130-131, pl. 2 figs. 20-21; FAUVEL, 1927*a*: 104-105, fig. 37*a-c*; BANSE, 1969: 2610-2613, figs. 1*f*, 6; HARTMANN-SCHRÖDER, 1996: 411-412; KIRKEGAARD, 1996: 166-167, fig. 84.
DISTRIBUTION: Northeastern Atlantic: Kattegat; Skagerrak; Norwegian coast; North Sea; British Isles; English Channel; Western Mediterranean Sea; Adriatic Sea; Aegean Sea; [?] Madeira. In calcareous algae, laminarian holfasts, muddy bottoms and coarse sand. From shallow water to 30 meters.
REMARKS: According to BANSE (1969), the record of *Macrochaeta clavicornis* from Madeira (LANGERHANS, 1880*b*: 95, pl. 4 fig. 7) requires further investigation, as it presents a very large first

segment and the swimming chaetae occur from the eighth chaetiger (CAULLERY & MESNIL, 1898), while in north European specimens they occur from the seventh chaetiger.

Macrochaeta helgolandica Friedrich 1937

Macrochaeta helgolandica FRIEDRICH, 1937: 347-349, figs. 7-8.

TYPE LOCALITY: Near Helgoland Island (Germany), approximately at 54º15.3'N, 7º55.9'E, at 19-21 meters, in coarse sand.

SELECTED REFERENCES: *Macrochaeta helgolandica* — BANSE, 1969: 2615-2617, fig. 8*a-c*; HARTMANN-SCHRÖDER, 1971*a*: 364, fig. 128*a-c*; HARTMANN-SCHRÖDER, 1996: 412-413, fig. 199; KIRKEGAARD, 1996: 167-168, fig. 85.

DISTRIBUTION: Southern North Sea (Helgoland); Skagerrak. In coarse sand. Between 19-25 meters.

REMARKS: HARTMANN-SCHRÖDER (1996: fig. 199) redraws the original figure by FRIEDRICH (1937: fig. 7), introducing erroneously three pairs of eyes, similar to the ones present in *Macrochaeta clavicornis*. No eyes are known to occur in *M. helgolandica* (FRIEDRICH, 1937; HARTMANN-SCHRÖDER, 1996).

Macrochaeta polyonyx Eliason 1962

Macrochaeta polyonyx ELIASON, 1962*b*: 269-271, fig. 18.

TYPE LOCALITY: Skagerrak, at 58º30'N, 10º26'E, at 300 meters, in grey mud.

SELECTED REFERENCES: *Macrochaeta polyonyx* — BANSE, 1969: 2616-2617; HARTMANN-SCHRÖDER, 1996: 413; KIRKEGAARD, 1996: 169, fig. 86.

DISTRIBUTION: Skagerrak, Northern North Sea (Norway). In muddy bottoms. Between 235-478 meters.

***Macrochaeta* sp.**

Macrochaeta sp. — NÚÑEZ, OCAÑA & BRITO, 1997: 255-256, fig. 3.

DISTRIBUTION: Natural lagoon of Jameos del Agua, Lanzarote (Canary Islands), at 3 meters, in black coarse sand.

REMARKS: The only specimen found was in good condition but incomplete, reason why it was identified by NÚÑEZ, OCAÑA & BRITO (1997) only to the generic level. The descripion states that the specimen had 25 segments, and that segments 2 and 3 are achaetous. What is then stated as being the chaetigers 4-8 are in reallity the segments 4-8, which correspond to chaetigers 1-5. The rest of the description makes again reference only to the segment number. In the above key, the distribution and arrangement of the different neurochaetae along the body are referred to the number of the chaetiger, not segment, as it is generally easier to identify the chaetigers when observing specimens of *Macrochaeta*.

*FAMILY **AMPHARETIDAE** Malmgren 1866

AS: *AMPHARETEA* MALMGREN, 1866: 361-362.

REMARKS: The family Ampharetidae includes at present about 76 genera, with more than 210 described species considered to be valid (HUTCHINGS *et al.*, 2000). The taxonomy of the group is based largely on external characters and, as pointed by REUSCHER, FIEGE & WEHE (2009), the diagnoses of genera often show only a few differences. This means that whenever a new single character or combination of characters is observed, it results more often in the description of a new genus than of a new species in an already recognised genus. This way, more than a half of the described genera are monospecific. Internal characters have been seldom used, due to the limited number of available specimens for many species, and to the difficulties in sectioning the specimens (REUSCHER, FIEGE & WEHE, 2009). Studies on internal anatomy of polychaetes, common at the end of the 19th and beginning of the 20th centuries, became more and more rare, with a few exceptions. This way, nowadays the internal anatomy is completely unknown for a large number of species, which makes very difficult to use it for phylogenetic purposes (REUSCHER, FIEGE & WEHE, 2009).

Following the studies by JIRKOV (2001), the number of genera will be greatly reduced, as many of these genera are to be considered under a wider definition. At least part of the changes proposed by Jirkov are consequence of the reevaluation of some of the taxonomic characters normally used to define genera in ampharetids. As a result of the redefiniton of genera, many characters considered to be generic will have a specific value, reducing this way the great number of monospecific genera. After his revision of the Arctic ampharetids, JIRKOV (2001) proposed a reduction from 66 to 23 genera. Note, however, that this revison only included genera occurring in Arctic waters, and some genera both from shallow and deep waters (as *Amphisamytha* Hessle 1917, *Egamella* Fauchald 1972, *Uschakovius* Laubier 1973, *Noanelia* Desbruyères & Laubier 1977, *Hobsonia* Banse 1979, *Decemunciger* Zottoli 1982, *Endecamera* Zotolli 1982, *Ymerana* Holthe 1986, *Grassleia* Solís-Weiss 1993, or *Amathys* Desbruyères & Laubier 1996), many of which also monospecific, were not included; otherwise, the reduction of the valid genera would have been probably bigger.

Some of the relevant taxonomic characters in Ampharetidae are discussed in JIRKOV (2008), and include 1) the shape of the prostomium, 2) the nephridial papillae in the anterior region of body, 3) the presence of a circular band in the anterior thorax, 4) the types of modification of notopodia and notopodial chaetae, 5) the number of uncinigers with modified notopodia, 6) the type of neuropodia, 7) the shape of buccal tentacles, 8) the presence or absence of paleae (notopodial chaetae on segment II) and its significance, 9) the number of thoracic uncinigers, 10) the number of pairs of branchiae, 11) the type of branchiostyles, and 12) the number of abdominal uncinigers. Previously JIRKOV (1994*a*) had already showed that in some cases the character presence *versus* absence of paleae (notopodial chaetae in segment II) is not good enough in order to separate some genera, at least within the Ampharetini, Amphicteini and Amagini (all tribe designations *sensu* HOLTHE, 1986*a*).

The main generic and specific external characters for distinction of taxa in Ampharetidae are also discussed by REUSCHER, FIEGE & WEHE (2009), as well as the main problems concerning each one of them, and the terminology normally used by the different authors. Thus, characters normally used for the distinction of genera include 1) prostomial glandular ridges (presence/absence), 2) buccal tentacles (smooth/papillose), 3) number and shape of branchiae, 4) notochaetae of segment II, sometimes referred to as paleae (presence/absence), 5) number of thoracic chaetigers and thoracic uncinigers, 6) modification of certain segments, 7) rudimentary notopodia in abdomen (presence/absence), and other special characters present, like jaw-like structures. In the specific case of the jaw-like structures, it is difficult to know its real taxonomic value, as most of the known species have not been dissected to reveal its presence or absence (REUSCHER, FIEGE & WEHE, 2009). Finally, characters commonly used to distinguish between species include 1) shape of the prostomium, 2) shape of uncini, 3) arrangement of branchiae, and 4) number of abdominal segments.

The new synonymies proposed by JIRKOV (2001) affect many genera and species occurring in the European waters, creating many new combinations, different from the ones that are normally used. Unfortunately Jirkov's publication of 2001 is in Russian, and it wasn't possible to obtain a complete translation of Jirkov's arguments or conclusions for the synonymies. For this motive, and mainly for practical reasons, it was decided to follow the denomination of the species as used by HOLTHE (1986*a*, 1986*b*). Jirkov's conclusions will not be followed here, and the synonymies and new combinations proposed by JIRKOV (2001) will not be applied in the following keys, but this does not mean that his conclusions are not accepted or are not considered as valid. The new synonymies and new combinations will be pointed under the *REMARKS* section of each of the affected genera. An exception to this are the conclusions published in JIRKOV (2008), and affecting the genera *Anobothrus* and *Melythasides*.

The number of important taxonomic publications in Terebellidae is big, and the biggest part of them, especially the most relevant for the study of the European Fauna, are cited below. However, it is worth to highlight the very recent and abovementioned paper by Reuscher, Fiege & Wehe (2009), which includes an updated key and synoptic table of characters for all the genera of Ampharetidae, as well as keys and synoptic tables for some of these genera, and an additional synoptic table of diagnostic characters of all genera with dorsal thoracic modifications.

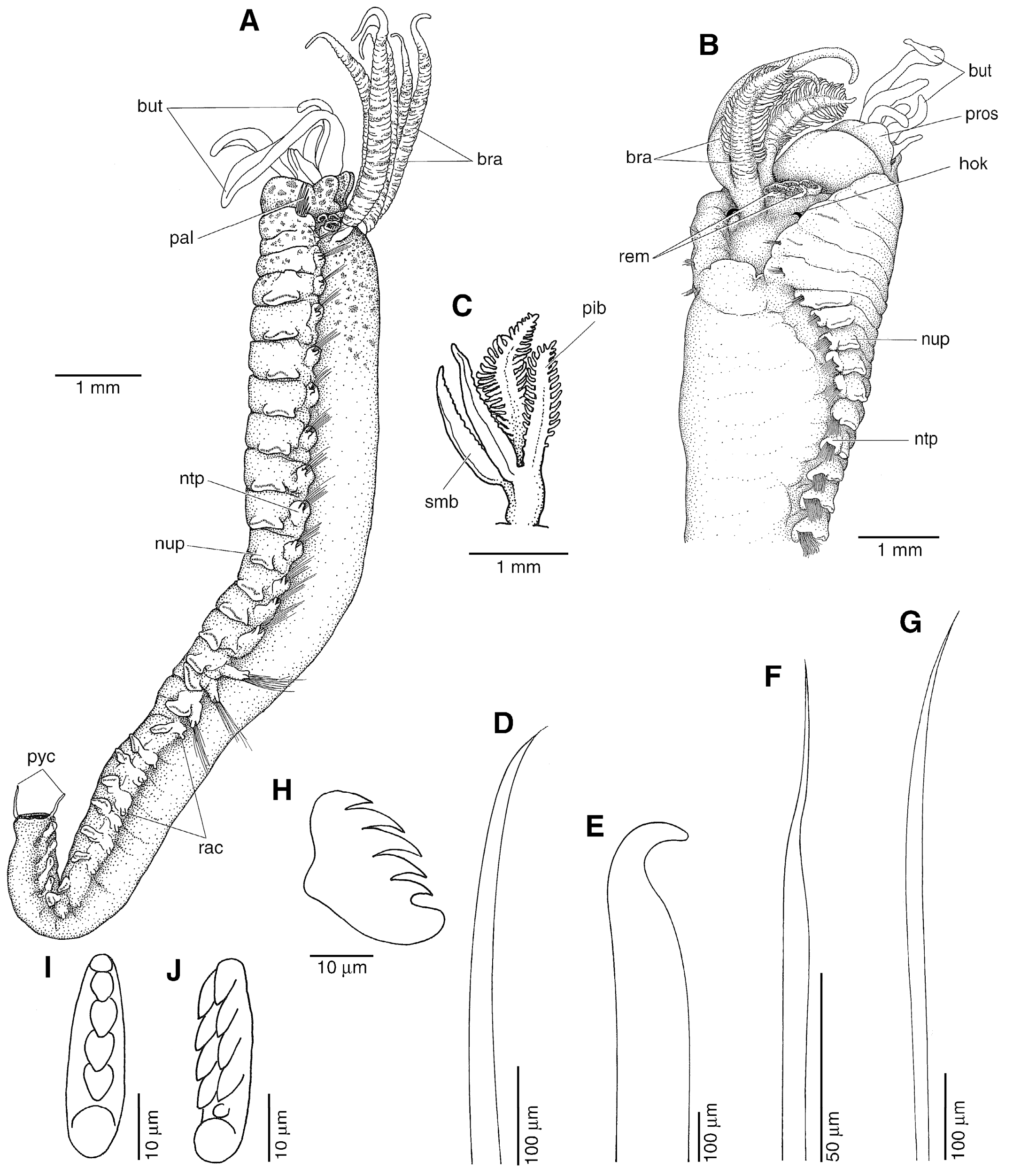

Figure legend: Family Ampharetidae. **A**, *Amphicteis* specimen, entire animal, lateral view. **B**, **C**, *Isolda*, specimen: **B**, anterior end, dorso-lateral view, right branchiae removed; **C**, branchia. **D**-**J**, chaetae: **D**, palea; **E**, hook from segment 4; **F**, acicular neurochaeta from chaetiger 1; **G**, capillary notochaeta; **H**, **I**, neurochaetal uncinus from chaetiger 15, lateral (**H**) and frontal (**I**) views; **J**, neurochaetal uncinus, almost frontal view. **D**, **G**, **H**, **I**, *Amphicteis* specimen; **E**, **F**, *Isolda* specimen; **J**, *Auchenoplax* specimen. **bra**, branchiae; **but**, buccal tentacles, retractile; **hok**, hook; **ntp**, notopodium; **nup**, neuropodium; **pal**, paleae; **pib**, pinnate branchia; **pros**, prostomium; **pyc**, pygidial cirri; **rac**, rudimentary abdominal notopodial cirrus; **rem**, basal stumps of detached branchiae; **smb**, smooth branchiae. (Adapted from Beesley, Ross & Glasby, 2000; drawings by A. Murray).

In the European and nearby waters, 29 genera including 54 species have been so far described or recorded. The family was represented in the studied material by 7 genera, each one of them with a single species.

In the following keys it is used mainly the number of "thoracic uncinigers" as a character (as used by DAY, 1964 and FAUCHALD, 1977*a*), instead of "thoracic chaetigers with dorsal bristles" (as used by HOLTHE, 1986*b*), as in some cases "dorsal bristles", especially the ones from segment II (also called paleae), can be overlooked due to its the small size or for being broken, inducing to an erroneous counting.

KEY TO SUBFAMILIES AND GENERA:

(adapted from: FAUCHALD, 1977*a*; HOLTHE, 1986*b*; REUSCHER, FIEGE & WEHE, 2009)

REMARKS: The expressions "segment" and "chaetiger" are sometimes confused; in order to avoid this, and as pointed by REUSCHER, FIEGE & WEHE (2009), Roman numerals are used for segments, and Arabic numerals for chaetigers. In Ampharetidae the thoracic uncinigers always start in segment VI. Chaetae on segment II (also designated as paleae) can be present or not, and sometimes, even when present, they can be difficult to see, or can be broken. For these reasons, and whenever possible, the counting of segments and/or chaetigers in Ampharetidae should always take the first unciniger (segment VI) as a reference. It is considered here that there is only one achaetous segment present behind the peristomium, following THORSON (1946), CAZAUX (1982), and REUSCHER, FIEGE & WEHE (2009). This way, the first segment bearing notochaetae is segment II, as stated above, and not segment III, as stated by other authors.

The family Ampharetidae Malmgren 1866, is normally divided in three subfamilies: Ampharetinae Chamberlin 1919, Melinninae Chamberlin 1919, and Uschakovinae Holthe 1986. These subfamilies are referred in the following key, but are not considered afterwards.

1a. Thoracic region with 4 chaetigers; thoracic uncini absent..**Subfamily USCHAKOVINAE**...***Uschakovius***
1b. Thoracic region with more than 4 chaetigers; thoracic uncini present..**2**

2a (1b). 3–4 anterior segments with fine acicular neurochaetae; chaetae on segment II (paleae) absent; post-branchial notopodial hooks may be present......................................**Subfamily MELINNINAE**...........**3**
2b (1b). Acicular neurochaetae absent; notochaetae on segment II (paleae) present or absent; post-branchial notopodial hooks absent...**Subfamily AMPHARETINAE**............**5**

3a (2a). Postbranchial notopodial hooks present; buccal tentacles of one type...**4**
3b (2a). No postbranchial notopodial hooks; buccal tentacles of two types.............................***Melinnopsis***

4a (3a). All branchiae smooth..***Melinna****
4b (3a). Some branchiae smooth, some pennate...***Isolda***

5a (2b). Two pairs of branchiae; 12 thoracic uncinigers..**6**
5b (2b). At least three pairs of branchiae...**7**

6a (5a). First pair of rows of thoracic uncini long, about 2 times longer than remaining ones, approaching ventrally; prostomium anteriorly pointed; notopodia of the 9th thoracic unciniger not displaced dorsally neither joined by a transverse ridge; 12 thoracic uncinigers..***Auchenoplax****
6b (5a). First pair of rows of thoracic uncini not prolonged nor approaching ventrally; prostomium anteriorly truncate; notopodia of the 9th thoracic unciniger (or second last pair of notopodia) displaced dorsally and joined by a transverse glandular ridge; 10 thoracic uncinigers................................***Zatsepinia***

7a (5b). Three pairs of branchiae...**8**
7b (5b). Four pairs of branchiae...**19**

8a (7a). Chaetae on segment II (paleae) present..**9**
8b (7a). Chaetae on segment II (paleae) absent...**11**

9a (8a). Nine thoracic uncinigers; last thoracic segment with elevated notopodia and modified notochaetae..***Mugga***
9b (8a). 11-12 thoracic uncinigers..**10**

10a (9b). Eleven thoracic uncinigers; few thick buccal tentacles present...............................***Amythasides***
10b (9b). Twelve thoracic uncinigers; buccal tentacles numerous...***Eclysippe****

11a (8b). Ten thoracic uncinigers; buccal tentacles papillose; buccal teeth present...................***Adercodon***
11b (8b). At least eleven thoracic uncinigers...**12**

12a (11b). Eleven thoracic uncinigers..**13**
12b (11b). At least twelve thoracic uncinigers..**15**

13a (12a). Last pair of thoracic notopodia achaetous and transformed into a flattened fan with dorsolateral wings and a ridge across dorsum..***Ymerana***
13b (12a). Last pair of thoracic parapodia chaetigerous, not transformed into a flattened fan with dorsolateral wings...**14**

14a (13b). Abdomen short (8-15 segments), with rudimentary notopodia; prostomial glandular ridges (or nuchal organs referred to as glandular ridges) present..***Amage gallasi***
14b (13b). Abdomen long (about 25 segments), without rudimentary notopodia; prostomial glandular ridges (or nuchal organ referred to as glandular ridges) absent.......................................***Glyphanostomum***

15a (12b). Twelve thoracic uncinigers...**16**
15b (12b). At least thirteen thoracic uncinigers...**18**

16a (15a). Fifth last thoracic unciniger with elevated notopodia connected by a dorsal glandular ridge...***Anobothrus laubieri***
16b (15a). Fifth last thoracic unciniger without elevated notopodia...**17**

17a (16b). Buccal tentacles smooth...***Samythella***
17b (16b). Buccal tentacles papillose..***Neosabellides***

18a (15b). Thirteen thoracic uncinigers...***Alkmaria***
18b (15b). Fourteen thoracic uncinigers...***Samytha***

19a (7b). Chaetae on segment II (paleae) absent..**20**
19b (7b). Chaetae on segment II (paleae) present...**22**

20a (19a). Eleven thoracic uncinigers; posterior thoracic notopodia not modified...................................**21**
20b (19a). Twelve thoracic uncinigers; 15 thoracic chaetigers; third last thoracic notopodia modified, elevated; prostomial glandular ridges (or nuchal organs referred to as glandular ridges) absent..***Sosanopsis***

21a (20a). Prostomial glandular ridges (or nuchal organs referred to as glandular ridges) present; 14-17 thoracic chaetigers; abdominal rudimentary notopodia present...***Amage* [in part]**
21b (20a). Prostomial glandular ridges (or nuchal organs referred to as glandular ridges) absent; 13 thoracic chaetigers; abdominal rudimentary notopodia absent....................................***Sabellides* [in part]***

22a (19b). Eleven thoracic uncinigers...**23**
22b (19b). At least twelve thoracic uncinigers (can be eleven in *Anobothrus bimaculatus* Fauchald 1972, and *A. mancus* Fauchald 1972; however both species were described from off western Mexico, and are not known to occur in the European and nearby waters)...**24**

23a (22a). Abdominal rudimentary notopodia absent; 14 thoracic chaetigers; buccal tentacles papillose..***Sabellides****
23b (22a). Abdominal rudimentary notopodia present; 15 thoracic chaetigers; buccal tentacles smooth..***Amagopsis***

24a (22b). Twelve thoracic uncinigers present..**25**
24b (22b). At least thirteen thoracic uncinigers present...**28**

25a (24a). Posterior thorax with modified segment (elevated notopodia, which may be connected by a dorsal glandular ridge, and with modified capillary chaetae)..**26**
25b (24a). Posterior thorax without modified segment..**27**

26a (25a). 4th, 5th, or 6th last thoracic unciniger with elevated or modified capillary chaetae; abdominal rudimentary notopodia absent..***Anobothrus****
26b (25a). 3rd last thoracic unciniger with elevated notopodia; abdominal rudimentary notopodia present...***Sosane****

27a (25b). Buccal tentacles papillose; 14 or 15 thoracic chaetigers; branchiae of similar sizes..***Ampharete***
27b (25b). Buccal tentacles smooth; 16 thoracic chaetigers; branchiae of different sizes..............***Noanelia***

28a (24b). Thirteen thoracic uncinigers...**29**
28b (24b). Fourteen thoracic uncinigers...**30**

29a (28a). Prostomial glandular ridges (or nuchal organs referred to as glandular ridges) present...***Hypania***
29b (28a). Prostomial glandular ridges (or nuchal organs referred to as glandular ridges) absent....***Lysippe***

30a (28b). Prostomial glandular ridges (or nuchal organs referred to as glandular ridges) present; anal cirri present...***Amphicteis****
30b (28b). Prostomial glandular ridges (or nuchal organs referred to as glandular ridges) absent; anal cirri present or absent..**31**

31a (30b). 3 pairs of branchiae in a transverse row, 4th pair behind outermost pair of the transverse row; anal cirri present; marine...***Lysippides***
31b (30b). Branchiae arranged as 2+1+1; anal cirri absent; in fresh and brackish water............***Hypaniola***

GENUS ***Adercodon*** Mackie 1994

Adercodon MACKIE, 1994: 244.
TYPE SPECIES: *Adercodon pleijeli* Mackie 1994.
REMARKS: JIRKOV (2001) proposed the synonymy of *Adercodon* Mackie 1994 with *Gnathampharete* Desbruyères 1978.

Adercodon pleijeli Mackie 1994

Adercodon pleijeli MACKIE, 1994: 244-248, figs. 1-2.
TYPE LOCALITY: Banyuls-sur-Mer (France), 42º29.55'N, 3º09.90'E, 45 meters, in mud with detritus.
DISTRIBUTION: Western Mediterranean Sea: Banyuls-sur-Mer (France); Eastern Sicily (Italy). In muddy sediments, with or without terrestrial/seagrasses detritus. Between 32-95 meters.

GENUS ***Alkmaria*** Horst 1919

Alkmaria HORST, 1919*b*: 100-101.
TYPE SPECIES: *Alkmaria romijni* Horst 1919.
REMARKS: JIRKOV (2001) proposed the synonymy of *Alkmaria* Horst 1919 with *Hypania* Ostroumov 1897.

Alkmaria romijni Horst 1919

Alkmaria romijni HORST, 1919*b*: 100-101, 1 figure.

TYPE LOCALITY: Alkmaarder Meer, Holland.

SYNONYMS: *Microsamytha ryckiana* Augener 1928.

SELECTED REFERENCES: *Alkmaria Romijni* — FAUVEL, 1927*a*: 240, fig. 82*g-h*. *Alkmaria romijni* — ANNENKOVA, 1930: 32, fig. 8; FRIEDRICH, 1939*b*: 369, fig. 8; AMOUREUX & ELKAÏM, 1972: 75-81, figs. 1-2; CAZAUX, 1982: 145-155, figs. 1-7; HOLTHE, 1986*b*: 73-74, fig. 30, map 29; JUNOY, 1987: 89-90, fig. 3; HARTMANN-SCHRÖDER, 1996: 488-490, fig. 237; KIRKEGAARD, 1996: 291-292, fig. 161. *Microsamytha ryckiana* — AUGENER, 1928*b*: 102-104, fig. 1.

REFERENCES FOR PORTUGAL: DEXTER, 1992 (previous records: Ria Formosa); [?] CANCELA DA FONSECA *et al.*, 2006 (as *Alkmaria* cf. *romijni*; Aljezur; Odeceixe).

DISTRIBUTION: From Holland to Denmark; Sweden; Norway; Baltic Sea; Arcachon (France); Galicia (Spain); Morocco; Mediterranean coast of France, in coastal lagoon (personal observation). On brackish waters, eulittoral to a depth of a few meters. On silty bottoms.

GENUS *Amage* Malmgren 1866

Amage MALMGREN, 1866: 370-371.

TYPE SPECIES: *Amage auricula* Malmgren 1866.

SYNONYMS: *Grubianella* McIntosh 1885.

REMARKS: JIRKOV (2001) removed *Grubianella* McIntosh 1885 from the synonymy with *Amage* Malmgren 1866, and considered *Amagopsis* Pergament & Chlebovitch *in* Chlebovitch 1964 as being a junior synonym of *Grubianella*. On the other side, he placed the following genera under synonymy with *Amage*: *Paramage* Caullery 1944; *Phyllampharete* Hartman & Fauchald 1971, *Mexamage* Fauchald 1972.

KEY TO SPECIES:

(adapted from HOLTHE, 1986*b*)

1a. Dorsal bristles on 17 segments; three or four pairs of branchiae...***A. adspersa***
1b. Dorsal bristles on 14 segments...**2**

2a (1b). Three pairs of branchiae; nine uncinigerous abdominal segments..................................***A. gallasii***
2b (1b). Four pairs of branchiae..**3**

3a (2b). Eight uncinigerous abdominal segments...***A. auricula***
3b (2b). Nine uncinigerous abdominal segments...***A. scotica***

Amage adspersa (Grube 1863)

Sabellides adspersa GRUBE, 1863: 57-58, pl. 6 fig. 2.

TYPE LOCALITY: Mali Lošinj (= Lussin Piccolo), in the Losinj (= Lussin) Island, Croatia, Adriatic Sea.

SELECTED REFERENCES: *Amage adspersa* — LANGERHANS, 1884: 261, pl. 15 fig. 19; GOURRET, 1901: 380-382, pl. 8 fig. 3; HESSLE, 1917: 121-122; FAUVEL, 1927*a*: 234-236, fig. 82*a-f*. *Samytha adspersa* — LO BIANCO, 1893: 64, pl. 3 fig. 3; FAUVEL, 1897: 431-438, pl. 25 figs. 162-165; FAUVEL, 1914*f*: 285-286, pl. 26 figs. 11-15.

REFERENCES FOR PORTUGAL: MONTEIRO-MARQUES, 1979 (southern continental shelf of Algarve); MONTEIRO-MARQUES, 1987 (continental shelf of Algarve); DEXTER, 1992 (previous records: Ria de Alvor; continental shelf of Algarve; Arrábida; Mondego Estuary); PARDAL, MARQUES & BELLAN, 1993 (Mondego Estuary); MOREIRA, FIGUEIRA & CUNHA, 1994 (Ria de Aveiro); PARDAL, MARQUES & BELLAN, 1994 (Mondego Estuary).

DISTRIBUTION: Mediterranean Sea: off Monaco (69 meters), Marseille, Naples; Adriatic Sea; Aegean Sea; Madeira Island ("*größerer Tiefe*"); Atlantic Morocco (100-118 meters). On muddy, sandy, and detritic bottoms.

Amage auricula Malmgren 1866

Amage auricula MALMGREN, 1866: 371, pl. 25 fig. 72.

TYPE LOCALITY: Koster Island, Bohuslän (Sweden), between 100-120 fathoms (183-220 meters), in mud.

SYNONYMS: [?] *Sabellides brevicaudata* M. Sars 1866.

SELECTED REFERENCES: *Amage auricula* — WOLLEBÆK, 1912: 65, pl. 13 figs. 1-6; HESSLE, 1917: 120-121; MCINTOSH, 1922*b*: 80-82, pl. 118 fig. 10, pl. 124 figs. 8-8*b*, pl. 125 fig. 9; HOLTHE, 1986*b*: 75-76, fig. 31, map 30; HARTMANN-SCHRÖDER, 1996: 490; KIRKEGAARD, 1996: 292-293, fig. 162. [?] *Sabellides brevicaudata* — M. SARS, 1867: 291.

DISTRIBUTION: Arctic Ocean; Eastern North Atlantic, from East Greenland to the Mediterranean Sea; Skagerrak; Kattegat; Canadian Arctic; Atlantic coast of USA; Japan; East India. On muddy or mixed bottoms. Between 10-1000 meters.

Amage gallasii Marion 1876

Amage Gallasii MARION, 1876: 308-309.

TYPE LOCALITY: Off Bidon, Gulf of Marseille (Mediterranean Sea), on mud.

SELECTED REFERENCES: *Amage Gallasii* — GOURRET, 1901: 382-384, pl. 9 fig. 4; FAUVEL, 1927*a*: 236, fig. 82*i-m*; FAUVEL, 1936*c*: 92. *Amage gallasii* — HESSLE, 1917: 122.

DISTRIBUTION: Western Mediterranean Sea; Morocco (280 meters); Aegean Sea. In muddy and sandy bottoms.

Amage scotica Clark 1952

Amage scotica CLARK, 1952: 19-21, fig. 4.

TYPE LOCALITY: Clyde Sea area, Scottish west coast, at Loch Fyne, Sgat Island Deep, at 230 meters, in floccular mud, and at Arran Deep, at 169 meters, in floccular mud.

DISTRIBUTION: Scottish west coast. In floccular mud. Between 168-230 meters.

GENUS ***Amagopsis*** Pergament & Khlebovich *in* Khlebovich 1964

Amagopsis PERGAMENT & KHLEBOVICH *in* KHLEBOVICH, 1964: 176.

TYPE SPECIES: *Amagopsis klugei* Pergament & Chlebovitch *in* Chlebovitch 1964.

REMARKS: As noted above, JIRKOV (2001) considered *Amagopsis* Pergament & Chlebovitch *in* Chlebovitch 1964 as being a junior synonym of *Grubianella* McIntosh 1885.

Amagopsis klugei Pergament & Khlebovich *in* Khlebovich, 1964

Amagopsis klugei PERGAMENT & KHLEBOVICH *in* KHLEBOVICH, 1964: 176-177, fig. 1.

TYPE LOCALITY: Arctic Ocean, north of Franz Josef's Land and Spitsbergen.

SELECTED REFERENCES: *Amagopsis klugei* — HOLTHE, 1986*b*: 77-78, fig. 32, map 31.

DISTRIBUTION: Southeast Iceland; Norwegian Basin; Arctic deep sea. Between 600-1445 meters. In muddy bottoms.

GENUS ***Ampharete*** Malmgren 1866

Ampharete MALMGREN, 1866: 362-363.

TYPE SPECIES: *Amphicteis acutifrons* Grube 1860.

SYNONYMS: *Branchiosabella* Claparède 1863; *Asabellides* Annenkova 1929.

REMARKS: JIRKOV (1994*a*; 2001) considered the following genera as being junior synonyms of *Ampharete* Malmgren 1866: *Sabellides* Milne-Edwards *in* Lamarck 1838; *Pterampharete* Augener 1918; *Asabellides* Annenkova 1929.

KEY TO SPECIES:
(from HOLTHE, 1986*b*)

1a. 12 (11) uncinigerous abdominal segments..**2**
1b. 13 (12-14) uncinigerous abdominal segments..***A. finmarchica***
1c. 17 uncinigerous abdominal segments..***A. goesi***
1d. 26 uncinigerous abdominal segments..***A. vega***

2a (1a). Anal segment with two long cirri and a number of long cirriform papillae……...........................**3**
2b (1a). Anal segment with two long cirri and a number of small round papillae......................................**4**

3a (2a). Last 14 uncinigers (last 2 thoracic and 12 abdominal) with a long cirrus over each neuropodium...***A. acutifrons***
3b (2a). Last 14 uncinigerous without cirri..***A. baltica***

4a (2b). Paleae much shorter than distance between the two groups of branchiae; geniculate bristles present..***A. falcata***
4b (2b). Paleae much longer than distance between the two groups of branchiae; no geniculate bristles...***A. lindstroemi***

Ampharete acutifrons (Grube 1860)

Amphicteis acutifrons GRUBE, 1860: 109-110, pl. 5 fig. 6.

TYPE LOCALITY: Greenland.

SYNONYMS: *Branchiosabella zostericola* Claparède 1863; *Ampharete Grubei* Malmgren 1866; *Amphicteis intermedia* Marion 1876; *Ampharete cirrata* Webster & Benedict 1887; *Ampharete trilobata* Webster & Benedict 1887.

SELECTED REFERENCES: *Ampharete acutifrons* — HESSLE, 1917: 96-97; MCINTOSH, 1922*b*: 66-69, text-figs. 143-145, pl. 112 fig. 3, pl. 118 fig. 12 [reference to pl. 116 fig. 8 is incorrect], pl. 124 figs. 4-4*c″*; ANNENKOVA, 1929*b*: 491-492, pl. 38 fig. 38; WESENBERG-LUND, 1950*a*: 47, chart 55; PETTIBONE, 1954: 316-317, fig. 36*b-d*; USCHAKOV, 1955*a*: 366, fig. 136*A-D*; DAY, 1967: 699-700, fig. 35.4.*a-f*; HARTMAN, 1969: 537-538, 4 figs.; BANSE, 1979*a*: 1544-1545, fig. 1*b*; HOLTHE, 1986*b*: 33-34, fig. 8, map 7; HARTMANN-SCHRÖDER, 1996: 491, fig. 238; KIRKEGAARD, 1996: 294-296, fig. 163. *Branchiosabella zostericola* — CLAPARÈDE, 1863: 35-36, pl. 14 figs. 32-37. *Ampharete Grubei* — MALMGREN, 1866: 363-364, pl. 19 fig. 44; FAUVEL, 1897: 289-410, pls. 15-24, pl. 25 fig. 169; WOLLEBÆK, 1912; 50-51, pl. 10 fig. 6; FAUVEL, 1927*a*: 227-228, fig. 79; MARQUES, 1947: 55, fig. B*4-7*. *Amphicteis intermedia* — MARION, 1876: 307-308. *Ampharete intermedia* — GOURRET, 1901: 384-387, pl. 9 figs. 5-6. *Ampharete cirrata* — WEBSTER & BENEDICT, 1887: 747, pl. 8 figs. 110-112. *Ampharete trilobata* — WEBSTER & BENEDICT, 1887: 747-748. *Ampharete gracilis* [not Malmgren 1866] — FAUVEL, 1909: 22-23.

REFERENCES FOR PORTUGAL: MARQUES, 1947 (as *Ampharete Grubei*; Cova-do-Vapor); BELLAN, 1960*a* (as *Ampharete grubei*; NW Cape Sardão; Setúbal Canyon; Cape Roca; off Cascais); AMOUREUX, 1974*b* (as *Ampharete grubei*; off Aveiro; off Porto); MONTEIRO-MARQUES, 1987 (as *Ampharete grubei*; continental shelf of Algarve); DEXTER, 1992 (previous records; Ria Formosa; continental shelf of Algarve; Sado Estuary; Arrábida); RAVARA, 1997 (off Aveiro).

DISTRIBUTION: Eastern North Atlantic: Iceland (5-158 meters), Jan Mayen (162 meters), Spitsbergen (20-110 meters), Faeroes, British Isles (3-28 meters), Norway, North Sea, Irish Sea, Skagerrak, Kattegat, Øresund, western Baltic Sea (18-167 meters); France: Normandy (19 meters), Gulf of Gascony (166 meters); Madeira Island; Portugal (4-6 meters); [?] Mediterranean Sea (including Adriatic and Aegean seas); Atlantic Morocco (36-265 meters); Labrador (13 meters) to Maine (10-20 meters); Greenland (17-25; 418 meters); Novaya Zemlya (7-50 meters); Kara Sea (45 meters); White Sea (65 meters); Siberian and Alaskan Arctic (6-82 meters); Arctic Ocean (650-1000 meters); Bering Sea; Sea of Okhotsk; Sea of Japan; North American Pacific: British Columbia (85 meters), Washington (12-196 meters), Oregon, Southern California (1254-1281 meters); South Africa. On stones and soft bottoms, ranging from silt to coarse sand. Lower eulittoral to 2290 meters.

REMARKS: This species was normally indicated as the only one of the genus *Ampharete* occurring in the Mediterranean Sea. However, and with base on personal observations from the Western Mediterranean, it seems to be absent in the region, being confused with at least two or three other species not yet identified with certainty, but close to (or that should be identified as) *Ampharete lindstroemi* or *A. finmarchica*, and *A. falcata*.

Ampharete baltica Eliason 1955

Ampharete grubei var. *baltica* ELIASON, 1955: 6-7.

TYPE LOCALITY: Baltic Sea, between Bornholm and Blekinge (Sweden), 48-77 meters, on mud pure or mixed with sand.

SELECTED REFERENCES: *Ampharete baltica* — FOURNIER & POCKLINGTON, 1984: 264; HOLTHE, 1986*b*: 34-35, fig. 9, map 8; HARTMANN-SCHRÖDER, 1996: 492, fig. 239; KIRKEGAARD, 1996: 296-297, fig. 164.

DISTRIBUTION: Arctic; Ireland; northern North Sea; Norway; Skagerrak; Kattegat; Øresund; Western Baltic Sea; Nova Scotia; Tunisia. On silt and mixed bottoms. Between 5-77 meters.

Ampharete falcata Eliason 1955

Ampharete falcata ELIASON, 1955: 3-6, fig. 1.

TYPE LOCALITY: East Spättebåde, Bohuslän (Swedish west coast), 20-30 fathoms (36.6-54.9 meters).

SELECTED REFERENCES: *Ampharete falcata* — HOLTHE, 1986*b*: 35-37, fig. 10, map 9; HARTMANN-SCHRÖDER, 1996: 492-493; KIRKEGAARD, 1996: 297, fig. 165.

REFERENCES FOR PORTUGAL: AMOUREUX, 1987 (off Porto).

DISTRIBUTION: Swedish west coast; Kattegat; Skagerrak; Norwegian coast; Ireland; Bretagne. On mixed bottoms. Between 30-90 meters.

Ampharete finmarchica (M. Sars 1865)

Amphicteis finmarchica SARS, 1865: 6.

TYPE LOCALITY: Ramfjorden, Tromsø (Norway).

SYNONYMS: *Ampharete arctica* Malmgren 1866; *Ampharete brevibranchiata* Treadwell 1926.

SELECTED REFERENCES: *Ampharete finmarchica* — WOLLEBÆK, 1912: 48-49, pl. 6 figs. 1-10; WESENBERG-LUND, 1950*a*: 47, chart 55; HOLTHE, 1986*b*: 38-39, fig. 11, map 10; PARAPAR, BESTEIRO & URGORRI, 1993*a*: 368-370, fig. 1; HARTMANN-SCHRÖDER, 1996: 493-494, fig. 240; KIRKEGAARD, 1996: 297-300, fig. 166. *Ampharete arctica* — MALMGREN, 1866: 364-365, pl. 26 fig. 77; LEVINSEN, 1886: 12, pl. 25 fig. 6; FAUVEL, 1914*f*: 283-285, pl. 26 figs. 1-10; HESSLE, 1917: 97-98, text-fig. 9; ANNENKOVA, 1929*b*: 490-491, pl. 38 fig. 36; OKUDA, 1936*b*: 153-155, text-figs. 6-7; BERKELEY & BERKELEY, 1952: 65-66, figs. 133-135; USCHAKOV, 1955*a*: 369, fig. 136*H*. *Ampharete brevibranchiata* — TREADWELL, 1926: 6-7, figs. 11-14.

DISTRIBUTION: Arctic Ocean; Greenland; Spitsbergen (36.6-430 meters); Jan Mayen; Kara Sea (37-110 meters); North Sea; Norwegian coast; Skagerrak; Øresund; Swedish west coast; Galicia (Spain); Quebec; Bering Sea; North American Pacific, from Canada to California; Sea of Okhotsk; Sea of Japan. On silt and mixed bottoms, seldom in pure sand. Between 1.5-5000 meters.

Ampharete goesi Malmgren 1866

Ampharete Goësi MALMGREN, 1866: 364, pl. 19 fig. 45.

TYPE LOCALITY: Spitsbergen, at Treurenbergbay, Wydebay, Danesgat, Haklyts Headland, Safehavn, Bellsund and Whalerspoint, between 20-50 fathoms (36.6-91.4 meters), on muddy bottoms.

SYNONYMS: *Ampharete goësi* subsp. *bražnikovi* Annenkova 1929.

SELECTED REFERENCES: *Ampharete Goësi* — WOLLEBÆK, 1912: 51. *Ampharete goësi* — HESSLE, 1917: 97; ANNENKOVA, 1929*b*: 492, pl. 38 fig. 37; WESENBERG-LUND, 1950*a*: 47, chart 55; BERKELEY & BERKELEY, 1952: 66, fig. 136; USCHAKOV, 1955*a*: 369, fig. 137*F*. *Ampharete goesi* — HOLTHE, 1986*b*: 40-41, fig. 12, map 11; HARTMANN-SCHRÖDER, 1996: 494. *Ampharete goësi* subsp. *bražnikovi* — ANNENKOVA, 1929*b*: 492-493, pl. 38 fig. 44; USCHAKOV, 1955*a*: 369, fig. 137*G*. *Ampharete goësi brazhnikovi* — BANSE, 1979*a*: 1545, fig. 1*c-e*.

DISTRIBUTION: East Greenland; Spitsbergen (33-84 meters); Iceland (19-28 meters); Faroes (1282 meters); Skagerrak; Baltic Sea (13-33 meters); Barents Sea; White Sea; Siberian, Canadian and Alaskan Arctic (34-206 meters); Bering Sea; North American Pacific Coast, from British Columbia (15 meters) to California; Sea of Okhotsk (18-26 meters); Japan Sea. On muddy bottoms and bottoms of rocks, stones and gravel. Between 13-1282 meters.

Ampharete lindstroemi Hessle 1917

Ampharete lindströmi HESSLE, 1917: 98-99, text-fig. 10, pl.1 fig. 5.

TYPE LOCALITY: Skårberget, Sweden.

SELECTED REFERENCES: *Ampharete lindströmi* — MALMGREN, 1867*a*: 105 [as a *nomen nudum*]. *Ampharete lindströmi* — ANNENKOVA, 1929*b*: 492, pl. 38 figs. 39-40; USCHAKOV, 1955*a*: 366, fig. 137*A-B*; FOURNIER & POCKLINGTON, 1984: 264-265; HOLTHE, 1986*b*: 41-42, fig. 13, map 12; HARTMANN-SCHRÖDER, 1996: 494; KIRKEGAARD, 1996: 301, fig. 167. [?] *Ampharete gracilis* [not Malmgren 1866] — LO BIANCO, 1893: 62-63.

REFERENCES FOR PORTUGAL: RAVARA, 1997 (off Aveiro).

DISTRIBUTION: Gulf of St. Lawrence; Nova Scotia; White Sea; Japan Sea; west coast of Scandinavia; northern North Sea; Øresund; Portugal; Mediterranean Sea. On muddy bottoms. Between 8-400 meters.

REMARKS: MALMGREN (1867*a*: 105) created the new name *Ampharete Lindströmi* for a species found at Bohuslän, without giving any further details or illustrations, besides: "Hab. *ad Bahusiam rarior (S. Lovén & Ipse)*". For this reason this name is normally considered as a *nomen nudum*. The species was fully described and illustrated later, by HESSLE (1917), and with base on specimens collected at Skårberget, in the Swedish west coast. For this reason, the authorship of the species is here considered as being Hessle 1917, instead of Malmgren 1867 *sensu* Hessle 1917.

Ampharete vega (Wirén 1883)

Amphicteis Vegæ WIRÉN, 1883: 415-417, pl. 32 figs. 3-4.
TYPE LOCALITY: Bering Sea.
SELECTED REFERENCES: *Ampharete Vega* — WOLLEBÆK, 1912: 51. *Ampharete vega* — HESSLE, 1917: 99-100; ANNENKOVA, 1929*b*: 493; PETTIBONE, 1954: 315-316, fig. 36*a*; HOLTHE, 1986*b*: 43, fig. 14, map 13.
DISTRIBUTION: Arctic Sea: Alaska (2 meters) and Siberia; Barents Sea; Bering Sea; Chuckchee Sea (10-15 meters); Laptev Sea; Kara Sea; Spitsbergen. On muddy bottoms. Between 2-18 meters.

*GENUS ***Amphicteis*** Grube 1850

Amphicteis GRUBE, 1850: 330.
TYPE SPECIES: *Amphitrite Gunneri* Sars 1835.
SYNONYMS: *Crossostoma* Gosse 1855.
REMARKS: JIRKOV (2001) considered the following genera as being junior synonyms of *Amphicteis* Grube 1850: *Phyllamphicteis* Augener 1918; *Paramphicteis* Caullery 1944; *Pseudoamphicteis* Hutchings 1977.

KEY TO SPECIES:

1a. 19 uncinigerous abdominal segments..***A. sundevalli***
1b. 15 uncinigerous abdominal segments..**2**

2a (1b). 10-23 paleae in each fascicle, gradually tapering; small area between branchial groups; raised flap uniting inner pair of posterior branchiae present...***A. gunneri****
2b (1b). 5-10 paleae in each fascicle, abruptly tapering; large area between branchial groups; no raised flap uniting inner pair of posterior branchiae...***A. midas***

****Amphicteis gunneri*** (M. Sars 1835)

Amphitrite Gunneri M. SARS, 1835: 50-51, pl. 11 fig. 30a-d.
TYPE LOCALITY: Glesvær (60º12'N, 05º02'W) and Florø (61º36'N, 05º04'W), western Norway.
SYNONYMS: *Amphicteis groenlandica* Grube 1860.
SELECTED REFERENCES: *Amphicteis Gunneri* [in part; in part = *A. midas* (Gosse 1855)] — MALMGREN, 1866: 365-366, pl. 19 fig. 46; FAUVEL, 1897: 411-430 [in part; in part = *Amphicteis midas* (Gosse 1855)], pl. 25 figs. 150-157, 159, 161 [not 158, 160 = *Amphicteis midas* (Gosse 1855)]; FAUVEL, 1914*f*: 281-282, pl. 26 fig. 26; MCINTOSH, 1922*c*: 70-74, pl. 118 fig. 7, pl. 124 figs. 5-5*b'*; FAUVEL, 1927*a*: 231, fig. 80*a-k*. *Amphicteis Gunneri* — WOLLEBÆK, 1912: 55-57, pl. 8 fgs. 1-11. *Amphicteis gunneri* — HESSLE, 1917: 116, text-fig. 21*a*, pl. 1 fig. 9; ANNENKOVA, 1929*b*: 497; WESENBERG-LUND, 1950*a*: 47-48, chart 56; DESBRUYÈRES, 1977: 137-140, figs. 1*A*, *F-G* [in part, specimens from Norway and from deeper water off Bretagne; in part = *A. midas* (Gosse 1855)]; HARTLEY, 1985: 311-313, figs. 3-4, table 2; HOLTHE, 1986*b*: 56-57, fig. 21, map 20 [in part; type material; in part = *A. midas* (Gosse 1855)]; HARTMANN-SCHRÖDER, 1996: 495; KIRKEGAARD, 1996: 301-302 [in part; in part = *A. midas* (Gosse 1855)]. *Amphicteis groenlandica* — GRUBE, 1860: 106-107, pl. 5 fig. 3.
REFERENCES FOR PORTUGAL: BELLAN, 1960*a* (Setúbal Canyon); AMOUREUX, 1974*b* (off Aveiro; off Porto); AMOUREUX, 1987 (off Aveiro); MONTEIRO-MARQUES, 1987 (continental shelf of Algarve); DEXTER, 1992 (previous records: Ria Formosa; continental shelf of Algarve; Sado Estuary; Mondego Estuary); RAVARA, 1997 (off Aveiro); present work (southwestern continental shelf).
MATERIAL: SEPLAT 7 (2nd part) — St. 25 (A.4085), north Sines, 134 m, sand: 1 incomplete specimen; branchiae missing; small area between branchial groups; there is a raised flap uniting the inner

pair of posterior branchae. **St. 266 (A.3865)**, off Cape Sardão, 175 m, sand: 2 specimens, one similar to the specimen described above; branchiae missing; one anal cirrus still attached; about 10 paleae per bundle; second specimen smaller and incomplete. **FAUNA 1 — St. 3*A***, Gulf of Cádiz, off Cádiz, 114-116 m, detritic: 1 specimen, complete and in good condition; 20 mm long, 3 mm wide; buccal tentacles smooth; 4 pairs of branchiae; segment III with paleae; segments IV-VI with dorsal bristles only; 14 uncinigerous thoracic segments; 17 thoracic chaetigers; notopodial cirri present; 15 uncinigerous abdominal segments; distal region of paleae gradually tapering; about 10 paleae in each bundle; area between branchial groups small; raised flap uniting inner pair of posterior branchiae; tube made of mucus with attached silt and some shell fragments; pygidium with two long lateral cirri.

DISTRIBUTION: West coast of Norway; [?] Spitsbergen (1865 meters); [?] East Orkney Islands (88 meters); central and northern North Sea (69-143 meters); English Channel (50-60 meters); Skagerrak; off Galicia (363 meters); Portugal; Gulf of Cádiz; Mediterranean Sea; [?] Adriatic Sea; [?] Black Sea. In sandy and muddy bottoms. All the other records need to be checked, as previous findings of this species could refer to specimens of *Amphicteis midas* or to undescribed species (HARTLEY, 1985).

Amphicteis midas (Gosse 1855)

Crossostoma Midas GOSSE, 1855*b*: 310-312, pl. 8 figs. 7-12.

TYPE LOCALITY: Ilfracombe (Devon, England), under a stone, at low water.

SYNONYMS: *Amphicteis curvipalea* Claparède 1870; [?] *Amphicteis ninonae* Jirkov 1985.

SELECTED REFERENCES: *Amphicteis midas* — HARTLEY, 1985: 309-311, figs. 1-2, table 1; HARTMANN-SCHRÖDER, 1996: 495-496, fig. 241. *Amphicteis curvipalea* — CLAPARÈDE, 1870: 496-498, pl. 13 fig. 5; LO BIANCO, 1893: 63; SAINT-JOSEPH, 1894: 163-165, figs. 204-206. [?] *Amphicteis ninonae* — JIRKOV, 1985: 1894-1897, 1 fig; JIRKOV, 2001: 472-473, 1 fig. *Amphicteis Gunneri* [not M. Sars 1835] — FAUVEL, 1897: 411-430 [in part; in part = *Amphicteis gunneri* (M. Sars 1835)], pl. 25 figs. 150-158, 160 [not 159, 161 = *Amphicteis gunneri* (M. Sars 1835)]; RIOJA, 1931: 266-268, pls. 86-87. *Amphicteis gunneri* [not M. Sars 1835] — HARTMANN-SCHRÖDER, 1971*a*: only fig. 159*f-i*; DESBRUYÈRES, 1977: 137-140, figs. 1*B-D*, *J*, 2*A-B* [in part, specimens from Bay of Naples, Tatihou (English Channel) and shallower water off Bretagne; in part = *A. gunneri* (M. Sars 1835)].

DISTRIBUTION: British Isles; North Sea; English Channel; Galicia, NW Spain; west coast of Sweden; Skagerrak; Kattegat; Mediterranean Sea; Adriatic Sea; Aegean Sea. On muddy bottoms. From intertidal to 27 meters.

REMARKS: JIRKOV (1985) described *Amphicteis ninonae* with base on specimens from the "Northern Waters", collected between 62º11.5'N and 80º40'N, around the Arctic Ocean, and at depths ranging between 49 and 1010 meters. These specimens were previously mixed with *Amphicteis gunneri* (M. Sars 1835), and *Amphicteis mederi* Annenkova 1929. The species was described as new because it "*differs by the obtuse tips of the paleae from all other species of the genus which have 17 thoracic setigers and 15 abdominal uncinigers*" (JIRKOV, 1985: 1897; English corrected by me). However, in the same year HARTLEY (1985) published his work with the resurrection of *Crossostoma midas* Gosse 1855, as *Amphicteis*, a species that had been considered as a synonym of *A. gunneri*. The diagnostic characters of *A. midas* fit the ones given for *A. ninoae*, reason why I believe that they could be synonymous. The main differences between both species seem to be the ventral pigmentation of the thorax, and the bathymetric distribution.

Amphicteis sundevalli Malmgren 1866

Amphicteis Sundevalli MALMGREN, 1866: 366-367, pl. 25 fig. 73.

TYPE LOCALITY: Eastern Spitsbergen, at Whalers Point and Edlunds Berg, at 15-30 fathoms (27.4-55 meters), in mud.

SELECTED REFERENCES: *Amphicteis sundevalli* — HESSLE, 1917: 118; ANNENKOVA, 1929*b*: 498; WESENBERG-LUND, 1950*a*: 48, chart 55, pl. 9 fig. 42; HOLTHE, 1986*b*: 58, fig. 22, map 21; HARTMANN-SCHRÖDER, 1996: 496.

DISTRIBUTION: East Greenland; Svalbard (Spitsbergen); North Sea; Chuckchee Sea. On sand, mud and mixed bottoms. Between 9-64 meters.

GENUS ***Amythasides*** Eliason 1955

Amythasides ELIASON, 1955: 14.

TYPE SPECIES: *Amythasides macroglossus* Eliason 1955.

Amythasides macroglossus Eliason 1955

Amythasides macroglossus ELIASON 1955: 14-17, fig. 4.

TYPE LOCALITY: Swedish west coast: Kosterfjorden, at 36 meters, on gravel and stones, and at 40 meters, on mud with *Zostera* debris and stones, and Singlefjord, at 75 meters, on stones with some mud.

SELECTED REFERENCES: *Amythasides macroglossus* — HOLTHE, 1986*b*: 62-63, fig. 24, map 23; HARTMANN-SCHRÖDER, 1996: 496-497; KIRKEGAARD, 1996: 302-304, fig. 169.

DISTRIBUTION: Swedish west coast; Skagerrak; North Sea. On mixed bottoms (clay and stones). Between 36-75 meters.

*GENUS ***Anobothrus*** Levinsen 1884

Anobothrus LEVINSEN, 1884: 158.

TYPE SPECIES: *Ampharete gracilis* Malmgren 1866.

SYNONYMS: *Sosanides* Hartmann-Schröder 1965; *Anobothrella* Hartman 1967; *Melythasides* Desbruyères 1976.

REMARKS: HOLTHE (1986*a*) changed the rank of this genus and, together with *Melinnata* Hartman 1965, and *Eusamythella* Hartman 1971, considered them as subgenera of *Melinnampharete* Annenkova 1937. JIRKOV (2001, 2008), on the other hand, emended the genus definition, and considered *Melythasides* as a junior synonym of *Anobothrus* Levinsen 1884, together with *Sosanides* Hartmann-Schröder 1965, and *Anobothrella* Hartman 1967, while *Melinnampharete* was considered to include *Neosamytha* Hartman 1967, and *Eusamythella* Hartman 1971.

KEY TO SPECIES:

(adapted from JIRKOV, 2008)

1a. Circular band (maybe of glandular origin) anterior to notopodia of second thoracic uncini; 3 pairs of branchiae...***A. laubieri***
1b. Circular band (maybe of glandular origin) anterior to notopodia of third thoracic uncini; 4 pairs of branchiae..**2**

2a (1b). Branchiophores of posterior pair of branchiae at least two times thinner and shorter than the rest; branchiostyles of posterior pair of branchiae at least 10 times shorter than the rest..................***A. patersoni***
2b (1b). Branchiophores of posterior pair of branchiae of same length as the rest; branchiostyles of posterior pair of branchiae no more than 2-3 times shorter than the rest...................................***A. gracilis****

****Anobothrus gracilis*** (Malmgren 1866)

Ampharete gracilis MALMGREN, 1866: 365, pl. 26 fig. 75.

TYPE LOCALITY: Bohuslän, Sweden, at 130 fathoms (217.3 meters), on mud.

SYNONYMS: *Sosane sulcata* var. *nidrosiensis* Bidenkap 1907; *Ampharete arctica* var. *gagarae* Uschakov 1950.

SELECTED REFERENCES: *Anobothrus gracilis* — LEVINSEN, 1886: 12, pl. 25 fig. 5; HESSLE, 1917: 106-107, text-fig. 12; FAUVEL, 1927*a*: 229-230, fig. 80*l-p*; ANNENKOVA, 1929*b*: 496 [in part]; HOLTHE, 1986*b*: 50-51, fig. 18, map 17; WILLIAMS, 1987: 251, fig. 1*A*, table 1; HARTMANN-SCHRÖDER, 1996: 497-498, fig. 242; KIRKEGAARD, 1996: 304-306, fig. 170; JIRKOV, 2008: 122-124, figs. 7-8. *Ampharete gracilis* — WOLLEBÆK, 1912: 50, text-fig. 7. *Sosane gracilis* — HARTMANN-SCHRÖDER, 1971*a*: 463-464, figs. 160, 161*a*; JIRKOV, 1989: 114, figs. 22.1-22.2. *Sosane sulcata* var. *nidrosiensis* — BIDENKAP, 1907: 33-34, pl. 3 fig. 21. *Ampharete arctica* var. *gagarae* — USCHAKOV, 1950: 218, pl. 2, 7, fig. 32; USCHAKOV, 1955*a*: 369, fig. 136*I-K*. *Ampharete finmarchica* [not Sars 1864] — HARTMANN-SCHRÖDER & STRIPP, 1968: 19-22, fig. 8*c-k*. Not *Anobothrus gracilis* — USCHAKOV, 1955*a*: 372, fig. 138*E-H*.

REFERENCES FOR PORTUGAL: RAVARA, 1997 (off Aveiro); GIL & SARDÁ, 1999 (southwestern continental shelf); present work (southwestern continental shelf).

MATERIAL: SEPLAT 7 (1st part) — St. 201 (A.3113), off Vila Nova de Milfontes, 240 m, sand: 1 incomplete specimen, with only 3 abdominal chaetigers present; 16 thoracic notopodial chaetigers, with a reduced number of notochaetae on chaetiger 2; notopodia of chaetiger 11 with modified chaetae and displaced dorsally; 12 thoracic uncinigers, starting at chaetiger 5; prostomium clearly trilobed. **SEPLAT**

7 (2nd part) — St. 25 (A.4085), north Sines, 134 m, sand: 1 small and complete specimen. **St. 86 (A.4021)**, near Sines, 275 m, sand: 3 specimens, in poor condition. **St. 283 (A.3851)**, off Arrifana, 245 m, muddy sand: 1 incomplete specimen, with only two abdominal chaetigers present; only one branchiae still attached; chaetiger 2 reduced, with few chaetae.

DISTRIBUTION: The species has been recorded from many locations and depths, but according to JIRKOV (2008) some of these records refer to different species. The locations from where the species has been recorded are the following ones: Arctic Ocean; Iceland (1535-2951 meters); Kara Sea (37-45 meters); Jan Mayen; Barents Sea; Norwegian coast (13-17 meters; 160 meters); North Sea (33-51 meters); Skagerrak; Kattegat; Swedish west coast (217 meters); Øresund; Baltic Sea; Mediterranean Sea; Adriatic Sea; Aegean Sea; Eastern North Atlantic; West Greenland; Western North Atlantic: off New England (300 meters), off Bermuda (1700-2000 meters); Bering Island; Northeastern Pacific Ocean: Canada, Washington (9-210 meters), Southern California (53-762 meters); Sea of Japan (44-2900 meters); Yellow Sea. Mainly on mixed, muddy and sandy bottoms. According to JIRKOV (2008) the species is widely distributed in the Arctic and the North Pacific, usually at shelf and slope depths; in the Arctic it is usually found at shallower depths than in the North Pacific, at it is replaced at deeper sites by *Anobothrus mironovi* Jirkov 2008 in the North Pacific, and by *A. laubieri* (Desbruyères 1978) in the Arctic; between 9-1960 meters.

Anobothrus laubieri (Desbruyères 1978)

Melythasides laubieri DESBRUYÈRES, 1978: 232-235, figs. 1-2.

TYPE LOCALITY: Spitsbergen Basin, 76º54.1'N, 01º49.8'E, at 3193 meters

SELECTED REFERENCES: *Melythasides laubieri* — HOLTHE, 1986*b*: 78-81, fig. 33, map 32. *Melinnampharete (Melythasides) laubieri* — HOLTHE, 1986*a*: 98. *Anobothrus laubieri* — JIRKOV, 2001: 476-477, figures in page 477; JIRKOV, 2008: 124-125, fig. 9.

DISTRIBUTION: Arctic Ocean, from Iceland and the Norwegian Sea, to Chuckchee Sea. Between 155-3965 meters.

Anobothrus patersoni Jirkov 2008

Anobothrus patersoni JIRKOV, 2008: 128-129, figs. 14-15.

TYPE LOCALITY: Off Japan, 37º51'N, 144º13'E, between 5290-5390 meters.

DISTRIBUTION: North Pacific and North Atlantic. Abyssal depths, between 3260-8292 meters.

*GENUS *Auchenoplax* Ehlers 1887

Auchenoplax EHLERS, 1887: 208.

TYPE SPECIES: *Auchenoplax crinita* Ehlers 1887.

**Auchenoplax crinita* Ehlers 1887

Auchenoplax crinita EHLERS, 1887: 209-214, pl. 44 figs. 10-16.

TYPE LOCALITY: Southern Florida: 28º42'N, 88º40'W, 321 fathoms (536.6 meters); 24º8'N, 82º51'W, 339 fathoms (566.7 meters).

SELECTED REFERENCES: *Auchenoplax crinita* — HESSLE, 1917: 127-128; FAUVEL, 1936*c*: 95-96; KIRKEGAARD, 1959: 80; HARTMAN, 1965*b*: 216-217, pl. 47; LAUBIER, 1966*e*: 438-439, fig. 1; GALLARDO, 1968: 126; AMOUREUX, 1987: 575.

REFERENCES FOR PORTUGAL: AMOUREUX, 1987 (off Aveiro; off Porto); GIL & SARDÁ, 1999 (southwestern continental shelf); present work (southwestern continental shelf).

MATERIAL: SEPLAT 6 — St. 206 (A.2674), off Arrifana, 155 m, sand: 2 specimens, with tube; two of the branchiae of one specimen are still inside the tube. **St. 237 (A.2705)**, off Praia da Amoreira, 148 m, sand: 3 specimens. **St. 238 (A.2706)**, off Praia da Amoreira, 157 m, sand: 1 incomplete specimen, in good condition. **St. 270 (A.2734)**, off Praia da Amoreira, 145 m, sand: 1 specimen. **St. 312 (A.2771)**, off Praia de Odeceixe, 310 m, muddy sand: 2 incomplete specimens, with branchiae missing; prostomium pointed; two pairs branchiae, in two separated groups, on a transverse fold (scars visible); buccal papillae smooth; 14 thoracic chaetigers; uncini from the third chaetiger, and onwards; first two pairs of ventral parapodia with uncini approaching closely ventrally; first one is longer, and the second almost unites ventrally; without paleae; first 12 chaetigers with a thin brown stripe, as described in FAUVEL (1936). **St. 316 (A.2773)**, off Praia de Odeceixe, 225 m, sandy mud: 1 specimen, in good condition; pygidium seems to have no anal cirri. **St. 317 (A.2774)**, off Praia de Odeceixe, 200 m, muddy sand: 1 specimen in very good condition, with tube; all branchiae present. **St. 336 (A.2790)**, off Praia de Odeceixe, 132 m, sand: 1 specimen. **St. 338 (A.2792)**, off Praia de Odeceixe, 155 m, muddy sand: 2 specimens. **SEPLAT 7 (1st part) — St. 7 (A.2946)**, SW Zambugeira do Mar, 180 m, muddy sand: 2 specimens. **St. 18 (A.2955)**, off Zambugeira do Mar, 240 m, muddy sand: 1 specimen. **St. 19 (A.2956)**, off Zambugeira do Mar, 225 m, muddy sand: 1 specimen. **St. 23 (A.2958)**, off Zambugeira do Mar, 150 m, muddy sand: 1 specimen. **St. 38 (A.2971)**, off Zambugeira do Mar, 262 m, muddy sand: 4 specimens. **St. 43 (A.2976)**, off Zambugeira do Mar, 255 m, muddy sand: 4 specimens in poor condition. **St. 44 (A.2977)**, off Zambugeira do Mar, 230 m, muddy sand: 2 specimens in poor condition, one with 2 branchiae remaining. **St. 47 (A.2979)**, off Zambugeira do Mar, 160 m, sand: 1 specimen. **St. 48 (A.2980)**, off Cape Sardão, 150 m, sand: 1 specimen in poor condition. **St. 69 (A.2998)**, off Cape Sardão, 160 m, sand: 4 specimens, with tubes. **St. 70 (A.2999)**, off Cape Sardão, 150 m, sand: 1 incomplete specimen with tube. **St. 77 (A.3006)**, off Cape Sardão, 162 m, sand: 2 specimens. **St. 78 (A.3007)**, off Cape Sardão, 170 m, sand: 1 specimen with tube. **St. 83 (A.3012)**, off Cape Sardão, 340 m, sandy mud: 1 specimen, in poor condition. **St. 85 (A.3015)**, off Cape Sardão, 280 m, muddy sand: 1 specimen. **St. 94 (A.3022)**, off Cape Sardão, 125 m, muddy sand: 1 incomplete specimen, in poor condition. **St. 98 (A.3026)**, off Praia de Almograve, 132 m, muddy sand: 1 specimen. **St. 132 (A.3059)**, off Praia de Almograve, 153 m, sand: 1 specimen. **St. 134 (A.3061)**, off Praia de Almograve, 210 m, muddy sand: 1 specimen. **St. 138 (A.3065)**, off Praia de Almograve, 356 m, sandy mud: 1 specimen, in poor condition. **St. 167 (A.3089)**, off Vila Nova de Milfontes, 237 m, muddy sand: 1 specimen with tube. **St. 168 (A.3090)**, off Vila Nova de Milfontes, 265 m, muddy sand: 1 specimen. **St. 170 (A.3092)**, off Vila Nova de Milfontes, 365 m, sandy mud: 4 specimens. **St. 196 (A.3018)**, off Vila Nova de Milfontes, 147 m, muddy sand: 1 specimen with tube. **St. 197 (A.3109)**, off Vila Nova de Milfontes, 155 m, muddy sand: 1 specimen. **St. 204 (A.3116)**, off Vila Nova de Milfontes, 410 m, sandy mud: 1 specimen with tube. **St. 238 (A.3142)**, off Praia do Malhão, 347 m, sandy mud: 2 specimens. **St. 242 (A.3146)**, off Praia do Malhão, 176 m, sand: 1 specimen. **St. 265 (A.3167)**, off Praia do Malhão, 175 m, sand: 1 specimen, in poor condition. **St. 301 (A.3197)**, off Porto Corvo, 360 m, mud: 1 incomplete specimen, branchiae missing; with a thin, membranous tube, with some sand and foraminiferan shells incrusted. **SEPLAT 7 (2nd part) — St. 4 (A.4094)**, off Lagoa de Santo André, 150 m, sand with shells: 1 specimen. **St. 23 (A.4083)**, north Sines, 127 m, sand: 1 specimen. **St. 24 (A.4084)**, north Sines, 130 m, sand: 1 specimen, partially still inside the tube. **St. 31 (A.4076)**, north Sines, 327 m, sand: 5 specimens. **St. 34 (A.4073)**, north Sines, 144 m, sand: 1 specimen. **St. 36 (A.4071)**, north Sines, 128 m, gravelly sand: 2 incomplete specimens. **St. 55 (A.4052)**, north Sines, 158 m, sand: 1 specimen, still inside the tube; it still has the two pairs of branchiae, and it is possible to see the smooth buccal tentacles. **St. 58 (A.4049)**, north Sines, 365 m, sand: 3 specimens plus one fragment with 3 chaetigers. **St. 109 (A.3998)**, off Sines, 146 m, sand: 1 specimen. **St. 168 (A.4083)**, off Sines, 267 m, sand: 2 specimens. **St. 196 (A.3916)**, off Sines, 125 m, muddy sand: 1 specimen. **St. 201 (A.3911)**, SW Sines, 253 m, sand: 1 specimen. **St. 210 (A.3902)**, off Porto Covo, 163 m, sand: 1 very small specimen, probably a juvenile. **St. 259 (A.3867)**, off Cape Sardão, 173 m, sand: 14 specimens; eyes present, dorsolateral, near the base of the branchiae; buccal palps smooth; some specimens with eggs. **St. 264 (A.3870)**, off Cape Sardão, 263 m, muddy sand: 1 specimen, kept inside the tube. **St. 265 (A.3866)**, off Cape Sardão, 227 m, muddy sand: 2 specimens. **St. 266 (A.3865)**, off Cape Sardão, 175 m, sand: 27 specimens, some still inside the tubes. **St. 267 (A.3864)**, south Cape Sardão, 155 m. muddy sand: 4 specimens. **St. 271 (A.3863)**, off Praia de Odeceixe, 232 m, muddy sand: 4 specimens. **St. 272 (A.3861)**, off Praia de Odeceixe, 305 m, muddy sand: 2 specimens, one of which very small, probably a juvenile. **St. 274 (A.3862)**, off Praia de Odeceixe, 327 m, muddy sand: 4 specimens. **St. 283 (A.3851)**, off Arrifana, 245 m, muddy sand: 10 specimens, in good condition; one incomplete, only with the thoracic region and only one gill missing; eyespots present, near the insertion of the external branchiae.

DISTRIBUTION: East Atlantic Ocean; British Isles, Gulf of Biscay (150-400 meters), Portugal (125-800 meters), western Mediterranean Sea (89-108 meters), Aegean Sea, Morocco (265 meters), Liberia (280 meters), Congo (205 meters); West Atlantic Ocean: off southern Florida (537-567 meters), off New England (200-823.5 meters), off Surinam (520-1500 meters); South Vietnam (2-48 meters). On muddy and sandy bottoms.

REMARKS: This species seems to be very common in the Portuguese continental shelf, below depths of about 125 m. It can be easily recognised by its pointed prostomium, by having only two pairs of branchiae in two separated groups located on a transverse fold and 14 thoracic chaetigers with uncini from the third chaetiger, being the first two pairs longer, closing together ventrally (especially the second pair).

The only previous record for Portuguese waters was done by AMOUREUX (1987).

*GENUS *Eclysippe* Eliason 1955

Eclysippe ELIASON, 1955: 10.

TYPE SPECIES: *Lysippe vanelli* Fauvel 1936.

REMARKS: JIRKOV (2001) considered *Eclysippe* Eliason 1955 as being a junior synonym of *Pterolysippe* Augener 1918.

**Eclysippe vanelli* (Fauvel 1936)

Lysippe vanelli FAUVEL, 1936*c*: 96-98, fig. 13.

TYPE LOCALITY: The type material is from two stations off the Atlantic coast of Morocco, but FAUVEL (1936*c*) didn't state which one of them is the type locality. The date of the two stations is as follows: 30º23'N, 9º54'30"W, at 100-118 meters, in sand with a little of mud and rocks; and 30º19'N, 9º58'30"W, at 140 meters, on sand.

SELECTED REFERENCES: *Lysippe vanelli* — KIRKEGAARD, 1959: 80-81. *Eclysippe vanelli* — ELIASON, 1955: 10-14, fig. 3; KIRKEGAARD, 1982: 257; HOLTHE, 1986*b*: 64-65, fig. 25, map 24; HARTMANN-SCHRÖDER, 1996: 498; KIRKEGAARD, 1996: 306-307, fig. 171.

REFERENCES FOR PORTUGAL: [?] HARTMANN-SCHRÖDER, 1977*a* (as *Samythella* cf. *vanelli*; off Cape Sardão); present work (southwestern continental shelf).

MATERIAL: SEPLAT 7 (2nd part) — St. 34 (A.4073), north Sines, 144 m, sand: 1 incomplete specimens; anterior region in good condition. **St. 260 (A.3873)**, NW Cape Sardão, 278 m, muddy sand: 1 incomplete specimen, in poor condition. **St. 266 (A.3865)**, off Cape Sardão, 175 m, sand: 3 specimens, one of which complete; prostomium triangular; paleae conspicuous, about 10 per bundle; branchiae in two groups of 3, only slightly separated dorsally, each group in a more or less straight row; all branchiae connected by a membrane that reaches the paleae; 15 thoracic segments with short notochaetae, with broad brims; the posterior 12 thoracic chaetigers are uncinigerous; posterior 4 thoracic segments clearly longer than the preceeding ones; 12 abdominal uncinigerous segments; pygidium with 2 lateral rounded lobes.

DISTRIBUTION: Arctic Ocean; Barents Sea; Norwegian coast; Swedish west coast; Skagerrak; Portugal; Morocco; Western Mediterranean Sea; Great Meteor Bank; Guinea. On sand, mud or mixed bottoms. Between 15-3965 meters.

GENUS *Glyphanostomum* 1884

Glyphanostomum LEVINSEN, 1884: 157-158.

TYPE SPECIES: *Samytha pallescens* Théel 1879.

Glyphanostomum pallescens (Théel 1879)

Samytha pallescens THÉEL, 1879: 61-62, pl. 4 figs. 60-62.

TYPE LOCALITY: Kara Sea, 75º40'N, 78º40'E, at 45 meters, on muddy sand.

SELECTED REFERENCES: *Sabellides pallescens* — FAUVEL, 1909: 24; FAUVEL, 1914*f*: 286-288, pl. 26 figs. 29-33. *Glyphanostomum pallescens* — LEVINSEN, 1884: 160; LEVINSEN, 1886: 11-12, pl. 25 figs. 7-8; WOLLEBÆEK, 1912: 64; HESSLE, 1917: 105, text-fig. 11; AUGENER, 1928*a*: 783-784, 822; BERKELEY & BERKELEY, 1944: 3-5, figs. 4-6; USCHAKOV, 1950: 219; WESENBERG-LUND, 1950*a*: 48-49, chart 57; USCHAKOV, 1955*a*: 371, fig. 138*I-L*; HARTMAN, 1965*b*: 217-218; HARTMAN, 1969: 561-562, figs. 1-3; HOLTHE, 1986*b*: 71-73, fig. 29, map 28; HILBIG, 2000*a*: 204-205, fig. 8.15. *Glyphaostomum pallescens* — HARTMANN-SCHRÖDER, 1977*a*: 95.

REFERENCES FOR PORTUGAL: HARTMANN-SCHRÖDER, 1977*a* (as *Glyphaostomum pallescens*; off Cape Sardão); [?] RAVARA, 1997 (as Cf. *Glyphanostomum pallescens*; off Aveiro).

DISTRIBUTION: Arctic Ocean (150 meters); West Greenland (682-7202 meters); East Greenland; Iceland; Spitsbergen (250-1000 meters); Barents Sea; Kara Sea (37-117 meters); Chuckchee Sea; Novaya Zemlya; Norwegian Sea; Portugal; Northwest Atlantic, off New England (823-2900 meters), and off Newfoundland (1267 meters); Canadian Arctic; North American Pacific southwards to California; Bering Sea; Sea of Okhotsk (443 meters); Antarctic Ocean. On mud and muddy sand. Between 45-7200 meters.

GENUS ***Hypania*** Ostroumov 1897

Hypania OSTROUMOV, 1897: 359.

TYPE SPECIES: *Amphicteis invalida* Grube 1860.

SYNONYMS: *Parhypania* Annenkova 1929.

REMARKS: JIRKOV (2001) considered the following genera as being junior synonyms of *Hypania* Ostrooumov 1897: *Alkmaria* Horst 1919; *Hypaniola* Annenkova 1927; *Microsamytha* Augener 1928; *Parhypania* Annenkova 1928.

KEY TO SPECIES:

(adapted from ANNENKOVA, 1929*a*)

1a. Between 15-30 long and thin paleae; 16 chaetigers with capillary notochaetae....................***H. invalida***
1b. Between 7-10 short and strong paleae; 17 chaetigers with capillary notochaetae............***H. brevispinis***

Hypania brevispinis (Grube 1860)

Amphicteis brivispinis GRUBE, 1860: 109, pl. 5 fig. 5.

TYPE LOCALITY: Caspian Sea.

SELECTED REFERENCES: *Amphicteis brevispinis* — HESSLE, 1917: 124. *Hypania brevispinis* — HOLTHE, 1986*a*: 96. *Parhypania brevispinis* — ANNENKOVA, 1929*a*: 15-16, pl. 3 fig. 7, pl. 4 fig. 17; ANNENKOVA, 1930: 30-31, figs. 5, 6а, 6д.

DISTRIBUTION: Caspian Sea. In muddy bottoms. Between 44-378 meters.

REMARKS: The authorship of this species is many times stated to be Grimm *in* Grube 1860. However, I wasn't able to find any reference on the original description to the fact that Dr. Grimm had contributed to the description of the species. The description of the species was based on specimens collected by Professor Baer. For this reason, the authorship of the species is here considered as been only as Grube 1860.

Hypania invalida (Grube 1860)

Amphicteis invalida GRUBE, 1860: 107-108, pl. 5 fig. 4.

TYPE LOCALITY: Caspian Sea.

SYNONYMS: *Phenacia oculata* Schmankevitsch 1875; *Amphicteis antiqua* Ostroumov 1896; *Hypania invalida occidentalis* Ostroumov 1897.

SELECTED REFERENCES: *Amphicteis invalida* — HESSLE, 1917: 124. *Hypania invalida* — ANNENKOVA, 1927: 53-57, plate 1 figs. 1-12, table page 61; ANNENKOVA, 1929*a*: 16-17; ANNENKOVA, 1929*c*: 123, 124; ANNENKOVA, 1930: 27-28, figs. 3*б*, 4, 6в; WEBER, 1964: 381-385; KOTHÉ, 1968: 90-94, text-fig. 1, pl. 6 fig. 1; MANOLELI, 1977: 10-14, figs. 2*c-d*, 3*a*; MARINOV, 1977: 206-207, pl. 29 fig. 1; HOLTHE, 1986*a*: 96; HARTMANN-SCHRÖDER, 1996: 499-500, fig. 243. *Phenacia oculata* — SCHMANKEVITSCH, 1875: 1. *Amphicteis antiqua* — OSTROUMOV, 1896: 117; HESSLE, 1917: 124. *Hypania antiqua* — HOLTHE, 1986*a*: 96. *Hypania invalida occidentalis* — OSTROUMOV, 1897: 359.

DISTRIBUTION: Caspian Sea; Black Sea (Romania, Bulgaria, Delta of River Don), also in brackish and fresh water, as in the lower parts of the rivers Volga, Dnipro, Bug, Dnister and Danube (13 meters; from the Delta up to Kachlet-Stufe, upper Passau, Germany), and probably Don. In muddy bottoms. In fresh water, found between 1-415 meters above the sea level. [?] Also recorded between 1-415 meters below sea water level.

GENUS ***Hypaniola*** Annenkova 1927

Hypaniola ANNENKOVA, 1927: 57.

TYPE SPECIES: *Amphicteis (?Aryandes) kowalewskii* Grimm 1887.

REMARKS: JIRKOV (2001) considered *Hypaniola* Annenkova 1927 as being a junior synonym of *Hypania* Ostroumov 1897.

Hypaniola kowalewskii (Grimm 1876)

Amphicteis (?Aryandes) kowalewskii Grimm 1876: 112-117.

Type locality: Caspian Sea.

Selected references: *Hypaniola kowalewskii* — Annenkova, 1927: 57-59, pl. 1 figs. 13-17, table page 61; Annenkova, 1929*a*: 14, pl. 3 fig. 8, pl. 4 fig. 16; Annenkova, 1929*c*: 123, 124; Annenkova, 1930: 29, figs. 3*a*, 6*б*; Marinescu, 1964: 87-95, figs. 1-6, tables 1-2; Manoleli, 1977: 10-14, figs. 2*a-b*, 3*b*.

Distribution: Azov Sea, Caspian Sea, Black Sea (Romania), also in brackish waters, as in the Delta of the Danube (13 meters) and Don. In muddy bottoms. Between 4.5-78 meters.

GENUS ***Isolda*** F. Müller 1858

Isolda F. Müller, 1858: 218.

Type species: *Isolda pulchella* F. Müller 1858.

Synonyms: *Irana* Wesenberg-Lund 1949.

Remarks: Jirkov (2001) considered the following genera as being possible junior synonyms of *Isolda* F. Müller 1858: *Melinna* Malmgren 1866; *Moyanus* Chamberlin 1919; *Irana* Wesenberg-Lund 1949. I had the opportunity to study newly collected material from the Iranian Gulf, and among others were present specimens of *Irana heterobranchiata* Wesenberg-Lund 1949. It was possible to observe in at least one specimen that it had four pairs of branchiae, two of them pinnate, and the other two smooth, while other specimens showed only three pairs of branchiae, with only one of them smooth. Being the smooth branchiae longer and more external than the pinnate branchiae, they seem more likely to be lost when the specimens are manipulated, and this was probably the case with the single specimen Wesenberg-Lund (1949) used to establish the genus *Irana*, as well as with some of the specimens I studied. This way, I confirm the synonymy proposed by Jirkov (2001), being *Irana* Wesenberg-Lund 1949 a junior synonym of *Isolda* F. Müller 1858.

Key to Species:

(from Day, 1967)

1a. Thirteen uncinigerous thoracic segments; inner two pairs of gills with two rows of long lamellae..***I. pulchella***

1b. Twelve uncinigerous thoracic segments; inner two pairs of gills with many minute lamellae..***I. whydahensis***

Isolda pulchella F. Müller 1858

Isolda pulchella F. Müller, 1858: 219.

Type locality: Santa Catarina Island, Brazil.

Synonyms: *Isolda warnbroensis* Augener 1914; *Isolda sibogae* Caullery 1944.

Selected references: *Isolda pulchella* — Augener, 1918: 517-518, text-fig. 88, pl. 7 fig. 229; Day, 1963*b*: 434-435; Day, 1967: 691-692, fig. 35.1.*k-n*; Day, 1973: 113, fig. 15*d-f*; Hutchings, 1977: 3-4. *Isolda warnbroensis* — Augener, 1914: 82-87, text-fig. 13, pl. 1 figs. 14-15. *Isolda sibogae* — Caullery, 1944*a*: 102-103, fig. 83.

References for Portugal: Ravara, 1997 (off Aveiro).

Distribution: Brazil; North Carolina, USA; Australia; Indonesia; South Africa; Portugal. In muddy bottoms. Intertidal to about 100 meters.

Isolda whydahensis Augener 1918

Isolda whydahensis Augener, 1918: 514-517, text-fig. 87, pl. 7 fig. 216.

Type locality: Western Africa: Whydah (Benin, ancient Dahomey), off Nyanga River mouth (Gabon), and N'Zeto (= Ambrizette, Northern Angola).

Selected references: *Isolda whydahensis* — Tebble, 1955: 136; Fauvel, 1958: 4; Kirkegaard, 1959: 79-80, fig. 20; Hartmann-Schröder, 1977*a*: 95. *Isolda wydahensis* — Intes & Le Lœuff, 1977: 238. *Isolda whydahaensis* — Day, 1967: 692, fig. 35.2.*a-d*; Amoureux, 1976*b*: 27.

References for Portugal: Hartmann-Schröder, 1977*a* (Bay of Setúbal).

DISTRIBUTION: Western Africa: Gambia (18 meters), Liberia, Ivory Coast (10-100 meters), Ghana (5.5-50 meters), Benin, Nigeria (15-78 meters), Gabon (Nyanga River), Congo (12-32 meters), Angola (360-440 meters); Portugal (Setúbal Bay; 85-90 meters); Mediterranean Sea: Cape Negro (Morocco; 200 meters).

GENUS *Lysippe* Malmgren 1866

Lysippe MALMGREN, 1866: 367.

TYPE SPECIES: *Lysippe labiata* Malmgren 1866.

SYNONYMS: *Pseudampharete* Hilbig 2000.

REMARKS: JIRKOV (2001) considered the following genera as being junior synonyms of *Lysippe* Malmgren 1866: *Samytha* Malmgren 1866; *Lysippides* Hessle 1917.

Lysippe labiata Malmgren 1866

Lysippe labiata MALMGREN, 1866: 367, pl. 26 fig. 78.

TYPE LOCALITY: Spitsbergen, at Hakluyts Headland, Kingsbay, Safehavn, and Storfjorden, between 30-50 fathoms (55-91.4 meters), in mud.

SELECTED REFERENCES: *Lysippe labiata* — LEVINSEN, 1884: 163; WOLLEBÆK, 1912: 59-60, pl. 10 figs. 1-5; HESSLE, 1917: 109-110, text-fig. 14; AUGENER, 1928*a*: 780, 822; ANNENKOVA, 1929*b*: 496-497; ANNENKOVA, 1937: 189; DITLEVSEN, 1937: 40-41; BERKELEY & BERKELEY, 1942: 201; USCHAKOV, 1950: 219; WESENBERG-LUND, 1950*a*: 48, chart 56; BERKELEY & BERKELEY, 1952: 67, fig. 138; USCHAKOV, 1955: 372-374, fig. 138*A-D*; HARTMAN, 1965*b*: 218; BANSE, 1979*a*: 1549; FOURNIER & POCKLINGTON, 1984: 265; HOLTHE, 1986*b*: 52-54, fig. 19, map 18; HARTMANN-SCHRÖDER, 1996: 500; KIRKEGAARD, 1996: 307-308, fig. 172. *Sabellides borealis* [not Malmgren 1866] — HANSEN, 1882: 46.

DISTRIBUTION: Davis Strait (128-166 meters); Nova Scotia (9-270 meters); off New England (200-1000 meters); Arctic Ocean; West Greenland; Iceland; Spitsbergen (33-84 meters); Novaya Zemlya (13-17 meters); Kara Sea (26-45 meters); Svalbard; Barents Sea; Canadian and Siberian Arctic; Sea of Okhotsk (42-307 meters); Sea of Japan (40-780 meters); Avacha Bay (2-29 meters); Alaska (16-22 meters); British Columbia (117 meters); Kattegat; probably in Skagerrak and northern North Sea, but rare; [?] Mediterranean Sea (including Adriatic and Aegean seas). On muddy and sandy bottoms. Between 50-1500 meters.

GENUS *Lysippides* Hessle 1917

Lysippides HESSLE, 1917: 110-111.

TYPE SPECIES: *Amphicteis fragilis* Wollebæk 1912.

REMARKS: As stated above, JIRKOV (2001) considered the genus *Lysippides* Hessle 1917 as being a junior synonym of *Lysippe* Malmgren 1866.

Lysippides fragilis (Wollebæk 1912)

Amphicteis fragilis WOLLEBÆK, 1912: 57-58, text-fig. 8, pl. 9 figs. 1-7.

TYPE LOCALITY: Norway, Bergen region: Osterfjord, at 20-110 meters, and Hjeltefjord, at 95 meters, in sandy bottoms. According to HOLTHE (1986*b*), Hordaland, Norway.

SELECTED REFERENCES: *Amphicteis fragilis* — HESSLE, 1917: 111. *Lysippides fragilis* — ELIASON, 1955: 10; HOLTHE, 1986*b*: 55-56, fig. 20, map 19; HARTMANN-SCHRÖDER, 1996: 500; KIRKEGAARD, 1996: 308-310, fig. 173.

DISTRIBUTION: Southern Norway; Skagerrak; Kattegat; northern coast of Jutland; Japan. On mud mixed with sand, gravel or pebbles. Between 20-180 meters.

*GENUS *Melinna* Malmgren 1866

Melinna MALMGREN, 1866: 371.

TYPE SPECIES: *Sabellides cristata* M. Sars 1851.

REMARKS: JIRKOV (2001) suggested the possible synonymy of *Melinna* Malmgren 1866 with *Isolda* F. Müller 1858.

KEY TO SPECIES:

1a. Postbranchial hooks almost straight, not curved..***M. collare***
1b. Postbranchial hooks curved...**2**

2a (1b). A smooth fold between the postbranchial hooks and the serrated fold........................***M. islandica***
2b (1b). No fold as such..**3**

3a (2b). One single large buccal tentacle; dorsal crest across segment VI smooth............***M. monoceroides***
3b (2b). Numerous buccal tentacles; dorsal crest across segment VI crenate...**4**

4a (3b). Dorsal crest with a scalloped margin, with blunt points; neurochaetae on the fourth chaetigerous segment absent...***M. palmata****
4b (3b). Dorsal crest with a serrated brim with sharp points; neurochaetae on the fourth chaetigerous segment present..**5**

5a (4b). Postbranchial hooks with a gently curved tip, with internal canal; serrations on the dorsal fold of equal size; neuropodia of chaetiger 3 dorsally projecting; abdominal ciliated notopodial projections papilliform...***M. cristata***
5b (4b). Postbranchial hooks with a strongly curved tip, lacking an internal canal; serrations on the dorsal fold usually of unequal size; neuropodia of chaetiger 3 inconspicuous; abdominal ciliated notopodial projections low, rounded..**6**

6a (5b). Eyespots abundant; white bands on branchiae absent; dorsal depression narrow; about 72 abdominal chaetigers...***M. elisabethae***
6b (5b). Eyespots absent; white bands on branchiae present; dorsal depression wide; 44-49 abdominal chaetigers...***M. albicincta***

Melinna albicincta Mackie & Pleijel 1995

Melinna albicincta MACKIE & PLEIJEL, 1995: 116-120, figs. 3, 5, table 1.

TYPE LOCALITY: Kosterfjord, southwest of Yttre Vattenholmen (Sweden), 58º52.5'N, 11º06.3'E, 60-80 meters, in sand, mud and gravel.

SELECTED REFERENCES: *Melinna cristata* [not Sars 1851] — WHITEAVES, 1901: 74 [in part; in part = *M. cristata* (M. Sars 1851)]; [?] FAUVEL, 1911*d*: 38; [?] WOLLEBÆK, 1912: 65-67, pl. 14 figs. 2-4, 6 (at least) [in part?; in part = *M. cristata* (M. Sars 1851)]; MCINTOSH, 1922*b*: 83-86, pl. 118 fig. 9, pl. 125 fig. 1 [in part; part of the specimens from Canada = *M. cristata* (M. Sars 1851)]; HARTMANN-SCHRÖDER, 1974*d*: 261 [in part?]; HOLTHE, 1986*b*: 81-83, fig. 34, map 33 [in part?]. *Melinna elisabethœ* [not McIntosh 1885] — MCINTOSH, 1914: 106-107 [in part; in part = *Melinna cristata* (M. Sars 1851); in part = *Melinna elisabethae* McIntosh 1885]. *Melinna elisabethae* [not McIntosh 1885] — MCINTOSH, 1922*b*: 86-88, pl. 119 fig. 1, pl. 125 fig. 2 [in part]; ANNENKOVA, 1929*b*: 489-490, pl. 39 figs. 52-55 [in part?]; USCHAKOV, 1955*a*: 363, fig. 134*A-D* [in part?]; HARTMANN-SCHRÖDER, 1996: 504, fig. 244 [in part?].

DISTRIBUTION: Sweden (40-100 meters); Norway; Faroe Islands (350-356 meters); Gulf of Saint Lawrence, Canada (402 meters); [?] Novaya Zemlya (135 meters). In mixed bottoms of stones, gravel, sand and mud.

Melinna collare Detinova 1985

Melinna collare DETINOVA, 1985*a*: 128, fig. 3*m-p*.

TYPE LOCALITY: Reykjanes Ridge (North Atlantic), 58º22'00"N, 31'32'09"W, at 1895 meters.

DISTRIBUTION: Reykjanes Ridge (North Atlantic). Between 1535-1984 meters.

Melinna cristata (M. Sars 1851)

Sabellides cristata M. SARS, 1851: 205-206.

TYPE LOCALITY: Finmark (Norway), at 50-100 fathoms (91.4-182.9 meters).

SELECTED REFERENCES: *Sabellides cristata* — M. SARS, 1856: 19-23, pl. 2 figs. 1-7. *Melinna cristata* — MALMGREN, 1866: 371-372, pl. 20 fig. 50; MCINTOSH, 1874*b*: 204; [?] LEVINSEN, 1884: 159-160;

McIntosh, 1885*a*: 438-440, pl. 27*A* figs. 14, 16; [?] Levinsen, 1886: 11; Ehlers, 1887: 214-220, pl. 49 figs. 7-10; [?] Cunningham & Ramage, 1888: 660, pl. 42 fig. 22; [?] Fauvel, 1897: 439-448; Whiteaves, 1901: 74 [in part; in part = *M. albicincta* Mackie & Pleijel 1995]; [?] Bidenkap, 1907: 33; [?] Fauvel, 1907*b*: 34; Wollebæk, 1912: 65-67, pl. 14 figs. 1, 5, 7, 8?, 9? [in part; in part (at least figures 2-4 and 6) = *M. albicincta* Mackie & Pleijel 1995 or *M. elisabethae* McIntosh 1885]; [?] Fauvel, 1914*f*: 291-292; McIntosh, 1914: 104-106; Hessle, 1917: 92-93; McIntosh, 1922*b*: 83-86, pl. 118 fig. 9, pl. 125 figs. 1-1*c* [in part; part of specimens from Canada = *M. albicincta* Mackie & Pleijel 1995]; Fauvel, 1927*a*: 237-239, fig. 83*i-n* [in part]; [?] Augener, 1928*a*: 782-783; Annenkova, 1929*b*: 488-489, pl. 39 fig. 56; [?] Ditlevsen, 1937: 41; [?] Wesenberg-Lund, 1950*a*: 49, chart 57; [?] Wesenberg-Lund, 1950*b*: 114-115; [?] Wesenberg-Lund, 1951: 105-106, chart 50; [?] Berkeley & Berkeley, 1952: 70, figs. 143-145; [?] Wesenberg-Lund, 1953*a*: 93-94; Uschakov, 1955*a*: 363, fig. 134*G*; [?] Berkeley & Berkeley, 1956*a*: 241; [?] Pettibone, 1956: 571-572; [?] Bellan, 1959*a*: 334-335; [?] Kirkegaard, 1959: 78; Laubier, 1961*b*: 189-190, fig. 1; Reyss, 1961*a*: 189-190, fig. 1; [?] Hartman, 1965*b*: 218-219; [?] Hartman, 1966*b*: 82 [figs. 4-5 from pl. 26 belong probably to *M. albicincta* Mackie & Pleijel 1995, or to *M. elisabethae* McIntosh 1885]; [?] Day, 1967: 691, fig. 35.1.*c-j*; [?] Hartman, 1967: 160; Hartmann-Schröder, 1971*a*: 451 [in part?]; Hartmann-Schröder, 1974*d*: 261 [in part]; [?] Intes & Le Lœuff, 1977: 238; [?] Uebelacker, 1984*i*: 51.9, figs. 51.3-51.4; Holthe, 1986*b*: 81-83, fig. 34, map 33 [in part; in part = *Melinna elisabethae* McIntosh 1885]; [?] Hartmann-Schröder & Rosenfeldt, 1989: 84-85; Mackie & Pleijel, 1995: 104-111, figs. 1-3, table 1; Hartmann-Schröder, 1996: 503; Kirkegaard, 1996: 310-311, fig. 174 [in part; in part = *M. albicincta* Mackie & Pleijel 1995 or *M. elisabethae* McIntosh 1885]. *Phenacia cristata* — Quatrefages, 1866*b*: 377. *Mellina elisabethae* — McIntosh, 1914: 106-107 [in part; in part = *Melinna elisabethae* McIntosh 1885; in part = *Melinna albicincta* Mackie & Pleijel 1995]; McIntosh, 1922*b*: 86-88 [in part; 3 Norwegian specimens]. Not *Melinna cristata* — Moore, 1906*a*: 851-853, pl. 44 figs. 9-10 [homonym; = *Melinna denticulata* Moore 1908].

References for Portugal: Amoureux, 1974*b* (off Aveiro; off Porto).

Distribution: Arctic and Subarctic; Northern Europe; Mediterranean Sea; Black Sea; West Atlantic; Gulf of Mexico; Southeast Atlantic; Northeast Pacific; Northwest Pacific; Antarctic and Subantarctic. The species was recorded worldwide, but all those records require to be re-evaluated, as they can refer to the ocurrence of other *Melinna* species (Mackie & Pleijel, 1995). It can only be confirmed as occurring in northeastern Atlantic and Arctic waters. In muddy bottoms, sometimes mixed with shells, sand or gravel. From shallow to moderate depth (40-550 meters).

Worldwide records of the species include the following localities and depths: Norway (18-550 meters); Sweden (30-170 meters); Iceland (297-504 meters; if Wesenberg-Lund's records are confirmed, the distribution of the species in Iceland ascends to a depth of 8 meters); Gulf of Saint Lawrence, Canada (402 meters); Western Mediterranean Sea (400 meters); [?] Alboran Sea (285-370 meters); [?] Northeastern Atlantic, off British Isles (1053-2284 meters); [?] ridge between Iceland and Faroes (170-512 meters); [?] West Greenland (85-2258 meters); [?] Jan Mayen (162 meters); [?] Spitsbergen (20-50 meters; 1000 meters); [?] Novaya Zemlya; [?] Kara Sea (34-134 meters); [?] Seas of Japan and Okhotsk (100-1643 meters); [?] Ivory Coast (200 meters); [?] South Atlantic, near Bouvet Island (400 meters); [?] South Africa (246 meters); [?] Labrador (9-11 meters); [?] New England (11-2000 meters); [?] Maine (9-22 meters); [?] northeastern Gulf of Mexico (69-189 meters); [?] West coast of Canada (37-128 meters); [?] Canadian Arctic, western Norway Island (30 meters); [?] Antarctic Seas: Western Chile (1007-1025 meters), Falkland Islands (646-845 meters), South Georgia (2714-2727 meters), Drake Passage (2672-3803 meters), Scotia Sea (1733-2818 meters), South Shetland Islands (265 meters; 1437 meters), Bransfield Strait (220-311 meters).

Melinna elisabethae McIntosh 1885

Melinna elisabethœ McIntosh, 1885*a*: 438.

Type locality: Scotland, Fife, St. Andrews Bay, in the stomachs of haddocks (*Melanogrammus aeglefinus*).

Selected references: *Melinna elisabethœ* — McIntosh, 1914: 106-107 [in part; in part = *M. cristata* (M. Sars 1851); in part = *Melinna albicincta* Mackie & Pleijel 1995]; Hessle, 1917: 94; McIntosh, 1922*b*: 86-88, pl. 119 fig. 1, pl. 125 fig. 2 [in part; in part = *M. albicincta* Mackie & Pleijel 1995; in part, Norwegian specimens = *M. cristata* (M. Sars 1851)]. *Melinna elisabethae* — Annenkova, 1929*b*: 489-490, pl. 39 figs. 52-55 [in part?]; Annenkova, 1937: 186 [in part?]; Uschakov, 1950: 217 [in part?]; Uschakov, 1955*a*: 363, fig. 134*A-D* [in part?]; [?] Banse & Hobson, 1968: 45; [?] Banse, 1979*a*: 1549; [?] Fournier & Pocklington, 1984: 265; Hartmann-Schröder, 1996: 504, fig. 244 [in part?]; Mackie & Pleijel, 1995: 111-116, figs. 3-4, table 1. *Melinna cristata* [not M. Sars 1851] — [?]

WOLLEBÆK, 1912: 65-67, pl. 14 figs. 2-4, 6 (at least) [in part?; in part = *M. cristata* (M. Sars 1851)]; FAUVEL, 1927*a*: 237-239, fig. 83*i-n* [in part]; HARTMANN-SCHRÖDER, 1971*a*: 451 [in part]; HOLTHE, 1986*b*: 81-83, fig. 34, map 33 [in part]; KIRKEGAARD, 1996: 310-311, fig. 174 [in part?].

DISTRIBUTION: British Isles (7-50 meters); Irish Sea (42-120 meters); Sweden (40-65 meters); Iceland (53 meters); Spitsbergen (69-293 meters); Kara Sea (19-21 meters). Records from other regions need to be checked (MACKIE & PLEIJEL, 1995): [?] Seas of Japan and Okhotsk (128-2900 meters); [?] Puget Sound, Washington (10-24 meters); [?] Nova Scotia (9-270 meters). In mixed bottoms of stones, gravel, sand and mud.

Melinna islandica Sædmundsson 1918

Melinna islandica SÆDMUNDSSON, 1918: 200-221, pl. 2 fig. 2.

TYPE LOCALITY: Western Iceland, Dyrafjörður, 19-24 meters.

SELECTED REFERENCES: *Melinna islandica* — WESENBERG-LUND, 1951: 106, chart 50; HOLTHE, 1986*b*: 84, fig. 35, map 34; MACKIE & PLEIJEL, 1995: 111.

DISTRIBUTION: Known from the type locality.

REMARKS: MACKIE & PLEIJEL (1995) considered this species as a *nomen dubium*, pending on the re-collection of specimens conforming the original description. It is known from one incomplete single specimen, and differs from all the other known species of *Melinna* by the presence of a smooth fold anterior to the serrated one. According to MACKIE & PLEIJEL (1995) this fold could be due to an artefact. On other aspects, it resembles *Melinna cristata*.

Melinna monoceroides Fauvel 1936

Melinna monoceroïdes FAUVEL, 1936*c*: 93-95, fig. 12.

TYPE LOCALITY: Off the Atlantic coast of Morocco (10º3’50”W, 30º28’30”N), at 224 meters, on sand.

SELECTED REFERENCES: *Melinna monoceroides* — KIRKEGAARD, 1959: 78-79; DAY, 1967: 689, fig. 35.1.*a-b*; INTES & LE LŒUFF, 1977: 238.

DISTRIBUTION: Morocco (224 meters); Ivory Coast (50 meters); Angola (60 meters); Adriatic Sea; Aegean Sea. On sand.

****Melinna palmata*** Grube 1870

Melinna palmata GRUBE, 1870*c*: 68-69.

TYPE LOCALITY: Saint Malo, English Channel coast of France.

SYNONYMS: *Melinna adriatica* Marenzeller 1874.

SELECTED REFERENCES: *Melinna palmata* — FAUVEL, 1897: 440-448, pl. 25 figs. 166-168; FAUVEL, 1909: 24-26; HESSLE, 1917: 94; MCINTOSH, 1922*b*: 88-90, pl. 113 fig. 1, pl. 119 fig. 2, pl. 125 figs. 3-3*c*; FAUVEL, 1927*a*: 239-240, fig. 83*a-h*; ANNENKOVA, 1929*b*: 490-491, pl. 39 fig. 57; FAUVEL, 1936*c*: 92-93; MARQUES, 1947: 55, fig. A; HOLTHE, 1986*b*: 85-86, fig. 36, map 35. *Melinna adriatica* — MARENZELLER, 1874: 472-475, pl. 7 fig. 6; MARENZELLER, 1893: 34, pl. 2 fig. 6; RIOJA, 1917*c*: 45-48, fig. 12.

REFERENCES FOR PORTUGAL: MARQUES, 1947 (Cova-do-Vapor; Caxias); COSTA, GAMITO & OLIVEIRA, 1984 (Sado Estuary); AMOUREUX, 1987 (off Aveiro); MONTEIRO-MARQUES, 1987 (continental shelf of Algarve); DEXTER, 1992 (previous records: Ria Formosa; Ria de Alvor; continental shelf of Algarve; Mira Estuary; Sado Estuary; Arrábida; Ria de Aveiro); SPRUNG, 1994 (Ria Formosa); AMARAL & COSTA, 1999 (Sado Estuary); MUCHA & COSTA, 1999 (Ria de Aveiro and/or Sado Estuary); present work (southwestern continental shelf).

MATERIAL: SEPLAT 7 (1st part) — St. 11 (A.2950), SW Zambugeira do Mar, 248 m, muddy sand: 1 small specimen, incomplete, with only 8 abdominal chaetigers; dorsal transverse ridge with about 7 teeth, rounded and little pronounced; the anterior region seems narrower that in other specimens; rest of characters are very similar; prostomium clearly trilobed; a fragment of tube still present, being a thin layer covered with mud. **St. 38 (A.2971)**, off Zambugeira do Mar, 262 m, muddy sand: 1 small specimen; transverse dorsal ridge smooth; incomplete, with 48 abdominal chaetigers; buccal tentacles not seen. **St. 170 (A.3092)**, off Vila Nova de Milfontes, 365 m, sandy mud: 1 specimen, probably incomplete, 2.5 cm long for 83 chaetigers, with about 18 thoracic chaetigers and 65 abdominal chaetigers; not possible to appreciate if the prostomium is trilobed or eyes or glandular ridges are present; branchiae in two groups of four, three of which are united by less than half of their length, and arranged in a semicircle around the fourth; individual gills long and smooth, projecting far beyond the prostomium; segments III-V withe fine neuropodial acicula; segment IV with stout notopodial hooks; segments V and VI with fine notopodial capillaries (difficult to see in segment V); segment VI without neuropodial chaetae; thansverse dorsal ridge across segment VI forming a deep pocket with a smooth margin; 14 uncinigerous thoracic segments, from segment VII; thoracic and abdominal uncini with 5 teeth, in a single series, above the small rostral point and basal prow; abdominal neuropodia seem to present superior cirri; buccal tentacles not visible; methyl blue stains strongly the anterior ventral region up to segment XIV. **SEPLAT 7 (2nd part) — St. 210 (A.3902)**, off Porto Covo, 163 m, sand: 1 very small specimen, maybe a juvenile, broken in two pieces; anterior fragment with 16 thoracic chaetigers; some smooth buccal tentacles present; prostomium trilobed; transverse dorsal ridge not completely smooth, having some round tips; posterior fragment with about 8 chaetigers.

DISTRIBUTION: Eastern North Atlantic; Portugal (4-365 meters); Morocco (55-140 meters); Mediterranean Sea; Adriatic Sea; Aegean Sea; Black Sea; Sea of Azov; Persian Gulf. On muddy and sandy bottoms. Shore to 384 meters.

REMARKS: Two of the above referred specimens show the smooth transverse dorsal ridge typical of *Melinna monoceroides*. However, the large buccal tentacle that also characterizes the species was not found. For this reason, and because the species so far was not found in the Portuguese waters, in spite of its presence being likely for the region, both specimens were considered as belonging to *Melinna palmata*. This last species was found in stations close to the ones where the specimens with the smooth transversal dorsal ridge were found.

GENUS ***Melinnopsis*** McIntosh 1885 *sensu* Day 1964

Melinnopsis MCINTOSH, 1885*a*: 441-442.

TYPE SPECIES: *Melinnopsis atlantica* McIntosh 1885.

SYNONYMS: *Melinnexis* Annenkova 1931; *Mellinides* Wesenberg-Lund 1950.

REMARKS: JIRKOV (2001) considered as junior synonyms of *Melinnopsis* McIntosh 1885 the following genera: *Melinnexis* Annenkova 1931; *Melinnopsides* Day 1964; *Amelinna* Hartman 1969. He also considered *Mellinides* Wesenberg-Lund 1950 (with *M. rostrata* Wesenberg-Lund 1950 as type species) as being a valid genus, with *Melinnantipoda* Hartman 1967 as a junior synonym.

KEY TO SPECIES:

(from HOLTHE, 1986*b*)

1a. One very large and several small tentacles; dorsal brim absent or indistinct...**2**
1b. Several long and short tentacles; dorsal brim present and denticulate; anterior ventral margin of segment III finely crenulate..***M. rostrata***

2a (1a). Large tentacle cylindrical; thoracic uncini with four teeth..***M. arctica***
2b (1a) Large tentacle trihedral and twisted; thoracic uncini with five teeth.......................***M. annenkovae***

Melinnopsis annenkovae (Uschakov 1952)

Melinnexis annenkovae USCHAKOV, 1952: 110-111, fig. 6*a-c*.

TYPE LOCALITY: Off the southeast coast of Kamchatka, at 4100 meters.

SELECTED REFERENCES: *Melinnexis annenkovae* — USCHAKOV, 1955*a*: 364, fig. 135*D-F*. *Melinnopsis annenkovae* — HOLTHE, 1986*b*: 87.

DISTRIBUTION: Northwest Pacific (4100 meters); Ellesmere Island.

Melinnopsis arctica (Annenkova 1931)

Melinnexis arctica ANNENKOVA, 1931: 269-272, figs. 1-4.

TYPE LOCALITY: Queen Victoria Sea, off Franz Joseph's Land: 82º14'N, 52º10'E, at 165 meters; 78º33'N, 63º10'E, at 363 meters; 79º11'N, 69º55'E, at 480 meters.

SYNONYMS: *Melinnexis somovi* Uschakov 1957.

SELECTED REFERENCES: *Melinnexis arctica* — USCHAKOV, 1955*a*: 364, fig. 135*G-L*. *Melinnopsis arctica* — HOLTHE, 1986*b*: 87-88, fig. 37, map 36. *Melinnexis somovi* — USCHAKOV, 1957: 1667. *Melinnopsis somovi* — HOLTHE, 1986*b*: 87.

DISTRIBUTION: Polar Basin; continental slope of East Greenland; Barents Sea; Franz Joseph's Land. Between 165-1694 meters.

REMARKS: According to JIRKOV *in* HOLTHE (1986*b*) and JIRKOV (2001), *Melinnexis somovi* Uschakov 1957 is a junior synonym of *Melinnopsis arctica* (Annenkova 1931).

Melinnopsis rostrata (Wesenberg-Lund 1950)

Melinnides rostrata WESENBERG-LUND, 1950*a*: 49-50, chart 57, pl. 9 fig. 43.
TYPE LOCALITY: West of Greeland, 60º17'N, 54º05'W, at 3229 meters.
SELECTED REFERENCES: *Melinnopsis rostrata* — HOLTHE, 1986*b*: 87.
DISTRIBUTION: Known from the type locality.

GENUS *Mugga* Eliason 1955

Mugga ELIASON, 1955: 7.
TYPE SPECIES: *Mugga wahrbergi* Eliason 1955.
REMARKS: JIRKOV (2001) considered *Mugga* Eliason 1955 as being a junior synonym of *Sosane* Malmgren 1866.

See also the *REMARKS* section under the genus *Sosane*.

KEY TO SPECIES:

1a. Abdomen short and narrow, with about the same length than the thorax, or shorter; uncini with a large rostrum; deep waters (900-2630 meters)..***M. bathyalis***
1b. Abdomen long, longer than thorax; uncini with a poorly developed rostrum; shallow waters (20-80 meters)...***M. wahrbergi***

Mugga bathyalis Holthe 1986

Mugga bathyalis HOLTHE, 1986*c*: 228-229, figs. 1, 5.
TYPE LOCALITY: Norwegian Sea, 64º16.9'N, 0º11.7'W, 2620 meters.
DISTRIBUTION: Deep regions of the Norwegian Sea (900-2630 meters).
REMARKS: As stated by HOLTHE (1986*c*) there are inadequate meristic characters in order to separate this species from *M. wahrbergi*, but the author erected the new species with basis on the proportionally shorter abdomen of *M. bathyalis*, and on the uncini of *M. wahrbergi* having smaller rostra than *M. bathyalis*. Besides, *M. wahrbergi* is known from shallower (20-80 meters), and often brackish waters.

Mugga wahrbergi Eliason 1955

Mugga wahrbergi ELIASON, 1955: 8-9, fig. 2.
TYPE LOCALITY: Koster Island, Swedish west coast, at 20-80 meters, on sandy mud mixed with stones and shells.
SELECTED REFERENCES: *Mugga wahrbergi* — HOLTHE, 1986*b*: 60-62, fig. 23, map. 22; HARTMANN-SCHRÖDER, 1996: 501; KIRKEGAARD, 1996: 311-313, fig. 175.
DISTRIBUTION: Southern Norway; Swedish west coast; north coast of Jutland; Kattegat; Skagerrak. On muddy and mixed bottoms. Between 20-80 meters.

GENUS *Neosabellides* Hessle 1917

Neosabellides HESSLE, 1917: 103-104.
TYPE SPECIES: *Neosabellides elongata* Hessle 1917.
REMARKS: JIRKOV (2001) considered *Amythas* Benham 1921 as being a junior synonym of *Neosabellides* Hessle 1917.

Neosabellides oceanica (Fauvel 1909)

Sabellides oceanica FAUVEL, 1909: 75-76.
TYPE LOCALITY: Gulf of Gascony (43º30'N, 9º37'45"W), 1743 meters, on mud.
SELECTED REFERENCES: *Sabellides oceanica* — FAUVEL, 1914*f*: 288-289, pl. 26 figs. 16-25. *Neosabellides oceanica* — HESSLE, 1917: 104; FAUVEL, 1927*a*: 233-234, fig. 81*h-o*.

REFERENCES FOR PORTUGAL: AMOUREUX, 1974*b* (off Aveiro).
DISTRIBUTION: From the Gulf of Gascony to off Portugal. On mud. Between 220-1743 meters.

GENUS *Noanelia* Desbruyères & Laubier 1977

Noanelia DESBRUYÈRES & LAUBIER, 1977: 279-280.
TYPE SPECIES: *Noanelia hartmanae* Desbruyères & Laubier 1977.

Noanelia hartmanae Desbruyères & Laubier 1977

Noanelia hartmanae DESBRUYÈRES & LAUBIER, 1977: 280-283, fig. 1.
TYPE LOCALITY: Gulf of Gascony, 47º32.5'N, 8º40.2'W, 2215 meters.
SELECTED REFERENCES: *Noannelia hartmanae* — DETINOVA, 1985*a*: 128.
DISTRIBUTION: Gulf of Gascony, between 2115-4251 meters; off Iceland, 1550-2951 meters.

*GENUS *Sabellides* Milne-Edwards *in* Lamarck 1838

Sabellide [sic] MILNE-EDWARDS *in* LAMARCK, 1838: 608.
TYPE SPECIES: *Sabella octocirrata* M. Sars 1835.
SYNONYMS: *Heterobranchus* Wagner 1885.
REMARKS: The genus was originally named as *Sabellide* by MILNE-EDWARDS *in* LAMARCK (1838), but later it was spelled as *Sabellides* in GRUBE (1850: 330), and SARS (1851: 205). Nowadays the genus is normally designated as *Sabellides*, and this was also the spelling used by MALMGREN (1866: 368) when he redefined the genus, to what it is known today. JIRKOV (2001) considered *Sabellides* Milne-Edwards *in* Lamarck 1838 as being a junior synonym of *Ampharete* Malmgren 1866. The spelling of the genus will not be changed here for the original one, in order to avoid creating more nomenclatural noise.

A key for the world species of *Sabellides* was provided by SALAZAR-VALLEJO (1996*a*).

KEY TO SPECIES:
(from HOLTHE, 1986*b*)

1a. Branchiae long, in one transverse row; 15-18 uncinigerous abdominal segments............***S. octocirrata***
1b. Branchiae short, three branchiae of each group in a transverse row, the fourth one slightly behind the row; 12 uncinigerous abdominal segments..***S. borealis***

Sabellides borealis M. Sars 1856

Sabellides borealis SARS, 1856: 22-23.
TYPE LOCALITY: Northern Norway.
SELECTED REFERENCES: *Sabellides borealis* — MALMGREN, 1866: 368-369, pl. 20 fig. 47; LEVINSEN, 1886: 12; WOLLEBÆK, 1912: 53-55, pl. 8 figs. 1-5; MCINTOSH, 1915*a*: 48-50, pl. 1 figs. 7-10, pl. 2 figs. 2-3; HESSLE, 1917: 103; ANNENKOVA, 1929*b*: 495-496; WESENBERG-LUND, 1950*a*: 47, chart 55; USCHAKOV, 1955*a*: 370, fig. 137*H-J*; FOURNIER & POCKLINGTON, 1984: 265; HOLTHE, 1986*b*: 45, fig. 15, map 14; HARTMANN-SCHRÖDER, 1996: 501.
DISTRIBUTION: Greenland; Iceland; Svalbard; northern Norway (18-146 meters); Skagerrak; Kara Sea (18-37 meters); Labrador; Nova Scotia; Canadian and Siberian Arctic; Bering Sea; Canadian Pacific. On silt and mixed bottoms. Between 30-350 meters.

**Sabellides octocirrata* (M. Sars 1835)

Sabella? octocirrata M. SARS, 1835: 51-52, pl. 13 [reference to pl. 12 is incorrect] fig. 32.
TYPE LOCALITY: Glesvær (60º12'N, 05º02'W) and Florø (61º36'N, 05º04'W), western Norway, between 37-73 meters.
SYNONYMS: *Heterobranchus speciosus* Wagner 1885; *Sabellides octocirrata* var. *mediterranea* Marion 1879; *Sabellides octocirrata* var. *britannica* McIntosh 1922.
SELECTED REFERENCES: *Sabellides octocirrata* — MALMGREN, 1866: 369-370, pl. 25 fig. 74; WOLLEBÆK, 1912: 52-53, pl. 7 fig. 6; HESSLE, 1917: 101-103; RIOJA, 1917*c*: 44-45, fig. 11; FAUVEL,

1927*a*: 232, fig. 81*a-g*; DAY, 1967: 697, fig. 35.3.*h-k*; GEORGE, 1979: 204; UEBELACKER, 1984*i*: 51.20-51-22, figs. 51.15-51.16; HOLTHE, 1986*b*: 46-48, fig. 16, map 15; HARTMANN-SCHRÖDER, 1996: 501; KIRKEGAARD, 1996: 313-314, fig. 176. *Sabellides octocirrata* var. *mediterranea* — MARION, 1879: 21-26, pl. 16 fig. 5; SAINT-JOSEPH, 1906: 234-235, pl. 5 figs. 104-105; HESSLE, 1917: 103. *Sabellides octocirrata* var. *britannica* — MCINTOSH, 1922*b*: 75-78, pl. 118 fig. 11, pl. 124 fig. 7-7*b*, pl. 138 fig. 2. *Heterobranchus speciosus* — WAGNER, 1885: 56.

REFERENCES FOR PORTUGAL: HARTMANN-SCHRÖDER, 1977*a* (off Cape Sardão); MONTEIRO-MARQUES, 1987 (continental shelf of Algarve); DEXTER, 1992 (previous records: continental shelf of Algarve); present work (southwestern continental shelf).

MATERIAL: SEPLAT 7 (2nd part) — St. 175 (A.3935), off Sines, 205 m, gravelly sand: 1 specimen, in poor condition; only two branchiae still attached; prostomium damaged; paleae fine and short, smaller than normal notochaetae; 13 thoracic segments with notopodia with bristles, the posterior 11 also with uncini; 15 abdominal uncinigerous segments; posterior abdominal segments with a small cirrus at the upper edge of each neuropodium; pygidium with 2 lateral cirri; notochaetae capillary with narrow brims; thoracic uncini with one vertical row of 4 teeth; first 2 abdominal uncinigerous segments also with the same type of uncini; rest of abdominal uncini with 2-3 vertical rows of about 8 teeth each; tube narrow and cylindrical, as a thin layer of secretion incrusted with mud; papillose buccal tentacles not visible.

DISTRIBUTON: East Greenland; Iceland; Faroes Islands; Shetland (91-110 meters); Norway and Swedish west coast (37-238 meters); Øresund; British Isles (91-293 meters); Eastern North Atlantic to the Canary Islands; Mediterranean Sea; Adriatic Sea; Aegean Sea; Caspian Sea; South and Southwest Africa; Canadian Atlantic; Maine (11-64 meters); Gulf of Mexico (88-91 meters). On mud, sand or mixed bottoms. Upper sublittoral to 500 meters.

REMARKS: GEORGE (1979) stated that his specimens of *Sabellides octocirrata* collected at Lewis and Harris (Outer Hebrides, Scotland) showed some differences in relation to what was the classical definition of the species, possibly because of being immature specimens. This way, the specimens were described as having 13 (instead of 11) thoracic uncinigers bearing the thoracic single-tooth-row type uncini, and before the multiple-tooth-row abdominal unicini started along with the long notopodial cirri. According to George, the confusion may have arisen in the past because the last two thoracic segments do not bear notopodial capillary chaetae. The same was observed in the Portuguese specimen, with the thoracic uncini with one single row of 4 teeth, which were also present in the first two segments at the end of the thorax that didn't show notopodial capillary chetae. After these two segments, which are here also considered as belonging to the thorax, the abdominal uncini show 2-3 vertical rows of about 8 teeth each.

GENUS ***Samytha*** Malmgren 1866

Samytha MALMGREN, 1866: 370.

TYPE SPECIES: *Sabellides sexcirrata* Sars 1856.

REMARKS: JIRKOV (2001) considered *Samytha* Malmgren 1866 as being a junior synonym of *Lysippe* Malmgren 1866.

Samytha sexcirrata (M. Sars 1856)

Sabellides sexcirrata M. SARS, 1856: 24.

TYPE LOCALITY: Manger, western Norway.

SELECTED REFERENCES: *Samytha sexcirrata* — MALMGREN, 1866: 370, pl. 20 fig. 49; WOLLEBÆK, 1912: 60-61, pl. 11 figs. 1-9; HESSLE, 1917: 113-114; CHAMBERLIN, 1920: 23-24; MCINTOSH, 1922*b*: 78-80, pl. 118 fig. 8, pl. 124 figs. 6-6*a*; MOORE, 1923: 214; DITLEVSEN, 1937: 41; USCHAKOV, 1955*a*: 374; HARTMAN & FAUCHALD, 1971: 162-163; HOLTHE, 1986*b*: 68, fig. 27, map 26; HARTMANN-SCHRÖDER, 1996: 502; KIRKEGAARD, 1996: 314-315, fig. 177.

DISTRIBUTION: Arctic Ocean; Greenland; Svalbard; Barents Sea; Kara Sea; Norwegian Sea; Norwegian coast; Shetland; North Sea; Skagerrak; Kattegat; Swedish west coast; Jutland; Off New England; Canadian Atlantic; North American Pacific (California). On muddy bottoms. Upper sublittoral to 4749 meters.

GENUS ***Samythella*** Verrill 1873

Samythella VERRILL, 1873: 98.

TYPE SPECIES: *Samythella elongata* Verrill 1873.

SYNONYMS: *Eusamytha* McIntosh 1885.

REMARKS: JIRKOV (1986*c*) revised the genera *Samythella* Verrill 1873 and *Eusamytha* McIntosh 1885, and found out that all the described species in both genera were synonymous with *S. elongata* Verrill 1873.

Samythella elongata Verrill 1873

Samythella elongata VERRILL, 1873: 98-99.

TYPE LOCALITY: New England coast.

SYNONYMS: *Eusamytha pacifica* McIntosh 1885; *Samythella neglecta* Wollebæk 1912; *Samythella bathycola* Uschakov 1950; *Samythella interrupta* Fauchald 1972; *Samythella pala* Fauchald 1972.

SELECTED REFERENCES: *Samythella elongata* — VERRILL, 1874*d*: 43; HARTMAN & FAUCHALD, 1971: 163-164; AMOUREUX, 1982*b*: 202; JIRKOV, 1986*c*: 330-331, figs. 1-3, table in page 326. *Eusamytha pacifica* — MCINTOSH, 1885*a*: 436-437, pl. 48 fig. 4, pl. 27*A* fig. 9. *Samythella neglecta* – WOLLEBÆK, 1912: 62-64, pl. 12 figs. 1-9; HESSLE, 1917: 125-126; WESENBERG-LUND, 1950*a*: 48, chart 56; USCHAKOV, 1955*a*: 374; HOLTHE, 1986*b*: 69-70, fig. 28, map 27. *Samythella bathycola* — USCHAKOV, 1950: 220-221, pl. 2, 10, fig. 34; USCHAKOV, 1955*a*: 374, fig. 139*A-F*. *Samythella interrupta* — FAUCHALD, 1972*a*: 313-314, pl. 66 figs. *a-b*. *Samythella pala* — FAUCHALD, 1972*a*: 315-316, pl. 66 figs. *c-f*.

DISTRIBUTION: Northern Atlantic (128-2154 meters); Davis Strait (446-930 meters); Arctic Ocean, including Iceland and the Norwegian and Greenland Seas (125-2154 meters); off SW Ireland (850-1400 meters); Northern Pacific (894-5460 meters). On muddy bottoms. Between 100-5500 meters.

*GENUS ***Sosane*** Malmgren 1866

Sosane MALMGREN, 1866: 367-368.

TYPE SPECIES: *Sosane sulcata* Malmgren 1866.

REMARKS: JIRKOV (2001) considered as junior synonyms of *Sosane* Malmgren 1866 the following genera: *Sosanopsis* Hessle 1917; *Mugga* Eliason 1955; *Muggoides* Hartman 1965; *Sosanella* Hartman 1965; Genus A sensu Uebelacker 1984; and possibly *Melinnata* Hartman 1965.

JIRKOV (1994*b*) proposed a wider deffinition of the genera *Sosane* and *Mugga*, in order to include all the genera and species with modified notopodia with highly modified chaetae situated in thoracic chaetigers 9-11, with independence of the presence or absence of paleae (notopodial chaetae on segment II). The difference between *Sosane* sensu lato and *Mugga* sensu lato, would be the number of branchiae, 4 pairs in the first, and 3 in the later. *Mugga* sensu lato would include the genera *Melinnata*, *Muggoides*, and *Sosanella* as junior synonyms, while *Sosane* sensu lato would include *Sosanopsis*. The same author (JIRKOV, 2001) proposed later *Mugga* as a junior synonym of *Sosane*, as the number of pairs of branchiae, at least in one genera of Ampharetidae (*Amage*) is accepted to vary between 3 and 4 pairs, and the same can be expected to happen in other genera of ampharetids.

****Sosane sulcata*** Malmgren 1866

Sosane sulcata MALMGREN, 1866: 368, pl. 26 fig. 79*a-e*.

TYPE LOCALITY: Koster, Bohuslän (Swedish west coast), at 13 fathoms (23.8 meters).

SELECTED REFERENCES: *Sosane sulcata* — WOLLEBÆK, 1912: 60; HESSLE, 1917: 108-109, text-fig. 13; FAUVEL, 1934: 63-64, fig. 4*a-h*; KIRKEGAARD, 1959: 75-76, fig. 19; GIBBS & PROBERT, 1973: 399-400, fig. 2*b-g*; UEBELACKER, 1984*i*: 51.11-51.14, figs. 51.7-51.8; HOLTHE, 1986*b*: 48-50, fig. 17, map 16; HARTMANN-SCHRÖDER, 1996: 502; KIRKEGAARD, 1996: 315-317, fig. 178; HAYASHI & HANAOKA, 1997: 385-388, fig. 2.

REFERENCES FOR PORTUGAL: RAVARA, 1997 (off Aveiro); GIL & SARDÁ, 1999 (southwestern continental shelf); present work (southwestern continental shelf).

MATERIAL: SEPLAT 6 — St. 198 (A.2666), near Arrifana, 43 m, sand: 1 incomplete specimen; prostomium trilobed; branchiae in a ridge across segment III; some branchiae missing. **St. 203 (A.2670)**, off Arrifana, 127 m, muddy sand: 1 specimen complete and in good condition; 16 thoracic notopodial chaetigers, from segment IV; 12 thoracic uncinigers; notopodia of tenth thoracic unciniger (third last notopodia) displaced dorsally and bearing hirsute chaetae; 12 abdominal segments; abdominal notopodial rudiments not observed; pygidium with two cirri; two groups of 4 smooth branchiae, in segment III; buccal tentacles smooth. **St. 336 (A.2790)**, off Praia de Odeceixe, 132 m, sand: 1 specimen, exactly as described in HOLTHE (1986*b*); the specimen is complete, but lacks the anal cirri; only one branchia remaining; posterior edge broke during the manipulation; dorsal region with many glandular spots. **SEPLAT 7 (1st part) — St. 225**, exact location unknown, NW Vila Nova de Milfontes, 90 m, rock: 1 specimen. **St. 281 (A.3181)**, off Pessegueiro Island, 105 m, muddy sand: 1 complete specimen; seems as it has been dried. **SEPLAT 7 (2nd part) — St. 23 (A.4083)**, north Sines, 127 m, sand: 4 specimens, all complete. **St. 34 (A.4073)**, north Sines, 144 m, sand: 2 complete specimens, with 12 abdominal uncinigerous segments; two short anal cirri. **St. 36 (A.4071)**, north Sines, 128 m, gravelly sand: 1 incomplete specimen, missing the anterior region, having the last 5 thoracic chaetigers; bristles of what would be the 13th thoracic chaetiger are arranged in a row along the upper edge of the notopodium, with long, plumed tips; 12 abdominal uncinigerous segments; pygidium with 2 short anal cirri. **St. 86 (A.4021)**, near Sines, 275 m, sand: 1 complete specimen, in poor condition. **St. 185 (A.3926)**, near Sines, 37 m, sandy mud: 1 specimen in poor condition. **St. 194 (A.3918)**, south Sines, 84 m, sand: 1 incomplete specimen, with the anterior region missing; 11 thoracic uncinigers; modified chaetae as described, at the third last thoracic unciniger; 12 abdominal uncinigers; pygidium with 2 anal cirri. **St. 266 (A.3865)**, off Cape Sardão, 175 m, sand: 1 complete specimen; eyespots at the base of the anal cirri.

DISTRIBUTION: Barents Sea; Norway; Skagerrak; Kattegat; Swedish west coast; British Isles; North Sea; Portugal; Mediterranean Sea; Adriatic Sea; Aegean Sea; West Africa; Gulf of Mexico; Sea of Japan. On mud, clay, sand or mixed bottoms. Between 12-500 meters.

REMARKS: The species is characterised by having 15 thoracic notopodial chaetigers, being the 13th pair elevated and transformed into transverse narrow wings, that almost meet at the middorsum. The chaetae of this chaetiger present long, plumed tips.

This species can be superficially confused with *Anobothrus gracilis*, but the different position of the elevated parapodia, and the shape of its modified chaetae, make possible a clear separation between both species.

GENUS ***Sosanopsis*** Hessle 1917

Sosanopsis HESSLE, 1917: 111-112.

TYPE SPECIES: *Sosanopsis wireni* Hessle 1917.

REMARKS: JIRKOV (2001) considered *Sosanopsis* Hessle 1917 as being a junior synonym of *Sosane* Malmgren 1866.

Sosanopsis wireni Hessle 1917

Sosanopsis wireni HESSLE, 1917: 112-113, text-fig. 17, pl. 1 fig. 6.

TYPE LOCALITY: Sneholmarna, Kosterfjorden, Swedish west coast.

SELECTED REFERENCES: *Sosanopsis wireni* — HOLTHE, 1986*b*: 66-67, fig. 26, map 25; HARTMANN-SCHRÖDER, 1996: 503; KIRKEGAARD, 1996: 317-318, fig. 179.

DISTRIBUTION: Barents Sea; Norwegian coast; Swedish west coast; north coast of Jutland; Skagerrak; northern North Sea. On mixed bottoms. Between 50-440 meters.

GENUS ***Uschakovius*** Laubier 1973

Uschakovius LAUBIER, 1973: 2723.

TYPE SPECIES: *Uschakovius enigmaticus* Laubier 1973.

Uschakovius enigmaticus Laubier 1973

Uschakovius enigmaticus LAUBIER, 1973: 2723-2725, fig. 1.

TYPE LOCALITY: Eastern Mediterranean Sea, at the Matapan Trench, 36º01.8'N, 22º24.6'E, at 3174 meters.

DISTRIBUTION: Known from the type locality.

GENUS *Ymerana* Holthe 1986

Ymerana HOLTHE, 1986*c*: 229-230.
TYPE SPECIES: *Ymerana pteropoda* Holthe 1986.

Ymerana pteropoda Holthe 1986

Ymerana pteropoda HOLTHE, 1986*c*: 231-232, figs. 2, 6.
TYPE LOCALITY: Polar Sea, 81º50'N, 26º34'E, at 3270 meters.
DISTRIBUTION: Known from the type locality.

GENUS *Zatsepinia* Jirkov 1986

Zatsepinia JIRKOV, 1986*b*: 289.
TYPE SPECIES: *Zatsepinia rittichae* Jirkov 1986.

Zatsepinia rittichae Jirkov 1986

Zatsepinia rittichae JIRKOV, 1986*b*: 289-290, 1 fig.
TYPE LOCALITY: Barents Sea: 71º10'N, 17º00'E, 345-357 meters.
DISTRIBUTION: Norwegian and Barents Seas. Between 175-357 meters.

*FAMILY **AMPHINOMIDAE** Lamarck 1818

AS: *AMPHINOMÆ* LAMARCK, 1818: 327.

TYPE GENUS: *Amphinome* Bruguière 1789.

SYNONYMS: *ARCHINOMIDAE* Kudenov 1991.

REMARKS: Amphinomidae (together with Euphrosinidae, forming the "Amphinomidans") are unusual polychaetes in having calcified chaetae. These chaetae are brittle and detachable, and break easily when touched, lodging under the skin, sometimes together with a discharge of an acidic neurotoxicin (HUTCHINGS, 2000*a*). The reaction produced by the toxin in humans is local irritation, swelling, and infection, but apparently this is only produced by some amphinomids, normally called "fireworms".

Two of the main problems that can be found while identifying Amphinomidae, especially when using specimens preserved for a long time, were already pointed by HORST (1910): the calcified chaetae suffer morphological changes, due to the lowering of the pH of the preserving fluid, and the colour patterns fade or are discoloured due to the action of the formaline or alcohol.

Particularly important for the taxonomy of the Amphinomidae is the fact that the chaetae are calcified, and that many of the ornamentations they present can disappear due to the action of the acidity of fixation and preservation fluids. The pH of the ethanol soluction in one of the containers of the present study, was measured using a pH strip. The pH of this preservation fluid was found to be between 5 and 6, which means a slight acidic solution. This result agrees with other studies, where preservation fluids of biological collections were found to become slightly acid with time (*e.g.* WALLER & SIMMONS, 2003).

The effect of the acid in the chaetae of Amphinomidae was apparently first stated by MCINTOSH (1876*c*: 396) who wrote about the chaetae of *Chloeia venusta* (as *C. fucata*): "*Acetic acid demonstrates a considerable amount of calcareous matter in their composition, a flexible translucent chitine remaining, while the dorsal bristles lose their serrations.*" FAUVEL (1923*c*: 126-127) also states the same problem: "*On a donné aussi une importance souvent exagerée à la présence ou à la absence de denticulations sur les soies, sans tenir en compte suffisamment de la variabilité de ce caractère et de la dificulté de le constater nettement quand les dents sont très fines et quand les soies sont altérées, cas fréquent pour les animaux conservés dont les soies, en partie calcaires, sont attaquées par les réactifs et à la longue par l'alcool qui finit par prendre une réaction acide. Dans ces conditions, les soies glochidiées des Amphinomiens perdent leurs dents.*"

All chaetae of the Amphinomidae are simple, and apparently hollow, except for the recurved neurochaetal spines of *Hipponoe* and *Amphinome*, and the notochaetal spines of *Paramphinome* (J.D. KUDENOV, personal communication, *in* PLEIJEL, 2001*h*). The notochaetae include bifurcate chaetae, ringent chaetae, harpoon chaetae and spines and capillaries with or without secondary teeth. The neurochaetae include bifurcate chaetae and various spines and capillaries, with or without secondary teeth. Both noto- and neurochaetae may be ornamented, and numerous transient forms may be present. The effect of the acidity of the preservation fluids on the chaetae difficults even more the taxonomic study of the group, especially when using material from collections.

Amphinomidae species also present, in many cases, bright colours, and coloration patterns are thought to be specific, especially in the genera *Chloeia* and *Notopygos* (*e.g.* HORST, 1910; FAUVEL, 1953*c*: fig. 46). However, and as observed by HORST (1910) and other authors, these colour patterns fade by action of the preservation fluids, disappearing completly in many cases. Normally, this renders this taxonomic character useless, especially when using material not recently collected.

Recent taxonomic accounts on the family are not numerous, and they are almost all cited in the text below. WIKLUND *et al.* (2008) studied the phylogenetic relationships between Amphinomidae, Archinomidae, and Euphrosinidae, with base on molecular data, and concluded that while Amphinomidae and Euphrosinidae are sister taxa, the Archinomidae is a junior synonym of the first, with *Archinome* being sister of *Chloeia* within the Amphinomidae.

The family counts at present with 19 genera, including about 130 species (HUTCHINGS *et al.*, 2000). Ten genera including 14 species are known to occur in European and nearby waters. Two species belonging to two different genera were present in the studied material.

KEY TO GENERA:

(adapted from FAUCHALD, 1977*a*)

1a. Caruncle completely absent; neurochaetae as simple hooks..***Hipponoe***

1b. Caruncle present, usually well developed (may be difficult to discern in some species); neurochaetae otherwise......2

2a (1b). Body ovate or fusiform......3
2b (1b). Body elongated with parallel sides and usually abruptly tapering anteriorly and posteriorly........5

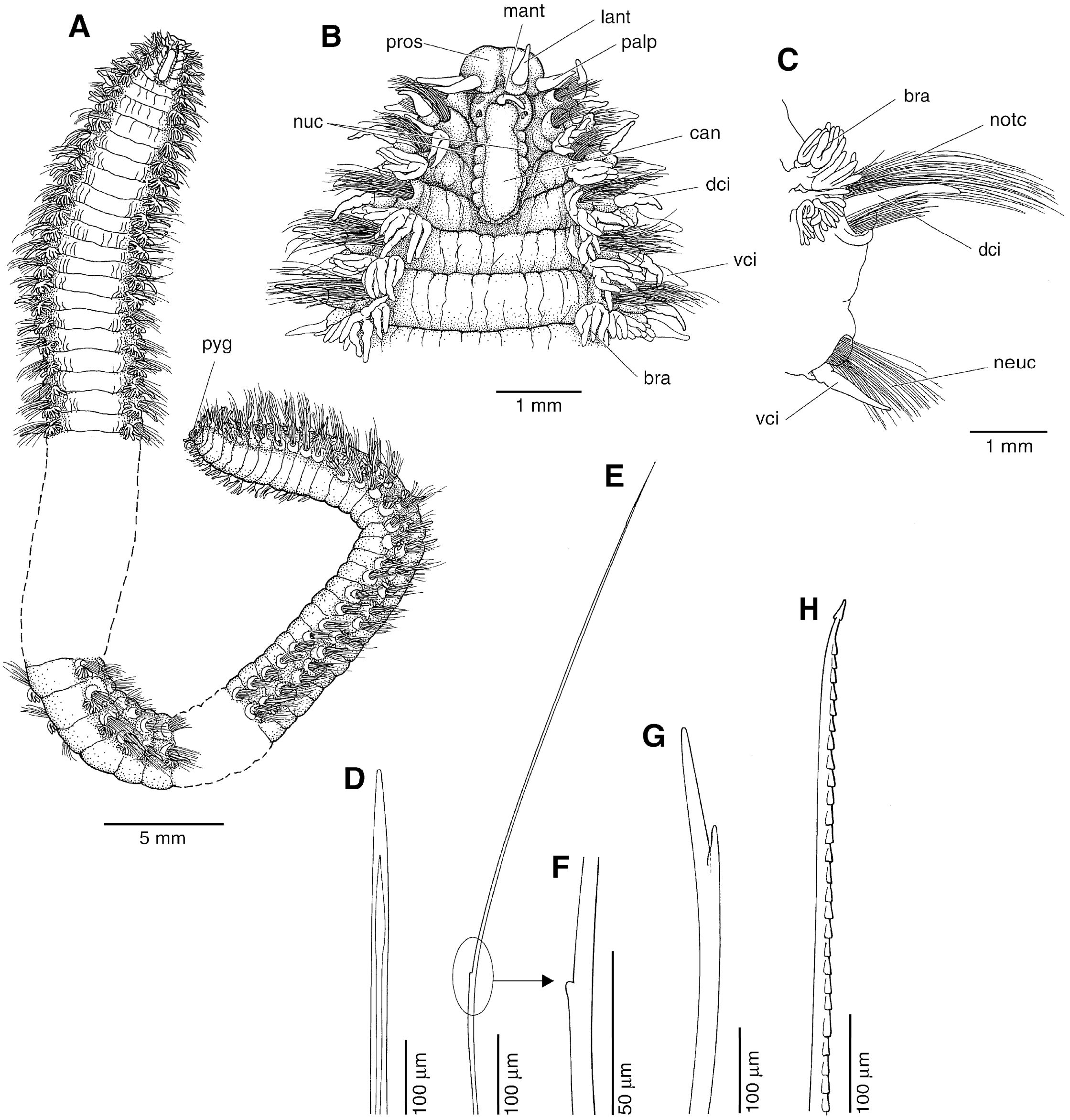

Figure legend: Family Amphinomidae. *Eurythoe* specimen. **A**, entire animal with details of anterior (dorsal view), mid-body (lateral view) and posterior (latero-ventral view) segments. **B**, anterior end, dorsal view; **C**, parapodium of chaetiger 13, posterior view. **D**-**F**, chaetae from parapodium of chaetiger 13: **D**, notoacicular spine; **E**, fine 'spurred' notochaeta; **F**, detail of spur as indicated in **E**. **G**, **H**, chaetae from parapodium of chaetiger 38: **G**, furcate neurochaeta. **H**, 'harpoon' notochaeta. **bra**, branchia; **can**, caruncle; **dci**, dorsal cirrus; **lant**, lateral antenna; **mant**, median antenna; **neuc**, neurochaetae; **notc**, notochaetae; **nuc**, nuchal organ; **palp**, palp; **pros**, prostomium; **pyg**, pygidium; **vci**, ventral cirrus. (Adapted from BEESLEY, ROSS & GLASBY, 2000; drawings by A. Murray).

3a (2a). One dorsal cirrus per notopodium; caruncle long and folded with indistinct lateral folds; eyes present, first branchiae not larger than the following ones..***Chloeia****
3b (2a). Two dorsal cirri per notopodium..**4**

4a (3b). Caruncle with high central ridge and two wide flattened lateral folds...........................***Notopygos***
4b (3b). Caruncle high, loosely plaited and rugose; lateral lobes of caruncle small and hidden under the central ridge...***Chloenopsis***

5a (2b). Caruncle small and inconspicuous, stretching through maximally three segments........................**6**
5b (2b). Caruncle large and conspicuous, stretching through at least three segments................................**9**

6a (5a). Branchiae present on all segments from the second or third..**7**
6b (5a). Branchiae limited to the anterior part of the body..**8**

7a (6a). Caruncle broadly triangular or cordate..***Amphinome***
7b (6a). Caruncle sinuous, narrow and elongated...***Pareurythoe****

8a (6b). First segment with large, anteriorly directed hooks..***Paramphinome***
8b (6b). First segment without hooks...***Linopherus***

9a (5b). Caruncle longer than wide, with a large, sinuous, smooth median ridge nearly covering the narrow folded lateral parts..***Eurythoe***
9b (5b). Caruncle about as long as wide or wider, without distinct median ridge, with a few deep transverse folds...***Hermodice***

GENUS ***Amphinome*** Bruguière 1789

Amphinome BRUGUIÈRE, 1789: 44.
TYPE SPECIES: *Aphrodita rostrata* Pallas 1766.
SYNONYMS: *Plëione* Savigny *in* Lamarck 1818; *Asloegia* Kinberg 1867; *Colonianella* Kinberg 1867; *Lenora* Grube 1878.

Amphinome rostrata (Pallas 1766)

Aphrodite rostrata PALLAS, 1766: 106-109, pl. 8 figs. 14-18.
TYPE LOCALITY: Amboine, Indian Ocean.
SYNONYMS: *Amphinome tetraëdra* Bruguière 1789; [?] *Pleïone vagans* Leach *in* Savigny 1822; *Amphinome Pallasii* Quatrefages 1866; [?] *Amphinome Lepadis* Verrill 1885.
SELECTED REFERENCES: *Amphinome rostrata* — MCINTOSH, 1885*a*: 21-24, pl. 1 fig. 7, pl. 4 fig. 1, pl. 1*A* fig. 16, pl. 2*A* figs. 8-12; FAUVEL, 1914*f*: 87; AUGENER, 1924*a*: 39; MCINTOSH, 1923*b*: 90-94; FAUVEL, 1930*b*: 10; FAUVEL, 1932*b*: 44; OKUDA, 1938: 78; HARTMAN, 1951*b*: 22, pl. 4 fig. 1; DAY, 1953: 408; FAUVEL, 1953*c*: 81-82, fig. 37; RIOJA, 1958: 223; PETTIBONE, 1963*a*: 59-60, fig. 13*d-e*; GARDINER, 1976: 101, fig. 5*j-k*; SALAZAR-VALLEJO, 1992: 216, fig. 1*A-C* *Amphinome vagans* — SAVIGNY, 1822: 60-61; KINBERG, 1857*b*: 12; KINBERG, 1910: 34-35, pl. 11 fig. 6; HORST, 1886: 159-160. *Amphinome Pallasii* — EHLERS, 1887: 26-27, pl. 1 fig. 4; FAUVEL, 1914*f*: 85-87; FAUVEL, 1923*c*: 127-128, fig. 46*a-g*. [?] *Amphinome lepadis* — HARTMAN, 1944*e*: 337, pl. 23 fig. 3.
REFERENCES FOR PORTUGAL: CARVALHO, 1929 (Lisboa); CAMPOY, 1982 (previous records: Lisboa).
DISTRIBUTION: Gulf of Mexico; Azores Archipelago; North Carolina; [?] coasts of England; [?] coasts of Portugal. Associated especially with drifting material, like logs, fronds of large algae, or floatings buoys.
REMARKS: *Amphinome rostrata* (as *Pleïone vagans*), was reported to be present in the coasts of England, on *Fucus* floating at the surface at the sea (W.E. LEACH, personnal communication in SAVIGNY, 1822). SAVIGNY (1822) regarded the studied specimens of *P. vagans* as being quite probably juveniles, and later FAUVEL (1923*c*) considered this record as very dubious, but also that the species could reach the European coasts on drifting material. GEORGE & HARTMANN-SCHRÖDER (1985: 52), on the other side, consider that *Pleïone vagans* Leach *in* Savigny 1822 (as *Amphinome*) is probably a synonym of *Pareurythoe borealis* (Sars 1862).

*GENUS **Chloeia** Lamarck 1818

Chloeia LAMARCK, 1818: 328.
TYPE SPECIES: *Aphrodita flava* Pallas 1766.
SYNONYMS: *Chloenea* Kinberg 1867; *Chloochaeta* Kinberg 1867; *Strategis* Kinberg 1867; *Thesmia* Kinberg 1867.

****Chloeia venusta*** Quatrefages 1866

Chloeia venusta QUATREFAGES, 1866*b*: 391.
TYPE LOCALITY: Palermo, Sicily.
SELECTED REFERENCES: *Chloeia venusta* — MARENZELLER, 1893: 26-28, pl. 1 fig. 1; FAUVEL, 1914*f*: 90; FAUVEL, 1923*c*: 134, fig. 48*d-h*; FAUVEL, 1936*c*: 18-19; FAUVEL, 1950*a*: 347; BELLAN, 1964*b*: 40-41; CAMPOY, 1982: 119-120. *Chloecia venusta* — RIOJA, 1918*b*: 26-27, fig. 6. *Chloëia fucata* [not Quatrefages 1866] — MCINTOSH, 1876*c*: 395-396, pl. 71 figs. 2-4.
REFERENCES FOR PORTUGAL: MCINTOSH, 1876*c* (as *Chloëia fucata*; NW Cape Sagres); BELLAN, 1960*a* (Cape Espichel); AMOUREUX, 1974*b* (off Aveiro); HARTMANN-SCHRÖDER, 1977*a* (as *Chloeia viridis*; off Cape Sardão); HARTMANN-SCHRÖDER, 1979*a* (as *Chloeia viridis*; western continental shelf of Algarve); CAMPOY, 1982 (previous records: Cape Sagres; Aveiro; Portugal); MONTEIRO-MARQUES, 1987 (continental shelf of Algarve); DEXTER, 1992 (previous records: continental shelf of Algarve; Sado Estuary); RAVARA, 1997 (off Aveiro); MACHADO & CANCELA DA FONSECA, 2007 (Algarve); present work (southwestern continental shelf).
MATERIAL: SEPLAT 6 — **St. 364 (A.2815)**, off Praia do Carvalhal, 52 m, gravelly sand: 1 specimen with 31 chaetigers; everted proboscis; colorless. **SEPLAT 7 (1st part) — St. 171 (A.3093)**, off Vila Nova de Milfontes, 325 m, muddy sand: 1 specimen in poor condition, broken in two pieces; one with prostomium and 15 chaetigers; the other with pygidium and about 14 chaetigers. **[?] St. 186**, 159 m, rest of data unknown: 1 incomplete specimen, with about 23 chaetigers, posterior region missing. **St. 233 (A.3137)**, off Vila Nova de Milfontes, 212 m, sand: 1 small specimen in poor condition with about 21 chaetigers and 7 mm long; serrated bifurcated notochaetae not seen. **St. 244 (A.3148)**, off Praia do Malhão, 155 m, muddy sand: 1 specimen with 31 chaetigers. **SEPLAT 7 (2nd part) — St. 10 (A.4100)**, off Lagoa de Santo André, 118 m, sand: 1 small specimen with 17 chaetigers, pygidium missing, 8 mm long; bidentate notochaetae present in more than half of the body, with longer tine serrated. **St. 97 (A.4010)**, near Sines, 86 m, gravelly sand: 1 specimen with 28 chaetigers; no color pattern; serrated bifurcated chaetae not seen. **St. 193 (2nd. try) (A.3919)**, south Sines, 69 m, sandy mud: 1 small specimen; not possible to count the number of chaetigers due to its poor condition. **St. 254 (A.3877)**, off Cape Sardão, 74 m, sand: 1 small specimen in poor condition; not possible to count the number of chaetigers. **FAUNA 1 — St. 13*A***, Alborán Sea, off Cape Sagra, Motril, 62 m, coarse gravel: 1 specimen with 29 chaetigers; bifurcated chaetae can be seen on the 3 anterior chaetigers; serrated chaetae not seen; dorsal cirri violet. **St. 21*A***, Alborán Sea, off Marbella, 130-164 m, detritic: 1 specimen with 33 chaetigers, 70 mm long; dorsal cirri without the characteristic coloration of smaller specimens; bifurcate chaetae present; serrated notochaetae not seen. **St. 27*A***, Alborán Sea, Djibouti Bank, off Nerja, 288-297 m, sand with mud: 2 specimens, with 30 and 32 chaetigers, one of them with proboscis slightly everted; colorless except for violet dorsal cirri from chaetiger 3. **St. 37*A***, Alborán Sea, off Punta de la Chullera, 95-100 m, coarse gravel: 20 specimens, with about 30 chaetigers; 2 pairs of eyes, being the anterior one bigger, below which exists a small ocular dot per eye, in one specimen; one specimen with everted proboscis, without papillae; one pair of branchiae per segment, from chaetiger 4; dorsal cirri long, being the posterior ones longer than the anterior; first 3 chaetigers with 2 dorsal cirri per parapodium; anus dorsal; caruncle with a darker median line; some specimens with a violet dorsal midline, sometimes very faded, better seen in the posterior region; dorsal cirri violet or reddish. **St. 38*A***, Alborán Sea, off Punta de la Chullera, 60-62 m, mud: 1 specimen with 28 chaetigers, in poor condition, probably a juvenile; one middorsal violet or dark brown line along the whole body; one spot per parapodium, located anteriorly, between the dorsal and the ventral ramus; dorsal cirri violet. **St. 39*A***, Alborán Sea, off Santa Margarita, northern La Linea de la Concepción, 21-23 m, detritic with photophilic algae: 1 specimen with 30 chaetigers; coloration like anterior specimens. **St. 42*A***, Alborán Sea, NE La Linea de la Concepción, 86-87 m, coastal detritic: 3 specimens, bigger one with proboscis slightly everted. **St. 57*A***, Gulf of Cádiz, off Cape Trafalgar, 76-80 m, gravel and stones: 9 specimens, with 29-30 chaetigers. **St. 63*A***, Gibraltar Strait, off Atlanterra, 97-118 m, detritic: 3 specimens with 28 chaetigers. **St. 72*A***, Gulf of Cádiz, off Isla

Cristina, 450-468 m, muddy sand: 1 specimen with 29 chaetigers. **Unknown station (destroyed label)**: 17 specimens with 28-32 chaetigers, some with proboscis everted.

DISTRIBUTION: From the Atlantic coast of Spain (Santander) to the Mediterranean Sea; Adriatic Sea; Aegean Sea; Black Sea. On bottoms of mud and sand. Between 20-470 meters.

REMARKS: With one exception (small specimen, 8 mm long, from SEPLAT 7 (2nd part), St. 10 (A.4100), I was unable to find the bifurcated notochaetae with the outer margin of the long tine serrated, as described by MARENZELLER (1893) and FAUVEL (1923*c*). The bifurcated notochaetae appear in the anterior chaetigers (in smaller specimens they can be present in more than half of the body), but normally both tines are completely smooth, probably as a consequence of the pH of the preservation fluids. Besides the colour pattern has faded in the biggest part of the specimens. When present, the coloration fits the described by FAUVEL (1923*c*): caruncle with a median dorsal dark line, a median violet line on the dorsum (in the present specimens better visible in the posterior region of the body), a violet spot in the anterior region of the notopodia (hardly visible, and only in two specimens of the present material), and dark violet or reddish dorsal cirri, beggining at chaetiger 3 (visible in the biggest part of the specimens). The examined specimens ranged from 7 to 70 mm long, and the observed characters didn't seem to vary with the age of the worm.

Chloeia viridis Schmarda 1861 (type locality Jamaica) and *C. venusta* Quatrefages 1866 (type locality Palermo) have been normally considered as different species with base mainly on the absence (in the first) versus presence (in the second) of notopodial bifurcated chaetae, with the outer margin of the long tine serrated. This distinctive feature seems to result from the fact that no bifurcate notochaetae was reported to be present on the original description of *C. viridis*, or on the description of its synonymy, *Chloeia euglochis* Ehlers 1887, from Florida. On the other hand, bifurcate notochaetae were described by MARENZELLER (1893) from Mediterranean specimens of *Chloeia venusta* Quatrefages 1866, a description that was later repeated by FAUVEL (1923*c*).

The discussion on the possible synonymy between the two species seems to have been carried on mainly with base on West African material. FAUVEL (1950*a*), while describing *C. venusta* specimens from Senegal, stated that the original description of the species made by Quatrefages was so brief that it could fix any *Chloeia* species. As *C. venusta* was the single species described from Europe, MARENZELLER (1893) assigned to it the species he described from Cerigo, and since then this description as being the one that has characterized the species. Later, FAUVEL & RULLIER (1957*a*), when describing *Chloeia* specimens again from Senegal, suggested the synonymy of *Chloeia venusta* with *Chloeia viridis*, with base on the argument that *C. venusta* had been the name retained by Marenzeller because it was the only species of *Chloeia* Marenzeller knew. However, they also pointed that a final statement on this and other possible synonymies with *C. viridis* would depend on a direct comparison between the types. Later, RULLIER (1964) reconsidered that synonymy, as his specimens of *C. viridis* collected at Cape Verde Islands didn't show the same bifurcate notochaetae as the pictured by MARENZELLER (1893: pl. 1 fig. 1) and FAUVEL (1923*c*: fig. 48*f*) for *C. venusta*. Also GUY (1964) didn't accept that synonymy, basing himself again in the presence/absence of the bifurcate notochaetae, but also in differences of colour and ecology (*C. venusta* would be a deeper species), supporting his oppinion on specimens identified as *C. viridis* and *C.* cf. *venusta* collected at the Ivory Coast, but comparing his Ivorian *Chloeia* cf. *venusta* specimens with Mediterranean individuals. A similar position was supported by AMOUREUX (1973*b*) and INTES & LE LŒUFF (1975), dividing the collected specimens of *Chloeia* from Congo and the Ivory Coast, respectively, between *C. venusta* (with bifurcated notochaetae and less contrasted coloration) and *C. viridis* (without bifurcated notochaetae and very contrasted coloration). Finally KIRKEGAARD (1983*a*), studied material from West Africa and found great colour variations among specimens from the same station, and also that smaller specimens had bifurcate chaetae, which didn't occur in the bigger ones, and considered that *C. venusta* was a junior synonym of *C. viridis*.

However, the assumption that *Chloeia viridis* does not present bifurcated notochaetae seems to be erroneous. HARTMAN (1948*a*) revised the type material of two species described by Kinberg from near the type locality of *C. viridis* (Jamaica): *Chloeia candida* Kinberg 1858, from West Indies, and *Chloenea pallida* Kinberg 1867, from Pernambuco (Northern Brazil). Both species were represented by single immature specimens, and were considered as being junior synonyms of *Chloeia viridis*. Particularly interesting is the fact that both specimens were described by HARTMAN (1948*a*) as presenting numerous bifid notochaetae, most of which with serrations directed downward on the outer side of the main fang, which normally lack in the lowermost bifid notochaetae. GATHOF (1984*d*) also described specimens of *C. viridis* from the Gulf of Mexico with bifurcated notochaeta with the outer margin of the long tine serrated, quite similar to the ones pictured by MARENZELLER (1893) and FAUVEL (1923*c*) for the Mediterranean populations (compare FAUVEL, 1923*c*: fig. 48*f*, with GATHOF, 1984*d*: fig. 37-6*d*). This kind of chaetae were probably absent on Schmarda's and Ehlers' specimens, or were not seen. As already stated by FAUVEL & RULLIER (1957*a*), for a better approach of the possible synonymy between *C. viridis* and *C. venusta* it will be necessary to compare directly the type material from both species, as well as other material from both type localities, as there is also the possibility that more species are involved. Anyway, and as happens with the specimens presently studied, bifurcated notochaetae seem to be present mainly in juveniles or young adults, being absent or not detected in adult worms.

I consider the specimens found in the present study as belonging to *C. venusta*, due to its proximity with the type locality of this species, the fact that they seem to fit the description given by MARENZELLER (1893), FAUVEL (1923*c*) and CAMPOY (1982), and also because the synonymy with *C. viridis* is not clear at all. The northernmost record of this species seems to be the one by RIOJA (1918*b*), from the Gulf of Biscay (off Asturias, Spain), between 110-460 m.

GENUS ***Chloenopsis*** Fauchald 1977

Chloenopsis FAUCHALD, 1977*a*: 102.
TYPE SPECIES: *Chloenea atlantica* McIntosh 1885.

Chloenopsis atlantica (McIntosh 1885)

Chloenea atlantica MCINTOSH, 1885*a*: 15-17, pl. 1 fig. 4, pl. 1*A* figs. 10-13.
TYPE LOCALITY: South of Canary Islands (25º45'N, 20º14'W), at 1525 fathoms (2788.9 meters), on a hard ground.
SELECTED REFERENCES: *Chloenea atlantica* — ROULE, 1896: 444; FAUVEL, 1923*c*: 135-136, fig. 48*a-c*. *Chloenopsis atlantica* — FAUCHALD, 1977*a*: 102.
DISTRIBUTION: South of Canary Islands; Gulf of Gascony; [?] Adriatic Sea. In rocky and muddy bottoms. Between 950-2500 meters.
REMARKS: According to FAUCHALD (1977*a*), *Chloenea* Kinberg 1867 is a synonym of *Chloeia* Lamarck 1818. Being *Chloenea* McIntosh 1885 generically different from Kinberg's genus, FAUCHALD (1977*a*) proposed *Chloenopsis* as a new name.

GENUS ***Eurythoe*** Kinberg 1857

Eurythoe KINBERG, 1857*b*: 13.
TYPE SPECIES: *Eurythoe chilensis* Kinberg 1857.
SYNONYMS: *Blenda* Kinberg 1867; *Lycaretus* Kinberg 1867.

KEY TO SPECIES:
(adapted from FAUVEL, 1923*c*)

1a. Anterior pair of eyes bigger than the posterior one; caruncle anteriorly not bilobed; anus terminal.............**2**
1b. Four small eyes, with the same size; caruncle bilobed anteriorly; anus dorsal.............***E. syriaca***

2a (1a). Caruncle long, extending to the posterior margin of chaetiger 2 or 3; dendritically branched branchiae from chaetiger 2.............***E. complanata***
2b (1a). Caruncle short, rounded, extending over chaetiger 1; dendritically branched branchiae commencing on chaetiger 3.............***E. turcica***

Eurythoe complanata (Pallas 1766)

Aphrodita complanata PALLAS, 1766: 109-112, pl. 8 figs. 19-26.
TYPE LOCALITY: Caribbean Sea.
SYNONYMS: *Eurythoe alcyonia* Savigny 1822; *Euhrythoe pacifica* Kinberg 1857; *Amphinome indica* Schmarda 1861; *Amphinome encopochaeta* Schmarda 1861; *Amphinome longicirra* Schmarda 1861; *Amphinome macrotricha* Schmarda 1861; *Eurythoe latissima* Schmarda 1861; *Eurythoe pacifica* var. *levukaensis* Fischli 1900; *Eurythoe laevisetis* Fauvel 1914; *Eurythoe karachiensis* Bindra 1927.
SELECTED REFERENCES: *Amphinome complanata* — LANGERHANS, 1881: 108-109. *Eurythoe complanata* — EHLERS, 1887: 29-31; BINDRA, 1927: 9-11, pl. 1 figs. 5-6, pl. 2 fig. 1; DAY, 1967: 128-

129, fig. 3.2*a-h*; SOSA, NÚÑEZ & BACALLADO, 1977: 234, pl. 4 figs. *C-D*; FAUCHALD, 1977*b*: 11-12; KIRKEGAARD, 1983*a*: 203; NÚÑEZ, BRITO & OCAÑA, 1991*a*: 471-473, fig. 2; BARROSO & PAIVA, 2007: 358-359, fig. 1. *Eurythoë complanata* — AUGENER, 1913*a*: 164-165; AUGENER, 1913*b*: 87-89; AUGENER, 1918: 88-89; CHAMBERLIN, 1919*a*: 28-30, pl. 14 figs. 3-8; FAUVEL, 1919*a*: 348-349; FAUVEL, 1930*b*: 45; FAUVEL *in* PRUVOT, 1930: 25; PRUVOT, 1930: 23-25; MONRO, 1933*c*: 4-5; FAUVEL, 1936*c*: 17-18; OKUDA, 1937*a*: 263-266, figs. 1-2; HARTMAN, 1940*a*: 202-203, pl. 31 figs. 1-4; FAUVEL, 1943*b*: 5-6 [in part; in part (at least specimens from Bay of La Paz) = *Pareurythoe californica* (Johnson 1897)]; FAUVEL, 1950*a*: 346-347; HARTMAN, 1951*b*: 25, pl. 4 fig. 2; FAUVEL, 1953*a*: 5-6; FAUVEL, 1953*c*: 83-84, fig. 38*b-d, k-m*; TEBBLE, 1955: 83-84; FAUVEL & RULLIER, 1959*a*: 508-509; EBBS, 1966: 512-518, fig. 7. *Euhrythoë pacifica* — KINBERG, 1857*b*: 14; KINBERG, 1910: 36, pl. 12 fig. 11. *Amphinome indica* — SCHMARDA, 1861: 142, text-figs. *a-c*, pl. 35 fig. 294. *Amphinome encopochaeta* — SCHMARDA, 1861: 153, text-figs. *a-c*, *A*, pl. 35 fig. 293. *Amphinome latissima* — SCHMARDA, 1861: 141, text-figs. *a-c*, pl. 34 figs. 291-291*a*. *Amphinome longicirra* — SCHMARDA, 1861: 142, text-figs. *a-c*, *A*, pl. 34 fig. 292. *Amphinome macrotricha* — SCHMARDA, 1861: 144, text-figs. *a-c*, pl. 34 fig. 290. *Eurythoe alcyonia* — GRAVIER, 1902: 248-254, text-figs. 257-268, pl. 9 figs. 140-143, pl. 10 figs. 144-146; PRUVOT, 1930: 21-23. *Eurythoe laevisetis* — FAUVEL, 1914*f*: 116-119, pl. 8 figs. 28-30, 33-37. *Eurythoe karachiensis* — BINDRA, 1927: 13-14, pl. 2 fig. 6.

DISTRIBUTION: Circumtropical, in the Atlantic, Indian and Pacific Oceans On hard bottoms, as rocks and stones. Intertidal to 160 meters. The species has been recorded at the Canary Islands and Mediterranean Sea.

REMARKS: *Eurythoe complanata* has been repeatedly recorded from Eastern Mediterranean (for references check ÇINAR, 2008). MONRO (1937*a*) was the first to record it in the region, and considered *E. syriaca* Kinberg 1857, a species described from Syria, as a junior synonym. However, this synonymy is not clear, and it hasn't been accepted by all authors, being necessary a comparison between *Eurythoe* specimens from the Caribbean Sea and the Levantine coast.

On the other hand, the juvenile specimen of *Eurythoe complanata* described by NÚÑEZ, BRITO & OCAÑA (1991*a*) seems to be very close to *Pareurythoe borealis* (M. Sars 1862) in spite of the long caruncle that reaches the end of the fourth chaetiger.

Eurythoe syriaca Kinberg 1857

Eurythoe syriaca KINBERG, 1857*b*: 13.

TYPE LOCALITY: Syria (Eastern Mediterranean).

SELECTED REFERENCES: *Eurythoe syriaca* — FAUVEL, 1923*c*: 130; BINDRA, 1927: 4.

DISTRIBUTION: Only known from the original description, off Syria.

Eurythoe turcica Çinar 2008

Eurythoe turcica ÇINAR, 2008: 1976-1983, figs. 1-5.

TYPE LOCALITY: Off Çevlik (36º02'51"N, 35º56'23"E), Iskenderun Bay, Levantine coast of Turkey, at 50 meters, in a section of sunken wood.

DISTRIBUTION: Iskenderun Bay, Levantine coast of Turkey, between 40-60 meters, in sunken wood and mud.

GENUS ***Hermodice*** Kinberg 1857

Hermodice KINBERG, 1857*b*: 12-13.

TYPE SPECIES: *Aphrodita caruncululata* Pallas 1766.

SYNONYMS: *Amphibranchus* Kinberg 1867.

Hermodice caruncululata (Pallas 1766)

Aphrodita caruncululata PALLAS, 1766: 102-106, pl. 8 figs. 12-13.

TYPE LOCALITY: Haiti, West Indies.

SYNONYMS: *Amphinome Savignyi* Brullé 1832; *Hermodice nigrolineata* Baird 1870; *Hermodice caruncululata* variété *didymobranchiata* Fauvel 1914.

SELECTED REFERENCES: *Amphinome caruncululata* — LANGERHANS, 1880*b*: 277-278, pl. 14 fig. 8. *Hermodice caruncululata* — MCINTOSH, 1885*a*: 24-27, pl. 5, pl. 3*A* figs. 1-4; HORST, 1886: 162; EHLERS, 1887: 27-29; FAUVEL, 1914*a*: 113-116, pl. 8 figs. 22-27, 31-32; FAUVEL, 1914*f*: 88, pl. 1 figs. 6, 10;

Augener, 1918: 93-94; Fauvel, 1923*c*: 130-132, fig. 47*a-i*; Mullin, 1923: 44-45, pls. 5 figs. 2-3, pl. 6, figs. 3-5; Fauvel, 1939*b*: 8; Hartman, 1951*b*: 22-25, pl. 5 fig. 1; Fauvel, 1953*b*: 12; Chapman & Dales, 1954: 679; Fauvel & Rullier, 1957*a*: 57-58; Fauvel & Rullier, 1959*a*: 508; Bellan, 1964*b*: 40; Guy, 1964: 177; Rullier, 1965*a*: 20-21; Ebbs, 1966: 518-524, fig. 8; Sosa, Núñez & Bacallado, 1977: 235, pl. 5; Kirkegaard, 1983*a*: 204-205; George & Hartmann-Schröder, 1985: 48, fig. 5; Hartmann-Schröder, 1988: 178; Núñez, Brito & Ocaña, 1991*a*: 470-471; Kirkegaard, 1992: 345, fig. 169; Hartmann-Schröder, 1996: 29; Barroso & Paiva, 2007: 359-360, fig. 2. *Hermodice* cf. *carunculata* — Hartmann-Schröder, 1979*a*: 68. *Hermodice carunculata* var. *didymobranchiata* — Tebble, 1955: 83.

References for Portugal: Saldanha, 1995 (Portugal).

Distribution: Amphiatlantic; North Sea; Azores; Canary Islands; Madeira Island; Mediterranean Sea; Adriatic Sea; Aegean Sea; West coast of Africa, from Morocco to Angola; Rea Sea; West Indies, Gulf of Mexico, Caribbean Sea, and Brazil. In tropical and subtropical waters, from infralittoral to 307 meters, in all kind of bottoms.

GENUS ***Hipponoe*** Audouin & Milne-Edwards 1830

Hipponoe Audouin & Milne-Edwards, 1830: 156.

Type species: *Hipponoe Gaudichaudi* Audouin & Milne-Edwards 1830.

Remarks: The diagnosis of the genus was emmended by Kudenov (1994), differing from the previous ones in that a nuchal organ is present, branchiae are planar and bipinnate, and the anus is terminal.

Hipponoe gaudichaudi Audouin & Milne-Edwards 1830

Hipponoe Gaudichaudi Audouin & Milne-Edwards, 1830: 156-159, pl. 3 figs. 1-5.

Type locality: Port Jackson, Australia.

Synonyms: *Metamphinome multibranchiata* Treadwell 1940; *Hipponoa gaudichaudi agulhana* Day 1967; *Hipponoe gaudichaudi gigantea* Hartmann-Schröder 1981.

Selected references: *Hipponoa gaudichaudi* — Núñez, Brito & Ocaña, 1991*a*: 470, fig. 1; Kudenov, 1994: 200-205, figs. 1-2. *Hipponoë gaudichaudi* — McIntosh, 1885*a*: 30-33, pl. 1 fig. 5, pl. 4 fig. 3, pl. 3*A* figs. 13-17; Augener, 1910: 247, fig. 7; Okuda, 1950: 49-50, figs. *a-b*. *Hipponoë Gaudichaudi* — Fauvel, 1914*f*: 89, pl. 1 figs. 2, 12; Fauvel, 1923*c*: 132, fig. 47*l-p*. *Hipponoe gaudichaudi* — Pettibone, 1963*a*: 57-59, fig. 13*a-b*; Gardiner, 1976: 103, fig. 5*l-m*; Salazar-Vallejo, 1992: 216-217, fig. 1*D-E*. *Hipponoa gaudichaudi agulhana* — Day, 1967: 122, fig. 3.1*a-e*. *Hipponoe gaudichaudi gigantea* — Hartmann-Schröder, 1981: 24-25, figs. 1-2. *Metamphinome multibranchiata* — Treadwell, 1940: 1-2, figs. 1-3. *Hipponoë multibranchiata* — Hartman, 1951*b*: 29, pl. 8 figs. 1-2. Not *Hipponoe cranchii* — Baird, 1870: 240, pl. 6 figs. 7-14 [= probably a juvenile *Amphinome*, according to Kudenov (1994)]. Not *Hipponoe elongata* — Treadwell, 1931: 3-4, figs. 10-12; Treadwell, 1939*b*: 177-178, fig. 11 [= most certainly a *Linopherus*-like species, according to Kudenov (1994)].

Distribution: Cosmopolitan in tropical and warm temperate oceans, on floating objects, and as commensal of *Lepas* sp., also attached to floating objects. Between 0-5320 meters.

Remarks: Kudenov (1994) provided a redescription and detailed study of this species, with a synonymy list which, in spite of not been exhaustive, updates numerous records of the species.

GENUS ***Linopherus*** Quatrefages 1866

Linopherus Quatrefages, 1866*b*: 407.

Type species: *Amphinome incarunculata* Peters 1854.

Synonyms: *Pseudeurythoe* Fauvel 1932.

Remarks: A key for the previously known species of *Linopherus* (as *Pseudeurythoe*) was provided by Fauchald (1972*a*).

Key to Species:

(adapted from Fauchald, 1972*a*):

1a. Branchiae from chaetiger 3..**2**
1b. Branchiae from chaetiger 4; five pairs of branchiae present; eyes indistinct...........................***L. hemuli***

2a (1b). More than twenty pairs of branchiae present; 2 small, inconspicuous eyes......***L. paucibranchiata***
2b (1b). Five to seven pairs of branchiae present; eyes clearly distinct.................................***L. canariensis***

Linopherus canariensis Langerhans 1881

Linopherus canariensis LANGERHANS, 1881: 109-110, pl. 4 fig. 14*a-g*;
TYPE LOCALITY: Puerto de la Orotava, northern Tenerife, Canary Islands.
SYNONYMS: *Linopherus fauchaldi* San Martín 1986.
SELECTED REFERENCES: *Linopherus canariensis* — FAUCHALD, 1977*b*: 12, fig. 1*a*; NÚÑEZ, BRITO & OCAÑA, 1991*a*: 473-475, fig. 3. *Linopherus fauchaldi* — SAN MARTÍN, 1986*a*: 21, figs. 6-7.
DISTRIBUTION: Amphiatlantic (Canary Islands, Panama, Cuba). Mesolittoral, on organogenic sand and algae.

Linopherus hemuli (Fauchald 1972)

Pseudeurythoe hemuli FAUCHALD**,** 1972*b*: 93-94, fig. 2*A-E*.
TYPE LOCALITY: Sognefjorden (Norway), south of Raudberg light, 61º03’N, 05º24’E, 1228-1248 meters, on clay.
SELECTED REFERENCES: *Pseudeurythoe hemuli* — GEORGE & HARTMANN-SCHRÖDER, 1985: 54, fig. 8.
DISTRIBUTION: Sognefjorden, Norway, 1228-1248 meters, on clay.

Linopherus paucibranchiata (Fauvel 1932)

Pseudeurythoe paucibranchiata FAUVEL, 1932*b*: 47-49, text-fig. 8*a-e*, pl. 1 figs. 3-4.
TYPE LOCALITY: Ain Musa, Gulf of Suez.
SELECTED REFERENCES: *Pseudeurythoe paucibranchiata* — FAUVEL, 1953*c*: 86, figs. 39-40.
DISTRIBUTION: Gulf of Suez.

GENUS ***Notopygos*** Grube 1855

Notopygos GRUBE, 1855: 93.
TYPE SPECIES: *Notopygos crinita* Grube 1855.
SYNONYMS: *Lirione* Kinberg 1857.

Notopygos megalops McIntosh 1885

Notopygos megalops MCINTOSH, 1885*a*: 17-19, pl. 1 fig. 1, pl. 2*A* figs. 3-4.
TYPE LOCALITY: Off Bermudas, at 30 fathoms (54.9 meters).
SELECTED REFERENCES: *Notopygos megalops* — HORST, 1911: 243; FAUVEL, 1914*f*: 91-92; FAUVEL, 1923*c*: 133, fig. 48*i-n*; MONRO, 1930: 30-31; HARTMAN, 1965*b*: 57; HARTMANN-SCHRÖDER, 1981: 25.
DISTRIBUTION: North Atlantic Ocean (littoral-350 meters); off Bermuda (50 meters, among corals); Aegean Sea.

GENUS ***Paramphinome*** M. Sars 1869

Paramphinome M. SARS, 1869: 254.
TYPE SPECIES: *Paramphinome pulchella* M. Sars 1869.
REMARKS: It is curious to point that the generic name *Paramphinome* was first published by M. SARS (1869) in association with a *nomen nudum*, *Paramphimone pulchella*. The specis was only fully described by M. Sars in a posthumous work (M. SARS *in* G.O. SARS, 1872).

Paramphinome jeffreysii (McIntosh 1868)

Hipponoë Jeffreysii MCINTOSH, 1868*a*: 250, figs. 7-9 [*nomen nudum*?; the figures 7-9 were cited by HARTMAN (1965*b*), but I was unable to find them, or any reference to them, in the original publication].

Type locality: St. Magnus Bay, off Shetland Islands, at 80-100 fathoms (146.3-183 meters).
Synonyms: *Paramphinome pulchella* M. Sars 1869.
Selected references: *Paramphinome jeffreysii* — Hartman, 1965*b*: 58, pl. 1 figs. *b-c*; George & Hartmann-Schröder, 1985: 50, fig. 6; Kirkegaard, 1992: 347-348, fig. 170; Hartmann-Schröder, 1996: 28. *Paramphinome pulchella* — M. Sars, 1869: 254 [*nomen nudum*]; M. Sars *in* G.O. Sars, 1872*b*: 45-49, pl. 4 figs. 19-35; Ehlers, 1875: 17, 31; McIntosh, 1900*a*: 222-223, text-fig. 15; Fauvel, 1914*f*: 88-89; Augener, 1933*b*: 186-187; Wesenberg-Lund, 1951: 23; Eliason, 1962*b*: 230; Pettibone, 1963*a*: 61-62, fig. 13*f-g*; Amoureux, 1973*a*: 435. *Amphinome vagans* [not Leach *in* Savigny 1822 = indeterminable, according to Hartman (1959*a*)] — McIntosh, 1869: 406-407, pl. 15 fig. 1.
References for Portugal: Amoureux, 1987 (as *Paramphinome pulchella*; off Porto).
Distribution: Northeastern Atlantic Ocean; Bermuda slopes; off northeast South America; Northwestern Atlantic Ocean; Norway; northern North Sea; Skagerrak; Kattegat. In muddy and sandy bottoms. Between 10-5000 meters.
Remarks: Amoureux (1973*a*) identified as *Paramphinome pulchella* M. Sars 1869 (later synonymized with *P. jeffreysii*) one single specimen collected at the Bay of Biscay (44º19.7'N, 2º17.8'W), at 890 meters, from a bottom of homogenous mud. This specimen was quite small (5-6 mm long, for 40 chaetigers), and showed all the features of the genus: prostomium with 3 antennae and 2 palps, small caruncle, and first chaetiger with 2 pairs of anteriorly directed ventral and transparent curved hooks. The specimen also showed only 6 pairs of branchiae, from the fourth parapodium, which approaches it to *P. jeffreysii*, in spite of its small size.

I have some doubts concerning the validity of the species *Hipponoe jeffreysii* McIntosh 1868. The species was named by McIntosh (1868*a*: 250) without a description: "Hipponoë Jeffreysii*, n.sp., a small Amphinomecean.*" Hartman (1965*b*) refers the existence of figures 7-9 in the same paper, dealing with the species, but I was unable to find such figures or any reference to them in the original paper. This way, in the 1868 publication the species appears as a *nomen nudum*. In a posterior paper, McIntosh (1869: 406) referred the "*Two very minute specimens (¼th of an inch in length), from St Magnus Bay* [in Shetland]" to "*Amphinome vagans*, Leach (?)". The same author (McIntosh, 1869: 407) stated: "*I had provisionally termed the two minute eyeless specimens from the Shetlands* Hipponoë jeffreysii*, but I think they may more correctly be grouped with the example last described* [*Amphinome vagans*]." This time it is given a full description of the species, together with drawings, all under the name *Amphinome vagans*. It seems clear the initial intention of the author to give provisionally the name *Hipponoe jeffreysii* to the specimens from Shetland, which was done as a *nomen nudum*, and later to attribute them to *Amphinome vagans*. The same species was named in 1869 by M. Sars (1869: 254) as *Paramphinome pulchella*. However, this is also a *nomen nudum*, as it is not accompanied by a description or a drawing of the species, nor to a published reference where the species was previously described. The species was only fully described and illustrated in M. Sars *in* G.O. Sars (1872*b*). This way, it seems that the first valid description of the species would be the one by M. Sars *in* G.O. Sars (1872*b*), as *Paramphinome pulchella*. However, as there is the possibility that the figures 7-9 in McIntosh (1868*a*) do exist, I maintain here the name of *Paramphinome jeffreysii* as the valid one for the species.

*GENUS ***Pareurythoe*** Gustafson 1930

Pareurythoë Gustafson, 1930: 308.
Type species: *Pareurythoë japonica* Gustafson 1930.

****Pareurythoe borealis*** (M. Sars 1862)

Eurythoe borealis M. Sars, 1862*a*: 58-59.
Type locality: Manger, Norway.
Synonyms: [?] *Pleïone vagans* Savigny 1822.
Selected references: *Eurythoe borealis* — Racovitza, 1896: 179, pl. 1 figs. 1-6; McIntosh, 1900*a*: 224, pl. 27 fig. 16, pl. 35 figs. 20-23, pl. 36 fig. 16; Fauvel, 1923*c*: 129, fig. 46*h-n*; Bellan, 1964*b*: 39. *Pareurythoë borealis* — Okuda, 1938: 78, figs. 1-2. *Pareurythoe borealis* — Pettibone, 1963: 60-61, fig. 13*c*; George & Hartmann-Schröder, 1985: 52, fig. 7. *Pareurythoe borealia* — Hartmann-Schröder, 1996: 28-29.
References for Portugal: Amoureux, 1974 (as *Eurythoe borealis*; off Porto).
Material: **FAUNA 1 — St. 33*A***, Alborán Sea, Alborán Island, 34-44 m, laminarians on rocks: 1 complete specimen, with about 18 chaetigers; caruncle reaches the beginning of the third chaetiger;

branchiae with digitiform branches; branchiae from chaetiger 2, with 3 branches, reaching 5 branches in the posterior chaetigers; dorsal and ventral cirri articulated; chaetae of several kinds: notochaetae: a) bifurcated, with unequal tines, in which the longer one is serrated, b) simple, thicker, denticulated as a harpoon, c) simple, capillary, with a small distal spur, from which the chaetae extends as a capillar spine with small denticles; neurochaetae: a) bifurcated, thicker than dorsal ones, and with well marked teeth (about 7), b) capillary chaetae similar to the notopodial *c)*.

DISTRIBUTION: North East Atlantic, off Chesapeake Bay; North Atlantic to the Mediterranean Sea; Aegean Sea; English Channel; northern North Sea; Norway; Japan. In all kinds of bottoms. Intertidal to 128 meters.

REMARKS: *Pleïone vagans* Savigny 1822 is also considered as a possible synonym of *Amphinome rostrata* (Pallas 1766).

In spite of some differences in relation to the available descriptions, I have identified the above specimen as *Pareurythoe borealis*.

The specimen is complete, with about 18 chaetigers, and with about 4.5 mm long and 1.5 mm wide. The caruncle is simple, smooth and sinuous, not wrinkled laterally, reaching the beginning of the third chaetiger. Branchiae from chaetiger 2 to the last segments of the body, with about 3 digitiform ramifications in the first segments, reaching up to 5 in the posterior ones. Dorsal and ventral cirri articulated. Anal cirri absent. Notochaetae of three kinds: a) thick harpoon-shaped, weakly serrated; b) bifurcated, with unequal tines, being the longest one serrated; c) thin, almost capillary, with a small basal spur, from which projects a serrated hairlike tip. Neurochaetae of two types: a) bifurcated and as thick as the bifurcated notochaetae but with a strongest serration of the longest tine, showing about 7 teeth; b) thin, like the above type c of notochaeta.

Pareurythoe borealis has been described as having 25-44 mm, which means that the specimen here described is probably a juvenile.

*FAMILY **APHRODITIDAE** Malmgren 1867

AS: *APHRODITIDÆ* MALMGREN, 1867*a*: 3.
TYPE GENUS: *Aphrodita* Linnaeus 1758.
SYNONYMS: *APHRODITACEA* Kinberg 1856; *PALMYRACEA* Kinberg 1858.
REMARKS: Aphroditidae are among the first polychaetes that were described following the binomial nomenclature proposed by Linné, in 1758. They are strong worms, sometimes reaching big sizes, with the dorsum covered by a felt which in many cases shows a characteristic iridescence.

In spite of reaching big sizes and being known for a long time, the biology of the family is poorly known. Information on reproduction is quite limited (DRASCHE, 1885; THORSON, 1946; PILLAI, 1965; WATSON-RUSSELL, 1989; GIANGRANDE, 1997; ROUSE, 2000*d*), and no development studies on the early stages of any species have been undertaken (HUTCHINGS, 2000*c*).

HUTCHINGS & MCRAE (1993) stated that smaller specimens (2-3 mm long) can not be reliably identified to species level, as inmature specimens and juveniles lack particular chaetal types, and no studies on chaetal development and other structures, such as palps and tentacles, with increasing size (and presumably age), have been carried out on this family. Chaetal structure and composition probably change markedly during the initial stages of development (HUTCHINGS & MCRAE, 1993), which makes identification of smaller specimens problematic, as while some of them may represent juveniles, other may represent undescribed species. A good knowledge of local Faunas and their ecological preferences may help in the elucidation of some identifications.

The main taxonomic characters of the family are discussed in HUTCHINGS & MCRAE (1993). Besides this work, recent taxonomic publications concerning the Aphroditidae include WATSON-RUSSELL (1990) and ROZBACZYLO & CANAHUIRE (2000), with the description of new species, the revision of the genus *Palmyra* by WATSON-RUSSELL (1989), the revision of the North East Atlantic and Mediterranean *Aphrodita* and *Aphroditella* by BARNICH & FIEGE (2000*b*), and the revision of the Mediterranean Aphroditidae by BARNICH & FIEGE (2003). An important reference paper on the family is also PETTIBONE (1966*a*).

Today the Aphroditidae includes 7 genera, with about 75 species considered to be valid (HUTCHINGS *et al.*, 2000). Three genera and eight species are known to occur in European and nearby waters. Among the studied material, the three genera were present with four species.

KEY TO GENERA:

(adapted from PETTIBONE, 1966*a*)

1a. Elytra covered by compact dorsal feltage (must be removed to see elytra); with some stout, dark, amber-colored protective notochaetae extending laterally or dorsolaterally; prostomium without ocular peduncles; neurochaetae of few anterior segments numerous, bipinnate....................................***Aphrodita****
1b. Elytra not covered by compact dorsal feltage (fine capillary chaetae may form slightly developed dorsal feltage); prostomium with ocular peduncles...**2**

2a (1b). Notochaetae including some dark, amber-colored protective chaetae with tips in form of barbed arrow (harpoon chaetae); some anterior neurochaetae bipinnate; neuropodial unidentate chaetae with denticles or a filamentous row of hairs on the terminal recurved surface................................***Laetmonice****
2b (1b). Notochaetae curved over dorsum, flattened, serrated; without harpoon chaetae; anterior neurochaetae with some extra teeth (not bipinnate)..***Pontogenia****

*GENUS *Aphrodita* Linnaeus 1758

Aphrodita LINNAEUS, 1758: 655.
TYPE SPECIES: *Aphrodita aculeata* Linnaeus 1758.
SYNONYMS: *Halithea* Savigny *in* Lamarck 1818; *Milnesia* Quatrefages 1866; *Aphroditella* Roule 1898.

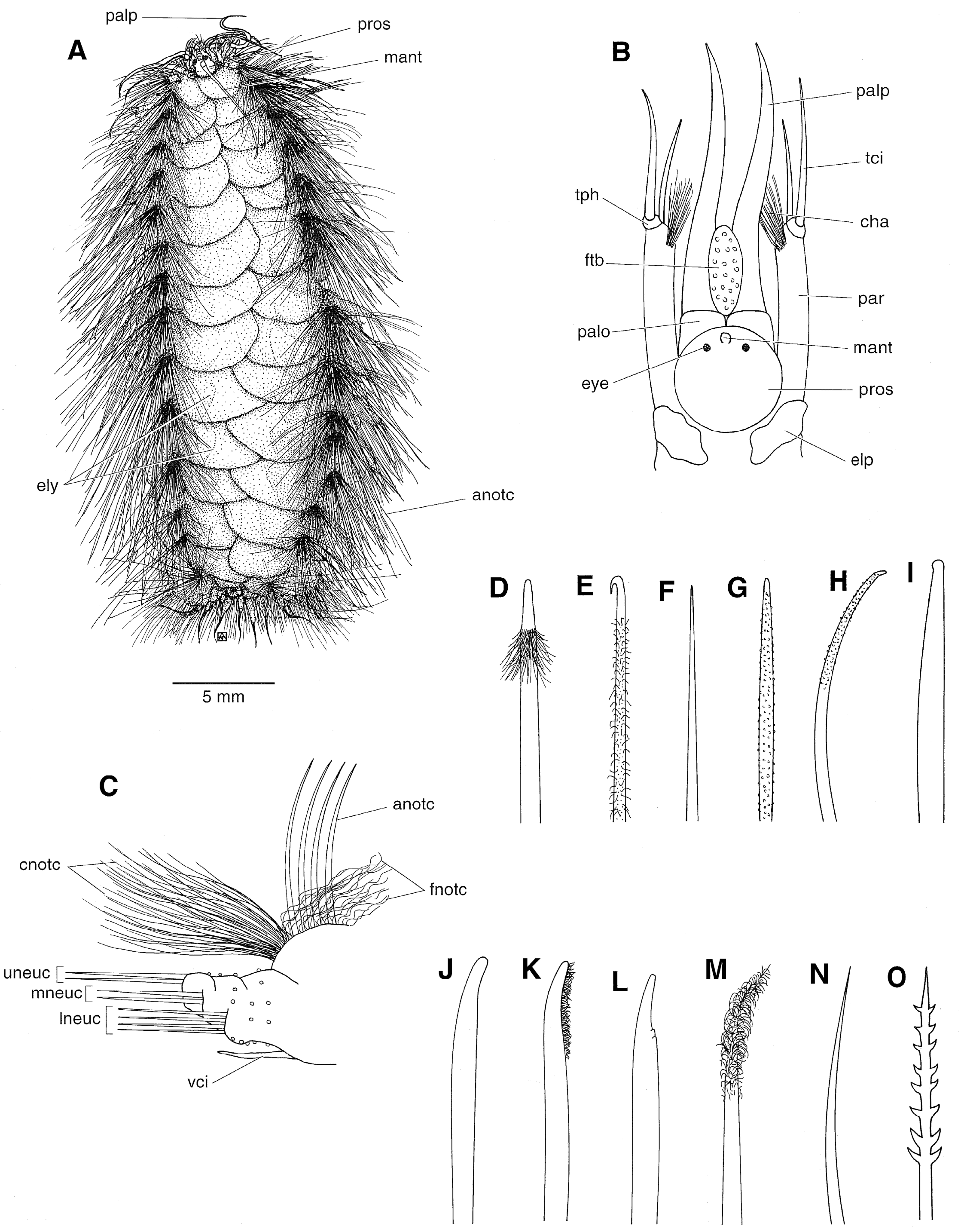

Figure legend: Family Aphroditidae. **A**, *Laetmonice* specimen, dorsal view of entire animal. **B**, **C**, morphological aspects of a generalised aphroditid: **B**, prostomium and first segment, dorsal view; **C**, parapodium, posterior view. **D**-**I**, notochaetal types of a generalised aphroditid: **D**, triangular tip with fine hairs radiating from expansion; **E**, hooked tip with fine hairs and tubercles; **F**, acicular, smooth; **G**, acicular, tuberculated; **H**, bent with distal region densely tuberculated; **I**, paleal-like, smooth. **J**-**O**, neurochaetal types of a generalised aphroditid: **J**, slightly curved tip; **K**, slightly curved tip with plumose margin; **L**, slightly curved tip with two small teeth; **M**, pilose tip; **N**, extended tip; **O**, bipinnate. **anotc**, acicular notochaeta; **cha**, chaetae; **cnotc**, capillary notochaetae; **elp**, elytrophore; **ely**, elytra; **eye**, eye; **fnotc**, felt notochaetae; **ftb**, facial tubercle; **lneuc**, lower tier of neurochaetae; **mant**, median antenna; **mneuc**, middle tier of neurochaetae; **palo**, palpophore; **palp**, palp; **par**, first parapodium; **pros**, prostomium; **tci**, tentacular cirrus; **tph**, tentaculophore; **uneuc**, upper tier of neurochaetae; **vci**, ventral cirrus. (Adapted from BEESLEY, ROSS & GLASBY, 2000; drawings by A. Murray).

KEY TO SPECIES:
(from BARNICH & FIEGE, 2000*b*)

1a. Lateral capillary notochaetae iridescent; acicular neurochaetae smooth or pilose (younger specimens), without lateral spine subdistally; felt covering elytra, but their silhouette still visible; acicular notochaetae dark, very stout, usually projecting from felt (large specimens)..***A. aculeata****
1b. Lateral capillary notochaetae not iridescent...**2**

2a (1b). Acicular neurochaetae usually pilose, without lateral spine subdistally; felt covering elytra very dense, silhouette of elytra not visible; acicular notochaetae tapering to fine hook-shaped tips, entangled in felt...***A. alta***
2b (1b). Acicular neurochaetae not pilose, but with lateral spine subdistally; felt covering elytra, but their silhouette still visible; acicular notochaetae tapering to acute tips, projecting from felt.........***A. perarmata***

**Aphrodita aculeata* Linnaeus 1758

Aphrodita aculeata LINNAEUS, 1758: 655.
TYPE LOCALITY: Western Europe: "*Habitat in Oceano*".
SYNONYMS: [?] *Halithea aurata* Risso 1826; [?] *Aphrodita borealis* Johnston 1840; [?] *Aphrodita echidna* Small 1912; [?] *Aphrodita sericea* Quatrefages 1866; [?] *Milnesia nuda* Quatrefages 1866.
SELECTED REFERENCES: *Aphrodita aculeata* — MCINTOSH, 1900*a*: 247-257, text-figs. 16-18, pl. 24 figs. 4-6, pl. 27 fig. 1, pl. 35 figs. 24-27, pl. 36 figs. 2-3, 10, 17-20, 22-23, pl. 37 fig. 1; CHAMBERS, 1985: 9-10, figs. 3*a*, 4*a*, 7; KIRKEGAARD, 1992: 30-31, fig. 6; HARTMANN-SCHRÖDER, 1996: 33-35, fig. 7 [in part; in part = *Aphrodita perarmata* Roule 1898, or *Laetmonice hystrix* (Savigny *in* Lamarck 1818), or both (see BARNICH & FIEGE, 2000*b*: 135)]; BÖGGEMANN, 1997: 13, fig. 1; CHAMBERS & MUIR, 1997: 60, fig. 7; BARNICH & FIEGE, 2000*b*: 132-136, figs. 1-2; BARNICH & FIEGE, 2003: 13-16, figs. 1-2, plate 1.1; IMAJIMA, 2003: 6-10, figs. 3-5. *Aphrodite aculeata* — FAUVEL, 1923*c*: 33-34, fig. 10*a-g* [in part; not *Aphroditella pallida* Roule 1898 in the synonymy list = *Aphrodita alta* Kinberg 1856]; FAUVEL, 1925*b*: 132-136, figs. 1-2 [in part; not *Aphroditella pallida* Roule 1898 = *Aphrodita alta* Kinberg 1856]; BELLAN, 1964*b*: 19, 21, fig. 1. [?] *Aphrodita borealis* — JOHNSTON, 1840*b*: 368-370, pl. 10.
REFERENCES FOR PORTUGAL: NOBRE, 1903*a* (coast of Porto); NOBRE, 1903*b* (Setúbal); FAUVEL, 1913*a* (as *Aphrodite aculeata*; off Cape Espichel); FAUVEL, 1914*f* (as *Aphrodite aculeata*; off Cape Espichel); CARVALHO, 1929 (as *Aphrodite aculeata*; Lisboa; Buarcos); HARTMANN-SCHRÖDER, 1977*a* (off Cape Sardão); MONTEIRO-MARQUES, 1979 (southern continental shelf of Algarve); CAMPOY, 1982: (previous records: Setúbal; Lisboa; Buarcos; Porto); MONTEIRO-MARQUES, 1987 (continental shelf of Algarve); DEXTER, 1992 (as *Aphrodite aculeata*; previous records: continental shelf of Algarve); SALDANHA, 1995 (Portugal); MACHADO & CANCELA DA FONSECA, 2007 (Algarve).
MATERIAL: FAUNA 1 — St. 0*A*, Galicia, off Cies Islands, Ria de Vigo, 82-96 m, unknown substrate: 1 complete specimen with 41 chaetigers. **St. 4*A***, Alborán Sea, between Rincón de la Victoria and Vélez-Málaga, 60 m, sand with mud: 9 complete specimens, 39-42 chaetigers. **St. 5*A***, Alborán Sea, off Veléz-Málaga, 67-68 m, mud: 7 complete specimens, 39-42 chaetigers, one with everted proboscis. **St. 6*A***, Alborán Sea, off Nerja, 70-74 m, sand with mud: 1 complete specimen, 40 chaetigers, juvenile, 30 mm long, 18 mm wide. **St. 8*A***, Alborán Sea, off La Herradura, Granada, 238-291 m, mud: 1 complete specimen, 41 chaetigers. **St. 69*A***, Gulf of Cádiz, off mouth of Guadiana, 110-112 m, mud: 1 complete specimen, 41 chaetigers, everted proboscis. **Unknown station (destroyed label)**: 1 complete specimen with 42 chaetigers. Some worms have Entoprocta in the interparapodial regions of some parapodia.
DISTRIBUTION: North Atlantic, both east and west; Mediterranean Sea; Adriatic Sea; Aegean Sea; Japan. Probably all the northern hemisphere (HARTMANN-SCHRÖDER, 1996). Records from the Adriatic Sea and Aegean Sea need to be verified due to confusion with *A. alta* and *A. perarmata* (BARNICH & FIEGE, 2000*b*). On muddy or sandy bottoms, in shallow waters to about 80 meters. Reported down to 260 meters in the Mediterranean, 3000 meters in the Atlantic, and 80-220 meters in Japan.
REMARKS: The genus *Aphrodita* comprises three different species in the North East Atlantic and Mediterranean waters (BARNICH & FIEGE, 2000*b*): *A. aculeata* Linnaeus 1758, *A. alta* Kinberg 1856 and *A. perarmata* Roule 1898. *A. aculeata*, however, can be easily distinguished from the other species by the presence of iridescent lateral capillary notochaetae. This identifying character is particularly useful in smaller specimens and juveniles, in which other chaetal details are still not fully developed.

HARTMANN-SCHRÖDER (1996) described the neurochaetae of juvenile *A. aculeata* as bearing tips either pilose or with accessory tooth subdistally, with or without additional small teeth between the larger one and the tip. As noted by BARNICH & FIEGE (2000*b*), neurochaetae with one subdistally lateral spine are characteristic of *A. perarmata*, while neurochaetae with one lateral spine and additional smaller teeth point to *Laetmonice hystrix* (Savigny *in* Lamarck 1818).

Aphrodita alta Kinberg 1856

Aphrodita alta KINBERG, 1856: 381.
TYPE LOCALITY: Rio de Janeiro (Brazil), 40º55'W, 22º30'S, 20-30 fathoms (36.6-54.9 meters).
SYNONYMS: *Aphrodita pallida* Roule 1898.
SELECTED REFERENCES: *Aphrodita alta* — DAY, 1967: 35, fig. 1.1.*m-q*; BARNICH & FIEGE, 2000*b*: 136-137, fig. 3; BARNICH & FIEGE, 2003: 16-18, fig. 3. *Aphrodite alta* — AMOUREUX, 1973*a*: 432-433; *Aphroditella alta* — ORENSANZ, 1972: 511-516, pl. 2, pl. 3 figs. 3-4, pl. 4; AMARAL & NONATO, 1982: 14-15, figs. 3-4. *Aphroditella pallida* — ROULE, 1898*a*: 191; ROULE, 1906: 15-18, pl. 1 figs. 1-2, pl. 2 fig. 8, pl. 7 figs. 53-54. *Aphrodite pallida* — BELLAN, 1962: 24, fig. 1*a*; BELLAN, 1964*b*: 19-21, fig. 1.
DISTRIBUTION: Off the Atlantic Spanish coast; Morocco; western Mediterranean Sea; off Brazil and Argentina; West Africa; Madagascar; Persian Gulf. Also reported from the Antarctic Ocean and South Africa, but these records need confirmation due to confusion with *A. aculeata* and *A. perarmata* (BARNICH & FIEGE, 2000*b*). In seagrass beds and on muddy bottoms. From 6 to 1482 meters.

Aphrodita perarmata Roule 1898

Aphrodita perarmata ROULE, 1898*a*: 190-191.
TYPE LOCALITY: Las Pilones, at 640 meters, together with *Lophoelia*.
SYNONYMS: *Aphrodite roulei* Horst 1917.
SELECTED REFERENCES: *Aphrodita perarmata* — ROULE, 1906: 12-15, pl. 1 fig. 5, pl. 3 fig. 20, pl. 7 figs. 47-48; FAUVEL, 1923*c*: 34, fig. 10*h*; BARNICH & FIEGE, 2000*b*: 137-139, fig. 4; BARNICH & FIEGE, 2003: 18. *Aphrodita roulei* — HORST, 1917: 261, figs. 1-3.
DISTRIBUTION: Northeast Atlantic; [?] Aegean Sea. At 640 meters, on corals.

*GENUS ***Laetmonice*** Kinberg 1856

Lætmonice KINBERG, 1856: 382.
TYPE SPECIES: *Laetmonice filicornis* Kinberg 1856.
SYNONYMS: *Hermione* Blainville 1828, nom. cons. [preoccupied in Diptera by *Hermione* Meigen 1800, however supressed by the I.C.Z.N. (1963: 339), = *Oxycera* Meigen 1803]; *Laetmatonice* Kinberg 1857; *Letmonicella* Roule 1898; *Halogenia* Horst 1916; *Hermonia* Hartman 1959.
REMARKS: The genus *Laetmonice* is the only in Aphroditidae to possess harpoon notochaetae, with a series of recurved fangs on the lateral margins (HUTCHINGS & MCRAE, 1993). The tips of these notochaetae can be covered by a transparent sheath, and the shafts may present spines, tubercles, or be smooth, and the number and arrangement of harpoon notochaetae may be a useful specific character, as it varies between species (HUTCHINGS & MCRAE, 1993). However, in juvenile specimens these harpoon notochaetae can be not fully developed, or even absent. According to HUTCHINGS & MCRAE (1993), the presence of harpoon notochaetae may represent an apomorphic state. This seems to be in agreement with the late appearance of this kind of chaetae during the ontogeny.

KEY TO SPECIES:

1a. Neuropodial unidentate chaetae with denticles on the terminal recurved surface..................***L. hystrix****
1b. Neuropodial unidentate chaetae with a filamentous row of hairs on the terminal recurved surface......**2**

2a (1b). Body with 15 pairs of elytra, notopodial capillary chaetae forming a thin layer of pseudo-felt; 34-36 chaetigers...***L. filicornis****
2b (1b). Body with more than 15 pairs of elytra (18-20 pairs), without felt; 43-47 chaetigers...***L. producta***

****Laetmonice filicornis*** Kinberg 1856

Laetmonice filicornis KINBERG, 1856: 382.
TYPE LOCALITY: West coast of Sweden.

SYNONYMS: *Lætmatonice Kinbergi* Baird 1865; *Letmonicella spinosissima* Roule 1898.

SELECTED REFERENCES: *Laetmonice filicornis* — MCINTOSH, 1900*a*: 258-262, pl. 24 fig. 9, pl. 27 fig. 2, pl. 36 figs. 1, 6-8, 12, 21, 24, pl. 37 figs. 2; CHAMBERS, 1985: 12-14, figs. 3*b*, 5*c*, 9, 10; KIRKEGAARD, 1992: 31-33, fig. 7; HARTMANN-SCHRÖDER, 1996: 36-37, fig. 8; CHAMBERS & MUIR, 1997: 64-65, fig. 9; BARNICH & FIEGE, 2003: 18-20, fig. 4. *Lætmatonice filicornis* — FAUVEL, 1923*c*: 36-38, fig. 12*a-f*. *Letmonicella spinosissima* — ROULE, 1898*a*: 191-192; ROULE, 1906: 23-25, pl. 2 fig. 9, pl. 3 figs. 15-17, pl. 7 figs. 55-56 [juvenile of *L. filicornis*, according to FAUVEL (1923*c*, p. 36)].

REFERENCES FOR PORTUGAL: AMOUREUX, 1974*b* (off Aveiro; off Porto); HARTMANN-SCHRÖDER, 1977*a* (off Cape Sardão); HARTMANN-SCHRÖDER, 1979*a* (western continental shelf of Algarve); CAMPOY, 1982: (previous records: Aveiro; Porto); GIL & SARDÁ, 1999 (as *Hermonia hystrix*; southwestern continental shelf).

MATERIAL: FAUNA 1 — St. 3*A*, Gulf of Cádiz, off Cádiz, 114-116 m, detritic: 6 complete specimens, 31-34 chaetigers; two specimens with Entoprocta. **St. 29*A***, Alborán Sea, Djibouti Bank, off Nerja, 400-411 m, mud: 1 complete specimen, 32 chaetigers. **St. 72*A***, Gulf of Cádiz, off Isla Cristina, 450-468 m, muddy sand: 4 complete specimens, 31-33 chaetigers. **St. 76*A***, Gulf of Cádiz, off Isla Cristina, 535-546 m, muddy sand: 2 complete specimens, juveniles; one very small and in bad condition, with 30 chaetigers; the second one even smaller, with about 22 chaetigers and 3.375 mm long; both present already the harpoonlike chaetae, but I wasn't able to see any tubercles in the surface of the chaetae.

DISTRIBUTION: From the North Atlantic to West India (HARTMANN-SCHRÖDER, 1996); Skagerrak; Kattegat; North Sea; British Channel; Gulf of Gascony; Northeast Atlantic; Mediterranean Sea; Adriatic Sea; Aegean Sea. On muddy bottoms. From 20 to 2000 meters, but recorded down to 5000 meters.

REMARKS: *Laetmonice filicornis* can be confused with *Laetmonice producta* Grube 1878, another species ocurring in European waters that shows a fringe of distal hairs on the inner end of the neurochaetae, above the basal spur. However, in European waters, *L. producta* has only been recorded in the East Atlantic (off Scotland, Irish Sea, and North Sea), and can be separated from *L. filicornis* by the presence of 18 to 20 pairs of elytra (against 15 in *L. filicornis*), and absence of felt (against presence of a thin layer of pseudo-felt).

****Laetmonice hystrix*** (Savigny *in* Lamarck 1818)

Halithea hystrix SAVIGNY *in* LAMARCK, 1818: 307-308.

TYPE LOCALITY: Mediterranean Sea.

SYNONYMS: *Hermione hystricella* Cuvier 1836; *Hermione fallax* Quatrefages 1866; *Hermione Kinbergi* Quatrefages 1866.

SELECTED REFERENCES: *Hermione hystrix* — MCINTOSH, 1900*a*: 264-270; pl. 24 figs. 7-8, pl. 36 figs. 9, 11, 13-15, pl. 37 figs. 4-8; FAUVEL, 1923*c*: 35-36, fig. 11. *Hermonia hystrix* — CHAMBERS, 1985: 11-12, figs. 4*b*, 5*a-b*, 8; HARTMANN-SCHRÖDER, 1996: 35-36; CHAMBERS & MUIR, 1997: 62-63, fig. 8. *Laetmonice hystrix* — BARNICH & FIEGE, 2003: 20-21, fig. 5, plate 1.2.

REFERENCES FOR PORTUGAL: BELLAN, 1960*a* (as *Hermione hystrix*; off Cape Roca); MONTEIRO-MARQUES, 1987 (as *Hermione hystrix*; continental shelf of Algarve); CAMPOY, 1982: (previous records: Portugal); DEXTER, 1992 (as *Hermione hystrix*; previous records: continental shelf of Algarve); present work (southwestern continental shelf).

MATERIAL: SEPLAT 6 — St. 359, NW mouth of Seixe River, 92 m, rock: 1 complete specimen, 34 chaetigers. **SEPLAT 7 (2nd part) — St. 193 (1st. try)**, south Sines, 70 m, rock: 1 complete specimen, 33 chaetigers. **St. 225 (A.3892)**, off Porto Covo, 40 m, rock: 1 complete specimen, 34 chaetigers. **FAUNA 1 — St. 13*A***, Alborán Sea, off Cape Sagra, Motril, 62 m, coarse gravel: 9 complete specimens, 32-34 chaetigers, biggest specimen 65 mm long, about 20 mm wide with parapodia; at least one specimen with Entoprocta; one specimen had one Syllidae located in the dorsal, between the elytra and the dorsum. **St. 17*A***, Alborán Sea, Alborán Island, 70-74 m, stones: 1 complete specimen, 32 chaetigers, about 22 mm long, still without harpoonlike chaetae. **St. 22*A***, Alborán Sea, Placer de las Bóvedas, off San Pedro de Alcántara, 30 m, coralligenous: 6 complete specimens, 33-34 chaetigers, can reach 5 cm long. **St. 23*A***, Alborán Sea, Placer de las Bóvedas, off San Pedro de Alcántara, 30-32 m, coralligenous: 2 complete specimens; bigger specimen, 34 chaetigers, about 4 cm long; smaller specimen a juvenile, about 2 mm long and 1.5 mm wide with parapodia, for 16 chaetigers, serrated margin of notochaetae difficult to see, harpoonlike chaetae still not present. **St. 42*A***, Alborán Sea, NE La Linea de la Concepción, 86-87 m, coastal detritic: 1 complete specimen, 33 chaetigers. **St. 43*A***, Gulf of Cádiz, near Rota, 20-24 m, rocks with white coral: 9 complete specimens, 31-34 chaetigers; one small specimen, 12.5 mm long, had already the harpoonlike chaetae well formed. **St. 44*A***, Gulf of Cádiz, off Cádiz, 25-26 m, mud: 4 complete specimens, 34 chaetigers. **St. 45*A***, Gulf of Cádiz, near Rota, 18 m, rocks with white coral: 2 complete specimens, 33 chaetigers. **St. 51*A***, Gulf of Cádiz, Placer de los Mártires, off Chiclana de la

Frontera, 27-28 m, rock and mud: 11 complete specimens, 33-34 chaetigers, biggest one 55 mm long for 23 mm wide, with parapodia. **St. 52*A***, Gulf of Cádiz, Placer de los Mártires, off Chiclana de la Frontera, 22-24 m, rock: 3 complete specimens, 33-34 chaetigers. **St. 55*A***, Gulf of Cádiz, off Cape Trafalgar, 38-42 m, gravel: 26 complete specimens, 33-35 chaetigers, biggest specimens about 5 cm long, 1.8-2 cm wide, with parapodia. **St. 57*A***, Gulf of Cádiz, off Cape Trafalgar, 76-80 m, gravel and stones: 15 specimens, complete, 30-34 chaetigers. **St. 61*A***, Gibraltar Strait, Tarifa, 39-44 m, rock: 1 complete specimen, 34 chaetigers, about 4 cm long. **St. 70*A***, Gulf of Cádiz, off Isla Cristina, 22 m, muddy sand: 18 complete specimens, 33-35 chaetigers, one specimen had a Lumbrineridae located between the dorsum and the elytra, in the posterior region of the body; another specimen had a Platyhelmintha in the same position. **Unknown station (destroyed label)**: 5 complete specimens, 34 chaetigers.

DISTRIBUTION: North Sea; English Channel; Irish Sea; North Atlantic; Mediterranean Sea; Adriatic Sea; Aegean Sea; Southern Africa; Red Sea; Indian Ocean. On gravel, coralligenous, *Posidonia* beds, and muddy, sandy or rough bottoms. Between 2-650 meters.

REMARKS: The problems related with the generic allocation of this species are described in detail in PETTIBONE (1966*a*), HUTCHINGS & MCRAE (1993), and BARNICH & FIEGE (2003). I follow CLAPARÈDE (1868), PETTIBONE (1966*a*), HUTCHINGS & MCRAE (1993), and BARNICH & FIEGE (2003), in that the presence or absence of a fringe of hairs between the basal spur and the tip of the neurochaetae are of specific importance, and not generic. This way, *Halithea hystrix* Savigny *in* Lamarck 1818 should be placed under the genus *Laetmonice*.

One of the specimens of St. 23A is a juvenile 1.5 mm wide (with parapodia), with the harpoonlike notochaetae still not developed. This confirms the stated by HUTCHINGS & MCRAE (1993; see above) on the difficulties of identifying small specimens, due to the late development of certain kinds of chaetae.

Many of the studied specimens presented dark spots, both dorsally and ventrally, forming distinct patterns. Harpoonlike chaetae was only observed in the parapodia bearing elytra.

Laetmonice producta Grube 1878

Laetmonice producta GRUBE, 1878*d*: 512-513.

TYPE LOCALITY: Kerguelen Island.

SELECTED REFERENCES: *Lætmatonice producta* — MCINTOSH, 1885*a*: 39-44, pl. 6 figs. 1-2, pl. 4*A* figs. 1-8; FAUVEL, 1923*c*: 38. *Laetmonice producta* — HORST, 1917: 54-56, pl. 13 figs. 1-3; IZUKA, 1912: 82-84, text-fig. page 83; CHAMBERS, 1985: 14-15, figs. 1*a*, 6, 11; HUTCHINGS & MCRAE, 1993: 333-336, figs. 45-46, 59*E*, tables 6, 8-9; IMAJIMA, 2003: 30-31, fig. 16. *Laetmonice producta* var. *Britannica* — MCINTOSH, 1900*a*: 262-264, pl. 36 figs. 4-5, pl. 37 fig. 3.

DISTRIBUTION: Kerguelen Island; Japan; Ireland; English Channel; around Scotland; Australia. On sandy bottoms. It has been generally found at big depths (300-2070 meters in Europe; 457-2377 meters in Australia; 76-320 meters in Japan), but it occurs also at low water (3 meters, Heard Island, Australia).

REMARKS: In order to separate *Laetmonice producta* from the similar species *L. filicornis*, see the *REMARKS* section under this later species.

The type locality of *L. producta* is the Kerguelen Islands (GRUBE, 1878*d*), but several varieties were described later, named or not (MCINTOSH, 1885*a*, 1900*a*; HORST, 1917; HUTCHINGS & MCRAE, 1993), with base on the general proportions of the prostomium and ocular peduncles, eye pigment, length and ornamentation of the chaetae, and the amount of papillation on the ventrum (HUTCHINGS & MCRAE, 1993). HUTCHINGS & MCRAE (1993) suggested that if these varieties were examined in detail probably they would be found to belong to separate species. This can be the case of *Laetmonice producta* var. *Britannica* McIntosh 1900, described from off Achill Head, at 914.4 meters (Achill Island, Ireland), and also recorded from off Shetland (355 meters) and at the continental slope surrounding the Gulf of Biscay (300-2070 meters). According to MCINTOSH (1900*a*) the European *Britannica* variety differs from the stem form of *L. producta* from the Kerguelen by some small details: 1) the prostomial posterior lateral papillae in the *Britannica* variety is only a small papillae, touching the base of the lateral cephalic swelling (see CHAMBERS, 1985: fig. 1*a*), while in the Kerguelen's form, it is a lobate flattened process, that reaches the base of the ocular peduncles; 2) the palps seem less robust in *Britannica* than in the stem form; 3) there are apparently more little papillae towards the tip of the palpi in the *Britannica* variety; 4) the tips of tentacular cirri are shorter in the *Britannica* than in the stem variety; 5) in the *Britannica* variety the segmental papillae are somewhat more distinct than in *L. producta* from Kerguelen; 6) the segmental papillae start from the posterior face of the fifth parapodia, extending to the 38 in the *Britannica* variety, while in the stem form, they start at the tenth foot and extend to parapodia 39; 7) finally, the reticulate cordate structure of the elytra are apparently better marked in the variety *Britannica* than in the stem form, "*forming a series of wavy lines like those on the sand of the sea-shore*"

(MCINTOSH, 1900*a*). In case this variety is considered to be a valid species, different from the stem form, its status should be raised to the species level, as *Laetmonice britannica* McIntosh 1900 stat.n., following article 45.6.4 of the I.C.Z.N.

*GENUS ***Pontogenia*** Claparède 1868

Pontogenia CLAPARÈDE, 1868: 367-368.

TYPE SPECIES: *Hermione chrysocoma* Baird 1865.

SYNONYMS: *Tricertia* Haswell 1883; *Pontogenessa* Monro 1924.

REMARKS: The species of *Pontogenia* present large flattened paleal notochaetae arched over the dorsum, normally described as being serrated. However, this is not always the case. These chaetae can be serrated along the margin, with spines, or be papillated, with one or more rows of small denticles along the axis of the chaetae, giving it the "serrated" appearance. In the case of the studied specimens of *Pontogenia chrysocoma* the notochaetae have along the curved margin small teeth, with the tips pointing upwards. In some chaetae it is possible to observe that these teeth are disposed in two alternated longitudinal rows.

KEY TO SPECIES:

1a. Ocular peduncles present (eyes stalked); median antenna and dorsal and ventral tentacular cirri articulated...***P. chrysocoma****

1b. Ocular peduncles absent or very reduced (eyes not stalked); median antenna and dorsal and ventral cirri smooth, not articulated...***P. sericoma***

****Pontogenia chrysocoma*** (Baird 1865)

Hermione chrysocoma BAIRD, 1865*c*: 178.

TYPE LOCALITY: Naples, Mediterranean Sea.

SYNONYM: *Aphrodite echinus* Quatrefages 1866.

SELECTED REFERENCES: *Pontogenia chrysocoma* — CLAPARÈDE, 1868: 368-371, pl. 1 fig. 3; FAUVEL, 1923*c*: 38-39, fig. 13; DAY, 1967: 35, fig. 1.1.*r*-*v*; BARNICH & FIEGE, 2003: 23, fig. 6, plate 1.3.

REFERENCES FOR PORTUGAL: CARVALHO, 1929 (Vila Nova de Milfontes; Sines); SALDANHA, 1974 (coast of Arrábida); CAMPOY, 1982: (previous records: Vila Nova de Milfontes; Sines); SALDANHA, 1995 (Portugal).

MATERIAL: FAUNA 1 — St. 33*A*, Alborán Sea, Alborán Island, 34-44 m, laminarians on rocks: 1 complete specimen, juvenile, with about 10 mm long for 28 chaetigers. **St. 56*A***, Gulf of Cádiz, off Cape Trafalgar, 24 m, rock and gravel: 2 complete specimens, juveniles; first specimen with about 25 chaetigers, in which is possible to see notochaetae of 3 kinds, a) flattened and marginally serrated, b) long and capillary, and c) short and capillary, and neurochaetae with curved tips, with spur, anterior ones sometimes with extra teeth, very small; second specimen very small, 2 mm long and 1 mm wide with parapodia, for about 14 chaetigers, notochaetae as above, and neurochaetae with various small teeth, between the spur and the tip; palps shorter than in other species of Aphroditidae; serrated notochaetae with teeth in the curved margin, disposed in two alternated longitudinal rows, with points directed upwards.

DISTRIBUTION: Mediterranean Sea; Adriatic Sea; Aegean Sea; off Portugal and Morocco; off South Africa, Zanzibar and Madagascar. Between stones and algae, in *Posidonia* beds, and on muddy and sandy bottoms, from 0 to 273 meters (BARNICH & FIEGE, 2003).

Pontogenia sericoma Ehlers 1887

Pontogenia sericoma EHLERS, 1887: 46-48, pl. 7 figs. 1-5.

TYPE LOCALITY: Off Havana, Cuba, at 80 fathoms (146.3 meters).

SELECTED REFERENCES: *Pontogenia sericoma* — FAUVEL, 1913*a*: 3; FAUVEL, 1914*f*: 35.

DISTRIBUTION: Atlantic Ocean: Ponta de Santo António (Azores), 54 meters; off Havana (Cuba), 146.3 meters.

FAMILY **APISTOBRANCHIDAE** Mesnil & Caullery 1898

AS: *APISTOBRANCHIENS* MESNIL & CAULLERY, 1898: 147.

TYPE GENUS: *Apistobranchus* Levinsen 1884.

REMARKS: The most important taxonomic paper concerning the family is still ORRHAGE (1962), complemented by BLAKE (1996*c*). ORRHAGE (1962) found that the *Apistobranchus* had a very slow ontogenesis, with the progressive development of of the interramal cirri of chaetiger 6, and also of the ventral lamella and notopodium of chaetiger 7. This way, it can be difficult to differentiate juvenile specimens of *A. tullbergi* from *A. tenuis*.

The family Apistobranchidae Mesnil & Caullery 1898, includes one single genus, *Apistobranchus* Levinsen 1884, and up to five valid species, depending upon authority and point of view (BLAKE, 1996*c*). No specimens were found among the studied material.

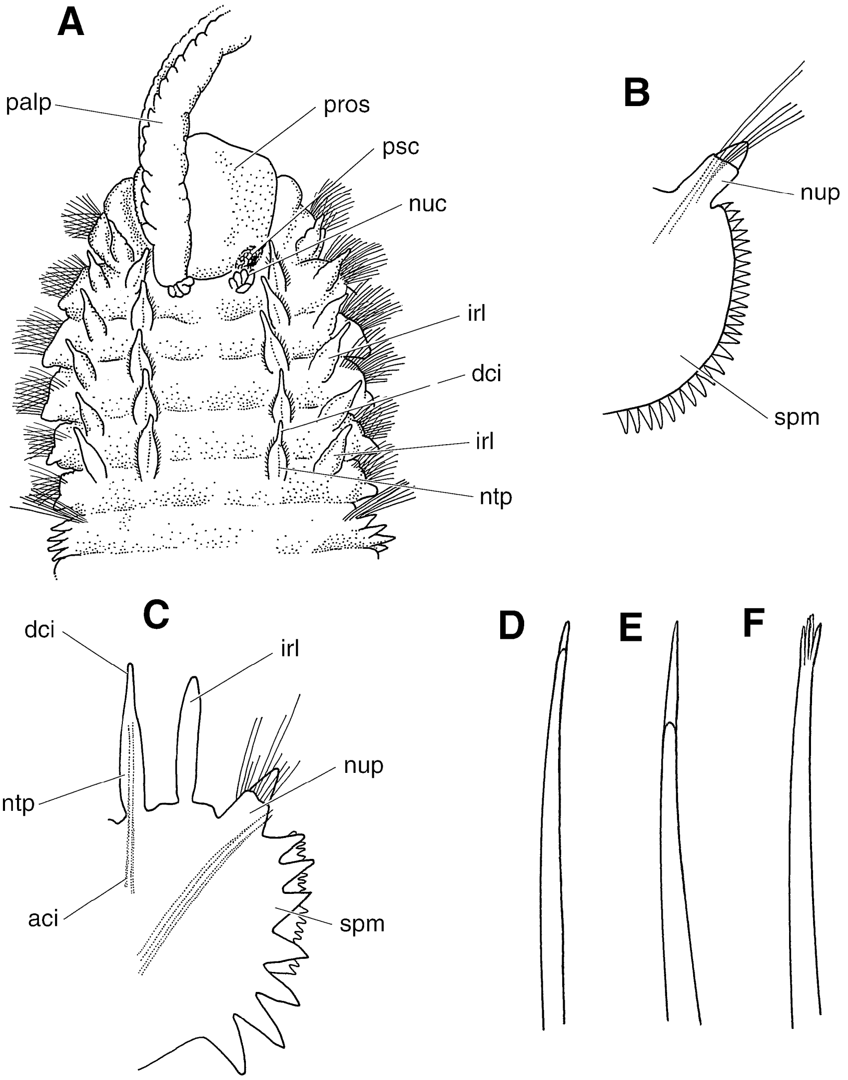

Figure legend: Family Apistobranchidae. **A**, *Apistobranchus* specimen, anterior end, dorsal view; right palp missing. **B**, **C**, parapodia of *Apistobranchus* specimen, showing marginal serrations of the subpodal membrane: **B**, parapodium of chaetiger 5, posterior view (notopodium and inter-ramal lobe not shown); **C**, parapodium of chaetiger 7, posterior view. **D**-**F**, *Apistobranchus* specimen, neurochaetae, variously worn. **aci**, acicula; **dci**, dorsal cirrus; **irl**, inter-ramal lobe; **ntp**, notopodium; **nuc**, nuchal organ; **nup**, neuropodium; **palp**, palp; **pros**, prostomium; **psc**, palpal scar; **spm**, subpodal membrane. (Adapted from BEESLEY, ROSS & GLASBY, 2000; drawings by K. Nolan).

GENUS *Apistobranchus* Levinsen 1884

Apistobranchus LEVINSEN, 1884: 114.

TYPE SPECIES: *Aricia Tullbergi* Théel 1879.

SYNONYMS: *Ethocles* Webster & Benedict 1887; *Scardaria* Wesenberg-Lund 1951.

REMARKS: LAUBIER (1964*c*) reported six specimens of *Apistobranchus*, all incomplete posteriorly and referred as belonging to several post-embryonary states, collected at 30-32 meters deep in the Bay of Troc (French Mediterranean coast), from a bottom of mud rich in organic debris. These specimens showed the neuropodia of chaetiger 4 with 1-3 lobes, and the interramal cirri and notopodia were anteriorly present only up to chaetiger 6. On 5 specimens the notopodia reappeared at chaetiger 11, and in one case at chaetiger 10, but only in one side. LAUBIER (1964*c*) did not make a specific identification, as the specimens showed characters of both *A. tullbergi* (presence of notopodia at chaetiger 10 or 11) and of *A. tenuis* (absence of interramal cirri and of notopodia at chaetiger 7). I have had the opportunity to examine specimens of *Apistobranchus* collected at the Western Mediterranean (Spain and France), but normally they were in a very poor condition. The biggest part of these specimens were unidentifiable, but some of them seemed to be *A. tullbergi*, a species reported to be present in the Mediterranean and Adriatic Seas (HARTMANN-SCHRÖDER, 1996). As I'm not positive about the identity of both Laubier's specimens and the specimens I have examined, I prefer not to include these records under any of the beneath species of *Apistobranchus*.

KEY TO SPECIES:
(adapted from BLAKE, 1996*c*; HARTMANN-SCHRÖDER, 1996)

1a. Notopodia present on all segments from chaetiger 2 except on the last few; interramal cirri present on chaetigers 1-7..***A. tullbergi***

1b. Notopodia present from chaetiger 2, then absent on chaetigers 6 or 7 to 10 or 11; interramal cirri on chaetigers 1-5 or 6...***A. tenuis***

Apistobranchus tenuis Orrhage 1962

Apistobranchus tenuis ORRHAGE, 1962: 429-436, 438, figs. 2-9, diagrams 1-3.

TYPE LOCALITY: 58º15.8'N, 11º15.9'E (Skagerrak), on thin mud with a little of sand, at 57 meters.

SELECTED REFERENCES: *Apistobranchus tenuis* — ORRHAGE, 1964*a*: 7-8; HARTMANN-SCHRÖDER, 1996: 346.

DISTRIBUTION: Skagerrak and Kattegat, on muddy bottoms, between 13-358 meters.

REMARKS: According to BLAKE (1996*c*) this species is possibly a neotenous phase of *A. tullbergi*, as the interramal cirri of some anterior chaetigers are missing.

Apistobranchus tullbergi (Théel 1879)

Aricia Tullbergi THÉEL, 1879: 45-48, pl. 3 figs. 40-43.

TYPE LOCALITY: Cape Grebeni (Vaygach Island, Arctic Ocean), 69º38'N, 59º53'E, 13-17 meters, on silty sand.

SYNONYMS: *Skardaria fragmentata* Wesenberg-Lund 1951.

SELECTED REFERENCES: *Apistobranchus Tullbergi* — EISIG, 1914: 523; ELIASON, 1920: 39-40. *Apistobranchus tullbergi* — FRIEDRICH, 1939*b*: 370-371, fig. 9; SOUTHWARD, 1956, 268, fig. 1*Q-T*; ELIASON, 1962*b*: 262; ORRHAGE, 1962: 427-429, 440, diagrams 4-6; ORRHAGE, 1964*a*: 7-8; HARTMANN-SCHRÖDER, 1971*a*: 282-284, figs. 94-95 [in part; in part = *A. tenuis* Orrhage 1962]; HARTMANN-SCHRÖDER, 1996: 346-348, fig. 159; KIRKEGAARD, 1996: 36-38, fig. 15 [in part; in part = *A. tenuis* Orrhage 1962]. *Skardaria fragmentata* — WESENBERG-LUND, 1951: 59-65, figs. 1-4, chart 30; MCINTYRE, 1961: 358-359.

REFERENCES FOR PORTUGAL: AMOUREUX, 1987 (off Aveiro).

DISTRIBUTION: Sea of Okhotsk; Arctic Ocean; Iceland; North Atlantic to the Mediterranean Sea; Adriatic Sea; Black Sea; northern North Sea; Skagerrak; Kattegat; Øresund; western Baltic Sea. On muddy bottoms. Between 5-360 meters.

*FAMILY **ARENICOLIDAE** Johnston 1835

AS: *ARENICOLIDAE* JOHNSTON, 1835*c*: 566.
TYPE GENUS: *Arenicola* Lamarck 1801.
SYNONYMS: *DORSALÉES* Lamarck 1818 [in part]; *TELETHUSÆ* Savigny 1822; *ARÉNICOLIENS* Audouin & Milne Edwards 1833; *BRANCHIOMALDANIDAE* Amoureux & Calvário 1981.
REMARKS: Important publications in Arenicolidae include the monograph by ASHWORTH (1912), where all the hitherto species were revised and illustrated in detail, including also an extensive synonymy list that should be consulted for synonymies anterior to 1912. Another important contribution to the knowledge of the Arenicolidae was performed by G.P Wells and collaborators, who studied extensively several aspects of the biology, ecology, taxonomy and distribution of the family in numerous papers (*e.g.*: HEALY & WELLS, 1959; WELLS, 1944, 1945, 1950, 1952, 1954*a*, 1954*b*, 1957, 1958*a*, 1958*b*, 1959, 1961, 1962, 1963*a*, 1963*b*; 1964). Particularly interesting is WELLS (1959), where the genera are redefined and the new genus *Abarenicola* erected. Recent publications on new taxa of Arenicolidae, posterior to the works by G.P. Wells, are scarse and include the revision of the genus *Branchiomaldane* with the description of a new species by FOURNIER & BARRIE (1987), the detection and posterior description of a new species of *Arenicola* by CADMAN & NELSON-SMITH (1990 and 1993, respectively), and finally the description of a second new species of *Branchiomaldane*, with an emended diagnosis of the genus by NOGUEIRA & RIZZO (2001). Other recent publications deal with new records of previously known species (IMAJIMA, 1988; GRAVINA & SOMASCHINI, 1991; RINGVOLD, VAN DER MEEREN & OUG, 2000).

Typically, in Arenicolidae any two chaetigerous annuli are separated by 4 ordinary annuli, so the number of annuli per segment is 5. However, in the anterior segments, normally in the first 3 segments, the number of annuli can be reduced. WELLS (1950) found that each species had a fairly constant and characteristic annulation formula as a result of various degrees of reduction of the annuli in the first segments, and gave to this fact taxonomic value. This way, WELLS (1950, 1957) proposed an *Annulation Formula*, composed by a series of numbers, using serial Roman figures to indicate the chaetigerous annuli, and Arabic figures for the intervening ordinary annuli. This way, for *Arenicola marina*, the *Annulation Formula* would be:

***i*.2. *ii*.3. *iii*.4. *iv*.4 *v*.4 (...)**

In the taxonomy of the Arenicolidae, besides the external morphology, other characters are normally used in order to define and separate species, as the internal anatomy, habitat and reproductive biology.

The family is actually composed by 4 genera, with 20 species and 11 subspecies considered to be valid. All the four genera are present in the European waters, represented by 8 species. Only one genus, represented by one single species, was present among the studied material.

KEY TO GENERA:

(adapted from: WELLS, 1959; FAUCHALD, 1977*a*):

1a. Body slender; branchiae first present from chaetiger 18, or later, as thick filaments arranged with maximally two or three in a tuft..***Branchiomaldane****
1b. Body thick; branchiae first present from a more anterior chaetiger as thick tufts of very fine filaments..**2**

2a (1b). Differentiated achaetous caudal end absent; first gill on chaetigers 12 to 16; neuropodia of the most anterior chaetigers long and closely approaching the mid-ventral line............................***Arenicolides***
2b (1b). Differentiated achaetous caudal end present; first gill on chaetiger 7 or 8; neuropodia of the most anterior chaetigers short, with their ventral ends not closely approaching the mid-ventral line...................**3**

3a (2b). Neuropodia of the hinder branchiate segments closely approach the mid-ventral line; a single pair of oesophageal caeca present..***Arenicola****
3b (2b). Neuropodia of the hinder branchiate segments do not closely approach the mid-ventral line, being well separated; more than one pair of oesophageal caeca present..................................***Abarenicola***

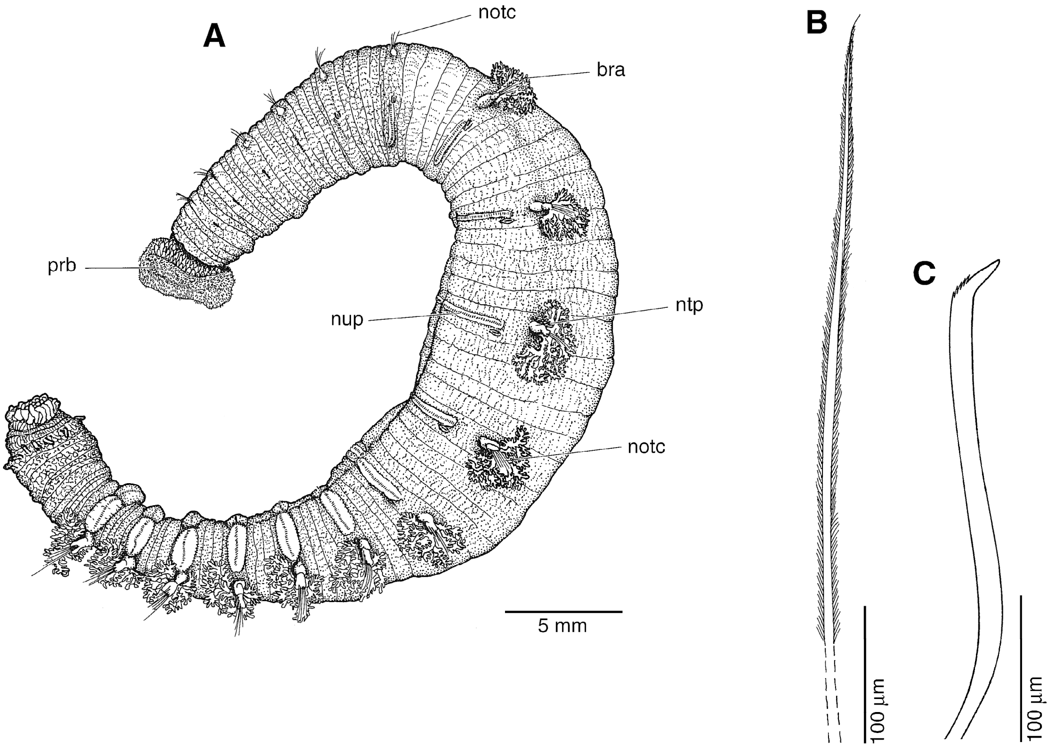

Figure legend: Family Arenicolidae. *Arenicola* specimen. **A**, entire animal, lateral view. **B**, pilose notopodial capillary from parapodium of chaetiger 3. **C**, neuropodial hook from parapodium of chaetiger 10. **bra**, tufted branchia; **notc**, notochaetae; **ntp**, notopodium; **nup**, neuropodium; **prb**, proboscis everted. (Adapted from Beesley, Ross & Glasby, 2000; drawings by A. Murray).

GENUS *Abarenicola* Wells 1959

Abarenicola Wells, 1959: 307-310, 311.

Type species: *Arenicola claparedii* Levinsen 1884.

Key to Species:

(adapted from Ashworth, 1912)

1a. Lateral lobes of prostomium of moderate size, not dilated or folded anteriorly; statocysts present, each with a tube leading to the exterior and with numerosous statoliths; *Annulation Formula* (from Wells, 1963*a*: fig. 4): *i*.2. *ii*.1. *iii*.4. *iv*.4 (...)..***A. affinis africana***

1b. Lateral lobes of prostomium large or very large, generally folded at their anterior end; statocysts absent, but otic grooves are present; the post-rostral region of the neuropodial crotchets is more dilated and convex than in the preceding species; *Annulation Formula* (from Wells, 1963*a*: fig. 7): *i*.1. *ii*.1. *iii*.3. *iv*.4 (...)...***A. claparedii***

Abarenicola affinis africana Wells 1963

Abarenicola affinis africana Wells, 1963*a*: 142, 146-147, text-figs. 3, 6*a-b*, pls. 1, 5.

Type locality: Lüderitz Bay (Angra Pequena Bay), Namibia.

Selected references: *Arenicola assimilis* var. *affinis* [not Ashworth 1903] — Ashworth, 1911*a*: 18-21, 23-25, text-figs. 4-5 [in part, only specimens from Lüderitz Bay; in part, specimens from Table

Bay = *Abarenicola gilchristi* Wells 1963]; ASHWORTH, 1912: 129. *Abarenicola affinis africana* — DAY, 1967: 611, fig. 29.1.*l-q*.

DISTRIBUTION: South West Africa; Cape. On mud above M.S.L., in protected bays; [?] Italy.

REMARKS: CASTELLI *et al.* (1995) record this species as being present in Italy, along the east coast of Sicilly.

Abarenicola claparedii (Levinsen 1884)

Arenicola Claparèdi LEVINSEN, 1884: 134.

TYPE LOCALITY: Bay of Naples, Mediterranean Sea.

SELECTED REFERENCES: *Arenicola Claparedi* — HORST, 1889*a*: 38-40, pl. 3 fig. 1. *Arenicola Claparedii* — LO BIANCO, 1893: 9-10, pl. 2 fig. 3; FAUVEL, 1899*c*: 175-176, figs. 1, 8; FAUVEL, 1927*a*: 163, fig. 57*k-n*. *Arenicola claparedii* — GAMBLE & ASHWORTH, 1900: 423-551, text-fig. page 542, pl. 23 figs. 23-25, pl. 24 figs. 26-27, 29, pl. 27, figs. 61-62 [in part; in part (Californian specimens) = *Abarenicola vagabunda oceanica* Healy & Wells 1959 (see HEALY & WELLS, 1959: 331)]; ASHWORTH, 1910*b*: 349-351 [in part; specimens from Japan and South Atlantic belong probably to different species]. *Abarenicola claparedii* — WELLS, 1963*a*: 150, figs. 1, 7-8, 10*a*. *Arenicola marina* [not Linnaeus, 1758] — CLAPARÈDE, 1869: 40-43, pl. 19 fig. 3. *Arenicola pusilla* [not Quatrefages 1866] — ASHWORTH, 1912: 114-123 [in part], text-figs. 8, 24*A*, pl. VII fig. 15, pl. VIII fig. 18, pl. X figs. 21-25; RIOJA, 1917*c*: 30-32, fig. 6. *Arenícola pusilla* [not Quatrefages 1866] — RIOJA, 1931: 166-168, pls. 53-54. Not *Arenicola claparedei* — JOHNSON, 1901: 421-422, pl. 14 figs. 143-144 [= *Abarenicola pacifica* Healy & Wells 1959; *Abarenicola vagabunda* Healy & Wells 1959; see HEALY & WELLS, 1959: 319-321]. Not *Arenicola claparedii* — ASHWORTH, 1903: 773-774 [specimen from Crescent City, California = *Abarenicola vagabunda oceanica* Healy & Ashworth 1959; specimen from Puget Sound, Washington = *Abarenicola pacifica* Healy & Wells 1959, or *Abarenicola vagabunda vagabunda* Healy & Wells 1959]. Not *Arenicola claparedii* — ASHWORTH, 1911*b*: 11-17, figs. 2-6 [= *Abarenicola pusilla* (Quatrefages 1866); *Abarenicola pacifica* Healy & Wells 1959; *Abarenicola vagabunda oceanica* Healy & Wells 1959; *Abarenicola vagabunda vagabunda* Healy & Wells 1959].

DISTRIBUTION: Atlantic coast of Europe; Mediterranean Sea; Adriatic Sea; Aegean Sea. Shallow water, to 5 meters.

REMARKS: *Abarenicola claparedii* (Levinsen 1884) was first described as *Arenicola*, and placed under synonymy with *Abarenicola pusilla* (Quatrefages 1866) by ASHWORTH (1910*a*, 1912), where it remained for several decades, in spite of the founded and justified objections by FAUVEL (1914*e*). *A. claparedii* was finally removed from this synonymy by WELLS (1954*a*), after discovering a second specimen of *A. pusilla*, and comparing the holotype with a series of specimens of *A. claparedii* from several localities. As stated by WELLS (1954*a*, 1963*a*), *A. pusilla* resembles *A. claparedii* in the shape of the prostomium, absence of statocysts, and shape of the neuropodial chaetae. However, they differ from each other in the following characters: (1) there are 5 pairs of nephridia in *A. claparedii* against 6 in *A. pusilla*; (2) in *A. claparedii* the most anterior neuropodia are the shortest, increasing the length rapidly when approaching the level of the first gill, while in *A. pusilla* the first neuropodium is almost of the same length then those of the branchiate region; (3) the anterior chaetigerous annuli is greatly expanded in *A. claparedii*, while in *A. pusilla* these annuli are not expanded, ressembling the majority of the arenicolid worms; (4) the *Annulation Formula* of *A. claparedii* is ***i*.1. *ii*.1. *iii*.3. *iv*.4. *v*.4 (...)**, while the *Annulation Formula* of *A. pusilla* is stated to be ***i*.2. *ii*.3. *iii*.4. *iv*.4. *v*.4 (...)** .

WELLS (1954*a*) considered that, by then, only two individuals of *Abarenicola pusilla* were known, both coming from Chile, being the type, from Coquimbo, and his own specimen, from Seno Reloncaví. All the other specimens recorded as *A. pusilla* in the Northern Hemisphere were referred to *A. claparedii* in European and Mediterranean waters, or to *A. pacifica* Healy & Wells 1959, *A. vagabunda vagabunda* Healy & Wells 1959, and *A. vagabunda oceanica* Healy & Wells 1959, in the Northern Pacific (WELLS, 1954*a*, 1963*a*; HEALY & WELLS, 1959).

*GENUS ***Arenicola*** Lamarck 1801

Arenicola LAMARCK, 1801: 324.

TYPE SPECIES: *Lumbricus marinus* Linnaeus 1758.

SYNONYMS: *Telethusae* Savigny *in* Lamarck 1818; *Clymenides* Claparède 1863; *Pteroscolex* Lütken 1864; *Chorizobranchus* Quatrefages 1866.

KEY TO SPECIES:

(adapted from: ASHWORTH, 1912; CADMAN & NELSON-SMITH, 1993)

1a. Seventeen chaetigerous segments; eleven pairs of gills, the first on the seventh segment; gills large, pinnate......***A. cristata***
1b. Nineteen chaetigerous segments; thirteen pairs of gills, the first on the seventh segment; gills either bushy (dendritic) or pinnate......**2**

2a (1b). Gills pinnate, with more and longer main stems and side branches; palmar membrane present; interval between chaetiger 2 and 3 divided in two rings; longer worms (mean total length 18.12 cm, according to CADMAN & NELSON-SMITH, 1993); lower position on the shore; J-shaped burrows......***A. defodiens***
2b (1b). Gills dendritic, with fewer and shorter main stems and side branches; no palmar membrane; interval between chaetigers 2 and 3 divided in three rings; shorter worms (mean total length 11.22 cm, according to CADMAN & NELSON-SMITH, 1993); higher position on the shore; U-shaped tubes......***A. marina****

Arenicola cristata Stimpson 1856

Arenicola cristata STIMPSON, 1856: 114.
TYPE LOCALITY: Shore of Maurice Island, at the entrance of Charlestown Harbour, South Carolina.
SYNONYMS: *Arenicola antillensis* Lütken 1865.
SELECTED REFERENCES: *Arenicola cristata* — HORST, 1889*a*: 40-42, pl. 3 figs. 6-11; ANDREWS, 1891: 289-290; LO BIANCO, 1893: 11-12, pl. 1 fig. 1, pl. 2 fig. 1, pl. 3 figs. 5-6; FAUVEL, 1899*c*: 169-171, fig. 5; GAMBLE & ASHWORTH, 1900: 423-550, text-fig. page 542, pl. 22 figs. 1-2, pl. 23 figs. 13-17, pl. 24 fig. 30-33, pl. 29 fig. 81; ASHWORTH, 1911*b*: 21-24, fig. 9; ASHWORTH, 1912: 105-111, text-figs. 7, 12, 25-26, 40, pl. 5 figs. 12-13, pl. 8 fig. 17, pl. 10 fig. 30, pl. 13 figs. 41-42; FAUVEL, 1927*a*: 163-164, fig. 57*o-r*; WELLS, 1961: 2-10, figs. 1-2, pls. 1-4. *Arenicola (Pteroscolex) antillensis* — LÜTKEN, 1865: 120; EHLERS, 1887: 173.
DISTRIBUTION: Northeastern coast of the USA, from Massachusetts to South Carolina; Bermudas; Eastern Gulf of Mexico; St. Croix, Jamaica and Curaçao, West Indies; Naples, Western Mediterranean Sea (rare). On shore or at shallow water, generally on muddy sand, occupying more inner waters and salt water ponds with salt marshes nearby.

Arenicola defodiens Cadman & Nelson-Smith 1993

Arenicola defodiens CADMAN & NELSON-SMITH, 1993: 214-220, figs. 1, 2*A*, *C*, 3*A*, 4*A*, *C*, table 1.
TYPE LOCALITY: Pembrey, Dyfed, south-west Wales (United Kingdom), below mid-tide level, on sand.
SELECTED REFERENCES: *Arenicola marina* [not Linnaeus 1758] — GAMBLE & ASHWORTH, 1898: 1-36, pl. 1 figs. 1-2, pl. 2 fig. 5, pl. 3 figs. 12-14 [in part; "*Laminarian* variety"; not "littoral variety" and not pl. 1 figs. 3-4, pl. 3 figs. 6-11, 15-17, pls. 4-5 = *Arenicola marina* (Linnaeus 1758)]; ASHWORTH, 1912: 59, 65, 97, 108 ["*Laminarian* form"].
DISTRIBUTION: South-east England, Swansea Bay, Gower Peninsula, Dyfed, Lancashire coast, Northumberland, and Firth of Forth (Great Britain); Jersey (English Channel); Northwest coast of France; North Sea coast of Germany. On exposed sandy shores, at mid-tide level or below, extending sub-tidally to an unknown depth.
REMARKS: See the *REMARKS* section under *Arenicola marina*.

**Arenicola marina* (Linnaeus 1758)

Lumbricus marinus LINNAEUS, 1758: 648.
TYPE LOCALITY: "*Habitat in fundo Maris, sub arena*". Probably Sweden, in sand.
SYNONYMS: *Lumbricus papillosus* O.F. Müller 1776; *Nereis lumbricoides* Pallas 1788; *Arenicola piscatorum* Lamarck 1801; *Arenicola carbonaria* Leach 1816; *Arenicola tinctoria* Leach 1816; *Arenicola clavatus* Ranzani 1817; *Clymenides sulphurea* Claparède 1863; *Arenicola papillosa* Quatrefages 1866.
MATERIAL: Holotype of *Arenicola carbonaria* Leach 1816, deposited in the British Museum (Natural History), with specimen number 1953.5.27.1. Locality: Black Rock, Firth of Forth.
SELECTED REFERENCES: *Arenicola marina* — SAINT-JOSEPH, 1894: 121-129, pl. 6 figs. 158-159; MESNIL, 1897*b*: 163, pl. 6 figs. 17-18; GAMBLE & ASHWORTH, 1898: 1-36, pl. 1 figs. 3-4, pl. 3 figs. 6-11, 15-17, pls. 4-5 [in part; "littoral variety"; not "*Laminarian* variety" and not pl. 1 figs. 1-2, pl. 2 fig. 5, pl. 3 figs. 12-14 = *Arenicola defodiens* Cadman & Nelson-Smith 1993]; FAUVEL, 1899*a*: 307-308, text-fig.

2, table page 313; FAUVEL, 1899*c*: 171-174, figs. 6-7; GAMBLE & ASHWORTH, 1900: 422-552, text-fig. page 542, pl. 23 figs. 8-12, pl. 24 fig. 34, pl. 25 figs. 42-43, pl. 27 fig. 63, pl. 29 fig. 80; ASHWORTH, 1910*a*: 112; ASHWORTH, 1910*b*: 348-349; ASHWORTH, 1912: 86-102, text-figs. 9, 13, 17-20, 31, 37, 42*A-B*, pl. 1, pl. 4 fig. 10, pl. 10 figs. 26-28, pl. 12 figs. 39-40, pl. 13 figs. 43, 46, pl. 14 figs. 47-48 [in part; not "*Laminarian* form", page 97]; FAUVEL, 1927*a*: 161-162, fig. 57*a-i* [in part; not *Nota* on the variety described by GAMBLE & ASHWORTH (1898) = *Arenicola defodiens* Cadman & Nelson-Smith 1993]; HARTMANN-SCHRÖDER, 1996: 446-448, fig. 219; KIRKEGAARD, 1996: 183-186, fig. 94; RINGVOLD, VAN DER MEEREN & OUG, 2000: fig. 1*B*. *Arenícola marina* — RIOJA, 1931: 164-166, pl. 52. *Arenicola carbonaria* — LEACH, 1816: 452, pl. 26. *Arenicola tinctoria* — LEACH, 1816: 452. *Clymenides sulphurea* — CLAPARÈDE, 1863: 30-31. *Clymenides sulfurea* — CLAPARÈDE, 1863: 118, pl. 15 figs. 24-27. *Clymenides sulfureus* — MESNIL, 1896*b*: 388-390; MESNIL, 1897: 148-152, 163, text-fig. 3, pl. 6 figs. 5-11. *Arenicola piscatorum* — JOHNSTON, 1865: 229-231, 344.

REFERENCES FOR PORTUGAL: NOBRE, 1903*a* (Mouth of Douro); ASHWORTH, 1912 (previous records: Mouth of Douro); NOBRE, 1937 (Setúbal); SALDANHA, 1995 (Portugal).

DISTRIBUTION: Arctic; North Pacific; Eastern coast of North America; Northeastern Atlantic to Mediterranean Sea; Adriatic Sea; Black Sea; English Channel; North Sea; Skagerrak, Kattegat; Öresund; western Baltic Sea. In closed beaches with a considerable portion of decomposing organic matter, like in estuaries. Intertidal to 20 meters.

REMARKS: An extensive list of references of *Arenicola marina* previous to 1912 is given in ASHWORTH (1912).

For many years anglers and bait diggers in Britain have differentiated between two forms, varieties or types of the common lugworm *Arenicola marina*, which is largely used as a bait species. The forms were normally referred to as "lugs" or "worms" (GAMBLE & ASHWORTH, 1898), or more recently as "blow lugs" (or "red lugs") and "black lugs" (CADMAN & NELSON-SMITH, 1990). Their earliest mention in the scientific literature appears to be by GAMBLE & ASHWORTH (1898).

GAMBLE & ASHWORTH (1898) differentiated two "varieties" of *Arenicola marina* from the coast of Lancashire, calling them "*littoral*" and "*Laminarian*", with base mainly on their habits, morphology, and times of maturity. This way, the "*littoral*" variety would be present from the high-water mark down to the beginning of the Laminarian zone, sinking their **U**-shaped burrows to a depth that could reach 0.5 meters, with a colour stated to vary from greenish brown to reddish black, according to the amount of muddy organic matter in the sand, gills with 9-11 pairs of branches, each one with 3-5 pairs of short lateral twigs, and reaching the maturation in July and August on the Lancashire coast. The second variety, called "*Laminarian*", occurred at the upper part of the Laminarian zone, being obtained only at low spring-tides, were normally black or very dark brown, with very large vertical burrows of about 1 meter, gills with about 12 branches united by a connecting membrane at their bases, and bearing 10 or more pinnules on each side of the main axis. This variety was stated to be fully mature from February to May at the Lancashire coast.

The existence of two varieties in *Arenicola marina* was dealed again by ASHWORTH (1912), who separated again the species in the "*littoral*" and the "*Laminarian*" varieties, according to their habit and nature of the gills. This way, and according to ASHWORTH (1912: 97):

"*Specimens taken in the littoral zone* [...] *are generally found in **U**-shaped burrows* [with one end terminating in the funnel and the other being indicated by the casting]*, have bushy gills* [...]*, and average 180 to 230 mm. in length; but occasionally larger specimens, up to 360 mm. in length, are obtained.*

*Specimens from the upper part of the Laminarian zone, which can be readily obtained only at very low tides, are found in vertical or **L**-shaped burrows* [where the worms are invariably found head downwards]*, and generally possess pinnate gills* [...]. *Laminarian examples are more massive than those from the littoral zone, and attain a length of 400 mm., and a girth, at the widest part, of about 70 mm. Besides the difference in the character of the gills* [...]*, the Laminarian differs usually from the littoral form in the subdivision of the interval between the second and third chaetiferous annuli: in littoral examples this region is almost invariably divided into three rings, while in Laminarian specimens only two rings are indicated. The Laminarian form has been found on the Lancashire coast, in the Firth of Forth, in Salcombe Estuary (S. Devon), in Jersey, on the north-west coast of France, the North Sea coast of Germany, and is represented by two specimens in the British Museum, from Deal.*"

WELLS (1957) did not consider this distinction valid, and subsequently it seems to have disappeared from literature, until CADMAN & NELSON-SMITH (1990) gave again support to the existence of two different forms of *Arenicola marina*. These authors showed that the two forms should be considered as separate species on the basis of genetic evidence (using isozyme analysis). These results, together with further morphological and ecological evidence that also indicated that the two forms of

Arenicola present on British shores should be considered as two separate and distinct species, conducted to the description of the "*Laminarian*" variety as a valid species by CADMAN & NELSON-SMITH (1993), as *Arenicola defodiens*. The validity of the species is at present fully established (CADMAN, 1997; WATSON *et al.*, 1998, 2007).

CADMAN & NELSON-SMITH (1993) stated a colour variation amongst the black lug or *Arenicola defodiens*. This way, while the great majority of the worms were dark or black in colour, occasionally it was possible to collect yellow worms and, very rarely, light brown worms. These worms are normally smaller in size, and as stated by the same authors, they may have been unpigmented worms in which the very bright yellow celomic or epidermal fluid is viewed through a colourless epidermis.

The fact that *Arenicola defodiens* was in general black or very dark, together with the fact that its known distribution included the Firth of Forth, raised the possibility that *Arenicola carbonaria*, a dark species described by LEACH (1816) from the Firth of Forth, and normally considered as a synonym of *A. marina*, could be the same species than the described by CADMAN & NELSON-SMITH (1993).

The holotype of *Arenicola carbonaria* Leach 1816 is deposited at the the Natural History Museum (London), with the specimen number 1953.5.27.1. Locality: Black Rock, Firth of Forth.

The specimen is in a fair condition, good if we take in account its age. The epithelium is loose, detached from the body in the biggest part of the surface. The neuropodial hooks are generally attached to this epithelium. In the vial were present some fragments of the epithelium, one of which had some neurohooks attached. There's an artificial hole that crosses the anterior region of the specimen from side to side (made to remove the statocysts?).

Colour of the specimen is dark brown.

The specimen is complete, but broken in 4 main pieces: the head, the thorax and one fraction of the tail form the biggest piece; the second piece is formed by another fraction of the tail; the third and fourth pieces are also tail portions, and are kept together by the epithelium and other portions of tissue, and include the anus. All the tail portions show points of weak connection and possible future fragmentation in smaller pieces. Total length of 16.3 cm.

The head is 0.4 mm long, and includes the prostomium (partially invaginated, making it difficult to see the trilobated prostomium), the peristomium (which includes the mouth opening with the proboscis partially everted, with proboscidial papillae), and one achaetous bilobated segment.

The thorax is 10 cm long, and 0.9 cm wide in the abranchiate region and 0.8 cm in the branchiate region. The first 6 chaetigers are abranchiate. Branchiae start at chaetiger 7, being the first pair of branchiae small. There are 13 branchiate chaetigers, making a total number of 19 chaetigerous segments. Nephridial pores are present in chaetigers 5-9 (6 pairs of pores). Thoracic segments are externally sub-divided into annulations. With exception of the first two chaetigers, the annulation pattern of each segment consists in one larger ring, which bears the parapodia (and the branchiae in the last 13 chaetigers), and 4 smaller annulations, between following chaetigerous rings. Between the first and the second chaetigerous rings there are only 2 achaetigerous annulations, and between the second and third chaetigerous rings, 3 achaetigerous annulations. Using the *Annulation Formula* proposed by WELLS (1957), we would have:

i*.2 *ii*.3 *iii*.4 *iv*.4 ... *xviii*.4 *xix,

where the Roman numerals refer the number of the chaetigerous annulations, and the Arabic numerals the number of achaetigerous annulations present between successive chaetigerous rings.

Branchiae are bushy and composed by a a number of main stems (up to 15), which originate from a crescentic fold. This crescentic fold forms a reduced palmar membrane between the bases of the gill axes, which covers less than half of the length of the gill stems. The gills are dendritic, with short main stems and side branches (see ASHWORTH, 1912: plate 13, fig. 43).

The total length of the tail is 5.9 cm, and the width 0.5 cm. The length in distributed by the following pieces, from the anterior to the posterior region: (head fragment) 0.5 cm + 2.4 cm + 1.7 cm + 1.3 cm (anus).

From the description it is possible to state that the holotype of *Arenicola carbonaria* Leach 1816 fits the description of *Arenicola marina* (Linnaeus 1758), being a junior synonym of this species. It represents a dark-coloured specimen of *A. marina*.

GENUS *Arenicolides* Mesnil 1898

Arenicolides MESNIL, 1898: 638.
TYPE SPECIES: *Arenicola ecaudata* Johnston 1835.

KEY TO SPECIES:
(from ASHWORTH, 1912)

1a. First gill on the sixteenth chaetigerous segment; thirteen pairs of nephridia opening on the fifth to the seventeenth segments; gonads large...***A. ecaudata***
1b. First gill on the twelfth chaetigerous segment; five pairs of nephridia opening on the fifth to the ninth segments; gonads small...***A. branchialis***

Arenicolides branchialis (Audouin & Milne Edwards 1833)

Arenicola branchialis AUDOUIN & MILNE EDWARDS, 1833*d*: 422, pl. 22 fig. 13.
TYPE LOCALITY: Near Saint-Malo (Northern France, English Channel).
SYNONYMS: *Arenicola cyaneus* Czerniavsky 1868; *Arenicola Grubii* Claparède 1869; *Arenicola Bobretzkii* Czerniavsky 1881; *Arenicola dioscurica* Czerniavsky 1881.
SELECTED REFERENCES: *Arenicola branchialis* — JOHNSTON, 1865: 231, 345; MESNIL, 1898: 631-634; MESNIL, 1899*a*: 318-321; ASHWORTH, 1912: 138-147, text-figs. 3, 16*B*, 30, 35, 41, 42*c*, pl. 2 figs. 5-6, pl. 9 fig. 20, pl. 15 fig. 51; RIOJA, 1917*c*: 32. *Arenícola branchialis* — RIOJA, 1931: 170, pl. 55, pl. 56 figs. 1-4. *Arenicola Grubii* — CLAPARÈDE, 1869: 36-40, pl. 19 fig. 2; HORST, 1889*a*: 43-44, pl. 3 figs. 12-15; LO BIANCO, 1893: 10, pl. 2 fig. 2; FAUVEL, 1898: 734; FAUVEL, 1899*a*: 292-294, pl. 3 figs. 17-23, table page 313; FAUVEL, 1899*c*: 166-168, fig. 4; GAMBLE & ASHWORTH, 1900: 424-552, text-fig. page 542, pl. 22 figs. 3, 5-6, pl. 23 fig. 22, pl. 25 figs. 38-41, 44, pl. 26 figs. 53-54, pl. 28, pl. 29 fig. 79; ASHWORTH, 1909: 2; FAUVEL, 1909: 8-9; FAUVEL, 1914*f*: 254; ASHWORTH, 1910*a*: 113-114; FAUVEL, 1927*a*: 165-166, fig. 58*a-d*. *Arenicola grubii* — ASHWORTH, 1910*b*: 353-354.
REFERENCES FOR PORTUGAL: ASHWORTH, 1912 (as *Arenicola branchialis*; previous records: Berlengas; Praia da Granja); FAUVEL, 1909 (as *Arenicola Grubii*; Berlengas); FAUVEL, 1914*f* (as *Arenicola Grubii*; Berlengas); RIOJA, 1917*c* (as *Arenicola branchialis*; previous records: Berlengas; Praia da Granja, near Porto); [?] CARVALHO, 1929 (as *?Arenicola Grubii*; Sines); RIOJA, 1931 (as *Arenicola branchialis*; previous records: Berlengas and near Porto).
DISTRIBUTION: English Channel; Ireland; Atlantic coast of France; northern Spain; Portugal; Atlantic coast of Morocco; Mediterranean Sea; Adriatic Sea; northern Black Sea. In coarse, sandy or gravelly material, among stones, in about the mid-littoral zone, normally in organic enriched sediments

Arenicolides ecaudata (Johnston 1835)

Arenicola ecaudàta JOHNSTON, 1835*c*: 568-569, fig. 54.
TYPE LOCALITY: Berwick Bay (Berwick-upon-Tweed, Northumberland, NE England), burrowing in the sand in holes of about 2 feet (0.6 meters), prefering locations near the low-water mark.
SYNONYMS: *Arenicola Bœckii* Rathke 1843; *Arenicola bucci* Hanna 1898; *Clymenides ecaudatus* Mesnil 1897.
SELECTED REFERENCES: *Arenicola ecaudata* — JOHNSTON, 1865: 231-232, 345, fig. 66; FAUVEL, 1898: 733-734; MESNIL, 1898: 631-635; FAUVEL, 1899*a*: 285-288, 294-296, 297-300, text-fig. 1, pl. 3 figs. 1-16, table page 313; FAUVEL, 1899*b*: 64-93, pl. 1; FAUVEL, 1899*c*: 163-165, fig. 2; MESNIL, 1899*a*: 318-323; GAMBLE & ASHWORTH, 1900: 423-553, text-fig. page 542, pl. 22 figs. 4-5, 7, pl. 23 figs. 18-21, pl. 24 figs. 35-37, pl. 25 fig. 45, pl. 26 figs. 46-52, pl. 27 figs. 63*A*, 64; MCINTOSH, 1908*a*: 382-383; ASHWORTH, 1909: 2; ASHWORTH, 1910*a*: 114-115; ASHWORTH, 1910*b*: 354; ASHWORTH, 1912: 132-138, text-figs. 5-6, 10, 16*A*, 28-29, 36, pls. 2 figs. 7-8, pl. 9 fig. 19, pl. 11 figs. 34-35, pl. 15 figs. 52-53; FAUVEL, 1927*a*: 164, fig. 58*e-l*. *Arenícola ecaudata* — RIOJA, 1931: 170-172, pl. 56 figs. 5-7. *Arenicolides ecaudata* — HARTMANN-SCHRÖDER, 1996: 448; KIRKEGAARD, 1996: 186-187, fig. 95; RINGVOLD, VAN DER MEEREN & OUG, 2000: 93-95, fig. 1*A*. *Clymenides ecaudatus* — MESNIL, 1897*b*: 152-154, 163, pl. 6 figs. 12-14. *Arenicola branchialis* [not Audouin & Milne Edwards 1833] — JOHNSTON, 1865: 231, 345; MESNIL, 1897*b*: 163, pl. 6 fig. 19; FAUVEL, 1899*d*: 229-230.
REFERENCES FOR PORTUGAL: CANCELA DA FONSECA *et al.*, 2006 (Aljezur).
DISTRIBUTION: From Northeastern Atlantic to Western Mediterranean Sea; Ireland; English Channel; Norway; from North Sea to Skagerrak. Intertidal to 10 meters, in coarse soft bottoms, like coarse boulders with patches of cobble ground, calcareous sand with shell fragments, or sand with stones.

*GENUS **Branchiomaldane** Langerhans 1881

Branchiomaldane LANGERHANS, 1881: 116.

TYPE SPECIES: *Branchiomaldane vincenti* Langerhans 1881.

SYNONYMS: *Protocapitella* Berkeley & Berkeley 1932.

REMARKS: As stated above, this genus was revised by FOURNIER & BARRIE (1987), and considered to include 3 species, one of which new: *Branchiomaldane vincenti* Langerhans 1881, from Canary Islands; *B. simplex* (Berkeley & Berkeley 1932), from British Columbia; and *B. labradorensis* Fournier & Barrie 1987, from Newfoundland. A fourth species, *B. maryae* Nogueira & Rizzo 2001, was later described from São Paulo, Brazil (NOGUEIRA & RIZZO, 2001). FOURNIER & BARRIE (1987) presented a comparative table of characters used to separate different populations of *Branchiomaldane*, which includes not only populations of the 3 hitherto known species, but also 3 other populations belonging to unidentified species. However, the same authors also stated that a complete revision of the genus will only be possible when Langerhans' missing type specimens are found, or when new material is collected from the type locality. This is particularly important in order to revise many of the worlwide records of *B. vincenti*.

****Branchiomaldane vincenti*** Langerhans 1881

Branchiomaldane Vincentii LANGERHANS, 1881: 116, pl. 5 fig. 21*a-g*.

TYPE LOCALITY: Tenerife Island (Canary Islands), beach off La Orotava.

SYNONYMS: *Clymenides incertus* Mesnil 1897.

SELECTED REFERENCES: *Branchiomaldane Vincenti* — MESNIL, 1897*b*: 156-159, 163, text-fig. 4; MESNIL, 1898: 635-637, figs. 1-5; MESNIL, 1899*a*: 323-325, figs. 1-5; GAMBLE & ASHWORTH, 1900: 536, 553; ASHWORTH, 1912: 147-156, text-figs. 59-68, pl. 11 figs. 31-33; RIOJA, 1918*a*: 68-69, fig. 4; FAUVEL, 1927*a*: 166-167, fig. 58*m-p*; RIOJA, 1931: 172-173, pl. 56 figs. 8-11; [?] DAY, 1967: 608, fig. 29.1.*a-e*; [?] HARTMAN, 1969: 417-418, figs. 1-4. *Branchiomaldane Vincenti* — FOURNIER & BARRIE, 1987: 100-101, fig. 1*a*, table 1; GRAVINA & SOMASCHINI, 1991: 160-162, fig. 1. *Arenicola Vincenti* — FAUVEL, 1898: 734-735; FAUVEL, 1899*a*: 289-291, 300, table page 313; FAUVEL, 1899*c*: 165-166, fig. 3. *Clymenides incertus* — MESNIL, 1897*b*: 154-155, 163, pl. 6 figs. 15-16. *Protocapitella simplex* [not *Protocapitella simplex* Berkeley & Berkeley 1932 = *Branchiomaldane simplex* (Berkeley & Berkeley 1932)] — HARMELIN, 1964: 90, plate 10. Not *Branchiomaldane vincenti* — BERKELEY & BERKELEY, 1950: 60; HARTMAN & REISH, 1950: 39; BERKELEY & BERKELEY, 1952: 99-100, figs. 203-205; HOBSON & BANSE, 1981: 68, fig. 15*e* [all = *Branchiomaldane simplex* (Berkeley & Berkeley 1932)].

REFERENCES FOR PORTUGAL: AMOUREUX & CALVÁRIO, 1981 (Peniche).

MATERIAL: FAUNA 1 — St. 33*A*, Alborán Sea, Alborán Island, 34-44 m, laminarians on rocks: 2 specimens, represented by posterior fragments, with 15 and 21 chaetigers; segments with 2 annuli, typical of posterior chaetigers of *Branchiomaldane*; capillary chaetae with distal spinose tips; ventral hooks without hood; branchiae monofilamentous or bifid; pygidium with rounded lobes, lacking appendages.

DISTRIBUTION: Canary Islands; English Channel; Portugal; Spain. Mediterranean Sea: Spain, Tunisia, Gulf of Marseille; Tyrrhenian Sea; Adriatic Sea; Black Sea; [?] South Africa. Rocky coastal bottoms, among calcareous and soft algae, and among rhizomes of *Posidonia oceanica*. Between 0.5-21 meters.

REMARKS: As stated above *Branchiomaldane vincenti* needs to be redescribed, in order to clarify the identity of some of its records. The species was originally described from the Canary Islands, and later recorded to be present from the English Channel to the Adriatic Sea and Black Sea, and also in South Africa. FOURNIER & BARRIE (1987) found some differences between the original description and the posterior records, but some of these differences (as the starting chaetiger of the branchiae) could be size dependent. The identity of the South African population is also doubtful, as it also shows some differences in relation to the original description.

*FAMILY **CAPITELLIDAE** Grube 1862

AS: *CAPITELLACEEN* GRUBE, 1862*a*: 378.
TYPE GENUS: *Capitella* Blainville 1828.
SYNONYMS: *HALELMINTHEA* Carus 1863; *HALELMINTHIDAE* McIntosh 1885.
REMARKS: There is a general claim that the taxonomy of the Capitellidae needs to be revised (*e.g.* EWING, 1991; ROUSE, 2001*a*). The number of characters normally used for the taxonomy of the group is limited, and they are all external: shape of the prostomium and pygidium, distribution and shape of chaetae (both capillary and hooked), shape and distribution of respiratory structures ("branchiae" and enlarged parapodial lobes), presence and distribution of genital pores. The different combination of these characters gave place to the erection of numerous genera (many monospecific) and species, without any knowledge on the phyllogenetic relationships between them (ROUSE, 2001*a*). The number of thoracic chaetigers and the chaetal distribution have been particularly used. Many genera seem to be erected with base on slight variations of the distribution of the capillary chaetae, but these variations may have importance only as a specific character, instead of defining genera.

The presence or absence of branchiae in the family Capitellidae has been used as a valid taxonomic character, both at generic and specific levels, normally to discriminate taxa, and are present in numerous keys of the family (*e.g.*: FAUCHALD, 1977*a*; GREEN, 2002). However, as pointed by ROUSE & FAUCHALD (1997: 187), branchiae or gills are absent in the Capitellidae. Though, some species present extensions from the body that may have a respiratory function, but as there is no circulatory system, these extensions contain fluid from the coelomic cavity, and so they are not true branchiae. Sometimes these structures have the possibility of being invaginated, apparently by means of hydrostatic pressure. The designation as "branchiae" for these body expansions with respiratory functions, is here replaced by "branchia-like expansions". As stated by GREEN (2002), some genera have been defined on the basis of the presence of branchia-like body expansions (like *Branchiocapitella* Fauvel 1932 or *Paracapitella* Carrasco & Gallardo 1987), while other genera include species with and without such structures (like the genus *Notomastus* Sars 1851). Quite probably these body expansions should be given a specific value, not generic, like in the genus *Notomastus* (see the *REMARKS* section under the genus *Capitella*). I was able to study specimens tentativelly identified as *Branchiocapitella* cf. *singularis* from East Africa, and a circulatory system was absent at the notopodial expansions, being the specimens, otherwise, very similar to the ones in the genus *Capitella*. The two genera are possibly synonyms.

The methyl green stainning pattern has become lately a current tool in the taxonomy of Capitellidae, giving good results in order to sharpen the separation between species (*e.g.*: WARREN, HUTCHINGS & DOYLE, 1994; BLAKE, 2000*b*; GREEN, 2002). On the other way, the importance of various aspects of the morphology of the different hooks was first noticed by HARTMAN (1947), and later recognized by other authors (*e.g.*, THOMASSIN & PICARD, 1972). Recently, the significance of these aspects was highlighted by GREEN (2002) as having diagnostic taxonomic value. Some of these features, visible using light microscopy, include the overall appearance of the exposed and embedded parts of the chaetae, the relative lengths of shaft, shoulder, and hood, the development of node and constriction, and the overall dentition pattern (GREEN, 2002).

Important recent contributions to this family include BLAKE (2000*b*), and especially GREEN (2002). Other recent papers revised genera like the *Capitella* (WARREN 1976*a*, 1991) or the *Mediomastus* (WARREN, HUTCHINGS & DOYLE, 1994), described new genera like *Amastigos* (PILTZ, 1977), *Dodecaseta* (MCCAMMON & STULL, 1978), *Nonatus* (AMARAL, 1980), *Undecimastus* (AMOUREUX, 1983*a*), *Paracapitella* (KIRKEGAARD, 1983*b*; CARRASCO & GALLARDO, 1987, being the later a homonym of the first), *Octocapitella* (BROWN, 1987), *Pseudonotomastus* (WARREN & PARKER, 1994), *Dodecamastus* (BLAKE, 2000), *Abyssocapitella* (BUZHINSKAJA & SMIRNOV, 2000), *Polymastigos* (GREEN, 2002), or redefined and emmended old genera, like *Notomastus* (EWING, 1982), *Mastobranchus* and *Peresiella* (EWING, 1984*a*), or *Capitellethus*, *Dasybranchus*, *Dodecaseta*, *Heteromastus*, *Leiocapitella*, *Mastobranchus* and *Rashgua* (GREEN, 2002).

The family Capitellidae includes at present 43 genera (being one a junior homonym), and about 170 described species (including one secondary homonymy) and 3 subspecies, considered as valid.

In the European and adjacent waters, 15 genera and 32 species, one of which doubtful, have been so far recorded, but taking into account the several sibling species of the genus *Capitella* already detected, these numbers are expected to increase in the near future. Six species belonging to four different genera were identified among the studied material.

Due to the recent changes in the definitions of some genera (GREEN, 2002), a short diagnosis is given for each genus referred below.

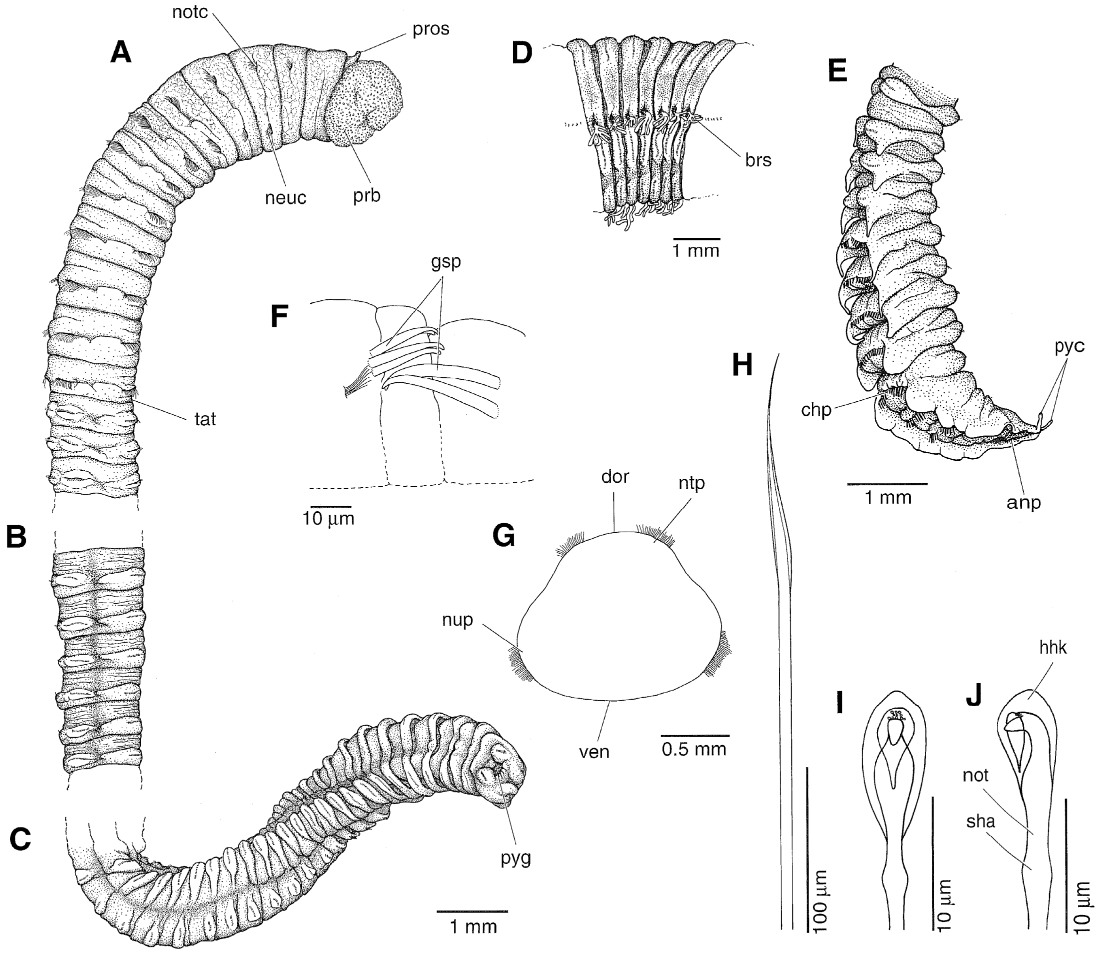

Figure legend: Family Capitellidae. **A**-**C**, *Notomastus* specimen, parts of the entire animal: **A**, anterior end, lateral view; **B**, several mid-body segments, lateral view; **C**, posterior end, latero-ventral view. **D**, *Dasybranchus* specimen, mid-body/posterior segments (*ca* chaetigers 80 to 86) bearing 'branchial'-like structures, latero-ventral view. **E**, *Scyphoproctus* specimen, posterior end with anal plate, lateral view. **F**, *Capitella* specimen, thoracic segments (7 to 9) showing genital spines, lateral view. **G**, **H**, *Notomastus* specimen: **G**, transverse section of body at chaetiger 10 (thoracic) showing arrangement of notopodia and neuropodia; **H**, capillary notochaeta from thoracic chaetiger 11. **I**, **J**, notochaeta of *Mediomastus* specimen: **I**, frontal view of abdominal notopodial hook from chaetiger 23; **J**, lateral view of **I**. **anp**, anal plate; **brs**, 'branchial'-like structure; **chp**, chaetae of anal plate; **dor**, dorsum; **gsp**, genital spine; **hhk**, hood surrounding hook; **neuc**, neurochaeta; **not**, notch; **notc**, notochaeta; **ntp**, notopodium; **nup**, neuropodium; **prb**, proboscis everted; **pros**, prostomium; **pyc**, pygidial cirri; **pyg**, pygidium; **sha**, shaft; **tat**, thoracic/abdominal transition; **ven**, ventral surface. (Adapted from BEESLEY, ROSS & GLASBY, 2000; drawings by A. Murray).

KEY TO GENERA:
(adapted from GREEN, 2002)

1a. No capillary chaetae, chaetigers only with hooks; 9 thoracic chaetigers......................................***Baldia***
1b. Capillary chaetae present...**2**

2a (1b). Thorax with 9 or fewer chaetigers with capillary chaetae..**3**
2b (1b). Thorax with 10 or more chaetigers with capillary chaetae...**8**

3a (2a). Genital spines on chaetigers 8-9 in males and hermaphrodites; hooded hooks of similar length in thorax and abdomen; three to seven chaetigers with capillary chaetae, otherwise with capillaries and hooks in various combinations in both rami; branchiae absent..***Capitella***
3b (2a). Genital spines absent; hooded chaetae more than twice as long in thorax than in abdomen, or relative length of hooded chaetae in thorax and abdomen unknown..**4**

4a (3b). Three chaetigers with capillary chaetae...**5**
4b (3b). More than three chaetigers with capillary chaetae, remaining thoracic chaetigers with long-shafted hooded hooks; abdomen with shorter hooded hooks..**6**

5a (4a). Chaetiger 4 with mixed capillary chaetae and hooks in both rami, from chaetiger 5 only hooks are present; twelve thoracic chaetigers; first chaetiger complete; anal plate present, with or without hooks, and with two anal cirri...***Heteromastides***
5b (4a). Chaetigers 4-11 with modified spatulate chaetae, capillary chaetae, or short hooded hooks; eleven thoracic chaetigers; first chaetiger only with notochaetae; anal plate absent...................***Peresiella****

6a (4b). Four chaetigers with capillary chaetae; thorax with 10 chaetigers; long-shafted hooks on chaetigers 5-10...***Mediomastus****
6b (4b). More than four chaetigers with capillary chaetae...**7**

7a (6b). Five chaetigers with capillary chaetae...***Heteromastus***
7b (6b). Nine chaetigers with capillary chaetae; spines in posterior abdomen................................***Pulliella***

8a (2b). Transitional chaetigers absent, or if they occur, no more than two chaetigers with capillary notochaetae and hooded neurohooks; no chaetigers with mixed chaetal fascicles......................................**9**
8b (2b). Abdomen with several (three or more) transitional chaetigers with capillary notochaetae and hooded neurohooks, or at least two chaetigers with mixed fascicles of capillary chaetae and hooded hooks..**14**

9a (8a). Ten chaetigers with capillary chaetae; first chaetiger only with notochaetae; transition between thorax and abdomen abrupt, without transitional chaetigers...***Pseudonotomastus***
9b (8a). More than ten chaetigers with capillary chaetae..**10**

10a (9b). Uncini with one or more rows of teeth, basal row with one or two teeth above main fang........**11**
10b (9b). Uncini with one or more rows of teeth, basal row with more than 2 teeth above main fang......**13**

11a (10a). Capillary chaetae on 11-12 chaetigers; one or two of them may or may not be transitional with capillary notochaetae and neurohooks..**12**
11b (10a). Capillary chaetae on 13-17 chaetigers; one or two of them are transitional with capillary notochaetae and neurohooks; 12-16 chaetigers exclusively with capillary chaetae................***Leiocapitella****

12a (11a). Capillary chaetae on 11 chaetigers; one of them may or may not be transitional with capillary notochaetae and neurohooks..***Capitellethus***
12b (11a). Capillary chaetae on 12 chaetigers; one or two of them may or may not be transitional with capillary notochaetae and neurohooks..***Leiochrides***

13a (10b). Eleven chaetigers with capillary chaetae; last thoracic chaetiger with or without capillary chaetae in neuropodia; branchia-like body expansions may be present...................................***Notomastus****
13b (10b). Thirteen chaetigers with capillary chaetae, or twelve chaetigers with capillary chaetae preceeded by an achaetous segment (besides peristomium); branchia-like body expansions present..***Dasybranchus***

14a (8b). Two or more chaetigers with mixed fascicles of capillary chaetae and hooded hooks...***Mastobranchus***
14b (8b). No chaetigers with mixed chaetal fascicles; several transitional abdominal chaetigers with capillary notochaetae and neurohooks..**15**

15a (14b). Thorax with 18 chaetigers with capillary chaetae, 10 chaetigers exclusively with capillary chaetae; first chaetiger only with notochaetae; posterior 8 thoracic chaetigers with capillary notochaetae and neurohooks; abdomen with four transitional chaetigers with capillary notochaetae and neurohooks...***Paracapitella***

15b (14b). Thorax with 16-17 chaetigers with capillary chaetae, first 13-14 exclusively with capillary chaetae, following 3 with notopodial capillary chaetae and neurohooks; first chaetiger with notochaetae only...***Pseudocapitella***

GENUS ***Baldia*** Garwood & Bamber 1988

Baldia GARWOOD & BAMBER, 1988: 120.

TYPE SPECIES: *Baldia johnstoni* Garwood & Bamber 1988.

DIAGNOSIS (from GARWOOD & BAMBER, 1988): Nine thoracic chaetigers, with no achaetous segment immediately behind the mouth and with no capillary chaetae, all chaetae being hooded hooks.

Baldia johnstoni Garwood & Bamber 1988

Baldia johnstoni GARWOOD & BAMBER, 1988: 120-125, figs. 1-7.

TYPE LOCALITY: Hadson Carrs, 58º18'N, 1º35'W, at the northern end of Druridge Bay, Northumberland (Northeast England, U.K.), intertidal, in fine sand with less than 4% silt.

DISTRIBUTION: Northumberland Coast (U.K.), intertidal, in fine sand with less than 4% silt.

GENUS ***Capitella*** Blainville 1828

Capitella BLAINVILLE, 1828: 443.

TYPE SPECIES: *Lumbricus capitatus* Fabricius 1780.

SYNONYMS: *Lumbriconais* Blainville 1828; *Valla* Johnston 1865; *Capitomastus* Eisig 1887; *Capitellides* Mesnil 1897; *Isomastus* Gravier 1911; *Branchiocapitella* Fauvel 1932; *Paracapitella* Carrasco & Gallardo 1987 [HOMONYM].

DIAGNOSIS (adapted from GREEN, 2002): Thorax with an achaetous peristomium and 9 chaetigers. Peristomium forms a distinct or indistinct ring. Capillary chaetae in both rami of a variable number of segments ranging from 3 to 7; following segments up to chaetiger 7 with mixed fascicles of capillary chaetae and hooded hooks or exclusively with hooded hooks. Chaetigers 8-9 with notopodial spines in males and some females; chaetigers 8-9 with hooded hooks in some females. Remaining chaetigers after chaetiger 9 exclusively with hooded hooks. Parapodia reduced; branchia-like body expansions absent or present.

REMARKS: In the taxonomy of the genus *Capitella*, as in almost all the other genera in Capitellidae, there is a limited number of morphological characters which are normally used to define species. The most used morphological character is the distribution of the chaetae (capillary chaetae, hooks, and genital spines) in the thoracic region (PLANAS & MORA, 1989). However this distribution can change during growth, and the presence of different chaetal thoracic types of distribution in the same population can complicate the identification. Knowing the different ontogenic stages that can occur during growth in a specific population makes species identification easier.

Genital spines are normally present in notopodia of chaetigers 8 and 9 in males and hermaphrodites. For a population identified as *Capitella capitata* from Northwest Spain, PLANAS & MORA (1989) determined that all specimens showed the first 3 thoracic chaetigers with capillary chaetae, and the last two with hooded hooks, being substituted in the notopodia of males by genital spines. In the in-between chaetigers, initially only with hooded hooks in both podia, capillary chaetae appeared progressively from anterior to posterior chaetigers, first mixed with hooks, and later replacing them, in such a way that finally only capillary chaetae were present in the first 7 chaetigers. A similar situation was described in *Capitella caribeorum* by WARREN & GEORGE (1986). In this species, after metamorphosis, specimens show only the first 3 chaetigers with capillary chaetae. With growth, capillaries replace gradually the hooks backwards along the thorax, reaching finally the adult chaetal thoracic formula (both in males and females): $1\text{-}6C\ 7^{C}_{H}\ 8\text{-}9^{G}_{H}$ (designating C the capillary chaetae, H the hooded hooks, and G the genital spines.

In accordance to the diagnosis given by GREEN (2002), and to the discussed above, in the genus *Capitella* "branchiae" can be present or absent (as body expansions without a circulatory system). This way, the genera *Branchiocapitella* Fauvel 1932 (including the type species *B. singularis* Fauvel 1932, from India, and *B. abranchiata* Hartmann-Schröder 1962, from Punta Arenas, Chile, a species curiously described as lacking branchiae), and *Paracapitella* Carrasco & Gallardo 1987 (including the type species *P. pettiboneae* Carrasco & Gallardo 1987, from Bay of Concepción, Chile) are here considered as synonyms of *Capitella* Blainville 1828. *Capitella singularis* (Fauvel 1932) nov. comb. is easily separated from the rest of the members in the genus by the presence of enlarged expansions in the notopodia of the posterior region of the body, while *Capitella pettiboneae* (Carrasco & Gallardo 1987) nov. comb. is distinguished by the presence of such expansions in the ventral region of the neuropodia. *Capitella abranchiata* (Hartmann-Schröder 1962) nov. comb. was described in the genus *Branchiocapitella* with base on other characters than the lobular expansions of the body wall, which were stated as being absent. Apparently it is mainly characterized by the presence of papillae at the parapodial tori of the middle and posterior regions of the body.

As noted above, *Paracapitella* Carrasco & Gallardo 1987 is a junior homonym of *Paracapitella* Kirkegaard 1983. The synonymy of the genus with *Capitella* Blainville 1828, avoids the need to create a new name for it.

KEY TO SPECIES:

1a. Capillary chaetae present in chaetigers 1-3 or 4; hooded hooks present from chaetiger 4 or 5..............**2**
1b. Capillary chaetae present at least up to chaetiger 6...**3**

2a (1a). Capillary chaetae in chaetigers 1-4; known to inhabit squid eggs masses; hermaphroditic (gravid individuals occurring with genital spines)...***C. hermaphrodita***
2b (1a). Capillary chaetae in chaetigers 1-3 or 1-4; known as free living; [?] hermaphroditic.....***C. minima***

3a (1b). Capillary chaetae present in noto- and neuropodia of chaetigers 1-6, mixed fascicles in notopodia of chaetiger 7, and hooks in neuropodia of chaetiger 7; chaetigers 8-9 with either noto- and neuropodial hooded hooks, or dorsal hooks being replaced by genital spines in males; eggs diameter 334 × 230 µm...***C. giardi***
3b (1b). Capillary chaetae present in noto- and neuropodia of chaetigers 1-7; chaetigers 8-9 with either noto- and neuropodial hooded hooks, neuropodial capillaries, or dorsal hooks being replaced by genital spines in males...**4**

4a (3b). Capillaries absent from neuropodia of chaetigers 8-9; body slender, elongate and narrow, except for chaetigers 8-9 in males, which are greatly enlarged proportionally compared with the first seven chaetigers, with heavy dorsal musculature surrounding spines on chaetiger 9, while females lack evidence of either genital spines or heavy musculature; prostomium with a weak dorsal notch or none at all, merged together with peristomium, forming a head longer than wide; first chaetiger only 1.5 times wider than the posterior margin of the peristomium; hooded hooks with 3 rows of apical teeth; genital spines larger and more prominent than in *C. capitata*; eggs 260 × 180 µm, 30-400 eggs being spawned into individual tubes; primarily a sexually dimorphic species with protandric hermaphrodites being produced from feminized males when densities of females are low; males without apparent methyl green staining reaction, females retaining stain on posterior thoracic segments and with distinct turquoise-colored speckled band on chaetiger 9, in the anterior margin of segment, the posterior margin, or both......***C. teleta***
4b (3b). Capillaries often present in neuropodia of chaetigers 8-9 (absent in specimens with 30-40 chaetigers, specimens with about 45 chaetigers with mixed fascicles of hooks and capillaries in neuropodia of chaetiger 8, specimens with 55 or more chaetigers with capillaries in neuropodia of chaetigers 8-9); body large, robust, thickened along most of its length, first seven thoracic chaetigers enlarged and chaetigers 8-9 reduced and lacking heavy musculature on specimens with genital spines; prostomium as wide as long, with deep dorsal groove, distinct from peristomium; first chaetiger much wider than the posterior margin of peristomium; hooded hooks with at leat 4 rows of apical teeth; genital spines smaller and less prominent than in *C. teleta*; eggs with average diameter of 312 µm, with 1125-1300 eggs being spawned into individual tubes; appears to be hermaphroditic, with the majority of specimens (> 80%) with genital spines; methyl green staining reaction equal in both sexes, absent from prostomium, peristomium staining and recessed into darkly staining chaetiger 1, chaetigers 1-5 and sometimes 6 staining more prominently, chaetigers 7-9 staining darkly, and abdominal segments not staining except for minute speckles, uniformly distributed or concentrated around raised noto- and neuropodia..***C. capitata***

Capitella capitata (Fabricius 1780)

Lumbricus capitatus FABRICIUS, 1780: 279-280.

TYPE LOCALITY: Paamiut/Frederikshåb region, Western Greenland, in the littoral and under stones. Neotype designated by BLAKE (2009), from Mârmorilik (Western Greenland), at 71º6.5'N, on the Affarlikassâ Fjord on the inner Uummannaq Fjord system, north of Disko Bay, Western Greenland, 20-40 meters.

SYNONYMS: *Capitella Fabricii* Blainville 1828.

SELECTED REFERENCES: *Capitella capitata* — WESENBERG-LUND, 1950*b*: 91-92; PETTIBONE, 1954: 298-299, fig. 33*r-u*; CURTIS, 1977: 332-333, fig. 6; BLAKE, 2009: 58-68, figs. 1-5, tables 1-2. *Capitella Fabricii* — BLAINVILLE, 1828: 443-444. Not *Capitella capitata* — EISIG, 1887: 849-857, pl. 1 figs. 5-5*b*, pl. 27 figs. 1-14, pl. 29 figs. 1-8, pl. 30 figs. 1-36, pl. 32 figs. 19-23, pl. 33 figs. 21-23, pl. 34 figs. 29-32, pl. 35 figs. 39-45, pl. 36 figs. 1-3; MCINTOSH, 1915*b*: 280-285, text-figs. 130, 132, pl. 92 fig. 3, pl. 98 fig. 20, pl. 107 figs. 10-12; FAUVEL, 1926*a*: 300; FAUVEL, 1927*a*: 154-155, fig. 55*a-h*; WARREN, 1976*a*: 196-201, fig. 1, pls. 1, 4; GILLANDT, 1979: 59-60, fig. 22; GRAVINA & SOMASCHINI, 1990: 263-264; HARTMANN-SCHRÖDER, 1996: 436-438, fig. 214; KIRKEGAARD, 1996: 170-173, fig. 87.

REFERENCES FOR PORTUGAL: CARVALHO, 1929 (Sines); AMOUREUX & CALVÁRIO, 1981 (Tagus Estuary; Peniche); MONTEIRO-MARQUES *et al.*, 1982 (Ponta do Baleal); ANDRADE, 1984 (Mira Estuary); CALVÁRIO, 1984 (Tagus Estuary); PINTO, 1984 (Sado Estuary); MONTEIRO-MARQUES, 1987 (continental shelf of Algarve); QUINTINO & GENTIL, 1987 (Lagoon of Albufeira; Lagoon of Óbidos); CANCELA DA FONSECA, COSTA & BERNARDO, 1989 (Lagoon of Santo André); GAMITO, 1989 (Ria Formosa); QUINTINO, RODRIGUES & GENTIL, 1989 (Lagoon of Óbidos); DEXTER, 1992 (previous records: Ria Formosa; Ria de Alvor; continental shelf of Algarve; Lagoon of Carrapateira; Sines; Sado Estuary; Arrábida; Lagoon of Albufeira; Tagus Estuary; Lagoon of Óbidos; Figueira da Foz; Mondego Estuary; Ria de Aveiro); MARQUES & BELLAN, 1993 (Mondego Estuary); PARDAL, MARQUES & BELLAN, 1994 (Mondego Estuary); SALDANHA, 1995 (Portugal); MUCHA & COSTA, 1999 (Ria de Aveiro and/or Sado Estuary); [?] MUCHA & COSTA, 1999 (as *Capitella* cf. *capitata tripartita*; Ria de Aveiro and/or Sado Estuary); CANCELA DA FONSECA *et al.*, 2006 (Aljezur; Odeceixe). [Quite probably all these records refer to other species of *Capitella*].

DISTRIBUTION: Arctic waters: Western, South and Eastern Greenland, on sandy and muddy sediments, sometimes with stones and algae, between 4-115 meters; Alaskan Arctic, Point Barrow, on bottoms of stones and various combinations of gravel, stones and rocks, between 22-65 meters. The species has been reported to be widely distributed, but it was restricted to Arctic and subarctic localities by BLAKE (2009), until more collections are analysed. There are no data from Greenland to suggest that *Capitella capitata* occurs is organically enriched sediments, as has been suggested from worldwide reports, but it was shown to be an opportunistic species (BLAKE, 2009). All the records outside the Arctic and subarctic waters need confirmation, as the wide distribution of the species is the result of the presence of several sibling species, like *Capitella teleta* Blake, Grassle & Eckelbarger 2009.

REMARKS: *Capitella capitata* is a clear example of a species incorrectly considered as cosmopolitan. Its worldwide distribution is the result of several sibling species being considered under the same name, as demonstrated in repeated occasions (*e.g.*: GRASSLE & GRASSLE, 1976; GRASSLE, 1980; ECKELBARGER & GRASSLE, 1987*a*, 1987*b*; GRASSLE, GELFMAN & MILLS, 1987; PEARSON & PEARSON, 1991; WU, QIAN & ZHANG, 1991; GAMENICK *et al.*, 1998; MÉNDEZ, 2002, 2006).

The species was recently redescribed by BLAKE (2009), a long time need due to the worldwide reports of the species, the taxonomic complexity of the group, with the presence of numerous sibling species, and its common utilization in a wide range of scientific studies. As highlighted by its author, this redescription will serve as a base to which all the other worldwide recorded sibling species can be formally compared and contrasted with the type species, and new species described whenever necessary, or old names checked for availability. Besides the redescription, a neotype for the species was designated by BLAKE (2009) from material collected in Western Greenland. The neotype was collected 20-40 meters deep at Mârmorilik, located approximately 1,000 Km north of Frederikshåb, the colony where Otto Fabricius worked as a missionary and presumably collected his material of *Capitella capitata* in the intertidal zone. BLAKE (2009) defended his decision for this neotype designation with the need to put an end to the everlasting discussions concerning the identity of the species, instead of keep waiting for the possibility of collecting new material from the type locality.

However, taking into account the great taxonomic diversity and the presence of numerous sibling species in *Capitella*, there is also the risk that the neotype does not represent the same species than the collected and briefly described by Otto Fabricius in 1780. New material was recently collected from the original type locality by Karine Meißner, Andreas Bick, and Ralf Bastrop. This material is still being analyzed (KARINE MEIßNER, personal communication, June 2010), but for the sake of taxonomic stability, it is hoped that the material from Frederikshåb is conspecific with the neotype from Mârmorilik.

As stated above, *Capitella capitata* is so far confirmed to be present only in Arctic and subarctic waters. This way, all the other European and North African records of the species need to be confirmed, as quite probably most of them represent different species from *C. capitata* or *C. teleta*. Some of these species might have been previously described and later synonymized with *C. capitata*.

The list of species and subspecies previously synonymized with *Capitella capitata* includes the following taxa, many of which have its type locality in Europe: *Lumbricus littoralis* Johnston 1827; *Lumbriconais marina* Ørsted 1842; *Lombricus canalium* Nardo 1847; *Capitella capitata belgica* Czerniavsky 1881; *Capitella capitata* forma *danica* Czerniavsky 1881; *Capitella capitata hebridarum* Czerniavsky 1881; *Capitella capitata neapolitana* Czerniavsky 1881; *Capitella capitata suchumica* Czerniavsky 1881; *Capitella intermedia* Czerniavsky 1881; *Capitella prototypa* Czerniavsky 1881; *Capitella similis* Czerniavsky 1881; *Capitella dizonata* Johnson 1901; *Capitella capitata antarctica* Monro 1930; *Capitella capitata japonica* Kitamori 1960; *Capitella capitata oculata* Hartman 1961; *Branchiocapitella abranchiata* Hartmann-Schröder 1962; *Capitella capitata europaea* Wu 1964.

There are evidences of the presence of different sibling and cryptic species of *Capitella* in several parts of Europe (PEARSON & PEARSON, 1991; GAMENICK *et al*, 1998; MÉNDEZ, 2002). These European species include probably both endemic species and some of the sibling species already identified from North America in laboratory cultures (see BLAKE, GRASSLE & ECKELBARGER, 2009). Future research will establish how many taxa of the list of synonymies should be considered as valid, synonymous with other species, or invalid. For the moment the single species that seems to be a real synonymy of *C. capitata* is *Capitella Fabricii* Blainville 1828. The species *Ancistria acuta* Verrill 1874 was in the meantime considered to be *incertae sedis* by BLAKE, GRASSLE & ECKELBARGER (2009).

With base on the published descriptions it is also possible to confirm the presence of several different species masked by the European records of *Capitella capitata* that refer to taxa distinct from this species and from *C. teleta*. This way, EISIG (1887) described specimens from Naples having the modified chaetigers 8-9 in males not enlarged in relation to chaetigers 7 and 10, capillary chaetae present in chaetigers 1-6 being followed by a transitional chaetiger with capillaries, hooks, or mixed fascicles, large eggs (> 288 µm), and producing planktotrophic larvae that are planktic for seven days. These features separate the Naples specimens from both *C. capitata* and *C. teleta*, with base not only on the morphological characters, but also on reproductive features, with *C. teleta* having lecitotrophic larvae and *C. capitata* being also suposed to (BLAKE, 2009; BLAKE, GRASSLE & ECKELBARGER, 2009). For a different population, this time from Devon (England), WARREN (1976*b*) reported eggs with diameters of less than 100 µm and a number of 10,000-14,000 fertilized eggs being produced per female brood tube. Once again, these data separate the population not only from *C. capitata* and *C. teleta*, but also from the specimens from Naples studied by EISIG (1887), confirming the presence of several different species in the European waters.

Capitella giardi (Mesnil 1897)

Capitellides Giardi MESNIL, 1897*c*: 442-443.

TYPE LOCALITY: French coast of the English Channel: Wimereux (Pas-de-Calais), in the mud covering the clayey rocks of Tour Croy; Anse Saint Martin, near the Cap de la Hague (Cotentin), among the *Lithothamnium polymorphum* covering the granitic rocks of the shore.

SELECTED REFERENCES: *Capitellides Giardi* — FAUVEL, 1926*a*: 300; FAUVEL, 1927*a*: 157-158, fig. 56*a-g*; AUGENER, 1939: 143-146; KIRKEGAARD, 1996: 173-174, fig. 88. *Capitomastus giardi* — GILLANDT, 1979: 60, fig. 23. *Capitella giardi* — WARREN, 1976*a*: 205-206, fig. 1; GRAVINA & SOMASCHINI, 1990: 264-265; HARTMANN-SCHRÖDER, 1996: 438-439, fig. 215.

REFERENCES FOR PORTUGAL: DEXTER, 1992 (as *Capitellides giardi*; previous records: Ria de Aveiro).

DISTRIBUTION: [?] North Pacific; North Atlantic; Mediterranean Sea; Aegean Sea; Black Sea; English Channel; North Sea; Skagerrak; Kattegat; Kiel Bight. In fine sand, mixed or not with mud, among laminarian rhizopodes and *Lithothamnium*. Between 1-10 meters.

Capitella hermaphrodita Boletzky & Dohle 1967

Capitella hermaphrodita BOLETZKY & DOHLE, 1967: 81-94, figs. 1-7.

TYPE LOCALITY: Banyuls-sur-Mer (France, Mediterranean Sea), on egg masses of *Loligo vulgaris*.

SELECTED REFERENCES: *Capitella hermaphrodita* — WARREN, 1976*a*: 205, fig. 1; WARREN, 1991: 280.

DISTRIBUTION: On *Loligo* sp. egg masses, Banyuls-sur-Mer (France, Mediterranean Sea)

Capitella minima Langerhans 1880

Capitella minima LANGERHANS, 1880*b*: 99-100, pl. 4 fig. 12.

TYPE LOCALITY: Madeira Island, in a fish basket.

SELECTED REFERENCES: *Capitella minima* — HARTMANN-SCHRÖDER, 1996: 439-441, fig. 216; GREEN, 2002: 261-263, fig. 4. *Capitella minimus* — WARREN, 1991: 280. *Capitomastus minimus* — EISIG, 1887: 857-859; FAUVEL, 1926*a*: 300; FAUVEL, 1927*a*: 156, fig. 54*k-m*; GRAVINA & SOMASCHINI, 1990: 265; KIRKEGAARD, 1996: 174-175, fig. 89.

REFERENCES FOR PORTUGAL: MONTEIRO-MARQUES, 1987 (as *Capitomastus minimus*; continental shelf of Algarve); DEXTER, 1992 (previous records: Ria de Alvor; continental shelf of Algarve; Arrábida; Ria de Aveiro).

DISTRIBUTION: Northeastern Atlantic; Madeira Island; Mediterranean Sea; Adriatic Sea; Aegean Sea; Black Sea; North Sea; Red Sea; Andaman Sea. In gravel, fine and *Amphioxus*-sand, with or without some mud, and coralligenous bottoms. Between 10-50 meters.

Capitella teleta Blake, Grassle & Eckelbarger 2009

Capitella teleta BLAKE, GRASSLE & ECKELBARGER, 2009: 27-34, figs. 1-3, table 1.

TYPE LOCALITY: The holotype is a male removed from a laboratory culture, from stocks originally collected at Woods Hole, Massachusetts, Northeastern U.S.A..

SELECTED REFERENCES: *Capitella capitata* [not Fabricius 1780] — REISH, 1974: 181-195, figs. 1-7; REISH, 1980: 36-53, figs. 9-14, 16; [?] BERKELEY & BERKELEY, 1952: 100-101, figs. 206-208. *Capitella* sp. I — GRASSLE & GRASSLE, 1976: 567-569, figs. 1*A*, 2; table 1; ECKELBARGER & GRASSLE, 1987*a*: 63-74, figs. 2-4, 5*a*, 6, 7*a*, 8-13, 23-24, tables 1-4.

DISTRIBUTION: Widely distributed in North America, occurring in intertidal to shallow subtidal water habitats along the northeastern U.S.A. coast (confirmed records from Boston Harbor to Long Island), and the eastern Pacific coast (from Long Beach Harbor, California, to Elkhorn Slough, California, and probably extending north to British Columbia); Japan; Mediterranean Sea (Cortiou and Fos, near Marseille).

REMARKS: Several populations in Europe were studied in culture and by allozyme electrophoresis for the presence of sibling species, and so far the only confirmed presence of *Capitella teleta* (as *Capitella* sp. I) from Europe was from samples collected in 1984 by J.-P. Guérin in Cortiou and Fos, near Marseille (Mediterranean Sea) (GRASSLE *in* BLAKE, GRASSLE & ECKELBARGER, 2009). The species was not found in samples from Oslo (Norway), Reykjavik (Iceland), Newcastle-upon-Tyne (England), Firth-of-Clyde (Scotland), Wadden Sea (Holland), or Helgoland and Sylt (Germany) (BLAKE, GRASSLE & ECKELBARGER, 2009).

An annoted guide to the literature concerning *Capitella teleta* is given in BLAKE, GRASSLE & ECKELBARGER (2009).

GENUS ***Capitellethus*** Chamberlin 1919

Capitellethus CHAMBERLIN, 1919*a*: 465.

TYPE SPECIES: *Capitellides dispar* Ehlers 1907.

DIAGNOSIS (from GREEN, 2002): Thorax with 12 segments including an achaetous peristomium and 11 chaetigers. Capillary chaetae occur exclusively in the first ten chaetigers. Last thoracic segment (chaetiger 11) with either capillary chaetae in both rami or capillary chaetae in notopodia and hooded hooks in neuropodia. Abdominal chaetigers exclusively with hooded hooks. Hooded hooks with one or more rows of teeth above the main fang; basal row with two teeth. Abdominal noto- and neuropodia reduced. Branchia-like body expansions may be present in posterior segments of abdomen.

Capitellethus dispar (Ehlers 1907)

Capitellides dispar EHLERS, 1907: 24-25, figs. 15-16.

TYPE LOCALITY: Waiheke, Auckland Harbour, New Zealand.

SELECTED REFERENCES: *Capitellethus dispar* — FAUVEL, 1930*a*: 548; FAUVEL, 1932*b*: 197; FAUVEL, 1953*c*: 371; RULLIER, 1963*b*: 218-219; FISHELSON & RULLIER, 1969: 87; KISSELEVA, 1971: 65.

DISTRIBUTION: New Zealand; Indian Ocean; Red Sea; Aegean Sea; Sea of Marmara; Bosphorus; Black Sea.

REMARKS: RULLIER (1963*b*) suggests that the presence of this species in the Sea of Marmara, Bosphorus and Black Sea is the consequence of a Lessepsian migration through the Suez Canal.

GENUS *Dasybranchus* Grube 1850

Dasybranchus GRUBE, 1850: 324.

TYPE SPECIES: *Dasymallus caducus* Grube 1846.

SYNONYMS: *Dasymallus* Grube 1846 [not Dejean 1835 (Coleoptera)]; *Polybranchia* Potts 1928 [not Pease 1860 (Sacoglossa, Opistobranchia, Gastropoda)]; *Bucherta* Rullier 1965.

DIAGNOSIS (from GREEN, 2002): Thorax with 14 segments; achaetous peristomium and 13 chaetigers with capillary chaetae. Abdominal parapodia tori without expanded lobes. Branchia-like body expansions retractile or nonretractable as simple filaments or branched tufts arising from superior edge of neuropodia on median and posterior segments.

REMARKS: *Bucherta lumbricoides* was described by RULLIER (1965*b*) as a new genus and species, with base on a single specimen 60 mm long with more than 200 segments, collected down-shore, at Dunwich, North Stradbroke Island (Brisbane, East Australia). The genus is diagnosed as "*Capittelidae ne pόssedant que des crochets, à l'exclusion de toute soie capillaire*" (RULLIER, 1965*b*: 191), and it is also suggested that this taxa could belong to a new familly, between Arenicolidae and Capitellidae, but that numerous points in common with other genera of Capitellidae supported its placement under this family. However, both the illustrations and the description given by RULLIER (1965*b*) show that this taxa was described with base on a posterior fragment of a capittelid, and that the described retracted prostomium is in reallity the pygidium. This explains also the lack of capillary chaetae in such a long portion of capittelid. In the same station where this specimen was collected, RULLIER (1965*b*) identified as *Dasybranchus caducus* (Grube 1846), one specimen 25 cm long, and a middle fragment 12 cm long, without prostomium nor pygidium. In my opinion, the posterior fragment described as *Bucherta lumbricoides* is the posterior part, including the pygidium, of this specimen. This way, the genus *Bucherta* Rullier 1965 becomes a junior synonym of *Dasybranchus* Grube 1850. This synonymy is already stated at the Online *Australian Faunal Directory* (http://www.environment.gov.au/biodiversity/abrs/online-resources/fauna/afd/index.html), as well as at WILSON, HUTCHINGS & GLASBY (2003).

As a result of synonymizing *Bucherta* Rullier 1965 with *Dasybranchus*, *Bucherta lumbricoides* Rullier 1965 becomes a junior homonym of *Dasybranchus lumbricoides* Grube 1878, a species described from Philippines. There are several scenarios for this case: a) the holotype of *Bucherta lumbricoides* is part of the specimen identified by RULLIER (1965*b*) as *Dasybranchus caducus* (Grube 1846), from the type locality of the first, and same collection station and date, and this specimen represents the same species described from the Mediterranean Sea by GRUBE (1846*b*), in which case *Bucherta lumbricoides* Rullier 1965 would become a junior synonym of *Dasybranchus caducus* (Grube 1846); b) the specimen identified by RULLIER (1965*b*) as *D. caducus* is different from the European species described by GRUBE (1846*b*), but is identical to the species described from the Philippines by GRUBE (1878*c*) as *D. lumbricoides*, in which case Rullier's species would become a junior synonym and homonym of *Dasybranchus lumbricoides* Grube 1878; c) the specimen identified by RULLIER (1965*b*) as *D. caducus*, including the posterior region, belongs to an undescribed species of *Dasybranchus*, in which case it would be necessary to give it a new name, as the bynomyn *D. lumbricoides* would be a junior homonym of Grube's 1878 species; d) it is not possible to identify the holotype of *Bucherta lumbricoides* as the posterior part of the specimen identified as *D. caducus* by RULLIER (1965*b*) from the same station and collection date, and the species is, at least for the moment, considered to be indeterminable; e) the holotype of *Bucherta lumbricoides* is determined to be the posterior region a different species, previously named or not, from a different genus of Capitellidae, and occurring in the same area, as *Capithellethus dispar* (Ehlers 1907), also identified by RULLIER (1965*b*), in which case the problem of homonymy does not exist. The resolution of this case requires the study of the type material of *Bucherta lumbricoides*, as well as the rest of the material belonging to Capitellidae collected at the same date and station, which will not the done here.

The genus *Polybranchia* Potts 1928 is here also considered as a synonym of *Dasybranchus* Grube 1850. For this synonymy see the comments below, under the *REMARKS* section of the species *Dasybranchus carneus* Ehrenberg *in* Grube 1870.

KEY TO SPECIES:

(adapted from FAUVEL, 1927*a*; RULLIER, 1963*b*):

1a. Chaetae from the third segment; thoracic surface smooth..***D. carneus***
1b. Chaetae from the second segment; thoracic surface tessellated...**2**

2a (1b). Prostomium small and conical; retractile body branchia-like body expansions from about abdominal chaetiger 20, composed by numerous filaments (about 20).......................................***D. caducus***
2b (1b). Prostomium relatively big, glandiform; branchiae-like body expansions from about abdominal chaetiger 40, composed by few filaments (4-6)..***D. gajolae***

Dasybranchus caducus (Grube 1846)

Dasymallus caducus Grube, 1846*b*: 166-169, pl. 5 figs. 3-4.

Type locality: Losinj (= Lussin) Island, Croatia, Adriatic Sea.

Synonyms: *Dasybranchus cirratus* Grube 1867; *Dasybranchus umbrinus* Grube 1878; *Dasybranchus lumbricoides* Grube 1878; *Notomastus roseus* Langerhans 1880; [?] *Notomastus exsertilis* Saint-Joseph 1906.

Selected references: *Dasybranchus caducus* — Claparède, 1864: 516-520, pl. 8 fig. 8; Eisig, 1887: 823-828, pl. 1 figs. 2-2*a*, pl. 16 figs. 1-5, 9-12, pl. 17 figs. 1-6, 8, pl. 18 figs. 1-12, pl. 19 figs. 1-8, 10-12, pl. 20 figs. 1-21, pl. 21 figs. 1-8, 10-14, pl. 22 figs. 4-7, 14, pl. 23 figs. 2, 4-11, 14-18, pl. 32 figs. 1-5, pl. 33 figs. 8-10, pl. 34 figs. 18-20, pl. 35 figs. 27-33; Lo Bianco, 1893: 15-16; Saint-Joseph, 1898: 387-391; McIntosh, 1915*b*: 286-289, pl. 101 fig. 4, pl. 107 fig. 15; Fauvel, 1926*a*: 299; Fauvel, 1927*a*: 148-149, fig. 52*a-h*; Tebble, 1954: 316-320; Gravina & Somaschini, 1990: 265-266; Hartmann-Schröder, 1996: 441; Kirkegaard, 1996: 175-177, fig. 90. *Dasybranchus umbrinus* — Grube, 1878*c*: 189. *Dasybranchus lumbricoides* — Grube, 1878*c*: 190-190. *Notomastus roseus* — Langerhans, 1880*b*: 99, pl. 4 fig. 11. [?] *Notomastus exsertilis* — Saint-Joseph, 1906: 169-173, pl. 2 figs. 44-47; Fauvel, 1926*a*: 298-299; Fauvel, 1927*a*: 147, fig. 49*i-p*. [?] *Notomastus exertilis* — Torres-Gavilá, Capaccioni-Azzati & Villora-Moreno, 1989: 24, figs. 2*B*, 3*A*, 4*B*, table. [?] *Dasybranchus caducus* variété? — Saint-Joseph, 1898: 391.

References for Portugal: Carvalho, 1929 (Faro); Bellan, 1960*a* (Cape Espichel; Setúbal Canyon; NW Cape Sardão); Monteiro-Marques, 1987 (some as *Notomastus exertilis*; continental shelf of Algarve); Dexter, 1992 (some as *Notomastus exertilis*; previous records: Ria Formosa; continental shelf of Algarve).

Distribution: Skagerrak; British Channel; Atlantic coast of Europe, from France southwards; Mediterranean Sea; Adriatic Sea; Aegean Sea; Madeira Island; West to South Africa; [?] Red Sea; [?] China Sea; [?] Indian Ocean; [?] Pacific Ocean. In sand, muddy sand, and rock crevices. Intertidal and shallow water to 470 meters.

Remarks: I follow here Fauvel (1926*a*, 1927*a*), considering that *Notomastus exsertilis* Saint-Joseph 1906 could be a specimen of *Dasybranchus caducus*. This species occurs on the same habitat than *N. latericeus*, and besides the difference in the number of chaetae, all the other characters seem to be similar. In fact, Saint-Joseph (1906) already states that his new species resembles *Dasybranchus caducus* in certain aspects.

Dasybranchus carneus Ehrenberg *in* Grube 1870

Dasybranchus carneus Ehrenberg *in* Grube, 1870*e*: 505.

Type locality: Tor (El Tûr), Sinai Peninsula (Egypt), Suez Gulf, between coral.

Synonyms: [?] *Polybranchia foxi* Potts 1928.

Selected references: *Dasybranchus carneus* — Fauvel, 1933*b*: 140; Fauvel, 1933*c*: 69; Rullier, 1963*b*: 217; Hartman, 1974*b*: 628. [?] *Polybranchia foxi* — Potts, 1928: 693-694, figs. 210-211.

Distribution: Suez Gulf; [?] Suez Canal; Sea of Marmara; Aegean Sea. Shallow water.

Remarks: This species is mainly characterized by the absence of chaetae on the second segment, the smooth tegument, and the retractile branchia-like body expansions with about 4-6 filaments in the middle region of the body. After the round prostomium, the peristomium is followed by an achaetous segment, and by 12 chaetigerous segments, with capillary chaetae on both noto and neuropodia (Fauvel, 1933*b*, 1933*c*).

Rullier (1963*b*) suggests that the presence of *D. carneus* in the Sea of Marmara is due to a Lessepsian migration, through the Suez Canal.

I include under *Dasybranchus carneus*, as a possible synonymy, the species *Polybranchia foxi*, described by Potts (1928) with base on two specimens collected at the Lake Timsah, at the Suez Canal. The specimen used for the description was 8 cm long and 0.3 mm wide, for about 160 segments, being incomplete posteriorly, while the second specimen had a regenerated anterior end (POTTS, 1928). The species was included under the family Spionidae, but both the description of the new genus and species, as well as the drawings, show that the two specimens are the posterior ends, including pygidium, of Capitellidae worms.

P. foxi is described as having: a prostomium with frontal horns; branchia-like body expansions from the first chaetigerous segment, but also present in the peristomium, as digitate processes which progressively increase in number, until reaching 6-7 on each side of the segments (at about segment 20-30), and than getting smaller, remaining as minute stumps till about segment 60; dorsal and ventral lamellae absent or rudimentary; all present chaetae as hooded hooks in both noto and neuropodium, as a single row in each rami, being fewer in the noto than in the neuropodium. All the described fit the morphology of the posterior region of a branchiate Capitellidae, with a pair of anal cirri.

The second specimen of the type material of *P. foxi* is described as having a regenerated anterior end, which could mean that it doesn't present the two pairs of "frontal horns", *i.e.*, that the posterior end doesn't show the two anal cirri.

On the same station (T.8, from Lake Timsah) where the two specimens of *P. foxi* were collected, POTTS (1928) also records the presence of *Dasybranchus caducus* (Grube 1846). Probably, the two posterior ends described by Potts as *P. foxi* belonged originally to those specimens. However, anal cirri haven't been described in *Dasybranchus caducus*, which means that probably at least one of the type specimens of *P. foxi* doesn't belong to *D. caducus*, or that at least part of the specimens recorded as so by Potts in 1928 are not *D. caducus*. On the other hand, the maximal number of branchial processes described and pictured by POTTS (1928) for *P. foxi* (6-7) approaches the number indicated by FAUVEL (1933*b*, 1933*c*) for *Dasybranchus carneus* (6), a species described and known to occur in the Suez Gulf. However, the pygidium of *D. carneus* is not known. The synonymy of the two species is here proposed only tentatively.

Finally, the genus *Polybranchia* Potts 1928 is preoccupied by *Polybranchia* Pease 1860, in Sacoglossa (Opistobranchia, Gastropoda). This way, in the improbable case that the type material of *Polybranchia foxi* Potts 1928 turns up to belong to a new genus, the name *Polybranchia* cannot be used for it.

Dasybranchus gajolae Eisig 1887

Dasybranchus Gajolae EISIG, 1887: 828-831, pl. 16 figs. 6-8, 13-15, pl. 17 fig. 7, pl. 19 fig. 9, pl. 21 fig. 9, pl. 22 figs. 1-3, 8-13, pl. 23 figs. 1, 3, 12-13, pl. 32 figs. 6-9, pl. 34 figs. 21-23, pl. 35 fig. 34.

TYPE LOCALITY: Secca di Gajola, Secca di Benta Palummo, and Secca di Forio (Gulf of Naples), between 40-80 meters.

SELECTED REFERENCES: *Dasybranchus Gajolae* — LO BIANCO, 1893: 16; FAUVEL, 1909: 10; FAUVEL, 1926*a*: 299; FAUVEL, 1927*a*: 149-150, fig. 52*i-n*. *Dasybranchus gajolae* — GRAVINA & SOMASCHINI, 1990: 266. *Dasybranchus caducus* [not Grube 1846] — CLAPARÈDE, 1864: 516-520, pl. 8 fig. 8.

REFERENCES FOR PORTUGAL: FAUVEL, 1909 (as *Dasybranchus gajolæ*; off Lagos); FAUVEL, 1914*f* (as *Dasybranchus Gajolæ*; off Lagos); BELLAN, 1960*a* (Cape Espichel); AMOUREUX, 1974*b* (off Aveiro; off Porto); MONTEIRO-MARQUES, 1987 (continental shelf of Algarve); DEXTER, 1992 (previous records: continental shelf of Algarve).

DISTRIBUTION: Mediterranean Sea; Adriatic Sea; Aegean Sea; Azores; Madeira. Among corallines and *Lithothamnium*. Circalittoral (recorded around 40-80 meters).

GENUS ***Heteromastides*** Augener 1914

Heteromastides AUGENER, 1914: 63-64.

TYPE SPECIES: *Heteromastides bifidus* Augener 1914.

REMARKS: MUCHA & COSTA (1999) recorded the presence of an unidentified species of this genus in Portuguese estuaries, without providiving more taxonomic information. Nowadays the genus *Heteromastides* includes two species, *H. bifidus* Augener 1914 (the type species), described from Fremantle, Southwestern Australia, at 3 meters, and *H. platyproctus* Pillai 1961, from Tambalagam Lake, Sri Lanka, at shallow water. The species described by PILLAI (1961) differs from the type species and the generally accepted definition of the genus in the structure of the thoracic chaetae. This way, *H. platyproctus* is described as having all 11 thoracic chaetigers with capillary chaetae, while *H. bifidus* has capillary chaetae only in the first three chaetigers, being the fourth one mixed and the rest with hooded hooks. The definition of the genus *Heteromastides* should be emmended, or *H. platyproctus* assigned to a different genus. *Heteromastides* is included here, but its record in Portuguese waters could be the result of an erroneous identification, and its presence in the European waters requires confirmation.

Heteromastides sp.

Heteromastides sp. MUCHA & COSTA, 1999: table 4.

REFERENCES FOR PORTUGAL: MUCHA & COSTA, 1999 (Ria de Aveiro and/or Sado Estuary).

DISTRIBUTION: Portugal: Ria de Aveiro, in mud and/or Sado Estuary, in sandy and muddy sediments (not specified in MUCHA & COSTA, 1999), in both locations at the high infralittoral zone.

GENUS *Heteromastus* Eisig 1887

Heteromastus EISIG, 1887: 835.

TYPE SPECIES: *Capitella filiformis* Claparède 1864.

DIAGNOSIS (from GREEN, 2002): Prostomium short to long, conical, sometimes tapering, eyes present or absent. Thorax with 12 segments including an achaetous peristomium and 11 chaetigers. Chaetiger 1 biramous. Chaetigers 1-5 with capillary chaetae, chaetigers 6-11 with long-shafted hooded hooks. Abdominal chaetigers with short-shafted hooded hooks. Branchia-like body expansions may be present on posterior abdomen.

REMARKS: The genus definition was emended by GREEN (2002).

HUTCHINGS & RAINER (1981), in order to stabilize the genus *Heteromastus* Eisig 1887, redescribed its type species, *Capitella filiformis* Claparède 1864, designating a neotype for the species. The type locality is Port-Vendres, in the Mediterranean coast of France, but the only Mediterranean material available to HUTCHINGS & RAINER (1981) was a specimen collected the 1933, in Alexandria (Egypt), and previously identified by FAUVEL (1937). This way, the neotype is not from the type locality which, in case it is demonstrated that in the Mediterranean Sea occur more than one species of *Heteromastus*, could raise new problems concerning the stability of the type species of the genus.

Heteromastus filiformis (Claparède 1864)

Capitella filiformis CLAPARÈDE, 1864: 509-510, pl. 4 fig. 10.

TYPE LOCALITY: Port-Vendres, Southern France, Mediterranean Sea. Neotype designated by HUTCHINGS & RAINER (1981), from Alexandria, Egypt.

SYNONYMS: [?] *Capitella fimbriata* Van Beneden 1857; *Ancistria minima* Quatrefages 1866; *Capitella costana* Claparède 1869; *Ancistria capillaris* Verrill 1874; *Notomastus filiformis* Verrill 1874 [junior synonym and homonym].

SELECTED REFERENCES: *Heteromastus filiformis* — EISIG, 1887: 839-846, pl. 1 figs. 4-4*a*, pl. 27 figs. 15-21, pl. 28 figs. 1-17, pl. 32 figs. 15-18, pl. 33 figs. 17-20, pl. 34 figs. 27-28, pl. 35 figs. 37-38; LO BIANCO, 1893: 18; FAUVEL, 1926*a*: 300; FAUVEL, 1927*a*: 150-152, fig. 53*a-i*; WESENBERG-LUND, 1942: 37-38, fig. 5; HUTCHINGS & RAINER, 1981: 374-379; GRAVINA & SOMASCHINI, 1990: 266-267; HARTMANN-SCHRÖDER, 1996: 441-443, fig. 217; KIRKEGAARD, 1996: 177-179, fig. 91; [?] DEAN, 2001: 75, figs. 10-12. *Capitella Costana* — CLAPARÈDE, 1869: 15-16, pl. 27 fig. 2. *Capitella capitata* — ELIASON, 1920: 63 [in part]. [?] *Capitella fimbriata* — VAN BENEDEN, 1857: 140. [?] *Ancistria minima* — QUATREFAGES, 1866*b*: 252, pl. 11 figs. 28-34. *Ancistria capillaris* — VERRILL, 1874*b*: 351, 385. *Notomastus capillaris* — VERRILL, 1880: 181. *Notomastus filiformis* — VERRILL, 1874*c*: 342, 611.

REFERENCES FOR PORTUGAL: AMOUREUX & CALVÁRIO, 1981 (Peniche); COSTA, GAMITO & OLIVEIRA, 1984 (Sado Estuary); MONTEIRO-MARQUES, 1987 (continental shelf of Algarve); QUINTINO & GENTIL, 1987 (Lagoon of Albufeira; Lagoon of Óbidos); GAMITO, 1989 (Ria Formosa); QUINTINO, RODRIGUES & GENTIL, 1989 (Lagoon of Óbidos); DEXTER, 1992 (previous records: Ria Formosa; Ria de Alvor; continental shelf of Algarve; Sines; Sado Estuary; Arrábida; Lagoon of Albufeira; Lagoon of Óbidos; Figueira da Foz; Mondego Estuary; Ria de Aveiro); PARDAL, MARQUES & BELLAN, 1993 (Mondego Estuary); MOREIRA, FIGUEIRA & CUNHA, 1994 (Ria de Aveiro); SPRUNG, 1994 (Ria Formosa); CANCELA DA FONSECA *et al.*, 2006 (Aljezur).

DISTRIBUTION: Arctic Ocean; English Channel; French Atlantic; North Sea; Skagerrak; Kattegat; Öresund; Mediterranean Sea; Adriatic Sea; Aegean Sea; Black Sea; Morocco; North Atlantic (coasts of U.S.A.) to Gulf of Mexico; [?] Persian Gulf; [?] South Africa; [?] Australia and New Zealand; [?] Pacific coast of Costa Rica. Intertidal and shallow water, on bottoms of muddy sand, and among seagrasses. KIRKEGAARD (1996) states that it occurs between 0-3000 meters.

*GENUS *Leiocapitella* Hartman 1947

Leiocapitella HARTMAN, 1947*a*: 437-438.

TYPE SPECIES: *Leiocapitella glabra* Hartman 1947.

DIAGNOSIS (adapted from GREEN, 2002): Anterior region with a variable number of chaetigers (12-16) exclusively with capillary chaetae and 1 to 2 transitional chaetigers with capillary chaetae in the notopodia and hooded hooks in the neuropodia; remaining chaetigers exclusively with hooded hooks. Branchia-like body extensions absent (?).

REMARKS: The genus definition was emended by GREEN (2002).

Two species of *Leiocapitella* are known to occur in European and nearby waters: *Leiocapitella dollfusi* (Fauvel 1936), and *L. norvegica* (Fauchald 1972). The variability found in the transition between the thoracic and the abdominal regions described by FAUVEL (1936*c*) for *L. dollfusi*, comprises the described for *L. norvegica*, for which reason both species could be synonymous. However, *L. dollfusi* was described with base on material collected between 70-200 meters, from Morocco, while *L. norvegica* was described from 1272 meters, from Norway. The species was later recorded by AMOUREUX (1972*b*, 1973*a*, 1982*b*) as being present between 200-1000 meters, at the continental slope going from Ireland to Portugal. As there is the possibility of the existence of two very similar species associated at different depths, and it is convenient to compare the available material of both species before establishing the synonymy, I maintain here the two species as being valid.

KEY TO SPECIES:

1a. Chaetigers 1-13 only with capillary chaetae, chaetiger 14 with capillary chaetae on notopodia and hooks on neuropodia, from chaetiger 15 both podia with hooks (exceptions may occur: also chaetiger 13 with hooks on neuropodia; chaetiger 14 with hooks on both podia; chaetigers 12 and 13 with hooks on the neuropodia and chaetiger 14 with hooks on both podia; chaetiger 15 with capillary chaetae on notopodia and chaetigers 14 and 15 with hooks on neuropodia); chaetiger 1 only with notopodial chaetae...***L. dollfusi****

1b. Chaetigers 1-12 only with capillary chaetae, chaetigers 13 and 14 with capillary chaetae on notopodia and hooks on neuropodia, from chaetiger 15 hooks on both podia; chaetiger 1 only with notopodial chaetae...***L. norvegica* nov. comb.**

**Leiocapitella dollfusi* (Fauvel 1936)

Mastobranchus Dollfusi FAUVEL, 1936*c*: 81-83, fig. 11.

TYPE LOCALITY: FAUVEL (1936*c*) described the species with base on numerous specimens collected at 8 stations located off the Atlantic coasts of Morocco, but apparently he didn't designate a holotype. The stations can be divided in two groups, according to their locations. One group is located off Rabat, between 34º – 34º54'30"N, and 7º31'30" – 7º59'W, at 145-200 m, on bottoms of rocks, mud, muddy sand and, sand. The second group is located south of Agadir, between 30º21'10" – 30º39'N, and 9º44'20" – 10º3'W, at 70-129 m, on bottoms of calcareous rocks, sand, muddy sand, mud and clay. The data of the 8 stations is as follows: 1) 34ºN, 7º46'W, at 157 meters, in a bottom of rocks with *Dendrophyllia* and mud with *Brissopsis*; 2) 34º1'N, 7º31'30"W, at 145 meters, in a bottom of mud with *Brissopsis* and rocks with gorgoneans; 3) 34º6'15"N, 7º35'W, at 200 meters, in a bottom of sand with *Brissopsis* and rocks with *Ostrea cochlear*; 4) 34º54'30"N, 7º54'16"W, at 145 meters, in a bottom of sandy mud with *Brissopsis* and rocks with *Dendrophyllia*; 5) 33º54'N, 7º59'W, at 158 meters, in a bottom of sand and mud with *Brissopsis* and *Dendrophyllia*; 6) 30º27'N, 9º56'10"W, at 125 meters, in a bottom of sand with some mud with *Cyclammina*, pennatulaceans, *Geodia*, and Veretillidae; 7) 30º39'N, 10º3'W, at 129 meters, in a bottom of clay and sandy mud, and calcareous rocks, with *Dendrophyllia* and *Antedon*; 8) 30º21'10"N, 9º44'20"W, at 70 meters, in a bottom of mud with *Sternaspis*.

SYNONYMS: [?] *Leiocapitella glabra* Hartman 1947.

SELECTED REFERENCES: *Mastobranchus Dollfusi* — KIRKEGAARD, 1959: 51-52. *Leiocapitella dollfusi* — BELLAN, 1964*b*: 145-147; RULLIER & AMOUREUX, 1969: 400; [?] AMOUREUX, 1971*a*: 13; AMOUREUX, 1972*b*: 81; AMOUREUX, 1973*a*: 444; DESBRUYÈRES, GUILLE & RAMOS, 1974: 359; AMOUREUX, 1982*b*: 196-197; GRAVINA & SOMASCHINI, 1990: 267-268. [?] *Leiocapitella glabra* — HARTMAN, 1947*a*: 438-439, pl. 54 figs. 1-3; EWING, 1984*c*: 14.45-14.47, figs. 14.39-14.40. [?] *Leiocapitella* cf. *glabra* — LÓPEZ *et al.*, 2005: 63-64, fig. 3.

REFERENCES FOR PORTUGAL: [?] Present work (southwestern continental shelf).

MATERIAL: SEPLAT 6 — St. 237 (A.2705), off Praia da Amoreira, 148 m, sand: [?] 1 middle fragment with 44 chaetigers; about 12 chaetigers with dorsal branchia-like body expansions, which can reach 7-8 filaments just posteriorly to the dorsal tori; branchia-like body expansions first appear as 2 small papillae on each side of both dorsal tori, and then the number of filaments increases; the fragment is here tentatively identified as belonging to *Leiocapitella dollfusi*, due to its morphology and ecology.

DISTRIBUTION: Western Africa, from Morocco to Congo; eastern European continental slope, from Ireland to Portugal; Mediterranean Sea; Aegean Sea. On muddy bottoms, between 19-1000 meters. [?] Aegean Sea; [?] Gulf of California and Cedros Island, western side of Lower California, 36-100.5 meters, in mud; [?] Gulf of Mexico, off Texas, at 65 meters, in silty clay; [?] Pacific coast of Panamá, at 10 meters, in coarse sand.

REMARKS: GALLARDO (1968: 119) points out the fact that *Mastobranchus dollfusi* could belong to another genus, as it lacks abdominal notopodia with mixed chaetae and hooks. On the other hand, he also pointed the fact that the presence of 13 thoracic chaetigers with simple chaetae, the first chaetiger being hemipodial with only notopodial chaetae, and chaetiger 14 being transitional with simple notochaetae and neuropodial hooks were typical of *Leiocapitella*. This genus was described by HARTMAN (1947*a*), but she stated that it was probably abranchiate. However, *Leiocapitella dollfusi* does present branchia-like body expansions (or structures similar to branchiae) on the posterior region of the body. EWING (1984*c*) points this, considering *Mastobranchus dollfusi* Fauvel 1936 as being *incertae sedis*, due to the fact that the palmate branchia-like body expansions are not known in *Leiocapitella*. I follow here GRAVINA & SOMASCHINI (1990) in maintaining this species in the genus *Leiocapitella*, as the presence or absence of branchia-like body expansions could be of specific level, instead of generic. Anyway, further studies are needed to clarify this point.

Leiocapitella glabra was recorded by ARVANITIDIS (2000) from the Aegean Sea. It represents the type species of the genus, and was described by HARTMAN (1947*a*) with base on two incomplete specimens collected in two different stations, at the Gulf of California and Lower California (Mexico), being the type locality one mile northwest of San Gabriel Bay, Espiritu Santo Island, Gulf of California (Mexico), at 20-35 fathoms (36.6-64 meters), in mud. The species was described as having 13 thoracic chaetigers with simple chaetae, being the first chaetiger hemipodial, only with notopodia, and chaetiger 14 as being transitional with simple notochaetae and neuropodial hooks. One of the specimens had mixed fascicles in the notopodia of chaetiger 15. The species and the genus were "*believed to be abranchiate*" (HARTMAN, 1947*a*: 438), with one of the specimens on which the original description was based having 16 abdominal segments, and the other 36. The incomplete specimen described by EWING (1984*c*) from the Gulf of Mexico was also abranchiated, having 35 chaetigers, including thorax (so, 21 abdominal chaetigers plus a transitional one). The thoracic distribution of the chaetae in *L. glabra* ressembles the one present in *L. dollfusi* (Fauvel 1936), reason why the two species are here considered as being possibly synonymous, or at least the Aegean record as belonging to *L. dollfusi*. It is possible that the branchia-like body expansions were not observed in *Leiocapitella glabra* specimens due to the fact that they are present only in the posterior region of the body, as described by FAUVEL (1936*c*) for *L. dollfusi*.

The species described by LÓPEZ *et al.* (2005) from Panamá as *Leiocapitella* cf. *glabra* showed only 11 thoracic chaetigers, being the 12th transitional, instead of 13 thoracic segments with the 14th transitional. The difference was considered by LÓPEZ *et al.* (2005) as being probably due to the incomplete development of the specimen. This record is here considered as being highly doubtful.

Leiocapitella norvegica (Fauchald 1972) **nov. comb.**

Leiochrides norvegicus FAUCHALD, 1972*b*: 103, fig. 4*E-G*.

TYPE LOCALITY: Sognefjorden (Western Norway), southwest of the mouth of Vadheimsfjorden, 61º08'15"N, 05º45'30"E, 1272 meters, clay with brownish top layer.

DISTRIBUTION: Known from the type locality.

REMARKS: Like in the preceeding species, *Leiochrides norvegicus* Fauchald 1972 seems like if it should be included in the genus *Leiocapitella* as emended by GREEN (2002), except for the fact that *L. norvegicus* presents branchia-like body expansions, while the *Leiocapitella* is considered to lack them. For the moment, I include this species under this genus, as the chaetal distribution approaches it more to *Leiocapitella* than to the genus *Leiochrides*.

The chaetal distribution of this species fits the distribution of one of the anomalous specimens of *Leiocapitella dollfusi* referred by FAUVEL (1936*c*): chaetigers 1-12 exclusively with capillar chaetae and with chaetiger 1 with notopodial chaetae only, chaetigers 13 and 14 with notopodial capillar chaetae and neuropodial hooks, and hooks on both podia from chaetiger 15. Besides the different depths of occurrence and geographical distribution, both species are quite similar, and *L. norvegica* could be a junior synonym of *L. dollfusi*.

GENUS *Leiochrides* Augener 1914

Leiochrides AUGENER, 1914: 60.

TYPE SPECIES: *Leiochrides australis* Augener 1914.

SYNONYMS: *Pseudoleiocapitella* Harmelin 1964; *Pseudomastus* Capaccioni-Azzati & Martin 1992 [not O. Boettger 1889 (Mollusca); not Emetz 1972 (Carabidae, Coleoptera)]; *Paraleiochrides* Zhang & Sun 1997.

DIAGNOSIS (from GREEN, 2002): Thorax with 13 segments including an achaetous peristomium and 12 chaetigers with capillary chaetae. Chaetigers 11 and 12 may have capillary chaetae in both rami or may be transitional with capillary chaetae in the notopodia and hooded hooks in the neuropodia. Remaining chaetigers with hooded hooks. Parapodia reduced. Retractile branchia-like body expansions may be present.

REMARKS: The name *Pseudomastus* is already preoccupied in Mollusca, as *Pseudomastus* O. Boettger 1889 (= *Mastus* H. Beck 1837), and later in Carabidae (Coleoptera), as *Pseudomastus* Emetz 1972, a subgenus of *Cymindis* Latreille 1806. I think, however, that it is unnecessary to designate a new name for the genus, as *Pseudomastus* Capaccioni-Azzati & Martin 1992 becomes a synonym of *Leiochrides* Augener 1914, according to the redefinition of the genus given by BLAKE (2000*b*), and GREEN (2002).

KEY TO SPECIES:

1a. Chaetiger 1 uniramous; thoracic chaetigers 2-10 with capillary chaetae, on both noto- and neuropodia; chaetigers 11-12 with capillary chaetae on notopodia and hooded hooks on neuropodia; from chaetiger 13 both podia with hooded hooks; branchia-like body expansions present from mid- to posterior abdominal region, as palmate tufts of 2-3 (occasionally 4) digitate filaments, emerging posteriorly to notopodial tori at the dorsal-lateral end of each segment (branchia-like body expansions stated to extend from chaetigers 205-210 to chaetigers 255-260, in specimens that can reach 270 chaetigers for 50 mm long)..***L. fauveli***

1b. Chaetiger 1 biramous; thoracic chaetigers 1-12 with capillary chaetae, on both noto- and neuropodia; from chaetiger 13 both podia with hooded hooks..***L. australis* sensu Gravina, Mollica & Somaschini 1996**

Leiochrides australis Augener 1914 *sensu* Gravina, Mollica & Somaschini 1996

Leiochrides australis AUGENER, 1914: 60-63, text-fig. 7, pl. 1 figs. 12-13.

TYPE LOCALITY: Australia: Sharks Bay, 7-12.5 meters, on sandy bottom with vegetation, and rocks with corals; Rottnest, at low tide; Oyster Harbour, near Albany, 0.75-5.5 meters, sand and muddy bottoms, with vegetation and oyster beds.

SELECTED REFERENCES: *Leiochrides australis* — GREEN, 2002: 286. *Leiochrides australis* — GRAVINA, MOLLICA & SOMASCHINI, 1996: 36-39, figs. 1-2. *Leiochrides* sp. — GRAVINA & SOMASCHINI, 1990: 268.

DISTRIBUTION: Southern Australian coasts, on rocky bottoms and *Posidonia australis* beds, intertidal to 5.5. meters. [?] Italian coasts of the Tyrrhenean, Adriatic, Ionian and Ligurian Seas, 0-20 meters, on rocky bottoms with phophilic algae, artificial substrata and among rhizomes of *Posidonia oceanica*.

REMARKS: According to GRAVINA, MOLLICA & SOMASCHINI (1996), the recent records of *L. australis* along the Italian coasts suggest a recent colonization of the Mediterranean Sea through a passive contemporary dispersal. The same authors compared Australian specimens with the Mediterranean ones, and found that they were morphologically identical, which led them to reject the hypothesis of being the result of an ancient Tethyan relic. However, in my opinion, the specimens studied by GRAVINA, MOLLICA & SOMASCHINI (1996) probably don't belong to this species. GREEN (2002) refers *L. australis* as having 2 teeth above the main fang and the superior rows with 3 and 5-6 teeth, besides of having the first chaetiger uniramous. The specimens studied by GRAVINA, MOLLICA & SOMASCHINI (*op.cit.*) are described as having one large and numerous small teeth above the main fang, being the first chaetiger biramous. For the moment I keep *L. australis* in the key, as belonging to the European Fauna, but probably this is not true. A further study on this question will be necessary.

Leiochrides fauveli (Harmelin 1964) nov. comb.

Pseudoleiocapitella fauveli HARMELIN, 1964: 90-91, pl. 11.

TYPE LOCALITY: Gulf of Marseille, France (Mediterranean Sea), on *Posidonia oceanica* meadows with mud and sand, and on dead meadows, between 4 and 21 meters.

SYNONYMS: *Pseudomastus deltaicus* Capaccioni-Azzati & Martin 1992.

SELECTED REFERENCES: *Pseudoleiocapitella fauveli* — AMOUREUX, 1983*b*: 254; GRAVINA & SOMASCHINI, 1990: 273-274. *Pseudomastus deltaicus* — CAPACCIONI-AZZATI & MARTIN, 1992: 247-249, figs. 1-2.

DISTRIBUTION: France (Mediterranean Sea): Gulf of Marseille, on *Posidonia oceanica* meadows with mud and sand, and on dead meadows, between 4-21 meters; Villefranche-sur-Mer, at the harbour, in a biotope with *Upogebia*. Spain (Mediterranean Sea): Els Alfacs Bay, Ebre Delta (Tarragona), 40º33' to 38'N 0º32' to 44'E, between 2-10 meters; Adriatic Sea; Aegean Sea.

REMARKS: According to the definition of the genus *Leiochrides* presented by BLAKE (2000*b*) and GREEN (2002) the genus *Pseudoleiocapitella* becomes a junior synonym of *Leiochrides*. The genus includes one single species, *Pseudoleiocapitella fauveli* Harmelin 1964, which is very close to *Pseudomastus deltaicus* Capaccioni-Azzati & Martin 1992, a species described from the Els Alfacs Bay, in the Ebre Delta (Mediterranean coast of Spain). The big difference between these two species is the presence of branchia-like body expansions in the later one. However, branchia-like body expansions are reported be present in *Pseudomastus deltaicus* in the mid- to posterior abdominal region, from chaetigers 205-210 to chaetigers 255-260. The holotype of this species is reported to be a specimen with 270 chaetigers for 50 mm long, and a maximum width of 0.7 mm. This could mean that all the specimens of *P. fauveli* lacked the abdominal region bearing the body expansions. *Pseudoleiocapitella fauveli* was described with base on 43 specimens, all of them incomplete, with the longer ones measuring from 15 to 20 mm and a medium diameter of 0.5 mm. Besides, the ecology and geographic distribution of both taxa seem to be quite similar: *P. fauveli* was described from the Gulf of Marseille, between 4-21 meters, and occurring in *Posidonia oceanica* meadows with mud and sand, among dead material of *P. oceanica*, and also at the harbour of Villefranche, in a muddy bottom with *Upogebia*; *P. deltaicus* was described from Els Alfacs Bay, near Tarragona, about 450 Km south of Marseille, occurring between 2-10 meters, in muddy bottoms. Finally, in samples with specimens of *Leiochrides fauveli* collected at South France, it was possible to find posterior fragments presenting body expansions resembling branchiae as described for *Pseudomastus deltaicus* (personal observation).

From the stated above, both species are here considered as synonymous, being *Pseudomastus deltaicus* Capaccioni-Azzati & Martin 1992 a junior synonym of *Leiochrides fauveli* (Harmelin 1964).

CAPACCIONI-AZZATI & MARTIN (1992) state in the original description that the paratypes of *Pseudomastus deltaicus* deposited at the Museo Nacional de Ciencias Naturales, in Madrid, are numbered from 16-01/798 to 16-01/801. However, the numbers 16-01/800 and 16-01/801 correspond both to the holotype and paratype of *Syllis ortizi* San Martín 1992.

GENUS *Mastobranchus* Eisig 1887

Mastobranchus EISIG, 1887: 831.

TYPE SPECIES: *Mastobranchus Trinchesii* Eisig 1887.

SYNONYMS: *Neopseudocapitella* Rullier & Amoureux 1979.

DIAGNOSIS (from GREEN, 2002): Thorax with 12 segments including achaetous peristomium and 10 or 11 chaetigers. Second segment with or without chaetae. Thorax with capillary chaetae or last thoracic chaetiger with capillary chaetae and hooded hooks. Two or more abdominal chaetigers with mixed fascicles of capillary chaetae and hooded hooks in notopodia; abdominal neuropodia exclusively with hooded hooks.

REMARKS: The genus definition was emended by GREEN (2002).

KEY TO SPECIES:

1a. Chaetiger 1 biramous; branchia-like body expansions present: neuropodial body expansions are simple, as extensions of the ventral tori on the anterior region of the abdomen, while the notopodial expansions are composed, digitiform, retractil, and occur at the posterior region of the abdomen..***M. trinchesii***

1b. Chaetiger 1 uniramous, with notochaetae; branchia-like body expansions absent...........***M. brasiliensis***

Mastobranchus brasiliensis (Rullier & Amoureux 1979) **comb. nov.**

Neopseudocapitella brasiliensis RULLIER & AMOUREUX, 1979: 185, fig. 7.

TYPE LOCALITY: Brazil, 11º34'S, 37º22'W, 26 meters, sand, mud, shells.

SELECTED REFERENCES: *Neopseudocapitella brasiliensis* — AMOUREUX, 1983*a*: 738-739, fig. 8; AMOUREUX, 1983*b*: 254; ZAVODNIK, VIDAKOVIC & AMOUREUX, 1985: 433, table 1; GRAVINA & SOMASCHINI, 1990: 269-270; CAPACCIONI-AZZATI, TORRES-GAVILÁ & TENA, 1991: 117-118, fig. 2; ÇINAR , 2005: 150.

DISTRIBUTION: Brazil; Mediterranean Sea; Adriatic Sea; Aegean Sea; Sinai, Gulf of Aqaba (Red Sea). In the Mediterranean Sea it seems to be present only on sheltered environments. In sandy and muddy bottoms. Intertidal to 26 meters.

REMARKS: This species was cited in the European waters for the first time by AMOUREUX (1983*b*), based on a collection of polychaetes from the Adriatic Sea, later also studied by ZAVODNIK, VIDAKOVIC & AMOUREUX (1985). CAPACCIONI-AZZATI, TORRES-GAVILÁ & TENA (1991) cited the species for the first time in the Iberian Peninsula, from Los Alfaques Bay (Mediterranean coast of Spain), while AMOUREX (1983*a*) recorded it from the Gulf of Aqaba (Red Sea).

Neopseudocapitella brasiliensis Rullier & Amoureux 1979 is the only species of the genus *Neopseudocapitella*. The description of both the species and genus fits the emended definition of *Mastobranchus* given by GREEN (2002): thorax with 12 segments including achaetous peristomium and 10 or 11 chaetigers; second segment with or without chaetae; thorax with capillary chaetae or last thoracic chaetiger with capillary chaetae and hooded hooks; two or more abdominal chaetigers with mixed fascicles of capillary chaetae and hooded hooks in notopodia; abdominal neuropodia exclusively with hooded hooks.

The species described by RULLIER & AMOUREUX (1979) is stated to have a thorax with 15 segments, with the first one achaetigerous, the following 11 with capillary chaetae only and the last 3 with mixed notopodia of capillary chaetae and hooks, and neuropodia with hooks. However, the separation between thorax and abdomen was not clear, and the own authors stated that they considered the chaetigers 12-14 as belonging to the thorax with base on a slight constriction after chaetiger 14. The chaetal composition of the first abdominal chaetigers is the same than chaetigers 12-14.

I believe that probably the thorax is only composed by the first 11 chaetigers, and that the first chaetiger with mixed notochaetae belongs already to the abdomen. As a result of this, the genus *Neopseudocapitella* would be a synonym of *Mastobranchus*. However, a definitive statement will depend on a study of the type or topotype material of *N. brasiliensis*.

The species described by CAPACCIONI-AZZATI, TORRES-GAVILÁ & TENA (1991) as being *N. brasiliensis* seems to fit the description given by RULLIER & AMOUREUX (1979). However the ecology of both populations are different (open water, at 22 meters, on bottoms of sand, mud and shells in Brazil, against beds of *Cymodocea nodosa* and muddy sand, at 0.4 to 2 meters deep, on a sheltered bay, in Spain). The found specimens are stated to have 15 thoracic segments, which surface is rugose. Nothing is said concerning the surface of the abdominal region, if it has a similar texture to the thoracic region or not, but from fig. 2 it is possible to see a constriction between chaetigers 11 and 12. This seems to give support to the possibility that this species only has 11 thoracic chaetigers, in case that both populations belong to the same species.

Mastobranchus trinchesii Eisig 1887

Mastobranchus Trinchesii EISIG, 1887: 833-835, pl. 1 figs. 3-3*a*, pl. 24 figs. 1-13, pl. 25 figs. 1-9, pl. 26 figs. 1-31, pl. 32 figs. 10-14, pl. 33 figs. 11-16, pl. 34 figs. 24-26, pl. 35 figs. 35-36.

TYPE LOCALITY: Posillipo Beach, Gulf of Naples (Mediterranean Sea), at 5-10 meters.

SELECTED REFERENCES: *Mastobranchus Trinchesi* — FAUVEL, 1926*a*: 300. *Mastobranchus Trinchesii* — LO BIANCO, 1893: 17; FAUVEL, 1927*a*: 152-154, fig. 54*a-i*. *Mastobranchus trinchesii* — GRAVINA & SOMASCHINI, 1990: 268-269.

DISTRIBUTION: Mediterranean Sea; Adriatic Sea; Aegean Sea. In sand. Between 5-10 meters.

*GENUS ***Mediomastus*** Hartman 1944

Mediomastus HARTMAN, 1944*c*: 264.

TYPE SPECIES: *Mediomastus californiensis* Hartman 1944.

SYNONYMS: *Capititia* Hartman 1947.

DIAGNOSIS (from GREEN, 2002): Body small, thread-like. Proboscis papillated. Thorax with 9-11 chaetigers, usually 10. Chaetigers 1-4 with capillary chaetae in both rami. Remaining thoracic and abdominal chaetigers with hooded hooks. Sometimes paddle-like chaetae may occur in the thorax and sometimes capillary chaetae may occur in notopodia of posterior abdominal segments. Pygidium terminal with midventral caudal cirrus.

KEY TO SPECIES:

1a. Boundary between thorax and abdomen distinct, at chaetigers 10/11; distinctive staining pattern with methyl green present..**2**
1b. Boundary between thorax and abdomen indistinct; no distinctive staining pattern with methyl green; thoracic hooks with 2+ rows of teeth, hood 3-5 times longer than wide; egg diameter 70 µm.....***M. fragilis***

2a (1a). Methyl green pattern as a distinct band around posterior half of chaetiger 9; thoracic hooks with 3 steep rows of teeth, hood 2-3 times longer than wide; egg diameter 40 µm.........................***M. capensis****
2b (1a). Methyl green pattern as a solid band of colour extending from chaetiger 6 to the midsegmental groove of chaetiger 9, with the heaviest staining on chaetiger 9; the remainder of chaetigers 9 and 10 less intensively stained; with dark stained spots in addition; abdominal chaetigers with a narrow band of colour at the extreme posterior end; thoracic hooks with 3+ rows of teeth, hood 4 times longer than wide; egg diameter 65+ µm...***M. cirripes***

****Mediomastus capensis*** Day 1961

Mediomastus capensis DAY, 1961: 518-519, fig. 11*a-d*.

TYPE LOCALITY: Saldanha Bay, Cape, South Africa, 33º03'5"S, 18º01'5"E, between 8-12 meters, in a bottom of khaki sand.

SELECTED REFERENCES: *Mediomastus capensis* — DAY, 1967: 600-601, fig. 28.2.*n-p*; HARTMANN-SCHRÖDER, 1974*a*: 187; WARREN, HUTCHINGS & DOYLE, 1994: 243-244, figs. 2*c*, 12, tables 1-2. [?] *Mediomastus capensis* — GRAVINA & SOMASCHINI, 1988: 60-61, figs. 4-6, table 1; GRAVINA & SOMASCHINI, 1990: 269. Not *Mediomastus capensis* — THOMASSIN, 1970*b*: 80, fig. 5*a-d* [= *Mediomastus thomassini* Warren, Hutchings & Doyle 1994]. Not *Mediomastus capensis* — FOURNIER & LEVINGS, 1982: 36-37 [= *Mediomastus californiensis* Hartman 1944; see WARREN, HUTCHINGS & DOYLE, 1994: 244]. Not *Mediomastus* cf. *capensis* — GIBBS, 1971: 186 [= *Mediomastus* sp.; see WARREN, HUTCHINGS & DOYLE, 1994: 244].

REFERENCES FOR PORTUGAL: QUINTINO & GENTIL, 1987 (Lagoon of Albufeira; Lagoon of Óbidos); QUINTINO, RODRIGUES & GENTIL, 1989 (Lagoon of Óbidos); DEXTER, 1992 (previous records: Lagoon of Albufeira; Lagoon of Óbidos; Figueira da Foz); present work (southwestern continental shelf).

MATERIAL: SEPLAT 7 (2nd part) — St. 39 (A.4068), north Sines, 110 m, sand with shells: 1 incomplete specimen with 22 chaetigers; thorax-abdomen boundary distinct. **St. 129 (A.3980)**, near Sines, 52 m, sand: 1 complete specimen with about 60 chaetigers. **St. 187 (A.3924)**, south Sines, 17 m, sand: 1 anterior fragment with 36 chaetigers, with thorax-abdomen boundary distinct, plus 1 middle abdominal fragment with 16 chaetigers. **St. 254 (A.3877)**, off Cape Sardão, 74 m, sand: 1 incomplete specimen, broken in 3 pieces; it was dry; anterior fragment with 25 chaetigers, two middle fragments with 9 and 7 chaetigers.

DISTRIBUTION: South Africa and Mozambique; [?] coast of Spain; [?] coast of the Salerno Gulf and coast of Latium (Italy); [?] Adriatic Sea.

REMARKS: WARREN, HUTCHINGS & DOYLE (1994) did not examined material of this species collected at the Mediterranean. The specimens described by GRAVINA & SOMASCHINI (1988) could belong to the Mediterranean population of *Mediomastus fragilis*. The differences between both species pointed by these authors (thoracic and abdominal chaetigers of similar sizes and hardly distinguishable in *M. fragilis* against thoracic chaetigers wider than the abdominal ones in *M. capensis*), could be due to the fixation process. Besides, the eyes can be present both on *M. fragilis* and on *M. capensis*, but are not always visible (WARREN, 1979; WARREN, HUTCHINGS & DOYLE, 1994), so the presence/absence of eyes is a bad taxonomic character to separate these species.

Mediomastus capensis was recorded for the first time in Iberian waters by DESBRUYÈRES, GUILLE & RAMOS (1974) in the Catalan coast, as *M.* cf. *capensis*. Other authors recorded *M.* cf. *capensis* from the Mediterranean Sea (*e.g.*, ABADA-GUERRONI & WILLSIE, 1984; WILLSIE, 1986; SALEN-PICARD, 1987). However, after the record of *M. fragilis* on the Mediterranean Sea by CAPACCIONI-AZZATI (1985), the records of *M. capensis* on the Mediterranean almost disappeared, with exception of some records from Italy. This could be due to the fact that the species had been erroneously identified, under the name of a species not present in Europe.

In my opinion *Mediomastus capensis* is not present in the European waters. The introduction of this name for specimens belonging to the European Fauna was probably due to the use of the monography by DAY (1967) on the Polychaeta from South Africa to identify European worms.

On the other hand, there seems to be at least two undescribed species of *Mediomatus* in the European waters, very close to *Mediomastus capensis* (see the above *MATERIAL* section). These specimens are here considered, for the moment, under *M. capensis*, and the previous records of this species from the Portuguese waters refer quite probably to these forms. The observed differences refer mainly to some differences in the pattern of methyl green staining, but a more detailed study of these specimens is being carried.

Mediomastus cirripes Ben-Eliahu 1976

Mediomastus cirripes BEN-ELIAHU, 1976*b*: 138, fig. 6*a-c*.

TYPE LOCALITY: Shavei Zion, Israel, 32º59'N, 35º05'E, 347.2 Km north of Bet Ha'Emek creek, in the shore, among the *Dendropoma* infauna (Eastern Mediterranean Sea).

SELECTED REFERENCES: *Mediomastus cirripes* — GRAVINA & SOMASCHINI, 1988: table 1. *Mediomastus cirripes* — WARREN, HUTCHINGS & DOYLE, 1994: 244-245, figs. 2*f*, 12, tables 1-2.

DISTRIBUTION: Mediterranean coast of Israel.

Mediomastus fragilis E. Rasmussen 1973

Mediomastus fragilis E. RASMUSSEN, 1973: 115-117.

TYPE LOCALITY: Isefjord (Denmark), described to be present in all sorts of bottoms, from soft mud in the greatest depths to fine sand or stony ground in shallow water, and also among the mussel layers on the piers, but more common in the shallow intertidal areas consisting of fine muddy sand.

SELECTED REFERENCES: *Mediomastus fragilis* — WARREN, 1979: 758-760, fig. 1; [?] CAPACCIONI-AZZATI, 1985: 48-51, figs. 3-5; GRAVINA & SOMASCHINI, 1988: 60, figs. 1-3, table 1; GRAVINA & SOMASCHINI, 1990: 269; WARREN, HUTCHINGS & DOYLE, 1994: 245-247, figs. 7*g-i*, 11*a-f*, 12, tables 1-2; HARTMANN-SCHRÖDER, 1996: 443; KIRKEGAARD, 1996: 179-180, fig. 92. *Heteromastus filiformis* [not Claparède] — E. RASMUSSEN, 1956: 64-74, figs. 20-23.

REFERENCES FOR PORTUGAL: DEXTER, 1992 (previous records: Ria de Alvor); RAVARA, 1997 (off Aveiro); [?] MUCHA & COSTA, 1999 (as *Mediomastus* cf. *fragilis*; Ria de Aveiro and/or Sado Estuary).

DISTRIBUTION: Denmark; British Isles; North Sea; Atlantic coast of France; Mediterranean Sea, from Spain to the Aegean Sea. Muddy to fine sand and stony ground. Intertidal to 35 meters.

REMARKS: The records of *Mediomastus capensis* Day 1961 from the Mediterranean Sea correspond probably to this species (see *REMARKS* section under *M. capensis*).

*GENUS ***Notomastus*** Sars 1851

Notomastus M. SARS, 1851: 199-200.

TYPE SPECIES: *Notomastus latericeus* M. Sars 1851.

SYNONYMS: *Sandis* Kinberg 1867; *Paraleiocapitella* Thomassin 1970.

DIAGNOSIS (from GREEN, 2002): Thorax with 12 segments, including an achaetous peristomium and 11 chaetigers with capillary chaetae. Last thoracic chaetiger may or may not have capillary chaetae in neuropodia. Remaining chaetigers with hooded hooks. Hooded hooks with one or more rows of teeth above the main fang; more than two teeth in basal row. Branchia-like body expansions may be present or absent.

KEY TO SPECIES:

(adapted from GRAVINA & SOMASCHINI, 1990)

1a. First chaetiger with capillary chaetae in the notopodia only..**2**
1b. First chaetiger with capillary chaetae both in notopodia and neuropodia..**4**

2a (1a). Last thoracic chaetiger (or chaetiger 11) transitional, with capillary chaetae in notopodia and hooded hooks in neuropodia; first 3-4 thoracic chaetigers with epithelium with transverse and

longitudinal wrinkles, producing hexagonal plaques, chaetigers 5-10 with epithelium without wrinkles, being smooth and granulated, chaetiger 11 and following abdominal segments with smooth epithelium; branchia-like body expansions apparently absent..***N. mossambicus***
2b (1a). Last thoracic chaetiger (or chaetiger 11) not transitional, with capillary chaetae in noto and neuropodia..**3**

3a (2b). Thorax divided in two regions: the first (chaetigers 1-5) is conical (with the section becoming wider from the first to the 5th chaetiger), and without branchia-like body expansions, the second (chaetigers 6-11) with a similar shape than the abdominal region and with neuropodial, digitiform and non-retractile body expansions; abdomen with notopodial and neuropodial digitiform body expansions; prostomium big and pointed..***N. formianus***
3b (2b). Thorax not divided in two regions; branchia-like body expansions absent; abdominal segments with ventral uncinigerous tori reduced and dorsal tori close to each other..................................***N. aberans***

4a (1b). Notopodial branchia-like body expansions absent; neuropodial body expansions developed, particularly in the first abdominal chaetigers, and formed by a wide expansion inserted in the dorsal side of the ventral uncinigerous tori...***N. lineatus****
4b (1b). Notopodial branchiae-like body expansions present, visible at the posterior abdominal segments; neuropodial body expansions formed by an extension of the ventral uncinigerous tori, with the shape of a triangular tongue and visible in the first abdominal chaetigers...**5**

5a (4b). Notopodial branchia-like body expansions rudimentary or weakly developed, as vesicles at both sides of the dorsal uncinigerous tori...***N. latericeus****
5b (4b). Notopodial branchia-like body expansions appearing around abdominal chaetiger 26-40, as well developed digitiform or bag-like projections, first in one side of the dorsal uncinigerous tori, and then in both sides..***N. profundus****

Notomastus aberans Day 1957

Notomastus aberans DAY, 1957: 105-106, figs. 7*a-b*.
TYPE LOCALITY: Kosi Bay (Natal, South Africa), estuarine.
SELECTED REFERENCES: *Notomastus aberans* — DAY, 1961: 519; DAY, 1962: 649; DAY, 1967: 599, fig. 28.1.*m-q*; HARMELIN, 1968: 254, pl. 1 figs. 1-5; HARMELIN, 1969: 313; THOMASSIN, 1970*b*: 82-83; CAPACCIONI-AZZATI, 1988: 52-53, fig. 3; TORRES-GAVILÁ, CAPACCIONI-AZZATI & VILLORA-MORENO, 1989: 24, figs. 2*A*, 3*C*, 4*A*, table; GRAVINA & SOMASCHINI, 1990: 270.
DISTRIBUTION: South Africa; Mediterranean Sea; Adriatic Sea; Aegean Sea. Natal and Cape (South Africa), estuarine and intertidal; Morrumbene Estuary and Inhaca Island (Mozambique), estuarine and intertidal; Madagascar, intertidal, on coarse sand; Kalolimniones (Crete), 10-21 meters; Standia (Crete), 12 meters; Bay Grandes (Crete), 20 meters; Cape Messa-Juno (Santorin Island), 31-36 meters; Plage du Prado (Marseille), 5 meters; Alfaques Inlet (Catalonia), 4.5-10 meters. On bottoms covered with *Halophila stipulacea*, in Crete and Santorin Islands; on clean sand well calibrated in the French locality; in muddy sediments or in sediments with *Caulerpa prolifera* and/or *Cymodocea nodosa* at the Alfaques Inlet.
REMARKS: DAY (1961) remarks the fact that this species, besides the lack of neuropodial chaetae in the first chaetiger, can be easily distinguished from *N. latericeus* by the shortness of the rows of neuropodial hooks in the anterior abdominal segments. In *N. aberans* the ventral gap between the rows is longer than the rows themselves. Besides, the hoods of the hooks would be more than twice as long as broad, while in *N. latericeus* they are not more than 1.5 times as long as broad.

Notomastus formianus Eisig 1887

Notomastus formianus EISIG, 1887: 820.
TYPE LOCALITY: Gulf of Gaeta (Tyrrhenian Sea), at 30 meters, on muddy sand.
SELECTED REFERENCES: *Notomastus formianus* — FAUVEL, 1926*a*: 298; FAUVEL, 1927*a*: 145; HARMELIN, 1968: 254-256, pl. 1 figs. 6-10; CAPACCIONI-AZZATI, 1988: 53-55, fig. 4; TORRES-GAVILÁ, CAPACCIONI-AZZATI & VILLORA-MORENO, 1989: 24-25, figs. 2*A*, 3*F*, 4*C*, table; GRAVINA & SOMASCHINI, 1990: 270-271.
DISTRIBUTION: Gulf of Gaëte (Mediterranean Sea), at 30 meters, on muddy sand; Bay of Bandol and Prado Beach, Marseille (Mediterranean Sea), at 6 meters, on fine sand; Alfaques Inlet, Catalonia (Mediterranean Sea), at 7-10 meters, in muddy sand; Aegean Sea.

****Notomastus latericeus*** M. Sars 1851

Notomastus latericeus M. SARS, 1851: 199-200.

TYPE LOCALITY: Floro and Söndfjord, at Bergen, and Komagfjord, Norway, from shallow water to 20-30 fathoms (36.6-54.9 meters).

SYNONYMS: *Capitella rubicunda* Keferstein 1862; *Notomastus Benedeni* Claparède 1864; *Arenia cruenta* Quatrefages 1866.

SELECTED REFERENCES: *Notomastus latericeus* — EISIG, 1887: 861-863; SAINT-JOSEPH, 1894: 117-121, pl. 6 figs. 152-157; FAUVEL, 1914*f*: 250-251, pl. 1 fig. 14, pl. 22 fig. 20; MCINTOSH, 1915*b*: 276-279, text-figs. 128-129, pl. 92 fig. 2, pl. 107 fig. 9, pl. 108 fig. 19; FAUVEL, 1926*a*: 297-298; FAUVEL, 1927*a*: 143, fig. 49*a-h*; TORRES-GAVILÁ, CAPACCIONI-AZZATI & VILLORA-MORENO, 1989: 25, figs. 2*B*, 3*D*, 4*D*, table; GRAVINA & SOMASCHINI, 1990: 271-272; KIRKEGAARD, 1996: 180-182, fig. 93. *Notomastus (Notomastus) latericeus* — HARTMANN-SCHRÖDER, 1996: 444-445, fig. 218. *Notomastus rubicundus* — EISIG, 1887: 863-864. *Notomastus (Tremomastus) rubicundus* — MCINTOSH, 1923*a*: 493, pl. 136 fig. 16. *Capitella rubicunda* — KEFERSTEIN, 1862: 123-126, pl. 11 figs. 7-8. *Sandanis rubicundus* — KINBERG, 1867: 343. *Notomastus (?) fragilis* — EISIG, 1887: 866. *Arenia fragilis* — QUATREFAGES, 1866*b*: 251. *Notomastus cruentus* — EISIG, 1887: 865-866. *Arenia cruenta* — QUATREFAGES, 1866*b*: 250. *Notomastus (Tremomastus) fertilis* — EISIG, 1887: 819-820, pl. 1 fig. 1*f*, pl. 2 figs. 14-15, 29, pl. 4 fig. 5, pl. 10 figs. 2, 4, pl. 12 fig. 7, pl. 14 figs. 11-22, pl. 15 figs. 15-16, 19-27, pl. 31 figs. 16-21, pl. 34 figs. 15-17, pl. 35 fig. 26; LO BIANCO, 1893: 14. *Notomastus Benedeni* — CLAPARÈDE, 1864: 514-516, pl. 4 fig. 9. *Notomastus (Tremomastus) Benedeni* — EISIG, 1887: 815-817, pl. 1, figs. 1*b-c*, pl. 2 figs. 12-13, pl. 3 fig. 13, pl. 4 figs. 3, 12-13, pl. 5 figs. 4-5, pl. 9 figs. 11-15, pl. 10 fig. 9, pl. 11 figs. 3, 18, pl. 12 figs. 4-5, pl. 14 figs. 1-9, pl. 15 figs. 1-4, 7-11, 31, pl. 31 figs. 8-11, pl. 33 fig. 4, pl. 34 figs. 7-10, pl. 35 figs. 17-22. *Notomastus (Tremomastus) Benedenii* — LO BIANCO, 1893: 13-14. [?] *Paraleiocapitella* cf. *mossambica* [not Thomassin 1970] — MARTIN, 1986: 134-136, plate page 135.

REFERENCES FOR PORTUGAL: FAUVEL, 1909 (Berlengas); FAUVEL, 1914*f* (Berlengas); RIOJA, 1917*c* (previous records: Berlengas); BELLAN, 1960*a* (Cape Espichel; Setúbal Canyon; NW Cape Sardão); AMOUREUX, 1974*b* (off Aveiro; off Porto); AMOUREUX & CALVÁRIO, 1981 (Peniche); SOUSA-REIS *et al.*, 1982 (Peniche region); COSTA, GAMITO & OLIVEIRA, 1984 (Sado Estuary); MONTEIRO-MARQUES, 1987 (continental shelf of Algarve); GAMITO, 1989 (Ria Formosa); DEXTER, 1992 (previous records: Ria Formosa; continental shelf of Algarve; Sado Estuary; Peniche; Figueira da Foz); SPRUNG, 1994 (Ria Formosa); RAVARA, 1997 (off Aveiro); MUCHA & COSTA, 1999 (as *Notomastius latericeus*; Ria de Aveiro and/or Sado Estuary); present work (southwestern continental shelf).

MATERIAL: SEPLAT 7 (2nd part) — St. 20 (A.4080), north Sines, 89 m, sand: 1 incomplete specimen with anterior region and 25 abdominal chaetigers; methyl green stain: thorax all pigmented, first abdominal chaetigers all stained except at the tori, both dorsal and ventral, posterior chaetigers stained with a longitudinal middorsal band and also posteriorly to the tori. **St. 39 (A.4068)**, north Sines, 110 m, sand with shells: 1 incomplete specimen, including 10 abdominal chaetigers, plus one middle fragment with 7 abdominal chaetigers; no notopodial branchia-like expansions present; of about the same dimensions than the specimen from St. 66*A*. **St. 79 (A.4028)**, near Sines, 110 m, muddy sand: 1 incomplete specimen with 15 abdominal chaetigers; methyl green pattern: thorax like specimen from St. 124 (A.3983), except in that only chaetiger 11 is stained, abdomen with two longitudinal stripes, connecting the nephridia. **St. 124 (A.3983)**, near Sines, 108 m, gravelly sand: 1 incomplete specimen with 2 abdominal chaetigers; methyl green pattern: stain on the achaetous segment and chaetigers 1-4, dorsal posterior half of chaetiger 10, and chaetiger 11, abdominal chaetigers pigmented, with a transversal dark strip posterior to all tori. **FAUNA 1 — St. 47*P***, Gulf of Cádiz, off Cádiz, 370-380 m, pelagic: 1 incomplete specimen, with anterior region and 6 abdominal chaetigers; methyl green pattern not checked. **St. 66*A***, Gulf of Cádiz, off Cádiz, 25-28 m, muddy sand: 1 incomplete big specimen, plus one middle fragment with 18 chaetigers, being about 30 mm long in total; thorax with 11 chaetigers with capillary chaetae on both rami; 21 abdominal chaetigers; after abdominal chaetiger 15 the segments are shorter; from abdominal chaetiger 32 (considering that the middle fragment is continuous with the anterior fragment), there are dorsal branchia-like expansions visible as vesicles, just posterior to the dorsal tori; methyl green stains the thorax, but no special pattern is present in the abdomen.

DISTRIBUTION: Kattegat; Skagerrak; North Sea; English Channel; Mediterranean Sea; Adriatic Sea; Aegean Sea; Black Sea; Madeira Island; Northeastern Atlantic; Arctic Ocean to North Carolina; West and South Africa; Indian Ocean; Chile; Antarctica. In bottoms of sand, muddy sand, mud, or in *Zostera* meadows. Normally from shallow water to the circalittoral, but recorded between 10-4000 meters.

REMARKS: The specimens tentatively referred to *Paraleiocapitella* cf. *mossambica* Thomassin 1970 by MARTIN (1986) on his Master Thesis, are here considered as belonging probably to the species

Notomastus latericeus Sars 1851, as stated by MARTIN (1986) himself. The specimens do not belong to *P. mossambica*, as the first chaetiger of this species presents capillary chaetae only in the notopodia, while the specimens referred by MARTIN (1986) show these chaetae on both podia of the first chaetiger. On the other side, the small size of the specimens may indicate that they are juveniles, and that probably the chaetal pattern shown, with notopopial capillary chaetae and neuropodial hooks on chaetiger 11 may not be the definitive. Presently the genus *Notomastus* Sars 1851 is considered to have 11 thoracic chaetigers with the last one with or without capillary chaetae on the neuropodia (GREEN, 2002). Finally, specimens with the chaetal distribution described by MARTIN (1986) weren't found again at the same area of the original record (Blanes, Spain).

The record by MARTIN (1986) was erroneously referred by ARIÑO (1987) as *Paraleiocapitella mossambica*, without any reference to the fact that the record needed confirmation, and the species has been ever since referred as belonging to the European Fauna.

****Notomastus lineatus*** Claparède 1869

Notomastus lineatus CLAPARÈDE, 1869: 18-20, pl. 27 fig. 4;

TYPE LOCALITY: Gulf of Naples (Mediterranean Sea).

SYNONYMS: [?] *Notomastus Sarsii* Claparède 1864; *Notomastus (Clistomastus) lineatus* var. *Balanoglossi* Eisig 1887.

SELECTED REFERENCES: *Notomastus lineatus* — FAUVEL, 1927*a*: 145-146, fig. 51*a-i*; TORRES-GAVILÁ, CAPACCIONI-AZZATI & VILLORA-MORENO, 1989: 26, figs. 2*B*, 3*B*, 4*E*, table; GRAVINA & SOMASCHINI, 1990: 272. *Notomastus (Clistomastus) lineatus* — EISIG, 1887: 811-813, pl. 1 fig. 1-1*a*, pl. 2 figs. 1-4, 8-9, 16-19, 22-26, pl. 3 figs. 1-3, 5-12, 14-18, pl. 4 figs. 1-2, 6-11, pl. 5 figs. 1-3, 6-15, pl. 6 figs. 1-24, pl. 7 figs. 1-28, pl. 8 figs. 1-18, pl. 9 figs. 1-10, 17-21, pl. 10 figs. 1, 6-8, 10, 12-13, pl. 11 figs. 1-2, 4-6, 8-13, 15-17, 19-21, pl. 12 figs. 6, 8, pl. 13 figs. 1-5, 8-13, pl. 15 figs. 5-6, 12-14, 17-18, 28-29, 33-40, pl. 31 figs. 1-4, pl. 33 figs. 1-3, pl. 34 figs. 1-6, pl. 35 figs. 1, 3-16; LO BIANCO, 1893: 13; FAUVEL, 1926*a*: 298. [?] *Notomastus Sarsii* — CLAPARÈDE, 1864: 511-514, pl. 4 fig. 8, pl. 8 fig. 7; EISIG, 1887: 864-865. *Notomastus (Clistomastus) lineatus* var. *Balanoglossi* — EISIG, 1887: 813-814, pl. 31 figs. 5-7, pl. 35 fig. 2.

REFERENCES FOR PORTUGAL: Present work (southwestern continental shelf).

MATERIAL: SEPLAT 6 — St. 7 (A.2514), off Cape São Vicente, 77 m, fine sand: 1 incomplete specimen with 13 abdominal chaetigers; neuropodial branchia-like expansions in the first abdominal chaetigers very wide and developed, very conspicuous; proboscis everted; methyl green pattern: chaetigers 1-5 with reticulated pattern, chaetigers 6-9 without marks, chaetiger 10 as a dark band, chaetiger 11 uncoloured, abdomen without any pattern. **SEPLAT 7 (2nd part) — St. 129 (A.3980)**, near Sines, 52 m, sand: 1 incomplete specimen, with 13 abdominal chaetigers; methyl green pattern: thoracic chaetigers 1-7 with reticulated pattern, dark band at the posterior half of chaetiger 11, abdominal segments with two dorso-lateral longitudinal bands, two short transversal bands anterior to the dorsal tori, 1 single transversal band posterior to the dorsal tori, and some spots, anterior and posterior to the ventral tori.

DISTRIBUTION: Western Mediterranean Sea (Naples; Port-Vendres); Aegean Sea; Black Sea. In sand, between 1-3 meters.

REMARKS: EISIG (1887) described a variety of the species, *Notomastus lineatus* var. *balanoglossi*, found at Posillipo, and living in *Posidonia* meadows, together with *Glossobalanus minutus* Kowalevsky 1866. The variety would differ from the stem species by being smaller and having the first abdominal segments less flattened.

Notomastus mossambicus (Thomassin 1970)

Paraleiocapitella mossambica THOMASSIN, 1970*b*: 87-88, fig. 9.

TYPE LOCALITY: Tulear, southwest Madagascar (Indian Ocean), on sandy mud sediment of the dunes above and near the Grand Récif, among phanerogames, and in association with a community of Enteropneusta.

SELECTED REFERENCES: *Notomastus mossambicus* — EWING, 1982: 232-234; ÇINAR, 2005: 155-156, figs. 3-4.

DISTRIBUTION: Tulear, southwest Madagascar (Indian Ocean), on sandy mud sediment, among phanerogames and in association with a community of Enteropneusta at shallow water; Cyprus (Eastern Mediterranean Sea), on muddy sand with *Caulerpa racemosa* and *Udotea petiolata*, between 62-70 meters, and on mud accumulated within hard substratum, at 50 meters.

**Notomastus profundus* Eisig 1887

Notomastus (Tremomastus) profundus EISIG, 1887: 817-819, pl. 1 fig. 1*d-e*, pl. 2 figs. 5-7, 10-11, 20-21, 27-28, pl. 3 fig. 4, pl. 4 fig. 4, pl. 9 fig. 16, pl. 10 figs. 3, 5, 11, pl. 11 figs. 7, 14, pl. 12 figs. 1-3, pl. 13 figs. 6-7, pl. 14 fig. 10, pl. 15 figs. 30, 32, pl. 31 figs. 12-15, pl. 33 figs. 5-7, pl. 34 figs. 11-14, pl. 35 figs. 23-25.

TYPE LOCALITY: Gulf of Naples (Mediterranean Sea), between 15-20 meters, in mud.

SYNONYMS: [?] *Capitella major* Claparède 1868.

SELECTED REFERENCES: *Notomastus (Tremomastus) profundus* — LO BIANCO, 1893: 14. *Notomastus profundus* — FAUVEL, 1926: 298; FAUVEL, 1927: 144-145, fig. 50*a-k*; FAUVEL, 1936*c*: 79-80, fig. 10; KIRKEGAARD, 1959: 49; BELLAN, 1964*b*: 144; TORRES-GAVILÁ, CAPACCIONI-AZZATI & VILLORA-MORENO, 1989: 26-27, figs. 2*B*, 3*E*, 4*F*, table; GRAVINA & SOMASCHINI, 1990: 272. [?] *Capitella major* — CLAPARÈDE, 1869: 16-18, pl. 27 fig. 3.

REFERENCES FOR PORTUGAL: MONTEIRO-MARQUES, 1979 (southern continental shelf of Algarve); PINTO, 1984 (Sado Estuary); MONTEIRO-MARQUES, 1987 (continental shelf of Algarve); DEXTER, 1992 (previous records: continental shelf of Algarve; Sado Estuary); RAVARA, 1997 (off Aveiro).

MATERIAL: FAUNA 1 — St. 5*A*, Alborán Sea, off Veléz-Málaga, 67-68 m, mud: 2 incomplete specimens; (1) big specimen, broken in two fragments; anterior fragment with 27 chaetigers, including the 11 thoracic chaetigers; middle fragment with about 43 chaetigers (fragment very coiled, which makes difficult to count the number of chaetigers); in the posterior region of the second fragment it is possible to see the branchiae-like expansions, both notopodial and neuropodial, as well as developed digitiform projections in both sides of the dorsal uncinigerous tori, and also at the dorsal side of the ventral uncinigerous tori; it is quite similar to fig. 10 of FAUVEL (1936*c*); total length of the two fragments about 70 mm long; proboscis everted; methyl green pattern: thorax darkly stained from the prostomium to the end of chaetiger 5, chaetigers 6-8 lighter, chaetiger 9 darker and 10-11 very dark, especially the 11th (except for the lateral papillae), and especially the posterior half of it, first abdominal chaetiger darkly pigmented, as the posterior half of chaetiger 11, uncinigerous tori not pigmented, second abdominal chaetiger as the first one, but with ventral side less pigmented, posteriorly the pigment stains the dorso-lateral region, anterior to the lateral papillae, and anteriorly and posteriorly to the dorsal tori, with one lighter band anterior to one darker at the posterior region of these dorsal tori, and finally one lighter band posterior to the ventral tori; (2) smaller specimen, in a poorer condition, broken in two fragments; anterior fragment with 14 chaetigers, and pattern of methyl green not very clear; middle fragment with 7 chaetigers, and seems to follow the anterior one; this specimen is considered here as belonging to the same species than the anterior one.

DISTRIBUTION: Mediterranean Sea (Naples), between 15-20 meters, in muddy bottoms; Adriatic Sea; Aegean Sea; Black Sea; Morocco, 55-140 meters, mainly in muddy bottoms, but also in rocks with gorgoneans, and sand; Liberia, 74-75 meters.

REMARKS: This species is quite similar to *Notomastus latericeus* Sars 1851, and difficult to separate from it. The main character to separate both species is the different development of the dorsal branchia-like body expansions in the abdomen. However, the dorsal branchia-like body expansions appear at the posterior portion of the abdomen, and as it can be difficult to obtain complete specimens (especially if using a dredge), it can be particularly difficult to separate both species (FAUVEL, 1936*c*: 80; BELLAN, 1964*b*: 144; KIRKEGAARD, 1959: 49).

BELLAN (1964*b*) suggests that both species could be the same, with *N. profundus* being a variety with more developed branchia-like body expansions. THOMASSIN (1970*b*), with some doubts, synonymises *N. profundus* with *N. latericeus*. According to this author, the only character valid to separate both species would be the different development of the branchia-like body expansions, but this could depend both on the state of turgidity and age of the specimens. *N. profundus* would be a variety of *N. latericeus* in which the absence of notopodial branchia-like body expansions in the anterior portion of the abdomen would be compensate by the bigger development of the neuropodial branchia-like body expansions. A similar position was sustained by GRAVINA & SOMASCHINI (1990).

Finally, KIRKEGAARD (1959: 49) sustains that *N. profundus* differs from *N. latericeus* in the posterior part of the abdomen: "*From the 20th abdominal segment onwards the central part of the dorsal notopodial ridges disappears, and the two notopodia become distinct. At the 26th-32nd abdominal segments the first branchiae appear. A single branchia arises dorsal and ventral to each notopodia and dorsal to each neuropodia in this posterior part of the abdomen. The branchiae are long and translucent, in some of them the red blood is visible.*" Also according to the same author, *N. profundus* would be more frequent than what is known, as it would be normally mistaken by *N. latericeus*.

I maintain here a conservative position, and for the moment I consider both species to be valid and separate.

GENUS ***Paracapitella*** Kirkegaard 1983

Paracapitella KIRKEGAARD, 1983*b*: 602.

TYPE SPECIES: *Paracapitella southwardi* Kirkegaard 1983.

DIAGNOSIS (from KIRKEGAARD, 1983*b*): Thorax with 19 segments; one achaetous segment present; first chaetiger with notopodia only. Up to segment 11 with capillary chaetae only; next 8 thoracic chaetigers with notopodial capillary chaetae and neuropodial hooks. Branchia-like body expansions absent.

REMARKS: As already stated above, the genus *Paracapitella* Carrasco & Gallardo 1987 is a junior homonym of *Paracapitella* Kirkegaard 1983. The junior homonym was created to include *P. pettiboneae*, a species described with base on specimens collected at the Bay of Concepción (Chile), at a depth of 5 meters, and which diagnosis is as follows: thorax with 9 segments, all chaetigerous; first 7 chaetigers with both noto- and neuropodial capillary chaetae; last 2 thoracic chaetigers (8-9) with modified notopodial genital spines in male; both sexes with neuropodial hooks in chaetigers 8 and 9, female with notopodial hooks in same chaetigers; abdominal chaetae are also longhandled uncini; ventral branchiae-like expansions on medioposterior abdominal segments (from CARRASCO & GALLARDO, 1987).

Paracapitella southwardi Kirkegaard 1983

Paracapitella southwardi KIRKEGAARD, 1983*b*: 602-604, fig. 3.

TYPE LOCALITY: Shamrock Canyon (North-East Atlantic), 47º 48.9’N, 8º 11.3’W, 1620-1700 meters, in soft mud.

DISTRIBUTION: Known from a single specimen collected at the type locality.

*GENUS ***Peresiella*** Harmelin 1968

Peresiella HARMELIN, 1968: 256-257.

TYPE SPECIES: *Peresiella clymeneoides* Harmelin 1968.

DIAGNOSIS (from GREEN, 2002): Thorax with an achaetous peristomium and 11 chaetigers. First three chaetigers with capillary chaetae; remainder of thorax with modified spatulate chaetae, capillary chaetae, or hooded hooks. Abdominal chaetigers with hooded hooks. Branchia-like body expansions, if present, on posterior abdominal segments as simple expansions of superior part of notopodia.

****Peresiella clymenoides*** Harmelin 1968

Peresiella clymenoides HARMELIN, 1968: 257-259, plate 2.

TYPE LOCALITY: The original description of the species makes reference to several localities where the type material was collected, but no type locality or holotype is referred. The species was described originally from the following localities: Kalolimniones (Crete), 21 meters; Cape Messa-Vuno (Santorin Island), 36 meters; Bandol Bay (near Marseille), 6 meters; Plage du Prado (Marseille), 5 to 7 meters. On muddy sand sediments, with pumice stone, on bottoms covered with *Halophila stipulacea*, in Crete and Santorin Islands; on clean sand well calibrated, or on sand covered with *Cymadocea nodosa*, in the French localities.

SELECTED REFERENCES: *Peresiella clymenoides* — HARMELIN, 1969: 313; DESBRUYÈRES, GUILLE & RAMOS, 1974: 361; DINNEEN, 1982: 472-475, fig. 1, table 1; GRAVINA & SOMASCHINI, 1990: 272-273.

REFERENCES FOR PORTUGAL: Present work (southwestern continental shelf).

MATERIAL: SEPLAT 7 (2nd part) — St. 25 (A.4085), north Sines, 134 m, sand: 1 incomplete specimen with about 17 chaetigers; tube present. **St. 34 (A.4073)**, north Sines, 144 m, sand: 1 incomplete specimen with 20 chaetigers. **St. 259 (A.3867)**, off Cape Sardão, 173 m, sand: 1 incomplete specimen with 20 chaetigers, plus one fragment with 8 chaetigers. **St. 265 (A.3866)**, off Cape Sardão, 227 m, muddy sand: 3 incomplete specimens, with 16, 22, and 24 chaetigers. **St. 266 (A.3865)**, off Cape Sardão, 175 m, sand: 3 incomplete specimens; (1) small, with 17 chaetigers, 5 mm long, 150 µm wide; thorax with 12 segments; first segment achaetous; first 3 chaetigers with limbate capillary chaetae, absent in the neuropodia of the first chaetiger; other 8 thoracic chaetigers with flanged chaetae; abdominal uncini of chaetigers 12 and 13 different from the rest; anterior region resembling the cephalic plaque of the Maldanidae; branchia-like body expansions absent; (2) with 19 chaetigers; (3) with 20 chaetigers. **St. 274 (A.3862)**, off Praia de Odeceixe, 327 m, muddy sand: 1 incomplete specimen, with about 22 chaetigers, still with some fragments of the tube attached. **St. 283 (A.3851)**, off Arrifana, 245 m, muddy sand: 2 incomplete specimens, one with about 13 chaetigers and tube fragments still attached, and the other with 15 chaetigers. **St. 306 (A.3847)**, SW Praia de Odeceixe, 105 m, sand: 1 incomplete specimen with 19 chaetigers.

DISTRIBUTION: Western Mediterranean Sea: Spanish Catalan coast, 30 to 105 meters, on muddy bottoms; Marseille, at 5 to 7 meters, on clean sand well calibrated, or on sand covered with *Cymadocea nodosa*. Eastern Mediterranean Sea, Aegean Sea: Santorin and Crete Islands, on muddy sand sediments, with pumice stone, on bottoms covered with *Halophila stipulacea*. Portugal, 105-327 meters, on sand and muddy sand. Celtic Sea: Kinsale Harbour (Ireland), 7-19 meters, in silty sand. Southern Irish Sea: on mud, sandy mud, fine sand, and mixture of mud, sand, gravel, and stones, between 93-112 meters.

REMARKS: MACKIE & GARWOOD (1995) refer the presence of specimens identified as *Peresiella* cf. *clymenoides* from the Southern Irish Sea. The species was only tentatively identified due to the presence of small discrepancies with the original description. The maldanid-like head region described by HARMELIN (1968) was not observed in the Irish material, but some degree of variation in the head's morphology has been recorded, both in Mediterranean and southern Irish material (DINNEEN, 1982). The specimens from Portugal, as well as several specimens from the western Mediterranean Sea that I have observed (including the Gulf of Marseille), present the prostomium has pictured and described by DINNEEN (1982), with the first two segments flattened. This region can, however, display a different degree of flattening, possibly as a consequence of the fixation process.

DINNEEN (1982) also recorded some differences between the material studied by she from the Celtic and the Mediterranean Seas, and the original description by HARMELIN (1968), concerning the shape of the pseudocrotchets and the number of thoracic pseudocrotchets and abdominal hooks. This way, the pseudocrotchets do have a distal opening in the hood, and the number of abdominal hooks is normally higher at the original description than in the observed, existing some minor differences between the Mediterranean and the Celtic Sea populations. However, and as stated by Dinneen, to know whether these last differences are significant or not would require a much larger sample size.

Here, the species is considered to be present from the Mediterranean Sea to the Southern Irish Sea.

GENUS ***Pseudocapitella*** Fauvel 1913

Pseudocapitella FAUVEL, 1913*a*: 78-79.

TYPE SPECIES: *Pseudocapitella incerta* Fauvel 1913.

DIAGNOSIS (from FAUCHALD, 1977*a*): Thorax with 15 to 18 segments; one achaetigerous segment present; first chaetiger with notopodia only. Up to segment 15, capillary chaetae only; next three with notopodial capillary chaetae and neuropodial hooks. Branchia-like body expansions absent.

KEY TO SPECIES:

1a. Exclusively capillary chaetae on the first 14 chaetigers; thoracic chaetigers 15-17 with notopodial capillary chaetae and neuropodial hooks..***P. incerta***

1b. Exclusively capillary chaetae on the first 13 chaetigers; thoracic chaetigers 14-16 with notopodial capillary chaetae and neuropodial hooks..***P. aberrans***

Pseudocapitella aberrans Amoureux 1972

Pseudocapitella incerta var. *aberrans* AMOUREUX, 1972*b*: 81-82.

TYPE LOCALITY: Off Galicia (Spain), between 42º08' and 44º20'N, and 8º20' and 9º40'W, at 200-1000 meters.

REFERENCES FOR PORTUGAL: AMOUREUX, 1974*b* (as *Pseudocapitella incerta* var. *aberrans*; off Aveiro).

DISTRIBUTION: Off Galicia (Spain) between 200-1000 meters; off Aveiro (Portugal), between 435-800 meters, in mud and sandy mud, with some stones and shell fragments.

Pseudocapitella incerta Fauvel 1913

Pseudocapitella incerta FAUVEL, 1913*a*: 79, fig. 13.

TYPE LOCALITY: Mediterranean Sea (5 miles off Cannes), at 712 meters, on compact grey mud.

SELECTED REFERENCES: *Pseudocapitella incerta* — FAUVEL, 1914*f*: 252-254, pl. 22 figs. 11-13; FAUVEL, 1926*a*: 300; FAUVEL, 1927*a*: 158-159, fig. 55*i-k*; AMOUREUX, 1971*a*: 13; AMOUREUX, 1972*b*: 81; GRAVINA & SOMASCHINI, 1990: 273.
DISTRIBUTION: Mediterranean Sea (about 5 miles off Cannes), at 712 meters, on compact grey mud; Aegean Sea; off Galicia, 300-1000 meters.
REMARKS: As stated by GRAVINA & SOMASCHINI (1990), and by AMOUREUX (1971*a*) himself, the single specimen reported by this later author from the Gulf of Taranto presented some differences in relation to the described by FAUVEL (1913*a*): the ventral uncini start at chaetiger 14 instead of the 15, and at the notopodium of chaetiger 18 the uncini are accompanied by a bundle of capillary chaetae. GRAVINA & SOMASCHINI (1990) hypothesized that this could be due to ontogenic variability.

GENUS ***Pseudonotomastus*** Warren & Parker 1994

Pseudonotomastus WARREN & PARKER, 1994: 300.
TYPE SPECIES: *Pseudonotomastus southerni* Warren & Parker 1994.
DIAGNOSIS (from WARREN & PARKER, 1994): Thorax with 11 segments; peristomium and first segment achaetous; first chaetiger with capillary chaetae in notopodia only; following 9 chaetigers with capillary chaetae only in both rami; abrupt transition between thorax and abdomen.

Pseudonotomastus southerni Warren & Parker 1994

Pseudonotomastus southerni WARREN & PARKER, 1994: 300-303, figs. 1-2.
TYPE LOCALITY: Celtic Sea, off Cork, Ireland, 8º20'W, 51º30'N.
DISTRIBUTION: Ireland (Celtic Sea), area between 7º50' to 8º26'W, and 51º27' to 51º42'N, 20 to 30 Km south of the entrance of Cork Harbour, in 70-90 meters, on mixed poorly sorted sediments, slightly coarser at shallower sites closer to shore and muddier offshore.

GENUS ***Pulliella*** Fauvel 1929

Pulliella FAUVEL, 1929: 184.
TYPE SPECIES: *Pulliella armata* Fauvel 1929.
DIAGNOSIS (from DAY, 1967): Thorax with an achaetous peristomium followed by nine chaetigerous segments bearing winged capillaries in both rami. No specialized copulatory chaetae. Anterior abdominal segments with hooded hooks in both rami, but the last 8-11 with acicular spines in the notopodia and hooded hooks in the neuropodia. Branchia-like body expansions absent. Pygidium with a pair of anal cirri.

Pulliella armata Fauvel 1929

Pulliella armata FAUVEL, 1929: 184-186, fig. 3.
TYPE LOCALITY: Pulli Island, Gulf of Manaar (India).
SELECTED REFERENCES: *Pulliella armata* — FAUVEL, 1930*b*: 48, fig. 13; FAUVEL, 1947: 71, fig. 67; FAUVEL, 1953*c*: 374-375, fig. 195; DAY, 1967: 595-597, fig. 28.1.*a-f*; ROSENFELDT, 1982: 50, figs. 23-24.
DISTRIBUTION: Tropical Indo-west-Pacific (Gulf of Manaar Mozambique, Indo-China, New Caledonia); off Northern Mauritania. Intertidal to 212 meters.

DOUBTFUL OR INDETERMINABLE SPECIES

Notomastus agassizii McIntosh 1885

Notomastus Agassizii MCINTOSH, 1885*a*: 389-390, pl. 46 fig. 3, pl. 24*a* fig. 15.
TYPE LOCALITY: Off New York, 41º14'N, 65º45'W, at 1340 fathoms (2450.6 meters), in blue mud.
SELECTED REFERENCES: *Notomastus Agassizii* — ROULE, 1896: 457.
DISTRIBUTION: Known from the type locality.

REMARKS: According to EISIG (1887) and FAUVEL (1927*a*: 159) this species was incompletly described with base on an anterior dry fragment, and it is unidentifiable or doubtful. HARTMAN (1947*a*: 411), however, considers the species as being valid but incompletely known. The same name was used by ROULE (1896) for an anterior fragment in poor condition, collected at the Atlantic Ocean (6º21'W, 45º57'N), at 1410 meters, but the probability of this specimen being conspecific with McIntosh's specimen seems to be very small. For this reason, *N. agassizii* is considered here as not belonging to the European Fauna.

*FAMILY **Chaetopteridae** Malmgren 1867

As: *Chætopteridæ* Malmgren, 1867*a*: 88.

Type genus: *Chaetopterus* Cuvier 1827.

Remarks: The family Chaetopteridae includes at present 4 genera with about 65 nominal species considered to be valid (Rouse, 2001*i*). All the species are tubiculous with exception of *Chaetopterus pugaporcinus* Osborn, Rouse, Goffredi & Robison 2007, a mesopelagic species that lives in the waters off Monterey Bay (California).

The biggest part of relevant recent bibliography on the group is cited below, but to these it is possible to add Nishi (1999), Bhaud *et al.* (2002), Bhaud (2005), and Bhaud, Koh & Martin (2006), on *Mesochaetopterus*, and Bhaud (1998*a*), Nishi, Miura & Bhaud (1999), Nishi & Bhaud (2000), and Bhaud, Martin & Gil (2003), on *Spiochaetopterus*, among others.

The four genera of the family are represented in the European waters, but it is difficult to say by how many valid species, as the genus *Chaetopterus*, with many old described taxa, needs to be revised, as well as, in my opinion, some of the older species of *Phyllochaetopterus*. The number of possible valid species in European waters is here considered to be of 19. Among the studied material, only one species was identified.

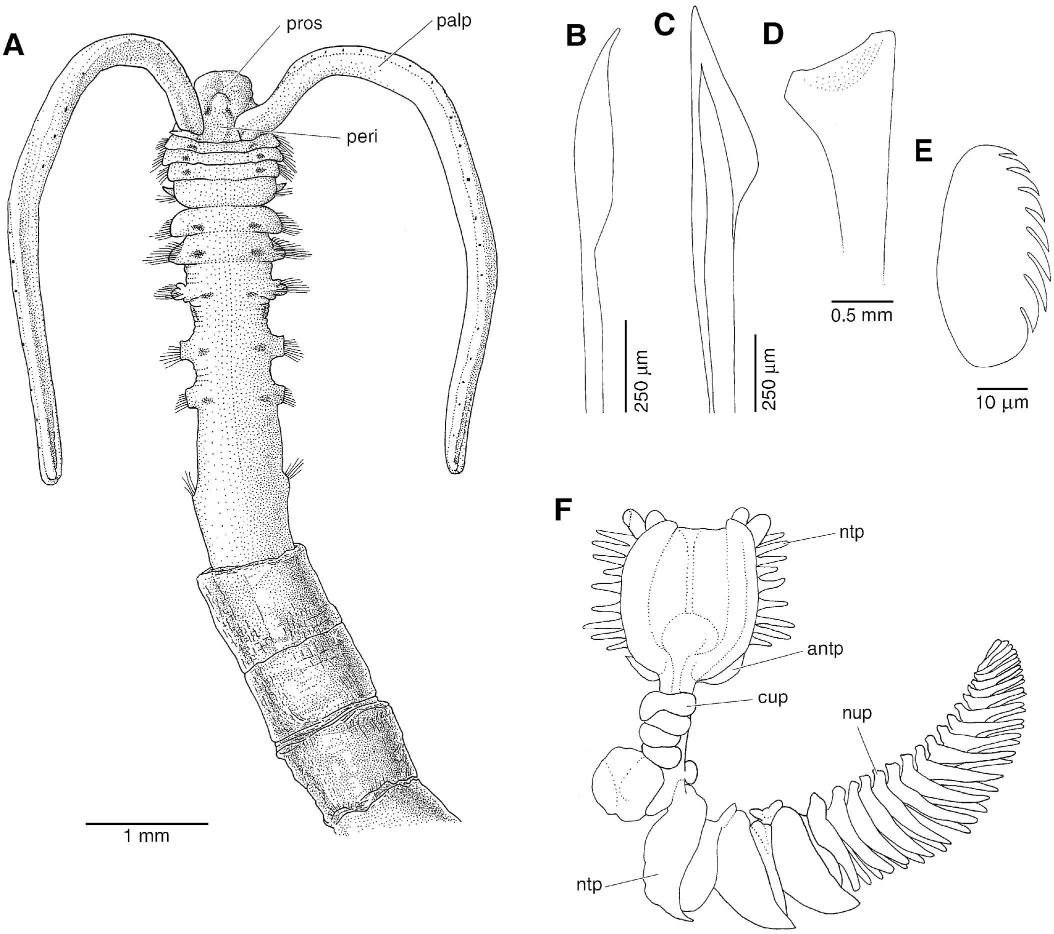

Figure legend: Family Chaetopteridae. **A**-**D**, *Spiochaetopterus* specimen: **A**, anterior end of worm extended from its tube; **B**, long notochaeta from parapodium of chaetiger 6; **C**, short notochaeta from parapodium of chaetiger 6; **D**, modified chaeta from parapodium of chaetiger 4. **E**, *Phyllochaetopterus* specimen, uncinus from parapodium of chaetiger 7. **F**, *Chaetopterus* specimen, entire body removed from tube, dorso-lateral view. **antp**, ailiform notopodium; **cup**, cupule; **ntp**, notopodium; **nup**, neuropodial tori; **palp**, palp; **peri**, peristomium; **pros**, prostomium. (Adapted from Beesley, Ross & Glasby, 2000; drawings by A. Murray).

KEY TO GENERA:

(adapted from GITAY, 1969; BLAKE, 1996*e*)

1a. Anterior end with a pair of palps and a pair of short tentacular cirri arising from the first chaetigerous segment; median notopodia bilobed or multilobed; tube corneous and semitransparent, sometimes branched, more or less clearly ringed..***Phyllochaetopterus***
1b. Anterior end with a pair of palps and no tentacular cirri...**2**

2a (1b). Palps long, prehensile, longer than anterior region; notopodia of middle region with 1-3 lobes, never fused across dorsum..**3**
2b (1b). Palps shorter than anterior region; middle region with 5 segments, the first of which bears a pair of separate winglike notopodia, while the remainder formed into paddles; peristomium forming a broad collar; tube large, U-shaped, sometimes covered with sand grains.......................................***Chaetopterus****

3a (2a). Middle region with unilobed, conical fleshy or fingerlike notopodia; chaetiger 4 with several stout modified chaetae; tube usually straight or J-shaped, covered with sand or shells...***Mesochaetopterus***
3b (2a). Middle region with bi- or trilobed notopodia; chaetiger 4 usually only with a single stout modified chaeta; tube distinctly annulated, semitransparent, straight or twisted..............***Spiochaetopterus***

*GENUS ***Chaetopterus*** Cuvier 1827

Chaetopterus CUVIER, 1827: 27.
TYPE SPECIES: *Tricoelia variopedata* Renier 1847.
REMARKS: As noted by HARTMAN (1959*a*), many authors recognize a single species in the genus, *Chaetopterus variopedatus* (Renier 1847), being the various other specific names retained sometimes to designate geographic populations, without reliable specific distinctions. Today this vision is not supported by most authors, and several different species are considered to be valid. However, a revisionary work on the genus has not been published, so far, for which reason this can be a problematic group to work with.

PETERSEN (1984*a*, 1984*b*, 1997) started the revision of the genus, defining useful characters in order to delimit chaetopterid species, such as tube shape, whether infaunal or epifaunal, presence of the internal talon in A4 modified chaetae, presence or absence of a dorsal bulbous inflation on the notopodial bases of region A, and shape of the cirri of the lateral lobe in region C notopodia (NISHI, HICKMAN & BAILEY-BROCK, 2009). As a result of these studies, it was stated that *Chaetopterus variopedatus* was not a cosmopolitan species, and *C. appendiculatus* Grube 1874, *C. cautus* Marenzeller 1879, and *C. pergamentaceus* Cuvier 1827 were considered to be valid species. Besides, PETERSEN (1984*a*) determined that about 9-10 valid species were present in the Caribbean, North Atlantic and Mediterranean Sea, with 5-6 species in European waters and another 3-4 in the western North Atlantic and adjacent waters. Two different species were found to be present in Danish waters, but PETERSEN (1984*a*) didn't reported which ones. However, KIRKEGAARD (1996) presented a key for the Danish *Chaetopterus*, which included *C. norvegicus* Sars 1835, and *C. sarsii* Boeck *in* M. Sars 1861 (see key below).

PETERSEN & BRITAYEV (1997) presented a synoptic table of chaetopterids known to host symbiontic species of Polychaeta, which included species of *Chaetopterus* believed to be distinct by these authors. These species were: *Chaetopterus appendiculatus* Grube 1874; *C. cautus* Marenzeller 1879; *C. insignis* Baird 1864; *C. luteus* Stimpson 1855; *C. norvegicus* Sars 1835; *C. pergamentaceus* Cuvier 1827; *C. sarsii* Boeck *in* M. Sars 1861; and *C. variopedatus* (Renier 1847). The types of the *Chaetopterus* species were stated to be currently being examined, and redescriptions of many of these species to be in preparation by M.E. Petersen (PETERSEN & BRITAYEV, 1997). This revision has not been published yet, but Petersen's methodology was adopted by E. Nishi in some of his papers, in order to redescribe old and describe new species of *Chaetopterus* (NISHI, ARAI & SASANUMA, 2000; NISHI, 2001; NISHI & KOTSUKA, 2005), namely *C. capensis* Stimpson 1855, *C. cautus* Marenzeller 1879, *C. gregarius* Nishi, Arai & Sasanuma 2001, *C. izuensis* Nishi 2001, *C. japonicus* Nishi 2001, *C. longipes* Crossland 1904, *C. luteus* Stimpson 1855, *C. pacificus* Nishi 2001, and *C. takahashii* Izuka 1911.

More recently OSBORN *et al.* (2007) described the aberrant species *Chaetopterus pugaporcinus*, living in mesopelagic waters off Monterey Bay (California), and exhibiting a combination of both adult and larval characters. The same authors performed the first molecular phylogenetic analysis of the

Chaetopteridae, which provided the first molecular evidence that *Chaetopterus variopedatus sensu* HARTMAN (1959*a*) was not a single cosmopolitan species.

Finally, NISHI, HICKMAN & BAILEY-BROCK (2009) described 3 new species (*Chaetopterus aduncus*, *C. charlesdarwinii*, and *C. galapagensis*), and redescribed another two older ones (*C. longipes* Crossland 1904, and *C. macropus* Schmarda 1861) from the Galapagos Islands. The same authors provided a synoptic table of Pacific species of *Chaetopterus* that included, besides the five species mantioned above, the following ones: *C. appendiculatus* Grube 1874; *C. cautus* Marenzeller 1879; *C. gregarius* Nishi, Arai & Sasanuma 2000; *C. izuensis* Nishi 2001; *C. japonicus* Nishi 2001; *C. longimanus* Crossland 1904; *C. luteus* Stimpson 1855; *C. pacificus* Nishi 2001; and *C. variopedatus* Renier 1847.

Currently there is no synoptic table or updated key for the European species of *Chaetopterus*, and I do not feel able to elaborate a key with base on the available information. Apparently, the single modern key for European species was published by KIRKEGAARD (1996), and included the two species reported to be present in Danish waters (*C. variopedatus* and *C. sarsii*). *Chaetopterus varipedatus*, the Mediterranean type species of the genus, is not included, and besides it should be noted that this is not the only species of the genus occurring in the Mediterranean Sea. *C. variopedatus* is an infaunal species with U-shaped tubes partially buried in the substrate (PETERSEN, 1984*b*), while apparently there is at least one epifaunal species occurring in the coralligenous bottoms of Southern Spain, with irregular tubes affixed to hard substrates (personal observation, on very fragmented specimens). Besides, *C. leuckartii* Quatrefages 1866 was described from the Adriatic Sea. The key presented below includes only two species, and it should be used with care, as it only refers to species reported to be present at Danish waters.

No synonymies will be considered here, with one exception, as it is not clear which of the described species are valid or not, and in the later case, if they are synonymies of other species.

KEY TO SPECIES:

(from KIRKEGAARD, 1996)

NOT INCLUDED IN THE KEY: *Chaetopterus brevis* Lespès 1872; *Chaetopterus insignis* Baird 1864; *Chaetopterus leuckartii* Quatrefages 1866; *Chaetopterus pergamentaceus* Cuvier 1827; *Chaetopterus valencinii* Quatrefages 1866; *Chaetopterus variopedatus* (Renier 1847).

1a. Parapodia of segment 4 smaller than the others, with few chaetae....................................***C. norvegicus***
1b. Parapodia of segment 4 of the same size than the others, with numerous chaetae.....................***C. sarsii***

Chaetopterus brevis Lespès 1872

Chaetopterus brevis LESPÈS, 1872: 63, pl. 4.
TYPE LOCALITY: France, Atlantic Ocean.
DISTRIBUTION: Known from the type locality.

Chaetopterus insignis Baird 1864

Chaetopterus insignis BAIRD, 1864: 477, pl. 49.
TYPE LOCALITY: England.
DISTRIBUTION: Known from the type locality.

Chaetopterus leuckartii Quatrefages 1866

Chaetopterus Leuckartii QUATREFAGES, 1866*b*: 216.
TYPE LOCALITY: Adriatic Sea.
DISTRIBUTION: Known from the type locality.

Chaetopterus norvegicus Sars 1835

Chaetopterus norvegus SARS, 1835: 54-58, pl. 11 fig. 29*a-h*.
TYPE LOCALITY: Norway.
SELECTED REFERENCES: *Chaetopterus norvegicus* — KIRKEGAARD, 1996: 120-123, fig. 58.
DISTRIBUTION: Norway.

Chaetopterus pergamentaceus Cuvier 1827

Chaetopterus Pergamentaceus CUVIER, 1827: 28.

TYPE LOCALITY: Antilles, West Indies.
DISTRIBUTION: Caribbean Sea; Gulf of Mexico.
REMARKS: This species was cited as being present in the European waters, but this is probably the result of erroneous identifications.

Chaetopterus sarsii Boeck *in* M. Sars 1861

Chaetopterus Sarsii BOECK *in* M. SARS, 1861*b*: 86, 87.
TYPE LOCALITY: Norway.
SELECTED REFERENCES: *Chaetopterus Sarsii* — M. SARS, 1863: 302-303. *Chaetopterus sarsi* — KIRKEGAARD, 1996: 123.
DISTRIBUTION: Norway. Between 35-55 meters.

Chaetopterus valencinii Quatrefages 1866

Chaetopterus Valencinii QUATREFAGES, 1866*b*: 210, pl. 12 fig. 1.
TYPE LOCALITY: Saint-Vaast-la-Hague, Northern coast of France (English Channel).
SYNONYMS: *Chaetopterus Quatrefagesii* Jourdain 1868.
SELECTED REFERENCES: *Chaetopterus Quatrefagesii* — JOURDAIN, 1868: 23, pl. 1.
DISTRIBUTION: Known from the type locality.
REMARKS: JOYEUX-LAFFUIE (1890) considered *Chaetopterus valencinii* Quatrefages 1866 and *Chaetopterus quatrefagesii* Jourdain 1868, both with type locality at Saint-Vaast-la-Hague, as synonymous. This opinion will be followed here. The same author also proposed the synonymy of *C. valencinii* with *C. insignis* Baird 1864, and of this one with *C. variopedatus* (Renier 1847), but I think that both of these synonymies require confirmation, especially the second one.

****Chaetopterus variopedatus*** (Renier 1847)

Tricoelia variopedata RENIER, 1847: 35-40, pls. 8-9.
TYPE LOCALITY: Adriatic Sea.
SELECTED REFERENCES: *Tricœlia variopedata* — RENIER, 1804: xviii [rejected by the ICZN]. *Chætopterus variopedatus* — CLAPARÈDE, 1869: 78-79; MARQUES, 1942: 42-44, fig. 1*a-b*. *Chaetopterus variopedatus* — [?] JOYEUX-LAFFUIE, 1890: 245-360, pls. 15-20; LO BIANCO, 1893: 35-36; [?] SAINT-JOSEPH, 1894: 147-153, pl. 7 figs. 189-199; [?] MCINTOSH, 1915*b*: 120-129, text-figs. 111-112, pl. 89 fig. 3, pl. 98 fig. 7, pl. 102 fig. 5; [?] FAUVEL, 1919*a*: 446-448; [?] FAUVEL, 1926*b*: 308-309; FAUVEL, 1927*a*: 77-78, fig. 26 [in part]; [?] RIOJA, 1931: 124-128, pls. 36-39; BHAUD, 1966: 1101-1104, figs. 6-7; [?] HARTMANN-SCHRÖDER, 1996: 354-356, fig. 162.
REFERENCES FOR PORTUGAL: FAUVEL, 1914*f* (as *Chætopterus variopedatus*; off Faro); MARQUES, 1942 (Sesimbra); BELLAN, 1960*a* (Cascais); MONTEIRO-MARQUES, 1979 (southern continental shelf of Algarve); MONTEIRO-MARQUES, 1987 (continental shelf of Algarve); DEXTER, 1992 (previous records: continental shelf of Algarve); PARDAL, CALDEIRA & MARQUES, 1992 (previous records: Estoril; Algarve); SALDANHA, 1995 (Portugal); BOAVENTURA *et al.*, 2006 (Ancão, Algarve).
MATERIAL: FAUNA 1 — St. 45*A*, Gulf of Cádiz, near Rota, 18 m, rocks with white coral: 1 specimen and tube, identified with doubts; specimen incomplete, in two fragments; anterior fragment up to the first segment of the middle region; posterior fragment seems to be the anterior region of the middle region. **St. 55*A***, Gulf of Cádiz, off Cape Trafalgar, 38-42 m, gravel: 3 specimens and tubes, identified with doubts; all specimens broken in several pieces; bigger specimen up to 5 cm long; 2 specimens with 9 chaetigers in the anterior region, one with 10 chaetigers; fourth chaetiger with up to 6 modified chaetae; about 17 (?) chaetigers in the posterior region.
DISTRIBUTION: The species was recorded from: Northeastern Atlantic; Arctic Ocean; Norwegian coast to North Sea; Skagerrak; Kattegat; Øresund; English Channel; Mediterranean Sea; Adriatic Sea; Aegean Sea; Indian Ocean; Pacific Ocean; on muddy and sandy bottoms, between 1-150 meters. As it was considered as being cosmopolitan for a long time, its distribution is the result of the clump of the distribution of several different species. How many species are represented in this distribution and which is the real distribution of *Chaetopterus variopedatus* is not known, at present. The species was described from the Adriatic Sea, and quite probably is at least also present in the Mediterranean Sea.
REMARKS: As stated above, the species *Chaetopterus variopedatus* was considered as being cosmopolitan by most authors for a long time. In Europe, JOYEUX-LAFFUIE (1890) was the first to unite all the described species under the name of the older species, in which was followed by others. This vision has changed, and according to PETERSEN (1984*a*) there could be about 5-6 valid species in the European waters.

Another problem concerning this species is related with its original publication, and if it is to be considered as a valid publication or not, as already debated by CLAPARÈDE (1869). Nowadays this publication is rejected by the International Commission of Zoological Nomenclature for nomenclatorial purposes, and it is necessary to check the next available publication with a description of the species, or the next available name. A new illustrated description of the species, as *Trocoelia variopedata*, was published in a posthumous work by RENIER (1847), and could accomplish the need to find that next available name for the species, unless it is demonstrated that the name is a junior synonym of another *Chaetopterus* species described in the meantime.

GENUS ***Mesochaetopterus*** Potts 1914

Mesochaetopterus POTTS, 1914: 957.

TYPE SPECIES: *Mesochaetopterus taylori* Potts 1914.

SYNONYMS: *Ranzania* Claparède 1870 [not Nardo 1840 (Pisces); not Berteloni 1855 (Coleoptera)]; *Ranzanides* Chamberlin 1919; *Sasekumaria* Rullier 1976.

KEY TO SPECIES:

1a. Small sized worms (reaching about 3.5 cm); largest uncinal plates shorter than 70 µm; palps uniformly rose coloured...***M. saggitarius***

1b. Large sized worms (reaching 8.3 cm, for regions A, B, and 10 segments of C); uncinal plates slightly longer than 110 µm; palps with two longitudinal orange to light-brown stripes (one dorsal and one ventral), covering the whole palp in the least third, several successive series of dorsal or dorsolateral transversal black stripes, alternating one thick and wide with one to several thin and narrow ones (less than one third the thickness, and from half to one third of the width of the broad stripes), and a longitudinal black stripe of variable length, usually in the first basal half of the palps, just at the lateral limits of the orange ventral bands...***M. rogeri***

Mesochaetopterus rogeri Martin, Gil, Carreras-Carbonell & Bhaud 2008

Mesochaetopterus rogeri MARTIN, GIL, CARRERAS-CARBONELL & BHAUD, 2008: 207-213, 215-223, figs. 1-2, 4-6, 12, table 3.

TYPE LOCALITY: Punta del Tordera (Blanes), Mediterranean coast of Spain, 41.40ºN, 2.48ºE, at 13-15 meters, in sand.

DISTRIBUTION: Spanish Mediterranean coast: Almeria (Andaluzia); Alicante; Valencia; Barcelona and Girona provinces (Catalonia). In fine to coarse grain sandy bottoms (grain diameter of 400-600 µm). Between 5-30 meters (most commonly between 6-15 meters), in tubes buried into the sediment more than 2.5 meters deep. The species was recently recorded in images made about 100 meters deep, in the region of Cap de Creus (Catalonian coast of Spain), which might indicate that the recent finding of the species at shallower waters, from where it was described, is the consequence of a colonization coming from deeper regions of the coast (RAFAEL SARDÁ, personal communication, February 2010).

Mesochaetopterus sagittarius (Claparède 1870)

Ranzania sagittaria CLAPARÈDE, 1870: 490-492, pl. 11 fig. 1.

TYPE LOCALITY: Gulf of Naples, in groups of many individuals.

SELECTED REFERENCES: *Ranzania sagittaria* — LO BIANCO, 1893: 39, pl. 1 fig. 3; FAUVEL, 1914*f*: 268-269, pl. 25 figs. 11-15; FAUVEL, 1926*b*: 309-310; FAUVEL, 1927*a*: 80-81, fig. 27. *Ranzanides sagittaria* — BHAUD, 1966: 1089-1095, figs. 1-3. *Mesochaetopterus minutus* [not Potts 1914] — BHAUD & DUCHÊNE, 1975: 341-343.

REFERENCES FOR PORTUGAL: RAVARA, 1997 (as *Mesochaetopterus saggitarus*; off Aveiro).

DISTRIBUTION: Portugal to Western Mediterranean Sea; Adriatic Sea; Aegean Sea; Cape Verde. In bottoms of sand. From near the shore to about 90 meters.

REMARKS: The genus *Ranzania* was created by CLAPARÈDE (1870: 489-490) to include the species *R. sagittaria*, from the Gulf of Naples. As the generic name *Ranzania* was preoccupied, CHAMBERLIN (1919*a*: 365) replaced it for *Ranzanides*. Later DAY (1961: 499) suggested that the genera *Mesochaetopterus* Potts 1914 and *Ranzanides* Chamberlin 1919 were synonymous, which was confirmed by BHAUD (1969*a*; 1969*b*), being the *Ranzanides* description based on incomplete specimens. BHAUD

(1969*b*) supported his conclusions on the rearing of Chaetopteridae planktonic larvae collected at Nosy-Bé (Madagascar). The morphology of the reared larvae was very close to another planktonic larvae from the West Mediterranean Sea, previously studied by BHAUD (1966) and attributed by him to the species *Ranzanides sagittaria* (Claparède 1870).

Apparently BHAUD (1969*b*) considered that the reared larvae from Madagascar were representative specimens of *Mesochaetopterus minutus* Potts 1914, a species originally described from the Torres Strait (between Northern Australia and Papua), and from Cape Verde Islands (São Vicente and Porto Praia), and synonymised both species, under *Mesochaetopterus sagittarius* (Claparède 1870). This synonymy was also justified by the fact that both populations from the Gulf of Naples and Madagascar lived in gregarious conditions. Later, BHAUD & DUCHÊNE (1975) recorded the finding of a single specimen of *Mesochaetopterus minutus* at a depth of 90 meters, on sand, near Banyuls-sur-Mer, a specimen that probably should be attributed to *M. sagittarius*. The synonymy between these two species is not accepted here, at least without a direct comparison between adult specimens from both populations of the type localities (Gulf of Naples and Torres Strait).

GENUS ***Phyllochaetopterus*** Grube 1863

Phyllochaetopterus GRUBE, 1863: 52-54.

TYPE SPECIES: *Phyllochaetopterus gracilis* Grube 1863.

REMARKS: Architomy, as a form of asexual reproduction, is known to occur in *Phyllochaetopterus*, in which up to six individuals resulting from that process have been found in a single tube (POTTS, 1914; ROUSE, 2001*i*). This way, the number of segments occurring in each of the body regions of the worms (A, B, or C), can be affected by that process of fragmentation, and seems to be a poor taxonomic character. However, they are used in the key below, as it was not possible to find other characters in order to separate the species *P. anglica*, *P. fallax*, and *P. socialis*, only with base on the available descriptions.

KEY TO SPECIES:

(adapted from FAUVEL, 1927*a*)

1a. Middle region with numerous segments (7-30)..**2**
1b. Middle region with few segments (2-3)..**3**

2a (1a). Anterior region of body (region A) with 13 chaetigers (according to CLAPARÈDE, 1869; 10-18, according to FAUVEL, 1927*a*); middle region of body (region B) with 9 chaetigers (according to CLAPARÈDE, 1869; 7-24 according to FAUVEL, 1927*a*); worms 2-4 cm long; forming big colonies, of hundreds of parallel and adherent tubes..***P. socialis***
2b (1a). Anterior region of body (region A) with 13-16 chaetigers (according to POTTS, 1914); middle region of body (region B) with 11-25 chaetigers (according to POTTS, 1914); worms 2-12 cm long; forming big colonies, of hundreds of tubes which tend to run parallel, but are not, as a rule, adherent..***P. anglica***
2c (1a). Anterior region of body (region A) with 19 chaetigers (according to CLAPARÈDE, 1869); middle region of body (region B) with 13 chaetigers (according to CLAPARÈDE, 1869); worms 3 cm long; forming small colonies, of about 10-20 tubes..***P. fallax***

3a (1b). One big modified chaeta on chaetiger 4; big size (25-30 cm)..***P. major***
3b (1b). Many modified chaetae on chaetiger 4; small size (8-20 mm)..***P. gracilis***

Phyllochaetopterus anglica Potts 1914

Phyllochaetopterus anglica POTTS, 1914: 984-985, pl. 6 figs. 9-10, 12.

TYPE LOCALITY: Trawled to the south of Eddystone, Plymouth (England, English Channel).

SELECTED REFERENCES: *Phyllochætopterus anglica* — MCINTOSH, 1922*a*: 16-17. *Phyllochaetopterus anglica* — MCINTOSH, 1923*a*: 475-477, text-figs. 173-174, pl. 136 fig. 12.

DISTRIBUTION: English Channel, in water of some depth.

REMARKS: FAUVEL (1927*a*) considered *Phyllochaetopterus anglica* as a possible synonym of *P. socialis* Claparède 1869, while HARTMAN (1959*a*) considered both species as valid. I have decided to consider the species as being probably valid. As I cannot distinguish it with certainty from *P. socialis* with base on the available descriptions, the diagnosis of the species is given here, according to POTTS (1914: 984): "Phyllochaetopterus *of moderate size (2-12 cm. in length), with eye-spots. Anterior region with a variable number of segments (13-16); a single enlarged seta in each parapodium of the 4th segment. Median region also with a variable number of segments (11-25). Tubes creeping; often several run parallel to each other, with short lateral connections. More than one individual in the same system of tubes. (...) In* P. anglica *(...) the colony is likewise contained in a number of tubes, which tend to run parallel, but are not, as a rule, adherent. The open nature of the colony leaves no but doubt that the tubes are connected. (...) Small subsidiary apertures may be placed at the end of branchlets of the main tube (...).*"

Phyllochaetopterus fallax Claparède 1869

Phyllochaetopterus fallax CLAPARÈDE, 1869: 90-92, pl. 21 fig. 2.

TYPE LOCALITY: Gulf of Naples.

SELECTED REFERENCES: *Phyllochaetopterus fallax* — FAUVEL, 1914*f*: 267-268, pl. 25 figs. 16-21.

DISTRIBUTION: Gulf of Naples; Gulf of Gascony. Shallow water to 160 meters.

REMARKS: *Phyllochaetopterus fallax* has been normally considered as a junior synonym of *P. socialis* Claparède 1869 (*e.g.*: FAUVEL, 1927*a*; HARTMAN, 1959*a*). I prefer to maintain here this species has being probably valid, until further evidence on that synonymy is given.

According to CLAPARÈDE (1869: 90), the diagnosis of the species is as follows: "*Phyllochaetopterus circa 3 cent. longus. 1^{mm},7 latus, tubum incolens vitreum, annulatum, tubo Telepavi simillimum. Regio antica e 19 segmentis (segmenti buccali incluso) constans; regio media segmentis branchiatis 13, postica ramis dorsualibus cylindraceis insignis. Tentacula maxima, flava, aurata, annulis brunnceis.*" [Body about 3 cm long and 1,7 mm wide; tubes uncolored, vitreous, annulated, similar to *Spiochaetopterus*; anterior region always with 19 segments, including the buccal segment; median region with 13 segments. Tentacles with transversal brown spots; brown violet line between the first and second chaetigers and also at the border of chaetiger 6].

CLAPARÈDE (1869: 90-91) also stated about the tubes and the special chaetae of chaetiger 4: "*Les tubes sont* (in relation to *Telepsavus Costarum*) *un peu plus larges, un peu plus solides, et souvent enfumés ou même encroûtés ça et là d'une substance noirâtre étrangère. En outre j'ai toujours trouvé ces tubes engagés par leur partie postérieur dans des éponges* (...). *Ces vers vivent en société et l'on en reçoit des pêcheurs dix à vingt à la fois* (the tubes). (...) *La grosse soie du 4me segment sétigère* (...) *se renfle à quelque distance de l'extrémité en une massue cylindrique, tronquée obliquement par une surface concave, à bords crénelés. Deux des crénelures se développent en dents vigoureuses, mais obtuses.*"

Phyllochaetopterus gracilis Grube 1863

Phyllochaetopterus gracilis GRUBE, 1863: 52-54, pl. 5 fig. 4.

TYPE LOCALITY: Krivica (= Crivizza), Losinj (= Lussin piccolo) Island, Croatia, Northern Adriatic Sea.

SELECTED REFERENCES: *Phyllochaetopterus gracilis* — LANGERHANS, 1881: 114-115, pl. 5 fig. 19; [?] MCINTOSH, 1915*b*: 130-132, pl. 102 fig. 6, pl. 108 fig. 15; FAUVEL, 1927*a*: 88, fig. 31*d-f*; RIOJA, 1931: 138-140, pl. 46; BHAUD & VON BUREN, 1975: fig. 1*C*. *Phyllochaetopterus garcilis* [sic] — BHAUD, 1977: table 1.

REFERENCES FOR PORTUGAL: [?] MUCHA & COSTA, 1999 (as *Phyllochaetopterus* cf. *gracilis*; Ria de Aveiro and/or Sado Estuary).

DISTRIBUTION: Adriatic Sea; Canary Islands; [?] Portugal; [?] Cape Finisterre. In rocks and among sponges. Near the coast.

Phyllochaetopterus major Claparède 1869

Phyllochaetopterus major CLAPARÈDE, 1869: 92-94, pl. 19 fig. 1.

TYPE LOCALITY: Gulf of Naples.

SELECTED REFERENCES: *Phyllochaetopterus major* — FAUVEL, 1927*a*: 86-88, fig. 31*a-c*; KIRKEGAARD, 1996: 123-124, fig. 59.

DISTRIBUTION: Mediterranean Sea; West Africa; Oslofjord (Norway). Between 10-300 meters.

Phyllochaetopterus socialis Claparède 1869

Phyllochætopterus socialis CLAPARÈDE, 1869: 85-90, pl. 21 fig. 1.

TYPE LOCALITY: Gulf of Naples.

SYNONYMS: [?] *Phyllochaetopterus pictus* Crossland 1903; [?] *Phyllochaetopterus anglica* Potts 1914.

SELECTED REFERENCES: *Phyllochaetopterus socialis* — LO BIANCO, 1893: 36-37; [?] RIOJA, 1917*c*: 41; FAUVEL, 1927*a*: 84-85, fig. 30 [in part?]; RIOJA, 1931: 132-134, pls. 41-43; BHAUD, 1975*a*: 455-462, figs. 1-3, table 1; BHAUD & AMOUROUX, 1975: 335-339; BHAUD & VON BUREN, 1975: fig. 1*A*; BHAUD, 1977: 22, pl. 1 figs. *c-d*, pl. 2, table 1. *Phyllochætopterus socialis* — [?] FAUVEL, 1916*b*: 451-455, text-fig. 1, pl. 9 figs. 44-47; MARQUES, 1942: 44-45, fig. 1*c-e*. [?] *Phyllochaetopterus pictus* — CROSSLAND, 1903*a*: 174-176, pl. 16 figs. 5-7, 9.

REFERENCES FOR PORTUGAL: MARQUES, 1942 (Farilhões; Belatina); BELLAN, 1960*a* (Cape Roca; Cape Espichel; Setúbal Canyon; Cape São Vicente); [?] AMOUREUX, 1974*b* (as *?Phyllochaetopterus socialis*; off Porto); PARDAL, CALDEIRA & MARQUES, 1992 (previous records: Porto; Cape Roca; Cape Espichel; Cape São Vicente).

DISTRIBUTION: Mediterranean Sea; Adriatic Sea; Aegean Sea; Bay of Biscay; English Channel; [?] Wasin Harbour, Kenia; [?] Falkland Islands. In rocks, forming masses of interconnected tubes. Near the coast from 1 meter to about 132 meters.

REMARKS: According to CLAPARÈDE (1869: 85), the diagnosis of the species is as follows: "*Corpus circa 2 cent. longum. Regio antica sive thoracica e segmentis 13 (præter segmentum buccal) constans; media branchiata e segmentis 9 quorum tria anteriora brevissima, cætera præsertim septimum octavumque longiora; postica segmentis ultra 35 efformatur.*" [Body 2 cm long; anterior region always with 13 chaetigers, median region with 9 segments, the first 3 shorter than the following, and the 7th and 8th longer; posterior region with more than 35 segments.].

CLAPARÈDE (1869: 85-86) described the tubes as being "*juxtaposés, grisâtres, papyracés et enchevêtrés les uns dans les autres par leur extrémité postérieur, paraissent former d'immenses prairies.* (...) *Ces petites habitations cylindriques, larges à peine d'un millimètre et longues parfois de 8 à 10 centimètres, sont irrégulièrement contournées dans leur partie postérieur, soudées les unes aux autres, et ne peuvent se séparer sans déchirures*", while the modified chaetae of the fourth chaetiger is referred as "*Encore ici* (at the thoracic region) *c'est le 3^{me} segment (4^{me} sétigère) qui, en outre d'un petit nombre de soies normales, porte une soie cylindrique, colossale par son diamètre, tronquée et irregulièrement dentée à l'extrémité. Quelques fois on compte deux de ces soies, mais alors l'une est plus courte; c'est une soie de remplacement en genèse.*"

GENUS *Spiochaetopterus* M. Sars 1853

Spiochaetopterus M. SARS, 1853: 390-391.

TYPE SPECIES: *Spiochaetopterus typicus* M. Sars 1856.

SYNONYMS: *Telepsavus* Costa 1868; *Leptochaetopterus* Berkeley 1927.

REMARKS: The genus definition was emended by WEBSTER (1879*a*).

KEY TO SPECIES BASED ON THE TUBE:
(from BHAUD, 1998*b*)

1a. Tube not articulated..**2**
1b. Tube multiarticulated with alternation of homogeneous zones and joints; bamboo-like appearance: circular articulations slightly inflated, separated by a region with a constant diameter...............................**3**

2a (1a). Longitudinal outline of tube with regular undulations; circular swelling continuous and developed on the whole circumference; diameter = 1.6-2.6 mm..***S. typicus***
2b (1a). Longitudinal outline of tube with external wall crumpled, irregularly pleated; with a slight roughness and marks of longitudinal tears; diameter = 0.6-0.8 mm...***S. bergensis***

3a (1b). Successive layers visible, clear desquamation at articulations; clear marks of broken layers lengthwise; diameter = 1.1-1.3 mm...***S. costarum***
3b (1b). Successive layers indistinct, numerous marks of cross incisions of the tube; diameter = 0.6 mm...***S. solitarius***

KEY TO SPECIES, MAINLY BASED ON A4 SPECIALIZED CHAETAE:
(adapted from BHAUD, 1998*b*)

1a. Upper oblique plane rhomboid; horizontal ventral edge with protuberance; cross section of shaft approximately oval or with flattened ventral face; ventral limit of upper oblique plane as simple ledge; overhang not clearly marked, horizontal ventral edge weakly protruding; oblique plane rounded-triangular (*S. typicus* + *S. bergensis*)..**2**
1b. Upper oblique plane clearly cordate; horizontal ventral edge incised or excavated, without protuberance; shafts grooved throughout length; ventral limit of upper oblique plane as balcony with clear overhang..**3**

2a (1a). Chaeta large, length: 1200 µm; ventral width of head: 100-120 µm; horizontal ventral edge evenly rounded, close to the part of a circle..***S. typicus***
2b (1a). Chaeta small, length: 430 µm (according to GITAY, 1969: 370 µm), ventral width of head: 35-40 µm; horizontal ventral edge in three juxtaposed equal rounded protuberances..........................***S. bergensis***

3a (1b). Chaeta relatively short and compact, ratio total length/ width of shaft close to 5; shape slightly curved; maximal length: 300-350 µm; number of segments in region B between 7-27; anterior region of body, from the prostomium to shortly after the ventral shield, with a lateral pigmented stripe..***S. solitarius***
3b (1b). Chaeta slender and straight, ratio total length/ width of shaft close to 8; maximal length: 650-700 µm; number of segments in region B between 36-55; anterior region of body, from the prostomium to shortly after the ventral shield, with a lateral string of pigmented spots....................................***S. costarum***

Spiochaetopterus bergensis Gitay 1969

Spiochaetopterus bergensis GITAY, 1969: 12-13, figs. 2-3.

TYPE LOCALITY: Sørfjorden, east of Åkre, 60º15'35"N, 6º35'00"E, western Norway, 396-397 meters, in a bottom of fine sand.

SELECTED REFERENCES: *Spiochaetopterus bergensis* — HARTMANN-SCHRÖDER, 1996: 356-357; BHAUD, 1998*b*: 248, 257-260, figs. 3*B*, *D*, *F*, *H*, 8*D-E*, 9*B*, table 1.

DISTRIBUTION: Western Norway; Skagerrak. On fine sand and mud. Between 396-640 meters.

Spiochaetopterus costarum (Claparède 1869)

Thelepsavus Costarum CLAPARÈDE, 1869: 80-84, pl. 20 fig. 1.

TYPE LOCALITY: Gulf of Naples, on sand.

SYNONYMS: [?] *Telepsavus vitrarius* Ehlers 1908; [?] *Telepsavus Bonhourei* Gravier 1905. .

SELECTED REFERENCES: *Telepsavus Costarum* — LO BIANCO, 1893: 37-38; FAUVEL, 1908: 235; [?] FAUVEL, 1919*a*: 448-449; FAUVEL, 1927*a*: 82, fig. 28. *Telepsavus costarum* — [?] FAUVEL, 1914*f*: 268, pl. 25 fig. 10; FAUVEL, 1926*b*: 313; RIOJA, 1931: 128-130, pl. 40. *Spiochaetopterus costarum costarum* — GITAY, 1969: 14-15. *Spiochaetopterus costarum* — BHAUD, 1972: 143-149, figs. 1-3; BHAUD, 1998*b*: 248-255, 257-260, figs. 1, 6*C-D*, 7, 8*F-G*, 9*C*, table 1. [?] *Telepsavus Bonhourei* — GRAVIER, 1905*a*: 93-94; GRAVIER, 1906*d*: 191-197, text-figs. 358-366, pl. 3 figs. 209-213; GITAY, 1969: 15, fig. 1*C*. [?] *Telepsavus vitrarius* — EHLERS, 1908: 114-116, pl. 15 figs. 1-8; KIRKEGAARD, 1959: 29-30; DAY, 1967: 528, fig. 22.1.*u-v*. Not *Telepsavus costarum* — BARNES, 1965: 218-223, figs. 1-3 [= *Spiochaetopterus oculatus* Webster 1879].

DISTRIBUTION: Western Mediterranean Sea; Adriatic Sea; Aegean Sea; Bay of Biscay; [?] West Africa, from Guinea Bissau to South Angola; [?] Madagascar; [?] Red Sea. In mixed bottoms or bottoms of sand. Intertidal to shallow water, near the shores; [?] 748 meters.

Spiochaetopterus solitarius (Rioja 1917)

Phyllochætopterus solitarius RIOJA, 1917*b*: 226-228, fig. 3.

TYPE LOCALITY: Sable de Enmedio, and Sable located east of Huera Grande, Santander (Cantabria, Northern Spain), on sand.

SELECTED REFERENCES: *Phyllochaetopterus solitarius* — FAUVEL, 1927*a*: 85-86, fig. 31*g-l*; RIOJA, 1931: 134-138, pls. 44-45; BHAUD & VON BUREN, 1975: 471-475, fig. 1*B*; BHAUD, 1977: table 1. *Spiochaetopterus solitarius* — BHAUD, 1975*a*: 462-465, fig. 4, table 1; BHAUD, LASTRA & PETERSEN, 1994: 118-129, figs. 2-5; BHAUD, 1998*b*: 248-255, 257-260, figs. 1, 4, 6*A-B*, 8*H-K*, 9*D*, table 1. *Spiochaetopterus costarum* [not Claparède 1869] — BHAUD & AMOUROUX, 1974: 371-373.

REFERENCES FOR PORTUGAL: BELLAN, 1960*a* (as *Phyllochaetopterus solitarius*; Cape Roca and off Cape Roca; Cape Espichel; Setúbal Canyon; Cape São Vicente; Cape Sagres and off Cape Sagres); PARDAL, CALDEIRA & MARQUES, 1992 (as *Phyllochaetopterus solitarius*; previous records: Cape São Vicente; Bay of Setúbal; Cape Espichel; Cape Roca).

DISTRIBUTION: Bay of Biscay; Galicia; Western Mediterranean Sea; Aegean Sea. In sand and silty sand. Between 2-12 meters.

Spiochaetopterus typicus M. Sars 1856

Spiochaetopterus typicus SARS, 1856: 1-9, pl. 1 figs. 8-21.

TYPE LOCALITY: Western Norway.

SYNONYMS: *Spiochaetopterus madeirensis* Langerhans 1880.

SELECTED REFERENCES: *Spiochaetopterus typicus* — FAUVEL, 1914*f*: 266-267, pl. 25 figs. 5-9; MCINTOSH, 1923*a*: 474-475, pl. 138 fig. 14; FAUVEL, 1927*a*: 82-84, fig. 29; USCHAKOV, 1955*a*: 292, fig. 106; BHAUD, 1966: 1095-1101, figs. 4-5; GITAY, 1969: 11, fig. 1*A*; HARTMANN-SCHRÖDER, 1996: 357-358, fig. 163; KIRKEGAARD, 1996: 125, fig. 60; BHAUD, 1998*b*: 248, 257-260, figs. 3*A*, *C*, *E*, *G*, 8*A-C*, 9*A*, table 1. *Spiochaetopterus madeirensis* — LANGERHANS, 1880*b*: 94-95, pl. 4 fig. 6; GITAY, 1969: 11-12, fig. 1*B*.

REFERENCES FOR PORTUGAL: BELLAN, 1960*a* (off Cape Santa Maria); [?] AMOUREUX, 1974*b* (as *?Spiochaetopterus typicus*; off Aveiro; off Porto); PARDAL, CALDEIRA & MARQUES, 1992 (previous records: Porto; Aveiro; coast of Alentejo).

DISTRIBUTION: Arctic Ocean; Northwest Pacific Ocean; North Atlantic; Azores; Denmark; North Sea; Skagerrak; Kattegat; Øresund; Adriatic Sea. In bottoms of sand, gravel, and mud. Between 15-4000 meters.

*FAMILY CHRYSOPETALIDAE Ehlers 1864

AS: *CHRYSOPETALEA* EHLERS, 1864: 80.

TYPE GENUS: *Chrysopetalum* Ehlers 1864.

REMARKS: The family Chrysopetalidae is characterized by specimens normally golden coloured, due to the presence of petal-like dorsal chaetae or paleae, that cover the dorsum in many taxa of the family. Chrysopetalids have been thoroughly studied in the last 25 years, and 8 of its 12 known genera with extant representatives were described during that period: *Hyalopale* and *Heteropale* by PERKINS (1985), *Acanthopale* by SAN MARTÍN (1986*b*), *Paleaequor* by WATSON RUSSELL (1986), *Strepternos* by WATSON RUSSELL *in* BHAUD *et al.* (1987) and WATSON RUSSELL (1991), *Victoriella* by KISSELEVA (1992, later changed to *Vigtorniella* by KISSELEVA, 1996), *Arichlidon* by WATSON RUSSELL (1998), and *Thrausmatos* by WATSON RUSSELL (2001). Besides the previous cited publications, other recent papers describing new species include MORGADO & AMARAL (1981), DAHLGREN (1996), WATSON RUSSELL (2000), AGUADO, CAPA & SAN MARTÍN (2003), DAHLGREN *et al.* (2004), and WIKLUND *et al.* (2009). Finally, DAHLGREN & PLEIJEL (1995) redescribe *Chrysopetalum caecum*, as *Dysponetus*, and AGUIRREZABALAGA *et al.* (1999) gave the first record of *Dysponetus gracilis* for the European coasts.

The Chrysopetalidae includes at present 12 genera, with 53 described species and 1 subspecies considered to be valid. In the European and nearby waters, 6 genera with 13 described species are known to occur. One single species was found among the studied material.

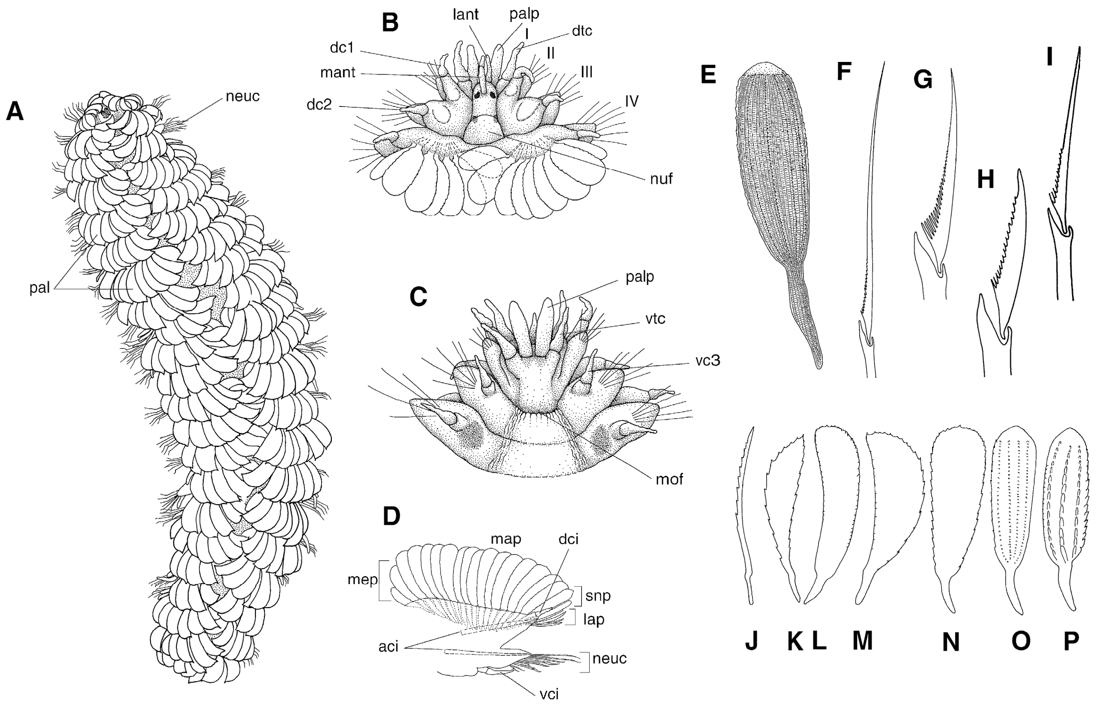

Figure legend: Family Chrysopetalidae. **A**, *Paleonotus* specimen, entire animal, dorsal view. **B**, *Paleaequor* specimen, anterior end, dorsal view; paleae on chaetigers 1 and 2 removed. **C**, *Paleaequor* specimen, anterior end, ventral view. **D**, *Paleaequor* specimen, parapodium from chaetiger 30, ventral view; notochaetal paleal groups shown. **E**, *Paleaequor* specimen, a main palea from the mid-body showing internal and external structure. **F**-**I**, *Paleaequor* specimen, compound neurochaetae from chaetiger 34: **F**, superior spiniger; **G**, mid-superior falciger; **H**, mid-inferior falciger; **I**, inferior spiniger. **J**-**P**, the main paleal type of several genera: **J**, *Dysponetus*; **K**, *Chrysopetalum*; **L**, *Treptopale*; **M**, *Paleanotus*; **N**, *Arichlidon*; **O**, *Paleaequor*; **P**, *Bhawania*. **aci**, aciculae; **dci**, dorsal cirrus; **dc1**, dorsal cirrus chaetiger 1; **dc2**, dorsal cirrus chaetiger 2; **dtc**, dorsal tentacular cirrus; **lant**, lateral antenna, **lap**, lateral paleae; **mant**, median antenna; **map**, main paleae; **mep**, median paleae; **mof**, mouth fold; **neuc**, neurochaetae; **nuf**, nuchal fold; **pal**, paleae; **palp**, palp; **snp**, subunit 1 notochaetal paleae; **vci**, ventral cirrus; **vc3**, ventral cirrus chaetiger 3; **vtc**, ventral tentacular cirrus; **I**-**IV**, segments I-IV. (Adapted from BEESLEY, ROSS & GLASBY, 2000; drawings by A. Murray).

KEY TO GENERA:

(adapted from: PERKINS, 1985; SAN MARTÍN, 2004*b*)

1a. Notopodia of middle segments with spines, only..**2**
1b. Notopodia of middle segments with paleae or paleae and some spines...**3**

2a (1a). Median antenna present...***Dysponetus***
2b (1a). Median antenna absent...***Vigtorniella***

3a (1b). All the paleae of the middle group symmetrical, produced separately, forming broad imbricated row; body long, with prostomium retractile within the anterior segments; one single pair of ventral cirri in the first two segments; dorsal cirri retractile within cirrophores...***Bhawania****
3b (1b). Paleae of the middle group symmetrical and/or asymmetrical; body relatively long to short; prostomium only slightly retractile within the anterior segments; with 1 or 2 pairs of ventral cirri in the first two segments; dorsal cirri not retractile within cirrophores...**4**

4a (3b). Body relatively short, oval, dorsoventrally flattened, covered by the paleae; paleae of the middle group symmetrical, with some asymmetrical paleae in the lateral group...**5**
4b (3b). Body relatively long to short; paleae not covering completely the dorsal region; some or all paleae of the middle group asymmetrical, produced in fan-shaped groups from several developmental centers...**6**

5a (4a). Paleae of the middle group of middle segments produced separately, forming broad imbricated row; compound neurochaetae of middle segments with spinigerous and falcigerous blades.......***Arichlidon***
5b (4a). Paleae of the middle group of middle segments produced from two developmental centers in fan-shaped rows, one behind the other; compound neurochaetae of middle segments with spinigerous blades, only..***"Paleonotus schmardai*** **Mileikovsky 1961" [see *Paleonotus*]**

6a (4b). Paleae of the middle group symetrical and asymmetrical; with 2 pairs of ventral cirri in the first two segments; caruncle present...***Chrysopetalum***
6b (4b). Paleae of the middle group strongly asymmetrical; one pair of ventral cirri in the first two segments; caruncle, if present, reduced to a flattened structure...***Paleanotus***

GENUS *Arichlidon* Watson Russell 1998

Arichlidon WATSON RUSSELL, 1998: 160-162.
TYPE SPECIES: *Arichlidon hanneloreae* Watson Russell 1998.

Arichlidon reyssi (Katzmann, Laubier & Ramos 1974)

Bhawania reyssi KATZMANN, LAUBIER & RAMOS, 1974*a*: 314-316, fig. 1.
TYPE LOCALITY: Adriatic Sea, 43º41'N, 15º44.2'E, at 51 meters.
SELECTED REFERENCES: *Arichlidon reyssi* — WATSON RUSSELL, 1998: 173-175, figs. 4*C*, 6*G-I*; WATSON RUSSELL, 2000: 475-476, fig. 1*A-C*, tables 1-2; SAN MARTÍN, 2004*b*: 438-440, figs. 159*D-F*, 160. *Bhawania reyssi* — CAMPOY, 1982: 106-107. Chrysopetalidae gen. sp.? — LAUBIER, 1966*d*: 11-12. *Bhawania* — JORGE, 1953: 103, figs. 3-4, 9-10 [species not named, later described as *Bhawania reyssi* by KATZMANN, LAUBIER & RAMOS (1974)].
REFERENCES FOR PORTUGAL: JORGE, 1953 (as *Bhawania*; Portugal).
DISTRIBUTION: Adriatic Sea (51-77 meters); Aegean Sea; Mediterranean Sea (intertidal to 3947 meters); Red Sea (intertidal to 757 meters); from Portugal to the French Atlantic coast; Cape Verde Islands (20-425 meters); Madagascar. On numerous kinds of bottoms, from hard substrates, as rock and calcareous algae, reefs of vermetids, coralligenous blocks, or red coral, to soft bottoms, as coarse sand, sandy muds with shell debris, or deep water soupy muds. Intertidal to almost 4000 meters.

*GENUS **_Bhawania_** Schmarda 1861

Bhawania Schmarda, 1861: 164.
Type species: *Bhawania myriolepis* Schmarda 1861.
Synonyms: *Psectra* Grube 1868.

*_**Bhawania goodei**_ Webster 1884

Bhawania goodei Webster, 1884: 308-309, pl. 7 figs. 10-15.
Type locality: Bermuda.
Selected references: *Bhawania goodei* — Day, 1967: 118-119, fig. 2.1.*a-f*; Gardiner, 1976: 100, fig. 5*a-e*; Fauchald, 1977*b*: 10; San Martín *et al.*, 1982: 173-174, fig. 1; Perkins, 1985: 895-899, figs. 21-22; San Martín, 2004*b*: 434-437, figs. 158, 159*A-C*. *Palmyra goodei* — Treadwell, 1939*b*: 199-200, fig. 29.
References for Portugal: [?] Saldanha, 1974 (as *Bahwania sp. I*; coast of Arrábida); [?] Monteiro-Marques, 1987 (as *Bhawania* sp.; continental shelf of Algarve).
Material: FAUNA 1 — St. 33*A*, Alborán Sea, Alborán Island, 34-44 m, laminarians on rocks: 8 specimens plus 11 fragments; one complete specimen with about 90 chaetigers, 12 mm long and 2 mm wide; 7 incomplete specimens, with 80, 77, 60, 37, 30, 27 and 22 chaetigers; 3 posterior fragments with 53, 30 and 20 chaetigers, the last one missing the pygidium; 8 middle body fragments, with 45, 28, 25, 24, 22, 20, 19, and 12 chaetigers; paleae blunt-tipped as described in Perkins (1985); spinigers about 115 µm long, falcigers about 30 µm long; upper falcigers with serration on margin; mouth opening ventrally at anterior margin of chaetiger 3 or 4. **St. 56*A***, Gulf of Cádiz, off Cape Trafalgar, 24 m, rock and gravel: 1 specimen, incomplete, 110 chaetigers for 30 mm long, 1 mm wide, anterior region missing; body long and slender, flattened, convex dorsally and flat ventrally; middle segment notopodia with about 17 paleae in the middle group, in a long and imbricated row, and slender chaetae in a lateral group, with more than 10 chaetae; tips of middle group palleae all broken, making impossible to see if the tips are blunt; palleae with about 10 internal ribs with cross-bars, extending almost to the tip, with a pair of lateral and 3 dorsal surface ribs, consisting in prominent, irregular, reticulate ridges, with irregular knobs; notopodia with dorsal cirri retractile into the cirrophore; neuropodia with compound chaetae as described for the species; pygidium as described, with very large ventrolateral cirri.
Distribution: Bermuda Islands; Caribbean Sea; Gulf of Mexico; Porto Rico; Atlantic coast of USA, from North Carolina to Florida; West Africa: Senegal and Ghana; Atlantic coast of Morocco; South Africa; Red Sea; Indian Ocean; Madagascar; Pacific Ocean; Portugal to Western Mediterranean; Adriatic Sea. On hard bottoms, like rocks with crevices, among red coral, and on calcareous bottoms of animal origin, like madreporarians, reefs of vermetids, and also among rhizomes of *Posidonia oceanica*, sciaphile algae, or facies of circalittoral gorgonians. Intertidal to 80 meters.
Remarks: The studied specimens were considered as belonging to *Bhawania goodei* as redescribed by Perkins (1985), as paleae, as well as the rest of the characters, seem to be identical.

GENUS **_Chrysopetalum_** Ehlers 1864

Chrysopetalum Ehlers, 1864: 81.
Type species: *Palmyra debilis* Grube 1855.
Synonyms: *Palmyra (Palmyropsis)* Claparède 1864.

Chrysopetalum debile (Grube 1855)

Palmyra debilis Grube, 1855: 90-91, pl. 2 figs. 3-5.
Type locality: Villefranche-sur-Mer (= Villa Franca), Southern France (Mediterranean Sea).
Synonyms: *Palmyra (Palmyropsis) Evelinæ* Claparède 1864; *Chrysopetalum fragile* Ehlers 1864.
Selected references: *Chrysopetalum debile* — Quatrefages, 1866*b*: 296; Southern, 1914: 60; Fauvel, 1923*c*: 123, fig. 44*r-u* [in part; not *Chrysopetalum caecum* Langerhans 1880, and *Palmyra (Palmyrides) portus veneris* Claparède 1864, in the synonymy list]; McIntosh, 1923*b*: 421-422, pl. 136 fig. 1; Laubier, 1968*a*: 80-81; Campoy, 1982: 107-109, pl. 7; Perkins, 1985: 866-868, fig. 2; San Martín, 2004*b*: 440-442, figs. 161, 162*A-D*. *Chrysopetalum* — Jorge, 1953: 103-104, figs. 5-7, 10 [species name not given but apparently *Chrysopetalum debile*, according to Laubier, 1968*a* and Perkins, 1985]. *Palmyra (Palmyropsis) Evelinæ* — Claparède, 1864: 586-587, pl. 8 fig. 6. *Paleonotus*

debilis — Chambers & Muir, 1997: 52, fig. 5. *Chrysopetalum fragile* — Ehlers, 1864: 81-92, pl. 2 figs. 3-9; Quatrefages, 1866*b*: 296; Claparède, 1868: 417-418; Marion & Bobretzky, 1875: 9-10.
References for Portugal: Amoureux & Calvário, 1981 (as *Chrysopetalum* sp.; Peniche); Jorge, 1953 (as *Chrysopetalum*; Portugal).
Distribution: European and North African Atlantic coasts, from France to the Canary Islands; Mediterranean Sea; Adriatic Sea; Aegean Sea. The species was also recorded from the Red Sea and Indian and Pacific Oceans, but according to San Martín (2004*b*) these records could refer to other species. In all kinds of hard substrata, and also recorded from coarse sand. It occurs among algae, vermetid reefs, coralligenous blocks, or inside sponges. From mesolittoral to 200 meters.

GENUS ***Dysponetus*** Levinsen 1879

Dysponetus Levinsen, 1879*a*: 9.
Type species: *Dysponetus pygmaeus* Levinsen 1879.
Synonyms: *Taphus* Webster & Benedict 1887.

Key to Species:
(based in Dahlgren, 1996)

Remarks: The tentacular segments formula shows chaetal (S) and tentacular (l) distribution on notopodia and neuropodia of the first three segments of the species (Dahlgren, 1996).

1a. Sphaerical antennae and palpostyles........................**2**
1b. Palpostyles elongated, antennae fusiform........................**4**

2a (1a). Tentacular segments formula as: (0 – l/ 0 – 0) + (S – l/ S – l) + (S – N/ S – N)..............***D. gracilis***
2b (1a). Tentacular segments formula as: (0 – l/ 0 – 0) + (S – l/ S – 0) + (S – N/ S – N)..............**3**

3a (2b). Mouth appendage absent........................***D. paleophorus***
3b (2b). Mouth appendage double........................***D. pygmaeus***

4a (1b). Two pairs of eyes; palpostyles stout, oval, twice as long as wide, not extending ventrally; digitiform appendages can be present ventrally on segment 8 in some specimens with 10 or more segments; tentacular segments formula as: (0 – l/ 0 – l) + (S – l/ 0 – l) + (S – N/ S – 0).......***D. bipapillatus***
4b (1b). Eyes absent; palpostyles can reach segment 4 when folded backwards on ventral side; digitiform ventrally appendages on segment 8 absent; tentacular segments formula as: (0 – l/ 0 – l) + (S – l/ 0 – l) + (S – N/ S – N)........................***D. caecus***

Dysponetus bipapillatus Dahlgren 1996

Dysponetus bipapillatus Dahlgren, 1996: 576-581, figs. 1-5, table 1.
Type locality: Off Ischia harbor (Bay of Naples, Italy), 40º45.3'N, 13º55.8'E, at 9 meters, on "*Amphioxus* sand".
Distribution: Known from the type locality.

Dysponetus caecus (Langerhans 1880)

Chrysopetalum caecum Langerhans, 1880*a*: 278-279, pl. 14 fig. 9*a-c*.
Type locality: Madeira Island, sublittoral. Neotype designated by Dahlgren & Pleijel (1995) from Banyuls-sur-Mer (Southern France), Cap Oullestrel (42º29.78'N, 03º08.43'E), at 24 meters, in coarse sand and shells with mud.
Selected references: *Chrysopetalum caecum* — Laubier, 1964*b*: 127-137, figs. 1-2; Laubier, 1968*a*: 81, figs. 1-2; Kirkegaard, 1992: 103, fig. 44. *Dysponetus caecus* — Augener, 1913*b*: 78-79; Parapar *et al.*, 1993*a* 369, fig. 3; Dahlgren & Pleijel, 1995: 167-171, figs. 2-4; Dahlgren, 1996: table 1; Hartmann-Schröder, 1996: 85-86; San Martín, 2004*b*: 429-431, figs. 155, 156*A-D*.
Distribution: Madeira; Ireland; Northern and Western Scotland; west coast of Sweden; northern Denmark; Western Mediterranean. On numerous kinds of substrata, like coralligenous bottoms, mud,

muddy sand, silty to coarse sand, shells with mud, gravel, and among algae, sponges, and kelp holdfasts. Intertidal and subtidal to at least 85 meters.

Dysponetus gracilis Hartman 1965

Dysponetus gracilis HARTMAN, 1965*b*: 56-57, pl. 1 figs. *d-e*.

TYPE LOCALITY: Off New England, upper end of canyon, just west of Atlantis Canyon, 39º56'30"N, 70º39'54"W, in 400 meters.

SELECTED REFERENCES: *Dysponetus gracilis* — AGUIRREZABALAGA *et al.*, 1999: 23-24, figs. 1-2, pl. 1; SAN MARTÍN, 2004*b*: 431-433, figs. 156*E-F*, 157. *Dysponetus gracile* [sic] — DAHLGREN, 1996: table 1.

DISTRIBUTION: New England continental slope, NW Atlantic (400-2802 meters); Capbreton Canyon, Gulf of Biscay (984-1029 meters). Muddy bottoms. Between 400-2800 meters.

Dysponetus paleophorus Hartmann-Schröder 1974

Dysponetus paleophorus HARTMANN-SCHRÖDER, 1974*d*: 180-183, figs. 1-4.

TYPE LOCALITY: Norwegian Trench (58º40'N, 05º20'E), at 255 meters, in mud.

SELECTED REFERENCES: *Dysponetus paleophorus* — DAHLGREN, 1996: table 1; HARTMANN-SCHRÖDER, 1996: 86.

DISTRIBUTION: Known from the type locality.

Dysponetus pygmaeus Levinsen 1879

Dysponetus pygmaeus LEVINSEN, 1879*a*: 9, pl. 1 figs. 1-6.

TYPE LOCALITY: Egedesminde, Greenland.

SYNONYMS: [?] *Taphus hebes* Webster & Benedict 1887.

SELECTED REFERENCES: *Dysponetus pygmaeus* — ANNENKOVA, 1935: 233-235; USCHAKOV, 1955*a*: 168, fig. 45*E-I*; [?] PETTIBONE, 1963*a*: 54-55, fig. 12; [?] IMAJIMA & HARTMAN, 1964: 48-49, pl. 10 figs. *a-f*; DAHLGREN, 1996: table 1. [?] *Taphus hebes* — WEBSTER & BENEDICT, 1887: 716-717, pl. 8 figs. 113-118.

DISTRIBUTION: East and West Greenland; Spitsbergen; [?] Maine (Eastport); [?] North of Japan Sea; [?] Shirikishinai, north Japan. In sandy bottoms and among holdfasts of *Laminaria*. From low water to 51 meters.

REMARKS: PETTIBONE (1963*a*) considered *Taphus hebes* Webster & Benedict 1887, described from Eastport (Maine, NW coast of USA) as a junior synonym of *Dysponetus pygmaeus* Levinsen 1879, from Greenland. This synonymy was not considered as valid by DAHLGREN (1996). According to the main morphological characters of both species (DAHLGREN, 1996), the species should be separated by the presence of a pair of eyes and the insertion of the median antenna in an anterior position of the prostomium in *Dysponetus hebes*, and the absence of eyes and the insertion of the middle antenna in a more dorsal position in *D. pygmaeus*. Whether the two species are synonymous or not, is not clear, in my opinion. Besides, the presence or absence of eyes in the specimens can be a poor taxonomic character, as WEBSTER & BENEDICT (1887: 716) stated that in *Dysponetus hebes* (as *Taphus*), "*Eyes* [are] *minute, anterior just back of the origin of the lateral antennae, not visible in alcoholic specimens*".

Some variability can be found among the available descriptions of *Dysponetus pygmaeus*. According to the description given by PETTIBONE (1963*a*), based on the type material of *Dysponetus hebes*, and probably in the original description by WEBSTER & BENEDICT (1887), the eyes are absent, but a minute pair of eyes is visible when living. On the other hand, the antennae are stated to be present in the anterior margin of the of the prostomium. The specimens described as *D. pygmaeus* from the North Sea of Japan by USCHAKOV (1955*a*) are stated to be blind, according to the definition of the genus, and the median antennae to be displaced somewhat dorsally, which fits the description of *D. pygmaeus* according to DAHLGREN (1996). Finally, the specimens described from Shirikishinai (Japan) by IMAJIMA & HARTMAN (1964) are also described as being blind, but the median antenna is stated to arise from the region in front of the prostomium, which approaches it to *D. hebes*.

GENUS ***Paleanotus*** Schmarda 1861

Paleanotus SCHMARDA, 1861: 163.

TYPE SPECIES: *Paleanotus chrysolepis* Schmarda 1861.

SYNONYMS: *Palmyra (Palmyrides)* Claparède 1864; *Heteropale* Johnson 1897.

REMARKS: The genus *Heteropale* Johnston 1897 was synonymized with *Paleonotus* by AUGENER (1913*b*). This synoynmy was questioned by JORGE (1953) and especially by MILEIKOVSKY (1962), who traced especially well the history of this synonymy, and whose work should be consulted for further information on the matter. However, the biggest part of the recent authors accept this synonymy as valid, and the same will be followed here. A definitive statement on the validity of this synonymy requires the study of type and/or topotype material of type species of both genera, *Paleonotus chrysolepis* Schmarda 1861, from the Cape of Good Hope, and *Heteropale bellis* Johnson 1897, from the North Eastern Pacific coast of America.

KEY TO SPECIES:

1a. Neuropodia only with long falcigerous chaetae; paleae with 11 longitudinal ribs............***P. chrysolepis***
1b. Neuropodia only with spinigerous chaetae; paleae with 35-40 weakly expressed ribs......***P. schmardai***

Paleanotus chrysolepis Schmarda 1861

Paleanotus chrysolepis SCHMARDA, 1861: 163, text-figs. *a-e*, pl. 37 figs. 326-329.
TYPE LOCALITY: Cape of Good Hope, South Africa, among stones.
SYNONYMS: *Palmyra (Palmyrides) Portus veneris* Claparède 1864.
SELECTED REFERENCES: *Paleanotus chrysolepis* — DAY, 1967: 116-117, fig. 2.1.*l-m*; CAMPOY, 1982: 109-112, pl. 8; GATHOF, 1984*b*: 26.6, figs. 26.3-26.4; SAN MARTÍN, 2004*b*: 444-446, figs. 162*E-F*, 163. *Palmyra (Palmyrides) Portus veneris* — CLAPARÈDE, 1864: 583-586, pl. 8 fig. 5. *Heteropale* — JORGE, 1953: 99-103, figs. 1-2, 8, 10 [species not named, probably *Paleonotus chrysolepis* sensu CAMPOY (1982)].
REFERENCES FOR PORTUGAL: JORGE, 1953 (as *Heteropale*; Portugal).
DISTRIBUTION: Apparently cosmopolitan: Red Sea; South Africa; Australia; Alaska; California; Chile; Panama; Gulf of Mexico; Western Mediterranean; Aegean Sea; Galicia (NW Spain) and Portugal. Among infralittoral and circalittoral algae, but also recorded in coralligenous blocks, and coarse and fine sands. From shallow water to about 106 meters.
REMARKS: *Heteropale bellis* Johnston 1897 was recorded at the Ría de Pontevedra (Galicia, NW Spain), by VILLALBA & VIÉITEZ (1985: 373-376). However, this record was the result of a misidentification, and it was later attributed to *Paleanotus chrysolepis* by SAN MARTÍN (2004*b*: 446).

Paleanotus schmardai Mileikovsky 1962

Paleonotus schmardai MILEIKOVSKY, 1962: 651-652, figs. 2-3.
TYPE LOCALITY: Coast of NE Norway, 30 miles (48.28 Km) east of the border between the Norwegian and Barents Sea, along the line Nordkap-Medveschij (71º12'N, 24º14'E), at 310 meters.
DISTRIBUTION: Only known from the type locality.
REMARKS: According to PERKINS (1985), *Paleonotus schmardai* is not a *Paleonotus*, appearing similar to *Chrysopetalum* in some characters. It differs from *Chrysopetalum* in having dorsal cirri resembling those of *Paleonotus* (cirrostyles piriform, more or less elongate, instead of cirrostyles long, with oval bases and filiform tips), paleae of the middle group produced in two transverse rows from two developmental centers, and middle group paleae with symmetrical tips, the larger ones having about 40 internal, longitudinal ribs. Besides, the short paleae of the anterior row of the middle group appear to be homologous with midline paleae of most other genera (PERKINS, 1985). For these reasons, PERKINS (*op. cit.*) considered the generic status of *P. schmardai* undefined. The species in keyed above as belonging to a separate genus, but as so far no conclusive study has been carried on its generic status, it is considered here under the genus *Paleonotus*.

GENUS ***Vigtorniella*** Kisseleva 1996

Vigtorniella KISSELEVA, 1996: 1092.
TYPE SPECIES: *Victoriella zaikai* Kisseleva 1992.
SYNONYMS: *Victoriella* Kisseleva 1992 [not Eichwald 1830 (Foraminifera)].

KEY TO SPECIES:

1a. Presence of an achaetous first segment, without acicula, with dorsal tentacular cirri only; absence of plate like jaws (feeding apparatus probably present only in small specimens); whip-like chaetae absent; known from whale falls environments...***Vigtorniella* sp.**
1b. Presence of a chaetigerous first segment, with dorsal and ventral tentacular cirri; plate like jaws present; whip-like chaetae present; known from large and presumably relatively stable environments (the oxic/anoxic boundary in the Black Sea)..***V. zaikai***

Vigtorniella ardabilia Wiklund, Glover, Johannessen & Dahlgren 2009

Vigtorniella ardabilia WIKLUND *et al.*, 2009: 778-780, figs. 2-4.
TYPE LOCALITY: Northern North Atlantic, coastal Skagerrak, 58º53.1'N, 11º06.4'E, from experimental tank with bone material sampled with ROV from an implanted Minke whale carcass (probably *Balaenoptera acutorostrata* Lacépède 1804), at 125 meters, in Kosterfjord (Swedish west coast).
DISTRIBUTION: Known from a Minke Whale carcass implanted at 125 meters in Kosterfjord (Swedish West coast), and also found in sediment samples collected beneath Norwegian fish farms in Svåsand, at 84 and 150 meters, and Mele at 104 meters, both places at the Hardangerfjord, in the region of Bergen.
REMARKS: *Vigtorniella ardabilia* is morphologically similar to *V. flokati* Dahlgren, Glover, Baco & Smith 2004, described from whale-falls in the Pacific Ocean (DAHLGREN *et al.*, 2004), but molecular studies using the nuclear genes 18S and 28S, the mitochondrial 16S, and cytochrome c oxidase subunit I (COI) revealed that they belong to different species.

Vigtorniella zaikai (Kisseleva 1992)

Victoriella zaikai KISSELEVA, 1992: 129-132, figs. 1-2.
TYPE LOCALITY: Black Sea (43º 29'3"N, 37º 35'1"E), at 100-130 meters.
DISTRIBUTION: Central areas of the Black Sea; 100-130 meters.

*FAMILY **CIRRATULIDAE** Ryckholt 1851

AS: *CIRRATULIDÆ* RYCKHOLT, 1851: 29.

TYPE GENUS: *Cirratulus* Lamarck 1801.

SYNONYMS: *CIRRATULIDA* Carus 1863; *CTENODRILIDAE* Kennel 1882.

REMARKS: The authorship of the family Cirratulidae has been normally attributed to CARUS (1863: 441) as Cirratulida. However, ROSENBERG & PETIT (1987: 57) determined that the family name Cirratulidae should instead be attributed to RYCKHOLT (1851).

The taxonomy of the family Cirratulidae is quite problematic, as denoted by the fact that so far, some of its species have been placed in as much as 3 different genera. In spite of several recent publications and the redefinition of almost of all its genera, the family still requires to be further investigated. The main taxonomic problems of the family are discussed in BLAKE (1996*g*), who also traces the taxonomic history of the group, and whose comments are largely followed here. A good account on the taxonomy of the group is also available in ROUSE (2001*g*). A great deal of these problems are due to the fact that the family presents few morphological taxonomic characters, and most of the older descriptions are not accurate enough in order to adequately characterize species (BLAKE, 1996*g*). Besides, other taxonomic characters such as the first occurrence of acicular spines and also its shape, are often size related and can change throughout the life of the worm. Small specimens of multidentate cirratulids appear to possess chaetal types and branchial distributions that are different from the adults, making it impossible to accurately determine even the genus of the juveniles (BLAKE, 1996*g*). Due to all these limitations and difficulties, many species have been described as having a worldwide distribution, but as pointed by BLAKE (1996*g*), relatively few cirratulid species seem to be globally distributed. The employ of methyl green coloration patterns to cirratulids, first used by BLAKE (1991), seems to be a good taxonomic tool in order to find further characters to distinguish among taxa, and has been used with very good results.

The family Ctenodrilidae was originally considered to be related with the Cirratulidae by MESNIL & CAULLERY (1897). The family was redefined by PETERSEN & GEORGE (1991), who gave an emended diagnosis in order to include the genus *Raricirrus* Hartman 1961, previously placed in the family Cirratulidae. On the other hand, the genus *Zeppelina* Vaillant 1890, was revised by GEORGE & PETERSEN (1991), and seven of the eight species described in the genus were referred to the Cirratulidae, all of them being developmental stages of well known species of *Dodecaceria* and *Monticellina*. The eighth species, *Zeppelina branchiata* Sokolow 1911, was determined to be a valid species of Ctenodrilidae, being however a junior synonym of *Rhaphidrilus nemasoma* Monticelli 1910 (GEORGE & PETERSEN, 1991). The phylogenetic affinities of the family Ctenodrilidae were studied by BLEIDORN, VOGT & BARTOLOMAEUS (2003) and ROUSE & PLEIJEL (2003), and the family was found to be nested within the Cirratulidae, where they were previously placed. These results are followed here.

The most recent review of ctenodrilids was performed by PETERSEN & GEORGE (1991), who considered 4 genera as valid: *Aphropharynx*, *Ctenodrilus*, *Raphidrilus*, and *Raricirrus*, stating however that a review was necessary to confirm the status of *Raphidrilus* and *Raricirrus*. This matter was later discussed by DEAN (1995), maintaining however the two taxa. A recent account on the family can be also found in ROUSE (2001*h*). This way, the Ctenodrilidae included 4 genera, 7 species and probably one subspecies considered to be valid. Two of these species are not known to occur in Europe. *Raricirrus variabilis* Dean 1995, was described from the Tongue of the Ocean, St. Croix, Virgin Islands, where it was collected from submerged wood at 4000 meters (DEAN, 1995), while *Ctenodrilus paucidentatus* Ben-Eliahu 1976 was described with base on 4 specimens collected from *Dendropoma* formations in the shore of the Gulf of Elat (= Gulf of Aqaba) (BEN-ELIAHU, 1976*b*). In spite of not occurring in Europe, this last species is here considered.

The family Cirratulidae is under an extensive ongoing revision by Mary Petersen, with the main results of the review being only partially published, many times under the form of Proceedings' Abstracts or as personal communications. This fact difficults the application of those results to the identification of material, as normally no justification is available concerning such matters as synonymies or the validation of previously synonymized species. In addition, good redescriptions of old species from regions like Northern Europe or the Mediterranean are still largely lacking.

In a work concerning the bitentaculate cirratulids from the western North Atlantic BLAKE (1991) redefined the genus *Tharyx*, reinstated *Monticellina*, and created the genus *Aphelochaeta*, while in a review of asexual reproduction in cirratulids PETERSEN (1991) redefined the multitentaculate genera *Cirratulus* and *Timarete*, and ressurrected *Protocirrineris*. ÇINAR & PETERSEN (2011) described *Fauvelicirratulus* as a new genus, with base on *Cirratulus dollfusi* Fauvel 1928. Finally, the *Dodecaceria* complex was revised by GIBSON (1978, 1979) and GEORGE & PETERSEN (1991), becoming evident that the systematics of this genus are closely tied to an understanding of the patterns of asexual reproduction that characterizes the group (BLAKE, 1996*g*).

The multitentaculate cirratulids (cirratulids with groups of tentacular filaments instead of paired dorsal tentacles) are nowadays roughly organized into five genera: *Cirratulus*, *Cirriformia*, *Fauvelicirratulus*, *Timarete*, and *Protocirrineris*. These genera are separated from each other on the basis of the type(s) of chaeta(e) present, the segment(s) from which the tentacular filaments arise, the segment(s) from which the first branchia arises, position of the branchiae, and shape of the prostomium (BLAKE, 1996*g*). This way, the first four genera have a more or less wedge-shaped prostomium, capillary chaetae, and acicular spines (aciculars), while *Protocirrineris* has a bluntly conical to wedge-shaped prostomium and only capillary chaetae (BLAKE, 1996*g*). Moreover (BLAKE, 1996*g*; ÇINAR & PETERSEN, 2011), *Cirratulus* and *Fauvelicirratulus* have numerous tentacular filaments arising from a single segment on either side of the dorsum, usually the posterior edge of the peristomium or one of chaetiger 1-7, and branchiae beginning on the same segment as the tentacular filaments, whereas *Cirriformia* usually has tentacular filaments over 1-2 anterior chaetigers and branchiae usually begin on chaetiger 1 in adults (may be present on the posterior edge of the peristomium in juveniles). In addition, *Cirratulus* and *Cirriformia* has stout, generally curved spines, while in *Fauvelicirratulus* the spines are straight and tapering (ÇINAR & PETERSEN, 2011). On the other hand (BLAKE, 1996*g*), *Timarete* and *Protocirrineris* have tentacular filaments arising over two or more anterior segments, with the first branchiae (which in some species may be multiple on some segments) typically arising from the posterior edge of the peristomium in *Timarete* and usually from the same segment as the first tentacular filaments in *Protocirrineris* (but sometimes branchiae occur on a few segments anterior to the tentacular filaments).

The family Cirratulidae includes at present 15 genera, all of which with representatives among the European fauna, and due to its complex history of synonymies and sibling species, probably much more than the 160 described species considered to be valid by HUTCHINGS *et al.* (2000). The 15 valid genera can be roughly divided into four groups (BLAKE, 1996*g*), including the ctenodrilids: (1) multitentaculate genera (*Cirratulus* Lamarck 1801; *Cirriformia* Hartman 1936; *Fauvelicirratulus* Çinar & Petersen 2011; *Protocirrineris* Czerniavsky 1881; *Timarete* Kinberg 1866); (2) bitentaculate soft-substrate genera (*Aphelochaeta* Blake 1991; *Caulleriella* Chamberlin 1919; *Chaetozone* Malmgren 1867; *Monticellina* Laubier 1961; *Tharyx* Webster & Benedict 1887); (3) bitentaculate hard-substrate genera (*Dodecaceria* Ørsted 1843); (4) untentaculate genera (*Aphropharynx* Wilfert 1974; *Ctenodrilus* Claparède 1863; *Raphidrilus* Monticelli 1910; *Raricirrus* Hartman 1961).

Due to the difficulties in identifying cirratulids, a short diagnosis based in FAUVEL (1927*a*), PETERSEN & GEORGE (1991), HARTMANN-SCHRÖDER (1996), BLAKE (1996*g*) and ÇINAR & PETERSEN (2011) is given for each genus.

As stated above, the 15 genera of Cirratulidae are present in the European and nearby waters, with about 48 described species. However, some of these species need to be revised, and could be determined to be invalid or indeterminable. On the other hand, several new species are already known and await description. Among the studied material three species belonging to three different genera were identified, but due to the difficulties with the taxonomy of this group, many of the cirratulids from the campaigns Seplat 6 and 7, and Fauna 1 remain unidentified.

KEY TO GENERA:

(adapted from: PETERSEN & GEORGE, 1991; BLAKE, 1996*g*; ÇINAR & PETERSEN, 2011)

1a. With short bodies (up to c. 15 segments); without branchiae; palps absent [formerly Family CTENODRILIDAE, Subfamily CTENODRILINAE...................**2**
1b. With long bodies (up to c. 35 segments); with filamentous branchiae...................**3**

2a (1a). All chaetae of one type, coarsely serrate or spearlike, with the apical part slightly bent...................***Ctenodrilus***
2b (1a). With capillaries in addition to serrate forms...................***Aphropharynx***

3a (1b). Palps absent [formerly Family CTENODRILIDAE, Subfamily RAPHIDRILINAE]...................**4**
3b (1b). Palps present, grooved, usually paired (palps may be lost, in which case palpal scars are always present)...................**5**

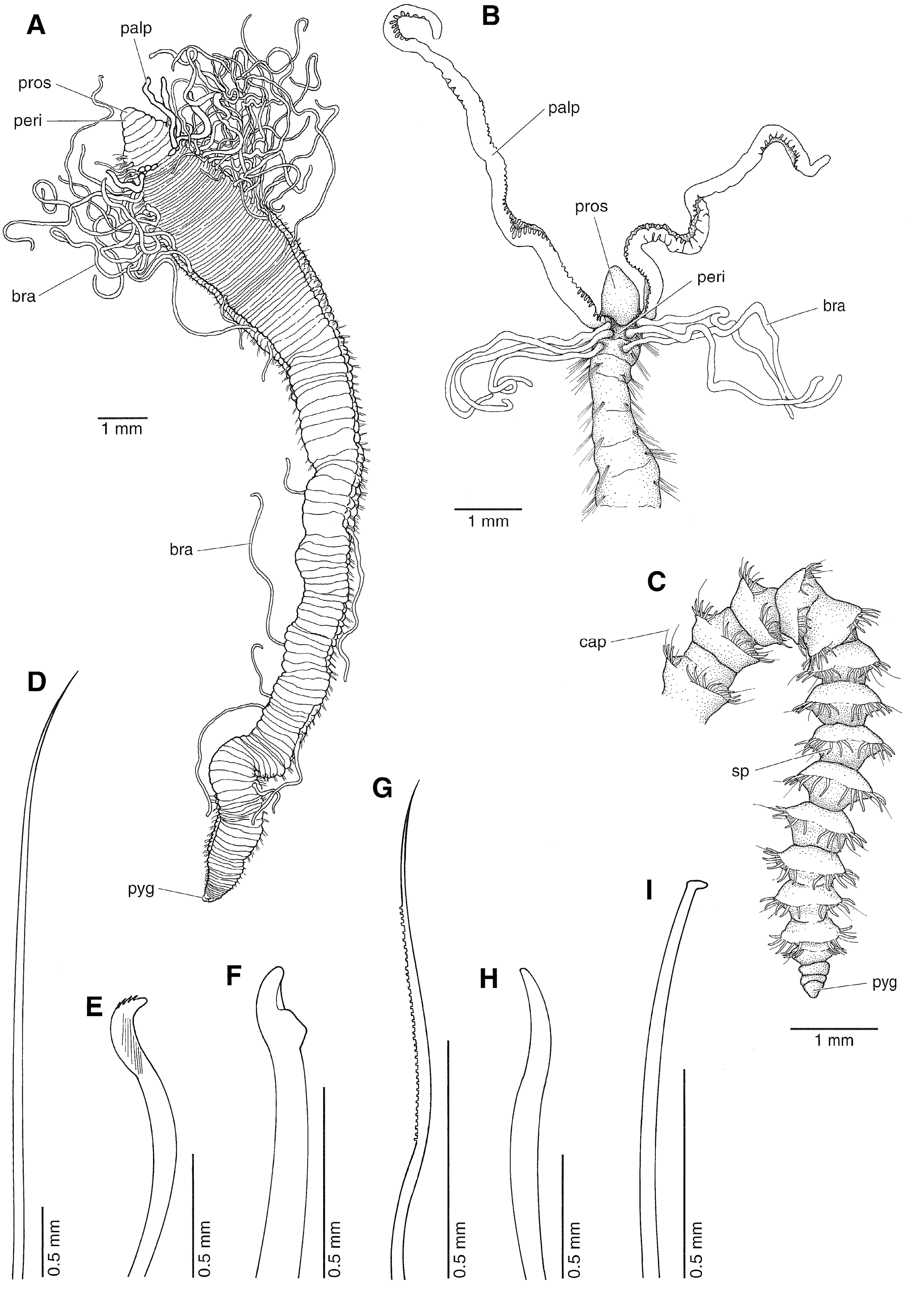

Figure legend: Family Cirratulidae. **A**, *Cirriformia* specimen, entire animal, dorsal view. **B**, *Dodecaceria* specimen, anterior end, dorsal view. **C**, *Chaetozone* specimen, posterior end, dorsal view. **D**-**I**, chaetae: **D**, *Cirratulus* specimen capillary notochaeta from mid-body chaetiger; **E**, *Caulleriella* specimen, spine from mid-body neurochaetiger; **F**, *Dodecaceria* specimen, hook from mid-body neurochaetiger; **G**, *Monticellina* specimen, capillary notochaeta from posterior chaetiger; **H**, *Chaetozone* specimen, spine from posterior chaetiger; **I**, *Tharyx* specimen, spine from posterior chaetiger. **bra**, branchia; **cap**, capillary; **palp**, palp; **peri**, peristomium; **pros**, prostomium; **pyg**, pygidium; **sp**, spine. (Adapted from Beesley, Ross & Glasby, 2000; drawings by A. Murray).

4a (3a). Heart body mainly in chaetiger 4 (4-6); posterior region not reported to be distinct; with smooth curved spines in segments 5-8 of male phase..***Raphidrilus***
4b (3a). Heart body from chaetiger 8, 9 or 10, present in a variable number of segments; posterior region distinct, with short segments and coarsely serrate chaetae; with pectinate chaetae throughout; some forms with hooked spines replacing normal chaetae in 1-2 posterior segments......................................***Raricirrus***

5a (3b). Anterior end with single pair of long, grooved dorsal tentacles or tentacular filaments................**6**
5b (3b). Anterior end with 2 groups or series of numerous tentacular filaments......................................**10**

6a (5a). Chaetae all smooth or capillaries denticulate; modified acicular spines or hooks absent...............**7**
6b (5a). Chaetae include smooth capillaries, and modified chaetae such as acicular spines, hooks, or knobby-tipped chaetae...**8**

7a (6a). Capillary chaetae smooth, sometimes with fibrils splayed or spread out along edge..***Aphelochaeta***
7b (6a). Capillaries include both smooth chaetae and ones with broad, basally flattened blades having fine to coarse denticles along one edge...***Monticellina****

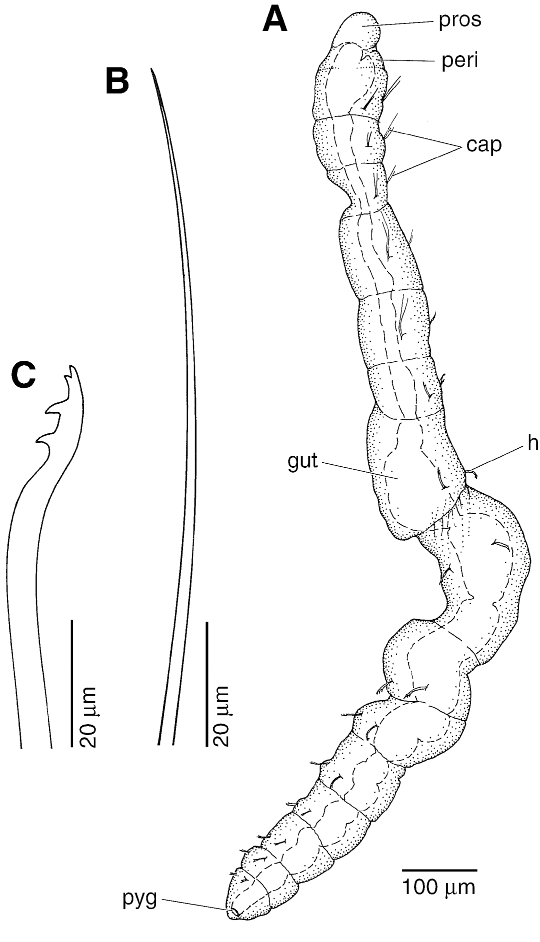

Figure legend: Family Cirratulidae. **A**-**C**, *Aphropharynx* specimen: **A**, lateral view of entire animal; **B**, capillary chaeta from parapodium of chaetiger 12; **C**, multidentate hook from parapodium of chaetiger 12. **cap**, capillary chaetae; **gut**, gut; **hok**, chaetal hook; **peri**, peristomium; **pros**, prostomium; **pyg**, pygidium. (Adapted from BEESLEY, ROSS & GLASBY, 2000; drawings by A. Murray).

8a (6b). Segmental branchiae limited to few anterior chaetigers; modified chaetae usually spatulate, with distal excavation; body usually dark green or brown in life or blackish or brown in alcohol; sometimes regenerating anterior or posterior sections of body..***Dodecaceria****
8b (6b). Segmental branchiae numerous, extending over anterior and middle parts of body, sometimes to posterior end; modified chaetae never with excavate tip; body color sometimes dark, but usually light tan or brown in alcohol; regenerates rare..**9**

9a (8b). Modified chaetae distally entire acicular spines, rarely with 1-2 additional bidentate spines (present especially in juveniles or small adults); spines of posterior chaetigers usually arranged in cintures, providing bristly armature..***Chaetozone***
9b (8b). Modified chaetae bidentate crochetlike hooks, with well developed teeth, both sharply pointed and sometimes hooded, not arranged in cinctures in posterior segments..................................***Caulleriella***
9c (8b). Modified chaetae with irregular knoblike or sub-bidentate tips, with poorly developed teeth, being normally reduced to rounded knobs or stumps, usually geniculate and grading into similarly shaped capillaries, never arranged in cinctures..***Tharyx***

10a (5b). Chaetae all capillaries; tentacular filaments of each side often forming a longitudinal series; branchiae occurring singly...***Protocirrineris***
10b (5b). Chaetae include capillaries and acicular spines; tentacular filaments of each side usually forming a transverse series...**11**

11a (10b). Tentacular filaments arising only from chaetiger 1..**12**
11b (10b). Tentacular filaments arising from 2 or more segments..**13**

12a (11a). Parapodia with stout, curved spines; branchiae as a single filament per parapodium..***Cirratulus***
12b (11a). Parapodia with straight, tapering spines; branchiae occurring as several filaments per parapodium..***Fauvelicirratulus****

13a (11b). Branchiae close to notopodium in anterior chaetigers, shifting toward mid-dorsum of body in middle chaetigers; branchiae occurring singly or with several filaments per parapodium.............***Timarete***
13b (11b). Branchiae remaining just dorsal to notopodium throughout, not becoming more mid-dorsal in middle chaetigers; branchiae occurring singly...***Cirriformia***

GENUS *Aphelochaeta* Blake 1991

Aphelochaeta BLAKE, 1991: 28.
TYPE SPECIES: *Tharyx monilaris* Hartman 1960.
DIAGNOSIS (from BLAKE, 1996*g*): Prostomium conical; peristomium elongate, with pair of grooved dorsal tentacles arising either on or anterior to chaetiger 1; abdominal segments frequently beaded in appearance; chaetae as simple capillaries, lacking distinct serrations or sawtooth edge; moniliform segments present or absent; posterior end frequently expanded.
REMARKS: BLAKE (1991) created the genus *Aphelochaeta* to include bi-tentaculated cirratulid species having only simple, non-serrated capillary chaetae. According to BLAKE (1996*g*) the *Aphelochaeta* are among the most difficult to identify of all cirratulids, due to the lack of obvious variability in chaetal morphology. Some differences can be detected between species, as chaetal thickness and length, but they are difficult to quantify and depict in a manner that enables readers of descriptions to readily distinguish one species from another (BLAKE, 1996*g*). For this reason, BLAKE (1996*g*) supports the species distintion on the prostomial shape, form and size of the peristomium in relation to the prostomium and first chaetiger, placement of the dorsal tentacles and first pair of branchiae, degree of elaboration of the thoracic region, presence or absence of moniliform segments, degree of enlargement of the posterior segments, and species-specific methyl green staining patterns. In spite of using all these characters, closely related species are often difficult to distinguish from one another, and keys to species usually only have any utility at the local or regional level (BLAKE, 1996*g*).

KEY TO SPECIES:

NOT INCLUDED IN THE KEY: *Cirratulus mcintoshi* Southern 1914.

1a. Prostomium with 2 eyes; distance from branchiae to notopodia bigger than from notopodia to neuropodia; palps on the last achaetigerous segment..***A. multibranchis***
1b. Prostomium without eyes; branchiae attached very close to notopodia; palps on the anterior margin of the 1st chaetiger..***A. marioni* AND *A. filiformis***

Aphelochaeta filiformis (Keferstein 1862)

Cirratulus filiformis KEFERSTEIN, 1862: 122-123, pl. 10 figs. 28-31.

TYPE LOCALITY: St. Vaast (Northern France, English Channel), on the beach, intertidal, frequent.

SYNONYMS: [?] *Cirratulus tessellatus* McIntosh 1911.

SELECTED REFERENCES: *Cirratulus filiformis* — SAINT-JOSEPH, 1894: 47-48; FAUVEL, 1927*a*: 94-95, fig. 33*h*; KIRKEGAARD, 1996: 137-138, fig. 37. *Aphelochaeta filiformis* — PETERSEN, 1999: 109, footnote on page 116. [?] *Cirratulus tessellatus* — MCINTOSH, 1911*a*: 162-163, pl. 5 fig. 2.

DISTRIBUTION: Northern France: St. Vaast la Hague and Bay of Seine; Kattegat; Mediterranean Sea; Adriatic Sea; Aegean Sea. Intertidal to 100 meters.

REMARKS: *Cirratulus tessellatus* was described by MCINTOSH (1911*a*) from off the Algerine coast, from depths between 7-51 fathoms (12.8-93.3 meters). It has a pointed prostomium with two eyes. The body has its greatest diameter at the anterior third, from which it tapers to the prostomium and more gently to the posterior end. It is rounded dorsally and flattened ventrally. The anterior rings are slightly tessellated. Only capillary chaetae is present, with the dorsal chaetae being longer than the ventral ones, but with a length being about half the diameter of the body anteriorly. All chaetae with very fine tips. Posteriorly one of the dorsal bristles in each bundle is considerably larger than the rest. The ventral chaetae are shorter and slightly broader. The species was considered to be a junior synonym of *Aphelochaeta filiformis* (as *Cirratulus*), by HARTMAN (1959*a*).

Aphelochaeta marioni (Saint-Joseph 1894)

Heterocirrus Marioni SAINT-JOSEPH, 1894: 56-58, pl. 3 figs. 62-64.

TYPE LOCALITY: Dinard, Northern France (English Channel).

SELECTED REFERENCES: *Tharyx Marioni* — FAUVEL, 1927*a*: 100, fig. 35*a-b*. *Tharyx marioni* — PETERSEN, 1999: 116. *Aphelochaeta marioni* — BLAKE, 1991: 28. Not *Tharyx marioni* — HARTMANN-SCHRÖDER & STRIPP, 1968: 19, fig. 8*a*; HARTMANN-SCHRÖDER, 1971*a*: 357; KIRKEGAARD, 1996: 141-142, fig. 70. Not *Aphelochaeta marioni* — HARTMANN-SCHRÖDER, 1996: 389-390, fig. 185.

REFERENCES FOR PORTUGAL: SALDANHA, 1974 (as *Tharyx marioni*; coast of Arrábida); PINTO, 1984 (as *Tharix marioni*; Sado Estuary); DEXTER, 1992 (as *Tharyx marioni*; previous records: Ria Formosa; Sado Estuary; Ria de Aveiro); PARDAL, CALDEIRA & MARQUES, 1992 (as *Tharyx marioni*; previous records: Aveiro; Arrábida; Lagoon of Albufeira; Ria Formosa); MOREIRA, FIGUEIRA & CUNHA, 1994 (as *Tharyx marioni*; Ria de Aveiro); SALDANHA, 1995 (as *Tharyx marioni*; Portugal); RAVARA, 1997 (as *Tharyx marioni*; off Aveiro); MUCHA & COSTA, 1999 (as *Tarix marioni* and *Tharyx marioni*; Ria de Aveiro and/or Sado Estuary).

DISTRIBUTION: Skagerrak; from the North Sea to the Mediterranean Sea; Adriatic Sea; Aegean Sea; Black Sea; Morocco; North Carolina; Indian Ocean; Australia; Chile; Antarctic. In several types of muddy sediments, coarse sand with mud and stones, among *Posidonia*, laminarian rhizomes, in crevices of rocks, and coralligenous bottoms. From the eulittoral to 5000 meters.

REMARKS: *Aphelochaeta marioni* (Saint-Joseph 1894), described as *Heterocirrus marioni*, has been recorded worldwide, including European waters, Western North Atlantic, South Africa, and southwest Asia. However, as stated by BLAKE (1996*g*), widely distributed cirratulid species are probably rare, while high numbers of endemic species are to be expected. This is also probably true for *A. marioni*. As remarked by BLAKE (1996*g*), the description of the species that is normally accepted is the one *sensu* HARTMANN-SCHRÖDER & STRIPP (1968) and HARTMANN-SCHRÖDER (1971*a*), in which the species is considered as having an expanded thoracic region, dorsal tentacles arising more or less medially over or just anterior to chaetiger 1, without moniliform segments, no eyes, and with an expanded posterior region with both dorsal and ventral grooves (BLAKE, 1996*g*). On the other hand, the original description and illustrations of *Heterocirrus marioni* by SAINT-JOSEPH (1894) suggest also a blind species, but less robust than the above one, with the head narrower and more acute, with the dorsal tentacles arising from the first chaetiger and the first branchiae lateral to them (BLAKE, 1996*g*). Besides, as remarked by BLAKE (1996*g*), some neurochaetae from the middle body are short, wide and curved, with a hair-like termination, bearing some resemblance to the ones found in species of *Monticellina*, except in that denticles are not evident in the figure published by SAINT-JOSEPH (1894: plate 3 fig. 63). As described by

SAINT-JOSEPH (1894: 56) "*A chaque segment sétigere, on n'observe partout aux deux rames qu'un faisceau de soies capillaires; à la rame dorsale elles sont toutes droites, très fines et aussi longues que la larguer du corps. Dans les segments antérieurs, les soies ventrales sont semblables aux dorsales; mais vers le 16^{me} à 20^{me} segment, quelques-unes d'entre elles deviennent un peu plus courtes, plus larges et légèrement courbes.*" MARY PETERSEN (*in* BLAKE, 1996*g*) studied specimens of bi-tentaculate cirratulids from Dinard, and suggested that Saint-Joseph may have been dealing with more than one species and that none are likely the same as the form described by HARTMANN-SCHRÖDER & STRIPP (1968) and HARTMANN-SCHRÖDER (1971*a*).

Cirratulus mcintoshi Southern 1914

Cirratulus Mcintoshi SOUTHERN, 1914: 110-111.

TYPE LOCALITY: The type locality of the species is stated by HARTMAN (1959*a*) as being Ireland. However, when SOUTHERN (1914) described the species, besides the specimens collected in West Ireland, at Clew Bay, he also used the specimens from off Drøbak (Oslo Fjord), identified by MCINTOSH (1911*a*) as *Cirratulus norvegicus ?*, as well as other specimens from the west coast of Norway. This way, there are several locations for the type locality, which are as follows: West Ireland: a) Clew Bay, in Inishlyre Harbour, in 5 fathoms (9.1 meters), on mud; b) Killary Harbour, in 7 fathoms (12.8 meters), on mud; c) Bofin Harbour; Norway: a) off Drøbak, Oslo Fjord, in 30-100 fathoms (55-183 meters); b) west coast of Norway.

SELECTED REFERENCES: *Cirratulus mcintoshi* — MCINTOSH, 1922*a*: 23. *Cirratulus Mcintoshi* — MCINTOSH, 1923*a*: 488-489, pl. 130 figs. 11, 11*a*. *Tharyx mcintoshi* — KIRKEGAARD, 1996: 142-143, fig. 71. *Cirratulus norvegicus ?* — MCINTOSH, 1911*a*: 171-172, pl. 7 figs. 12-12*a*.

DISTRIBUTION: West coast of Ireland; Norway; Skagerrak. Between 30-500 meters.

REMARKS: SOUTHERN (1914) states that this species only has capillary chaetae, approaching it to species as *Heterocirrus marioni* Saint-Joseph 1894, *Heterocirrus multibranchis* Grube 1863, *Cirratulus filiformis* Keferstein 1862, and *Cirratulus tenuisetis* Grube 1860, all of them, with exception of the last one, placed today in the genus *Aphelochaeta*. *Cirratulus mcintoshi* was considered to belong to the genus *Tharyx* by KIRKEGAARD (1996), but it seems more plausible that it belongs to *Aphelochaeta*, and even that it is a synonymy of an older species of the genus. The species is here considered under the genus *Aphelochaeta*, but to avoid possible unnecessary new combinations, as no type material was studied, it is referred under its original combination, *Cirratulus mcintoshi*. HARTMAN (1959*a*) considered the species as being a junior synonym of *Aphelochaeta filiformis* (as *Cirratulus*).

Aphelochaeta multibranchis (Grube 1863)

Heterocirrus multibranchis GRUBE, 1863: 49-50, pl. 5 fig. 2.

TYPE LOCALITY: Nerezine (= Neresine), in the Lošinj (= Lussin) Island, Croatia, Adriatic Sea.

SELECTED REFERENCES: *Tharyx multibranchis* — FAUVEL, 1927*a*: 101, fig. 35*c*; HARTMANN-SCHRÖDER, 1971*a*: 357; KIRKEGAARD, 1996: 143-144, fig. 72. *Tharyx multibranchiis* — GILLANDT, 1979: 53-54, fig. 18. *Aphelochaeta multibranchis* — HARTMANN-SCHRÖDER, 1996: 390, fig. 186.

REFERENCES FOR PORTUGAL: RAVARA, 1997 (as *Tharyx multibranchis*; off Aveiro).

DISTRIBUTION: Northeastern Atlantic, from North Sea to the Mediterranean Sea; Adriatic Sea; Aegean Sea; Black Sea; West Africa. In muddy and sandy bottoms, and among *Posidonia*, rhizomes of laminarians, and oyster banks. From eulittoral to about 128 meters.

GENUS ***Aphropharynx*** Wilfert 1974

Aphropharynx WILFERT, 1974: 502.

TYPE SPECIES: *Aphropharynx heterochaeta* Wilfert 1974.

DIAGNOSIS (from HARTMANN-SCHRÖDER, 1996): Body with less than 15 chaetigers; prostomium ventrally ciliated, peristomium and anterior segments without ciliated areas; eyes absent; three kinds of chaetae present, capillary chaetae in some anterior segments and two kinds of acicular chaetae; pharyngeal bulb with a heavily vacuolized tissue within, mid-gut beginning between segments 5 and 6.

Aphropharynx heterochaeta Wilfert 1974

Aphropharynx heterochaeta WILFERT, 1974: 496-501, figs. 1-5.

TYPE LOCALITY: Seawater aquarium, "*Aquarium und Löbbecke-Museum der Stadt Düsseldorf*", Düsseldorf (Germany), among brown algae. Original habitat unknown.
SELECTED REFERENCES: *Aphropharynx heterochaeta* — HARTMANN-SCHRÖDER, 1996: 403, fig. 194.
DISTRIBUTION: Known from the type locality. Original habitat unknown.

GENUS *Caulleriella* Chamberlin 1919

Caulleriella CHAMBERLIN, 1919*a*: 372.
TYPE SPECIES: *Cirratulus viridis* Langerhans 1880.
DIAGNOSIS (from BLAKE, 1996*g*): Prostomium elongate; peristomium elongated to short, dorsal tentacles usually beginning anterior to chaetiger 1; middle body segments not beaded: parapodia with noto- and neuropodia widely separated laterally; modified chaetae including bidentate, crochetlike hooks, not arranged into modified cinctures.
REMARKS: BLAKE (1996*g*) revised the definition of *Caulleriella* to restrict it to bidentate cirratulid species having only bidentate, crochetlike hooks in addition to capillaries.

Following the same author (BLAKE, 1996*g*), the genera *Caulleriella* and *Tharyx* are very similar and difficult to separate. The two genera have modified spines that are more or less bidentate, but in *Caulleriella* these spines have two well-developed teeth, both sharply pointed and sometimes hooded, while in *Tharyx* the spines have poorly developed teeth on the hooks, being normally reduced to rounded knobs or stumps. Besides, *Caulleriella* and *Tharyx* are also very different in the manner in which the chaetal bundles arise along the body. In species of *Caulleriella* examined by BLAKE (1996*g*), there is a large lateral gap between the noto- and neuropodial chaetal bundles, while in *Tharyx* the points of origin of noto- and neurochaete are very close together, with virtually no lateral gap at all.

Some authors (*e.g.*, HARTMAN, 1959*a*) consider the type species of the genus *Caulleriella* as being *Cirratulus bioculatus* Keferstein 1862. However, CHAMBERLIN (1919*a*: 372) clearly stated that the genotype was *Cirratulus viridis* Langerhans 1880. Besides, the new genus should include "*also* Heterocirrus caput-esocis *St. Joseph,* Cirratulus fragilis *Leidy, and perhaps* Cirratulus bioculatus *Keferstein*".

KEY TO SPECIES:

1a. No eyes; branchiae from the 2nd chaetiger; hook-shaped chaetae subdistally dentate, distally unidentate, capillary; hook shaped chaetae present at middle and posterior parapodia.......................***C. serrata***
1b. Two eyes; branchiae from the 1st chaetiger; hooks smooth, distally bi-dentate more or less clearly....**2**

2a (1b). Palps on the anterior margin of the 1st chaetiger; ventral hooks usually from the 3rd chaetiger...**3**
2b (1b). Palps on the last achaetigerous segment; ventral hooks from chaetiger 1-4..................................**4**

3a (2a). Pygidium with lobes; adults with up to 40 mm long, with more than 100 segments....***C. bioculata***
3b (2a). Pygidium without lobes; adults with about 3 mm long, number of segments under 60.....***C. parva***

4a (2b). Ventral hooks from the 1st chaetiger, dorsal hooks from chaetiger 17-21..........................***C. alata***
4b (2b). Ventral hooks from chaetiger 2-4, dorsal hooks from chaetiger 7-15..............................***C. viridis***

Caulleriella alata (Southern 1914)

Chaetozone alata SOUTHERN, 1914: 112-113, pl. 12 figs. 27*A-D*.
TYPE LOCALITY: The species was described with base on three specimens collected in the region of the Clare Island (West Ireland): Blacksod Bay, in laminarian roots from Carrigeenmore; Ballynakill Harbour, in the surface tow-net at night.
SELECTED REFERENCES: *Chaetozone alata* — MCINTOSH, 1923*a*: 490-491, pl. 136 fig. 15. *Heterocirrus alatus* — FAUVEL, 1927*a*: 99, fig. 34*a-c*. *Caulleriella alata* — HARTMANN-SCHRÖDER, 1996: 392; PETERSEN, 1999: 110.
REFERENCES FOR PORTUGAL: DEXTER, 1992 (as *Caulleriella (Heterocirrus) alata*; previous records: Ria Formosa; Ria de Alvor); PARDAL, CALDEIRA & MARQUES, 1992 (previous records: Lagoon of Albufeira; Ria Formosa); RAVARA, 1997 (as *Caulleriella alatus*; off Aveiro); MUCHA & COSTA, 1999 (as *Heterocirrus alactus*; Ria de Aveiro and/or Sado Estuary).

DISTRIBUTION: Subantarctic islands; American west coast, from Canada to South Chile; Patagonia; east Atlantic, from Ireland to South Africa; Mediterranean Sea; Adriatic Sea; Aegean Sea; Black Sea; English Channel to south North Sea. Quite probably this wide distribution includes more than one species. Among rhizomes of laminarians.

REMARKS: According to SOUTHERN (1914), bidentate neuropodial hooks are present in all chaetigers, being 5-7 in the anterior segments and accompanied by 2 very slender capillary chaetae, and 3-5 in the posterior segments, accompanied by 1-2 fine capillary chaetae, while the notopodial bidentate hooks appear on the 21st chaetigerous segment, being 1-2 in the middle region, and increasing to 3 in the posterior region.

Caulleriella bioculata (Keferstein 1862)

Cirratulus bioculatus KEFERSTEIN, 1862: 121-122, pl. 10 figs. 23-27.

TYPE LOCALITY: St. Vaast (Northern France, English Channel), on the intertidal beach, rare.

SYNONYMS: *Heterocirrus flavo-viridis* Saint-Joseph 1894.

SELECTED REFERENCES: *Heterocirrus bioculatus* — FAUVEL, 1927*a*: 96-97, fig. 33*i*. *Caulleriella bioculata* — HARTMANN-SCHRÖDER, 1996: 392; PETERSEN, 1999: 110. *Heterocirrus flavo-viridis* — SAINT-JOSEPH, 1894: 54-55, pl. 3 fig. 61. *Heterocirrus viridis* — MCINTOSH, 1915*b*: 261-262, pl. 111 fig. 9.

REFERENCES FOR PORTUGAL: [?] AMOUREUX & CALVÁRIO, 1981 (as *Caulleriella* cf *bioculata*; Peniche); MONTEIRO-MARQUES *et al.*, 1982 (as *Cauleriella bioculata*; Ponta do Baleal); DEXTER, 1992 (as *Caulleriella (Heterocirrus) bioculata*; previous records: Ria Formosa; Arrábida); PARDAL, CALDEIRA & MARQUES, 1992 (previous records: Peniche; Lagoon of Albufeira; Ria Formosa); RAVARA, 1997 (as *Caulleriella bioculatus*; off Aveiro).

DISTRIBUTION: Australia; New Caledonia; North Pacific; Northeast Atlantic, from North Sea to the Mediterranean Sea; Adriatic Sea; Aegean Sea; Black Sea. Shallow water, among algae on rocks, shells, and rhizomes of laminarians.

REMARKS: KEFERSTEIN (1862) described the species as having neuropodial hooks from chaetiger 3, and FAUVEL (1927*a*) stated that notopodial hooks were present from chaetigers 6-9, numbering 1-3.

According to PETERSEN (1999), this species is probably a synonym of *Caulleriella viridis* (Langerhans 1880).

Heterocirrus flavo-viridis Saint-Joseph 1894, considered as a junior synonym of *C. bioculata*, was described from the coasts of Dinard (Northern France, English Channel) as having a pair of eyes and bidentate hooks starting at chaetiger 3 in the neuropodia, and chaetiger 13 in the notopodia.

Caulleriella parva Gillandt 1979

Caulleriella bioculata parva GILLANDT, 1979: 51-52, fig. 17.

TYPE LOCALITY: NE Helgoland (North Germany), on intertidal rocks.

SELECTED REFERENCES: *Caulleriella bioculata parva* — KIRKEGAARD, 1996: 128-129, fig. 61. *Caulleriella parva* — HARTMANN-SCHRÖDER, 1996: 393-394, fig. 188; PETERSEN, 1999: 110, fig. 2*H-P*, table 2. [?] *Cirratulus fragilis* — LEIDY, 1855: 147.

DISTRIBUTION: North Sea; Kattegat. On rocks and holdfasts. Intertidal to 20 meters.

REMARKS: According to MARY PETERSEN (pers. comm. *in* HARTMANN-SCHRÖDER, 1996), *Caulleriella parva* Gillandt 1979 is probably a junior synonym of *Caulleriella fragilis* (Leidy 1855), described from Rhode Island, in the east coast of the USA. The species was described by GILLANDT (1979) as having neuropodial hooks from chaetiger 3, numbering 4-10, and notopodial hooks from chaetiger 7-11, numbering 1-3.

Caulleriella serrata Eliason 1962

Caulleriella (?) serrata ELIASON, 1962*b*: 267-269, fig. 17.

TYPE LOCALITY: Skagerrak, 58º8'N, 10º7'E, at 295 meters, on grey mud.

SELECTED REFERENCES: *Caulleriella serrata* — HARTMANN-SCHRÖDER, 1996: 394; KIRKEGAARD, 1996: 132-133, fig. 64.

DISTRIBUTION: Known from the type locality.

REMARKS: According to ELIASON (1962*b*), the hook-shaped chaetae are subdistally dentate and distally uni-dentate, capillary, and they are present in the middle and posterior parapodia.

Caulleriella viridis (Langerhans 1880)

Cirratulus viridis LANGERHANS, 1880*b*: 98, pl. 4 fig. 9.

TYPE LOCALITY: Madeira Island, among algae, at intertidal rocks.
SELECTED REFERENCES: *Heterocirrus viridis* — CAULLERY & MESNIL, 1898: 117-122, pl. 2 figs. 15-18. *Chaetozone viridis* — SOUTHERN, 1914: 112. *Caulleriella viridis* — PETERSEN, 1999: 110, table 2.
DISTRIBUTION: English Channel; Madeira Island; west coast of Ireland. Very common in laminarian roots. From shore to about 30 meters.
REMARKS: According to LANGERHANS (1880*b*), *Caulleriella viridis* (as *Cirratulus*) presents ventral hooks from chaetiger 3-4, and dorsal hooks from chaetiger 7-15, while according to CAULLERY & MESNIL (1898), *Caulleriella viridis* (as *Heterocirrus*), has ventral hooks from chaetiger 2-4, and dorsal hooks from chaetiger 6-9. The species *sensu* CAULLERY & MESNIL (1898) seems to be very close to *Caulleriella bioculata* (Keferstein 1862), and both could be synonymous.

GENUS ***Chaetozone*** Malmgren 1867

Chaetozone MALMGREN, 1867*a*: 96.
TYPE SPECIES: *Chaetozone setosa* Malmgren 1867.
SYNONYMS: *Cirratulispio* McIntosh 1911.
DIAGNOSIS (from BLAKE, 1996*g*): Prostomium conical, blunt or acute on anterior margin; peristomium elongate to short, with dorsal tentacles usually arising from peristomium or an anterior chaetiger; middle body segments sometimes beaded or moniliform, with natatory chaetae; chaetae include acicular spines in neuropodia and usually also in notopodia, sometimes forming posterior cinctures; bidentate spines sometimes present in juveniles or occasionally in far posterior chaetigers of adults with unidentate spines in cinctures; pygidium simple lobe, disclike, or with long, terminal, cirrus.
REMARKS: The species of *Chaetozone* are diagnosed by the presence of acicular spines in some neuro- and/or notopodia. In order to identify species it is essential to check the structure of these spines, their point of origin on the body, and whether they form an armature in posterior segments. In the posterior chaetigers the spines may occur: (1) inconspicuously among capillaries, not forming an obvious armature or cincture; (2) as partial or incomplete cinctures derived from the noto- and neuropodial fascicles and usually with a wide dorsal and ventral gap, with no more than 6-12 spines on each side; or (3) as a highly modified and extreme type of cincture where the segments are separated from one another by deep constrictions and the spines number 15 or more on each side and arise from elevated membranous podial lobes, with dorsal and ventral gaps in the cinctures being narrow and typically with the spines from the left side overlaping with spines from the right (BLAKE, 1996*g*).

According to BLAKE (1996*g*) the definitions of *Caulleriella* and *Chaetozone* needed to be redefined, as some species of *Chaetozone* have been discovered with one or more bidentate spines among the posterior cinctures of unidentate spines, especially in juveniles. This way, he modified the definition of *Chaetozone* to include species having an occasional bidentate spine present in juveniles or in the lower parts of spinous cinctures of adults. Thus, BLAKE (1996*g*) moved *Caulleriella zetlandica* (McIntosh 1911) to *Chaetozone*, where it had been originally described, in spite of the finding of bidentate chaetae among the partial posterior cinctures, especially in juveniles, by WOODHAM & CHAMBERS (1994).

Chaetozone benthaliana was described by MCINTOSH (1885*a*: 386-387, pl. 24*A* figs. 13-14) with base on one specimen from off Halifax, Nova Scotia, at 48º8'N, 63º39'W, collected at 1250 fathoms (about 2285 meters). Later the species was recorded by KIRKEGAARD (1983*b*: 600-602, fig. 2), with base on a single specimen collected in soft mud off the south of Ireland (48º28.7'N, 10º20.3'W), at 1900 meters. CHAMBERS & WOODHAM (2003) examined the holotype of *C. benthaliana*, which is a fragment 42 mm long for 79 chaetigers, of a much larger individual. It lacks the head and anterior chaetigers, tentacular palps and branchiae. Besides, most of the chaetae are broken off close to the body wall, and the ones that remain, in spite of being probably damaged, seem to be short capillaries. CHAMBERS & WOODHAM (2003) considered the specimen to be indeterminate, due to the lack of essential diagnostic characters. The same authors examined the specimen identified by KIRKEGAARD (1983*b*) from off south Ireland, which is 35 mm long for 98 chaetigers. The specimen was similar to multi-palpate cirratulid genera rather than to bipalpate genera, and was considered as not belonging to the genus *Chaetozone*. The specimen seems close to *Cirratulus dollfusi* Fauvel 1928.

According to CHAMBERS & WOODHAM (2003) *Caulleriella zetlandica* is often confused with *Chaetozone* species and may belong in this genus, but further work would be required to be certain. However, BLAKE (1996*g*) placed the species in the genus *Chaetozone*, where it was originally described by MCINTOSH (1911), as bidentate hooks were normally found in juveniles only, being missing in the adults. Blake's oppinion will be followed here.

CHAMBERS & WOODHAM (2003) stated that in the Northeast Atlantic region there are still at least three deep water and two shallow water eyeless undescribed species.

In the Western Mediterranean Sea (south France and Spain), there are at least three species which so far I wasn't able to identify, but that may belong to species already described. Two of these species are oculate, and the third one is blind. A short description of each one of the species is given here:

1) Species with pointed prostomium, blind, with the thorax inflated, but from chaetigers 22-24 onwards the width of the body reduces and remains constant to the posterior region; body surface opaque; chaetae short, with neuropodial spines starting at chaetiger 32-34, numbering 1 to 3 in the posterior chaetigers; notopodial spines first present at chaetiger 74, as a single spine; in another specimen they appeared around chaetiger 50, and a couple of chaetigers later they number 4-5, while in the neuropodia they number 5-6.

2) Species with a pair of eyes, prostomium pointed, robust, more inflated anteriorly, at the thoracic region, with the chaetigers very tightly compressed, but with the abdominal region also robust; yellowish-orange colour; with long capillary chaetae, but shorter than body width; spines appearing first dorsally, around chaetiger 22-34, like more robust and shorter chaetae, with the tip tapering abruptly; in an incomplete specimen with 103 chaetigers, the neuropodial spines were not present, but in another they were visible from about chaetiger 40; in the middle/posterior region of the body, the upper neurochaetae are slightly geniculate, and appear to be hollow at the base, or at least it seems that the density of the chaetae is somehow different; at the posterior end the spines form some kind of cincture, and normally they have the tip geniculated.

3) species with a pair of eyes, a pointed prostomium, very robust, but with well marked segments, dorsal capillary chaetae very long, longer than the ventral ones, and strong spines with blunt tips, present on both noto- and neuropodia from about chaetiger 6-8.

KEY TO SPECIES:

(adapted from CHAMBERS & WOODHAM, 2003)

NOT INCLUDED IN THE KEY: *Chaetozone abyssorum* (Hansen 1878); *Chaetozone abranchiata* (Hansen 1878); *Chaetozone macrophthalma* Langerhans 1880; *Chaetozone carpenteri* McIntosh 1911; *Cirratulispio Caulleryi* McIntosh 1915.

1a. Eyes present..**2**
1b. Eyes absent..**6**

2a (1a). Very long capillary chaetae, being longer than body width; well defined constrictions between posterior chaetigers; posterior segments with noto- and neuropodial spines forming partial cinctures, interrupted in the dorsal and ventral midlines; neuropodial spines present at chaetiger 1.............***C. corona***
2b (1a). No chaetae longer than body width; slight constrictions between posterior chaetigers; spines do not form cinctures in posterior region..**3**

3a (2b). Posterior chaetigers with modified pseudocompound spines, with tips bending from basal parts, with a bradly attached mucron that frequently breaks away from the spine; neuropodia with 1-3 aristate chaetae from chaetiger 40-70, and notopodia of chaetigers 50-80 with 1-2 aristate chaetae; body long and slender, tapering at both ends, with moderately expanded anterior third, slightly flattened posteriorly..***Tharyx retieri***
3b (2b). Acicular spines not pseudocompound nor bearing a long, bradly attached mucron that frequently breaks away from the spine...**4**

4a (3b). Body surface with iridiscent sheen; posterior spines in neuropodia only; chaetae very dense, giving almost a furry appearance; anterior dorsal surface rounded..***C. zetlandica***
4b (3b). Body surface opaque; posterior spines in notopodia and neuropodia; chaetae numerous but not dense..**5**

5a (4b). Anterior dorsal surface with obvious hump; neuropodial acicular spines from anterior region (segments 50-80) to end of body, notopodial acicular spines from mid-body (segments 90-100) to end of body..***C. gibber***

5b (4b). Anterior dorsal surface rounded, without hump; neuropodial acicular spines from chaetiger 11-13, notopodial acicular spines in the last chaetigers..***C. caputesocis***

6a (1b). Very long capillary chaetae (2-3 times body width) present from the 2nd or approx. the 20th chaetiger; well defined constrictions (about half of chaetiger width) between posterior chaetigers; posterior segments with noto- and neuropodial spines forming partial cinctures, interrupted in the dorsal and ventral midlines...**7**
6b (1b). No chaetae longer than body width; slight constrictions (about 1/5 of chaetiger width) between posterior chaetigers (*C. christiei*) or presence of constrictions in posterior regions unknown (*C. incerta*) or not described (*C. vivipara*); noto- and neuropodial spines do not form cinctures in the posterior segments..**8**

7a (6a). Very long capillary chaetae present from the 2nd chaetiger; 12-14 spines in each ramus in posterior chaetigers...***C. jubata***
7b (6a). Very long capillary chaetae present from approx. the 20th chaetiger, 6-8 spines in each ramus in posterior chaetigers...***C. setosa***

8a (6b). Segments narrow and crowded in the anterior region, difficult to distinguish, becoming wider and more obvious in posterior region; neuro- and notopodial spines from about chaetiger 30....***C. christiei***
8b (6b). Segments clearly evident from the anterior region..**9**

9a (8b). Neuropodial spines from chaetiger 12-13, or a little later, notopodial spines from about chaetiger 35; spines slightly sigmoid, with a long tapering tip when intact, and a blunt tip when used..***C. incerta* nov. comb.**
9b (8b). Spines present only in the posterior segments; spines as thicker capillary chaetae with abruptly tapering tips..***C. vivipara***

Chaetozone abyssorum (Hansen 1878)

Cirratulus abyssorum HANSEN, 1878: 10, pl. 7 figs. 1-2.
TYPE LOCALITY: North Sea, 64º2'N, 5º35'E, at 911 meters, in clay.
SELECTED REFERENCES: *Cirratulus abyssorum* — HANSEN, 1882: 40, pl. 7 figs. 33-34.
DISTRIBUTION: Known from the type locality.

Chaetozone abranchiata (Hansen 1878)

Cirratulus (?) abranchiatus HANSEN, 1878: 10-11, pl. 7 figs. 3-7.
TYPE LOCALITY: North Sea, 63º10'N, 4º0'E, at 763 meters, in sabulous clay.
SELECTED REFERENCES: *Cirratulus (?) abranchiatus* — HANSEN, 1882: 40, pl. 7 figs. 1-4.
DISTRIBUTION: Known from the type locality.
REMARKS: HARTMAN (1959*a*: 402) suggests that this species could be a synonym of *Chaetozone abyssorum* (Hansen 1878).

Chaetozone caputesocis (Saint-Joseph 1894)

Heterocirrus caput esocis SAINT-JOSEPH, 1894: 53-54, pl. 3 figs. 58-60.
TYPE LOCALITY: Dinard (Northern France).
SELECTED REFERENCES: *Heterocirrus caput-esocis* — CAULLERY & MESNIL, 1898: 122-123; MCINTOSH, 1915*b*: 263, pl. 111 fig. 10; RIOJA, 1917*c*: 11; FAUVEL, 1927*a*: 97, fig. 33*l-m*. *Caulleriella caput-esocis* — HARTMANN-SCHRÖDER, 1971*a*: 356; GILLANDT, 1979: 52-53, fig. 18; KIRKEGAARD, 1996: 129-130, fig. 62. *Caulleriella caputesocis* — HARTMANN-SCHRÖDER, 1996: 392, fig. 187. *Chaetozone caputesocis* — WOODHAM & CHAMBERS, 1994: 310, 315; PETERSEN, 1999: 110, footnote on page 116, table 2.
REFERENCES FOR PORTUGAL: RAVARA, 1997 (as *Caulleriella caput-esocis*; off Aveiro).
DISTRIBUTION: Northeast Atlantic, from the North Sea to the Mediterranean Sea; Adriatic Sea; Aegean Sea; Black Sea. In many kinds of sediments, as mud with stones, among algae and their rhizomes, or in crevices of rocks. Recorded from small pools, and from sublittoral to bathyal depths.
REMARKS: SAINT-JOSEPH (1894) described the species as being oculated, with 1-4 acicular notochaetae present in the last 23 chaetigers (of a specimen presumably with 84 segments), and with acicular neurochaetae present from chaetiger 11-13.

WOODHAM & CHAMBERS (1994) revised one syntype of *Heterocirrus caput esocis* deposited at the MNHN, in Paris. The specimen was in poor condition and in three pieces, measuring 15 mm for 75 segments in total. The eyes described and pictured by SAINT-JOSEPH (1894) were not visible, and the specimen was stated to "*not closely resemble the original figures*". However, it presented unidentate spines in both rami of the posterior region, not forming complete rings around the body. The presence of such unidentate spines suggested that the species should be referred to the genus *Chaetozone*. The same authors defended the need of a further examination of the status of this species. It is also possible that the syntypes of the species included specimens from more than one species, and that one of these was the studied by WOODHAM & CHAMBERS (1994). PETERSEN (1999) also placed the species in the genus *Chaetozone* in accordance with the definition of the genus given by BLAKE (1996*g*).

Chaetozone carpenteri McIntosh 1911

Chaetozone carpenteri MCINTOSH, 1911*a*: 166-167, pl. 6 figs. 5-5*e*.

TYPE LOCALITY: Bono Bay, Algiers coast, in 25 fathoms (45.7 meters), and off Cape Guardia, off Cape Finisterre.

DISTRIBUTION: Known from the type locality.

REMARKS: FAUVEL (1927*a*) suggests the possible synonymy between this species and *Chaetozone setosa* Malmgren 1867.

Chaetozone christiei Chambers 2000

Chaetozone christiei CHAMBERS, 2000: 592-594, figs. 2-3.

TYPE LOCALITY: North Sea: Northumberland coast (NE England), Low Newton by the Sea, 55º32'N, 0.1º36'W, low shore, in clean sand.

SELECTED REFERENCES: *Chaetozone setosa* [not Malmgren 1867] — CHRISTIE, 1985: 241-244, fig. 4*C*, *F*, *I* [in part; population from Low Newton by the Sea].

DISTRIBUTION: British Isles, intertidally and in shallow sub-littoral habitats in clean stable sand. North Sea: Northumberland coast (NE England), between 0-10 meters, in clean sand; English Channel: Southampton Water, low shore, in clean sand; West Scotland: Ayrshire coast, at 10 meters.

Chaetozone corona Berkeley & Berkeley 1941

Chaetozone spinosa corona BERKELEY & BERKELEY, 1941: 45-46.

TYPE LOCALITY: Off Corona del Mar, Southern California, at 22-31 meters.

SELECTED REFERENCES: *Chaetozone corona* — HARTMAN, 1961: 109-110; HARTMAN, 1969: 235, figs. 1-3; BLAKE, 1996*g*: 285-287, fig. 8.6; ÇINAR & ERGEN, 2007: 341-345, figs. 2-4. [?] *Chaetozone ?corona* — HARTMAN, 1960: 125.

DISTRIBUTION: Southern California; Western Mexico; Gulf of California; SE Brazil; Eastern Mediterranean (Turkish Aegean coast, 2.5-50 meters, in mud and sandy mud); [?] Western Mediterranean Sea; [?] Adriatic Sea; [?] Aegean Sea; [?] Black Sea. In bottoms of sand and mud. Between 24-119 meters.

REMARKS: The record by HARTMAN (1960), from deep waters off California, doesn't belong probably to *Chaetozone corona*, as already stated by Hartman, as the specimens are described as nearly or altogether lacking eyes. In *Chaetozone corona* the eyes are clearly visible.

Chaetozone gibber Woodham & Chambers 1994

Chaetozone gibber WOODHAM & CHAMBERS, 1994: 308-310, figs. 1, 3.

TYPE LOCALITY: United Kingdom: off Folkestone, Kent, SE England, in very fine silt-medium sand, between 3.5-20.5 meters.

DISTRIBUTION: United Kingdom: off Folkestone, Kent, SE England, in very fine silt-medium sand, between 3.5-20.5 meters; Turnaware Point, Cornwall, SW England, at 4.3 meters; Milford Haven, South Wales. Mediterranean Sea: Banyuls-sur-Mer (France), 40-45 meters.

REMARKS: According to WOODHAM & CHAMBERS (1994) this species can be easily recognized by its characteristic shape (a dorsal hump anteriorly and a tapering, dorso-ventrally flattened posterior end) and by its distinct eyes.

Chaetozone incerta (Fauvel 1936) **nov. comb.**

Cirrineris incertus FAUVEL, 1936*c*: 72-73, fig. 9.

TYPE LOCALITY: FAUVEL (1936*c*) described this species with base on numerous specimens collected in six stations near the Atlantic coast of Morocco, between 43 and 130 meters, in muddy bottoms. The data of the six stations is as follows: 30º22'N, 9º49'W, 90 meters, in mud; 30º34'40"N, 9º48'30"W, 43 meters, in mud; 30º20'10"N, 9º46'10"W, 75 meters, in mud; 30º29'30"N, 9º55'50"W, 120 meters, in mud; 30º27'20"N, 9º45'W, 65 meters, in mud; 30º40'N, 10º7'W, 130 meters, in mud.
DISTRIBUTION: Atlantic coasts of Morocco, between 43-130 meters, in muddy bottoms.
REMARKS: Apparently this species was not found again since its original description by FAUVEL (1936*c*), based in numerous specimens. According to Fauvel's description, the species seems to belong to the genus *Chaetozone*. What is described as a pair of filiform branchiae at the achaetigerous segment just before the first chaetiger, seems to be one pair of palps, in spite of Fauvel's words that they are "*bien des branchies et non palpes, car ils renferment deux vaisseaux sanguins bien visibles par transparence*" (FAUVEL, 1936*c*: 73). The species is blind, with a pointed prostomium, and the neuropodial spines start at chaetigers 12-13, and the notopodial spines around chaetiger 35. The spines are stated to be slightly sigmoid and to have a long tapering tip when intact, and a blunt tip when used. The species is here considered as being a *Chaetozone*.

Chaetozone jubata Chambers & Woodham 2003

Chaetozone jubata CHAMBERS & WOODHAM, 2003: 43-47, fig. 2, table 1.
TYPE LOCALITY: Faroe-Shetland Channel, 61º8.06'N, 2º41.78'W, at 806 meters, in very fine sand.
DISTRIBUTION: Faroe-Shetland Channel, in the lower continental slope and floor, between 697-1000 meters, in fine to very fine sand; Iceland-Faroe Rise 453 meters, in sand; off north Iceland, 781 meters, in sandy silt.

Chaetozone macrophthalma Langerhans 1880

Chaetozone macrophthalma LANGERHANS, 1880*b*: 98-99, pl. 4 fig. 10.
TYPE LOCALITY: Madeira Island, at 20 fathoms (36.6 meters).
SELECTED REFERENCES: *Chaetozone macrophthalma* — PETERSEN, 1999: 111.
DISTRIBUTION: Madeira Island.

Chaetozone setosa Malmgren 1867

Chaetozone setosa MALMGREN, 1867*a*: 96-97, pl. 14 fig. 84.
TYPE LOCALITY: The species was described by MALMGREN (1867*a*) with base on numerous specimens collected in Spitsbergen (where it is stated to be frequent), Finmark (Norway), and Bohuslän (Sweden, where it is recorded as rare), all specimens having been collected between 20-40 fathoms (36.6-73.2 meters), in muddy bottoms. A lectotype was designated by PETERSEN (1999), from Isfjord (Spitsbergen), at 30 fathoms (54.9 meters), in mud. A second lectotype was designated by CHAMBERS (2000), from Crossbay (Spitsbergen), collected at 60 fathoms (109.7 meters). Both lectotypes are from Spitsbergen, but from different stations, and I consider here as valid the lectotype from Islefjord, as it was the first one to be published.
SELECTED REFERENCES: *Chætozone setosa* — MCINTOSH, 1911*a*: 170-171, pl. 7 fig. 11; MCINTOSH, 1915*b*: 264-266, pl. 107 fig. 4. *Chaetozone setosa* — [?] THÉEL, 1879: 54-56, pl. 4 figs. 49-51; FAUVEL, 1927*a*: 101, fig. 35*d-k* [in part; probably not records from the Mediterranean Sea]; WESENBERG-LUND, 1950*a*: 34, chart 43; HARTMANN-SCHRÖDER, 1974*d*: 234; CHRISTIE, 1985: 241-244, figs. 2, 4*A*, *D*, *G* [in part; sub-littoral population from St. P]; HARTMANN-SCHRÖDER, 1996: 394-395, fig. 189; KIRKEGAARD, 1996: 133-135, fig. 65; PETERSEN, 1999: 111; CHAMBERS, 2000: 589-591, figs. 1, 3; CHAMBERS & WOODHAM, 2003: table 1.
REFERENCES FOR PORTUGAL: HARTMANN-SCHRÖDER, 1977*a* (Bay of Setúbal); AMOUREUX, 1987 (off Aveiro; off Porto); QUINTINO & GENTIL, 1987 (Lagoon of Albufeira); DEXTER, 1992 (previous records: Ria de Alvor; Lagoon of Óbidos); PARDAL, CALDEIRA & MARQUES, 1992 (previous records: Mondego Estuary; Lagoon of Albufeira); PARDAL, MARQUES & BELLAN, 1993 (Mondego Estuary); RAVARA, 1997 (off Aveiro).
DISTRIBUTION: Arctic; Greenland; Spitsbergen; Iceland; Faroes; North Sea; West Scotland; Barents Sea; west and south Sakhalin. Gulf of Aniva (NW Pacific). In muddy sediments with a high silt/clay content. Between 38-200 meters. According to CHAMBERS (2000) all the other records need to be re-examined, as other similar but different species are involved in these records. According to BLAKE (1996: 271) *C. setosa* is probably restricted to the Arctic, sub-arctic and high boreal latitudes.

Chaetozone vivipara (Christie 1984)

Tharyx vivipara CHRISTIE, 1984: 69-72, figs. 1-3.

TYPE LOCALITY: Tyne Estuary (Tyne and Wear, Northeastern England), 55º0.6'N, 1º25.7'W, in silty sand, at 3.5-7 meters, 34.3‰.

SELECTED REFERENCES: *Aphelochaeta vivipara* — HARTMANN-SCHRÖDER, 1996: 391. *Chaetozone vivipara* — PETERSEN, 1999: 111-112, footnote on page 116, fig. 2*R*, table 2.

REFERENCES FOR PORTUGAL: [?] RAVARA, 1997 (as *Tharyx* cf. *vivipara*; off Aveiro).

DISTRIBUTION: Blyth and Coquet (Northumberland), Tyne (Tyne and Wear), Tees (Cleveland), and Humber (Humberside) estuaries, Northeastern England, on silty sand and soft silt, between 1-13 meters, and 23-35‰; Denmark (8-10 meters); Eastern Canada (7-10 meters); Maine, U.S.A. (muddy flats). On silty and muddy bottoms.

REMARKS: *Tharyx vivipara* Christie 1984 was referred to the genus *Chaetozone* by PETERSEN (1999: 116), as according to her the "*posterior segments of smaller species contain slender acicular chaetae alternating with the capillaries, as in* Chaetozone*; the species has also been identified as* Chaetozone *because of its general appearance*."

Chaetozone zetlandica McIntosh 1911

Chætozone zetlandica MCINTOSH, 1911*a*: 161-162.

TYPE LOCALITY: St. Magnus Bay, Shetland (Scotland, United Kingdom), 100 fathoms (183 meters).

SELECTED REFERENCES: *Chætozone zetlandica* — MCINTOSH, 1915*b*: 266-267, pl. 107 fig. 5. *Chaetozone zetlandica* — SOUTHERN, 1914: 115-119, pl. 12 fig. 29*A-B*, pl. 13 fig. 29*C-K*; BLAKE, 1996*g*: 22. *Heterocirrus zetlandicus* — FAUVEL, 1927*a*: 99, figs. 34*i-n*. *Caulleriella zetlandica* — [?] DAY, 1967: 509; WOODHAM & CHAMBERS, 1994: 311-315, figs. 2, 4; PETERSEN, 1999: 110, table 2.

DISTRIBUTION: Shetland; Clare Island and Clew Bay region (West Ireland); English Channel (Southampton). In very fine to medium sand. Intertidal to about 183 meters.

REMARKS: WOODHAM & CHAMBERS (1994) examined numerous specimens of *Caulleriella zetlandica* collected at Sullom Voe, near the type locality in the Shetland. The material included specimens from 4 mm for 54 chaetigers, to 24 mm for 154 chaetigers. The bidentate spines were present only in the posterior segments of juvenile or small specimens, and were absent in larger specimens, where the spines had unidentate tips. This fact can difficult the identification, as small specimens can be identified as belonging to the genus *Caulleriella*.

Chaetozone zetlandica can be distinguished from many of the other members of the genus *Chaetozone* by the presence of the acicular spines only in the neuropodium.

Cirratulispio caulleryi McIntosh 1915

Cirratulispio Caulleryi MCINTOSH, 1915*b*: 268-269, pl. 101 fig. 1, pl. 107 fig. 14.

TYPE LOCALITY: Off the coast of Ireland, in 378 fathoms (691.3 meters), in sticky mud.

SELECTED REFERENCES: *Cirratulispio* — MCINTOSH, 1911*a*: 167-168, pl. 6 fig. 7, pl. 7 figs. 7*a-b*.

DISTRIBUTION: Known from the type locality.

REMARKS: This species was first described as *Cirratulispio* by MCINTOSH (1911*a*), with base on a single specimen collected off Ireland. The species was later redescribed and named as *Cirratulispio Caulleryi* by MCINTOSH (1915*b*), with base on the same specimen. Finally HARTMAN (1959*a*) regarded the species as being perhaps a *Cirratulus* or a *Chaetozone*.

Cirratulispio caulleryi was described as being a bitentaculate species, without eyes, and with a body filiform and elongate, separated into two different regions. The anterior region has 9 segments and long noto- and neurochaetae, being the notochaetae considerably longer than the neurochaetae, but both with the same structure, as a long cylindrical shaft not differentiated from the tip, tapering gradually to a fine point. The posterior region, with the first segment 3 times broader than the anterior ones, has shorter chaetae, with each of the two rami with a continuous row of stout curved spines. The dorsal rami was described as having two smooth capillary bristles, followed by 5-6 spines with the tips produced into slender processes, and then a series of stout curved spines with slightly tapered tips ending in a stout though more or less pointed tip. The arrangement of these spines was described by MCINTOSH (1911*a*) as recalling the condition in *Chaetozone setosa*.

The species is here considered as belonging to the genus *Chaetozone*, being *Cirratulispio* a junior synonym. In order to avoid a possible unnecessary combination, as the revision of the type material may reveal its synonymy with an older species, the species is here designated under its original combination, as *Cirratulispio caulleryi*.

Tharyx retieri Lechapt 1994

Tharyx retieri LECHAPT, 1994: 414-417, figs. 1-3.

TYPE LOCALITY: Moroccan Atlantic coast, *Abra alba* community, in fine sand, at 31º55'N, 9º31'W [stated to be at 9º91'W in the original], at 25 meters.

SELECTED REFERENCES: *Tharyx retieri* — PETERSEN, 1999: table 2.

DISTRIBUTION: Moroccan Atlantic coast: *Abra alba* community, in fine sand, between 31º53'N and 31º57'N, and 9º29'W and 9º35'W, and between 17-35 meters.

REMARKS: According to BLAKE (1996*g*), this bitentaculate cirratulid is unusual in having modified spines bearing a long, bradly attached mucron that frequently breaks away from the spine. This way, the species does not agree with *Tharyx* owing to the nature of the spines and to the fact that the first pair of branchiae arises from the first chaetigerous segment instead of immediately posterior to the dorsal tentacles on the peristomium. Due to the robust nature of the specimens depicted by Lechapt using SEM photographs, and the form of the spines after removal of the mucron, BLAKE (1996*g*) stated that the species should be reconsidered and referred to another genus, probably *Chaetozone*.

For the stated above the species is here included under the genus *Chaetozone*. However, in order to avoid the possibility of creating an unnecessary new combination, as the species needs to be revised and this revision could indicate that it should be placed somewhere else, it is maintained as *Tharyx retieri*.

GENUS ***Cirratulus*** Lamarck 1818

Cirratulus LAMARCK, 1818: 300-301.

TYPE SPECIES: *Lumbricus cirratus* O.F. Müller 1776.

SYNONYMS: *Archidice* Kinberg 1866.

DIAGNOSIS (from BLAKE, 1996*g*): Prostomium wedge-shaped, elongate or blunt, usually with eyes; peristomium with 2-3 annulations; two or more grooved tentacular filaments arising from a single anterior segment; branchiae first present from same chaetiger as tentacular filaments, occurring singly, continuing over most of body to posterior end; parapodial rami well separated; chaetae including capillaries and acicular spines.

KEY TO SPECIES:

NOT INCLUDED IN THE KEY: *Cirratulus longisetis* Möbius 1874; *Cirratulus caudatus* Levinsen 1893.

1a. Posterior region with capillary chaetae and acicular spines in both noto- and neuropodia....................**2**
1b. Acicular spines only in neuropodia, from chaetiger 18, notopodia with capillary chaetae along the whole body; head with a well marked basal constriction; prostomium with one pair of eyes..***C. glandularis***

2a (1a). Head with a well marked basal constriction; neuropodial spines first present at chaetiger 13, and notopodial spines from about chaetiger 30; prostomium with 2-8 pairs of eyes...***C. borealis* AND *C. cirratus***
2b (1a). Head with a weak basal constriction; prostomium only with one pair of eyes...............***C. incertus***

Cirratulus borealis Lamarck 1818

Cirratulus borealis LAMARCK, 1818: 302.

TYPE LOCALITY: "*Habite les mers du nord* [probably of Europe]*, dans le sable, sous et entre les pierres des rivages.*"

SELECTED REFERENCES: *Cirratulus borealis* — ØRSTED, 1843*a*: 43-44; KEFERSTEIN, 1862: 120-121, pl. 10 figs. 19-22; JOHNSTON, 1865: 210-212, 343, text-fig. 37, pl. 18 figs. 7-12.

DISTRIBUTION: Arctic Ocean, at shallow water, in sand and under stones.

REMARKS: According to PETERSEN (in litt. *in* BLAKE, 1996*g*), *Cirratulus borealis* Lamarck 1818 is distinct from *Lumbricus cirratus* O.F. Müller 1776, and not a junior synonym of it, as indicated by HARTMAN (1959*a*). However, as no further information is available on how to distinguish both species, they are kept together in the above key.

Cirratulus caudatus Levinsen 1893

Cirratulus caudatus LEVINSEN, 1893: 338.

TYPE LOCALITY: Kattegat, Norway.

SYNONYMS: *Chætozone dunmanni* McIntosh 1911.

SELECTED REFERENCES: *Cirratulus caudatus* — MCINTOSH, 1915*b*: 253-254, pl. 100 fig. 13, pl. 109, fig. 14, pl. 111 fig. 3. *Chætozone dunmanni* — MCINTOSH, 1911*a*: 160-161.

DISTRIBUTION: Kattegat; Dunmanus Bay (Ireland).

REMARKS: According to MCINTOSH (1911*a*, 1915 *b*) the acicular spines appear at chaetiger 30.

Cirratulus cirratus (O.F. Müller 1776)

Lumbricus cirratus O.F. MÜLLER, 1776: 214.

TYPE LOCALITY: Greenland.

SYNONYMS: *Cirratulus medusa* Quatrefages 1866; *Cirratulus Blainvillii* Grube 1855 [new name for *Cirrinereis filigerus* Blainville 1828].

SELECTED REFERENCES: *Cirratulus cirratus* — MCINTOSH, 1911*a*: 154-156; MCINTOSH, 1915*b*: 249-252, text-fig. 125, pl. 91 fig. 2, pl. 107 fig. 2; FAUVEL, 1927*a*: 94, fig. 33*a-g*; WESENBERG-LUND, 1950*a*: 33-34, chart 43; HARTMANN-SCHRÖDER, 1996: 396-397, fig. 190; KIRKEGAARD, 1996: 135-136, fig. 66; PETERSEN, 1999: 112, table 2. *Cirratulus Blainvillii* — GRUBE, 1855: 110.

REFERENCES FOR PORTUGAL: SALDANHA, 1974 (coast of Arrábida); AMOUREUX & CALVÁRIO, 1981 (Tagus Estuary; Peniche); CASTRO & VIEGAS, 1981 (Tagus Estuary); MONTEIRO-MARQUES *et al.*, 1982 (Cape Carvoeiro; Ponta do Baleal); CALVÁRIO, 1984 (Tagus Estuary); MONTEIRO-MARQUES, 1987 (continental shelf of Algarve); DEXTER, 1992 (previous records: Ria Formosa; continental shelf of Algarve; Sines; Sado Estuary; Tagus Estuary; Mondego Estuary); PARDAL, CALDEIRA & MARQUES, 1992 (previous records: Mondego Estuary; Peniche; Tagus Estuary); SALDANHA, 1995 (Portugal).

DISTRIBUTION: Recorded as being cosmopolitan, but this wide distribution can be the result of the mixture of several similar but distinct species. Known from: Greenland; Finmark; Spitsbergen; Iceland; Faroes; Barents Sea; British Isles, English Channel, North Sea, Skagerrak, Kattegat to Öresund, and Kleiner Belt in the Kieler Bight; [?] Adriatic Sea. Recorded in many types of sediment, from fine sand to mud, and among *Zostera*, algae and rhizomes of seaweeds, in oyster banks and stones, and in holes and clefts of rocks. Intertidal to about 2000 meters.

Cirratulus glandularis (Langerhans 1884)

Archidice glandularis LANGERHANS, 1884: 259, pl. 15 fig. 18.

TYPE LOCALITY: Madeira Island, at great depth ("*größerer Tiefe*").

SELECTED REFERENCES: *Cirratulus glandularis* — PETERSEN, 1999: 112.

DISTRIBUTION: Known from the type locality.

Cirratulus incertus McIntosh 1923

Cirratulus incertus MCINTOSH, 1923*a*: 489-490, pl. 137 fig. 9.

TYPE LOCALITY: Off Shetland.

SYNONYMS: *Cirratulus bioculatus* McIntosh 1911 [homonym; not *Cirratulus bioculatus* Keferstein 1862 (= *Caulleriella bioculata* (Keferstein 1862)].

SELECTED REFERENCES: *Cirratulus incertus* — PETERSEN, 1999: 112, fig. 3*E-G*, table 2. *Cirratulus bioculatus* [not Keferstein 1862] — MCINTOSH, 1915*b*: 253, pl. 103 fig. 16, pl. 105 fig. 19. *Cirratulus cirratus* [not O.F. Müller 1776] — MCINTOSH, 1911*a*: 156.

DISTRIBUTION: English Channel; Cullercoats, NE England; Kattegat and Øresund. In shells and holdfasts.

REMARKS: This species may be a juvenile form of another species.

Cirratulus longisetis Möbius 1874

Cirratulus longisetis MÖBIUS, 1874: 160.

TYPE LOCALITY: Bukenfjord (Norway), 365 meters, in mud.

SELECTED REFERENCES: *Cirratulus longisetis* — PETERSEN, 1999: 112.

REMARKS: This species has been considered as a junior synonym of *Chaetozone setosa* by several authors.

GENUS *Cirriformia* Hartman 1936

Cirriformia HARTMAN, 1936*a*: 31.

TYPE SPECIES: *Terebella tentaculata* Montagu 1808.

SYNONYMS: *Audouinia* Quatrefages 1866 [not Costa 1834 (Crustacea)].

DIAGNOSIS (from BLAKE, 1996*g*): Prostomium elongate or blunt, usually without eyes; peristomium with 2-3 annulations; grooved tentacular filaments limited to 1-3 anterior segments, arising between chaetigers 2-7; branchiae occurring singly, usually first present from chaetiger 1, arising close to notopodia throughout, not shifting dorsally in middle body segments and not forming dorsolateral branchial bulges; parapodia rami well separated; chaetae including capillaries and acicular spines.

KEY TO SPECIES:

1a. Tentacular filaments arise above chaetiger 2; branchiae of middle segments arise closer above the notochaetae than distance between notochaetae and neurochaetae; 1-2 hooks per rami in the posterior region, sometimes also present in the middle region...***C. afer***
1b. Tentacular filaments arise above chaetigers 4-6..**2**

2a (1b). Branchiae of middle segments arise farther above the notochaetae than the distance between notochaetae and neurochaetae; 1-2 hooks per neuropodium, from chaetiger 19-30; notopodial hooks from chaetiger 37-44; tentacular filaments arise above chaetiger 4-5..***C. filigera***
2b (1b). Branchiae of middle segments arise closer above the notochaetae than distance between notochaetae and neurochaetae; 2-3 hooks per neuropodium, from chaetiger 45-60; notopodial hooks from chaetiger 90-95; tentacular filaments arise above chaetiger 5-6...***C. tentaculata***

Cirriformia afer (Ehlers 1908)

Cirratulus afer EHLERS, 1908: 127, pl. 17 figs. 10-12.

TYPE LOCALITY: Walfish Bay (South Angola), 16º36'S, 11º46'W.

SELECTED REFERENCES: *Cirratulus afer* — AUGENER, 1918: 462-463. *Audouinia afra* — FAUVEL, 1936*c*: 69-70. *Cirriformia afer* — DAY, 1967: 515-517, fig. 20.4.*h-i*.

DISTRIBUTION: Atlantic coast of Africa: Walfish Bay (South Angola, shallow depth), and Morocco (124-158 meters, in mud and sand).

Cirriformia filigera (Delle Chiaje 1828)

Lumbricus filigerus DELLE CHIAJE, 1828: 178, pl. 45.

TYPE LOCALITY: Naples (Italy).

SYNONYMS: *Cirratulus chiajei* Marenzeller 1888.

SELECTED REFERENCES: *Audouinia filigera* — CLAPARÈDE, 1869: 7-9, pl. 23 fig. 3; LO BIANCO, 1893: 4; FAUVEL, 1916*b*: 446-447; FAUVEL, 1927*a*: 92-93, fig. 32*h-m*. *Cirratulus (Audouinia) filigerus* — MCINTOSH, 1911*a*: 153-154. *Timarete filigera* — PETERSEN, 1999: 116,figs. 2*Q*, 3*H*, table 2. *Cirratulus chiajei* — MARENZELLER, 1888: 18. *Cirratulus Chiaji* — MCINTOSH, 1915*b*: 247-248, pl. 94 fig. 18, pl. 107 fig. 3; MCINTOSH, 1923*a*: 489. *Cirratulus chiajii* — MCINTOSH, 1922*a*: 23.

REFERENCES FOR PORTUGAL: CARVALHO, 1929 (as *Audouinia filigera*; Faro; Sines; Granja); AMOUREUX & CALVÁRIO, 1981 (Peniche); MONTEIRO-MARQUES *et al.*, 1982 (Cape Carvoeiro; Ponta do Baleal; Ponta do Surdão); MONTEIRO-MARQUES, 1987 (as *Audouinia filigera*; continental shelf of Algarve); DEXTER, 1992 (as *Cirriformia (Audouinia) filigera*; previous records: Ria Formosa; continental shelf of Algarve); PARDAL, CALDEIRA & MARQUES, 1992 (previous records: Praia da Granja; Peniche; Sines; Ria Formosa); SPRUNG, 1994 (as *Audouinia filigera*; Ria Formosa).

DISTRIBUTION: Western Mediterranean Sea; Adriatic Sea; Aegean Sea; British Isles; Bermuda; SE Brazil; Falkland Islands; Lizard Island, Australia; off Phuket, Andaman Sea. In mud mixed with sand, under stones, and among the rhizomes of *Posidonia*. Between 1-10 meters.

REMARKS: In one small specimen (0.5 mm wide at the anterior region) from South Spain (Murcia), the neurohooks started at chaetiger 9-10, and the notohooks at chaetiger 11. The insertion of the branchiae seemed to remain throughout the whole body at a distance from the notochaetae bigger than the distance between notochaetae and neurochaetae, instead of shifting towards the mid-dorsum of the body in the middle chaetigers. For this reason, I maintain here the species in the genus *Cirriformia*, instead of including it at *Timarete*, as suggested by PETERSEN (1999).

Cirriformia tentaculata (Montagu 1808)

Terebella tentaculata MONTAGU, 1808: 110-111, pl. 6 fig. 2.

TYPE LOCALITY: South Coast of Devonshire (England), taken from a piece of timber perfurated by pholades.

SYNONYMS: *Cirratulus Lamarckii* Audouin & Milne-Edwards 1833; *Audouinia norwegicus* Quatrefages 1866.

SELECTED REFERENCES: *Cirratulus tentaculatus* — MCINTOSH, 1911*a*: 151-153; MCINTOSH, 1915*b*: 242-247, pl. 91 fig. 1, pl. 92 fig. 1, pl. 98 fig. 18, pl. 107 figs. 1-1*a* [in part; not *Lumbricus filigera* Delle Chiaje 1828]. *Audouinia tentaculata* — SAINT-JOSEPH, 1894: 48-52, pl. 3 figs. 55-57; RIOJA, 1917*a*: 177; RIOJA, 1917*c*: 9; FAUVEL, 1927*a*: 91-92, fig. 32*a-g*. *Cirriformia tentaculata* — HARTMANN-SCHRÖDER, 1996: 397; KIRKEGAARD, 1996: 138-139, fig. 68; PETERSEN, 1999: 114, fig. 2*S-U*, table 2. *Cirratulus norvegicus* — SOUTHERN, 1914: 107-110, pl. 11 figs. 26*A-D*. *Cirratulus borealis* [not Lamarck 1818] — RATHKE, 1843: 180-181, pl. 8 figs. 16-17. Not *Cirratulus norvegicus ?* — MCINTOSH, 1911*a*: 171-172, pl. 7 figs. 12-12*a* [= *Tharyx mcintoshi* (Southern 1914)].

REFERENCES FOR PORTUGAL: CARVALHO, 1929 (as *Audouinia tentaculata*; Sines; Granja); SALDANHA, 1974 (as *Audouinia tentaculata*; coast of Arrábida); AMOUREUX & CALVÁRIO, 1981 (Peniche); MONTEIRO-MARQUES *et al.*, 1982 (Ponta do Baleal; Ponta do Surdão); [?] SOUSA-REIS *et al.*, 1982 (as *Cirriformia* c.f. *tentaculata*; Peniche region); MONTEIRO-MARQUES, 1987 (as *Audouinia tentaculata*; continental shelf of Algarve); QUINTINO & GENTIL, 1987 (Lagoon of Albufeira; Lagoon of Óbidos); QUINTINO, RODRIGUES & GENTIL, 1989 (Lagoon of Óbidos); DEXTER, 1992 (as *Cirriformia (Audouinia) tentaculata*; previous records: Ria Formosa; Ria de Alvor; continental shelf of Algarve; Sado Estuary; Arrábida; Lagoon of Albufeira; Peniche; Lagoon of Óbidos); PARDAL, CALDEIRA & MARQUES, 1992 (previous records: Praia da Granja; Lagoon of Óbidos; Peniche; Arrábida; Lagoon of Albufeira; Sines; Ria Formosa); SALDANHA, 1995 (Portugal).

DISTRIBUTION: Pacific and Indian Oceans; Atlantic, from Norway to the Mediterranean Sea; British Isles; Shetland; Skagerrak; Kattegat; Madeira and Canary Islands; Adriatic Sea; Aegean Sea; Black Sea. On muddy and sandy bottoms, under stones, and in cracks and crevices of rocks. Intertidal to 100 meters.

GENUS *Ctenodrilus* Claparède 1863

Ctenodrilus CLAPARÈDE, 1863: 25.

TYPE SPECIES: *Parthenope serrata* Schmidt 1857.

SYNONYMS: *Parthenope* O. Schmidt 1857 [not Weber 1795 (Crustacea)].

DIAGNOSIS (from HARTMANN-SCHRÖDER, 1996): Body with 15 chaetigers, at most; prostomium, peristomium and anterior segments ventrally ciliated; eyes absent; chaetae acicular, all similar, smooth or subdistally roughly dentated; pharyngeal bulb present, eversible; sexual and asexual reproduction present.

REMARKS: WESTHEIDE *et al.* (2003) alert for the fact that the attempts to separate taxa inside the genus *Ctenodrilus* have not been credible, so far. The animals exhibit few appropriate structures for diagnostic evaluation and, besides, the only structures that can be compared in detail are the serrated chaetal hooks. These chaetae are highly variable, in particular in the number of their subdistal teeth, which can vary within the same specimen. Variation can also be found in the number of chaetae, size of the zooids and color of the skin glands (WESTHEIDE *et al.*, 2003).

WESTHEIDE (1981) collected in Galapagos Islands specimens identified as *Ctenodrilus serratus* which showed serrated chaetal hooks that were close to the ones described for *C. paucidentatus* Ben-Eliahu 1976, from the Red Sea. However, the same author also found among a population from Helgoland with the typical *C. serratus* chaetal hooks, specimens with the hook shape typical of *C. paucidentatus*, and similar to the ones from Galapagos population. Other populations of *C. serratus* with a reduced number of teeth in the chaetae have been described from California, Florida and Bimini, or Africa (HARTMAN, 1944*d*; RENAUD, 1956; HARTMANN-SCHRÖDER, 1974*a*). Variations in size, colour of epidermal glands, number of bristles within a bundle, and shape of bristles had been already referred and described by WILFERT (1973).

On the contrary, ROUSE (2001*h*) states that a closer examination of the worldwide distribution of *Ctenodrilus serratus* will show probably that several different species were identified under the same name. This way, the synonymy by WILFERT (1973) of *Ctenodrilus serratus limulicolis* Sudzuki & Sekiguchi 1972, from Japan, with the nominal species would have been unnecessary.

Until more evidence is given concerning the synonymies, ROUSE (2001*h*) is followed here, and the three species included in the following key are considered as being valid.

KEY TO SPECIES:
(from FAUVEL, 1927*a*)

1a. Coarsely serrated (pectinated) chaetae..**2**
1b. Chaetae not coarsely serrated, spearlike, with the apical part slightly bent...........................***C. parvulus***

2a (1a). Chaetae with proximal teeth of about the same size..***C. serratus***
2b (1a). Chaetae with proximal tooth much larger than the other teeth.............................***C. paucidentatus***

Ctenodrilus parvulus Scharff 1887

Ctenodrilus parvulus SCHARFF, 1887: 591-602, pl. 1 figs. 1-3.

TYPE LOCALITY: Found in a British seawater aquarium, in Birmingham. Original habitat unknown, but from some place along the British coast.

SELECTED REFERENCES: *Ctenodrilus parvulus* — FAUVEL, 1927*a*: 109.

DISTRIBUTION: Known from the type locality. Original habitat unknown.

Ctenodrilus paucidentatus Ben-Eliahu 1976

Ctenodrilus paucidentatus BEN-ELIAHU, 1976*b*: 131-132, fig. 4.

TYPE LOCALITY: “Wadi Kabila” (near Dahab, Egypt), Gulf of Aqaba, Red Sea, in *Dendropoma* formations encrusted on the seaward margins of beachrock slabs (BEN-ELIAHU, 1975*a*).

SELECTED REFERENCES: *Ctenodrilus paucidentatus* — BEN-ELIAHU & SAFRIEL, 1982: 389.

DISTRIBUTION: Known from the type locality.

Ctenodrilus serratus (Schmidt 1857)

Parthenope serrata SCHMIDT, 1857: 363, pl. 5 fig. 13.

TYPE LOCALITY: Mediterranean Sea.

SYNONYMS: *Ctenodrilus pardalis* Claparède 1863; [?] *Ctenodrilus serratus limulicolus* Sudzuki & Sekiguchi 1972.

SELECTED REFERENCES: *Ctenodrilus serratus* — CAULLERY & MESNIL, 1898: 132, pl. 2 fig. 13, pl. 3 fig. 1; FAUVEL, 1927*a*: 108-109, fig. 38; HARTMAN, 1944*d*: 323, pl. 27 figs. 6-7 WILFERT, 1973: 333-341, figs. 1-7; WESTHEIDE, 1981: 18-19, fig. 7; SAN MARTÍN & VIÉITEZ, 1982: 18-19, fig. 1; HARTMANN-SCHRÖDER, 1996: 404-405, fig. 195; KIRKEGAARD, 1996: 145-146, fig. 73. *Ctenodrilus pardalis* — CLAPARÈDE, 1863: 25-26, pl. 15 figs. 28-29.

DISTRIBUTION: Northern Pacific Ocean; Atlantic Ocean: Mediterranean Sea, Adriatic Sea, Aegean Sea, Black Sea; English Channel; North Sea; SW Africa; Galapagos Islands; probably with a wider distribution. Frequent in seawater aquaria. In bottoms from coarse sand to mud with detritus, is typical in polutted waters. Euhaline to polyhaline tolerant, in shallow waters (0-10 meters).

REMARKS: Molecular studies performed by WESTHEIDE *et al.* (2003) and using *Ctenodrilus serratus* specimens collected at USA (Morehead City, both from culture aquarium and seaside population), Bermuda Islands, France (Roscoff and Luc-sur-Mer, both from aquaria), and Germany (Helgoland and Onasbrück, both from aquaria), showed that *Ctenodrilus serratus* is an amphi-Atlantic species. The same authors suggested that some kind of trans-Atlantic dispersal of individuals must be inferred, and moreover, that the dispersal method used must cover broad oceanic regions, as the same species was also recorded from Galapagos Islands, besides Japan, or California, in the Pacific Ocean. On the other hand, and as stated above, this wide distribution of the species includes probably also different taxa misidentified as *C. serratus*.

*GENUS ***Dodecaceria*** Ørsted 1843

Dodecaceria ØRSTED, 1843*a*: 44.

TYPE SPECIES: *Dodecaceria concharum* Ørsted 1843.

SYNONYMS: *Heterocirrus* Grube 1855; *Naraganseta* Leidy 1855; *Zeppelina* Vaillant 1890.

DIAGNOSIS (from BLAKE, 1996*g*): Prostomium blunt, forming hood over mouth; peristomium long, achaetous, with pair of thick, grooved dorsal tentacles at junction with chaetiger 1; one to several pairs of branchial filaments extending over anterior segments; chaetae simple, including capillaries and stout, acicular, spoon-shaped hooks.

REMARKS: GIBSON (1978) revised the systematics of the genus *Dodecaceria*, concluding that the distribution of chaetae and branchiae was closely correlated with size, placing a great deal of significance in the mode and details of the asexual reproduction (BLAKE, 1996*g*). After earlier studies on reproduction by GIBSON & CLARK (1976) and GIBSON (1977), GIBSON (1978) evaluated 10 species of *Dodecaceria*, but could not arrive to any consensus regarding the validity of several proposed synonymies (BLAKE, 1996*g*).

KEY TO SPECIES:

NOT INCLUDED IN THE KEY: *Dodecaceria ostrae* (Dalyell 1853); *Dodecaceria saxicola* (Grube 1855); *Dodecaceria sextentaculata* (Delle Chiaje 1828).

1a. Body short and broad, segments short throughout, not particularly beadlike, posterior end broad and flattened; nuchal slits linear, usually recognizable under a stereomicroscope; chaetae large and conspicuous, easy to see; posterior segments with chisel-shaped (oar-shaped) spatulate chaetae without basal boss..***D. ater****

1b. Body long and slender, middle segments often beadlike, posterior end tapering; nuchal "slits" as flat oval patches, inconspicuous; chaetae small and inconspicuous, difficult to see at lower magnifications; posterior segments with spatulate neurochaetae, some or all of which with pronounced basal boss..***D. concharum***

****Dodecaceria ater*** (Quatrefages 1866)

Heterocirrus ater QUATREFAGES, 1866*b*: 405, pl. 10 figs. 13-17.

TYPE LOCALITY: France.

SELECTED REFERENCES: *Dodecaceria ater* — MCINTOSH, 1911*a*: 158-160. *Heterocirrus ater* — MCINTOSH, 1915*b*: 259-261, text-fig. 127, pl. 107 fig. 8. *Dodecaceria ater* — PETERSEN, 1999: 114, table 2. *Dodecaceria concharum* forme A — CAULLERY & MESNIL, 1898: 11-16, pl. 1 figs. *A*, *a*, pl. 2 figs. 10, 12, pl. 3 figs. 16-19, pl. 4 fig. 18 [represents an atokous form of the species, according to PETERSEN, 1999: page 114]. *Dodecaceria concharum* forme C_2 — CAULLERY & MESNIL, 1898: 22-23, pl. 1 figs. C_2, *c* [represents an epitokous form of the species, according to PETERSEN, 1999: page 114].

REFERENCES FOR PORTUGAL: AMOUREUX, 1974*b* (as *Dodecaceria concharum* forme A; off Porto); present work (southwestern continental shelf).

MATERIAL: SEPLAT 6 — St. 54 (A.2547), off Praia do Amado, 58 m, sand and rock: 1 posterior fragment, plus 2 middle fragments; the posterior end is broad and flattened; posterior segments with chisel-shaped spatulate chaetae without basal boss; dark coloured (almost black). **FAUNA 1 — St. 23*A***, Alborán Sea, Placer de las Bóvedas, off San Pedro de Alcántara, 30-32 m, coralligenous: one posterior end, broad and flattened; dark coloured; chaetae are chisel-shaped, but not specially spatulated.

DISTRIBUTION: Northern France; British Isles; English Channel. In *Lithothamnion* covering the gneiss rocks, in cracks and crevices of rocks. Low water.

REMARKS: May be a synonym of *D. saxicola* (Grube 1855).

Dodecaceria concharum Ørsted 1843

Dodecaceria concharum ØRSTED, 1843*a*: 44-45, pl. 6 fig. 99.

TYPE LOCALITY: Denmark, between Fredrikshavn and Skagen, and near Hellebæk, in oysters.

SYNONYMS: [?] *Naraganseta coralii* Leidy 1855; [?] *Heterocirrus fimbriatus* Verrill 1880; *Ctenodrilus monostylos* Zeppelin 1883; [?] *Heterocirrus gravieri* McIntosh 1911; *Dodecaceria Caulleryi* Dehorne 1933; *Zeppelina mediopigmentada* Gillandt 1979.

REFERENCES: *Dodecaceria concharum* — SAINT-JOSEPH, 1898: 346-348, pl. 20 figs. 160-161; MCINTOSH, 1911*a*: 156-157; MCINTOSH, 1915*b*: 255-258, text-fig. 126, pl. 91 fig. 3, pl. 100 fig. 1, pl. 107 fig. 7 [in part?]; RIOJA, 1917*c*: 10-11, fig. 1; FAUVEL, 1927*a*: 102-103, fig. 36 [in part]; GEORGE & PETERSEN, 1991: 91-94, fig. 1*A-E*, and 97, fig. 1*H-I* [under *Zeppelina monostyla* (Zeppelin 1883), and *Zeppelina mediopigmentata* Gillandt 1979, respectively]; HARTMANN-SCHRÖDER, 1996: 398-399, fig. 191; KIRKEGAARD, 1996: 139-141, fig. 69; PETERSEN, 1999: 114, fig. 3*I-J*, *O*, table 2. *Dodekaceria concharum* — LANGERHANS, 1880*b*: 96-97, pl. 4 fig. 8. *Dodecaceria Caulleryi* — DEHORNE, 1933: 304. [?] *Naraganseta coralii* — LEIDY, 1855: 144. *Ctenodrilus monostylos* — ZEPPELIN, 1883: 615-652, pls. 36-37. *Zeppelina monostyla* — FAUVEL, 1927*a*: 109-110, fig. 39*g*; HARTMANN-SCHRÖDER, 1971*a*: 369;

GILLANDT, 1979: 55. *Zeppelina mediopigmentada* — GILLANDT, 1979: 55-57, fig. 20. [?] *Heterocirrus fimbriatus* — VERRILL, 1880: 177-178. [?] *Heterocirrus gravieri* — MCINTOSH, 1911*a*: 164-165, pl. 5 fig. 3*a*, pl. 6 fig. 3.

REFERENCES FOR PORTUGAL: SALDANHA, 1974 (coast of Arrábida); AMOUREUX & CALVÁRIO, 1981 (Peniche); MONTEIRO-MARQUES *et al.*, 1982 (Ponta do Baleal); AMOUREUX, 1987 (off Porto); PARDAL, CALDEIRA & MARQUES, 1992 (previous records: Porto; Peniche; Arrábida); SALDANHA, 1995 (Portugal).

DISTRIBUTION: North Pacific; Atlantic, from the English Channel to the Mediterranean Sea; Adriatic Sea; Aegean Sea; Morocco; North Sea; Skagerrak; Kattegat; Öresund; Sea of Japan (Vostok Bay); California; [?] Northeastern coast of North America. In hard bottoms, like oyster banks, rocks, coralligenous bottoms, among rhizomes of *Posidonia*, bryozoans, laminarian rhizomes, and also in *Amphioxus*-sand. From the eulittoral to about 400 meters.

REMARKS: GEORGE & PETERSEN (1991) determined that *D. concharum* was the only species of *Dodecaceria* that occurred in Danish waters, the type locality of the species, and that it reproduced asexually by fragmentation.

D. concharum was misinterpreted in the papers by GIBSON & CLARK (1976) and GIBSON (1977, 1978, 1979, 1981), which led GEORGE & PETERSEN (1991) to revise the synonymies of the European species. This way, *D. caulleryi* Dehorne 1933 (type locality norther France) and possibly *D. fimbriata* (Verrill 1880) (type locality Bay of Fundy, Eastern Canada) were synonymized with *D. concharum* (*sensu* Ørsted 1843, *non* Gibson & Clark 1976 and Gibson 1977, 1978, 1979, 1981). *D. concharum sensu* Gibson (*non* Ørsted) was referred to *D. ater* (Quatrefages 1866), and it was pointed that this species might prove to be a junior synonym of *D. saxicola* (Grube 1855), from Villefranche, western Mediterranean (BLAKE, 1996*g*).

Heterocirrus gravieri was described by MCINTOSH (1911*a*) with base on material dredged from off Cádiz, to the west of the Straits of Gibraltar, in 227 fathoms (415.1 meters). The shape of the posterior neuropodial hooks seems to indicate a proximity of the species with the northern *D. concharum*.

Dodecaceria ostrae (Dalyell 1853)

Terebella ostrae DALYELL, 1853: 209-210, pl. 26 fig. 10.

TYPE LOCALITY: Scotland, probably North Sea coast, living as a symbiont in the shells of oysters, which it perforates.

SELECTED REFERENCES: *Dodecaceria concharum* forme B_2 — CAULLERY & MESNIL, 1898: 16-22, pl. 1 fig. *B_2*, pl. 2 fig. 11, pl. 3 figs. 26-27, pl. 4 figs. 19-21, pl. 5 fig. 8*b*. [?] *Zeppelina varioseta* — HARRIS, 1971: 707-711, fig. 15, tables 4-5.

DISTRIBUTION: Scotland, symbiont in the shells of oysters; [?] English Channel, intertidal, amongst *Lithophyllum incrustans*.

Dodecaceria saxicola (Grube 1855)

Heterocirrus saxicola GRUBE, 1855: 109-110.

TYPE LOCALITY: Villefranche-sur-Mer, Southern France (Mediterranean Sea), inside a large and firm block of limestone.

SELECTED REFERENCES: *Heterocirrus saxicola* — MARION & BOBRETZKY, 1875: 67. *Dodecaceria saxicola* — PETERSEN, 1999: 115, fig. 1*A-D*, table 2.

DISTRIBUTION: Villefranche-sur-Mer; Mont Rose, near Marseille. In limestone and hard surfaces. Between 3-5 meters.

Dodecaceria sextentaculata (Delle Chiaje 1828)

Nereis sextentaculata DELLE CHIAJE, 1822: pl. 43 fig. 8.

TYPE LOCALITY: Naples (Italy).

SELECTED REFERENCES: *Nereis sextentaculata* — DELLE CHIAJE, 1828: 168, 176. *Dodecaceria sextentaculata* — PETERSEN, 1999: 115.

DISTRIBUTION: Naples (West Italy). In barnacle shells. Shallow water (1 meter).

GENUS ***Fauvelicirratulus*** Çinar & Petersen 2011

Fauvelicirratulus ÇINAR & PETERSEN, 2011: 415-416.

TYPE SPECIES: *Cirratulus dollfusi* Fauvel 1928.

DIAGNOSIS (from ÇINAR & PETERSEN, 2011): Body large, dorso-ventrally flattened. Prostomium broadly rounded anteriorly, without eyes. Tentacular filaments emerging on dorso-lateral area of chaetiger 1, arranged in two dense groups of circular pattern, with 25 filaments each. Branchial filaments are multiple in anterior end; they arise as 1-2 filaments from each of 4-8 raised notopodial lobes on parapodia of anterior and middle segments, with lobes reducing in size and fewer or no branchiae posteriorly. Two types of chaetae: long, fine capillaries, and straight, tapering spines.

****Fauvelicirratulus dollfusi*** (Fauvel 1928)

Cirratulus dollfusi FAUVEL, 1928: 9-10, fig. 1*h-k*.

TYPE LOCALITY: Atlantic coast of Morocco, 30º21'10"N, 9º44'20"W, at 70 meters, in mud with *Sternaspis*.

SELECTED REFERENCES: *Ambo dollfusi* — FAUVEL, 1936*c*: 70-72, fig. 8. *Cirratulus dollfusi* — AMOUREUX, 1971*a*: 12. '*Cirratulus*' *dollfusi* — PETERSEN, 1999: 116. *Timarete dollfusi* — HARTMAN, 1959*a*: 411. *Fauvelicirratulus dollfusi* — ÇINAR & PETERSEN, 2011: 416-417, figs. 2-3.

MATERIAL: FAUNA 1 — St. 5*A*, Alborán Sea, off Veléz-Málaga, 67-68 m, mud: 1 complete specimen with about 185 chaetigers, being 13 cm long and 1.5 cm wide; it fits quite well the descriptions given by FAUVEL (1928, 1936*c*). **St. 6*A***, Alborán Sea, off Nerja, 70-74 m, sand with mud: 1 specimen, complete but in a poorer condition than the anterior one; about 175 chaetigers, being about 8 cm long for 1.5 cm wide; seems more contracted than the specimen from the anterior station.

DISTRIBUTION: Atlantic coast of Morocco; Alborán Sea; Gulf of Taranto (SE Italy); Marmara Sea. In mud. Between 65-800 meters.

REMARKS: Apparently the species was first recorded to be present in the Mediterranean Sea by RULLIER (1963*b*), without giving further indications on the locality.

The species was considered to belong to the genus *Timarete* by HARTMAN (1959*a*), but the description of the species given by FAUVEL (1928, 1936*c*) differed from the current definition of the genus *Timarete* by the absence of acicular spines, with the chaetae being described as numerous long and short yellow capillaries, and acicular spines absent. Branchiae were present as several filaments per notopodium, 5-6 in the anterior region, 2-3 in the middle region, 2 (rarely one) in the posterior region, but their insertion did not shift towards the mid-dorsum in the middle region of the body. FAUVEL (1928: 9) described the branchiae as being "*insérées immédiatement au-dessus de la rame dorsale*", and figure 1*k* in the same publication pictures a semisection of a segment from the posterior region of the body, showing a pair of branchial filaments inserted just above the notopodium.

The specimens studied in the present work matched the descriptions given by FAUVEL (1928, 1936*c*), and the interpretation done of the chaetal structure was that acicular spines were absent. For this reason the species was here considered at first as *incertae sedis*, following PETERSEN (1999), who refered to the species as '*Cirratulus*' *dollfusi*.

Finally ÇINAR & PETERSEN (2011) examined the holotype as well as new material collected at the Marmara Sea, and described the chaetae of the species as being of two types, long and thin capillaries, and straight, tapering spines, erecting the new genus *Fauvelicirratulus* for the species.

*GENUS ***Monticellina*** Laubier 1961

Monticellina LAUBIER, 1961*d*: 601-602.

TYPE SPECIES: *Monticellina heterochaeta* Laubier 1961.

DIAGNOSIS (from BLAKE, 1996*g*): Prostomium long or short, sometimes pointed; peristomium elongated to short, with dorsal tentacles usually arising anterior to chaetiger 1; middle body segments frequently beadlike; posterior segments usually expanded or enlarged; chaetae include capillaries with distinct sawtooth (denticulate) edge, often basally expanded.

REMARKS: The genus was first described by LAUBIER (1961*d*), for *Monticellina heterochaeta*, a species collected near Banyuls-sur-Mer, in the Mediterranean Sea, and placed in the Ctenodrilidae. Later LAUBIER (1966*c*) transferred the genus to the family Cirratulidae, and synonymized it with *Tharyx* Webster & Benedict 1887. Finally BLAKE (1991*g*) reinstated the genus, to include the bipalpated species with capillary chaetae with distinct sawtooth (denticulate) edges.

The identification of specimens belonging to the genus *Monticellina* requires a careful study of the morphology, to which the utilization of methyl green staining patterns gives a good support.

KEY TO SPECIES:

1a. Tube with numerous thin, membranous lateral extensions through which branchiae protrude; thoracic mid-dorsal ridge poorly marked; worms robust...***Monticellina* sp.**
1b. Tube without lateral extensions; thoracic mid-dorsal ridge well marked; worms thin, threadlike...***M. heterochaeta****

****Monticellina heterochaeta*** Laubier 1961

Monticellina heterochaeta LAUBIER, 1961*d*: 602-604, fig. 1.

TYPE LOCALITY: Baie du Troc, Banyuls-sur-Mer (Southern France, Mediterranean Sea), on mud, at 30 meters.

SELECTED REFERENCES: *Tharyx heterochaeta* — LAUBIER, 1966*c*: 631-637. *Monticellina heterochaeta* — PETERSEN, 1999: 115. *Monticellina dorsobranchialis* [not Kirkegaard 1959] — BLAKE, 1991: 24-26 [in part].

REFERENCES FOR PORTUGAL: AMOUREUX, 1987 (as *Tharyx heterochaeta*; off Porto); GIL & SARDÁ, 1999 (southwestern continental shelf); present work (southwestern continental shelf).

MATERIAL: SEPLAT 7 (2nd part) — St. 15 (A.4107), near Lagoa de Santo André, 23 m, sand: 2 specimens; one specimen apparently complete, with 52 chaetigers; palps and branchiae missing; second specimen incomplete, with 44 chaetigers; thoracic region well defined, with 12 chaetigers; insertion of the palps clearly visible; two branchiae present. **St. 196 (A.3916)**, off Sines, 125 m, muddy sand: 1 incomplete specimen, with 19 chaetigers; without chaetae or palps; thoracic region with about 13 chaetigers; dorsal groove visible; chaetae with denticulated edges from chaetiger 15, first at neuropodia, and about 2 segments later, also on notopodia; prostomium pointed, without eyes; peristomium without pseudosegmentation. **FAUNA 1 — St. 1*A***, Gulf of Cádiz, off Huelva, 190 m, mud: 1 incomplete specimen, with 26 chaetigers; chaetae denticulated or serrated, as described by LAUBIER (1961*d*); palps missing; one branchia present at chaetiger 2. **St. 5*A***, Alborán Sea, off Veléz-Málaga, 67-68 m, mud: 1 incomplete specimen, with 17 chaetigers; branchiae present at chaetigers 2, 4, and 7; insertion of the palps clearly visible; dorsal groove clear; proboscis everted, without papillae visible; serrated neurochaetae from chaetiger 15. **St. 14*A***, Alborán Sea, off Castell de Ferro, Granada, 285-290 m, mud: 1 middle fragment with 13 chaetigers; chaetae as in complete specimens. **St. 69*A***, Gulf of Cádiz, off mouth of Guadiana, 110-112 m, mud: 1 fragment with 21 chaetigers; chaetae as described.

DISTRIBUTION: Western and Eastern Mediterranean Sea; Adriatic Sea; Aegean Sea; Southwestern Portugal. On mud. Between 30-70 meters.

REMARKS: This species was first described by LAUBIER (1961*d*) with base on a single specimen, and included in the family Ctenodrilidae due to the presence of denticulated chaetae. Later it was redescribed and positioned in the family Cirratulidae (LAUBIER, 1966*c*), as *Tharyx heterochaeta*, being the genus *Monticellina* Laubier 1960 synonymised with *Tharyx* Webster & Benedict 1887. LAUBIER (1966*c*) approached the species to others of the genus *Tharyx* with capillaries with distinct sawtooth edges. BLAKE (1991) reinstated the genus *Monticellina* for these species and synonymised *M. heterochaeta* with *M. dorsobranchialis* (Kirkegaard 1959), from the western coast of Africa. However, *M. heterochaeta* is to be resurrected (J.A. BLAKE and M.E. PETERSEN, unpublished results *in* BLAKE, 1996*g*). In agreement to these studies, I refer here the Portuguese specimens to this species.

According to LAUBIER (1966*c*), *M. heterochaeta* can be separated from *M. dorsobranchialis* with base on the absence of segmentation on the anterior region of the body (against anterior region formed by 3 segments) and the presence of chaetae in both podia of the posterior region of the body all denticulate (against denticulate chaetae rare). The Mediterranean records of *Tharyx dorsobranchialis* refer probably to this species.

***Monticellina* sp.**

SELECTED REFERENCES: *Tharyx* cf. *tesselata* — DESBRUYÈRES, GUILLE & RAMOS, 1974: 363. *Tharyx tesselata* — CAMPOY, 1982: 706.

DISTRIBUTION: Mediterranean coast of Spain and France; Basque coast (Bay of Biscay). At shelf depths.

REMARKS: This species forms tubes with numerous thin, membranous lateral extensions through which branchiae protrude, like the species *Monticellina tesselata* (Hartman 1960) or *M. baptisteae* Blake 1991. *M. tesselata* was described by HARTMAN (1960: 126-127, pl. 11 figs. 1-4), from 13 miles from Point Concepcion light (California), at 39 fathoms (71.3 meters), in green mud, as was later redescribed by BLAKE (1996*g*: 328-329, fig. 8.27), with base on more material from California. The species is known to occur in central and southern California, in shelf and slope depths (70-167 meters).

M. baptisteae was described by BLAKE (1991: 26-28, fig. 4), being the type locality Georges Bank (Western North Atlantic, off USA), 40º40.1'N, 67º46.1'W, at 80 meters, and is known to occur in the Western North Atlantic, at Massachusetts Bay and Georges Bank, between 70-560 meters. The two North American species can be separated by the fact that *M. tesselata* is much larger (up to 55 mm long, against 6.5 mm in *M. baptisteae*) and has a more conspicuously inflated posterior end.

Probably the European populations belong to a different species from the North American ones, but this requires further investigation, including the comparison of material from the several populations and species involved. Besides, it is not known if the populations from the Mediterranean Sea and the Bay of Biscay belong to the same species or not, or how the Mediterranean population differs from *Monticellina heterochaeta*, besides by its characteristic tube.

GENUS ***Protocirrineris*** Czerniavsky 1881

Protocirrineris CZERNIAVSKY, 1881*b*: 374.

TYPE SPECIES: *Cirratulus tenuisetis* Grube 1860.

DIAGNOSIS (from BLAKE, 1996*g*): Prostomium bluntly conical to wedge-shaped, with or without eyes; body nearly round in cross section, with segments distinct; grooved tentacular filaments few, arising singly or in paired groups on several anterior chaetigers following chaetiger 1; individual tentacular filaments often arranged in longitudinal rows; branchiae occurring singly, usually first present from segments with tentacular filaments, sometimes on more anterior chaetigers; all chaetae capillaries.

REMARKS: The genus *Protocirrineris* was resurrected and partially redefined by PETERSEN (1991).

Protocirrineris chrysoderma (Claparède 1869)

Cirratulus chrysoderma CLAPARÈDE, 1869: 2-6, pl. 23 fig. 4.

TYPE LOCALITY: Gulf of Naples, living in small amounts of mud accumulated among balanids.

SELECTED REFERENCES: *Cirratulus chrysoderma* — FAUVEL, 1927*a*: 95-96; LO BIANCO, 1893: 3-4; RIOJA, 1917*a*: 177. *Protocirrineris chrysoderma* — PETERSEN, 1999: 116, fig. 3*L-N*.

REFERENCES FOR PORTUGAL: PINTO, 1984 (as *Cirratulus chrysoderma*; Sado Estuary); MONTEIRO-MARQUES, 1987 (as *Cirratulus chrysoderma*; continental shelf of Algarve); DEXTER, 1992 (as *Cirratulus chrysoderma*; previous records: continental shelf of Algarve).

DISTRIBUTION: Mediterranean Sea (Bay of Naples, Marseille, Malaga); Aegean Sea. At shallow water (1-2 meters), among ascideans, balanids, rhizomes of *Posidonia*, and in mud.

GENUS ***Raphidrilus*** Monticelli 1910

Raphidrilus MONTICELLI, 1910*b*: 61.

TYPE SPECIES: *Raphidrilus nemasoma* Monticelli 1910.

DIAGNOSIS (from: FAUVEL, 1927*a*; MAGALHÃES, BAILEY-BROCK & DAVENPORT, 2011): Body long, with 18 to 35 segments; prostomium with scarse ventral ciliation; peristomium obviously dilimited from prostomium and first achetous segment both dorsally and ventrally; nuchal organs as shallow depressions with cilia; palps absent; 1-2 dorsally biannulated achaetous segments between peristomium and first chaetiger; posterior end indistinct from posterior segments; pharyngeal bulb well developed; heart-body always present from chaetiger 4; larval branchiae disappear in adults; serrate capillaries in all segments, more abundant anteriorly; males with smooth curved spines in some segments; sexual and asexual reproduction present.

REMARKS: MAGALHÃES, BAILEY-BROCK & DAVENPORT (2011) present a key for all the species of *Raphidrilus*.

Raphidrilus nemasoma Monticelli 1910

Raphidrilus nemasoma MONTICELLI, 1910*a*: 61-64.

TYPE LOCALITY: Gulf of Naples.

SYNONYMS: *Ctenodrilus branchiatus* Sokolow 1911.

SELECTED REFERENCES: *Raphidrilus nemasoma* — MONTICELLI, 1910*b*: 403-406, pls. 12-13; FAUVEL, 1927*a*: 111, fig. 39*a-f*; BANSE, 1959*d*: 307; GEORGE & PETERSEN, 1991: 97-98 [under *Zeppelina branchiata* Sokolow 1911]; MAGALHÃES, BAILEY-BROCK & DAVENPORT, 2011: 4-5, fig. 1, tables 1-2.

Ctenodrilus branchiatus — SOKOLOW, 1911*a*: 548-565., pls. 27-29; KORSCHELT, 1919: 640-642, pl. 26 fig. 40. *Zeppelinia branchiata* — SOKOLOW, 1911*a*: 597-598. Not *Raphidrilus nemasoma* — HARRIS, 1971: 706, fig. 14 [= juvenile *Dodecaceria* sp. (see PETERSEN & GEORGE, 1991: 205)].

DISTRIBUTION: Mediterranean Sea, including the Ligurian, Tyrrhenian and northern Adriatic seas. On *Amphioxus* sand and *Caulerpa racemosa*. At shallow water.

REMARKS: SOKOLOW (1911*a*) described *Ctenodrilus branchiatus* from the Mediterranean Sea as a new species, but later in the same year (SOKOLOW, 1911*b*) the species was synonymized with *Raphidrilus nemasoma* Monticelli 1910.

GENUS ***Raricirrus*** Hartman 1961

Raricirrus HARTMAN, 1961: 114.

TYPE SPECIES: *Raricirrus maculatus* Hartman 1961.

DIAGNOSIS (from PETERSEN & GEORGE, 1991): Peristomium not obviously delimited from prostomium or chaetiger 1 dorsally, only poorly delimited laterally and ventrally; nuchal organs flat oval areas surrounded by fields of cilia; peristomium and first few segments with ventral cilia; last 6-9 segments shorter than preceding ones, forming a distinct posterior region; branchiae simple, filamentous, of similar width throughout; heart body in variable number of anterior and middle segments, first present in chaetiger 8, 9 or 10; notochaetae serrated capillaries, natatory capillaries, and in posterior region also relatively straight coarsely serrate forms; neurochaetae falcate and finely pectinate, in posterior region grading into broader, falcate, coarsely, serrate forms; simple curved spines sometimes replacing most or all normal chaetae in 1-2 posterior segments; reproduction sexual and asexual.

REMARKS: The genus definition was emended by PETERSEN & GEORGE (1991), in order to include a new species, *Raricirrus beryli*.

Raricirrus beryli Petersen & George 1991

Raricirrus beryli PETERSEN & GEORGE, 1991: 193-202, figs. 4-7.

TYPE LOCALITY: Northern North Sea: Beryl Oilfield, 59º32.59'N, 01º32.26'E, 100-115 meters.

SELECTED REFERENCES: *Raricirrus beryli* — MOORE, 1991: 478-483, figs. 1-4, tables 1-2; HARTMANN-SCHRÖDER, 1996: 406.

DISTRIBUTION: Northern North Sea, off western Norway; Skagerrak; Clyde Sea area. On fine sediments with organic enrichment or hydrocarbon pollution. Between 60-300 meters.

GENUS ***Tharyx*** Webster & Benedict 1887

Tharyx WEBSTER & BENEDICT, 1887: 741-742.

TYPE SPECIES: *Tharyx acutus* Webster & Benedict 1887.

DIAGNOSIS (from BLAKE, 1996*g*): Prostomium conical; peristomium elongate, with pair of grooved dorsal tentacles arising anterior to chaetiger 1; first pair of branchiae frequently on peristomial segment, arising immediately posterior to dorsal tentacles; abdominal segments sometimes beadlike; chaetae including simple capillaries and acicular spines with irregular notched tips, appearing more or less bidentate with a pair of stunted or rounded knobs, but never with distinct, sharply pointed teeth.

REMARKS: BLAKE (1991) found that the type species of the genus *Tharyx*, *T. acutus* Webster & Benedict 1887, had knob-tipped hooks or spines in addition to capillaries. According to this, the definition of the genus *Tharyx* Webster & Benedict 1887 was emended by BLAKE (1991), in order to include bipalpated species with simple capillaries and acicular spines with irregular knobbed tips, while the species with simple and serrated capillaries were moved to the genera *Aphelochaeta* and *Monticellina*, respectively.

Tharyx killariensis (Southern 1914)

Chaetozone killariensis SOUTHERN, 1914: 113-115, pl. 12 fig. 28.

TYPE LOCALITY: Killary Harbour (west coast of Ireland), in 7 fathoms (12.8 meters), in rich black mud.

SELECTED REFERENCES: *Chaetozone killariensis* — MCINTOSH, 1923*a*: 491, pl. 136 fig. 13. *Heterocirrus Killariensis* — FAUVEL, 1927*a*: 97-98, fig. 34*d-h*. *Caulleriella killariensis* — ELIASON, 1962*b*: 266-267; HARTMANN-SCHRÖDER, 1971*a*: 355; KIRKEGAARD, 1996: 130-131, fig. 63. *Tharyx* *killariensis* — BLAKE, 1991: 19; HARTMANN-SCHRÖDER, 1996: 399-400, fig. 192; PETERSEN, 1999: 116, table 2. *Tharyx marioni* [not Saint-Joseph 1894] — FARKE, 1979: 74-97, fig. 6-11.

DISTRIBUTION: Kattegat; Skagerrak; North Sea; West Ireland; Mediterranean Sea; Adriatic Sea. In mud and sandy mud. Intertidal to 488 meters.

REMARKS: According to SOUTHERN (1914), the segment on which the hooks first appear is variable in position. In the largest specimen studied by him, the first neuropodial hook appeared in the 56th segment, and the first notopodial hook at segment 61. The hooks were stated to "*resemble the short capillary chaetae in shape, except that the tip is curved and bifid.* (...) *The tip of the crochets is curved, and the two points diverge at a very wide angle*" (SOUTHERN, 1914: 115). As remarked by BLAKE (1996*g*), in *Tharyx* the spines have poorly developed teeth on the hooks, against the sharply pointed and well developed teeth of the genus *Caulleriella*, reason why this species is considered as belonging to *Tharyx*.

Tharyx killariensis is at present the single species of the genus known to occur in the European waters. Besides its characteristic spines with irregular knobbed tips, it is a blind species, with branchiae from the last achaetigerous segment, neurohooks from chaetiger 40-56, and notohooks from about chaetiger 61, being like short bifid capillary chaetae.

GENUS *Timarete* Kinberg 1866

Timarete KINBERG, 1866*b*: 254.

TYPE SPECIES: *Cirratulus anchylochaetus* Schmarda 1861.

SYNONYMS: *Ambo* Chamberlin 1918.

DIAGNOSIS (from BLAKE, 1996*g*): Prostomium wedge-shaped, with or without eyes; body nearly round in cross section, with segments distinct; grooved tentacular filaments arising in 2 groups from dorsum of 2 or more anterior chaetigers, posterior to chaetiger 1; branchiae occurring singly or with several filaments per parapodium, individual branchial filaments robust, becoming more dorsal in origin in middle body segments, with each sometimes forming dorsolateral bulge over notopodium; chaetae including capillaries and acicular spines.

Timarete punctata (Grube 1859)

Cirrhatulus punctata GRUBE, 1859: 107.

TYPE LOCALITY: St. Croix, Virgin Islands, Caribbean Sea.

SYNONYMS: *Cirrhatulus nigromaculatus* Grube 1869; *Cirratulus nigromaculata* Treadwell 1901 [homonym; not Grube 1869]; *Cirratulus niger* Hartman 1939.

SELECTED REFERENCES: *Cirratulus punctatus* — AUGENER, 1918: 465-467. *Audouinia punctata* — TEBBLE, 1955: 126-127. *Cirriformia punctata* — HARTMAN, 1956: 292; DAY, 1962: 648; HARTMANN-SCHRÖDER, 1965*a*: 148-149; HARTMAN, 1966*a*: 227; DAY, 1967: 517, fig. 20.4.*j-m*; GIBBS, 1971: 179; FAUCHALD, 1977*b*: 50; HARTMANN-SCHRÖDER, 1992*b*: 71. *Timarete punctata* — PETERSEN, 1999: 116, fig. 3*M*; ÇINAR, 2007*b*: 757-763, figs. 1-6. *Cirrhatulus nigromaculatus* — GRUBE, 1870*e*: 504-505. *Cirratulus nigromaculata* [not Grube 1859] — TREADWELL, 1901: 204, fig. 66; TREADWELL, 1939*b*: 273, fig. 88. *Cirratulus niger* — HARTMAN, 1939*b*: 17-18, fig. 3*l*. *Cirriformia semicincta* [not *Cirratulus semicinctus* Ehlers 1905] — LAUBIER, 1966*d*: 16.

DISTRIBUTION: Pacific coast of Central America; Caribbean; Bermuda; Puerto Rico; NE and SE Brazil; West Africa; South Africa; Mozambique; Madagascar; Red Sea; Solomon Islands; Polynesian Islands; Lizard Island, Great Barrier Reef (Australia); Hawaiian Islands; Levantine coast of Turkey and Lebanon, Eastern Mediterranean Sea. At shallow water, in hard surfaces and coral sand between stones.

REMARKS: *Timarete punctata* has a characteristic colour pattern, with a background colour dark brownish, with black irregular spots on dorsal and ventral body surface. Besides, the acicular spines are present from chaetiger 6 on neuropodium, and chaetiger 8 on notopodium, and one single branchiae is present per notopodium.

ÇINAR (2007) states that the presence of *Timarete punctata* in the Levantine Sea but not in the rest of the Mediterranean Sea suggests that it could be a Lessepsian species. However, some of the details presented by ÇINAR (2007) indicate that the species cannot be considered as a real Lessepsian migrant according to the definitions given by POR (1973, 1978). First of all, the known distribution of the species (material studied by the author from Caribbean Sea, Indian coast of South Africa, and Mediterranean Sea, and previous records of the species covering the western and eastern Atlantic, the western Indian Ocean, and the Pacific Ocean, together with a possible record from the Red Sea) indicate not only a circumtropical, but also a circumafrican distribution. Second, there is a probable record of the species from the Red Sea (GRUBE, 1870*e*), but so far it is not known from the vicinity of the Canal. Third, the fact that the species was not found in the rest of the Mediterranean Sea does not mean that it is not present. Even for the Levantine Sea, there is a possible first record of the species from the coast of Lebanon in 1965 (LAUBIER, 1966*d*), and the second record was made only 42 years later, by ÇINAR (2007). Fourth, the finding of the species in a port structure such as a submerged tyre at Çevlik Harbour (Turkey), gives more support to the possibility of an introduced species than to a Lessepsian migrant. Anyway, for the moment there is no evidence supporting any of the two hypotheses. Finally, and as in many similar cases, the wide distribution of the species could indicate the presence of a complex of sibling species. Many times these complexes of sibling species need molecular techniques to unveil the sibling species present. In the same way, molecular techniques seem to be an excellent method to confirm or reject the alien condition of presumably introduced, fouling or Lessepsian species, when there is no direct evidence of such condition.

FAMILY **COSSURIDAE** Day 1963

AS: *COSSURIDAE* DAY, 1963*b*: 426.

TYPE GENUS: *Cossura* Webster & Benedict 1887.

REMARKS: The family Cossuridae includes three described genera, *Cossura* Webster & Benedict 1887, *Cossurella* Hartman 1974, and *Heterocossura* Wu & Chen 1977. GARDINER & WILSON (1979) synonymized *Heterocossura* with *Cossurella*, while READ (2000) did not consider *Cossurella* as a valid genus, synonymising it with *Cossura*. This way, the family Cossuridae is now monogeneric, including 23 species. *Cossura lepida* Tamai 1986, described from South Japan, at 2 meters, was considered as a junior synonym of *C. pygodactylata* Jones 1956, by HILBIG (1996). On the other side, GRANADOS-BARBA & SOLÍS-WEISS (1997) proposed the synonymy between *C. delta* Reish 1958 and *C. soyeri* Laubier 1963, but this synonymy was not accepted by READ (2000), who found both species to be distinct, and this opinion will be followed here.

HARTMAN (1974*a*) created the "*new name*" *Cossura dayi* to include the specimens identified by DAY (1963*b*, 1967) as *Cossura coasta* Kitamori 1960, from the west and south coasts of Cape Province in South Africa (143-320 meters), other records from South-west Africa, and Natal (both between 100-499 meters), and her own specimens from the Arabian Sea and Bay of Bengal (1.5-37 meters). However, more than giving Day's specimens a new name, HARTMAN (1974*a*) described the South African and Indian Ocean specimens as a new species. She didn't designate a type specimen, but clearly stated that the species was "*originally named from Cape Province, South Africa*" (HARTMAN, 1974*a*: 234), and the "*new name*", *C. dayi*, visibly demonstrates Hartman's will to create a new taxon with base on the South African specimens described by Day. This way, and in order to stabilize the definition of *C. dayi* against the possibility that more than one species of *Cossura* is present among the specimens designated by HARTMAN (1974*a*) as *C. dayi*, the type locality is considered here as being Cape Province, South Africa.

The genus *Cossura* was divided in three groups by FOURNIER & PETERSEN (1991), according to the chaetiger where the dorsal branchial filament arises (chaetiger 2, chaetiger 3, or chaetiger 4 and between chaetiger 4 and 5), while EWING (1987) did the same in *Cossurella* (between chaetigers 2 and 3, or between chaetigers 3 and 4). Other characters normally used to separate species are the structure and distribution of the chaetae, number of thoracic chaetigers, the apparent number of achaetigerous buccal segments, the presence and number of uniramous chaetigers, or the structure of the pygidium, when known (EWING, 1987; FOURNIER & PETERSEN, 1991). HILBIG (1996) proposed the use of the methyl green staining patterns to discriminate species, as these patterns are concentrated in the anterior region of thorax and allow the identification of taxa even if the abdomen is missing, which is the normal situation due to the fragility of these worms.

Important recent taxonomic papers on the family include EWING (1987), FOURNIER & PETERSEN (1991), HILBIG (1996), and READ (2000). Dichotomic keys for hitherto known species can be found in LAUBIER (1963), FAUCHALD (1972*a*), and ORENSANZ (1976), while comparative tables can be found in LAUBIER (1963), FOURNIER & PETERSEN (1991), and READ (2000).

In European waters four species have been so far recorded (see below), but none was found among the studied material.

GENUS ***Cossura*** Webster & Benedict 1887

Cossura WEBSTER & BENEDICT, 1887: 743.

TYPE SPECIES: *Cossura longocirrata* Webster & Benedict 1887.

SYNONYMS: *Cossurella* Hartman 1974; *Heterocossura* Wu & Chen 1977.

REMARKS: *Cossura* specimens have the body divided in two different regions, the thoracic and the abdominal. FOURNIER & PETERSEN (1991), commented the way to distinguish both regions in *C. longocirrata*: the first region, the thorax, is characterized by short crowded segments with chaetae emerging very close to the anterior margin of each chaetiger, and a deep dorsal groove running from the base of the filament to the first of the moniliform abdominal segments; the transition from the thorax to the abdomen regions can be abrupt, with a distinct change from one chaetiger to the next, while in other specimens the transition is more gradual. *Cossura* specimens, however, tend to autotomize within a few segments between the thorax and the abdomen, reason why it is generally difficult to obtain complete specimens, and many of the known species were described from incomplete worms, being the structure of the pygidium unknown. However, all the pygidia so far described, with one single exception, bear 3 long anal cirri, being 2 dorsal and 1 ventral. The exception is *Cossura pseudakaina* (Ewing 1987), with 1 single short cirrus, plus intercirral papillae or processes (READ, 2000). The number of these intercirral processes or papillae varies with the species.

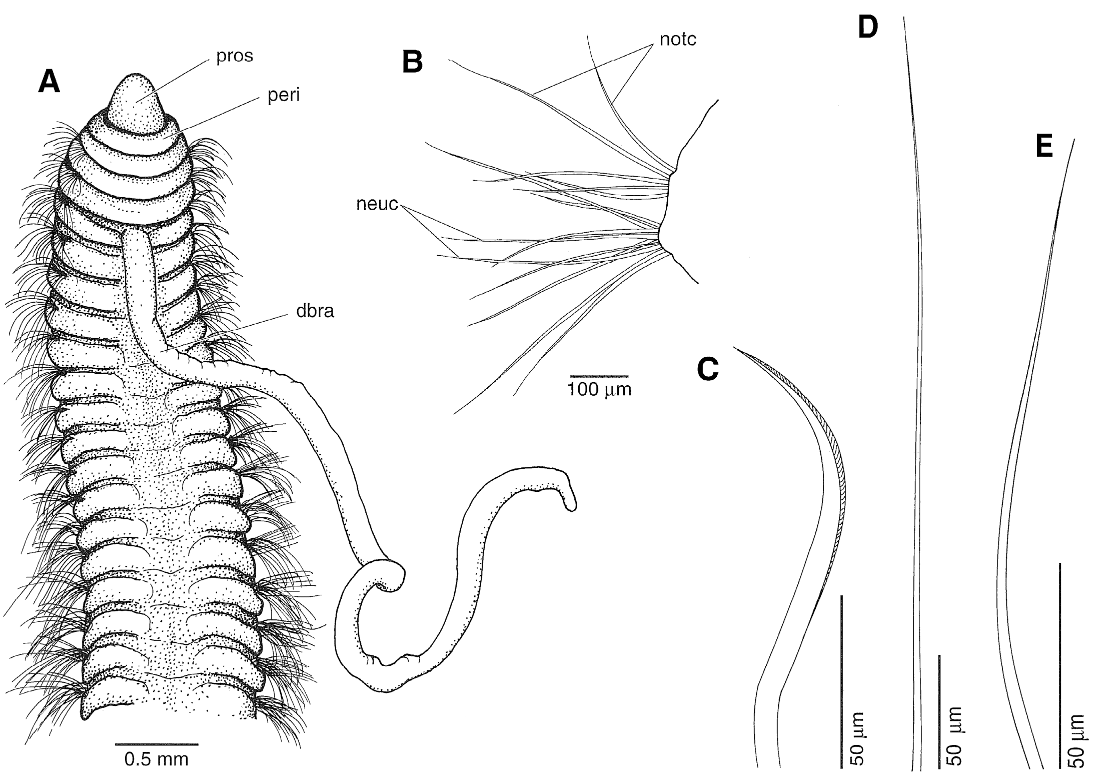

Figure legend: Family Cossuridae. *Cossura* specimen. **A**, anterior end, dorsal view; **B**, parapodium of chaetiger 18, anterior view; **C**, neurochaeta from parapodium of chaetiger 8; **D**, neurochaeta from parapodium of chaetiger 23. **E**, posterior abdominal chaeta. **dbra**, dorsal median branchia; **neuc**, neurochaeta; **notc**, notochaetae; **peri**, peristomium; **pros**, prostomium. (Adapted from BEESLEY, ROSS & GLASBY, 2000; drawings by A. Murray).

KEY TO SPECIES:

(data from FOURNIER & PETERSEN, 1991; READ, 2000)

1a. Dorsal branchial filament arising from posterior region of chaetiger 2; pygidium with 3 long unbranched anal cirri..........**2**
1b. Dorsal branchial filament arising from midlength of chaetiger 3; pygidium with 3 long branched anal cirri, with bifid tips..........***C. coasta***

2a (1a). Thorax with 20-31 chaetigers; 7 buccal tentacles..........***C. soyeri***
2b (1a). Thorax with about 15-21 chaetigers..........**3**

3a (2b). 16-21 thoracic chaetigers; pygidium without anal intercirral processes; 10 buccal tentacles..........***C. longocirrata***
3b (2b). 13-21 thoracic chaetigers; pygidium with 12-20 intercirral processes; 4-8 buccal tentacles..........***C. pygodactylata***

Cossura coasta Kitamori 1960

Cossura coasta KITAMORI, 1960: 1082-1083, fig. 1.

TYPE LOCALITY: Seto-Island Sea, South Japan, costal bottom.

SELECTED REFERENCES: *Cossura coasta* — [?] DAY, 1963*b*: 427; [?] DAY, 1967: 581-582, fig. 21.1; [?] BOGDANOS & FREDJ, 1983: 7-13; FOURNIER & PETERSEN, 1991: table 1; READ, 2000: table 1.
DISTRIBUTION: Known from South Japan, from the "coastal bottom". [?] Aegean Sea (Saronikos Gulf and Pagasitikos Gulf), between 15-92 meters, on muddy bottoms; [?] Ionian Sea (Gulf of Patras), between 32-59 meters, on muddy bottoms; [?] West and South coasts of Cape Province, and Natal, South Africa, between 143-320 meters, on muddy bottoms.
REMARKS: BOGDANOS & FREDJ (1983) identified as *C. coasta* numerous specimens collected at the Ionian and Aegean Seas (Eastern Mediterranean). This identification was based mainly on the insertion of the dorsal branchial filament on chaetiger 3, and the presence of two achaetigeous peristomial segments, followed by one uniramous chaetiger. The authors used the key and table of *Cossura* given in LAUBIER (1963), where *C. coasta* is stated to have the first chaetigerous segment uniramous, in spite of being described as biramous by KITAMORI (1960), but with both bundles close to each other, forming an almost continuous fan. This error led BOGDANOS & FREDJ (1983) to identify their specimens as *C. coasta*. Besides, the same authors stated that the Eastern Mediterranean specimens showed the posterior region as pictured by DAY (1967: fig. 26.1.*c*), with three long filiform anal cirri, while the Japanese specimens were described as having the anal cirri with bifid tips. Finally, another difference is the presence in the Japanese specimens of short and stiff capillaries, very spinous along the outer edge, while in both Mediterranean and South African specimens the chaetae are all described as capillary.

The records of *C. coasta* from the Eastern Mediterranean and South Africa are very dubious, and almost with confidence should be referred to other species (a single one or several), already described or not. Any European specimen that can be keyed to *C. coasta* should have that identification confirmed with base on the comparison with the original description (KITAMORI, 1960), or the available comparative tables of species (FOURNIER & PETERSEN, 1991; READ, 2000).

Cossura longocirrata Webster & Benedict 1887

Cossura longocirrata WEBSTER & BENEDICT, 1887: 743, pl. 8 figs. 105-107.
TYPE LOCALITY: Eastport, Maine (U.S.A.), on mud and sandy mud, at 6-12 fathoms (11-22 meters).
SELECTED REFERENCES: *Cossura longocirrata* — ELIASON, 1920: 58-59, fig. 17; THULIN, 1921: 3-6, figs. 1-6; WESENBERG-LUND, 1950*a*: 34, chart 43, pl. 8 fig. 36; FOURNIER & PETERSEN, 1991: 65-77, figs. 1-2, tables 1-2; HARTMANN-SCHRÖDER, 1996: 401, fig. 193; KIRKEGAARD, 1996: 150-152, fig. 76.
DISTRIBUTION: Northwestern Atlantic Ocean: Maine, New Brunswick, Nova Scotia, Newfoundland, Quebec, Northwest Territories; Northeastern Atlantic Ocean: between Iceland and the Faroes, Denmark (Øresund, Kattegat); Canadian Arctic. Cold-temperate arctic-boreal species, inhabiting sublittoral and shelf depths between 7-887 meters, mainly on bottoms of silty sand or silt-clay.

Cossura pygodactylata Jones 1956

Cossura pygodactylata JONES, 1956: 127-130, fig. 1.
TYPE LOCALITY: Off Point Richmond, San Francisco Bay, South California, 1-9 meters.
SELECTED REFERENCES: *Cossura pygodactylata* — FOURNIER & PETERSEN, 1991: table 1; BACHELET & LAUBIER, 1994: 357-364, figs. 1-4, table 1; HILBIG, 1996: 398-400, fig. 9.6; MOREIRA, QUINTAS & TRONCOSO, 1999: 25-27, fig. 1. *Cossura soyeri* [not Laubier 1963] — GARDINER & WILSON, 1979: 169, fig. 4*a-c*.
DISTRIBUTION: Pacific coast of USA, from British Columbia to Southern California; Japan; Atlantic coast of USA, from Cape Hatteras to South Carolina; English Channel, Western France, Bay of Biscay, and Galicia (NW Spain); [?] Disko Bay, West Greenland. Mainly between 1-30 meters, but recorded from 1720 meters, mostly on muddy bottoms, from silt to muddy sand.
REMARKS: FOURNIER & PETERSEN (1991) observed that specimens belonging to *C. pygodactylata* species-group appeared to be present in the North Atlantic, namely at the Plymouth Sound, West Greenland and Arcachon Bay. This observation was confirmed by BACHELET & LAUBIER (1994), who revised the type material and material from several records of *C. pygodactylata*, *C. longocirrata*, and *C. soyeri*. *C. pygodactylata* was confirmed to be present in the English Channel and the Arcachon Bay, while other records (West Greenland, Bay of Biscay or Bay of Morlaix) were tentatively attributed to this species.

Cossura soyeri Laubier 1963

Cossura soyeri LAUBIER, 1963: 833-838, fig. 1.
TYPE LOCALITY: Off Baie du Troc (Banyuls-sur-Mer, Western Mediterranean), at 35 meters, on mud.

SELECTED REFERENCES: *Cossura soyeri* — EWING, 1984*b*: 4.6, figs. 4.3-4.4; PARAPAR, BESTEIRO & URGORRI, 1995: 106, fig. 1*A*; FOURNIER & PETERSEN, 1991: table 1; BACHELET & LAUBIER, 1994: 364-365, fig. 5, table 1; READ, 2000: table 1. Not *Cossura soyeri* — GARDINER & WILSON, 1979: 169, fig. 4*a-c* [= *Cossura pygodactyla* Jones 1956 (see BACHELET & LAUBIER, 1994)].

REFERENCES FOR PORTUGAL: [?] AMOUREUX, 1987 (as *Cossura* cf *soyeri*; off Aveiro; off Porto).

DISTRIBUTION: Western Mediterranean Sea and Adriatic Sea, on muddy bottoms, between 12-35 meters; Aegean Sea; Northern Spain (Guipúzcoa and and Galicia), 8-100 meters, in muddy and sandy bottoms; Northern Gulf of Mexico, 21-189 meters, in sandy and muddy bottoms; [?] Celtic Sea, Banc Le Danois, and off Portugal, 450-1500 meters.

REMARKS: According to the description by GARDINER & WILSON (1979) of the specimens from the Gulf of Mexico, the pygidium of *Cossura soyeri* would present 4 intercirral small papillae, besides the 3 long anal cirri. This data was repeated by FOURNIER & PETERSEN (1991) in their table of species. However, BACHELET & LAUBIER (1994), after the examination of one complete specimen of *C. soyeri* collected near the type locality, found that the pygidium presents only 3 anal cirri, without additional intercirral papillae. Furthermore, the same authors revised specimens from different collections identified as *C. soyeri*. The specimens identified by GARDINER & WILSON (1979) as *C. soyeri*, from North Carolina, were found to belong to *C. pygodactyla*, as well as a record by BANSE (1981) from Washington, Pacific coast of USA., and quite probably several records from the Basque Country coast (Spain), and Bay of Morlaix (France).

*FAMILY **DORVILLEIDAE** Chamberlin 1919

AS: *DORVILLEIDAE* CHAMBERLIN, 1919*a*: 338-339.

TYPE GENUS: *Dorvillea* Parfitt 1866.

SYNONYMS: *STAUROCEPHALEA* Kinberg 1865; *PSEUDOPHYLLODOCIDAE* Bidenkap 1895; *DINOPHILIDAE* Schultz 1902; *IPHITIMIDAE* Fauchald 1970; *DIURODRILIDAE* Kristensen & Niilonen 1982.

REMARKS: The family definition is here considered as emended by EIBYE-JACOBSEN & KRISTENSEN (1994).

The family Dinophilidae Schultz 1902, including the genera *Dinophilus* O. Schmidt 1848, *Trilobodrilus* Remane 1925, and *Apharyngtus* Westheide 1971, were included in the Dorvilleidae by EIBYE-JACOBSEN & KRISTENSEN (1994), together with the family Iphitimidae Fauchald 1970. However, recent molecular analysis did not support the progenetic origin of Dinophilidae within Eunicida (STRUCK, HALANYCH & PURSCHKE, 2005), and the position of the Dinophilidae among the Dorvilleidae has been questioned by several authors (see WESTHEIDE, 2008). Relationships of Dinophilidae with other groups of Polychaeta or Clitellata have been suggested, but so far they have not been supported by further evidences. The phylogenetic position of Dinophilidae within the Annelida remains, this way, uncertain. The Dinophilidae is here maintained within the Dorvilleidae, but it is possible that the family will be re-established shortly. Finally, in case that both families are synonymous, the name Dinophilidae would have priority, as it is an older name, as pointed by WESTHEIDE (2008).

The family Diurodrilidae was established by KRISTENSEN & NIILONEN (1982), and included minute, soft-bodied worms, adapted to life in interstitial waters. The family includes a single genus, *Diurodrilus*, with 6 valid species. No diurodrilid was found in the present study, but four of the known species were described from Europe, and a fifth one from Western Greenland. Recent taxonomic accounts on the family include KRISTSENSEN & NIILONEN (1982), with dichotomic and pictorial keys for all the described species, and WESTHEIDE (1990, 2008). When first described, for *Diurodrilus minimus*, the genus *Diurodrilus* was placed within the Dinophilidae by REMANE (1925). Later, KRISTENSEN & NIILONEN (1982), argued that the genus was so aberrant that it should be placed in a new family, the Diurodrilidae, with no obvious relationship to other families. The phylogenetic relationships to other families remained unclear in a posterior study by KRISTENSEN & EIBYE-JACOBSEN (1995), based on the sperm ultrastructure of *Diurodrilus*.

After performing a cladistic analysis of the Polychaeta, ROUSE & FAUCHALD (1997) suggested that the Diurodrilidae was likely to be a member of the Eunicida (as *incertae sedis*), instead of a plesiomorphic clade of the Annelida. ROUSE (2000*a*) argued that the unusual features of the group were emphasised by KRISTSENSEN & NIILONEN (1982), while the similarities with *Dinophilus* were disregarded. The previous placement of *Dinophilus* among the Dorvilleidae by EIBYE-JACOBSEN & KRISTENSEN (1994) gave further support to the argument of *Diurodrilus* being a possible dorvilleid. Finally, PLEIJEL (2001*i*) included the genus *Diurodrilus* in the family Dorvilleidae, with base on the following arguments: (1) a ventral pharyngeal organ is present that may indicate affinity with the Eunicida; (2) the sperm exibits similarities to *Apodotrocha*, a dorvilleid genus; 3) in some *Diurodrilus* there seems to be a posterior copulatory organ that may be homologous with that in *Dinophilus*, at present another dorvilleid genus. However, the same author stated that further studies on the matter are required.

HØISÆTER & SAMUELSEN (2006) remarked the great similarity between *Iphitime* and *Ophryotrocha*, especially if we take into acccount that the branchiae may be an inappropriate diagnostic character, as they may lack in juveniles and some males of certain species of *Iphitime*. The same authors also commented the possibility to reinstate Iphitimidae as a family containing both genera and a small number of related taxa, a possibility already argued by ORENSANZ (1990) but rejected by EIBYE-JACOBSEN & KRISTENSEN (1994). HEGGØY, SCHANDER & ÅKESSON (2007) performed a phylogenetic study of *Ophryotrocha* using molecular data from mitochondrial 16S and cytochrome c oxidase I (COI), and included a species of the genus *Iphitime* in the analysis, *I. paguri* Fage & Legendre 1934. As a result *I. paguri* was placed within the *Ophryotrocha* clade, indicating that probably the two genera are synonymous. However, as the type species of the genus *Iphitime*, *I. doederleinii* Marenzeller 1902, was not investigated, a formal synonymy between the two genera could not be made. WIKLUND, GLOVER & DAHLGREN (2009) performed further phylogenetic studies of *Ophryotrocha*, using the nuclear gene H3 and the mitochondrial genes COI and 16S. Besides 18 species of *Ophryotrocha* and seven outgroup taxa, the study also included two species of *Iphitime*, namely *I. paguri* and *I. hartmanae* Kirkegaard 1977, and two species of the close genus *Palpiphitime*, *P. lobifera* (Oug 1978), which ORENSANZ (1990) moved originally to the new genus from *Ophryotrocha*, and *P. lipovskyae* Paxton 2009. As a result of the analysis, the studied species of the genera *Iphitime* and *Palpiphitime* were nested inside the *Ophryotrocha* clade. As a consequence, the only way of maintaining *Palpiphitime* and *Iphitime* as valid genera would be by further dividing the *Ophryotrocha* into several more genera, as otherwise this genus would be paraphyletic (WIKLUND, GLOVER & DAHLGREN, 2009). Finally, the genus *Palpiphitime* was synonymized with *Ophryotrocha* by WIKLUND, GLOVER & DAHLGREN (2009), but once again the formal synonymy of *Iphitime* with *Ophryotrocha* required the analysis of the type species of the genus, *I. doederleini* Marenzeller 1902, which was not performed. In the text below, the genus *Iphitime* will be considered under the genus *Ophryotrocha*, as a possible synonymy, and the species *Iphitime paguri* and *I. hartmanae*, the species used in the cited phylogenetic studies, considered as being *Ophryotrocha*, as there are evidences that these species should be placed in that genus. *Iphitime cuenoti* Fauvel 1914 quite probably also belongs to *Ophryotrocha*, but as no phylogenetic study has been so far performed with it, is only considered as belonging probably to *Ophryotrocha*, without making a new combination.

Another problem is the location of the genus *Pettiboneia* Orensanz 1973, as according to molecular studies (STRUCK, WESTHEIDE & PURSCHKE, 2002; STRUCK & PURSCHKE, 2005; STRUCK, PURSCHKE & HALANYCH, 2006) it is more close to the Lumbrineridae than to the other Dorvilleidae included in the same studies. Again, for the moment *Pettiboneia* will be considered here as belonging to the Dorvilleidae.

BLAKE (1979) excluded the genus *Apophryotrocha* Jumars 1974, with *A. mutabiliseta* Jumars 1974 as the type species, from the Dorvilleidae, pointing that it is represented by juvenile specimens of Onuphidae. This opinion is followed here.

The family Dorvilleidae (considered here to comprise the Dinophilidae and the Diurodrilidae) includes at present 32 genera, with about 173 species. In the European and nearby waters, 16 genera are known to occur, including 67 species and one subspecies, with two more possible new species being also present, as well as a new species still undescribed but designated by a *nomen nudum*. In the studied material only two species were present, representing two different genera.

KEY TO GENERA:

(adapted from EIBYE-JACOBSEN & KRISTENSEN, 1994)

1a. Notopodia with notoacicula present..**2**
1b. Notopodia and notoacicula absent..**6**

2a (1a). Notopodia on anterior chaetigers only; neuropodial branchiae can be present or absent; maxillary carriers and superior basal plates absent; antennae simple; inferior free denticles absent; furcate chaetae present..***Pettiboneia***
2b (1a). Notopodia on most chaetigers; neuropodial branchiae absent..**3**

3a (2b). Anterolateral accessory mandibular teeth present; pygidium with 4 anal cirri, without pygidial stylus; furcate chaetae present or absent..**4**
3b (2b). Mandibles without accessory teeth; pygidium with 2 anal cirri and pygidial stylus; furcate chaetae usually present..**5**

4a (3a). Furcate chaetae absent..***Dorvillea****
4b (3a). Furcate chaetae present..***Schistomeringos***

5a (3b). Maxillary carriers present; ventral neuropodial chaetal lobe absent..***Ougia***
5b (3b). Maxillary carriers absent; ventral neuropodial chaetal lobe present or absent..***Parougia***

6a (1b). Furcate chaetae present..**7**
6b (1b). Furcate chaetae absent..**8**

7a (6a). Palps long, with distal palpostyles; dorsal cirri present..***Protodorvillea****
7b (6a). Palps short, biarticulate; dorsal cirri absent..***Marycarmenia***

8a (6b). Adults with more than 20 segments between peristomium and pygidium (except in some *Ophryotrocha*); chaetae present..**9**
8b (6b). Adults with 20 or fewer segments between peristomium and pygidium (except in some *Ophryotrocha*); chaetae present or absent..**10**

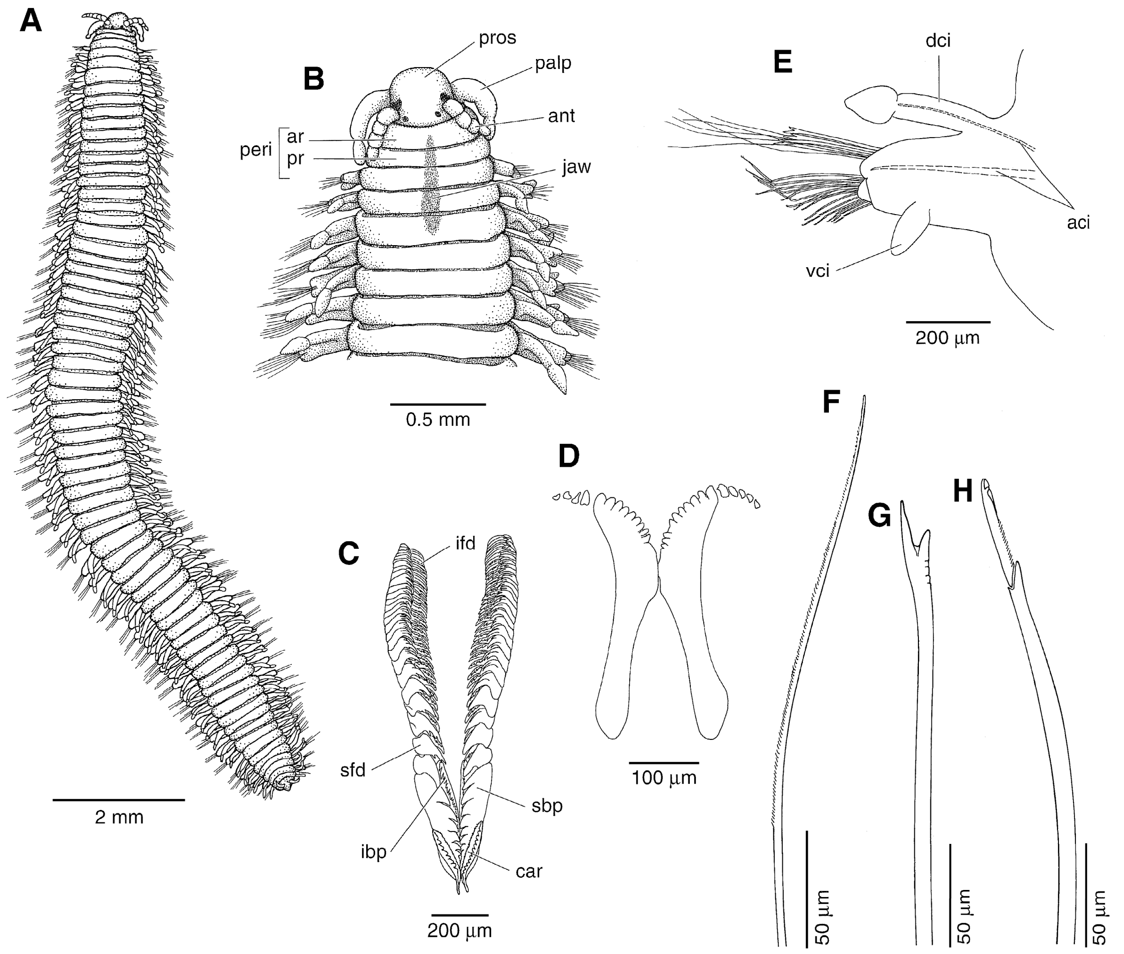

Figure legend: Family Dorvilleidae. *Schistomeringos* specimen. **A**, entire animal, dorsal view. **B**, anterior end, dorsal view. **C**, **D**, jaw parts: **C**, maxillae, dorsal view; **D**, mandibles, ventral view. **E**, parapodium from chaetiger 10, anterior view. **F**-**H**, chaetae from parapodium of chaetiger 10: **F**, simple chaeta; **G**, furcate chaeta; **H**, compound falciger. **aci**, aciculae; **ant**, antenna; **ar**, anterior ring; **car**, carrier; **dci**, dorsal cirrus; **ibp**, inferior basal plate; **ifd**, inferior free denticle; **jaw**, jaw apparatus; **palp**, palp; **peri**, peristomium; **pr**, posterior ring; **pros**, prostomium; **sbp**, superior basal plate; **sfd**, superior free denticle; **vci**, ventral cirrus. (Adapted from BEESLEY, ROSS & GLASBY, 2000; drawings by A. Murray).

9a (8a). Compound chaetae and anal cirri absent; free maxillary denticles present; neuropodium with one acicula; free-living species..***Parophryotrocha***

9b (8a). Subacicular compound chaetae and two anal cirri present; free-living or commensal species...***Ophryotrocha* [in part]**

10a (8b). Compound and capillary chaetae present; maxillar apparatus present.......................................**11**

10b (8b). Chaetae, if present, either all compound or all capillary; maxillar apparatus absent..................**12**

11a (10a). Antennae present, simple; maxillary carrier absent; ventral neuropodial chaetal lobe absent...***Arenotrocha***

11b (10a). Antennae absent; maxillar carrier absent; ventral neuropodial chaetal lobe absent..***Pusillotrocha***

11c (10a). Antennae present, simple, or absent; maxillar carrier present; ventral neuropodial chaetal lobe present..***Ophryotrocha* [in part]**

12a (10b). Chaetae present; all chaetae capillary; 4 chaetigers..***Parapodrilus***
12b (10b). Chaetae absent; at least four segments...**13**

13a (12b). Pharyngeal apparatus absent; pygidium without appendages.................................***Apharyngtus***
13b (12b). Pharyngeal apparatus present...**14**

14a (13b). Pygidial cirri enlarged, toe-like, adhesive appendages...***Diurodrilus***
14b (13b). Pygidial cirri, if present not toe-like, adhesive...**15**

15a (14b). Pygidial stylus absent; prostomium trilobate; ciliary rings on anterior part of body only...***Trilobodrilus***
15b (14b). Pygidial stylus present; prostomium not trilobate; ciliary rings on most of body......***Dinophilus***

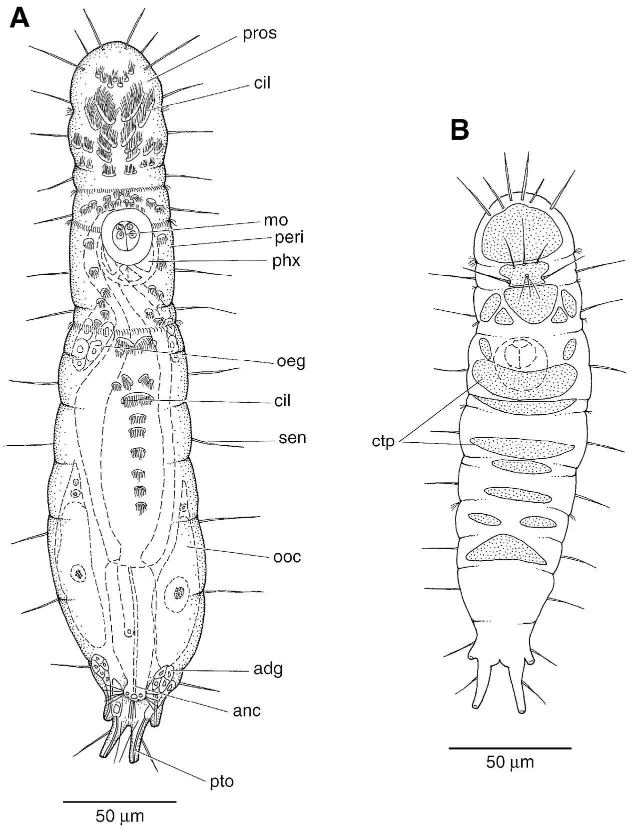

Figure legend: Family Dorvilleidae. *Diurodrilus* specimen. **A**, entire adult female, ventral view. **B**, entire young female, dorsal view showing 'cuticular plates'. **adg**, adhesive gland; **anc**, anal cone; **cil**, ciliophore; **ctp**, cuticular plates; **mo**, mouth; **oeg**, oesophageal gland; **ooc**, oocyte; **peri**, peristomium; **phx**, pharynx; **pros**, prostomium; **pto**, pygidial 'toe'; **sen**, sensorium. (Adapted from BEESLEY, ROSS & GLASBY, 2000; drawings by A. Murray).

GENUS *Apharyngtus* Westheide 1971

Apharyngtus WESTHEIDE, 1971: 17.
TYPE SPECIES: *Apharyngtus punicus* Westheide 1971.

Apharyngtus punicus Westheide 1971

Apharyntus punicus WESTHEIDE, 1971: 6-15, figs. 1-10.

TYPE LOCALITY: Mesopsammic in a narrow sandy beach at the west coast of the Gulf of Tunis (Tunisia), in front of the locality of Le Kram, about 1 Km SW of the Institute d'Océanographie et de Pêche, in Salambô; beach with a weak slope, 2-3 meters above the shoreline, at a depth of 5-15 cm; homogenous fine sand, with a granulometry of 250 µm, and a selection coefficient $S_o = 1.23$; salinity of the interstitial water of 25.9‰, at about 30 cm deep.
DISTRIBUTION: Tunisia, in sandy beaches. Besides the type locality, also known from the east coast of the Gulf of Tunis, in front of the beach restaurant near Sidi Rais, at about 3 meters from the shoreline, 15 cm deep.

GENUS *Arenotrocha* Westheide & von Nordheim 1985

Arenotrocha WESTHEIDE & VON NORDHEIM, 1985: 198.
TYPE SPECIES: *Ophryotrocha minuta* Lévi 1954.

KEY TO SPECIES:

1a. Chaetae distally unidentate; each parapodium with two supra-acicular simple chaetae and three subacicular compound chaeta; prostomium with short papilliform antennae and short ovoid ventrolateral palps; pygidium with short cirri..***A. lanzarotensis***
1b. Chaetae distally bidentate, with a small subdistal tooth; each parapodium with 1-3 supra-acicular simple chaetae and 3-4 subacicular compound chaetae; prostomium with slender rod-shaped antennae and relatively thick ventrolateral palps, broadly attached; pygidium with long cirri....................***A. minuta***

Arenotrocha lanzarotensis Brito & Núñez 2003

Arenotrocha lanzarotensis BRITO & NÚÑEZ, 2003: 30-33, fig. 3.
TYPE LOCALITY: Lanzarote (Canary Islands): Playa Quemada, 28º53.4'N, 13º43.5'W, on muddy sand, at 9 meters.
DISTRIBUTION: Known from the type locality, between 7-9 meters.

Arenotrocha minuta (Lévi 1954)

Ophryotrocha minuta LÉVI, 1954: 466-468, figs. 1-4.
TYPE LOCALITY: Île de Callot, near Roscoff (Northern France), interstitially in sand.
SELECTED REFERENCES: *Ophryotrocha minuta* — GEORGE & HARTMANN-SCHRÖDER, 1985: 188, fig. 66. *Arenotrocha minuta* — WESTHEIDE & VON NORDHEIM, 1985: 194-198, figs. 10*C-D*, 12-13; HARTMANN-SCHRÖDER, 1996: 270-272, fig. 120.
DISTRIBUTION: English Channel and North Sea, interstitially in sand, at 7-18 meters.

GENUS *Dinophilus* E.O. Schmidt 1848

Dinophilus E.O. SCHMIDT, 1848: 3-8.
TYPE SPECIES: *Dinophilus vorticoides* Schmidt 1848.
REMARKS: The genus *Dinophilus* E.O. Schmidt 1848 includes very small worms, reaching a maximum length of about 2 mm. Its taxonomy is quite confuse, and needs revision. Unlike other genera of small sized polychaetes, the biggest part of the species were described before 1960, and it is not clear how many of them are valid. The proposed synonymies are quite numerous, but still it is difficult to be sure on how many species are valid and how many synonymous. Many descriptions are poor, type material normally doesn't exist, and so far it hasn't been performed a comparative study based on topotype material (in the case of *D. apatris* Korschelt 1882 the type locality is a salt water aquarium at Freibourg, being the original locality unknown). WESTHEIDE (1990) and HARTMANN-SCHRÖDER (1996) considered 2 species to be present in the European Atlantic waters (*D. gyrociliatus* and *D. taeniatus*), while FAUVEL (1927*a*) considered them to be 4. I preferred to use here a more conservative position, and follow FAUVEL (1927*a*), while waiting for further studies on the taxonomy of the genus.

KEY TO SPECIES:
(adapted from: FAUVEL, 1927*a*; WESTHEIDE, 1990)

NOT INCLUDED IN THE KEY: Due to the lack of information on the species, *Planaria caudata* Fabricius 1780, later transferred to the genus *Dinophilus* by LEVINSEN (1879*b*), is not included in the key. See the *REMARKS* section under this species.

1a. Intensive orange coloured; sexual dimorphism absent, with males and females of same size; gonads paired or Y-shaped..........**2**
1b. Whitish coloured; sexual dimorphism present, with males extremely reduced in size, only 50 µm long; one ciliary ring per segment; ovary single; 5 segments (if the two annuli of the buccal region are considered to be one)..........***D. gyrociliatus***

2a (1a). Gonads paired; two ciliary rings per trunk segment..........**3**
2b (1a). Gonads Y-shaped; one ciliary ring per trunk segment..........***D. gigas***

3a (2a). Caudal appendage triannulated; 6 segments..........***D. vorticoides***
3b (2a). Caudal appendage not annulated; 5 segments..........***D. taeniatus***

Dinophilus caudatus (O. Fabricius 1780)

Planaria caudata FABRICIUS, 1780: 327.
TYPE LOCALITY: SW Greenland, probably in the area of Frederikshaab/ Paamiut, in great numbers at the littoral, grouped in clusters.
SYNONYMS: *Vortex capitata* Ørsted 1843; [?] *Dinophilus vorticoides* O. Schmidt 1848; [?] *Dinophilus metameroïdes* Hallez 1879; *Dinophilus caudatus* Levinsen 1880; [?] *Dinophilus gigas* Weldon 1886; [?] *Dinophilus tæniatus* Harmer 1889; [?] *Dinophilus Gardineri* Moore 1899.
SELECTED REFERENCES: [?] *Dinophilus caudatus* — LEVINSEN, 1879*b*: 197-199. [?] *Dinophilus gardineri* — NELSON, 1907: 92.
DISTRIBUTION: SW Greenland; [?] Faroes; [?] Helgoland; [?] Sweden; [?] Bergen; [?] East England; [?] British Channel; [?] New England. Littoral.
REMARKS: *D. caudatus* is the oldest species belonging to the genus *Dinophilus*. However, the poor original description, together with the lack of a redescription based on topotype material, makes difficult to determine how many (and which) of the posteriorly described species on the genus are synonymous with *D. caudatus*. An exception is *Vortex capitata* Ørsted 1843, about which seems to exist a consensus regarding its synonymy with *D. caudatus*.

The species was originally described as *Planaria caudata* by FABRICIUS (1780), which is not surprising, taking into account the Turbellaria-look of *Dinophilus* specimens. In fact, *D. borealis* Diesing 1862, *D. simplex* Verrill 1892, and *D. rostratus* Schultz 1902, originally described as *Dinophilus*, were proven to be turbellarian species.

LEVINSEN (1879*b*) identified Fabricius' species as a *Dinophilus*, but a detailed description of the species, complemented with figures, was not given. HARMER (1889*a*) described a new species from England, *D. taeniatus*, followed by a second paper with a more detailed description of the anatomy of the species (HARMER, 1889*b*). For this second paper the author obtained the report on *D. caudatus* by LEVINSEN (1879*b*), previously inaccessible to him. HARMER (1889*b*) recognises the similarity between the description of *D. caudatus* and his own species, but the lack of a detailed description of the first made impossible a definitive statement. In his own words: "*It appears to me quiet possible that "*D. tæniatus*" is identical with* D. caudatus*, but as the evidence on this point is quite inconclusive, I do not propose to withdraw, for the present at least, the species name, which has already been published in the Proceedings of the Cambridge Philosophical Society (vol. vi).*" (HARMER, 1889*b*: 141-142).

More than a hundred years later, the situation is still open and unsolved, with almost all the orange coloured forms described from the northern hemisphere being considered as possible junior synonyms of *D. caudatus*.

The validity of *D. gardineri* Moore 1899, described from Massachusetts, was established in a posterior detailed study by RUEBUSH (1940), but even in this case the species is considered to be a possible synonymy of *D. caudatus*.

Dinophilus gigas Weldon 1886

Dinophilus gigas WELDON, 1886: 109-116, pl. 10 figs. 1-11.

TYPE LOCALITY: Mount's Bay, near Penzance, Cornwall (England), "*on red seaweeds* (...)*, in pools, near spring-tide low water mark, on the rocks to the west of St. Michael's Mount*" (WELDON, 1886: 109).
SELECTED REFERENCES: *Dinophilus gigas* — NELSON, 1907: 93, text-fig. 5*B*; FAUVEL, 1927*a*: 442, fig. 149*c-e*; REMANE, 1932: 34.
DISTRIBUTION: Known from the type locality.
REMARKS: *D. gigas* is considered as being possibly conspecific with *D. taeniatus* Harmer 1889 (*e.g.* WESTHEIDE, 1990), and as a consequence, with *D. caudatus*.

Dinophilus gyrociliatus E.O. Schmidt 1857

Dinophilus gyrociliatus E.O. SCHMIDT, 1857: 348.
TYPE LOCALITY: Mediterranean Sea.
SYNONYMS: [?] *Dinophilus apatris* Korschelt 1882; [?] *Dinophilus Conklini* Nelson 1907; [?] *Dinophilus apatris* forma *tergestina* Stiasny 1910.
SELECTED REFERENCES: *Dinophilus gyrociliatus* — NELSON, 1907: 93; SHEARER, 1912: 329-366, text-figs. 1-5, plates 30-34; FAUVEL, 1927*a*: 442-443, figs. 149*f*, 150*c-g*; REMANE, 1932: 33-34, fig. 5; WESTHEIDE, 1990: 120, fig. 42; HARTMANN-SCHRÖDER, 1996: 287-288, fig. 126; KIRKEGAARD, 1996: 249-250, fig. 134; WESTHEIDE, 2008: 130, fig. 91. [?] *Dinophilus apatris* — KORSCHELT, 1882: 317, pls. 21-22; MALSEN, 1906: 63-99, pl. 2; NELSON, 1907: 93. [?] *Dinophilus apatris* forma *tergestina* — STIASNY, 1910: 587-589, fig. 1. [?] *Dinophilus conklini* — NELSON, 1907: 82-91, 93, 94-131, pls. 12-13, text-figs. 1-4, 5*C*; BEAUCHAMP, 1910*a*: 18-24, figs. 1-2.
DISTRIBUTION: North Sea; English Channel; probably all British Isles; European and North American Atlantic coasts; Mediterranean Sea; Adriatic Sea; Black Sea. On various intertidal substrates, especially in sheltered pools. Frequent on marine aquaria, where the species lives in the layer of debris from the bottom of the tanks. Interstitial on sand.
REMARKS: There is a consensus in that *D. gyrociliatus* is a valid species, but as in the case of other species of *Dinophilus*, there is no agreement on how many of the posteriorly described species are synonymous with it. Normally it has been considered that *D. apatris* Korschelt 1882, *D. conklini* Nelson 1907, and *D. apatris tergestina* Stiasny 1910, are synonymous with this species (FAUVEL, 1927*a*; WESTHEIDE, 1990). In the case of *D. apatris*, which type locality is unknown (it was decribed with base on specimens found in a salt water aquarium at Freibourg), REPIACHOFF (1886) stated that it was a junior synonym of *D. gyrociliatus*. WESTHEIDE (1990) also stated that the synonymy of *D. gyrociliatus* with other colourless dimorphic species of the region, like *D. apatris*, had not been demonstrated definitely, but that it should be considered to be very likely. On the other hand, *D. conklini* Nelson 1907, described from New Jersey, was considered by posterior authors to be no more than a geographic variant of *D. gyrociliatus* (see references in JONES & FERGUSON, 1957).

Dinophilus taeniatus Harmer 1889

Dinophilus taeniatus HARMER, 1889*a*: 1.
TYPE LOCALITY: Plymouth (South England, English Channel), in rock-pools far above low-water mark.
SELECTED REFERENCES: *Dinophilus taeniatus* — HARMER, 1889*b*: 119-137, pls. 9-10 [figure 2 seems to represent a turbellarian specimen]; NELSON, 1907: 92-93, text-fig. 5*A*; SOUTHERN, 1910: 219; FAUVEL, 1927*a*: 441-442, fig. 150*a-b*; REMANE, 1932: 34-35; JOUIN *in* CABIOCH, L'HARDY & RULLIER, 1968: 8; HAMOND, 1972: 342; JENNINGS & DONWORTH, 1986: 123-136, figs. 1-3, tables 1-3; WESTHEIDE, 1990: 122, fig. 43; HARTMANN-SCHRÖDER, 1996: 288-289, fig. 127; KIRKEGAARD, 1996: 250-251, fig. 135; WESTHEIDE, 2008: 132, fig. 92.
DISTRIBUTION: North Sea; English Channel; Irish Sea; Ireland; Faroes; Skagerrak; Baltic Sea; White Sea; Barents Sea. On sheltered tide pools rich in diatoms and algae. Interstitial on sand.
REMARKS: See the *REMARKS* section under *D. caudatus*. Being this species younger than all the other species with which its synonymy is proposed, if any of these synonymies is proven to be true, *D. taeniatus* would become a junior synonym.

Dinophilus vorticoides E.O. Schmidt 1848

Dinophilus vorticoïdes E.O. SCHMIDT, 1848: 3-8, pl. 1 figs. 1, *A*, *B*, *C*.
TYPE LOCALITY: Thorshavner Bay, Faroe Islands, at shallow water, at the shore washed by the waves, grouped in clusters.
SYNONYMS: [?] *Dinophilus metameroides* Hallez 1879.
SELECTED REFERENCES: *Dinophilus vorticoïdes* — SCHIMKEWITSCH, 1895: 46, pls. 5-6; REMANE, 1925: 17; FAUVEL, 1927*a*: 441, fig. 149*a-b*. *Dinophilus vorticoides* — NELSON, 1907: 92, text-fig. 5*A*;

REMANE, 1932: 34. [?] *Dinophilus metameroides* — NELSON, 1907: 93; HALLEZ, 1879: 155-162, pl. 4 figs. 3-9.

DISTRIBUTION: North Sea; English Channel; Kiel Bight; Faroe Islands; White Sea. Normally on sheltered tide pools, among red algae, or in aquaria.

REMARKS: According to FAUVEL (1927*a*), *D. metameroides* seems to be synonymous with *D. vorticoides*. The species was poorly described, differing from *D. vorticoides* by having a prostomium bigger than the rest of the body. The dorsal position of the pharynx described by HALLEZ (1879) is also very doubtful, and the fact that the male was not seen doesn't prove the supposed dimorphism of the species (FAUVEL, 1927*a*).

Some authors consider that *D. vorticoides* is possibly conspecific with *D. taeniatus* Harmer 1889 (*e.g.* WESTHEIDE, 1990).

GENUS *Diurodrilus* Remane 1925

Diurodrilus REMANE, 1925: 15-16.

TYPE SPECIES: *Diurodrilus minimus* Remane 1925.

REMARKS: For a pictorial key of the described species of the genus see KRISTENSEN & NIILONEN (1982: fig. 17). The same authors suggested that the morphology and length of the adhesive toe-like appendages are closely related to the habitat of the different species. This way, species from the "Küstengrundwasser" (coastal ground water), would have reduced appendages, being absent in *D. benazzii* and very short in *D. subterraneus*, while species from unstable habitats (due to tidal waves, etc.) would have longer appendages, which includes the rest of the species (KRISTENSEN & NIILONEN, 1982).

KEY TO SPECIES:

(adapted from KRISTENSEN & NIILONEN, 1982; WESTHEIDE, 1990)

1a. One pair of toe-like appendages..***D. benazzii***
1b. Two pairs of toe-like appendages...**2**

2a (1b). Primary and secondary toe-like appendages of equal size...**3**
2b (1b). Primary and secondary toe-like appendages of unequal size...**4**

3a (2a). Pygidial toe-like appendages relatively long; with small median anal cone..................***D. minimus***
3b (2a). Pygidial toe-like appendages short; no median anal cone....................................***D. subterraneus***

4a (2b). Secondary toe-like appendages tube-like; large median anal cone............................***D. westheidei***
4b (2b). Secondary toe-like appendages cone-like; no median anal cone.....................................***D. dohrni***

Diurodrilus benazzii Gerlach 1952

Diurodrilus benazzii GERLACH, 1952: 186-188, figs. 1-3.

TYPE LOCALITY: Tyrrhenian Sea (Mediterranean Sea), at San Rossore (between Livorno and Viareggio, Pisa, Italy), at the sandy beach slope, at about 3 to 5 meters from the sea, and about 30 to 60 centimeters deep, in the interstitial water ("*Küstengrundwasser*").

SELECTED REFERENCES: *Diurodrilus benazzi* — KRISTENSEN & NIILONEN, 1982: fig. 17*a*.

DISTRIBUTION: Tyrrhenian Sea; Wimereux, English Channel (DAUVIN, DEWARUMEZ & GENTIL, 2003); [?] India. In sandy beaches, as interstitial.

Diurodrilus dohrni Gerlach 1953

Diurodrilus dohrni GERLACH, 1953: 250, pl. 28 fig. 3.

TYPE LOCALITY: Gulf of Naples (Mediterranean Sea), about 150 meters off Capo Posilipo, at 15-16 meters, on sands mixed with shells,.

SELECTED REFERENCES: *Diurodrilus dohrni* — KRISTENSEN & NIILONEN, 1982: fig. 17*d*.

DISTRIBUTION: Wimereux (English Channel) (DAUVIN, DEWARUMEZ & GENTIL, 2003); Gulf of Naples (Mediterranean Sea). On coarse sand, in the sublittoral.

Diurodrilus minimus Remane 1925

Diurodrilus minimus REMANE, 1925: 15-16, fig. 2.

TYPE LOCALITY: Sublittoral zone of Kiel Bay (Germany, Baltic Sea), and Helgoland (Germany, North Sea).

SELECTED REFERENCES: *Diurodrilus minimus* — REMANE, 1932: 33; FAUVEL, 1927*a*: 439, fig. 148*b*; JOUIN *in* CABIOCH, L'HARDY & RULLIER, 1968: 9; KRISTENSEN & NIILONEN, 1982: fig. 17*e*; WESTHEIDE, 1990: 128, fig. 46; HARTMANN-SCHRÖDER, 1996: 594-595, fig. 294; KIRKEGAARD, 1996: 252, fig. 136; WESTHEIDE, 2008: 138-139, fig. 96.

DISTRIBUTION: Northern Norway; North Sea; Irish Sea; English Channel; Skagerrak; Baltic Sea; French Atlantic coast; Mediterranean Sea; [?] India. Inhabiting fine to coarse sand with shell gravel in the sublittoral, and lower parts of intertidal sandy beaches.

REMARKS: WESTHEIDE (1990, 2008) refers the fact that in spite of the numerous records, this species was never adequately described, and that different numerical data and a wide variety of ecological localities suggested that one or more closely related, but still undescribed, species may exist, with which *Diurodrilus minimus* has been confused.

Diurodrilus subterraneus Remane 1934

Diurodrilus subterraneus REMANE, 1934: 479, fig. 1.

TYPE LOCALITY: "Küstengrundwasser" (coastal ground water), Kiel Bay (Germany).

SELECTED REFERENCES: *Diurodrilus subterraneus* — MOCK, 1981: 329-333, figs. 1-4; KRISTENSEN & NIILONEN, 1982: 7, figs. 11-15, 17*b*; WESTHEIDE, 1990: 130, fig. 47; HARTMANN-SCHRÖDER, 1996: 596, fig. 295; KIRKEGAARD, 1996: 253, fig. 137; WESTHEIDE, 2008: 140, fig. 97.

DISTRIBUTION: English Channel; North Sea; Irish Sea; western Baltic Sea; Western Greenland; Mediterranean Sea. In the middle and upper slope of tideless beaches, in the damp sand, and also in deeper layers of temporarily damp sand at low tide in the upper region of sheltered tidal beach slopes (WESTHEIDE, 1990).

Diurodrilus westheidei Kristensen & Niilonen 1982

Diurodrilus westheidei KRISTENSEN & NIILONEN, 1982: 2-6, figs. 1-8, 10, 16, 17*f*.

TYPE LOCALITY: A longshore barrier at 2-5 meters depth near Kigdlugssaitsut (69°29'N, 52°11'W) Disko Island, West Greenland, on middle-coarse, well sorted sand.

DISTRIBUTION: Known from the type locality.

*GENUS ***Dorvillea*** Parfitt 1866

Dorvillea PARFITT, 1866*b*: 113.

TYPE SPECIES: *Staurocephalus rubrovittatus* Grube 1855.

SYNONYMS: *Staurocephalus* Grube 1855 [not Barrande 1846 (Trilobita)]; *Stauroceps* Verrill 1900; *Teleonereis* Verrill 1900.

KEY TO SPECIES:

(adapted from GEORGE & HARTMANN-SCHRÖDER, 1985)

1a. Antennae with 3-6 annulations; palps less than twice as long as the antennae; dorsal anal cirri with annulations..**2**
1b. Antennae without annulations; palps long, more than twice as long as the antennae; dorsal anal cirri without annulations; supra-acicular chaetae distally bifid........................***D. erucaeformis***

2a (1a). Antennae with 3-4 annulations; palps short, with about the same length than the width of the prostomium; supra-acicular chaetae distally irregularly crenulate; ventral cirri inserted proximally to the base of the parapodia........................***D. rubrovittata****
2b (1a). Antennae with 3-6 annulations; palps long, with a length bigger than the width of the prostomium; supra-acicular chaetae distally tapering, with a fine tip........................**3**

3a (2b). Antennae with about 6 annulations; ventral cirri inserted distally to the base of the parapodia; subacicular parapodial lobe absent; dorsal cirri long........................***D. kastjani***

3b (2b). Antennae with about 3-5 annulations; ventral cirri inserted medially to the base of the parapodia; subacicular parapodial lobe present; dorsal cirri short...***D. roemeri***

Dorvillea erucaeformis (Malmgren 1865)

Staurocephalus erucœformis MALMGREN, 1865: 184-185.

TYPE LOCALITY: Öxfjorden (Finmark, Norway), at "*profunditate magna*".

SELECTED REFERENCES: *Staurocephalus erucœformis* — MALMGREN, 1867*a*: 62, pl. 8 fig. 50. *Dorvillea erucaeformis* — JOSEFSON, 1975: 51-54, figs. 8-13; GEORGE & HARTMANN-SCHRÖDER, 1985: 168, fig. 56; HARTMANN-SCHRÖDER, 1996: 272.

DISTRIBUTION: Norwegian west coast, on *Lophohelia* coral reefs, sand, gravel, sponges and serpulid tubes, at 200-260 meters.

REMARKS: See the *REMARKS* section under *Dorvillea rubrovittata*.

Dorvillea kastjani Tzetlin 1980

Dorvillea kastjani TZETLIN, 1980*a*: 18-19, fig. 1.

TYPE LOCALITY: Kandalaksha Bay, Velikaya Salma Strait (White Sea), on the littoral zone.

DISTRIBUTION: Known from the type locality.

Dorvillea roemeri (Augener 1913)

Stauronereis Römeri AUGENER, 1913*a*: 172-174, pl. 5 figs. 3-8.

TYPE LOCALITY: Spitsbergen Sea, at 1000 meters.

SELECTED REFERENCES: *Dorvillea römeri* — HARTMAN, 1959*a*: 349.

DISTRIBUTION: Known from the type locality.

****Dorvillea rubrovittata*** (Grube 1855)

Staurocephalus rubrovittatus GRUBE, 1855: 97-98, pl. 3 figs. 8-12.

TYPE LOCALITY: Near Trieste, Adriatic Sea, under algae.

SYNONYMS: *Dorvillea lobata* Parfitt 1866.

SELECTED REFERENCES: *Staurocephalus rubrovittatus* — PRUVOT & RACOVITZA, 1895: 349-373, text-figs. 1-2, pl. 15; MCINTOSH, 1910: 353-357, pl. 55 fig. 1, pl. 61 fig. 7, pl. 73 fig. 4, pl. 81 fig. 9; FAUVEL, 1923*c*: 445-446, fig. 177*a-l* [not *Staurocephalus erucaeformis* Malmgren 1865, in the synonymy list = *Dorvillea erucaeformis* (Malmgren 1865)]. *Dorvillea rubrovittata* — HARTMAN, 1944*b*: 187-190; DAY, 1967: 457-458, fig. 17.21.*k-m*; JUMARS, 1974: 112-113, fig. 4 [not *Staurocephalus erucaeformis* Malmgren 1865, in the synonymy list = *Dorvillea erucaeformis* (Malmgren 1865)]; JOSEFSON, 1975: 52-53, figs. 14-15; CAMPOY, 1982: 636-637; SARDÀ, 1984*c*: 474-475, 1 plate; GEORGE & HARTMANN-SCHRÖDER, 1985: 170, fig. 57; [?] NÚÑEZ, 1990: 560-562, fig. 183. [?] *Dorvillea* cf. *similis* — NÚÑEZ, PASCUAL & BRITO, 1996: 140-142, figs. 1, 4*A-I*. *Dorvillea lobata* — PARFITT, 1866*b*: 113.

REFERENCES FOR PORTUGAL: BELLAN, 1960*a* (as *Staurocephalus rubrovittatus*; Setúbal Canyon); AMOUREUX & CALVÁRIO, 1981 (Peniche); CAMPOY, 1982 (previous records: 38º11.5'N – 5º51.4'W).

MATERIAL: FAUNA 1 — St. 56*A*, Gulf of Cádiz, off Cape Trafalgar, 24 m, rock and gravel: 1 specimen broken in two pieces, first piece with 18 chaetigers, second piece with 23 chaetigers; this specimen fits the description given by SARDÁ (1984*c*); these would be specimens with some characters of *Dorvillea rubrovittata* and others of *D. erucaeformis* (Malmgren 1865); the antennae are non articulated, and the supra-acicular unjointed chaetae are distally bifid, as in *D. erucaeformis*; on the other hand, the parapodia has the cirrostyle typical of *D. rubrovittata*, longer than wider, and conical; it is possible to note a slight ciliation on the cirrophore and neuropodium; the palps are about twice longer than the antennae (or a little less); pygidium is damaged, but shows two short and smooth cirri, and only one of the two dorsal cirri, which has at least two articulations; due to the presence of what seems to be a population of *Dorvillea* with characters of both species, *D. rubrovittata*, and *D. erucaeformis*, I have chosen to name this specimen from the older species.

DISTRIBUTION: From the Arctic to tropical West Africa; Mediterranean Sea; Adriatic Sea; Aegean Sea; Black Sea; Caribbean Sea. On sand, mud, gravel, shell fragments, rocks, corals, algae and seagrasses, under stones and amongst sponges and mussels. In the intertidal zone and shallow waters.

REMARKS: PRUVOT & RACOVITZA (1895) considered *Staurocephalus erucaeformis* Malmgren 1865 as a junior synonym of *S. rubrovittatus* Grube 1855. This synonymy was accepted by later authors (*e.g.*, MCINTOSH, 1910; FAUVEL, 1923*c*; HARTMANN-SCHRÖDER, 1971*a*; JUMARS, 1974). JOSEFSON (1975) compared *Dorvillea* specimens from North European populations (West Norway) with southern populations (English Channel and West Mediterranean Sea), and found enough differences in order to separate them and re-establish *D. erucaeformis* (Malmgren 1865).

The species would be separated by the following characters, according to JOSEFSON (1975) and GEORGE & HARTMANN-SCHRÖDER (1985):

Dorvillea rubrovittata (Grube 1855)	***Dorvillea erucaeformis*** (Malmgren 1865)
a) Adults with articulated antennae and dorsal anal cirri;	a) Adults with nonarticulated antennae and dorsal anal cirri;
b) Palps about twice (or a little less) the length of the antennae;	b) Palps longer, more than twice as long as antennae;
c) Notopodial cirrostyles conical, longer than wider;	c) Notopodial cirrostyles rounded, about as long as wide;
d) Ciliation present both on the cirrophore and the neuropodium;	d) No sign of ciliation on the cirrophore and neuropodium;
e) Supra-acicular unjointed chaetae distally irregularly crenulate;	e) Supra-acicular unjointed chaetae distally bifid;
f) Colour with transverse bands.	f) Colour red.

The specimen of *D. rubrovittata* described by CAMPOY (1982), from Columbretes, agrees with all characters referred in the table above. The specimens described by NÚÑEZ (1990) seem also to fit the description, but later NÚÑEZ, PASCUAL & BRITO (1996) attributed them to *Dorvillea* cf. *similis*. It is possible that the differences found in relation to the described for *D. rubrovittata* are due to the size of the worms, as they are stated as being small, being the biggest one 0.8 mm wide (NÚÑEZ, 1990). It is possible that they are juvenile specimens of *D. rubrovittata* not fully developed, but as I did not check them, or compared them directly with the adults, I prefer to consider them here as being questionably juveniles of *D. rubrovittata*. However, the specimen I have identified from St. 56*A*, is similar to the ones described by SARDÀ (1984*c*) from the Gibraltar Strait region, and differ from both *D. rubrovittata* and *D. erucaeformis* by presenting characters of both species.

The Gibraltar Strait specimens present nonarticulated antennae and supra-acicular unjointed chaetae distally bifid, as in *D. erucaeformis*. On the other hand, the parapodia has the cirrostyle longer than wider and conical, typical of *D. rubovittata*, and in my specimen it was possible to observe a slight ciliation on the cirrophore and neuropodium. Besides, the palps are about twice (or a little less) longer than the antennae. The specimen of St. 56*A* has the pygidium damaged, but it still shows 2 ventral cirri short and smooth, and only one of the two dorsal cirri, which has at least two articulations.

For the moment I don't think that the observed differences are sufficient to erect a new taxon. It seems, however, that in the region of the Gibraltar Strait exists a population of *Dorvillea* showing some characters of both species. The presence of nonarticulated antennae could be the result of the fixation process, but there is still the problem of the bifid tips of the unjointed supra-acicular chaetae. The possibility of being a hybrid population between both species is not considered here, as *D. erucaeformis* is not known to occur southern to the Norwegian coast. As there is also the possibility that both species are synonymous, with intermediate forms between them, I have identified the specimen I have found as *D. rubrovittata*, as it is the older species, and also the species known to occur in the region. A definitive statement on this problem will require a deeper study of specimens of the three morphotypes.

JUMARS (1974) studied by dissection specimens of *D. rubrovittata* from two populations, Dinard (Brittany, France), and Algiers (Mediterranean Sea). Externally they were similar with each other, and to a third specimen, from Nice (France). Internally, however, the specimens from Dinard showed denticles in the middle of the superior rows, with main fangs well over five times the lengths of the corresponding teeth in Mediterranean specimens. JUMARS (1974), suggested that close comparisons of even more widely separated populations of *D. rubrovittata* could reveal the presence of several subspecies or even species under the same binominal. This could be also the case of the specimens studied by SARDÀ (1984*c*) and here, in the present work.

GENUS *Marycarmenia* Núñez 1998

Marycarmenia NÚÑEZ, 1998: 115-116.
TYPE SPECIES: *Protodorvillea gaspeensis* Pettibone 1961.

Marycarmenia lysandrae Núñez 1998

Marycarmenia lysandrae NÚÑEZ, 1998: 116-119, figs. 1-2.
TYPE LOCALITY: Madeira, Laginha (Ponta de S. Lourenço), UTM 28S CB 3980/2422, at 4 meters, in organogenous coarse-grained sand.
DISTRIBUTION: Known from the type locality.

GENUS *Ophryotrocha* Claparède & Mecznikow 1869

Ophryotrocha CLAPARÈDE & MECZNIKOW, 1869: 184.
TYPE SPECIES: *Ophryotrocha puerilis* Claparède & Mecznikow 1869.
SYNONYMS: *Eteonopsis* Esmark 1874; *Paractius* Levinsen 1879; [?] *Iphitime* Marenzeller 1902; [?] *Coelobranchus* Izuka 1914; [?] *Mammiphitime* Orensanz 1990; *Palpiphitime* Orensanz 1990.
REMARKS: PAIVA & NONATO (1991) presented a worldwide key for all the hitherto known species in the genus *Iphitime*, while HØISÆTER & SAMUELSEN (2006) gave a comparative table for all the described species in the genus, and HILBIG & BLAKE (1991) provided a key for all the species of *Ophryotrocha* and other selected genera (*Anchidorvillea*, *Exallopus*, *Parophryotrocha*, and *Pseudophryotrocha*).

The genus *Ophryotrocha* presents a large variety of reproductive strategies that can be used to identify species that are morphologicaly similar. Many of the species have a short generation time, and are easily maintained as laboratory cultures, sometimes for decades. This way, the genus became a very used system for bioassays, in order to study biological questions ranging from developmental genetics or toxicology, to ethology and sexual selection (PLEIJEL & EIDE, 1996; DAHLGREN *et al.*, 2001). For these reasons many new species are detected and isolated in the laboratory before being formally described. This is the reason why so many species exist as *nomina nuda* in published molecular and phylogenetic papers, while waiting for a properly description according to the accepted rules of taxonomy. In this case are *Ophryotrocha japonica*, *O. macrovifera*, *O. rubra*, and *O. rubusta*, all of them previously studied as nomina nuda until their recent description by PAXTON & ÅKESSON (2010).

In *Ophryotrocha*, distinguishing characters include conventional traits, like the morphology of the chaetae, parapodia, cephalic appendages or jaw plates, together with less conventional ones, like reproductive patterns, morphology of the egg masses, if brood protection is present or not, chromosome numbers ($2n = 6$; $2n = 8$; $2n = 10$), or other molecular data. In what concerns the molecular data, it has been widely used in taxonomic and phylogenetic studies within the group. However, several discrepancies were found concerning the accession numbers of the sequences given in some of the published papers and the ones deposited in the GenBank, as they refer to different taxa. Besides, the repeated lack of a reference in the GenBank concerning the collection site of the sequenced specimen, or where (and if) voucher specimens of the species were deposit, can difficult the repeatability of the obtained and published results and the reexamination of that data by other authors.

The genus has uniramous parapodia, with an acicular lobe, and with or without an extra ventral chaetal lobe. Besides these two lobes, dorsal and ventral cirri may or may not be present. This way, only a single aciculum is present. The ventral chaetal lobe is retractile and was described in about half the species, but may have been overlooked in others, exactly due to its retractile nature. This lobe is supported by the inferiormost chaeta of the subacicular bundle. This chaeta is inserted more deeply in the parapodium than the other chaetae, and is easily (and frequently) misinterpreted as a second acicula (HILBIG & BLAKE, 1991). In two cases, *O. gerlachi* Hartmann-Schröder 1974, and *O. paragerlachi* Brito & Núñez 2003, the species were described, and have been considered, as having a supplementary acicula, thinner than the main one. These aciculae are here considered as being the inferiormost chaeta of the subacicular fascicle, and these two species will be considered as having simple subacicular chaetae. Besides, these subacicular chaetae will be temptatively considered in the following key as being capillary, as the cultriform type simple chaeta, presented by *O. dubia*, seems to be too conspicuous in order to be unnoticed. However, no material of these species was studied in the present work. In addition, the holotype of *O. gerlachi*, and apparently the only known specimen, has been lost (HILBIG, pers. comm. *in* BRITO & NÚÑEZ, 2003).

As stated above, some species or groups of species of *Ophryotrocha* can be extremely difficult to differentiate, like in the *Ophryotrocha labronica* group. In some cases, species are differenciated only with base on biological characters of the worms, like the reproductive mode, or on small anatomical details that can be affected by the fixation process. This way, it can be impossible to identify certain species with base only on fixed material. Molecular techniques provide a step forward in the study of the group, but live material is in general the best way to study this genus.

See also the *REMARKS* section above, at the introduction of the family.

KEY TO SPECIES:

(adapted from: HILBIG & BLAKE, 1991; PAXTON & ÅKESSON, 2010)

REMARKS ON THE KEY: For the reasons stated above, a new combination is not made here for *Iphitime cuenoti*.

NOT INCLUDED IN THE KEY: *Ophryotrocha minuta* Averintsev 1989, and *Ophryotrocha scarlatoi* Averintsev 1989, both with Franz-Joseph Land as type locality, as it was not possible to obtain the original descriptions, in AVERINTSEV (1989). Besides, *O. minuta* Averintsev 1989 is a homonym of *O. minuta* Lévi 1954, now placed at the genus *Arenotrocha* Westheide & von Nordheim 1985.

One more species has been recorded from the European waters, as *nomen nudum*, and will not be included in the key, as a formal description so far has not been provided. The species is known as *Ophryotrocha alborana* nomen nudum (PLEIJEL & EIDE, 1996), and so far has been found in Algeciras, Marbella and Ceuta (Spain, Strait of Gibraltar and Western Mediterranean Sea) (DAHLGREN *et al.*, 2001; HEGGØY, SCHANDER & ÅKESSON, 2007; WIKLUND, GLOVER & DAHLGREN, 2009). Helpful information in order to identify this *nomen nudum*, as well as phylogenetic analyses of the genus *Ophryotrocha* that include the species, can be found in PLEIJEL & EIDE (1996), DAHLGREN *et al.* (2001), HEGGØY, SCHANDER & ÅKESSON (2007), and WIKLUND, GLOVER & DAHLGREN (2009), but a resume of the morphological and reproductive characters of the species is presented here, with data from PLEIJEL & EIDE (1996).

***Ophryotrocha alborana* nomen nudum** – antenna medium size, cylindrical; palps absent; eyes situated posteriorly; jaws of P- and K-type; one pair of maxillary rows, with eight maxillary plates; dorsal cirri absent; notoaciculae absent; forked chaetae absent; ventral cirri absent; rosette-glands absent; dorsolateral processes present; larval pygidial stylus present; adult pygidial stylus absent; pygidial cirri tapering; egg colour white; red pigment spots absent; blue-white pigment spots present; ocular pigment strand absent; simultaneous hermaphrodite; egg mass shape irregular; diameter of eggs 190 μm; 8 diploid chromossomes.

1a. Palps with palpostyles; segments with prominent lateral branchiae-like bulbous lobes, dorsal and ventral to the parapodia; neuropodium with subacicular chaetal lobe with simple chaetae.........................**2**
1b. Palps simple or absent (with palpostyles in *O. longidentata* and *O. paragerlachi*); segments without prominent lateral branchiae-like bulbous lobes, dorsal and ventral to the parapodia; neuropodium with or without subacicular chaetal lobe with simple chaetae...**3**

2a (1a). Eyes present, as a white pigmentation on the prostomium, easily visible in live animals, but difficult to see in preserved specimens; dorsal branchial-like structures broadly triangular, one half to one third the length of parapodia, without covering partly the dorsum..***O. lobifera***
2b (1a). Eyes absent; dorsal branchial-like structures very large and rounded in shape, partly covering the dorsum..***O. craigsmithi***

3a (1b). Digitiform branchiae present, being simple or branched, dorsal or dorsolateral; commensal species on gills of brachyuran crabs; [species previously assigned to the genus *Iphitime*].........................**4**
3b (1b). Digitiform branchiae absent; free-living or commensal species on gills of brachyuran crabs (*O. geryonicola* and *O. mediterranea*)..**6**

4a (3a). Simple and compound chaetae; branchiae start on chaetiger 1 or 4-5..**5**
4b (3a). All chaetae simple; gills start on chaetiger 3; maximum number of chaetigers 130...***O. hartmanae* nov. comb.**

5a (4a). 60 segments; branchiae start on chaetiger 1, inserted dorsolaterally; branchiae branched, palmate; maximum number of chaetigers 120....................***Iphitime cuenoti***
5b (4a). 170 segments; branchiae start on chaetiger 4-5, inserted dorsally; branchiae cirriform; maximum number of chaetigers 170....................***O. paguri* nov. comb.**

6a (3b). Commensal in the branchial chamber of *Geryon* spp. and *Cancer borealis*; large species, can reach several hundreds of segments; intestine with two lateral branches on each segment; adults with modified jaws....................**7**
6b (3b). Free living; generally small species....................**8**

7a (6a). Number of maxillary plates shows variation with age, ranging between 3-14, but the 7th pair, if present, never bidentate; basal maxillae without thick aileron-shaped posterior ends; smooth chaetae; middle anal cirrus shorter than the 2 lateral anal cirri....................***O. geryonicola***
7b (6a). 7 maxillary plates present, being the 7th pair thickly bidentate; basal maxillae with one thick aileron-shaped posterior end; strongly spinulate chaetae; middle anal cirrus similar in length to the 2 lateral anal cirri....................***O. mediterranea***

8a (6b). Segmental ciliation absent; antennae cirriform, palps biarticulate, with globular palpophore and digitiform palpostyle; parapodia with dorsal and ventral cirri and 6-14 chaetae per fascicle....................***O. longidentata***
8b (6b). Segmental ciliation present, may be incomplete (assumed to be present in *O. scutellus* and *O. eutrophila*)....................**9**

9a (8b). Simple subacicular chaetae present, may be absent in some anterior segments (present in the last pair of parapodia in *O. splendida*)....................**10**
9b (8b). All subacicular chaetae compound (probably simple subacicular chaetae present in *O. schubravyi*)....................**30**

10a (9a). Simple subacicular chaetae cultriform; antennae present or absent....................**11**
10b (9a). Simple subacicular chaetae neddle-like capillary; antennae present....................**12**

11a (10a). Prostomium round and dorso-ventrally flattened, disc-like; antennae and palps present, long and cirriform; mandibles rod-like, without any serration; parapodia with very long dorsal cirri; length of species not stated, 29 chaetigers....................***O. scutellus***
11b (10a). Prostomium broadly rounded; antennae and palps absent; mandibles rod-like with short, bifid, serrated cutting edge; parapodia with very small dorsal cirri; small species, about 0.69 mm long for 11 chaetigers....................***O. dubia***

12a (10b). Antennae papilliform, palps biarticulate, with finger-shaped palpophore and short palpostyle; deeply embedded, thin simple chaeta present in neuropodia....................***O. paragerlachi***
12b (10b). Antennae and palps otherwise....................**13**

13a (12b). Both antennae and palps present, simple, short and cirri- or papilliform....................**14**
13b (12b). Antennae short and cirri- or papilliform, palps absent, reduced to a ciliated pads....................**21**

14a (13a). Supra-acicular chaetae cultriform, smooth or serrated....................**15**
14b (13a). Supra-acicular chaetae of two kinds: cultriform and capillary....................**19**

15a (14a). Dorsal and ventral cirri present....................**16**
15b (14a). Dorsal and ventral cirri absent....................***O. adherens***

16a (15a). Antennae and palps well developed, digitiform; dorsal and ventral cirri long, threadlike; adults with P-type maxillae; contemporary hermaphrodite, with anterior male and posterior female trunk regions; sexual dimorphism absent....................***O. baccii***
16b (15a). Antennae and palps small; dorsal and ventral cirri short, bluntly conical; adults with K-type maxillae; sexual dimorphism present, protandrous hermaphrodite (assumed to be so in *O. eutrophila*)....................**17**

17a (16b). Eyes absent; median pygidial stylus well developed....................***O. eutrophila***

17b (16b). Eyes present; median pygidium stylus short..**18**

18a (17b). Additional lateral sclerotization present below the cutting plates of the mandibles, giving a wing-like appearance, being the anterior external borders of the mandibular shafts triangular and broad; adult specimens with an average of 18 chaetigerous segments (small oocytes appear at a mean size of 18.2 chaetigers; range 16-22); earliest appearance of K-forceps at 17 chaetigers; Mediterranean specimens, westernmost records from Malaga...***O. puerilis puerilis***
18b (17b). Lateral sclerotization in the mandibular shafts reduced, not reaching a wing-like appearance, being the anterior external borders of the mandibular shafts elongated and straight; adult specimens with an average of 20 chaetigerous segments (small oocytes appear at a mean size of 20.4 chaetigers; range 17-24); earliest appearance of K-forceps at 19 chaetigers; English Channel and North European specimens, occurring southwards to Strait of Gibraltar and Alboran Sea (Marbella)........***O. puerilis siberti***

19a (14b). Last 7-9 segments and pygidium rimmed by two scalloped longitudinal folds arising dorsolaterally and curving across the dorsum...***O.* cf. *scarlatoi***
19b (14b). Last segments and pygidium without scalloped longitudinal folds arising dorsolaterally and curving across the dorsum...**20**

20a (19b). Capillary chaetae smooth; mandibles elongate-triangular, each piece with four distinct teeth...***O. littoralis***
20b (19b). Capillary chaetae serrated; mandibles rod-like with bifid serrated cutting edge.........***O. gracilis***

21a (13b). Supra-acicular chaetae of 2 kinds: capillary and cultriform; maxillae with P- or K-type maxillae; K-type maxillae with both prongs entire; up to 7-8 subacicular compound chaetae per fascicle...***O. maculata***
21b (13b). Supra-acicular chaetae of 1 kind: needle-like capillary or cultriform......................................**22**

22a (21b). Supra-acicular chaetae needle-like capillaries, normally serrated...**23**
22b (21b). Supra-acicular chaeta cultriform...**26**

23a (22a). Maxillae with K- and P-type jaws; supra-acicular chaetae capillaries, with fine serration, numbering 1-5; 0-2 subacicular compound chaetae with pointed serrated blades per fascicle (in some specimens, only in a few segments); 2-4 subacicular simple chaetae; K-type maxillae with entire prongs and present only in males with dorsolateral processes; sexual dimorphism present: males with dorsolateral processes from chaetiger 15-17 to posterior end, and a mid-dorsal conical or funnel-shaped protuberance, inclined backwards, while females and young males have the typical *Ophryotrocha* shape; a pair of eyes as light-reflecting structures located within the prostomium at the posterior margin, invisible in preserved specimens..***O. cosmetandra***
23b (22a). Maxillae only with P-type jaws...**24**

24a (23b). Eyes consisting of at least 3 pigment cells with densely packed granules, connected by a transverse pigment strand of cells irregularly branched (in transmitted light the pigment is dark grey, but strongly reflects the incident light in which it appears as a luminous white spot); supra-acicular chaetae capillaries, slightly flattened distally, numbering 2-3; 2-6 subacicular compound chaetae; sexual dimorphism absent;...***O. diadema***
24b (23b). Eyes absent; supra-acicular chaetae serrated capillaries, one per parapodium........................**25**

25a (24b). One supra-acicular chaeta serrated capillary; 3-4 subacicular compound chaetae with pointed serrated blades per fascicle; one subacicular thin simple chaeta deeply embedded in neuropodia in most part of the body...***O. gerlachi***
25b (24b). Supra-acicular chaetae serrated capillaries, geniculate; 3 subacicular compound chaetae with smooth blades; one subacicular simple chaeta as long as inferiormost compound chaeta in the last pair of parapodia..***O. splendida***

26a (22b). 4-5 subacicular compound chaetae per fascicle; maxillae with P- or K-type jaws; K-forceps right distal tip bidentate, left tip falcate; prostomium without a distinct elevated central region; prostomium clearly separated from the peristomium...**27**

26b (22b). About 7 subacicular compound chaetae per fascicle; maxilla always with P-type maxillae; prostomium with a pair of dorsolateral depressions leaving a distinct elevated central region; prostomium separated from the peristomium by a furrow.. ***O. socialis***

27a (26a). Median connection of pigment between eyes present (may not be visible in preserved material); maximum number of dorsal median rosette glands on posterior segments in males 5; 6 diploid chromossomes.. **28**
27b (26a). Median connection of pigment between eyes absent... **29**

28a (27a). Maximum length of 4 mm for 24 chaetigers; serration of falcigers coarse; maximum number of dorsal median rosette glands on posterior segments in females 3; 25-28 teeth at the edge of mandible; diameter of eggs 120-130 µm; 0 chaetigers at larval release; larval pygidial stylus long.......... ***O. labronica***
28b (27a). Maximum length of 5 mm for 22 chaetigers; serration of falcigers fine; maximum number of dorsal median rosette glands on posterior segments in females 5; 21-24 teeth at the edge of mandible; diameter of eggs 150-180 µm; 2 chaetigers at larval release; larval pygidial stylus short..... ***O. macrovifera***

29a (27b). Maximum length of 6 mm for 28 chaetigers; serration of falcigers fine; maximum number of dorsal median rosette glands in males 5; maximum number of dorsal median rosette glands in females 5; 20-24 teeth at the edge of mandible; 6 diploid chromossomes; diameter of eggs 145-160 µm; 2-3 chaetigers at larval release; larval pygidial stylus short.. ***O. japonica***
29b (27b). Maximum length of 6 mm for 22 chaetigers; serration of falcigers coarse; maximum number of dorsal median rosette glands in males 7; maximum number of dorsal median rosette glands in females 7; 22-25 teeth at the edge of mandible; 10 diploid chromossomes; diameter of eggs 120-130 µm; 0 chaetigers at larval release; larval pygidial stylus long... ***O. robusta***
29c (27b). Maximum length of 4 mm for 20 chaetigers; serration of falcigers coarse; maximum number of dorsal median rosette glands in males 6; maximum number of dorsal median rosette glands in females 5; 18-21 teeth at the edge of mandible; 10 diploid chromossomes; diameter of eggs 165-170 µm; 2 chaetigers at larval release; larval pygidial stylus short.. ***O. rubra***

30a (9b). Palps present, short and papilliform; dorsal cirri present, ventral cirri unknown; adults with P-type maxillae; 3 chaetae per fascicle.. ***O. irinae***
30b (9b). Palps absent; dorsal and ventral cirri absent; parapodia without cirri; adults with K-type maxillae, with both prongs bifid.. **31**

31a (30b). Supra-acicular chaetae of 2 kinds: geniculate, smooth and serrated; up to six supra-acicular chaetae per fascicle... ***O. hartmanni***
31b (30b). Supra-acicular chaetae of 1 kind, smooth capillaries; up to four supra-acicular chaetae per fascicle... ***O. schubravyi***

Ophryotrocha adherens Paavo, Bailey-Brock & Åkesson 2000

Ophryotrocha adherens PAAVO, BAILEY-BROCK & ÅKESSON, 2000: 251-259, figs. 1-8, tables 1-2, 4.

TYPE LOCALITY: Near the Sand Island advanced primary seawage outfall, in Mamala Bay, off the south shore of Oahu Island, Hawaii (USA), 21º16.802'N, 157º54.545'W, at 70 meters, in the upper centimeters of clean, calcareous sand just seaward of an ancient coral reef; sediment granulometry as primarily medium grains with smaller proportions of coarse and fine fractions.

SELECTED REFERENCES: *Ophryotrocha adherens* — ÅKESSON, 1975: 378-379, table 1 [nomen nudum]; PLEIJEL & EIDE, 1996: table 2 [nomen nudum]; DAHLGREN *et al.*, 2001: table 1; SIMONINI *et al.*, 2009: 82, figs. 2-3, tables 1-2.

DISTRIBUTION: Mamala Bay, off the south shore of Oahu Island (Hawaii); Hawaii Kai Marina and Barber's Point sewage outfall on Oahu (Hawaii); Sailor's Hat pool on Kaho`olawe (Hawaii); Kyrenia harbour (Cyprus); Porto Palo di Capo Passero and Porto Empedocle (Southern Sicily, Italy); Las Palmas harbour (Canary Islands). Found in benthic communities living near a sewage outfall in the Hawaiian Islands, and in the sediment below a tuna farm and a mussel aquaculture plant in the Mediterranean (SIMONINI *et al.*, 2009). At shallow water to 70 meters.

Ophryotrocha baccii Parenti 1961

Ophryotrocha baccii PARENTI, 1961: 438-440, figs. I*1-5*, II*6-7*.

TYPE LOCALITY: Île Vert, Roscoff (France), interstitial on sand.

SELECTED REFERENCES: *Ophryotrocha baccii* — PARENTI, 1964: 37-38; OUG, 1994: 253-254, fig. 2. *Ophryotrocha bacci* — ÅKESSON, 1973*b*: 151-152, figs. 9-11; GEORGE & HARTMANN-SCHRÖDER, 1985: 172, fig. 58.

DISTRIBUTION: From Wales to western Sweden and Northern Norway; English Channel. Lives among shell fragments and on coarse muddy gravel from the intertidal zone to a depth of 7 meters.

Ophryotrocha cosmetandra Oug 1990

Ophryotrocha cosmetandra OUG, 1990: 192-201, figs. 1-6, table 1.

TYPE LOCALITY: Marisletta, Kvaløya, near Tromsø (Norway), 69º37'N, 18º49'E, on soft mud, at 6-10 meters.

SELECTED REFERENCES: *Ophryotrocha cosmetandra* — OUG, 1994: 255; HØISÆTER & SAMUELSEN, 2006: table 7.

DISTRIBUTION: Tromsø and Finmark (Norway), 6-26 meters, on muddy bottoms with H_2S, especially in polluted harbours; Godhavn Havn (Greenland), on sand, at 7 meters; Faroes, in organically polluted harbours.

REMARKS: The genus *Mammiphitime* was created by ORENSANZ (1990) to include *Ophryotrocha*-like specimens without ventral palps, neuropodia distally partitioned into low lobes, including pre-chaetal lobe and ventral retractile lobe, and median and posterior segments with large dorsal lobes. The main diagnostic feature are the large dorsal lobes of the posterior segments. The genus was created for *M. tridentata*, collected from the region of Falkland and South Georgia Islands, and also for an unidentified specimen collected at the Kerguelen Islands (ORENSANZ, 1990). One posterior end of *M. tridentata* was carrying eggs, but sexual dimorphism was not described.

In the same year, *Ophryotrocha cosmetandra* was described by OUG (1990), from shallow-water soft bottoms in Tromsø and Finnmark (Norway). This species shows a strong sexual dimorphism, with mature males showing conspicuous dorsolateral processes on posterior segments (from chaetiger 15-17) and pygidium, and a single mid-dorsal funnel-shaped protuberance anterior to pygidium (OUG, 1990). Young males and mature females, however, did't show any of these protuberances, presenting the typical morphology of the *Ophryotrocha*.

OUG (1990) studied in detail the dorsal processes of *O. cosmetandra*. The glands in the dorsal processes of the males stained brightly red with eosin, showing a granulose appearance, and consisted in a number of long tubular structures opening to the surface at the tips of the processes. In females, similar staining granulose cells were scattered in the epidermis, and in both sexes a number of other staining glandular cells dispersed over the body (OUG, 1990). In section, the dorsal protuberance of the males showed to be made of compact tissues, without any particular internal structures. This way, the anatomy of the protuberances gave no clues as to their possible function. OUG (1994) referred the possibility that *O. cosmetandra* should be referred to the genus *Mammiphitime*, but apparently this new combination has never been published. In spite of all this, the species has been normally considered to belong to the genus *Mammiphitime* (*e.g.*, the MarBEF, APHIA, or NEAT online species lists).

According to EIBYE-JACOBSEN & KRISTENSEN (1994), the validity of the genus *Mammiphitime* appears to be especially dubious. It is separated from the genus *Ophryotrocha* with base on the presence of supplementary acicula in the parapodia, and the proeminent dorsolateral lobes in the posterior segments, but the same authors suggested to leave the problem unsolved until further evidence is available. The phylogenetic study of the entire family performed by the same authors gave as a result a polytomy containing *Iphitime*, *Mammiphitime*, *Ophryotrocha* and the *Parophryotrocha*-*Veneriserva* clade, which was explained as being a byproduct of the many polymorphisms found in *Ophryotrocha* (EIBYE-JACOBSEN & KRISTENSEN, 1994).

EIBYE-JACOBSEN & KRISTENSEN's (1994) suggestion will be followed here, as I also agree that the genus *Mammiphitime* is very dubious, and quite probably a synonym of *Ophryotrocha*, and that the dorsal protuberances are apomorphic characters inside the genus *Ophryotrocha*. The genus is thus questionably referred to *Ophryotrocha*. On the other side, the species *Ophryotrocha cosmetandra* is here maintained under *Ophryotrocha*, as apparently it has never been published as *Mammiphitime* (besides in internet lists), and I think it is useless to do it and create a new combination until it is demonstrated that this genus, with *M. tridentata* Orensanz 1990 as the type species, is valid.

Ophryotrocha craigsmithi Wiklund, Glover & Dahlgren 2009

Ophryotrocha craigsmithi WIKLUND, GLOVER & DAHLGREN, 2009: 48, fig. 2.

TYPE LOCALITY: Northern North Atlantic, in the Koster area of Sweden, coastal Skagerrak, 58º53.1'N, 11º06.4'E, from experimental tank with bone material sampled from a Minke whale carcass implanted at 125 meters.
DISTRIBUTION: Known from a Minke whale carcass at 125 meters in the Koster area of Sweden (58º53.1'N, 11º06.4'E, Skagerrak), and from sediment sampled at 84 and 150 meters beneath a fish farm in Svåsand, Hardangerfjord (60º21.27'N, 6º20.89'E), in Norway.

Iphitime cuenoti Fauvel 1914

Iphitime Cuenoti FAUVEL, 1914*b*: 34-37, fig. 1.
TYPE LOCALITY: Off Arcachon (France), on a hydroid fixed on a juvenile *Maja squinado* (Herbst 1788).
SELECTED REFERENCES: *Iphitime Cuenoti* — FAUVEL, 1923*c*: 428, fig. 170; FAGE & LEGENDRE, 1925: 220-224, fig.1; FAGE & LEGENDRE, 1934: 299-304, figs. 3-4; HARTNOLL, 1962: 93-95, plate 1. *Iphitime cuenoti* — ABELLÓ, 1985: 355-356, tables 1-3; BELLONI & MORI, 1985: 402; GEORGE & HARTMANN-SCHRÖDER, 1985: 144, fig. 47; ABELLÓ, SARDÁ & MASALES, 1988: 151-161, figs. 1-3; HØISÆTER & SAMUELSEN, 2006: 349, figs. 7*C*, 8*B*, 9*B*, 10*D*, 11*C*, tables 6-7.
DISTRIBUTION: Along the Atlantic coast of France north to the entrance of the English Channel; Isle of Man; Mediterranean Sea, at 50-400 meters. Generally occurs in the gill chambers of several different species of crustaceans, e.g. *Maja squinado* (Herbst 1788), *Liocarcinus depurator* (Linnaeus 1758), *Pagurus bernhardus* (Linnaeus 1758), *Goneplax rhomboides* (Linnaeus 1758), *Macropipus tuberculatus* (Roux 1830) and *Macropodia tenuirostris* (Leach 1814). In the Mediterranean Sea, the infestation prevalence is higher at higher depths (ABELLÓ, 1985; ABELLÓ, SARDÁ & MASALES, 1988).

Ophryotrocha diadema Åkesson 1976

Ophryotrocha diadema ÅKESSON, 1976: 24-33, figs. 6, tables 1-4.
TYPE LOCALITY: Harbour of Los Angeles, California.
SELECTED REFERENCES: *Ophryotrocha diadema* — SIMONINI *et al.*, 2009: 82, 85-86, figs. 2-4, tables 1-2; SIMONINI *et al.*, 2010: 27, 30, 32, 34, 36, fig. 3, table 2.
DISTRIBUTION: Harbour of Los Angeles, California; Mediterranean Sea: Porto Empedocle, Sicily (Italy, Ionian Sea).
REMARKS: SIMONINI *et al.* (2009) consider the presence of *Ophryotrocha diadema* in the Mediterranean waters as the consequence of an anthropogenic dispersion. Moreover, as it was found in a single site, it was suggested that the species was introduced in recent times.

Ophryotrocha dubia Hartmann-Schröder 1974

Ophryotrocha dubia HARTMANN-SCHRÖDER, 1974*d*: 218-220, figs. 36-40.
TYPE LOCALITY: Northwestern North Sea, 58º27'N, 2º52'W, on muddy sand, at 68 meters.
SELECTED REFERENCES: *Ophryotrocha dubia* — GEORGE & HARTMANN-SCHRÖDER, 1985: 174, fig. 59; HILBIG & BLAKE, 1991: 165, fig. 17*A*; HARTMANN-SCHRÖDER, 1996: 280.
DISTRIBUTION: Known from the type locality.

Ophryotrocha eutrophila Wiklund, Glover & Dahlgren 2009

Ophryotrocha eutrophila WIKLUND, GLOVER & DAHLGREN, 2009: 49-50, fig. 3.
TYPE LOCALITY: Northern North Atlantic, in the Koster area of Sweden, coastal Skagerrak, 58º53.1'N, 11º06.4'E, from experimental tank with bone material sampled from a Minke whale carcass implanted at 125 meters.
DISTRIBUTION: Known from a Minke whale carcass at 125 meters in the Koster area of Sweden (58º53.1'N, 11º06.4'E, Skagerrak).

Ophryotrocha gerlachi Hartmann-Schröder 1974

Ophryotrocha gerlachi HARTMANN-SCHRÖDER, 1974*d*: 220-223, figs. 41-43.
TYPE LOCALITY: Eastern North Sea, 56º42'N, 6º5'E, on coarse sand with gravel, at 52 meters.
SELECTED REFERENCES: *Ophryotrocha gerlachi* — GEORGE & HARTMANN-SCHRÖDER, 1985: 176, fig. 60; HILBIG & BLAKE, 1991: 165, fig. 17*B*; KIRKEGAARD, 1992: 387, fig. 187; HARTMANN-SCHRÖDER, 1996: 280.
DISTRIBUTION: Known from the type locality.

Ophryotrocha geryonicola (Esmark 1874)

Eteonopsis geryonicola ESMARK, 1874: 497-498.

TYPE LOCALITY: Oslofjorden (= Christianiafjorden), Norway, commensal in the branchial chambers of *Geryon tridens* crabs.

SELECTED REFERENCES: *Eteonopsis geryonicola* — BIDENKAP, 1895: 72-74, pl. 3 figs. 1-3; GASTON & BENNER, 1981: 79-85, figs. 2-4. *Ophryotrocha geryonicola* — WESENBERG-LUND, 1938: 3-13, figs. 1-11; PFANNENSTIEL, GROTHE & KEGEL, 1982: 120-123, figs. 1-2; GEORGE & HARTMANN-SCHRÖDER, 1985: 178, fig. 61; MARTIN, ABELLÓ & CARTES, 1991: table 1, fig. 6; KIRKEGAARD, 1992: 387-388, fig. 188; HARTMANN-SCHRÖDER, 1996: 280. Not *Ophryotrocha geryonicola* — DESPORTES, LAUBIER & THÉODORIDÈS, 1977: 131-133 [= *Ophryotrocha mediterranea* Martin, Abelló & Cartes 1991].

DISTRIBUTION: Eastern and Western North Atlantic. As commensal in the gill chambers of several deep-water crabs of the genus *Geryon* (*G. tridens* Krøyer, *G. longipes* Milne-Edward, *G. quinquedens* Smith), and also of *Cancer borealis* Stimpson, between 70-210 meters.

REMARKS: *Eteonopsis geryonicola* Esmark 1874, was first attributed to the genus *Ophryotrocha* by WESENBERG-LUND (1938). Later, GASTON & BENNER (1981) reestablished the genus *Eteonopsis* for *E. geryonicola* Esmark 1874, separating it from the genus *Ophryotrocha* with base on the following statements: 1) *Eteonopsis* is much bigger than *Ophryotrocha* specimens, attaining a length of 140 mm against about 10 mm or less in the later; 2) *Eteonopsis* is an epizoic species, living in branchial chambers of brachyuran crustaceans, while *Ophryotrocha* specimens are free living; 3) ciliary rings present in many *Ophryotrocha* are lacking in *Eteonopsis*; 4) blades of composite falcigers are shorter in *Eteonopsis* than in most *Ophryotrocha*. Shortly after, PFANNENSTIEL, GROTHE & KEGEL (1982) provided a more detailed description based on living specimens. They stated that the big size of the specimens, the laterally extended branches of the intestine on each segment (not reported before and considered as adaptative, due to the lack of a circulatory system), and the epizoic manner of living separated this species from all the other known species of *Ophryotrocha*. However, all the other morphological characters were typical of *Ophryotrocha*, not showing a morphology beyond the normal range of the genus. Segmentally arranged rings of cilia were found to be present, and probably were not seen by GASTON & BENNER (1981) because their description was based on fixed specimens. *Eteonopsis geryonicola* was considered to be a member of the genus *Ophryotrocha*, and *Eteonopsis* a junior synonym of it. The unique characters of *O. geryonicola* would be the result of the epizoic way of living of the species. Many of these characters were found to be present also in *O. mediterranea*, another epizoic species of brachyuran crabs.

As pointed by MARTIN, ABELLÓ & CARTES (1991), the descriptions of *O. geryonicola* given by GASTON & BENNER (1981), PFANNENSTIEL, GROTHE & KEGEL (1982) and GEORGE & HARTMANN-SCHRÖDER (1985), seem to differ in several aspects. As stated also by MARTIN, ABELLÓ & CARTES (1991) the descriptions of the parapodia are so different that they could be attributed to different species. However, the external morphology of the parapodia described by GASTON & BENNER (1981) are quite similar to the one described by MARTIN, ABELLÓ & CARTES (*op. cit.*) for *Ophryotrocha mediterranea*.

Ophryotrocha gracilis Huth 1933

Ophryotrocha gracilis HUTH, 1933: 311-313, fig. 1*c*, table 1.

TYPE LOCALITY: Helgoland, Germany.

SELECTED REFERENCES: *Ophryotrocha gracilis* — PARENTI, 1964: 35-37, figs. 1-7; DOHLE, 1967: 69-73, plates 1-2; GILLANDT, 1979: 45, pl. 1 figs. 6-9; GEORGE & HARTMANN-SCHRÖDER, 1985: 180, fig. 62; KIRKEGAARD, 1992: 389-390, fig. 189; HARTMANN-SCHRÖDER, 1996: 281-282, fig. 124.

DISTRIBUTION: In the North Sea and English Channel (Roscoff, Plymouth). Lives interstitially in sand, gravel, and fragments of shells, and on *Corallina*, from the intertidal zone to shallow subtidal depths.

Ophryotrocha hartmanae (Kirkegaard 1977) **nov. comb.**

Iphitime hartmanae KIRKEGAARD, 1977: 199-203, figs. 1-4, plate 1.

TYPE LOCALITY: Off Dröbak, Oslo Fjord (Norway), on the tail of female egg-bearing crabs of *Hyas araneus* (Linnaeus 1758) and *Hyas coarctatus* Leach 1815.

SELECTED REFERENCES: *Iphitime hartmanae* — GEORGE & HARTMANN-SCHRÖDER, 1985: 146, fig. 48; KIRKEGAARD, 1992: 381-383, fig. 186; HARTMANN-SCHRÖDER, 1996: 279.

DISTRIBUTION: On *Hyas araneus* and *Hyas coarctatus*, in the Oslo Fjord, Norway.

Ophryotrocha hartmanni Huth 1934

Ophryotrocha Hartmanni HUTH, 1933: 311-313, table 1, figs. 1*c-d.*

TYPE LOCALITY: Plymouth, English Channel.

SYNONYMS: *Ophryotrocha hartmanni medicea* Parenti 1962.

SELECTED REFERENCES: *Ophryotrocha hartmanni* — PARENTI, 1961: 440-444, figs. I*6-11*, II*4-5*, III*4-5, 7*; ÅKESSON, 1973*b*: 149-151, figs. 7-8; ÅKESSON, 1975: 390; GEORGE & HARTMANN-SCHRÖDER, 1985: 182, fig. 63; BACHELET, 1990: 177; KIRKEGAARD, 1992: 390-392, fig. 190; SIMONINI *et al.*, 2009: 82, figs. 2-3, tables 1-2. *Ophryotrocha hartmanni hartmanni* — PARENTI, 1962: 78-83, fig. 1.*3*, *5*. *Ophryotrocha hartmanni medicea* — PARENTI, 1962: 78-83, fig. 1.*1-2*, *4*, table 1 figs. 1-5.

DISTRIBUTION: Scotland; English Channel and Mediterranean Sea; Ionian Sea; Adriatic Sea. Known to occur amongst bottom detritus of marine aquaria, and in harbours, in muddy sand. Shallow water.

REMARKS: PARENTI (1962) suggested that the Mediterranean population of *O. hartmanni* collected at Leghorn (Livorno) should be considered as a subspecies, *O. hartmanni medicea*. The suggestion was based on the fact that the Leghorn population presented 2, 3, or 4 male segments, against 2 male segments in the Atlantic population. ÅKESSON (1975) performed cross experiments between strains from Malaga, Plymouth, and Roscoff, and all the combinations proved to be completely fertile, as well as the back crosses of F_1, F_2, and F_3 generations with the parent strains. For this reason, ÅKESSON (1975) considered that the erection of the new subspecies by PARENTI (1962) was not justified.

Ophryotrocha irinae Tzetlin 1980

Ophryotrocha irinae TZETLIN, 1980*a*: 20-22, fig. 2.

TYPE LOCALITY: Kandalaksha Bay, Salma Strait (White Sea), in the littoral zone.

DISTRIBUTION: White Sea and Barents Sea, in the littoral zone.

Ophryotrocha japonica Paxton & Åkesson 2010

Ophryotrocha japonica PAXTON & ÅKESSON, 2010: 7-8, fig. 1*B*, table 1.

TYPE LOCALITY: Holotype from a strain of cultured specimens collected in 1989 near Amakusa Marine Biological Laboratory, in Southern Japan.

SELECTED REFERENCES: *Ophryotrocha japonica* nomen nudum — PLEIJEL & EIDE, 1996: 648, fig. 1, table 2; DAHLGREN *et al.*, 2001: 196, tables 1-2; SIMONINI, 2002: 59-63, fig. 2*A-C*, table 1; SIMONINI & PREVEDELLI, 2003: 172, 174-178, figs. 1-3, tables 1-3; ÅKESSON & PAXTON, 2005: 127, 138, table 1; PREVEDELLI, N'SIALA & SIMONINI, 2005: 287-292, figs. 1-2, tables 1-2; HEGGØY, SCHANDER & ÅKESSON, 2007: 415-417, figs. 1-6, tables 1-2; SIMONINI *et al.*, 2009: 80, 82-86, figs. 2-4, tables 1-2; WIKLUND, GLOVER & DAHLGREN, 2009: fig. 5, table 1; SIMONINI *et al.*, 2010: 27, 29-30, 32-33, 35-36, figs. 3-4, table 2.

DISTRIBUTION: North Pacific Ocean: Japan and Southern California (Los Angeles harbour); Mediterranean Sea (Gulf of Genoa and Adriatic Sea). On harbour and brackish environments.

REMARKS: The presence of *Ophryotrocha japonica* in the Mediterranean was considered by SIMONINI *et al.* (2009) as the consequence of an anthropogenic dispersion.

The species is characterized by the following features: adults usually more than 5 mm long; prostomium roundish, with short antennae, and no palps; eyes present, but pigmented transverse strand connecting the two eyes absent; right branch of the forceps with a double apical tooth; blue-white iridescent pigmentation, located dorsally and ventrally on posterior segments, present; gonochoric species; egg masses rigid, tubular or "spoon-shaped"; eggs white, with a diameter of 145-160 µm (130-140 µm in some populations); larvae hatches with 2-3 chaetigers.

Ophryotrocha labronica La Greca & Bacci 1962

Ophryotrocha labronica LA GRECA & BACCI, 1962: 9-16 , figs. 1-4, 7-8, 11-16, 18, table 1.

TYPE LOCALITY: Gulf of Naples and Livorno (Tyrrhenian Sea). Neotype designated by PAXTON & ÅKESSON (2007) from a strain of cultured specimens collected in the Bay of Naples (Mergellina harbour), Italy, 1965.

SELECTED REFERENCES: *Ophryotrocha labronica* [nomen nudum] — PARENTI, 1961: fig. III*1-2, 6*. *Ophryotrocha labronica* — ÅKESSON, 1972: 207-210, tables 1-4; ÅKESSON, 1973*b*: 146-149, figs. 3-4, tables 1-2. *Ophryotrocha labronica labronica* — SIMONINI *et al.*, 2009: 82, figs. 2-3, tables 1-2; ; PAXTON & ÅKESSON, 2007: 10-16, figs. 5-8, table 1; PAXTON & ÅKESSON, 2010: 2-3, figs. 2*A-B*, *H*, 4*D-E*, table 1.

REFERENCES FOR PORTUGAL: ÅKESSON, 1975 (Faro); ÅKESSON, 1984 (Faro).

DISTRIBUTION: Mediterranean Sea; Ionian Sea; Adriatic Sea; Aegean Sea; Gulf of Aqaba (Red Sea); Sydney harbour (Australia). Occurs in polluted biotops as harbours, and also in brackish waters. CAMPOY (1982) refers to this species 2 specimens collected at the coast of Guipúzcoa (Bay of Biscay), in rocky bottoms between 5-18 meters. However, this record is here considered to be dubious. The record by NÚÑEZ, PASCUAL & BRITO (1996: 143-144, figs. 3, 4*J*), from Canary Islands, is also considered as dubious, as the specimens are described as having simple subacicular chaetae absent. SIMONINI *et al.* (2009) considered that *O. labronica* could be a true cosmopolitan species, but also that records as the one from Australia could be the result of a recent episode of an anthropogenic dispersion of the species.

REMARKS: The jaw growth and replacement in *Ophryotrocha labronica* was studied in detail by PAXTON (2004). See also the *REMARKS* section under *O. puerilis puerilis*.

The species is characterized by the following features: sibling species with *O. macrovifera* and *O. robusta*; adults reach a length of 4 mm, but mature females are smaller than females of *O. robusta* with the same segment number; prostomium triangular, elongate, largely joined to the metastomium, with two very short antennae and no palps; eyes present, as well as a characteristic transverse strand of pigment connecting them; right branch of the forceps with a double apical tooth; blue-white iridescent pigmentation, situated dorsally and ventrally on posterior segments, present; gonochoric species, without sex dimorphism; egg masses as a mucous tube; eggs white, with a diameter of 120-125 μm; larvae hatches with no chaetigers.

Ophryotrocha littoralis (Levinsen 1879)

Paractius littoralis LEVINSEN, 1879*a*: 11.

TYPE LOCALITY: Arctic Ocean.

SELECTED REFERENCES: *Ophryotrocha littoralis* — OUG, 1994: 256, fig. 4*i*. *Ophryotrocha* sp. — OUG, 1994: 255-126, fig. 4*a-h*.

DISTRIBUTION: Arctic Ocean; Tromsø, Norway. Between 6-10 meters, in soft sand mixed mud.

Ophryotrocha lobifera Oug 1978

Ophryotrocha lobifera OUG, 1978: 299-301, fig. 7.

TYPE LOCALITY: Middle basin of Lindåspollene, western Norway, 60º43'N, 5º10'E, black mud with H_2S, 50 meters.

SELECTED REFERENCES: *Palpiphime lobifera* — ORENSANZ, 1990: 125; HARTMANN-SCHRÖDER, 1996: 285; WIKLUND, GLOVER & DAHLGREN, 2009: 51, fig. 4.

DISTRIBUTION: Western Norway, in black mud with H_2S, at 50 meters; Koster area of Sweden, Skagerrak, from a Minke whale carcass at 125 meters.

Ophryotrocha longidentata Josefson 1975

Ophryotrocha longidentata JOSEFSON, 1975: 49-51, figs. 1-7.

TYPE LOCALITY: Skagerrak, Swedish west coast, 58º32'30"N, 10º47'30"E, at 100 meters, on soft mud.

SELECTED REFERENCES: *Ophryotrocha longidentata* — GEORGE & HARTMANN-SCHRÖDER, 1985: 184, fig. 64; KIRKEGAARD, 1992: 392-393, fig. 191; HARTMANN-SCHRÖDER, 1996: 282-283.

DISTRIBUTION: Skagerrak, Swedish west coast, between 58º32'30"N and 58º51'N, and 10º46'E and 11º02'30"E, at 50-110 meters, on fine sand and soft mud.

REMARKS: As noted by EIBYE-JACOBSEN & KRISTENSEN (1994) and HARTMANN-SCHRÖDER (1996), this species seems to be quite close to the genus *Palpiphitime*. However, HARTMANN-SCHRÖDER (*op. cit.*) did not agree with the inclusion of *Ophryotrocha longidentata* in the *Palpiphitime*, pointing differences in the mandibles, and the lack of the parapodial prominent dorsal and ventral lateral lobes characteristic of this genus. For this species, and for *O. labidon* Hilbig & Blake 1991, another *Ophryotrocha* species with biarticulated palps, she comments the possibility of the creation of a new genus. On the other hand, EIBYE-JACOBSEN & KRISTENSEN (1994: 115-116) stated that *O. longidentata* should probably be referred to the genus *Palpiphitime*. I also think this may be true, but until more data is available, for this species and for *O. labidon*, I maintain here the species in the genus *Ophryotrocha*.

Ophryotrocha macrovifera Paxton & Åkesson 2010

Ophryotrocha macrovifera PAXTON & ÅKESSON, 2010: 8, figs. 1*C*, 2*D*, *F-G*, 3*C-F*, *H-I*, 4*A-B*, 5*A*, *C*, table 1.

TYPE LOCALITY: Holotype from a strain of cultured specimens collected at Kyrenia, Cyprus, in 1972.

SELECTED REFERENCES: *Ophryotrocha macrovifera* nomen nudum — ÅKESSON, 1975: 382-383, 390, 394-395, figs. 1-4, tables 1, 6; LEVINTON, 1983: 688-689, 693-694, tables 1-5; PLEIJEL & EIDE, 1996: 648, fig. 1, tables 2-3; DAHLGREN *et al.*, 2001: 196, tables 1-2; SIMONINI, 2002: 59-62, table 1; ÅKESSON & PAXTON, 2005: 127, table 1; PREVEDELLI, N'SIALA & SIMONINI, 2005: 287-288, table 1; HEGGØY, SCHANDER & ÅKESSON, 2007: fig. 6; SIMONINI *et al.*, 2009: 80, 82, 84, 86, figs. 2-4, tables 1-2; SIMONINI *et al.*, 2010: 27, 30, 32, 34, 36, fig. 3, table 2.

REFERENCES FOR PORTUGAL: ÅKESSON, 1973*b* (as *Ophryotrocha* sp. I; Faro); ÅKESSON, 1975 (as nomen nudum; Faro); ÅKESSON, 1984 (as strain of *O. labronica*); PAXTON & ÅKESSON, 2010 (Portugal).

DISTRIBUTION: Mediterranean Sea: Italy (Genoa harbour and the Venice-Chioggia Lagoon, in the Adriatic Sea), Cyprus (Kyrenia), and Egypt (Alexandria); North Atlantic: Portugal (Faro) and USA (Florida: Tampa Bay and St. Lucie's Inlet).

REMARKS: The species is characterized by the following features: sibling species with *O. labronica* and *O. robusta*; adults reach a length of 4 mm, but mature females are smaller than females of *O. robusta* with the same segment number; prostomium triangular, elongate, largely joined to the metastomium, with two very short antennae and no palps; eyes present, as well as a characteristic transverse strand of pigment connecting them; right branch of the forceps with a double apical tooth; blue-white iridescent pigmentation, located dorsally and ventrally on posterior segments, absent; gonochoric species, with sex dimorphism; egg masses as a mucous tube; eggs white, with a diameter of 175-185 µm (some populations have eggs with a diameter of about 150 µm); larvae hatches with 1-2 chaetigers.

Ophryotrocha maculata Åkesson 1973

Ophryotrocha maculata ÅKESSON, 1973*a*: 141-144, figs. 1-3.

TYPE LOCALITY: Swedish west coast, Gullmarsfjord, Saltkällefjord, on a muddy bottom, at 25 meters.

SELECTED REFERENCES: *Ophryotrocha maculata* — GEORGE & HARTMANN-SCHRÖDER, 1985: 186, fig. 65; KIRKEGAARD, 1992: 393-395, fig. 192; HARTMANN-SCHRÖDER, 1996: 283; WIKLUND, GLOVER & DAHLGREN, 2009: 51.

DISTRIBUTION: Swedish coast of Skagerrak: Gullmarsfjord, Saltkällefjord, on a muddy bottom, at 25 meters, and Koster area, from a Minke whale carcass, at 125 meters.

Ophryotrocha mediterranea Martin, Abelló & Cartes 1991

Ophryotrocha mediterranea MARTIN, ABELLÓ & CARTES, 1991: 280-291, table 1, figs. 1-5.

TYPE LOCALITY: Western Mediterranean Sea, 40º52.6'N, 02º31.1'E, 1246-1284 meters, commensal in the branchial chambers of *Geryon longipes* Milne-Edwards 1881.

SELECTED REFERENCES: *Ophryotrocha geryonicola* [not Esmark 1874] — DESPORTES, LAUBIER & THÉODORIDÈS, 1977: 131-133; MORI & BELLONI, 1985: 277-284, figs. 2-4, table 1.

DISTRIBUTION: Western Mediterrean Sea, at 400-1800 meters, as commensal in the branchial chambers of *Geryon longipes* Milne-Edwards 1881.

Ophryotrocha paguri (Fage & Legendre 1934) **nov. comb.**

Iphitime paguri FAGE & LEGENDRE, 1934: 301-304, figs. 1-2.

TYPE LOCALITY: South of Iles Glénans, south of Concarneau (Bretagne, France), in the gill chambers of *Pagurus bernhardus* (Linnaeus 1758), collected at 80-100 meters on a silty bottom.

SELECTED REFERENCES: *Iphitime paguri* — MOORE & GORZULA, 1973: 161-163, figs. 1, 2*B*; GEORGE & HARTMANN-SCHRÖDER, 1985: 148, fig. 49; HØISÆTER & SAMUELSEN, 2006: 336-346, figs. 2-6, 7*A-B*, 8*A*, 9*A*, 10*A-B*, 11*A-B*, 12-14, tables 1-7.

DISTRIBUTION: Along the French Atlantic coast, English Channel and Firth of Clyde. Generally lives in the gill chambers of the hermit crab *Pagurus bernhardus* (Linnaeus 1758), inhabiting the empty shell of the whelk *Buccinum undatum*, but has been found also associated with crabs such as *Goneplax rhomboides* (Linnaeus 1758), *Macropodia tenuirostris* (Leach 1814), and *Liocarcinus depurator* (Linnaeus 1758), in French waters. In Norway it was found to live in the apical part of the gastropod shells inhabited by *Pagurus prideaux* Leach 1815, and at the branchial chambers, the sulcus of the carapax, or between coxae of *P. prideaux*, collected between 1-150 meters.

Ophryotrocha paragerlachi Brito & Núñez 2003

Ophryotrocha paragerlachi BRITO & NÚÑEZ, 2003: 28-30, fig. 1.

TYPE LOCALITY: Lanzarote (Canary Islands), Playa Quemada, 28º53.4'N 13º43.5'W, at 8 meters, on muddy sand.

DISTRIBUTION: Canary Islands: Lanzarote, Fuerteventura, Gran Canaria, Tenerife. On muddy and fine sand. Between 6-15 meters.

Ophryotrocha puerilis puerilis Claparède & Mecznikow 1869

Ophryotrocha puerilis CLAPARÈDE & MECZNIKOW, 1869: 184.

TYPE LOCALITY: Bottom of aquaria at the marine station in Naples (Italy). Neotype designated by PAXTON & ÅKESSON (2007), from a strain of cultured specimens collected in Genoa, Italy, in 1990.

SELECTED REFERENCES: *Ophryotrocha puerilis* — FAUVEL, 1923*c*: 450-451, fig. 180*a-h* [in part; not *Staurocephalus siberti* McIntosh 1885; not *Ophryotrocha claparedii* Studer 1878; not *Paractius littoralis* Levinsen 1879]; HUTH, 1933: 311-313, table 1, fig. 1*a*; PARENTI, 1961: figs. II*1-2*, III*3*; ÅKESSON, 1967: 113-117, figs. 1-3; ÅKESSON, 1973*b*: 146, figs. 1-2 [in part, Mediterranean specimens]; JUMARS, 1974: 125. *Ophryotrocha puerilis puerilis* — BACCI & LA GRECA, 1953*a*: 93-98, figure, table; BACCI & LA GRECA, 1953*b*: 1115; LA GRECA & BACCI, 1962: 10-16, figs. 5-6, 9-10, 17-18; SIMONINI *et al.*, 2009: 82, figs. 2-3, tables 1-2; PAXTON & ÅKESSON, 2007: 5-9, figs. 1-3, table 1.

DISTRIBUTION: Mediterranean Sea, reaching Malaga in its western distribution; Ionian Sea; Adriatic Sea (Ancona harbour); Aegean Sea. Polluted harbours. At shallow water.

REMARKS: The genus *Ophryotrocha* was established by Claparède & Mecznikow in 1869, for the species *O. puerilis*, collected on the bottom of the tanks of the Naples aquarium, while in 1885 McIntosh described a new species from the English Channel, *Staurocephalus siberti*. Both species were synonymized under *O. puerilis* by BONNIER (1893: 215-218), together with *O. claparedei* Studer 1878, from the Antarctic Ocean, *Paractius littoralis* Levinsen 1879, from the Arctic, *Staurocephalus minimus* Langerhans 1884, from Madeira, and *Paractius mutabilis* Saint-Joseph 1888, from the English Channel. All these synonymies were done without comparing type or topotype material, and as a result *O. puerilis* became a polymorphic species. With the increasing knowledge of the group, with new material becoming available from different regions of the globe, as well as the employ of more taxonomic characters to separate the species and better descriptions of these species, it was realized that different taxa were present under the same binomen. From all those species, *O. claparedei* was removed from the synonymy by Augener in 1913, but the synonymy between *O. puerilis* and *O. siberti* remained. Finally, BACCI & LA GRECA (1953*a*, 1953*b*) realized that *O. puerilis* was polytypic, and using both morphological and genetical features, recognised two subspecies, one present in the Mediterranean (*O. puerilis puerilis*) and the other in the English Channel and near Atlantic European coast (*O. puerilis siberti*). BACCI & LA GRECA (1953*b*) were unable to cross specimens *in vitro* of *O. puerilis* from Naples with specimens from Plymouth, but PARENTI (1961) did obtain a small percentage of viable descendants by crossing specimens from Roscoff and Livorno, showing at least the theoretical possibility of a genetic exchange between both populations.

The two subspecies can be separated with base on a number of biological characters, which include the size of the worms at sex change (it is a protandrous hermaphrodite, switching from male to female: approximately 18 chaetigers in *O. puerilis puerilis*, and 20 chaetigers in *O. puerilis siberti*, depending somewhat on the temperature), or different rates of growth (BACCI & LA GRECA, 1953*a*, 1953*b*; LA GRECA & BACCI, 1962; LEVINTON & MONAHAN, 1983). Hybridization experiments between the two subspecies revealed that only an average of less than 1% of the hybrids attain sexual maturity (ÅKESSON, 1975). Researches were also carried to determine the position of the subspecies European border, and the geographical gap between the two subspecies could be narrowed to a 50-60 km long shoreline between Marbella and Malaga, in the southern Mediterranean coast of Spain (ÅKESSON, 1984; ÅKESSON & PAXTON, 2007).

LA GRECA & BACCI (1962) described *O. labronica*, from the Gulf of Naples, a species very similar to *O. puerilis*, with which it had been confused previously. PFANNENSTIEL (1972) was the first to raise some doubts on whether the original description of *O. puerilis* by Claparède & Mecznikow concerns the same species which all the subsequent writers have named *O. puerilis*. The situation is explained in detail by ÅKESSON (1973*b*, 1984) and PAXTON & ÅKESSON (2007). The Gulf of Naples is the type locality of both species, *O. puerilis* and *O. labronica*, and only these two species have been reported there since 1869 (ÅKESSON, 1973*b*, 1984; SIMONINI, 2002; PAXTON & ÅKESSON, 2007). Probably, both specimens were present in the aquaria where Claparède and Mecznikow collected their specimens. Some features of their description (but not all) are characteristic of *O. labronica*: the size of the sexually mature specimens, the absence of palps, the transversely-connected eye pigment, the outline of the parapodia, the picture of a juvenile with 13 chaetigers showing a K-type maxillae, which never occur before the 17-segment-stage in *O. puerilis*. However, ÅKESSON (1973*b*) presented two reasons for not revising the names. First, both species were probably present in the material studied by Claparède and Mecznikow. Second, *O. labronica* La Greca & Bacci 1962 was a member of a species group with, by then, 4 sibling species: *O. labronica*, *O. notoglandulata* Pfannenstiel 1972, *O. macrovifera* nomen nudum, and *O. robusta* nomen nudum (ÅKESSON, 1973*b*: table 3; ÅKESSON, 1975: table 1). This idea was supported later by PAXTON & ÅKESSON (2007) who, in order to stabilize the taxonomy of the group and to preserve well established names, designated neotypes for the two species.

Ophryotrocha puerilis siberti (McIntosh 1885)

Staurocephalus Siberti MCINTOSH, 1885*b*: 482-484, pl. 13 figs. 5-8.
TYPE LOCALITY: Whitstable, England, in oysterbeds.
SYNONYMS: [?] *Staurocephalus minimus* Langerhans 1884; [?] *Paractis mutabilis* Saint-Joseph 1888.
SELECTED REFERENCES: *Ophryotrocha puerilis* — BONNIER, 1893: 198-211, pls. 1-4; FAUVEL, 1923*c*: 450-451, fig. 180*a-h* [in part; not Claparède & Mecznikow 1869; not *Ophryotrocha claparedii* Studer 1878; not *Paractius littoralis* Levinsen 1879]; ÅKESSON, 1973*b*: 146, figs. 1-2 [in part, Atlantic specimens]. *Ophryotrocha puerilis siberti* — BACCI & LA GRECA, 1953*a*: 93-98, figure, table; BACCI & LA GRECA, 1953*b*: 1115; PARENTI, 1961: 444, fig. II*3*; LA GRECA & BACCI, 1962: fig. 18; GEORGE & HARTMANN-SCHRÖDER, 1985: 190, fig. 67; KIRKEGAARD, 1992: 395, fig. 193; HARTMANN-SCHRÖDER, 1996: 283-284, fig. 125; PAXTON & ÅKESSON, 2007: 9-10, fig. 4. [?] *Staurocephalus minimus* — LANGERHANS, 1884: 257-258, pl. 15 fig. 16. [?] *Paractis mutabilis* — SAINT-JOSEPH, 1888: 240-245, pl. 10 figs. 103-112; SAINT-JOSEPH, 1895: 210-214, pl. 12 figs. 31-32.
REFERENCES FOR PORTUGAL: ÅKESSON, 1975 (Lagos); ÅKESSON, 1984 (Lagos).
DISTRIBUTION: North Atlantic, between White Sea and the English Channel; North Sea to western Baltic and to Strait of Gibraltar, reaching Marbella and Ceuta, in the northern and southern shores of the Western Mediterranean Sea, respectively; questionably Beaufort, North Carolina (USA). There is evidence of the presence of the species in California and in New Hampshire, but these records may be the result of anthropogenic distribution (PAXTON & ÅKESSON, 2007). On coarse sand and gravel, amongst plants, tunicates, hydroids, and in mollusc beds. Intertidal and in shallow subtidal zones. Frequent also in marine aquarium systems.
REMARKS: See the *REMARKS* section under *Ophryotrocha puerilis puerilis*.

Ophryotrocha robusta Paxton & Åkesson 2010

Ophryotrocha robusta PAXTON & ÅKESSON, 2010: 11, figs. 1*D*, 3*A-B*, 5*B*, table 1.
TYPE LOCALITY: Holotype from a strain of cultured specimens collected at Malaga, Spain, in 1978.
SELECTED REFERENCES: *Ophryotrocha robusta* nomen nudum — ÅKESSON, 1975: 382-383, 390, 394-395, figs. 2-4, tables 1, 6; ROLANDO, 1982: 147-152, figs. 1-2; PLEIJEL & EIDE, 1996: 648, fig. 1, tables 2-3; DAHLGREN *et al.*, 2001: 194, 196, 200, tabls 1-2; SIMONINI, 2002: 59, 62-63, table 1; ÅKESSON & PAXTON, 2005: 127, table 1; PREVEDELLI, N'SIALA & SIMONINI, 2005: 287-288, table 1; HEGGØY, SCHANDER & ÅKESSON, 2007: 415, 417,figs. 1-6, tables 1-2; SIMONINI *et al.*, 2009: 80, 82-83, 86, figs. 2-4, tables 1-2; WIKLUND, GLOVER & DAHLGREN, 2009; fig. 5, table 1; SIMONINI *et al.*, 2010: 27, 30, 32, 34, fig. 3, table 2.
DISTRIBUTION: Mediterranean Sea and Strait of Gibraltar: Spain (Malaga, Ceuta, Tarifa) and Italy (Genoa harbour and Southern Sicily).
REMARKS: The species is characterized by the following features: sibling species with *O. labronica* and *O. macrovifera*; adults reach a length of 4 mm, but mature females are bigger than females of *O. labronica* and *O. macrovifera* with the same segment number; prostomium roundish, with two very short antennae and no palps; eyes present, but pigmented transverse strand connecting the two eyes absent; right branch of the forceps with a double apical tooth; blue-white iridescent pigmentation, located dorsally and ventrally on posterior segments, absent; gonochoric species, with sex dimorphism; egg masses as a mucous coocon; eggs yellow, with a diameter of 125-130 µm; larvae hatches with no chaetigers.

Ophryotrocha rubra Paxton & Åkesson 2010

Ophryotrocha rubra PAXTON & ÅKESSON, 2010: 11-12, fig. 1*E*, table 1.
TYPE LOCALITY: Holotype from a strain of cultured specimens collected at Ceuta (Spain, Northern Africa), in 1978.
SELECTED REFERENCES: *Ophryotrocha rubra* nomen nudum — PLEIJEL & EIDE, 1996: 648, 656, fig. 1, tables 2-3; ÅKESSON & PAXTON, 2005: 127, table 1; HEGGØY, SCHANDER & ÅKESSON, 2007: 415, 417, figs. 1-2, tables 1-2; WIKLUND, GLOVER & DAHLGREN, 2009; fig. 5, table 1.
DISTRIBUTION: Mediterranean Sea and Strait of Gibraltar: Spain (Ceuta, Tarifa).

Ophryotrocha* cf. *scarlatoi Averintsev 1989 *sensu* Oug 1994

Ophryotrocha cf. *scarlatoi* OUG, 1994: 254-255, fig. 3.

REMARKS: OUG (1994) identified as *O.* cf. *scarlatoi* Averincev 1989 some specimens collected at the Tromsø region (Northern Norway), at 7-15 meters. The original description is brief and illustrated with simple drawings, and some details were not given. The Norwegian specimens differ in having shorter mandibles, by some minor differences in the maxillary parts, and in having a ventral cirrus on the posterior parapodia (OUG, 1994).

DISTRIBUTION: *O.* cf. *scarlatoi* is present on the Tromsø area (Northern Norway), at 7-15 meters, on muddy bottoms. *O. scarlatoi* Averintsev 1989 (or Averincev), is known from Franz Joseph Land, but may have a wider distribution in the Arctic (OUG, 1994).

Ophryotrocha schubravyi Tzetlin 1980

Ophryotrocha schubravyi TZETLIN, 1980*b*: 666-667, fig. 1.

TYPE LOCALITY: The specimens were collected in a marine aquarium in Moscow. The initial origin of the species is not known, as animals from different seas were kept in the same aquarium.

SELECTED REFERENCES: *Ophryotrocha schubravyi* — PAXTON & ÅKESSON, 2010: 12, table 1.

DISTRIBUTION: Known from original description.

Ophryotrocha socialis Ockelmann & Åkesson 1990

Ophryotrocha socialis OCKELMANN & ÅKESSON, 1990: 146-156, figs. 1-14.

TYPE LOCALITY: Known from laboratory populations, first found in the Helsingør Marine Biological Laboratory (Denmark), in an aquarium with coarse sand and burrowing bivalves; it can be reared at temperatures of 4-15ºC and salinities of 29-34‰.

SELECTED REFERENCES: *Ophryotrocha socialis* — HARTMANN-SCHRÖDER, 1996: 284-285.

DISTRIBUTION: Probably distributed in the Kattegat and North Øresund, from where they may have been introduced into the seawater system of the Helsingør Laboratory with bottom samples; according to the species' salinity and temperature requirements it has a boreal distribution and does not normally occur in shallow or brackish waters; it seems rather unspecialized in what concerns the substrate, but certainly it avoids unstable coarse sands.

Ophryotrocha splendida Brito & Núñez 2003

Ophryotrocha splendida BRITO & NÚÑEZ, 2003: 30, fig. 2.

TYPE LOCALITY: Lanzarote, Playa Quemada, 28º53.4'N, 13º43.5'W, on muddy sand at 9 meters.

DISTRIBUTION: Known from the type locality.

Ophryotrocha scutellus Wiklund, Glover & Dahlgren 2009

Ophryotrocha scutellus WIKLUND, GLOVER & DAHLGREN, 2009: 46-48, fig. 1.

TYPE LOCALITY: Northern North Atlantic, in the Koster area of Sweden, coastal Skagerrak, 58º53.1'N, 11º06.4'E, from experimental tank with bone material sampled from a Minke whale carcass implanted at 125 meters.

DISTRIBUTION: Known from a Minke whale carcass at 125 meters in the Koster area of Sweden (58º53.1'N, 11º06.4'E, Skagerrak), and from sediment sampled at 104 meters beneath a fish farm in Mele, Hardangerfjord (60º21.27'N, 6º20.89'E), in Norway.

GENUS ***Ougia*** Wolf 1986

Ougia WOLF, 1986*b*: 617.

TYPE SPECIES: *Ougia tenuidentis* Wolf 1986.

Ougia subaequalis (Oug 1978)

Schistomeringos subaequalis OUG, 1978: 296-298, fig. 6.

TYPE LOCALITY: Øresund, northern part of Ellekilde Hage (Denmark), 56º6'N, 12º30'E, in mud, at 29-30 meters.

SELECTED REFERENCES: *Schistomeringos subaequalis* — KIRKEGAARD, 1992: 404-405, fig. 198. *Ougia subaequalis* — WOLF, 1986*b*: 617; HARTMANN-SCHRÖDER, 1996: 273.

DISTRIBUTION: Known from the type locality.

GENUS *Parapodrilus* Westheide 1965

Parapodrilus WESTHEIDE, 1965: 212.
TYPE SPECIES: *Parapodrilus psammophilus* Westheide 1965.

Parapodrilus psammophilus Westheide 1965

Parapodrilus psammophilus WESTHEIDE, 1965: 207-212, figs. 1-3.
TYPE LOCALITY: Eulittoral sandy interstitial zone, Sylt Island, (German Bight, North Sea), in the first 2 to 18 cm of the substrate.
SELECTED REFERENCES: *Parapodrilus psammophilus* — WESTHEIDE, 1974*c*: 367; WOLFF & STEGENGA, 1975: 87, fig. 4; GEORGE & HARTMANN-SCHRÖDER, 1985: 192, fig. 68; KIRKEGAARD, 1992: 396-398, fig. 194; HARTMANN-SCHRÖDER, 1996: 273-274, fig. 121.
DISTRIBUTION: North Sea and eastern French Atlantic (Arcachon). Interstitially in intertidal sand.

GENUS *Parophryotrocha* Hartmann-Schröder 1971

Parophryotrocha HARTMANN-SCHRÖDER, 1971*a*: 260.
TYPE SPECIES: *Ophryotrocha (?) isochaeta* Eliason 1962.
REMARKS: The genus definition was emended by HILBIG & BLAKE (1991).

KEY TO SPECIES:

1a. Worms bigger and thicker in size, 18-19 mm long for 130-135 mm, 0.8-0.9 mm wide at chaetiger 10; ventral cirri short and papillate, often partly retracted and hardly visible; chaetae slightly curved, with obtuse tips, thicker and less curved than in *P. rhadina*; mandibles as two triangular plates, with anterior margin gently undulate, without defined teeth; maxillae composed of strong forceps and anterior denticles in two partly coalesced rows on each side; prongs of forceps fused with the most posterior denticle on each side, each prong forming a structure with a medially-directed branch with strong teeth followed by a cutting edge with 4-6 small teeth and an incurved hook; prongs asymmetrical, medial branch of left prong situated posterior to the branch of right prong, occasionally two most posterior denticles fused with forceps; seven free denticles on each side, each denticle with an inward directed strong hook; most posterior free denticle with small teeth or serration along inner margin.......***P. isochaeta***
1b. Worms smaller and slimmer in size, 6.0 mm long for 58 chaetigers, 0.45 mm wide at chaetiger 10-20; ventral cirri absent; chaetae distally sigmoid, slightly dilated in the curved part, with obtuse knob-like tip; mandibles as two anteriorly-flared rods, each with a marked tooth on inner border of anterior margin, with a process on left piece fitting into a socket on right piece, and several more or less irregular hook-shaped or globular processes located posteriorly on the rods; maxillae of p-type, composed of the forceps and anterior denticles in two rows on each side; prongs of forceps with anterior hook and inner cutting edge with 6-8 teeth, and a median raised ridge with about 6 teeth, plus seven free denticles on each side, outer row denticles with a strong tooth and serrated inner margin, inner row denticles with fine teeth along inner margin..***P. rhadina***

Parophryotrocha isochaeta (Eliason 1962)

Ophryotrocha (?) isochaeta ELIASON, 1962*b*: 260, fig. 16.
TYPE LOCALITY: Skagerrak, 637 meters.
SELECTED REFERENCES: *Parophryotrocha isochaeta* — HARTMANN-SCHRÖDER, 1971*a*: 260; JUMARS, 1974: 127; GEORGE & HARTMANN-SCHRÖDER, 1985: 194, fig. 69; KIRKEGAARD, 1992: 398-399, fig. 195; HARTMANN-SCHRÖDER, 1996: 285-286; OUG, 2006: 152-154, fig. 1.
DISTRIBUTION: Skagerrak, on mud at 637-670 meters. In dark brown sediment.

Parophryotrocha rhadina Oug 2006

Parophryotrocha rhadina OUG, 2006: 154-155, fig. 2.
TYPE LOCALITY: Northern North Sea, Snorre B oil field, 61º35’15”N, 02º04’30”E, 341 meters, in fine silt.

DISTRIBUTION: Northern North Sea, between 312-379 meters, in fine silt, silty sand, and silt overlying clay.

GENUS *Parougia* Wolf 1986

Parougia WOLF, 1986*c*: 636.
TYPE SPECIES: *Schistomeringos nigridentata* Oug 1978.

KEY TO SPECIES:
(adapted from WOLF, 1986*c*)

1a. Tines of furcate chaetae with pointed, entire tips; neuropodium without suprachaetal lobe..................**2**
1b. Tines of furcate chaetae blunt, pubescent..**3**

2a (1a) Dorsal cirrus with an elongated cirrostyle; ventral neuropodial chaetal lobe present..........***P. caeca***
2b (1a) Dorsal cirrus with a blunt oviform cirrostyle; ventral neuropodial chaetal lobe absent...***P. albomaculata* nov. comb.**

3a (1b). Dorsal cirrus short, with cirrophore very short or absent, when absent cirrostyle articulates directly on neuropodium; neuropodium without dorsal, suprachaetal lobe..............................***P. macilenta***
3b (1b). Dorsal cirrus long, with cirrophore and cirrostyle clearly visible and separated; neuropodium with dorsal, suprachaetal lobe...**4**

4a (1b). Maxillary denticles of superior row with large, hook-shaped main fangs; free denticles of inferior row widest medially; neuropodial suprachaetal lobe of anterior chaetigers shorter than postchaetal acicular lobe...***P. eliasoni***
4b (1b). Maxillary denticles of superior row with main fangs not hook-shaped; free denticles of inferior row widest distally, at dentate margin; neuropodial suprachaetal lobe of anterior chaetigers about equal in length to postchaetal acicular lobe...***P. nigridentata***

Parougia albomaculata (Åkesson & Rice 1992) nov. comb.

Dorvillea albomaculata ÅKESSON & RICE, 1992: 353-355, figs. 1*B*, 1*D*, 2*B*, 3*B*, 5.
TYPE LOCALITY: Tarifa (Spain), on sandy mud in polluted harbours.
SELECTED REFERENCES: [?] *Schistomeringos albomaculata* — BRITO, NÚÑEZ & PASCUAL, 2002: 209-211, fig. 1.
DISTRIBUTION: Tarifa, Marbella, Malaga (Spain). On sandy mud in polluted harbors.
REMARKS: *Dorvillea albomaculata* is here considered as belonging to the genus *Parougia*, according to the diagnosis of the genus given by WOLF (1986*c*). The species doesn't present maxillary carriers or accessory teeth in the mandibles, the antennae are well developed and articulated, the palps well-developed and biarticulate, the notopodia is present throughout the body, being well developed and with internal notoacicula, the furcate chaetae has long thin tines, and the pygidium presents two dorsal anal cirri and one single midventral cirrus. However, the species doesn't present a ventral neuropodial chaetal lobe.

BRITO, NÚÑEZ & PASCUAL (2002), identified some specimens collected at the Canary Islands as belonging to this species, placing it in the genus *Schistomeringos*, as *S. albomaculata* nov. comb. Though, this combination is erroneous, as both the species and the Canary specimens don't present maxillary carriers or mandibular accessory teeth, and the pygidium presents one pair of long dorsal cirri, and a single midventral cirrus, instead of the two pairs of anal cirri typical of *Schistomeringos*. Besides, I consider as dubious the identification of the Canarian specimens, as their parapodia are pictured with a big ventral neuropodial chaetal lobe, something that is not described or pictured in the original description of *Parougia albamaculata* by ÅKESSON & RICE (1992). It can be argued that this neuropodial chaetal lobe is retractile, something that occurs in many species of *Ophryotrocha*, and that it was not observed in the original description, but so far there is no data supporting such possibility.

Parougia caeca (Webster & Benedict 1884)

Staurocephalus cæcus WEBSTER & BENEDICT, 1884: 721-722, pl. 4, figs. 44-48.

TYPE LOCALITY: Provincetown, Massachusetts (U.S.A.), in sand, at low water.

SELECTED REFERENCES: *Staurocephalus caecus* — USCHAKOV, 1955*a*: 246, fig. 83*M-P*. *Stauronereis caecus* — PETTIBONE, 1963*a*: 233-234, fig. 61; [?] GOVAERE, 1976: 31-35, figs. 2-3. *Dorvillea caeca* — BANSE & HOBSON, 1974: 92, fig. 26*b*. *Schistomeringos caeca* — GARDINER, 1976: 216, fig. 29*o-q*; OUG, 1978: 286-288, fig. 2, table 1; [?] GEORGE & HARTMANN-SCHRÖDER, 1985: 198, fig. 71. *Parougia caeca* — WOLF, 1986*c*: 636. Not *Stauronereis caecus* — HARTMANN-SCHRÖDER, 1971*a*: 260 [= *Parougia eliasoni* (Oug 1978), *Schistomeringos* sp. and Dorvilleidae indet. (see OUG, 1978)].

DISTRIBUTION: From the Gulf of St. Lawrence to Massachusetts, and North Carolina (U.S.A.), in muddy bottoms, intertidal to 10 meters; [?] Northern part of Sea of Okhotsk, Bering Sea, Chukchee Sea, Murmansk Coast, 18-141 meters; [?] continental shelf of British Columbia and Washington, 15-40 meters, on muddy bottoms; [?] Southern North Sea, 9.1-25.6 meters; [?] Western Mediterranean Sea.

REMARKS: According to OUG (1978), the specimens described by GOVAERE (1976) from the Southern North Sea are close to this species but deviate in some characters. Govaere's specimens show furcate chaetae with serration on both sides, compound chaetae with subdistally serrated blades, a ventral cirrus situated on the proximal part of the neuropodium, and mandibles with a medial cup-shaped projection, while none of these characters were observed on specimens from the Atlantic coast of North America (OUG, 1978).

Parougia eliasoni (Oug 1978)

Schistomeringos eliasoni OUG, 1978: 288-291, fig. 3, table 1.

TYPE LOCALITY: Øresund, off Ellekilde Hage, 56°6'N, 12°30'E, in mud, at 28-30 meters.

SELECTED REFERENCES: *Schistomeringos eliasoni* — KIRKEGAARD, 1992: 403, fig. 197. *Parougia eliasoni* — WOLF, 1986*c*: 636; HARTMANN-SCHRÖDER, 1996: 275-276, fig. 122.

DISTRIBUTION: Øresund and Skagerrak, in muddy bottoms, between 13-410 meters. [?] Eastern Canada, in mixed bottoms and mud with detritus, between 7-35 meters.

Parougia macilenta (Oug 1978)

Schistomeringos macilenta OUG, 1978: 294-296, fig. 5.

TYPE LOCALITY: Middle basin of Lindåspollene, western Norway, 60°43'N, 5°10'E, on sandy mud, 30-35 meters.

SELECTED REFERENCES: *Ougia macilenta* — WOLF, 1986*b*: 617; HARTMANN-SCHRÖDER, 1996: 272-273. *Parougia macilenta* — EIBYE-JACOBSEN & KRISTENSEN, 1994: 127-128.

DISTRIBUTION: Known from the type locality.

REMARKS: EIBYE-JACOBSEN & KRISTENSEN (1994) included this species on the genus *Parougia*, stating that it shared two autapomorphic characters with this genus: the apparent absence of maxillary carriers and the posterior fusion of the superior basal plates. The lack of styles on the dorsal cirri are seen as an autapomorphic character, and the lack of a ventral neuropodial chaetal lobe as a convergent character between this species and the genus *Ougia*.

Parougia nigridentata (Oug 1978)

Schistomeringos nigridentata OUG, 1978: 291-294, fig. 4, table 1.

TYPE LOCALITY: Middle basin of Lindåspollene, western Norway, 60°43'N, 5°10'E, on mixed to muddy bottoms, 20-70 meters.

SELECTED REFERENCES: *Parougia nigridentata* — WOLF, 1986*c*: 636; HARTMANN-SCHRÖDER, 1996: 276.

DISTRIBUTION: Known from the type locality.

GENUS ***Pettiboneia*** Orensanz 1973

Pettiboneia ORENSANZ, 1973*a*: 337.

TYPE SPECIES: *Pettiboneia sanmatiensis* Orensanz 1973.

REMARKS: A key for the hitherto known species of *Pettiboneia* was provided by HILBIG & RUFF (1990), and a comparative table by AGUIRREZABALAGA & CEBERIO (2003).

KEY TO SPECIES:

(data from AGUIRREZABALAGA & CEBERIO, 2003)

1a. Geniculate supraacicular chaetae in anterior chaetigers absent; notopodia from chaetiger 2 to chaetiger 10/12; one pair of eyes..***P. urciensis***
1b. Geniculate supraacicular chaetae in anterior chaetigers present, in number of 1-2, being replaced by 1-3 furcate chaetae from chaetiger 5; notopodia from chaetiger 2 to chaetiger 21/27; eyes absent...***P. sanmartini***

Pettiboneia sanmartini Aguirrezabalaga & Ceberio 2003

Pettiboneia sanmartini AGUIRREZABALAGA & CEBERIO, 2003: 42-43, figs. 1-3.
TYPE LOCALITY: Capbreton Canyon (Bay of Biscay, NE Atlantic Ocean), 43º35.26'N, 1º55.28'W, at 1002 meters, in soft sediment.
DISTRIBUTION: Capbreton Canyon, Bay of Biscay, between 1002-1113 meters, in soft sediment.

Pettiboneia urciensis Campoy & San Martín 1980

Pettiboneia urciensis CAMPOY & SAN MARTÍN, 1980: 202-206, figs. 1-3.
TYPE LOCALITY: Cala Cerrada, Aguilas (Murcia, Spain), at 0.1 meters, on muddy sand.
SELECTED REFERENCES: *Pettiboneia urciensis* — HILBIG & RUFF, 1990: 122.
DISTRIBUTION: Cala Cerrada, Aguilas (Murcia, Spain), and Cap Enderrocat, Bay of Palma de Mallorca (Balearic Islands, Spain), at 0.1-2 meters, on sandy bottoms; Aegean Sea.

*GENUS ***Protodorvillea*** Pettibone 1961

Protodorvillea PETTIBONE, 1961: 178.
TYPE SPECIES: *Staurocephalus kefersteini* McIntosh 1869.

KEY TO SPECIES:

(adapted from PETTIBONE, 1961)

1a. Antennae lacking (?); without eyes; neuropodia without postchaetal lobes; dorsal cirri lacking on first chaetiger; blades of compound neurochaetae with tips entire...***P. atlantica***
1b. Antennae present; eyes present; neuropodia with postchaetal lobes...**2**

2a (1b). Dorsal cirri lacking on first chaetiger; blades of compound neurochaetae with tips entire; four eyes; antennae short, clavate...***P. egena***
2b (1b). Dorsal cirri present on first chaetiger; blades of compound neurochaetae with tips bidentate, hooked; two eyes; antennae rather short, indistinctly articled...***P. kefersteini****

Protodorvillea atlantica (McIntosh 1885)

Staurocephalus atlanticus MCINTOSH, 1885*a*: 233-235, pl. 36 figs. 4-5, pl. 17*A* figs. 5-8.
TYPE LOCALITY: Atlantic Ocean, west of Azores, 38º30'N, 31º14'W, at 1000 fathoms (1828.8 meters), on pteropod ooze.
SELECTED REFERENCES: *Protodorvillea atlantica* — PETTIBONE, 1961: 179-180. Not *Staurocephalus atlanticus* — FAUVEL, 1923*b*: 306-309, fig. 1*a-h*; FAUVEL, 1923*c*: 448-450, fig. 179*a-h* [= *Schistomeringos neglecta* (Fauvel 1923)].
DISTRIBUTION: Known from the type locality; also recorded from the Italian coasts of the Adriatic Sea (CASTELLI *et al.*, 1995).

Protodorvillea egena (Ehlers 1913)

Stauronereis egena EHLERS, 1913: 501-503, pl. 35 figs. 1-6.
TYPE LOCALITY: Simonstown, South Africa (SE Atlantic).
SYNONYMS: *Dorvillea mandapamae* Banse 1959; *Dorvillea graciloides* Hartmann-Schröder 1960.
SELECTED REFERENCES: *Protodorvillea egena* — PETTIBONE, 1961: 179-180; BANSE & HARTMANN-SCHRÖDER, 1964: 241-242, fig. 1; DAY, 1967: 454, fig. 17.20.*m*. *Dorvillea mandapamae* — BANSE,

1959*a*: 166, fig. 1. *Dorvillea graciloides* — HARTMANN-SCHRÖDER, 1960*b*: 117-118, pl. 19 figs. 169, 172, pl. 20 fig. 171, pl. 21 fig. 170.

DISTRIBUTION: South Africa; South India. Also recorded from the Italian coasts of the Adriatic Sea (CASTELLI *et al.*, 1995).

****Protodorvillea kefersteini*** (McIntosh 1869)

Staurocephalus kefersteini MCINTOSH, 1869: 417, pl. 16 fig. 11.

TYPE LOCALITY: Eastern and western shores of North Uist, Outer Hebrides.

SYNONYMS: *Staurocephalus hyalinus* Jakubova 1930.

SELECTED REFERENCES: *Staurocephalus Kefersteini* — MCINTOSH, 1910: 358, pl. 55 fig. 2, pl. 66 fig. 8, pl. 73 fig. 5, pl. 81 fig. 10; FAUVEL, 1923*c*: 444-445, fig. 177*m-u*. *Protodorvillea kefersteini* — PETTIBONE, 1961: 179-180; HOBSON, 1971: 542-543, fig. 8; HARRIS, 1971: 702-703, figs. 10-11; JUMARS, 1974: 117-118, fig. 7; GARDINER, 1976: 214-215, fig. 29*h-k* [not *Protodorvillea biarticulata* Day 1963 in the synonymy list = valid species, according to JUMARS (1974)]; GEORGE & HARTMANN-SCHRÖDER, 1985: 196, fig. 70; KIRKEGAARD, 1992: 399-401, fig. 196; HARTMANN-SCHRÖDER, 1996: 276-278, fig. 123; NÚÑEZ, PASCUAL & BRITO, 1996: 142-143: fig. 2; AGUIRREZABALAGA & CEBERIO, 2003: 44. *Staurocephalus hyalinus* — JAKUBOVA, 1930: 873.

REFERENCES FOR PORTUGAL: MONTEIRO-MARQUES, 1984 (as *Staurocephalus kefersteini*; Praia da Falésia); AMOUREUX, 1987 (off Aveiro; off Porto); MONTEIRO-MARQUES, 1987 (as *Staurocephalus kefersteini*; continental shelf of Algarve); DEXTER, 1992 (some as *Staurocephalus kefersteini*; previous records: continental shelf of Algarve; Arrábida; Figueira da Foz); RAVARA, 1997 (as *Protodorvilleia kefersteini*; off Aveiro); present work (southwestern continental shelf).

MATERIAL: SEPLAT 7 (2nd part) — St. 26 (A.4086), north Sines, 140 m, sand: 1 incomplete specimen, with 34 chaetigers; as the following specimen, except in that it has several capillary chaetae per parapodium, without any ornamentation, occurring in a number of 1-3 in the supra-acicular region of the parapodia, and in a bundle in the subacicular region. **St. 178 (A.3933)**, off Sines, 130 m, sand: 1 complete specimen, with 61 chaetigers; eyes not seen, probably having faded away in the alcohol; antennae short, without a distinct annulation; palps long, with a short terminal section; peristomium (and apodous segment) a little longer than the following chaetigerous segments; dorsal cirrus short, without internal acicula, present on all chaetigers; supra-acicular chaetae of two kinds: a) stout forked chaetae (can be two per parapodium) with subequal smooth branches, and b) 1-2 finely toothed capillary chaetae; subacicular chaetae jointed, with bifid, finely toothed hooked blades; lower (ventral) jointed chaetae with shorter blades; pygidium with 2 pairs of anal cirri, one shorter and smooth and the other longer and annulated; mandibles short, X-shaped, with finely toothed anterior margins; maxillary carriers fused posteriorly, V-shaped; maxillae with two upper rows, with basal plates posteriorly fused, and two lower rows of fine teeth, with the basal plates free.

DISTRIBUTION: European Atlantic Coast; North Sea, English Channel, Mediterranean Sea, Adriatic Sea, Aegean Sea, Black Sea; Canary Islands; Massachusetts (U.S.A.). Mostly on sandy bottoms, less commonly on mud, also under stones, amongst sea grasses, algae and serpulid empty tubes. Intertidal to 120 meters, but recorded at the Capbreton Canyon between 984-1113 meters.

GENUS ***Pusillotrocha*** Westheide & von Nordheim 1985

Pusillotrocha WESTHEIDE & VON NORDHEIM, 1985: 193-194.

TYPE SPECIES: *Pusillotrocha akessoni* Westheide & von Nordheim 1985.

Pusillotrocha akessoni Westheide & von Nordheim 1985

Pusillotrocha akessoni WESTHEIDE & VON NORDHEIM, 1985: 191-194, figs. 8-9, 10*A*, *B*.

TYPE LOCALITY: Skagerrak, west coast of Sweden, in the vicinity of the Marine Biological Station, Kristineberg, at a depth of 15-25 meters east of the island of Bonden, on *Amphioxus*-gravel.

SELECTED REFERENCES: *Pusillotrocha akessoni* — HARTMANN-SCHRÖDER, 1996: 278.

DISTRIBUTION: Known from the type locality.

GENUS *Schistomeringos* Jumars 1974

Schistomeringos Jumars, 1974: 103-104.
Type species: *Nereis Rudolphi* Delle Chiaje 1828.
Synonyms: *Prionognathus ciliatus* Keferstein 1862.

Key to Species:

(adapted from George & Hartmann-Schröder, 1985)

1a. Forked chaetae finely toothed at outer margin of shorter branch..**2**
1b. Forked chaetae nearly smooth; two eyes (some Mediterranean specimens with 4 eyes).......***S. neglecta***

2a (1a). Four eyes...***S. rudolphi***
2b (1a). Eyes absent..***S.* cf. *anoculata***

Schistomeringos* cf. *anoculata (Hartman 1965) *sensu* Aguirrezabalaga & Ceberio 2003

Schistomeringos cf. *anoculata* Aguirrezabalaga & Ceberio, 2003: 44-47, figs. 4-6.
Remarks: Aguirrezabalaga & Ceberio (2003) identified as *Schistomeringos* cf. *anoculata* (Hartman 1965) one incomplete specimen collected at the Capbreton Canyon (Bay of Biscay, NE Atlantic Ocean), between 492-495 meters. The single specimen agrees well with the description given by Orensanz (1973*a*), but the absence of antennae did not enable the authors to make a precise determination, pending this on the collection of new material from the same area. Descriptions of *S. anoculata* (Hartman 1965) can be found in Hartman (1965*b*: 124-125, pl. 22), and Orensanz (1973*a*: 333, pl. 3 figs. 1-4).
Distribution: *S.* cf. *anoculata* was found at the Capbreton Canyon (Bay of Biscay, NE Atlantic Ocean), between 492-495 meters, in soft bottoms. *S. anoculata* is known from bathyal depths in the West Atlantic, from New England (USA) to the mouth of the La Plata River.

Schistomeringos neglecta (Fauvel 1923)

Staurocephalus neglectus Fauvel, 1923*b*: 309-311, fig. 1*i-q*.
Type locality: Urville, near Cherbourg (France), on shallow water, under stones.
Selected references: *Staurocephalus neglectus* — Fauvel, 1923*c*: 447-448, fig. 179*i-q*. *Stauronereis neglectus* — Pettibone, 1961: 181. *Schistomeringos neglecta* — Jumars, 1974: 104; George & Hartmann-Schröder, 1985: 200, fig. 72. *Staurocephalus atlanticus* [not McIntosh 1885] — Fauvel, 1923*b*: 306-309, fig. 1*a-h*; Fauvel, 1923*c*: 448-450, fig. 179*a-h*.
References for Portugal: Dexter, 1992 (as *Staurocephalus neglectus*; previous records: Sines); Ravara, 1997 (off Aveiro); [?] Mucha & Costa, 1999 (as *Staurocephalus* cf. *neglectus*; Ria de Aveiro and/or Sado Estuary).
Distribution: Eastern part of the Atlantic, between Great Britain and South Africa, including the English Channel, Mediterranean Sea, Adriatic Sea, Aegean Sea, and Black Sea; [?] British Columbia; [?] Sumatra. On mud, sand, shell fragments, gravel, among algae, and under stones. In intertidal and shallow subtidal zones.
Remarks: Fauvel (1923*c*: 449-450) suggested that the species *Staurocephalus atlanticus* McIntosh 1885 (now *Protodorvillea atlantica*) was probably an epitokous form of *Staurocephalus neglecta* (now *Schistomeringos neglecta*). However, this is true only for the specimens identified by Fauvel (1923*b*, 1923*c*) as *Staurocephalus atlanticus*.

Schistomeringos rudolphi (Delle Chiaje 1828)

Nereis Rudolphii Delle Chiaje, 1828: 176.
Type locality: Gulf of Naples (Italy).
Synonyms: *Prionognathus ciliata* Keferstein 1862; *Staurocephalus Chiaji* Claparède 1868; *Staurocephalus pallidus* Verrill 1874; *Stauronereis Madeiræ* Verrill 1900; [?] *Stauronereis polydonta* Verrill 1900.
Selected references: *Staurocephalus Rudolphii* — Fauvel, 1923*c*: 446-447, fig. 178*a-p*. *Dorvillea rudolphii* — Hartman, 1942*a*: 56-57, figs. 98-103; Fauchald, 1970: 156-159, pl. 27 figs. *a-j* [in part, Italian specimens; in part, Pacific specimens = *Schistomeringos longicornis* (Ehlers 1901)]. *Stauronereis rudolphi* — [?] Pettibone, 1963*a*: 231-233, fig. 60*a-f*; Richards, 1967: 124-132, figs. 1-12, table 1; *Schistomeringos rudolphi* — Jumars, 1974: 104-106, fig. 1; Gardiner, 1976: 216-217, fig. 29*r-u*; George & Hartmann-Schröder, 1985: 202, fig. 73. *Staurocephalus Chiaji* — Claparède, 1868: 115-

122, pl. 7 fig. 2. *Staurocephalus pallidus* — VERRILL, 1874*c*: 595-596. *Staurocephalus pallidus* — LANGERHANS, 1880*a*: 300-301, pl. 16, fig. 35 [HOMONYM; not Verrill 1874]. *Staurocephalus (Prionognathus) ciliatus* — SAINT-JOSEPH, 1888: 236-238, pl. 10 figs. 100-101. *Stauronereis Madeiræ* — VERRILL, 1900: 650 [new name for *Staurocephalus pallidus* Langerhans 1880]. [?] *Stauronereis polydonta* — VERRILL, 1900: 650-651; TREADWELL, 1921: 120-121, text-figs. 435-441, pl. 9 figs. 14-16. Not *Dorvillea rudolphi* — DAY, 1967: 457, fig. 17.21.*d-j* [see JUMARS, 1974: 106].

REFERENCES FOR PORTUGAL: AMOUREUX, 1987 (as *Schistomeringos rudolphii*; off Porto); MONTEIRO-MARQUES, 1987 (as *Staurocephalus rudolphii*; continental shelf of Algarve); DEXTER, 1992 (as *Staurocephalus rudolphii*; previous records: continental shelf of Algarve).

DISTRIBUTION: Ireland; English Channel; Madeira Island; Mediterranean Sea; Adriatic Sea; Aegean Sea; Black Sea; North Carolina; New Haven, Massachusetts; West Indies; [?] Bermudas; [?] Amphi-Atlantic. In shallow water, on mud, sand, gravel, shell particles, rocky bottoms, and amongst sea grasses and algae.

GENUS ***Trilobodrilus*** Remane 1925

Trilobodrilus REMANE, 1925: 15.

TYPE SPECIES: *Trilobodrilus heideri* Remane 1925.

KEY TO SPECIES:

1a. With five trunk segments; outline of prostomium oval; epidermis with compound refractive glands with 5-10 parts, and bacillary elongated glands; worms 0.8-1.0 mm long, and about 100 µm wide....***T. axi***

1b. With about ten trunk segments; outline of prostomium squarish; epidermis with compound refractive glands with 4-5 parts, and bacillary glands rounded or egg-shaped; worms 1.5-1.9 mm long, and 100-200 µm wide..***T. heideri***

Trilobodrilus axi Westheide 1967

Trilobodrilus axi WESTHEIDE, 1967*a*: 211-214, figs. 3-4, 5*b*, 6*b*.

TYPE LOCALITY: East and west coasts of the Island of Sylt (Germany, North Sea), at the eulittoral breaking shoreline, in coarse sand.

SELECTED REFERENCES: *Trilobodrilus axi* — WESTHEIDE, 1974*c*: 368; WESTHEIDE, 1990: 126, fig. 45; HARTMANN-SCHRÖDER, 1996: 289-290, fig. 128; KIRKEGAARD, 1996: 253-254, fig. 138; WESTHEIDE, 2008: 136, fig. 94.

DISTRIBUTION: North Sea and French Atlantic coast. Lives interstitially, in a narrow zone (a few meters wide) parallel to the low water level in intertidal sand beaches and sand flats.

Trilobodrilus heideri Remane 1925

Trilobodrilus heideri REMANE, 1925: 15, fig. 1.

TYPE LOCALITY: Helgoland, North Sea.

SELECTED REFERENCES: *Trilobodrilus Heideri* — FAUVEL, 1927*a*: 438-439, fig. 148*a*. *Trilobodrilus heideri* — WESTHEIDE, 1967: 208-211, figs. 1-2, 5a, 6*a*, 7; WESTHEIDE, 1990: 124, fig. 44; HARTMANN-SCHRÖDER, 1996: 290-291, fig. 129; KIRKEGAARD, 1996: 255, fig. 139; WESTHEIDE, 2008: 134, fig. 93.

DISTRIBUTION: North Wales; North Sea; English Channel; Skagerrak; Mediterranean Sea; Black Sea. Lives interstitially, in subblittoral (5-20 meters) coarse sand and shelly sediments; typical of *Amphioxus* sands.

FAMILY **EULEPETHIDAE** Chamberlin 1919

AS: *EULEPETHINAE* CHAMBERLIN, 1919*a*: 89

TYPE GENUS: *Eulepethus* Chamberlin 1919.

SYNONYMS: *EULEPIDINAE* Darboux 1899; *PAREULEPIDAE* Hartman 1939.

REMARKS: Eulepidinae was established by DARBOUX (1899) with base on *Eulepis hammifera* Grube 1875 and including a new genus, *Pareulepis* Darboux 1899, for *Eulepis Wyvillei* McIntosh 1885. CHAMBERLIN (1919*a*) indicated that the name *Eulepis* Grube was already preoccupied in Insecta (Lepidoptera) by Dalman (in manuscript) and Billberg 1820, and also in Reptilia, by Fitzenger 1843 (see also PETTIBONE, 1969*c*). For this reason he replaced *Eulepis* by *Eulepethus* nom. nov., and the name of the, by then, subfamily, from Eulepidinae to Eulepethinae.

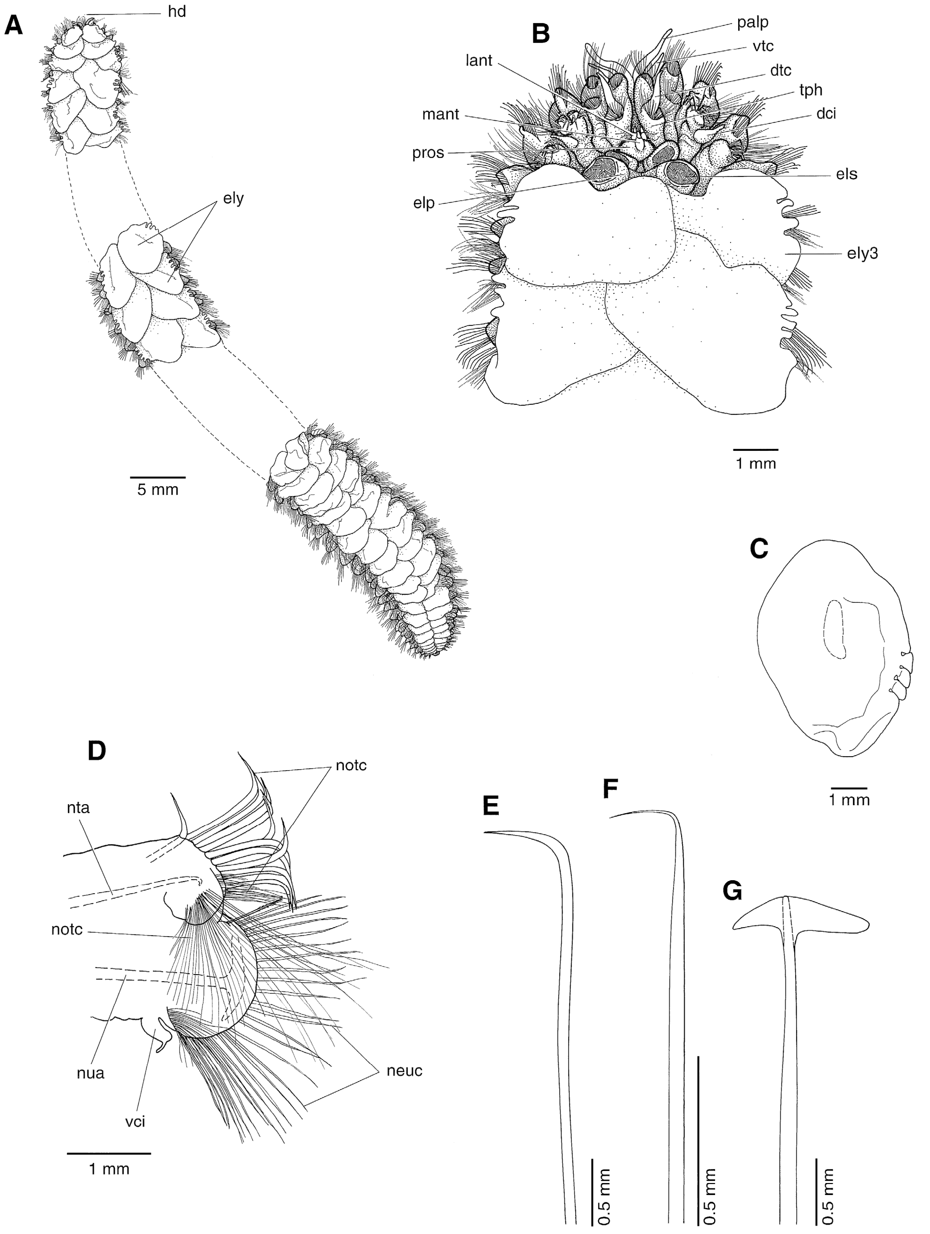

Figure legend: Family Eulepethidae. *Mexieulepis* specimen. **A**, dorsal view of entire animal, anterior, middle and posterior sections shown in detail. **B**, dorsal view of anterior end with first two pairs of elytra removed. **C**, elytron from chaetiger 13. **D**, posterior view of parapodium of chaetiger 21 with elytron removed. **E**, **F**, chaetae from parapodium of chaetiger 27: **E**, superior notochaetal spine; **F**, neurochaetal spine. **G**, neuroacicula from parapodium of chaetiger 27. **dci**, dorsal cirrus; **dtc**, dorsal tentacular cirrus; **elp**, elytrophore; **els**, elytral scar; **ely**, elytra; **ely3**, elytron 3; **hd**, head; **lant**, lateral antenna; **mant**, median antenna; **neuc**, neurochaetae; **notc**, notochaetae; **nta**, notoacicula; **nua**, neuroacicula; **palp**, palp; **pros**, prostomium; **tph**, tentaculophore; **vci**, ventral cirrus; **vtc**, ventral tentacular cirrus. (Adapted from BEESLEY, ROSS & GLASBY, 2000; drawings by A. Murray).

The genus *Pareulepis* was separated from *Eulepis* in the assumption that the elytra were inserted on segments 2, 3, 4, 6, 8, ... 18, 20, 23 in the former, and on segments 2, 4, 5, 7, 9, ... 19, 21, 24 in the latter. However, this observation by MCINTOSH (1885*a*) was erroneous (see HARTMAN, 1939*a* for references), and HARTMAN (1939*a*) considered *Pareulepis* and *Eulepis* as synonymous (and, as a consequence, *Eulepethus* became also a junior synonym). With *Eulepis* preoccupied, HARTMAN (1939*a*) designated the genus *Pareulepis* Darboux 1899 as the type genus, and renamed the family as Pareulepidae. However, PETTIBONE (1969*c*) considered that there were other characters by which *Eulepis wyvillei*, the type-species of *Pareulepis*, could be separated from *E. hammifera*, the type-species of *Eulepis*, renamed by CHAMBERLIN (1919*a*) as *Eulepethus*, and kept the two as separate valid genera. With *Eulepethus* as a valid genus, the name Eulepethidae has priority over Pareulepidae.

The most important taxonomic works on the Eulepethidae were published by PETTIBONE (1969*c*, 1986).

The Eulepethidae counts nowadays with 6 genera and 18 species described worldwide, but the detailed revision of some of the widely scattered records of the family may reveal undescribed species (HUTCHINGS, 2000*d*; NISHI, 2001*b*).

One genus with two species are present in the Mediterranean area.

GENUS ***Grubeulepis*** Pettibone 1969

Grubeulepis PETTIBONE, 1969*c*: 22.
TYPE SPECIES: *Eulepis fimbriata* Treadwell 1901.

KEY TO SPECIES:
(adapted from PETTIBONE, 1969*c* and 1986)

1a. First elytra with 11-13 papillae on anterior border; twelfth elytra (last pair) with up to 6 subrectangular low wide lateral processes, without or with a few terminal buds; without acicular neurochaeta in cirrigerous parapodia of segment 3..***G. augeneri*** **[adult]**
1b. First elytra with 14-18 or more papillae on anterior border..**2**

2a (1b). Middle and posterior elytra with 3-5 short wide lateral processes, without buds (Gulf of Mexico population) or with buds (West Africa population); without acicular neurochaetae in segment 3 (West Africa population) or with acicular neurochaetae (Gulf of Mexico population)........***G. augeneri*** **[juvenile]**
2b (1b). Middle and posterior elytra with 5-6 lateral processes, with terminal buds and additional papillae on posterior border; with acicular neurochaetae in segment 3....***G. katzmanni*** **[juvenile; adult unknown]**

Grubeulepis augeneri Pettibone 1969

Grubeulepis augeneri PETTIBONE, 1969*c*: 38-43, figs. 30-31.
TYPE LOCALITY: French Congo, Setté Cama.
SELECTED REFERENCES: *Grubeulepis augeneri* — UEBELACKER, 1984*d*: 24.11, figs. 24.7-24.8; PETTIBONE, 1986: 27-30, figs. 20-22; BARNICH & FIEGE, 2003: 105-106, fig. 54. *Eulepis fimbriata* [not Treadwell 1901] — AUGENER, 1918: 153-157, text-fig. 10, pl. 3 figs. 39-41. *Eulepis Geayi* [not Fauvel 1918] — FAUVEL, 1940: 9-10, fig. 1*a*.
DISTRIBUTION: West Africa (Congo, Togo); Adriatic Sea; Western Mediterranean Sea; Gulf of Mexico. In silty and sandy bottoms. At 19-100 meters.

Grubeulepis katzmanni Pettibone 1986

Grubeulepis katzmanni PETTIBONE, 1986: 30-34, figs. 23-26.
TYPE LOCALITY: Middle Adriatic Sea, near Zlorin Island (Croatia, Adriatic Sea), 20-60 meters.
SELECTED REFERENCES: *Grubeulepis katzmanni* — BARNICH & FIEGE, 2003: 107.
DISTRIBUTION: Known from type locality.
REMARKS: This species was described only with base on juvenile specimens. According to its author, it is possible that *G. katzmanni* proves to be still younger specimens of *G. augeneri* (PETTIBONE, 1986).

*FAMILY EUNICIDAE Berthold 1827

AS: *EUNICAEA* BERTHOLD, 1827: 227-228.

TYPE GENUS: *Eunice* Cuvier 1817.

SYNONYMS: *EUNICEA* Kinberg 1865; *EUNIPHYSIDAE* Shen & Wu 1991.

REMARKS: The family Eunicidae includes at present 10 genera, with about 335 described species and one subspecies considered as being valid.

Important recent taxonomic works on Eunicidae include the revisions of the genera *Eunice* (FAUCHALD, 1992*b*), *Palola* (FAUCHALD, 1992*a*), and *Euniphysa* (LU & FAUCHALD, 2000), but are numerous the papers describing new taxa (*e.g.*: HUTCHINGS & KARAGEORGOPOULOS, 2003; ARDILA, FAUCHALD & LATTIG, 2005; LEWIS & KARAGEORGOPOULOS, 2008). The phylogeny of the genus *Eunice* was analysed by ZANOL, FAUCHALD & PAIVA (2007), while the phylogeny of the tropical North Pacific and Caribbean *Palola* was analysed by SCHULZE (2006).

In the European and nearby waters, 7 genera, including 40 species, one of which unnamed, are known to occur. In the studied material, 5 genera and 7 species were present.

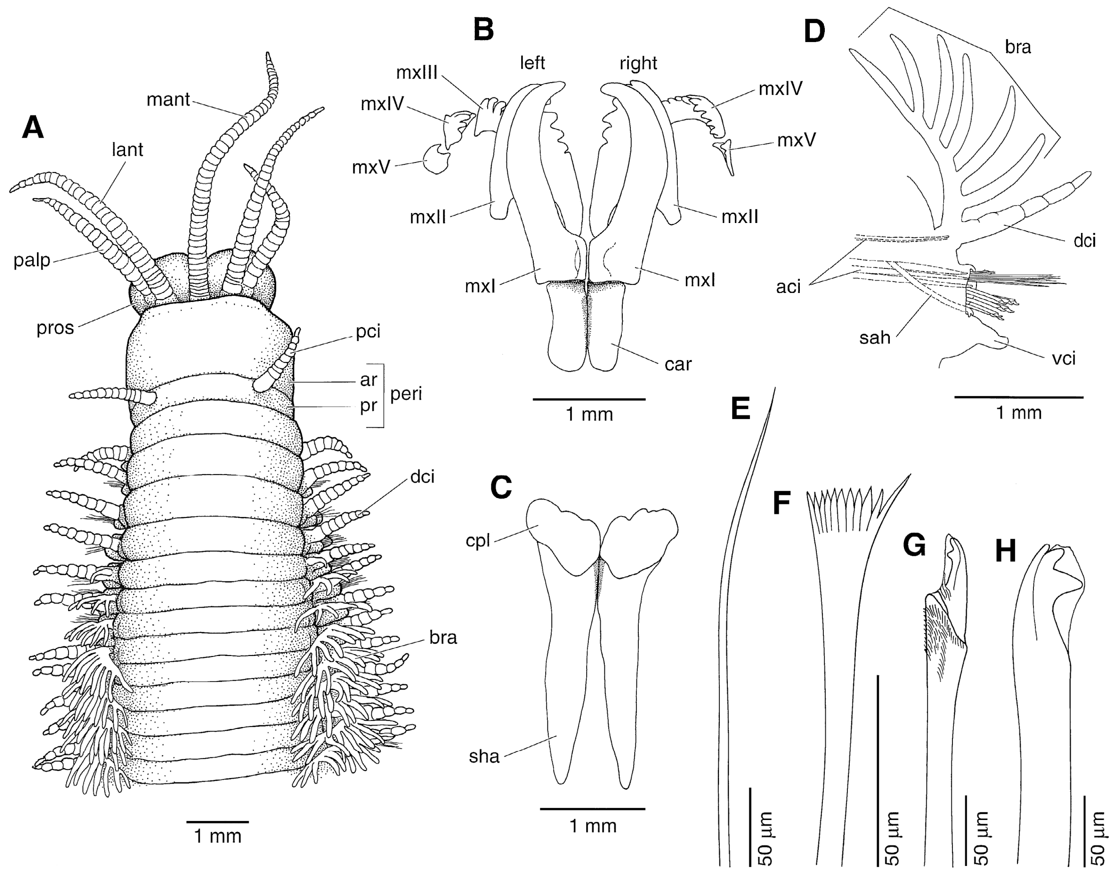

Figure legend: Family Eunicidae. *Eunice* specimen. **A**, anterior end, dorsal view. **B**, **C**, jaw parts: **B**, maxillae, dorsal view; **C**, mandibles, ventral view. **D**, parapodium from chaetiger 29, anterior view. **E**-**H**, chaetae: **E**, simple limbate chaeta from parapodium of chaetiger 41 (wings obscured); **F**, pectinate chaeta from parapodium of chaetiger 41; **G**, compound falciger from parapodium of chaetiger 29; **H**, subacicular hook from parapodium of chaetiger 29. **aci**, aciculae; **ar**, anterior ring; **bra**, branchia; **car**, carrier; **cpl**, cutting plate; **dci**, dorsal cirrus; **lant**, lateral antenna; **mant**, median antenna; **mxI-V**, maxillary plates I-V; **palp**, palp; **pci**, peristomial cirrus; **peri**, peristomium; **pr**, posterior ring; **pros**, prostomium; **sah**, subacicular hook; **sha**, shaft; **vci**, ventral cirrus. (Adapted from BEESLEY, ROSS & GLASBY, 2000; drawings by A. Murray).

KEY TO GENERA:

(adapted fom FAUCHALD, 1977*a*)

1a. Five occipital antennae present..**2**
1b. One to three occipital antennae present...**6**

2a (1a). Tentacular cirri absent...**3**
2b (1a). Tentacular cirri present...**4**

3a (2a). Branchiae present..***Marphysa****
3b (2a). Branchiae absent...***Paramarphysa***

4a (2b). Subacicular hooks absent...***Palola****
4b (2b). Subacicular hooks present...**5**

5a (4b). Composite chaetae only (or mainly) falcigers; anterior jaw elements (Mx-III, IV and V) not fang-like, being short and triangular; number of teeth in each piece high.......................................***Eunice****
5b (4b). Composite chaetae only (or mainly) spinigers; anterior jaw elements (Mx-III, IV and V) fang-like with slender, pointed tips; number of teeth in each piece low...***Euniphysa***

6a (1b). One occipital antenna present..***Nematonereis****
6b (1b). Three occipital antennae present...***Lysidice****

*GENUS ***Eunice*** Cuvier 1817

Eunice CUVIER, 1817*a*: 524-525.
TYPE SPECIES: *Leodice gigantea* Lamarck 1818 (junior synonym of *Nereis aphroditois* Pallas 1788), by subsequent designation by Verrill 1900 [for a detailed discussion see FAUCHALD, 1992*b*: 3-4].
SYNONYMS: *Tibiana* Lamarck 1816; *Leodice* Lamarck 1818; *Eriphyle* Kinberg 1865; *Nicidon* Kinberg 1865; *Mayeria* Verrill 1900.

KEY TO SPECIES:

(adapted from FAUCHALD, 1992*b*)

NOT INCLUDED IN THE KEY: *E. amphiheliae* Marion *in* Filhol 1885; *E. gravieri* Fauvel 1911; *E. limosa* Ehlers 1868; *E. rubrocincta* Ehlers 1868.

1a. Subacicular hooks light yellow or translucent...**2**
1b. Subacicular hooks dark honey-colored to black; subacicular hooks bidentate.......................................**7**

2a (1a). Subacicular hooks bidentate...**3**
2b (1a). Subacicular hooks tridentate...**5**

3a (2a). Branchiae present on more than 65% of total number of chaetigers..**4**
3b (2a). Branchiae present on less than 55% of total number of chaetigers; peristomial cirri reach middle or anterior end of peristomium; subacicular hooks paired in some chaetigers; neuroaciculae emerging dorsal to parapodial midline; ceratostyle articulations moniliform or drop-shaped distally; inflated bases of ventral cirri ovate or spherical; antennae with A-III isolated by a gap; A-I thicker than other three; peristomial cirri digitiform; narrow tips of ventral cirri tapering...***E. pennata***

4a (3a). Branchiae present to near posterior end of body; peristomial cirri reach middle or anterior end of peristomium; branchiae distinctly longer than notopodial cirri; ceratostyles without articulations; aciculae dark honey-colored to black; all antennae similar in length (short); antennae arranged in a horseshoe..***E. schizobranchia***
4b (3a). Branchiae terminating well before posterior end of body; eyes absent; ceratostyles tapering; peristomial cirri tapering; A-I slimmer than other three antennae.......................................***E. heterochaeta***

5a (2b). Branchiae present on more than 65% of total number of chaetigers; all ceratostyle articulations moniliform; branchiae pectinate; subacicular hooks always single (except for replacements); prostomium distinctly shorter than peristomium; peristomial cirri reach middle or anterior end of peristomium; neuroaciculae distinctly pointed (sharp or blunt); notopodial cirri articulated throughout body; appendages of compound falcigers distally bidentate; ceratostyle tapering; neuroaciculae emerging at parapodial midline; prostomial median sulcus deep; eyes behind bases of A-I; ceratophores ring-shaped in all antennae; anterior ventral cirri tapering from narrow bases; anterior notopodial cirri basally inflated...***E. antennata***
5b (2b). Branchiae present on less than 55% of total number of chaetigers, terminating well before the posterior end...**6**

6a (5b). Hoods of compound falcigers distally mucronate; ceratostyles articulated; peristomial cirri reach middle or anterior end of peristomium; three or more subacicular hooks in most chaetigers; narrow tips of ventral cirri tapering...***E. woodwardi***
6b (5b). Hoods of compound falcigers distally without mucros; ceratostyles long or short cylinders; peristomial cirri reach middle or nearly the front edge of prostomium; three or more subacicular hooks in most chaetigers; pectinate chaetae tapering in both anterior and posterior chaetigers; prostomial median sulcus invisible dorsally...***E. vittata* [in part]***

7a (1b). Branchiae present on more than 65% of total number of chaetigers; branchiae present to near posterior end...**8**
7b (1b). Branchiae present on less than 55% of total number of chaetigers...**18**

8a (7a). Branchiae pectinate...**9**
8b (7a). Branchiae palmate; ceratostyles articulated; ceratostyle articulations as long or short cylinders; A-II and III similar in length, with A-I shorter; prostomium less than ½ as deep as peristomium; antennae with A-I isolated by a gap; branchiae distinctly shorter than notopodial cirri; anterior postchaetal lobes form low transverse folds; prostomial lobes dorsally inflated...***E. prognatha***

9a (8a). Ceratostyles articulated...**10**
9b (8a). Ceratostyles without articulation..**17**

10a (9a). Ceratostyle articulations as long or short cylinders; guards of compound falcigers distally without mucros; neuroaciculae distally pointed (sharp or blunt); **11**
10b (9a). Ceratostyle articulations moniliform or drop-shaped distally...**15**
10c (9a). All ceratostyle articulations moniliform..**16**

11a (10a). Peristomial cirri reach middle or anterior end of peristomium...**12**
11b (10a). Peristomial cirri reach middle or front of prostomium; length of antennae increasing from A-I to A-III...**14**

12a (11a). Narrow tips of ventral cirri short and button shaped; A-II and III similar in length, with A-I shorter; pectinate chaetae flaring..**13**
12b (11a). Narrow tips of ventral cirri tapering; subacicular hooks always single (except for replacements); peristomial cirri tapering; length on antennae increasing from A-I to A-III; peristomial cirri without articulations; eyes lateral to the bases of A-I; neuroaciculae emerging at parapodial midline...***E. harassii***

13a (12a). Anterior postchaetal lobes follow outline of acicular lobes closely.............***E. vittata* [in part]***
13c (12a). Anterior postchaetal lobes project as free lobes; subacicular hooks paired in most chaetigers; median acicular lobes bilobed; neuroaciculae emerging at parapodial midline; pectinate chaetae tapering...***E. roussaei***

14a (11b). Subacicular hooks paired in some chaetigers; prostomial lobes dorsally excavate with thickened rim...***E. norvegica***
14b (11b). Three or more subacicular hooks in some chaetigers; prostomial lobes dorsally inflated...***E. philocorallia***

15a (10b). Subacicular hooks always single (except for replacements); peristomial cirri reach middle or front of prostomium..***E. laurillardi***
15b (10b). Subacicular hooks paired in some chaetigers; peristomial cirri reach middle or front of prostomium; length of antennae increasing from A-I to A-III; branchiae reduced in mid-body region; ceratostyles digitiform..***E. floridana***

16a (10c). Peristomial cirri reach middle or anterior end of peristomium; subacicular hooks paired in some chaetigers; antennae in a horseshoe; peristomial cirri tapering..***E. torquata****
16b (10c). Peristomial cirri reach middle or front of prostomium; subacicular hooks always single (except for replacements); antennae in a transverse row; peristomial cirri digitiform.......................***E. annulicornis***

17a (9b). Subacicular hooks always single (except for replacements); inflated bases of ventral cirri scoop-shaped; anterior postchaetal lobes follow outline of acicular lobes closely, forming a collar; ventral cirri with short, tapering tips; peristomial cirri reach middle or anterior end of peristomium; peristomial cirri basally inflated..***E. aphroditois***
17b (9b). Subacicular hooks paired in most chaetigers; inflated bases of ventral cirri thick, transverse welts; anterior postchaetal lobes distinct, free, distally rounded; narrow tips of ventral cirri short and button-shaped; peristomial cirri often as long as peristomium (FAUVEL, 1917)..........................***E. roussaei***

18a (7b). Branchiae palmate; ceratostyles articulated; peristomial cirri reach middle or posterior edge of prostomium, being slender and digitiform; antennae with A-I thicker than other three; inflated bases of ventral cirri; inflated bases of ventral cirri ovate..***E. dubitata***
18b (7b). Branchiae as single filaments [branchiae terminating well before posterior end; branchiae distinctly shorter than notopodial cirri; ceratostyles articulated]; peristomial cirri reach middle or front of prostomium, being slender and tapering, with articulations; antennae similar in thickness; inflated bases of ventral cirri very large, ovate or spherical..***E. nicidioformis***
18c (7b). Branchiae absent [according to NÚÑEZ *et al.* (1997) branchiae are present as single filaments, to near the end of the body, and can be much longer than notopodial cirri; ceratostyles smooth]; peristomial cirri reach posterior end of first peristomial ring, being oval, without articulations; antennae similar in thickness; inflated bases of ventral cirri transversely elongated...***E. cariboea***

Eunice amphiheliae Marion *in* Filhol 1885

Eunice amphiheliæ MARION *in* FILHOL, 1885: 199.
TYPE LOCALITY: Gulf of Gascony, on stony corals, at 1200-1500 meters.
SELECTED REFERENCES: *Eunice amphiheliæ* — ROULE, 1896: 446-449, pl. 19 figs. 1-2, pl. 20 fig. 3, pl. 23 figs. 16-21, pl. 25 figs. 25-26. *Eunice amphiheliae* — FAUCHALD, 1992*b*: 53-54, table 27.
DISTRIBUTION: Gulf of Gascony.

Eunice annulicornis Johnston 1865

Eunice annulicornis JOHNSTON, 1865: 131-132.
TYPE LOCALITY: Maybe Gulf of Genoa (Mediterranean Sea).
SELECTED REFERENCES: *Eunice annulicornis* — BAIRD *in* JOHNSTON, 1865: 340; FAUCHALD, 1992*b*: 54-56, fig. 9, table 27.
DISTRIBUTION: Known from the type locality.
REMARKS: FAUCHALD (1992*b*) noted that this species agrees in most aspects with *E. torquata* Quatrefages 1866, while FAUVEL (1923*c*) had already suggested that they might be synonymous. They only differ in minor details, that may fall within the range of variability of the species. FAUCHALD's study (*op. cit.*) was based on the holotype (and only known specimen) of *E. annulicornis*, and on what seems to be Quatrefage's holotype of *E. torquata*. His observations refer to a single specimen of each species and the differences found must be corroborated with the observation of more specimens, and corrected by their variability. For the moment, both species can be differentiated according to the following characters: *E. annulicornis* – the peristomial cirri reach the middle or front of prostomium and are digitiform, the subacicular hooks are always single, the antennae are in a transverse row, the upper end of the shaft of the compound falcigers are smooth, and the pectinate chaetae are mildly flaring; *E. torquata* – the peristomial cirri reach the middle or anterior end of peristomium and are tapering, the subacicular hooks are paired in some chaetigers, the antennae are in a horseshoe, the upper end of the shaft of the compound falcigers present marginal teeth, and the pectinate chaetae are tapering.

As stated by FAUCHALD (1992*b*), Johnston's name predates Quatrefages', as Quatrefages' book was not issued until 1866, but in case the two species are showed to be synonymous, Quatrefages' name should be preferred for two reasons: it is a well known name, having been frequently used since its description, and has a known type locality.

Eunice antennata (Savigny *in* Lamarck 1818)

Leodice antennata SAVIGNY *in* LAMARCK, 1818: 322.

TYPE LOCALITY: Gulf of Suez.

SELECTED REFERENCES: *Leodice antennata* — SAVIGNY, 1822: 50, pl. 5 fig. 1. *Eunice antennata* — CROSSLAND, 1904: 312-318, text-figs. 56-60, pl. 22 figs. 1-7; FAUVEL, 1953*c*: 240, fig. 118*f-g*; PILLAI, 1965: 148-150, figs. 15, 16*A-D*; DAY, 1967: 384, fig. 17.2.*k-q*; IMAJIMA, 1967: 433-435, fig. 10; GARDINER, 1976: 181, fig. 22*c-j*; MIURA, 1977*a*: 7-9, fig. 3; GATHOF, 1984*e*: 40.23-40.25, figs. 40.19-40.20; FAUCHALD, 1992*b*: 57-60, fig. 11, tables 2, 46-47; CANTONE, 1994: 231-232; CARRERA-PARRA & SALAZAR-VALLEJO, 1998: 1500, fig. 1; ŞAHIN & ÇINAR, 2009: 332-338, figs. 2-3.

DISTRIBUTION: Gulf of Suez; Red Sea; Zanzibar; Maldives; Madagascar; Indian Ocean; Philippines; Japan; South Africa; Senegal; Mediterranean Sea; Levantine Sea; Caribbean Sea; Gulf of Mexico; North Carolina. On sand, coral, shelly and rock bottoms. Intertidal to 275 meters.

REMARKS: *Eunice antennata* was reported from the Mediterranean Sea by ŞAHIN & ÇINAR (2009), who compared their Levantine specimens with specimens from the Gulf of Suez. Moreover, those authors stated that *E. antennata* was an alien species in the Mediterranean Sea. However, and taking into account the wide distribution of the species that has been recorded by different authors, it is possible that several different taxa are involved in this wide distribution, like in the case of the Californian record by HARTMAN (1944*b*; see FAUCHALD, 1992*b*), and that the Mediterranean records refer to a different species. *E. limosa* Ehlers 1868, for instance, is a poorly known species with tridentate subacicular hooks and articulated antennae that was described from the Adriatic Sea and that should be considered. In the meantime, and taking into account that the species has been reported to be cosmopolitan in tropical and subtropical waters (GATHOF, 1984*e*), and that there is no direct evidence that it is an introduced species, its status as an alien species for the Mediterranean Sea is doubtful, and the statement that it was introduced from the Red Sea unconfirmed, as there is no data supporting such assertion. Besides, there is a previous record of the species for the Mediterranean, from Sicily (see CANTONE, 1994).

Eunice aphroditois (Pallas 1788)

Nereis aphroditois PALLAS, 1788: 229-230, pl. 5 figs. 1-7.

TYPE LOCALITY: Sri Lanka, from an hermatypic coral reef.

SELECTED REFERENCES: *Eunice aphroditois* — EHLERS, 1868: 306-310, pl. 15 figs. 23-29; FAUVEL, 1917: 215-220, fig. 18 [in part], pl. 7; FAUCHALD, 1992*b*: 62-63, fig. 13*a-d*, tables 27-28; ZANOL & BETTOSO, 2006: 1017-1023, fig. 3, table 1. *Leodice gigantea* — LAMARCK, 1818: 322; SAVIGNY, 1822: 49-50.

DISTRIBUTION: Indian Ocean: La Reúnion; Sri Lanka; Indonesia.

REMARKS: Probably the European records of *Eunice aphroditois* refer to a close species, maybe *Eunice roussaei* Quatrefages 1866. The species is known from the Indian Ocean, and all the European records need confirmation.

Eunice cariboea Grube 1856

Eunice cariboea GRUBE, 1856: 57 [in part; in part = *Eunice gagzoi* Augener 1924; in part = *Eunice excariboea* Fauchald 1992].

TYPE LOCALITY: Christiansted, St. Croix, Virgin Islands.

SYNONYMS: *Nicidion incerta* Hansen 1882.

SELECTED REFERENCES: *Eunice cariboea* — LANGERHANS, 1884: 256, pl. 15, fig. 14; AUGENER, 1933*c*: 124; FAUCHALD, 1992*b*: 98-101, fig. 29*g-q*, tables 3, 33, 40; [?] NÚÑEZ *et al.*, 1997: 48-50, fig. 1. *Eunice (Nicidion) cariboea* — HARTMAN, 1944*b*: 123-124, pl. 7 figs. 157-163, pl. 8 fig. 178; FAUCHALD, 1970: 38-39, table 1; FAUCHALD, 1977*b*: 39-40, fig. 10; MIURA, 1977*b*: 67-69, fig. 3. *Leodice cariboea* — TREADWELL, 1921: 47-49, text-figs. 136-143, pl. 4 figs. 1-4; TREADWELL, 1939*b*: 241-243, fig. 61. *Nicidion incerta* — A. HANSEN, 1882: 8, pl. 2 figs. 19-21.

DISTRIBUTION: From Bermudas Islands to Caribbean Sea; Brazil; Madeira Island; Canary Islands; Gulf of California; Pacific coast of Japan. Intertidal to about 40 meters, mainly in hard bottoms, especially calcareous, where it lives as endolithic, and also among algae and sponges.

REMARKS: FAUCHALD (1992*a*) restricted the species definition of *Eunice cariboea* to include only abranchiate forms. On the other hand, NÚÑEZ *et al.* (1997) observed that the Canarian specimens presented branchiae with a similar distribution to the described for *Eunice gagzoi* Augener 1924, but that the shape and colour of the acicular chaetae were different from this species, being similar to the described for *E. cariboea*. The same authors observed that in some specimens the branchiae were inconspicuous, and that if these were not fully developed, they could retract when fixed. For this reason, NÚÑEZ *et al.* (1997) considered that *E. cariboea* is a branchiate species, with a single filament located at the posterior region of the body.

Eunice dubitata Fauchald 1974

Eunice dubitatus FAUCHALD, 1974*b*: 18-21, fig. 2*a-f*.

TYPE LOCALITY: Hardangerfjorden, South of Huglhamaren, 59º48'42"N, 15º35'10" E, 180-260 meters, coral bottom.

SELECTED REFERENCES: *Eunice dubitatus* — GEORGE & HARTMANN-SCHRÖDER, 1985: 94, fig. 24. *Eunice dubitata* — WINSNES, 1989: 488-491, figs. 5-6; FAUCHALD, 1992*b*: 124-126, fig. 39*a-g*, tables 4, 24-25; HARTMANN-SCHRÖDER, 1996: 258; NÚÑEZ *et al.*, 1997: 54, figs. 4, 5*C-D*. *Eunice Oerstedii* [not Stimpson 1853 = indeterminable, according to FAUCHALD (1992*b*: 244)] — STØP-BOWITZ, 1948*b*: 64. *Eunice oerstedii* [not Stimpson 1853 = indeterminable, according to FAUCHALD (1992*b*: 244)] — AMOUREUX, 1976*b*: 20; KIRKEGAARD, 1983*b*: 595. [?] *Eunice Œrstedii* [not Stimpson 1853] — FAUVEL, 1914*f*: 143-145, pl. 10 figs. 5-10; FAUVEL, 1923*c*: 405, fig. 159*a-d*. [?] *Eunice (Eunice) oerstedii* [not Stimpson 1853] — AMOUREUX, 1974*b*: 134-135. [?] *Eunice oerstedi* [not Stimpson 1853] — CAMPOY, 1982: 589-591, pl. 76; CANTONE, 1994: 232. [?] *Eunice (Eunice) oerstedi* [not Stimpson 1853] — HARTMANN-SCHRÖDER, 1977*a*: 90-91, figs. 53-55; HARTMANN-SCHRÖDER, 1979*a*: 86; HARTMANN-SCHRÖDER, 1982*a*: 13.

REFERENCES FOR PORTUGAL: AMOUREUX, 1974*b* (as *Eunice oerstedii*; off Porto); HARTMANN-SCHRÖDER, 1979*a* (as *Eunice oerstedi*; western continental shelf of Algarve); CAMPOY, 1982 (as *Eunice oerstedi*; previous records: Porto); DEXTER, 1992 (as *Eunice oerstedi*; previous records: Sado Estuary).

DISTRIBUTION: Coast of Norway, South of Nordland County; Iceland; Kattegat; West coast of France and Spain; from Portugal to Morocco; Azores; Canary Islands; Mediterranean Sea. On pebbles, shell fragments, and rocky bottoms. Normally around 200 meters, down to 500 meters; also 1215-1950 meters.

Eunice floridana (Pourtalès 1867)

Marphysa floridana POURTALÈS, 1867: 108.

TYPE LOCALITY: Off Sand Key (South Florida), at 100 fathoms (182.9 meters).

SELECTED REFERENCES: *Leodice floridana* — TREADWELL, 1939*b*: 247-248, fig. 65. *Eunice floridana* — EHLERS, 1887: 88-90, pl. 22 figs. 1-7; FAUCHALD, 1992*b*: 146-148, fig. 47*d-m* tables 5, 27, 32.

DISTRIBUTION: South Florida; Puerto Rico; [?] Dry Tortugas. Between 1.8-322 meters.

REMARKS: *Eunice floridana* has been referred to be present in Europe. However, the biggest part of these records should be referred to *E. norvegica* (*e.g.*: FAUVEL, 1923*c*). This way, the species is quite probably absent in the European and nearby waters.

Eunice gravieri Fauvel 1911

Eunice Gravieri FAUVEL, 1911*c*: 14-15, figs. 1-2.

TYPE LOCALITY: Seine Bank (NE Madeira Island), 33º47'N, 14º21'W, at 185 meters.

SELECTED REFERENCES: *Eunice Gravieri* — FAUVEL, 1914*f*: 145-146, pl. 10 figs. 1-4, 11-18. *Eunice gravieri* — FAUCHALD, 1992*b*: 160, tables 24-25.

DISTRIBUTION: Known from the type locality.

Eunice harassii Audouin & Milne Edwards 1833

Eunice harassii AUDOUIN & MILNE EDWARDS, 1833*a*: 215-218, pl. 11 figs. 5-7, 10-11 [figures in AUDOUIN & MILNE EDWARDS, 1832].

TYPE LOCALITY: Chausey Islands and Saint-Malo (France, Gulf of Saint-Malo, English Channel).

SELECTED REFERENCES: *Eunice Harassii* — AUDOUIN & MILNE EDWARDS, 1834: 141-144, pl. 3 figs. 5-7, 10-11; QUATREFAGES, 1866*b*: 307-309, pl. 10 fig. 3; SAINT-JOSEPH, 1888: 197-201, pl. 8 fig. 59 FAUVEL, 1914*f*: 134-136; FAUVEL, 1923*c*: 399-400, fig. 156*a-g*. *Eunice harassii* — CAMPOY, 1982: 584-585, pl. 74; GEORGE & HARTMANN-SCHRÖDER, 1985: 98, fig. 25; GIANGRANDE, 1989: 136-140, figs. 1-6; WINSNES, 1989: 494-497, fig. 9; FAUCHALD, 1992*b*: 166-168, fig. 54*a-d*, tables 27, 31; CANTONE, 1994: 232. *Eunice harasii* — NÚÑEZ *et al*, 1997: 50-52, fig. 2. [?] *Eunice punctata* — HEIDER, 1925: 55-89, figs. 1-2, 7-16 [not *Leodice punctata* Risso 1826 = indeterminable; see FAUCHALD (1992*b*: 279)].

REFERENCES FOR PORTUGAL: CARVALHO, 1929 (as *Eunice Harassii*; Sines); BELLAN, 1960*a* (Cape Roca; Cape São Vicente); CAMPOY, 1982 (previous records: Sines); MONTEIRO-MARQUES, 1987 (continental shelf of Algarve); DEXTER, 1992 (previous records: continental shelf of Algarve; Sines); SALDANHA, 1995 (Portugal).

DISTRIBUTION: Scotland; [?] Norway; Eastern parts of North Atlantic; from the English Channel to the Mediterranean Sea; Adriatic Sea; Aegean Sea; Madeira; Canary Islands. Under stones, among old shells, and in rock crevices. At shallow water, intertidal to 248 meters.

Eunice heterochaeta Quatrefages 1866

Eunice heterochaeta QUATREFAGES, 1866*b*: 314, pl. 10 fig. 3.

TYPE LOCALITY: Guettary (Guéthary), Bay of Biscay, France.

SELECTED REFERENCES: *Eunice heterochaeta* — GRUBE, 1870*a*: 295-296; FAUCHALD, 1992*b*: 169-171, fig. 55*g-l*, tables 19, 21.

DISTRIBUTION: Known from the type locality.

Eunice laurillardi Quatrefages 1866

Eunice Laurillardi QUATREFAGES, 1866*b*: 314-315, pl. 10 fig. 3.

TYPE LOCALITY: Nice, Palermo and Marseille (Mediterranean Sea).

SELECTED REFERENCES: *Eunice Laurillardi* — GRUBE, 1870: 294. *Eunice laurillardi* — FAUCHALD, 1992*b*: 190-192, fig. 63, tables 27, 32.

DISTRIBUTION: Western Mediterranean Sea.

Eunice limosa Ehlers 1868

Eunice limosa EHLERS, 1868: 348-352, pl. 15 figs. 15-22.

TYPE LOCALITY: Kvarner Gulf (= Quarnero), Croatia, Adriatic Sea.

SELECTED REFERENCES: *Eunice limosa* — FAUCHALD, 1992*b*: 196-198, tables 41, 43. *Eunice vittata* — FAUVEL, 1911*c*: 11 [? not *Eunice vittata* (Chiaje 1829)].

DISTRIBUTION: Known from the type locality.

REMARKS: This species has been usually considered as a synonym of *Eunice vittata* (Delle Chiaje 1829). As noted by FAUCHALD (1992*b*), the two species are very similar, showing minor differences, which could be due to the species variability, being probably synonymous. *E. limosa* is characterised by combine mucronate guards on the compound falcigers with as many as 12 branchial filaments.

Eunice nicidioformis Treadwell 1906

Eunice nicidioformis TREADWELL, 1906: 1169, figs. 49-51.

TYPE LOCALITY: Hawaiian Islands: 6.5 miles off Puniawa (= Pauwela) Point, Maui (~21º01'N 156º12'W), 95-152 fathoms (174-278 meters), on fine coral sand and foraminifera.

SELECTED REFERENCES: *Eunice nicidioformis* — FAUCHALD, 1992*b*: 237-238, fig. 79*f-m*, tables 11, 24-25.

DISTRIBUTION: Hawaiian Islands, 174-278 meters, on fine coral sand and foraminifera (TREADWELL, 1906; FAUCHALD, 1992*b*); North Atlantic, southern Azores: Seamounts Atlantis, Hyeres, Irving, Meteor, and Plato (GILLET & DAUVIN, 2000; GILLET & DAUVIN, 2003), between 275-845 meters, in bioclastic sand, gravel, basalt and sponges.

Eunice norvegica (Linnaeus 1767)

Nereis norvegica LINNAEUS, 1767: 1086.

TYPE LOCALITY: Norwegian Sea ("*Oceano Norvegico*"). Neotype designated by FAUCHALD (1992*b*), from Röberg, Stadsbygd, Trondheimsfjord (Norway), on an ahermatypic coral reef.

SYNONYMS: *Nereis madreporæ pertusæ* Gunnerus 1768; *Leodice gunneri* Storm 1881.

SELECTED REFERENCES: *Nereis norvegica* — GUNNERUS, 1768: pl. 2 fig. 7. *Nereis madreporæ pertusæ* — GUNNERUS, 1768: 45-51, plate 2 fig. 11. *Leodice norwegica* — LAMARCK, 1818: 323 [in part; in part = *E. pennata* (O.F. Müller 1776)]. *Eunice florideana* [not *Eunice floridana* (Pourtalès 1867)] — PRUVOT & RACOVITZA, 1895: 395-407, text-figs. 4-6, pl. 17 figs. 59-62, pl. 18 fig. 68. *Eunice floridana* [not *Eunice floridana* (Pourtalès 1867)] — FAUVEL, 1923*c*: 402-403, fig. 157*a-g*. *Eunice Norwegica* [in part; in part = *E. pennata* (O.F. Müller 1776)] — AUDOUIN & MILNE EDWARDS, 1833*a*: 219; GRUBE, 1850:

292. *Eunice norvegica* — ØRSTED, 1845*b*: 406-407 [in part; in part = *Eunice pennata* (O.F. Müller 1776)]; MCINTOSH, 1910: 434 [in part; in part = *E. pennata* (O.F. Müller 1776)]; CAMPOY, 1982: 578-579; GEORGE & HARTMANN-SCHRÖDER, 1985: 98, fig. 26; WINSNES, 1989: 491-494, figs. 7-8; FAUCHALD, 1992*b*: 165 [under *"Eunice" gunneri* (Storm 1881)], 241-243, fig. 81*a-e*, tables 27, 30; KIRKEGAARD, 1992: 362-363, fig. 176; HARTMANN-SCHRÖDER, 1996: 258-259; NÚÑEZ *et al.*, 1997: 54-57, figs. 6, 8*A-B*.

REFERENCES FOR PORTUGAL: BELLAN, 1960*a* (as *Eunice floridana*; Setúbal Canyon); AMOUREUX, 1974*b* (as *Eunice floridana*; off Porto); CAMPOY, 1982 (previous records: Porto; Portuguese coast).

DISTRIBUTION: Norwegian coast; South of Iceland; Shetland; Southwest coast of Sweden; East Atlantic south to Morocco and Canary Islands; Mediterranean Sea; Northwest Atlantic (New England area). Living together as a commensal with a reefbuilding coldwater coral, *Lophelia pertusa* (Linnaeus 1758). Between 100-500 meters, but also recorded at 1500 meters.

Eunice pennata (O.F. Müller 1776)

Nereis pennata O.F. MÜLLER, 1776: 217.

TYPE LOCALITY: Storskjær, Oslofjorden (Norway).

SELECTED REFERENCES: *Nereis pennata* — O.F. MÜLLER, 1779: 60-61, pl. 29 figs. 1-3. *Leodice norwegica* [in part; not *Nereis norvegica* Linnaeus, 1767] — LAMARCK, 1818: 323; SAVIGNY, 1822: 51; AUDOUIN & MILNE EDWARDS, 1833*a*: 219; ØRSTED, 1845*b*: 406-407, pl. 2 figs. 13-15. *Nereidonta norwegica* — BLAINVILLE, 1828: 476 [in part, not *Nereis norvegica* Linnaeus 1767]. *Leodice gunneri* — SØMME, 1927: table 1 [not Storm 1881 = *Eunice norvegica* (Linnaeus 1767)]. *Eunice pennata* — FAUVEL, 1914: 136-139, pl. 11 figs. 8-9; FAUVEL, 1923*c*: 400-401, fig. 156*h-o*; CAMPOY, 1982: 586; GEORGE & HARTMANN-SCHRÖDER, 1985: 100, fig. 27; WINSNES, 1989: 485-488, figs. 3-4; FAUCHALD, 1992*b*: 165, 263-264, fig. 87*g-p*, tables 19-20; KIRKEGAARD, 1992: 363-365, fig. 177; CANTONE, 1994: 233; HARTMANN-SCHRÖDER, 1996: 259-260, fig. 116. *Eunice norvegica* — MCINTOSH, 1910: 434 [in part].

REFERENCES FOR PORTUGAL: MCINTOSH, 1910 (publication not seen; Cape Sagres); FAUVEL, 1911*c* (off Lagos); FAUVEL, 1914*f* (off Lagos); RIOJA, 1918*b* (previous records: Cape Sagres); AMOUREUX, 1974*b* (off Porto); MONTEIRO-MARQUES, 1979 (southern continental shelf of Algarve); CAMPOY, 1982 (previous records: Cape Sagres; Porto); MONTEIRO-MARQUES, 1987 (continental shelf of Algarve); DEXTER, 1992 (previous records: continental shelf of Algarve; Sado Estuary).

DISTRIBUTION: Spitsbergen; Iceland; Faroes; Shetland; Orkneys; North Sea; Skagerrak; Kattegat; Northeast Atlantic south to the Azores and Morocco; Mediterranean Sea; Adriatic Sea; Aegean Sea; Southwest coast of Greenland; Davis Strait; Northwest Atlantic (New England and Bay of Fundy). In mixed substrata of stones, shells, gravel and coral fragments; occurs associated with ahermatypic coral reefs. Intertidal to 3500 meters.

Eunice philocorallia Buchanan 1893

Eunice philocorallia BUCHANAN, 1893: 173-176, pl. 9 figs. 2-6, pl. 10 figs. 7-9, pl. 11.

TYPE LOCALITY: 50 miles off Bolus Head, Kerry, Ireland, dredged at 375 meters, in parchment-like tubes on *Lophophelia prolifera*.

SELECTED REFERENCES: *Eunice philocorallia* — FAUCHALD, 1992*b*: 267-269, fig. 89*j-q*, tables 27, 29.

DISTRIBUTION: Known from type locality.

Eunice prognatha McIntosh 1885

Eunice prognatha MCINTOSH, 1885*a*: 268-270, figs. 29-31, pl. 37 figs. 16-17, pl. 19*A* figs. 10-11.

TYPE LOCALITY: Off Ascension Island, 7º54'20"S, 14º28'20"W, at 420 fathoms (768 meters), in volcanic sand.

SELECTED REFERENCES: *Eunice prognatha* — FAUCHALD, 1992*b*: 274-276, fig. 92*a-e*, tables 27, 31, 33, 36.

DISTRIBUTION: South Atlantic, off Ascension Island, at 768 meters, in volcanic sand (MCINTOSH, 1885*a*; FAUCHALD, 1992*b*); North Atlantic, southern Azores: Seamounts Atlantis, Hyeres, Irving, Meteor, and Plato (GILLET & DAUVIN, 2000; GILLET & DAUVIN, 2003), between 275-845 meters, in bioclastic sand, gravel, basalt and sponges.

Eunice purpurea Grube 1866

Eunice purpurea GRUBE, 1866: 68.

TYPE LOCALITY: Kraljevica (= Porto Ré) and Hvar (= Lesina) (Croatia, Adriatic Sea).

SELECTED REFERENCES: *Eunice purpurea* — FAUCHALD, 1992*b*: 279-281, fig. 94, tables 27, 30. *Eunice violacea* — GRUBE, 1861: 60-61 [not *Eunice violacea* Grube 1856 = indeterminable, according to FAUCHALD (1992*b*: 335)].
DISTRIBUTION: Adriatic Sea; Aegean Sea.

Eunice roussaei Quatrefages 1866

Eunice roussaei QUATREFAGES, 1866*b*: 309-311, pl. 10 figs. 1-4.
TYPE LOCALITY: Saint-Jean-de-Luz (Atlantic coast of France) and Martinique (Antilles). According to ZANOL & BETTOSO (2006), QUATREFAGES (1866*b*) examined specimens from both places, but he represented and concentrated the description on one of the specimens from Saint-Jean-de-Luz, while the colour and size of the Martinique specimens are mentioned along the description.
SELECTED REFERENCES: *Eunice Roussaei* — GRUBE, 1870*a*: 298; FAUVEL, 1917: 220-225, text-fig. 19, pl. 8 [in part]. *Eunice Rousseaui* — FAUVEL, 1923*c*: 403-404, fig. 158*a-g*. *Eunice roussaei* — FAUCHALD, 1992*b*: 155 [under *Eunice gigantea* auctores], 288, fig. 97, tables 27-28; NÚÑEZ *et al.*, 1997: 57-61, figs. 7, 8*C-E*; ZANOL & BETTOSO, 2006: 1017-1023, figs. 1-2, table 1. *Eunice aphroditois* [not Pallas 1788] — CAMPOY, 1982: 582-584; CANTONE, 1994: 232.
REFERENCES FOR PORTUGAL: CARVALHO, 1929 (as *Eunice Rousseaui*; Sines); CAMPOY, 1982 (as *Eunice aphroditois*; previous records: Sines). SALDANHA, 1995 (as *Eunice rousseaui*; Portugal; Sado Estuary).
DISTRIBUTION: Antilles Islands; Canary Islands; Santander (Northern Spain); Naples; Adriatic Sea; Aegean Sea; Atlantic Ocean. In coralligenous bottoms. Circalittoral, down to 82 meters.

Eunice rubrocincta Ehlers 1868

Eunice rubrocincta EHLERS, 1868: 344-347, pl. 15 figs. 4-14.
TYPE LOCALITY: Kvarner Gulf (= Quarnero), Croatia, Adriatic Sea.
SELECTED REFERENCES: *Eunice rubrocincta* — FAUCHALD, 1992*b*: 294, tables 19, 21.
DISTRIBUTION: Known from the type locality.
REMARKS: As noted by FAUCHALD (1992*b*), this species has been considered to be synonymous with *Eunice harassii*, from which it seems to be differentiated by the branchiae ending well before the end of the body (against the apparently continuation until the far posterior end of the body), and by having light yellow aciculae and subacicular hooks (against light brown acicular and subacicular hooks in *E. harassii*).

Eunice schizobranchia Claparède 1870

Eunice schizobranchia CLAPARÈDE, 1870: 394-398, pl. 2 fig. 6.
TYPE LOCALITY: Gulf of Naples.
SELECTED REFERENCES: *Eunice schizobranchia* — FAUVEL, 1923*b*: 301-302; FAUVEL, 1923*c*: 407-408, fig. 160; RIOJA, 1935: 31, figs. 46-49; CAMPOY, 1982: 591-593, pl. 77; FAUCHALD, 1992*b*: 298-299, fig. 100*i-q*, tables 22-23; CANTONE, 1994: 233.
DISTRIBUTION: Western Mediterranean Sea; Adriatic Sea. Among *Posidonia*, detritic bottoms, sandy mud, coralligenous with mud, and coralligenous on rocks. Between 35-100 meters, but probably occurs at shallower waters.

**Eunice torquata* Quatrefages 1866

Eunice torquata QUATREFAGES, 1866*b*: 312-313, pl. 10.
TYPE LOCALITY: Saint-Jean-de-Luz (Aquitaine, Northwestern France), Atlantic Ocean.
SYNONYMS: *Eunice claparedii* Quatrefages 1866.
SELECTED REFERENCES: *Eunice torquata* — PRUVOT & RACOVITZA, 1895: 389-395, pl. 17 figs. 63-67, pl. 18 figs. 70-75; SAINT-JOSEPH, 1898: 266-272, pl. 14 figs. 45-54; FAUVEL, 1914*f*: 140-143; FAUVEL, 1923*c*: 401-402, fig. 157*h-o*; CAMPOY, 1982: 587-589, pl. 75; GEORGE & HARTMANN-SCHRÖDER, 1985: 102, fig. 28; FAUCHALD, 1992*b*: 106 [under *Eunice claparedii* Quatrefages 1866], 319-321, fig. 109*a-f*, tables 27-28; CANTONE, 1994: 233. *Eunice claparedii* — QUATREFAGES, 1866*b*: 652-653. *Eunice Harassii* [not *Eunice harassii* Audouin & Milne Edwards 1833] — CLAPARÈDE, 1864: 578-580, pl. 2 fig. 5. *Eunice fasciata* — HEIDER, 1925: 55-89, figs. 3-6 [not *Leodice fasciata* Risso 1826 = indeterminable; see FAUCHALD (1992*b*: 136)].
REFERENCES FOR PORTUGAL: CARVALHO, 1929 (Sines); NOBRE, 1937 (S. Pedro de Muel); CAMPOY, 1982 (previous records: Sines; S. Pedro de Muel).

MATERIAL: FAUNA 1 — St. 17*A*, Alborán Sea, Alborán Island, 70-74 m, stones: 1 incomplete specimen, with about 110 chaetigers; gills from chaetiger 3, with up to 6 filaments at chaetiger 15; hooded hooks from chaetiger 32. **St. 22*A***, Alborán Sea, Placer de las Bóvedas, off San Pedro de Alcántara, 30 m, coralligenous: 1 incomplete specimen, with 56 chaetigers; branchiae from chaetiger 3, with a maximum of 5 filaments from about chaetiger 10-15; hooded dark chaetae from chaetiger 26. **St. 33*A***, Alborán Sea, Alborán Island, 34-44 m, laminarians on rocks: 7 specimens, 2 complete, 5 incomplete; (1) 131 chaetigers for about 11 cm long, branchiae from chaetiger 3 to the last chaetiger present, starting with 4 filaments, and increasing up to 8 filaments, in chaetiger 14, stout bidentate hooded hook from chaetiger 27, possible to see a lighter coloured band on chaetiger 4, found among rhizomes of laminarians; (2) complete specimen with about 130 chaetigers, branchiae in chaetigers 3-99, with up to 4 filaments, 1 subacicular hook from chaetiger 29; (3) complete specimen with 80 chaetigers, branchiae in chaetigers 3-32, 1 subacicular hook from chaetiger 18, probably a juvenile; (4) incomplete, with 46 chaetigers, subacicular black hook from chaetiger 23; (5) incomplete, with 39 chaetigers, subacicular black hook from chaetiger 28; (6) incomplete, with 35 chaetigers, subacicular black hook from chaetiger 21; (7) incomplete juvenile with 23 chaetigers, subacicular black hook from chaetiger 17; plus 5 middle body fragments and 5 posterior fragments with pygidium. **St. 34*A*,** Alborán Sea, Alborán Island, 62-69 m, porous rocks: 1 incomplete specimen, with 52 chaetigers, 4.5 cm long, 4 mm wide; without colouration, plus two middle fragments, with 52 and 28 chaetigers; body cylindrical; prostomium rounded, with two eyes; three antennae and two palps, all distinctly annulated; peristomium 3 to 4 times longer than the following segments; apodous segment with 2 distinctly annulated cirri; gills from chaetiger 3, with up to 5 filaments, on segment 15; aciculae and hooked chaetae black; stout bidentate subacicular hooked from chaetiger 29. **St. 45*A***, Gulf of Cádiz, near Rota, 18 m, rocks with white coral: 1 specimen, broken in two pieces; anterior fragment with about 97 chaetigers; posterior fragment with about 23 chaetigers, but missing the pygidium and possibly some of the posteriormost segments; this specimen doesn't fit exactly the descriptions of *E. torquata* nor *E. annuliformis* given by FAUCHALD (1992*b*), but as these descriptions did not consider the variability of the species, the specimen is here considered as belonging to *E. torquata*; peristomial cirri reach middle of prostomium; aciculae always paired, present from chaetiger 2; bidentate subacicular hooks always single, from chaetiger 30; aciculae and subacicular hooks black or dark, except the ones on chaetiger 1, which are light coloured; peristomial cirri digitiform; branchiae from chaetiger 3, shorter than the dorsal cirri; maximum number of filaments 6, from chaetiger 14 to 17; after that chaetiger the number of filaments decrease, reaching 2 filaments at chaetiger 54, and 1 filament from about chaetiger 81; ceratostyles with moniliform articulation; antennae seem to be in a horseshoe; marginal teeth present along the upper end of the shafts of the falcigerous chaetae; guards bluntly pointed, marginally serrated; pectinate chaetae mildly flaring.

DISTRIBUTION: Atlantic coast of France; Mediterranean Sea; Adriatic Sea; Aegean Sea. Under rocks and in rock crevices. At shallow water.

REMARKS: SAINT-JOSEPH (1898) described the characteristic colour pattern of this species, based on live material. It is of a dark metallic brownish red, with a white collar at chaetiger 4. The following segments show a white spot on each side, near the dorsal cirrus, which are connected by a thin white line after about chaetiger 55. This line becomes wider at the midline of the body. The body presents tiny white spots all over. The antennae, dorsal and anal cirri, are all white, with a brownish red ring present at each articulation. It is light brown on the ventral side.

FAUCHALD (1992*b*) noted that *Eunice annulicornis* Johnston 1865 [type locality: Maybe Gulf of Genoa (Mediterranean Sea)] agrees in most respects with *E. torquata* Quatrefages 1866, and FAUVEL (1923*c*) suggested that they might be synonymous. They differ only in minor details, that may fall within the range of variability of the species. For more details see the *REMARKS* section under *Eunice annulicornis*.

****Eunice vittata*** (Delle Chiaje 1829)

Nereis vittata DELLE CHIAJE, 1829: 195.

TYPE LOCALITY: Gulf of Naples.

SYNONYM: *Eunice minuta* Grube 1850.

SELECTED REFERENCES: *Eunice vittata* — FAUVEL, 1923*c*: 404-405, fig. 158*h-n*; CAMPOY, 1982: 579-582, pl. 73; GEORGE & HARTMANN-SCHRÖDER, 1985: 104, fig. 29; FAUCHALD, 1992*b*: 222 [under *Eunice minuta* Grube 1850], 337-339, fig. 115*a-i*, tables 18, 41, 42; CANTONE, 1994: 233-234; NÚÑEZ *et al.*, 1997: 52-54, figs. 3, 5*A-B*; ŞAHIN & ÇINAR, 2009: 338-339. *Eunice minuta* — GRUBE, 1850: 292.

REFERENCES FOR PORTUGAL: MCINTOSH, 1903*b* (off Cape Sagres); BELLAN, 1960*a* (Cape Roca; Cape Espichel; Setúbal Canyon; Cape São Vicente); AMOUREUX, 1974*b* (off Aveiro; off Porto); HARTMANN-SCHRÖDER, 1977*a* (as *Eunice (Eunice) vittata*; off Cape Sardão; Bay of Setúbal); CAMPOY, 1982 (previous records: Aveiro; Porto); AMOUREUX, 1987 (off Aveiro; off Porto); MONTEIRO-MARQUES, 1987 (continental shelf of Algarve); DEXTER, 1992 (previous records: continental shelf of Algarve; Sines; Arrábida); RAVARA, 1997 (off Aveiro); MACHADO & CANCELA DA FONSECA, 2007 (Algarve); present work (southwestern continental shelf).

MATERIAL: SEPLAT 6 — St. 22, off Praia de Castelejo, 52 m, rock: 1 fragment with 51 chaetigers. **St. 78 (A.2562)**, off Carrapateira, 83 m, gravelly sand: 1 middle fragment with 38 chaetigers. **St. 110 (A.2591)**, off Carrapateira, 145 m, muddy sand: 1 posterior fragment with pygidium. **St. 128 (A.2607)**, off Carrapateira, 99 m, shelly sand, rock: 1 incomplete specimen. **St. 160 (A.2633)**, off Arrifana, 110 m, sand: 1 posterior fragment with 52 chaetigers and pygidium, with anal cirri. **St. 208 (A.2676)**, off Arrifana, 205 m, sand: 2 specimens, one incomplete, the other still partially inside the tube, made of a translucid membrane with pieces of shells and other debris attached, including black sand. **St. 306 (A.2767)**, off Praia de Odeceixe, 224 m, sandy mud: 1 specimen, still partially inside the tube; tube with Foraminifera attached to a translucid membrane. **SEPLAT 7 (1st part) — St. 11 (A.2950)**, SW Zambugeira do Mar, 248 m, muddy sand: 1 incomplete juvenile specimen, with 30 chaetigers and hooked chaetae from chaetiger 14. **St. 43 (A.2976)**, off Zambugeira do Mar, 255 m, muddy sand: 1 complete specimen with 59 chaetigers and 10 mm long, in poor condition; hooked chaetae from chaetiger 15. **St. 73 (A.3002)**, off Cape Sardão, 120 m, muddy sand: 1 very small specimen, 7 mm long, broken in two but complete; anterior fragment with 27 chaetigers, hooked chaetae from chaetiger 11; posterior fragment with 14 chaetigers and pygidium, with 2 pairs of anal cirri, one long and the other (ventral) short. **St. 74 (A.3003)**, off Cape Sardão, 134 m, muddy sand: 1 specimen in very poor condition, broken in two pieces; anterior fragment with about 26 chaetigers; posterior fragment with 80 chaetigers; hooked chaetae from chaetiger 26. **St. 131 (A.3058)**, off Praia de Almograve, 145 m, muddy sand: 1 posterior fragment with 27 chaetigers and pygidium. **St. 145 (A.3072)**, off Praia de Almograve, 150 m, sand: 1 incomplete specimen, broken in two pieces; anterior fragment with 34 chaetigers and hooked chaetae from chaetiger 23, middle fragment with 35 chaetigers. **St. 165 (A.3087)**, off Vila Nova de Milfontes, 170 m, sand: 1 incomplete specimen with 47 chaetigers, hooked chaetae from chaetiger 18. **St. 179 (A.3100)**, off Vila Nova de Milfontes, 140 m, gravelly sand: 2 incomplete specimens; (1) with 54 chaetigers, hooked chaetae from chaetiger 22; (2) with 27 chaetigers, hooked chaetae from chaetiger 21; plus a posterior fragment with 30 chaetigers and pygidium. **St. 202 (A.3114)**, off Vila Nova de Milfontes, 255 m, muddy sand: 1 posterior fragment with 34 chaetigers, in poor condition. **St. 203 (A.3115)**, exact location unknown, off Vila Nova de Milfontes, 302 m, rock: 1 incomplete specimen with 82 chaetigers, hooked chaetae from chaetiger 23. **St. 227 (A.3131)**, exact location unknown, NW Vila Nova de Milfontes, 125 m, sand: 1 complete specimen. **St. 311 (A.3207)**, exact location unknown, off Pessegueiro Island, 120 m, rock, muddy sand: 1 posterior fragment in poor condition, with pygidium; biggest part of chaetigers with 3 tridentate hooked chaetae. **Unknown station**, 180-200 meters: 1 specimen, apparently complete, but broken in two pieces. **SEPLAT 7 (2nd part) — St. 7 (A.4097)**, off Lagoa de Santo André, 132 m, sand with shells: 1 specimen partially still inside the tube; tube mainly with attached pieces of shells. **St. 10 (A.4100)**, off Lagoa de Santo André, 118 m, sand: 1 incomplete specimen. **St. 11 (A.4101)**, off Lagoa de Santo André, 97 m, sand with shells: 1 incomplete specimen with 72 chaetigers, 35 mm long, with hooked chaetae from chaetiger 18; eggs present. **St. 20 (A.4080)**, north Sines, 89 m, sand: 1 posterior fragment with pygidium. **St. 21 (A.4081)**, north Sines, 116 m, sand with shells: 5 specimens, all juveniles; 4 are complete, with 39 chaetigers (hooked chaetae from the 11th), 37 (hooked chaetae from the 10th), and 43 chaetigers (hooked chaetae from the 10th), being the fourth very coiled; incomplete specimen with 17 chaetigers (hooked chaetae from the 11th); only one hooked chaetae per parapodium. **St. 22 (A.4082)**, north Sines, 122 m, sand: 4 incomplete specimens, 2 adults, with 19 chaetigers (hooked chaetae from chaetiger 15), and 28 chaetigers (hooked chaetae from chaetiger 19), and 2 juveniles, with 24 chaetigers (hooked chaetae from chaetiger 10), and 15 chaetigers (hooked chaetae from chaetiger 15), plus one middle fragment with 24 chaetigers. **St. 23 (A.4083)**, north Sines, 127 m, sand: 2 specimens, one of which complete. **St. 26 (A.4086)**, north Sines, 140 m, sand: 1 complete specimen with 86 chaetigers; hooked chaetae from chaetiger 20. **St. 35 (A.4072)**, north Sines, 135 m, gravelly sand: 1 incomplete juvenile specimen with 23 chaetigers, hooked chaetae from chaetiger 10. **St. 40 (A.4067)**, exact location unknown, north Sines, 92 m, sand: 2 incomplete specimens, plus one fragment. **St. 51 (A.4056)**, north Sines, 125 m, sand: 3 incomplete specimens; (1) with 25 chaetigers, hooked chaetae from chaetiger 17; (2) with 46 chaetigers, hooked chaetae from chaetiger 21; (3) with 19 chaetigers, without hooked chaetae; plus 2 posterior fragments with pygidium. **St. 54 (A.4053)**, north Sines, 145 m, sand with shells: 1 posterior fragment with pygidium, very coiled and long. **St. 109 (A.3998)**, off Sines, 146 m, sand: 1 fragment with 27 chaetigers. **St. 136 (A.3973)**, off Sines, 192 m, sand: 1 middle fragment plus one posterior fragment with pygidium. **St. 175 (A.3935)**, off Sines, 205 m, gravelly sand: 2 incomplete specimens; one is a female with eggs, with 20 chaetigers, hooked chaetae from chaetiger 18, plus 2 fragments of the same specimen, with 12 and 36 chaetigers; the other is a juvenile with 26 chaetigers and hooked chaetae from chaetiger 16. **St. 176 (A.3934*A*)**, off Sines, 157 m, sand: 2 incomplete specimens plus 5 fragments with different sizes; (1) big specimen with 35 chaetigers and hooked chaetae from chaetiger 25; (2) smaller specimen with 18 chaetigers and hooked chaetae from chaetiger 11. **St. 182 (A.3929)**, near Sines, 61 m, gravelly sand: 2 complete specimens; (1) female, with eggs, about 30 mm long, with about 100 chaetigers, hooked chaetae from chaetiger 23; (2) with about 80 chaetigers, hooked chaetae from chaetiger 24. **St. 196 (A.3916)**, off Sines, 125 m, muddy sand: 2 incomplete specimens; (1) bigger specimen with 40 chaetigers, hooked chaetae from chaetiger 22, plus one middle fragment with 20 chaetigers and one posterior fragment with pygidium and 24 chaetigers; (2) smaller specimen with 21 chaetigers, and hooked chaetae from chaetiger 15, plus one fragment with 21 chaetigers. **St. 197 (A.3915)**, south Sines, 130 m, muddy sand: 3 specimens, all incomplete and in poor condition; they are somehow translucid; (1) with 34 chaetigers and hooked chaetae from chaetiger 18; (2) with 25 chaetigers and hooked chaetae from chaetiger 17; (3) with 36 chaetigers and hooked chaetae from chaetiger 18. **St. 211 (A.3901)**, south Sines, 140 m, muddy sand: 1 incomplete specimen with 44 chaetigers, with hooked chaetae from chaetiger 20, plus a posterior fragment with 54 chaetigers. **St. 214 (A.3898)**, off Sines, 115 m, muddy sand: 2 complete specimens, one with 76 chaetigers and hooked chaetae from chaetiger 16, and the other with 71 chaetigers and hooked chaetae from chaetiger 19. **St. 220 (A.3895)**, off NW Porto Covo, 28 m, rock: 1 female with eggs, almost complete, with about 90 chaetigers; hooked chaetae from chaetiger 31. **St. 223 (A.3894)**, off Porto Covo, 38 m, schists: 1 incomplete specimen with 42 chaetigers, hooked chaetae from chaetiger 23. **St. 266 (A.3865)**, off Cape Sardão, 175 m, sand: 3 specimens, 2 adults still inside the tubes, and 1 juvenile, plus one posterior fragment with pygidium. **St. 271 (A.3863)**, off Praia de Odeceixe, 232 m, muddy sand: 1 juvenile specimen, complete, with 25 chaetigers; hooked chaetae from chaetiger 9; falciger chaetae do not show a tip in the hoods of the hooks; antennae with constrictions, resembling articulations. **St. 283 (A.3851)**, off Arrifana, 245 m, muddy sand: 1 incomplete specimen. **St. 290 (A.3885)**, off Arrifana, 371 m, sand: 1 complete specimen with about 69 chaetigers, hooked chaetae from chaetiger 22. **St. 309**, off Arrifana, 93 m, rock: 2 incomplete specimens; (1) with 70 chaetigers, hooked chaetae from chaetiger 22; (2) with about 66 chaetigers, in poor condition, hooked chaetae from chaetiger 25. **FAUNA 1 — St. 3*A***, Gulf of Cádiz, off Cádiz, 114-116 m, detritic: 1 incomplete specimen, very big and broken, plus a middle fragment; anterior fragment with 43 chaetigers for about 20 mm long; branchiae in chaetigers 3-40, with 14 filaments at chaetiger 20; hooked chaetae from chaetiger 29; middle fragment with 29 chaetigers for about 20 mm long. **St. 13*A***, Alborán Sea, off Cape Sagra, Motril, 62 m, coarse gravel: 6 specimens; (1) very big, 2 mm wide, 46 chaetigers, with posterior end regenerating, with pygidium already formed, hooked chaetae from chaetiger 27; (2) complete specimen, about 1.5 mm wide, broken in two pieces, anterior fragment with 50 chaetigers and hooked chaetae from chaetiger 23, posterior fragment with 50 chaetigers and pygidium; (3) incomplete, 35 chaetigers, very big, hooked chaetae from chaetiger 26; (4) incomplete with 29 chaetigers and hooked chaetae from chaetiger 19; (5) juvenile, incomplete, with 18 chaetigers, hooked chaetae from chaetiger 12; (6) incomplete with 49 chaetigers, hooked chaetae from chaetiger 22; two posterior fragments, one very wide, with eggs, with 27 chaetigers and pygidium, and the other with 39 chaetigers and pygidium; several middle fragments, with 10, 18, 19, 21, 24 (2), and 53 chaetigers. **St. 18*A***, Alborán Sea, Alborán Island, 45-52 m, stones: 3 fragments. **St. 22*A***, Alborán Sea, Placer de las Bóvedas, off San Pedro de Alcántara, 30 m, coralligenous: 28 specimens, from which 5 complete, 18 incomplete, 5 juveniles, 18 middle fragments, and 3 posterior fragments with pygidium; hooked hooks starting between chaetiger 11 and 28. **St. 23*A***, Alborán Sea, Placer de las Bóvedas, off San Pedro de Alcántara, 30-32 m, coralligenous: 1 incomplete juvenile with 18 chaetigers and hooked chaetae from chaetiger 15, plus 2 middle body fragments and a posterior fragment of a bigger specimen, with pygidium. **St. 32*A***, Alborán Sea, Alborán Island, 28 m, laminarians on rocks: 2 complete specimens, one of which broken in two pieces. **St. 34*A***, Alborán Sea, Alborán Island, 62-69 m, porous rocks: 1 posterior fragment, with 52 chaetigers and pygidium; pygidium with 4 anal cirri, 2 longer dorsal, and 2 shorter ventral; two dorsal cirri, small and triangular, between the last chaetiger and the pygidium; aciculae yellow; two hooded hooked chaetae ventral and tridentate; two dorsal stout aciculae. **St. 37*A***, Alborán Sea, off Punta de la Chullera, 95-100 m, coarse gravel: 1 incomplete specimen with 96 chaetigers, 3.5 cm long; branchiae in chaetigers 4-36, with up to 8 filaments; hooks from about chaetiger 24. **St. 44*A***, Gulf of Cádiz, off Cádiz, 25-26 m, mud: 1 juvenile specimen with hooked chaetae from chaetiger 11, and 3 middle fragments of a bigger specimen. **St. 52*A***, Gulf of Cádiz, Placer de los Mártires, off Chiclana de la Frontera, 22-24 m, rock: 2 specimens; (1) broken in two pieces, anterior fragment with 49 chaetigers, hooked chaetae from about chaetiger 27, posterior fragment with 42 chaetigers; (2) incomplete, with 36 chaetigers, hooked chaetae from chaetiger 20, glandular material in parapodia 6-16; plus six fragments, one of which with eggs. **St. 55*A***, Gulf of Cádiz, off Cape Trafalgar, 38-42 m, gravel: 4 specimens; (1) complete with about 100 chaetigers and hooked chaetae from about chaetiger 27; (2) complete with about 84 chaetigers and hooked chaetae from chaetiger 24; (3) complete, very big and coiled, hooked chaetae from chaetiger 29; (4) incomplete with 25 chaetigers, hooked chaetae from chaetiger 23. **St. 56*A***, Gulf of Cádiz, off Cape Trafalgar, 24 m, rock and gravel: 9 specimens; one complete juvenile with the posterior region regenerating, hooked chaetae from chaetiger 16, and antennae articulated (as in other juveniles), with the articles as cylinders; 8 incomplete specimens; 7 middle fragments; 1 posterior fragment with pygidium. **St. 57*A***, Gulf of Cádiz, off Cape Trafalgar, 76-80 m, gravel and stones: 19 incomplete specimens, two of which are juveniles with hooked chaetae from chaetigers 7 and 10; one of the specimens has 3 hooked chaetae per parapodia; some of them with transversal brown bands in the anterior segments; biggest part of specimens broken before the occurrence of the first hooked chaetae; besides, there are 24 middle fragments and one posterior fragment with pygidium. **St. 58*A***, Gulf of Cádiz, 33-34 m, detritic with rocks: 5 specimens; one complete with 70 chaetigers and hooked chaetae from the 19th; the rest are all incomplete with 26 chaetigers (no hooked chaetae), 42 chaetigers (hooked chaetae from the 27th), 45 chaetigers (hooked chaetae from the 29th); the fourth specimen was not studied in detail; besides there are 5 middle fragments and 3 posterior fragments with pygidium. **St. 60*A***, Gibraltar Strait, Tarifa, 12-16 m, sand, stones, photophile algae: 7 juvenile specimens, in poor condition. **St. 61*A***, Gibraltar Strait, Tarifa, 39-44 m, rock: 2 incomplete specimens, plus one middle fragment, and one posterior fragment. **St. 63*A***, Gibraltar Strait, off Atlanterra, 97-118 m, detritic: 52 specimens, 7 of which are complete and 2 juveniles, plus 10 fragments, 6 of which with pygidia; one of the incomplete specimens with 54 chaetigers, 15 mm long, 1.5 mm wide, subacicular hooks yellow, tridentate, with teeth in a crest, hooks first present from about chaetiger 23, dorsal cirri shorter than gills, gills from chaetiger 3 to at least chaetiger 54 (as one filament), with a maximum number of 4 filaments per parapodium, one dorso-lateral pair of dark spots at the end of the posterior chaetigers. **St. 70*A***, Gulf of Cádiz, off Isla Cristina, 22 m, muddy sand: 4 incomplete specimens, plus 2 fragments. **St. 76*A***, Gulf of Cádiz, off Isla Cristina, 535-546 m, muddy sand: 9 specimens; one complete specimen with 44 chaetigers and hooked chaetae from chaetiger 12; 8 incomplete specimens, with hooked chaetae starting at chaetiger 11-15; plus 4 middle fragments and one posterior fragment. **Unknown station**, polychaetes associated to *Flustra* sp. ("*Poliquetos asociados a* Flustra *sp.*"): 2 incomplete specimens, one with 48 chaetigers (hooked chaetae from chaetiger 26), and the other with 58 chaetigers (hooked chaetae from chaetiger 22), plus one posterior fragment with 33 chaetigers and pygidium.

DISTRIBUTION: Reported to occur worldwide, in a variety of depths and bottoms, but probably many of these records refer to related or close species. At the present material the bathymetry of the species ranges between 12-546 meters.

REMARKS: *Eunice vittata* is normally considered as being the only European species of *Eunice* to present tridentate subacicular hooks. However, this is probably not true. FAUCHALD (1992*b*), states the existence of other two European species showing tridentate subacicular hooks, and whose synonymy with *E. vittata* is still not clear: *E. limosa* Ehlers 1868, from the Adriatic Sea, and *E. woodwardi* Baird 1869, from Galicia (Northern Spain). A third species, *E. antennata* (Savigny *in* Lamarck 1818), was described from the Gulf of Suez, and could be present in the Eastern Mediterranean. Undescribed species can also be present. A comparison between specimens from the different populations is necessary, in order to solve this question.

DOUNAS & KOUKOURAS (1989) proposed the synonymy of *E. indica* Kinberg 1865 (described from the Bangka Strait, Indonesia), with *E. vittata*. However, their study was only based on the variability showed by specimens collected at the Aegean Sea. No specimens from the type locality of *E. indica*, or near it, were used. FAUCHALD (1992*b*) studied the holotype of *E. indica* and specimens collected close to the type locality of *E. vittata*, and found enough differences in order to consider both species as being separated and valid.

PARAPAR *et al.* (1993*b*) studied the morphological variability in *Eunice vittata*, with base on a population from Galicia, finding it to be allometric.

Eunice woodwardi Baird 1869

Eunice woodwardi BAIRD, 1869: 347-348.

TYPE LOCALITY: A Coruña (Galicia, Northern Spain).

SELECTED REFERENCES: *Eunice woodwardi* — FAUCHALD, 1992*b*: 343-345, fig. 117, tables 41-42.

DISTRIBUTION: Known from the type locality.

REMARKS: See the *REMARKS* section under *Eunice vittata*.

GENUS *Euniphysa* Wesenberg-Lund 1949

Euniphysa WESENBERG-LUND, 1949: 305-310.
TYPE SPECIES: *Euniphysa aculeata* Wesenberg-Lund 1949.
SYNONYMS: *Paraeuniphysa* Wu & He 1988; *Heterophysa* Shen & Wu 1990.

KEY TO SPECIES:

(adapted from LU & FAUCHALD, 2000)

1a. Compound falcigers present...***E. italica***
1b. Compound falcigers absent...***E. jeffreysii***

Euniphysa italica Cantone & Gravina 1991

Euniphysa italica CANTONE & GRAVINA, 1991: 230-233, figs. 1-2.
TYPE LOCALITY: Coast of Latium, Tyrrhenian Sea (Italy), 58 meters, in soft bottom (M.F. Gravina, *pers. com.*).
SELECTED REFERENCES: *Euniphysa italica* — LU & FAUCHALD, 2000: 1027-1029, fig. 17.
DISTRIBUTION: Tyrrhenian Sea, soft bottoms, 21-58 meters.

Euniphysa jeffreysii (McIntosh 1903)

Eunice Jeffreysii MCINTOSH, 1903*b*: 137-140, text-fig. 1, pl. 11 figs. 15-20.
TYPE LOCALITY: Tangiers Bay, Morocco, Atlantic Ocean, 35º50'N, 5º49'W, 30 fathoms (54.9 meters).
SELECTED REFERENCES: *Euniphysa jeffreysii* — LU & FAUCHALD, 2000: 1029-1031, fig. 18.
DISTRIBUTION: Known from the type locality.

*GENUS *Lysidice* Savigny *in* Lamarck 1818

Lysidice SAVIGNY *in* LAMARCK, 1818: 324.
TYPE SPECIES: *Lysidice Ninetta* Audouin & Milne-Edwards 1833.
REMARKS: SAVIGNY *in* LAMARCK (1818) originally described three species in the genus *Lysidice*, all of which were considered to be indeterminable by HARTMAN (1959*a*): *L. galathina* and *L. olimpia*, both from France, and *L. valentina*, from Spain. In LAMARCK (1818) there is no direct reference to Savigny as being the author of the generic name. However, the three species mentioned above are clearly attributed by LAMARCK (1818) to Savigny, as being referred in a manuscript ("*Sav.mss.*") and, as a consequence, the name of the genus is here also attributed to Savigny.

The genus needs to be revised, especially in what concerns the older taxa and their synonymies. In Europe, two species belonging to the genus *Lysidice* are normally cited: *Lysidice collaris* Ehrenberg & Grube *in* Grube 1870, and *L. ninetta* Audouin & Milne Edwards 1833. However, in my opinion, the true identity of both species in Europe is not clear at all, and they could represent other described species. Besides, it is also possible that the name *L. ninetta* as used today designates a species that in Europe is known as *L. collaris*, a species which probably does not occur in the European waters. For this reason they will be here referred according to the two distinct morphotypes described in detail by MARTIN (1987), *i.e.*, *L. collaris* sensu Martin 1987, and *L. ninetta* sensu Martin 1987 (for more details in the morphotypes see the key below).

KEY TO SPECIES:

(data from MARTIN, 1987)

1a. Antennae reaching the anterior end of the prostomium; origin of antennae covered by peristomium; kidney-shaped eyes; aciculae yellow; acicular hooded chaetae with rounded teeth, in a close angle; acicular chaetae from chaetigers 20-23; colour uniform..............................***L. collaris* sensu Martín 1987**
1b. Antennae shorter than the prostomium; origin of antenna uncovered; rounded eyes; aciculae dark; acicular chaetae with pointed teeth, in an open angle; acicular chaetae from chaetigers 13-14; chaetiger 2 white collored..***L. ninetta* sensu Martín 1987***

Lysidice collaris Ehrenberg & Grube *in* Grube 1870 sensu Martin 1987

Lysidice collaris [not Ehrenberg & Grube in Grube 1870] — MARTIN, 1987: 66-68, fig. 4*a-h*, table 1.

SYNONYMS: [?] *Lysidice Ninetta* Audouin & Milne-Edwards 1833; [?] *Lysidice margaritacea* Claparède 1868.

SELECTED REFERENCES: *Lysidice collaris* [not Ehrenberg & Grube in Grube 1870] — CANTONE, 1994: 234. [?] *Lysidice margaritacea* — CLAPARÈDE, 1868: 453-454, pl. 8 fig. 3; ŞAHIN & ÇINAR, 2009: 340-342, fig. 5. Not *Lysidice collaris* EHRENBERG & GRUBE *in* GRUBE, 1870: 495-496; GRAVIER, 1900*b*: 272-275, text-figs. 144-147, pl. 14 figs. 93-95; [?] DAY, 1967: 402-403, fig. 17.8.*a-f*; ŞAHIN & ÇINAR, 2009: 339-340, fig. 4.

DISTRIBUTION: Mediterranean Sea; Aegean Sea. Among hard substrates and calcareous algae. Intertidal to subtidal.

REMARKS: According to ZENETOS *et al.* (2005), the record of *Lysidice collaris* from Cyprus by BEN-ELIAHU (1972*c*) is doubtful, being probably confused with the native species *Lysidice margaritacea* Claparède 1868, described from the Gulf of Naples. A similar situation probably happened also with the posterior Mediterranean records of *L. collaris* (as in MARTIN, 1987), and the species recorded is a native one, instead of a hypothethic Lessepsian migrant, as normally stated.

The name *Lysidice collaris*, originally described from the Red Sea, was most likely introduced for the Mediterranean Fauna through the use of the monographic work by DAY (1967), on the South African Polychaeta. Being other names in the genus synonymized with *L. ninetta*, *L. collaris* appeared as a possible name for the uniformly coloured species of *Lysidice* that occurred in the Mediterranean Sea, especially when the description given by DAY (1967) fitted the morphology of the Mediterranean form. However, at least the species *Lysidice margaritacea*, one of the synonymized taxa with another species in the genus, *L. ninetta*, was originally described as being "*colorée d'un jaune pâle à reflets nacrés*" (CLAPARÈDE, 1868: 453). Besides, other details approach the Mediterranean records of *L. collaris* to this species, as the fact that its eyes are kidney-shaped, and the antennae are pictured as reaching the anterior end of the prostomium. Nevertheless, other characters of *L. margaritacea* seem to contradict this possibility, and the aciculae is stated to be black, with pale tips, while the acicular chaetae are pictured has being bidentate with the teeth in an open angle.

Another possible name for what is known today in the Mediterranean Sea as *L. collaris*, is the original *Lysidice ninetta*. As stated below, in the description given by AUDOUIN & MILNE-EDWARDS (1833*a*: 235) of *L. ninetta*, it is stated that the species is "*d'une couleur brune avec des reflets métalliques irisés*". This apparently uniform colour is in agreement with what is considered today as being *L. collaris* from the Mediterranean Sea.

ŞAHIN & ÇINAR (2009) revised the type material of *Lysidice collaris*, described by EHRENBERG & GRUBE *in* GRUBE (1870) from the Red Sea, and determined that the species was not present in the Levantine Sea, and probably in the whole Mediterranean Sea. The species similar to *L. collaris* found in the region was described as belonging to *Lysidice margaritacea* Claparède 1868, a species for which there is no extant type material, while the second species present in the region was assigned to *L. ninetta* Audouin & Milne-Edwards 1833. However, as already explained, there is the possibility that *L. margaritacea* is a junior synonym of *L. ninetta*.

For the moment the name *L. collaris* is maintained here as "sensu Martin 1987". A revision of the whole genus and its synonymized species, and especially of *L. ninetta* and *L. margaritacea* with base on type or topotype material, is needed in order to clarify the true identity of the forms existing in the European waters.

**Lysidice ninetta* Audouin & Milne-Edwards 1833 sensu Martin 1987

Lysidice Ninetta AUDOUIN & MILNE-EDWARDS, 1833*a*: 235, pl. 12 fig. 1-8 [figures in AUDOUIN & MILNE EDWARDS, 1832].

TYPE LOCALITY: Chausey Islands, English Channel.

SYNONYMS: [?] *Lysidice rufa* Gosse 1853; [?] *Lysidice brevicornis* Kinberg 1857; [?] *Lysidice Mahagoni* Claparède 1864; [?] *Lysidice torquata* Quatrefages 1866.

SELECTED REFERENCES: *Lysidice Ninetta* — EHLERS, 1868: 366-373, pl. 16 figs. 12-16; SAINT-JOSEPH, 1888: 209-212, pl. 8 fig. 61; FAUVEL, 1923*c*: 411-412, fig. 162*a-g*. *Lysidice ninetta* — [?] KEFERSTEIN, 1862: 101-102, pl. 9 figs. 10-16; DAY, 1967: 403, fig. 17.8.*g-i*; GEORGE & HARTMANN-SCHRÖDER, 1985: 106, fig. 30 [in part]; MARTIN, 1987: 66-68, fig. 4*i-l*, table 1; CANTONE, 1994: 234-235; NÚÑEZ *et al.*, 1997: 69, fig. 14; ŞAHIN & ÇINAR, 2009: 342. [?] *Lysidice rufa* — GOSSE, 1853: 385. [?] *Lysidice brevicornis* — KINBERG, 1910: 45, pl. 17 fig. 28. [?] *Lysidice Mahagoni* — CLAPARÈDE, 1864: 576-578, pl. 2 fig. 4. [?] *Lysidice torquata* — QUATREFAGES, 1866*b*: 376, pl. 9 figs. 19-20. *Lysidice punctata* [not *Leodice punctata* Risso 1826 = indeterminable; see FAUCHALD (1992*b*: 279)] — GRUBE, 1855: 95-96.

REFERENCES FOR PORTUGAL: CARVALHO, 1929 (as *Lysidice Ninetta*; Sines); AUGENER, 1933*d* (Coimbra, probably to designate Buarcos); AMOUREUX, 1974*b* (off Porto); SALDANHA, 1974 (coast of Arrábida); CAMPOY, 1982 (previous records: Arrábida; Sines; Porto); MONTEIRO-MARQUES *et al.*, 1982 (Cape Carvoeiro); AMOUREUX, 1987 (off Porto); MONTEIRO-MARQUES, 1987 (continental shelf of Algarve); DEXTER, 1992 (as *Lysidice ninnetta*; previous records: continental shelf of Algarve; Sines; Sado Estuary; Arrábida); SALDANHA, 1995 (Portugal); present work (southwestern continental shelf).

MATERIAL: SEPLAT 7 (1st part) — St. 285, exact location unknown, off Pessegueiro Island, 20 m, rocks, stones with corals: 1 incomplete specimen, with 34 chaetigers; antennae shorter than prostomium; eyes not seen; acicular chaetae with teeth making an angle of 90º, and beginning at chaetiger 17; aciculae ambar coloured; plus one middle fragment with 19 chaetigers. **SEPLAT 7 (2nd part) — St. 175 (A.3935)**, off Sines, 205 m, gravelly sand: 1 incomplete specimen with 40 chaetigers, without colour patters; prostomium slightly notched anteriorly, with two rounded eyes; 3 smooth antennae, very short; prostomium a little longer than the following segments; gills absent; dorsal cirri longer than parapodia; ventral cirri short; aciculae dark and straight; acicular chaetae from chaetiger 17, with teeth disposed in an angle of 90º. **St. 225 (A.3892)**, off Porto Covo, 40 m, rock: 2 complete specimens; (1) with 114 chaetigers and hooked chaetae from chaetiger 19; only two anal cirri still attached, being one long and the other short; (2) with 126 chaetigers, hooked chaetae from chaetiger 18. **St. 232**, NW Vila Nova de Milfontes, 18 m, rock: 1 specimen, complete but broken in two pieces, with the anterior half damaged at the middle; total length of about 35 mm; pygidium with 2 pairs of anal cirri, dorsal one slightly longer than the ventral one; acicular chaetae from about chaetiger 18/19. **FAUNA 1 — St. 22*A***, Alborán Sea, Placer de las Bóvedas, off San Pedro de Alcántara, 30 m, coralligenous: 1 incomplete specimen with 40 chaetigers, without colour patterns; acicular chaetae from chaetiger 14. **St. 57*A***, Gulf of Cádiz, off Cape Trafalgar, 76-80 m, gravel and stones: 1 incomplete specimen, very coiled. **St. 66*A***, Gulf of Cádiz, off Cádiz, 25-28 m, muddy sand: 1 small and incomplete specimen, with 23 chaetigers; acicular chaetae from chaetiger 16; 3 antennae visible.

DISTRIBUTION: Northeastern Atlantic, from the English Channel to the Mediterranean Sea; Adriatic Sea; Aegean Sea; Black Sea; North Carolina; Angola; [?] Indian Ocean; [?] Port Jackson, near Sidney, Australia. Stated to be cosmopolitan in warm and warm-temperate waters. In rocks, dead coral, gravel, stones, shell fragments, coralligène, sand, mud, in holdfasts of *Laminaria*, among *Posidonia*, algae and sponges. Intertidal to about 350 meters.

REMARKS: In the description of *Lysidice ninetta* given by AUDOUIN & MILNE-EDWARDS (1833*a*: 235), it is stated that the species is "*d'une couleur brune avec des reflets métalliques irisés*". This is in agreement with what is considered today as being *L. collaris* sensu lacto, or *Lysidice margaritacea* sensu ŞAHIN & ÇINAR (2009).

CLAPARÈDE (1864: 576-577) described *Lysidice Mahagoni*, from the region of Port-Vendres, with the coloration as being "*d'une belle couleur de vieil acajou, semée de taches blanches circulaires* (...). *Ces taches couvrent irregulièrement le lobe céphalique et les segments suivants. Plus en arrière, elles sont rapprochées en une bande transversale sur le milieu de chaque segment. Une bande blanche occupe le quatrième segment (second sétigère) et la moitié du segment suivant.*" KEFERSTEIN (1862: 101-102) also described a variety of *L. ninetta* from Saint-Vaast-la-Hougue with a similar coloration to *L. mahagoni*, also with a white space behind the antennae, but with the anterior margin of the prostomium bilobed, while in *L. mahagoni* the anterior margin in rounded. CLAPARÈDE (1864) also added that if the form of the anterior margin of the prostomium (bilobed or entire) is not important, than probably *L. ninetta* would include *L. punctata sensu* Grube 1855, with the anterior margin of the prostomium bilobed, as well as *L. mahagoni*, with the anterior margin of the prostomium entire, and this in spite of the differences in the coloration.

The description given by GEORGE & HARTMANN-SCHRÖDER (1985) of *L. ninetta* seems to be a mixture of the two morphotypes recorded by MARTIN (1987). This way, the species is described as having antennae reaching the anterior border of the prostomium, with two oval or kidney-shaped eyes, typical of the morphotype *L. collaris* sensu MARTIN (1987), while the acicular chaetae are stated to have a big angle between the two teeth, and the aciculae as being dark, which is typical of the morphotype of *L. ninetta* sensu MARTIN (1987). Finally, the colour is described as being anteriorly red with white spots, posteriorly pink, with chaetiger 2 and sometimes also chaetiger 5 white. This colour pattern corresponds to what is considered to be *L. ninetta*. Finally, the acicular chaetae is stated to begin at chaetigers 12-20, which would include both forms.

The species is here considered "sensu Martin 1987", until a revision of the genus is performed.

*GENUS ***Marphysa*** Quatrefages 1866

Marphysa QUATREFAGES, 1866*b*: 331.

TYPE SPECIES: *Nereis sanguinea* Montagu 1815.

SYNONYMS: *Amphiro* Kinberg 1865; *Nauphanta* Kinberg 1865; *Nausicaa* Kinberg 1865; [?] *Macduffia* McIntosh 1885; *Aphelothrix* Chamberlin 1919; *Lysibranchia* Cantone 1983.

REMARKS: PARAPAR, BESTEIRO & URGORRI (1993*b*) highlighted the fact that the presence and development of some of the main taxonomic characters used to define taxa in the Eunicidae, as the number of cephalic appendages, the presence or absence of tentacular cirri, and number and shape of branchiae, are size dependent, and are closely linked to the state of development of the specimens. This is particularly evident in the genus *Marphysa*, where several taxa has been described as new with base on juveniles of previously known species.

Amphiro simplex Langerhans 1884, described from Madeira Island by LANGERHANS (1884: 256-257, pl. 15 fig. 15) was questionably attributed to *Marphysa* by HARTMAN (1959*a*). On the other way, the description of the species seems to approach it to *Marphysa fallax*, due to the presence of branchiae with few filaments. As it is difficult to reach a conclusion on the validity of the species with base on the available description, the species will not be considered here or included in the key. CROSSLAND (1903*b*) described *Marphysa simplex* from Zanzibar, what could be a homonym of the species. However DAY (1962) synonymized posteriorly the species with *Marphysa mcintoshi* Crossland 1903.

KEY TO SPECIES:

1a. Branchiae with only 1-2 filaments; falciger and spiniger composite chaetae present, at least in the anterior region of the body.......................................**2**
1b. Pectinate branchiae with numerous filaments.......................................**3**

2 (1a). Aciculae light; bidentate acicular chaetae from chaetiger 17; spiniger composite chaetae absent at the posterior 10-15 chaetigers; falciger composite chaetae bidentate.......................................***M. fallax***
2b (1a). Aciculae dark; bidentate acicular chaetae from chaetiger 21; falciger composite chaetae tridentate, absent after chaetiger 15.......................................***Marphysa* sp.**

3a (1b). Branchiae present along the biggest part of the body.......................................***M. sanguinea***
3b (1b). Branchiae present only on a short part of the body.......................................**4**

4a (3b). Compound chaetae only spinigers.......................................***M. kinbergi****
4b (3b). Compound chaetae include spinigers and bidentate falcigers.......................................**5**

5a (4b). Compound spinigers limited to the anterior ⅓ of the body region or less.......................................***M. bellii****
5b (4b). Compound spinigers present along nearly the entire body.......................................***M. totospinata***

****Marphysa bellii*** (Audouin & Milne-Edwards 1833)

Eunice Bellii AUDOUIN & MILNE-EDWARDS, 1833*a*: 223-224, pl. 11 figs. 1-4, 8-9 [figures in AUDOUIN & MILNE EDWARDS, 1832].

TYPE LOCALITY: Chausey Islands, English Channel.

SYNONYMS: [?] *Eunice zonata* Quatrefages 1843 [not Delle Chiaje 1841 = homonym]; *Lysibranchia paucibranchiata* Cantone 1983.

SELECTED REFERENCES: *Marphysa Bellii* — QUATREFAGES, 1866*b*: 333-334; SAINT-JOSEPH, 1888: 204-205; MCINTOSH, 1910: 448, pl. 55 figs. 5-6; FAUVEL, 1923*c*: 410, fig. 161*i-q*. *Marphysa bellii* — GEORGE & HARTMANN-SCHRÖDER, 1985: 108, fig. 31; CANTONE, 1994: 235; NÚÑEZ *et al.*, 1997: 63-66, fig. 12; ŞAHIN & ÇINAR, 2009: 342. *Marphysa belli* — PARAPAR, BESTEIRO & URGORRI, 1993*b*: 424, fig. 7*A-D*; LU & FAUCHALD, 1998: 829-834, figs. 1-6, table 1. *Lysibranchia paucibranchiata* — CANTONE, 1983: 82-84, figs. 1-2; CANTONE, 1994: 234. [?] *Eunice zonata* — QUATREFAGES, 1843: 4-6, pl. 2 figs. 1-2.

REFERENCES FOR PORTUGAL: BELLAN, 1960*a* (off Cape Roca; Cape Espichel; Setúbal Canyon); AMOUREUX, 1974*b* (off Porto); MONTEIRO-MARQUES, 1979 (southern continental shelf of Algarve); CAMPOY, 1982 (as *Marphysa belli*; previous records: Porto); AMOUREUX, 1987 (off Aveiro; off Porto); MONTEIRO-MARQUES, 1987 (continental shelf of Algarve); DEXTER, 1992 (previous records: continental shelf of Algarve; Sado Estuary); RAVARA, 1997 (as *Marphysa belli*; off Aveiro); present work (southwestern continental shelf).

MATERIAL: SEPLAT 7 (1st part) — St. 139 (A.3066), off Praia de Almograve, 380 m, sandy mud: 1 complete specimen, with about 185 chaetigers, 30 mm long, 1 mm wide; acicular chaetae from chaetiger 27; bidentate chaetae from chaetiger 51, very rare; aciculae ambar coloured; branchiae in about chaetigers 11-22; 4 anal cirri, 2 long and 2 short. **SEPLAT 7 (2nd part) — St. 272 (A.3861)**, off Praia de Odeceixe, 305 m, muddy sand: 1 incomplete specimen, coiled, in good condition; branchiae in chaetigers 9-17; hooked acicular chaetae from chaetiger 18; bidentate composed chaetae from chaetiger 21.

DISTRIBUTION: North and Central Atlantic, from the English Channel to the Mediterranean Sea, and from Massachusetts to Gulf of Mexico, off Florida; Adriatic Sea; Aegean Sea; Persian Gulf; Indochina;. In sand, mud, and mixtures of both with gravel and broken shells, under stones, and among seagrasses (*Posidonia*, *Zostera*). Intertidal to about 550 meters.

Marphysa fallax Marion & Bobretzky 1875

Marphysa fallax MARION & BOBRETZKY, 1875: 13-15, pl. 1 fig. 1.

TYPE LOCALITY: Gulf of Marseille (Southern France, Mediterranean Sea).

SYNONYMS: *Amphiro Johnsoni* Langerhans 1880.

SELECTED REFERENCES: *Marphysa fallax* — MARION & BOBRETZKY *in* MARION, 1874: 399 [*nomen nudum*]; SAINT-JOSEPH, 1888: 205; FAUVEL, 1923*c*: 410-411, fig. 162*o-v*; MCINTOSH, 1923*a*: 468, pl. 135 fig. 24; GEORGE & HARTMANN-SCHRÖDER, 1985: 110, fig. 32; CANTONE, 1994: 235; NÚÑEZ *et al.*, 1997: 63, figs. 10-11; ŞAHIN & ÇINAR, 2009: 343. *Amphiro Johnsoni* — LANGERHANS, 1880*a*: 294-295, pl. 16 fig. 28; SAINT-JOSEPH, 1888: 206-207.

REFERENCES FOR PORTUGAL: BELLAN, 1960*a* (Setúbal Canyon; Cape Santa Maria).

DISTRIBUTION: Eastern part of North Atlantic, between Ireland and Madeira; English Channel; Mediterranean Sea; Adriatic Sea; Aegean Sea; Persian Gulf; Gulf of Manaar (Indian Ocean); Indochina; Hawaii; Gulf of Mexico. In coralligène, gravel, rocks, and coarse sand with shell fragments. From the low intertidal zone to a depth of about 400 meters.

REMARKS: *Amphiro Johnsoni* Langerhans 1880 was considered to be a young form of *Marphysa sanguinea* by FAUVEL (1923*c*: 408). However, NÚÑEZ *et al.* (1997) considered *A. Johnstoni* as being a junior synonym of *Marphysa fallax*, with base on the study of juveniles collected at Canary Islands, which were similar to the description and figures given by LANGERHANS (1880*a*).

****Marphysa kinbergi*** McIntosh 1910

Marphysa Kinbergi MCINTOSH, 1910: 451-452, pl. 74 fig. 9, pl. 83 fig. 6.

TYPE LOCALITY: Off Cape Finisterre (Galicia, Northeast Spain).

SELECTED REFERENCES: *Marphysa kinbergi* — RULLIER, 1965: 32, fig. 4; AMOUREUX, 1974*b*: 135; ORENSANZ, 1975: 103-104, pl. 6; CAMPOY, 1982: 573-574; CANTONE, 1994: 235-236.

REFERENCES FOR PORTUGAL: AMOUREUX, 1974*b* (off Porto); CAMPOY, 1982 (previous records: Porto); AMOUREUX, 1987 (off Porto); present work (southwestern continental shelf).

MATERIAL: SEPLAT 7 (1st part) — St. 62 (A.2992), off Cape Sardão, 384 m, muddy sand: 1 incomplete specimen in poor condition, small, maybe a juvenile, with 29 chaetigers, branchiae in chaetigers 13-23, aciculae ambar coloured. **St. 204 (A.3116)**, off Vila Nova de Milfontes, 410 m, sandy mud: 1 incomplete specimen with 38 chaetigers, branchiae in chaetigers 14-30, plus one fragment with about 80 chaetigers. **St. 236 (A.3140)**, off Vila Nova de Milfontes, 390 m, sandy mud: 1 incomplete specimen with 88 chaetigers, branchiae in chaetigers 14-23, acicular chaetae from about chaetiger 34. **SEPLAT 7 (2nd part) — St. 61 (A.4046)**, north Sines, 285 m, sand: 1 small juvenile specimen in poor condition, plus one fragment; specimen with only 3 antennae; only falcigerous composed chaetae present, starting at chaetiger 1; acicular chaetae from about chaetiger 24. **FAUNA 1 — St. 1*A***, Gulf of Cádiz, off Huelva, 190 m, mud: 2 incomplete specimens, plus 5 fragments and one pygidium with two pairs of anal cirri, one long and the other short; one specimen with 72 chaetigers, acicular chaetae from chaetiger 42, and branchiae in chaetigers 14-29, the other long and coiled, with branchiae in chaetigers 15-29 and acicular chaetae from chaetiger 42; one of the specimens with the proboscis everted, being possible to see the maxillary apparatus. **St. 14*A***, Alborán Sea, off Castell de Ferro, Granada, 285-290 m, mud: 5 incomplete specimens, one of which with 67 chaetigers for 3.5 cm long and 3 mm wide, another with 92 chaetigers for 4 cm long and 3 mm wide, and a third one with 56 chaetigers; one specimen with pigmented spots in the rear of the more external antennae; branchiae at chaetigers 15-31, 15-32, 14-30, 16-30 and 14-28; dark acicular chaetae from chaetiger 39, 40, 40, 44 and 51; plus one fragment with 98 chaetigers and another fragment with 44 chaetigers (broken in two pieces). **St. 15*A***, Alborán Sea, off Adra, 274-306 m, mud: 1 incomplete specimen, with 97 chaetigers, branchiae in chaetigers 14-31, acicular chaetae from chaetiger 45. **St. 25*A***, Alborán Sea, off Fuengirola, 227-233 m, mud: 3 incomplete specimens; (1) with 88 chaetigers, branchiae in chaetigers 14-32, acicular chaetae from chaetiger 40; (2) with 114 chaetigers, branchiae in chaetigers 14-29, acicular chaetae from chaetiger 40; (3) with 84 chaetigers, branchiae in chaetigers 14-29, acicular chaetae from chaetiger 42.

DISTRIBUTION: Northeastern Atlantic, from Cape Finisterre to Iberian Peninsula and Western Mediterranean Sea (190-550 meters); Adriatic Sea; Aegean Sea; Gulf of Guinea (48-55 meters); off Uruguay (90 meters). On muddy and sandy bottoms.

REMARKS: As pointed by ORENSANZ (1975), some differences are present between the specimens studied by MCINTOSH (1910), from Cape Finisterre, and the single specimen collected off Uruguay. This way, the European specimens presented branchiae in the chaetigers 16-36, with up to 25 filaments, while the South American specimen presented branchiae in chaetigers 11-23, with up to 10 filaments.

Marphysa sanguinea (Montagu 1815)

Nereis sanguinea MONTAGU, 1815: 20-21, pl. 3 figs. 1-3.

TYPE LOCALITY: South coast of Devonshire (England), in rocks. Neotype designated by HUTCHINGS & KARAGEORGOPOULOS (2003), from Polpero, Cornwall, England (50º19'40"N, 4º30'45"W).

SYNONYMS: *Lysidice multicirrata* Claparède 1863; *Marphysa mauritanica* Gillet 1990.

SELECTED REFERENCES: *Marphysa sanguinea* — SAINT-JOSEPH, 1888: 201-204, pl. 8 fig. 60; FAUVEL, 1923*c*: 408-410, fig. 161*a-h*; GEORGE & HARTMANN-SCHRÖDER, 1985: 112; PARAPAR, BESTEIRO & URGORRI, 1993*b*: 426, fig. 7*E-J*; CANTONE, 1994: 236; HARTMANN-SCHRÖDER, 1996: 261; HUTCHINGS & KARAGEORGOPOULOS, 2003: 88-90, figs. 1, 3*A*, *C*, 4*A*, *C* [captions of figures 2 and 3 are interchanged]; ŞAHIN & ÇINAR, 2009: 343. *Lysidice multicirrata* — CLAPARÈDE, 1863: 60, pl. 14 figs. 23-26. *Marphysa mauritanica* — GILLET, 1990: 79-82, fig. 3.

REFERENCES FOR PORTUGAL: NOBRE, 1903*a* (Mouth of Douro; Viana do Castelo); CARVALHO, 1929 (Granja); BELLAN, 1960*a* (Setúbal Canyon; Cape Santa Maria); CAMPOY, 1982 (previous records: Praia da Granja; Mouth of Douro; Viana do Castelo); CALVÁRIO, 1984 (Tagus Estuary); MONTEIRO-MARQUES, 1987 (continental shelf of Algarve); DEXTER, 1992 (previous records: Ria Formosa; Ria de Alvor; continental shelf of Algarve; Lagoon of Carrapateira; Sines; Sado Estuary; Tagus Estuary).

DISTRIBUTION: Considered to be cosmopolitan. In fine sand, mud and mixtures of both, clay, under stones, in crevices of rocks, wooden pilings, oyster beds, sponges, empty worm tubes, roots of sea grass (*Zostera*). It is the only known species of *Marphysa* to occur in the North Sea. From intertidal zone to about 200 meters. HUTCHINGS & KARAGEORGOPOULOS (2003) refer the species as living in deep burrows in crevices in the rocks at low watermark, and referred to the species only Northern European records.

REMARKS: *Marphysa mauritanica* was described by GILLET (1990) with base on two small specimens, collected at the Banc d'Arguin, in Mauritania. Their small size and the presence of only three antennae, characteristic of younger stages of the genus *Marphysa*, suggests that Gillet described juvenile specimens of *Marphysa*, as already pointed by GILLET (*op. cit.*) in his description of the species. PARAPAR, BESTEIRO & URGORRI (1993*b*) referred *M. mauritanica* to *M. sanguinea*, stating however that in the studied juvenile of *M. sanguinea* from Galicia the MII presented 3 teeth, and MIV 4 and 6, while *M. mauritanica* showed a MII with 4 teeth, and a MIV with 3 teeth.

Marphysa totospinata Lu & Fauchald 1998

Marphysa totospinata LU & FAUCHALD, 1998: 839-841, figs. 2-4, 6, 9, table 1.

TYPE LOCALITY: Atlantic coast of Ireland, Mayo, near Blacksod Bay.

SELECTED REFERENCES: *Marphysa belli* [not Audouin & Milne Edwards 1833] — MCINTOSH, 1910: 448-451, pl. 55 figs. 5-6, pl. 60 fig. 12, pl. 63 fig. 2, pl. 65 fig. 11, pl. 86 fig. 3.

DISTRIBUTION: British Isles: Blacksod Bay, Atlantic coast of Ireland and Plymouth region, English Channel.

***Marphysa* sp.**

Marphysa sp. WINSNES, 1989: 497-499, fig. 10.

SELECTED REFERENCES: *Marphysa* sp. — HARTMANN-SCHRÖDER, 1996: 261.

DISTRIBUTION: Swedish west coast, near Uddevalla.

REMARKS: The tridentate condition of the composite falcigers of the single studied specimen seems to be unique within the genus. According to WINSNES (1989), *Marphysa* sp. conforms the description of *M. sanguinea* in most aspects, but differs in the appearance of tridentate composite falcigers in the anterior 15 chaetigers, while most authors describe *M. sanguinea* with composite spinigers only. FAUVEL (1923*c*: 410) refers that "*La forme jeune* [of *M. sanguinea*] (6 à 10 mm) a des branchies simples, 3 antennes, 4 yeux et des soies composées les unes cultriformes les autres à article bidenté, ces dernières disparaissent progressivement", but as stated by WINSNES (1989: 498), it is uncertain if Fauvel "*means that the setae disappear towards the posterior end of the young worm or that they disappear as the individual grows older*".

The specimen described by WINSNES (1989) seems to be also very close to *Marphysa fallax* Marion & Bobretzky 1875.

*GENUS ***Nematonereis*** Schmarda 1861

Nematonereis SCHMARDA, 1861: 119.
TYPE SPECIES: *Lumbriconereis unicornis* Grube 1840.
SYNONYMS: *Blainvillea* Quatrefages 1866.

****Nematonereis unicornis*** (Grube 1840)

Lumbriconereis unicornis GRUBE, 1840: 80.
TYPE LOCALITY: Mediterranean Sea.
SYNONYMS: *Lombrineris pectinifera* Quatrefages 1843; [?] *Blainvillea elongata* Quatrefages 1866; [?] *Blainvillea filum* Quatrefages 1866; *Nematonereis contorta* Quatrefages 1866; *Nematonereis Grubei* Quatrefages 1866; *Nematonereis oculata* Ehlers 1868.
SELECTED REFERENCES: *Lumbriconereis unicornis* — CLAPARÈDE, 1864: 572-573, pl. 4 fig. 2. *Nematonereis unicornis* — SAINT-JOSEPH, 1888: 207-209; MCINTOSH, 1910: 453, pl. 54 fig. 3, pl. 63 fig. 5; FAUVEL, 1923*c*: 412-413, fig. 162*h-n*; DAY, 1967: 403-404, fig. 17.8.*j-n*; GEORGE & HARTMANN-SCHRÖDER, 1985: 114, fig. 34; CANTONE, 1994: 236; NÚÑEZ *et al.*, 1997: 71, fig. 15; ŞAHIN & ÇINAR, 2009: 343. *Lombrineris pectinifera* — QUATREFAGES, 1843: 6-8, pl. 2 figs. 3-8. *Nematonereis oculata* — EHLERS, 1868: 374-376, pl. 16 figs. 19-22.
REFERENCES FOR PORTUGAL: HARTMANN-SCHRÖDER, 1977*a* (Bay of Setúbal); AMOUREUX, 1987 (off Aveiro); MONTEIRO-MARQUES, 1987 (continental shelf of Algarve); DEXTER, 1992 (previous records: continental shelf of Algarve; Mira Estuary; Sado Estuary); present work (southwestern continental shelf).
MATERIAL: SEPLAT 6 — St. 128 (A.2607), off Carrapateira, 99 m, shelly sand, rock: 1 juvenile specimen, very small, incomplete; acicular chaetae from chaetiger 10. **SEPLAT 7 (2nd part) — St. 22 (A.4082)**, north Sines, 122 m, sand: 3 incomplete specimens; (1) with 38 chaetigers, acicular chaetae from chaetiger 19; (2) very coiled and long, inside a tube, with the jaws everted; (3) coiled and long, with acicular chaetae from chaetiger 20; besides, one middle fragment with 35 chaetigers and one posterior fragment with 21 chaetigers and pygidium. **St. 48 (A.4059)**, north Sines, 73 m, sand: 1 incomplete specimen, very small, probably a juvenile; partially inside an old tube of *Dentalium* sp.. **St. 136 (A.3973)**, off Sines, 192 m, sand: 1 middle fragment plus one posterior fragment with pygidium. **St. 177 (A.3934)**, off Sines, 141 m, sand: 1 incomplete specimen with 78 chaetigers; subacicular hooks from chaetiger 11. **St. 178 (A.3933)**, off Sines, 130 m, sand: 3 incomplete specimens, plus 5 fragments with 10, 14, 15, 25 and 26 chaetigers; (1) with 43 chaetigers, subacicular hooks from chaetiger 19; (2) in poor condition (translucid), with 120 chaetigers, subacicular hooks from chaetiger 19; (3) in poor condition (translucid), with 55 chaetigers, subacicular hooks from chaetiger 17. **St. 196 (A.3916)**, off Sines, 125 m, muddy sand: 1 incomplete specimen with 48 chaetigers; prostomium round, with a pair of rounded eyes; one single smooth antenna, almost reaching the anterior border of the prostomium; peristomium slightly longer than the following segments; no cirri on the apodous segment; gills absent; subacicular hooks from about chaetiger 24; subacicular hooks and aciculae ambar coloured. **St. 199 (A.3913)**, SW Sines, 155 m, sand: 1 incomplete specimen with 51 chaetigers; subacicular hooks from chaetiger 18; antenna missing. **St. 316 (A.3844)**, off Arrifana, 82 m, sand: 1 specimen in poor condition, incomplete but very long, plus 1 fragment; acicular chaetae from chaetiger 23. **FAUNA 1 — St. 23*A***, Alborán Sea, Placer de las Bóvedas, off San Pedro de Alcántara, 30-32 m, coralligenous: 1 very small specimen, probably a juvenile; incomplete and in poor condition; antennae present; 15 chaetigers; acicular chaetae from chaetiger 13; joined chaetae present a kind of pilosity in the shaft and in the blade; prostomium rounded anteriorly. **St. 56*A***, Gulf of Cádiz, off Cape Trafalgar, 24 m, rock and gravel: 1 incomplete specimen with about 43 chaetigers, hooked chaetae from chaetiger 13; very small, maybe a juvenile. **St. 57*A***, Gulf of Cádiz, off Cape Trafalgar, 76-80 m, gravel and stones: 1 incomplete specimen with 21 chaetigers, hooked chaetae from chaetiger 8; antennae missing; probably a juvenile. **St. 60*A***, Gibraltar Strait, Tarifa, 12-16 m, sand, stones, photophile algae: 1 incomplete specimen in poor condition, maybe a juvenile, with 39 chaetigers and hooked chaetae from chaetiger 13; prostomium rounded. **St. 70*A***, Gulf of Cádiz, off

Isla Cristina, 22 m, muddy sand: 2 juvenile specimens, incomplete; one with acicular chaetae from chaetiger 8, and the other from chaetiger 11; one single antenna; aciculae dark.
DISTRIBUTION: Considered as cosmopolitan in warm-temperate waters: Northeastern Atlantic, from the English Channel to Morocco; Mediterranean Sea; Adriatic Sea; Aegean Sea; Black Sea; Suez Canal; tropical Indo-west-Pacific. In sand, mud, and mistures of both, rock, shells, amongst sea grasses (*Posidonia*, *Zostera*) and algae, under stones, and in crevices of rocks. Intertidal to about 300 meters.

*GENUS ***Palola*** Gray *in* Stair 1847

Palola GRAY *in* STAIR, 1847: 17.
TYPE SPECIES: *Palola viridis* Gray *in* Stair 1847.
REMARKS: A genetic and phylogenetic study of tropical Caribbean and Pacific *Palola* was performed recently by SCHULZE (2006), suggesting the existence of long-lived planktotrophic larvae, in at least some *Palola* lineages, in order to explain the presence of geographically widespread haplotypes.

KEY TO SPECIES:

(adapted from FAUCHALD, 1992*a*)

1a. A-I and II similar in length; A-III much longer; branchiae start late, at about chaetiger 231-248...***P. madeirensis***
1b. Length of antennae increasing from A-I through A-III...**2**

2a (1b). Prostomium dorsally inflated...**3**
2b (1b). Prostomium dorsally flattened; median postchaetal lobes low, transverse folds; prostomium distinctly shorter than peristomium; antennae in a shallow horseshoe; branchiae from about chaetiger 112...***P. valida***

3a (2a). Median postchaetal lobes follow outline of acicular lobes closely; prostomium nearly as long as peristomium; antennae in a transverse line; branchiae from chaetiger 92-180 (depending on size of specimen)...***P. siciliensis****
3b (2a). Median postchaetal lobes project as free lobes, being slightly higher than acicular lobes; prostomium distinctly shorter than peristomium; antennae in a very shallow horseshoe shape; reported to miss branchiae (they are absent in an incomplete specimen with 130 chaetigers..................***P. ebranchiata***

Palola ebranchiata (Quatrefages 1866)

Eunice ebranchiata QUATREFAGES, 1866*b*: 316-317.
TYPE LOCALITY: Palermo (Sicily).
SELECTED REFERENCES: *Palola ebranchiata* — FAUCHALD, 1992*a*: 1185-1187, figs. 1, 3.
DISTRIBUTION: Mediterranean Sea.

Palola madeirensis Baird 1869

Eunice madeirensis BAIRD, 1869: 344-345.
TYPE LOCALITY: Madeira Island.
SELECTED REFERENCES: *Palolo madeirensis* — FAUCHALD, 1992*a*: 1192-1194, figs. 1, 6.
DISTRIBUTION: Known from the type locality.

****Palola siciliensis*** (Grube 1840)

Eunice siciliensis GRUBE, 1840: 83.
TYPE LOCALITY: Palermo, Sicily (Mediterranean Sea).
SYNONYMS: *Eunice adriatica* Schmarda 1861; *Eunice Tænia* Claparède 1864; *Eunice bitorquata* Grube 1870.
SELECTED REFERENCES: *Eunice siciliensis* — FAUVEL, 1923*c*: 405-407, fig. 159*e-m*. *Palola siciliensis* — FAUCHALD, 1992*a*: 1199-1201, figs. 1, 9*d-j*; CANTONE, 1994: 237; NÚÑEZ *et al.*, 1997: 61, fig. 9; ŞAHIN & ÇINAR, 2009: 344-345. *Eunice Tænia* — CLAPARÈDE, 1864: 580-581, pl. 4 fig. 11.
REFERENCES FOR PORTUGAL: SALDANHA, 1974 (as *Eunice siciliensis*; coast of Arrábida); HARTMANN-SCHRÖDER, 1979*a* (as *Eunice siciliensis*; western continental shelf of Algarve); MONTEIRO-MARQUES,

1987 (as *Eunice siciliensis*; continental shelf of Algarve); DEXTER, 1992 (as *Eunice siciliensis*; previous records: continental shelf of Algarve); SALDANHA, 1995 (as *Palolo siciliensis*; Portugal).

MATERIAL: FAUNA 1 — St. 18*A*, Alborán Sea, Alborán Island, 45-52 m, stones: 1 specimen in good condition, incomplete; about 140 mm long for 350 chaetigers; body divided in two parts; jaws partially everted; branchiae appear quite late, as a single filament; plus numerous fragments with sexual products.

DISTRIBUTION: Mediterranean Sea; Adriatic Sea; Aegean Sea; Canary Islands. On hard-bottom environments, in shallow waters.

Palola valida (Gravier 1900)

Eunice valida GRAVIER, 1900*b*: 264-267, text-figs. 134-136, pl. 13 figs. 80-82.

TYPE LOCALITY: Périm and Djibouti, Gulf of Aden.

SELECTED REFERENCES: *Palolo valida* — FAUCHALD, 1992*a*: 1203-1205, fig. 10, table 2. *Palola valida* — ŞAHIN & ÇINAR, 2009: 345, fig. 6. *Eunice siciliensis* [not Grube 1840] — CROSSLAND, 1904: 323-326, pl. 22 figs. 8-9 (in part).

DISTRIBUTION: Gulf of Aden; Eastern Mediterranean: Turkish Levantine waters. In hard surfaces. Between 0-3 meters.

REMARKS: *Palola valida* was recorded from the Levantine waters of the Mediterranean Sea by ŞAHIN & ÇINAR (2009), and distinguished from *P. siciliensis* with base mainly on differences on the number of the teeth present in the maxillae and the colour patterns.

GENUS ***Paramarphysa*** Ehlers 1887

Paramarphysa EHLERS, 1887: 99.

TYPE SPECIES: *Paramarphysa longula* Ehlers 1887.

Paramarphysa longula Ehlers 1887

Paramarphysa longula EHLERS, 1887: 99-100, pl. 29 figs. 3-12.

TYPE LOCALITY: Off Havana, at 127 fathoms (232.2 meters).

SYNONYMS: [?] *Marphysa saxicola* Langerhans 1881; *Paramarphysa obtusa* Verrill 1900.

SELECTED REFERENCES: *Paramarphysa longula* — AUGENER, 1918: 334-335, text-fig. 34, pl. 5 fig. 133; FAUVEL, 1950*a*: 366-367; RIOJA, 1961: 302; RULLIER, 1964: 180-181; RULLIER, 1974: 56; NÚÑEZ, 1990: 532-534, fig. 173; NÚÑEZ *et al.*, 1997: 66-69, fig. 13. *Paramarphysa obtusa* — VERRILL, 1900: 646; TREADWELL, 1921: 76-77, text-figs. 269-278. [?] *Marphysa saxicola* — LANGERHANS, 1881: 111-112, pl. 5 fig. 17 [in part].

DISTRIBUTION: Cuba; eastern coasts of Mexico; Bermudas; Florida; Canary Islands (Tenerife, La Palma, Fuerteventura, Lanzarote); Cape Verde; Senegal; Gulf of Guinea. In rocky bottoms, and endolithic in calcareous algae. Between 3-10 meters.

REMARKS: LANGERHANS (1881) described *Marphysa saxicola* from Puerto de la Orotava (nowadays Puerto de La Cruz), in the northern side of Tenerife (Canary Islands). As noted by NÚÑEZ (1990) and NÚÑEZ *et al.* (1997), the description was based in more than one species, as some specimens are stated as presenting very reduced tentacular cirri, and sometimes simple branchiae in the posterior region of the body. For this reason NÚÑEZ (1990), and later and NÚÑEZ *et al.* (1997), considered the species as being *incertae sedis*. However, part of the material used to describe *M. saxicola*, as well as new material collected from the Canary Islands, was referred to *Paramarphysa longula* by the same author.

*FAMILY **EUPHROSINIDAE** Williams 1851

AS: *EUPHROSINIDAE* WILLIAMS, 1851: 174.
TYPE GENUS: *Euphrosine* Savigny *in* Lamarck 1818.
SYNONYMS: *EUPHROSYNEA* Kinberg 1857; *HIPPONOACEA* Carus 1863.
REMARKS: The members of the family Euphrosinidae have a characteristic short and compact body, with the dorsal region normally covered by transversal rows of calcareous chaetae and branchiae, except for a longitudinal median stripe. Euphrosinids are very close to amphinomids, in which family they were normally included until GUSTAFSON (1930) demonstrated their separate status as a family. Due to the calcareous nature of their chaetae, the fixation and preservation fluids can create some problems if not tamponate, as the chaetal ornamentation can be lost due to the acidity of the liquids (see *REMARKS* under the family Amphinomidae).

The most important recent taxonomic accounts on the family include DETINOVA (1985*a*), with the description of one new genus and one new species, HARTMANN-SCHRÖDER & ROSENFELDT (1992), with the description of two new species, and the important work by KUDENOV (1993*a*), with the description of one new genus and 8 new species, including identification keys for species of three genera, with base on the branchial schemes, and a key for species from Antarctica. The species characters for the genus *Euphrosine* were revised and standardized by KUDENOV (1987*a*), who also presented a character matrix for the known species of *Euphrosine*, and separated the genus in six groups of species, according to characters like the presence or absence of ringent chaetae and its morphology, and type of caruncle, while the morphometric variation in bifurcate chaetae of *Euphrosine* was analysed by VOGT & KUDENOV (1994). Finally, the phylogenetic relationships of the Euphrosinidae with the close families Amphinomidae and Archinomidae were studied by WIKLUND *et al.* (2008), with base on molecular data.

Nowadays the family includes 4 genera, and 60 species considered to be valid. One case of homonymy exits (*Euphrosine antarctica* Hartmann-Schröder & Rosenfeldt 1992, and its junior homonym *Euphrosine antarctica* Kudenov 1993), and it is possible that the species described by HARTMANN-SCHRÖDER & ROSENFELDT (1992) from Antarctica, was also described as new by KUDENOV (1993*a*), with base on material from the same region. However, this possibility was not investigated here.

In European and nearby waters, two genera and seven species are known to occur. From these, only two species belonging to the genus *Euphrosine* were present among the studied material.

KEY TO GENERA:

(from FAUCHALD, 1977*a*)

1a. Notochaetae bifurcate, with cylindrical shafts..***Euphrosine****
1b. Notochaetae flattened, smooth paleae...***Palmyreuphrosyne***

*GENUS ***Euphrosine*** Savigny *in* Lamarck 1818

Euphrosine SAVIGNY *in* LAMARCK, 1818: 331.
TYPE SPECIES: *Euphrosine myrtosa* Savigny *in* Lamarck 1818.
SYNONYMS: *Lophonota* Costa 1841.

KEY TO SPECIES:

(adapted from: PETTIBONE, 1963*a*; GEORGE & HARTMANN-SCHRÖDER, 1985)

1a. Gills consisting of a single curled filament close to the upper dorsal cirrus, never more than one pair per segment...**2**
1b. Gills branched and more numerous; notochaetae of two kinds: (1) very unequally bifurcated, smooth, (2) unequally bifurcated, serrated on inner sides of branches (ringent notochaetae)...................................**3**

2a (1a). Notochaetae of one kind, unequally bifurcated, smooth..***E. cirrata***
2b (1a). Notochaetae of two kinds: (1) very unequally bifurcated, smooth, (2) unequally bifurcated, serrated on inner sides of branches (ringent notochaetae)...***E. cirrataepropinqua***

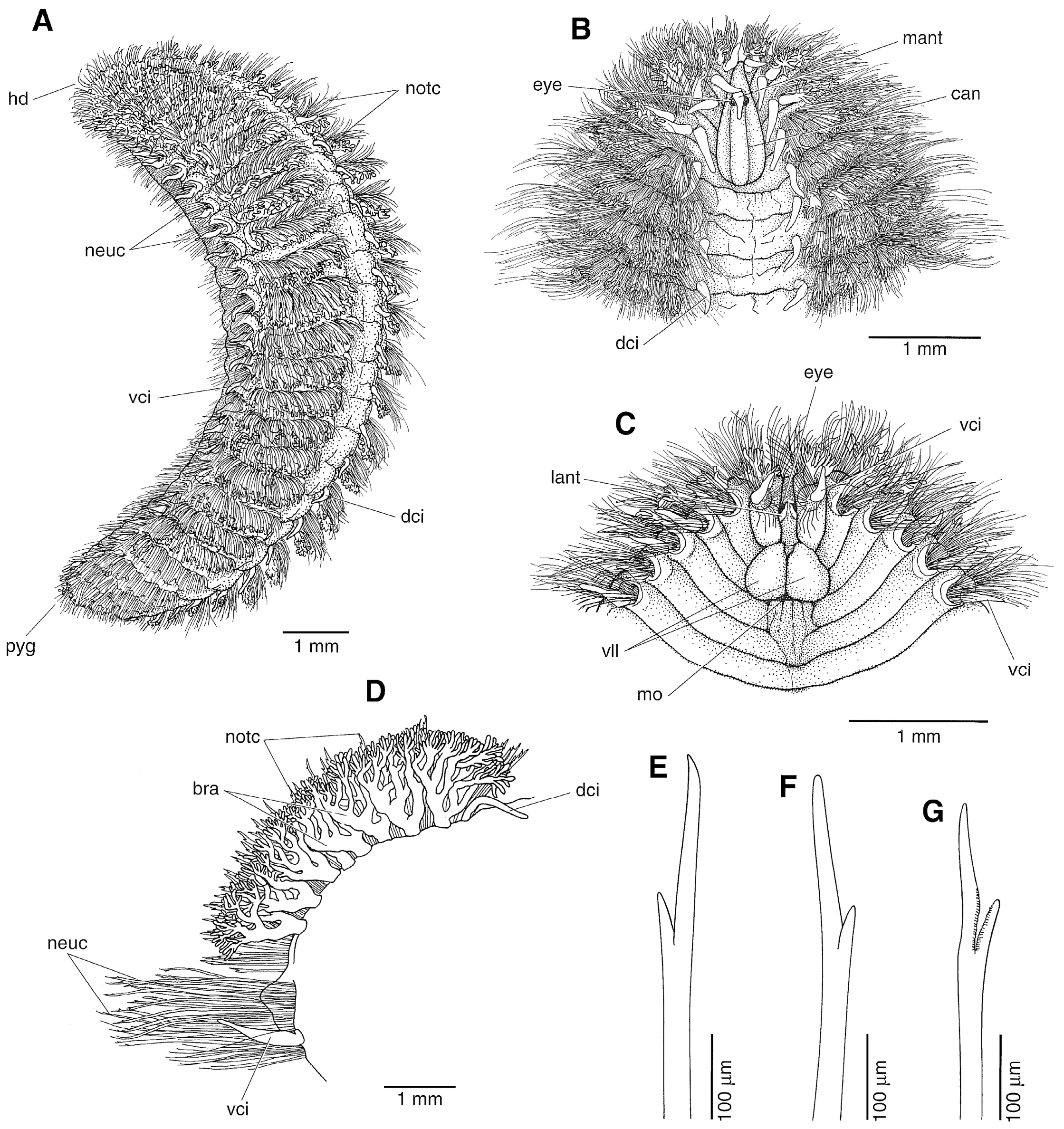

Figure legend: Family Euphrosinidae. **A**-**C**, euphrosinid specimen: **A**, entire animal, dorso-lateral view; **B**, anterior end, dorsal view; **C**, anterior end, ventral view. **D**-**G**, *Euphrosine* specimen: **D**, parapodium of chaetiger 19, posterior view; **E**, furcate neurochaeta from parapodia of chaetiger 19; **F**, furcate notochaeta from parapodium of chaetiger 32; **G**, ringent notochaeta from parapodium of chaetiger 32. **bra**, branchiae; **can**, caruncle; **dci**, dorsal cirrus; **eye**, eye; **hd**, head; **lant**, lateral antenna; **mant**, median antenna; **mo**, mouth; **neuc**, neurochaetae; **notc**, notochaetae; **pyg**, pygidium; **vci**, ventral cirrus; **vll**, ventro-lateral lips. (Adapted from BEESLEY, ROSS & GLASBY, 2000; drawings by A. Murray).

3a (1b). Each notopodium usually with 5-6 gills; dorsal serrated bifurcated chaetae with divergent curved branches; notochaetae only slightly longer than branchiae, shorter than neurochaetae, giving a neat, trim appearance to dorsum; length up to 10 mm... ***E. armadillo****
3b (1b). Each notopodium with usually more than 6 gills; dorsal serrated bifurcated chaetae with lower part of longer branch curved towards the shorter branch (ringent chaetae); length up to 25-30 mm...........**4**

4a (3b). Each notopodium with 7-9 gills, with terminal filaments knobbed or thickened; about a third of middorsum without chaetae.. ***E. foliosa****
4b (3b). Each notopodium with 6-8 gills, with terminal filaments not thickened......................................**5**

5a (4b). Nuchal organ with lateral lobes fused to median lobe all along their length; dorsal surface nearly covered by notochaetae; notochaetae much longer than branchiae, longest about same length as neurochaetae, giving a shaggy appearance to dorsum..***E. borealis***
5b (4b). Nuchal organ trilobed, with lobes fused or helded together by a membrane; unforked chaetae present, curved like a scythe near the tip..***E. myrtosa***

****Euphrosine armadillo*** M. Sars 1851

Euphrosyne armadillo M. SARS, 1851: 211.

TYPE LOCALITY: Manger, Norway.

SYNONYMS: *Euphrosyne lanceolata* McIntosh 1876; *Euphrosine branchiata* Treadwell 1939.

SELECTED REFERENCES: *Euphrosyne armadillo* — M. SARS, 1862*a*: 55-56; FAUVEL, 1923*c*: 137-139, fig. 49*o-q*; WESENBERG-LUND, 1950*a*: 12, chart 16, plate 2 figs. 10-11. *Euphrosine armadillo* — MCINTOSH, 1900*a*: 238-240, pl. 35 figs. 2, 8-14; PETTIBONE, 1963*a*: 65-66, fig. 14*f*; AMOUREUX, 1982*a*: 34, fig. 3*ea*; GEORGE & HARTMANN-SCHRÖDER, 1985: 58, fig. 9; KUDENOV, 1987*a*: 189, table 1; KUDENOV, 1993*a*: 138; HARTMANN-SCHRÖDER, 1996: 30. *Euphrosyne lanceolata* — MCINTOSH, 1876*c*: 395, pl. 71 fig. 1. *Euphrosine branchiata* — TREADWELL, 1939*a*: 170-171, fig. 46*c-f*.

REFERENCES FOR PORTUGAL: AMOUREUX, 1974*b* (as *Euphrosyne armadillo*; off Aveiro); present work (southwestern continental shelf).

MATERIAL: SEPLAT 6 — St. 42, off Praia do Amado, 60 m, rock: 1 specimen, with about 16 chaetigers. **St. 74 (A.2558)**, off Carrapateira, 67 m, sand: 1 specimen, complete and in good condition, with about 19 chaetigers; internal dorsal cirrus by the side of the first branchia; lateral cirrus between branchiae 2 and 3; 5 pairs of branchiae per parapodium, in the middle region of the body; caruncle type K-1; notochaetae as a) smooth bifurcated, with one tyne much shorter than the other, and b) unequally bifurcated, with curved divergent tynes, with serrations on inner sides; ringent chaetae absent. **FAUNA 1 — St. 63*A***, Gibraltar Strait, off Atlanterra, 97-118 m, detritic: 1 specimen with about 18 chaetigers. **St. 76*A***, Gulf of Cádiz, off Isla Cristina, 535-546 m, muddy sand: 1 specimen, with about 18 chaetigers; median antenna longer than in *E. foliosa*.

DISTRIBUTION: North Atlantic to the English Channel, and Mediterranean Sea; Madeira Island; Azores; off Massachusetts to off Chesapeake Bay. On sand, mixtures of mud, shells and gravel, and corals. From shallow subtidal regions to depths of about 3000 meters.

Euphrosine borealis Ørsted 1843

Euphrosyna borfalis [sic] ØRSTED, 1843*b*: 170-171, pl. 2 figs. 23-27 [also referred in the text as *borealis*].

TYPE LOCALITY: Godthaab, Western Greenland.

SYNONYMS: *Euphrosyne longisetis* Treadwell 1939.

SELECTED REFERENCES: *Euphrosyne borealis* — M. SARS, 1862*a*: 56-57; MCINTOSH, 1876*b*: 373; DITLEVSEN, 1914: 710; AUGENER, 1928*a*: 671, pl. 11 fig. 1; DITLEVSEN, 1929: 9-10; WESENBERG-LUND, 1934: 24; ANNENKOVA, 1937: 155; DITLEVSEN, 1937: 16-17; ANNENKOVA, 1938: 139; TREADWELL, 1939*a*: 170, fig. 46*a-b*; WESENBERG-LUND, 1950*a*: 11, chart 16; WESENBERG-LUND, 1953*a*: 29; USCHAKOV, 1955*a*: 224, fig. 71*D-G*. *Euphrosine borealis* — PETTIBONE, 1963*a*: 65, fig. 14*a-e*; GEORGE & HARTMANN-SCHRÖDER, 1985: 60, fig. 10; KUDENOV, 1987*a*: 189, table 1; KUDENOV, 1993*a*: 137; KIRKEGAARD, 1992: 349-350, fig. 171; HARTMANN-SCHRÖDER, 1996: 30. *Euphrosyne longisetis* — TREADWELL, 1939*a*: 172, fig. 46*g-i*.

DISTRIBUTION: Arctic, North Pacific and North Atlantic, including northern part of North Sea and off Iceland. On sand, gravel, stones, rocks, and mud. From intertidal to depths of about 1635 meters.

Euphrosine cirrata Sars 1862

Euphrosyne cirrata M. SARS, 1862*a*: 56.

TYPE LOCALITY: Dub, North of Bergen, Norway.

SELECTED REFERENCES: *Euphrosyne cirrata* — M. SARS, 1863: 302; BIDENKAP, 1895: 107; FAUVEL, 1936*e*: 14-15; MONRO, 1939*d*: 94; WESENBERG-LUND, 1950*a*: 11-12, chart 16, plate 2 figs. 8-9; WESENBERG-LUND, 1953*a*: 29. *Euphrosine cirrata* — PETTIBONE, 1963*a*: 63-65 fig. 14*g*; GEORGE & HARTMANN-SCHRÖDER, 1985: 62, fig. 11; KUDENOV, 1987*a*: 189, table 1; KUDENOV, 1993*a*: 137.

DISTRIBUTION: Arctic and Antarctic waters, and American and European North Atlantic. On gravel, pebbles, boulders, and ooze. Subtidal to 3505.8 meters.

Euphrosine cirrataepropinqua Amoureux 1982

Euphrosine cirratae-propinqua AMOUREUX, 1982*a*: 35-36, fig. 4.

TYPE LOCALITY: The species was described by AMOUREUX (1982*a*) with base on 72 specimens collected in several stations, located at the western mouth of the English Channel, between Brest and south of Ireland. Apparently a type was not designated. The data of the stations are as follows: 1) 47º32’4”N, 7º06’8”W, 900 meters, in rock and coral; 2) 47º43’1”N, 8º04’0”W, 1035-1080 meters, gravel with mud and corals; 3) 48º03’1”N, 8º29’4”W, 805 meters, in mud and coral; 4) 48º05’0”N, 8º29’8”W, 650 meters, in muddy gravel; 5) 48º12’0”N, 9º09’5”W, 865 meters, sandy mud and corals; 6) 48º22’5”N, 9º33’5”W, 950 meters, in mud, and rocks; 7) 48º27’9”N, 9º44’0”W, 700 meters, in mud and rocks; 8) 48º28’2”N, 9º39’1”W, 860 meters, in sandy mud; 9) 48º27’2”N, 10º49’7”W, 850 meters, in soft mud with spots of clay; 10) 48º28’0”N, 9º50’0”W, 1300 meters, in mud and rocks; 11) 48º37’0”N, 9º52’2”W, 1080 meters, in rocks; 12) 48º38’2”N, 9º47’3”W, 800 meters, rocks, corals and some mud; 13) 48º39’7”N, 9º53’2”W, 1050 meters, in fine sand with mud and rocks, corals and stones; 14) 48º35’0”N, 10º23’7”W, 610 meters, in mud with some sand; 15) 48º33’7”N, 10º25’0”W, 1400 meters, in mud; 16) 48º47’3”N, 11º12’0”W to 48º47’4”N, 11º14’3”W, between 1430-1550 meters, in soft bottom; 17) 48º39’3”N, 10º36’5”W, 1400 meters, in soft mud with some compact spots; 18) 48º38’2”N, 9º52’6”W, 800 meters, in soft mud with some compact spots; 19) 48º37’3”N, 9º53’0”W, 1180 meters, in soft sandy mud with compact spots.

SELECTED REFERENCES: *Euphrosine cirrataepropinqua* — KUDENOV, 1993*a*: 137.

REFERENCES FOR PORTUGAL: AMOUREUX, 1987 (as *Euphrosine cirratae-propinqua*; off Porto).

DISTRIBUTION: Western mouth of the English Channel, between Brest and South Ireland. In muddy bottoms. Between 610-1550 meters.

****Euphrosine foliosa*** Audouin & Milne Edwards 1833

Euphrosine foliosa AUDOUIN & MILNE EDWARDS, 1833*a*: 200-201, pl. 9 figs. 1-4.

TYPE LOCALITY: English Channel: between Grainville and Chausey Islands (Normandie, Northern France) in a oyster bank at 25 meters (“*15 brasses d’eau*”), and at the harbour of Saint-Malo (Brittany, Northern France), in an oyster bank near the rock Dodeal.

SYNONYMS: *Lophonota Audouinii* Costa 1841; *Euphrosyne mediterranea* Grube 1863; *Euphrosyne racemosa* Ehlers 1864; *Euphrosyne intermedia* Saint-Joseph 1888; *Euphrosine Robertsoni* McIntosh 1900.

SELECTED REFERENCES: *Euphrosyne foliosa* — MCINTOSH, 1876*b*: 373; MCINTOSH, 1900*a*: 234-238, pl. 24 fig. 3, pl. 35 figs. 1, 3, 15-18; FAUVEL, 1919*a*: 350-351, fig. 1; FAUVEL, 1923*c*: 136-137, fig. 49*a-g*; FAUVEL, 1953*c*: 102-103, fig. 48*a-h*. *Euphrosine foliosa* — AMOUREUX, 1982*a*: 34-35, fig. 3*ef*; GEORGE & HARTMANN-SCHRÖDER, 1985: 64, fig. 12; KUDENOV, 1987*a*: 189, table 1; KUDENOV, 1993*a*: 138. *Euphrosyne Audouini* — CLAPARÈDE, 1868: 418-421, pl. 9 fig. 8. *Euphrosyne intermedia* — SAINT-JOSEPH, 1888: 191-192, pl. 8 fig. 56; FAUVEL, 1923*c*: 137, fig. 49*i*. *Euphrosyne Robertsoni* — MCINTOSH, 1900*a*: 240, pl. 35 figs. 4, 6-7, 28, pl. 37 fig. 33.

REFERENCES FOR PORTUGAL: CARVALHO, 1929 (as *Euphrosyne foliosa*; Sines; Setúbal); AMOUREUX, 1974*b* (as *Euphrosyne foliosa*; off Aveiro); SALDANHA, 1974 (as *Euphrosyne foliosa*; coast of Arrábida); HARTMANN-SCHRÖDER, 1979*a* (western continental shelf of Algarve); CAMPOY, 1982 (previous records: Sines; Setúbal; Arrábida); SALDANHA, 1995 (Portugal); present work (southwestern continental shelf).

MATERIAL: SEPLAT 7 (2nd part) — St. 33 (A.4074), north Sines, 156 m, gravelly sand: 1 small specimen, with about 22 chaetigers. **St. 156 (A.3955)**, near Sines, 29 m, stones: 1 specimen, complete and in good condition, with about 25 chaetigers; possible to see the bifurcated chaetae with double curvature, and also the branchial rami with subterminal swelling; caruncle seems to be of K-2 type. **St. 225 (A.3892)**, off Porto Covo, 40 m, rock: 1 specimen with about 28 chaetigers. **St. 231**, off Praia do Malhão, 32 m, rock: 1 small specimen, with 19 chaetigers; branchiae still with few ramifications. **FAUNA 1 — St. 13*A***, Alborán Sea, off Cape Sagra, Motril, 62 m, coarse gravel: 7 specimens, bigger one with 30 chaetigers and 9-10 pairs of branchiae in the middle region, 3 other with 24-27 chaetigers and about 65 mm long and 25 mm wide and 7 pairs of branchiae, and smaller specimens (juveniles) with 12-15 chaetigers (5x2 mm, 6 pairs of branchiae, 2x1 mm, 5 pairs of branchiae, 1.2x0.8 mm, 4 pairs of branchiae). **St. 22*A***, Alborán Sea, Placer de las Bóvedas, off San Pedro de Alcántara, 30 m, coralligenous: 2 specimens, one of which is very small, probably a juvenile, with about 15 chaetigers, branchiae with few ramifications, but with the dilated extremities typical of the species; the other specimen has about 25 chaetigers. **St. 33*A***, Alborán Sea, Alborán Island, 34-44 m, laminarians on rocks: 1 specimen with about 22 chaetigers, in poor condition. **St. 37*A***, Alborán Sea, off Punta de la Chullera, 95-100 m, coarse gravel: 2 specimens, with about 30 chaetigers, being 25 mm long and 7 mm wide, and 14 mm long and 4 mm wide; in the bigger specimen it is possible to see that the caruncle is K-2 type;

lateral cirrus between branchiae 2 and 3, but closer to this one; bigger specimen with 9 branchiae per parapodium, with 4 in the lower row, while smaller specimen has 8 branchiae per parapodium. **St. 42*A***, Alborán Sea, NE La Linea de la Concepción, 86-87 m, coastal detritic: 1 complete specimen in good condition, with about 32 chaetigers, about 30 mm long for 7 mm wide, with parapodia; chaetae no longer calcified; bifurcated chaetae with double curvature; branchial rami with weak subterminal swelling; lateral cirrus well visible, between branchiae 2 and 3; first 2-3 branchiae form an almost horizontal row just above the neurochaetae; they are quite close between each other; other 3 branchiae in a vertical line, behind the notochaetae, and below the lateral cirrus, and the other 2 also in a vertical line, also behind the notochaetae and above the lateral cirrus and below the dorsal one. **St. 58*A***, Gulf of Cádiz, 33-34 m, detritic with rocks: 10 specimens, of similar sizes, with between 25 and 30 chaetigers; one specimen 8 mm long and 2 mm wide has 8 pairs of branchiae in the middle segments, but the number can vary between 7-10 pairs; in some specimens the ventralmost branchia is formed by a single filament. **St. 61*A***, Gibraltar Strait, Tarifa, 39-44 m, rock: 1 specimen with about 30 chaetigers. **St. 63*A***, Gibraltar Strait, off Atlanterra, 97-118 m, detritic: 4 specimens; bigger specimen with about 30 chaetigers; 3 smaller specimens of similar size, probably juveniles, one with about 20 chaetigers, being possible to see clearly the ramifications of the branchiae, with the dilated extremities, another with about 22 chaetigers and branchiae with few ramifications, and the third very small, with 14 chaetigers, but with the dilated extremities of the branchiae visible. **Unknown station**, polychaetes associated to *Flustra* sp. ("*Poliquetos asociados a* Flustra *sp.*"): 1 complete specimen with about 30 chaetigers and 14 mm long; 8-9 pairs of branchiae.

DISTRIBUTION: Considered to be cosmopolitan. On many kinds of bottoms: mud, sand, gravel, stones, rocks, corals, under stones, in holdfasts of algae, among algae and in mussel beds. Intertidal to slope depths.

Euphrosine myrtosa Savigny *in* Lamarck 1818

Euphrosine myrtosa SAVIGNY *in* LAMARCK, 1818: 332.

TYPE LOCALITY: Coasts of the Red Sea.

SYNONYMS: *Euphrosyne ceylonica* Michaelsen 1892.

SELECTED REFERENCES: *Euphrosyne myrtosa* — GRAVIER, 1902: 254-258, text-figs. 269-275; pl. 10 figs. 147-149; FAUVEL, 1923*c*: 139, fig. 49*k-n*; FAUVEL, 1930*b*: 11, fig. 1; FAUVEL, 1953*c*: 101, fig. 48*k-n*. *Euphrosine myrtosa* — DAY, 1967: 127, fig. 3.1.*z*; KUDENOV, 1987*a*: 189, fig. 4*A*, table 1.

REFERENCES FOR PORTUGAL: AMOUREUX, 1974*b* (as *Euphrosyne myrtosa*; off Aveiro).

DISTRIBUTION: Mediterranean Sea; Adriatic Sea; Aegean Sea; Portugal; Red Sea; Indian Ocean; tropical west Africa. On stones and coral. Intertidal to shallow water.

REMARKS: KUDENOV (1987*a*) considers this species has having the tips of the branchiae subdistally expanded, in opposition to what is normally considered for it. I follow here the description given by GRAVIER (1902), for specimens collected at Djibouti, where it is clearly stated, about the branchiae, that "*l'extrémité des ramifications terminales est le plus souvent en pointe mousse*" and later, "*les divisions dernières des branchies de l'*Euphrosyne foliosa *présentent des expansions foliacées qu'on n'observe pas chez l'*Euphrosyne myrtosa". Besides, his figure 271 (GRAVIER, *op. cit.*) representing one branchia, shows the tips evenly tapered and blunt, insted of swollen.

GENUS ***Palmyreuphrosyne*** Fauvel 1913

Palmyreuphrosyne FAUVEL, 1913*a*: 34.

TYPE SPECIES: *Palmyreuphrosyne paradoxa* Fauvel 1913.

Palmyreuphrosyne paradoxa Fauvel 1913

Palmyreuphrosyne paradoxa FAUVEL, 1913*a*: 34-35, fig. 8.

TYPE LOCALITY: Azores, 39º25'N, 31º22'30"W, at 1229 meters, on mud, volcanic sand and globigerins.

SELECTED REFERENCES: *Palmyreuphrosyne paradoxa* — FAUVEL, 1914*f*: 93-95, pl. 5, figs. 1-13; DETINOVA, 1985*a*: 107.

DISTRIBUTION: Azores, at 1229 meters, on mud, volcanic sand and globigerins; off south Iceland, at 1330 meters.

FAMILY **FAUVELIOPSIDAE** Hartman 1971

AS: *FAUVELIOPSIDAE* HARTMAN, 1971: 1411.

TYPE GENUS: *Fauveliopsis* McIntosh 1922.

REMARKS: The family Fauvielopsidae was created by HARTMAN (1971), originally to include the genera *Bruunilla* Hartman 1971, *Flabelligella* Hartman 1965, *Flota* Hartman 1967, and *Fauveliopsis* McIntosh 1922. From these, only *Fauveliopsis* remains in the family, as the other genera were referred, respectively, to Polynoidae, Acrocirridae, and Flotidae (now in Flabelligeridae). Identification of fauveliopsids can be difficult, due to the fact that as a result of the fixation process the worms usually retract the prostomium and peristomium between the first chaetigers, and should be dissected in order to observe that region of the body. Moreover, specimens of *Laubieriopsis* can also retract the pygidium. Due to the lack of cephalic or other anterior appendages (tentacles, branchiae, etc.), it can be hard to orientate the worm correctly, and the posterior region of the body can (and has been) confused with the anterior one.

The most important recent work on Fauveliopsidae is PETERSEN (2000*a*), which includes the emendation of the family's definition, the restriction of the genus *Fauveliopsis*, the creation of a new genus, *Laubieriopsis* Petersen 2000, and the redescription of some previously described taxa. Other good accounts on the family can be found in WOLF (1984*e*), RISER (1987), and BLAKE & PETERSEN (2000). Besides these, comparative tables or keys for species can be found in KATZMANN & LAUBIER (1974), AMOUREUX (1982*b*), and HARTMANN-SCHRÖDER (1983*b*).

For a detailed revision of the external morphology and its terminology of the group, see PETERSEN (2000*a*), but some aspects will be highlighted here, mainly based on the cited work. The first segment after the prostomium is already chaetigerous, for which reason in Fauveliopsidae the terms segment and chaetiger refer to the same chaetigerous segment. Based on differences in chaetation, the body is usually weakly divided into 2-3 regions, with the anterior region comprising 0 to 4 segments, with modified aciculars.

When modified chaetae are present in the anterior chaetigers, they are normally larger and clearly different in shape from the rest of the chaetae of the first body segments. The basal chaetal arrangement in each ramus of the Fauveliopsidae is an outer capillary (c) and an inner sigmoid acicular (A), and this arrangement is quite typical especially in the middle and posterior regions of the body. Abbreviating, it will be cA/Ac, being the slash the separation between notochaetae and neurochaetae. This arrangement can vary in the genus *Fauveliopsis*, and multiple chaetae arrangements be present in the middle and/or posterior segments, normally preceded by a few transitional segments (but not all species show this "multipe chaetae" condition). On the other hand, in the known species of *Laubieriopsis* the middle and posterior segments are always cA/Ac.

An interramal papilla (IRP) between the noto- and neurochaetae is typical of the family, and while in the anterior segments it is located just in the middle of the two rami, posteriorly it becomes smaller and more dorsal, being usually associated with the notopodia.

One (or less commonly a pair) of genital papilla (GP) occurs in both sexes of most of the species, with one single exception, where females lacked it (RISER, 1987). In *Fauveliopsis* it appears normally to arise in association with the right parapodium (or both, if it is a pair) of the following segment to the one where it is located, while in *Laubieriopsis*, where it was only seen retracted, it appears as a small, transversely oval swelling or blisterlike structure slightly anterior to the posterior segmental boundary, and slightly dorsal to the notochaetae of the following segment (PETERSEN, 2000*a*). Besides, PETERSEN (2000*a*) observed that in most of the cases this papilla is retracted, which is probably a consequence of the fixation process.

A detailed taxonomic history of the family is provided by BLAKE & PETERSEN (2000). The family Fauveliopsidae includes at present 2 genera, with 17 valid species: *Fauveliopsis* McIntosh 1922 (with 13 species), and *Laubieriopsis* Petersen 2000 (with 4 species). PETERSEN (2000*a*) remarked that several species are incompletely described, and their generic affinities are presently uncertain, but that for the moment, none of them appeared to belong to *Laubieriopsis*. Moreover, one of the species, *Laubieriopsis brevis* (Hartman 1965), is a species complex, also according to PETERSEN (2000*a*), while other three were considered to be distinct, described, and in two cases pictured, but so far not named (HARTMAN, 1971; KATZMANN & LAUBIER, 1974; WOLF, 1984*e*). Finally, PETERSEN (2000*a*) refers the existence of two additional new species of Fauveliopsidae, present in material collected near the Faroe Islands and Iceland, and still undescribed and unnamed. One of these species would have been confused previously with *Fauveliopsis olgae*. PETERSEN (2000*a*) also comments that the record by HARTMANN-SCHRÖDER (1975: 70-71, figs. 39-40) on *Fauveliopsis scabra* Hartman & Fauchald 1971, from off northwest Iberian Peninsula, at depths of 5260-5325 meters, is one of the new species, but doesn't state if it is the same that was previously confused with *F. olgae*.

The two genera are present in the European and nearby waters, where they are represented by 8 described species, and one species still unnamed.

KEY TO GENERA:

(from PETERSEN, 2000*a*)

1a. Body elongate to fusiform or club-shaped, often swollen posteriorly; number of segments usually variable; cuticle dull, opaque, multiannulate or rugose, often with minute papillae; modified aciculars falcate, dissimilar, or absent (?); middle and sometimes posterior segments with cA/Ac (c, outer capillary; A, inner sigmoid acicular), or with multiple chaetae ventrally (middle segments) or in both rami (posterior segments); IRP (interramal papilla) prominent at least anteriorly, usually long-stalked; posteriormost segments conspicuously smaller than preceding ones, chaetae fewer and smaller; last segment not bilobed; with or without a ventral shield; often in shells of molluscs or tubular tests of foraminiferans..***Fauveliopsis***

1b. Body linear; with fixed number of segments in adults; cuticle shiny, smooth, without conspicuous surface papillae; modified aciculars weakly sigmoid, of similar thickness, may include bidentate forms; middle and posterior segments with cA/Ac; IRP inconspicuous throughout, usually short-stalked or sessile; posteriormost segments similar in size to preceding ones; last segment bilobed, aciculars often elongated; without a ventral shield. Free living?..***Laubieriopsis***

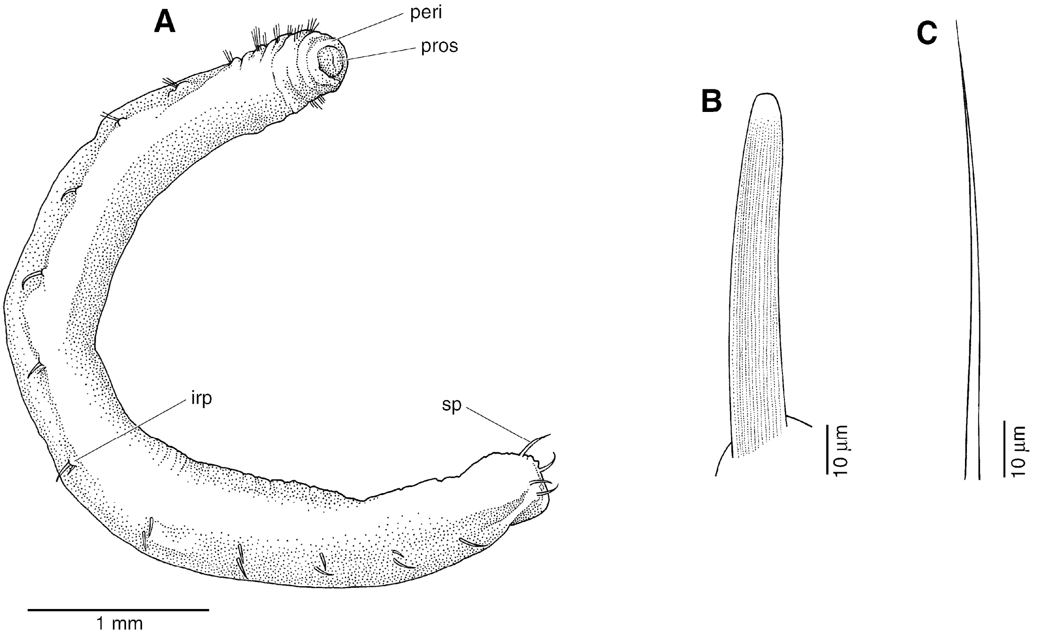

Figure legend: Family Fauveliopsidae. *Fauveliopsis* specimen. **A**, entire animal, ventro-lateral view; **B**, notopodial spine from chaetiger 2; **C**, simple chaeta from posterior end. **irp**, inter-ramal papilla; **peri**, peristomium; **pros**, prostomium; **sp**, spine. (Adapted from BEESLEY, ROSS & GLASBY, 2000; drawings by K. Nolan).

GENUS *Fauveliopsis* McIntosh 1922

Fauveliopsis MCINTOSH, 1922*a*: 4.

TYPE SPECIES: *Fauveliopsis challengeriae* McIntosh 1922.

REMARKS: So far, 7 species of *Fauveliopsis* as restricted by PETERSEN (2000*a*) have been recorded from the European and close waters. One of them, *F. scabra* Hartman & Fauchald 1971 *sensu* Hartmann-Schröder 1975, was attributed by PETERSEN (2000*a*) to a new species still undescribed (see above). According to the same author, what is described and pictured by HARTMANN-SCHRÖDER (1975: fig. 39) as being the posterior end of the worm, is in reallity its anterior end. This way, the only record of *F. scabra* in the studied area was shown to be erroneous and it appears below as *Fauveliopsis* sp.. *Fauveliopsis arabica* Hartman 1976, was recorded in the Mediterranean Sea, but the identification was considered to be dubious, representing probably a new species (see below). Curiously, in *F. arabica*, what was described and pictured as being its anterior end by HARTMAN (1974*a*: fig. 12*a*), was later stated by PETERSEN (2000*a*), with base on newly collected material from the Andaman Sea, to be a posterior end.

In spite of the necessity of redescribing many of the known species, and of the great emphasis placed in some descriptions on the number of segments as a way of defining taxa, I present here an adaptation of the key by KATZMANN & LAUBIER (1974). As in all the cases where a dichotomic key is used, the identified specimens should be confirmed against a good description of the species. Besides the characters normally used, like the way generic characters express themselves (number, size, shape, etc) alone or in association with others, other specific characters to discriminate species that should be included in future descriptions are the location and number of genital papillae (one or a pair), the relative length and proportion of anterior body segments, and shape and position of the parapodia (whether their ventral portion is visible ventrally or not) (PETERSEN, 2000*a*).

KEY TO SPECIES:

(adapted from KATZMANN & LAUBIER, 1974)

1a. Body short, with less than 18 segments...**2**
1b. Body long, with more than 18 segments..**3**

2a (1a). Body with 10 segments, parapodia all of the same kind, with 2 short aciculars and 2 long capillaries (1 chaetae of each type per rami); interramal papilla not visible.....................***F. jameoaquensis***
2b (1a). Body with 16 segments, parapodia all of the same type, with 4 short aciculars and 4 long capillaries (2 chaetae of each type per rami); interramal papilla long-stalked........................***F. brattegardi***

3a (1b). Cuticle dull, rugose, clearly wrinkled transversely or multiannulated, with numerous papillae....**4**
3b (1b). Cuticle more or less smooth, not clearly wrinkled transversely, with few papillae.......................**5**

4a (3a). From segment 4, notopodia with 1-2 capillaries and 1-2 aciculars, and more posteriorly with 1-3 capillaries and 1-3 aciculars; neuropodia from segment 4 on, with 1-7 capillaries and 1-7 aciculars...***F. olgae***
4b (3a). Parapodia in the middle body with 2 capillaries and 2 aciculars, following the formula cA/Ac...***Fauveliopsis* sensu Hartmann-Schröder 1975**

5a (3b). Parapodia of a single type, with aciculars in transverse series, numbering 4-5 in notopodia, and 1 to 5 in neuropodia, aciculars alternating with capillaries..***F. arabica***
5b (3b). Parapodia of three types, defined by the arrangement, type and shape of the chaetae present.......**6**

6a (5b). Never more than two chaetae per rami; notopodial aciculars of the middle region of the body stronger than their neuropodial homologues; notopodial capillaries absent in the middle region; 47 segments; one single specimen known...***F. fauchaldi***
6b (5b). More than two chaetae per rami, at least in the posterior segments..**7**

7a (6b). Interramal papillae of constant size through all segments; posterior parapodia with 2 to 4 chaetae in the notopodia (aciculars and capillaries) and 3 to 8 chaetae in the neuropodia (aciculars and capillaries); body more than twice wider in the middle than in the anterior region; 18 to 26 segments, normally more than 20..***F. adriatica***
7b (6b). Interramal papillae of the posterior region smaller; posterior parapodia with 1 to 2 aciculars in the notopodia, and 4 to 5 chaetae in the neuropodia (1 to 2 aciculars and 2 to 3 capillaries); width of the body constant; 22 to 26 segments...***F.* cf. *adriatica***

Fauveliopsis adriatica Katzmann & Laubier 1974

Fauveliopsis adriatica KATZMANN & LAUBIER, 1974: 5-7, fig. 2.

TYPE LOCALITY: Adriatic Sea, between Prvić Island and Zlarin Island (off Šibenik, Dalmatia, Croatia), 43º42.6'N, 15º47.7'E, at 54 meters.

REFERENCES FOR PORTUGAL: AMOUREUX, 1987 (off Aveiro).

DISTRIBUTION: Adriatic Sea, off Šibenik (Dalmatia, Croatia), between 54-66 meters. The biggest part of the specimens were found inside shells of Gastropoda.

Fauveliopsis* cf. *adriatica Katzmann & Laubier 1974

Fauveliopsis cf. *adriatica* KATZMANN & LAUBIER, 1974: 9-11, fig. 3.

DISTRIBUTION: Adriatic Sea: 42º27.8'N, 17º10'E, at 400 meters; 43º39'N, 15º46'E, at 77 meters. Both specimens in shells of Gastropoda.

REMARKS: KATZMANN & LAUBIER (1974) considered these specimens as being very close to *Fauveliopsis adriatica* especially in what concerns the anterior and median regions. The distinctive features referred to the posterior region (number and shape of the chaetae, and reduction of the parapodial papillae).

Fauveliopsis arabica Hartman 1974

Fauveliopsis arabica HARTMAN, 1974*a*: 235-236, fig. 12.

TYPE LOCALITY: Arabian Sea (25º06'N, 60º45'E), at 110 meters.

DISTRIBUTION: Arabian Sea and Mozambique Channel, at 110 meters and deeper; [?] West Italian Basin.

REMARKS: *Fauveliopsis arabica* was recorded from the West Italian Basin by CASTELLI *et al.* (1995). However, the same authors stated that the record is dubious, and probably represents an undescribed species.

Fauveliopsis brattegardi Fauchald 1972

Fauveliopsis brattegardi FAUCHALD, 1972*b*: 101, fig. 4*A-B*.

TYPE LOCALITY: Sognefjorden (Western Norway), south of Raudberg light, 61º03'N, 05º24'E, at 1228-1248 meters, in clay.

DISTRIBUTION: Known from a single specimen, collected at the type locality.

Fauveliopsis fauchaldi Katzmann & Laubier 1974

Fauveliopsis fauchaldi KATZMANN & LAUBIER, 1974: 11-12, fig. 4.

TYPE LOCALITY: Adriatic Sea (off Dalmatia, Croatia), 43º29'N, 15º15.1'E, 135 meters.

DISTRIBUTION: Known from the type locality.

Fauveliopsis jameoaquensis Núñez *in* Núñez, Ocaña & Brito 1997

Fauveliopsis jameoaquensis NÚÑEZ *in* NÚÑEZ, OCAÑA & BRITO, 1997: 254, fig. 2.

TYPE LOCALITY: Natural lagoon of Jameos del Agua, Lanzarote (Canary Islands), in coarse black sand, at 5 meters.

DISTRIBUTION: Known from the type locality.

REMARKS: According to PETERSEN (2000*a*), *Fauveliopsis jameoaquensis* is not quite a typical *Fauveliopsis*, being its generic status presently uncertain. It shows a brownish cuticle covered with sediment, suggesting the presence of minute surface papillae, in spite of that none was apparently obvious (NÚÑEZ, OCAÑA & BRITO, 1997). Besides, the species has a small size (0.8-1.3 mm), with all 4 found specimens with 10 chaetigers, and what appeared to be sexual products present in chaetigers 6-9.

Fauveliopsis olgae Hartmann-Schröder 1983

Fauveliopsis olgae HARTMANN-SCHRÖDER, 1983*b*: 172-173, figs. 8-11.

TYPE LOCALITY: SW Ireland (49º45'N, 14º8'W), 4040-4060 meters, in a foraminiferan test of *Bathysiphon rusticum*.

SELECTED REFERENCES: *Fauveliopsis olgae* — PETERSEN, 2000*a*: 497, 513, fig. 1*E-F*.

DISTRIBUTION: NW Atlantic Ocean: SW Ireland and off NW Africa, between 3980-4341 meters, on foraminiferan tests.

Fauveliopsis* sp. *sensu Hartmann-Schröder 1975

Fauveliopsis scabra [not *Fauveliopsis scabra* Hartman & Fauchald 1971] — HARTMANN-SCHRÖDER, 1975: 70-71, figs. 39-40 [= *Fauveliopsis* sp. (see PETERSEN, 2000*a*: 497)].
DISTRIBUTION: Off NW Iberian Peninsula: 45º55.4'N, 14º07.9'W, at 5260 meters, and 42º41.6'N, 14º45.9'W, at 5325 meters. According to PETERSEN (2000*a*) it is also present in material from Iceland and Faroe Islands.
STEM SPECIES: *Fauveliopsis scabra* HARTMAN & FAUCHALD, 1971: 117-118, pl. 17.
TYPE LOCALITY OF STEM SPECIES: Between New England and Bermudas, 36º24.4'N, 67º56'W, in the Gulf Stream, at 4749 meters, nestled in the coils of death scaphopod shells.
KNOWN DISTRIBUTION OF STEM SPECIES: Off New England and Bermuda, between 530-5023 meters, nestled in the coils of death scaphopod shells.

GENUS *Laubieriopsis* Petersen 2000

Laubieriopsis PETERSEN, 2000*a*: 502-503.
TYPE SPECIES: *Fauveliopsis cabiochi* Amoureux 1982.
REMARKS: PETERSEN (2000*a*) included in the genus *Laubieriopsis* four species: *L. brevis* (Hartman 1965), *L. hartmanae* (Levenstein 1970), *L. cabiochi* (Amoureux 1982), and *L. arenicola* (Raiser 1987). In spite of this, in the key presented in the same work, only 3 species were keyed. The fourth, *L. hartmanae*, belongs to the *Lauberiopsis brevis* species complex, and was keyed as so.

KEY TO SPECIES:
(adapted from PETERSEN, 2000*a*)

1a. With 16 segments, last segment with aciculars extending beyond end of body; GP (genital papillae) perhaps unpaired, on right side of 6/7 (segments 1-4 of holotype without bidentate modified chaetae)..*L. brevis*
1b. With 21 segments; aciculars of last segment extending beyond end of body; GP unpaired, on right side of 8/9 (segments 1-4 usually with some modified chaetae strongly or weakly bidentate)..*L. cabiochi*

Laubieriopsis brevis (Hartman 1965)

Brada brevis HARTMAN, 1965*b*: 172-173.
TYPE LOCALITY: Off New England, 39º42'N, 70º39'W, in 2000 meters.
SYNONYMS: [?] *Fauveliopsis hartmani* Levenstein 1970.
SELECTED REFERENCES: *Fauveliopsis brevis* — HARTMAN & FAUCHALD, 1971: 115-116, pl. 16; LAUBIER, 1972: 699-700; KATZMANN & LAUBIER, 1974: 5, fig. 1; HARTMAN, 1978: 175; DETINOVA, 1985*a*: 124. *Laubieriopsis brevis* — PETERSEN, 2000*a*: 510-512, table 3. [?] *Fauveliopsis hartmani* — LEVENSTEIN, 1970: 229, figs. 2-3. [?] *Fauveliopsis hartmanae* — LEVENSTEIN, 1972: 173, text-fig. 1. [?] *Laubieriopsis hartmanae* — PETERSEN, 2000*a*: 510-512, table 3.
REFERENCES FOR PORTUGAL: AMOUREUX, 1987 (as *Fauveliopsis brevis*; off Aveiro; off Porto).
DISTRIBUTION: NW Atlantic, off New England, 1500-2500 meters; Gulf of Gascony, 2025-2989 meters; off Iceland, 1595-1795 meters; Portugal; Western Mediterranean Sea, 2090-2920 meters; off NE South America, 1500 meters; Southeast Atlantic, 2514 meters; Weddel Sea, 3111-4575 meters; Northwest and Southeast Pacific, 4065-6835 meters. Recorded to occur between 1300-6860 meters.
REMARKS: The nomenclatural and taxonomic history of *Brada brevis* Hartman 1965 and *Fauveliopsis brevis* Hartman 1967 was traced in BLAKE & PETERSEN (2000) and PETERSEN (2000*a*).

HARTMAN (1960) described *Brada glabra* from Southern California, and later she described another new species from the North Atlantic (HARTMAN, 1965*b*), which she also placed among the Flabelligeridae, as *Brada brevis* Hartman 1965. Two years later she described a third new species from the Antarctic (HARTMAN, 1967), this time placing it in McIntosh's genus *Fauveliopsis*, as *Fauveliopsis brevis* Hartman 1967. *Brada glabra* Hartman 1960 was transfered to the genus *Fauveliopsis* by HARTMAN (1969), and the North Atlantic *Brada brevis* Hartman 1965 also placed in the same genus by HARTMAN & FAUCHALD (1971), converting this way the Antarctic species in a secondary homonym. Until then, the genus *Fauveliopsis* had been always considered as being a Flabelligeridae, but late in the same year Hartman created the new family Fauveliopsidae, renaming then the Antarctic *Fauveliopsis brevis* as *Fauveliopsis brevipodus* new name (HARTMAN, 1971: 1422), in order to correct the secondary homonym. The new name was posteriorly emmended to *Fauveliopsis brevipoda* by FAUCHALD & HANCOCK (1981).

Fauveliopsis hartmani was described independently by LEVENSTEIN (1970), with base on material from the Japan Trench (5400 meters), the Kurile-Kamchatka Trench (4090-6700 meters), and off Peru (5300 meters), and the name was later corrected to *F. hartmanae* by LEVENSTEIN (1972). The new species was not compared with the North Atlantic *F. brevis*, by then still in the genus *Brada*, but was so with the Antarctic *F. brevis* Hartman 1967 (later *F. brevipoda* Hartman 1971), and considered to be a different species. KATZMANN & LAUBIER (1974) synonymised it with the North Atlantic *F. brevis* (Hartman 1965), something already suggested by LAUBIER (1972), and that synonymy was accepted later by LEVENSTEIN (1975). PETERSEN (2000*a*) revised the syntypes of *Fauveliopsis hartmanae*, and included the species in the new genus *Laubieriopsis*, as *L. hartmanae*. Besides, she found them to present minor differences in relation to *L. brevis* (paired GP against single, presence of weakly bidentate anterior aciculars, not seen in *L. brevis*). The confirmation or rejection of the synonymy could not be made with base on the available material, and the status of *L. hartmanae* remains for the moment unsolved, being *L. hartmanae* included in the *L. brevis* species complex.

To resume, the North Atlantic species *Brada brevis* Hartman 1965, later became *Fauveliopsis brevis* (Hartman 1965), and finally *Laubieriopsis brevis* (Hartman 1965). For the moment, it includes as a possible synonymy the species originally described as *Fauveliopsis hartmani* Levenstein 1970, later corrected to *Fauveliopsis hartmanae* Levenstein 1970, and now combined as *Laubieriopsis hartmanae* (Levenstein 1970). On the other hand, the Antarctic *Fauveliopsis brevis* Hartman 1967, was later renamed *Fauveliopsis brevipodus* Hartman 1971, and then finally corrected to *Fauveliopsis brevipoda* Hartman 1971.

The problem with *L. brevis* species complex results from the fact that the species was originally described without figures by HARTMAN (1965*b*). It was only pictured later, in HARTMAN & FAUCHALD (1971), but with base on nontype material collected from a nontype locality. Besides, the original description presented some incorrections (J.A. BLAKE, pers. comm. *in* PETERSEN, 2000*a*). Some differences exist between the several available descriptions of the species, including the synonymised *L. hartmanae* (see table 3 in PETERSEN, 2000*a*), which could imply at least the validity of *L. hartmanae*.

Laubieriopsis cabiochi (Amoureux 1982)

Fauveliopsis cabiochi AMOUREUX, 1982*b*: 192-194, fig. 3.

TYPE LOCALITY: Northeast North Atlantic: continental slope south of Ireland (48º38'2"N, 9º52'06"W), at 800 meters, in soft mud with compact lumps.

SELECTED REFERENCES: *Laubieriopsis cabiochi* — PETERSEN, 2000*a*: 503-509, figs. 2*A-K*, *N-P*, table 2.

REFERENCES FOR PORTUGAL: AMOUREUX, 1987 (as *Fauveliopsis cabiochi*; off Aveiro; off Porto).

DISTRIBUTION: Northeast North Atlantic: continental slope off entrance to English Channel, Faroe Islands, and Iceland. On bottoms with mud, muddy sand, gravel, silt plus clay, and sand with sponge spicules. Between 265-1200 meters.

*FAMILY **FLABELLIGERIDAE** Saint-Joseph 1894

AS: *FLABELLIGÉRIENS* SAINT-JOSEPH, 1894: 96.
TYPE GENUS: *Flabelligera* M. Sars 1829.
SYNONYMS: *CHLORAEMEA* Quatrefages 1849; *PHERUSEA* Grube 1850; *SIPHONOSTOMACEÆ* Johnston 1865; *CHLORHAEMINA* Grube 1877; *POEOBIIDAE* Heath 1930; *FLOTIDAE* Buzhinskaya 1996.
REMARKS: The family Flabelligeridae includes at present about 18 genera with more than 130 described species considered to be valid (HUTCHINGS *et al.*, 2000).

The pelagic genus *Buskiella* was recently designated as the type genus of the new family Flotidae by BUZHINSKAYA (1996; see also SALAZAR-VALLEJO & ZHADAN, 2007), but molecular analysis performed by OSBORN & ROUSE (2008) returned it to the Flabelligeridae, becoming Flotidae a junior synonym of Flabelligeridae. The Flotidae was at first supposed to be benthic. When MCINTOSH (1885*a*) described the first species in the genus, *Buskiella abyssorum*, with base on deep water material from central South Atlantic and West Africa, stated that "*all the specimens are fragmentary, but it is clear that the type is peculiar and apparently intermediate between the Chlorœmidae and Chætopteridae*" (MCINTOSH, 1885*a*: 375), creating for this reason a new genus for it. Afterwards, MESNIL (1899*b*) suspected, and FAUVEL (1916*c*) confirmed, that *Buskiella* was pelagic, while HARTMAN (1967) created the new genus *Flota* for another deep water pelagic polychaete from the southeastern Pacific and southwestern Chile, *F. flabelligera*. *Flota* Hartman 1967 was finally placed into synonymy with *Buskiella* by SALAZAR-VALLEJO & ZHADAN (2007). A third species, *Flota vitjasi*, from the northwestern Pacific, was in the meanwhile described by BUZHINSKAYA (1977).

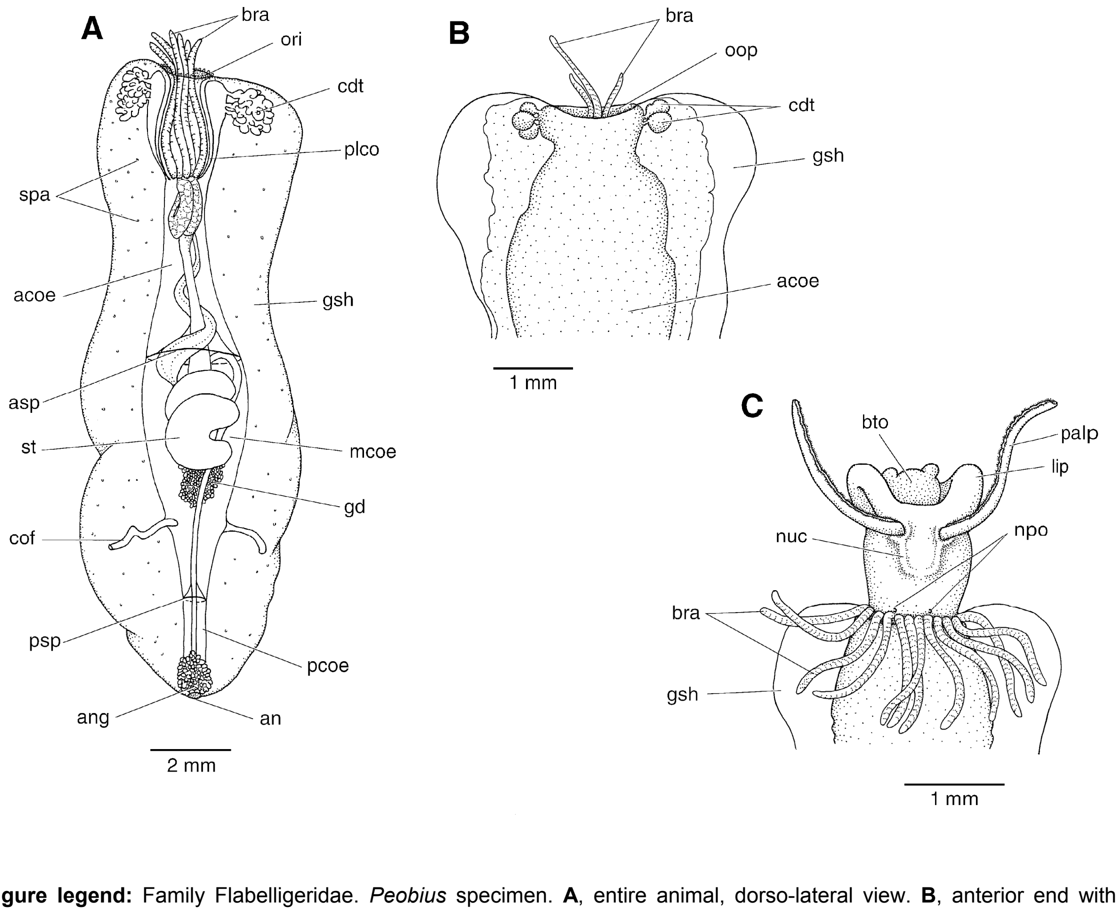

Figure legend: Family Flabelligeridae. *Peobius* specimen. **A**, entire animal, dorso-lateral view. **B**, anterior end with head retracted, lateral view. **C**, anterior end with head everted, dorsal view. **acoe**, anterior coelom; **an**, anus; **ang**, anal gland; **asp**, anterior septum; **bra**, branchiae; **bto**, buccal 'tongue'; **cdt**, coelomic diverticula; **cof**, coelomic funnel; **gd**, gonad; **gsh**, gelatinous sheath; **lip**, lips; **mcoe**, middle coelom; **npo**, nephridial pores; **nuc**, nuchal organ; **oop**, oral opening; **ori**, oral ring; **palp**, palp; **pcoe**, posterior coelom; **plco**, palpal coelom; **psp**, posterior septum; **spa**, sensory papillae; **st**, stomach. (Adapted from BEESLEY, ROSS & GLASBY, 2000; drawings by A. Murray).

In was concerns the afiliation of the two genera placed into the Flotidae, *Buskiella* was first placed in the Flabelligeridae (as Chloraemidae), by MCINTOSH (1885*a*), where it stayed until being moved to Flotidae. On the other hand, *Flota* was also placed at first in the Flabelligeridae, and later integrated in the new family Fauveliopsidae, by HARTMAN (1971). Finally, BUZHINSKAYA (1996) created the new family Flotidae, for the two species originally described as *Flota*. The status of Flotidae was challenged by ROUSE & PLEIJEL (2003), whose results placed it again among the Flabelligeridae, but the validity of the family was supported by BUZHINSKAYA (2006) and SALAZAR-VALLEJO & ZHADAN (2007). These last authors also included *Buskiella* McIntosh 1885, with *B. abyssorum*, in the family, as an older synonym of *Flota*. This way, the type genus of the family, *Flota* Hartman 1967, became a junior synonym of an older genus, *Buskiella* McIntosh 1885, a situation that is not very frequent, being the type species of the family *Flota flabelligera* Hartman 1967. To make things more complex, *F. flabelligera* could also be a junior synonym of *B. abyssorum* (SALAZAR-VALLEJO & ZHADAN, 2007). Finally, and as stated above, OSBORN & ROUSE (2008) returned *Buskiella* to the Flabelligeridae, becoming Flotidae a junior synonym of Flabelligeridae.

A taxon considered to be close to *Buskiella*, the holopelagic *Poeobius meseres* Heath 1930, the type of the family Poeobiidae, was recently showed to be derived from benthic flabelligerid worms (BURNETTE, STRUCK & HALANYCH, 2005; HALANYCH, COX & STRUCK, 2007; see also SALAZAR-VALLEJO, 2008; SALAZAR-VALLEJO, CARRERA-PARRA & FAUCHALD, 2008; OSBORN & ROUSE, 2008), being closely related to *Therochaeta*, and the family Poeobiidae was also placed into synonymy with Flabelligeridae (BURNETTE, STRUCK & HALANYCH, 2005).

In spite the synonymy between the families Flabelligeridae and Flotidae, and of the common features between both families, as the similar epidermal papillae, tunic, cephalic hood, and chaetal structure, other features of flotids are unique, such as trifid organs, the modification of the nervous system, and the oligomeric body (SALAZAR-VALLEJO & ZHADAN, 2007). Nevertheless, the phyllogenetic origins of flotid and poeobiid worms are closely related with the typical Flabelligeridae (ROUSE & PLEIJEL, 2003; HALANYCH, COX & STRUCK, 2007), from which they could have derived through paedomorphic processes acting on larvae (BURNETTE, STRUCK & HALANYCH, 2005; HALANYCH, COX & STRUCK, 2007).

Recent taxonomic publications concerning the family include BUZHINSKAJA (1993), with the description of the new genus and species *Diversibranchius nicolaji*, BURNETTE, STRUCK & HALANYCH (2005), and SALAZAR-VALLEJO (2008), dealing with the position of *Poebius meseres* as a member of the family, the revisions of the genera *Flabelliderma*, and *Piromis* and *Pycnoderma* by SALAZAR-VALLEJO (2007 and 2011, respectively), including keys of species, the description of two new species of *Diplocirrus* by DARBYSHIRE & MACKIE (2009), with a synoptic table with the main characters of the species in the genus and in two other similar genera, and the analysis of the phylogenetic affinities of the Flabelligeridae by SALAZAR-VALLEJO, CARRERA-PARRA & FAUCHALD (2008) and OSBORN & ROUSE (2008, 2011). Other not so recent important papers on the group include HAASE (1914), and STØP-BOWITZ (1948*a*, 1948*b*), mainly on North European flabelligerids, and HARTMAN (1965*b*), with the description of several new deep-water species and a key for the genus *Ilyophagus*. CASTELLI (1989) provides information on the Fauna of the Flabelligeridae from the Italian waters, which comprises about all the Mediterranean species, together with a dichotomic key.

Ten genera, including 22 species are known to be present in the European waters. From these, two species were identified only tentatively. Another species was originally described in *Buskiella* by AMOUREUX (1986), but was later considered by SALAZAR-VALLEJO & ZHADAN (2007: 69) to be more closelly allied to *Piromis*. It is here considered as *incertae sedis*. Among the studied material, only one species was identified.

KEY TO GENERA:

(adapted from FAUCHALD, 1977*a*)

NOT INCLUDED IN THE KEY: *Buskiella minuta* Amoureux 1986 [see *insertae sedis* at the end of this chapter].

1a. Body with a distinct incision just posterior to the chaetigers carrying the cage-forming chaetae; pseudocompound neurochaeta in the anterior chaetigers, being replaced by unidentate neurohooks....................***Therochaeta***
1b. Body without distinct incisions....................**2**

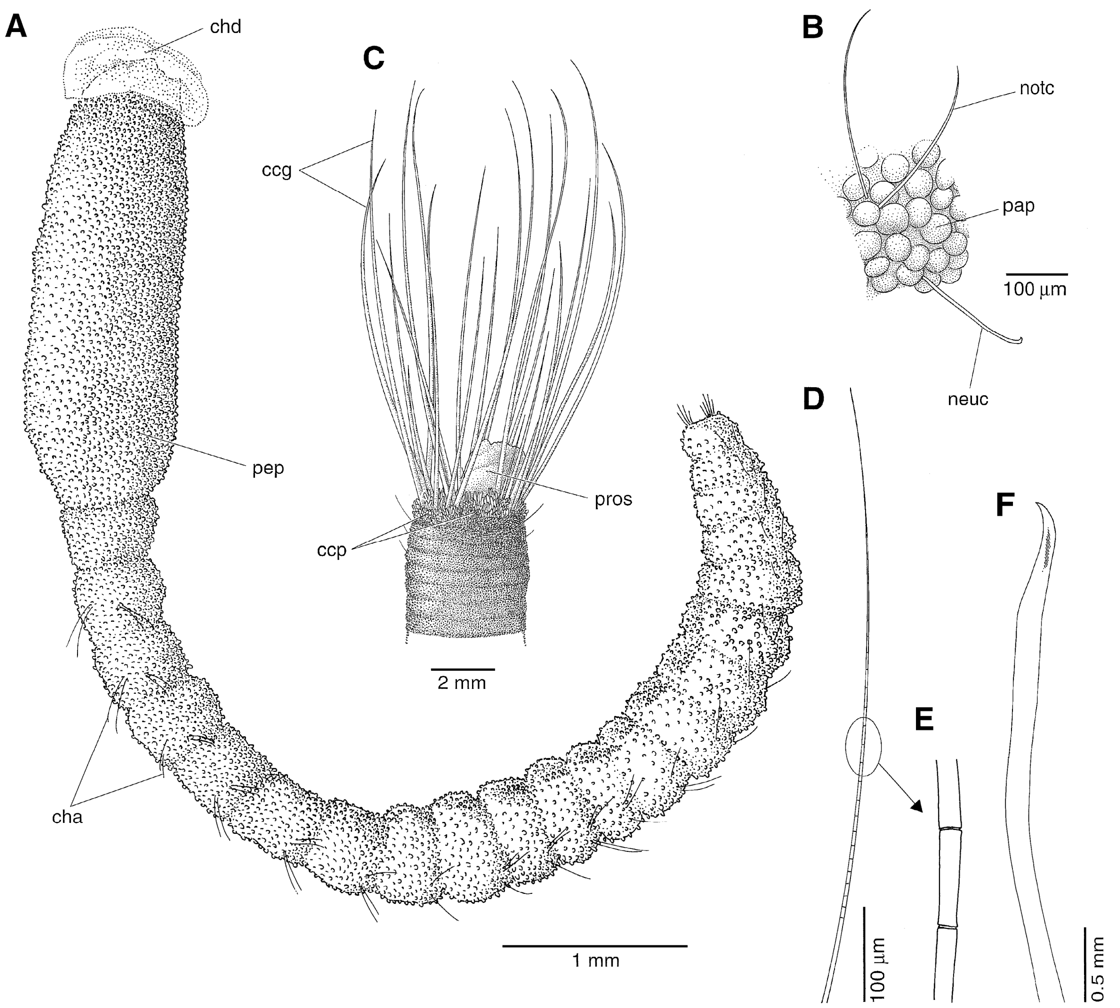

Figure legend: Family Flabelligeridae. **A**, **B**, *Diplocirrus* specimen: **A**, entire animal, dorso-lateral view; **B**, chaetae and papillae of chaetiger 15. **C**, *Therochaeta* specimen, anterior end showing the cephalic cage, dorsal view. **D**-**F**, *Pherusa* specimen, chaetae from chaetiger 20: **D**, barred capillary with details of surface shown in **E**; **F**, spine. **ccg**, capillary chaetae forming cephalic cage; **ccp**, cephalic cage papillae; **cha**, chaetae; **chd**, cephalic hood; **neuc**, neurochaeta; **notc**, notochaeta; **pap**, papilla; **pep**, papillate epidermis; **pros**, prostomium. (Adapted from BEESLEY, ROSS & GLASBY, 2000; drawings by A. Murray).

2a (1b). Neurochaetae composite or pseudocomposite; mucus sheath can be present................................3
2b (1b). Neurochaetae entirely simple, but usually cross-barred; mucus sheath normally absent...............4

3a (2a). Body encased in a smooth continuous mucus sheath, covering all the papillae...........***Flabelligera***
3b (2a). Body with individual papillae covered with mucus and impregnated with debris; papillae usually grouped, forming dorsal and lateral tubercles, loaded with sediment, and forming elongate thick notopodial lobes, free from the rest of the body..***Flabelliderma***

4a (2b). Branchiae absent...***Bradabyssa***
4b (2b). Branchiae present..**5**

5a (4b). Branchial membrane long, flattened, with branchial filaments attached on one side only; neurochaetae can have curved tips, with a long subdistal spine...***Piromis***
5b (4b). Branchial membrane short, rounded or triangular...**6**

6a (5b). All chaetae capillary..**7**
6b (5b). At least some neurochaetae acicular or falcigerous..**8**

7a (6a). Body anteriorly inflated with tapering posterior end..***Diplocirrus****
7b (6a). Body short, flattened and nearly disc-shaped..***Ilyphagus***

8a (6b). Cephalic cage poorly developed or absent; nephridial papillae ventrolateral on chaetigers 4 and 5...***Brada***
8b (6b). Cephalic cage well developed; nephridial papillae absent..***Pherusa***

GENUS *Brada* Stimpson 1853

Brada STIMPSON, 1853: 32.
TYPE SPECIES: *Brada granosa* Stimpson 1853.

KEY TO SPECIES:
(from STØP-BOWITZ, 1948*a*)

1a. Dorsal chaetae well developed...**2**
1b. Dorsal chaetae poorly developed..**3**

2a (1a). Body covered by papillae...***B. villosa***
2b (1a). Body wrinkled, without papillae...***B. rugosa***

3a (1b). Papillae very small, dome-shaped, covered by a thin layer of sand..............................***B. inhabilis***
3b (1b). Papillae long, conical, with a sharp tip...**4**

4a (3b). Papillae in 2-3 transversal rows by chaetiger, each row covered by a thick layer of sand...***B. incrustata***
4b (3b). Papillae scattered, covered by an entire layer of sand...***B. granulosa***

Brada granulosa Hansen 1880

Brada granulosa HANSEN, 1880: 229-230, pl. 5 figs. 4-6.
TYPE LOCALITY: The species is described by HANSEN (1880) with base on specimens from five stations: 270, 275, 323, 337 and 366, but no type locality was selected from these stations. However, in the list of species for each station in G.A. HANSEN (1882), only four stations are indicated as having fournished specimens of *Brada granulosa*: stations 270, 275, 323, and 338. No specimen is indicated for station 366. Besides, station 337 is not present in this work, and station 338 appears as a new one with the species. This is particularly important, as in the description of the species in G.A. HANSEN (1882), only station 337 is indicated. It is possible that the intention of G.A. HANSEN (1882) was to indicated that station 338 was the type locality of the species. The data of station 338 is as follows: Off South Spitsbergen, 76º19'N, 18º01'E, at 267 meters, in a hard bottom. The date of the other 3 stations with *Brada granulosa* is as follows: St. 270, Barents Sea, 72º27.5'N, 35º01'E, at 249 meters, in brownish clay; St. 275, Barents Sea, 74º8'N, 31º12'E, at 269 meters, in greenish clay; St. 323, Off Finnmark, 72º53'N, 21º51'E, at 408 meters, in brown sabulous clay.
SYNONYMS: *Brada normani* McIntosh 1908.
SELECTED REFERENCES: *Brada granulosa* — G.A. HANSEN, 1882: 39, pl. 7 figs. 21-22; LEVINSEN, 1884: 123; STØP-BOWITZ, 1948*a*: 47-50, fig. 13, maps page 59; STØP-BOWITZ, 1948*c*: 46-47, fig. 18; WESENBERG-LUND, 1951: 80, chart 36. *Brada normani* — MCINTOSH, 1908*b*: 543-544, pl. 12 figs. 4-5, pl. 12*a* fig. 10. *Brada inhabilis* [not Rathke 1843] — HAASE, 1914: 38-41 [in part]; AUGENER, 1928*a*: 772-774. Not *Brada granulosa* — FAUVEL, 1907*b*: 23; FAUVEL, 1914*f*: 238, pl. 21 figs. 10-12 [= *Brada incrustata* (Støp-Bowitz 1948)].
DISTRIBUTION: Arctic Ocean; Iceland; Spitsbergen; Norway. In mud. Between 5-271 meters.

Brada incrustata Støp-Bowitz 1948

Brada incrustata STØP-BOWITZ, 1948*a*: 44-47, fig. 12, map page 59.

TYPE LOCALITY: No holotype was designated. The species was described by STØP-BOWITZ (1948) as *nomen novum*, and with base on material collected at Spitsbergen, at the following points: 1) Spitsbergen, 55 meters; 2) Horn Sound, 110 meters, mud and stones; 3) Islands of Horn Sound; 4) Storfjord, 40-55 meters; 5) Advent Bay, 45 meters, mud; 6) 79º20'N, 10º0'E, 100 meters, stones; 7) Magdalenefjord, sand; 8) Danesgat, 35 meters, sand with stones and mud; 9) Shoal Point, northwest of Northeast Land, 45-55 meters, mud; 10) Low Island, northwest of Northeast Land, 30 meters; 11) Lommebay, 18 meters.

SELECTED REFERENCES: *Brada incrustata* — STØP-BOWITZ, 1948*c*: 44-46, fig. 17. *Brada inhabilis* [not Rathke 1843] — MALMGREN, 1867*a*: 84; HANSEN, 1880: 230; MARENZELLER, 1892*b*: 427, pl. 19 fig. 6; HAASE, 1914: 38-41 [in part]. *Brada granulosa* [not Hansen 1880] — FAUVEL, 1907*b*: 23; FAUVEL, 1914*f*: 238, pl. 21 figs. 10-12.

DISTRIBUTION: Spitsbergen; Norway; Northern coast of Asia; [?] Kattegat. In muddy and sandy bottoms, sometimes with stones. Between 18-175 meters.

Brada inhabilis (Rathke 1843)

Siphonostoma inhabile RATHKE, 1843: 218-219, pl. 11 fig. 13.

TYPE LOCALITY: Molde, Norway, in a muddy bottom.

SYNONYMS: [?] *Brada granosa* Stimpson 1853; *Brada granulata* Malmgren 1867.

SELECTED REFERENCES: *Siphonostomum inhabile* — GRUBE, 1850: 321. *Brada inhabilis* — LEVINSEN, 1884: 123; DITLEVSEN, 1929: 36-37; STØP-BOWITZ, 1948*a*: 40-44, fig. 11, maps pages 58-59; STØP-BOWITZ, 1948*c*: 42-44, fig. 16; WESENBERG-LUND, 1951: 80, chart 36; HARTMANN-SCHRÖDER, 1996: 414-415, fig. 200; KIRKEGAARD, 1996: 153-154, fig. 77. *Brada granulata* — MALMGREN, 1867*a*: 85, pl. 12 fig. 71; LEVINSEN, 1884: 123; BIDENKAP, 1907: 26, pl. 2 fig. 16; MCINTOSH, 1908*b*: 543, pl. 12*a* fig. 9; FAUVEL, 1907*b*: 23; FAUVEL, 1914*f*: 237, pl. 21 figs. 1-2, 22-23; HAASE, 1914: 38-41 [in part; in part = *Brada incrustata* Støp-Bowitz 1948]; AUGENER, 1928*a*: 772; DITLEVSEN, 1929: 36. [?] *Brada granosa* — STIMPSON, 1853: 32. Not *Brada inhabilis* — FAUVEL, 1909: 7; FAUVEL, 1914: 236-237, pl. 21 figs. 3-9 [= *Brada rugosa* (Hansen 1880)].

DISTRIBUTION: Arctic Ocean; Greenland; Iceland; Faroes; Spitsbergen; Norway; North Sea; Skagerrak; Kattegat; northern Øresund; Northern coast of Asia to Bering Sea; North Pacific; [?] New England. Among *Lithothamnion*, in rocky bottoms, mud, sand, stones, broken shells. Between 2-3000 meters.

Brada rugosa (Hansen 1880)

Trophonia rugosa HANSEN, 1880: 231, pl. 4 figs. 4-7.

TYPE LOCALITY: Magdalena Bay, Spitsbergen, 30-50 fathoms (55-91.4 meters).

SYNONYMS: [?] *Brada sublævis* Stimpson 1853; *Trophonia arctica* Hansen 1880; [?] *Brada laevis* Grube 1877.

SELECTED REFERENCES: *Trophonia rugosa* — G.A. HANSEN, 1882: 38-39, pl. 7 figs. 9-12. *Trophonia arctica* — HANSEN, 1880: 230, pl. 5 figs. 1-3; G.A. HANSEN, 1882: 39, pl. 7 figs. 17-20. *Brada rugosa* — STØP-BOWITZ, 1948*a*: 37-40, fig. 10, maps page 59; STØP-BOWITZ, 1948*c*: 41-42. [?] *Brada sublævis* — STIMPSON, 1853: 32. [?] *Brada laevis* — GRUBE, 1877: 69 [*nomen nudum*]. *Brada inhabilis* [not Rathke 1843] — FAUVEL, 1909: 7; FAUVEL, 1914*f*: 236-237, pl. 21 figs. 3-9.

DISTRIBUTION: Spitsbergen. In mud. Between 20-91.4 meters, and 1203 meters.

Brada villosa (Rathke 1843)

Siphonostoma villosum RATHKE, 1843: 215-218, pl. 11 figs. 11-12.

TYPE LOCALITY: Molde, Norway.

SYNONYMS: *Brada parthenopeia* Lo Bianco 1893; *Brada pilosa* Moore 1906; *Brada villosa* var. *pilosa* Fauvel 1907.

SELECTED REFERENCES: *Siphonostomum villosum* — GRUBE, 1850: 321. *Brada villosa* — MALMGREN, 1867*a*: 84; G.O. SARS, 1873*b*: 261; LEVINSEN, 1884: 123; FAUVEL, 1907*b*: 22-23; MCINTOSH, 1908*b*: 538-540, 540-541, pl. 12*a* fig. 6; FAUVEL, 1909: 6-7; FAUVEL, 1914*f*: 235-236, pl. 21 figs. 19-21; HAASE, 1914: 35-38, map; MCINTOSH, 1915*b*: 104-106, pl. 95 fig. 12, pl. 96 figs. 6, 12, pl. 102 fig. 2; FAUVEL, 1927*a*: 121-122, fig. 43*e-l* [in part; not *Trophonia rugosa* Hansen 1880 and *Trophonia arctica* Hansen 1880, in the synonymy list = *Brada rugosa* (Hansen 1880)]; DITLEVSEN, 1929: 35-36; RIOJA, 1931: 92-94, pl. 27; AUGENER, 1928*a*: 774; STØP-BOWITZ, 1948*a*: 33-37, fig. 9, maps page 58; STØP-BOWITZ, 1948*c*: 39-41, fig. 15; WESENBERG-LUND, 1951: 78-80, fig. 7, chart 36; CASTELLI, 1989: 15-16; HARTMANN-SCHRÖDER, 1996: 415-416, fig. 201; KIRKEGAARD, 1996: 155-156, fig. 78. *Brada pilosa* — MOORE, 1906*b*: 231-233, pl. 10 figs. 14-17. *Brada villosa* var. *pilosa* — FAUVEL, 1907*b*: 22 [HOMONYM]. *Brada parthenopeia* — LO BIANCO, 1893: 44, pl. 3 figs. 1, 9, 10.

REFERENCES FOR PORTUGAL: AMOUREUX, 1974*b* (off Porto).
DISTRIBUTION: Arctic Ocean; Atlantic Ocean; Greenland; Iceland; Spitsbergen; Norway; Kara Sea; Bering Sea; North Sea; Skagerrak; Kattegat; Øresund; English Channel; from Northern Spain to the Mediterranean Sea; Adriatic Sea; Aegean Sea; North Pacific; Antarctic Ocean. In muddy and sandy bottoms, sometimes with stones, and among *Zostera*. Between 3-2000 meters.

GENUS ***Bradabyssa*** Hartman 1967

Bradabyssa HARTMAN, 1967: 122.
TYPE SPECIES: *Bradabyssa papillata* Hartman 1967.

Bradabyssa papillata Hartman 1967

Bradabyssa papillata HARTMAN, 1967: 122-123, pl. 37 fig. *C*.
TYPE LOCALITY: Scotia Sea (Antarctica), 59º08' to 59º01'S, 36º57' to 36º50'W, 2815-2818 meters.
REFERENCES FOR PORTUGAL: [?] RAVARA, 1997 (as cf. *Bradabyssa papilata*; off Aveiro).
DISTRIBUTION: Scotia Sea, 2815-2818 meters; [?] Portugal, coarse sand, 48.2-79 meters.
REMARKS: As already pointed by RAVARA (1997), by the Portuguese record of this species needs to be confirmed.

*GENUS ***Diplocirrus*** Haase 1914

Diplocirrus HAASE, 1914: 26-27.
TYPE SPECIES: *Trophonia glauca* Malmgren 1867.
SYNONYMS: *Saphobranchia* Chamberlin 1919.

KEY TO SPECIES:
(data and adaptation from: STØP-BOWITZ, 1948*a*; DARBYSHIRE & MACKIE, 2009)

1a. Cephalic cage absent; encrusting sand grains on the body wall absent, being replaced by fine silt/clay adhered to the papillae but not to the epidermis; papillae distributed at random; neurochaetae with blunt hooked tips..........***D. stopbowitzi***
1b. Cephalic cage present; encrusting sand grains on the body wall present; papillae distributed at random, with clusters around chaetae..........**2**

2a (1b). Not more than 3 chaetae at the dorsal bundles of the first chaetigers; papillae short, not very elongated; neurochaetae with blunt hooked tips; whitish, silver coloration..........***D. glaucus****
2b (1b). More than 3 chaetae at the dorsal bundles of the first chaetigers..........**3**

3a (2b). Papillae very long, with free bases; neurochaetae with blunt hooked tips; without nephridial papillae; reddish, cinnamon colour..........***D. hirsutus***
3b (2b). Papillae long, some attached at the same basis, forming groups of 2 or 3; neurochaetae with fine tips; one pair of nephridial papillae at the ventral face, near chaetiger 5; greyish colour......***D. longisetosus***

****Diplocirrus glaucus*** (Malmgren 1867)

Trophonia glauca MALMGREN, 1867*a*: 82-83, pl. 13 fig. 78.
TYPE LOCALITY: Bohuslän (Sweden), in mud, between 8-70 fathoms (14.6-128 meters).
SYNONYMS: *Trophonia pallida* M. Sars 1869 [in part].
SELECTED REFERENCES: *Trophonia glauca* — LEVINSEN, 1884: 122; G.O. SARS, 1873*b*: 248-249; BIDENKAP, 1907: 26. *Stylarioides glauca* — FAUVEL, 1907*b*: 21-22; MCINTOSH, 1908*b*: 530-531; FAUVEL, 1914*f*: 234-235, pl. 21 figs. 24-25; MCINTOSH, 1915*b*: 96-98, pl. 96 fig. 2, pl. 104 fig. 9. *Diplocirrus glaucus* — HAASE, 1914: 27-29, text-figs. 3-5, map; FAUVEL, 1927*a*: 120-121, fig. 43*a-d*; DITLEVSEN, 1929: 35; RIOJA, 1931: 98-100, pl. 30; STØP-BOWITZ, 1948*a*: 25-28, fig. 6, map page 57; STØP-BOWITZ, 1948*c*: 36-37; WESENBERG-LUND, 1951: 78, chart 35; LAUBIER, 1960*b*: 507-508; CASTELLI, 1989: 15; HARTMANN-SCHRÖDER, 1996: 416-417, fig. 202; KIRKEGAARD, 1996: 156-158, fig.

79; DARBYSHIRE & MACKIE, 2009: fig. 3*C-D*, table 1. *Trophonia pallida* — M. SARS, 1869: 253 [*nomen nudum*; in part; in part = *Therochaeta flabellata* (M. Sars *in* G.O. Sars 1872]. [?] *Brada inhabilis* [not Rathke 1843] — LANGERHANS, 1880*b*: 102-103, pl. 4 fig. 14.

REFERENCES FOR PORTUGAL: AMOUREUX, 1987 (off Porto); DEXTER, 1992 (previous records: Figueira da Foz); present work (southwestern continental shelf).

MATERIAL: SEPLAT 6 — St. 265 (A.2730), off Praia do Vale dos Homens, 78 m, sand: 1 specimen. **SEPLAT 7 (2nd part) — St. 22 (A.4082)**, north Sines, 122 m, sand: 1 incomplete specimen. **St. 33 (A.4074)**, north Sines, 156 m, gravelly sand: 1 incomplete specimen. **St. 185 (A.3926)**, near Sines, 37 m, sandy mud: 1 specimen broken in several pieces. **St. 186 (A.3925)**, south Sines, 27 m, muddy sand: 3 specimens plus 6 fragments; less than 3 chaetae on anterior chaetigers; specimens fragmented; body whitish, covered with sand; papillae short. **St. 187 (A.3924)**, south Sines, 17 m, sand: 1 incomplete specimen. **St. 189 (A.3922)**, south Sines, 29 m, muddy sand: 10 specimens plus 8 fragments; one specimen complete, with about 43 chaetigers. **St. 318 (A.3843)**, near Arrifana, 54 m, sand: 1 incomplete specimen.

DISTRIBUTION: Arctic Ocean; Norway; Kara Sea; North Sea; Skagerrak; Kattegat; Øresund; English Channel; Irish Sea; Northern Spain; Portugal; [?] Madeira Island; Mediterranean Sea; Adriatic Sea; Aegean Sea; [?] South Africa. In muddy bottoms and muddy sand, sometimes with stones, clean sand. Between 0-750 meters.

REMARKS: LAUBIER (1960*b*) refers the apparent variability concerning the presence versus absence of eyes in this species. HAASE (1914) and FAUVEL (1927*a*) refer the presence of four eyes in the Northern European populations, while MCINTOSH (1915*b*) refers only the presence of two small eyes. Finally LANGERHANS (1880*b*) doesn't refer the presence of eyes in the specimens collected by him in Madeira, and the specimens from Banyuls studied by LAUBIER (1960*b*) were blind. If this presence or absence of eyes is the result of intraspecific variability or of the occurrence of more than one taxon in the studied area, is not clear.

Diplocirrus hirsutus (Hansen 1878)

Trophonia hirsuta HANSEN, 1878: 9-10, pl. 1 figs. 1-4.

TYPE LOCALITY: The species was described with base on 3 specimens from two different stations. The data of the stations is as follows: off Norway, 62º44'N, 01º48'E, 753 meters, in clay; off Norway, 63º10'N, 04º00'E, 763 meters, in sabulous clay.

SELECTED REFERENCES: *Trophonia hirsuta* — G.A. HANSEN, 1882: 38, pl. 7 figs. 5-8; LEVINSEN, 1884: 122. *Stylarioides hirsutus* [not Lo Bianco 1893] — MARENZELLER, 1889: 129-131; AUGENER, 1928*a*: 770-771. *Stylarioides hirsuta* [not Lo Bianco 1893] — MCINTOSH, 1908*b*: 541-542, pl. 12 fig. 2, pl. 12*a* fig. 7. *Diplocirrus hirsutus* — HAASE, 1914: 30-32; FAUVEL, 1927*a*: 120; STØP-BOWITZ, 1948*a*: 28-30, fig. 7, maps page 57; STØP-BOWITZ, 1948*c*: 37-39, fig. 13; WESENBERG-LUND, 1951: 78, chart 35; DARBYSHIRE & MACKIE, 2009: table 1.

REFERENCES FOR PORTUGAL: RAVARA, 1997 (off Aveiro).

DISTRIBUTION: Iceland; Norway; Spitsbergen; Portugal. In muddy bottoms. Between 10-1785 meters.

Diplocirrus longisetosus (Marenzeller 1890)

Stylarioides longisetosus MARENZELLER, 1890: 5, pl. 1 fig. 3.

TYPE LOCALITY: Bering Sea, at Plover Bay, between 7-20 fathoms (12.8-36.6 meters), in argillaceous and sandy grounds.

SYNONYMS: *Stylarioides normani* McIntosh 1908.

SELECTED REFERENCES: *Stylarioides longisetosus* — MARENZELLER, 1892*b*: 426-427; AUGENER, 1928*a*: 771. *Diplocirrus longisetosus* — HAASE, 1914: 32-34, text-figs. 6-7; STØP-BOWITZ, 1948*a*: 30-33, fig. 8, maps page 57; STØP-BOWITZ, 1948*c*: 38-39, fig. 14; DARBYSHIRE & MACKIE, 2009: table 1. *Stylarioides normani* — MCINTOSH, 1908*b*: 542-543, pl. 12 fig. 3, pl. 12*a* fig. 8. *Trophonia hirsuta* [not Hansen 1878] — DITLEVSEN, 1911: 426, pl. 29 fig. 11, pl. 31 figs. 23-24.

DISTRIBUTION: Northern Norway; Spitsbergen; White Sea; Barents Sea; Bering Sea. Muddy bottoms. Between 12-90 meters.

Diplocirrus stopbowitzi Darbyshire & Mackie 2009

Diplocirrus stopbowitzi DARBYSHIRE & MACKIE, 2009: 93-96, figs. 1-2, 3*A*, table 1.

TYPE LOCALITY: Southern Irish Sea: North Anglesey (Wales), 53º38.631'N, 04º21.157'W, coarse sandy gravel, 54 meters.

DISTRIBUTION: Southern Irish Sea. In coarse sediments, mainly sandy gravels and gravelly sands. Between 28-112 meters.

GENUS ***Flabelliderma*** Hartman 1969

Flabelliderma HARTMAN, 1969: 286.
TYPE SPECIES: *Stylarioides papillosa* Essenberg 1922.
REMARKS: The genus was redefined by SALAZAR-VALLEJO (2007).

Flabelliderma claparedei (Saint-Joseph 1898)

Flabelligera Claparedii SAINT-JOSEPH, 1898: 363-365, pl. 21 figs. 176-179.
TYPE LOCALITY: Remardy, close to St. Jean de Luz (43º22'48"N, 01º40'12"W), Gulf of Biscay, (Aquitaine, Western France), in rocks at the shore.
SELECTED REFERENCES: *Flabelligera claparedii* — GÜNTHER, 1912: 102. *Flabelliderma claparedei* — SALAZAR-VALLEJO, 2007: 2047-2049, fig. 3.
DISTRIBUTION: Known from the type locality.
REMARKS: *Flabelligera claparedii* Saint-Joseph 1898 was usually considered to be a junior synonym of *Flabelligera affinis* M. Sars 1829. However, SALAZAR-VALLEJO (2007) established that the species was valid, and that it belonged to the genus *Flabelliderma*.

GENUS ***Flabelligera*** M. Sars 1829

Flabelligera M. SARS, 1829: 31.
TYPE SPECIES: *Flabelligera affinis* M. Sars 1829.
SYNONYMS: *Siphostoma* Otto 1821 [not Rafinesque 1810 (Pisces)]; *Chlorœma* Dujardin 1838; *Siphonostoma* Rathke 1843; *Tecturella* Stimpson 1853.

KEY TO SPECIES:
(adapted from FAUVEL, 1927*a*)

1a. At the ventral rami one, or at most, two thick pseudocompound hooks....................................***F. affinis***
1b. At the ventral rami, 4 to 6 pseudocompound thin hooks..***F. diplochaitus***

Flabelligera affinis M. Sars 1829

Flabelligera affinis M. SARS, 1829: 31, pl. 3 fig. 16.
TYPE LOCALITY: Bergenfjord, Norway.
SYNONYMS: *Siphostoma uncinata* Cuvier 1830; *Chlorœma Edwardsii* Dujardin 1838; *Siphonostoma vaginiferum* Rathke 1843; *Chloraema Dujardini* Quatrefages 1849; *Chloraema sordidum* Quatrefages 1849; [?] *Siphonostoma gelatinosa* Dalyell 1853; *Tecturella flaccida* Stimpson 1853; *Siphonostoma affine* Leidy 1855; [?] *Tecturella luctator* Stimpson 1855; [?] *Siphonostoma Buskii* McIntosh 1869; *Chlorœma pellucidum* M. Sars *in* G.O. Sars 1872; [?] *Flabelligera idiura* Ehlers 1897; [?] *Flabelligera infundibularis* Johnson 1901; *Flabelligera diplochaitos* var. *affinis* Haase 1914.
SELECTED REFERENCES: *Flabelligera affinis* — MALMGREN, 1867*a*: 83-84; LEVINSEN, 1884: 121-122; SAINT-JOSEPH, 1894: 96-101, pl. 5 figs. 121-123; BIDENKAP, 1907: 25-26; FAUVEL, 1907*b*: 19-20; MCINTOSH, 1908*b*: 532, 541; DITLEVSEN, 1909: 16; DITLEVSEN, 1911: 33-34; GÜNTHER, 1912: 97-98; FAUVEL, 1914*f*: 233; SOUTHERN, 1914: 138; MCINTOSH, 1915*b*: 107-114, pl. 89 fig. 2, pl. 96 fig. 10, pl. 104 fig. 7; FAUVEL, 1927*a*: 113, fig. 40*a-f*; AUGENER, 1928*a*: 768; RIOJA, 1931: 88-90, pl. 24; STØP-BOWITZ, 1948*a*: 8-13, fig. 1, maps page 56; STØP-BOWITZ, 1948*c*: 30-33, fig. 11; WESENBERG-LUND, 1951: 76-77, chart 35; E. RASMUSSEN, 1973: 113-114, fig. 38; CASTELLI, 1989: 11-12; HARTMANN-SCHRÖDER, 1996: 417-419, fig. 203; KIRKEGAARD, 1996: 158, fig. 80. *Siphostoma uncinata* — CUVIER, 1830: 196. *Siphonostoma uncinata* — QUATREFAGES, 1849: 287; JOHNSTON, 1865: 223, 344. *Chlorœma Edwardsii* — DUJARDIN, 1838: 648-649; DUJARDIN, 1839: 288-290, pl. 7 figs. 1-5; ØRSTED, 1844*b*: 79. *Siphonostomum Edwardsii* — GRUBE, 1850: 320. *Siphonostoma vaginiferum* — RATHKE, 1843: 211-215, pl. 11 figs. 3-10. *Siphonostomum vaginiferum* — LEUCKART, 1849: 164-168; GRUBE, 1850: 321; M. SARS *in* G.O. SARS, 1873*b*: 247. *Chloraema Dujardini* — QUATREFAGES, 1849: 282. *Chloraema*

sordidum — QUATREFAGES, 1849: 285. *Flabelligera sordidum* — GÜNTHER, 1912: 98. [?] *Siphonostoma gelatinosa* — DALYELL, 1853: 256-257, pl. 18 figs. 10-12. *Tecturella flaccida* — STIMPSON, 1853: 32, pl. 2 fig. 21. [?] *Tecturella luctator* — STIMPSON, 1856*a*: 391. [?] *Flabelligera luctator* — GÜNTHER, 1912: 100. [?] *Siphonostoma Buskii* — MCINTOSH, 1869: 420, pl. 15 fig. 13, pl. 16 fig. 4. [?] *Flabelligera buskii* — MCINTOSH, 1908*b*: 533; MCINTOSH, 1915*b*: 114-115, pl. 96 fig. 11, pl. 102 fig. 3, pl. 104 fig. 8. *Chlorœma pellucidum* — M. SARS, 1869: 253 [*nomen nudum*]; M. SARS *in* G.O. SARS, 1872*a*: 409-410; M. SARS *in* G.O. SARS, 1873*b*: 252-261, pl. 16 figs. 9-20. *Flabelligera pellucidum* — GÜNTHER, 1912: 99. [?] *Flabelligera infundibularis* — JOHNSON, 1901: 417, pl. 12 figs. 124-127; STØP-BOWITZ, 1948*c*: 33. [?] *Flabelligera infundibulis* — GÜNTHER, 1912: 101. [?] *Flabelligera infundibularum* — MOORE, 1902: 275. *Siphonostoma affine* — LEIDY, 1855: 148. *Siphonostoma affinis* — NEWBIGIN, 1900: 190, pl. 4 figs. 5-6. *Flabelligera affinus* — MOORE, 1909*c*: 143. [?] *Flabelligera idiura* — EHLERS, 1897: 105-107, pl. 7 figs. 168-173. *Flabelligera diplochaitos* var. *affinis* — HAASE, 1914: 15-18, text-fig. 1, plates 1-2. Not *Siphonostoma affine* — HASWELL, 1886: 750-752, pl. 54 figs. 1-5 [= HOMONYM].

DISTRIBUTION: Arctic Ocean; Greenland; Iceland; Spitsbergen; Faroes; Norway; Sweden; North Sea; Skagerrak; Kattegat; Baltic Sea; English Channel; Bay of Biscay; Mediterranean Sea; Adriatic Sea; Aegean Sea; North America; northern coast of Siberia; [?] Australia; [?] South Atlantic. At low tide, under stones or among *Fucus*; in muddy and sandy bottoms, also under stones, laminarians, algae and in rockpoools. Between 0-1500 meters.

REMARKS: According to STØP-BOWITZ (1948*a*), *Flabelligera affinis* is not present at the Mediterranean Sea, where it would be replaced by *Flabelligera diplochaitus*. However, the species has been cited not only from the Mediterranean Sea (see CASTELLI, 1989), but also from the Adriatic and Aegean Seas. I was able to study some specimens collected at the Étang de Bages (southern France) that presented two thick pseudocompound neurohooks, typical of *F. affinis*. For this reason, the species is here considered to be present also in the Mediterranean Sea, together with *F. diplochaitus*.

Flabelligera diplochaitus (Otto 1821)

Siphostoma diplochaitus OTTO, 1821: 628, pl. 51.

TYPE LOCALITY: Gulf of Naples.

SYNONYMS: *Amphitrite viridis-purpurea* Renier 1847; *Chloraema dubium* Quatrefages 1866.

SELECTED REFERENCES: *Siphonostomum diplochaitos* — GRUBE, 1850: 320. *Siphonostoma diplochaïtos* — CLAPARÈDE, 1869: 109-113, pl. 25 fig. 3. *Siphonostoma diplochaetos* — JOURDAN, 1887: 7-38, pls 1-4. *Siphonostoma diplochaites* — LO BIANCO, 1893: 40. *Flabelligera diplochaitus* — GÜNTHER, 1912: 96-97, 102-182, text-figs. 1-55, 1 map, pl. 7 figs. 1-16; CASTELLI, 1989: 12. *Flabelligera diplochaitos* — FAUVEL, 1927*a*: 114-115, fig. 40*g-o*; RIOJA, 1931: 90-92, pls. 25-26. *Chloraema dubium* — QUATREFAGES, 1866*b*: 476.

DISTRIBUTION: Mediterranean Sea; Adriatic Sea; Aegean Sea. Common on detritic bottoms and among *Corallina*. Between 20-50 meters.

REMARKS: Several authors (*e.g.*: NEWBIGIN, 1900; HAASE, 1914) suggested that *Flabelligera diplochaitus* was just a variety of *Flabelligera affinis*, from which it would differ by its bigger size, bigger number of branchiae, and mainly by the bigger number of ventral hooks, numbering 4-6 instead of 1-2. FAUVEL (1927*a*) stated, however, that the bigger number of hooks was a typical character of the Mediterranean specimens, while the Atlantic ones always had a reduced number of hooks, considering both populations as belonging to different species.

GENUS ***Ilyphagus*** Chamberlin 1919

Ilyphagus CHAMBERLIN, 1919*a*: 396, 402.

TYPE SPECIES: *Ilyphagus bythincola* Chamberlin 1919.

Ilyphagus ilyvestis Hartman 1960

Ilyphagus ilyvestis HARTMAN, 1960: 130-133, pl. 13.

TYPE LOCALITY: Long Basin, off Southern California, 68 miles 225° T from China Point light, San Clemente Island, 32º01’00”N, 119º22’00”W, in 1821 meters, bottom of stiff silty clay, containing burrows filled with lighter gray clay and some black rocks, probably phosphoritic.

SELECTED REFERENCES: *Ilyphagus* cf. *ilyvestris* [sic] — AMOUREUX, 1982*b*: 191, fig. 2*I*.

DISTRIBUTION: Off Southern California, at 1821 meters, in stiff silty clay with some black rocks. As *I.* cf. *ilyvestis*: Continental slope, between Brittany and Ireland, between 1100 and 1700 meters.
REMARKS: AMOUREUX (1982*b*) states that the shape of the body as well as the details of the chaetae of his 19 specimens fit the drawings given by HARTMAN (1960).

GENUS *Pherusa* Oken 1807

Pherusa OKEN, 1807: 1168.
TYPE SPECIES: *Amphitrite plumosa* O.F. Müller 1776.
SYNONYMS: *Aristenia* Savigny 1822; *Trophonia* Audouin & Milne-Edwards 1830; *Stylaroides* Delle Chiaje 1841; *Lophiocephala* Costa 1841; *Lophocephalus* Costa 1841; *Flemingia* Johnston 1846.

KEY TO SPECIES:
(from STØP-BOWITZ, 1948*a*)

1a. Capillary noto- and neurochaetae in the first two chaetigers; following chaetigers with ventral pseudocompound chaetae, with terminal article like a sharp claw..***P. arctica***
1b. Capillary noto and neurochaetae in the first three chaetigers; hooked chaetae at the following chaetigers; without pseudocompound chaetae...**3**
1c. Noto and neurochaetae in the first four chaetigers; following chaetigers with ventral pseudocompound chaetae with a very large terminal article scythe shaped; without hooked chaetae.........................***P. falcata***

2a (1b). Body not very narrow posteriorly; branchiae thick and few (8-10)...............................***P. plumosa***
2b (1b). Body very narrow posteriorly; branchiae thin and numerous (50-100)......................***P. monilifera***

Pherusa arctica Støp-Bowitz 1948

Pherusa arctica STØP-BOWITZ, 1948*a*: 20-22, fig. 4, map page 57.
TYPE LOCALITY: Lødingen, west of Narvik (Norway), 10-15 meters; Evenskjær, between Lødingen and Harstad (Norway), 70-90 meters.
SELECTED REFERENCES: *Pherusa arctica* — STØP-BOWITZ, 1948*c*: 36.
DISTRIBUTION: Known from the original records.

Pherusa falcata Støp-Bowitz 1948

Pherusa falcata STØP-BOWITZ, 1948*a*: 22-24, fig. 5, map page 57.
TYPE LOCALITY: At the middle of Karmøsund, in front of Kopervik (Norway), 108 meters.
SELECTED REFERENCES: *Pherusa falcata* — HARTMANN-SCHRÖDER, 1996: 419; KIRKEGAARD, 1996: 160, fig. 81.
DISTRIBUTION: Northern North Sea; Skagerrak. Between 100-180 meters.

Pherusa monilifera (Delle Chiaje 1841)

Stylarioïdes moniliferus DELLE CHIAJE, 1841*a*: 75-76.
TYPE LOCALITY: Gulf of Naples.
SYNONYMS: *Siphonostomum papillosum* Grube 1840; *Lophiocephala Edwardsii* O.G. Costa 1841; *Trophonia barbata* Milne-Edwards 1849; *Stylarioides hirsutus* Lo Bianco 1893.
SELECTED REFERENCES: *Stylarioïdes moniliferus* — DELLE CHIAJE, 1841*d*: pl. 134 fig. 5. *Stylarioïdes monilifer* — CLAPARÈDE, 1869: 98-104, pl. 25 fig. 1. *Stylarioides monilifer* — LO BIANCO, 1893: 41-42, pl. 2 fig. 7; FAUVEL, 1927*a*: 118-119, fig. 42*a-g*. *Pherusa monilifera* — CASTELLI, 1989: 13-14. *Siphonostomum papillosum* — GRUBE, 1840: 68-69; GRUBE, 1850: 320-321. *Lophiocephala Edwardsii* — O.G. COSTA, 1841: 276, pl. 12 fig. 2. *Pherusa barbata* — QUATREFAGES, 1866*b*: 481. *Stylarioides hirsutus* [not Hansen 1879; HOMONYM] — LO BIANCO, 1893: 42-43, pl. 2 fig. 5.
REFERENCES FOR PORTUGAL: RAVARA, 1997 (as *Pherusa monilifer*; off Aveiro).
DISTRIBUTION: Atlantic coast of France; Portugal; Mediterranean Sea; Adriatic Sea; Aegean Sea. In sand, mud, and *Posidonia* beds. Intertidal to about 35 meters.

Pherusa plumosa (O.F. Müller 1776)

Amphitrite plumosa O.F. MÜLLER, 1776: 216.

TYPE LOCALITY: Norway.

SYNONYMS: *Pherusa Mülleri* Oken 1807; *Flemingia muricata* Johnston 1832; *Trophonia ? Goodsirii* Johnston 1840; *Pherusa obscura* Quatrefages 1849; *Trophonia pilosa* M. Sars 1869; *Trophonia borealis* Hansen 1880; [?] *Stylarioides Horstii* Haswell 1885; [?] *Trophonia papillata* Johnson 1901; [?] *Stylarioides sarsii* McIntosh 1908.

SELECTED REFERENCES: *Flabelligera plumosa* — M. SARS, 1829: 32. *Siphonostoma plumosum* — RATHKE, 1842: 84-92, pl. 6 figs. 1-7. *Siphonostoma plumosa* — RATHKE, 1843: 208-211, pl. 11 figs. 1-2. *Pherusa plumosa* — ØRSTED, 1844*b*: 79; STØP-BOWITZ, 1948*a*: 13-18, fig. 2, maps page 56; STØP-BOWITZ, 1948*c*: 33-36, fig. 12; CASTELLI, 1989: 12-13; HARTMANN-SCHRÖDER, 1996: 421-422, fig. 205; KIRKEGAARD, 1996: 163-165, fig. 83. *Siphonostomum plumosum* — GRUBE, 1850: 321. *Trophonia plumosa* — JOHNSTON, 1865: 224-225, pl. 19 figs. 1-10; MALMGREN, 1867*a*: 82; G.O. SARS, 1873*b*: 247-248; LEVINSEN, 1884: 122; BIDENKAP, 1907: 26. *Stylarioides plumosa* — SAINT-JOSEPH, 1894: 101-103, pl. 5 fig. 125; SAINT-JOSEPH, 1898: 367-369, pl. 21 fig. 180; FAUVEL, 1907*b*: 20; MCINTOSH, 1908*b*: 529-530, 540; FAUVEL, 1909: 6; FAUVEL, 1914*f*: 233-234, pl. 21 fig. 26; MCINTOSH, 1915*b*: 89-95, text-fig. 110, pl. 89 fig. 1, pl. 95 fig. 11, pl. 96 fig. 1, pl. 104 fig. 1; FAUVEL, 1927*a*: 116-117, fig. 41*a-g*; RIOJA, 1931: 96-98, pls. 28-29; WESENBERG-LUND, 1951: 77, chart 35. *Stylarioides plumosus* — SAINT-JOSEPH, 1898: 367-369, pl. 21 fig. 180; HAASE, 1914: 19-24, map; AUGENER, 1928*a*: 769-770. *Styrlarioides plumosa* — DITLEVSEN, 1929: 34. *Pherusa Mulleri* — BLAINVILLE, 1828: 440; DALYELL, 1853: 257-258, pl. 18 figs. 5-9. *Pherusa Mülleri* — QUATREFAGES, 1849: 291. *Flemingia muricata* — JOHNSTON, 1833*a*: 15. *Trophonia ? Goodsirii* — JOHNSTON, 1840*b*: 371-373, pl. 11 figs. 1-10. *Pherusa Goodsiri* — QUATREFAGES, 1849: 290. *Pherusa obscura* — QUATREFAGES, 1849: 289. *Trophonia pilosa* — M. SARS, 1869: 253 [*nomen nudum*]. *Trophonia borealis* — HANSEN, 1880: 230, pl. 4 figs. 8-12; G.A. HANSEN, 1882: 38, pl. 7 figs. 13-16. [?] *Stylarioides Horstii* — HASWELL, 1892: 335-336, pl. 26 figs. 6-8, pl. 27 fig. 17. [?] *Trophonia papillata* — JOHNSON, 1901: 416, pl. 12 figs. 122-123. [?] *Stylarioides sarsii* — MCINTOSH, 1908*b*: 536-538, pl. 12*a* figs. 3-5; MCINTOSH, 1915*b*: 102-103, pl. 96 fig. 5, pl. 104 fig. 5. Not *Trophonia sarsi* MCINTOSH, 1922*a*: 8-9, pl. 3 figs. 3-8 [= SECONDARY HOMONYMY].

REFERENCES FOR PORTUGAL: MCINTOSH, 1908*b* (as *Stylarioides sarsii*; off Cape Sagres); FAUVEL, 1909 (as *Stylarioides plumosa*; off Lagos); FAUVEL, 1914*f* (as *Stylarioides plumosa*; off Lagos); RIOJA, 1917*c* (as *Stylarioides Sarsi*; previous records: Cape Sagres); AMOUREUX, 1974*b* (as *Stylarioides plumosa*; off Aveiro; off Porto); MONTEIRO-MARQUES, 1979 (as *Stylarioides plumosa*; southern continental shelf of Algarve); [?] SOUSA-REIS *et al.*, 1982 (as *Stylanioides* c.f. *plumosa*; Peniche region); MONTEIRO-MARQUES, 1987 (as *Stylarioides plumosa*; continental shelf of Algarve); DEXTER, 1992 (as *Stylarioides (Pherusa) plumosa*; previous records: continental shelf of Algarve; Sines; Peniche; Figueira da Foz).

DISTRIBUTION: Arctic Ocean; Greenland; Spitsbergen; Lofoten; Novaya Zemlya; Kara Sea; Iceland; Norway; Faroes; North Sea; Skagerrak; Kattegat; Øresund; Western Baltic Sea; English Channel; European Atlantic coast; [?] Mediterranean Sea; [?] Adriatic Sea; [?] Aegean Sea; Northern Asia; Northern America; [?] Australia; [?] New Zealand. In crevices filled with mud of rocks, among mussels, shells or algae, under stones, in muddy and sandy bottoms. Between 0.5-1400 meters.

GENUS ***Piromis*** Kinberg 1867

Piromis KINBERG, 1867: 338.

TYPE SPECIES: *Piromis arenosus* Kinberg 1867.

SYNONYMS: *Pycnoderma* Grube 1878; *Balanochaeta* Chamberlin 1919; *Semiodera* Chamberlin 1919.

Piromis eruca (Claparède 1869)

Trophonia eruca CLAPARÈDE, 1869: 105-107, pl. 25 fig. 2.

TYPE LOCALITY: Gulf of Naples.

SYNONYMS: [?] *Pherusa incrustata* Quatrefages 1866; [?] *Trophonia arenosa* Webster 1879.

SELECTED REFERENCES: *Trophonia eruca* — LO BIANCO, 1893: 43-44. *Stylarioides eruca* — FAUVEL, 1927*a*: 119, fig. 42*h-l*. *Piromis eruca* — CASTELLI, 1989: 14; SALAZAR-VALLEJO, 2011: 16-17, fig. 5. [?] *Trophonia arenosa* — WEBSTER, 1879*a*: 245, pl. 7 figs. 92-97. *Stylarioides arenosa* — MCINTOSH, 1908: 531-532; MCINTOSH, 1915: 98-99, pl. 96 fig. 3, pl. 104 fig. 6. [?] *Pherusa incrustata* — QUATREFAGES, 1866*b*: 480.

REFERENCES FOR PORTUGAL: MONTEIRO-MARQUES, 1984 (as *Stylarioides eruca*; Praia da Falésia); MONTEIRO-MARQUES, 1987 (as *Stylarioides eruca*; continental shelf of Algarve); DEXTER, 1992 (as *Stylarioides eruca*; previous records: continental shelf of Algarve).

DISTRIBUTION: English Channel; Atlantique coast of France; Portugal; Mediterranean Sea; Adriatic Sea; Aegean Sea; [?] Virginia, U.S.A.. On sand and on the mud between the rhizomes of *Posidonia*. Intertidal to about 5 meters, but recorded to occur down to 200 meters. SALAZAR-VALLEJO (2011) restricted the distribution of the species to the Mediterranean Sea, on mixed or sandy sediments, at shallow water, considering the records beyond this area questionable and belong to other species.

GENUS *Therochaeta* Chamberlin 1919

Therochaeta CHAMBERLIN, 1919*a*: 397.

TYPE SPECIES: *Stylarioides collarifer* Ehlers 1887.

KEY TO SPECIES:

1a. Pseudocompound neurochaeta at chaetigers 2-3 to 8...***T. flabellata***

1b. Pseudocompound neurochaeta from chaetiger 5 to 7...***T. collarifera***

Therochaeta collarifera (Ehlers 1887)

Stylarioides collarifer EHLERS, 1887: 161-164, pl. 43 figs. 2-7.

TYPE LOCALITY: South Florida and Gulf of Mexico, on several localities: off Boca Grande, at 368 fathoms (673 meters); southwest of Sand Key, at 325 fathoms (594.4 meters); off Carysfort Reef, at 206 fathoms (376.7 meters); 24º8'N, 82º51'W, at 339 fathoms (620 meters).

SELECTED REFERENCES: *Therochaeta collarifera* — HARTMAN, 1965*b*: 180, pl. 40; AMOUREUX, 1982*b*: 192, fig. 2*Tc*.

DISTRIBUTION: South Florida and Gulf of Mexico, between 376-673 meters; off New England, between 200-500 meters; off Southern California, 774-892.5 meters; continental slope off Brittany, between 380-650 meters.

Therochaeta flabellata (M. Sars *in* G.O. Sars 1872)

Trophonia flabellata M. SARS *in* G.O. SARS, 1872*a*: 409.

TYPE LOCALITY: Norway, at Drøbak fjord, between 40-50 fathoms (73.2-91.4 meters), and at Lofoten Islands (Brettesnaes and Skraaven) between 120-300 fathoms (219.5-548.6 meters).

SYNONYMS: *Trophonia pallida* M. Sars 1869 [in part].

SELECTED REFERENCES: *Trophonia flabellata* — M. SARS, 1869: 253 [*nomen nudum*]; M. SARS *in* G.O. SARS, 1873*b*: 249-252, pl. 17 figs. 1-12; LEVINSEN, 1884: 122. *Stylarioides flabellata* — MCINTOSH, 1908*b*: 535-536, pl. 12 fig. 1, pl. 12*a* figs. 1-2; MCINTOSH, 1915*b*: 100-102, pl. 94 fig. 1, pl. 96 fig. 4, pl. 104 fig. 3; FAUVEL, 1927*a*: 117, fig. 41*h-m*; DITLEVSEN, 1929: 34-35. *Stylarioides flabellatus* — HAASE, 1914: 24-26, text-fig. 2. *Pherusa flabellata* — STØP-BOWITZ, 1948*a*: 18-20, fig. 3, map page 57; STØP-BOWITZ, 1948*c*: 36; HARTMANN-SCHRÖDER, 1996: 420, fig. 204; KIRKEGAARD, 1996: 163, fig. 82. *Therochaeta flabellata* — CASTELLI, 1989: 15. *Trophonia pallida* — M. SARS, 1869: 253 [*nomen nudum*; in part; in part = *Diplocirrus glaucus* (Malmgren 1867)].

REFERENCES FOR PORTUGAL: AMOUREUX, 1974*b* (as *Stylarioides flabellata*; off Aveiro); MONTEIRO-MARQUES, 1987 (as *Stylarioides flabellata*; continental shelf of Algarve); DEXTER, 1992 (as *Stylarioides flabellata*; previous records: continental shelf of Algarve).

DISTRIBUTION: Lofoten Islands; Norway; Skagerrak; North Sea; English Channel; Portugal; [?] Western Mediterranean Sea; [?] Adriatic Sea; [?] Aegean Sea. In mud and sandy mud. Between 6-655 meters, more frequent between 50-550 meters.

INCERTAE SEDIS

Buskiella minuta Amoureux 1986

Buskiella minuta AMOUREUX, 1986: 607-608, fig. 2.

TYPE LOCALITY: The species was described with base on 220 specimens collected off the Iberian Peninsula, during the Campaign Abyplaine 1981, by the *N.O. Cryos* (1981) and *N.O. Jean-Charcot* (1983). AMOUREUX (1986) designated a holotype, but didn't state which was the station of the type locality. The date of the stations is as follows: 37º18'N, 15º33'W to 15º38'W, 4200-4500 meters; 34º48'N to 35º00'N, 21º19'W to 21º28'W, 5100-5160 meters; 32º02'N to 33º01'N, 21º59'W to 22º00W, 5230-5250 meters; 34º04'N to 34º06'N, 17º04'W to 17º07'W, 4260-4270 meters; 39º55'N to 40º00'N, 14º56'W to 15º06'W, 5270-5320 meters; 42º44'N, to 42º51'N, 15º53'W to 15º57'W, 4190-4480 meters; 42º57'N to 43º00N, 13º59'W to 14º08'W, 5260-5280 meters; 44º39'N to 44º41'N, 17º48'W to 18º01'W, 4990 meters.

DISTRIBUTION: Known from the original record.

REMARKS: This species was originally described in the genus *Buskiella* by AMOUREUX (1986). When this genus was revised by SALAZAR-VALLEJO & ZHADAN (2007), the species was considered to be more closelly allied to the genus *Piromis*. In the absence of more evidence concerning the generic placement of thespecies, it is here considered as *incertae sedis*.

*FAMILY **GLYCERIDAE** Grube 1850

AS: *GLYCEREA* GRUBE, 1850: 309.
TYPE GENUS: *Glycera* Savigny *in* Lamarck 1818.
SYNONYMS: *PROBOSCIDEA* Quatrefages 1866.
REMARKS: The family Glyceridae was thoroughly revised by BÖGGEMANN (2002) in what is the most important publication on the family. As a result of this worldwide revision, the Glyceridae was considered to include 42 valid species distributed by 3 genera. Afterwards IMAJIMA (2003) described a new taxon from Japan (*Glycera amadaiba*), raising the number of species to 43.

Dichotomic keys for worlwide, European and Iberian species of Glyceridae can be found, respectively, in BÖGGEMANN (2002), O'CONNOR (1987*b*), and PARRA *et al.* (1995).

Two genera and ten species are known to occur in European and nearby waters. Among the identified material one genus was found, represented by 8 species.

KEY TO GENERA:

(adapted from BÖGGEMANN, 2002)

1a. Ailerons rod-like; prostomium consisting of 4 rings, appendages relatively long; first two parapodia biramous with two prechaetal and two postchaetal lobes; branchiae absent; notopodia with simple capillaries, neuropodia with spinigerous and falcigerous compound chaetae...............................***Glycerella***
1b. Ailerons with more or less triangular or deeply incised bases; prostomium consisting of more than 5 rings, appendages relatively short; usually first two parapodia uniramous, following parapodia biramous with two prechaetal and one or two postchaetal lobes; branchiae present or absent; notopodia with simple capillaries, neuropodia with spinigerous compound chaetae...***Glycera****

*GENUS ***Glycera*** Savigny *in* Lamarck 1818

Glycera SAVIGNY *in* LAMARCK, 1818: 314.
TYPE SPECIES: *Glycera unicornis* Savigny *in* Lamarck 1818.
SYNONYMS: *Glyceres* Peters *in* Bianconi 1862; *Rhynchobolus* Claparède 1868; *Euglycera* Verrill 1881; *Hamiglycera* Ehlers 1908; *Telake* Chamberlin 1919; *Paranereites* Eisenack 1939.

KEY TO SPECIES:

(adapted from BÖGGEMANN, 2002):

1a. Proboscideal papillae without terminal fingernail structure..**2**
1b. Proboscideal papillae with terminal fingernail structure; all biramous parapodia with two postchaetal lobes; parapodia of mid-body with slender triangular notopodial and shorter, more or less rounded neuropodial postchaetal lobes; simple, digitiform branchiae present, situated termino-dorsally on parapodia..**8**

2a (1a). One postchaetal lobe in all parapodia; branchiae absent..**3**
2b (1a). Two postchaetal lobes at least on parapodia of mid-body; branchiae absent or present.................**5**

3a (2a). In mid-body, notopodial prechaetal lobes shorter than neuropodial lobes; digitiform proboscideal papillae..**4**
3b (2a). In mid-body, prechaetal lobes of about same length; conical proboscideal papillae with about 5-20 transverse ridges; ailerons with slightly arched bases; branchiae absent.........................***G. oxycephala****

4a (3a). Digitiform proboscideal papillae with straight, median, longitudinal ridge; ailerons with pointed triangular bases; notopodial prechaetal lobes slightly shorter than neuropodial lobes.................***G. capitata***
4b (3a). Digitiform proboscideal papillae with undulating ridge; ailerons with slight dent in pointed triangular bases; notopodial prechaetal lobes distinctly shorter than neuropodial lobes............***G. lapidum****

5a (2b). Ailerons with deeply incised bases; postchaetal lobes short, rounded, of about same length; branchiae absent; digitiform proboscideal papillae with straight, median, longitudinal ridge only... ***G. tesselata****

5b (2b). Ailerons with interramal plate; postchaetal lobes variable; branchiae present or absent; conical proboscideal papillae..**6**

6a (5b). Proboscideal papillae with about 6-16 ridges (small specimens sometimes with less ridges); branchiae absent; ailerons with rounded triangular bases; both postchaetal lobes more or less blunt triangular... ***G. celtica****

6b (5b). Proboscideal papillae with up to 3 ridges, variable; branchiae present, retractile; ailerons with triangular bases; parapodia of mid-body with two postchaetal lobes of about same length.........................**7**

7a (6b). Both postchaetal lobes short, being rounded, sometimes slightly blunt triangular notopodial and slightly shorter, rounded neuropodial postchaetal lobes; simple, retractile, blister-like branchiae, situated medially on anterior side of parapodia; conical proboscidial papillae with 3 ridges...................... ***G. fallax****

7b (6b). Both postchaetal lobes slender triangular; 1-2 retractile, digitiform branchial rami, situated medially on anterior side of parapodia; conical proboscidial papillae with 3 ridges............... ***G. unicornis****

8a (1b). Proboscideal papillae with long stalk; prostomium consisting of about 9-11 rings; ailerons with pointed triangular bases... ***G. alba****

8b (1b). Proboscedial papillae with short stalk; prostomium consisting of about 11-15 rings; ailerons with triangular bases... ***G. tridactyla****

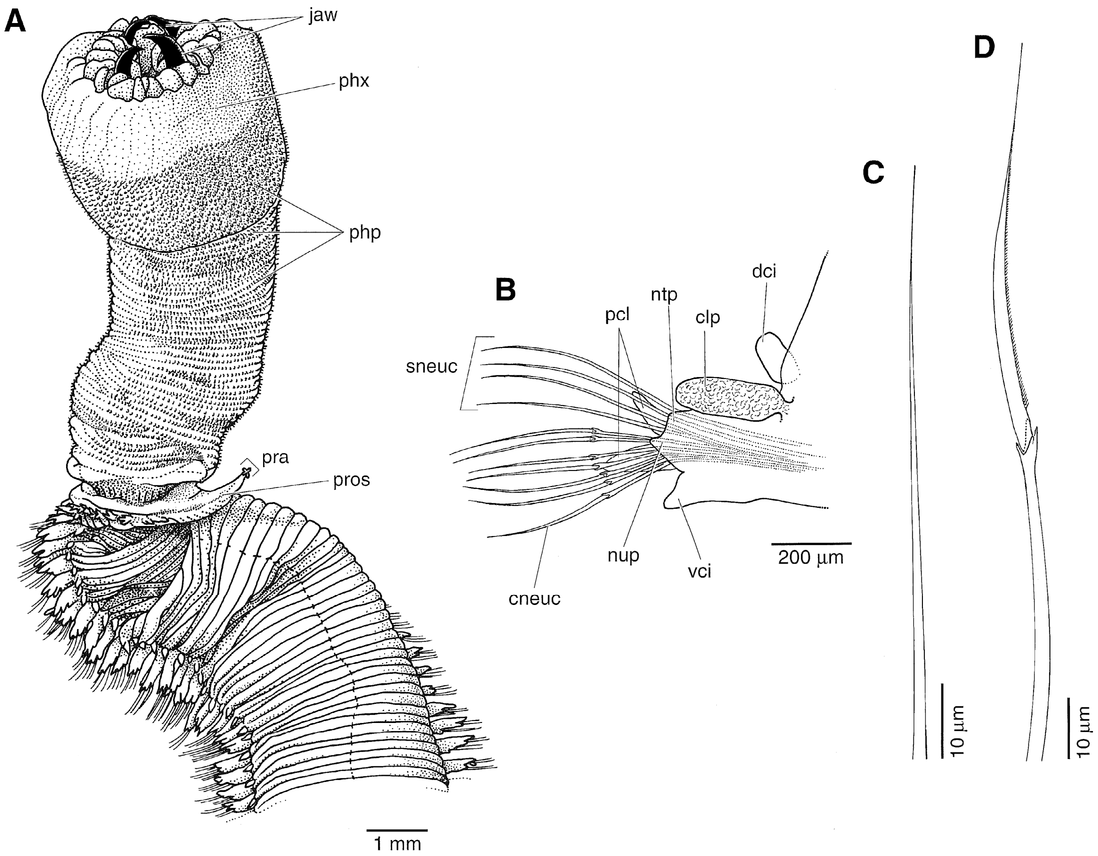

Figure legend: Family Glyceridae. *Glycera* specimen. **A**, anterior end with pharynx everted. **B**, parapodium of chaetiger 33, dorsal view. **C**, **D**, chaetae: **C**, simple notochaeta; **D**, compound neurochaetae. **clp**, coelomic loop; **cneuc**, compound neurochaetae; **dci**, dorsal cirrus; **jaw**, jaws; **ntp**, notopodium; **nup**, neuropodium; **pcl**, postchaetal lobes; **php**, pharyngeal papillae; **phx**, pharynx everted; **pra**, prostomial appendages; **pros**, prostomium; **sneuc**, simple neurochaetae; **vci**, ventral cirrus. (Adapted from BEESLEY, ROSS & GLASBY, 2000; drawings by K. Nolan).

****Glycera alba*** (O.F. Müller 1776)

Nereis alba O.F. Müller, 1776: 217.

Type locality: Locality unknown, probably Norway.

Synonyms: *Glycera nigripes* Johnston 1865 [in part]; *Glycera danica* Quatrefages 1866; [?] *Rhynchobolus minutus* Bobretzky 1870; [?] *Glycera minuta* Forma *suchumica* Czerniavsky 1881; [?] *Glycera minuta* Forma *sevastopolica* Czerniavsky 1881.

Selected references: *Glycera alba* — Fauvel, 1923*c*: 385, fig. 150*i-m*; O'Connor, 1987*b*: 174-175, fig. 5; Kirkegaard, 1992: 161-162, fig. 75; Hartmann-Schröder, 1996: 240-241, fig. 108; Böggemann, 2002: 72-73, figs. 109-111.

References for Portugal: McIntosh, 1905*a* (off Cape Sagres); McIntosh, 1910 (publication not seen; Cape Sagres); Rioja, 1918*b* (previous records: Cape Sagres); Monteiro-Marques, 1979 (southern continental shelf of Algarve); [?] Amoureux & Calvário, 1981 (as *Glycera convoluta* or *Glycera alba*; Tagus Estuary; Peniche); Campoy, 1982 (previous records: Cape Sagres); Sousa-Reis *et al.*, 1982 (Peniche region); Pinto, 1984 (Sado Estuary); Monteiro-Marques, 1987 (continental shelf of Algarve); Dexter, 1992 (previous records: Ria de Alvor; continental shelf of Algarve; Mira Estuary; Sines; Sado Estuary; Peniche; Figueira da Foz); present work (southwestern continental shelf).

Material: SEPLAT 7 (1st part) — St. 1 (A.2940), SW Zambugeira do Mar, off Praia do Carvalhal, 85 m, sand: 1 apparently complete specimen, with about 71 chaetigers; proboscis everted; poor condition; possible to see the proboscideal papillae with a long stalk. **St. 19 (A.2956)**, off Zambugeira do Mar, 225 m, muddy sand: 1 incomplete specimen with 47 chaetigers and everted proboscis. **St. 43 (A.2976)**, off Zambugeira do Mar, 255 m, muddy sand: 1 complete specimen, with about 120 chaetigers; proboscis everted; it dried, and now is in a very poor condition, brittle; possible to see the shape of the proboscideal papillae, with a long stalk and a fingernail structure at the tip; besides, the parapodia bear a digitiform branchiae located at the termino-dorsal region. **St. 120 (A.3047)**, off Praia de Almograve, 64 m, sand: 1 complete specimen with 87 chaetigers and everted proboscis; poor condition. **[?] St. 186**, 159 m, rest of data unknown: 1 incomplete specimen, with 64 chaetigers; proboscis partially everted. **SEPLAT 7 (2nd part) — St. 10 (A.4100)**, off Lagoa de Santo André, 118 m, sand: 1 complete specimen with about 69 chaetigers; proboscis everted. **St. 23 (A.4083)**, north Sines, 127 m, sand: 1 incomplete specimen with 33 chaetigers; proboscis everted; small specimen. **St. 25 (A.4085)**, north Sines, 134 m, sand: 2 specimens; (1) complete, with 77 chaetigers, proboscis everted; (2) middle fragment, with 25 chaetigers. **St. 26 (A.4086)**, north Sines, 140 m, sand: 1 small specimen, probably a juvenile, broken in two pieces; structure of parapodia not very clear, but the proboscideal papillae are the typical of the species. **St. 39 (A.4068)**, north Sines, 110 m, sand with shells: 1 incomplete specimen with 44 chaetigers; proboscis everted. **St. 109 (A.3998)**, off Sines, 146 m, sand: 2 incomplete specimens; (1) with 32 chaetigers, proboscis everted; (2) with 24 chaetigers, proboscis everted. **St. 176 (A.3934*A*)**, off Sines, 157 m, sand: 1 specimen represented by 2 fragments, with 10 and 20 chaetigers, in a very poor condition; one of the fragments withs the proboscis attached, in an inverted position; branchiae and the 2 postchaetal lobes not seen; proboscideal papillae typical of the species. **St. 184 (A.3927)**, near Sines, 47 m, mud: 2 specimens; (1) incomplete, with about 84 chaetigers, proboscis everted, plus 2 middle fragments, with 16 and 43 chaetigers; (2) incomplete, with about 25 chaetigers, proboscis lost, represented only by a fragment, parapodia as described for the species. **St. 185 (A.3926)**, near Sines, 37 m, sandy mud: 1 specimen, almost complete, with 89 chaetigers, and about 20 mm long; branchiae from chaetiger 21; proboscis everted; proboscideal papillae as described, of 3 types: fingernail, digitiform and conical. **St. 193 (2nd. try) (A.3919)**, south Sines, 69 m, sandy mud: 2 specimens, plus 1 middle fragment with 14 chaetigers; (1) incomplete, with about 49 chaetigers, proboscis inverted, proboscideal papillae as described, dried specimen; (2) incomplete, with about 42 chaetigers, everything else as other specimens. **St. 194 (A.3918)**, south Sines, 84 m, sand: 2 specimens; (1) anterior fragment in a very poor condition, without chaetae; identified with base on the proboscideal papillae; (2) anterior fragment with 30 chaetigers, proboscis slightly everted. **St. 199 (A.3913)**, SW Sines, 155 m, sand: 1 specimen, represented by a fragment in a very poor condition, with about 43 chaetigers; proboscis missing; parapodia typical of the species, some of them with dorsal branchiae; considered to be *Glycera alba* due to the depth of the station (*G. trydactyla* was found in shallower waters, in the Portuguese coast). **St. 210 (A.3902)**, off Porto Covo, 163 m, sand: 1 incomplete specimen with about 46 chaetigers; proboscis inverted; poor condition. **St. 259 (A.3867)**, off Cape Sardão, 173 m, sand: 1 specimen almost complete, with 93 chaetigers; proboscis everted. **St. 271 (A.3863)**, off Praia de Odeceixe, 232 m, muddy sand: 1 incomplete specimen, with about 81 chaetigers; proboscis everted. **St. 283 (A.3851)**, off Arrifana, 245 m, muddy sand: 1 incomplete specimen with about 60 chaetigers; anterior region of body inverted; very coiled. **St. 306 (A.3847)**, SW

Praia de Odeceixe, 105 m, sand: 3 specimens; (1) complete, with about 54 chaetigers, juvenile, proboscis everted; (2) incomplete, 83 chaetigers, proboscis everted; (3) incomplete, 32 chaetigers, proboscis inverted. **FAUNA 1** — **St. 1*A***, Gulf of Cádiz, off Huelva, 190 m, mud: 1 incomplete specimen with about 45 chaetigers, in poor condition; proboscis everted.

DISTRIBUTION: Norwegian Sea; North Sea; Atlantic coasts of Europe; Mediterranean Sea; Tyrrhenian Sea; Adriatic Sea; Aegean Sea; Black Sea; around Madagascar; Bay of Bengal; Northwestern Pacific coasts; East and South China Sea. Between 9-199 meters (BÖGGEMANN, 2002).

Glycera capitata Ørsted 1842

Glycera capitata ØRSTED, 1842: 123.

TYPE LOCALITY: Greenland, exact locality unknown.

SYNONYMS: *Glycera setosa* Ørsted 1842; *Glycera Mulleri* Quatrefages 1866; *Glycera kerguelensis* McIntosh 1885; [?] *Glycera longipes* M. Sars *in* Arwidsson 1899; *Glycera nana* Johnson 1901; *Hemipodia canadensis* Treadwell 1937; *Glycera mimica* Hartman 1965; [?] *Glycera capitata antarctica* Averincev 1972; [?] *Glycera capitata abyssicola* Averincev 1972.

SELECTED REFERENCES: *Glycera capitata* — FAUVEL, 1923*c*: 385-386, fig. 151*a-e*; O'CONNOR, 1987*b*: 183-184, fig. 13; KIRKEGAARD, 1992: 162-165, fig. 76; BÖGGEMANN, 2002: 34-37, figs. 16-18. *Glycera kerguelensis* — MCINTOSH, 1885*a*: 344-345, pl. 35*A* figs. 3-4. *Glycera nana* — JOHNSON, 1901: 411, pl. 10 figs. 103-103*a*. *Hemipodia canadensis* — TREADWELL, 1937*a*: 348-349, figs. 1-3. *Glycera mimica* — HARTMAN, 1965*b*: 97-98, pl. 15; O'CONNOR, 1987*b*: 186-187, fig. 16.

REFERENCES FOR PORTUGAL: [?] AMOUREUX & CALVÁRIO, 1981 (as *Glycera capitata* or *Glycera lapidum*; Lagoon of Óbidos); COSTA, GAMITO & OLIVEIRA, 1984 (Sado Estuary); PINTO, 1984 (Sado Estuary); MONTEIRO-MARQUES, 1987 (continental shelf of Algarve); DEXTER, 1992 (previous records: continental shelf of Algarve; Sines; Sado Estuary; Arrábida). [Probably all these records refer to *Glycera lapidum* Quatrefages 1866].

DISTRIBUTION: Arctic, Antarctic and adjacent cold temperate zones (Greenland, Spitsbergen, off Norway, Washington, Nova Scotia, New England, Agulhas Basin, Falkland Islands, Kerguelen). Intertidal to 4840 meters (BÖGGEMANN, 2002).

REMARKS: *Glycera capitata* was recorded frequently from southern European waters, by several authors [*e.g.*, see ARIÑO (1987) and records therein], but BÖGGEMANN (2002) didn't find this species among the studied material from South Europe. I revised the material identified by CAMPOY (1982) from the Bay of Biscay, and also numerous specimens identified by Rafael Sardá and Daniel Martin from the Mediterranean Sea, and all of them turned to be misidentifications, being specimens of *Glycera lapidum* Quatrefages 1866, a species similar to *G. capitata* (see in the above key how to separate the two species).

****Glycera celtica*** O'Connor 1987

Glycera celtica O'CONNOR, 1987*b*: 179-180, fig. 10.

TYPE LOCALITY: Celtic Sea (49º27'N 10º33.8'W), 144 meters, muddy sand.

SYNONYMS: [?] *Glycera dayi* O'Connor 1987.

SELECTED REFERENCES: *Glycera celtica* — BÖGGEMANN, 2002: 51-52, figs. 49-51. *Glycera capitata* [not Ørsted 1842] — GARDINER, 1976: 165, fig. 18*m-n*. [?] *Glycera dayi* — O'CONNOR, 1987*b*: 181, fig. 11.

REFERENCES FOR PORTUGAL: BÖGGEMANN, 2002 (southwestern continental shelf); present work (southwestern continental shelf).

MATERIAL: SEPLAT 6 — **St. 12 (A.2517)**, off Ponta Ruiva, 35 m, sand: 1 incomplete specimen with about 154 chaetigers, 70 mm long, 3 mm wide; proboscis everted, about 15 mm long. **St. 270 (A.2734)**, off Praia da Amoreira, 145 m, sand: 1 incomplete specimen, small, with 104 chaetigers; proboscis everted. **St. 320 (A.2777)**, off Praia de Odeceixe, 142 m, muddy sand: 1 incomplete specimen with 49 chaetigers; it is very contracted; proboscideal papillae and parapodia as described. **SEPLAT 7 (1st part)** — **St. 25 (A.2960)**, off Zambugeira do Mar, 126 m, sand: 1 incomplete specimen with 47 chaetigers; proboscis everted; poor condition; it dried, and now is brittle; identified with base on the proboscis and parapodia. **St. 242 (A.3146)**, off Praia do Malhão, 176 m, sand: 1 incomplete specimen with about 105 chaetigers, proboscideal papillae as described. **St. 312 (A.3208)**, off Porto Covo, 108 m, muddy sand: 1 complete specimen, with everted proboscis; very coiled, making difficult to count the number of chaetigers. **SEPLAT 7 (2nd part)** — **St. 7 (A.4097)**, off Lagoa de Santo André, 132 m, sand with shells: 1 middle fragment with 20 chaetigers. **St. 22 (A.4082)**, north Sines, 122 m, sand: 1 incomplete specimen, with 87 chaetigers, 35 mm long. **St. 38 (A.4069)**, north Sines, 120 m, sand with shells: 1 incomplete specimen with 63 chaetigers, 40 mm long, 4 mm wide; proboscis everted; mid-body segments biannulate.

St. 51 (A.4056), north Sines, 125 m, sand: 2 specimens; (1) incomplete, with 64 chaetigers, proboscis inverted, proboscideal papillae and parapodia as described; (2) middle fragment with 88 chaetigers, but specimen must be almost complete, as the anterior region is quite wide, and the posterior very narrow, with both the prostomium with proboscis, and pygidium missing, being the anterior region like having been cutted. **FAUNA 1 — St. 67*A***, Gulf of Cádiz, off Chipiona, 55-56 m, mud: 1 incomplete specimen with about 275 chaetigers; 130 mm long, 5 mm wide; proboscideal papillae with 12 rings; plus 2 middle fragments with 46 and 47 chaetigers, and one posterior fragment with about 110 chaetigers.

DISTRIBUTION: Northeastern coasts of North America; North Sea; Celtic Sea; English Channel; west coasts of Europe; Mediterranean Sea; Aegean Sea. Between 10-200 meters (BÖGGEMANN, 2002).

****Glycera fallax*** Quatrefages 1850

Glycera fallax QUATREFAGES, 1850*a*: 358

TYPE LOCALITY: St. Vaast, North-west of France.

SYNONYMS: [?] *Glycera mitis* Johnston 1865; [?] *Nereis tricolor* Johnston 1865; *Glycera decorata* Quatrefages 1866; *Glycera gigantea* Quatrefages 1866; *Glycera vesiculosa* Parfitt 1867; *Glycera folliculosa* Ehlers 1868.

SELECTED REFERENCES: *Glycera fallax* — QUATREFAGES, 1866*b*: 184, pl. 2 fig. 2, pl. 9 fig. 18; CLAPARÈDE, 1863: 54, pl. 15 figs. 14-15; BÖGGEMANN, 2002: 58-60, figs. 73-75. *Glycera gigantea* — SAINT-JOSEPH, 1894: 22-26, pl. 2 figs. 20-29; FAUVEL, 1923*c*: 387-389, fig. 152*d-k*; O'CONNOR, 1987*b*: 177-178, fig. 8; KIRKEGAARD, 1992: 165-166, fig. 77; HARTMANN-SCHRÖDER, 1996: 241-242, fig. 109.

REFERENCES FOR PORTUGAL: CARVALHO, 1929 (as *Glycera gigantea*; Vila Nova de Milfontes); BELLAN, 1960*a* (as *Glycera gigantea*; Cape Espichel); CAMPOY, 1982 (as *Glycera gigantea*; previous records: Vila Nova de Milfontes; 38º24'N – 9º13'8"W); MONTEIRO-MARQUES, 1987 (as *Glycera gigantea*; continental shelf of Algarve); DEXTER, 1992 (as *Glycera gigantea*; previous records: continental shelf of Algarve; Mira Estuary); present work (southwestern continental shelf).

MATERIAL: SEPLAT 7 (2nd part) — St. 129 (A.3980), near Sines, 52 m, sand: 1 incomplete specimen with about 120 chaetigers; proboscis everted, but difficult to see the ridges on the proboscideal papillae with clarity, seeming to have 3 ridges; shape of the parapodia like the ones described by BÖGGEMANN (2002), and it was possible to see the porus of the retractile branchiae; prostomium seems to be longer and sharper, and the prechaetal lobes more round than in *G. unicornis*. **St. 316 (A.3844)**, off Arrifana, 82 m, sand: 1 specimen broken in several fragments; anterior fragment with about 45 chaetigers, but is inverted, like a sock, and the visible region is the internal one; another fragment consists only on the proboscis, inverted; middle fragment with 75 chaetigers, with a portion of the digestive tract visible, with the mandibles at the tip; another middle fragment with 47 chaetigers; parapodia with branchiae retracted, but in some it is possible to see what seems to be the porous through which the branchiae everts; postchaetal notopodial lobe normally slightly triangular and longer than the neuropodial one; posterior parapodia with both postchaetal lobes very short and round.

DISTRIBUTION: Atlantic coasts of Europe, from the British Isles and English Channel south to the Mediterranean Sea; Adriatic Sea; Aegean Sea; Black Sea. Between 15-300 meters (BÖGGEMANN, 2002).

****Glycera lapidum*** Quatrefages 1866

Glycera lapidum QUATREFAGES, 1866*b*: 187.

TYPE LOCALITY: Holy Island (Berwick Bay), England.

SYNONYMS: *Nereis Sorex* Johnston 1865; *Glycera nigripes* Johnston 1865 [in part]; *Hamiglycera serrulifera* Ehlers, 1908; [?] *Nereis doreæ* McIntosh 1910.

SELECTED REFERENCES: *Glycera lapidum* — FAUVEL, 1923*c*: 386-387, fig. 151*f-m*; KIRKEGAARD, 1992: 166-168, fig. 78; HARTMANN-SCHRÖDER, 1996: 242-243, fig. 110; BÖGGEMANN, 2002: 37-40, figs. 19-21. *Glycera lapidum* "complex": varieties *A*, *B*, *C*, and *D* — O'CONNOR, 1987*b*: 184-186, figs. 1*d*, 14-15. *Hamiglycera serrulifera* — EHLERS, 1908: 105-106, pl. 14 figs. 14-17. [?] *Glycera capitata* [not Ørsted 1842] — SAINT-JOSEPH, 1894: 31-33, pl. 2 figs. 39-42.

REFERENCES FOR PORTUGAL: ARWIDSSON, 1899 (Bay of Setúbal); MCINTOSH, 1910 (publication not seen; Cape Sagres; Setúbal); RIOJA, 1918*b* (previous records: Cape Sagres; Setúbal); AMOUREUX, 1974*b* (off Aveiro); [?] AMOUREUX & CALVÁRIO, 1981 (as *Glycera capitata* or *Glycera lapidum*; Lagoon of Óbidos); CAMPOY, 1982 (previous records: Cape Sagres; Setúbal; Aveiro); MONTEIRO-MARQUES, 1987 (continental shelf of Algarve); DEXTER, 1992 (previous records: continental shelf of Algarve; Mira Estuary; Figueira da Foz); RAVARA, 1997 (off Aveiro); BÖGGEMANN, 2002 (previous records: Bay of Setúbal); present work (southwestern continental shelf).

MATERIAL: SEPLAT 7 (2nd part) — St. 13 (A.4103), off Lagoa de Santo André, 49 m, sand: 1 complete specimen with about 60 chaetigers and 2 achaetigerous pre-pygidial segments; proboscis everted; ailerons with a wide angle between the two branches, which can seem to be the typical of *Glycera tesselata*. **St. 106 (A.4001)**, near Sines, 110 m, gravelly sand: 1 incomplete specimen with 34 chaetigers; proboscis inverted. **St. 136 (A.3973)**, off Sines, 192 m, sand: 1 complete specimen, with 39 chaetigers, plus 2 achaetigerous parapodia; proboscis inverted. **St. 174 (A.3936)**, off Sines, 250 m, muddy sand: 1 incomplete specimen with 46 chaetigers; proboscis slightly everted. **St. 175 (A.3935)**, off Sines, 205 m, gravelly sand: 1 incomplete specimen with 48 chaetigers and everted proboscis; poor condition; not possible to see the undulating ridges on the proboscideal papillae; however it is possible to see that they have crenate edges; identified by comparison with the specimen from St. 176 (A.3934*A*). **St. 176 (A.3934*A*)**, off Sines, 157 m, sand: 1 incomplete specimen with 41 chaetigers; proboscis everted; it is possible to see the undulating ridge on the proboscideal papillae; prechaetal notopodial lobe much smaller than the neuropodial one. **St. 254 (A.3877)**, off Cape Sardão, 74 m, sand: 1 specimen, represented by a posterior fragment with 19 chaetigers and 2 achaetigerous parapodia, plus one middle fragment with 26 chaetigers, dried; parapodia the typical of the species. **St. 283 (A.3851)**, off Arrifana, 245 m, muddy sand: 1 small specimen, complete, with 48 chaetigers. **FAUNA 1 — St. 18*A***, Alborán Sea, Alborán Island, 45-52 m, stones: 2 specimens; (1) very small and incomplete, with 16 chaetigers, proboscis everted but detached during the manipulation of the specimen; (2) very small and incomplete, with 19 chaetigers, proboscis inverted. **St. 51*A***, Gulf of Cádiz, Placer de los Mártires, off Chiclana de la Frontera, 27-28 m, rock and mud: 1 complete specimen with 54 chaetigers; proboscis inverted; very small specimen. **St. 56*A***, Gulf of Cádiz, off Cape Trafalgar, 24 m, rock and gravel: 13 specimens, all very small; parapodia with the notopodial prechaetal lobe very small; (1) incomplete, 39 chaetigers, proboscis everted; (2) incomplete, 44 chaetigers, proboscis partially everted, ailerons resembling *G. tesselata*, but not entirely incised at the base, proboscideal papillae with undulating ridges, parapodia with prechaetal notopodial lobe quite small; (3) incomplete, with about 35 chaetigers, in poor condition and poorly preserved; (4) incomplete, 38 chaetigers, proboscis inverted; (5) complete, with about 50 chaetigers, proboscis lost; (6) complete, 40 chaetigers, proboscis inverted; (7) incomplete, 38 chaetigers, proboscis inverted; (8) incomplete, 21 chaetigers, proboscis inverted; (9) complete, with about 52 chaetigers, proboscis inverted; (10) incomplete, 35 chaetigers, proboscis inverted; (11) incomplete, 18 chaetigers, proboscis inverted; (12) incomplete, 37 chaetigers, proboscis everted; (13) incomplete, 45 chaetigers, proboscis everted. **St. 58*A***, Gulf of Cádiz, 33-34 m, detritic with rocks: 1 incomplete specimen with 16 chaetigers, plus one middle fragment with 4 chaetigers; very small (probably a juvenile); aileron seems to have a pointed triangular base, but the angle between both rami is quite big; proboscideal papillae close to the described for *Glycera tesselata*, but the undulating ridges were not observed; parapodia seem to have one postchaetal lobe, and the prechaetal notopodial lobe is much smaller than the neuropodial one.

DISTRIBUTION: Mainly in temperate zones and sometimes in tropical seas. In Europe, from Iceland south to the Azores, including the Mediterranean Sea; Adriatic Sea; Aegean Sea; Black Sea. Intertidal to 3947 meters (BÖGGEMANN, 2002).

****Glycera oxycephala*** Ehlers 1887

Glycera oxycephala EHLERS, 1887: 121, pl. 41 figs. 7-11.

TYPE LOCALITY: Barbados, West Indias.

SYNONYMS: *Glycera ehlersi* Ardwisson 1899; [?] *Glycera capitata* var. *benguellana* Augener 1931; *Glycera tenuis* Hartman 1944.

SELECTED REFERENCES: *Glycera oxycephala* — O'CONNOR, 1987*b*: 181-183, fig. 12; PARRA *et al.*, 1995: 55-56, figs. 1-3, table 1; BÖGGEMANN, 2002: 40-41, figs. 22-24. [?] *Glycera capitata* var. *benguellana* — AUGENER, 1931: 303-304, fig. 9. *Glycera tenuis* — HARTMAN, 1944*c*: 254, pl. 21 figs. 23-24.

REFERENCES FOR PORTUGAL: RAVARA, 1997 (off Aveiro); present work (southwestern continental shelf).

MATERIAL: SEPLAT 6 — St. 7 (A.2514), off Cape São Vicente, 77 m, fine sand: 1 complete specimen, in good condition; proboscideal papillae and parapodia as described; 131 chaetigers, 3 last parapodia achaetigerous; anal cirri present. **SEPLAT 7 (2nd part) — St. 194 (A.3918)**, south Sines, 84 m, sand: 3 incomplete specimens, plus 1 middle fragment with 8 chaetigers; very difficult to see the ridges on the proboscideal papillae; (1) with 63 chaetigers; (2) with 25 chaetigers plus one middle fragment that seems to belong to the same specimen; (3) with about 50 chaetigers. **FAUNA 1 — St. 56*A***, Gulf of Cádiz, off Cape Trafalgar, 24 m, rock and gravel: 1 incomplete specimen, with 42 chaetigers; proboscis partially everted.

DISTRIBUTION: In temperate zones and tropical seas, from the Norwegian coast to the southern coast of Bretagne (France); British Isles; Western Mediterranean Sea; Barbados; East coast of America; West Africa; California. Intertidal to 2951 meters (BÖGGEMANN, 2002).

****Glycera tesselata*** Grube 1863

Glycera tesselata GRUBE, 1863: 41-42, pl. 4 fig. 4.

TYPE LOCALITY: Mali Lošinj (= Lussin Piccolo), Nerezine (= Neresine), Lošinj Island, Croatia, Adriatic Sea.

SYNONYMS: *Glycera fundicola* Chamberlin 1919; [?] *Glycera tesselata* var. *minor* La Greca 1947; [?] *Glycera papillosa* var. *nigticans* Q. Wu 1994.

SELECTED REFERENCES: *Glycera tesselata* — FAUVEL, 1923*c*: 387, fig. 152*a-c*; O'CONNOR, 1987*b*: 178-179, figs. 1c, 9; KIRKEGAARD, 1992: 169-170, fig. 80; HARTMANN-SCHRÖDER, 1996: 245; BÖGGEMANN, 2002: 47-48, figs. 37-39. [?] *Glycera tesselata* var. *minor* — LA GRECA, 1947: 277-278, figs. 10-11.

REFERENCES FOR PORTUGAL: BELLAN, 1960*a* (Cape Sagres); AMOUREUX, 1974*b* (off Porto); HARTMANN-SCHRÖDER, 1977*a* (off Cape Sardão; Bay of Setúbal); CAMPOY, 1982 (previous records: Porto); MONTEIRO-MARQUES, 1987 (continental shelf of Algarve); DEXTER, 1992 (previous records: continental shelf of Algarve; Sines; Arrábida; Figueira da Foz); present work (southwestern continental shelf).

MATERIAL: SEPLAT 7 (2nd part) — **St. 10 (A.4100)**, off Lagoa de Santo André, 118 m, sand: 1 very small specimen, with 36 chaetigers and one achaetigerous segment with parapodia before the pygidium; proboscis and mandibulae lost, but parapodia seem to fit the description of the species, with 2 prechaetal pointed lobes of about the same length, and 2 short and rounded postchaetal lobes; it is identified here as belonging to this species, with some doubts. **St. 96 (A.4011)**, near Sines, 118 m, stones: 2 specimens; (1) incomplete, 59 chaetigers, proboscis slightly everted; (2) complete, 44 chaetigers, proboscis inverted, small specimen. **St. 309**, off Arrifana, 93 m, rock: 1 complete specimen with 61 chaetigers; proboscis only slightly everted. **FAUNA 1** — **St. 13*A***, Alborán Sea, off Cape Sagra, Motril, 62 m, coarse gravel: 8 specimens, plus 2 posterior fragments with 2 achaetigerous parapodia, one with 16 chaetigers and the other with 30; all specimens small and with brown pigment; (1) complete, with about 54 chaetigers, proboscis inverted, 2 last parapodia achaetigerous; (2) incomplete, 23 chaetigers and inverted proboscis; (3) incomplete, 23 chaetigers, everted proboscis; (4) incomplete, 24 chaetigers, inverted proboscis; (5) incomplete, 34 chaetigers, inverted proboscis; (6) incomplete, 33 chaetigers, inverted proboscis, poor condition; (7) incomplete, 29 chaetigers, inverted proboscis; (8) incomplete, 22 chaetigers, inverted proboscis. **St. 17*A***, Alborán Sea, Alborán Island, 70-74 m, stones: 1 small incomplete specimen with 25 chaetigers, proboscis inverted. **St. 18*A***, Alborán Sea, Alborán Island, 45-52 m, stones: 4 specimens; (1) complete, with about 75 chaetigers, prostomium with about 15 rings; (2) complete, with 68 chaetigers; (3) incomplete, with 43 chaetigers; (4) incomplete, small, with 26 chaetigers, proboscis everted, postchaetal lobe bilobed, papillae apparently rugose, but aileron similar to the described for the species. **St. 22*A***, Alborán Sea, Placer de las Bóvedas, off San Pedro de Alcántara, 30 m, coralligenous: 3 specimens, plus 2 posterior fragments with 23 and 25 chaetigers; (1) incomplete, with about 34 chaetigers, proboscis absent; (2) complete, 59 chaetigers, proboscideal papillae and ailerons as typical of the species; (3) complete, with 62 chaetigers. **St. 23*A***, Alborán Sea, Placer de las Bóvedas, off San Pedro de Alcántara, 30-32 m, coralligenous: 1 incomplete specimen with 36 chaetigers and everted proboscis, plus one middle fragment with 14 chaetigers and one posterior fragment with 7 chaetigers. **St. 33*A***, Alborán Sea, Alborán Island, 34-44 m, laminarians on rocks: 5 specimens; (1) incomplete, with about 36 chaetigers; (2) incomplete, with about 53 chaetigers, apparently almost complete; (3) incomplete, with 28 chaetigers, proboscis everted; (4) incomplete, with 31 chaetigers, proboscis lost, very poor condition; (5) complete, small specimen, with 42 chaetigers, proboscis inverted, brown pigmented. **St. 37*A***, Alborán Sea, off Punta de la Chullera, 95-100 m, coarse gravel: 2 specimens, small; (1) complete, with 50 chaetigers, everted proboscis and last 2 parapodia achaetigerous; (2) incomplete, with 21 chaetigers, proboscis everted. **St. 38*A***, Alborán Sea, off Punta de la Chullera, 60-62 m, mud: 3 specimens; (1) incomplete, with 29 chaetigers, proboscis everted; (2) incomplete, 25 chaetigers, proboscis everted; (3) incomplete, 32 chaetigers, proboscis lost. **St. 56*A***, Gulf of Cádiz, off Cape Trafalgar, 24 m, rock and gravel: 2 specimens, plus one middle fragment with 9 chaetigers; (1) incomplete, with 23 chaetigers, proboscis everted; (2) incomplete, with 34 chaetigers, proboscis everted. **St. 57*A***, Gulf of Cádiz, off Cape Trafalgar, 76-80 m, gravel and stones: 1 incomplete specimen with 22 chaetigers, proboscis lost, plus one posterior fragment with 21 chaetigers and one achaetigerous parapodium. **St. 58*A***, Gulf of Cádiz, 33-34 m, detritic with rocks: 5 specimens; (1) complete, with everted proboscis, 63 chaetigers, 2 last parapodia achaetigerous, 2 anal cirri; (2) complete, with everted proboscis, 66 chaetigers, 2 last parapodia achaetigerous, anal cirri missing; (3) incomplete, 47 chaetigers, proboscis inverted, brown pigmented; (4) complete, 64 chaetigers, anal cirri present, proboscis only partially everted; (5) complete, 75 chaetigers plus one achaetigerous segment, proboscis everted. **St. 61*A***, Gibraltar Strait, Tarifa, 39-44 m, rock: 5 specimens, plus 3 middle fragments, with 4, 15, and 32 chaetigers; (1) complete, 43 chaetigers plus one achaetigerous parapodium, proboscis inverted; (2) incomplete, 38 chaetigers, proboscis everted; (3) complete, 46 chaetigers, plus one achaetigerous segments, proboscis everted; (4) incomplete, with 32 chaetigers, proboscis everted; (5) incomplete, 37 chaetigers, proboscis and prostomium inverted. **St. 63*A***, Gibraltar Strait, off Atlanterra, 97-118 m, detritic: 6 specimens, plus one middle fragment with 8 chaetigers; (1) incomplete, 40 chaetigers, proboscis everted; (2) incomplete, 32 chaetigers, proboscis everted; (3) complete, 65 chaetigers plus 2 achaetigerous parapodia, proboscis everted; (4) complete, 60 chaetigers plus 2 achaetigerous parapodia, proboscis inverted; (5) incomplete, 16 chaetigers, very small and in poor condition, proboscis lost; (6) incomplete, 15 chaetigers, very small, proboscis everted.

DISTRIBUTION: Northwestern and northeastern Atlantic; mid-Atlantic (38º35.30'W 28ºN); south Atlantic (21º45'S 11º07'E); Gulf of Mexico; Caribbean Sea; Mediterranean Sea; Adriatic Sea; Aegean Sea; Black Sea; Red Sea; south coasts of Africa; Indo-Pacific; northwestern Pacific. Between 2-4066 meters (BÖGGEMANN, 2002).

****Glycera tridactyla*** Schmarda 1861

Glycera tridactyla SCHMARDA, 1861: 97, text-figs. *a-b*, *K*, pl. 30 fig. 238.

TYPE LOCALITY: Atlantic Ocean, Saint Malo (France).

SYNONYMS: [?] *Glycera convoluta* Keferstein 1862; *Glycera branchialis* Quatrefages 1866; [?] *Glycera retractilis* Quatrefages 1866; [?] *Rhynchobolus convolutus* Bobretzky 1870; [?] *Glycera convoluta* Forma *suchumica* Czerniavsky 1881; [?] *Glycera convoluta* Forma *sevastopolica* Czerniavsky 1881; *Glycera convoluta* var. *uncinata* Rioja 1918; [?] *Glycera alba* var. *cochinensis* Southern 1921.

SELECTED REFERENCES: *Glycera tridactyla* — O'CONNOR, 1987*b*: 173-174, fig. 4; HARTMANN-SCHRÖDER, 1996: 245; BÖGGEMANN, 2002: 75-77, figs. 118-120. [?] *Glycera convoluta* — SAINT-JOSEPH, 1894: 27-30, pl. 2 figs. 30-38; FAUVEL, 1923*c*: 383-385, fig. 150*a-h*. *Glycera convoluta* var. *uncinata* — RIOJA, 1918*b*: 85-86, fig. 20.

REFERENCES FOR PORTUGAL: AMOUREUX, 1974*b* (as *Glycera convoluta*; off Aveiro); [?] AMOUREUX & CALVÁRIO, 1981 (as *Glycera convoluta* or *Glycera alba*; Tagus Estuary; Peniche); CAMPOY, 1982 (previous records: Aveiro); SOUSA *et al.*, 1982 (as *Glycera convoluta*; Peniche region); CALVÁRIO, 1984 (as *Glycera convoluta*; Tagus Estuary); COSTA, GAMITO & OLIVEIRA, 1984 (as *Glycera convoluta*; Sado Estuary); MONTEIRO-MARQUES, 1984 (as *Glycera convoluta*; Praia da Falésia); MONTEIRO-MARQUES, 1987 (as *Glycera convoluta*; continental shelf of Algarve); QUINTINO & GENTIL, 1987 (as *Glycera convoluta*; Lagoon of Albufeira; Lagoon of Óbidos); CANCELA DA FONSECA, COSTA & BERNARDO, 1989 (Lagoon of Santo André); QUINTINO, RODRIGUES & GENTIL, 1989 (as *Glycera convoluta*; Lagoon of Óbidos); DEXTER, 1992 (as *Glycera convoluta*; previous records: Ria Formosa; Ria de Alvor; continental shelf of Algarve; Mira Estuary; Sines; Sado Estuary; Arrábida; Lagoon of Albufeira; Tagus Estuary; Peniche; Lagoon of Óbidos; Mondego Estuary; Ria de Aveiro); PARDAL, MARQUES & BELLAN, 1993 (as *Glycera convoluta*; Mondego Estuary); SPRUNG, 1994 (as *Glycera convoluta*; Ria Formosa); SALDANHA, 1995 (as *Glycera convoluta*; Portugal); RAVARA, 1997 (off Aveiro); MUCHA & COSTA, 1999 (as *Glycera convoluta*; Ria de Aveiro and/or Sado Estuary); CANCELA DA FONSECA *et al.*, 2006 (Aljezur); present work (southwestern continental shelf).

MATERIAL: SEPLAT 7 (1st part) — St. 155 (A.3081), near Vila Nova de Milfontes, 27 m, sand: 1 specimen, almost complete, with 133 chaetigers; proboscis inverted; prostomium broken, with the tip almost falling apart; prostomium with about 15 rings; otherwise in good condition. **St. 253 (A.3156)**, off Praia do Malhão, 22 m, sand: 2 incomplete specimens; biggest one with about 112 chaetigers, 35 mm long, 1.5 mm wide, branchiae from about chaetiger 32-35. **SEPLAT 7 (2nd part) — St. 186 (A.3925)**, south Sines, 27 m, muddy sand: 4 specimens; (1) complete, with about 127 chaetigers, 40 mm long, 1.5 mm wide, proboscis everted; (2) incomplete, with 63 chaetigers, postchaetal neuropodial lamellae clearly rounded; (3) incomplete, with 86 chaetigers, proboscis everted; (4) specimen small but complete, with 56 chaetigers, proboscis everted. **St. 187 (A.3924)**, south Sines, 17 m, sand: 3 specimens, plus one middle fragment with 5 chaetigers, and one posterior fragment without pygidium, with 25 chaetigers; (1) complete, 77 chaetigers, plus 3 achaetigerous parapodia, anal cirri present, proboscis everted; (2) incomplete, with about 84 chaetigers, proboscis everted; (3) incomplete, 36 chaetigers, proboscis everted. **St. 188 (A.3923)**, south Sines, 17 m, sand: 1 complete specimen, with one anal cirrus left and everted proboscis; 72 chaetigers plus 4 achaetigerous parapodia.

DISTRIBUTION: West coasts of Europe; from the North Sea to the Mediterranean Sea; Tyrrhenian Sea; Ionian Sea; Adriatic Sea; Gulf of Patras; Israel; Aegean Sea; Black Sea; coasts of South Africa; Red Sea;

Arabian Sea; Bay of Bengal; coasts of Japan; East and South China Sea; coasts of New Guinea; east coast of Australia. Intertidal to 55 meters (BÖGGEMANN, 2002).

****Glycera unicornis*** Savigny *in* Lamarck 1818

Glycera unicornis SAVIGNY *in* LAMARCK, 1818: 315.

TYPE LOCALITY: Locality unknown (? Egypt; ? Mediterranean Sea).

SYNONYMS: *Glycère de Meckel* Audouin & Milne Edwards 1832; [?] *Glycère de Roux* Audouin & Milne Edwards 1832; *Glycera Meckelii* Audouin & Milne Edwards 1833; [?] *Glycera Rouxii* Audouin & Milne Edwards 1833; *Glycera nigripes* Johnston 1865 [in part]; *Glycera Mulleri* Quatrefages 1866 [in part]; *Glycera peruviana* Quatrefages 1866; *Glycera Goësi* Malmgren 1867; [?] *Glycera Mauritiana* Grube 1870; *Glycera Mesnili* Saint-Joseph 1898; *Glycera guinensis* Augener 1918.

SELECTED REFERENCES: *Glycera unicornis* — FAUVEL, 1923*c*: 389-391, fig. 153*e-i*; O'CONNOR, 1987*b*: 176-177, fig. 7; HARTMANN-SCHRÖDER, 1996: 245-246; BÖGGEMANN, 2002: 60-62, figs. 79-81. [?] *Glycera Rouxii* — FAUVEL, 1923*c*: 389, 153*a-c*. *Glycera rouxi* — O'CONNOR, 1987*b*: 175-176, figs. 1*b*, 6. *Glycera rouxii* — KIRKEGAARD, 1992: 168-169. fig. 79; HARTMANN-SCHRÖDER, 1996: 244-245, fig. 111. *Glycera Goësi* — MALMGREN, 1867*a*: 71, pl. 15 figs. 81*A*, *C-D*, *F*. *Glycera Mesnili* — SAINT-JOSEPH, 1898: 339-344, pl. 19 figs. 146-148, pl. 20 figs. 149-157. *Glycera guinensis* — AUGENER, 1918: 389-391, text-fig. 48, pl. 5 figs. 128-130.

REFERENCES FOR PORTUGAL: GRUBE, 1870*b* (as *Glycera Meckelii*; Lisboa); MCINTOSH, 1910 (publication not seen; as *Glycera Goësi*; Cape Sagres); RIOJA, 1918*b* (as *Glycera Göesi*; previous records: Cape Sagres); BELLAN, 1960*a* (some as *Glycera rouxi*; off Cascais; Cape Espichel; Setúbal Canyon; NW Cape Sardão; Cape Santa Maria); AMOUREUX, 1974*b* (as *Glycera rouxii*; off Aveiro; off Porto); MONTEIRO-MARQUES, 1979 (as *Glycera rouxii*; southern continental shelf of Algarve); CAMPOY, 1982 (as *Glycera rouxii*; previous records: Cape Sagres; Aveiro; Porto; Portuguese coast); MONTEIRO-MARQUES, 1987 (as *Glycera rouxii*; continental shelf of Algarve); DEXTER, 1992 (some as *Glycera rouxii*; previous records: Ria de Alvor; continental shelf of Algarve); BÖGGEMANN, 2002 (previous records: Lisboa); present work (southwestern continental shelf).

MATERIAL: SEPLAT 6 — St. 218 (A.2684), off Arrifana, 162 m, sand: 1 specimen, in very poor condition, broken in 2 fragments; anterior fragment consisting only in the anterior portion of the digestive tract, including proboscis and mandibles with ailerons; second fragment is a middle fragment with 34 chaetigers; it wasn't possible to see the ridges on the proboscideal papillae, otherwise their shape fit the described; parapodia as described, with inverted branchiae on the anterior face. **SEPLAT 7 (1st part) — St. 43 (A.2976)**, off Zambugeira do Mar, 255 m, muddy sand: 1 incomplete specimen in a very poor condition, with 89 chaetigers; it dried, and now is brittle and fragile; the details cannot be observed; proboscideal papillae have the same shapes than the described, but it is not possible to observe the ridges; proboscis everted; parapodia seem to have the branchiae inverted, and have the described structure. **St. 70 (A.2999)**, off Cape Sardão, 150 m, sand: 1 middle fragment, with 25 chaetigers; it is brittle, and possible dried once; parapodia are the typical of the species, and it is possible to see the aperture of the branchiae (inverted) on the anterior surface of the parapodia. **St. 116 (A.3043)**, off Praia de Almograve, 135 m, muddy sand: 1 specimen, almost complete, with 104 chaetigers; proboscis everted. **St. 137 (A.3064)**, off Praia de Almograve, 300 m, muddy sand: 1 specimen broken in several fragments, in poor condition; it dried and now is very brittle and fragile; identification made with base on the parapodia; 1 middle fragment with about 20 chaetigers and the inverted proboscis with the mandibles attached, plus several fragments. **St. 184 (A.3104)**, off Vila Nova de Milfontes, 78 m, sandy mud: 1 specimen, anterior region lost, with about 170 chaetigers and 70 mm long. **[?] St. 186**, 159 m, rest of data unknown: 1 incomplete specimen, in a very poor condition; about 62 chaetigers; proboscis and mandibles missing; identified with base on the parapodia, which have two postchaetal lobes present, of about the same size; notopodial prechaetal lobe shorter than the neuropodial one. **St. 231 (A.3135)**, off Vila Nova de Milfontes, 162 m, sand: 1 incomplete specimen with 66 chaetigers, in poor condition; parapodia typical of the species. **St. 236 (A.3140)**, off Vila Nova de Milfontes, 390 m, sandy mud: 1 specimen with about 120 chaetigers and 35 mm long, in poor condition. **St. 244 (A.3148)**, off Praia do Malhão, 155 m, muddy sand: 1 incomplete specimen with about 72 chaetigers; proboscis lost; parapodia typical of the species. **St. 260 (A.3162)**, southwestern Pessegueiro Island, 127 m, muddy sand: 1 incomplete specimen with about 76 chaetigers, in poor condition; it dried and now is quite fragile and brittle; proboscis everted; identified by the parapodia; in one parapodium it is possible to see one everted branchia. **St. 263 (A.3165)**, southwestern Pessegueiro Island, 153 m, muddy sand: 1 incomplete specimen with 84 chaetigers, 15 mm long; proboscis everted. **St. 293 (A.3189)**, off Pessegueiro Island, 130 m, gravelly sand: 1 incomplete specimen, in good condition, with 74 chaetigers and everted proboscis. **SEPLAT 7 (2nd part) — St. 10 (A.4100)**, off Lagoa de Santo André, 118 m, sand: 1 incomplete specimen with about 40 chaetigers, plus one middle fragment with 19 chaetigers. **St. 21 (A.4081)**, north Sines, 116 m, sand with shells: 3 specimens; (1) complete, with 173 chaetigers, proboscis everted; (2) incomplete, with about 129 chaetigers, proboscis everted, posterior region very thin, probably close to the end of the body; (3) incomplete, with at least 55 chaetigers, prostomium and first chaetigers invaginated, proboscis inverted. **St. 26 (A.4086)**, north Sines, 140 m, sand: 3 middle and posterior fragments. **St. 34 (A.4073)**, north Sines, 144 m, sand: 1 incomplete specimen with prostomium and first chaetigers invaginated, plus one middle fragment with 16 chaetigers, and one posterior fragment with 40 chaetigers but without pygidium; it has at least 27 chaetigers; proboscis and mandibles, as well as a portion of the digestive tract continue posteriorly to the end of the fragment. **St. 131 (A.3978)**, off Sines, 115 m, muddy sand: 1 incomplete specimen with 112 chaetigers, 40 mm long, 5 mm wide. **St. 193 (2nd. try) (A.3919)**, south Sines, 69 m, sandy mud: 1 specimen, anterior region damaged. **St. 196 (A.3916)**, off Sines, 125 m, muddy sand: 1 middle fragment with 10 chaetigers; parapodia typical of the species. **St. 214 (A.3898)**, off Sines, 115 m, muddy sand: 1 specimen, almost complete, small, with 104 chaetigers, 20 mm long, 1 mm wide; branchiae not observed. **St. 242 (A.3884)**, off Vila Nova de Milfontes, 113 m, sandy mud: 1 incomplete specimen with 54 chaetigers; proboscis everted; plus one middle fragment with 29 chaetigers. **St. 265 (A.3866)**, off Cape Sardão, 227 m, muddy sand: 1 incomplete specimen with 53 chaetigers and everted proboscis, plus one middle fragment with 47 chaetigers. **St. 266 (A.3865)**, off Cape Sardão, 175 m, sand: 1 specimen, represented only by the inverted proboscis with the oral ring with the mandibles and ailerons attached; proboscideal papillae are the typical of *Glycera unicornis* and of *G. fallax*, but it was considered as being probably *G. unicornis*, as it is more frequent in the region and because the shape of the aileron resembles more the drawing given by BÖGGEMANN (2002) for this species. **St. 270 (A.3869)**, SW Cape Sardão, 243 m, muddy sand: 1 middle fragment with 20 chaetigers; identified with base on the parapodia; possible to see the pore of the retractile branchiae; besides, the postchaetal lobes are the typical of the species, with the notopodial lobe longer and triangular. **St. 271 (A.3863)**, off Praia de Odeceixe, 232 m, muddy sand: 1 incomplete specimen with 50 chaetigers; proboscis inverted; plus one middle fragment with 31 chaetigers. **St. 306 (A.3847)**, SW Praia de Odeceixe, 105 m, sand: 1 incomplete specimen with about 31 chaetigers, without jaws; juvenile. **FAUNA 1 — St. 0*A***, Galicia, off Cies Islands, Ria de Vigo, 82-96 m, unknown substrate: 2 incomplete specimens, with 130 and 110 chaetigers, with everted proboscis, plus one fragment with about 130 chaetigers; branchiae can be twice longer than the parapodia; proboscideal papillae rounded and conical. **St. 3*A***, Gulf of Cádiz, off Cádiz, 114-116 m, detritic: 1 specimen, almost complete, with about 180 chaetigers, for 40 mm long; proboscis everted. **St. 5*A***, Alborán Sea, off Veléz-Málaga, 67-68 m, mud: 3 incomplete specimens; 2 with the proboscis everted, with 68 and about 135 chaetigers; the third specimen is broken in 2 pieces, with 40 and 18 chaetigers. **St. 6*A***, Alborán Sea, off Nerja, 70-74 m, sand with mud: 1 middle fragment with 12 chaetigers; parapodia as described for the species. **St. 14*A***, Alborán Sea, off Castell de Ferro, Granada, 285-290 m, mud: 1 incomplete specimen with about 100 chaetigers; proboscideal papillae as described, plus 2 fragments, with 7 and 24 chaetigers. **St. 15*A***, Alborán Sea, off Adra, 274-306 m, mud: 3 specimens, plus one fragment with 16 chaetigers; in bigger specimens branchiae from chaetiger 25/30, numbering 1 per parapodium, located in the anterior face of the parapodium; 2 postchaetal lamellae, with the notopodial one chordate in shape; proboscideal papillae of 2 types: rounded and conical; mid-body segments biannulate; (1) incomplete, with about 146 chaetigers, 80 mm long, 5 mm wide, in the anterior region, proboscis everted; (2) about 130 chaetigers, 60 mm long, 5 mm wide in the anterior region; proboscis everted; (3) small specimen, 82 chaetigers, 20 mm long, 1.5 mm wide. **St. 25*A***, Alborán Sea, off Fuengirola, 227-233 m, mud: 3 big specimens, all incomplete; biggest specimen about 90 mm long, presenting some bifurcate branchiae, *i.e*, with a lateral expansion in the middle of the branchiae. **St. 66*A***, Gulf of Cádiz, off Cádiz, 25-28 m, muddy sand: 4 incomplete specimens; (1) poor condition, 73 chaetigers for about 20 mm long, inferior postchaetal lamellae with rounded tip; (2) almost complete, with about 210 chaetigers, proboscis everted, epitokous specimen, full of eggs; (3) about 150 chaetigers, proboscis everted, epitokous specimen; (4) poor condition, proboscis seems to be inverted, about 72 chaetigers. **St. 67*A***, Gulf of Cádiz, off Chipiona, 55-56 m, mud: 2 specimens; (1) incomplete with about 111 chaetigers, 105 mm long, proboscis inverted; (2) smaller, incomplete, proboscis everted, proboscideal papillae as described. **St. 69*A***, Gulf of Cádiz, off mouth of Guadiana, 110-112 m, mud: 1 incomplete specimen with 155 chaetigers, 50 mm long. **St. 70*A***, Gulf of Cádiz, off Isla Cristina, 22 m, muddy sand: 1 incomplete specimen with 159 chaetigers and 70 mm long, 3 mm wide (anterior region); proboscis everted, but jaws not observed; mid-body segments biannulated. **St. 71*A***, Gulf of Cádiz, off Islantilla, 13-15 m, muddy sand: 1 incomplete specimen with 42 chaetigers, in poor condition.

DISTRIBUTION: East Atlantic; coasts of Greenland; Norwegian Sea; North Sea; from southern coast of Bretagne (France) to the Atlantic coast of Morocco; Mediterranean Sea; Tyrrhenean Sea; Adriatic Sea;

Aegean Sea; Black Sea; West Africa; [?] west Indian Ocean; [?] Callao, Peru. Between 9-1024 meters (BÖGGEMANN, 2002).

GENUS ***Glycerella*** Arwidsson 1899

Glycerella ARWIDSSON, 1899: 25-26.
TYPE SPECIES: *Hemipodus (?) magellanicus* McIntosh 1885.
SYNONYMS: *Pseudolacydonia* Rullier 1964.

Glycerella magellanica (McIntosh 1885)

Hemipodus (?) magellanicus MCINTOSH, 1885*a*: 349-351, pl. 42 figs. 11-15, pl. 22*A* figs. 12-15, pl. 35*A* figs. 5, 7.
TYPE LOCALITY: Strait of Magellan, Chile.
SYNONYMS: *Glycerella atlantica* Wesenberg-Lund 1950; *Pseudolacydonia caeca* Rullier 1964.
SELECTED REFERENCES: *Glycerella magellanica* — ARWIDSSON, 1899: 26-27, pl. 2 fig. 22, pl. 3 fig. 52, pl. 4 fig. 57; DETINOVA, 1985*a*: 113, fig. 2*p*; BÖGGEMANN, 2002: 78-79, figs. 124-126. *Glycerella atlantica* — WESENBERG-LUND, 1950*a*: 24, pl. 5 fig. 22, pl. 6 fig. 28, map 31; O'CONNOR, 1987*b*: 172-173, figs. 1*a*, 3. *Pseudolacydonia caeca* — RULLIER, 1964: 151-153, fig. 8.
DISTRIBUTION: Strait of Magellan; North Atlantic, South of Iceland; Cape Verde Archipelago; Azores; Barbados; Marion and Prince Edward Islands; South Pacific. Between 45-1960 meters (BÖGGEMANN, 2002).

*FAMILY **GONIADIDAE** Kinberg 1866

AS: *GONIADEA* KINBERG, 1866*b*: 246.

TYPE GENUS: *Goniada* Audouin & Milne Edwards 1833.

REMARKS: The family Goniadidae was recently revised by BÖGGEMANN (2005), whose publication should be consulted for further information and details on the family. After this revision, the family was considered to have 63 valid species distributed by 8 genera, besides 4 species considered as *incertae sedis* or *nomina nuda*.

One of the species considered as *incertae sedis* by BÖGGEMANN (2005), was *Goniadella galaica* (Rioja 1923), described from the Isla de Tambo, Galicia (Northwestern Spain). However, it was suggested that the species could be similar to *G. bobrezkii*. As explained below, this species is valid, and seems to include *Goniadella bobrezkii* (Annenkova 1929) as a junior synonym.

The external surface of the everted proboscis in the genus *Glycinde* was divided by HARTMAN (1950) into well defined longitudinal areas covered by proboscideal papillae of characteristic shapes. BÖGGEMANN (2005) applied later this division to other genera of goniadids, namely to *Bathyglycinde* and *Goniadides*, besides *Glycinde*. The division is as follows: Area I – single and mid-dorsal; Area II – paired and dorso-lateral, with three, five or six rows of papillae, numbered from II-1 (dorsal) to II-6 (ventral); Area III – paired and lateral; Area IV – paired and latero-ventral; Area V – paired and ventro-lateral; Area VI – single, mid-ventral and always lacking papillae.

In the European and nearby waters, 5 genera and 13 species have been so far described or recorded. Six species, distributed by 3 genera were present among the studied material.

KEY TO GENERA:

(adapted from BÖGGEMANN, 2005)

1a. Proboscis with chevrons (might be lost in larger specimens of *Goniada gigantea*)..............................**2**
1b. Proboscis without chevrons...**4**

2a (1a). Usually all parapodia with falcigerous and spinigerous neurochaetae; parapodia biramous or subbiramous and/or uniramous..**3**
2b (1a). Usually all parapodia with only spinigerous neurochaetae; biramous parapodia present...***Goniada****

3a (2a). Biramous or subbiramous parapodia present...***Goniadella****
3b (2a). All parapodia uniramous..***Progoniada***

4a (1b). Notochaetae capillary...***Bathyglycinde***
4b (1b). Notochaetae stout, hooked at tip and with terminal pointed hood.................................***Glycinde****

GENUS ***Bathyglycinde*** Fauchald 1972

Bathyglycinde FAUCHALD, 1972*a*: 106-107.

TYPE SPECIES: *Bathyglycinde mexicana* Fauchald 1972.

KEY TO SPECIES:

(adapted from BÖGGEMANN, 2005)

1a. All parapodia with only one neuropodial prechaetal lobe; proboscideal area II with six rows of papillae; 32-39 uniramous parapodia (46-47 in one very large specimen)................................***B. profunda***
1b. Posterior parapodia with two neuropodial prechaetal lobes; proboscideal area II with five rows of papillae; 28-39 uniramous parapodia...***B. sibogana***

Bathyglycinde profunda (Hartman & Fauchald 1971)

Glycinde profunda HARTMAN & FAUCHALD, 1971: 74-76, pl. 4 figs. *c-e*.

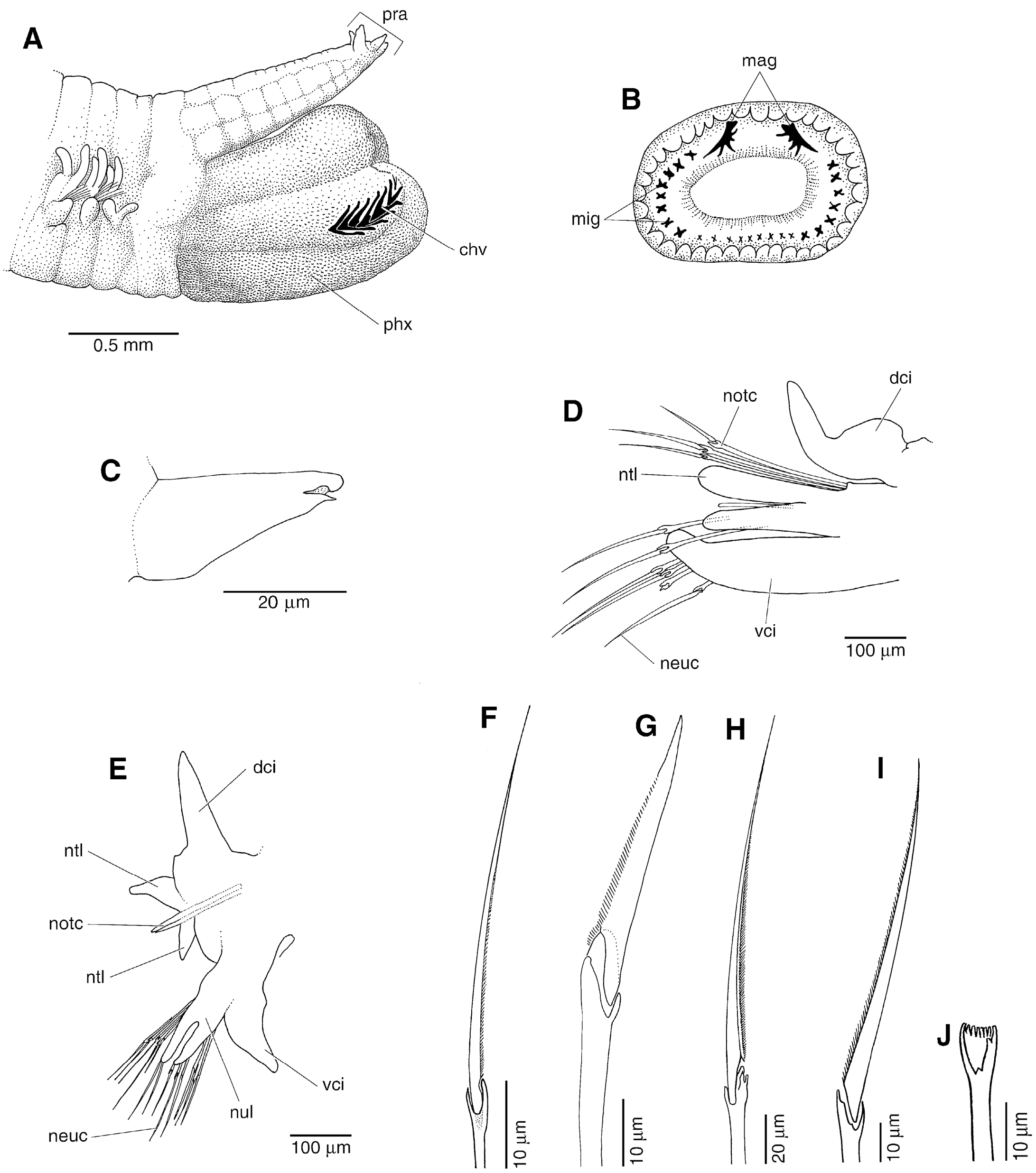

Figure legend: Family Goniadidae. **A**, *Goniada* specimen, anterior end with pharynx everted partially. **B**, *Glycinde* specimen, details of pharynx showing the micrognaths and macrognaths, terminal anterior view. **C**, *Glycinde* specimen, pharyngeal papillae. **D**, *Goniada* specimen, anterior parapodia. **E**, *Goniada* specimen, posterior parapodia. **F**-**J**, neurochaetae of *Goniada* specimen: **F**, compound chaeta from chaetiger 23; **G**, compound chaeta from chaetiger 21; **H**, compound chaeta from chaetiger 27; **I**, heterogomph spiniger from chaetiger 40; **J**, homogomph spiniger shaft. **chv**, chevron; **dci**, dorsal cirrus; **mag**, macrognaths; **mig**, micrognaths; **neuc**, compound neurochaeta; **notc**, notochaeta, spine-like; **ntl**, notopodial lobes; **nul**, neuropodial lobe; **phx**, pharynx; **pra**, prostomial appendages; **vci**, ventral cirrus. (Adapted from BEESLEY, ROSS & GLASBY, 2000; drawings by K. Nolan).

TYPE LOCALITY: Sargasso Sea, 35º50'N, 65º11'W, 4800 meters.

SELECTED REFERENCES: *Bathyglycinde profunda* — RIZZO, & AMARAL, 2004*b*: 938-942, figs. 1-21, table 1; BÖGGEMANN, 2005: 189-193, figs. 111-112.

DISTRIBUTION: Atlantic Ocean and northeast, east, and central Pacific; off Iceland; off Iberian Peninsula. Between 325-5500 meters.

Bathyglycinde sibogana (Augener & Pettibone *in* Pettibone 1970)

Glycinde sibogana AUGENER & PETTIBONE *in* PETTIBONE, 1970*b*: 244-245, figs. 40-41.

TYPE LOCALITY: Suwalesi (Celebes, Indonesia), 5º39'S, 122º12'E, 1886 meters, in solid green mud.

SELECTED REFERENCES: *Bathyglycinde sibogana* — RIZZO & AMARAL, 2004*b*: table 1; BÖGGEMANN, 2005: 196-198, figs. 115-116.

DISTRIBUTION: Indonesia; North East Atlantic, off Galicia; South West and East Atlantic; South Shetland Islands; Pacific Ocean. Between 1886-5424 meters.

*GENUS ***Glycinde*** F. Müller 1858

Glycinde F. MÜLLER, 1858: 214.

TYPE SPECIES: *Glycinde multidens* Müller 1858.

SYNONYMS: *Epicaste* Kinberg 1865; *Eone* Malmgren 1866.

****Glycinde nordmanni*** (Malmgren 1866)

Eone Nordmanni MALMGREN, 1866: 409-410.

TYPE LOCALITY: Coast of Bohuslän and Koster Island, Sweden.

SYNONYMS: *Goniada oculata* Treadwell 1901; *Eone longepapillata* Voit 1911.

SELECTED REFERENCES: *Eone Nordmanni* — FAUVEL, 1923*c*: 394-395, fig. 155*h-n*. *Glycinde nordmanni* — ARWIDSSON, 1899: 50-53, pl. 3 figs. 45-47, 53, pl. 4 64-65; KIRKEGAARD, 1992: 172-174, fig. 81; HARTMANN-SCHRÖDER, 1996: 246-248, fig. 112; BÖGGEMANN, 2005: 240-245, figs. 140-141.

REFERENCES FOR PORTUGAL: MONTEIRO-MARQUES, 1984 (as *Eone nordmanni*; Praia da Falésia); AMOUREUX, 1987 (off Aveiro); MONTEIRO-MARQUES, 1987 (as *Eone nordmanni*; continental shelf of Algarve); DEXTER, 1992 (as *Eone (Glycinde) nordmanni*; previous records: continental shelf of Algarve; Sines; Figueira da Foz); CANCELA DA FONSECA, COSTA & BERNARDO, 1989 (Lagoon of Santo André); RAVARA, 1997 (off Aveiro); present work (southwestern continental shelf).

MATERIAL: SEPLAT 7 (1st part) — St. 311 (A.3207), exact location unknown, off Pessegueiro Island, 120 m, rock, muddy sand: 1 incomplete specimen, about 27 mm long, 0.85 mm wide, 122 chaetigers; prostomium with about 10 annulations; 36 uniramous parapodia; chaetae as described; color brownish orange. **SEPLAT 7 (2nd part) — St. 33 (A.4074)**, north Sines, 156 m, gravelly sand: 1 incomplete specimen with about 126 chaetigers; notochaetae not detected before chaetiger 44. **St. 34 (A.4073)**, north Sines, 144 m, sand: 1 anterior fragment with 61 chaetigers; biramous parapodia from chaetiger 39; proboscis inverted. **St. 109 (A.3998)**, off Sines, 146 m, sand: 2 specimens, plus one middle fragment with 20 chaetigers, and one posterior fragment with 33 chaetigers; (1) incomplete, with 56 chaetigers, first 38 uniramous; in poor condition; possible to see the large proboscideal papillae through the body wall; inverted proboscis reaches chaetiger 29; (2) incomplete, with 79 chaetigers; biramous parapodia from chaetiger 39. **St. 110 (A.3997)**, off Sines, 160 m, gravelly sand: 1 incomplete specimen, with 44 chaetigers; biramous parapodia from chaetiger 37; poor condition. **St. 118 (A.3989)**, off Sines, 255 m, sand: 1 complete specimen, broken in 2 pieces; total number of chaetigers of 191 (anterior fragment with 132, posterior one with 59), 55 mm long, 1 mm wide; biramous parapodia from chaetiger 38; good condition. **St. 164 (A.3945)**, off Sines, 148 m, sand: 1 incomplete specimen, in poor condition; 36 uniramous parapodia. **St. 181 (A.3930)**, near Sines, 81 m, sand: 1 specimen in poor condition, incomplete, with 61 chaetigers, plus one fragment with 21 chaetigers; biramous parapodia from chaetiger 37; jaws can be seen through the body wall at the level of chaetiger 34. **St. 199 (A.3913)**, SW Sines, 155 m, sand: 2 specimens, one with 36 uniramous parapodia, and the other with 37. **St. 210 (A.3902)**, off Porto Covo, 163 m, sand: 1 complete specimen, with regenerated pygidium with one cirrus, and 91 chaetigers; about 37 anterior uniramous parapodia. **St. 211 (A.3901)**, south Sines, 140 m, muddy sand: 1 incomplete specimen, in good condition; 37 uniramous parapodia. **St. 254 (A.3876)**, off Cape Sardão, 71 m, sand: 1 incomplete specimen, with about 35 uniramous parapodia. **St. 254 (A.3877)**, off Cape Sardão, 74 m, sand: 1 fragment, with about 25 chaetigers; parapodia as described; notopodia with up to 3 chaetae. **St. 305 (A.3848)**, NW Arrifana, 120 m, sand: 1 posterior fragment with about 32 chaetigers; the posterior portion seems to be regenerating. **St. 318 (A.3843)**, near Arrifana, 54 m, sand: 1 very small specimen, with 34 chaetigers; no biramous parapodia; posterior region regenerating; proboscis partially everted, possible to see the papillae. **FAUNA 1 — St. 44*A***, Gulf of Cádiz, off Cádiz, 25-26 m, mud: 1 incomplete

specimen with 40 chaetigers; biramous parapodia from chaetiger 37. **St. 71*A***, Gulf of Cádiz, off Islantilla, 13-15 m, muddy sand: one middle fragment with 14 chaetigers; possible to see the notochaetae.
DISTRIBUTION: West Atlantic and Gulf of Mexico; Northeast Atlantic, from Iceland to Morocco; English Channel; Skagerrak; Kattegat; Mediterranean Sea; Adriatic Sea; Aegean Sea. On bottoms of sand and broken shells, mud and muddy sand. Between 9-470 meters; 1400 meters.

*GENUS ***Goniada*** Audouin & Milne Edwards 1833

Goniada AUDOUIN & MILNE EDWARDS, 1833*b*: 266.
TYPE SPECIES: *Goniada emerita* Audouin & Milne-Edwards 1833.
SYNONYMS: *Lacharis* Kinberg 1865; *Leonnatus* Kinberg 1865.

KEY TO SPECIES:

(adapted from BÖGGEMANN, 2005)

1a. Notochaetae acicular situated between dorsal cirrus and notopodium; body divided into anterior uniramous region followed directly by posterior biramous region with well developed notopodia; 46-69 uniramous parapodia........***G. emerita***
1b. Notochaetae capillary........**2**

2a (1b). Only four simple inverted Y-shaped or rod-like dorsal micrognaths with small bifid tips........**3**
2b (1b). Numerous compound usually H+v/w-shaped and sometimes additional small H- or X-shaped dorsal micrognaths........**5**

3a (2a). Lower neuropodial prechaetal lobe developed from parapodium 2-7 (up to 13 in juvenile specimens); notopodia subdivided into pre- and postchaetal lobes; 36-53 uniramous parapodia; terminal part of prostomium usually blunt; 4-20 pairs of chevrons........***G. brunnea***
3b (2a). Lower neuropodial prechaetal lobe developed from parapodium 14-51; notopodia not subdivided into pre- and postchaetal lobes; at least 23 uniramous parapodia; usually three compound ventral micrognaths........**4**

4a (3b). Up to 30 uniramous parapodia; usually 6-8 pairs of chevrons........***G. hexadentes***
4b (3b). 31-51 (60) uniramous parapodia; 3-11 pairs of chevrons........***G. maculata****

5a (2b). 29-38 uniramous parapodia........***G. norvegica****
5b (2b). At least 45 uniramous parapodia........**6**

6a (5b). 0-6 pairs of chevrons; ventral proboscideal papillae rounded, heart-shaped or triangular........***G. gigantea***
6b (5b). 9-36 pairs of chevrons; ventral proboscideal papillae in median part conical to globular with bifid tips........***G. vorax****

Goniada brunnea Treadwell 1906

Goniada brunnea TREADWELL, 1906: 1174, figs. 67-70.
TYPE LOCALITY: Off Maui Island, Hawaiian Islands, 202-220 fathoms (369.4-402.3 meters), on a bottom of gray sand and foraminifera.
SYNONYMS: *Goniada clavata* Kirkegaard 1995.
SELECTED REFERENCES: *Goniada brunnea* — BÖGGEMANN, 2005: 86-89, figs. 45-46. *Goniada clavata* — KIRKEGAARD, 1995: 28-30, fig. 16*a-d*.
DISTRIBUTION: North Atlantic, from off Iceland to Cape Finisterre; Indo Pacific; southwest, central and northeast Pacific. Between 18-2258 meters.
REMARKS: So far, the only Iberian record of the species is from off Cape Finisterre (Spain), collected by the *HMS Porcupine* at 81 fathoms (148 meters), on a bottom of sandy mud, in 1870. It was first identified by MCINTOSH (1905*a*) as *Goniada pallida*, and later (MCINTOSH, 1910) as *G. emerita* (see details in BÖGGEMANN, 2005: 302).

Goniada emerita Audouin & Milne-Edwards 1833

Goniada emerita AUDOUIN & MILNE-EDWARDS, 1833*b*: 268, pl. 18 figs. 1-4;
TYPE LOCALITY: Mediterranean Sea: Nice (France).
SELECTED REFERENCES: *Goniada emerita* — SAINT-JOSEPH, 1894: 33-37, pl. 2 figs. 43-50; FAUVEL, 1923*c*: 391-392, fig. 154*h-q*; BÖGGEMANN, 2005: 46-50, figs. 19-20.
REFERENCES FOR PORTUGAL: FAUVEL, 1913*a* (off Lagos); FAUVEL, 1914*f* (off Lagos); AMOUREUX, 1974*b* (off Porto); AMOUREUX & CALVÁRIO, 1981 (Lagoon of Óbidos); CAMPOY, 1982 (previous records: Porto); MONTEIRO-MARQUES, 1987 (continental shelf of Algarve); DEXTER, 1992 (previous records: continental shelf of Algarve; Sines); RAVARA, 1997 (off Aveiro); BÖGGEMANN, 2005 (previous records: Cape São Vicente).
DISTRIBUTION: Atlantic coast of South America; Northeast Atlantic, from Brittany to the Mediterranean Sea; Adriatic Sea; Aegean Sea; Red Sea; Indic coast of Africa; India; Indonesia; eastern coast of Australia; New Zealand; Hawaii. Between 5-550 meters.

Goniada gigantea (Verrill 1885)

Ophioglycera gigantea VERRILL, 1885*a*: 436.
TYPE LOCALITY: Harbor of Newport, Rhode Island, U.S.A..
SYNONYMS: *Ophioglycera grandis* Verrill 1885; *Goniada eximia* Ehlers 1900; *Goniada norvegica* var. *falklandica* Pratt 1901.
SELECTED REFERENCES: *Ophioglycera gigantea* — HARTMAN, 1944*e*: 339, pl. 15 [47] fig. 1, pl. 18 [50], fig. 4, pl. 25 [57] fig. 1. *Goniada gigantea* — BÖGGEMANN, 2005: 130-134, figs. 69-70.
DISTRIBUTION: Southern West and East Atlantic, Northern West Atlantic; Mediterranean Sea; Northeast Pacific. Intertidal-634 meters.

Goniada hexadentes Böggemann & Eibye-Jacobsen 2002

Goniada hexadentes BÖGGEMANN & EIBYE-JACOBSEN, 2002: 179-181, figs. 14-15.
TYPE LOCALITY: Andaman Sea (Thailand), 8º30'N, 98º6'E, at 42 meters, on muddy sand.
SELECTED REFERENCES: *Goniada hexadentes* — BÖGGEMANN, 2005: 117-120, figs. 61-62.
DISTRIBUTION: Northeast (Galicia) and east (Africa) Atlantic; Mediterranean Sea; Madagascar; Andaman Sea. On sandy bottoms. Between 5-148 meters.
REMARKS: *Goniada hexadentes* was described by BÖGGEMANN & EIBYE-JACOBSEN (2002) with base on specimens collected at the Andaman Sea. The species was first recorded for the Iberian Peninsula by BÖGGEMANN (2005), from off Cape Finisterre, with base on a specimen collected by the *HMS Porcupine* at 81 fathoms, at the same station as the specimen of *G. brunnea* referred above (see also details in BÖGGEMANN, 2005: 312), and from the Mediterranean coast of Spain.

Goniada hexadentes belongs to a group of species characterized by having 4 dorsal Y-shaped and 3 ventral H-shaped micrognaths and notopodia with single capillary chaetae, which also includes *G. maculata* (BÖGGEMANN & EIBYE-JACOBSEN, 2002). Species in this group are separated by the number of chevrons and the number of uniramous parapodia. *G. hexadentes* is characterized by presenting 6 chevrons on each side of the proboscis and 26 uniramous parapodia. Besides, the second lower pre-chaetal lobe appears around chaetigers 20-21.

Goniada hexadentes is quite close to *G. maculata*. However, BÖGGEMANN & EIBYE-JACOBSEN (2002) studied material collected from near the type locality of this species (Hellebæk, Denmark) and other locations in Europe, and considered that the *G. maculata* sensu stricto presented 7-11 pairs of chevrons, 38-41 uniramous chaetigers, and the second lower pre-chaetal lobe developed from chaetiger 25-32.

Later BÖGGEMANN (2005) considered a more wide definition of *Goniada maculata*, which included specimens not only from European populations, but also from a variety of other locations all around the world. In the wider definition of *G. maculata*, the species would include specimens with 3-11 chevrons on each side of the proboscis, 31-51 (60 in one case) uniramous parapodia, and the second lower pre-chaetal lobe developed from chaetiger 17-51. This way, the only clear difference between the two species seems to be the number of uniramous parapodia (26-30 against 31-51), which could be size-dependent. In my opinion the biggest part of the European records of *G. hexadentes* refer probably to young specimens of *G. maculata*. BÖGGEMANN (2005) states the great variation on *G. maculata*, especially in what concerns the number of uniramous parapodia, and also that these variations can be found even in the same area, which makes difficult to separate different taxa by using only morphological features. For the moment, I think it would be wiser to consider the European specimens that would key under *G. hexadentes* as belonging to *G. maculata*, as they would be probably closer to *G. maculata* than to *G. hexadentes*. A morphometrical study including different populations of *G. maculata* would be highly desirable in order to solve this case.

**Goniada maculata* Ørsted 1843

Goniada maculata ØRSTED, 1843*a*: 33-34, pl. 1 figs. 16, 23, pl. 6 figs. 91, 95, 97-98.

TYPE LOCALITY: Near Hellebæk, Denmark.

SYNONYMS: [?] *Glycera viridescens* Stimpson 1854; [?] *Goniada Alcockiana* Carrington 1865; [?] *Goniada felicissima* Kinberg 1865.

SELECTED REFERENCES: *Goniada maculata* — ARWIDSSON, 1899: 36-38, pl. 2 figs. 25-28, pl. 4 60-61; FAUVEL, 1923*c*: 392-393, fig. 154*a-g*; HARTMAN, 1950: 20, pl. 1 figs. 7-8; DAY, 1967: 367, fig. 16.4*k-n*; GARDINER, 1976: 167-169, fig. 19*c-f*; KIRKEGAARD, 1992: 174-176, fig. 82; HARTMANN-SCHRÖDER, 1996: 248-249, fig. 113; BÖGGEMANN, 2005: 104-115, figs. 57-58.

REFERENCES FOR PORTUGAL: BELLAN, 1960*a* (Cape Espichel); AMOUREUX, 1974*b* (off Aveiro); CAMPOY, 1982 (previous records: Portugal); SOUSA-REIS *et al.*, 1982 (Peniche region); AMOUREUX, 1987 (off Aveiro; off Porto); MONTEIRO-MARQUES, 1987 (continental shelf of Algarve); DEXTER, 1992 (previous records: continental shelf of Algarve; Sines; Arrábida; Peniche; Figueira da Foz; Ria de Aveiro); RAVARA, 1997 (off Aveiro); present work (southwestern continental shelf).

MATERIAL: SEPLAT 6 — St. 124 (A.2602), off Carrapateira, 135 m, sand: 1 complete specimen, in good condition, with about 130 chaetigers; biramous parapodia from chaetiger 31; second prechaetal lobe starts forming from chaetiger 25; anal cirri lost. **St. 238 (A.2706)**, off Praia da Amoreira, 157 m, sand: 1 incomplete specimen with 86 chaetigers, first 29 uniramous; a second prechaetal lobe appears 3 chaetigers before the biramous parapodia, small and ventral. **St. 286 (A.2747)**, off Praia de Odeceixe, 135 m, sand: 1 complete specimen, with about 105 chaetigers, coiled; first 30 chaetigers uniramous; from chaetiger 29 there are 2 prechaetal lobes present; this also happens in other specimens, with a small accessory ventral prechaetal lobe developing into a second prechaetal lobe, previously to the first occurrence of a biramous parapodium. **SEPLAT 7 (1st part) — St. 42 (A.2975)**, off Zambugeira do Mar, 292 m, muddy sand: 1 specimen in very poor condition, having been dried; incomplete, with 64 chaetigers; first 37 chaetigers uniramous; 7 chevrons. **St. 127 (A.3054)**, off Praia de Almograve, 113 m, sandy mud: 1 specimen in poor condition, incomplete, with 57 chaetigers; biramous parapodia from chaetiger 32. **St. 169 (A.3091)**, off Vila Nova de Milfontes, 300 m, muddy sand: 1 incomplete specimen, in very poor condition, with about 110 chaetigers; fist 37 chaetigers uniramous; possible to see the jaws through the body wall: 3 minute dorsal micrognaths, 3 larger ventral micrognaths, and 2 macrognaths with about 4 fangs; 8 chevrons. **St. 174 (A.3096)**, off Vila Nova de Milfontes, 238 m, muddy sand: 1 incomplete specimen, in poor condition; 93 chaetigers, first 36 uniramous. **St. 199 (A.3111)**, off Vila Nova de Milfontes, 190 m, muddy sand: 1 incomplete specimen, with 86 chaetigers; first 37 chaetigers uniramous; proboscis with 8 chevrons in one side; plus one fragment with 26 chaetigers. **St. 209 (A.3121)**, off Vila Nova de Milfontes, 187 m, sand: 1 incomplete specimen, with about 130 chaetigers; biramous parapodia from chaetiger 30. **St. 234 (A.3138)**, off Vila Nova de Milfontes, 237 m, muddy sand: 1 incomplete specimen with 80 chaetigers; biramous parapodia from chaetiger 37. **St. 239 (A.3143)**, off Praia do Malhão, 302 m, muddy sand: 1 specimen in poor condition, with about 20 chaetigers, plus 3 fragments; 8 chevrons; proboscideal papillae as described. **SEPLAT 7 (2nd part) — St. 5 (A.4095)**, off Lagoa de Santo André, 140 m, sand with shells: 1 incomplete specimen, with 77 chaetigers; biramous parapodia from chaetiger 31. **St. 7 (A.4097)**, off Lagoa de Santo André, 132 m, sand with shells: 1 incomplete specimen with about 108 chaetigers; biramous parapodia from chaetiger 29; good condition; big specimen. **St. 21 (A.4081)**, north Sines, 116 m, sand with shells: 1 incomplete specimen, very small, with 48 chaetigers; biramous parapodia from chaetiger 31. **St. 22 (A.4082)**, north Sines, 122 m, sand: 1 incomplete specimen with 53 chaetigers; biramous parapodia from chaetiger 31. **St. 23 (A.4083)**, north Sines, 127 m, sand: 1 fragment with 19 biramous chaetigers. **St. 36 (A.4071)**, north Sines, 128 m, gravelly sand: 1 incomplete specimen with 63 chaetigers; biramous parapodia from chaetiger 30. **St. 39 (A.4068)**, north Sines, 110 m, sand with shells: 3 specimens; (1) complete, with 124 chaetigers, biramous parapodia from chaetiger 29, one small anal cirrus; (2) incomplete, with 100 chaetigers and biramous chaetigers from chaetiger 29; (3) incomplete, with 89 chaetigers and biramous parapodia from chaetiger 30. **St. 92 (A.4015)**, near Sines, 160 m, sand: 1 incomplete specimen with 76 chaetigers; prechaetal neuropodial lobe bilobate from about chaetiger 32; biramous parapodia from chaetiger 37; color light brown. **St. 175 (A.3935)**, off Sines, 205 m, gravelly sand: 1 incomplete specimen, with 65 chaetigers; first 37 chaetigers uniramous; plus 2 fragments, one with 12 and the other with 17 chaetigers. **St. 177 (A.3934)**, off Sines, 141 m, sand: 1 incomplete specimen, very big, with 149 chaetigers, 50 mm long, 0.6 mm wide; biramous parapodia from chaetiger 39. **St. 185 (A.3926)**, near

Sines, 37 m, sandy mud: 2 incomplete specimens, plus 3 middle fragments with 43, 47 and 49 chaetigers, and one posterior fragment with 26 chaetigers and pygidium; (1) small specimen, damaged by a previous study (chevrons and buccal apparatus lost), with 53 chaetigers; 41 uniramous parapodia, first 32 of which with only one prechaetal lobe; (2) 99 chaetigers, with 40 uniramous. **St. 199 (A.3913)**, SW Sines, 155 m, sand: 1 incomplete specimen with 127 chaetigers; first 37 chaetigers uniramous; plus one fragment with about 36 chaetigers. **St. 214 (A.3898)**, off Sines, 115 m, muddy sand: 1 very small specimen, incomplete, with 25 chaetigers, all uniramous; about 11 chevrons can be perceived through the body wall, between the 3rd and the 4th chaetiger. **St. 242 (A.3884)**, off Vila Nova de Milfontes, 113 m, sandy mud: 4 incomplete specimens, one of which very big and other in poor condition, plus 3 middle fragments with 15, 23, and 32 chaetigers; (1) 73 chaetigers, biramous parapodia from chaetiger 31; (2) 57 chaetigers, biramous parapodia from chaetiger 37; (3) 43 chaetigers, biramous parapodia from chaetiger 30; (4) 50 chaetigers, biramous parapodia from chaetiger 31. **St. 265 (A.3866)**, off Cape Sardão, 227 m, muddy sand: 1 incomplete specimen, with about 100 chaetigers; biramous parapodia from chaetiger 38; 8 chevrons; prostomium missing. **St. 266 (A.3865)**, off Cape Sardão, 175 m, sand: 1 incomplete specimen, with 45 chaetigers; biramous parapodia from chaetiger 37. **St. 272 (A.3861)**, off Praia de Odeceixe, 305 m, muddy sand: 1 incomplete specimen with 60 chaetigers; biramous parapodia from chaetiger 36; good condition. **St. 305 (A.3848)**, NW Arrifana, 120 m, sand: 1 specimen, apparently complete, but anal cirri lost; very small, with 40 chaetigers; biramous parapodia from chaetiger 31. **St. 306 (A.3847)**, SW Praia de Odeceixe, 105 m, sand: 1 complete specimen, small, maybe a juvenile, in good condition; 59 chaetigers; biramous parapodia from chaetiger 30. **FAUNA 1 — St. 38*A***, Alborán Sea, off Punta de la Chullera, 60-62 m, mud: 2 incomplete specimens; (1) 47 chaetigers, biramous parapodia from chaetiger 30, chevrons not seen, in spite of the proboscis been everted; (2) 19 chaetigers, 6 chevrons.

DISTRIBUTION: Arctic; Faroes; North Atlantic, from the North Sea to the Mediterranean Sea; Adriatic Sea; Aegean Sea; Caribbean Sea; Barents Sea; east and southeast Atlantic; South Africa; Bering Sea; North Pacific; Southeast Pacific. Intertidal to 3859 meters.

REMARKS: Check the *REMARKS* section under *G. hexadentes*.

****Goniada norvegica*** Ørsted 1845

Goniada norvegica ØRSTED, 1845*b*: 411-412, pl. 5 figs. 7-9.

TYPE LOCALITY: Oslofjord, near Drøbak (Norway).

SYNONYMS: *Goniada magna* Treadwell 1945.

SELECTED REFERENCES: *Goniada norvegica* — ARWIDSSON, 1899: 38-40, pl. 2 figs. 29-30; FAUVEL, 1923*c*: 393-394, fig. 155*a-g*; GARDINER, 1976: 170-171, fig. 20*a-b*; KIRKEGAARD, 1992: 176-178, fig. 83; HARTMANN-SCHRÖDER, 1996: 249-250; BÖGGEMANN, 2005: 120-124, figs. 63-64.

REFERENCES FOR PORTUGAL: AMOUREUX, 1974*b* (off Porto); CAMPOY, 1982 (previous records: Portugal); MONTEIRO-MARQUES, 1987 (continental shelf of Algarve); DEXTER, 1992 (previous records: continental shelf of Algarve).

MATERIAL: FAUNA 1 — St. 29*A*, Alborán Sea, Djibouti Bank, off Nerja, 400-411 m, mud: 1 incomplete specimen, with 145 chaetigers, about 100 mm long, 0.4 mm wide; 19 chevrons; 32 anterior uniramous parapodia, with 2 prechaetal lobes; about 50 chaetigers of transition; biramous parapodia with 2 prechaetal lobes longer than the postchaetal lobe; shape of parapodia as described for the species. **St. 77*A***, Gulf of Cádiz, off Cádiz, 500-504 m, mud: 1 incomplete specimen, very long and coiled; proboscis everted, with 22/24 chevrons; 34 anterior uniramous parapodia; about 50 chaetigers of transition.

DISTRIBUTION: North Atlantic, from the North Sea to the Mediterranean Sea; Adriatic Sea; Aegean Sea; Skagerrak; Barents Sea. In mud, or fine sand. Between 60-760 meters.

****Goniada vorax*** (Kinberg 1866)

Leonnatus vorax KINBERG, 1866*b*: 247.

TYPE LOCALITY: Atlantic Ocean, off Brazil, 40º55'W, 22º30'S, at 20-30 fathoms (36.6-55 meters).

SYNONYMS: *Goniada pallida* Arwidsson 1899; *Goniada distorta* Moore 1903; *Goniada eximia* Benham 1909; *Goniada maorica* Benham 1932; *Goniada sagamiana* Imajima 2003.

SELECTED REFERENCES: *Goniada vorax* — BÖGGEMANN, 2005: 126-130, figs. 67-68. *Goniada pallida* — ARWIDSSON, 1899: 43-45, pl. 2 figs. 35-39; KIRKEGAARD, 1992: 178, fig. 84; HARTMANN-SCHRÖDER, 1996: 250. *Goniada sagamiana* — IMAJIMA, 2003: 121-125, figs. 72-74.

REFERENCES FOR PORTUGAL: MCINTOSH, 1905*a* (as *Goniada pallida*; Cape Sagres); MCINTOSH, 1910 (publication not seen; as *Goniada pallida*; Cape Sagres); RIOJA, 1918*b* (as *Goniada emerita*; previous records: Cape Sagres); HARTMANN-SCHRÖDER, 1977*a* (as *Goniada* sp.; Bay of Setúbal); CAMPOY, 1982 (as *Goniada pallida*; previous records: Cape Sagres); BÖGGEMANN, 2005 (NW Cape Sagres; Bay of Setúbal); present work (southwestern continental shelf).

MATERIAL: SEPLAT 7 (1st part) — St. 202 (A.3114), off Vila Nova de Milfontes, 255 m, muddy sand: 1 incomplete specimen, with 90 chaetigers, about 45 mm long, and 1.5 mm wide; 45 uniramous anterior parapodia; these parapodia have 2 prechaetal lobes; dorsal chaetae of biramous parapodia capillary; postchaetal lobe longer than prechaetal ones. **St. 245 (A.2712)**, off Praia da Amoreira, 372 m, sandy mud: 1 incomplete specimen with 70 chaetigers; biramous parapodia from chaetiger 51; prostomium with 8 rings; without color marks. **[?] St. 188**, 149 m, rest of data unknown: 1 specimen. **SEPLAT 7 (2nd part) — St. 107 (A.4000)**, off Sines, 133 m, muddy sand: 1 specimen in poor condition; 19 chevrons; also possible to see the jaws. **St. 175 (A.3935)**, off Sines, 205 m, gravelly sand: 1 fragment with 9 chaetigers; parapodia just like the ones from the other specimens. **St. 200 (A.3912)**, SW Sines, 200 m, gravelly sand: 2 fragments, one middle with 17 chaetigers, and the other posterior, with 35 chaetigers; coloration typical of the species, including a posterior longitudinal ventral stripe. **St. 212 (A.3900)**, south Sines, 140 m, muddy sand: 1 incomplete specimen, with 76 chaetigers, 50 mm long, 1.5 mm wide; about 48 anterior chaetigers uniramous; light tan coloration, except in the parapodia, where it is dark brown. **FAUNA 1 — St. 3*A***, Gulf of Cádiz, off Cádiz, 114-116 m, detritic: 1 incomplete specimen, with 87 chaetigers, 45 mm long, 1.5 mm wide; 45 anterior chaetigers uniramous; rest as described.

DISTRIBUTION: West Atlantic; Caribbean Sea; Brazil; northeast Atlantic (North Sea, British Isles, Portugal); Mediterranean Sea; Indian Ocean; Indonesia; Japan; New Zealand. Between 7-512 meters.

REMARKS: This species was recorded for the first time in the Iberian Peninsula as *Goniada vorax* by BÖGGEMANN (2005). The records refer to a specimen collected by the HMS *Porcupine* in 1870, 8 miles NW of the Cape Sagres (Portugal), at 45 fathoms (82.3 meters), and identified first by MCINTOSH (1905*a*) as *Goniada emerita*, and later as *G. pallida* (MCINTOSH, 1910), and to a second specimen collected by the R/V *Meteor* in 1967, off Portugal, at 85-90 meters, as identified as *Goniada* sp. by HARTMANN-SCHRÖDER (1977*a*: 89, figs. 50-52) (see details in BÖGGEMANN, 2005: 329).

*GENUS ***Goniadella*** Hartman 1950

Goniadella HARTMAN, 1950: 41-42.

TYPE SPECIES: *Eone gracilis* Verrill 1874.

KEY TO SPECIES:

(adapted from BÖGGEMANN, 2005):

1a. Subbiramous parapodia with acicular notochaetae arising dorsal to dorsal cirri; 21-24 uniramous parapodia............***G. galaica****

1b. Subbiramous parapodia with acicular notochaetae arising at level of dorsal cirri; 26-30 uniramous parapodia............***G. gracilis****

****Goniadella galaica*** (Rioja 1923)

Goniada galaica RIOJA, 1923*b*: 338-341, figs. 1-3.

TYPE LOCALITY: Tambo Island, Marín (Galicia, Northwestern Spain).

SYNONYMS: *Goniada bobrezkii* Annenkova 1929.

SELECTED REFERENCES: *Goniada bobrezkii* — ANNENKOVA, 1929*d*: 495-497, figs. 1-5; ZIEGELMEIER, 1953: 255-259, fig. 1, tables 1-2; MARINOV, 1959*a*: 88-89, fig. 5; BÖGGEMANN, 2005: 151-155, figs. 84-85. *Goniadella bobretzkii* — HARTMANN-SCHRÖDER & STRIPP, 1968: 15; HARTMANN-SCHRÖDER, 1971*a*: 242; WALKER, 1972: 85, table 1; WOLFF & STEGENGA, 1975: 85-87, fig. 3; KIRKEGAARD, 1992: 179-181, fig. 85; HARTMANN-SCHRÖDER, 1996: 250-251, fig. 114; BÖGGEMANN, 1997: 97, fig. 68. Not *Goniadella bobretzkii* — HARTMANN-SCHRÖDER, 1981: 32 [= *Progoniada regularis* Hartman 1965].

REFERENCES FOR PORTUGAL: MONTEIRO-MARQUES, 1984 (as *Goniada galaica*; Praia da Falésia); MONTEIRO-MARQUES, 1987 (as *Goniada galaica*; continental shelf of Algarve); QUINTINO & GENTIL, 1987 (as *Goniada galaica*; Lagoon of Albufeira); DEXTER, 1992 (previous records: Ria Formosa; Ria de Alvor; continental shelf of Algarve; Lagoon of Óbidos; Figueira da Foz); RAVARA, 1997 (as *Goniada galaica*; off Aveiro); MUCHA & COSTA, 1999 (as *Goniada galaica*; Ria de Aveiro and/or Sado Estuary).

MATERIAL: SPAIN: — Combarro, Ría de Pontevedra; Pontevedra [España] [Atlántico]; Neotype, 1 complete specimen (25425 µm long, 275 µm wide at chaetiger 10, 107 chaetigers, uniramous region with

22 chaetigers, 18/20 chevrons) (MNCN 16.01/10110); ENE 77; Coll. J.M. Viéitez; Det.: G. San Martín & J.M. Viéitez (as *Goniada galaica*). SPAIN: — Combarro, Ría de Pontevedra; Pontevedra [España] [Atlántico]; 15 complete specimens and 9 incomplete specimens (MNCN 16.01/295); ENE 77; Coll. J.M. Viéitez; Det.: G. San Martín & J.M. Viéitez (as *Goniada galaica*). SPAIN: — Baiona (Galicia), St. D17, 47º7'30"N, 8º50'15"W, 7 meters, Coll. and Det. Juan Moreira (as *Goniadella galaica*): June 1996, fine sand, pelits 4.1%, 3 complete specimens; September 1996, muddy sand, pelits 6.02%, 2 complete specimens.

DISTRIBUTION: Northeast Atlantic, from the North Sea to the Mediterranean Sea; Aegean Sea; Black Sea. In sandy bottoms. In shallow water, between 5-100 meters.

REMARKS: *Goniadella bobrezkii* (Annenkova 1929) seems to be a junior synonym of *G. galaica* (Rioja 1923), and will treated as so here. A paper on this synonymy is on preparation, but some comments on the issue will be given here.

In 1923 Enrique Rioja published an account on the annelids collected at A Coruña and Marín (Galicia, Spain), during a stay from July to September of 1922. Besides a list of 72 species of Polychaeta, many of them new records for the Iberian waters, Rioja presented the description of a new species, *Goniada galaica*, collected at the Island of Tambo, near Marín (Ría de Pontevedra) (RIOJA, 1923*b*). The type material was deposited at the Museo Nacional de Ciencias Naturales de Madrid, but later it was considered to be lost (RIOJA, 1923*b*: 341; SAN MARTÍN & VIÉITEZ, 1991; OSCAR SORIANO, pers. com. October 1999).

For more than 50 years, the only record of the species remained the original one. All the posterior references to *Goniada galaica* Rioja 1923 were made with basis on the original description. Shortly after its publication, the description was translated to French and included in the second volume of the polychaetous annelids of "*Faune de France*" (FAUVEL, 1927*a*). The same description served for comparison purposes in order to justify the description as new of a close species from the Black Sea, *Goniada bobrezkii*, by ANNENKOVA (1929*d*).

It was only in the late 1970's, when the studies on the benthic marine fauna of the Galician Rías flourished, that new findings of *Goniada galaica* were made, and new ecological data on the species known (*e.g.* ANADON, 1977; VIÉITEZ, 1978; MORA, 1979; VIÉITEZ, 1981; LABORDA & VIÉITEZ, 1984; PLANAS, RODRÍGUEZ-REY & MORA, 1984). However, no author made a new description of the species, and all of them used, once again, the original one.

In the meantime, *G. bobrezkii* was described by ANNENKOVA (1929*d*) from the Black Sea (as *Goniada*), with base on two specimens, one collected at 44º20'05"N, 33º30'12"E, at the south coast of Crimea, near the Monastery of Georgievskij, on sand mixed with gravel, at 12.5 meters, and the second at Dwujakornaja Bay, near Cape Ilja, in sand with shell fragments, at 17 meters. According to BÖGGEMANN (2005), the type material consists nowadays on two middle fragments from the first locality, and on another middle fragment from the second one. The species was later reported by VINOGRADOV (1949) from Karadag, also on Crimea, and by MARINOV (1959*a*), who collected three specimens in Nesebâr Bay, Bulgaria.

The first report of the species from outside the Black Sea was done by ZIEGELMEIER (1953), from western Sylt (German Bight). Other records followed, for the same region, all of them as *Goniadella bobretzkii*, and some including illustrated descriptions (*e.g.*, ZIEGELMEIR, 1963; HARTMANN-SCHRÖDER & STRIPP, 1968; HARTMANN-SCHRÖDER, 1971*a*; HARTMANN-SCHRÖDER, 1974*d*; WOLFF & STEGENGA, 1975; DAUVIN & GENTIL, 1980; KIRKEGAARD, 1992; PLATE & HUSEMANN, 1994; HARTMANN-SCHRÖDER, 1996; BÖGGEMANN, 1997).

Goniada bobrezkii Annenkova 1929 was first included in the genus *Goniadella* by HARTMANN-SCHRÖDER & STRIPP (1968), after being recorded from the German Bight (see references above). The possibility that *Goniada galaica* should also be included in the genus *Goniadella* was first mentioned by WALKER (1972), when recording the finding of *Goniadella gracilis* (Verrill 1874) at the Liverpool Bay, but he considered that a definitive statement on the generic location of *G. galaica* required the examination of further specimens. Finally, it was first cited under the new combination by DEXTER (1992), on a checklist of soft bottom invertebrates of the Portuguese benthos, apparently without studying specimens, and later by RIZZO & AMARAL (2004*a*), on a comparative table between species of the genus.

While elaborating the catalogue of the polychaetous annelids deposited at the Museo Nacional de Ciencias Naturales de Madrid, San Martín and Viéitez deposited some specimens of *Goniada galaica* from Viéitez's collection, in order to mitigate the lost of the type material and keep the species represented in the Museo's collections (SAN MARTÍN & VIÉITEZ, 1991). These worms had been collected at Combarro (Ría de Pontevedra, Galicia, Spain), at about 1 Km from the type locality (Isle of Tambo) and on the same environmental conditions, and had been referred in previous works (*e.g.* VIÉITEZ, 1981). The same authors didn't designate a neotype for the species as, according to them, the exceptional conditions established at the article 75 of the International Code of Zoological Nomenclature weren't present: the species was correctly described in the original paper by RIOJA (1923*b*) and the specimens included in the collection fitted that description.

When checking these specimens against the original description, it was found that the description by RIOJA (1923*b*) didn't correspond to the observed on the topotype specimens in some aspects, due to incorrections in the original descripton. Besides, they fitted closely the description of *Goniadella bobrezkii* (Annenkova 1929), which could be a junior synonym of the first species. In order to stabilize the nomenclature, a neotype was designated, and a redescription of the species is being prepared.

Due to the impossibility of studying the type specimens of *Goniadella bobrezkii*, it was made an effort to obtain other specimens from the Black Sea region, in order to compare them with the Galician specimens. Dr. Galena Vantsetti Murina (pers. com. October 2002) has on her collection a single specimen in poor condition of this species, collected at the Karadag' Natural Marine Reservation, on East Crimea. Other specimens are deposited at the collection of Dr. Ivan Sinegub, from the Odessa Branch of the Institute of Biology of the Southern Seas, Academy of Sciences of Ukraine. However, it wasn't possible to study any these specimens. According to Dr. Murina (pers. com. October 2002) the species is rare in Ukrainian waters.

MARINOV (1959*a*) had collected three specimens in Nesebâr Bay (Bulgaria). However these specimens are not deposited at the Institute of Zoology nor at the National Museum of Natural History, both belonging to the Bulgarian Academy of Sciences (Dr. Pavel Stoev, pers. com. December 2003). Dr. Tenyo Marinov worked at the Aquarium in Varna and probably his collection has been there, but part of his material has been probably lost after his retirement. (Dr. Pavel Stoev, *ibid*). Besides, *Goniadella bobrezkii* has not been found in the Bulgarian coast for the last 10-15 years, and the place where Marinov found his specimens has nowadays a very strong human pressure (Dr. Pavel Stoev, *ibid*).

In spite of this, the material from the type locality of *Goniadella galaica* fits the description of the *Goniadella bobretzii* from the North Sea, and these are here referred to *G. galaica*. Besides, the description given by ANNENKOVA (1929*d*) of *G. bobrezkii* agrees with the observed for *G. galaica*, and both species are here considered as being synonymous.

****Goniadella gracilis*** (Verrill 1874)

Eone gracilis VERRILL, 1874*c*: 508, 596.

TYPE LOCALITY: Off Gay Head, Massachussets (USA), at 19 fathoms (34.7 meters), in soft mud.

SYNONYMS: *Goniadella unicirra* Campoy & Aguirrezabalaga *in* Aguirrezabalaga 1984.

SELECTED REFERENCES: *Goniada gracilis* — WEBSTER & BENEDICT, 1884: 723-724, pl. 5 figs. 49-52; HARTMAN, 1944*e*: 339, pl. 15 [47] fig. 2, pl. 18 [50] fig. 3. *Goniadella gracilis* — HARTMAN, 1950: 42-44, pl. 5 figs. 4-8; DAY, 1963*b*: 408; DAY, 1967: 368, fig. 16.4.*o-t*; IMAJIMA, 1970: 121; WALKER, 1972: 85-87, tables I-II; BÖGGEMANN, 2005: 143-146, figs. 78-79. *Goniadella unicirra* — AGUIRREZABALAGA, 1984: 122-123, fig. 1.

REFERENCES FOR PORTUGAL: RAVARA, 1997 (off Aveiro).

MATERIAL: LECTOTYPE of *Goniadella unicirra* Campoy & Aguirrezabalaga *in* Aguirrezabalaga 1984: MZNA-TS-676 (slide). **FAUNA 1 — St. 0*A***, Galicia, off Cies Islands, Ria de Vigo, 82-96 m, unknowm substrate: 1 incomplete specimen, with 29 chaetigers, all uniramous; 24/25 chevrons on the proboscis; 2 macrognaths (lateral), plus 3 ventral micrognaths and 13 dorsal micrognaths (1 small + 3 big + 1 small + 3 big + 1 small + 3 big + 1 small). **St. 56*A***, Gulf of Cádiz, off Cape Trafalgar, 24 m, rock and gravel: 1 small and incomplete specimen, in a very poor condition; prostomium damaged and incomplete; chaetae with all blades missing; 38 chaetigers, the first 29 of which are uniramous; biramous chaetigers normally with 3 acicular notochaetae; proboscis with 27 chevrons.

DISTRIBUTION: Northwest Atlantic, from the Norwegian Sea to Northwest Africa; Mediterranean Sea; Atlantic coast of USA; South Africa; Japan. In sand and muddy sand. Intertidal to 545 meters.

REMARKS: *Goniadella unicirra* Campoy & Aguirrezabalaga *in* Aguirrezabalaga 1984, was described with base on 20 specimens from two different stations at Punta Endata (Guipúzcoa, Spain): 2 specimens from Station 0604 (Station 0419 in CAMPOY, 1982), from a bottom of "*Amphioxus*" sand at 30 m, 7/7/1976; and 18 specimens from Station 0605 (Station 0420 in CAMPOY, 1982), from a bottom of muddy sand at 70 m, 7/7/1976. All these specimens were thought to be lost, as they weren't deposited at the INSUB's collection, at Donóstia (Dr. F. Aguirrezabalaga, pers. com., May 2002), and weren't present at the type series collection of the Zoological Museum of the University of Navarra (Dr. A. Ariño, pers. com., June 2002). According to Dr. Ariño (pers. com., July and Agost 2002), after Dr. Campoy's death, in 1980, part of the material he was studying was relabeled by the laboratorial technicians, transcribing

Campoy's own provisional labels. This way, there was a possibility that *G. unicirra* material was kept under a different name.

A search was performed among Campoy's collection for specimens belonging to the family Goniadidae. Campoy's collection included only three specimens belonging to this family: two mounted on permanent microscope slides (labeled as *Goniada maculata* SA2, and *Goniada emerita* Endata 30), and a third in a vial (with two labels: *Goniadella* sp M.2.; 10/01/08/21/05; Punta Endata 8-7-76; st 0419; and the second label: 10 01 01; 14 02 01).

The specimen in the vial, *Goniadella* sp. M.2., is a complete juvenile specimen of *Goniadella* sp., with 19 chaetigers for 2,3 mm long, 4 pairs of chevrons, 6 micrognaths and 2 macrognaths. No biramous chaetiger is present, which makes its identification at the specific level not possible. The station where it was collected corresponds to one of the type material (Campoy's St. 0419, see above), as well as the month and year of collection (July 1977), but not the day (the 8th, instead of the 7th quoted by AGUIRREZABALAGA (1984); however this could be a minor error). However, there is no clear indication of it being one of the 20 syntypes used for the description of the species, and it isn't considered here as belonging to the type material. Its museum code is *MZNA 2909*.

Both mounted specimens proved to be erroneously labeled, probably due to the transcription of the provisional labels when Campoy's material under work was catalogued.

The specimen labeled as *Goniada maculata* SA2, is an anterior fragment of *Glycinde nordmanni* (Malmgren 1865) with 28 uniramous chaetigers and two separated biramous posterior parapodia (presumably from the same segment). The structure of the biramous parapodia, the shape of the notopodial chaetae, and the absence of chevrons on the proboscis, as well as the proboscideal papillae possible to see due to the diaphanization of the specimen, are typical of the species (*e.g.*, see HARTMANN-SCHRÖDER, 1996: fig. 122). There is no information on the locality where it was collected. Maybe it is one of the specimens offered by Dr. López-Jamar to Dr. Campoy (CAMPOY, 1982: page 534). Its new museum code is *MZNA 136003*.

The other mounted specimen, labeled as *Goniada emerita* Endata 30, is the syntype of *Goniadella unicirra* Campoy & Aguirrezabalaga *in* Aguirrezabalaga 1984 used for both the description and drawings of the species. It is mounted upside down, and is now diaphanous and squeezed by the cover slip. As it is actually the only known available original specimen, it was designated as lectotype of the species.

From the low number of micrognaths and chevrons, and by the small size of the worm, it is possible to see that the specimen is a juvenile. As already stated by BÖGGEMANN (2005), and also according to my own observations, the species must be considered as being a junior synonym of *Goniadella gracilis* (Verrill 1874). The presence of one single anal cirrus on the pygidium is the consequence of the lost of the second one, which place of insertion can still be seen in the lectotype.

GENUS ***Progoniada*** Hartman 1965

Progoniada HARTMAN, 1965*b*: 100.

TYPE SPECIES: *Progoniada regularis* Hartman 1965.

REMARKS: The Mediterranean record of *Progoniada* sp. by GAMBI & GIANGRANDE (1989) refers to a juvenile specimen of *Goniada* sp. (see BÖGGEMANN, 2005: 329). For the moment this genus is not known to occur in the Mediterranean, but the record of the species from the Gibraltar Strait by BÖGGEMANN (2005), based on a specimen previously identified by HARTMANN-SCHRÖDER (1981) as *Goniadella bobretzkii*, makes probable its presence also in the Mediterranean Basin.

Progoniada regularis Hartman 1965

Progoniada regularis HARTMAN, 1965*b*: 100-101, pl. 16.

TYPE LOCALITY: Bermuda, 32º16'30"N, 64º42'30"W, in 100 meters.

SYNONYMS: *Progoniada simplex* Hartman 1971.

SELECTED REFERENCES: *Progoniada regularis* — AMOUREUX, 1982*a*: 46-47, fig. 9; AMOUREUX, 1986: 600; RIZZO & AMARAL, 2004*a*: 48-52, figs. 1-3, table 1; BÖGGEMANN, 2005: 155-160, figs. 86-88. *Progoniada simplex* — HARTMAN, 1971: 1408-1409, fig. 1. *Goniadella bobretzkii* [not Annenkova 1929] — HARTMANN-SCHRÖDER, 1981: 32.

DISTRIBUTION: Arctic and Antarctic Oceans; Atlantic Ocean; from off Iceland to the Gibraltar Strait; Red Sea; Indian and Pacific Oceans. Between 10-5448 meters.

REMARKS: *Progoniada regularis* was recorded in Europe to be present in the Norwegian Sea, western European talus and abyssal plain, and Gibraltar Strait, by AMOUREUX (1982*a*, 1986) and BÖGGEMANN (2005).

*FAMILY **HESIONIDAE** Grube 1850

AS: *HESIONEA* GRUBE, 1850: 306.
TYPE GENUS: *Hesione* Lamarck 1818.
SYNONYMS: *HESIONIDÆ* Malmgren 1867.
REMARKS: PLEIJEL & DAHLGREN (1998) found that the genera *Hesionides* and *Microphthalmus* were not hesionids, and later DAHLGREN *et al.* (2000) showed that the assumption that these two groups were closely related to each other was contradicted by their results: *Microphthalmus* seems to be the sister group to pilargids (or nested within that group), and *Hesionides* has a basal position within the Nereidiformia.

For the moment, and only for practical reasons, I maintain here both *Hesionides* and *Microphthalmus* under the Hesionidae. For the same reason, I also keep the division of the Hesionidae in two subfamilies, as originally performed by HARTMANN-SCHRÖDER (1971*a*: 126): Microphthalminae and Hesioninae. I insist, however, that this only follows practical reasons, as it is not supported by the results obtained by PLEIJEL & DAHLGREN (1998) and DAHLGREN *et al.* (2000).

The most important paper recently published on Hesionidae is PLEIJEL (1998), where the phylogeny of the family is analized, and diagnoses and descriptions for all supraspecific hesionid taxa are provided, besides including a checklist of hesionids. Recently published papers on the Hesionidae include, among others, the revisions of *Heteropodarke* (PLEIJEL, 1999), *Amphiduros* (PLEIJEL, 2001*a*), *Hesiospina* (PLEIJEL, 2004), *Micropodarke* (PLEIJEL & ROUSE, 2005*b*), *Syllidia* (RUTA & PLEIJEL, 2006*a*), or the description of the new genera *Hesiolyra* (BLAKE, 1985), *Hesiodeira* (BLAKE & HILBIG, 1990), *Sirsoe* (PLEIJEL, 1998), *Lizardia* (PLEIJEL & ROUSE, 2005*a*), *Hesiobranchia* (RUTA & PLEIJEL, 2006*b*), and *Pleijelius* (SALAZAR-VALLEJO & ORENSANZ, 2006). Some species have been described from singular habitats, such as the "ice-worms" *Sirsoe methanicola*, originally described as *Hesiocaeca* by DESBRUYÈRES & TOULMOND (1998) from frozen methane hydrates associated with cold seeps in the Gulf of Mexico, or *Vrijenhoekia balaenophila*, described as a new genus and species from a whale carcass at near 3000 meters deep in the Monterey Canyon by PLEIJEL *et al.* (2008*a*). The phylogeny of the Hesionidae has been recently studied using morphological and molecular data by RUTA *et al.* (2006).

Concerning the Microphthalminae, the most important monography on the group is probably the one by WESTHEIDE (1967). Several taxa has been recently described or revised in papers like WESTHEIDE (1982), CLAUSEN (1986), WESTHEIDE & RIEGER (1987), FOURNIER (1991), SCHMIDT & WESTHEIDE (1999), or RISER (2000), just to cite a few.

The Hesionidae *sensu lato* (including the Microphthalminae) include at present about 33 genera (SALAZAR-VALLEJO & ORENSANZ, 2006), with more than 160 species considered to be valid. In the European and nearby waters 15 genera are known to occur, including about 38 taxa. Only two species belonging to two different genera have been identified among the studied material.

KEY TO "SUBFAMILIES" AND GENERA:

1a. Antennae, palps and cirri thread-like and normally fusing gradually with the body; pigidium with anal lamellae and anal cirri..**"Subfamily MICROPHTHALMINAE"**.............2
1b. Antennae, palps and cirri normally do not fuse gradually with the body; palps and cirri normally more or less clearly articulated i.e. ringed; pygidium with anal cirri, without anal lamellae..**"Subfamily HESIONINAE"**............3

2a (1a). 3 pairs of tentacular cirri; no eyes..***Hesionides***
2b (1a). 6 pairs of tentacular cirri; 2 eyes...***Microphthalmus***

3a (1b). 6 pairs of tentacular cirri...4
3b (1b). 7 pairs of tentacular cirri..***Periboea longocirrata* Ehlers 1864 or *Periboea halleziana* Malaquin 1890 (see *REMARKS* section under *Hesiospina aurantiaca*)**
3c (1b). 8 pairs of tentacular cirri...7

4a (3a). Parapodia sesquiramous, notopodia without chaetae; jaws present or absent................................5
4b (3a). Parapodia subbiramous or biramous; jaws present or absent...6

5a (4a). Jaws present, three-cornered, toothed...***Syllidia****

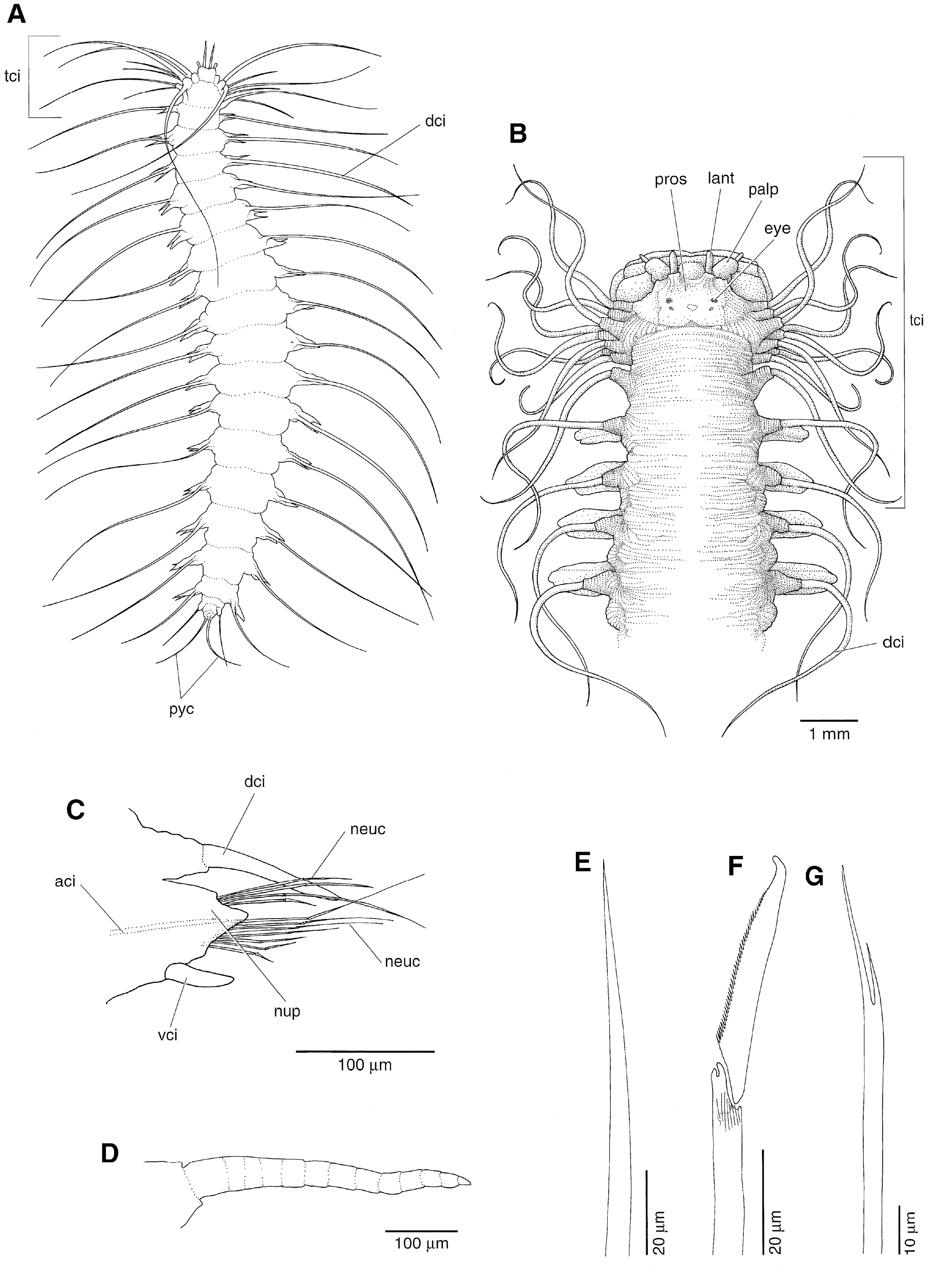

Figure legend: Family Hesionidae. **A**, hesionid specimen, dorsal view. **B**, *Leocrates* specimen, anterior end, dorsal view. **C**, *Nereimyra* specimen, median parapodium, anterior view. **D**-**F**, cirrus and chaetae of *Nereimyra* specimen: **D**, details of dorsal cirrus; **E**, simple chaeta; **F**, compound chaeta. **G**, forked chaeta of *Gyptis* specimen, from chaetiger 14. **aci**, acicula; **dci**, dorsal cirrus; **eye**, eye; **lant**, lateral antenna; **neuc**, neurochaeta, compound; **nup**, neuropodium; **palp**, palp, articulated; **pros**, prostomium; **pyc**, pygidial cirri; **tci**, tentacular cirrus; **vci**, ventral cirrus. (Adapted from BEESLEY, ROSS & GLASBY, 2000; drawings by K. Nolan).

5b (4a). Jaws absent..***Micropodarke***

6a (4b). Three antennae; parapodia biramous; jaws absent...***Ophiodromus***
6b (4b). Two antennae; parapodia subbiramous; jaws present, pincer-like................................***Nereimyra***

7a (3c). Two antennae...**8**
7b (3c). Three antennae...**12**

8a (7a). Parapodia with notopodial emergent hooks present, other notochaetae absent.............***Hesiospina***
8b (7a). Notopodial emergent hooks absent; parapodia sesquiramous...**9**

9a (8b). Palps absent...***Hesione***
9b (8b). Palps present..**10**

10a (9b). Terminal proboscis ring with papillae..***Psamathe***
10b (9b). Terminal proboscis ring without papillae..**11**

11a (10b). First chaetae in third segment (FAUCHALD, 1977*a*)..***Dalhousiella***
11b (10b). First chaetae in fifth segment (neurochaetae absent in segments 1-4; PLEIJEL, 1998)...***Wesenbergia***

12a (7b). Median antenna frontally inserted; furcate notochaetae present; terminal proboscideal ring with 10 papillae...***Podarkeopsis****
12b (7b). Median antenna dorsally inserted; furcate notochaetae absent...**13**

13a (12b). Single or double dorsal and single ventral teeth or plates present; proboscideal papillae present or absent, when present usually around 20, low cushion shape and poorly delineated, or small papilliform, not cylindrical...***Leocrates***
13b (12b). Jaws or teeth absent; proboscideal papillae present or absent, when present cylindrical.........**14**

14a (13b). Terminal proboscideal ring with papillae absent, but with cilia; eyes large, poorly delineated...***Amphiduros***
14b (13b). Terminal proboscideal ring with 10 or more cylindrical papillae present; generally eyes small, well delineated...***Gyptis***

GENUS *Amphiduros* Hartman 1959

Amphiduros HARTMAN, 1959*a*: 182.
TYPE SPECIES: *Amphiduros setosus* Hessle 1925.
SYNONYMS: *Amphidromus* Hessle 1925 [not Albers 1850 (Mollusca)].

Amphiduros fuscescens (Marenzeller 1875)

Oxydromus fuscescens MARENZELLER, 1875: 143-146, pl. 2 fig. 1.
TYPE LOCALITY: St. Servola, Bay of Muggia, Trieste (Adriatic Sea, Italy), 2-3 meters, stones with bore-holes.
SYNONYMS: *Amphidromus izukai* Hessle 1925; *Amphidromus setosus* Hessle 1925; *Amphiduros pacificus* Hartman 1961.
SELECTED REFERENCES: *Oxydromus propinquus* forme *fuscescens* — FAGE & LEGENDRE, 1927: 66-67, fig. 8. *Amphiduros fuscescens* — PLEIJEL, 1993*b*: 176-178, fig. 13; NÚÑEZ, PASCUAL & MORO, 1997: 16-20, figs. 1-3; PLEIJEL, 2001*a*: 20-26, figs. 2-6. *Amphidromus izukai* — HESSLE, 1925: 28-29, text-fig. 9. *Amphiduros izukai* — IMAJIMA & HARTMAN, 1964: 79-80. *Amphidromus setosus* — HESSLE, 1925: 26-28, text-fig. 8. *Amphiduros setosus* — IMAJIMA & HARTMAN, 1964: 78-79. *Amphiduros pacificus* — HARTMAN, 1961: 65-66, pl. 4; HARTMAN, 1968: 359-360, figs. 1-4. *Oxydromus propinquus* [not Marion & Bobretzky 1875] — FAUVEL, 1923*c*: 241-242 [in part].
DISTRIBUTION: Mediterranean Sea; Northern Adriatic Sea; Israel, Gulf of Aqaba; Canary Islands; Papua New Guinea; Japan; Great Barrier Reef, Australia; California. In rocks, stones, coarse shell gravel,

muddy sand, mixed substrata with bolders, gravel, bryozoans, ascideans, mussels, or algae. Between 2-50 meters.

GENUS *Dalhousiella* McIntosh 1901

Dalhousiella MCINTOSH, 1901: 231-232.
TYPE SPECIES: *Dalhousiella Carpenteri* McIntosh 1901.

Dalhousiella carpenteri McIntosh 1901

Dalhousiella Carpenteri MCINTOSH, 1901: 231-232, pl. 1 figs. 9-10.
TYPE LOCALITY: Celtic Sea, at the Channel Slope, 48º06'N, 9º18'W, at 539 fathoms (985.7 meters), on a bottom of grey mud.
SELECTED REFERENCES: *Dalhousiella Carpenteri* — MCINTOSH, 1908*c*: 134-135, pl. 58 fig. 18, pl. 78 fig. 7; FAUVEL, 1913*a*: 57; FAUVEL, 1914*f*: 124-125, pl. 7 figs. 10-13, 22; FAUVEL, 1923*c*: 234-235, fig. 88*o-r*; STØP-BOWITZ, 1948*b*: 61; AMOUREUX, 1977*b*: 409; HARTMANN-SCHRÖDER, 1977*a*: 83, fig. 22; HARTMANN-SCHRÖDER, 1982*a*: 8; PARAPAR, BESTEIRO & MOREIRA, 2004*a*: 224-225, fig. 80.
DISTRIBUTION: Atlantic Ocean; Celtic Sea; Azores; off the mouth of the English Channel; off Portugal; off the Straits of Gibraltar; off NW Africa; Adriatic Sea. On rocky or muddy bottoms, and among siliceous sponges. Between 880-1215 meters.
REMARKS: The type material was lost in the mail, and in the absence of type and detailed information on the species, it was considered as *insertae sedis* in the taxon Hesionini and *nomen dubium* by PLEIJEL (1998, pages 113-114 and 158).

GENUS *Gyptis* Marion & Bobretzky *in* Marion 1874

Gyptis MARION & BOBRETZKY *in* MARION, 1874: 399.
TYPE SPECIES: *Gyptis propinqua* Marion & Bobretzky 1875.
SYNONYMS: *Oxydromus* Grube 1855 [not Schlegel 1854 (Aves)].

KEY TO SPECIES:

(adapted from PLEIJEL, 1993*b*)

REMARKS: As stated by PLEIJEL (1993*b*: 176), the genus *Amphiduros* is presently separated from *Gyptis* only on the absence of the terminal ring of proboscideal papillae. For this reason, I maintain here the key as given by PLEIJEL (1993*b*), which includes both *Amphiduros* and *Gyptis*, for the case that specimens have the proboscis inverted.

1a. Prostomium wider than long, lip glands absent, ventral cirri inserted distally......................................**2**
1b. Prostomium as wide as long, lip glands present, ventral cirri inserted subdistally................................**4**

2a (1a). Eyes small with well delineated pigment; adults (> ca. 20 segments) with terminal papillae on proboscis; dorsal cirri distinctly annulated and tapering evenly to a point; acicular notochaetae present....**3**
2b (1a). Eyes large with poorly delineated pigment; adults without terminal papillae on proboscis; dorsal cirri subdistally widened, not annulated; acicular notochaetae absent....................***Amphiduros fuscescens***

3a (2a). Median antenna with distinct, well delineated tip; eyes brownish-black; proboscis of adults (> ca. 25 segments) with more than 35 papillae in terminal ring; dorsal cirri reaching farther than chaetae; distinct elevated dorsal ridges absent...***Gyptis rosea***
3b (2a). Median antenna without delineated tip; eyes red; proboscis of adults with less than 35 papillae in terminal ring; dorsal cirri not reaching farther than chaetae; distinct elevated dorsal ridges present..***Gyptis mediterranea***

4a (1b). Median antenna widest subdistally; adults (> ca. 20 segments) with neurochaetae from segment five; dorsal cirri much longer than chaetae..***Gyptis propinqua***

4b (1b). Median antenna widest medially; adults with neurochaetae from segment four; dorsal cirri much shorter than chaetae..***Gyptis golikovi***

Gyptis golikovi (Averincev 1990)

Podarke golikovi AVERINCEV, 1990: 156-158, fig. 5.*1-4*.
TYPE LOCALITY: Laptev Sea: Island of Malij Ljachovskij, Cape Vajgatsj, at 1.8 meters, on lightly-sandy ooze.
SYNONYMS: *Gyptis mackiei* Pleijel 1993.
SELECTED REFERENCES: *Gyptis mackiei* — PLEIJEL, 1993*b*: 165-168, figs. 4-5; HARTMANN-SCHRÖDER, 1996: 130-131.
DISTRIBUTION: Laptev Sea, Franz-Josefs Land and the New Siberian Isles, on the very upper part of the sublittoral. Northern part of Swedish west coast, Skagerrak, and Faroes, on muddy bottoms, between 78-859 meters.
REMARKS: According to FREDRIK PLEIJEL (personal communication, May 1997), it includes *Gyptis mackiei* Pleijel 1993 as a junior synonym.

Gyptis mediterranea Pleijel 1993

Gyptis mediterranea PLEIJEL, 1993*b*: 168-172, figs. 6-8, 12.
TYPE LOCALITY: Banyuls-sur-Mer (Southern France), Cap Oullestrell, 42º30.17'N, 3º09.48'E, mud, 40 meters.
SELECTED REFERENCES: *Gyptis mediterranea* — PARAPAR, BESTEIRO & MOREIRA, 2004*a*: 244-247, fig. 87.
DISTRIBUTION: Southern France; Sicily; Galicia (Sisargas Islands). Muddy and sandy mud bottoms. Between 35-159 meters.

Gyptis propinqua Marion & Bobretzky 1875

Gyptis propinqua MARION & BOBRETZKY, 1875: 51-54, pls. 5 figs. 15*B-D*, *F*, pl. 6 figs. 15-15*A*, *E*, *G-H*.
TYPE LOCALITY: Gulf of Marseille (Southern France).
SELECTED REFERENCES: *Gyptis propinqua* — PLEIJEL, 1993*b*: 161-165, figs. 1-3, 12; HARTMANN-SCHRÖDER, 1996: 131-132, fig. 52; PARAPAR, BESTEIRO & MOREIRA, 2004*a*: 239-240, fig. 85. *Oxydromus propinquus* — SAINT-JOSEPH, 1888: 321-323; FAUVEL, 1923*c*: 241-242, fig. 90*a-d* [in part; not *Oxydromus fuscescens* Marenzeller 1875]; USCHAKOV, 1950: 172-173, fig. 10; USCHAKOV, 1955*a*: 196-197, fig. 58; RULLIER, 1965*a*: 24; BHAUD, 1971: 154-159, fig. 1. *Gyptis rosea* [not Malm 1874] — HARTMANN-SCHRÖDER, 1971*a*: 132-134, fig. 43; HELGASON *et al.*, 1990: 205; [?] SORDINO, 1990: 33-34, table 1; KIRKEGAARD, 1992: 195-197, fig. 94.
DISTRIBUTION: Iceland; Faroes; Skagerrak; Kattegat; Øresund; English Channel; Bay of Biscay; Galicia; Mediterranean Sea; Adriatic Sea; Aegean Sea; West Africa; North Pacific; Sea of Okhotsk. In silty coarse sand, coarse and fine shell gravel, and mixed sediments. Between 10-500 meters.

Gyptis rosea (Malm 1874)

Ophiodromus roseus MALM, 1874: 82.
TYPE LOCALITY: Gullmarsfjorden (Sweden), 45 fathoms (82.3 meters), mud.
SELECTED REFERENCES: *Gyptis rosea* — ELIASON, 1962*b*: 238-240, fig. 9 [in part]; [?] CAMPOY, 1982: 216-217; HAALAND & SCHRAM, 1982: 108-115, figs. 1-9, table 1; PLEIJEL, 1993*b*: 172-176, figs. 9-12; HARTMANN-SCHRÖDER, 1996: 132; PARAPAR, BESTEIRO & MOREIRA, 2004*a*: 242-244, fig. 87. Not *Gyptis rosea* — HARTMANN-SCHRÖDER, 1971*a*: 132-134, fig. 43 [= *Gyptis propinqua* Marion & Bobretzky 1875]; HELGASON *et al.*, 1990: 205 [= *Gyptis propinqua* Marion & Bobretzky 1875]; KIRKEGAARD, 1992: 195-197, fig. 94 [= *Gyptis propinqua* Marion & Bobretzky 1875].
DISTRIBUTION: Skagerrak, Oslofjord and northern part of Swedish west coast. Muddy bottoms. Between 50-510 meters.

GENUS ***Hesione*** Lamarck 1818

Hesione LAMARCK, 1818: 315-316.
TYPE SPECIES: *Hesione splendida* Savigny *in* Lamarck 1818.

REMARKS: The authorship of the genus *Hesione* is here considered as being only Lamarck 1818. Probably the genus was created by Savigny, in the manuscript consulted by Lamarck in order to write his "*Histoire Naturelle des Animaux sans Vertèbres*" (LAMARCK, 1818), but in this later publication there is no reference to Savigny in the description of the genus *Hesione*.

The genus *Hesione* is normally considered as having palps absent. However PLEIJEL (1998: 108) underlines the following: "*Based on topological similarity with hesionids provided with both antennae and palps, the single pair of anteriorly inserted small papilliform projections in* Hesione *are here assumed to constitute antennae, whereas the palps are absent. The topological evidence, however, is not considered strong and the matter warrants further investigation.*"

According to the same author, the genus *Hesione* needs a revision, as the relationships within it are not clear. At present the genus includes 18 described species, mainly from warm or template waters: *H. ceylonica* Grube 1874 (Sri Lanka), *H. ehlersi* Gravier 1900 (Djibouti), *H. eugeniae* Kinberg 1866 (India), *H. festiva* Savigny *in* Lamarck 1818 (Nice, Mediterranean Sea), *H. genetta* Grube 1867 (Samoa), *H. intertexta* Grube 1878 (Philippines), *H. margaritae* Hansen 1882 (Brazil), *H. pacifica* McIntosh 1885 (Tonga), *H. panamena* Chamberlin 1919 (Pacific Panama), *H. pantherina* Risso 1826 (Southern France), *H. picta* F. Müller 1858 (Brazil), *H. praetexta* Ehlers 1887 (Florida), *H. protochona* Schmarda 1861 (Jamaica), *H. reticulata* Marenzeller 1879 (Southern Japan), *H. sicula* Delle Chiaje 1822 (Mediterranean Sea), *H. splendida* Savigny *in* Lamarck 1818 (Red Sea), *H. steenstrupii* Quatrefages 1866 (Guéthary, Atlantic France), and *H. vittigera* Ehlers 1887 (Southern Florida). All these species were described between 1818 and 1919, in many cases in short accounts without illustrations, making difficult to state the affinities or differences between them.

PLEIJEL (1998) considered 8 species of *Hesione* as being probably valid. From these, two were described from Europe (*H. festiva* and *H. pantherina*), and the third, described from the Red Sea and type of the genus (*H. splendida*), has been widely recorded in Europe, probably because it is one of the two oldest species in the genus, and also its genotype.

With the available information and present uncertainty, I don't feel able to elaborate a key for these three species. The original descriptions of *H. festiva* and *H. splendida* are very short (see the *REMARKS* section under each of these species), and probably the name *H. pantherina* is not being used nowadays for the same species than the described by Risso in 1826, and probably refer to a *Leocrates* species (see *REMARKS* under this species). While a revision is not done on the subject, for European specimens I recommend to use the oldest available name for the European waters, *Hesione festiva*, or simply use the generic name, *Hesione* sp.

Hesione festiva Savigny *in* Lamarck 1818

Hesione festiva SAVIGNY *in* LAMARCK, 1818: 316.
TYPE LOCALITY: Nice, France.
SELECTED REFERENCES: *Hesione festiva* — AUDOUIN & MILNE EDWARDS, 1833*b*: 235; MONRO, 1926: 312.
DISTRIBUTION: Gulf of Nice (Mediterranean Sea).
REMARKS: The first description of this species was published in LAMARCK (1818: 316), without any figure: "H. proboscide conicd; mamillarum setis apice nudis subtruncatis. Hesione festiva *Sav. Mss. Habite le golfe de Nice. M.* Risso. *Le corps a un peu moins de reflets que celui précédent, et ses anneaux sont un peu plus allongés.*"

This short description was later completed by SAVIGNY (1822: 40), in a publication than should have been published in 1809: "*Espèce des côtes de la Méditerranée, découverte à Nice par M. Risso; communiquée par M. Cuvier. Très-semblable à la précédente* [*H. splendida*], *quoique moins grande. Même nombre de segments et de pieds.* Trompe *conique plutôt que cylindrique. Le* corps *a fort peu de reflets, et ses anneaux sont un peu alongés. Je n'ai pas vu les* cirres *qui étoient tous retirés en dedans. Un second* acicule *fort grêle. Les* soies *sans lames mobiles, paroissoient tronquées accidentellement à la pointe.*"

Hesione pantherina Risso 1826

Hesione pantherina RISSO, 1826: 418-419.
TYPE LOCALITY: Region of Nice (Southern France), in muddy sediments.
SYNONYMS: [?] *Hesione sicula* Delle Chiaje 1822; [?] *Hesione Steenstrupi* Quatrefages 1866.
SELECTED REFERENCES: *Hesione pantherina* — SAINT-JOSEPH, 1898: 329-337, pl. 19 figs. 131-144. [?] GRAVIER, 1900*b*: 179-180, pl. 10 fig. 16; FAUVEL, 1911*a*: 374-376, fig. 6; FAUVEL, 1913*a*: 56; FAUVEL, 1923*c*: 233-234, fig. 87; FAUVEL, 1947: 30-31, fig. 27*A-G*; FAUVEL, 1953*c*: 104-105, fig. 49. [?] *Hesione*

sicula — DELLE CHIAJE, 1830: pl. 82 fig. 24; JOURDAN, 1892: 243, pl. 6 fig. 9. [?] *Fallacia sicula* — MARION & BOBRETZKY, 1875: 46-48, pl. 12 fig. 28. [?] *Telamone sicula* — CLAPARÈDE, 1868: 541-545, pl. 18 fig. 4. [?] *Hesione Steenstrupi* — QUATREFAGES, 1866*b*: 96-98, pl. 9 fig. 17.

REFERENCES FOR PORTUGAL: CARVALHO, 1929 (Sines).

DISTRIBUTION: Portugal; Mediterranean Sea; Adriatic Sea; [?] Red Sea; [?] Gulf of Aden; [?] Arabian Sea; [?] Indian Ocean. Under stones and on hard grounds. At shallow water.

REMARKS: According to PLEIJEL (1998: 159) *Hesione sicula* Delle Chiaje 1830 and *H. steenstrupii* Quatrefages 1866 are possibly junior synonyms of *H. pantherina* Risso 1826.

The original description of this species by RISSO (1826: 418-419) is as follows: “H. Corpore rubro fusco, nitidissimo, luteo, annulato; mamillarum setis viridissimis; ano fasciculis duobus, filamentorum octo compositis, instructo. *Cette nouvelle espèce présente un corps alongé, presque déprimé, composé de dix-huit segments; le dos, d’un rouge brun clair, à des reflets métalliques, est annelé de petites raies transversales jaune citron; l’abdomen est presque aplati, coloré d’un blanc rose un peu nacré, avec des petites traits obscurs, traversé au milieu par une bande longitudinale colorée par l’intestin; la tête est ornée de quatre longues antennes à peu près égales; chaque côté du corps est garni latéralment de seize paires de pieds, entourés chacun à leur extrémité d’une touffe de fortes soies vertes, de la base desquels sort en dessus et en dessous un long cirrhe jaunâtre; de la partie inférieure, où est placé l’orifice de l’anus, est munie de chaque côté d’une houppe de huit filaments séparés en deux paquets. Long. 0,068, larg. 0,009. Séj. Régions vaseuses. App. Janvier, octobre.*”

From the description above it is possible to state that the species does not belong to the genus *Hesione*, as it is clearly stated that it has “*quatre longues antennes à peu près égales*”, which would designate a pair of antennae and a pair of palps. The species is also described as having a metallic lustre of the cuticle, which, according to PLEIJEL (1998), is only present in four genera of Hesionidae: *Hesione*, *Leocrates*, *Leocratides*, and *Wesenbergia*. Taking into consideration the type locality of the species (Southern France, probably near Nice), it seems that *Hesione pantherina* should be placed in the genus *Leocrates*, as the last two genera are not known from the Mediterranean. On the other hand, according to FREDRIK PLEIJEL (personal communication, March 2009), the description of the species by Risso is confusing. The species has the number of segments (chaetigers) typical of the Hesionini, and according to the geographic region, it would be *Hesione* or *Leocrates*. The described number of 4 antennae (2 antennae and 2 palps) of about the same size points to *Leocrates*. However, the yellow transverse pigment bands on the body are not known for any species of *Leocrates*.

H. pantherina is here considered as belonging possibly to the genus *Leocrates*. In case it would be conspecific with *L. claparedii*, also described from the Western Mediterranean, it would predate it and have priority. However, as stated above, the colour patterns of the two taxa seem to be different. In spite of this, at least part of the posterior records of *H. pantherina* do refer to *Hesione* specimens (*e.g.*, SAINT-JOSEPH, 1898).

Hesione splendida Savigny *in* Lamarck 1818

Hesione splendida SAVIGNY *in* LAMARCK, 1818: 316.

TYPE LOCALITY: Red Sea and Mauritius (= Île-de-France).

SYNONYMS: [?] *Hesione Ehlersi* Gravier 1900.

SELECTED REFERENCES: *Hesione splendida* — AUGENER, 1913*b*: 187-189; AUGENER, 1922*b*: 21-22, fig. 4; HESSLE, 1925: 13-15, text-fig. 3; AUGENER, 1926: 451-452; MONRO, 1933*c*: 25-26; DAY, 1967: 228, fig. 11.2.*a-c*; HARTMANN-SCHRÖDER, 1979*b*: 84; CAMPOY, 1982: 208-210, pl. 11; HARTMANN-SCHRÖDER, 1982*a*: 8; KIRKEGAARD, 1983*a*: 213; SORDINO, 1990: 35, table 1; BRITO *et al.*, 1996: 163, fig. 5*A-C*; PARAPAR, BESTEIRO & MOREIRA, 2004*a*: 216, fig. 76. *Hesione ? splendida* — MONRO, 1931*b*: 11-12, fig. 6. [?] *Hesione Ehlersi* — GRAVIER, 1900*b*: 175-179, text-figs. 42-45, pl. 9 figs. 14-15.

REFERENCES FOR PORTUGAL: CAMPOY, 1982 (previous records: Sines); PARAPAR, BESTEIRO & MOREIRA, 2004*a* (previous records: Portugal). [CAMPOY (1982), and PARAPAR, BESTEIRO & MOREIRA (2004*a*) considered the record of CARVALHO (1929) of *Hesione pantherina* as belonging to *H. splendida*].

DISTRIBUTION: Eastern coast of Atlantic Ocean, from France to Senegal and Cape Verde Islands; Mediterranean Sea; Adriatic Sea; Aegean Sea; Red Sea; Persian Gulf; Djibuti; Indian Ocean; Pacific (Philippine Islands; Malaysia; Japan; Australia; Vietnam). Coralligenous bottoms, among *Posidonia*, stones, and *Mesophyllum lichenoides*. Between 3-40 meters, but according to HARTMANN-SCHRÖDER (1982*a*) can reach 1250 meters.

REMARKS: According to PLEIJEL (1998: 158), *Hesione ehlersi* Gravier 1900 is a possible junior synonym of *H. splendida* Savigny *in* Lamarck 1818.

The first description of this species was published in LAMARCK (1818: 316), and is quite short and without figures: "H. cinereo-margaritacea, nitore varia; mamillarum setis apice lamella cultriformi mobilique aucti. Hesione splendida. *Sav. Mss. et fig. Habite la mer Rouge, M.* Savigny*, et se trouve à l'Ile-de-France, M.* Mathieu *Corps un peu rétréci vers son extrémité antérieure, à environ 18 segments apparens*."

This description was later completed by SAVIGNY (1822: 40), in a publication that should have been published in 1809: " [...] *Espéce nouvelle que M. Mathieu a trouvée à l'Ile de France, et que j'ai rapportée moi-même des côtes de la mer Rouge. Elle nage assez bien en s'aidant de ses longs cirres.* Corps *long de près de deux pouces, sensiblement rétréci dans sa moitié antérieure, formé de dix-huit segments apparents, qui ont, à l'exception du premier, des côtés séparés de la partie dorsale, plissés et marqués d'un sillon profond sur l'alignement des pieds. Dix-sept paires de* pieds *à rames, fixées à la partie antérieure des segments; la dernière paire seul notablement plus petite que les autres, conservant toutefois de longs cirres, portée par un segment rétréci dès son origine et comme arrondi avec l'anus un peu saillant en tube.* Soies *fortes, roides, jaunâtres: leur petite lame terminale est plus alongée, plus obtuse, dans les individus de la mer Rouge.* Acicule *très-noir.* Cirres *roussâtres, fort délicats; les inférieures ne dépassent que de moitié les gaînes, dont l'orifice n'offre aucune dent particulière. Couleur générale gris de perle avec des très-beaux reflects; le ventre porte une bandelette plus éclatante, qui s'étend de la trompe à l'anus.*"

GENUS ***Hesionides*** Friedrich 1937

Hesionides FRIEDRICH, 1937: 343-345.
TYPE SPECIES: *Hesionides arenaria* Friedrich 1937.
SYNONYMS: *Anophthalmus* Rao & Ganapati 1967.

KEY TO SPECIES:
(adapted from WESTHEIDE, 1967*b*)

1a. Median antennae inserted at the level of the dorsal tentacular cirri; antennae, palps and tentacular cirri with small swellings and cilia; anal lamella indented as far as the pygidium; adults about 0.1 mm wide....................***H. arenaria***
1b. Median antennae inserted in front of the dorsal tentacular cirri; antennae, palps and tentacular cirri without swellings; anal lamellae not indented as far as the pygidium....................**2**

2a (1b). First pair of dorsal cirri longer than the tentacular cirri; body without regular red spots on the segments; adults wider than 0.2 mm....................***H. maxima***
2b (1b). First pair of dorsal cirri of about the same length of the tentacular cirri; body with two regular red spots on each segment, anterior to the parapodia; adults about 0.1 mm wide....................***H. gohari***

Hesionides arenaria Friedrich 1937

Hesionides arenaria FRIEDRICH, 1937: 343-345, figs. 1-4.
TYPE LOCALITY: Near Hörnum (Sylt), and Amrum, (North Frisian Islands, German North Sea), in interstitial sand.
SELECTED REFERENCES: *Hesionides arenaria* — LAUBIER, 1964*d*: 813-814; TENERELLI, 1964: 232-233, pl. 1 figs. 3-4; WESTHEIDE, 1967*b*: 33-41, 70-86, 94-100, 127-129, figs. 1-4, 5*a-c*, *e*, 6*b*, 7-13, 14*c-g*, 15, 16*d*, 17-23, 24*b*, 49-52, 55-58, 64, 68*a-b*, 69, tables 1, 8, 11; LAUBIER, 1968*b*: 588; LAUBIER, 1969: 427; WESTHEIDE, 1970: 127-128 fig. 10*A*; WESTHEIDE & RAO, 1977: 276-277, fig. 1*A-D*; CAMPOY, 1982: 222-223; SORDINO, 1990: 35-36, table 1 KIRKEGAARD, 1992: 198-199, fig. 95; HARTMANN-SCHRÖDER, 1996: 140-141, fig. 58; PARAPAR, BESTEIRO & MOREIRA, 2004*a*: 263-265, fig. 96.
REFERENCES FOR PORTUGAL: LAUBIER, 1969 (Francelos); GALHANO, 1970 (Francelos); CAMPOY, 1982 (previous records: Francelos; it was not recorded from Cabedelo, as stated); PARAPAR, BESTEIRO & MOREIRA, 2004*a* (previous records: Portuguese littoral).
DISTRIBUTION: Arctic Ocean; from the North Sea to the Mediterranean Sea; Aegean Sea; Black Sea; west and south Africa; Mozambique; Red Sea; east coast of India; El Salvador; Bahamas. Interstitial, on sand. Intertidal to 5 meters.
REMARKS: SCHMIDT & WESTHEIDE (2000) analysed the cosmopolitan status of *Hesionides arenaria arenaria* (not *H. arenaria pacifica* Westheide 1974, from the Galapagos Islands), applying the RAPD-

PCR analysis to specimens from 8 sites: Skagerrak (Denmark), North Sea (Sylt), French Atlantic coast (Arcachon), Canary Islands (Tenerife), Mediterranean Sea (Tunisia, Mallorca, Crete), and North American Pacific coast (San Juan Island). The analysis included the amplification of 469 DNA fragments with 12 primers, but it was not possible to differentiate genetic clades. As it was not possible to demonstrate diagnostic characters for the different populations, SCHMIDT & WESTHEIDE (2000) considered *Hesionides arenaria arenaria* as a cosmopolitan species.

Hesionides gohari Hartmann-Schröder 1960

Hesionides gohari HARTMANN-SCHRÖDER, 1960*b*: 74-75, pl. 2 fig. 12, pl. 3 figs. 13-15.

TYPE LOCALITY: Ghardaqa (Egypt, Red Sea), at low water, in fine sand covered by one foot of water.

SELECTED REFERENCES: *Hesionides gohari* — FIZE, 1963: 720; TENERELLI, 1966: 230; [?] RAO & GANAPATI, 1967: 11; WESTHEIDE, 1967*b*: 129-130, fig. 5*d*, tables 1, 11; [?] RAO, 1969: 97; WESTHEIDE, 1970: 101-128, figs. 1-19, 20*B*; WESTHEIDE, 1974*c*: 366; [?] WESTHEIDE & RAO, 1977: 277-278, fig. 1*E-G*; CAPACCIONI, VILLORA & TORRES, 1989: 15-18, figs. 4-5; SORDINO, 1990: 36, table 1; PARAPAR, BESTEIRO & MOREIRA, 2004*a*: 265-267, fig. 97.

DISTRIBUTION: European Atlantic coast; Mediterranean Sea; Red Sea (Ghardaqa); [?] Bay of Bengal; [?] Australia. Interstitial, in sand. Intertidal to 2.5 meters.

REMARKS: SCHMIDT & WESTHEIDE (1999), performed an analysis of the population genetics of the species, usually considered to be cosmopolitan, applying the RAPD-PCR method to specimens collected at 8 sites on three continents: French Atlantic coast (Arcachon), Mediterranean Sea (Mallorca, Giglio, Crete), Red Sea (Hurghada), Indian Ocean (Phuket), and U.S. Atlantic coast (Fort Pierce – Florida, Edenhouse – North Carolina). The data was evaluated by cluster programs, and three clades were obtained with high bootstrap values: (1) European-Mediterranean-Red Sea; (2) Indian Ocean; (3) Western Atlantic. As stated by the same authors, the genetic distances detected between the three clades was almost similar to those found between morphologically similar interstitial polychaete pairs of species. This way, it was suggested that each one of the three clades represented a different species. The name *Hesionides gohari* is here applied to the clade formed by the populations from Europe, Mediterranean and Red Sea. The references above concerning records and descriptions of *H. gohari* from the Indian Ocean are indicated as doubtful, as they refer to populations not studied by SCHMIDT & WESTHEIDE (1999) using the RAPD-PCR method. However, as the populations are morphologically similar, for the moment the descriptions of specimens from the Indian Ocean can be used in order to confirm the species identification.

Hesionides maxima Westheide 1967

Hesionides maxima WESTHEIDE, 1967*b*: 41-42, 130-133, figs. 24*a*, 55, 70, table 11.

TYPE LOCALITY: At the spring horizon of the outer bank of Ellenbogen, Sylt Island (Germany, North Sea), in coarse sand saturated with water and rich in detritus, partially with pebbles, not deeper than 25 cm.

SELECTED REFERENCES: *Hesionides maxima* — WESTHEIDE, 1966: 204, 206, 208 [*nomen nudum*]; WESTHEIDE, 1970: 128-129, fig. 20*C*; WESTHEIDE, 1974*c*: 366; KIRKEGAARD, 1992: 199-201, fig. 96; HARTMANN-SCHRÖDER, 1996: 142, fig. 59.

DISTRIBUTION: North Sea; French Atlantic coast; Mediterranean Sea (Tunisia). Interstitial, on intertidal sand.

GENUS ***Hesiospina*** Imajima & Hartman 1964

Hesiospina IMAJIMA & HARTMAN, 1964: 80-81.

TYPE SPECIES: *Kefersteinia similis* Hessle 1925.

SYNONYMS: *Periboea* Ehlers 1864 [*nomen dubium*, according to PLEIJEL, 2004: 2549].

REMARKS: According to PLEIJEL (1998: 115), the genus *Periboea* Ehlers 1864 may constitute a senior synonym of *Hesiospina* Imajima & Hartman 1964. However, no type material of *Periboea longocirrata* Ehlers 1864, the type species of the genus, is known to exist, and the designation of a neotype may be justified when topotype material becomes available, from the Northern Adriatic Sea.

Hesiospina aurantiaca (M. Sars 1862)

Castalia aurantiaca M. SARS, 1862*c*: 90.

TYPE LOCALITY: Florøen (Norway) at low water and at 2-3 fathoms (3.6-5.5 meters) depth, and Manger (Norway), at 40-60 fathoms (73.2-109.7 meters). Lectotype designated by PLEIJEL (2004), from Manger.
SYNONYMS: *Castalia longicornis* M. Sars 1862; [?] *Periboea longocirrata* Ehlers 1864; [?] *Periboea Halleziana* Malaquin 1890; *Kefersteinia similis* Hessle 1925.
SELECTED REFERENCES: *Hesiospina aurantiaca* — PLEIJEL, 2004: 2550-2559, figs. 1-6. *Castalia longicornis* — M. SARS, 1862*c*: 90. *Kefersteinia similis* — HESSLE, 1925: 29-32, text-fig. 10. *Hesiospina similis* — IMAJIMA & HARTMAN, 1964: 81, pl. 15. *Hesiospina similis* — IMAJIMA & HARTMAN, 1964: 81, pl. 15; O'CONNOR & SHIN, 1983: 356-360, fig. 1, table 1; SARDÁ, 1984*a*: 124-127, fig. 1; SORDINO, 1990: 36, table 1; PARAPAR, BESTEIRO & MOREIRA, 2004*a*: 227-229, fig. 81. [?] *Periboea longocirrata* — EHLERS, 1864: 199-202, pl. 8 figs. 12-16; FAUVEL, 1923*c*: 247-248, fig. 93*h*; SORDINO, 1990: 41, table 1. [?] *Peribœa longocirrata* — MALAQUIN, 1891: 100. [?] *Periboea Halleziana* — MALAQUIN, 1890*a*: 179. *Castalia fusca* var. [not Johnston 1836] — SOUTHERN, 1914: 49-50. *Hesiospina* A — UEBELACKER, 1984*e*: 28.25-28.27, figs. 28.23-28.24; PLEIJEL, 1998: 91, 115, fig. 10*A-D*, *F*, table 4. *Hesiospina* sp. — PLEIJEL, 1998: figs. 10*E*, 11. *Kefersteinia cirrhata* [not *Psamathe cirrhata* Keferstein 1862] — SAINT-JOSEPH, 1888: 324-325, pl. 13 figs. 199-203 [in part]; FAUVEL, 1913*a*: 57-58; FAGE & LEGENDRE, 1927: 65-66 [in part]; HARMELIN, 1969: 307. *Kefersteinia cirrata* [not *Psamathe cirrhata* Keferstein 1862] — HELGASON *et al.*, 1990: 205 [in part].
DISTRIBUTION: Iceland; Faroes; Ireland; Norway; Skagerrak; Atlantic French coast; Seamounts off Portugal (Gorringe, Josephine and Ampère Banks); Mediterranean Sea; [?] Adriatic Sea; Aegean Sea; Japan; Papua New Guinea; Australia (Great Barrier Reef); Loyalty Islands; Caribbean Sea (Belize); Gulf of Mexico. In sandy grounds, sometimes with rock and stones, among *Lophelia* and other corals, and among *Posidonia* and *Halophila* sea grasses. Between 1-545 meters.
REMARKS: PLEIJEL (1998: 115), stated that the European specimens of *Hesiospina* did not belong to *H. similis* (Hessle 1925), and that at least part of that records (the Mediterranean ones) could belong to the species *Periboea longocirrata* Ehlers 1864. However, no type material of this species is known to exist. The species was collected originally among algae at the littoral of Martinšćica (= Martinsica), in Cres Island, Kvarner (= Quarnero) Gulf, Croatia (Northern Adriatic Sea), and the study of topotype material, with the designation of a neotype, is required in order to solve the problem.

This opinion was reevaluated in PLEIJEL (2004), when the author considered that *Hesiospina similis* (Hessle 1925), described from Japan, was a junior synonym of *H. aurantiaca* (M. Sars 1862), described from Norway. However, the problem concerning the validity of *Periboea longocirrata* Ehlers 1864 remained. According to the original description, the species differs from *H. aurantiaca* in having seven enlarged anterior cirri on each side, rather than eight, and 16 terminal proboscideal papillae, rather than 20-45 in adults, and in addition no mention was made to the presence of notopodial hooks (PLEIJEL, 2004). PLEIJEL (1998) had considered that Ehlers had either miscounted the number of anterior cirri, or that his observation was based on a damaged specimen, and the notopodial hooks overlooked (PLEIJEL, 2004). However, the fact that MALAQUIN (1890*a*) had described as new species *Periboea Halleziana* from Normandy, France (later referred to *P. longocirrata* in MALAQUIN, 1891), with seven pairs of anterior cirri, and 20-22 proboscideal papillae, made PLEIJEL (2004) to assume that there was a possibility of the existence of a species in the European waters with that number of tentacular cirri. Due to the lack of type material of both species, PLEIJEL (2004) considered both *P. longocirrata* and *P. halleziana* as *nomina dubia*. As stated by the same author, for specific names *H. aurantiaca* is an older name than both *P. longocirrata* and *P. halleziana*, but in the case of synonymy of both generic names, *Periboea* would replace *Hesiospina*.

MALAQUIN (1890*a*) thought at first that the differences found between the population of *Periboea longocirrata* from Normandy and the Adriatic one, as described by EHLERS (1864), were significant enough in order to justify the erection of a new taxon, *P. halleziana*. However, the same author reconsidered later that decision (MALAQUIN, 1891), considering the material from Normandy as *P. logocirrata*. The differences found between the two populations are as follows:

***Periboea longocirrata* (Adriatic population)**	***Periboea longocirrata* (Atlantic population)**
a) 16 proboscideal papillae;	a) 20-22 proboscideal papillae
b) antennae and palps (as a second pair of antennae) of different dimensions.	b) antennae and palps (as a second pair of antennae) of equal dimensions.

Castalia aurantiaca M. Sars 1862 was first considered as a possible synonym of *Psamathe fusca* (as *Castalia fusca*) by SOUTHERN (1914), who compared specimens identified as *Castalia aurantiaca* by MICHAELSEN (1896) from the Kieler Bucht with *Psamathe fusca* , and concluded that they were identical. HELGASON *et al.* (1990) reached the same conclusion, by studying type material of *Castalia aurantiaca*

(7 syntypes in poor condition deposited at the Zoologisk Museum, in Oslo), and comparing it with the description of *Psamathe cirrhata* (later synonymized with *Psamathe fusca*) given in KEFERSTEIN (1862). Finally, PLEIJEL (2004) revised the extant type material of *Castalia aurantiaca*, to find that they were a mixture of fragments in a very poor condition of two species, with few characters that could be accurately assessed. However, some of the specimens had notopodial hooks, indicating that they belonged to *Hesiospina*, while others could belong to *Psamathe*. In order to avoid further ambiguities in the application of the name *C. aurantiaca*, PLEIJEL (2004) designated a lectotype, selected among those syntypes that clearly belonged to *Hesiospina*.

GENUS ***Leocrates*** Kinberg 1866

Leocrates KINBERG, 1866*b*: 244.

TYPE SPECIES: *Leocrates chinensis* Kinberg 1866.

SYNONYMS: *Lamprophaes* Grube 1867; *Tyrrhena* Claparède 1868; *Lamproderma* Grube 1877; *Dalhousia* McIntosh 1885.

KEY TO SPECIES:

1a. Proboscis with two dorsal teeth, being distally divergent; dorsal chaetae slightly spinous; big eyes...***L. atlanticus***

1b. Proboscis with one single dorsal tooth, spine shaped; dorsal chaetae strongly spinous; small eyes..***L. claparedii***

Leocrates atlanticus (McIntosh 1885)

Dalhousia atlantica MCINTOSH, 1885*a*: 186-188, pl. 29 fig. 3, pl. 33 fig. 2, pl. 15*A* figs. 5-7.

TYPE LOCALITY: South the Canary Islands, 25º45'N, 20º14'W, at 1525 fathoms (2788.9 meters), in hard ground.

SYNONYMS:[?] *Tyrrhena atlantica* Roule 1896; [?] *Leocrates indicus* Horst 1921.

SELECTED REFERENCES: *Leocrates atlantica* — MCINTOSH, 1908*c*: 130-134, pl. 58 fig. 17, pl. 69 fig. 17, pl. 78 fig. 5. *Leocrates atlanticus* — FAUVEL, 1913*a*: 56-57; FAUVEL, 1914*f*: 123-124, pl. 1 figs. 3-4, pl. 7 fig. 23; FAUVEL, 1923*c*: 235-237, fig. 88*a-h*; AMOUREUX, 1974*c*: 109; HARTMANN-SCHRÖDER, 1977*a*: 83; CAMPOY, 1982: 214-215; HARTMANN-SCHRÖDER, 1982*a*: 8; KIRKEGAARD, 1983*a*: 214; SORDINO, 1990: 37, table 1; PARAPAR, BESTEIRO & MOREIRA, 2004*a*: 219-221, figs. 77-78. [?] *Tyrrhena atlantica* — ROULE, 1896: 455-456, pl. 21 figs. 9-10, pl. 24 fig. 24, pl. 25 figs. 28-29. [?] *Leocrates atlantica* — ROULE, 1906: 52-57, pl. 2 fig. 10, pl. 5 figs. 36-39, pl. 8 figs. 72-73. *Tyrrhena atlantica* — MCINTOSH, 1901: 227-231, pl. 1 figs. 5-6, 8. [?] *Leocrates atlanticus* — PLEIJEL, 1998: 160. [?] *Leocrates indicus* — HORST, 1921: 82-83.

REFERENCES FOR PORTUGAL: AMOUREUX, 1974*b* (off Porto); HARTMANN-SCHRÖDER, 1977*a* (off Cape Sardão); CAMPOY, 1982 (previous records: Porto); PARAPAR, BESTEIRO & MOREIRA, 2004*a* (previous records: Portuguese continental shelf).

DISTRIBUTION: South Canary Islands; off Portugal; Azores; West Africa, from Morocco to Congo; Celtic Sea; [?] Bay of Biscay; Mediterranean Sea; [?] Banda Sea, Indonesia. On sandy, muddy and rocky bottoms. Between 40-1165 meters, but also recorded at 2165 and 2790 meters.

REMARKS: According to PLEIJEL (1998: 109), *Tyrrhena atlantica* Roule 1898 is a junior homonym and possible synonym of *Leocrates atlantica* (McIntosh 1885) (*Dalhousia* McIntosh 1885 and *Tyrrhena* Claparède 1868 are junior synonyms of *Leocrates* Kinberg 1866, and therefore *T. atlantica* Roule 1896 is a junior homonym and possible synonym of *D. atlantica* McIntosh 1885).

Leocrates claparedii (Costa *in* Claparède 1868)

Tyrrhena Claparedii COSTA *in* CLAPARÈDE, 1868: 538-541, pl. 18 fig. 3.

TYPE LOCALITY: Gulf of Naples.

SELECTED REFERENCES: *Tyrrhena Claparèdii* — MCINTOSH, 1901: 227-231, pl. 1 fig. 7. *Leocrates Claparedii* — FAUVEL, 1923*c*: 237-238, fig. 88*i-n*; [?] FAUVEL, 1935: 296-297; [?] FAUVEL, 1936*d*: 60; [?] OKUDA, 1937*a*: 270. *Leocrates claparèdi* — WESENBERG-LUND, 1949: 271-272, fig. 10. *Leocrates claparedii* — DAY, 1967: 230, fig. 11.2.*g-k*; KIRKEGAARD, 1983*a*: 214; PARAPAR, BESTEIRO & MOREIRA, 2004*a*: 221-222, fig. 79. *Leocrates chinensis* — [?] KINBERG, 1866*b*: 244; [?] IMAJIMA & HARTMAN, 1964: 82; SORDINO, 1990: 37-38, table 1. [?] *Leocrates anonymus* — HESSLE, 1925: 15-18, text-fig. 4.

DISTRIBUTION: Mediterranean Sea; Adriatic Sea; Aegean Sea; Senegal; Red Sea; Persian Gulf; tropical Indian and Pacific Oceans; from South Africa to Mozambique and Madagascar; [?] China; [?] Japan; [?] South Pacific areas. In detritic bottoms, among *Posidonia* and algae, in *Amphioxus*-sand, and in clay. Intertidal to 70 meters.

REMARKS: SORDINO (1990) accepted as valid the synonymy between *Leocrates claparedii* (Costa *in* Claparède 1868), from Naples, and *L. chinensis* Kinberg 1866, from Hong Kong, first proposed by HARTMAN (1940*a*) and followed in IMAJIMA & HARTMAN (1964). PLEIJEL (1998) considered both species to be closely related, but treated them as independent and valid, and this will be followed here, as the synonymy was not confirmed with base on the study of material. The European population of the species has been cited both as *Leocrates claparedii* and as *L. chinensis*, and some records from Far Eastearn Seas as *L. claparedii* do also exist. Besides, *Lamprophanes cuprea* Grube 1867, from Samoa Islands, and *Lamproderma longicirre* Grube 1877, from New Britain (Bismark Archipelago, Papua New Guinea) are normally considered to be synonymous with *L. chinensis*, while the synonymy of *Leocrates anonymous* Hessle 1925, from Japan, with *L. chinensis* is considered as possible. Finally, some records of both species from other localities could also refer to similar but different species.

In the above list, question marks precede references of records from Far Eastern Seas, both as *L. chinensis* or as *L. claparedii*, as well as the synonymies of *L. chinensis*. The question mark before *L. anonymous* indicates that this synonymy is not clear. In case the synonymy between *L. chinensis* and *L. claparedii* is confirmed, the first would have priority, being its type locality the sea by the fortress near Hong-Kong ("*mare juxta castrum prope Hongkong*"), 2 fathoms (3.6 meters) (KINBERG, 1866*b*).

GENUS ***Microphthalmus*** Mecznikow 1865

Microphthalmus MECZNIKOW, 1865: 334.

TYPE SPECIES: *Microphthalmus sczelkowii* Mecznikow 1865.

SYNONYMS: *Hesionella* Friedrich 1956 [junior homonym of *Hesionella* Hartman 1939]; *Fredericiella* Laubier 1967.

KEY TO SPECIES:

1a. Anal lamellae fringed; ventral chaetae compound and simple..**2**

1b. Anal lamellae have either entire edges or are bilobate; ventral chaetae are all compound or compound and simple..**4**

2a (1a). Notopodium with 1 acicula and 1 simple chaeta; simple notochaetae lyriform................***M. similis***

2b (1a). Notopodium with 1 acicula and 12-15 simple chaetae; simple notochaetae of two types: straight and smooth, or pectinate..**3**

3a (2b). Adults 15-25 mm long with 60-90 chaetigers; testes in chaetigers 2 or 3 through 35.....***M. fragilis***

3b (2b). Adults about 9 mm long with 30-45 chaetigers; testes in chaetigers 9 through 16......***M. aberrans***

4a (1b). Anal lamellae spatula-shaped, with entire edges and long; dorsal and ventral cirri are at least as long as the longest tentacular cirri or longer; notopodium with 3 chaetae: 1 pectinate, 1 simple slightly bent and 1 straight, acicula-like...***M. listensis***

4b (1b). Anal lamellae semi-circular or bilobate; dorsal and ventral cirri are distinctly shorter than the longest tentacular cirri; notopodium has 1 or 2 types of chaetae...**5**

5a (4b). Edge of anal lamellae usually entire..**6**

5b (4b). Edge of anal lamellae usually bilobate; notopodium with 1 smooth and 1 pectinate chaetae........**9**

6a (5a). Notopodia with one kind of chaetae, pectinate or subdistally roughly dentate..............................**7**

6b (5a). Notopodia with two kinds of simple chaetae, one short and pectinate, the other acicular, smooth and slightly bent..**8**

7a (6a). Notopodial pectinate chaetae with 5 long parallel teeth; neuropodial compound chaetae with 3 teeth at the tip..***M. southerni***
7b (6a). Notopodial pectinate chaetae with more than 10 short teeth; neuropodial compound chaetae bidentate..***M. sczelkowii***

8a (6b). Anal cirri more than twice longer than the dorsal cirri; coloration absent (or unknown)...***M. pseudoaberrans***
8b (6b). Anal cirri of about the same length than the dorsal cirri; coloration present, as transversal red-brownish bands, forming two stripes per segment, diminishing its intensity in the posterior region of the body, where the anal lamella is intensely pigmented..***M. tyrrhenicus***

9a (5b). Anal lamellae forked; short pectinate notopodial chaetae with about 8 big teeth; simple neurochaetae absent...***M. bifurcatus***
9b (5b). Anal lamellae divided more or less clearly in two lobes by a posterior incision; short pectinate notopodial chaetae with numerous fine teeth; neurochaetae simple and compound.................................**10**

10a (9b). Ocelli present; adults specimens less than 10 mm in length with 30-35 chaetigers; unpaired penis; oocyte diameter less than 100 µm...***M. pettiboneae***
10b (9b). Ocelli absent; adult specimens 3.2-4.2 mm in length with 27 chaetigers; paired penes; oocyte diameter reaching a maximum size of 250 µm..***M. ephippiophorus***

Microphthalmus aberrans (Webster & Benedict 1887)

Podarke aberrans WEBSTER & BENEDICT, 1887: 713-715 [in part; "adult form"], pl. 1 figs. 14-15, 18.
TYPE LOCALITY: Eastport, Maine (USA).
SELECTED REFERENCES: *Microphthalmus aberrans* — PETTIBONE, 1963*a*: 104, fig. 27*a-b* [in part]; RISER, 2000: 515-518, figs. 1-6, table 1. Not *Microphthalmus aberrans* — WESTHEIDE, 1967*b*: 139-141 [= *Microphthalmus pettiboneae* Riser 2000].
DISTRIBUTION: USA: Intertidal, in clean coarse sand beaches in Maine.
REMARKS: The historical background of the taxonomic problem involving this species was traced by RISER (2000). WEBSTER & BENEDICT (1887) described *Podarke aberrans* based on one "adult" collected at Eastport, Maine, and assumed that other specimens collected in Massachusetts, but not retained, were the same species. These specimens had a different anal lamella. Besides, the description of the species was based on the "adult" specimen, but was complemented with additional remarks on the morphology of "half-grown specimens" from the same region (Eastport, Maine). The figures accompanying the species' description were of both the "adult" and the "half-gown specimens", and the type material deposited was a mixture of both forms. SOUTHERN (1914) examined type material and stated that it didn't agree with the original description. He pictured the notopodial chaetae and tranferred the species to the genus *Microphthalmus*. According to RISER (2000), the material examined by Southern probably didn't included the "adult" specimen upon which Webster and Benedict mostly based their description, and would include only "half-grown specimens". ELIASON (1920) followed Southern's opinions concerning the type material, and ascribed to Webster and Benedict's species material collected at Öresund. After this, the epithet *aberrans* as been attributed to specimens that fit the description of *M. aberrans* sensu SOUTHERN (1914) and ELIASON (1920), instead of WEBSTER & BENEDICT (1887).

RISER (2000) revised the available type material of *Podarke aberrans*, and studied numerous specimens collected both at Maine and Massachusetts (USA), the localities from which *P. aberrans* was stated to occur by WEBSTER & BENEDICT (1887). According to his studies, RISER (2000) determined that three different species were involved: *Microphthalmus aberrans* (Webster & Benedict 1887), to which belongs the "adult form" upon which was based the main part of the original description of the species, and two new species, *M. aggregatus* Riser 2000, to which would belong the specimens collected but not retained from Massachusetts by Webster and Benedict, and *M. pettibobeae* Riser 2000, to which belongs the "juvenile form" of *M. aberrans* described by WEBSTER & BENEDICT (1887) and later revised by SOUTHERN (1914), as well as the specimens recorded by subsequent authors from Northern Europe (see the *SELECTED REFERENCES* section under *M. pettiboneae*).

This way, the distribution of *M. aberrans* is restricted to the coast of Maine (USA), and this species does not belong to the European Fauna of Polychaeta.

Microphthalmus bifurcatus Hartmann-Schröder 1974

Microphthalmus bifurcatus HARTMANN-SCHRÖDER, 1974*d*: 190-192, figs. 10-15.

TYPE LOCALITY: Skagerrak, 58º10'N, 08º42'E, in mud, at 500 meters.
SELECTED REFERENCES: *Microphthalmus bifurcatus* — KIRKEGAARD, 1992: 205-206, fig. 99; HARTMANN-SCHRÖDER, 1996: 144.
DISTRIBUTION: Skagerrak. In mud. Between 310-500 meters.

Microphthalmus ephippiophorus Clausen 1986

Microphthalmus ephippiophorus CLAUSEN, 1986: 178-183, figs. 2-11, table 1.
TYPE LOCALITY: Norway, Raunefjorden, Raunane, 60º15.8'N, 5º10.3'E, bottom coarse shelly sand with some detritus, at 1 meter.
DISTRIBUTION: Western Norway: Bergen area, Troms. In the shallow sublittoral, at a depth of 1-3 meters, mainly on coarse sediments in sheltered sites.

Microphthalmus fragilis Bobretzky 1870

Microphthalmus fragilis BOBRETZKY, 1870: 239.
TYPE LOCALITY: Black Sea.
SELECTED REFERENCES: *Microphthalmus fragilis* — LA GRECA, 1950: 9-13, figs. 1, 4, 5*b-d*, 6-7; WESTHEIDE, 1967*b*: 64-65, figs. 48*b-c*; WOLFF, 1969*c*: 307-309; SORDINO, 1990: 38, table 1; KIRKEGAARD, 1992: 207-208, fig. 100; HARTMANN-SCHRÖDER, 1996: 144.
DISTRIBUTION: Black Sea; Aegean Sea; Mediterranean Sea; southern North Sea; [?] eastern coast of USA. Coastal region, between 0-3 meters.

Microphthalmus listensis Westheide 1967

Microphthalmus listensis WESTHEIDE, 1967*b*: 57-61, 142-146, figs. 42*b*, 43-47, 48*b*, 55, 76-78, tables 1, 9.
TYPE LOCALITY: East side of List, Sylt Island (Germany, North Sea), eulittoral, in *Arenicola*-sand tidal flats, a few centimeters in the substract.
SELECTED REFERENCES: *Microphthalmus listensis* — WESTHEIDE, 1966: 204, 206, 208 [*nomen nudum*]; HARTMANN-SCHRÖDER & STRIPP, 1968: 11-13; WOLFF, 1969*c*: 309-310; WESTHEIDE, 1974*c*: 367; WESTHEIDE & RIEGER, 1987: 14-15, 16-28, figs. 1*c*, 2*c*, *f*, 3, 4*h-k*, 5*d*, 6*c*, *f*, 7*b*, 8*h-k*, 9*a-e*, 10*c*, 11*b*; KIRKEGAARD, 1992: 208-210, fig. 101; HARTMANN-SCHRÖDER, 1996: 144-145, fig. 61.
DISTRIBUTION: North Sea; Skagerrak; French Atlantic coast. Interstitial, on intertidal coarse sand.

Microphthalmus pettiboneae Riser 2000

Microphthalmus pettiboneae RISER, 2000: 520-522, fig. 10, table 1.
TYPE LOCALITY: Eastport, Maine (USA).
SELECTED REFERENCES: *Podarke aberrans* — WEBSTER & BENEDICT, 1887: 713-715 [in part; juvenile form], pl. 1 figs. 16-17, pl. 2 figs. 19-20. *Microphthalmus aberrans* [not Webster & Benedict 1887] — SOUTHERN, 1914: 46, fig. 7; ELIASON, 1920: 16; ELIASON, 1962*a*: 29; PETTIBONE, 1963*a*: 104 [in part]; WESTHEIDE, 1967*b*: 50-57, 100-103, 139-141, figs. 16*b*, 32*b*, 33-41, 42*c*, 55, 59-60, 61*c*, 67, 72*b*, *e-j*, tables 1, 9; HARTMANN-SCHRÖDER, 1971*a*: 142-143, fig. 48; CLAUSEN, 1986: 184-186, figs. 14-20; [?] SORDINO, 1990: 38, table 1; KIRKEGAARD, 1992: 203-205, fig. 98; HARTMANN-SCHRÖDER, 1996: 143-144, fig. 60. *Microphthalmus sczelkowii* var. *cantabrica* [not Rioja 1925] — AUGENER, 1939: 139, fig. 1. *Microphthalmus sczelkowii* [not Mecznikow 1865] — E. RASMUSSEN, 1956: 49-53, figs. 14-16. *Microphthalmus similis* [not Bobretzky 1870] — [?] BANSE, 1959*d*: 298-299, fig. 2.
DISTRIBUTION: U.S.A.: New England (Maine, Massachusetts, New Hampshire); Canada: New Brunswick, Nova Scotia; North Sea; Skagerrak; Øresund; [?] Adriatic Sea. In intertidal coarse sand beaches.
REMARKS: As stated above under *M. aberrans*, the biggest part of the North European records of *M. aberrans* refer to this species, or to a very similar one. As pointed by RISER (2000), an investigation similar to the one performed by WESTHEIDE & RIEGER (1987) concerning the *M. listensis* group of species, applied to the European records of *M. aberrans*, may demonstrate whether they are *M. pettiboneae* or if speciation has ocurred and they constitute different species.

WESTHEIDE (1967*b*) had already noted that the juveniles included in the original description of *M. aberrans* were a different species, as no ontogenetic evidence supported the fact that features as the presence of eyes, short cirri, and simple rounded anal lamella could change to the "adult" morphology (RISER, 2000).

Microphthalmus pseudoaberrans Campoy & Viéitez 1982

Microphthalmus pseudoaberrans CAMPOY & VIÉITEZ, 1982: 159-162, fig. 2.

TYPE LOCALITY: Combarro Beach (Ria de Pontevedra) and Meira Beach (Ria de Vigo), Galicia (western Spain), interstitial in intertidal sand.

SELECTED REFERENCES: *Microphthalmus pseudoaberrans* — CAMPOY, 1982: 224-228, pl. 13; SARDÁ, 1984*c*: 436, figs. *a-h* in page 437; CAPACCIONI-AZZATI, 1989: 238-240, pl. 1 ; PARAPAR, BESTEIRO & MOREIRA, 2004*a*: 259-261, fig. 94.

REFERENCES FOR PORTUGAL: DEXTER, 1992 (as *Microphthalmus aberrans*; previous records: Figueira da Foz).

DISTRIBUTION: Rias Bajas (Combarro Beach, in Ria de Pontevedra, and Meira Beach, in Ria de Vigo), Galicia (NW Spain); Mondego Estuary, Portugal; Gibraltar Strait; Western Mediterranean Sea; Adriatic Sea; Madeira Island. Mainly in sandy sediments with algae or seagrasses. Intertidal to 2 meters.

REMARKS: The species *M. pseudoaberrans* is quite similar to *M. tyrrhenicus*, and it is possible that both species could be synonymous.

Microphthalmus sczelkowii Mecznikow 1865

Microphthalmus sczelkowii MECZNIKOW, 1865: 334-335, pl. 24 figs. 10-12.

TYPE LOCALITY: Helgoland, North Sea.

SELECTED REFERENCES: *Microphthalmus sczelkowii* — WESTHEIDE, 1967*b*: 42-50, 103-104, 134-139, figs. 6*a*, 16*c*, 25-31, 32*a*, 42*a*, 54-55, 61*a-b*, 62-63, 65-66, 72*a*, *c-f*, tables 1, 9; CLAUSEN, 1986: 186-187, fig. 21; KIRKEGAARD, 1992: 210-211, fig. 102; HARTMANN-SCHRÖDER, 1996: 145-146, fig. 62. Not *Microphthalmus Sczelkowii* — SOUTHERN, 1914: 45-47, pl. 5 fig. 6; FAUVEL, 1923*c*: 250, fig. 93*a-f* [= *Microphthalmus southerni* Westheide 1967].

DISTRIBUTION: North Atlantic; British Isles; English Channel; North Sea; [?] Black Sea. Interstitial, in intertidal coarse to medium sand, mixed with mud, stones, or detritus. Eulittoral to upper sublittoral.

Microphthalmus similis Bobretzky 1870

Microphthalmus similis BOBRETZKY, 1870: 241.

TYPE LOCALITY: Bay of Sevastopol', Black Sea.

SELECTED REFERENCES: *Microphthalmus similis* — LA GRECA, 1950: 13-14, figs. 2-3, 5*a*; WESTHEIDE, 1967*b*: 133-134, fig. 71; HARTMANN-SCHRÖDER & STRIPP, 1968: 10-11, fig. 5; WOLFF, 1969*c*: 310; SORDINO, 1990: 38-39, table 1; KIRKEGAARD, 1992: 211-213, fig. 103; HARTMANN-SCHRÖDER, 1996: 147-148, fig. 63; PARAPAR, BESTEIRO & MOREIRA, 2004*a*: 261-263, fig. 95. Not *Microphthalmus similis* — BANSE, 1959*d*: 298-299, fig. 2 [= *Microphthalmus pettiboneae* Riser 2000].

DISTRIBUTION: North Sea; Southern Iberian Peninsula; Mediterranean Sea; Adriatic Sea; Black Sea. In coarse to muddy sand. Intertidal to about 20 meters.

Microphthalmus southerni Westheide 1967

Microphthalmus southerni WESTHEIDE, 1967*b*: 141-142, fig. 75.

TYPE LOCALITY: Under a stone on the north shore of Feorinyeeo Bay, Blacksod Bay, west coast of Ireland.

SELECTED REFERENCES: *Microphthalmus Sczelkowii* [not Mecznikow 1865] — SOUTHERN, 1914: 45-47, pl. 5 fig. 6; FAUVEL, 1923*c*: 250, fig. 93*a-f*.

DISTRIBUTION: Under stones on the shores of Blacksod Bay, Ireland; Helgoland.

Microphthalmus tyrrhenicus Zunarelli-Vandini 1967

Microphthalmus tyrrhenicus ZUNARELLI-VANDINI, 1967: 217-220, figs. *A-C*.

TYPE LOCALITY: Coast of Livorno (Ligurian Sea, Italy), on fine sand rich on organic detritus, between 2-5 meters.

SELECTED REFERENCES: *Microphthalmus tyrrhenicus* — SORDINO, 1990: 39, table 1.

DISTRIBUTION: Ligurian Sea, at the coast of Livorno. Infralittoral sand. Between 2-5 meters.

GENUS ***Micropodarke*** Okuda 1938

Micropodarke OKUDA, 1938: 90.

TYPE SPECIES: *Micropodarke Amemiyai* Okuda 1938.
REMARKS: The genus was revised by PLEIJEL & ROUSE (2005*b*). After the revision, the species *Micropodarke amemiyai* Okuda 1938, and *M. trilobata* Hartmann-Schröder 1983, were synonymized with *M. dubia* (Hessle 1925), becoming the genus monotypic.

Micropodarke sp.

Micropodarke sp. PLEIJEL, 1998: 115.
DISTRIBUTION: France.
REMARKS: PLEIJEL (1998) refers the presence of *Micropodarke* specimens in France. However, these specimens were not included or mentioned in the revision of the genus performed by PLEIJEL & ROUSE (2005*b*), but the genus would be prsent in Europe.

GENUS *Nereimyra* Blainville 1828

Nereimyra BLAINVILLE, 1828: 468.
TYPE SPECIES: *Nereis punctata* O.F. Müller 1788.
SYNONYMS: *Castalia* Savigny 1822 [not Lamarck 1819 (Mollusca)]; [?] *Halimede* Rathke 1843; *Neopodarke* Hartman 1965.
REMARKS: PLEIJEL (1998), following PETTIBONE (1963*a*), stated that the type species of *Nereimyra* was *Nereis rosea* Fabricius 1780. According to PETTIBONE (1963*a*), the type species would have been designated by STØP-BOWITZ (1948*b*), which is not correct. PETTIBONE (1963*a*: 107) states the designation of the type species as follows: "*Type designated by Støp-Bowitz, 1948a:* Nereimyra rosea *(Fabricius, 1780); =* Nereimyra punctata *(O.F. Müller, 1776).*" It is possible that she wanted to state that the type species was *Nereimyra punctata*, and that this species was a synonym of *N. rosea*. Anyway, STØP-BOWITZ (1948*b*) did not designate a type. This was done by HARTMAN (1959*a*), who designated *Nereis punctata* O.F. Müller 1788 as the type species of *Nereimyra*.

KEY TO SPECIES:
(adapted from USCHAKOV, 1955*a*)

1a. Pharynx provided with 24 terminal papillae; notopodia only with acicula present; capilliform notochaetae absent..***N. multipapillata***
1b. Pharynx provided with 10 terminal papillae and 2 chitinized ridges..**2**

2a (1b). Notopodia vestigial, each represented by one acicula and 2-6 short, slender, capilliform notochaetae..***N. punctata***
2b (1b). Notopodia vestigial, each represented by 1 or 2 acicula; capilliform notochaetae absent..***N. aphroditoides***

Nereimyra aphroditoides (Fabricius 1780)

Nereis aphroditoides FABRICIUS, 1780: 296-297.
TYPE LOCALITY: West Greenland, probably vicinity of Fedrikshåb, in muddy bottoms with strong currents.
SYNONYMS: [?] *Castalia Fabricii* Malmgren 1867.
SELECTED REFERENCES: *Castalia aphroditoides* — AUGENER, 1913*c*: 260; AUGENER, 1928*a*: 715-716; WESENBERG-LUND, 1950*a*: 13, pl. 3 fig. 14; WESENBERG-LUND, 1950*b*: 44-45; GRAINGER, 1954: 511; USCHAKOV, 1955*a*: 195, fig. 57*F-I*. PETTIBONE, 1954: 239-240, fig. 28*A-B*. *Psammate aphroditoides* — CHAMBERLIN, 1920: 13. *Nereimyra punctata* [not O.F. Müller 1780] — PETTIBONE, 1963*a*: 107-108, fig. 28*e*. [?] *Castalia Fabricii* — MALMGREN, 1867*a*: 32; THÉEL, 1879: 37-38, pl. 3 figs. 36-37.
DISTRIBUTION: Arctic Ocean; Bering Sea; Murmansk; Greenland; Alaska. Under stones, in crevices of rocks, sand, some mud, among algae and oysters. At shallow water to about 138 meters.

Nereimyra multipapillata (Théel 1879)

Castalia multipapillata THÉEL, 1879: 38-39, pl. 3 fig. 38.
TYPE LOCALITY: Novaya Zemlja, western region of Matotchkin, 73º19'N, between 7-34 meters, in sand, muddy sand, and clay.

Selected references: *Nereimyra multipapillata* — Uschakov, 1955*a*: 195.
Distribution: Arctic Ocean: Novaya Zemlja; Chuckchee Sea, near Point Barrow.

Nereimyra punctata (O.F. Müller 1776)

Nereis punctata O.F. Müller, 1776: 217.
Type locality: Probably Norway.
Selected references: *Castalia punctata* — M. Sars, 1862*c*: 89; McIntosh, 1908*c*: 121-125, pl. 46 fig. 2, pl. 69 fig. 14, pl. 78 fig. 2; Fauvel, 1913*a*: 56; Fauvel, 1914*f*: 122-123; Fauvel, 1923*c*: 240-241, fig. 89*f-k*; Banse, 1956*b*: 17-22, figs. 1-7. *Nereimyra punctata* — Campoy, 1982: 213-214; Schram & Haaland, 1984: 170-181, figs. 1-13, 14*I-L*, tables 1-2 Sordino, 1990: 39, table 1; Kirkegaard, 1992: 213-215, fig. 104; Hartmann-Schröder, 1996: 134-135, fig. 54; Parapar, Besteiro & Moreira, 2004*a*: 230-232, fig. 82. *Halimede venusta* — Rathke, 1843: 168-169, pl. 7 figs. 1-4.
References for Portugal: Amoureux, 1974*b* (as *Castalia punctata*; off Aveiro; off Porto); Campoy, 1982 (previous records: Aveiro; Porto); Amoureux, 1987 (off Aveiro).
Distribution: Arctic Ocean; North Atlantic, from Iceland to Azores; Mediterranean Sea; North Sea; Norway; Skagerrak; Kattegat; Øresund to western Baltic Sea; from Hudson Bay to North Carolina; Bering Sea. Under stones, among algae and rhizomes of laminarians on rocks, oyster banks, and many other different kinds of bottoms. Between 1-2990 meters.

GENUS *Ophiodromus* M. Sars 1862

Ophiodromus M. Sars, 1862*c*: 87.
Type species: *Ophiodromus vittatus* Sars 1862.
Synonyms: *Oxydromus* Grube 1855 [not Schegel 1854 (Aves)]; *Podarke* Ehlers 1864; *Mania* Quatrefages 1866; *Anoplonereis* Giard 1882.
Remarks: The species *Anoplonereis herrmanni* was described by Giard (1882) with base on specimens from Brittany (France), as combining characters of nereids, hesionids, polynoids, and syllids, and as living commensaly with *Balanoglossus*. The species was later considered as being a hesionid, and considered to be synonym with *Ophiodromus flexuosus* (Delle Chiaje 1827) (*e.g.*, Hartman, 1959*a*). Finally Pleijel (1998), considering the description given by Giard (1882) combined with the commensal habitat, also stated that the taxon could belong to *Ophiodromus*. However, due to the absence of type material, the affinity of the taxon was considered as uncertain (Pleijel, 1998: 150).

Key to Species:

1a. Parapodia clearly biramous with numerous capillary and furcate notochaetae....................***O. flexuosus***
1b. Parapodia sub-biramous with with few notochaetae...**2**

2a (1b). Notochaetae include 1-3 furcate chaetae and sometimes capillar chaetae; lateral antennae articulated..***O. pallidus***
2b (1b). Notopodial furcate chaetae absent; lateral antennae not articulated...**3**

3a (2b). One single notopodial capillar chaetae..***O. agilis***
3b (2b). Several (4-12) notopodial capillar chaetae...***O. pelagicus***

Ophiodromus agilis (Ehlers 1864)

Podarke agilis Ehlers, 1864: 197-199, pl. 8 figs. 9-11.
Type locality: Collected with net, among algae near Martinšćica (= Martinsica), in Cres Island, Kvarner (= Quarnero) Gulf, Croatia, Adriatic Sea.
Selected references: *Podarke agilis* — Saint-Joseph, 1906: 228-229; Fauvel, 1913*a*: 58; Fauvel, 1923*c*: 245-246, fig. 91*e-h*. *Ophiodromus agilis* — Sordino, 1990: 39, table 1.
References for Portugal: Ravara, 1997 (as *Podarke agilis*; off Aveiro).
Distribution: Mediterranean Sea; Adriatic Sea; Aegean Sea. Among algae and *Lithothamnion*. Between 1-50 meters.

Ophiodromus flexuosus (Delle Chiaje 1827)

Nereis flexuosa DELLE CHIAJE, 1827: 425.

TYPE LOCALITY: Gulf of Naples.

SYNONYMS: *Oxydromus fasciatus* Grube 1855; [?] *Ophiodromus vittatus* Sars 1862; *Podarke albocincta* Ehlers 1864; [?] *Ophiodromus adspersus* Grube 1874.

SELECTED REFERENCES: *Stephamia flexuosa* — CLAPARÈDE, 1870: 482-484, pl. 12 fig. 1. *Ophiodromus flexuosus* — SAINT-JOSEPH, 1888: 326-328; MCINTOSH, 1908*c*: 117-120, pl. 58 figs. 12-13, pl. 69 fig. 13, pl. 78 fig. 1; SOUTHERN, 1914: 47-48, pl. 5 fig. 9; FAUVEL, 1923*c*: 242-243, fig. 90*e-i*; RIOJA, 1923: 218-219, fig. 1; CAMPOY, 1982: 217-219, pl. 12; HAALAND & SCHRAM, 1983: 86-94, figs. 1-15; SORDINO, 1990: 39-40, table 1; KIRKEGAARD, 1992: 215-217, fig. 105; HARTMANN-SCHRÖDER, 1996: 135-136, fig. 55; PARAPAR, BESTEIRO & MOREIRA, 2004*a*: 248-250, fig. 88. [?] *Ophiodromus adspersus* — GRUBE, 1874*a*: 54. [?] *Ophiodromus vittatus* — M. SARS, 1862*c*: 87-88. *Oxydromus fasciatus* — GRUBE, 1855: 99-100. *Podarke albocincta* — EHLERS, 1864: 190-194, pl. 8 figs. 2-5.

REFERENCES FOR PORTUGAL: QUINTINO & GENTIL, 1987 (Lagoon of Albufeira); DEXTER, 1992 (previous records: Lagoon of Óbidos); PARAPAR, BESTEIRO & MOREIRA, 2004*a* (previous records: Portugal).

DISTRIBUTION: North Atlantic, from Norway to Angola; English Channel; North Sea; Skagerrak; Kattegat; Øresund; Mediterranean Sea; Adriatic Sea; Aegean Sea. In muddy and sandy grounds, and amongst algae, rare in rocks, but can be found in oyster banks and among *Posidonia*, *Zostera*, and rhizopods of algae, and also as a commensal of echinoderms and in the galleries of terebellids and maldanids. Between 0-240 meters.

REMARKS: According to PLEIJEL (1998: 161), both *Ophiodromus adspersus* Grube 1874 and *O. vittatus* Sars 1862 are possible junior synonyms of *O. flexuoxus* (Delle Chiaje 1827).

The notopodia of this species bears numerous chaetae. These chaetae are mainly thin capillary, but in the lower region of the bundle there are a few furcate chaetae.

Ophiodromus pallidus (Claparède 1864)

Oxydromus pallidus CLAPARÈDE, 1864: 521-522, pl. 4 fig. 1.

TYPE LOCALITY: Port-Vendres, Gulf of Lions, Mediterranean coast of France.

SYNONYMS: [?] *Podarke viridescens* Ehlers 1864.

SELECTED REFERENCES: *Podarke pallida* — PRUVOT & RACOVITZA, 1895: 423-428, pl. 18 figs. 77-83; SAINT-JOSEPH, 1898: 337-338, pl. 19 fig. 145; FAUVEL, 1923*c*: 244, fig. 91*a-d*. [?] *Podarke viridescens* — EHLERS, 1864: 194-197, pl. 8 figs. 6-8; MARION & BOBRETZKY, 1875: 49-50. *Ophiodromus pallidus* — CAMPOY, 1982: 220-221; SORDINO, 1990: 40, table 1; PARAPAR, BESTEIRO & MOREIRA, 2004*a*: 250-251, fig. 89. *Podarke cf. pallida* — BRITO *et al.*, 1996: 165-166, fig. 6*E-H*. [?] *Ophiodromus viridescens* — PLEIJEL, 1998: 161, 162.

DISTRIBUTION: Atlantic Ocean, from the English Channel to the Canary Islands; Mediterranean Sea; Adriatic Sea; Aegean Sea. In sandy, muddy, or coralligenous bottoms, among algae and *Posidonia*, hydroids, and in *Amphioxus*-sand. Between 1-40 meters.

REMARKS: According to PLEIJEL (1998: 161), *Podarke viridescens* Ehlers 1864 is possibly a junior synonym of *O. pallidus* (Claparède 1864).

Ophiodromus pelagicus Rioja 1923

Ophiodromus pelagica RIOJA, 1923*a*: 219-224, figs. 2-4.

TYPE LOCALITY: Near Marín, Ría de Pontevedra, Galicia (western Spain), in the water column.

SELECTED REFERENCES: *Ophiodromus pelagica* — FAUVEL, 1923*c*: 456; FAGE & LEGENDRE, 1927: 64. *Ophiodromus pelagicus* — CAMPOY, 1982: 219-220; PARAPAR, BESTEIRO & MOREIRA, 2004*a*: 253, fig. 90.

DISTRIBUTION: Ria de Pontevedra, Galicia (Spain); [?] Concarneau, French Atlantic coast; [?] Western Mediterranean Sea (Banyuls-sur-Mer). Planktonic.

REMARKS: FAUVEL (1923C) suggested that this species could be a juvenile form, near to *Podarke* or to *Ophiodromus*. FAGE & LEGENDRE (1927) went further, considering *O. pelagicus* as being probably a juvenile of *O. flexuosus*, besides, a species that is also present at the type locality of *O. pelagicus* (see RIOJA, 1923*a*). However, PLEIJEL (1998) considered the species as being possibly valid, in which was followed by PARAPAR, BESTEIRO & MOREIRA (2004*a*). The type material is apparently lost (SAN MARTÍN & VIÉITEZ, 1991), as it isn't deposited at the Museo Nacional de Ciencias Naturales, in Madrid, where the rest of the Spanish material studied by Rioja is deposited. This will require the collecting of new material in order to confirm the status of the species (PARAPAR, BESTEIRO & MOREIRA, 2004*a*). The species will be also considered here as being possibly valid, but with some doubts.

*GENUS ***Podarkeopsis*** Laubier 1961

Podarkeopsis LAUBIER, 1961*c*: 211-212.
TYPE SPECIES: *Podarkeopsis galangaui* Laubier 1961.

KEY TO SPECIES:

1a. Dorsal cirri smooth; first 5-7 chaetigers uniramous (in two specimens studied from Fos, Mediterranean coast of France, this number seems to be reduced to two)................................***P. capensis****
1b. Dorsal cirri articulated; chaetigers biramous..**2**

2a (1b). Prostomium pentagonal; ventral cirri articulated or wrinckled; palps inserted away from the anterior corners of the prostomium; shorter tine of the forked chaetae straight, or slightly bent outside; longer tine of the forked chaetae straight, without a hump dorsally..................................***P. helgolandicus***
2b (1b). Prostomium rectangular; ventral cirri smooth; palps inserted near the anterior corners of the prostomium; shorter tine of the forked chaetae bent inside, in direction of the longer tine; longer tine of the forked chaetae with a hump or swelling dorsally...***P. arenicolus***

Podarkeopsis arenicolus (La Greca 1947)

Oxydromus arenicolus LA GRECA, 1947: 273-276, figs. 4-9.
TYPE LOCALITY: Mergellina, Gulf of Naples, in sand near the coast.
SYNONYMS: *Podarkeopsis galangaui* Laubier 1961.
SELECTED REFERENCES: *Podarkeopsis galangaui* — LAUBIER, 1961*c*: 212-216, fig. 1; PERKINS, 1984*b*: 579. *Gyptis arenicola* — SORDINO, 1990: 33, table 1.
DISTRIBUTION: Aegean Sea; Mediterranean Sea: Gulf of Naples; Banyuls-sur-Mer, southern France. In mud and *Posidonia* meadows. Between 2-30 meters.

****Podarkeopsis capensis*** (Day 1963)

Oxydromus capensis DAY, 1963*b*: 397-398, fig. 4*e-j*.
TYPE LOCALITY: Off Saldanha Bay (Western Cape province, South Africa), 33º06.4'S, 17º47.2'E, at 141 meters, in dark green mud.
SELECTED REFERENCES: *Oxydromus capensis* — DAY, 1967: 231-232, fig. 11.2.*l-o*; GIBBS, 1971: 137; GIBBS, 1972: 204; GIBBS & PROBERT, 1973: 397-399, fig. 2. *Podarkeopsis capensis* — PERKINS, 1984*b*: 579; GRAVINA & GIANGRANDE, 1989: 156-159, fig. 2; SORDINO, 1990: 41, table 1; PARAPAR, BESTEIRO & URGORRI, 1993*b*: 421-423, fig. 6; PARAPAR, BESTEIRO & MOREIRA, 2004*a*: 255-258, figs. 92-93.
REFERENCES FOR PORTUGAL: DEXTER, 1992 (as *Gyptis capensis*; previous records: Ria de Alvor); present work (southwestern continental shelf).
MATERIAL: SEPLAT 7 (2nd part) — St. 193 (2nd. try) (A.3919), south Sines, 69 m, sandy mud: 1 incomplete specimen, with about 33 chaetigers; almost all cirri missing; present cirri smooth; proboscis everted, with 10 marginal papillae; 3 antennae, all arising from the anterior margin of prostomium; median antenna much shorter than lateral ones; prostomium wider than long; palps with a stout basal joint and a slightly shorter distal one; eyes not visible; 8 pairs of tentacular cirri; first 5 parapodia uniramous; notochaetae present from parapodia 6; notochaetae include capillaries and forked chaetae, with serrations along one edge of the shaft, just below the fork; neurochaetae compound and falcigerous, with blades varying greatly in length, but all with bidentate tips. **FAUNA 1 — St. 69*A***, Gulf of Cádiz, off mouth of Guadiana, 110-112 m, mud: 1 incomplete specimen with 20 chaetigers; proboscis everted with characteristic 10 papillae; all tentacular cirri missing, as the two lateral antennae; notochaetae from chaetiger 5, with forked chaetae; tip of main tine as in *Podarkeopsis helgolandicus* (Hilbig & Dittmer 1979).
DISTRIBUTION: Western South Africa, at 40-150 meters; Solomon and Cook Islands, at shallow water; South coast of Corwall, England, at 9-13 meters; Bay of Biscay; Mediterranean coast of Spain; brackish lagoons of Sabaudia (Lazio, Central Italy) and Santa Gilla (Sardinia), at 1-2 meters; Adriatic Sea; Aegean Sea. In muddy and sandy bottoms. Between 1-150 meters.

Podarkeopsis helgolandicus (Hilbig & Dittmer 1979)

Gyptis helgolandica HILBIG & DITTMER, 1979: 102-105, figs. 1-3.
TYPE LOCALITY: German Bight, 54º20'N, 5º40'E, at 43 meters, in silty fine sand.
Helgoland, Südhafen, Schlick (German Bight), 12 meters.
SELECTED REFERENCES: *Gyptis helgolandica* — KIRKEGAARD, 1992: 193-195, fig. 93. *Podarkeopsis helgolandica* — PLEIJEL, 1993*b*: 159; HARTMANN-SCHRÖDER, 1996: 136-138, fig. 56.
DISTRIBUTION: German Bight. In fine sand, with more or less silt. Between 10-53 meters.
REMARKS: It includes northern Europe records of *Gyptis capensis* Auctt. [not Day 1963], and *Gyptis brevipalpa* Auctt. [not Hartmann-Schröder 1959].

GENUS ***Psamathe*** Johnston 1836

Psamathe JOHNSTON, 1836: 14-15.
TYPE SPECIES: *Psamathe fusca* Johnston 1836.
SYNONYMS: *Kefersteinia* Quatrefages 1866. Not *Psamathe* Rafinesque 1814 [= *nomen nudum*].

KEY TO SPECIES:

1a. Black eyes; blades of compound chaetae with coarse teeth at base; tips of blades unidentate....***P. fusca***
1b. Red eyes; coarse teeth at the base of compound chaetae absent; tips of blades tend to be bifid at the point, especially in the dorsal part of the foot, and in the posterior segments........***Castalia fusca hibernica***

Psamathe fusca Johnston 1836

Psamathe fusca JOHNSTON, 1836: 15-16, fig. 1.
TYPE LOCALITY: Berwick Bay (Northeast England), at the roots of Confervae, corallines, and sponges, between tide marks.
SYNONYMS: *Psamathe cirrhata* Keferstein 1862.
SELECTED REFERENCES: *Castalia fusca* — MCINTOSH, 1908*c*: 127-130, pl. 46 fig. 3, pl. 58 figs. 15-16, pl. 69 fig. 16, pl. 78 fig. 4; SOUTHERN, 1914: 48. *Psamathe fusca* — PARAPAR, BESTEIRO & MOREIRA, 2004*a*: 233, fig. 83. *Psamathe cirrhata* — KEFERSTEIN, 1862: 107-109, pl. 9 figs. 32-36; CLAPARÈDE, 1863: 55-56, pl. 14 figs. 1-7. *Kefersteinia cirrata* — SAINT-JOSEPH, 1888: 324-325, pl. 13 figs. 199-203 [in part; in part = *Hesiospina aurantiaca* (M. Sars 1862)]; RIOJA, 1918*b*: 37-38, fig. 9; FAUVEL, 1913*a*: 57-58; FAUVEL, 1923*c*: 238-240, fig. 89*a-e*; CAMPOY, 1982: 211; SORDINO, 1990: 36-37, table 1; KIRKEGAARD, 1992: 201-202, fig. 97; BRITO *et al.*, 1996: 164-165, fig. 6*A-D*; HARTMANN-SCHRÖDER, 1996: 132-133, fig. 53. [?] *Kefersteinia Claparedii* — QUATREFAGES, 1866*b*: 42-43.
REFERENCES FOR PORTUGAL: SALDANHA, 1974 (as *Kefersteinia cirrata*; coast of Arrábida); AMOUREUX & CALVÁRIO, 1981 (as *Kefersteinia cirrata*; Peniche); CAMPOY, 1982 (as *Kefersteinia cirrata*; previous records: Arrábida); DEXTER, 1992 (as *Kefersteinia cirrata*; previous records: Sado Estuary; Figueira da Foz); SPRUNG, 1994 (as *Kefersteinia cirrata*; Ria Formosa); SALDANHA, 1995 (as *Kefersteinia cirrata*; Portugal); RAVARA, 1997 (as *Kefersteinia cirrata*; off Aveiro); PARAPAR, BESTEIRO & MOREIRA, 2004*a* (previous records: Portuguese coast).
DISTRIBUTION: Atlantic Ocean, from Iceland to South Africa; Mediterranean Sea; Adriatic Sea; Aegean Sea; Suez Canal; Adriatic Sea; English Channel to Kieler Bight; Indochina; Indian Ocean; Antarctic Ocean. In coarse *Amphioxus*-sand, among tubes of serpulids, rhizoids of laminarians, oyster banks, algae on rocks, and mud in coralligenous bottoms. Between 0-250 meters.
REMARKS: In the absence of type material of *Kefersteinia claparedii* Quatrefages 1866, PLEIJEL (1998) considered the species as being possibly a junior synonym of *Psamathe fusca* Johnston 1836.

Castalia fusca hibernica Southern 1914

Castalia fusca var. *hibernica* SOUTHERN, 1914: 49, pl. 5 fig. 8.
TYPE LOCALITY: Clew Bay (Ireland), in 24 fathoms (43.9 meters), on a bottom of sand and shells.
DISTRIBUTION: West Ireland: Clew Bay, in 24 fathoms (43.9 meters), and Dingle Bay, in 20 fathoms (36.6 meters). On bottoms of sand and shells.
REMARKS: SOUTHERN (1914) separated this variety from the stem species with base on the following differences: (1) the eyes are red, instead of black, as in *Psamathe fusca*; (2) the characteristic coarse teeth

on the basis of the blades of the compound chaetae of *P. fusca* are not found in this form; (3) the chaetae are shorter and thicker, and the blades tend to be bifid at the tip, especially in the dorsal part of the foot, and in the posterior segments.

The type material of this variety was not found, and it was not studied by PLEIJEL (1998). As it is not clear if the variety belongs to the genus *Psamathe*, or even if it is valid, I maintain here its name as originally published, in order to avoid a possible worthless new combination.

*GENUS ***Syllidia*** Quatrefages 1866

Syllidia QUATREFAGES, 1866*b*: 13.

TYPE SPECIES: *Syllidia armata* Quatrefages 1866.

SYNONYMS: *Magalia* Marion & Bobretzky *in* Marion 1874; *Pseudosyllidia* Czerniavsky 1882.

****Syllidia armata**** Quatrefages 1866

Syllidia armata QUATREFAGES, 1866*b*: 13-15, pl. 8 figs. 10-15.

TYPE LOCALITY: La Rochelle, Western France.

SYNONYMS: *Magalia perarmata* Marion & Bobretzky *in* Marion 1874; *Pseudosyllidia armata* Czerniavsky 1882 [HOMONYM]; *Megalia assimilis* Pryde 1914; *Psammate britannica* Chamberlin 1920; *Magalia capensis* McIntosh 1924.

SELECTED REFERENCES: *Syllidia armata* — LANGERHANS, 1880*a*: 305, pl. 16 fig. 40; DAY, 1967: 227, fig. 11.1.*h-l*; CAZAUX, 1970: 112-116, pl. 34 figs. 1-5, pl. 35 figs. 1-2; CAMPOY, 1982: 212-213; HARTMANN-SCHRÖDER, 1982*a*: 8; SORDINO, 1990: 41-42, table 1; KIRKEGAARD, 1992: 217-218, fig. 106; BRITO *et al.*, 1996: 164, fig. 5*D-F*; HARTMANN-SCHRÖDER, 1996: 138-139, fig. 57; PARAPAR, BESTEIRO & MOREIRA, 2004*a*: 235-237, fig. 84; RUTA & PLEIJEL, 2006*a*: 505-513, figs. 1-6, 9. *Pseudosyllidia armata* — CZERNIAVSKY, 1882: 174-175. *Magalia perarmata* — MARION & BOBRETZKY *in* MARION 1874: 399; MARION & BOBRETZKY, 1875: 54-56, pl. 6 figs. 16*A-E'*, *H*, pl. 7, figs. 16, 16*F-G*; SAINT-JOSEPH, 1888: 318-320, pl. 13 figs. 197-198; MCINTOSH, 1908*c*: 136-137, pl. 59 figs. 1-2, pl. 65 fig. 10, pl. 69 fig. 18, pl. 78 fig. 8; FAUVEL, 1923*c*: 246-247, fig. 92; CASANOVA, 1954: 155-160, pls. 1-3. *Castalia arctica* [not Malmgren 1867] — MCINTOSH, 1908*c*: 125-126, pl. 58 fig. 14, pl. 69 fig. 15, pl. 78 fig. 3. *Psammate britannica* — CHAMBERLIN, 1920: 13; WESENBERG-LUND, 1950*a*: 13, pl. 3 fig. 13, chart 13. *Megalia assimilis* — PRYDE, 1914: 273-275, pl. 11 figs. 1-3. *Magalia capensis* — MCINTOSH, 1924: 16; MCINTOSH, 1925: 41-42, pl. 5 fig. 2. *Syllidia capensis* — DAY, 1967: 227, fig. 11.1.*m*.

REFERENCES FOR PORTUGAL: QUINTINO & GENTIL, 1987 (Lagoon of Albufeira; Lagoon of Óbidos); QUINTINO, RODRIGUES & GENTIL, 1989 (Lagoon of Óbidos); DEXTER, 1992 (previous records: Lagoon of Albufeira; Lagoon of Óbidos); BOAVENTURA *et al.*, 2006 (Ancão, Algarve).

MATERIAL: FAUNA 1 — St. 33*A*, Alborán Sea, Alborán Island, 34-44 m, laminarians on rocks: 2 incomplete specimens, in a very poor condition, one with 12 and the other 14 chaetigers; proboscis invaginate, but the lateral jaws can be seen through the body wall. **St. 56*A***, Gulf of Cádiz, off Cape Trafalgar, 24 m, rock and gravel: 1 incomplete specimen, with 9 chaetigers; proboscis everted, with 10 papillae; it is armed with a median ventral stylet and a pair of lateral jaws with dentated cutting edges; parapodia uniramous; neuropodium with a triangular prechaetal lip and a low rounded postchaetael lamella; chaetae falcigerous, with blades of variable length ending in a terminal hook, below which is a very fine secondary tooth; antennae missing; 2 palps biarticulated; 6 pairs of annulated tentacular cirri; dorsal cirri faintly annulated. **St. 58*A***, Gulf of Cádiz, 33-34 m, detritic with rocks: 1 complete specimen, with about 19 chaetigers; 1.65 mm long, 0.3 mm wide; proboscis everted, armed with a median ventral stylet and a pair of lateral jaws with serrated cutting edges; posterior median ventral dark stripe, made of dark brown spherules.

DISTRIBUTION: Atlantic Ocean, from Hebrides to South Africa; North Sea; Skagerrak; Mediterranean Sea; Adriatic Sea; Aegean Sea; Madeira Island; Suez Canal; Mozambique. Among algae, rhizoids of laminarians, among tunicates, mussels, serpulids, and oysters, and also on rocky, sandy and muddy grounds. Intertidal to 400 meters.

REMARKS: As the genus *Pseudosyllidia* Czerniavsky 1882 is a junior synonym of *Syllidia* Quatrefages 1866, *Pseudosyllidia armata* Czerniavsky 1882 is both a junior homonym and synonym of *Syllidia armata* Quatrefages 1866.

The studied specimens of *Syllidia armata* showed normally a posterior midventral dark line or stripe.

GENUS *Wesenbergia* Hartman 1955

Wesenbergia HARTMAN, 1955*b*: 41.
TYPE SPECIES: *Hesionella problematica* Wesenberg-Lund 1950.

Wesenbergia problematica (Wesenberg-Lund 1950)

Hesionella problematica WESENBERG-LUND, 1950*a*: 14, pl. 3 fig. 15, chart 18.
TYPE LOCALITY: South-west of Iceland, 64º18'N, 27º00'W, in 555 meters.
DISTRIBUTION: Known from the type locality.

INVALID OR INDETERMINABLE SPECIES

Anoplonereis herrmanni Giard 1882

Anoplonereis Herrmanni GIARD, 1882: 390-391.
TYPE LOCALITY: Glénan Archipelago (Brittany, France), on the sandy beaches of Île du Loch and of Île Saint-Nicolas, living as commensal of *Balanoglossus salmoneus* and mainly on *B. robinii*, at the bottom of the water channel formed by the genital wings of the trunk.
REMARKS: PLEIJEL (1998), considering the description given by GIARD (1882) combined with the commensal habitat, stated that the taxon may belong within *Ophiodromus*. However, and due to the absence of type material, the affinity of the taxon was considered as uncertain (PLEIJEL, 1998: 150).

Castalia arctica Malmgren 1867

Castalia arctica MALMGREN, 1867*a*: 32.
TYPE LOCALITY: Safehavn, Wydebay, Kingsbay and Shoalpoint, at Spitsbergen, between 3-30 fathoms (5.5-55 meters), in muddy bottoms.
REMARKS: The type material was apparently studied by PLEIJEL (1998: 157). The genus *Castalia* is a junior synonym of *Nereimyra* Blainville 1828, but this species was not considered under this genus in the referred study.

Castalia fabricii Malmgren 1867

Castalia Fabricii MALMGREN, 1867*a*: 32.
TYPE LOCALITY: Greenland, at Julianehaab and Smallesund.
REMARKS: According to PLEIJEL (1998: 157) this species is possibly a junior synonym of *Nereimyra aphroditoides* (Fabricius 1780).

Cirrosyllis vittata Schmarda 1861

Cirrosyllis vittata SCHMARDA, 1861: 78, text-figs. *a-b*, *A-B*.
TYPE LOCALITY: Island of Losinj (= Lissa), Croatia, Adriatic Sea.
REMARKS: Based on the description of the species, as no type material is known to exist, PLEIJEL (1998) considered *Cirrosyllis vittata* as belonging to Nereididae.

Microphthalmus sczelkowii cantabrica Rioja 1925

Microphthalmus Sczelkowii var. *cantabrica* RIOJA, 1925*b*: 18-19.
TYPE LOCALITY: Among stones, at shallow water at the inlet near the castle, San Vicente de la Barquera (Northern Spain), Cantabrian Sea.
SELECTED REFERENCES: *Microphthalmus Sczelkowii* var. *cantabrica* — FAUVEL, 1927*a*: 408.
DISTRIBUTION: Known from the type locality.
REMARKS: WESTHEIDE (1978) considered this species as indeterminable. This opinion was followed by CAMPOY (1982: 223) and PARAPAR, BESTEIRO & MOREIRA (2004*a*: 258).

Nereis rosea Fabricius 1780

Nereis rosea FABRICIUS, 1780: 301-302.

TYPE LOCALITY: Western Greenland, probably in the vinity of Paamiut/Frederikshaab region, in the littoral, in sand under stones.
REMARKS: PLEIJEL (1998: pages 119, 121, 161) considered *Nereis rosea* Fabricius, 1780 as being probably a synonymy of *Nereimyra punctata* (O.F. Müller 1776) or *N. aphroditoides* (Fabricius 1780).

Ophiodromus longocirratus Tenerelli 1974

Ophiodromus longocirratus TENERELLI, 1974: 370-375, figs. 1-3.
TYPE LOCALITY: Southern coast of Isola Lachea, Sicily (Gulf of Catania, Italy), 20 meters.
DISTRIBUTION: Gulf of Catania (Sicily, Italy).
REMARKS: According to PLEIJEL (1998), the description of this species was probably based on juvenile specimens, it wasn't possible to locate the type material, and it is a junior homonym of *O. longocirratus* (Knox & Cameron 1971). *O. longocirratus* Tenerelli 1974 was considered as a *nomen dubium* by the same author.

Orseis pulla Ehlers 1864

Orseis pulla EHLERS, 1864: 188-190, pl. 8 fig. 1.
TYPE LOCALITY: Martinšćica (= Martinsica) Rijeka (Croatia, Northern Adriatic), among coastal algae.
SELECTED REFERENCES: *Orseis pulla* — FAUVEL, 1923*c*: 248-249, fig. 93*g*; SORDINO, 1990: 40-41, table 1.
REMARKS: In the absence of known type material, PLEIJEL (1998) considered this species as being a *nomen dubium*.

Parapodarke lubrica Czerniavsky 1882

Parapodarke lubrica CZERNIAVSKY, 1882: 177-178, pl. 4 fig. 10.
TYPE LOCALITY: Black Sea.
REMARKS: In the absence of known type material, PLEIJEL (1998) considered this species as being a *nomen dubium*.

FAMILY **HISTRIOBDELLIDAE** Vaillant 1890

As: *Histriobdellidae* Vaillant, 1890: 538.
Type genus: *Histriobdella* van Beneden 1858.
Remarks: The family Histriobdellidae comprises small annelids, rarelly exceeding 2 mm in length, which are known to live symbiotically in crustaceans Astacidea (lobsters and crayfishes), Anomura and Brachyura, and also in one species of Isopoda. Histriobdellids live normally in the branchial chambers of their hosts (where they feed on microorganisms), attached to the ventral body surface, or on the pleopods, in the case of the isopodan host. Besides, they can also be found among the eggs of their hosts, where the family was originally found by van Beneden (1853), and taken by a larval serpulid, due to their bizarre morphology. The family includes at date 3 genera and 13 species: *Histriobdella* van Beneden 1858 and *Dayus* Steiner & Amaral 1999, both genera including one single marine species, and *Stratiodrilus* Haswell 1900, with 11 species living in freshwater.

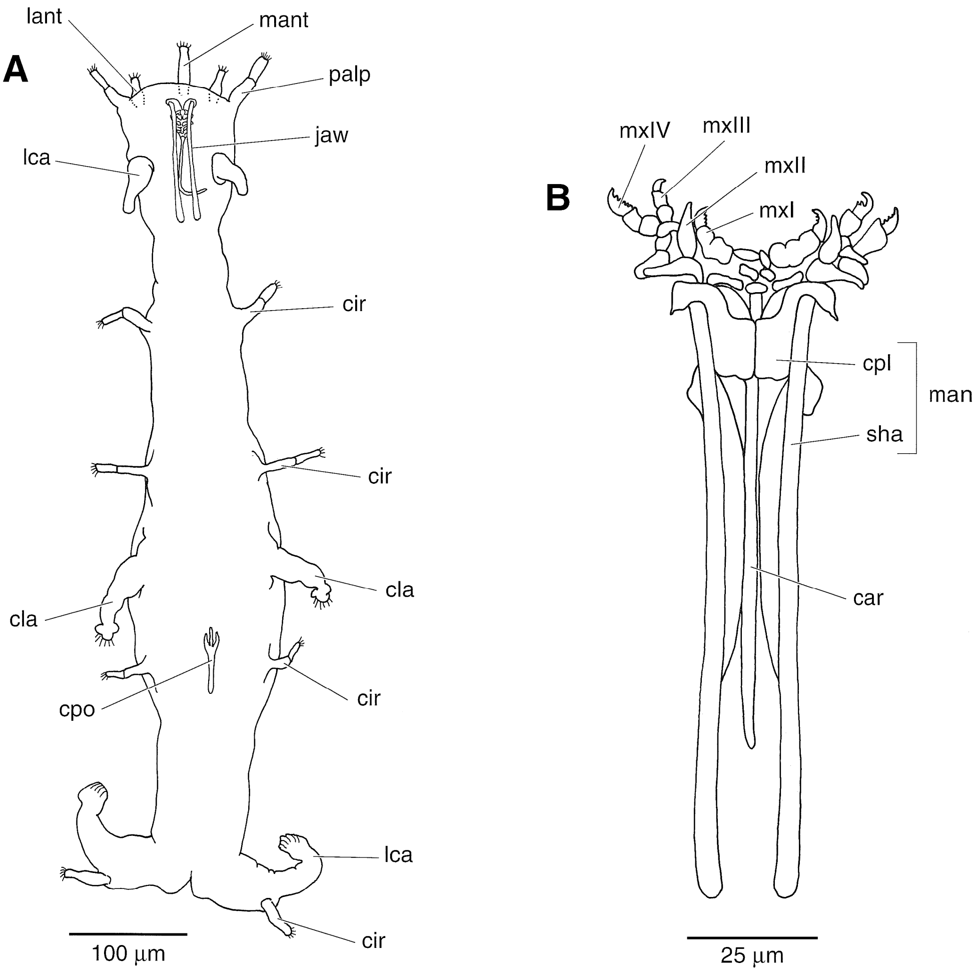

Figure legend: Family Histriobdellidae. *Stratiodrilus* specimen. **A**, entire animal, ventral view. **B**, jaws with maxillae everted, ventral view. **car**, carrier; **cir**, cirrus; **cla**, clasper; **cpl**, cutting plate; **cpo**, copulatory organ; **jaw**, jaw apparatus; **lant**, lateral antenna; **lca**, locomotory appendage; **man**, mandible; **mant**, median antenna; **mxI-IV**, maxillae plates I-IV; **palp**, palp; **sha**, shaft. (Adapted from Beesley, Ross & Glasby, 2000; drawings by A. Murray).

Histriobdella homari van Beneden 1858 is symbiotic with marine lobsters in northern European and northeastern American waters, while *Dayus cirolanae* (Führ 1971) was found living symbiotically with the marine isopod *Cirolana venusticauda* var. *simplex* Barnard, in Langebaan Lagoon (South Africa). *Stratiodrilus* species have been found in Tasmania, Australia, Uruguay, Madagascar, Chile, Brazil, and Argentina, where they live as symbionts with freshwater decapods of the genera *Astacopsis*, *Astacoides*, *Cherax*, *Parastacus*, *Samastacus* (all astacideans), *Aegla* (anomurean), and *Trichodactylus* (brachyurean) (STEINER & AMARAL, 1999). Due to their geographic distribution, a gondwanan origin has been postulated for the genus *Stratiodrilus* (HARRISON, 1928; FÜHR, 1971; GLASBY & TIMM, 1999: fig. 3).

Recent taxonomic publications on the Histriobdellidae come mainly from Brazil, and include AMARAL & MORGADO (1997), STEINER & AMARAL (1999), AMATO (2001), and AMATO, DAUDT & AMATO (2004), with the description of new taxa, and BRIGGS *et al.* (1997), and DAUDT & AMARAL (2007), with the description of new records or associations with new hosts.

Taxonomic tools can be found in MOYANO, CARRASCO & GACITÚA (1993), which includes a pictorical key for species, AMARAL & MORGADO (1997), with a table with the main species differences concerning the cirri (C1-C5), and STEINER & AMARAL (1999), with a table with the main characters of genera and species.

In European waters, both marine and continental, only *Histriobdella homari* is known to occur. It probably occurs also off Portugal and Northern Spain, as symbiont with lobsters, but so far it has not been recorded.

GENUS ***Histriobdella*** van Beneden 1858

Histrobdella VAN BENEDEN, 1858: 299.

TYPE SPECIES: *Histriobdella Homari* van Beneden 1858.

SYNONYMS: *Histriodrilus* Fœtingger 1884.

Histriobdella homari van Beneden 1858

Histriobdella Homari VAN BENEDEN, 1858: 270.

TYPE LOCALITY: Ostend (Belgium, North Sea), among the eggs of the European lobster (family Nephropidae). Reported also to be present in lobsters from the Norwegian coast.

SYNONYMS: *Histriodrilus Benedeni* Fœttinger 1884.

SELECTED REFERENCES: *Histriobdella Homari* — FŒTTINGER, 1884: 435; SHEARER, 1910: 291, 293-299, 300-346, 352-353, text-figs. 1-5, pls. 17-20; FAUVEL, 1923*c*: 452-453, fig. 180*i-k*. *Histriobdella homari* — MESNIL & CAULLERY, 1922: 914-916, figs. 1-3; BRATTEY & CAMPBELL, 1985: 392, fig. 2; GEORGE & HARTMANN-SCHRÖDER, 1985: 206, fig. 74; KIRKEGAARD, 1992: 407, fig. 199; HARTMANN-SCHRÖDER, 1996: 286. *Histriodrilus Benedeni* — FŒTTINGER, 1884: 435, pls. 25-29.

DISTRIBUTION: *Histriobdella homari* has been found in the branchial chambers of *Hommarus gammarus* Linnaeus 1758 (which includes *Hommarus vulgaris* Milne Edwards 1837 as a synonym), and *Nephrops norvegicus* (Linnaeus 1758), off the Atlantic coasts of France, Belgium, United Kingdom and Norway, and at the Irish Sea and Clyde Sea (*e.g.*: VAN BENEDEN, 1853, 1858; MESNIL & CAULLERY, 1922; JENNINGS & GELDER, 1976; LERCH & UGLEM, 1996; BRIGGS *et al.*, 1997), and also on the American lobster *Homarus americanus* Milne Edwards 1837, in the region of New England (SIMON, 1967, 1968; UZMANN, 1967; ENGEL, HARRIS & ZWERNER, 1986) and Canadian Maritimes (BOGHEN, 1978; BRATTEY & CAMPBELL, 1985).

FAMILY **ICHTHYOTOMIDAE** Eisig 1906

AS: *ICHTHYOTOMIDAE* EISIG, 1906: 150-151.
TYPE GENUS: *Ichthyotomus* Eisig 1906.
REMARKS: The family Ichthyotomidae has a single monospecific genus, described from the Gulf of Naples (Mediterranean Sea), with base on external parasitic specimens. According to PLEIJEL (2001*d*), the species had been studied only once, by EISIG (1906), and apparently never found again. It was recorded again recently by CULURGIONI *et al.* (2006), from Sardinian waters (Western Mediterranean Sea).

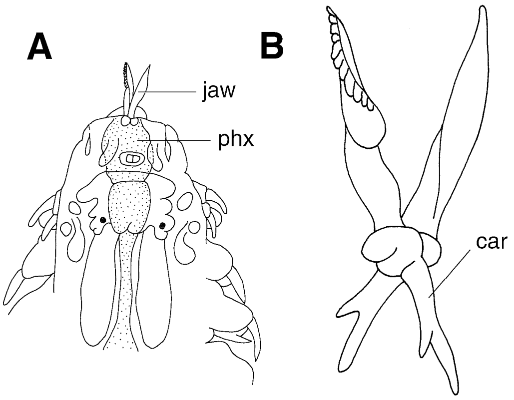

Figure legend: Family Ichthyotomidae. *Ichthyotomus sanguinarius*. **A**, anterior end, dorsal view; **B**, scissor-shaped jaws. **car**, maxillary carrier; **jaw**, jaw; **phx**, pharynx. (Adapted from BEESLEY, ROSS & GLASBY, 2000; after FAUVEL, 1923*c*).

GENUS ***Ichthyotomus*** Eisig 1906

Ichthyotomus EISIG, 1906: 150-151.
TYPE SPECIES: *Ichthyotomus sanguinarius* Eisig 1906.

Ichthyotomus sanguinarius Eisig 1906

Ichthyotomus sanguinarius EISIG, 1906: 1-156, 168-178, 188-189, 292-296, text-figs. 1-21, 22*b*, plates 1-10.
TYPE LOCALITY: Gulf of Naples, Mediterranean Sea. Parasitic, fixed by the jaws on dorsal and ventral fins of eels (*Myrus vulgaris* L., *Conger vulgaris* L., and *Sphagebranchus imberbis* De la R.).
SELECTED REFERENCES: *Ichthyotomus sanguinarius* — FAUVEL, 1923*c*: 454-455, fig. 181; PLEIJEL, 2001*d*: 115-116, fig. 25.1; CULURGIONI *et al.*, 2006: 254, 259, figs. 4-5, table 1.
DISTRIBUTION: Gulf of Naples and Sardinian waters, Mediterranean Sea. Parasitic, fixed by the jaws on fins of eels (*Myrus vulgaris* L., *Conger vulgaris* L., and *Sphagebranchus imberbis* De la R.). Probably the species is more frequent than it could be suggested with base on its findings. According to the monography on the species by EISIG (1906) the species wasn't rare in the Gulf of Naples, by the time when it was described.

FAMILY LACYDONIIDAE Bergström 1914

AS: *LACYDONIIDAE* BERGSTRÖM, 1914: 53.

TYPE GENUS: *Lacydonia* Marion & Bobretzky *in* Marion 1874.

REMARKS: Lacydoniidae is a small family, including a single genus, *Lacydonia* Marion & Bobretzky *in* Marion 1874. Its taxonomic history is explained in detail by BLAKE (1994*c*).

There are 12 described species, two of which were originally described in *Scalispinigera*, one is considered to be a junior synonymy of an older species, and another was placed in Goniadidae. By chronological order the species are:

Lacydonia miranda Marion & Bobretzky *in* Marion 1874 — Gulf of Marseille, Mediterranean Sea [type species];
Lacydonia mikrops Ehlers 1913 — Antarctica, 384 meters;
Lacydonia papillosa Uschakov 1958 — Kurile-Kamchatka Trench, NW Pacific, below 5000 meters;
Lacydonia incognita Rullier 1965 — Benin, West Africa;
Scalispinigera oculata Hartman 1967 — Antarctic Peninsula;
Scalispinigera cirrata Hartman & Fauchald 1971 — U.S. East Coast;
Lacydonia laureci Laubier 1975 — Eastern Mediterranean Sea, 4700 meters;
Lacydonia antarctica Hartmann-Schröder & Rosenfeldt 1988 — Antarctica, 265 meters;
Lacydonia elongata Hartmann-Schröder & Rosenfeldt 1992 — Antarctic Peninsula, 634 meters;
Lacydonia gordia Hartmann-Schröder 1993 — Antarctic Peninsula, 165-177 meters;
Lacydonia hampsoni Blake 1994 — California;
Lacydonia eliasoni Hartmann-Schröder 1996 — Skagerrak, 271-487 meters.

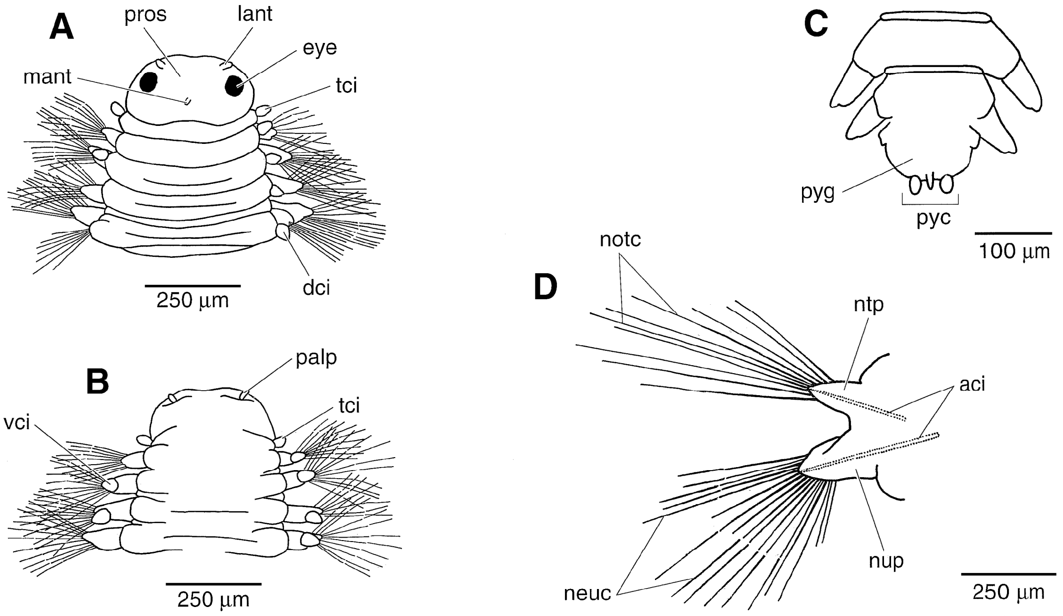

Figure legend: Family Lacydoniidae. *Lacydonia* specimen. **A**, anterior end, dorsal view. **B**, anterior end, ventral view. **C**, posterior end, ventral view; one pygidial cirrus obscured. **D**, parapodium from about chaetiger 20, posterior view; dorsal and ventral cirrus not shown. **aci**, aciculae; **dci**, dorsal cirrus; **eye**, eye; **lant**, lateral antenna; **mant**, median antenna; **neuc**, neurochaetal compound spinigers; **notc**, notochaetal capillaries; **ntp**, notopodium; **nup**, neuropodium; **palp**, palp; **pros**, prostomium; **pyc**, pygidial cirri; **pyg**, pygidium; **tci**, tentacular cirrus; **vci**, ventral cirrus. (Adapted from BEESLEY, ROSS & GLASBY, 2000; drawings by K. Nolan).

From these, *L. incognita* was considered to be a *nomen dubium* by BLAKE (1994*c*). The species was described from an anteriorly incomplete specimen by RULLIER (1965*a*), and the parapodia didn't resemble of *Lacydonia*. BÖGGEMANN (2005) placed this species in *Goniada*, stating that the shape of the biramous parapodia agreed perfectly with the parapodia of *Goniada congoensis*, a species present in the same area, and also found by RULLIER (1965*a*) near to the locality where the type of *L. incognita* was collected. However, BÖGGEMANN (2005) referred only questionably *L. incognita* to *G. congoensis*, as the type material lacks the anterior region, and this way it is not possible to know the exact number of uniramous parapodia. *Scalispinigera oculata* was transferred to *Lacydonia* by PLEIJEL & FAUCHALD (1993), who also considered *L. antarctica* as a junior synonym of *L. oculata*. *Scalispinigera cirrata* was also suggested to belong to the genus *Lacydonia* by PLEIJEL & FAUCHALD (1993), and this was later confirmed by BLAKE (1994*c*), who transferred it to *Lacydonia*.

GENUS ***Lacydonia*** Marion & Bobretzky *in* Marion 1874

Lacydonia MARION & BOBRETZKY *in* MARION, 1874: 399-400.
TYPE SPECIES: *Lacydonia miranda* Marion & Bobretzky *in* Marion 1874.
SYNONYMS: *Scalispinigera* Hartman 1967.

KEY TO SPECIES:

1a. Ventral palps, lateral and median dorsal antennae short, of about the same size than the tentacular cirri; pygidial cirri small and inflated, shorter than the pygidium; eyes present or absent...........................**2**
1b. Ventral palps, lateral and median dorsal antennae long, longer than the tentacular cirri; pygidial cirri long and slender, longer than the pygidium; eyes absent; all dorsal cirri of about the same size...***L. laureci***

2a (1a). Dorsal cirri of the first 3 chaetigers smaller than the following ones; eyes absent..........***L. eliasoni***
2b (1a). All dorsal cirri of about the same size; eyes present..***L. miranda***

Lacydonia eliasoni Hartmann-Schröder 1996

Lacydonia eliasoni HARTMANN-SCHRÖDER, 1996: 125-126.
TYPE LOCALITY: Skagerrak: 58º18'.8N, 9º57'E, 487 meters, 6.00ºC, 35.23‰, brown-greyish mud (1 specimen); 58ºN, 9º33'E, 271 meters, 6.72ºC, 35.17‰, grey mud (1 fragment); 57º50'N, 8º51'E, 358 meters, 6.81ºC, 35.28‰, grey mud (1 specimen).
SELECTED REFERENCES: *Lacydonia* nahe *miranda* — ELIASON, 1962*b*: 235-237, fig. 8; HARTMANN-SCHRÖDER, 1971*a*: 122.
DISTRIBUTION: Known from the original record.
REMARKS: ELIASON (1962*b*) states that the absence of eyes on his specimens could be due to their long time conservation in alcohol. However, the same specimens did present some coloration patters, which might indicate that the eyes were absent on the specimens prior to their conservation.

Lacydonia laureci Laubier 1975

Lacydonia laureci LAUBIER, 1975*b*: 76-78, fig. 1.
TYPE LOCALITY: South region of the Matapan Trench (SW Peloponnisos, Eastern Mediterranean), 35º49.8'N, 22º20.7'E, at 4690 meters.
DISTRIBUTION: Known from the original record.

Lacydonia miranda Marion & Bobretzky *in* Marion 1874

Lacydonia miranda MARION & BOBRETZKY *in* MARION, 1874: 399-400.
TYPE LOCALITY: Marseille and Saint-Raphael (Mediterranean Sea).
SELECTED REFERENCES: *Lacydonia miranda* — MARION & BOBRETZKY, 1875: 57-61, pl. 7 fig. 17, pl. 8 fig. 17; SAINT-JOSEPH, 1888: 314-316; FAUVEL, 1923*c*: 198, fig. 74*a-d*; CANTONE, 1973: 237-239, fig. 1; SARDÁ, 1982: 25-27, fig. 1; GATHOF, 1984*c*: 34.3-34.5, figs. 34.1-34.2; PLEIJEL & FAUCHALD, 1993: 675, fig. 2.
DISTRIBUTION: Northeast Atlantic: from Ireland and English Channel to the Mediterranean Sea, between 2-44 meters, on bottoms of sand and shells, and among bryozoans, calcareous algae and rhizomes of *Posidonia oceanica*; Adriatic Sea; Gulf of Mexico, 38-43 meters, on sandy bottoms.

REMARKS: *Lacydonia miranda* was first described by MARION & BOBRETZKY *in* MARION (1874), and this description was later complemented in MARION & BOBRETZKY (1875). The authorship of both the genus and the species is normally attributed to Marion & Bobretzky 1875, but PLEIJEL (2001*e*) corrected this, and seems to have been the first to attribute the authorship to Marion 1874. As MARION (1874: 398) clearly states that he presents the results of the studies "*que j'ai faites en collaboration avec M. Bobretzky, de Kiew*", the authorship of the new taxa should be attributed, in my opinion, to Marion & Bobretzky *in* Marion 1874.

The species was originally described as having four antennae (in fact two antero-dorsal antennae and two antero-ventral palps), and considered as being so until CANTONE (1973) described the presence of a fifth antennae (in fact, a third), located in the median dorsal region of the prostomium, just posterior to the eyes. This observation was later confirmed by SARDÁ (1982) and others. PLEIJEL (2001*e*) stated that this median antenna is probably always present in the genus, but that it many cases it was overlooked.

FAMILY **LONGOSOMATIDAE** Hartman 1944

AS: *LONGOSOMIDAE* HARTMAN, 1944*d*: 321.

TYPE GENUS: *Longosoma* Hartman 1944 (= *Heterospio* Ehlers 1874).

SYNONYMS: *HETEROSPIONIDAE* Hartman 1963.

REMARKS: The family Longosomatidae was erected by HARTMAN (1944*d*) as Longosomidae, to include her new genus and species, *Longosoma catalinensis* Hartman 1944, from California. Still, a similar species, *Heterospio longissima* Ehlers 1874, had been previously described by EHLERS (1874, 1875), from off western Ireland. When Hartman became aware of the existence of this species, she synonymized *Longosoma* with its older synonym, *Heterospio*, and renamed the family as Heterospionidae (HARTMAN, 1963: 48). PETERSEN (1992) noted that the name Longosomidae had preference over Heterospionidae, and this way the type genus of the family Longosomatidae became a junior synonym of the only known genus of the family, *Heterospio*. Finally BOROWSKI (1994*a*) corrected the spelling of the family name to Longosomatidae.

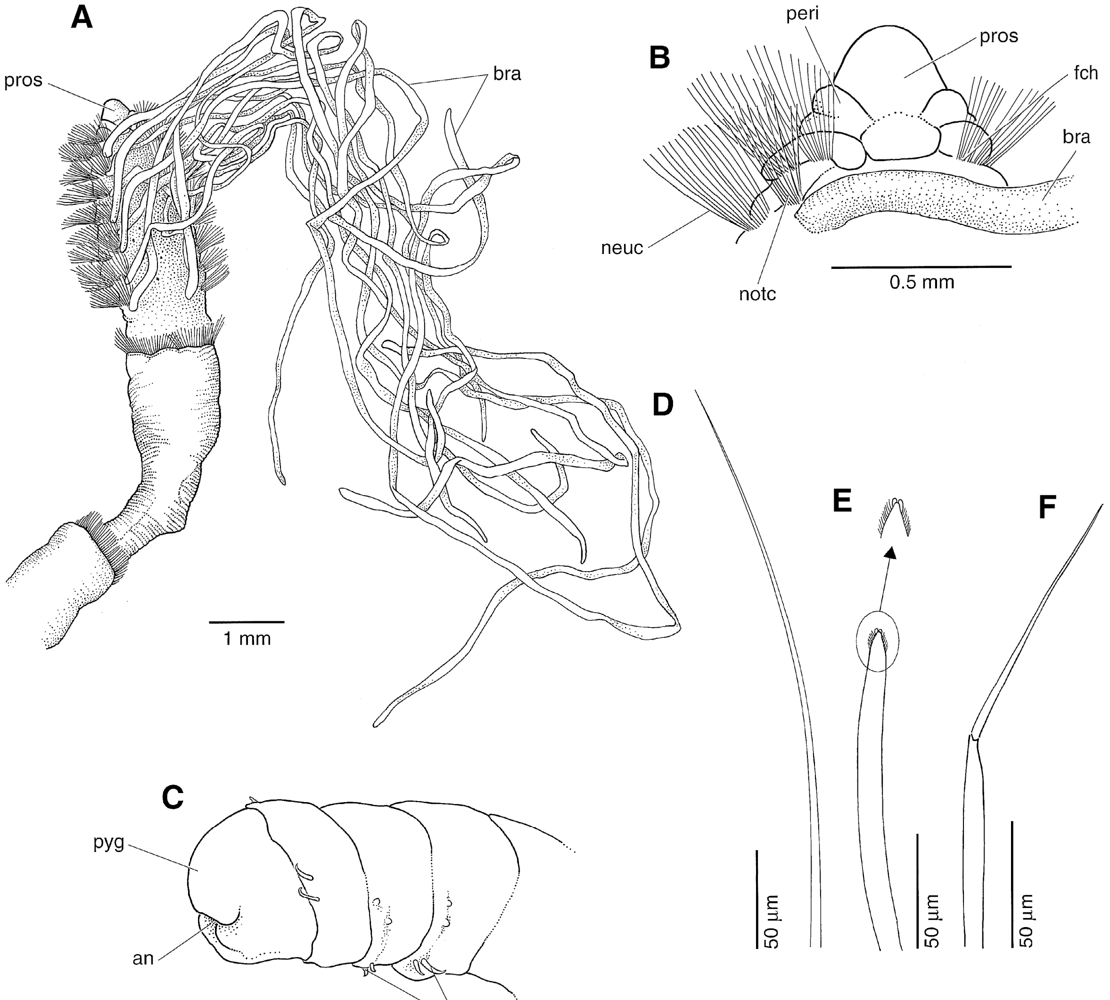

Figure legend: Family Longosomatidae. *Heterospio* specimen. **A**, anterior end, dorsal view. **B**, detail of head, dorsal view. **C**, posterior end. **D**-**F**, chaetae: **D**, notochaetal capillary; **E**, spine of posterior chaetiger with detail of tip; **F**, aristate notochaeta. **an**, anus; **bra**, branchiae; **fch**, first chaetiger; **fsp**, falcate spines; **neuc**, neurochaetae; **notc**, notochaetae; **peri**, peristomium; **pros**, prostomium; **pyg**, pygidium. (Adapted from BEESLEY, ROSS & GLASBY, 2000; drawings by K. Nolan).

The family includes at present one single genus and 6 described species. However, several unnamed species are also known to exist (*e.g.*: KNOX, 1960*a*; UEBELACKER, 1984*a*).

Four species are known to occur in European waters, but one of them remains unnamed and is still known as *Heterospio longissima* sensu Hartman 1965. A fifth species, *Heterospio catalinensis* (Hartman 1944), was recorded from the Mediterranean Sea, but is probably an erroneous identification (see below).

The most important recent taxonomic paper on Longosomatidae is BOROWSKI (1994*a*), which includes a comparative table of selected characters among world-wide reports of longosomatids.

GENUS ***Heterospio*** Ehlers 1874

Heterospio EHLERS, 1874: 296-297.
TYPE SPECIES: *Heterospio longissima* Ehlers 1874.
SYNONYMS: *Longosoma* Hartman 1944.

KEY TO SPECIES:

1a. Chaetiger 1 with neuropodial hooks; 9 thoracic chaetigers; 8 pairs of branchiae............***H. catalinensis***
1b. Chaetiger 1 without neuropodial hooks..**2**

2a (1b). Six (?) to seven thoracic chaetigers; 3 pairs of branchiae; anterior abdominal capillaries in fan-shaped fascicles...***H. reducta***
2b (1b). More than 7 thoracic chaetigers; more than 3 pairs of branchiae..**3**

3a (2b). Eight thoracic chaetigers; 7 or 8 pairs of branchiae..**4**
3b (2b). Nine thoracic chaetigers; 8 pairs of branchiae; anterior abdominal chaetal fascicles forming cinctures and bearing subuluncini..***H. longissima* sensu Hartman 1965**

4a (3a). Abdominal capillaries in fan-shaped fascicles; 7 or 8 (?) pairs of branchiae.............***H. longissima***
4b (3a). Abdominal capillaries in fan-shaped fascicles in chaetigers 9-11; abdominal chaetigers 12-16 (at least) with simple capillaries and subuluncini in cinctures; 7 pairs of branchiae................***H. mediterranea***

Heterospio catalinensis (Hartman 1944)

Longosoma catalinensis HARTMAN, 1944*d*: 322, pl. 27 figs. 1-3.
TYPE LOCALITY: Off Long Point, Catalina Island (California), at 40 fathoms (67 meters), from brachiopod and sponge masses.
SELECTED REFERENCES: *Longosoma catalinensis* — HARTMAN, 1957: 336, pl. 43 fig. 8. *Heterospio catalinensis* — LAUBIER, PICARD & RAMOS, 1974: fig. 3; BOROWSKI, 1994*a*: table 2. [?] Not *Heterospio* (probablement) *catalinensis* — AMOUREUX, 1971*a*: 10-11.
DISTRIBUTION: Southern California, in outer or exposed areas, from 11.5 to 67 meters. In very fine sand and silt.
REMARKS: According to LAUBIER, PICARD & RAMOS (1974), the specimen found by AMOUREUX (1971*a*) at the Gulf of Taranto in a muddy bottom, between 200 and 800 meters, seems to be closer to *Heterospio longissima sensu* Hartman 1965, than to *Heterospio catalinensis*. Quite probably *H. catalinensis* doesn't belong to the European fauna.

Heterospio longissima Ehlers 1874

Heterospio longissima EHLERS, 1874: 296-297.
TYPE LOCALITY: SW Ireland (51º1'N, 11º21'W), at about 426 fathoms [779.1 meters].
SELECTED REFERENCES: *Heterospio longissima* — EHLERS, 1875: 60-62, pl. 4 figs. 10-11; LAUBIER, PICARD & RAMOS, 1974: fig. 3; [?] AMOUREUX, 1982*b*: 185; BOROWSKI, 1994*a*: table 2. Not *Heterospio longissima* — HARTMAN, 1965*b*: 163-164, pl. 30 figs. *f-h*; HARTMAN & FAUCHALD, 1971: 108; INTES & LE LŒUFF, 1977: 223-224; [?] KIRKEGAARD, 1980*b*: 89.
REFERENCES FOR PORTUGAL: AMOUREUX, 1987 (off Aveiro; off Porto).
DISTRIBUTION: North Atlantic, western Irish coast; at about 739 meters. North-east Atlantic, at the continental slope from Ireland and Brittany to Portugal, at 500-1400 meters.

REMARKS: LAUBIER, PICARD & RAMOS (1974), pointed out that the species described by HARTMAN (1965*b*) as *Heterospio longissima* differs from the original description by EHLERS (1874, 1875). UEBELACKER (1984*a*) shares the same opinion, referring that Hartman's material may represent another species. *H. longissima* was described from an incomplete specimen, which is apparently lost, and until more material collected from the type locality is compared with Hartman's specimens, it is difficult to make a definitive statement concerning the specific status of this later form. Until then, I prefer to follow LAUBIER, PICARD & RAMOS (1974) and designate Hartman's form as *Heterospio longissima* sensu Hartman 1965. KIRKEGAARD (1980*b*) and AMOUREUX (1982*b*) studied material from near the type locality of *Heterospio longissima*, but while Amoureux's specimens seem to be closer to the species described by Ehlers, Kirkegaard's comments approach his specimens to the form described by Hartman. Probably there are more than one similar form occurring in the same area.

Heterospio longissima *sensu* Hartman 1965

Heterospio longissima HARTMAN, 1965*b*: 163-164, pl. 30 figs. *f-h*.

SELECTED REFERENCES: *Heterospio longissima* [not Ehlers 1874] — HARTMAN & FAUCHALD, 1971: 108; LAUBIER, PICARD & RAMOS, 1974: fig. 3; [?] HARTMAN, 1974*a*: 232; [?] INTES & LE LŒUFF, 1977: 223-224; [?] KIRKEGAARD, 1980*b*: 89; BOROWSKI, 1994*a*: table 2. [?] *Heterospio* (probablement) *catalinensis* — AMOUREUX, 1971*a*: 10-11.

DISTRIBUTION: Off New England and Bermuda, in 1500-4950 meters; off northeastern South America, in 520-1500 meters; [?] northeast Atlantic, southwest the British Isles (near 47º35'N, 9º33'W), at 4120-4165 meters; [?] Mediterranean Sea, at the Gulf of Taranto, between 200-800 meters, on a muddy bottom; [?] off Ivory Coast, West Africa, between 30-100 meters; [?] Arabian Sea, 34-88 meters.

REMARKS: From the short description given by AMOUREUX (1971*a*), it seems that his specimen is closer to *H. longissima* sensu Hartman 1965 than to *H. longissima* sensu Ehlers 1874. However, no information was given concerning the disposition and shape of the chaetae from the abdominal region. On the other side, AMOUREUX (*op. cit.*) refers the presence of acicular chaetae on the thoracic chaetigers, with exception of the first one, which seems to be an unic feature among the known species of *Heterospio*. This suggests that either Amoureux's observations were erroneous or his specimen could be a representative of an unknown Longosomatidae species.

The specimens collected by INTES & LE LŒUFF (1977) from off Ivory Coast are from shallower waters (30-100 meters) than the ones described by HARTMAN (1965*b*), collected between 1500 and 4950 meters.

Heterospio mediterranea Laubier, Picard & Ramos 1974

Heterospio mediterranea LAUBIER, PICARD & RAMOS, 1974: 245-246, figs. 1*A*, 2, 3.

TYPE LOCALITY: Bay of Rosas (Spain, Mediterranean Sea), 42º03'N, 3º15.33'E, at 308 meters, in a muddy bottom.

SELECTED REFERENCES: *Heterospio mediterranea* — BOROWSKI, 1994*a*: table 2.

REFERENCES FOR PORTUGAL: AMOUREUX, 1987 (off Aveiro; off Porto).

DISTRIBUTION: Western Mediterranean Sea, at the Marseille region (Cap Couronne trench), at 100-350 meters, and at the Bay of Rosas, at 308 meters; Aegean Sea. On muddy bottoms.

REMARKS: LAUBIER, PICARD & RAMOS (1974) refer the similarity of this species in relation to *Heterospio longissima* Ehlers 1874.

Heterospio reducta Laubier, Picard & Ramos 1974

Heterospio reducta LAUBIER, PICARD & RAMOS, 1974: 246-248, figs. 1*B-C*, 3.

TYPE LOCALITY: Western Mediterranean Sea, off Alger (37º03.3'N, 3º35.4'E), at 2290-2380 meters.

SELECTED REFERENCES: *Heterospio reducta* — AMOUREUX, 1982*b*: 185; BOROWSKI, 1994*a*: table 2.

REFERENCES FOR PORTUGAL: AMOUREUX, 1987 (off Aveiro; off Porto).

DISTRIBUTION: Mediterranean Sea, off Alger at 2290-2380 meters. North-east Atlantic, at the continental slope from Ireland and Brittany to Portugal, at 500-1400 meters.

*FAMILY **LUMBRINERIDAE** Schmarda 1861

AS: *LUMBRINEREIDA* SCHMARDA, 1861: 114.
TYPE GENUS: *Lumbrineris* Blainville 1828.
SYNONYMS: *LYSARETEA* Kinberg 1865; *NINOIDEA* Kinberg 1865; *LOMBRINEREA* Quatrefages 1866; *LUMBRINEREIDAE* Malmgren 1867; *LUMBRICONEREIDAE* Grube 1878; *UNCINISETIDAE* Bidenkap 1907; *AOTEARINAE* Benham 1927.
REMARKS: The family Lumbrineridae Schmarda 1861 presents some taxonomical problems that makes it a problematic group, mainly due to the gross similarity of their external morphology and to the inacuracy of many descriptions. The main problems were listed by FRAME (1992) and OUG (1998), and while some are due to poorly studied aspects of the family, others can be the result of bad taxonomical practices that urges to rectify:

a) many descriptions refer to general morphological features and fail to mention taxonomically important characters, like the pharyngeal structures;
b) identification of specimens is based many times on tradition rather than on type examinations;
c) some species show size-dependent variability and/or variation between specimens of similar size;
d) ontogeny and intra-populational variability is poorly known;
e) type specimens for some of the earliest described species are lacking.

In the recent reviews the lumbrinerid genera are separated mainly with base on the structure of the maxillae, types and shapes of the chaetae, and the presence or absence of respiratory parapodial lobes (ORENSANZ, 1990; FRAME, 1992; OUG, 1998; CARRERA-PARRA, 2006*a*).

A phylogenetic analysis of the family was recently performed by CARRERA-PARRA (2006*a*), who created six new genera, and several new combinations. The results of this author will be followed here.

A short history on the taxonomy of the group was traced by HILBIG (1995*a*) and PLEIJEL (2001*j*). Recent taxonomic papers on the family include the general contributions by ORENSANZ (1990), FRAME (1992), and CARRERA-PARRA (2006*a*), and the revisions of the genera *Cenogenus* (CARRERA-PARRA, 2001*b*), *Kuwaita* (CARRERA-PARRA, 2002), *Lumbricalus* (CARRERA-PARRA, 2004), and *Lumbrineris* (CARRERA-PARRA, 2006*b*). Regional studies on Lumbrineridae include the Aegean Sea (PAPADOPOULOU, DOUNAS & SMITH, 1994), Andaman Sea (OUG, 2002), Antarctic and Subantarctic Seas (ORENSANZ, 1990), Argentina (ORENSANZ, 1973*b*), Australia (PAXTON, 2000*a*), Bay of Biscay (AGUIRREZABALAGA & CARRERA-PARRA, 2006), California (HILBIG, 1995*a*), Canary Islands (NÚÑEZ, TALAVERA & OCAÑA, 1991), Brazil (CAMARGO & LANA, 1994, 1995*a*, 1995*b*), Gran Caribbean (CARRERA-PARRA, 2001*a*), Gulf of Mexico (UEBELACKER, 1984*g*; SOLÍS-WEISS *et al.*, 1995), Iberian Peninsula (CAMPOY, 1982), Japan (IMAJIMA & HIGUCHI, 1975; IMAJIMA, 1985), New Zealand (KNOX & GREEN, 1972*a*, 1973), North Atlantic, Mediterranean, and West Africa (MIURA, 1990), Northern Europe (GEORGE & HARTMANN-SCHRÖDER, 1985; KIRKEGAARD, 1992; HARTMANN-SCHRÖDER, 1996; OUG, 2003), Northwestern Atlantic (FRAME, 1992), South Africa (DAY, 1967), Southeastern USA (PERKINS, 1979), Western Mediterranean Sea (RAMOS, 1976*a*), or Western Mexico (FAUCHALD, 1970). Many of these publications include the description or redescription of new or old taxa, and/or dichotomic keys. Other recent relevant publications on the Lumbrineridae are cited below.

Nowadays the family Lumbrineridae include 20 genera and about 250 species. In the European and nearby waters, 13 genera are known to occur, including 37 described and 3 possible undescribed species (two *Lumbrinerides* and one *Aotearia*). Among the studied material, 4 genera, each one including one single species, were identified.

Due to the recent changes in the definition of some genera and the creation of new ones, a short diagnosis is given for each genus referred below.

KEY TO GENERA:

(adapted from HILBIG, 1995*a*; CARRERA-PARRA, 2006*a*)

1a. Prostomium much longer than wide, acutely pointed; hooded hooks bidentate....................................**2**

1b. Prostomium conical to rounded, about as long as wide; hooded hooks multidentate (worn hooks on small species may look bidentate)..**3**

2a (1a). Mandibles fused entirely; maxillary carriers very large and wide, joined to entire base of MI and shorter than MI; MI bi- or tridentate, MIV with smooth cutting edge (also referred to as unidentate)...***Lumbrinerides***
2b (1a). Mandibles free along posterior part; maxillary carriers long and slender, joined to ½ of base of MI and longer than MI; MI falcate, unidentate; MIV multidentate...***Aotearia***

3a (1b). Chaetae including simple and compound limbate chaetae, and simple and compound hooded hooks; wide connecting plate between MI and MII...***Lumbricalus***
3b (1b). Chaetae including simple limbate capillaries and simple hooded hooks, sometimes also compound hooded hooks in anterior chaetigers...**4**

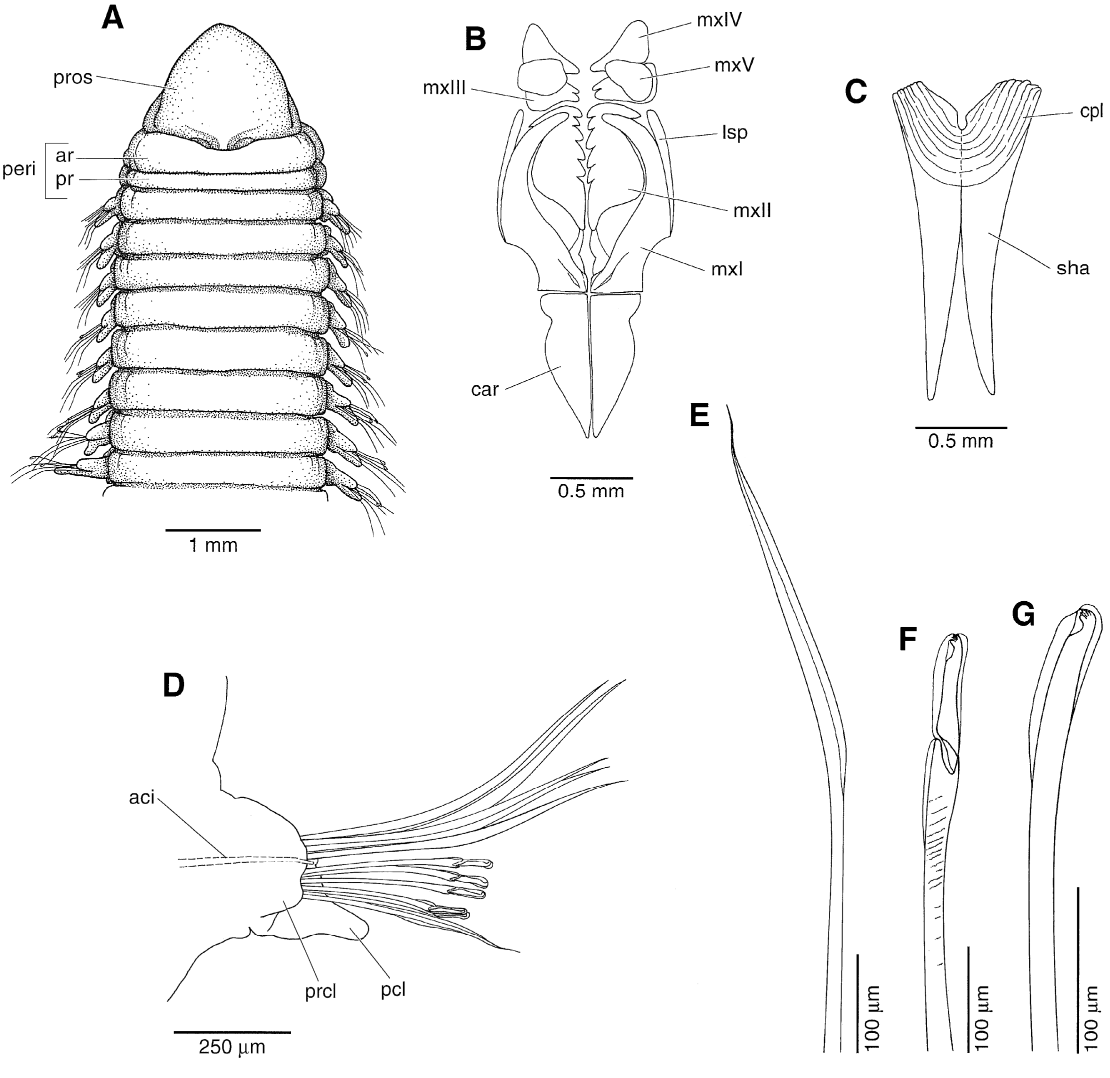

Figure legend: Family Lumbrineridae. *Lumbrineris* specimen. **A**, anterior end, dorsal view. **B**, **C**, jaw parts: **B**, maxillae, dorsal view; **C**, mandibles, ventral view. **D**, parapodium from chaetiger 11, anterior view. **E**-**G**, chaetae: **E**, simple limbate chaeta from parapodium of chaetiger 11; **F**, compound hook from parapodium of chaetiger 11; **G**, simple hook from parapodium of chaetiger 43. **aci**, acicula; **ar**, anterior ring; **car**, carrier; **cpl**, cutting plate; **lsp**, lateral support; **mxI-V**, maxillary plates I-V; **pcl**, postchaetal lobe; **peri**, peristomium; **pr**, posterior ring; **prcl**, prechaetal lobe; **pros**, prostomium; **sha**, shaft. (Adapted from BEESLEY, ROSS & GLASBY, 2000; drawings by A. Murray).

4a (3b). Anterior notopodia with palmate gills; MIII and MIV, or MIV only, with multidentate cutting edge..***Ninoe***
4b (3b). Gills absent or represented by vascularized postchaetal lobes of anterior parapodia.....................**5**

5a (4b). Postchaetal lobes of anterior parapodia vascularized; aciculae black; prostomium with two longitudinal slits...***Cenogenus***
5b (4b). Vascularized lobes, if present, on posterior parapodia; aciculae yellow or black; prostomium without dorsal slits..**6**

6a (5b). Chaetae including simple limbate capillaries and simple hooded hooks (may be absent or transitional in anteriormost chaetigers)..**7**
6b (5b). Chaetae including simple limbate capillaries and simple and compound hooded hooks............**10**

7a (6a). MV absent; MIII and MIV with whitish central area...***Helmutneris***
7b (6a). MV present, as a free maxilla or fused to MIV...**8**

8a (7b). MV (also referred to as lateral supports) fused with MIV, forming a rectangular structure with a protruding expansion; aciculae yellow...***Abyssoninoe****
8b (7b). MV free or partially fused with MIV; aciculae yellow or black..**9**

9a (8b). MV free from MIV; MIII with smooth cutting edge or 1, to 3 teeth; MI and MII of subequal length, connected by thin, treadlike basal ligament..***Scoletoma****
9b (8b). MV partially fused to MIV; MIII with smooth cutting edge; MII to 1/2 as long as MI, connected to MI by wide, ribbonlike, sclerotized ligament or aditional jaw piece...***Eranno***

10a (6b). Maxillary apparatus with four pairs of maxillae, MV absent; mandible only slightly longer than wide, roughly X-shaped; MII with 2-3 rounded teeth; MIV large, with white center and dark rim; connecting plate between MI and MII absent..***Augeneria***
10b (6b). Maxillary apparatus with five pairs of maxillae, with MV present in most species, free from MIV; mandible much longer than wide, roughly Y-shape; MII with 3-4 or more teeth; MIV uniformly dark; wide connecting plate between MI and MII...**11**

11a (10b). MII as long as MI; wide connecting plates between MI and MII poorly sclerotized..***Lumbrineris****
11b (10b). MII half as long as MI; wide connecting plates between MI and MII strongly sclerotized...***Hilbigneris****

*GENUS *Abyssoninoe* Orenzanz 1990

Abyssoninoe ORENSANZ, 1990: 76.

TYPE SPECIES: *Lumbriconereis abyssorum* McIntosh 1885.

DIAGNOSIS (from FRAME, 1992): Prostomium conical. Parapodia uniramous with simple limbate chaetae and simple, multidentate hooded hooks. Hooded hooks may have a transitional phase, evolving through anterior chaetigers from rounded tip limbate chaetae, to faintly outlined hooks, to clearly defined hooks and teeth. MV completely fused to MIV, forming a broad semicircular plate with a tooth protruding from the middle of the inferior border. MIII unidentate. Aciculae yellow. 1-2 pairs of anal cirri, if 2 pairs dorsal cirri longer than ventral.

REMARKS: The genus *Abyssoninoe* was erected in 1990 by Orensanz for lumbrinerids with antennae absent, reduced notopodia, only simple hooded hooks present, being those from the anterior parapodia intermediate in shape, approaching limbate chaetae in outline, and maxillae V completely fused with maxillae IV, having the whole structure a characteristic aspect of a broad rectangular plate with a tooth protunding from the middle of its inferior border (ORENSANZ, 1990). Later FRAME (1992) completed the definition of the genus by including the characters of unidentate MIII and yellow aciculae.

Five species are presently considered to belong to this genus: *Abyssoninoe abyssorum* (McIntosh 1885), *A. hibernica* (McIntosh 1903), *Abyssoninoe scopa* (Fauchald 1974), *Abyssoninoe winsnesae* Frame 1992, and *Abyssoninoe phuketensis* Oug 2002. Other described taxa that belong to the genus are considered to be junior synonyms of the above species (see the *SYNONYMS* sections, below).

Another described taxon could belong to the genus *Abyssoninoe*. *Lumbrineris emandibulata* Pillai 1961, was described with base on two specimens collected at Tambalagam Lake (Sri Lanka) (PILLAI, 1961). It was described as lacking mandibles (PILLAI, 1961), but this would be an unique case among the lumbrinerids, and was probably the result of an artifact. MIII is described as a pair of rectangular plates, each with a pair of blunt teeth, while MIV is a pair of broad dorso-ventrally curved plates devoid of teeth (instead of MIII being unidentate and of MIV having the protunding teeth on the inferior border, resulting from the fusion of MIV with MV, stated as characteristic of the genus *Abyssoninoe*). On the other hand, *L. emandibulata* was described has having some anterior chaetae with apparently rounded tips, which in close examination showed to have truncated tips, foreshadowing the hooks of the succeeding feet. The hooks appear as such from chaetiger 10, still with long guards, and attaining the final form at about chaetiger 20. The transitional shape of the hooks along the anterior parapodia seems to approach *L. emandibulata* of the genus *Abyssoninoe*.

KEY TO SPECIES:
(adapted from OUG, 2003)

1a. Clearly defined hooded hooks appear at chaetiger 10-18, posterior parapodia with short rounded prechaetal and short conical postchaetal lobes..***A. abyssorum***
1b. Transitional hooded hooks extend at least to chaetiger 15, posterior parapodia with prolonged digitiform lobes..**2**

2a (1b). Clearly defined hooded hooks appear at chaetiger 15-20, posterior parapodia with prolonged digitiform prechaetal and postchaetal lobes...***A. hibernica****
2b (1b). Clearly defined hooded hooks appear at chaetiger 20-25, posterior parapodia with digitiform postchaetal lobe, prechaetal lobe small...***A. scopa***

Abyssoninoe abyssorum (McIntosh 1885)

Lumbriconereis abyssorum MCINTOSH, 1885*a*: 250-251, text-figs. 16-18, pl. 36 figs. 20-21, pl. 18*A*. fig. 10.
TYPE LOCALITY: Off the west coast of South America, a little south of Valparaiso (Chile), 34°7'S, 73°56'W, at 2225 fathoms (4069 meters), on blue mud.
SYNONYMS: [?] *Lumbrineris galatheae* Knox & Green 1972.
SELECTED REFERENCES: *Abyssoninoe abyssorum* — ORENSANZ, 1990: 76-78, pl. 19, pl. 40 fig. b, chart 4*D*. *Lumbrineris* cf. *scopa* — MIURA, 1980: 1043-1044, fig. 12. [?] *Lumbrineris galatheae* — KNOX & GREEN, 1972*a*: 78-80, figs. 43-52. [?] *Paraninoe minuta* [not *Lumbrinereis minuta* Théel 1879] — MIURA, 1980: 1049-1050, fig. 15*A-G*.
DISTRIBUTION: Antarctic Ocean; Peru-Chile trench off Chile; fjords of New Zealand; fjords of Norway; off northern Ireland; Gulf of Gascony; Western Mediterranean Sea; off Congo. Between 274-6000 meters, but mainly in deep water.
REMARKS: ORENSANZ (1990) examined specimens identified by MIURA (1980) as *Lumbrineris* cf. *scopa*, from the Bay of Biscay (2742 meters), off Congo (1163-5121 meters), and from the Mediterranean Sea (1491-1856 meters). He couldn't find any difference between these specimens and *Abyssoninoe abyssorum* (McIntosh 1885), and synonymized both forms, stating that probably *A. abyssorum* was a species widely distributed in deep waters of the Atlantic and the Antarctic.

MIURA (1980) included *Lumbrinereis minuta* Théel 1879 in the genus *Paraninoe*, as the species was originally described without MV and only with simple hooded hooks. Besides, the original description states that "*chaque pied porte à l'arrière un petit appendice rond, foliacé, et à l'avant un autre qui est cependant plus rudimentaire, surtout sur la région antérieure du corps*" (THÉEL, 1879: 43). MIURA (1980) interpreted the posterior parapodial appendices as a small parapodial branchiae, typically present in the genus *Cenogenus*.

OUG (1998) revised the type material of *L. minuta* Théel 1879, and found that it included two or more species. Some of the specimens from the Kara Sea had a few anterior pseudocomposite hooks, and some larger ones showed a free MV, while specimens from Besimennia Bay belonged possibly to *Abyssoninoe*. The status of the species requires further investigation, as some of the original samples of the species haven't been located yet, and better material from the type localities is also necessary (OUG, 1998). For the moment, the synonymy of *L. minuta* with *Scoletoma fragilis* proposed by ELIASON (1920) is maintained here.

This way, as noted by CARRERA-PARRA (2001*b*), *Lumbrinereis minuta* Théel 1879 cannot belong to the genus *Cenogenus*. Besides, the specimens identified by MIURA (1980) as *Paraninoe minuta* seem to belong to the genus *Abyssoninoe*, particularly to *A. abyssorum*. This identification is, however, doubtful, as MIURA (1980) described his specimens as having black aciculae (they are yellow in *A, abyssorum* and in the other membres of the genus), and with the prostomium with two dorsal and ventral longitudinal slits, typical of the genus *Cenogenus*.

****Abyssoninoe hibernica*** (McIntosh 1903)

Lumbriconereis hibernica MCINTOSH, 1903*a*: 561.

TYPE LOCALITY: Southwestern Ireland, 25 miles west of the Blasket Islands, at 90 fathoms (164.6 meters).

SYNONYMS: *Lumbrineris emandibulata mabiti* Ramos 1976; *Lumbrineris scopa aequilobata* Winsnes 1981.

SELECTED REFERENCES: *Lumbriconereis hibernica* — MCINTOSH, 1910: 383-385, text-fig. 79, pl. 62 figs. 3-3*a*, pl. 74 figs. 1-1*a*, pl. 82 figs. 5-5*d*; CLARK, 1952: 11-12. *Abyssoninoe hibernica* — PARAPAR *et al.*, 1994*c*: 158-160, fig. 1 [in part]. *Lumbrineris scopa aequilobata* — WINSNES, 1981: 93-94, figs. 2*A*, 2*C*; KIRKEGAARD, 1992: 373-374, fig. 182*g*. *Abyssoninoe scopa aequilobata* — HARTMANN-SCHRÖDER, 1996: 262-263. *Lumbrineris emandibulata mabiti* — RAMOS, 1976*a*: 112-115, figs. 7-10; CAMPOY, 1982: 604-605; PAPADOPOULOU, DOUNAS & SMITH, 1994: 264. *Lumbrineris fragilis* [not O.F. Müller 1776] — HARTMANN-SCHRÖDER, 1974*d*: 215-217, figs. 27-35.

REFERENCES FOR PORTUGAL: Present work (southwestern continental shelf).

MATERIAL: SEPLAT 7 (2nd part) — St. 196 (A.3916), off Sines, 125 m, muddy sand: 1 incomplete specimen, with 32 chaetigers, and about 650 µm wide; buccal apparatus as described for the species; it seems to have a nuchal organ in the posterior margin of the prostomium; first 4 chaetigers with 2 long-bladed hooded hooked chaetae and winged chaetae; in chaetiger 5 they are replaced by a shorter hooded hooked chaetae, with stronger teeth; parapodia with a small prechaetal lobe and a slightly longer postchaetal lobe (both are short, anyway, in the anterior region); winged chaetae are still present at chaetiger 31.

DISTRIBUTION: Northeastern Atlantic, from Norway to Galicia: Irish waters, 10-165 meters; Norwegian waters and Skagerrak, 30-880 meters; Cantabric Sea, 75-180 meters; Northwestern Spain, 1.5-15 meters; Portugal, 125 meters; Mediterranean Sea, 6-295 meters; Aegean Sea, 10-330 meters; Adriatic Sea. On detritic bottoms, sand, mud, and mixtures of both.

REMARKS: MCINTOSH (1903*a*) described briefly and without figures *Abyssoninoe hibernica* (as *Lumbriconereis*), but later the same author presented a more extensive and illustrated description of the species (MCINTOSH, 1910). Both descriptions were based on specimens collected from SW Ireland, between 60 and 165 meters. The species was mainly characterized by a prostomium forming a narrow cone with a pointed apex, parapodia in the anterior region of the body with the anterior lobe very reduced and posterior lobe as a small triangle, while from the thirtieth parapodia both lobes (anterior and posterior) were of about the same length, and the presence of simple hooded hooks, that at the first chaetigers were like long limbate chaetae with a minute hook at the tip, and that gradually got shorter and thicker, becoming multidentate hooded hooks, already clearly present at chaetiger 20.

Abyssoninoe hibernica was attemptly synonymized with *Scoletoma impatiens* (Claparède 1868) by FAUVEL (1923*c*), and this synonymy was followed by most of the authors. Both species present yellow aciculae and simple hooded hooks. However, in *Abyssoninoe hibernica* the hooded hooks have a transitional phase, evolving from limbate chaetae with very tiny hooks on the tips in the anterior parapodia, to faintly outlined hooks, and finally clearly defined hooks from chaetigers 10-20, and the MV is completly fused with MIV, forming a characteristic broad rectangular plate (MV, as a lateral support) with a tooth protruding from the middle of the inferior border (MIV). On the other hand, *Scoletoma impatiens* has clearly defined hooks from chaetiger 1-5, and MV is free from MIV.

Many of the records of *Scoletoma impatiens* in the European waters refer probably to *Abyssoninoe hibernica*. AMOUREUX (1971*a*; 1974*b*) records specimens of *Lumbriconereis impatiens* with hooded hooks starting at chaetigers 8-16 (Gulf of Taranto), or 10-15 (Portugal). The description and figures also given for the Portuguese specimens seem to indicate that both records probably refer to the species *A. hibernica*. Besides, four new and very close taxa were described in the meantime from the European waters: *Lumbrineris scopa* Fauchald 1974, from the coast of Norway, *Lumbrineris emandibulata mabiti* Ramos 1976, from the Mediterranean Sea, *Lumbrineris pseudo-fragilis* Amoureux 1977, from south England and Ireland, and *Lumbrineris scopa aequilobata* Winsnes 1981, from Norway.

PARAPAR *et al.* (1994*c*) revised the type material from *Lumbriconereis hibernica* McIntosh 1903, *Lumbrineris scopa* Fauchald 1974, *Lumbrineris pseudofragilis* Amoureux 1977, and *Lumbrineris scopa aequilobata* Winsnes 1981, and as no significant differences were found between them, all these taxa were synonymised with *Lumbriconereis hibernica*, as *Abyssoninoe hibernica*.

However, this synonymy allowed a rather large morphological variation of the species, as stated by OUG (2003), especially in what concerns the first appearance of well developed simple hooded hooks, and the shape of postchaetal lobes in the posterior chaetigers, as already noted by WINSNES (1981) when describing *Lumbrineris scopa aequilobata*. Besides, the bathimetric range after the synonymy is very wide, going from 1.5 to 1200 meters, which could indicate that more than one form could be involved.

OUG (2003) considered *Abyssoninoe scopa* as a separate species from *A. hibernica* in the following way:

1a. Clearly defined hooded hooks appear at chaetiger 15-20, posterior parapodia with prolonged digitiform prechaetal and postchaetal lobes, moderate depths.....***Abyssoninoe hibernica* (McIntosh 1903)**
1b. Clearly defined hooded hooks appear at chaetiger 20-25, posterior parapodia with digitiform postchaetal lobe, prechaetal lobe small, deep water (>200m)............***Abyssoninoe scopa* (Fauchald 1974)**

Besides, *A. hibernica* would include *L. scopa aequilobata* Winsnes 1981 and *L. pseudofragilis* Amoureux 1977 as junior synonyms. However, *L. pseudofragilis* was described with fully developed hooded hooks from chaetiger 25, and with the postchaetal lobes always being longer than the prechaetal ones, which are always short (AMOUREUX, 1977*b*). Moreover, the described depth range of the species was from 380 to 1200 meters. This way, *L. pseudofragilis* is here considered to be a synonymy of *A. scopa*.

Lumbrineris emandibulata mabiti Ramos 1976, was described with base on specimens collected at the Gulf of Rosas, at the Catalan coast of Spain, at depths ranging between 6-295 meters (an average depth of 79 meters). RAMOS (1976*a*) considered her specimens as being a subspecies of *L. emandibulata*, stating that the similarity between the two morphotypes was probably due to the poorly characterization of the stem species. *L. emandibulata mabiti* was described as having bidentated MIII and unidentated MIV, and mandibles fused along all their length. The rest of its characters are quite similar to the described for the genus *Abyssoninoe*. The parapodia of *L. emandibulata mabiti* presents a postchaetal lobe, almost triangular at the anterior region, becoming longer at the middle and posterior regions, and a prechaetal lobe, first present at chaetiger 5 as a small anterior projection, and becoming quite developed at the posterior region. The shape and variation of these parapodial lobes resemble the described for *L. scopa aequilobata* Winsnes 1981. However, *L. emandibulata mabiti* was referred to the genus *Scoletoma* by PAPADOPOULOU, DOUNAS & SMITH (1994), after the study of material from the Island of Crete.

The resemblance between *A. hibernica* and the Mediterranean subspecies *Lumbrineris emandibulata mabiti* Ramos 1976, was noted by PARAPAR *et al.* (1994*c*), but the described maxillae and mandibles separated both species. I had the opportunity to study specimens of *L. emandibulata mabiti* collected near the type locality (Gulf of Rosas, Catalonian coast of Spain), and it was possible to observe in this material that the maxillae and mandibles are identical between the two taxa. This way, it is possible to confirm that the subspecies *Lumbrineris emandibulata mabiti* belongs to the genus *Abyssoninoe*, and that it is a junior synonymy of *A. hibernica* (McIntosh 1903).

With base on the bathymetrical ranges, and whenever possible, on described characters, the following records are attributed to *Abyssoninoe hibernica*: AMOUREUX (1971*a*, as *Lumbriconereis impatiens*), hooks stated to start between chaetigers 8-16, depth 10-50 and 100-800 meters; AMOUREUX [1973*a*, as *Lumbriconereis impatiens* Claparède, 1868 et *Lumbriconereis fragilis* (Müller) 1776], in part, specimens with hooks starting between chaetigers 10 and 20, depth 200-1000 meters; AMOUREUX (1974*b*, as *Lumbriconereis impatiens*), hooks stated to appear between chaetiger 10-15, but depth between 200-1400 meters; AMOUREUX (1985, as *Lumbrineris pseudofragilis*), depth 125-180 meters; MARTÍNEZ & ADARRAGA (2001, as *Lumbrineris scopa*), depth 75 meters.

With base on the bathymetrical ranges, and whenever possible, on described characters, the following records are attributed to *Abyssoninoe scopa*: ELIASON (1962*b*, as *Lumbrineris hibernica*), fully developed hooks appearing at chaetiger 27, depth 131-650 meters; HARTMANN-SCHRÖDER (1974*d*, as *Lumbrineris fragilis*), fully developed hooks at chaetiger 30, postchaetal lobe clearly more developed than prechaetal in posterior chaetigers, depth 135-670 meters; AMOUREUX (1982*a*, as *Lumbrineris pseudo-fragilis*), depth 380-1180 meters; KIRKEGAARD (1983*b*, as *Lumbrineris pseudofragilis*), depth 1160-1165 meters; AMOUREUX (1986, as *Lumbrineris* cf. *pseudofragilis*), stated to be similar to the form described from the continental slope, depth 4990-5300 meters; AMOUREUX (1987, as *Lumbrineris pseudofragilis*), depth 900-1500 meters.

Abyssoninoe scopa Fauchald 1974

Lumbrineris scopa FAUCHALD, 1974*b*: 26-27, fig. 5.

TYPE LOCALITY: Hardangerfjorden (Norway): Bondesundet, E of Langaneset, 60º08'50"N, 05º56'30"E, 210-270 meters, mud with some rocks.
SYNONYMS: *Lumbrineris pseudo-fragilis* Amoureux 1977.
SELECTED REFERENCES: *Lumbrineris scopa* — GEORGE & HARTMANN-SCHRÖDER, 1985: 138, fig. 45; KIRKEGAARD, 1992: 373-374, fig. 182*a-f*. *Lumbrineris scopa scopa* — WINSNES, 1981: 94, figs. 2*B*, 2*D*. *Lumbrineris pseudo-fragilis* — AMOUREUX, 1977*b*: 402-404, fig. 2; KIRKEGAARD, 1983*b*: 600. *Abyssoninoe scopa* — AGUIRREZABALAGA & CARRERA-PARRA, 2006: 19-20. *Abyssoninoe scopa scopa* — HARTMANN-SCHRÖDER, 1996: 262. *Abyssoninoe hibernica* [not McIntosh 1903] — PARAPAR *et al.*, 1994*c*: 158-160 [in part]. *Lumbrineris fragilis* [not O.F. Müller 1766] — HARTMANN-SCHRÖDER, 1974*d*: 215-217, figs. 27-35.
REFERENCES FOR PORTUGAL: AMOUREUX, 1987 (as *Lumbrineris pseudofragilis*; off Porto).
DISTRIBUTION: Norway: Hardangerfjorden, between 150-880 meters (average 394.4 meters), on mud, sandy mud, muddy sand, fine sand, and mixed bottoms; Skagerrak, between 135-670 meters (average 360.7 meters), in mud, sandy mud, mud with coarse sand and pebbles, small stones; SW British Isles, between 380-1500 meters, in mud; Capbreton Canyon, Bay of Biscay, between 480-1113 meters; Portugal; [?] off the Iberian Peninsula, between 4990-5300 meters.
REMARKS: See the *REMARKS* section under *Abyssoninoe hibernica*.

GENUS *Aotearia* Benham 1927

Aotearia BENHAM, 1927: 91.
SYNONYMS: *Lumbrineriopsis* Orensanz 1973.
TYPE SPECIES: *Aotearia sulcaticeps* Benham 1927.
DIAGNOSIS (from CARRERA-PARRA, 2006*a*, as *Lumbrineriopsis*): Prostomium without antennae, without eyes. Notopodia slightly developed. Without branchiae. Simple bidentate hooded hooks present. Pygidium without anal cirri. Maxillary apparatus with four pairs of maxillae, carriers longer than MI, joined to half of base of MI. MI forceps-like without internal accessory teeth, with attachment lamella. MII as long as MI, with ligament, wide attachment lamella along 2/3 of posterior lateral edge. Without connecting plates. MIII completely pigmented, narrow attachment lamella along 1/2 of posterior lateral edge. MIV completely pigmented, wide attachment lamella. Mandible fused up to 3/4 of its length.
REMARKS: The genus *Aotearia* was erected by BENHAM (1927), for *A. sulcaticeps* from New Zealand. The main diagnostic character of the genus ["*the upper jaw-plates are of unequal number on the two sides*" (BENHAM, 1927: 91)] was the result of an artefact during the dissection of the mouthparts, as demonstrated by KNOX & GREEN (1973). *Aotearia* was later considered by HARTMAN (1959*a*) as being a possible junior synonym of *Lumbrineris* Blainville 1828, and this opinion was followed by FAUCHALD (1970) and KNOX & GREEN (1972*a*, 1973), who also redescribed the species with base on a newly collected specimen (KNOX & GREEN, 1973). ORENSANZ (1973) created the genus *Lumbrineriopsis*, a junior synonym of *Aotearia*. Later, the same author (ORENSANZ, 1990: 76) alleged that *Aotearia* should be considered as a *nomen oblitum* according to the provision of the ICZN. However, in my oppinion, the conditions in order to considered the genus *Aotearia* Benham 1927 as a *nomen oblitum*, according to the ICZN in use, are not accomplished, and the name *Lumbrineriopsis* Orensanz 1973 should be regarded as a junior synonym of *Aotearia* Benham 1927, in spite of the error in the description of the older genus.

KEY TO SPECIES:
(adapted from MIURA, 1980)

1a. Aciculae yellow..**2**
1b. Aciculae black; long prostomium..............................***A. gasconiensis* nov. comb.**

2a (1a). Prostomium long..***A. paradoxa* nov. comb.**
2b (1a). Prostomium short..................***A. paradoxa* sensu Fauvel 1911, 1914 & 1923 (see MIURA, 1980)**

Aotearia gasconiensis (Miura 1980) **nov. comb.**

Lumbrineriopsis gasconiensis MIURA, 1980: 1030-1031, fig. 6.
TYPE LOCALITY: Gulf of Gascogne, 47º39.7'N, 8º05.5'W, 2438 meters.
DISTRIBUTION: Gulf of Gascogne. 2360-2438 meters.

Aotearia paradoxa (Saint-Joseph 1888) **nov. comb.**

Lumbriconereis paradoxa SAINT-JOSEPH, 1888: 217-218, pl. 8 figs. 72-73, pl. 9 figs. 74-76.

TYPE LOCALITY: Vieux-Banc, Dinard (France, English Channel).

SYNONYMS: *Lumbriconereis mucronata* Ehlers 1908.

SELECTED REFERENCES: *Lumbrineris paradoxa* — HARMELIN, 1964: 83-86, pl. 7 figs. 1-6; HARTMAN, 1965*b*: 119-120, pl. 20 figs. *a-b*. *Lumbrineriopsis paradoxa* — ORENSANZ, 1973*b*: 375; MIURA, 1980: 1032-1033, fig. 7; CAMPOY, 1982: 598-599; GEORGE & HARTMANN-SCHRÖDER, 1985: 118, fig. 35; PAPADOPOULOU, DOUNAS & SMITH, 1994: 265; SOLÍS-WEISS *et al.*, 1995: 66-67. *Lumbrineris* cf. *paradoxa* — RAMOS, 1976*a*: 127-129, figs. 22-23, table 3; CAMPOY, 1982: 599-600. *Lumbriconereis mucronata* — EHLERS, 1908: 95-96, pl. 12, figs. 9-13 [in part]. [?] *Lumbriconereis paradoxa* — FAUVEL, 1911*c*: 24-25; FAUVEL, 1914*f*: 156-158, pl. 11, figs. 1-7; FAUVEL, 1923*c*: 434-435, fig. 173*a-h*. Not *Lumbrineris paradoxa* — DAY, 1973: 51 [= *Lumbrineriopsis gardineri* Miura 1980]. Not *Lumbrineriopsis paradoxa* — GARDINER, 1976: 205, fig. 26*m-o* [= *Lumbrineriopsis gardineri* Miura 1980].

REFERENCES FOR PORTUGAL: MONTEIRO-MARQUES, 1987 (as *Lumbrinereis paradoxa*; continental shelf of Algarve); DEXTER, 1992 (as *Lumbrineris paradoxa*; previous records: continental shelf of Algarve); RAVARA, 1997 (as *Lumbrineriopsis paradoxa*; off Aveiro).

DISTRIBUTION: From the English Channel to the Mediterranean Sea; Adriatic Sea; Aegean Sea; Azores; off Congo; Gulf of Mexico. On muddy, sandy and detritic bottoms, and on *Posidonia*. Between 9-170 meters. Also recorded from off Bermuda Islands, at 1700 meters.

REMARKS: FAUVEL (1911*c*, 1914*f*, 1923*c*) identified as *Lumbriconereis paradoxa* a single specimen collected between the islands of Pico and Faial (Azores), at 130 meters. As remarked by MIURA (1980) this specimen seems to differ from the original description by SAINT-JOSEPH (1888) by presenting a shorter prostomium. If it represents the same species or not, is not clear.

GENUS *Augeneria* Monro 1930

Augeneria MONRO, 1930: 138.

TYPE SPECIES: *Augeneria tentaculata* Monro 1930.

DIAGNOSIS (adapted from CARRERA-PARRA, 2006*a*): Prostomium with three or more antennae, without eyes. Notopodia slightly developed. Without branchiae. Simple and composite multidentate hooded hooks present. Pygidium with anal cirri. Maxillary apparatus with four pairs of maxillae, carriers as long as MI, joined to entire base of MI. MI forceps-like without internal accessory teeth, with attachment lamella. MII as long as MI, with ligament, attachment lamella wide along 2/3 of posterior lateral edge. Without connecting plates. MIII completely pigmented, attachment lamella narrow along entire lateral edge. MIV with whitish central area, attachment lamella narrow. Mandible divergent at both anterior and posterior ends.

KEY TO SPECIES:

(adapted from: IMAJIMA & HIGUCHI, 1975; OUG, 2003)

1a. Anterior parapodia with long pseudocomposite to composite more or less twisted hooded hooks, present to about chaetiger 20-23; chaetae exceptionally numerous; prostomium broadly triangular..***A. algida***
1b. Anterior parapodia with straight distinctly composite hooded hooks, present to about chaetiger 15-20; hooded prostomium as wide as long or slightly longer...**2**

2a (1b). Prostomium with 3 short antennae (may be hidden by the peristomium); composite hooded hooks, present to about chaetiger 15; prechaetal lobe of 20th chaetiger shorter than postchaetal lobe; aciculae yellow...***A. tentaculata***
2b (1b). Prostomium with 8 small antennae in two rows (may be hidden by peristomium); composite hooded hooks, present to about chaetiger 20; prechaetal lobe of 20th chaetiger of about the same length than postchaetal lobe, being both well developed; aciculae dark..***A. riojai***

Augeneria algida (Wirén 1901)

Lumbriconereis algida WIRÉN, 1901: 253.

TYPE LOCALITY: Spitsbergen, 76º36’N, 12º10’E, 50’W of Hornsund, 1780 meters, on clay.

SYNONYMS: [?] *Lumbriconereis albidentata sadko* Annenkova 1952.

SELECTED REFERENCES: *Augeneria algida* — WINSNES, 1987: 40-45, figs. 2-4, 5*B*, table 1; AGUIRREZABALAGA & CARRERA-PARRA, 2006: 20.

DISTRIBUTION: Frank Joseph's Land, Spitsbergen, Sea of Norway; between 63º13'N and 81º38'N. On clay and mud. Between 520-1802 meters. At bottom temperatures between -0.2ºC and -1.4ºC. Capbreton Canyon, Bay of Biscay, between 492-1113 meters.

Augeneria riojai Aguirrezabalaga & Carrera-Parra 2006

Augeneria riojai AGUIRREZABALAGA & CARRERA-PARRA, 2006: 20-21, fig. 2.

TYPE LOCALITY: Capbreton Canyon, Bay of Biscay, NE Atlantic Ocean, from 43º37.72'N, 1º41.83'W, at 580 meters, to 43º37.43'N, 1º41.99'W, at 480 meters.

SELECTED REFERENCES: *Lumbriconereis albidentata* Ehlers 1908 ou *Lumbriconereis meteorana* Augener 1931 — AMOUREUX, 1974*b*: 137, fig. 3. *Lumbrineris* sp. — CAMPOY, 1982: 605.

REFERENCES FOR PORTUGAL: AMOUREUX, 1974*b* (as *Lumbriconereis albidentata* Ehlers 1908 ou *Lumbriconereis meteorana* Augener 1931; off Aveiro; off Porto).

DISTRIBUTION: Bay of Biscay, 480-580 meters; off Porto and Aveiro (Portugal). On muddy bottoms. Between 320-1000 meters.

REMARKS: AMOUREUX (1974*b*) approached his specimens to *Lumbrineris albidentata* and *L. meteorana*, without making a definitive identification. CAMPOY (1982), besides the referred species, also stated the proximity of Amoureux's specimens to the species *Lumbrineris cruzensis* Hartman 1944, *Lumbrineris quasibifilaris* Monro 1937 and, especially, to *Lumbrineris nonatoi* Ramos 1976, making a definitive statement to depend on an re-examination of specimens and type material.

Amoureux's specimens seem to fit the description of *Augeneria riojai*, a species described by AGUIRREZABALAGA & CARRERA-PARRA (2006) from the Capbreton Canyon. With the exception of the presence of 8 small antennae in two rows, which are normally hidden and are not referred by AMOUREUX (1974), all the other characters adjust to *A. riojai*, and the Portuguese specimens are here considered as belonging to this species.

Augeneria tentaculata Monro 1930

Augeneria tentaculata MONRO, 1930: 140-142, fig. 52.

TYPE LOCALITY: Off Signy Island (South Orkneys), 60º50'30"S, 46º15'00"W, 244-344 meters, on green mud, and Neumayr Channel (Palmer Archipelago), 64º48'30"S, 63º31'30"W, 259 meters, on mud.

SELECTED REFERENCES: *Augeneria tentaculata* — MONRO, 1936: 155-156; HARTMAN, 1964: 119, pl. 37, figs. 1-2; AVERINCEV, 1972: 187, pl. 37 figs. 11-12; ORENSANZ, 1973*b*: 369-371, pl. 11; IMAJIMA & HIGUCHI, 1975: 7-8, fig. 1; MIURA, 1980: 1021-1022, fig. 1; ORENSANZ, 1990: 94-96, pl. 24, pl. 40 figs. *a*, *f*, text fig. 23, chart 3*C*.

DISTRIBUTION: Antarctic Ocean and Southern South America to at least off La Plata River (80-2350 meters, and 4077-4176 meters); Pacific Ocean; South Africa; Atlantic Ocean (Gulf of Guinea, 1432-5121 meters; off Ireland, 2068-2503 meters; Gulf of Gascony, 400-4706 meters; Norwegian Sea, 2470-3709 meters; Western Mediterranean Sea, 1491 meters); Pacific coast of Japan (465-870 meters). Cosmopolitan, between 50-5121 meters.

GENUS ***Cenogenus*** Chamberlin 1919

Cenogenus CHAMBERLIN, 1919*a*: 333.

TYPE SPECIES: *Cenogenus descendens* Chamberlin 1919.

SYNONYMS: *Paraninoe* Levenstein 1977.

DIAGNOSIS (from CARRERA-PARRA, 2001*b*): Single small antenna in nuchal fold. Chaetae include limbate capillaries, limbate robust, and simple multidentate hooded hooks. Anterior segments with a parapodial branchia dorsal and posterior to parapodia. Maxillary apparatus and with four pairs of maxillae, MI forceps-like with smooth edges and bridles poorly developed, MII of similar length to MI, MIII and MIV edentate plates (MV absent); mandibles partially fused.

REMARKS: The genus *Cenogenus* Chamberlin 1919, normally considered as a junior synonym of *Lumbrineris*, was recently reinstated and emended by CARRERA-PARRA (2001*b*), regarding *Paraninoe* Levenstein 1977 as a junior synonym.

KEY TO SPECIES:

1a. MII with 3 teeth..***C. brevipes***
1b. MII with 2 teeth...***C. fusca***

Cenogenus brevipes (McIntosh 1903)

Lumbriconereis brevipes MCINTOSH, 1903*b*: 147-149, text-fig. 3, pl. 12 figs. 33-34.

TYPE LOCALITY: Off Cape Finisterre (NW Spain), at 81 fathoms (148.1 meters).

SELECTED REFERENCES: *Lumbrineris brevipes* — PETTIBONE, 1963*a*: 260-262, fig. 68; UEBELACKER, 1984*g*: 41.19-41.21, figs. 41.15-41.16. *Paraninoe brevipes* — MIURA, 1980: 1046-1048, fig. 14*A-C*; FRAME, 1992: 201-203, fig. 6; SOLÍS-WEISS *et al.*, 1995: 70.

DISTRIBUTION: NW Spain, 148 meters; off northern Ireland, 2068-2644 meters; Gulf of Gascony, 1845-4706 meters; North-East Atlantic, 1102-4825 meters; from Massachusetts to North Carolina, 105-2250 meters; Gulf of Mexico, 131 meters; off Congo, 1227-4655 meters.

Cenogenus fusca (Moore 1911)

Ninoë fusca MOORE, 1911: 285-288, pl. 19 figs. 110-118.

TYPE LOCALITY: Off Santa Catalina Islands, California (U.S.A.), 33º10'15"N, 121º42'15"W, between 2196-2228 fathoms (4016-4074 meters), in grey mud.

SELECTED REFERENCES: *Ninoë fusca* — KIRKEGAARD, 1956: 69, fig. 8. *Paraninoe fusca* — MIURA, 1980: 1048, fig. 14*D-G*. *Cenogenus fusca* — CARRERA-PARRA, 2001*b*: 723, fig. 1*H*.

DISTRIBUTION: Off California, 2770-4063 meters; Kermadec Trench, 6620-7000 meters; off Congo, 1432-4655 meters; Gulf of Gascogne, 334-4720 meters; off northern Ireland, 4268 meters.

GENUS ***Eranno*** Kinberg 1865

Eranno KINBERG, 1865: 567.

TYPE SPECIES: *Eranno bifrons* Kinberg 1865.

DIAGNOSIS (from FRAME, 1992): Prostomium conical. Parapodia uniramous with simple limbate chaetae and simple, multidentate hooded hooks. Mandible shafts long. MII proportionally short (about 1/2 the length of MI), connected to MI by broad basal supports or plates. MV partially fused to MIV.

REMARKS: The genus *Eranno* was emended and reinstated by ORENSANZ (1990).

Eranno bifrons Kinberg 1865

Eranno bifrons KINBERG, 1865: 567.

TYPE LOCALITY: Near Cabo Vírgenes, Patagonia (Argentina), on a rocky bottom at 32 fathoms (58.5 meters).

SYNONYMS: *Lumbriconereis ehlersii* McIntosh 1885; *Lumbriconereis ehlersii tenuisetis* McIntosh 1885; *Lumbrineris impatiens antarctica* Averincev 1972.

SELECTED REFERENCES: *Eranno bifrons* — KINBERG, 1910: 46, pl. 18 fig. 31; ORENSANZ, 1990: 78-80, pl. 20. *Lumbrineris bifrons* — HARTMAN, 1948*a*: 95-96, pl. 14 figs. 10-13; ORENSANZ, 1973*b*: 357-359, pl. 5; MIURA, 1980: 1036, fig. 9*E-G*. *Lumbrinereis bifrons* — WESENBERG-LUND, 1962: 113; DETINOVA, 1985*a*: 116. *Lumbriconereis ehlersii* — MCINTOSH, 1885*a*: 254. *Lumbriconereis ehlersi tenuisetis* — MCINTOSH, 1885*a*: 253-254, text-figs. 20-22, pl. 37 fig. 9, pl. 18*A* fig. 12. *Lumbrineris impatiens antarctica* — AVERINCEV, 1972: 186, pl. 36 figs. 6-7. *Lumbriconereis Virgini* — KINBERG, 1865: 568 [in part].

DISTRIBUTION: From New York to Halifax, 2400 meters; off Iceland, 1450-1895 meters; off northern Ireland, 2498-2644 meters; Gulf of Gascony, 1111-2150 meters; off Congo, 1163-5121 meters; Southwestern Atlantic (from Tierra del Fuego to Off Uruguay), 52-746 meters; Bellingshausen Plain, 4901 meters; South Sandwich Islands, 2492 meters.

GENUS ***Helmutneris*** Carrera-Parra 2006

Helmutneris CARRERA-PARRA, 2006*a*: 18.

TYPE SPECIES: *Lumbriconereis flabellicola* Fage 1936.

DIAGNOSIS (from CARRERA-PARRA, 2006*a*): Prostomium without antennae, without eyes. Notopodia slightly developed. Without branchiae. Simple multidentate hooded hooks present. Pygidium with anal cirri. Maxillary apparatus with four pairs of maxillae, carriers black, as long as MI, joined to base of MI. MI forceps-like without internal accessory teeth, wide base, with attachment lamella. MII as long as MI, with ligament, without connecting plates, attachment lamella narrow along 1/3 of posterior lateral edge. MIII with whitish central area, attachment lamella wide along 1/4 of posterior lateral edge. MIV with whitish central area, attachment lamella narrow. Mandible with shaft partly separated.

Helmutneris flabellicola (Fage 1936)

Lumbriconereis flabellicola FAGE, 1936: 943-944, figs. 1-2.

TYPE LOCALITY: Off Morocco, 32º31'N, 11º44'W, 450-600 meters, muddy bottom, several specimens on scleractinian corals *Flabellum chunii* Marenzeller 1904 (as *Flabellum pavoninum* var. *distinctum*).

SELECTED REFERENCES: *Lumbrineris flabellicola* — ZIBROWIUS, SOUTHWARD & DAY, 1975: 84-87, fig. 1, plate 1*A-C*, plate 3*C*; [?] MIURA & SHIRAYAMA, 1992: 23-26, figs. 1-3; CARRERA-PARRA, 2006*a*: 19, fig. 4*E-I*.

REFERENCES FOR PORTUGAL: ZIBROWIUS, SOUTHWARD & DAY, 1975 (as *Lumbrineris flabellicola*; off Vila do Conde; off Aveiro; off Cape São Vicente; off Lagos).

DISTRIBUTION: Celtic Sea (183-1175 meters); Off North and North-West of Spain (200-760 meters); Off Portugal (350-1150 meters); Gorringue and Lion Bank (262-630 meters); Off Morocco (160-600 meters); Off Occidental Sahara (489 meters); Off Natal, South Africa (138 meters). Probably also: Mozambique Channel (200-570 meters); China Sea; Japan (277-317 meters). The species was found living as a commensal or parasite on the following recent scleractinian corals: *Balanophyllia cellulosa* Duncan 1873, *Balanophyllia thalassae* Zibrowius 1980, *Caryophyllia sarsiae* Zibrowius 1974, *Caryophyllia smithii* Stokes & Broderip 1828 ("form clavus"), *Dendrophyllia cornigera* (Lamarck 1816), *Eguchipsammia cornucopia* (Pourtalès 1871), *Desmophyllum cristagalli* Milne-Edwards & Haime 1848, *Flabellum chunii* Marenzeller 1904, *Flabellum inconstans* Marenzeller 1904, *Flabellum pavoninum* Lesson 1831, *Flabellum* sp. (form from the Mozambique Channel), and *Stephanocyathus diadema* (Moseley 1876). In Japan, it was found associated with the ahermatypic coral *Flabellum pavoninum*. Besides, ZIBROWIUS, SOUTHWARD & DAY (1975) found, from the paleontological literature and through the examination of museum collections, fossil corals which showed scars identical to the ones present on recent corals infected by the worm. These fossil corals are from the Miocene and Pliocene of the Central Europe and the Western Mediterranean Basin (Austro-Hungarian region, Italy, Morocco, South Spain, Tunisia, and the Alpes Maritimes).

REMARKS: The first reference to this species seems to be made by MARENZELLER (1904*b*: 276, pl. 18 figs. 14-14*a*). In his description of a new species of scleractinian coral, *Flabellum chunii*, collected at 489 meters off Cape Bojador by the "Valdivia", he makes reference to the fact that the biggest part of the specimens had a coiled indetermined *Lumbriconereis* worm attached to their sides.

CARRERA-PARRA (2006*a*) considered the record of this species from Japan by MIURA & SHIRAYAMA (1992) as doubtful.

*GENUS ***Hilbigneris*** Carrera-Parra 2006

Hilbigneris CARRERA-PARRA, 2006*a*: 21-22.

TYPE SPECIES: *Hilbigneris pleijeli* Carrera-Parra 2006.

DIAGNOSIS (from CARRERA-PARRA, 2006*a*): Prostomium without antennae, without eyes. Notopodia as small knobs. Without branchiae. Composite and simple multidentate hooded hooks present. Pygidium with anal cirri. Maxillary apparatus with five pairs of maxillae, carriers as long as MI, joined to entire base of MI. MI forceps-like without internal accessory teeth, with attachment lamella. MII shorter than MI, with ligament, attachment lamella wide, along 2/3 of posterior lateral edge. Wide connecting plates strongly sclerotized. MIII and MIV completely pigmented, attachment lamella wide, along entire lateral edge. MV reduced to attachment lamella, lateral to MIV and MIII. Mandible with shaft partly fused.

REMARKS: The descriptions of the following two species by CARRERA-PARRA (2006*a*) were based in 3 specimens in one case, and in a single one, in the other. For these reason I present in the following dichotomic key all the characters that can separate the two species presented by the same author, as some of the separating characters can be the result of size depending intraspecific variation.

KEY TO SPECIES:

1a. Peristomium with rings of similar size; first four parapodia smaller than following; prechaetal lobe in parapodia 1-25 inconspicuous, from parapodia 26 until the end rounded, increasing gradually in size but always smaller than postchaetal lobe; postchaetal lobe in parapodia 1-24 well developed, digitiform, basally swollen, from parapodia 25 digitiform; composite multidentate hooded hooks in chaetigers 1-24, with long blade, with up to 7 teeth, proximal tooth largest, simple multidentate hooded hooks from chaetiger 25, with up 5 teeth, proximal tooth largest, with short hood; dorsal limbate chaetae in chaetigers 1-28, ventral limbate chaetae in chaetigers 1-36; MIII bidentate, distal tooth largest....................***H. pleijeli***
1b. Peristomium with anterior ring twice as long as posterior; first six parapodia smaller than following; prechaetal lobe short, rounded in all parapodia; postchaetal lobe in parapodia 1-5 digitiform, from parapodium 6-21 digitiform, basally swollen, from parapodia 22 until the end, shortest, conical; composite multidentate hooded hooks in chaetigers 1-21, with long blade, with up to 9 teeth of similar size, simple multidentate hooded hooks from chaetiger 21, with up to 9 teeth, proximal tooth largest, crenulated; dorsal limbate chaetae in chaetigers 1-50, ventral limbate chaetae in chaetigers 1-26; MIII unidentate, with prominent tooth followed by an expanded base...***H. gracilis****

**Hilbigneris gracilis* (Ehlers 1868)

Lumbriconereis gracilis EHLERS, 1868: 393-395, pl. 17 figs. 6-10.
TYPE LOCALITY: Rijeka (= Fiume, Croatia), Adriatic Sea.
SELECTED REFERENCES: *Lumbriconereis gracilis* — [?] FAUVEL, 1923*c*: 432, fig. 172*a-f*. *Lumbrineris gracilis* — RAMOS, 1976*a*: 116-118, figs. 12-13, table 2; [?] CAMPOY, 1982: 612-613; [?] NÚÑEZ, TALAVERA & OCAÑA, 1991: 94-96, fig. 4; [?] PAPADOPOULOU, DOUNAS & SMITH, 1994: 262-263. *Hilbigneris gracilis* — CARRERA-PARRA, 2006*a*: 24, fig. 6*A-E*.
REFERENCES FOR PORTUGAL: BELLAN, 1960*a* (as *Lumbriconereis gracilis*; Setúbal Canyon; Cape Santa Maria); SALDANHA, 1974 (as *Lumbriconereis gracilis*; coast of Arrábida); HARTMANN-SCHRÖDER, 1977*a* (as *Lumbrineris gracilis*; Bay of Setúbal); CAMPOY, 1982 (as *Lumbrineris gracilis*; previous records: Portuguese coast); MONTEIRO-MARQUES, 1987 (as *Lumbrinereis gracilis*; continental shelf of Algarve); DEXTER, 1992 (as *Lumbrineris gracilis*; previous records: Ria de Alvor; continental shelf of Algarve; Mira Estuary; Sado Estuary); SALDANHA, 1995 (as *Lumbrineris gracilis*; Portugal); RAVARA, 1997 (as *Lumbrineris gracilis*; off Aveiro); present work (southwestern continental shelf).
MATERIAL: SEPLAT 6 — St. 327 (A.2784), off Praia de Odeceixe, 47 m, sand: 1 incomplete specimen, broken in 3 pieces, 0.4-0.5 mm wide; prostomium slightly longer than wider; 2 first segments apodous; anterior 11 chaetigers with jointed multidentate hooded chaetae and winged chaetae; rest of the parapodia with unjointed hooded chaetae and winged chaetae; chaetae and aciculae yellow; middle and posterior parapodia with postchaetal lobes longer than pre-chaetal lobes; buccal apparatus not observed.
DISTRIBUTION: Mediterranean Sea; Adriatic Sea; [?] Aegean Sea. All the other records need confirmation.
REMARKS: This species was redescribed and assigned to a new genus by CARRERA-PARRA (2006*a*). This author used a specimen collected at Naples (Italy) and identified as *Lumbrineris latreilli* by Pierre Fauvel for the redescription. Normally *Lumbrineris* gracilis was considered as having the blades of the composed hooded hooks very short, but according to this new redescription, they are long. This way, all the other records of specimens identified as *L.* gracilis need confirmation, as well as the geographic and ecological distribution of the species. The species has been considered to occur, besides in the Mediterranean and the Adriatic Seas, from Norway to the Gulf of Guinea, Black Sea, and probably New Caledonia, on *Posidonia*, algae, maërl, coraligenous, muddy and sandy bottoms, at depths ranging from the intertidal to 681 meters.

Hilbigneris pleijeli Carrera-Parra 2006

Hilbigneris pleijeli CARRERA-PARRA, 2006*a*: 22-24, fig. 5*F-J*.
TYPE LOCALITY: France, Dinard, Gulf of St. Malo.
DISTRIBUTION: Northwestern France. Description based on specimens collected at Dinard (Gulf of St. Malo), Chaussey Island, and Le Croisic.
REMARKS: All the specimens used to describe this new species had been previously identified as *Lumbrineris latreilli* by Baron de Saint Joseph.

GENUS *Lumbricalus* Frame 1992

Lumbricalus FRAME, 1992: 195-196.

TYPE SPECIES: *Lumbriconereis januarii* Grube 1878.

DIAGNOSIS (from FRAME, 1992): Prostomium conical. Parapodia uniramous, may have a notopodial rudiment. Parapodia with composite spinigers; composite, multidentate hooded hooks (usually); simple limbate chaetae, and simple, multidentate hooded hooks. MIII with up to 5 small teeth, MIV unidentate, MV free standing, displaced outward to MIV. A typical fascicle is composed of a superior limbate chaeta, composite spinigers, followed by 1-2 composite hooks, and limbate chaetae.

KEY TO SPECIES:

1a. Maxillae MIII unidentate..***L. campoyi***
1b. Maxillae MIII bidentate..***L. adriatica***

Lumbricalus adriatica (Fauvel 1940)

Lumbriconereis adriatica FAUVEL, 1940: 16-18, fig. 3.

TYPE LOCALITY: Rovinj (= Rovigno), Croatia, Northern Adriatic Sea.

SELECTED REFERENCES: *Lumbrineris adriatica* — RAMOS, 1976*a*: 109; MIURA, 1980: 1035, fig. 9*A-D* [in part; not *Lumbriconereis adriatica foresti* Fauvel & Rullier 1959 = *Lumbricalus foresti* (Fauvel & Rullier 1959) (see CARRERA-PARRA, 2004: 86)]. *Lumbricalus adriatica* — CARRERA-PARRA, 2004: 82, fig. 2*A-E*. [?] Not *Lumbriconereis adriatica* — AMOUREUX, 1973*b*: 58 [probably = *Lumbricalus foresti* (Fauvel & Rullier 1959), or *Lumbricalus vossae* Carrera-Parra 2004].

DISTRIBUTION: Adriatic Sea, Aegean Sea, and Mediterranean Sea, at 35 meters. Among *Zostera nana*, and on sandy and muddy bottoms.

Lumbricalus campoyi Aguirrezabalaga & Carrera-Parra 2006

Augeneria riojai AGUIRREZABALAGA & CARRERA-PARRA, 2006: 21-23, fig. 3.

TYPE LOCALITY: Capbreton Canyon, Bay of Biscay, NE Atlantic Ocean, from 43º36.55’N, 1º54.70’W, at 990 meters, to 43º36.29’N, 1º54.96’W, at 979 meters.

DISTRIBUTION: Capbreton Canyon, Bay of Biscay, NE Atlantic Ocean, between 917-1012 meters.

GENUS *Lumbrinerides* Orensanz 1973

Lumbrinerides ORENSANZ, 1973*b*: 371-373.

TYPE SPECIES: *Lumbrinerides gesae* Orensanz 1973.

DIAGNOSIS (from FRAME, 1992): Prostomium long, distally pointed. Parapodia uniramous with simple bidentate hooded hooks, and simple limbate chaetae. Maxillary carriers large, triangular, broad anteriorly. MI usually with 1-2 accessory teeth on inner margin, mandibles usually fused for entire length. Aciculae yellow or black.

KEY TO SPECIES:

(adapted from MIURA, 1980)

1a. MI without an accessory tooth at the internal edge; MII with 3 teeth..**2**
1b. MI with at least one accessory tooth...**4**

2a (1a). Protomium very long (three times longer than wider), first 3-5 parapodia small; posterior parapodia located dorsally; simple hooks from chaetiger 1...***L. laubieri***
2b (1a). Prostomium long (two or more times longer than wider), first 7-9 parapodia small; posterior parapodia located laterally...**3**

3a (2b). Simple hooks from chaetiger 2-6..***L. amoureuxi***
3b (2b). Simple hooks from about chaetiger 16...***Lumbrinerides* sp. 1**

4a (1b). MI with one accessory tooth at the internal edge..**5**

4b (1b). MI with two accessory teeth at the internal edge; first 6-7 parapodia small; simple hooks from chaetiger 1..***Lumbrinerides* sp. 2**

5a (4a). Prostomium very long (four times longer than wider), first 3 parapodia small; posterior parapodia located dorsally; simple hooks from chaetiger 1..***L. carpinei***
5b (4a). Prostomium long (one to three times longer than wider), first small parapodia more than 3; posterior parapodia located laterally..**6**

6a (5b). Simple hooks from chaetiger 1; first 8 parapodia small; postchaetal lobes from the middle region of the body longer than the chaetae...***L. neogesae***
6b (5b). Simple hooks from median region of the body (from chaetiger 8-20); about first 6-10 parapodia small; postchaetal lobes from the middle region of the body not longer than the chaetae...............***L. acuta***

Lumbrinerides acuta (Verrill 1875)

Lumbriconereis acuta VERRILL, 1875: 39, pl. 3 fig. 5.
TYPE LOCALITY: Off Block Island, Rhode Island, U.S.A., 26 meters.
SELECTED REFERENCES: *Lumbrineris acuta* — HARTMAN, 1942*b*: 114, figs. 10*a-d*; PETTIBONE, 1963*a*: 260, fig. 67*g-i* [in part]. *Lumbrinerides acuta* — ORENSANZ, 1973*b*: 373; GARDINER, 1976: 203, figs. 26*i-l* [in part; New England specimens]; PERKINS, 1979: 419, fig. 1*a*; MIURA, 1980: 1025, fig. 3*A*; FRAME, 1992: 196-197; SOLÍS-WEISS *et al.*, 1995: 65-66; *Lumbrinerides ?acuta* — UEBELACKER, 1984*g*: 41.11-41.13, figs. 41.7-41.8. Not *Lumbrineris acuta* — HARTMAN, 1944*b*: 145-146, pl. 8 figs. 176-177; HARTMAN, 1968: 741, figs. 1-3; RAMOS, 1976*a*: 105-109, figs. 1-3, table 1; CAMPOY, 1982: 601-602.
REFERENCES FOR PORTUGAL: AMOUREUX, 1987 (as *Lumbrineris acuta*; off Aveiro; off Porto).
DISTRIBUTION: New England region; off NE USA; Gulf of Mexico. In bottoms of mud and coarse to medium sand. From low water, in mud and sand flats, to about 260 meters.
REMARKS: This species is quite probably not present in Europe. Its European records refer possibly to similar but different species. In order to ease the confirmation of rejection of its presence in European waters, it was decided to include the species here.

Lumbrinerides amoureuxi Miura 1980

Lumbrineris amoureuxi MIURA, 1980: 1028-1029, fig. 5.
TYPE LOCALITY: Coast of Arcachon (France), 20-25 meters, on sand.
SELECTED REFERENCES: *Lumbrinerides amoureuxi* — AGUIRREZABALAGA & CARRERA-PARRA, 2006: 23. *Lumbrineris aberrans* [not Day 1963] — AMOUREUX, 1971*b*: 155.
DISTRIBUTION: Coast of Arcachon (France), between 20-50 meters, on sand; Capbreton Canyon, Bay of Biscay, between 984-1113 meters.

Lumbrinerides carpinei (Ramos 1976)

Lumbrineris carpinei RAMOS, 1976*a*: 109-111, figs. 5-6.
TYPE LOCALITY: RAMOS (1976*a*) referes to 5 specimens of *Lumbrinerides carpinei*, but she only gives information on four of them. Probably the fifth specimen was the holotype of *Lumbrineris crassicephala* Hartman 1965 that she also studied (and now included in the genus *Lumbrinerides*). No holotype was clearly designated. Information on the type material is as follows: Catalonian Spanish coast, Rech Lacaze-Duthiers (1 specimen); Off Monaco, Mediterranean Sea, at 42º02'00"N, 9º38'30"E, 310 meters (1 specimen), at 42º06'00"N, 9º45'00"E, 600 meters (1 specimen), and at 42º19'00"N, 9º39'00"E, 290 meters (1 specimen) [latitude in RAMOS (1976*a*) erroneously referred as being South].
SELECTED REFERENCES: *Lumbrinerides carpinei* — PERKINS, 1979: 421; CAMPOY, 1982: 602.
DISTRIBUTION: Western Mediterranean Sea, off Monaco and at the Rech Lacaze-Duthiers, off Catalonia (Spain). Between 290-600 meters.

Lumbrinerides laubieri Miura 1980

Lumbrinerides laubieri MIURA, 1980: 1023-1025, fig. 2.
TYPE LOCALITY: Gulf of Gascony, 47º 34.7'N, 9º38.8'W, 2250 meters.
SELECTED REFERENCES: *Lumbrinerides laubieri* — DETINOVA, 1985*a*: 117.
DISTRIBUTION: Gulf of Gascony, between 1894-2775 meters; off Iceland, between 1560-1805 meters.

Lumbrinerides neogesae Miura 1980

Lumbrinerides neogesae MIURA, 1980: 1027-1028, fig. 4.

TYPE LOCALITY: 4-8 Km off Unkomass (near Durban), South Africa, at 20 meters.

SELECTED REFERENCES: *Lumbrinerides neogesae* — GRAVINA & CANTONE, 1991: 150-152, fig. 1, table 1. *Lumbrineris* cf. *mucronata* — HARTMANN-SCHRÖDER, 1974*b*: 61-63, figs. 53-56.

DISTRIBUTION: Off Unkomass, South Africa, at 20 meters; Adriatic and Tyrrhenian Seas, 5-12 meters, on coarse and fine sand.

***Lumbrinerides* sp. 1**

Lumbrineris acuta RAMOS, 1976*a*: 105-109, figs. 1-3, table 1 [not *Lumbrinerides acuta* (Verrill 1875)].

SELECTED REFERENCES: *Lumbrinerides acuta* — CAMPOY, 1982: 601-602 [in part; not GARDINER (1976) in the synonymy list = *Lumbrinerides acuta* sensu stricto (New England specimens) and *Lumbrinerides dayi* Perkins 1979 (North Carolina specimens)]. *Lumbrinerides* sp. — PERKINS, 1979: 421. *Lumbrinerides acuta* sensu Ramos (1976) — MIURA, 1980: 1025.

DISTRIBUTION: Bay of Rosas, Catalonian Spain (Mediterranean Sea), 42º24.4'N, 3º10.5'E, 30 meters. On detritic bottoms with mud.

REMARKS: According to PERKINS (1979), this seems to be an unnamed species, but the wide posterior division of the mandibles could also be due to an artifact during the dissection process.

***Lumbrinerides* sp. 2**

Lumbrinerides sp. A — PAPADOPOULOU, DOUNAS & SMITH, 1994: 265-266.

DISTRIBUTION: Island of Crete (Mediterranean Sea), 16-40 meters, on coarse sand with shell fragments, and on gravelly sand.

REMARKS: According to PAPADOPOULOU, DOUNAS & SMITH (1994) the description of this species was under preparation, but so far it seems to remain undescribed. To date this remains as the only reference to the presence of *Lumbrinerides* specimens with two accessory teeth on the internal edge of MI in Europe.

*GENUS ***Lumbrineris*** Blainville 1828

Lumbrineris BLAINVILLE, 1828: 486-487.

TYPE SPECIES: *Lumbrineris latreilli* Audouin & Milne Edwards 1833.

SYNONYMS: *Lumbriconereis* Grube 1840; *Lumbrinereis* Delle Chiaje 1841; *Zygolobus* Grube 1863; *Zygophyllus* Grube 1863.

DIAGNOSIS (from FRAME, 1992): Prostomium conical or globular, usually without papillae, occasionally with a single papilla in nuchal fold. Parapodia uniramous, sometimes with a notopodial rudiment. Parapodia with multidentate hooded hooks in the anterior parapodia; simple limbate chaetae, and simple, multidentate hooded hooks. MIII and MIV usually unidentate or bidentate. MV free standing, displaced outward to MIV. Aciculae yellow or black, of light color in juveniles.

REMARKS: For a detailed historical background on the taxonomy and nomenclature of this genus, see FRAME (1992). As stated by this author, the definition of the genus *Lumbrineris* Blainville 1828 is uncertain, and a new name may have to be created, or a junior synonym may have to be revised and redefined. All the three species originally placed in this genus by BLAINVILLE (1828), *Nereis ebranchiata* Pallas 1788, *Lumbrineris scolopendrina* Blainville 1828, and *Lumbrineris splendida* Blainville 1828, were considered as indeterminable by HARTMAN (1959*a*), and no type material is known to exist (FRAME, 1992). *Lumbrineris latreilli* Audouin & Milne Edwards 1833 was designated as type species of the genus by HARTMAN (1959*a*), but according to the Fourth Edition of the International Code of Zoological Nomenclature it cannot play this function, as it was not described or named in the original work where the genus was created. In spite of this, and waiting for a resolution on the matter, both the definition and the type species of the genus are considered here as in FRAME (1992).

The key presented by PAPADOPOULOU, DOUNAS & SMITH (1994) for the lumbrinerids from Crete presents an error: the species presenting unidentate MIII are *L. nonatoi* and *L. gracilis*, and the ones with bidentate MIII are *L. coccinea* and *L. laterilli* (and not the opposite, as stated at the published key).

KEY TO SPECIES:

1a. Aciculae black; MIII unidentate, with a swollen basis or knob; composite blades with hooded hooks with long blades on chaetigers 1-23..***L. futilis***
1b. Aciculae yellow..**2**

2a (1b). MIII uni- or bidentate...**3**
2b (1b). MIII with 3-5 teeth; MIV bidentate; compound hooks with short blades, about 3-5 times as long as wide...***L. inflata***

3a (2a). MIII unidentate (an arcuate cutting edge is present in *L. cingulata*)..**4**
3b (2a). MIII bidentate...**8**

4a (3a). Anterior parapodia (chaetigers 1-11) with both simple and composite hooded hooks, occurrence of composite hooks irregular...**5**
4b (3a). All anterior hooded hooks composite...**6**

5a (4a). Width of 0.5-0.8 mm; anterior parapodia with 6-9 chaetae (3-4 dorsal limbate chaetae, 2-4 hooded hooks of which one or more may be composite or pseudocomposite, and single ventral limbate chaeta); dorsal limbate chaetae extending posteriorly to about chaetiger 40-50; ventral limbate chaetae extending posteriorly to about chaetiger 13-15..***L. mixochaeta***
5b (4a). Width of 0.75-1.1 mm; anterior parapodia with 8-16 chaetae (4-8, usually 4-6, dorsal limbate chaetae, 3-6 hooded hooks, of which 1-3 may be composite or pseudocomposite, and one, occasionally two, ventral limbate chaetae); dorsal limbate chaetae extending posteriorly to about chaetiger 60-70; ventral limbate chaetae extending posteriorly to about chaetiger 15-18................................***L. vanhoeffeni***

6a (4b). Prechaetal parapodial lobes longer than postchaetal lobes from the median region of the body; M II = 3; blades of composite hooks short (about 3 times longer than wider)..................................***L. nonatoi***
6b (4b). Prechaetal parapodial lobes always shorter than postchaetal lobes; M II > 3................................**7**

7a (6b). Prostomium short, ovate; blades of composite hooks short (about 4-5 times longer than wider); composite hooks reach chaetiger 8-17; composite hooks with a crest of up to 9 teeth of similar size; simple hooks with 4-6 teeth in the crest [according to MIURA (1980), CAPACCIONI-AZZATI (1991) and CARRERA-PARRA (2006*b*); 10 teeth according to ORENSANZ (1973*b*)], with proximal tooth bigger; MII with 4 teeth; MIII unidentate, forming an arcuate cutting edge (MIII may seem bidentate); mandibles with 3-4 concentric bands..***L. cingulata***
7b (6b). Prostomium conical, as long as wide; blades of composite hooks short (about 5 times longer than wider); composite hooks reach chaetiger 15; composite hooks with a crest of about twenty teeth, without a discernible main fang; posterior simple hooks with a moderately developed main tooth and 8-12 progressively decreasing small teeth; MIII unidentate, without an arcuate cutting edge; concentric bands not particularly visible in the mandibles..***L. aniara***

8a (3b). Both parapodial lobes elongated and digitiform in posterior body region, with the prechaetal lobe being longer than the postchaetal one (about twice as long at the last chaetigers); composed hooks in the first 16-20 chaetigers, with short blades (about 3-4 times as long as wide).........................***L. longipodiata***
8b (3b). Parapodial lobes in the posterior body region with the prechaetal lobe not elongated; prechaetal lobe always shorther than postchaetal lobe...**9**

9a (8b). Prostomium short and round, globular; blades of composite hooks short (about 4-5 times longer than wider), of similar length throughout; composite hooks reach chaetiger 10-25; simple hooks with 5-6 teeth in the crest; MII with 4-6 teeth; MIII with pointed teeth; mandibles with 6-7 concentric bands; on hard bottoms..***L. coccinea***
9b (8b). Prostomium long and conical; blades of composite hooks long, being longer in anterior parapodia (6-11 times longer than wider); composite hooks reach chaetiger 11-25; simple hooks with 6-10 teeth in the crest; MII with 4-5 teeth; MIII with pointed teeth; mandibles with about 6 concentric bands; mainly on soft bottoms...***L. latreilli****

Lumbrineris aniara Fauchald 1974

Lumbrineris aniara FAUCHALD, 1974*b*: 24-25, fig. 4.

TYPE LOCALITY: Hardanger Fjord (Norway): Skåneviksfjorden, SE of Toftekalven, 59º44’45”N, 5º51’40”E, 354-350 meters, on soft bottom.

SELECTED REFERENCES: *Lumbrineris aniara* — GEORGE & HARTMANN-SCHRÖDER, 1985: 122, fig. 37; HARTMANN-SCHRÖDER, 1996: 263-264; CARRERA-PARRA, 2006*b*: 9-10, fig. 2*A-E*; AGUIRREZABALAGA & CARRERA-PARRA, 2006: 23-24.

DISTRIBUTION: Western Norway, in sand, mud, mixtures of both with clay, gravel, broken shells, and rocks; 150-800 meters; Capbreton Canyon, Bay of Biscay, between 492-1036 meters.

REMARKS: FAUCHALD (1974*b*) stated that the holotype was collected at station 110-58, which data is given above, under the *TYPE LOCALITY* section. This holotype was collected together with 4 paratypes, which were deposited at the Zoological Museum, in Bergen (together with holotype) and Allan Hancock Foundation, in Los Angeles. CARRERA-PARRA (2006*b*) revised all this type material, and stated that the type locality was at Skåneviksfjorden, SE of Toftekalven, 59º44'45"N, as above but at 5º32'35"E, 220-186 meters, in hard coral bottom with mud pockets, instead of what is given above. The date of collection is also different, being 11 November 1958, instead of 13 November 1958 that is given in FAUCHALD (1974*b*) for station 110-58. There is no station in FAUCHALD (1974*b*) with the data given by CARRERA-PARRA (2006*b*), being instead a mixture of the data from stations 110-58 and 101-58.

Lumbrineris cingulata (Ehlers 1897)

Lumbriconereis cingulata EHLERS, 1897: 76-78, pl. 5 figs. 119-124.

TYPE LOCALITY: Uschuaia, Southern Tierra del Fuego, low tide in beach.

SYNONYMS: *Lumbrineris patagonica* Hartmann-Schröder 1962; *Lumbrineris homodentata* Hartmann-Schröder 1965; *Lumbrineris limbata* Hartmann-Schröder 1965.

SELECTED REFERENCES: *Lumbriconereis cingulata* — FAUVEL, 1936*e*: 22; MONRO, 1936: 154-155. *Lumbrineris cingulata* — WESENBERG-LUND, 1962: 115; HARTMAN, 1964: 121, pl. 37 figs. 5-6; ORENSANZ, 1973*b*: 361-365, pls. 7-8; MIURA, 1980: 1038, fig. 9*H-J*; ORENSANZ, 1990: 82-85, pl. 21, pl. 22 figs. *a-f*, chart 4*C*; CAPACCIONI-AZZATI, 1991: 55-57, fig. 2, table 1; FRAME, 1992: 198-200, fig. 5¸ SOLÍS-WEISS *et al.*, 1995: 67; CARRERA-PARRA, 2006*b*: 13-15, fig. 3*F-K*. *Lumbrineris patagonica* — HARTMANN-SCHRÖDER, 1962*a*: 119-120, figs. 124-127. *Lumbrineris homodentata* — HARTMANN-SCHRÖDER, 1965*b*: 176-178, figs. 149-152. *Lumbrineris limbata* — HARTMANN-SCHRÖDER, 1965*b*: 178-180, figs. 153-156. *Lumbriconereis virgini* — KINBERG, 1865: 568 [in part].

DISTRIBUTION: Magellanic biogeographic province, ranging north to off Uruguay and Central Chile, sublittoral-260 meters; Antarctic Ocean; Northwestern Atlantic, from Massachusetts to Virginia, 15-244 meters; off northern Ireland, 2068-4734 meters; Gulf of Mexico; Gulf of Gascogne, 1894-4835 meters; Delta del Ebro, Mediterranean Sea, 7-8 meters. On many types of bottoms.

REMARKS: The described differences between some of the records of this species, as well as its distribution and bathymetrical range, point to the possible presence of distinct species being identified as *Lumbrineris cingulata*.

As remarked by ORENSANZ (1990), this species is characterized by having a MIII with a strongly arcuate cutting border and an aliform expansion with angulose borders. Depending on the position of MIII, it may seem to be bidentated.

Lumbrineris coccinea (Renier 1804)

Nereis coccinea RENIER, 1804: xix [invalid name].

TYPE LOCALITY: Mediterranean Sea. CARRERA-PARRA (2006*b*: 15) designated a neotype for the species, from the "*collection Pierre Fauvel, cruise Prince de Monaco, station 0174, 1908, Mediterranean Sea*".

SELECTED REFERENCES: *Lumbriconereis coccinea* — PRUVOT & RACOVITZA, 1895: 374-384, text-fig. 3, pl. 16 figs. 21-37; FAUVEL, 1923*c*: 432-433, fig. 172*g-n*. *Lumbrineris coccinea* — [?] PETTIBONE, 1963*a*: 257-258, fig. 67*d-f* [in part; not *Lumbrineris inflata* Moore 1911, in the synonymy list]; [?] DAY, 1967: 436, fig. 17.16.*i-m*; [?] GARDINER, 1976: 198, fig. 25*r-t*; RAMOS, 1976*a*: 111-112, fig. 4; MIURA, 1980: 1038-1039, fig. 9*K-L* [at least the specimen from Cap d'Ail, Southern France]; GIANGRANDE, GAMBI & FRESI, 1981: 312-314, figs. 2*A-A'*, 3*A*, 4*A*, 5*A*; CAMPOY, 1982: 610-611; GEORGE & HARTMANN-SCHRÖDER, 1985: 126, fig. 39; NÚÑEZ, TALAVERA & OCAÑA, 1991: 96-99, fig. 5; PAPADOPOULOU, DOUNAS & SMITH, 1994: 263-264; CARRERA-PARRA, 2006*b*: 15-16, fig. 4*A-F*.

REFERENCES FOR PORTUGAL: AMOUREUX & CALVÁRIO, 1981 (Peniche); MONTEIRO-MARQUES, 1987 (as *Lumbrinereis coccinea*; continental shelf of Algarve); DEXTER, 1992 (previous records: continental shelf of Algarve; Sines); SALDANHA, 1995 (Portugal).

DISTRIBUTION: From the North Sea and English Channel to the Mediterranean Sea and Canary Islands, between 6-280 meters; Adriatic Sea; Aegean Sea; [?] Gulf of Gascogne, 2138-5121 meters; [?] New Scotland; [?] off Beaufort; [?] North Carolina; Red Sea; [?] Cape and Mozambique. On coralligenous bottoms, sand, mud, sponges, and among algae on rocky bottoms.

REMARKS: CARRERA-PARRA (2006*b*) restricted the distribution of this species to the Mediterranean Sea, considering all the other records questionable.

The name *Nereis coccinea* was included in a work rejected for taxonomic purposes, for not being properly published, according to Opinion 316 of the ICZN (1954). This way, the name currently in use should be replaced for the following available one, if existent, or given a new name. *Lumbrinereis vasco* Quatrefages 1866 was considered as a possible junior synonym of *L. coccinea* by EHLERS (1868), shortly after being described, and would be a possible replacement name for *L. coccinea*. The type material of the species exists, and is deposited at the Muséum National d'Histoire Naturelle, in Paris (SOLÍS-WEISS *et al.*, 2004). It was revised by CARRERA-PARRA (2006*b*: 59) and considered to belong to the genus *Scoletoma*, so it cannot be a junior synonym of *L. coccinea*. Another possibility to solve the problem with *L. coccinea* would be the submission of an application to the ICZN, in order to maintain the name, as it is well established and known.

Lumbrineris futilis Kinberg 1865

Lumbriconereis futilis KINBERG, 1865: 568.

TYPE LOCALITY: North Sea, 53º37'N, 02º27'E, at 56 meters.

SYNONYMS: *Lumbrineris agastos* Fauchald 1974.

SELECTED REFERENCES: *Lumbrineris agastos* — FAUCHALD, 1974*b*: 22-23, fig. 3; GEORGE & HARTMANN-SCHRÖDER, 1985: 120, fig. 36; HARTMANN-SCHRÖDER, 1996: 263; AGUIRREZABALAGA & CARRERA-PARRA, 2006: 24. *Lumbrineris futilis* — CARRERA-PARRA, 2006*b*: 21-22, fig. 6*A-E*.

REFERENCES FOR PORTUGAL: RAVARA, 1997 (as *Lumbrinereis agastos*; off Aveiro).

DISTRIBUTION: North Sea; Hardanger Fjord (Norway), in coarse sand, shells, rocks, slag, and mixtures of these, between 56-300 meters; Capbreton Canyon, Bay of Biscay, between 624-652 meters.

REMARKS: FAUCHALD (1974*b*) described *L. agastos* with bidentate MIII, but according to CARRERA-PARRA (2006*b*), it is unidentate with a swollen basis.

Lumbrineris inflata Moore 1911

Lumbrineris inflata MOORE, 1911: 289-291, pl. 19 figs. 128-132, pl. 20 figs. 133-134.

TYPE LOCALITY: The species was described with base on specimens collected at three different stations at Montery Bay (California), but apparently a type locality was not designated. The data of the stations is as follows: Monterey Bay, off Point Pinos Lighthouse, 67-71 fathoms (122.5-129.8 meters), in green mud, shells and gravel; Monterey Bay, off Point Pinos Lighthouse, 36-51 fathoms (65.8-93.3 meters), in soft dark gray mud; Monterey Bay, off Santa Cruz Lighthouse, 10 fathoms (18.3 meters), in fine gray sand and rock.

SYNONYMS: *Lumbrineris cervicalis* Treadwell 1922.

SELECTED REFERENCES: *Lumbrineris inflata* — [?] DAY, 1967: 435-436, fig. 17.16*d-h*; FAUCHALD, 1970: 89-91, pl. 14 figs. *a-d*; IMAJIMA & HIGUCHI, 1975: 20-22, fig. 7; [?] GARDINER, 1976: 198, fig. 25*n-q*; GIANGRANDE, GAMBI & FRESI, 1981: 311-314, figs. 1, 2*B-B'*, 3*B*, 4*B-B'*, 5*B*; CAMPOY, 1982: 616; UEBELACKER, 1984*g*: 41.37-41.39, figs. 41.33-41.34; NÚÑEZ, 1990: 544-546, fig. 177; NÚÑEZ, TALAVERA & OCAÑA, 1991: 92-94, fig. 2; HILBIG, 1995*a*: 294-296, fig. 11.6; CARRERA-PARRA, 2006*b*: 29-31, fig. 9*A-D*. *Lumbrineris cervicalis* — TREADWELL, 1922*b*: 176; USCHAKOV, 1955*a*: 239, figs. 79*A-D*. *Lumbrineris cingulata* [not Ehlers 1897] — TREADWELL, 1917: 263, pl. 2 figs. 7-12.

DISTRIBUTION: From the North-east Pacific to the Gulf of California, 18-127.8 meters; [?] Bering Sea, Yellow Sea; Sea of Japan; [?] North Carolina; Gulf of Mexico; Western Mediterranean Sea to Canary Islands; Aegean Sea; [?] South Africa. On rocks, corals, mud, shells, gravel, and sand. In the Mediterranean, among *Lythophyllum incrustans*. Intertidal to 130 meters.

REMARKS: According to CARRERA-PARRA (2006*b*) this species is distributed from the British Columbia to Western Mexico, being all the other records questionable.

CAMPOY (1982) identified as *L. inflata* some specimens collected at Aguilas (Murcia), on *Lythophyllum incrustans*. These specimens showed MIII with 3-4 teeth, and MIV bidentate, typical of *L. inflata*. A similar specimen was found by NÚÑEZ (1990) in Tenerife (Canarias).

Lumbrineris latreilli* (Audouin & Milne-Edwards 1833)

Lombrineris Latreilli AUDOUIN & MILNE-EDWARDS, 1833*a*: 242-244, pl. 12 figs. 13-15.

TYPE LOCALITY: Chaussey Islands (France, English Channel), and Mediterranean coast of France.

SYNONYMS: *Lumbriconereis Nardonis* Grube 1840; *Lumbriconereis tingens* Keferstein 1862; *Lumbriconereis Edwardsii* Claparède 1863; *Zygolobus Grubianus* Claparède 1864; *Lumbrineris latreilli* var. *sphaerocephala* Harmelin 1964.

SELECTED REFERENCES: *Lumbriconereis Latreilli* — SAINT-JOSEPH, 1898: 276-278, pl. 15 figs. 60-61; MCINTOSH, 1910: 376, pl. 62 fig. 9; FAUVEL, 1923*c*: 431-432, fig. 171*m-r*; CROSSLAND, 1924: 10-15, text-figs. 8-14, 37-40. *Lumbrineris latreilli* — HARTMAN, 1944*b*: 158-159, pl. 9 figs. 213-216; PETTIBONE, 1963*a*: 258-260, fig. 67*a-c*; DAY, 1967: 438, fig. 17.16.*p-t*; ORENSANZ, 1973*b*: 359-361, text-fig. 1, pl. 6; GARDINER, 1976: 202, figs. 26*x*, 27*a-d*; RAMOS, 1976*a*: 121-124, figs. 16-18; SOSA, NÚÑEZ & BACALLADO, 1977: 237-238, pls. 9-10; MIURA, 1980: 1041, fig. 10*D-E*; CAMPOY, 1982: 608-610; GEORGE & HARTMANN-SCHRÖDER, 1985: 136, fig. 44; NÚÑEZ, TALAVERA & OCAÑA, 1991: 94, fig. 3; KIRKEGAARD, 1992: 370-371, fig. 180; PAPADOPOULOU, DOUNAS & SMITH, 1994: 263; HARTMANN-SCHRÖDER, 1996: 265-266, fig. 118; CARRERA-PARRA, 2006*b*: 35-37, fig. 11*F-J*. *Lumbrineris latreilli* var. *sphaerocephala* — HARMELIN, 1964: 86, pl. 8. *Lumbriconereis Nardonis* — GRUBE, 1840: 79-80; EHLERS, 1868: 381-388, pl. 16 figs. 23-30, pl. 17 figs. 1-2. *Lumbriconereis tingens* — KEFERSTEIN, 1862: 102-104, pl. 9 figs. 1-9. *Lumbriconereis Edwardsii* — CLAPARÈDE, 1863: 58-59, pl. 14 figs. 14-22. *Zygolobus Edwardsii* — CLAPARÈDE, 1864: 575. *Notocirrus Edwardsi* — QUATREFAGES, 1866*b*: 370. *Zygolobus Grubianus* — CLAPARÈDE, 1864: 575-576, pl. 4 fig. 4. *Lumbriconereis gracilis* [not Ehlers 1868] — AMOUREUX, 1971*b*: 154.

REFERENCES FOR PORTUGAL: FAUVEL, 1911*c* (as *Lumbriconereis Latreilli*; Berlengas); FAUVEL, 1914*f* (as *Lumbriconereis Latreilli*; Berlengas); RIOJA, 1918*b* (as *Lumbriconereis Latreilli*; previous records: Berlengas); BELLAN, 1960*a* (as *Lumbriconereis latreillei*; off Cape Roca; Cape Espichel; Setúbal Canyon); [?] AMOUREUX, 1974*b* (as *Lumbriconereis gracilis-latreilli*; off Aveiro; off Porto); SALDANHA, 1974 (as *Lumbriconereis latreilli*; coast of Arrábida); CAMPOY, 1982 (previous records: Berlengas; Aveiro; Porto); COSTA, GAMITO & OLIVEIRA, 1984 (as *Lumbriconereis latreillei*; Sado Estuary); [?] AMOUREUX, 1987 (as *Lumbrineris* groupe *gracilis-latreilli*; off Aveiro; off Porto); MONTEIRO-MARQUES, 1987 (as *Lumbrinereis latreilli*; continental shelf of Algarve); DEXTER, 1992 (previous records: Ria Formosa; continental shelf of Algarve; Mira Estuary; Sado Estuary; Arrábida); SALDANHA, 1995 (Portugal); present work (southwestern continental shelf).

MATERIAL: SEPLAT 7 (1st part) — St. 276 (A.3178), off Pessegueiro Island, 160 m, sand: 1 specimen in poor condition, apparently complete, but broken in 2 pieces, with 79 and 85 chaetigers; about 35 mm long for 1 mm wide; pygidium with 4 anal cirri; anterior 21 chaetigers with jointed multidentate hooded hooked chaetae, with blade smaller in the last chaetigers; aciculae and chaetae yellow to amber colored. **FAUNA 1 — St. 28*R***, Alborán Sea, Djibouti Bank, off Nerja, 308 m, sand with mud: 1 incomplete specimen, in good condition, plus one fragment; first 25 chaetigers with jointed multidentate hooded hooked chaetae; bigger than the specimens from St. 276 (A.3178).

DISTRIBUTION: Northeast Atlantic Ocean and Mediterranean Sea, between 0-308 meters; Adriatic Sea; Aegean Sea, 30-40 meters; Gulf of Gascony, 2438 meters; [?] Gulf of Guinea, 1163 meters; [?] Pacific Ocean: Mexico; [?] Indian Ocean: Red Sea, Maldives, East Equatorial Africa; North Carolina. Reported to be cosmopolitan and occurring between 10-2000 meters. Amongst algae, *Posidonia*, and on detritic bottoms, maërl, sand, mud, and mixtures of both. According to CARRERA-PARRA (2006*b*) this cosmopolitan distribution is questionable.

Lumbrineris longipodiata Cantone 1990

Lumbrineris longipodiata CANTONE, 1990*a*: 193-195, figs. 1-3.

TYPE LOCALITY: Catania Gulf (Mediterranean Sea, Italy), between 14-16 meters, on fine sand.

DISTRIBUTION: Known from the type locality.

REMARKS: The presence of only two anal cirri in this species was considered as being a distinctive character. However FRAME (1992) states that the number of anal cirri is frequently a size-dependent variability in the family Lumbrineridae.

Lumbrineris mixochaeta Oug 1998

Lumbrineris mixochaeta OUG, 1998: 149-157, figs. 1-4, tables 1-2.

TYPE LOCALITY: Svartnes Basin, Balsfjord (Northern Norway), 69º23'N, 19º03'E, in soft mud, at 185 meters.

DISTRIBUTION: Northern Norway: Svartnes Basin, at Balsfjord, Ramfjord, and Elvebakken, at Alta, in soft mud, between 25-185 meters; Svalbard Islands: Bellsund, Isfjorden, and Storfjorden, in soft mud, between 85-410 meters; Northern Barents Sea, in mud with sand and pebbles, and in sandy mud, between 120-235 meters; Kara Sea, between 39-64 meters.

REMARKS: The type material of the species was not available for the revision performed by CARRERA-PARRA (2006*b*). However, this author states that the presence of pseudocomposite multidentate hooded hooks in the anterior parapodia that characterize the species is not typical of the genus *Lumbrineris*. For this reason, the same author considered the species as having an uncertain status, until the type material is revised.

Lumbrineris nonatoi Ramos 1976

Lumbrineris nonatoi RAMOS, 1976*a*: 124-127, figs. 19-21.

TYPE LOCALITY: Bay of Rosas, 42º15'6"N, 3º9'6"E (Catalonian coast of Spain, Mediterranean Sea), 10 meters, on sandy mud.

SELECTED REFERENCES: *Lumbrineris nonatoi* — CAMPOY, 1982: 605-606; PAPADOPOULOU, DOUNAS & SMITH, 1994: 263. Not *Lumbrineris nonatoi* — CARRERA-PARRA, 2001*a*: 606, FIG. 4*A-F*; CARRERA-PARRA, 2006*b*: 45-46, fig. 14*F-J* [= new species].

DISTRIBUTION: Western Mediterranean Sea, on sandy and muddy bottoms, at about 10 meters; Aegean Sea, 30-40 meters. The specimens identified by CARRERA-PARRA (2001*a*, 2006*b*), from Gulf of Mexico (Florida, Texas, Mexico), 15-56 meters, belong to a different species.

REMARKS: The genus *Lumbrineris* is generally defined as having pygidium with cirri. However, none of the specimens from the southern coast of France identified by me under the scope of other studies showed anal cirri, which fits the description given by RAMOS (1976*a*: fig. 21*B*).

Lumbrineris vanhoeffeni Michaelsen 1898

Lumbriconereis Vanhöffeni MICHAELSEN, 1898: 123-124, figs. 2-3.

TYPE LOCALITY: Karajak (West Greenland), and Davis Strait, near Disko Island (West Greenland), at 290 meters.

SELECTED REFERENCES: *Lumbrineris vanhöffeni* — WESENBERG-LUND, 1950*b*: 72. *Lumbrineris vanhoeffeni* — OUG, 1998: 158-159; CARRERA-PARRA, 2006*b*: 56, fig. 18*F-H*. *Lumbriconereis minuta* [not Théel 1879] — DITLEVSEN, 1937: 28 [in part]; WESENBERG-LUND, 1953*a*: 52-53 [in part].

DISTRIBUTION: West Greenland, 120-290 meters; East Greenland, at 65 meters.

GENUS *Ninoe* Kinberg 1865

Ninoe KINBERG, 1865: 566.

TYPE SPECIES: *Ninoe chilensis* Kinberg 1865.

DIAGNOSIS (from CARRERA-PARRA, 2006*a*): Prostomium without antennae, without eyes. Notopodia slightly developed. Branchiae associated with anterior parapodia. Simple multidentate hooded hooks present. Pygidium with anal cirri. Maxillary apparatus with five pairs of maxillae, carriers as long as MI, joined to entire base of MI. MI forceps-like without internal accessory teeth, with attachment lamella. MII as long as MI, with ligament, wide attachment lamella along 2/3 of posterior lateral edge. Without connecting plates. MIII completely pigmented, wide attachment lamella along entire lateral edge. MIV completely pigmented, wide attachment lamella. MV free, reduced to attachment lamella, lateral to MIV and MIII. Mandible fused up to 3/4 of its length.

Ninoe armoricana Glémarec 1968

Ninoe armoricana GLÉMAREC, 1968: 315-320, figs. 1-4.

TYPE LOCALITY: Toull Don, Mez da c'hlenen Kornog, Mez da c'hlenen gevred, Toull e biz, Toull lid, and le Gran Lac, all of them fishing grounds of fine mud located near the rocky cliff edge limiting the coast from the "Grande Vasiére", a big muddy area located from off Pointe de Penmarc'h to the Plateau de Rochebonne, between 70-110 meters, in the continental shelf of the northern Gulf of Gascony (France).

SELECTED REFERENCES: *Ninoë armoricana* — RAMOS, 1976*a*: 130-132, figs. 24-26. *Ninoe armoricana* — AMOUREUX, 1972*b*: 78; AMOUREUX, 1973*a*: 441; CAMPOY, 1982: 617-618; PAPADOPOULOU, DOUNAS & SMITH, 1994: 265; AGUIRREZABALAGA & CARRERA-PARRA, 2006: 24. *Ninoe kinbergi* var. *armoricana* — AMOUREUX, 1971*a*: 8. *Ninoë kinbergi* [not Ehlers 1887] — FAUVEL, 1936*c*: 56; FAUVEL, 1940: 21; BELLAN, 1964*b*: 103; BELLAN, 1965: 7; GUILLE & LAUBIER, 1966: 268; PICARD, 1971: 599, 606, fig. 6, tables 2, 14-15, 18, 20-22.

REFERENCES FOR PORTUGAL: AMOUREUX, 1987 (off Porto).

DISTRIBUTION: From the Gulf of Gascony to Morocco, 70-580 meters; Spanish Catalan coast, 20-270 meters; Gulf of Taranto, 80-700 meters; Adriatic Sea; Aegean Sea, 95-330 meters. On muddy and detritic bottoms.

REMARKS: I agree with GLÉMAREC (1968), in that the records of *Ninoë kinbergi* in the Mediterranean and Moroccan waters refer probably to *N. armoricana*. After the description of *N. armoricana*, there is only one reference to *N. kinbergi* for the Mediterranean Sea, by PICARD (1971). I was able to study material collected off the French catalan coast, during the REDIT I Campaign, and all the specimens belonged to *N. armoricana*. As GLÉMAREC (1968), I also think that the description made by FAUVEL (1936*c*) of the Moroccan specimens refer to *N. armoricana*, which seems to be, for the moment, the only known species of this genus in European and Moroccan waters. On the other hand, PETTIBONE (1963*a*) synonymised *Ninoë kinbergi* Ehlers 1887 with *Ninoë nigripes* Verrill 1887. RAMOS (1976*a*) however, raised some doubts about this synonymy, as it was made without reference to type material of *N. kinbergi*.

*GENUS ***Scoletoma*** Blainville 1828

Scoletoma BLAINVILLE, 1828: 492.
TYPE SPECIES: *Lumbricus fragilis* O.F. Müller 1776; designated by Blainville 1828.
SYNONYMS: *Unciniseta* Bidenkap 1907.
DIAGNOSIS (from FRAME, 1992): Prostomium conical or globular, usually without papillae, occasionally with a singular papilla in the nuchal fold. Parapodia uniramous, or with notopodial rudiments. Parapodia with simple limbate chaetae and simple, multidentate hooded hooks. MV free standing and displaced outward to MIV. Aciculae yellow or black, of lighter color in juveniles.
REMARKS: The genus definition was emended by FRAME (1992).

KEY TO SPECIES:

1a. Aciculae black..**2**
1b. Aciculae yellow or amber..**4**

2a (1a). Hooks rare, only in some posterior chaetigers (as far back as chaetiger 56-67), with blunt tips, sometimes indistinctly dentate; winged capillary chaetae on all chaetigers; MII with 4 teeth; MIII unidentate; prostomium conical..***S. rovignensis***
2b (1a). Hooks present, multidentate; winged capillary chaetae absent at the posterior region of the body..**3**

3a (2b). Hooks starting on chaetiger 22-35; winged capillary chaetae to about chaetiger 60-100; MII with 4-5 teeth, without an open space between the first two teeth; MIII unidentate (rarely one side bidentate); prostomium conical; anterior postchaetal lobes short flap-like..***S. fragilis***
3b (2b). Hooks starting on chaetigers 1-9 (but variation have been found, with simple hooks starting as far back as chaetigers 26-55), usually with one hook per bundle in the first 10-25 chaetigers; winged capillary chaetae on to about chaetiger 50-80; MII with 4 teeth, with a characteristic open space between the first two teeth; MIII bidentate; prostomium broadly rounded to eggshaped; anterior postchaetal lobes tongue-shaped, obliquely conical..***S. magnidentata***

4a (1b). Prostomium broadly rounded; winged capillary chaetae in the anterior 12-20 parapodia; hooded hooks from chaetiger 1..***S. funchalensis***
4b (1b). Prostomium conical; winged capillary chaetae in the anterior 50-60 parapodia; hooded hooks starting on chaetiger 1-5..***S. tetraura****

Scoletoma fragilis (O.F. Müller 1776)

Lumbricus fragilis O.F. MÜLLER, 1776: 216.
TYPE LOCALITY: Denmark.
SYNONYMS: *Lumbrineris borealis* Kinberg 1865; *Lumbrinereis minuta* Théel 1879.
SELECTED REFERENCES: *Lumbriconereis fragilis* — MALMGREN, 1867*a*: 63, pl. 14 fig. 83; EHLERS, 1868: 395-397; MCINTOSH, 1910: 372; FAUVEL, 1923*c*: 430-431, fig. 171*k-l*. *Lumbrineris fragilis* — GARDINER, 1976: 198-199, fig. 25*u-w*; RAMOS, 1976*a*: 115; CAMPOY, 1982: 611-612; GEORGE & HARTMANN-SCHRÖDER, 1985: 128, fig. 40; KIRKEGAARD, 1992: 366-368, fig. 178; HARTMANN-SCHRÖDER, 1996: 264-265, fig. 117. *Scoletoma fragilis* — FRAME, 1992: 208-210, fig. 8; PAPADOPOULOU, DOUNAS & SMITH, 1994: 264. *Lumbrineris minuta* — OUG, 1998: 157-158.

Lumbriconereis borealis — Kinberg, 1865: 568. Not *Lumbrineris fragilis* — Hartmann-Schröder, 1974*d*: 215-217, figs. 27-35 [= *Abyssoninoe hibernica* (McIntosh 1903)].

References for Portugal: Fauvel, 1911*c* (as *Lumbriconereis fragilis*; off Faro); Fauvel, 1914*f* (*Lumbriconereis fragilis*; off Faro); Carvalho, 1929 (as *Lumbriconereis fragilis*; Vila Nova de Milfontes); Bellan, 1960*a* (as *Lumbriconereis fragilis*; Cape Roca; off Cascais; Cape Espichel; Setúbal Canyon); Hartmann-Schröder, 1977*a* (as *Lumbrineris fragilis*; off Cape Sardão); Monteiro-Marques, 1979 (as *Lumbrinereis fragilis*; southern continental shelf of Algarve); Campoy, 1982 (as *Lumbrineris fragilis*; previous records: Vila Nova de Milfontes; Portuguese coast); Monteiro-Marques, 1984 (as *Lumbrineris fragilis*; Praia da Falésia); Monteiro-Marques, 1987 (as *Lumbrinereis fragilis*; continental shelf of Algarve); Dexter, 1992 (as *Lumbrineris fragilis*; previous records: continental shelf of Algarve; Mira Estuary); present work (southwestern continental shelf).

Material: SEPLAT 6 — St. 40 (A.2534), off Praia do Castelejo, 105 m, gravelly sand: 1 complete specimen, broken in 2 pieces; total length of 235 mm for 4 mm wide, and 280 chaetigers; parapodia with short, rounded prechaetal lobe, and longer postchaetal, becoming somewhat finger-shaped and extending dorsally in middle and posterior parapodia; unjointed hooded hooked chaetae from chaetiger 15; aciculae black, chaetae yellow; pygidium with 5 anal cirri.

Distribution: Arctic Ocean; North Atlantic; from Norway to Azores and Madeira, and from Nova Scotia and Maine to North Carolina; Western Mediterranean Sea; Adriatic Sea; Aegean Sea; Bering Sea; Alaska; Japan. On sand, mud, mixtures of both, gravel, broken shells, stones. Between 5-4250 meters.

Scoletoma funchalensis (Kinberg 1865)

Lumbriconereis funchalensis Kinberg, 1865: 569.

Type locality: Madeira Island, near Funchal, at the rocky shore.

Selected references: *Lumbriconereis funchalensis* — Langerhans, 1880*a*: 297-298, pl. 16 fig. 29; Saint-Joseph, 1906: 213-214; Fauvel, 1914*f*: 155-156; Fauvel, 1923*c*: 434, fig. 173*i-n*. *Lumbrineris funchalensis* — Ramos, 1976*a*: 115-116, fig. 11; George & Hartmann-Schröder, 1985: 130, fig. 41; Núñez, Talavera & Ocaña, 1991: 90-92, fig. 1. *Scoletoma funchalensis* — Papadopoulou, Dounas & Smith, 1994: 265. *Lumbrineris funchalensis* Form A and Form B — Campoy, 1982: 613-615.

References for Portugal: Bellan, 1960*a* (as *Lumbriconereis funchalensis*; Cape Espichel); Saldanha, 1974 (as *Lumbriconereis funchalensis*; coast of Arrábida); Amoureux & Calvário, 1981 (as *Lumbrineris funchalensis*; Peniche); Campoy, 1982 (as *Lumbrineris funchalensis*; previous records: Arrábida; Cape Espichel); Monteiro-Marques *et al.*, 1982 (as *Lumbrineris funchalensis*; Cape Carvoeiro; Cape Papoa; Ponta do Baleal); Monteiro-Marques, 1987 (as *Lumbrinereis funchalensis*; continental shelf of Algarve); Dexter, 1992 (as *Lumbrineris funchalensis*; previous records: continental shelf of Algarve; Sines; Sado Estuary; Arrábida).

Distribution: North-eastern Atlantic, from the English Channel to Madeira Island and Canary Islands; Mediterranean Sea; Adriatic Sea; Aegean Sea. Among algae, hard bottoms, coarse sand, corals, broken shells. Between 10-50 meters.

Remarks: Ramos (1976*a*) was the first to notice the presence of two different forms of this species in European waters. Campoy (1982) also supported this oppinion, designating them as *Form A* and *Form B*. We can summarise the statements of both autors as follows:

Form A – without eyes; maxillary formula as MI = 1+1, MII = 4+5/5+5, D1 = 2+2, D2 = 1+1; mandibulae with handles united and anterior border semicircular, with concentric striations, more or less dark pigmented. To this form belong the specimens identified by Langerhans (1880*a*) from Madeira, Fauvel (1923*c*), probably with base on specimens from Azores or Monaco, Amoureux & Katzmann (1971; studied by Ramos, 1976*a*) from Rovinj, and Campoy (1982) from Blanes, Malgrat de Mar and one single specimen from Columbretes Islands (all in the Western Mediterranean).

Form B – with eyes; maxillary formula as MI = 1+1, MII = 4+4, D1 = 2+2, D2 = 1+1; mandibulae with handles more or less loose, the central region of the cutting edge and the axis of the handles heavily darkened, being the cutting edge irregularly denticulated. To this form belong the specimens studied by Ramos (1976*a*) from Saint-Joseph's collection, collected at Cannes and Saint-Raphaël, and the ones identified by Campoy (1982) from Columbretes Islands, which differ from the typical *Form B* by having a MII = 2+2.

Scoletoma magnidentata (Winsnes 1981)

Lumbrineris magnidentata Winsnes, 1981: 91-93, fig. 1.

Type locality: Bergen, Stongi (Stangen), Norway, 60º22'18"N, 5º10'18"E, 30-40 meters.

SELECTED REFERENCES: *Lumbrineris magnidentata* — KIRKEGAARD, 1992: 371-373, fig. 181; HARTMANN-SCHRÖDER, 1996: 266-267.

DISTRIBUTION: Norwegian coast (North Sea to Skagerrak). On sandy bottoms. Between 15-120 meters.

REMARKS: *Lumbrineris magnidentata* was described as having only 4 pairs of maxillae, and MV is not referred as being present. This would place the species under the genus *Helmutneris* Carrera-Parra 2006. However, it is not clear if the fact that MV is not mentioned in the description is the result of not being present or of not having been observed. This way, the species is here considered to belong to the genus *Scoletoma*, under which it was already placed in the *North East Atlantic Taxa (NEAT)* checklist (published online at: http://www.tmbl.gu.se/libdb/taxon/neat_pdf/NEAT*Annelida.pdf; active the 11th February 2010).

Scoletoma rovignensis (Fauvel 1940)

Lumbriconereis rovignensis FAUVEL, 1940: 13-16, fig. 2.

TYPE LOCALITY: Kvarner (= Quarnero), Rovinj (= Rovigno), Croatia, Northern Adriatic.

SELECTED REFERENCES: *Lumbrineris rovignensis* — RAMOS, 1976*a*: 129-130. *(?) Lumbriconereis atlantica* [not Kinberg 1865] — FAUVEL, 1934: 37-38, fig. 1.

DISTRIBUTION: Adriatic Sea; Aegean Sea.

REMARKS: See the *REMARKS* section for *Lumbrinereis cluthensis*, under *Drilonereis filum*, in the family Oenonidae. According to EIVIND OUG (personal communication, June 2010) this species belongs probably to the family Oenonidae.

****Scoletoma tetraura*** (Schmarda 1861)

Notocirrus tetraurus SCHMARDA, 1861: 117, text-figs. *a-b*, *OK*, *S*.

TYPE LOCALITY: Cape of Good Hope (South Africa), and coast of Chile, in sand and mud.

SYNONYMS: *Zygolobus Laurentianus* Grube 1863; *Lumbriconereis breviceps* Ehlers 1868; *Lumbriconereis impatiens* Claparède 1868; *Lumbriconereis maculata* Treadwell 1901; *Lumbrineris treadwelli* Hartman 1956.

SELECTED REFERENCES: *Lumbrineris tetraura* — HARTMAN, 1944*b*: 147-149, pl. 8 figs. 175, 190-191, pl. 9 figs. 192-195; DAY, 1967: 439, fig. 17.16.*u-w*; FAUCHALD, 1970: 109-111, pl. 19 figs. *b-e*; ORENSANZ, 1973*b*: 351-355, pl. 3 [in part]; MIURA, 1980: 1041-1043, fig. 11; GEORGE & HARTMANN-SCHRÖDER, 1985: 140, fig. 46; KIRKEGAARD, 1992: 375-377, fig. 183; HARTMANN-SCHRÖDER, 1996: 267-268, fig. 119. *Lumbriconereis impatiens* — CLAPARÈDE, 1868: 455-457, pl. 9 fig. 2; SAINT-JOSEPH, 1898: 279-282, pl. 15 figs. 62-68; MCINTOSH, 1910: 379; FAUVEL, 1923*c*: 429-430, fig. 171*a-j*; USCHAKOV & WU, 1962: 64-65, 80; BELLAN, 1964*b*: 101. *Lumbrineris impatiens* — PETTIBONE, 1963*a*: 265-266, fig. 67; GARDINER, 1976: 201, fig. 26*s-w*; RAMOS, 1976*a*: 119-120; MIURA, 1980: 1039-1040, fig. 10*A-C*; CAMPOY, 1982: 606-608. *Scoletoma impatiens* — PAPADOPOULOU, DOUNAS & SMITH, 1994: 264. *Zygolobus Laurentianus* — GRUBE, 1863: 40-41, pl. 4 fig. 3. *Lumbriconereis Laurentiana* — MCINTOSH, 1875*c*: 123. *Lumbriconereis breviceps* — EHLERS, 1868: 388-389. *Lumbriconereis maculata* — TREADWELL, 1901: 198-199, figs. 42-44. *Lumbrineris maculata* — TREADWELL, 1921: 103-104, text-figs. 378-385, pl. 8 fig. 10; TREADWELL, 1939*b*: 250-251, fig. 68. *Lumbrineris treadwelli* — HARTMAN, 1956: 253, 268, 288. *Lumbrineris hibernica* [not McIntosh 1903] — ELIASON, 1962*b*: 254.

REFERENCES FOR PORTUGAL: CARVALHO, 1929 (as *Lumbriconereis impatiens*; Sines); AUGENER, 1933*d* (as *Lumbriconereis impatiens*; Coimbra, probably to refer to Buarcos); BELLAN, 1960*a* (as *Lumbriconereis impatiens*; off Cascais; NW Cape Sardão); AMOUREUX, 1974*b* (as *Lumbriconereis impatiens*; off Aveiro; off Porto); MONTEIRO-MARQUES, 1979 (as *Lumbrinereis impatiens*; southern continental shelf of Algarve); AMOUREUX & CALVÁRIO, 1981 (as *Lumbrineris impatiens*; Peniche; Lagoon of Óbidos); CAMPOY, 1982 (as *Lumbrineris impatiens*; previous records: Sines; Aveiro; Porto; Portuguese coast); MONTEIRO-MARQUES *et al.*, 1982 (as *Lumbrineris impatiens*; Cape Carvoeiro; Ponta do Baleal; Ponta do Surdão); SOUSA-REIS *et al.*, 1982 (as *Lumbrineris impatiens*; Peniche region); MONTEIRO-MARQUES, 1984 (as *Lumbrineris impatiens*; Praia da Falésia); [?] AMOUREUX, 1987 (as *Lumbrineris impatiens (ou fragilis)*; off Porto); MONTEIRO-MARQUES, 1987 (as *Lumbrinereis impatiens*; continental shelf of Algarve); DEXTER, 1992 (as *Lumbrineris (Lumbriconereis) impatiens*; previous records: continental shelf of Algarve; Mira Estuary; Sines; Sado Estuary; Arrábida; Peniche; Figueira da Foz; Ria de Aveiro); RAVARA, 1997 (as *Lumbrineris tetraura*; off Aveiro); CANCELA DA FONSECA *et al.*, 2006 (as *Lumbrineris impatiens*; Aljezur); present work (southwestern continental shelf).

MATERIAL: SEPLAT 7 (2nd part) — St. 187 (A.3924), south Sines, 17 m, sand: 1 incomplete specimen, with 31 chaetigers and 650 µm wide; hooded hooked chaetae from chaetiger 1, with the first tooth bigger than the following ones; postchaetal lobe longer than the prechaetal one (but not as long as described by BLAKE, 1995); chaetae and aciculae yellow; buccal apparatus not observed.

DISTRIBUTION: Off Iceland, 1413-1560 meters; off Northern Ireland, between 2538-3709 meters; from the English Channel to the Mediterranean Sea, between 6-150 meters; Adriatic Sea; Aegean Sea, 20-160 meters; Red Sea; Persian Gulf; Indian Ocean; from New-Scotland to Florida, between 85-2222 meters; South America; Gulf of Guinea, at 3806 meters; Western Mexico, shallow water. On muddy and sandy bottoms, broken shells, gravel, coralligenous bottoms, and among algae.

REMARKS: *Scoletoma impatiens* (Claparède 1868), from the Gulf of Naples, is generally considered as a junior synonym of *Scoletoma tetraura* (Schmarda 1861), originally described from the Cape of Good Hope and Chile. In case it is showed that *S. impatiens* is a valid species, it should be taken into account that *Zygolobus Laurentianus* Grube 1863, from the Adriatic Sea, is an older name, and would have priority over *Scoletoma impatiens* (Claparède 1868), if valid. In this case, the situation would have to be revised, or *Zygolobus Laurentianus* considered as a *nomen oblitum*. A similar case applies to *Lumbriconereis breviceps* Ehlers 1868, also from the Adriatic Sea and published in the same year than *L. impatiens*. It would be necessary to state if *L. breviceps* is a valid species, and which of the two species was published first.

INVALID SPECIES

Lumbrineris labrofimbriata (Saint-Joseph 1888)

Lumbriconereis labrofimbriata SAINT-JOSEPH, 1888: 214-215, pl. 8 figs. 65-71.

TYPE LOCALITY: Dinard (Atlantic French coast, English Channel), on oyster shells, at 16 meters.

SELECTED REFERENCES: *Lumbriconereis labrofimbriata* — FAUVEL, 1923*c*: 434, fig. 173*i-n*; LAUBIER, 1958: 126-127, fig. 1. *Lumbrineris labrofimbriata* — RAMOS, 1976*a*: 120-121, figs. 14-15; CAMPOY, 1982: 615; GEORGE & HARTMANN-SCHRÖDER, 1985: 134, fig. 43; CARRERA-PARRA, 2006*b*: 57.

DISTRIBUTION: Recorded from the English Channel to the Western Mediterranean Sea. Among algae, gravel, mud, and on detritic and coraligenous bottoms, between 6-40 meters.

REMARKS: CARRERA-PARRA (2006*b*) studied the holotype and other specimens identified as *L. labrofimbriata* from Saint Joseph's collection, stating that all of them were juveniles of *Lumbrineris*. According to him, the presence of a mandible with a denticulated anterior end, which is the main character of the species, appears during the ontogenetic development. Besides, the mixture of composite and simple multidentate hooded hooks in the anterior parapodia, found by RAMOS (1976*a*) in the type material, is also a character normally present in juveniles of *Lumbrineris* (ORENSANZ, 1990; CARRERA-PARRA, 2006*b*). For these reasons, CARRERA-PARRA (2006*b*) considered this species as invalid.

*FAMILY **MAGELONIDAE** Cunningham & Ramage 1888

AS: *MAGELONIDAE* CUNNINGHAM & RAMAGE, 1888: 642.
TYPE GENUS: *Magelona* F. Müller 1858.
SYNONYMS: *MÆADAE* Johnston 1865.
REMARKS: The Magelonidae is a family of benthic polychaetes with a very characteristic shovel-shaped prostomium, and comprises presently 2 genera (one of which monospecific), with about 70 species.

Important and recent publications on the family include the series of papers by JONES (1963, 1968, 1971, 1977, 1978), who settled the basis of the modern taxonomy of the group. He highlighted the importance of taxonomic characters such as the prostomial horns, dimensions of the prostomium, presence of dorsal median lobes and lateral pouches, shape of lateral lamellae, morphology of chaetae of chaetiger 9, or structure of abdominal hooks, and proposed a new terminology to designate some of these structures and their location, which is currently used. Besides, JONES (1963) included a key for all the previously known species.

Other important papers focused on the study of the Magelonidae from some geographic regions, with the description and revision of numerous species: BOLÍVAR & LANA (1986), from Brazil, UEBELACKER & JONES (1984), from the Gulf of Mexico, NATEEWATHANA & HYLLEBERG (1991), from Thailand, BLAKE (1996*f*), from California, HERNÁNDEZ-ALCÁNTARA & SOLÍS-WEISS (2000), from both coasts of Mexico, FIEGE, LICHER & MACKIE (2000) from Europe, and MORTIMER & MACKIE (2003, 2006) on the Magelonidae from Seychelles. Finally, AGUIRREZABALAGA, CEBERIO & FIEGE (2001), described a new genus and species from the Bay of Biscay, and AGUADO & SAN MARTÍN (2003) a new species from the Pacific coast of Panama. The Magelonidae of the Indo-Pacific, including the Persian Gulf, are currently being investigated by Kate Mortimer. For European waters the most important paper is the one by FIEGE, LICHER & MACKIE (2000), which includes a comparative table of the main diagnostic characters of the European species.

The two genera of Magelonidae are represented in the European waters by eight described species. Two species previously recorded to be present in Europe, *Magelona papillicornis* F. Müller 1858 (originally described from Santa Catarina Island, Brazil), and *Magelona rosea* Moore 1907 (originally described from Massachusetts, USA), were later showed to be misidentifications and to represent different species. The redescription of *Magelona papillicornis* by JONES (1977), enabled the determination that its European records included a mixture of two other species, *M. mirabilis* (Johnston 1865) and *M. johnstoni* Fiege, Licher & Mackie 2000 (for details see FIEGE, LICHER & MACKIE, 2000). On the other side, ELIASON (1962*a*) determined that the European records of *M. rosea* represented in fact a new species, *M. minuta* Eliason 1962.

The studied material included seven species, with one confirmed new species and a possible second one in need of a deeper study.

KEY TO GENERA:

1a. Nine thoracic chaetigers..***Magelona****
1b. Eigth thoracic chaetigers...***Octomagelona***

*GENUS ***Magelona*** F. Müller 1858

Magelona F. MÜLLER, 1858: 215.
TYPE SPECIES: *Magelona papillicornis* F. Müller 1858.
SYNONYMS: *Rhynophylla* Carrington 1865; *Maea* Johnston 1865; *Papillaria* Sveshnikov 1963; *Meredithia* Hernández-Alcántara & Solís-Weiss 2000.
REMARKS: FIEGE, LICHER & MACKIE (2000) presented a key and a detailed table of characters for the European species of *Magelona*, based on type material.

KEY TO SPECIES:

(adapted from FIEGE, LICHER & MACKIE, 2000)

1a. Chaetiger 9 with specialized chaetae (mucronate, i.e. subdistally expanded).......................................**2**

1b. Chaetiger 9 without specialized chaetae..**3**

2a (1a). Notopodial lateral lamellae of chaetigers 1-8 with crenulate upper edge (often elkhorn shaped); dorsal medial lobe present on chaetigers (3)4-8; lateral pouches present between chaetigers 10 and 11...***M. johnstoni****
2b (1a). Thoracic notopodial lateral lamellae with smooth upper edge; no dorsal medial lobes on thoracic chaetigers; no lateral pouches between chaetigers 10 and 11...***M. mirabilis****

3a (1b). Abdominal hooks bidentate (1 long tooth above main fang)..**4**
3b (1b). Abdominal hooks tridentate (2 small teeth above main fang)..**5**

4a (3a). Prostomium without frontal horns; dorsal medial lobe (DML) absent.........................***M. minuta****
4b (3a). Prostomium with frontal horns; dorsal medial lobe (DML) present........................***Magelona* sp.***

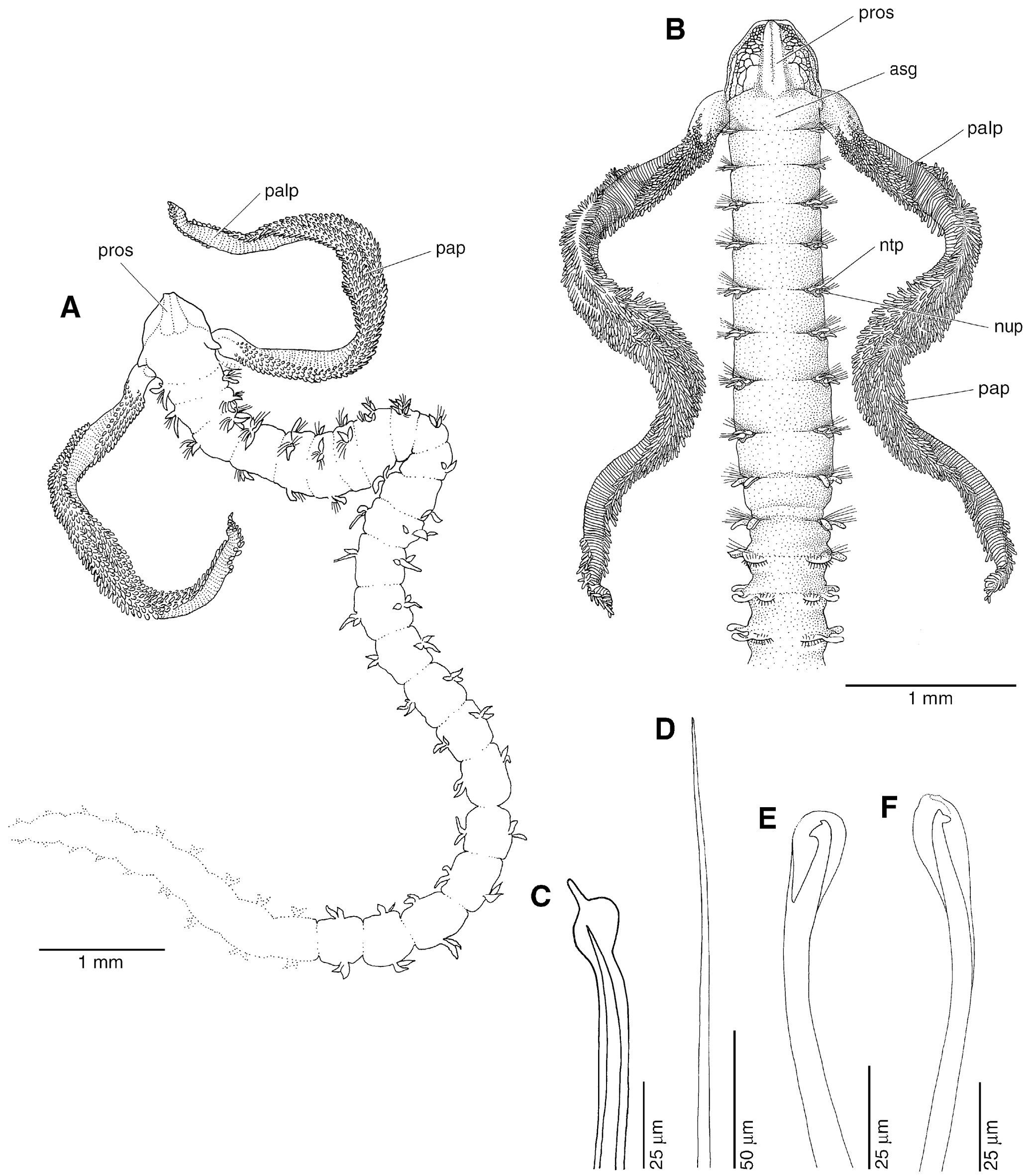

Figure legend: Family Magelonidae. **A**, anterior fragment of *Magelona* specimen, dorsal view. **B**, anterior end of *Magelona* specimen, dorsal view. **C**-**E**, notochaetae of *Magelona* specimen: **C**, modified capillary from parapodium of chaetiger 9; **D**, capillary from parapodium of chaetiger 22; **E**, dentate hooded hook from parapodium of chaetiger 22. **F**, *Magelona* species, neurochaetal dentate hooded hook from parapodium of chaetiger 22. **asg**, achaetous segment; **ntp**, notopodium; **nup**, neuropodium; **palp**, palp; **pap**, palpal papillae; **pros**, prostomium. (Adapted from BEESLEY, ROSS & GLASBY, 2000; drawings by K. Nolan).

5a (3b). Prostomium with frontal horns; coloured transversal band on chaetigers 4-8 absent.....................**6**
5b (3b). Prostomium without frontal horns, wider than long; coloured transversal band encircling the body from chaetigers 4-5 to 8-9 present (fades in alcohol)..**8**

6a (5a). Thoracic notopodial lateral lamellae leaf-like...**7**
6b (5a). Thoracic notopodial lateral lamellae digitiform; prostomium longer than wide........***M. filiformis****

7a (6a). Prostomium longer than wide, anterior margin smooth; thoracic dorsal median lobe (DML) digitiform to conical in chaetigers 1-8, absent in chaetiger 9; thoracic ventral neuropodial lobe (VNL) digitiform to conical in chaetigers 1-7, smaller and digitiform in chaetigers 8-9; thoracic neuropodial postchaetal lamellae absent in chaetigers 1-7, small and digitiform on chaetigers 8-9; thoracic dorsal and ventral shields not present...***Magelona* sp. nov***
7b (6a). Prostomium wider than long, compressed, anterior margin minutely crenulated; thoracic dorsal median lobe (DML) foliaceous in chaetigers 1-8, smaller and cirriform in chaetiger 9; thoracic ventral neuropodial lobe (VNL) triangular to foliaceous in chaetigers 1-6 or 7, than becoming smaller and digitiform in chaetigers 7-9 or 8-9 (earlier in big specimens); thoracic neuropodial postchaetal lamellae reduced in chaetigers 1-6 or 7, triangular in chaetigers 7-8, and longer in chaetiger 9, but smaller than the dorsal lateral lamella; thoracic dorsal and ventral shields present, well marked.........................***M. wilsoni****

8a (5b). Abdominal notopodial lateral lamellae much larger than neuropodial; reddish-brown pigment on chaetigers 4-5 to 8-9, darker on chaetigers 6-8 and dorsally..***M. alleni****
8b (5b). Abdominal notopodial and neuropodial lateral lamellae of equal size; carmin-coloured band dorsally and ventrally between chaetigers 5-8...***M. equilamellae***

**Magelona alleni* Wilson 1958

Magelona alleni WILSON, 1958: 618-620, 624-625, fig.1.

TYPE LOCALITY: Rame Head (Rame Mud), Devon, Plymouth, English Channel (England), in black sandy mud.

SELECTED REFERENCES: *Magelona alleni* — KIRKEGAARD, 1959: 24-25; GLÉMAREC, 1966*b*: 1082-1083; HARTMANN-SCHRÖDER, 1996: 359, fig. 164; KIRKEGAARD, 1996: 114-116, fig. 55; BÖGGEMANN, 1997: 141, fig. 99; FIEGE, LICHER & MACKIE, 2000: 229-230, table 1. *Magelona cincta* [not Ehlers 1908] — FAUVEL, 1936*c*: 64.

REFERENCES FOR PORTUGAL: DEXTER, 1992 (previous records: Ria de Alvor); RAVARA, 1997 (off Aveiro); present work (southwestern continental shelf).

MATERIAL: SEPLAT 7 (2nd part) — St. 185 (A.3926), near Sines, 37 m, sandy mud: 1 incomplete specimen with one attached palp and about 30 chaetigers, plus one middle fragment with 5 chaetigers and one loose palp; prostomium short, without horns; palp with a large number of densely packed papillae; first 9 chaetigers with capillary chaetae only; abdominal chaetigers only with hooded hooks, each with one main tooth surmounted by two smaller teeth; thoracic chaetigers with the dorsal lamellae flattened antero-posteriorly, and the ventral lamellae dorso-ventrally, the planes of flattening thus being at right angles to one another; constriction of the body at chaetiger 9; abdominal chaetigers with a dorsal leaflike lamella and a much smaller ventral lamella, both flattened antero-posteriorly; on both dorsal and ventral surfaces of the anterior region of body there is a pair of longitudinal grooves, merging into a single dorsal and ventral one at the region of chaetiger 9; pigment patterns not seen, probably faded away. **FAUNA 1 — St. 69*A***, Gulf of Cádiz, off mouth of Guadiana, 110-112 m, mud: 1 incomplete specimen, with 13 chaetigers; pigmented band in chaetigers 5-9.

DISTRIBUTION: Kattegat (Hallands Väderö); Skagerrak (Kosteröarna); English Channel; North Sea; Eastern Atlantic Ocean (Scotland, Firth of Clyde; Brittany; Portugal; Morocco; Western Sahara); Mediterranean Sea (France); Adriatic Sea; Aegean Sea. On muddy and sandy bottoms. From shallow water to 79 meters.

Magelona equilamellae Harmelin 1964

Magelona equilamellae HARMELIN, 1964: 86-88, plate 9.

TYPE LOCALITY: Rade de Villefranche (France, Mediterranean Sea), 13 meters, on a meadow of *Posidonia oceanica* with mud, and Gulf of Marseille (France, Mediterranean Sea), 18 meters, on a deposit of dead material of *Posidonia oceanica*.

SELECTED REFERENCES: *Magelona equilamellae* — CAPACCIONI-AZZATI, 1989: 240-241, pl. 2 figs. 1-4; FIEGE, LICHER & MACKIE, 2000: 230, table 1.
DISTRIBUTION: Western Mediterranean Sea (France and Spain). In muddy bottoms, on beds of *Posidonia oceanica*, *Caulerpa prolifera*, or *Cymodocea nodosa*; Aegean Sea. Between 5.5-18 meters.

****Magelona filiformis*** Wilson 1959

Magelona filiformis WILSON, 1959: 549-550, fig. 1.
TYPE LOCALITY: Mill Bay, Salcombe, South Devon (English Channel, England), intertidal, at low water, on sand.
SYNONYMS: *Magelona filiformis* var. *minuta* Wilson 1959.
SELECTED REFERENCES: *Magelona filiformis* — HARTMANN-SCHRÖDER, 1996: 359-362, fig. 165; BÖGGEMANN, 1997: 141, fig. 100; FIEGE, LICHER & MACKIE, 2000: 230, table 1. *Magelona filiformis* var. *minuta* — WILSON, 1959: 551.
REFERENCES FOR PORTUGAL: [?] AMOUREUX, 1987 (as *Magelona* cf *filiformis*; off Aveiro; off Porto); DEXTER, 1992 (previous records: Figueira da Foz); RAVARA, 1997 (off Aveiro); present work (southwestern continental shelf).
MATERIAL: SEPLAT 7 (2nd part) — St. 185 (A.3926), near Sines, 37 m, sandy mud: 29 specimens, all incomplete, longest one with 56 chaetigers, plus 10 fragments and two loose palps; one specimen with capillary chaetae on notopodia of chaetiger 10. **St. 186 (A.3925)**, south Sines, 27 m, muddy sand: 25 specimens, all incomplete; some have the proboscis everted and/or palps attached; longest specimen with 50 chaetigers. **St. 187 (A.3924)**, south Sines, 17 m, sand: 3 incomplete specimens, with 28, 30, and 33 chaetigers, plus one loose palp; width of specimens between 0.3-0.4 mm; little horns or corners on each side of the anterior margin of the prostomium; everted proboscis globular; first 9 pairs of chaetigers with double-winged capillaries; first eight chaetigers with similar structure, notopodia with a medial short cirrus and a lateral long finger-like process, and neuropodia with a ventral finger-like cirrus; annulations of the anterior region not well defined; ninth parapodia with a notopodium with a ventral finger-like process and a neuropodium with two finger-like processes, being the ventral one moderately shorter than the dorsal; abdominal chaetigers all with the same structure, each parapodia having a medial short cirrus and a lateral foliaceous lamella, on a short stalk; the lamellae are approximately equal in size; hooded hooks with one large tooth surmounted by two smaller teeth. **St. 189 (A.3922)**, south Sines, 29 m, muddy sand: 1 incomplete specimen with 25 chaetigers. **St. 318 (A.3843)**, near Arrifana, 54 m, sand: 1 incomplete specimen.
DISTRIBUTION: English Channel; North Sea (NE Scotland; German Bight); Northeastern Atlantic (Brittany); Mediterranean Sea; Aegean Sea; Black Sea. On sand and muddy bottoms. Intertidal to 48 meters.

****Magelona johnstoni*** Fiege, Licher & Mackie 2000

Magelona johnstoni FIEGE, LICHER & MACKIE, 2000: 226-229, figs. 4-5, table 1, appendix 2.
TYPE LOCALITY: St. Andrews, Fife (Scotland, North Sea).
SELECTED REFERENCES: *Magelona papillicornis* [not F. Müller 1858] — MCINTOSH, 1878*b* [in part]: 460, plate 30 fig. 7; MESNIL, 1896*a*: 257-259, plate 14 figs. 27-33; MCINTOSH, 1911*b* [in part]: 454-455; FAUVEL, 1927*a* [in part]: 64-65, fig. 22*h-k*. *Magelona mirabilis* [not Johnston 1865] — BÖGGEMANN, 1997: 141, fig. 101*a-h*. *Magelona* sp. A — MACKIE & GARWOOD, 1995: 42.
REFERENCES FOR PORTUGAL: RAVARA, 1997 (as *Magelona mirabilis*; off Aveiro); FIEGE, LICHER & MACKIE, 2000 (south Portugal); present work (southwestern continental shelf).
MATERIAL: SEPLAT 6 — St. 50 (A.2543), off Praia do Amado, 35 m, sand: 1 complete specimen with 70 chaetigers, about 30 mm long and about 0.5 mm wide. **St. 132 (A.2611)**, off Praia de Vale Figueiras, 51 m, sand: 2 incomplete specimens, one with 39 chaetigers and both palps still attached, and the other with 37 chaetigers. **St. 135 (A.2614)**, off Praia de Vale Figueiras, 37 m, sand: 6 specimens; the remaining specimens have 25 chaetigers and both palps attached, 18 and 35 (2) chaetigers, plus 2 loose palps. **St. 136 (A.2615)**, off Praia de Vale Figueiras, 25 m, fine sand: 1 incomplete specimen with 21 chaetigers; agrees very well with the description of the species, except in that the anterior margin of the prostomium is more straight than rounded; prostomium without frontal horns, spatulated. **St. 165 (A.2638)**, off Arrifana, 36 m, sand: 2 incomplete specimens, one with 36 chaetigers and one palp still attached, and the other with 34 chaetigers, plus 2 fragments with 4 chaetigers. **St. 166 (A.2639)**, near Arrifana, 23 m, sand: 1 incomplete specimen with 29 chaetigers, plus 2 fragments, with 2 and 23 chaetigers. **St. 261 (A.2726)**, near Praia do Vale dos Homens, 27 m, sand: 2 incomplete specimens, one with one palp attached and 37 chaetigers, the other still with both palps and 40 chaetigers, plus one fragment with 4 chaetigers. **St. 428**

(A.2844), south Cape Sardão, 54 m, sand: 3 fragments in poor condition, with 6 (2) and 10 chaetigers; considered here as belonging to this species as one of them appears to have a lateral pouch. **SEPLAT 7 (2nd part)** — **St. 185 (A.3926)**, near Sines, 37 m, sandy mud: 2 incomplete specimens, with 24 and 37 chaetigers; both small, probably juveniles. **St. 186 (A.3925)**, south Sines, 27 m, muddy sand: 6 incomplete specimens, with 9, 19, 20, 26, 40, and 48 chaetigers, plus 3 fragments, with 14 (2) and 52 chaetigers. **St. 187 (A.3924)**, south Sines, 17 m, sand: 12 specimens, all incomplete, with 11, 14, 17, 20 (2), 21, 21 (small specimen, juvenile), 22, 24, 27, 29, and 36 chaetigers, plus 2 posterior fragments with 15 and 33 chaetigers, with pygidium and 2 anal cirri, and 10 middle fragments, with 3 (2), 6, 7 (2), 8 (2), 9 (2), and 21 chaetigers; prostomium without frontal horns, spatulated; one specimen with globular proboscis everted; first eight pairs of parapodia with double winged capillaries, and dorsal medial lobes in chaetigers 4-8; no ventral medial lobes were visible; upper lateral lamellae with dorsal digitate lobes; at chaetiger 9 modified chaetae are present; from chaetiger 10 on, dorsal and ventral medial lobes are present; lateral lamellae are foliaceous, of equal sizes; abdominal chaetae as hooded hooks, with one large tooth surmounted by two smaller teeth; lateral pouches between chaetiger 10 and 11, and in some posterior chaetigers; transition between thorax and abdomen marked by a constriction. **St. 318 (A.3843)**, near Arrifana, 54 m, sand: 1 middle fragment with about 7 chaetigers; it shows two lateral pouches, in different chaetigers.

DISTRIBUTION: North Sea (Scotland; England; German Bight); Shetland Islands; Irish Sea (Wales; Ireland); Celtic Sea (Wales; Ireland); Bristol Channel; English Channel; Atlantic Ocean (Ireland; France; south Portugal); Western Mediterranean Sea (France). On sandy bottoms. Intertidal to 88 meters.

****Magelona minuta*** Eliason 1962

Magelona minuta ELIASON, 1962*a*: 58-60, fig. 7.

TYPE LOCALITY: Øresund (Sweden), mud, a little sand and shells, at 16 meters.

SELECTED REFERENCES: *Magelona minuta* — HARTMANN-SCHRÖDER, 1996: 362; KIRKEGAARD, 1996: 116-117, fig. 56; FIEGE, LICHER & MACKIE, 2000: 230, fig. 6, table 1. *Magelona rosea* [not Moore 1907] — SOUTHERN, 1914: 105; ELIASON, 1920: 52; KIRKEGAARD, 1969: 85.

REFERENCES FOR PORTUGAL: MONTEIRO-MARQUES, 1987 (as *Magelona rosea*; continental shelf of Algarve); DEXTER, 1992 (as *Magelona rosea*; previous records: Ria Formosa; continental shelf of Algarve); RAVARA, 1997 (off Aveiro); present work (southwestern continental shelf).

MATERIAL: SEPLAT 7 (1st part) — St. 48 (A.2980), off Cape Sardão, 150 m, sand: 1 incomplete specimen, in poor condition. **SEPLAT 7 (2nd part) — St. 10 (A.4100)**, off Lagoa de Santo André, 118 m, sand: 2 incomplete specimens. **St. 15 (A.4107)**, near Lagoa de Santo André, 23 m, sand: 1 complete specimen, with about 33 chaetigers. **St. 21 (A.4081)**, north Sines, 116 m, sand with shells: 1 incomplete specimen, with 30 chaetigers. **St. 22 (A.4082)**, north Sines, 122 m, sand: 1 incomplete specimen. **St. 36 (A.4071)**, north Sines, 128 m, gravelly sand: 1 incomplete specimen. **St. 39 (A.4068)**, north Sines, 110 m, sand with shells: 1 incomplete specimen, plus one fragment. **St. 185 (A.3926)**, near Sines, 37 m, sandy mud: 8 specimens, one complete, with 69 chaetigers, plus 4 fragments. **St. 186 (A.3925)**, south Sines, 27 m, muddy sand: 6 specimens, two complete, the rest incomplete; one of the complete specimens with 62 chaetigers, 14.2 mm long and 262.5 µm wide; prostomium short and curved upwards, without horns, but specimens with slight protuberances similar to horns; constriction of the body at chaetiger 9; thoracic chaetigers only with capillary chaetae, abdominal chaetigers with bidentated hooded hooks; dorsal and ventral short lamellae of thoracic chaetigers flattened antero-posteriorly, without dorsal or ventral cirri; abdominal chaetigers with lamellae flattened antero-posteriorly, of same size, with small dorsal and ventral cirri; middle and posterior segments biannulated, with chaetigers near the posterior region; glandular transversal band at the thoracic region, occurring near the anterior margin of the chaetigers; lateral glandular bands between and behind the parapodia, discontinuous; pygidium with 2 anal cirri. **St. 266 (A.3865)**, off Cape Sardão, 175 m, sand: 7 incomplete specimens. **St. 305 (A.3848)**, NW Arrifana, 120 m, sand: 3 incomplete specimens. **St. 306 (A.3847)**, SW Praia de Odeceixe, 105 m, sand: 11 incomplete specimens (2 deposited at the SMF; SMF 10172), plus 5 middle fragments and one posterior fragment with pygidium; one specimen seems to be almost complete and has 57 chaetigers for almost 2 cm long; one specimen with everted proboscis has the posterior segments with inflated parapodia, in which the lamellae have a shape closer to filiform than to the typical shape.

DISTRIBUTION: Øresund (Sweden); Skagerrak; Kattegat; North Sea; Northeastern Atlantic Ocean (Brittany; Ireland; Spain; Portugal); Mediterranean Sea (Gulf of Taranto; off Israel); Adriatic Sea; Aegean Sea; Black Sea. On muddy and sandy bottoms. Between 10-1000 meters.

****Magelona mirabilis*** (Johnston 1865)

Mœa mirabilis JOHNSTON, 1865: 278-279 [plate 22, not published].

TYPE LOCALITY: St. Andrews, Fife (Scotland, North Sea).

SELECTED REFERENCES: *Maea mirabilis* — CARRINGTON, 1865: 185. *Magelona mirabilis* — HARTMANN-SCHRÖDER, 1996: 362-364, fig. 166; KIRKEGAARD, 1996: 117-119, fig. 57; FIEGE, LICHER & MACKIE, 2000: 221-226, figs. 1-3, table 1, appendix 1. *Rhynophylla bitentaculata* — CARRINGTON, 1865: 185-186. *Magelona papillicornis* [not F. Müller 1858] — MCINTOSH, 1878*b* [in part]: 401-463, plate 29 fig. 10, plate 35 figs. 1-2; MESNIL, 1896: 257-261, pl. 14 figs. 27-33; MCINTOSH, 1911*b* [in part]: 417-457; MCINTOSH, 1915*b*: 223-227; MCINTOSH, 1916*c*: plate 90 fig. 6, plate 101 fig. 2; FAUVEL, 1927*a* [in part]: 64-65; HARTMANN-SCHRÖDER, 1971*a*: 344, fig. 121. *Magelona* sp. B — MACKIE & GARWOOD, 1995: 42.

REFERENCES FOR PORTUGAL: Present work (Ria de Alvor, Algarve).

MATERIAL: Ria de Alvor (Algarve, Portugal), Museu Nacional de História Natural (Lisboa), MB29-000165, Col. Leonel Gordo, donated in February 1981, previously identified as *Magelona papillicornis* F. Müller 1758: 1 incomplete specimen, represented by an anterior fragment up to chaetiger 9; length 8275 µm, width 625 µm, length of prostomium 2075 µm; the 2 palps are present, being longer than the anterior fragment; modified chaetae in chaetiger 9; specimen damaged between chaetigers 6-7.

DISTRIBUTION: Baltic Sea; North Sea (Scotland; England; German Bight); Irish Sea (Wales; England); Bristol Channel; Celtic Sea (Ireland); English Channel (France); Northeastern Atlantic Ocean (France; Portugal); Western Mediterranean Sea (France); Adriatic Sea; Aegean Sea. On fine or silty sand. Intertidal to 32 meters.

****Magelona wilsoni*** Glémarec 1966

Magelona wilsoni GLÉMAREC, 1966*b*: 1079-1081, figs. 1-2.

TYPE LOCALITY: "Grande Vasière", South Brittany (France, Atlantic Ocean), on fine muddy sand, on three stations: 47º38'N, 3º41'40"W, at 60 meters; 47º30'30"N, 4º1'40"W, at 90 meters; 47º34'N, 4º24'W, at 110 meters. GLÉMAREC (1966*b*) states that one holotype was designated, but he doesn't say from which station.

SELECTED REFERENCES: *Magelona wilsoni* — FIEGE, LICHER & MACKIE, 2000: 230, table 1.

REFERENCES FOR PORTUGAL: Present work (southwestern continental shelf).

MATERIAL: **SEPLAT 6 — St. 125 (A.2603)**, off Carrapateira, 125 m, sand: 1 incomplete specimen. **SEPLAT 7 (1st part) — St. 150 (A.3078)**, off Praia de Almograve, 115 m, sandy mud: 1 incomplete specimen in poor condition, with 19 chaetigers, 9.7 mm long for 1.2 mm wide. **St. 214 (A.3126)**, off Vila Nova de Milfontes, 135 m, muddy sand: 1 incomplete specimen with only 8 chaetigers; very poor condition; possible to see the dorsal and ventral shields, and also the prostomial horns; the methyl green pattern is similar to the found in the specimen from St. 39 (A.4068). **SEPLAT 7 (2nd part) — St. 21 (A.4081)**, north Sines, 116 m, sand with shells: 1 incomplete specimen, plus a middle fragment and a loose palp. **St. 23 (A.4083)**, north Sines, 127 m, sand: 1 incomplete specimen, in poor condition, plus one middle fragment. **St. 39 (A.4068)**, north Sines, 110 m, sand with shells: 2 incomplete specimens, big, one of which has an attached palp and 21 chaetigers, being about 14 mm long and 1 mm wide at chaetiger 7; anterior margin of prostomium with two well marked horns; ventral lip of mouth smooth; body with a constriction at chaetiger 9; thoracic chaetigers only with capillary chaetae; thoracic notopodia with a foliaceous dorsal cirrus and a big ventral lamella, both flattened antero-posteriorly, neuropodia with a ventral lamella, smaller than the notopodial one; from the 7th chaetiger neuropodia with a small ventral cirri and a postchaetal lobe which, at chaetiger 9, becomes long and triangular; ninth chaetiger without dorsal foliaceous cirri, being cirriform instead, and the big ventral lamella becomes triangular; limits of the thoracic segments well defined; dorsal and ventral shields well visible; after the ninth chaetiger the ventral shields converge in a single ventral groove; from the tenth chaetiger the parapodia bear hooks with one main tooth surmounted by two smaller teeth; abdominal noto- and neuropodial lamellae present, of about the same size; noto- and neuropodial cirri present; with the methyl green staining the thoracic region dyes strongly, except for two very clear parallel longitudinal lines, at the ventral region of chaetigers 7 and 8, and also at some dorsal anterior regions of thoracic chaetigers, at both sides of the median line.

DISTRIBUTION: Atlantic Ocean (Brittany, France); Portugal; Mediterranean Sea (France). Between 60-135 meters, on muddy bottoms.

REMARKS: There is not much literature concerning the morphology of *M. wilsoni* (see above), but the Portuguese specimens studied presented some differences in relation to the described by GLÉMAREC (1966*b*), and FIEGE, LICHER & MACKIE (2000).

The general shape of the body in the Portuguese specimens is the same than in *M. wilsoni*, with a big, wider than long, prostomium, well defined prostomial horns, and well marked dorsal and ventral shields. The body has a constriction at the ninth chaetiger, after which the ventral shields converge into a single median ventral groove. The first nine chaetigers have only bilimbate capillary chaetae. The notopodia shows a dorsal median cirrus (DML) and a big lateral lamellae, both foliaceous and flattened antero-posteriorly, in chaetigers 1-8, but in chaetiger 9 the foliaceous DML is replaced by a cirriform DML. The interpretation of the neuropodial structure is more problematical, and the present observations need to be confirmed by a more detailed study, not done here in order to avoid to further damage the few available specimens. Neuropodia 1-6 have a conical to foliaceous ventral neuropodial lobe (VNL), flattened dorso-ventrally, that becomes smaller and digitiform at neuropodia 7-9. At neuropodia 7 appears a neuropodial postchaetal lamellae, as a digitiform lobe at chaetigers 7-8, becoming a foliaceous lamellae at chaetiger 9. From chaetiger 10 the parapodia bear hooks with one main tooth surmounted by two smaller teeth. Abdominal noto- and neuropodial lamellae are present, being of the same size. Moreover, dorsal medial lobes (DML) and ventral medial lobes (VML) are present.

The worms stain strongly with methyl green except for two parallel longitudinal lines at the ventral region of chaetigers 7 and 8, which are not stained. Other regions that are not stained are located at the dorsal region of middle and posterior thoracic chaetigers, at both sides of the median line and anterior to the bundles of notochaetae. This staining pattern enabled the identification of the specimen from St. 214 (A.3126), which is in a very poor condition.

These specimens differ clearly from the descriptions of *M. wilsoni* given by GLÉMAREC (1966*b*) and FIEGE, LICHER & MACKIE (2000) by the presence of abdominal DML and VML. Besides, *M. wilsoni* was stated to have leaf-like neuropodial lateral lamellae present in chaetigers 1-9 and VNL absent in chaetigers 1-8 and present and small only in chaetiger 9. According to the interpretation made here of the neuropodial structure of the Portuguese specimens, the neuropodial lateral lamellae is absent or very reduced in chaetigers 1-6 or 7, present and digitiform in chaetigers 7-8, and foliaceous in chaetiger 9, while the VNL are present in chaetigers 1-9, as they are clearly located below the neurochaetae, being foliaceous in chaetigers 1-6 or 7 and smaller and digitiform in chaetigers 8-9 (with digitiform VNL starting slightly before in big specimens). The difference in the presence *versus* absence of the VNL and neuropodial lateral lamellae in the two populations seems to be the consequence of a different interpretation of the parapodial structure.

A deeper study of these specimens, together with a revision of the type material of *Magelona wilsoni*, was performed by Kate Mortimer, João Gil and Dieter Fiege (submitted in June 2010), and it determined that the Portuguese and the French Atlantic populations, as well as a third population from the region of the Gulf of Lions (Mediterranean Sea), represented all the same species, *Magelona wilsoni.*

**Magelona* sp. nov.

REFERENCES FOR PORTUGAL: AGUIRREZABALAGA, CEBERIO & FIEGE, 2001 (as *Magelona cornuta*; off Portugal); MORTIMER & MACKIE, 2009 (as "*morphologically similar but different species* [from *Magelona cornuta*]"; Portugal); present work (southwestern continental shelf).

MATERIAL: SEPLAT 6 — St. 306 (A.2767), off Praia de Odeceixe, 224 m, sandy mud: 1 incomplete specimen, with 54 chaetigers (SMF 9246/1). **St. 316 (A.2773)**, off Praia de Odeceixe, 225 m, sandy mud: 1 incomplete specimen, in poor condition, with 35 chaetigers (MB29-000176). **SEPLAT 7 (1st part) — St. 272 (A.3175)**, off Porto Covo, 306 m, muddy sand: 1 specimen, incomplete and in poor condition (coiled and brittle), having been dried, with about 43 chaetigers (MB29-000177). **SEPLAT 7 (2nd part) — St. 174 (A.3936)**, off Sines, 250 m, muddy sand: 1 fragment with 10 chaetigers (MB29-000182); it is considered here as belonging to this species due to the depth where it was collected; however, the abdominal lateral lamellae seem to be longer than in the other specimens. **St. 211 (A.3901)**, south Sines, 140 m, muddy sand: 1 fragment with 6 chaetigers, in poor condition (MB29-000183); it is considered here as belonging to this species due to the depth where it was collected. **St. 242 (A.3884)**, off Vila Nova de Milfontes, 113 m, sandy mud: 2 incomplete specimens (NMW.Z.2010.010.0001), one in a very poor condition, like having been dried, with 22 chaetigers, and another one with 20 chaetigers, plus one middle fragment with 3 chaetigers, and one big palp, possibly not belonging to these specimens, but no other material of Magelonidae was present in this sample; anterior margin of prostomium can be crenulated. **St. 260 (A.3873)**, NW Cape Sardão, 278 m, muddy sand: 1 incomplete specimen with 25 chaetigers, in very poor condition, having been dried (MB29-000178). **St. 265 (A.3866)**, off Cape Sardão, 227 m, muddy sand: 3 incomplete specimens, with 10, 20, and 22 chaetigers and one palp still attached, plus one middle fragment with 10 chaetigers (NMW.Z.2010.010.0002). **St. 266 (A.3865)**, off Cape Sardão, 175 m, sand: 4 incomplete specimens, with 6, 11 and 39 chaetigers, plus one fragment with 15 chaetigers that includes the transition between thorax (chaetigers 7-9) and abdomen (rest of chaetigers) (NMW.Z.2010.010.0003); species with a prostomium longer than wider, with horns; notopodia 1-8 with leaf-like lateral lamellae, being shorter and conical at chaetiger 9; DML digitiform to conical in chaetigers 1-8, absent in chaetiger 9; neuropodia 1-8 with a VNL digitiform to conical, and in chaetiger 9 digitiform; neuropodial lateral lamellae absent in chaetigers 1-7, present in chaetigers 8-9, where it is small, digitiform; abdomen with DML and VML; thoracic dorsal and ventral shields not present; 6-8 hooks per bundle, normally distributed vis-à-vis as 4x2, 5x2, or 5x3. **St. 267 (A.3864)**, south Cape Sardão, 155 m. muddy sand: 1 incomplete specimen, with 19 chaetigers (MB29-000179). **St. 270 (A.3869)**, SW Cape Sardão, 243 m, muddy sand: 1 middle fragment with 5 chaetigers (MB29-000184); it is considered here as belonging to this species due to the depth where it was collected; apparently a female with eggs. **St. 271 (A.3863)**, off Praia de Odeceixe, 232 m, muddy sand: 4 specimens, all incomplete, one of them without prostomium, plus 2 loose palps and 2 middle fragments, with 9 and 11 chaetigers (NMW.Z.2010.010.0004; NMW.Z.2010.010.0005); (1) with 46 chaetigers; (2) with 38 chaetigers, one palp still attached; (3) with 23 chaetigers; (4) with 26 chaetigers, starting at chaetiger 7. **St. 272 (A.3861)**, off Praia de Odeceixe, 305 m, muddy sand: 3 incomplete specimens plus one fragment with 8 chaetigers (NMW.Z.2010.010.0006); (1) very small with one palp, possibly a juvenile, with 23 chaetigers; (2) with 36 chaetigers; (3) with 42 chaetigers. **St. 274 (A.3862)**, off Praia de Odeceixe, 327 m, muddy sand: 9 specimens, all incomplete (SMF 9245/1); (1) with 10 chaetigers; (2) with 27 chaetigers; (3) with 21 chaetigers; (4) with 20 chaetigers and one palp; (5) with 5 chaetigers; (6) with 38 chaetigers and one palp; (7) with 36 chaetigers; (8) with 35 chaetigers and one palp; (9) with 33 chaetigers. **St. 283 (A.3851)**, off Arrifana, 245 m, muddy sand: 2 incomplete specimens, one in poor condition, with 33 chaetigers, and the second one with 11 chaetigers, plus one fragment with 9 chaetigers (MB29-000180); dorsal and ventral shields visible. **St. 306 (A.3847)**, SW Praia de Odeceixe, 105 m, sand: 1 incomplete specimen, with 13 chaetigers, plus one middle fragment with 7 chaetigers (MB29-000181); with methyl green the specimen dyed slightly ventrally at the chaetiger 5 and lighter at chaetiger 6.

DISTRIBUTION: Southwestern continental shelf of Portugal, between 105-327 meters, in sand, muddy sand, and sandy mud.

REMARKS: The main characters of these specimens include a prostomium longer than wider, with horns, and notopodia with leaf-like lateral lamellae in chaetigers 1-8, being shorter and conical at chaetiger 9. The dorsal median lobes (DML) are digitiform to conical in chaetigers 1-8, and absent in chaetiger 9. The thoracic neuropodia have a ventral neuropodial lobe (VNL) digitiform to conical between chaetigers 1-8, being clearly digitiform in chaetiger 9. The neuropodial lateral lamellae is absent or very reduced in chaetigers 1-7, and present in chaetigers 8-9, where it is small and digitiform. Abdomen with foliaceous noto and neuropodial lateral lamellae, and dorsal and ventral digitiform medial lobes (DML and VML). Chaetae are winged capillaries in chaetigers 1-9, and tridentate hooks (a main fang surmounted by two smaller teeth) in the abdominal region. The specimens were collected between 105-327 meters, mainly in muddy sand, being the deeper species of Magelonidae in the present material.

These specimens from the Portuguese continental shelf were at first identified as belonging to *Magelona cornuta* Wesenberg-Lund 1949, a species originally described from the Gulf of Oman. The specimens fitted the redescription of the species given by WILSON (1959), based on the holotype. The identification was later revised and confirmed by Dieter Fiege (January 1999), who had also revised the holotype of *Magelona cornuta*. However, some small differences, almost all related with the dimensions of the worms, were detected, being the holotype of *M. cornuta* described as being larger and stronger than the Portuguese specimens.

In the context of a wider revision of the Magelonidae from the Indo-Pacific region, the Portuguese specimens of "*M. cornuta*" were submitted to a preliminary revision by Kate Mortimer (November 2007), who had also studied the holotype of the species. KATE MORTIMER (personal communication, February 2008) stated that the two populations were morphologically very similar, but that some small differences were present and could be significative, supporting the idea that the two populations geographically separated could belong to two different species. This way, the main differences observed in the preliminary study were the following ones (KATE MORTIMER, personal communication, February 2008): *a*) the thoracic neuropodial lamellae of the Portuguese population do not appear to extend postchaetally as in the holotype, where a short and rounded postchaetal lobe is visible on chaetigers 2 and 3, appearing to become broader and lower, continuous with the ventral processes on chaetigers 4-6 (chaetiger 7 being previously dissected, is unknown), while in chaetigers 8 and 9 it develops into a conspicuous triangular postchaetal lamellae; *b*) the thoracic notopodial lamellae of the Portuguese specimens seem to be more slender and less foliaceous than in the holotye; *c*) the abdominal lamellae in the Portuguese specimens appear to be more basally constricted than in the holotype; *d*) the prostomium shape seems to be longer and less rounded than in the holotype; *e*) in chaetiger 9 the notopodial lamellae seems to be more postchaetal than in holotype.

Magelona cornuta was originally described as *Magellone* [sic] *cornuta* by WESENBERG-LUND (1949: 328-330, fig. 36), with base on a single specimen collected 20 miles East by North of Ras Jagin (Gulf of Oman), 25º31'30"N, 30º29'E, at 12 meters, on clay. The holotype was later redescribed by WILSON (1959: 553-555, fig. 2), who corrected some points of the original description, observing that the species had tridentated hooks, instead of bidentate, as formerly described. The species was later recorded by KIRKEGAARD (1959: 26), from West Africa (Nigeria; Congo; Angola), at 19-308 meters, and by AMOUREUX (1983*a*: 737), from the Red Sea (Gulf of Aqaba), as intertidal on sand, but both records are considered as dubious. The fact that only a single and incomplete specimen of *Magelona cornuta* is available represents a problem, as both parapodia of chaetiger 7 were removed, and its morphology is unknown.

The Portuguese specimens were described as a new species by Kate Mortimer, João Gil and Dieter Fiege (submitted in June 2010).

**Magelona* sp.

MATERIAL: *Magelona* cf. *minuta*; DBUA 00685 (Departmant of Biology, University of Aveiro, Portugal); Captain Arutyunov Mud Volcano, Gulf of Cádiz; lat: 35º39.805'N, lon: 7º19.997'W; depth: 1339 m; coll. date: Jul 2002; R/V: Prof. Logatchev.

DISTRIBUTION: Gulf of Cádiz, 35º39.805'N, 7º19.997'W, 1339 meters.

REMARKS: The single specimen observed is incomplete, but it clearly represents a species not recorded previously from the European and nearby waters. A short description of the specimen is given below.

The specimen is incomplete, with 13 chaetigers (9 thoracic; 4 abdominal), and in poor condition from chaetiger 8 backwards. Palps are absent and the proboscis everted. Prostomium is wider than long, with a ratio of length/width of about 0.75, and has horns in the anterior margin. Thoracic length of 3875 µm, thoracic width (excluding lamellae) of 730 µm. Chaetigers 1-8 with notopodial lateral lamellae cone shaped, about 200 µm long, and neuropodial lateral lamellae absent. DML present. VNL in chaetigers 1-5 cone shaped, like the notopodia, and in chaetigers 6-8 shorter, digitiform, inserted in a wide base. Chaetiger 9 without specialized chaetae, notopodial and neuropodial lateral lamellae leaf-like to cone-shaped, DML absent (?), and VNL absent (?). Abdomen with notopodial and neuropodial lateral lamellae leaf-like, stalked, with neuropodial lateral lamellae of same size than notopodial ones. DML and VML short. Abdominal hooks bidentate, apparently in 2 groups in each ramus, facing vis-a-vis. Presence of lateral pouches unknown. Colour yellowish, with some glandular regions in abdomen.

GENUS ***Octomagelona*** Aguirrezabalaga, Ceberio & Fiege 2001

Octomagelona AGUIRREZABALAGA, CEBERIO & FIEGE, 2001: 221.

TYPE SPECIES: *Octomagelona bizkaiensis* Aguirrezabalaga, Ceberio & Fiege 2001.

Octomagelona bizkaiensis Aguirrezabalaga, Ceberio & Fiege 2001

Octomagelona biskaiensis AGUIRREZABALAGA, CEBERIO & FIEGE, 2001: 221-223, figs. 1-3.

TYPE LOCALITY: Capbreton Canyon (Bay of Biscay, Atlantic Ocean), 43º41.88'N, 2º18.14'W, 1020 meters, on soft bottom.

DISTRIBUTION: Capbreton Canyon (Bay of Biscay, Atlantic Ocean), 984-1040 meters, in soft bottoms.

*FAMILY **MALDANIDAE** Malmgren 1867

As: *Maldanidæ* Malmgren, 1867*a*: 98.
Type genus: *Maldane* Grube 1860.
Synonyms: *Maldaniæ* Savigny 1822; *Maldania* Grube 1850; *Bogueidae* Hartman & Fauchald 1971.
Remarks: One of the main problems with the taxonomy of maldanids, also known as bamboo-worms, is the necessity of having complete worms in order to make a correct identification. In many cases, it is essential to have both anterior and posterior ends, and in the case that they are detached, to be sure that both belong to the same specimen. Besides, another important character is the total number of chaetigers, something difficult to determine in the case that the worms are broken, and impossible when only fragments are present.

The family Maldanidae Malmgren 1867 is considered to be divided into eight subfamilies: Euclymeninae Arwidsson 1906, Lumbriclymeninae Arwidsson 1906, Maldanidae Arwidsson 1906, Nicomachinae Arwidsson 1906, Rhodininae Arwidsson 1906, Boguinae Hartman & Fauchald 1971, Clymenurinae Imajima & Shiraki 1982, and Notoproctinae Detinova 1985. With the exception of the subfamily Bogueinae, established by Wolf (1983) for the family Bogueidae Hartman & Fauchald 1971, all the other subfamilies occur in European and adjacent waters.

The genus *Chaponella* Rullier 1972, was created to include the species *C. heterochaeta* Rullier 1972, collected in New Caledonia and reported to belong to the family Maldanidae by Rullier (1972). However, the drawings of the holotype and only known specimen clearly picture a sabellid belonging to the genus *Euchone* Malmgren 1866, with its branchial crown lost. This way, the genus *Chaponella* is considered here as being a junior synonym of *Euchone*.

A species particularly interesting for this study due to its type locality, is *Praxilla (?) challengeriæ* McIntosh 1885, described by McIntosh (1885: 404, pl. 35 fig. 5) from off Setúbal (Portugal, 38º10'S, 9º14'W), at 470 fathoms (786 meters). The species was referred again in Rioja (1931: 230), as being insufficiently characterized, and it is known only from its original description. According to Fauvel (1927*a*), Rioja (1931) and Hartman (1959*a*), this species is indeterminable.

Important publications on the family include the monography and posterior works by Arwidsson (1906, 1911*a*, 1911*b*, 1912, 1922), which comprise detailed and profusely illustrated descriptions of many species, as well as the work on Greenlandic maldanids by Wesenberg-Lund (1948). More recent publications on the taxonomy of Maldanidae include Imajima & Shiraki (1982*a*, 1982*b*), on Japanese maldanids, Rouse (1990*a*), on *Micromaldane*, Light (1991), on Maldaninae genera, Mackie & Gobin (1993) on *Johnstonia*, or Detinova (2001), on the Arctic Maldanidae, among others. Lana (1983) presented a key and a table for five species of *Lumbryclymene*, while Gillet (1989) gave a comparative table for the known species of *Axiothella*, together with 4 unnamed species.

At present, 35 genera including about 240 species and 15 subspecies are considered to be valid. One of the genus, *Petaloclymene* Green 1997, is a junior homonym of *Petaloclymene* Augener 1918, a genus considered as questionable by Hartman (1959*a*), and should be given a new name. In the European and nearby waters, 23 genera are known, including 55 species and 3 subspecies. In the studied material, 5 species belonging to 4 genera were identified.

KEY TO SUBFAMILIES AND GENERA:

(adapted from: Fauchald, 1977*a*; Imajima & Shiraki, 1982*a*)

1a. Ventral hooks or uncini from chaetiger 5 or further back; hooks of the anterior neuropodia arranged in double rows..**Subfamily Rhodininae**.................***Rhodine***
1b. Ventral hooks or uncini from the 1st, 2nd or 3rd chaetiger; hooks always in single rows.....................**2**

2a (1b). With a ventral glandular shield on the eighth chaetigerous segment; cephalic plate present, being well or poorly defined...**Subfamily Clymenurinae**……..***Clymenura***
2b (1b). Without a ventral glandular shield on the eighth chaetigerous segment..**3**

3a (2b). With cephalic plate; with anal plate or anal funnel...**4**
3b (2b). Without cephalic plate; with or without anal funnel..**5**

4a (3a). Anal plate present, without anal cirri; anus above anal plate, generally formed by an anal plug or valve formed by a fold of tissue from the dorsal pygidial lobe extending into a U-shaped anal opening, whose apex is directed anteriorly (LIGHT, 1991); no acicular spines on anterior neuropodia, rostrate uncini present instead..**Subfamily MALDANIDAE**....................**7**

4b (3a). Anal funnel present, with anal cirri (sometimes few or absent); anus located in an anal cone, which can project well beyond the rim of the anal funnel, or be sunken in it; acicular spines or rostrate uncini on anterior neuropodia...**Subfamily EUCLYMENINAE**...................**9**

5a (3b). Anal funnel present, with or without anal cirri; 2 or 3 types of dorsal chaetae...............**Subfamily NICOMACHINAE**..**20**

5b (3b). Anal funnel absent; 1 or 2 types of dorsal chaetae...**6**

6a (5b). Pygidium conical with anus terminal..........................**Subfamily LUMBRICLYMENINAE**...........**22**

6b (5b). Pygidium forming a flat annal plate, with the anus dorsal...**Subfamily NOTOPROCTINAE**..***Notoproctus***

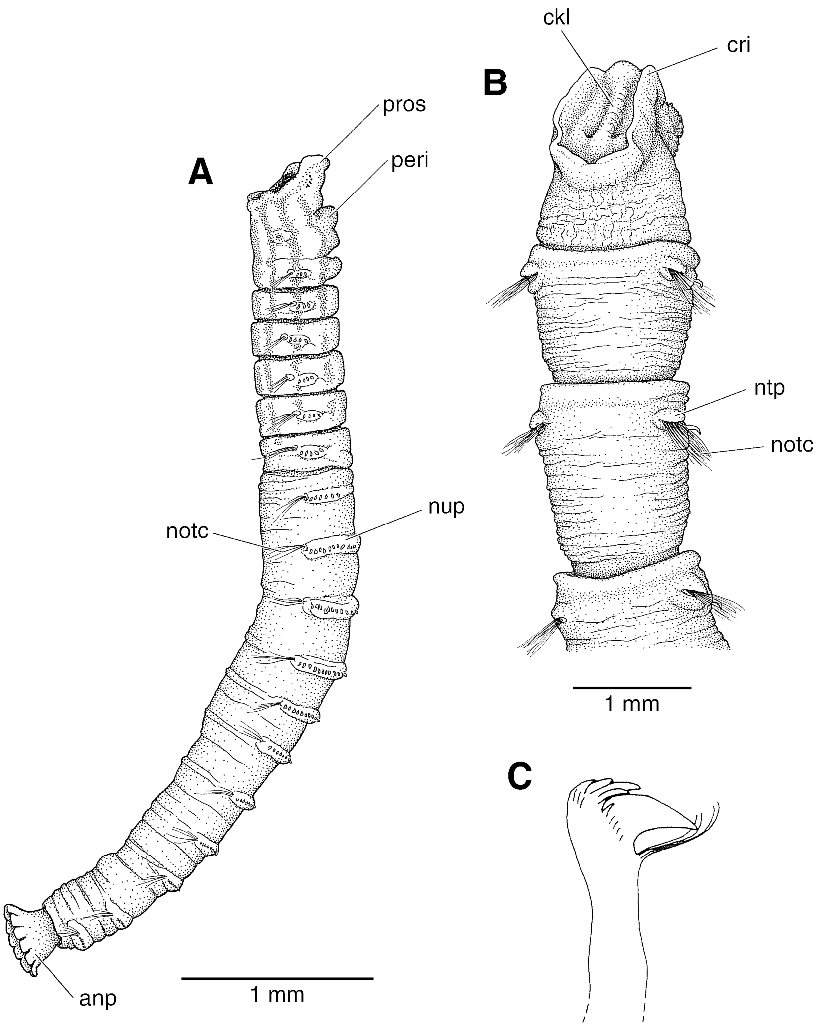

Figure legend: Family Maldanidae. **A**, *Micromaldane* specimen (subfamily Nicomachinae), entire animal, lateral view. **B**, *Euclymene* specimen (subfamily Euclymeninae), dorso-lateral view. **C**, *Maldane* specimen (subfamily Maldanidae), neuropodial hook with subdistal beard. **anp**, anal plaque; **ckl**, cephalic keel; **cri**, cephalic rim; **notc**, notochaetae; **ntp**, notopodium; **nup**, neuropodium; **peri**, peristomium; **pros**, prostomium. (Adapted from BEESLEY, ROSS & GLASBY, 2000; drawings by A. Murray).

7a (4a). Longitudinal cephalic keel (carina) well developed; prostomium prowlike; cephalic plate elliptical; cephalic rim low, smooth; nuchal slits short, being straight, slightly curved or J-shaped; first chaetiger generally doesn't extend to form a collar; 2 developed preanal achaetous segments; pygidium reduced or vestigial, with the posterior surface flat; without anal cirri; anal valve present...........***Maldane****
7b (4a). Longitudinal cephalic keel reduced or absent; prostomium mushroom shaped.............................**8**

8a (7b). Cephalic plate rounded; cephalic rims subrectangular, with margins smooth or serrated; nuchal slits curved, U-shaped; anterior margin of the first chaetiger forming a collar; 1 or 2 preanal achaetous segments; pygidium vestigial to moderate, sometimes with the dorsal lobe forming a shallow pocket over the ventral lobe; without anal cirri; anal valve present..***Chirimia***
8b (7b). Cephalic plate elliptical; cephalic rims reduced, with low crenulated margins, or well developed, with slender processes; nuchal slits curved, J- or U-shaped; chaetiger 1 forming a collar, usually only ventrally, sometimes complete; none or 1 preanal achaetous segment; pygidium well developed, petaloid with flaring dorsal lobe; with or without anal cirri; anal valve absent......................................***Metasychis****

9a (4b). Chaetiger 1 only with notochaetae, neurochaetae absent; first neurochaetae with rostrate uncini; anal plate with numerous cirri, short, of similar size..***Maldanella***
9b (4b). Chaetiger 1 with noto- and neurochaetae...**10**

10a (9b). Neurochaetae of the first 3-4 chaetigers as rostrate uncini, essentially similar to those of later chaetigers, with a series of teeth above the main fang, barbules missing (may be reduced rostrate uncini in *A. catenata*); anal cirri with a longer midventral cirrus and shorter lateral and dorsal cirri, or all anal cirri of similar length...***Axiothella***
10b (9b). Neurochaetae of the first 3-4 chaetigers as acicular spines or more or less reduced rostrate uncini, different from those of later chaetigers..**11**

11a (10b). Series of vascular caeca or cirri covering the surface of several posterior chaetigers; neuropodia of first 1-3 chaetigers with up to 3 smooth or slightly denticulate acicular hooks....***Johnstonia***
11b (10b). Vascular chaetae absent...**12**

12a (11b). Anal plaque marginally smooth or with few cirri; neuropodial acicular spines present or absent; nuchal slits long and straight...***Microclymene***
12b (11b). Anal plaque generally bordered by numerous distinct anal cirri...**13**

13a (12b). Chaetiger 4 with a deep encircling anterior collar; anterior neuropodia with acicular spines or strongly reduced rostrate uncini; all anal cirri evenly long, alternating between long and short, or absent; nuchal slits long and straight...***Clymenella***
13b (12b). Chaetiger 4 without an anterior collar..**14**

14a (13b). All anal cirri of similar length; absence of midventral cirrus or cirri distinctly longer than all the other anal cirri; neuropodial acicular spines present..**15**
14b (13b). Presence of midventral anal cirrus (rarely two cirri) distinctly longer than all the other anal cirri...**16**

15a (14a). More than 30 chaetigers present; nuchal slits long and straight...
....***Macroclymene* [see commentes under *Macroclymene santanderensis*]**
15b (14a). About 20 chaetigers present; nuchal slits long and straight or deeply curved..............***Isocirrus***

16a (14b). More than 30 chaetigers present; acicular neuropodial spines present.......................................
....***Macroclymene santanderensis* [see comments under this species]**
16b (14b). 18 to 20 chaetigers present; acicular neuropodial chaetae as spines or reduced rostrate unicini...**17**

17a (16b). Anal plaque with two large ventral and several shorter lateral and dorsal anal cirri, of about the same length; nuchal slits anteriorly curved...***Proclymene***
17b (16b). Anal plate with a single large midventral cirrus and several shorter lateral and dorsal anal cirri present..**18**

18a (17b). Nuchal slits short, straight and diverging anteriorly...***Pseudoclymene***

18b (17b). Nuchal slits long, straight and parallel..**19**

19a (18b). Anal cone projecting well beyond the rim of the anal plaque..................................***Praxillella****
19b (18b). Anal cone low, not projecting beyond the rim of the anal plaque.............................***Euclymene***

20a (5a). Rostrate uncini in all neuropodia, from chaetiger 1; acicular uncini absent; notopodia with striated spatulate chaetae, very long capillary notochaetae absent.......................................***Micromaldane***
20b (5a). Acicular spines in the first three or four chaetigers, thereafter rostrate uncini; notopodia without striated spatulate chaetae, very long capillary notochaetae present...**21**

21a (20b). Anal funnel more or less symmetrically developed, with cirri; posterior segments without a dorsal process on the rear edge...***Nicomache***
21b (20b). Anal funnel asymmetrical, petaloid, with the dorsal side reduced and generally without cirri; posterior segments with a more or less developed dorsal papilla-like process on the rear edge...***Petaloproctus****

22a (6a). More than 20 chaetigers present..***Praxillura***
22b (6a). Nineteen chaetigers present..**23**

23a (22b). Chaetiger 4 with a deep encircling collar..***Clymenopsis***
23b (22b). Chaetiger 4 without collar...***Lumbriclymene***

GENUS *Axiothella* Verrill 1900

Axiothella VERRILL, 1900: 657-658.
TYPE SPECIES: *Axiothea catenata* Malmgren 1865.
SYNONYMS: *Axiothea* Malmgren 1865 [not Pascoe 1864 (Coleoptera)].

KEY TO SPECIES:

1a. 18 chaetigers and 4 preanal achaetous segments; without ocelli; first 3 chaetigers with modified rostrate uncini, without gular bristles; 22 anal cirri, alternately short and long..........................***A. catenata***
1b. 19 chaetigers and 2 preanal achaetous segments; ocelli present; first 3 chaetigers with uncini with gular bristles (?); one median longer anal cirrus, and 14 shorter cirri of equal size....................***A. cirrifera***
1c. 21 (?) chaetigers and 3 preanal achaetous segments; ocelli present; fully developed uncini from the first chaetiger, with gular bristles; one long anal cirrus and numerous shorter cirri.................***A. constricta***

Axiothella catenata (Malmgren 1865)

Axiothea catenata MALMGREN, 1865: 190-191.
TYPE LOCALITY: Spitsbergen, in Treurenbergbay at Shoalpoint, and Hackluyts Headland, in muddy bottoms between 15-30 fathoms (27.4-55 meters), and also Greenland, at Sukkertoppen, from 200 fathoms (365.8 meters).
SELECTED REFERENCES: *Axiothea catenata* — MALMGREN, 1867*a*: 99-100, pl. 10 fig. 59. *Axiothella catenata* — ARWIDSSON, 1906: 209-216, pl. 5 figs. 166-170, pl. 9 figs. 308-311; WESENBERG-LUND, 1948: 44-47, figs. 22-23; WESENBERG-LUND, 1950*a*: 44, pl. 10 fig. 45, chart 52; USCHAKOV, 1955*a*: 341, fig. 124*F-H*; GILLET, 1989: table 1; DETINOVA, 2001: 405, figs. 1-2, map.
DISTRIBUTION: Circumpolar. Davis Strait, West Greenland; East Greenland; Norway; Spitsbergen; White Sea; Kara Sea; Bering Strait. On muddy and sandy bottoms. Between 10-686 meters.

Axiothella cirrifera (Langerhans 1880)

Axiothea cirrifera LANGERHANS, 1880*b*: 103, pl. 4 fig. 16
TYPE LOCALITY: Madeira Island, between 15-30 fathoms (27.4-54.9 meters).
SELECTED REFERENCES: *Axiothella cirrifera* — GILLET, 1989: table 1.
DISTRIBUTION: Known from the type locality.

Axiothella constricta (Claparède 1869)

Axiothea constricta CLAPARÈDE, 1869: 195-196, pl. 26 fig. 3.

TYPE LOCALITY: Gulf of Naples (Italy).

SELECTED REFERENCES: *Axiothea constricta* — FAUVEL, 1927*a*: 183-184, fig. 63*i-m*; GILLET, 1989: table 1.

DISTRIBUTION: Gulf of Naples, Mediterranean Sea; Adriatic Sea; Aegean Sea. On bottoms of mud and sand. Known from 35 meters.

REMARKS: ARWIDSSON (1906: 206) states that this is a doubtful species, and that the posterior part is particularly poorly known. To FAUVEL (1927*a*) this species was incompletly described by CLAPARÈDE (1869) and probably was based in an animal regenerating its anterior portion. This could explain the presence of fully developed uncini in the first chaetiger. FAUVEL (*op. cit.*) also says that "(...) *l'extremité postérieure ressemble beaucoup à celle de* Clymene palermitana*. Il s'agit donc probablement de spécimens régénérés de cette dernière espèce et non d'une véritable* Axiothella" (page 184). In spite of this, the species was considered as valid by HARTMAN (1959*a*) and has been repeatedly recorded in the Italian waters (*e.g.* CASTELLI *et al.*, 1995).

GENUS ***Chirimia*** Light 1991

Chirimia LIGHT, 1991: 136-138.

TYPE SPECIES: *Chrysothemis amoena* Kinberg 1867.

SYNONYMS: *Chrysothemis* Kinberg 1867 [not Berendt 1845 (Diptera)]; *Asychis* Kinberg 1865 [in part].

Chirimia biceps (M. Sars 1862)

Clymene biceps SARS, 1862*c*: 93-95.

TYPE LOCALITY: Bollærene, at Christianiafjorden (= Oslofjord), at 50-60 fathoms (91.4-109.7 meters); Mængde, near Christianiasund (= Oslosund?), at 50-70 fathoms (91.4-128 meters); Leerbund, near Tromsø, Øxfjord and Vadsø, in Finmark. Normally between 50-100 fathoms (91.4-182.9 meters), but sometimes down to 200 fathoms (365.8 meters).

SYNONYMS: *Asychis Jeffreysii* McIntosh 1915; *Asychis lacera* Moore 1923; *Asychis lobata* Fauchald 1972.

SELECTED REFERENCES: *Maldane biceps* — MALMGREN, 1867*a*: 98, pl. 10 fig. 58; FAUVEL, 1914*f*: 259-260. *Asychis biceps* — ARWIDSSON, 1906: 263-271, pl. 6 figs. 200-207, pl. 10 figs. 339-344; NOLTE, 1912: 61-65, pl. 1 figs. 23-24, map; FAUVEL, 1927*a*: 200-201, fig. 70*g-o*; RIOJA, 1931: 228-230, pl. 76; WESENBERG-LUND, 1948: 52-56, figs. 27-29; WESENBERG-LUND, 1950*a*: 45, chart 53; AMOUREUX, 1974*b*: 144, fig. 5*B-3-4*; IMAJIMA & SHIRAKI, 1982*b*: 77-80, fig. 37; HARTMANN-SCHRÖDER, 1996: 462-463, fig. 224; KIRKEGAARD, 1996: 190-191, fig. 96; DETINOVA, 2001: 413-414, figs. 1-4, map. *Asychis biceps?* — MCINTOSH, 1915*b*: 348-352, pl. 101 fig. 7, pl. 108 fig. 14, pl. 110 fig. 6. *Asychis Jeffreysii* — MCINTOSH, 1915*b*: 352-353, pl. 101 fig. 6, pl. 108 fig. 13.

REFERENCES FOR PORTUGAL: AMOUREUX, 1974*b* (as *Asychis biceps*; off Porto); AMOUREUX, 1987 (as *Asychis biceps*; off Porto); MONTEIRO-MARQUES, 1987 (as *Asychis biceps*; continental shelf of Algarve); DEXTER, 1992 (as *Asychis biceps*; previous records: continental shelf of Algarve).

DISTRIBUTION: North Pacific Ocean; Pacific coast of Japan; Greenland; Arctic Ocean; Iceland; North Atlantic; North Sea; Skagerrak; northern Kattegat; Portugal; Mediterranean Sea; Adriatic Sea; Aegean Sea. On muddy bottoms. Between 45-1095 meters, but recorded in Sagami Bay (Japan) at 1830 meters.

REMARKS: According to LIGHT (1991), the species *Chirimia biceps* (M. Sars 1862) includes two subspecies, *C. biceps biceps* (M. Sars 1862), widespread in shelf and upper slope depths in the North Atlantic, and *C. biceps lacera* (Moore 1923), occurring in lower slope depths off California and Western Mexico, and which includes *Maldane lacera* Moore 1923, and *Asychis lobata* Fauchald 1972. The above references refer, presumely, only to *C. biceps biceps*.

GENUS ***Clymenella*** Verrill 1874

Clymenella VERRILL, 1874*c*: 607-608.

TYPE SPECIES: *Clymene torquatus* Leidy 1855.

KEY TO SPECIES:

1a. Nuchal slits and cephalic keel short, in the first third of the cephalic disc; lateral notches of the cephalic rim in the anterior half of the cephalic disc; posterior margin of the rim smooth; surface of the cephalic disc with 2-3 curved grooves, the first of which connects the lateral notches of the rim, with the convex side pointing backwards; membranous collar at chaetiger 4 with lateral notches which separate the ventral side from the dorsal, being the dorsal side shorter; capillar notochaetae bilimbate and plumose; neuropodia of chaetigers 1-3 with 1-4 acicular spines with blunt tips; anal funnel rimmed with 30-37 small rounded teeth of equal size...***C. cincta***
1b. Nuchal slits and cephalic keel long, reaching the posterior third of the cephalic disc; lateral notches of the cephalic rim in the posterior half of the cephalic disc; posterior margin of the rim crenulated; surface of cephalic disc without grooves; membranous collar at chaetiger 4 broadly indented dorsally; notochaetae bilimbate, hispid chaetae with limbae forming a channel along one edge, pinnate chaetae, and specialized chaetae in chaetiger 9, with pseudoarticulated long tip; neuropodia of chaetigers 1-3 with reduced rostrate uncini, without gular bristles; anal funnel rimmed with about 12-24 subequal cirri...***C. torquata***

Clymenella cincta (Saint-Joseph 1894)

Maldane (?) cincta SAINT-JOSEPH, 1894: 142-144, pl. 6 figs. 176-179.
TYPE LOCALITY: Between Dinard and Saint-Énogat (English Channel), shallow water, in sand.
SELECTED REFERENCES: *Clymenella (?) cincta* — FAUVEL, 1926*c*: 474; FAUVEL, 1927*a*: 182-183, fig. 63*a-h*. *Clymenella cincta* — RIOJA, 1928: 491-494, figs. 1-9; KIRKEGAARD, 1996: 191-192, fig. 97.
DISTRIBUTION: Western coast of Europe: Northern Spain (Santander); English Channel; Swedish coast of Skagerrak and Kattegat. Shallow sandy bottoms.

Clymenella torquata (Leidy 1855)

Clymene torquatus LEIDY, 1855: 146.
TYPE LOCALITY: New Jersey (U.S.A.).
SYNONYMS: *Paraxiothea latens* Webster 1879; *Clymenella torquata calida* Hartman 1951.
SELECTED REFERENCES: *Praxilla torquata* — VERRILL, 1874*c*: 343, 608, pl. 14 figs. 71-73. *Clymenella torquata* — WEBSTER, 1879*a*: 258; ANDREWS, 1891: 294; ARWIDSSON, 1906: 207-208; HARTMAN, 1945: 40, pl. 8 figs. 1-2; NEWELL, 1949: 147; MANGUM, 1962: 3-5, figs. 1*A*, 2*A*; BANSE, 1981: 634-635; WOLF, 1984*b*: 15.10-15.12, figs. 15.7-15.8; HARTMANN-SCHRÖDER, 1996: 452. *Axiothea torquata* — LEWIS, 1897: 111-112, 114-115, pl. 1 figs. 2, 7, pl. 2 figs. 9, 15. *Paraxiothea latens* — WEBSTER, 1879*b*: 125-126; WEBSTER, 1886: 156-157, pl. 10 figs. 62-66. *Axiothea mucosa* — ANDREWS, 1891: 295, pl. 16 fig. 34 [in part, only]. *Clymenella torquata calida* — HARTMAN, 1951*b*: 105.
DISTRIBUTION: New England to northern Florida; Gulf of Mexico; Atlantic coast of England; British Columbia. In sand, sandy silt or mud, and among eelgrasses. Intertidal to 175 meters.
REMARKS: It would be interesting to compare directly specimens from both North American and European populations, especially for the notochaetae composition. Probably, at least some of the European records of this species correspond in reality to misidentified specimens of *C. cincta*.

NEWELL (1949) comments the possibility of the presence of *Clymenella torquata* in England as the result of the introduction of the species as accompanying fauna of imported oysters. BANSE (1981) also points to the human intervention to explain the presence of *C. torquata* in the British Columbia, as oysters from the North American east coast, where the species was known to occur, were planted in the Boundary Bay, where it was posteriorly found. The explanation, using *Crassostrea virginica* (Gmelin) as a vector, was also used to justify the appearance of *Sabaco elongatus* (Verrill 1874), a maldanid previously known from the Atlantic coast of the USA, in the San Francisco Bay (LIGHT, 1974).

GENUS ***Clymenopsis*** Verrill 1900

Clymenopsis VERRILL, 1900: 654.
TYPE SPECIES: *Clymene cingulata* Ehlers 1887.

Clymenopsis constricta (Wesenberg-Lund 1948)

Lumbriclymene constricta WESENBERG-LUND, 1948: 12-15, figs. 3*c-d*, 4.

TYPE LOCALITY: Davis Strait (West Greenland), 63º06'N, 56º00'W, at 2258 meters.
SELECTED REFERENCES: *Axiothella constricta* — FAUVEL, 1926*c*: 474-475. *Lumbriclymene constricta* — WESENBERG-LUND, 1950*a*: 40, chart 49.
DISTRIBUTION: Davis Strait (West Greenland), and South of Iceland. Between 1096-2258 meters.

GENUS *Clymenura* Verrill 1900

Clymenura VERRILL, 1900: 654.
TYPE SPECIES: *Clymene cirrata* Ehlers 1887.
SYNONYMS: *Leiochone* Auctt., not Grube 1868.
REMARKS: The genus *Leiochone* was created by GRUBE (1868*b*: 56) for the species *Clymene urceolatus* Leidy 1853, from New Jersey, but was used by most authors in the sense as defined later by VERRILL (1900) for *Clymenura*, while *Clymene urceolatus* Leidy 1855 was considered to belong to the genus *Asychis* by HARTMAN (1959*a*). However LIGHT (1974) argued that *C. urceolatus* had 26 segments, according to LEIDY (1855: 145), while the genus *Asychis* would not present more than 19 chaetigers. The holotype of *C. urceolatus* could not be located by LIGHT (1974), and was considered to be lost. As a consequence of the lack of material, the inadequacy of the description, and the lack of figures, the species was consequently declared a *nomen dubium* (LIGHT, 1974).

The genus *Clymenura* was divided in two subgenera by IMAJIMA & SHIRAKI (1982*a*), with base on the development and definition of the cephalic plate: *Clymenura* Verrill 1900, and *Cephalata* Imajima & Shiraki 1982.

KEY TO SUBGENERA AND SPECIES:

1a. Cephalic plate well defined and bordered by a raised rim........................**Subgenus *Cephalata*............2**
1b. Cephalic plate poorly defined...**Subgenus *Clymenura*...........3**

2a (1a). Cephalic plate with two lateral notches and a slight middorsal one; 5 preanal achaetous segments, the first of which is much longer; anal cone supported by a flat plate, from the rim of which are projected 8 to 9 slender, long cirri...***C. (Cephalata) lankesteri***
2b (1a). Cephalic plate with two small lateral notches, at the points where the lateral and posterior borders meet in a right angle, without middorsal notch; 4 preanal achaetous segments; anal cone supported by a long cylinder with an annulate rim, from which projects a single long cirrus..***C. (Cephalata) polaris***

3a (1b). Body with 19 chaetigerous segments; about 5 achaetous preanal segments..................................**4**
3b (1b). Body with about 23-25 chaetigerous segments; 0-2 achaetous preanal segments..........................**5**

4a (3a). First 3 chaetigers with numerous neuropodial uncini (1st with 2-3; 2nd with 2-6; 3rd with 3-8), with 5-7 denticles above rostrum, and weak gular bristles; pygidium with 3 (sometimes 4) short anal cirri, being the middle ventral one longer (about twice the length of the anal cone)....***C. (Clymenura) johnstoni***
4b (3a). First 3 chaetigers with few neuropodial uncini (1 at first, and then 2), with about 4 denticles above rostrum, without gular bristles; pygidium with 3 long anal cirri (more than twice the length of the anal cone)..***C. (Clymenura) tricirrata***

5a (3b). First 3 chaetigers with 1 to 3 neuropodial uncini, with about 3-6 denticles above rostrum (absent in fully developed uncini) and without gular bristles; 2 achaetous preanal segments; pygidium without cirri..***C. (Clymenura) leiopygos***
5b (3b). First chaetiger either without neurochaetae or with 2-3 hooks, with 2-4 denticles above rostrum and poorly marked gular bristles; 0-1 achaetous preanal segments, followed by 3-5 annuli without parapodial ridges; pygidium with 3 slender cirri..***C. (Clymenura) tenuis***

Clymenura (Cephalata) lankesteri (McIntosh 1885)

Praxilla lankesteri MCINTOSH, 1885*a*: 403-404, pl. 25*A* fig. 3.
TYPE LOCALITY: South of Yedo (= Tokyo), 35º11'N, 139º28'E, Sagami Bay, Honshu, Pacific coast of Japan, in 345 fathoms (630.9 meters), on green mud.
SYNONYMS: *Leiochone borealis* Arwidsson 1906.

SELECTED REFERENCES: *Praxillella lankesteri* — IMAJIMA & HARTMAN, 1964: 320. *Clymenura (Cephalata) lankesteri* — IMAJIMA & SHIRAKI, 1982*a*: 16-19, figs. 3-4; HARTMANN-SCHRÖDER, 1996: 449-451, fig. 220. *Leiochone borealis* — ARWIDSSON, 1906: 156-163, pl. 3 figs. 108-115, pl. 4 figs. 116-117, pl. 9 figs. 281-283, pl. 11 figs. 352-353; NOLTE, 1912: 33-37, text-figs. 8-10, pl. 1 fig. 11, pl. 2 fig. 31, map; MCINTOSH, 1915*b*: 317-319, pl. 100 figs. 15-17, pl. 108 figs. 5-6; WESENBERG-LUND, 1948: 33-35, fig. 16; WESENBERG-LUND, 1950*a*: 42-43, pl. 9 fig. 41, chart 51; USCHAKOV, 1955*a*: 340, fig. 125 G. *Clymenura borealis* — KIRKEGAARD, 1980*b*: 92; KIRKEGAARD, 1996: 193-194, fig. 98; DETINOVA, 2001: 406, figs. 1-3, map.
DISTRIBUTION: East Greenland; Arctic Sea; North Pacific; Pacific coast of Japan; North Atlantic, from the West coast of Norway, Shetlands, and Orkneys, to North Sea, Skagerrak, and western Baltic Sea; Southwest British Isles; Sea of Okhotsk. On muddy, clayed and medium sand bottoms. Between 80-2258 meters.
REMARKS: IMAJIMA & SHIRAKI (1982*a*) synonymised *Leiochone borealis* Arwidsson 1906 with the present species, due to the characteristics of the anterior region of the body.

Clymenura (Cephalata) polaris (Théel 1879)

Praxilla polaris THÉEL, 1879: 58-59, pl. 4 figs. 55-56.
TYPE LOCALITY: West Matotchkin, Novaya Zemlya, 7-34 meters, on sand, muddy sand, and mud.
SELECTED REFERENCES: *Leiochone polaris* — WESENBERG-LUND, 1948: 31-33, fig. 15; WESENBERG-LUND, 1950*a*: 42, chart 51. *Clymenura polaris* — DETINOVA, 2001: 406-407, figs. 1-2, map.
DISTRIBUTION: Davis Strait, West Greenland; East Greenland; Iceland; Jan Mayen; Spitsbergen; Novaya Zemlya. Between 599-2250 meters.

Clymenura (Clymenura) johnstoni McIntosh 1915

Leiochone Johnstoni MCINTOSH, 1915*b*: 319-320, pl. 100 fig. 19, pl. 108 fig. 7.
TYPE LOCALITY: Loch Alsh and Loch Broom (Scotland).
SELECTED REFERENCES: *Leiochone johnstoni* — ARWIDSSON, 1922: 12-18, text-figs. 1-4, pl. 1 figs. 7-13; SOUTHWARD, 1956: 274, fig. 2*J-K*.
DISTRIBUTION: Great Britain (Firth of Clyde, Loch Alsh, Loch Broom). In sandy shores and mud.

Clymenura (Clymenura) leiopygos (Grube 1860)

Clymene leiopygos GRUBE, 1860: 91-92, pl. 4 fig. 3.
TYPE LOCALITY: Cres (= Cherso) Island, Croatia, Adriatic Sea.
SYNONYMS: [?] *Clymene ebiensis* Audouin & Milne-Edwards 1844; [?] *Praxilla simplex* Claparède 1869; *Leiochone clypeata* Saint-Joseph 1894.
SELECTED REFERENCES: *Leiochone leiopygos* — ARWIDSSON, 1922: 18-23, text-figs. 5-8, pl. 1 figs. 14-19. *Leiochone clypeata* — SAINT-JOSEPH, 1894: 139-142, pl. 7 figs. 167-175; ORLANDI, 1898: 272-273; MCINTOSH, 1915*b*: 320-322, pl. 109 fig. 11; RIOJA, 1917*c*: 38, fig. 10; FAUVEL, 1926*c*: 475; FAUVEL, 1927*a*: 188-189, fig. 65*h-q*; RIOJA, 1931: 222-224, pls. 73-74. [?] *Praxilla simplex* — CLAPARÈDE, 1869: 192-194, pl. 27 fig. 7. *Clymene ebiensis* — MCINTOSH, 1892: 103, pl. 8 figs. 1-4. *Leiochone (Clymene) ebiensis* — MCINTOSH, 1915*b*: 312-316, pl. 100 fig. 18, pl. 109 fig. 10.
REFERENCES FOR PORTUGAL: MONTEIRO-MARQUES, 1987 (as *Leiochone clypeata*; continental shelf of Algarve); DEXTER, 1992 (as *Clymenura (Leiochone) clypeata*; previous records: Ria Formosa; Ria de Aveiro; continental shelf of Algarve; Arrábida); [?] RAVARA, 1997 (as *Clymenura* cf. *Clypeata*; off Aveiro).
DISTRIBUTION: Shetland; British Isles; English Channel; Atlantic European coast; Mediterranean Sea; [?] Adriatic Sea; Aegean Sea; Black Sea. In fine sand. Intertidal to 558 meters.
REMARKS: *Leiochone clypeata* Saint-Joseph 1894 was synonymized with *Clymene leiopygos* Grube 1860 by ARWIDSSON (1922).

Clymenura (Clymenura) tenuis (Day 1957)

Leiochone tenuis DAY, 1957: 110-111, fig. 7 *g-l*.
TYPE LOCALITY: Durban Bay, South Africa, on intertidal sand banks.
SELECTED REFERENCES: *Clymenura tenuis* — DAY, 1967: 623, fig. 30.2 *e-i*.
DISTRIBUTION: Natal, Moçambique; [?] Catalonian coast of Spain, Mediterranean Sea, between 87-195 meters, in mud.

REMARKS: This species was identified only once in European waters, with doubts, from the Mediterranean Sea. The record was made by DESBRUYÈRES, GUILLE & RAMOS (1974), as *Clymenura* cf. *tenuis*, from the community of "*Vase du Large*", between 87-195 meters. However, this record should be considered as doubtful, as already stated by the authors of the record.

Clymenura (Clymenura) tricirrata (Bellan & Reys 1967)

Leiochone tricirrata BELLAN & REYS, 1967: 200-205, figs. 1-3, table 1.

TYPE LOCALITY: Gulf of Marseille (Mediterranean coast of France). The species was collected in 14 stations, but none of them seems to have been designated as the type locality. The stations ranged between 30-71 meters, and the sediment varied between sandy mud, muddy sand, and *Peyssonnelia*. The available data of the stations is as follows: 61 meters, sandy mud; 71 meters, sandy mud; 70 meters, sandy mud; 61 meters, muddy sand; 45 meters, muddy sand; 62 meters, muddy sand; 46 meters, muddy sand; 61 meters, muddy sand; 54 meters, muddy sand; 63 meters, muddy sand; 59 meters, muddy sand; 40 meters, *Peyssonnelia*; 50 meters, muddy sand; 30 meters, very muddy sand.

DISTRIBUTION: Gulf of Marseille (Mediterranean coast of France), between 30-71 meters, in sandy mud, muddy sand, and *Peyssonnelia*; Adriatic Sea; British Islands; Southern Irish Sea, between 28.6-113 meters, in different mixtures of gravel, mud and sand.

GENUS *Euclymene* Verrill 1900

Euclymene VERRILL, 1900: 654-655.

TYPE SPECIES: *Clymene Oerstedii* Claparède 1863.

SYNONYMS: *Clymene* Savigny *in* Lamarck 1818 [not Oken 1815 (Mollusca)]; *Heteroclymene* Arwidsson 1906; *Caesicirrus* Arwidsson 1911; *Arwidssonia* McIntosh 1915.

KEY TO SPECIES:

1a. Posterior margin of the cephalic rim dentate; 19 chaetigers; neuropodial chaetae of the first 3 chaetigers acicular..**2**

1b. Cephalic rim not dentate, with one lateral incision on each side and one posterior middorsal cleft; 19-22 chaetigers; neuropodial chaetae of the first 3 chaetigers acicular or like modified normal hooks..........**3**

2a (1a). 3 preanal achaetigerous segments; anal funnel long, deep and laterally striated; anus in the top of a cone..***E. lumbricoides***

2b (1a). 5 preanal achaetigerous segments, being the first 3 longer than the other two; anal funnel short and shallow; anus at the center of a flat or depressed disc..***E. robusta***

3a (1b). Posterior margin of the cephalic rim deeply incised in "V"; 16-23 anal cirri equal in length, except the ventral one, which is clearly longer; 19-21 chaetigers; ocelli present; neuropodia of the first 3 chaetigers like modified normal hooks..***E. collaris***

3b (1b). Posterior margin of the cephalic rim weakly incised..**4**

4a (3b). 20 chaetigers and 3 preanal achaetigerous segments; nuchal slits extend almost along the entire length of the prostomium; neuropodia of the first 3 chaetigers acicular and/or like modified normal hooks; anal funnel with approximately 10-30 longer cirri, with 0-3 shorter cirri inserted between them, and one long ventral cirrus..***E. droebachiensis***

4b (3b). 18-22 chaetigers and 3-5 preanal achaetigerous segments; nuchal slits extend only as far as the lateral incisions on the cephalic rim; anal funnel with a variable number of long cirri with shorter ones inserted between them, and 1 slightly longer midventral cirrus..**5**

5a (4b). 18 or 19 chaetigers and 5 preanal achaetigerous segments; prostomium without ocelli; neuropodia of the first 3 chaetigers like modified normal hooks..***E. lindrothi***

5b (4b). 19-22 chaetigers and 3 preanal achaetigerous segments; prostomium with or without ocelli........**6**

6a (5b). 20-22 chaetigers; anal funnel short, with 20-30 long and flat anal cirri, subequal in length, midventral one a little longer; ocelli may be present; neuropodia of the first 3 chaetigers acicular..***E. palermitana***
6b (5b). 19 chaetigers; the last preanal achaetigerous segment very short; 5-10 big anal cirri, alternating with shorter ones, often bifurcated and with digitiform expansions at the tip; prostomium with ocelli; neuropodia of the first 3 chaetigers like modified normal hooks...***E. oerstedii***

Euclymene collaris (Claparède 1869)

Praxilla collaris CLAPARÈDE 1869: 194-195, pl. 26 fig. 2.

TYPE LOCALITY: Gulf of Naples.

SELECTED REFERENCES: *Clymene collaris* — ORLANDI, 1898: 262-264, 302-304, pl. 5 figs. 1-4, pl. 8 figs. 56-58. *Clymene (Euclymene) collaris* — FAUVEL, 1927*a*: 172-173, fig. 59*k-o*.

REFERENCES FOR PORTUGAL: MONTEIRO-MARQUES, 1987 (as *Clymene (Euclymene) collaris*; continental shelf of Algarve); QUINTINO & GENTIL, 1987 (Lagoon of Albufeira); DEXTER, 1992 (as *Clymene (Euclymene) collaris*; previous records: Ria de Alvor; continental shelf of Algarve; Sado Estuary; Lagoon of Óbidos).

DISTRIBUTION: Mediterranean Sea; Adriatic Sea; Aegean Sea; Black Sea. In sand. Between 1-20 meters.

Euclymene droebachiensis (M. Sars *in* G.O. Sars 1872)

Clymene Dröbachiensis M. SARS *in* G.O. SARS, 1872*a*: 412.

TYPE LOCALITY: Drøbak, Oslofjorden (Norway), 40-50 fathoms (73.2-91.4 meters).

SELECTED REFERENCES: *Euclymene droebachiensis* — ARWIDSSON, 1906: 218-226, pl. 5 figs. 159-165, pl. 9 figs. 312-314, pl. 10 figs. 315-317, pl. 12 figs. 368-370; NOLTE, 1912: 46-50, pl. 1 figs. 17-18, map; HARTMANN-SCHRÖDER, 1996: 452-453, fig. 221; KIRKEGAARD, 1996: 194-195, fig. 99; DETINOVA, 2001: 407, figs. 1-2.

DISTRIBUTION: Norwegian coast, North Sea, Skagerrak, Kattegat and northern and middle Øresund. On muddy bottoms. Between 20-350 meters.

Euclymene lindrothi Eliason 1962

Euclymene lindrothi ELIASON, 1962*b*: 278-281, fig. 22.

TYPE LOCALITY: Skagerrak, off Vest-Agder (South Norway), 57º58'N, 6º44'W, at 384 meters, on grey mud.

SELECTED REFERENCES: *Euclymene lindrothi* — HARTMANN-SCHRÖDER, 1996: 453-454; KIRKEGAARD, 1996: 196-197, fig. 100.

DISTRIBUTION: Skagerrak. On muddy bottoms. Between 235-531 meters.

Euclymene lumbricoides (Quatrefages 1866)

Clymene lumbricoides QUATREFAGES, 1866*b*: 236.

TYPE LOCALITY: France.

SYNONYMS: *Clymene modesta* Quatrefages 1866; *Clymene zostericola* Quatrefages 1866; *Clymene brachysoma* Orlandi 1898; *Arwidssonia zetlandica* McIntosh 1915.

SELECTED REFERENCES: *Clymene lumbricoides* — SAINT-JOSEPH, 1894: 134-137, pl. 6 figs. 160-165. *Clymene lumbricoïdes* — FAUVEL, 1926*c*: 473. *Clymene (Euclymene) lumbricoides* — FAUVEL, 1927*a*: 172, fig. 59*a-i*; RIOJA, 1931: 196-198, pl. 63. *Arwidssonia zetlandica* — MCINTOSH, 1915*b*: 331-334, pl. 99 fig. 6, pl. 110 fig. 5; RIOJA, 1918*a*: 70-72, fig. 6. *Euclymene modesta* — ARWIDSSON, 1922: 32-36, text-figs. 14-16, pl. 2 figs. 30-35. *Clymene brachysoma* — ORLANDI, 1898: 268-270, pl. 5 figs. 17-21.

REFERENCES FOR PORTUGAL: CARVALHO, 1929 (as *Clymene (Euclymene) lumbricoides*; Sines); MONTEIRO-MARQUES, 1987 (as *Clymene (Euclymene) lumbricoides*; continental shelf of Algarve); DEXTER, 1992 (as *Clymene (Euclymene) lumbricoides*; previous records: continental shelf of Algarve); SALDANHA, 1995 (as *Clymene lumbricoides*; Portugal).

DISTRIBUTION: Northeastern Atlantic: Shetland, North Sea, and from the English Channel to the Mediterranean Sea; Adriatic Sea; Aegean Sea. In sand among *Zostera* meadows, near rocks and stones. On shallow water to about 183 meters.

Euclymene oerstedii (Claparède 1863)

Clymene Oerstedii CLAPARÈDE, 1863: 28-30, pl. 13 figs. 6-13.

TYPE LOCALITY: St. Vaast la Houge (Normandie, Northern France), in mud in *Zostera* meadows.

SYNONYMS: *Clymene digitata* Grube 1863; *Leiocephalus coronatus* Quatrefages 1866; *Johnstonia? gracilis* Kinberg 1867; *Clymene Claparedei* Orlandi 1898; *Caesicirrus neglectus* Arwidsson 1911.

SELECTED REFERENCES: *Pseudoclymene Œrstedi* — MCINTOSH, 1915*b*: 338-340, pl. 100 fig. 22, pl. 101 fig. 9, pl. 108 fig. 12. *Pseudoclymene œrstedi* — MCINTOSH, 1923*a*: 495. *Clymene Œrstedii* — SAINT-JOSEPH, 1894: 137-139, pl. 6 fig. 166; RIOJA, 1917*c*: 34-35, fig. 7; FAUVEL, 1926*c*: 473-474. *Clymene (Euclymene) Œrstedii* — FAUVEL, 1927*a*: 173-174, fig. 60*a-i*. *Clymene (Euclymene) OErstedii* — RIOJA, 1931: 200-201, pl. 64 figs. 1-10. *Euclymene (Euclymene) oerstedii* — ARWIDSSON, 1906: 218. *Euclymene oerstedi* — DAY, 1967: 635, fig. 30.5.*o-q*; IMAJIMA & SHIRAKI, 1982*b*: 71-73, fig. 34; HARTMANN-SCHRÖDER, 1996: 454. *Euclymene oerstedii* — MACKIE & GOBIN, 1993: 237-239, fig. 7*C*. *Clymene digitata* — GRUBE, 1863: 54-55, pl. 5 fig. 5. *Leiocephalus coronatus* — QUATREFAGES, 1866*b*: 242. *Johnstonia? gracilis* — KINBERG, 1867: 342. *Clymene Claparedei* — ORLANDI, 1898: 271-272, 304-305, pl. 5 figs. 22-25, pl. 8 fig. 59. *Caesicirrus neglectus* — ARWIDSSON, 1911*a*: 217-224, pl. 17, figs. 1-9, pl. 18, figs. 10-12, pl. 19, figs. 20-26; SOUTHERN, 1914: 134-135; ARWIDSSON, 1922: 36-41, pl. 2 figs. 36-40. *Cæsicirrus neglectus* — MCINTOSH, 1915*b*: 341-343, pl. 110, fig. 15, pl. 111, fig. 5.

REFERENCES FOR PORTUGAL: DEXTER, 1992 (as *Clymene (Euclymene) oerstedii*; previous records: Mira Estuary).

DISTRIBUTION: Pacific coast of Japan; Northeastern Atlantic to Mediterranean Sea; Ireland, English Channel, and North Sea; Adriatic Sea; Aegean Sea; Black Sea; [?] South Africa. On sandy and muddy bottoms, and among meadows of *Zostera*. Lower shore to 18 meters, but recorded in Sagami Bay (Japan) at 1100 meters.

Euclymene palermitana (Grube 1840)

Clymene palermitana GRUBE, 1840: 66-67.

TYPE LOCALITY: Palermo, Sicily (Western Mediterranean), at the beach sand.

SELECTED REFERENCES: *Clymene palermitana* — ORLANDI, 1898: 264-267, 276-302, pl. 5 figs. 5-9, pls. 6-7, pl. 8 figs. 49-55; FAUVEL, 1926*c*: 474. *Clymene (Euclymene) palermitana* — FAUVEL, 1927*a*: 176-177, fig. 61*i-q*.

REFERENCES FOR PORTUGAL: CARVALHO, 1929 (as *Clymene (Euclymene) palermitana*; Sines); MONTEIRO-MARQUES, 1979 (as *Clymene palermitana*; southern continental shelf of Algarve); [?] COSTA, GAMITO & OLIVEIRA, 1984 (as *Clymene* cf. *palermitana*; Sado Estuary); MONTEIRO-MARQUES, 1987 (as *Clymene (Euclymene) palermitana*; continental shelf of Algarve); [?] GAMITO, 1989 (as *Clymene* cf. *palermitana*; Ria Formosa); DEXTER, 1992 (as *Clymene (Euclymene) palermitana*; previous records: continental shelf of Algarve; Sado Estuary); [?] MUCHA & COSTA, 1999 (as *Clymene* cf. *palermitana*; Ria de Aveiro and/or Sado Estuary).

DISTRIBUTION: Mediterranean Sea; Adriatic Sea; Aegean Sea; Black Sea. On sand and meadows of *Posidonia*. Between 1-2 meters.

Euclymene robusta (Arwidsson 1906)

Heteroclymene robusta ARWIDSSON, 1906: 227-235, pl. 5 figs. 171-178, pl. 10 figs. 318-320, pl. 12 figs. 371-372.

TYPE LOCALITY: ARWIDSSON (1906) used specimens from several locations in Norway, in order to describe the species, apparently without choosing a holotype. The locations are: 1) Hardangerfjord, Masterhavn, 20-160 meters; 2) region of Bergen, Hjeltefjord, Traettefluen, 140 meters; 3) region of Bergen, Hjeltefjord, WNW Bölholmene, about 170 meters; 4) region of Bergen, Hjeltefjord, NW Gjetanger, 100-125 meters; 5) region of Bergen, Byfjord, several localities, at 270-350 meters; 6) region of Bergen, Osterfjord, right west of the church in Hammer; 7) Trondhjemsfjord, Rödberg, 90-140, 210-270, 270-300, and 60 meters, in stones and some mud; 8) Trondhjemsfjord, Rödberg, western bay, 70-110, 350 meters; 9) Trondhjemsfjord, Rödberg, western bay, 180 meters, in mud with shells, stones and sand; 10) Trondhjemsfjord, Rödberg, western bay, 195 meters, in mud with stones, some shells, and *Lophohelia*; 11) Trondhjemsfjord, Bay Indals, 140 meters, in muddy sand with shells and stones; 12) Trondhjemsfjord, Gjetnes, 350 meters, in mud and shells; 13) Trondhjemsfjord, Gjeten, 440 meters, in mud and very little gravel; 14) Trondhjemsfjord, Gjetstrand, 140, 215, 250, 280 meters, in mud and some gravel; 15) in the stomach of *Centridermichthys uncinatus*.

SELECTED REFERENCES: *Heteroclymene robusta* — ARWIDSSON, 1911*a*: 224-225; NOLTE, 1912: 51-55, pl. 1 figs. 19-21, map; MCINTOSH, 1915*b*: 335-336, pl. 100 fig. 23, pl. 109 fig. 4; KIRKEGAARD, 1996: 197-198, fig. 101; DETINOVA, 2001: 408, figs. 1-3. *Clymene (Euclymene) robusta* — FAUVEL, 1927*a*: 174-176, fig. 60*k-p*. *Euclymene robusta* — HARTMANN-SCHRÖDER, 1996: 454.

REFERENCES FOR PORTUGAL: [?] AMOUREUX, 1974*b* (as *Clymene? robusta*; off Porto); MONTEIRO-MARQUES, 1987 (as *Clymene (Euclymene) robusta*; continental shelf of Algarve); DEXTER, 1992 (as *Clymene (Euclymene) robusta*; previous records: continental shelf of Algarve).
DISTRIBUTION: Northeastern Atlantic: Ireland, English Channel, North Sea, and Skagerrak; [?] Aegean Sea. On muddy bottoms, with sand or shells. Between 20-440 meters.

GENUS *Isocirrus* Arwidsson 1906

Isocirrus ARWIDSSON, 1906: 136-137.
TYPE SPECIES: *Clymene planiceps* M. Sars *in* G.O. Sars 1872.

Isocirrus planiceps (M. Sars *in* G.O. Sars 1872)

Clymene planiceps M. SARS *in* G.O. SARS, 1872*a*: 411-412.
TYPE LOCALITY: Drøbak, Oslofjorden (Norway), in 40-60 fathoms (73.2- 109.7 meters), and Teröen Island, Hardangerfjorden, 15 fathoms (27.4 meters).
SELECTED REFERENCES: *Isocirrus planiceps* — ARWIDSSON, 1906: 137-143, pl. 3 figs. 98-107, pl. 8 figs. 276-280, pl. 11 figs. 348, 351; MCINTOSH, 1915*b*: 310-311, pl. 99 fig. 5, pl. 108 fig. 4, pl. 109 fig. 6; IMAJIMA & SHIRAKI, 1982*b*: 73-74, fig. 35; HARTMANN-SCHRÖDER, 1996: 455; KIRKEGAARD, 1996: 200, fig. 102.
DISTRIBUTION: Pacific coast of Japan; North Atlantic, from Western Norway to northern North Sea, Skagerrak and Kattegat. Between 30-530 meters, but recorded in Japan between 390-1050 meters.

GENUS *Johnstonia* Quatrefages 1866

Johnstonia QUATREFAGES, 1866*a*: 21 [name conserved; not *Johnstonia* Quatrefages 1849 = indeterminate species of Nereididae; not *Johnstonia* Jay 1850 = *nomen nudum* for a gastropod mollusc; see MACKIE & GOBIN (1994), and Opinion 1807 of the ICZN (1995)].
TYPE SPECIES: *Johnstonia clymenoides* Quatrefages 1866.
REMARKS: As noted by MACKIE & GOBIN (1993), the name of the genus was first introduced by QUATREFAGES (1865: 597) as "*Johnstonie*", a French vernacular name, and later latinised as *Johnstonia* in an English translation of the same paper (QUATREFAGES, 1866*a*). To avoid confusion (HEPPELL, pers. com. *in* MACKIE & GOBIN, 1993), the latinised form was taken as the correct citation, which will be followed here. The genus definition was emended by MACKIE & GOBIN (1993).

Johnstonia clymenoides Quatrefages 1866

Jonhstonia [sic] *clymenoides* QUATREFAGES, 1866*b*: 245-246, pl. 11 figs. 10-15.
TYPE LOCALITY: San Sebastian (Spain).
SELECTED REFERENCES: *Jonhstonia* [sic] *clymenoides* — RIOJA, 1917*c*: 35-37, fig. 8; RIOJA, 1918*a*: 69-70, fig. 5. *Johnstonia clymenoides* — ARWIDSSON, 1906: 165; FAUVEL, 1927*a*: 184-185, fig. 64*a-h*; RIOJA, 1931: 208-210, pl. 67 figs. 1-2, pl. 68 figs. 1-6; [?] DAY, 1967: 631, fig. 30.4.*f-h*; MACKIE & GOBIN, 1993: 230-233, figs. 1-3*A*, tables I, III. Not *Johnstonia clymenoides* — KIRKEGAARD, 1959: 57-58 [= *Johnstonia* sp.; see MACKIE & GOBIN, 1993]. Not *?Johnstonia clymenoides* — INTES & LE LŒUFF, 1977: 231 [= *Johnstonia* sp.; see MACKIE & GOBIN, 1993].
REFERENCES FOR PORTUGAL: DEXTER, 1992 (previous records: Sado Estuary).
DISTRIBUTION: English Channel; Atlantic coast of France and Spain; Western Mediterranean Sea (France and Spain); Aegean Sea; Israel; Atlantic coast of Morocco; [?] South Africa. In sand, rock crevices and under stones. Intertidal and shallow water.

GENUS *Lumbriclymene* M. Sars *in* G.O. Sars 1872

Lumbriclymene M. SARS *in* G.O. SARS, 1872*a*: 412-413.
TYPE SPECIES: *Lumbriclymene cylindricaudata* M. Sars *in* G.O. Sars 1872.

KEY TO SPECIES:

1a. Cephalic lobe with frontal border turned upwards, and cephalic keel distinctly set off; pygidium cylindrical to almost conical; stout anus terminal; acicular hooks large, stout...............................***L. nasuta***
1b. Cephalic lobe without frontal border turned upwards or cephalic keel set off.....................................**2**

2a (1b). Pygidium diagonally truncated; parapodia of the 6th chaetiger in the middle of the segment; acicular hooks small, slender...***L. minor***
2b (1b). Pygidium cylindrical to almost conical; parapodia of the 6th chaetiger clearly behind the middle of the segment; acicular hooks large, stout...***L. cylindricaudata***

Lumbriclymene cylindricaudata M. Sars *in* G.O. Sars 1872

Lumbriclymene cylindricaudata M. SARS *in* G.O. SARS, 1872*a*: 413.
TYPE LOCALITY: Oslofjorden, Norway, 40-60 fathoms (73.2-109.7 meters).
SELECTED REFERENCES: *Lumbriclymene cylindricaudata* — ARWIDSSON, 1906: 40-45, pl. 1 figs. 15-24, pl. 7 figs. 219-221; WESENBERG-LUND, 1951: 87-88, fig. 8; LANA, 1983: table 1; HARTMANN-SCHRÖDER, 1996: 459-460; KIRKEGAARD, 1996: 201-203, fig. 103; DETINOVA, 2001: 411-412, figs. 1-2, map.
REFERENCES FOR PORTUGAL: AMOUREUX, 1974*b* (off Aveiro; off Porto); AMOUREUX, 1987 (off Aveiro; off Porto).
DISTRIBUTION: Northeast Atlantic, from Iceland and Norway to Skagerrak; Northern Spain; [?] South Africa. On sand or mud, sometimes mixed with shells. Between 80-400 meters.

Lumbriclymene minor Arwidsson 1906

Lumbriclymene minor ARWIDSSON, 1906: 46-51, pl. 1 figs. 26-29, pl. 7 figs. 223-225*a*, 226.
TYPE LOCALITY: Kosterfjord, east Sneholmarne (Sweden), at 200 meters, on mud with shell fragments.
SELECTED REFERENCES: *Lumbriclymene minor* — MCINTOSH, 1915*b*: 297-298, pl. 108 fig. 1; RIOJA, 1917*b*: 224-226, fig. 2; FAUVEL, 1927*a*: 196-197, fig. 68*k-q*; RIOJA, 1931: 217-218, pl. 71; WESENBERG-LUND, 1948: 15-17, fig. 5; WESENBERG-LUND, 1950*a*: 40, chart 49; LANA, 1983: table 1; HARTMANN-SCHRÖDER, 1996: 460; KIRKEGAARD, 1996: 203, fig. 104; DETINOVA, 2001: 412, figs. 3-4, map.
DISTRIBUTION: Davis Strait; Arctic Ocean; Northeastern Atlantic, from Norwegian coast to northern Spain; English Channel, Skagerrak and Kattegat; Mediterranean Sea; [?] South Africa. On muddy bottoms. Between 35-3000 meters.

Lumbriclymene nasuta Wesenberg-Lund 1948

Lumbriclymene nasuta WESENBERG-LUND, 1948: 10-12, figs. 2-3.
TYPE LOCALITY: Davis Strait, 65º06’N, 56º00’W, 2258 meters.
SELECTED REFERENCES: *Lumbriclymene nasuta* — WESENBERG-LUND, 1950*a*: 39-40, pl. 9 fig. 40, chart 49; LANA, 1983: table 1. *Lumbriclymene nazuta* — DETINOVA, 1985*a*: 125.
DISTRIBUTION: Davis Strait; off Iceland. Between 1484-2258 meters.

GENUS ***Macroclymene*** Verrill 1900

Macroclymene VERRILL, 1900: 655.
TYPE SPECIES: *Clymene producta* Lewis 1897.

Macroclymene santanderensis (Rioja 1917)

Clymene santanderensis RIOJA, 1917*b*: 221-224, fig.1.
TYPE LOCALITY: Santander Bay (Cantabria, Northern Spain), on shallow water.
SELECTED REFERENCES: *Clymene (Euclymene) santanderensis* — FAUVEL, 1927*a*: 177-178, fig. 61 *a-h*. *Clymene (Euclymene) Santanderensis* — RIOJA, 1931: 201-202, pl. 65. *Macroclymene santanderensis* — HARTMAN, 1959*a*: 459.
DISTRIBUTION: Spanish Atlantic coast (Santander); Adriatic Sea; Aegean Sea; Black Sea. On sand. In shallow water.
REMARKS: According ot the actual definition of the genus *Macroclymene* Verrill 1900, the species *Clymene santanderensis* Rioja 1917 should be included in a different genus, probably new. As an

alternative solution, the genus could be redefined in order to include species with midventral cirri distinctly longer than the rest (see below). *Macroclymene* is actually defined as having more than 30 chaetigers, presenting both cephalic and anal plates, nuchal slits long and straight, acicular spines present in anterior neuropodia, terminal anus, and anal plate with numerous cirri, all of similar length (FAUCHALD, 1977*a*; HOBSON & BANSE, 1981). *C. santanderensis* shows one midventral cirrus distinctly longer than all the other anal cirri, which are of unevenly size, alternating one long cirrus with several shorter ones. On the other hand, the fact of having about 40 chaetigers also means that it doesn't belong to genus *Euclymene* Verrill 1900. Finally, as it has acicular spines in the first three neuropodia it isn't possible to include it in the genera *Gravierella* Fauvel 1919 or *Macroclymenella* Augener 1926.

The species was included in the genus *Macroclymene*, with some doubts, by HARTMAN (1959*a*), who also stated that it could be a junior synonym of *Macroclymene monilis* (Fauvel 1901), from Senegal. CAMPOY (1979, 1982) also considered the species as belonging to *Macroclymene*.

Clymene santanderensis is here maintained in the genus *Macroclymene*, but its position should be revised. In the key of genera given above, there are two entries, one leading to the genus *Macroclymene* as generally defined, and the other leading directly to the species. The inclusion of the species in *Macroclymene* would imply to emend the genus, in order to include species with anal cirri of different length, especially with the midventral anal cirrus distinctly longer than all the other anal cirri. As I think this should be done in the context of a revision of the genus, the generic emendation is not done here.

*GENUS ***Maldane*** Grube 1860

Maldane GRUBE, 1860: 92.
TYPE SPECIES: *Maldane glebifex* Grube 1860.
SYNONYMS: *Heteromaldane* Ehlers 1908; *Sonatsa* Chamberlin 1919.
REMARKS: The genus definition was emended by LIGHT (1991).

KEY TO SPECIES:

1a. Cephalic plate with an even rim with the exception of a slight notch over the mouth......***M. malmgreni***
1b. Cephalic plate with the rim divided into three parts by a pair of deep lateral incisions.........................**2**

2a (1b). Incisions in the anal plate are lateral; dorsal margin of anal plate rounded...................................**3**
2b (1b). Incisions in the anal plate are ventrolateral; dorsal margin of anal plate pointed; ventral margin always smooth; chaetiger 5 without a dorsal halfmoon-shaped glandular blot.............................***M. arctica***

3a (2a). Cephalic keel convex, very pronounced; ventral margin of anal plate smooth, crenulated or weakly serrated; chaetiger 5 with a dorsal halfmoon-shaped glandular blot....................................***M. sarsi***
3b (2a). Cephalic keel low, flattened; ventral margin of anal plate clearly serrated, with rounded teeth; chaetiger 5 without a dorsal halfmoon-shaped glandular blot..***M. glebifex****

Maldane arctica Detinova 1985

Maldane arctica DETINOVA, 1985*b*: 1490-1492, figs. 1-2.
TYPE LOCALITY: Norwegian Sea, 65º45'N, 11º00'W, at 960 meters.
SELECTED REFERENCES: *Maldane arctica* — HARTMANN-SCHRÖDER, 1996: 463; DETINOVA, 2001: 414, figs. 1-3, map.
DISTRIBUTION: Arctic Ocean; Norwegian Sea, between 210-1480 meters; Chuckchee Sea, between 215-470 meters; Skagerrak.

****Maldane glebifex*** Grube 1860

Maldane glebifex GRUBE, 1860: 92, pl. 4 fig. 4.
TYPE LOCALITY: Martinšćica (= Martinsica) and Kraljevica (= Porto Ré), Croatia, Adriatic Sea, numerous in muddy bottoms.
SELECTED REFERENCES: *Maldane glebifex* — ARWIDSSON, 1912: 425, pl. 21 figs. 1-14; FAUVEL, 1927*a*: 199, fig. 70*a-f*; WESENBERG-LUND, 1948: 50-52, fig. 26. *Maldane glebifex* var. *transversi-maculata* — FAUVEL, 1914*f*: 256-259, pl. 23 figs. 16-23.

REFERENCES FOR PORTUGAL: BELLAN, 1960*a* (Cape Espichel); AMOUREUX, 1974*b* (off Porto); MONTEIRO-MARQUES, 1987 (continental shelf of Algarve); DEXTER, 1992 (previous records: continental shelf of Algarve); RAVARA, 1997 (off Aveiro); present work (southwestern continental shelf).

MATERIAL: SEPLAT 7 (1st part) — St. 170 (A.3092), off Vila Nova de Milfontes, 365 m, sandy mud: 1 incomplete specimen with 12 chaetigers. **SEPLAT 7 (2nd part) — St. 21 (A.4081)**, north Sines, 116 m, sand with shells: 1 complete specimen, in good condition. **St. 132 (A.3977)**, off Sines, 130 m, muddy sand: 1 complete specimen; reddish coloured. **FAUNA 1 — St. 0*A***, Galicia, off Cies Islands, Ria de Vigo, 82-96 m, unknown substrate: 3 specimens, plus tubes; 2 of the specimens are complete and in good condition, with 19 chaetigers, length up to 55 mm, width of about 2.5 mm; mouth like an inverted T; first neuropodium absent; two achaetous preanal segments, both specimens with rectum prolapsed; cephalic rim low, with a pair of deep lateral notches; cephalic keel broad, not rising above level of cephalic rim; nuchal slits short, divergent anteriorly; chaetigers 1-6 biannulate; thick glandular regions on anterior chaetigers; dorsal groove after chaetiger 6; 3 kinds of capillary notochaetae; uncini from chaetiger 2; anal plaque flattened, with crenulate ventral rim separated from smooth dorsal rim by a pair of lateral notches; colour red-brownish; third specimen incomplete, with 12 chaetigers. **St. 45*A***, Gulf of Cádiz, near Rota, 18 m, rocks with white coral: 1 incomplete specimen, with 17 chaetigers, plus tube. **St. 51*A***, Gulf of Cádiz, Placer de los Mártires, off Chiclana de la Frontera, 27-28 m, rock and mud: 5 specimens, plus tubes; specimens still inside the tubes, one incomplete; colour pale brown with dark brown spots; cephalic keel sometimes above, others below the cephalic rim; tubes covered with mud; between the external and more loose mud and the internal membrane of the tube, there is a layer of hardened mud. **St. 55*A***, Gulf of Cádiz, off Cape Trafalgar, 38-42 m, gravel: 2 specimens, plus tubes; first specimen as described, anal plaque not so clearly crenulated as other studied specimens, rectum prolapsed; with tube covered with silt; colour pale, with brown spots on anterior region; second specimen apparently with anterior region regenerating, being thinner in this region, which includes only the first chaetiger, without neuropodial chaetae; anal plaque more clearly crenulated; rectum also prolapsed. **St. 70*A***, Gulf of Cádiz, off Isla Cristina, 22 m, muddy sand: 65 specimens, one probably a juvenile, plus 6 posterior ends and tubes; specimens are smaller than the ones from stations 0*A* and 55*A* (about 40 mm long); almost all of them present the cephalic keel rising above the cephalic rim; some specimens without cephalic plate, probably regenerating the anterior region, presenting a mouth or an anterior opening, in a terminal position and directed ventrally, with the form of a valve with folds, and apparently funtional; dorsal groove present after chaetiger 6/7; glands with the same distribution than the represented in FAUVEL (1927*a*) for *M. sarsi*; anal plaques always with crenulated ventral rims, sometimes more marked, but always present; colour pale with anterior dark brown spots; some females present, with eggs; one specimen incomplete.

DISTRIBUTION: West Greenland; Atlantic coast of Europe; Mediterranean Sea; Adriatic Sea; Aegean Sea; Black Sea. On muddy bottoms. Between 19-300 meters.

REMARKS: The specimens from station 70*A* of Fauna 1 Cruise are here considered as belonging to the species *Maldane glebifex*, in spite of the fact that the cephalic keel rises above the cephalic rim. According to HARTMANN-SCHRÖDER (1996), the ventral rim of the pygidium of *Maldane sarsi* doesn't present crenulations, while other authors consider that these crenulations can be present. Some variation is present in the studied specimens in what concerns both the rise of the cephalic keel and the degree of crenulation of the ventral rim of the pygidium, which can go from clearly crenulated to almost only ondulated. After reading the comments by FAUVEL (1914*f*), I think that some confusion may be present on the descriptions given by him, and that some different species may be involved in his descriptions. As *M. glebifex* is an older species than *M. sarsi*, I prefer to refer these specimens to the first and older species.

Maldane malmgreni McIntosh 1885

Maldane malmgreni MCINTOSH, 1885*a*: 393-394, pl. 25*A* fig. 1.

TYPE LOCALITY: In the Atlantic Ocean, off south coast of Spain, westwards the Gibraltar Straits, 36º23'N, 11º18'W, 1525 fathoms (2788.9 meters), in a sea bottom of *Globigerina* ooze.

SELECTED REFERENCES: *Maldane Malmgreni* — ROULE, 1896: 456-457; RIOJA, 1931: 227.

DISTRIBUTION: Atlantic Ocean: off Gibraltar Straits and Bay of Biscay. On muddy bottoms. Between 1400-2788.9 meters.

REMARKS: This species was described with base on an anterior fragment in poor condition, measuring about 35 mm in length, and with a diameter of 5 mm . MCINTOSH (1885*a*: 393) separated the species from *Maldane sarsi* and *Chirimia biceps* (as *Maldane*) with base on the "*perfectly even rim round the anterior disk, with the exception of a slight notch over the mouth*". Other distinctive features of the species pointed by MCINTOSH (1885*a*: 393-394), seem to be less useful in order to characterize it: "*The* *first bristle segment presents only a long tuft of bristles, which are rather more slender and elongate toward the tip than in* Maldane sarsi. *(...) The next and succeeding segments bear a series of hooks which differ from those of either species mentioned. The great fang has three distinct teeth (...) above it, and the curvature between the latter and the tuft of fibres is peculiar. The fibres themselves are finely divided, that is, are more numerous and more slender than usual*." ROULE (1896) refers to the same species another anterior fragment, also in poor condition. FAUVEL (1927*a*) and RIOJA (1931) considered this species as being undeterminable, while HARTMAN (1959*a*) and LIGHT (1991*a*) considered it as being a valid species.

Maldane sarsi Malmgren 1865

Maldane Sarsi MALMGREN, 1865: 188.

TYPE LOCALITY: The species was described with base on specimens from several localities, but apparently MALMGREN (1865) didn't designate a type locality. The localities are as follows: Spitsbergen: Crossbay, at 200 fathoms (365.8 meters), Adventbay, Treurenbergbay, Isfjorden and Whalerpoint, 20-30 fathoms (36.6-54.9 meters); Finmark (Norway): Kalfjorden, 70 fathoms (128 meters), and Ulfsfjorden, 25 fathoms (45.7 meters); Bahüslan (Sweden): Lindö and Koster Island, 130 fathoms (237.7 meters); Iceland: Arnanäs.

SYNONYMS: *Clymene Koreni* Hansen 1878.

SELECTED REFERENCES: *Maldane Sarsi* — MALMGREN, 1867*a*: 99, pl. 10 fig. 57; NOLTE, 1912: 56-59, text-figs. 1-3, 12, pl. 1 fig. 22, map; FAUVEL, 1914*f*: 254-256, pl. 23 figs. 5-15, 24-25; MCINTOSH, 1915*b*: 343-348, pl. 109 fig. 16, pl. 110 fig. 8, pl. 111 fig. 8; FAUVEL, 1927*a*: 197-199, fig. 69*a-i*; RIOJA, 1931: 226-227, pl. 75. *Maldane sarsi* — ARWIDSSON, 1906: 251-261, pl. 6 figs. 192-199, pl. 10 figs. 333-338; ARWIDSSON, 1922: 43; WESENBERG-LUND, 1948: 48-50, figs. 24-25; WESENBERG-LUND, 1950*a*: 44-45, chart 53; USCHAKOV, 1955*a*: 344, fig. 126*A-D*; HARTMANN-SCHRÖDER, 1996: 463-464, fig. 225; KIRKEGAARD, 1996: 204-205, fig. 105; DETINOVA, 2001: 415, figs. 1-3, map.

REFERENCES FOR PORTUGAL: MCINTOSH, 1915*b* (as *Maldane Sarsi*; off the coast of Portugal); RIOJA, 1917*c* (previous records: Portuguese coast); DEXTER, 1992 (previous records: Arrábida).

DISTRIBUTION: Arctic Ocean; Spitsbergen; Greenland; Kara Sea; western European coast, from Norway to Portugal; North Sea, Skagerrak, Kattegat, and Øresund; Portugal; Adriatic Sea; Aegean Sea; west coast of Africa to South Africa; Indian Ocean; Japan; Western Canada; California; Antarctica. On muddy and sandy bottoms. Between 8-4400 meters.

GENUS ***Maldanella*** McIntosh 1885

Maldanella MCINTOSH, 1885*a*: 394-396.

TYPE SPECIES: *Maldanella antarctica* McIntosh 1885.

KEY TO SPECIES:

1a. Rim of the cephalic plate without any incisions; nuchal organs deeply curved, with the inner shanks of the curves nearly parallel to each other, and less than half the length of the cephalic plate........***M. harai***

1b. Rim of the cephalic plate with a deep notch in the ventral midline, where the two halves of the rim do not meet; nuchal organs short, slightly curved outwards at both ends, otherwise straight and parallel, being less than half of the length of the cephalic plate...***M. davisi***

Maldanella davisi Wesenberg-Lund 1948

Maldanella davisi WESENBERG-LUND, 1948: 35-39, figs. 17-18.

TYPE LOCALITY: Davis Strait, West Greenland, 66º35'N, 56º38'W, at 599 meters.

SELECTED REFERENCES: *Maldanella davisi* — WESENBERG-LUND, 1950*a*: 43, chart 51.

DISTRIBUTION: Davis Strait, West Greenland; Southwest of Iceland. Between 599-3229 meters.

Maldanella harai (Izuka 1902)

Clymene harai IZUKA, 1902: 111-113, pl. 3 figs. 9-12.

TYPE LOCALITY: Sagami Bay, Japan.

SYNONYMS: *Axiothea campanulata* Moore 1903.

SELECTED REFERENCES: *Maldanella Harai* — [?] FAUVEL, 1911*c*: 29-30; [?] FAUVEL, 1914*f*: 260-261, pl. 23 fig. 1; [?] FAUVEL, 1927*a*: 186, fig. 64*i-n*; FAUVEL, 1953*c*: 383-384, fig. 199*i-n*; IMAJIMA & HARTMAN, 1964: 319-320. *Maldanella harai* — MOORE, 1906*b*: 239; USCHAKOV, 1955*a*: 342, fig. 126*E-G*; AMOUREUX, 1974*b*: 143, fig. 4*M.h.*; KIRKEGAARD, 1980*b*: 92; BANSE, 1981: 635; IMAJIMA & SHIRAKI, 1982*b*: 55-56, fig. 25. *Axiothea campanulata* — MOORE, 1903: 485-487, pl. 27 figs. 97-99. *Maldanella robusta* [not Moore 1906] — BERKELEY & BERKELEY, 1952: 51, figs. 103-104.
REFERENCES FOR PORTUGAL: AMOUREUX, 1974*b* (off Aveiro; off Porto).
DISTRIBUTION: Southwest British Isles, 3820-4265 meters; off Portugal, 410-1250 meters, in muddy bottoms; [?] Bay of Biscay, in mud, at 4380 meters; Japan, between 54-1650 meters; Indian Ocean; Okhotsk Sea; British Columbia and Washington, Pacific coast of North America, 27-140 meters.
REMARKS: BANSE (1981) confirmed the synonymy of *Axiothea campanulata* Moore 1903, described from Suruga Bay in Japan, with *Maldanella harai* (Izuka 1902). However, and in opposition to what M.H. Pettibone believed, according to unpublished data (see details in BANSE, 1981), the synonymy of *Maldanella robusta* Moore 1906 with *M. harai* was not confirmed, as *M. robusta* presents the rim of the cephalic plate crenulated, while in *M. harai* it is smooth.

According to BANSE (1981: 635), the deep sea record by FAUVEL (1911*c*, 1914*f*, 1927*a*) from the Bay of Biscay may represent a different species, as "*both his text and fig. 64*n [in FAUVEL, 1927*a*] *indicate that the nuchal organs are not V-shaped as in* M. harai*; also, the posterior end of the specimen studied by Fauvel (fig. 64*l*), does not show the bell-shaped, typical pygidium of the animals available to me* [from Japan, British Columbia and Washington]".

*GENUS ***Metasychis*** Light 1991

Metasychis LIGHT, 1991:141
TYPE SPECIES: *Maldane disparidentatus* Moore 1904.

****Metasychis gotoi*** (Izuka 1902)

Maldane gotoi IZUKA, 1902: 109-111, pl. 3 figs. 1-8.
TYPE LOCALITY: Sagami Bay, Japan.
SYNONYMS: *Maldane coronata* Moore 1903; *Asychis shaccotanus* Uchida 1968.
SELECTED REFERENCES: *Asychis Gotoi* — MESNIL & FAUVEL, 1939: 16-17, fig. 11. *Asychis gotoi* — FAUVEL, 1932*b*: 205; FAUVEL, 1934: 57-59, figs. 2-3; OKUDA, 1938: 100; OKUDA, 1939*b*: 239; FAUVEL, 1953*c*: 387, fig. 200 *a-b*; USCHAKOV, 1955*a*: 344, fig. 127*A-D*; IMAJIMA & HARTMAN, 1964: 317; AMOUREUX, 1974*b*: 144, fig. 5*G1-2*; IMAJIMA & SHIRAKI, 1982*b*: 75-77, fig. 36. *Maldane coronata* — MOORE, 1903: 483-485, pl. 27 figs. 94-96. *Asychis shaccotanus* — UCHIDA, 1968: 603, fig. 7.
REFERENCES FOR PORTUGAL: AMOUREUX, 1974*b* (as *Asychis gotoi*; off Porto); present work (southwestern continental shelf).
MATERIAL: **SEPLAT 7 (2nd part) — St. 51 (A.4056)**, north Sines, 125 m, sand: 1 incomplete specimen, with 18 chaetigers and pygidium; prostomium, peristomium, and first chaetiger missing; identification confirmed by comparison with specimens from the above station. **FAUNA 1 — St. 1*A***, Gulf of Cádiz, off Huelva, 190 m, mud: 3 specimens, fitting the description given by IMAJIMA & SHIKARI (1982*b*); biggest worm 75 mm long and 4 mm wide; one of the worms with a prostomium with a medium incision; peristomium biannulated; number of serrations in prostomial posterior rim varying, but between 12-30; number of uncini varying, being 7-11 in chaetiger 2, 8-12 in chaetiger 3, 9-14 in chaetiger 4, and 26-31 in chaetiger 5 (counted in 2 specimens, different sizes); tube membranous, coated with mud; one female, with eggs; I couldn't see the presence of two median teeth much larger than the rest, in the first arc of small teeth of the uncini; the anus of the species (or at least of the observed specimens), seems to have the U-shaped anal opening directed anteriorly.
DISTRIBUTION: Japan; Indo-Pacific areas; Andaman Sea; off Portugal, 125-300 meters, in sand and mud; Gulf of Cádiz, 190 meters, in sand; Adriatic Sea; Aegean Sea; California. In Japan recorded between 40-2770 meters.

GENUS ***Microclymene*** Arwidsson 1906

Microclymene ARWIDSSON, 1906: 165-166.

TYPE SPECIES: *Microclymene acirrata* Arwidsson 1906.

KEY TO SPECIES:

1a. No anal cirri; cephalic rim poorly developed; normally 28 chaetigers, being the last one poorly developed; cephalic disc and posterior part of the body with numerous glandular spots; from chaetiger 8 fully developed long capillar notochaetae, bent up- and outwards, with a plumose thin tip........***M. acirrata***
1b. 3 anal cirri; cephalic rim well developed; 19 chaetigers and 5 preanal achaetous segments, from which the anterior 2 are quite long and clearly marked; cephalic disc and posterior part of the body with few glandular spots; posterior capillar chaetae not bent and without plumose tip; notochaetae of the last chaetiger with a thick base..***M. tricirrata***

Microclymene acirrata Arwidsson 1906

Microclymene acirrata ARWIDSSON, 1906: 166-172, pl. 4 figs. 126-134, pl. 9 figs. 289-292, pl. 11 figs. 355*a*-356.

TYPE LOCALITY: ARWIDSSON (1906) used specimens from several locations in order to describe the species, apparently without choosing a holotype. The locations are: 1) Kosterfjord, near Sneholmarne, 160-215 meters, in mud; 2) Skagerrak, "Djuphålan", 350 meters, in mud mixed with sand; 3) Trondhjemsfjord, near Rödberg, 350 meters, in mud; 4) Trondhjemsfjord, Rödberg, western bay, 50-105 meters, in sandy mud, shells and some stones.

SELECTED REFERENCES: *Microclymene acirrata* — HARTMANN-SCHRÖDER, 1996: 455-456; KIRKEGAARD, 1996: 207, fig, 106.

DISTRIBUTION: North Pacific; North Atlantic, from western Norway to Skagerrak, and northern Kattegat. Between 50-350 meters.

Microclymene tricirrata Arwidsson 1906

Microclymene tricirrata ARWIDSSON, 1906: 172-174, pl. 4 figs. 135*a-c*, pl. 9 fig. 293, pl. 11 figs. 357-358, pl. 12 figs. 359-360.

TYPE LOCALITY: Trondhjemsfjord (Norway), Rödberg, western bay, at 270 meters, in mud with fine sand and some shell fragments.

SELECTED REFERENCES: *Microclymene tricirrata* — WESENBERG-LUND, 1951: 92, fig. 144; DETINOVA, 1985*a*: 125-126, fig. 3*к-л*.

DISTRIBUTION: Norway, at 270 meters, in muddy bottoms; Iceland, 38-1565 meters.

GENUS ***Micromaldane*** Mesnil 1897

Micromaldane MESNIL, 1897*b*: 146-148.

TYPE SPECIES: *Micromaldane ornitochaeta* Mesnil 1897.

REMARKS: A key and a comparative table for all the hitherto known species of *Micromaldane* are given in ROUSE (1990*a*). The same author states that a maximum number of chaetigers is apparently reached by each species, being used as a specific taxonomic character. In the case of the single species known from European waters, *Micromaldane ornitochaeta* Mesnil 1897, this maximum number is of 17 chaetigers.

Micromaldane ornitochaeta Mesnil 1897

Micromaldane ornitochœta MESNIL, 1897*b*: 146-148, text-figs. 1-2, pl. 6 figs. 1-4.

TYPE LOCALITY: Anse St-Martin (Normandy, France), among *Lithothamnion polymorphum*, at the littoral zone.

SELECTED REFERENCES: *Micromaldane ornitochaeta* — FAUVEL, 1927*a*: 193-194, fig. 67*l-r*; MCINTOSH, 1923*a*: 497-498, pl. 136 fig. 18; RIOJA, 1925*a*: 22, figs. 1-3; RIOJA, 1931: 214-216, pls. 69-70; DUMITRESCO, 1962: 63-64; ROUSE, 1990*a*: table 1.

REFERENCES FOR PORTUGAL: MONTEIRO-MARQUES, 1987 (continental shelf of Algarve); DEXTER, 1992 (previous records: continental shelf of Algarve).

DISTRIBUTION: English Channel; west coast of Ireland; Irish Sea; northern coast of Spain; Portugal; Adriatic Sea; Black Sea. Among algae, in Laminarian roots, and on muddy bottoms. Intertidal to about 78 meters.

GENUS *Nicomache* Malmgren 1865

Nicomache MALMGREN, 1865: 189.

TYPE SPECIES: *Sabella lumbricalis* Fabricius 1780.

REMARKS: The genus *Nicomache* was divided in two subgenera by ARWIDSSON (1906), with base on the morphology of the anal funnel (see the key below): *Nicomache* Malmgren 1865, and *Loxochona* Arwidsson 1906.

KEY TO SUBGENERA AND SPECIES:

1a. Anal funnel cut-off diagonally, being ventrally distictly longer than dorsally.....................**SUBGENERA *Loxochona***...**2**
1b. Anal funnel terminally almost straight, dorsally and ventrally almost of the same length.... **SUBGENERA *Nicomache***...**3**

2a (1a). Neurochaetae of the first 3 chaetigers acicular, with slightly curved tip; uncini of 4th chaetiger and superior uncini of the following chaetigers without gular bristles; 2-3 long capillary notochaetae, strongly spinous, in chaetigers 8-20; anal funnel conspicuously longer ventrally, bottom of the anal disc very steep; 23 chaetigers, one preanal achaetous segment; anterior portion of the body weakly pigmented, porterior portion very pigmented...***N. (L.) trispinata***
2b (1a). Neurochaetae of the first 4 chaetigers acicular; 5th chaetiger with reduced rostrate hooks; all hooks without gular bristles; 2-3 long capillary notochaetae, weakly spinous, in chaetigers 7-18; anal funnel only slightly loger ventrally, bottom of the anal disc weakly steep; 22 chaetigers, one preanal achaetous segment; anterior portion of body very pigmented, especially chaetigers 5 and 6, posterior portion weakly pigmented...***N. (L.) quadrispinata***

3a (1b). Nuchal slits relatively large, like an inverted J to S-shaped; 2-3 preanal achaetous segments; adults without ocelli..***N.(N.) lumbricalis***
3b (1b). Nuchal slits short or relatively long, from slightly curved to semi-circular; 1 preanal achaetous segment; adults with ocelli...**4**

4a (3b). Nuchal slits short, from slightly curved to semi-circular; longitudinal cephalic keel between the nuchal organs reduced or little developed; acicular hooks with very slender tips............***N. (N.) personata***
4b (3b). Nuchal slits moderately long, from slightly curved to semi-circular; cephalic keel between nuchal organs conspicuous; acicular hooks thick, with blunt tips..***N. (N.) minor***

Nicomache (Loxochona) quadrispinata Arwidsson 1906

Nicomache (Loxochona) quadrispinata ARWIDSSON, 1906: 108-113, pl. 3 figs. 80-84, pl. 5 figs. 179-180, pl. 8 figs. 262-267.

TYPE LOCALITY: ARWIDSSON (1906) used specimens from several locations around Spitsbergen and East Greenland, in order to describe the species, apparently without choosing a holotype. The locations are: 1) 74º55'N, 17º59'W, 350 meters, in mud with some sand and small stones; 2) 74º35'N, 18º23'W, southern the small Island Pendulum, 18-21 meters, in sandy mud; 3) 74º10'N, 20º8'W, Clavering Island, 25-40 meters, in mud with many shells and some stones; 4) 72º28'N, 21º48'W, 180 meters, in mud, with some small stones; 5) 79º58'N, 9º30'E, 425 meters, in grey mud with stones; 6) 75º58'N, 13º18'E, 350 meters, in grey mud with worm tubes; 7) King Karl Land, Rivalensund (about 78ºN, 27ºE), 100-110 meters, in fine mud with big stones.

SELECTED REFERENCES: *Nicomache (Loxochona) quadrispinata* — WESENBERG-LUND, 1948: 27-29, figs. 11*a-c*, 12-13; IMAJIMA & SHIRAKI, 1982*a*: 39-42, fig. 17; DETINOVA, 2001: 417, figs. 1-3, map. *Nicomache quadrispinata* — WESENBERG-LUND, 1950*a*: 41-42, chart 50.

DISTRIBUTION: Arctic Ocean: Greenland; Spitsbergen; northern Iceland; Japan. Between 18-1000 meters.

Nicomache (Loxochona) trispinata Arwidsson 1906

Nicomache (Loxochona) trispinata ARWIDSSON, 1906: 104-108, pl. 2 figs. 74-77, pl. 3 figs. 78-79, pl. 8 figs. 257-261, pl. 11 fig. 349.

TYPE LOCALITY: ARWIDSSON (1906) used specimens from several locations in the Trondhjemsfjord (Norway), in order to describe the species, apparently without choosing a holotype. The locations are: 1) Rödberg, at the western and eastern bays, from 50 to 125 meters, in mud with some sand, and 160 meters, in a dead *Lophohelia*; 2) Indals Bay, around 105 meters, and between Rödberg and the last locality, at about 350 meters, in mud with shells; 3) Skjörnfjord, in several localities, in mud with shells: south Brackstadland, at 160 meters; Schalenkies, in a shell of a dead *Cyprina*; Örlands Bay, at about 90 meters, in muddy sand with shells; South Skjeghaugflua, at 30-50 meters, in fine sand and shells.

SELECTED REFERENCES: *Nicomache (Loxochona) trispinata* — FAUVEL, 1926*c*: 475; FAUVEL, 1927*a*: 192, fig. 67*a-k*; HARTMANN-SCHRÖDER, 1996: 465. *Nicomache trispinata* — KIRKEGAARD, 1996: 211-212, fig. 109.

REFERENCES FOR PORTUGAL: AMOUREUX, 1974*b* (as *Nicomache (Loxochone) trispinata*; off Aveiro; off Porto).

DISTRIBUTION: Arctic Ocean; North Atlantic to Mediterranean Sea; Aegean Sea; English Channel; North Sea, Skagerrak, Kattegat and Øresund. On sandy bottoms, in rock crevices, and among algae and shells. Between 30-150 meters.

Nicomache (Nicomache) lumbricalis (Fabricius 1780)

Sabella lumbricalis FABRICIUS, 1780: 374-375.

TYPE LOCALITY: West Greenland, probably vicinity of Fedrikshåb, "*in profundo, lapidum tam inferiori quam superiori paginae adhaerens et praecipue fissuras occupans*".

SYNONYMS: *Nicomache* (?) *benthaliana* McIntosh 1885; *Nicomache lumbricalis borealis* Arwidsson 1906; *Nicomache carinata* Moore 1906.

SELECTED REFERENCES: *Nicomache lumbricalis* — MALMGREN, 1867*a*: 99, pl. 10 fig. 60; ARWIDSSON, 1906: 86-93, pl. 8 figs. 244-245; FAUVEL, 1927*a*: 190-191, fig. 66*a-i*; RIOJA, 1931: 210-212, pl. 64 figs. 11-18; WESENBERG-LUND, 1948: 23-27, figs. 10, 11*d-f*; HARTMAN, 1948*b*: 42; WESENBERG-LUND, 1950*a*: 41, chart 50; BERKELEY & BERKELEY, 1952: 54-55, figs. 111-112; PETTIBONE, 1954: 305-306, fig. 34*i-j*; USCHAKOV, 1955*a*: 336, fig. 124*A-D*; IMAJIMA, 1964: 248-249, figs. 39-41; DAY, 1967: 621, fig. 30.1.*i-o*; KIRKEGAARD, 1996: 208-209, fig. 107; DETINOVA, 2001: 416, figs. 1-4, map. *Nicomache (Nicomache) lumbricalis* — IMAJIMA & SHIRAKI, 1982*a*: 35-37, fig. 14; HARTMANN-SCHRÖDER, 1996: 466-467, fig. 226. *Nicomache lumbricalis borealis* — ARWIDSSON, 1906: 94-100, pl. 2 figs. 59-67, pl. 8 figs. 246-251. *Nicomache lumbricalis* var. *borealis* — NOLTE, 1912: 27-31, text-figs. 6-7, 23-25, pl. 1 figs. 9-10, pl. 2 fig. 30, map; FAUVEL, 1914*f*: 261-262, pl. 23 fig. 2; ARWIDSSON, 1922: 6-7. *Nicomache* (?) *benthaliana* — MCINTOSH, 1885*a*: 400, pl. 46 fig. 8, pl. 24*A* fig. 21. *Nicomache carinata* — MOORE, 1906*b*: 242-246, pl. 11 figs. 36-39, pl. 12 figs. 43-44.

DISTRIBUTION: North Pacific: Western Canada, California, and west coast of Japan; Labrador; Arctic Ocean, Greenland; Spitsbergen; Iceland; White Sea; Kara Sea; Bering Sea; west European coast, including Ireland, Norway, North Sea, English Channel, Skagerrak, Kattegat, and Øresund; Aegean Sea; West Africa to South Africa; subantarctic islands; Antarctica. On muddy and sandy bottoms. Between 5-5000 meters.

Nicomache (Nicomache) minor Arwidsson 1906

Nicomache minor ARWIDSSON, 1906: 100-104, pl. 2 figs. 68-73, pl. 8 figs. 252-256.

TYPE LOCALITY: ARWIDSSON (1906) used specimens from several locations in Norway, in order to describe the species, apparently without choosing a holotype. The locations are: 1) Exterior region of Trondhjemsfjords, Skjörnfjord, in *Lithothamnion norvegicum* (Aresch.) Kjellm. *f. nodulosa* Fosl. in a bottom of mud, at the Örlands Bay at 8-12 meters, and in a similar bay at 4-5 meters, under a big stone; 2) Finmark, Karlsö, in *Lithothamnion*; 3) northern West Spitsbergen, Moselbay, in *Lithothamnion*, at 34 meters.

SELECTED REFERENCES: *Nicomache minor* — USCHAKOV, 1955*a*: 338, fig. 124*E*. *Nicomache (Nicomache) minor* — IMAJIMA & SHIRAKI, 1982*a*: 39, fig. 16; HARTMANN-SCHRÖDER, 1996: 467, fig. 227; DETINOVA, 2001: 416, figs. 1-2.

DISTRIBUTION: West Norway; Kieler Bight; Arctic Ocean; Okhotsk Sea; Bering Sea; Sea of Japan. On muddy sand and under stones. Between 3-313 meters.

Nicomache (Nicomache) personata Johnson 1901

Nicomache personata JOHNSON, 1901: 419-420, pl. 13 figs. 134-139.

TYPE LOCALITY: Alki Point, near Seattle (Washington, Pacific coast of USA), probably between and under stones.

SYNONYMS: *Nicomache (Nicomache) maculata* Arwidsson 1911.

SELECTED REFERENCES: *Nicomache (Nicomache) personata* — ARWIDSSON, 1922: 7, pl. 1 figs. 5-6; HARTMANN-SCHRÖDER, 1996: 468-469, fig. 228. *Nicomache personata* — HARTMAN, 1948*b*: 41-42, fig. 11 *d-g*; BERKELEY & BERKELEY, 1952: 54, figs. 109-110; IMAJIMA & SHIRAKI, 1982*a*: 37-39, fig. 15; KIRKEGAARD, 1996: 209-211, fig. 108. *Nicomache (Nicomache) maculata* — ARWIDSSON, 1911*a*: 209-214, pl. 18 figs. 13-19, pl. 19 figs. 27-30. *Nicomache maculata* — MCINTOSH, 1915*b*: 302-306, text-fig. 133, pl. 92 fig. 5, pl. 109 fig. 2, pl. 110 fig. 13; FAUVEL, 1927*a*: 191-192, fig. 66*k-r*.

REFERENCES FOR PORTUGAL: [?] MONTEIRO-MARQUES, 1987 (as *?Nicomache maculata*; continental shelf of Algarve); [?] DEXTER, 1992 (as *Nichomache maculata?*; previous records: continental shelf of Algarve).

DISTRIBUTION: Pacific coast of North America, from southern Alaska to Vancouver; Japan; Arctic Ocean; Norway¸ North Sea; Irish Sea; Ireland; English Channel. On sandy and muddy bottoms, between laminarian roots, and occasionally under stones. Intertidal to 500 meters.

GENUS *Notoproctus* Arwidsson 1906

Notoproctus ARWIDSSON, 1906: 51.

TYPE SPECIES: *Notoproctus oculatus* Arwidsson 1906.

KEY TO SPECIES:

1a. Anterior region of body dark brown coloured, especially on the dorsal and lateral regions; 19 chaetigers; chaetigers 1-4 with strong acicular spines; tubes weakly attached or free................***N. oculatus***

1b. Anterior region of body not dark brown coloured; (17-)18 chaetigers; chaetigers 1-4 with thin acicular spines; tubes probably attached..***N. oculatus minor***

1c. At least the bigger specimens dark brown coloured; (17-)18 chaetigers; chaetigers 1-4 of smaller specimens with more or less reduced hooks or uncini, bigger specimens gradually mainly with thin acicular spines; tubes probably free..***N. oculatus arctica***

Notoproctus oculatus Arwidsson 1906

Notoproctus oculatus ARWIDSSON, 1906: 52-55, pl. 1 figs. 30*a*-34, pl. 7 figs. 227-230, pl. 11 fig. 345.

TYPE LOCALITY: ARWIDSSON (1906) used specimens from several locations in order to describe the species, apparently without choosing a holotype. The locations are: 1) Gullmarfjord, Bohuslän (Sweden), on very shallow water, on a bottom of sand with shell fragments; 2) Styrsö, Kosterfjord (Sweden); 3) Kosterfjord (Sweden), SW the south end of "*Stora Sneholmen*", 50-100 meters, on a rocky bottom, probably on a patch with sandy mud; 4) Hjeltefjord, near Bergen (Norway), 80 meters, on sand.

SELECTED REFERENCES: *Notoproctus oculatus* — AMOUREUX, 1976*b*: 26; DETINOVA, 1985*a*: 126; DETINOVA, 2001: 418, figs. 1-2, map.

REFERENCES FOR PORTUGAL: AMOUREUX, 1974*b* (off Aveiro; off Porto); AMOUREUX, 1987 (off Porto).

DISTRIBUTION: From Iceland and West Norway to West Sweden, between very shallow water and 2667 meters, on sandy and muddy bottoms; Portugal; Cape Spartel, Morocco coast of the Gibraltar Strait, at 160 meters; Western Mediterranean Sea.

Notoproctus oculatus arctica Arwidsson 1906

Notoproctus oculatus var. *arctica* ARWIDSSON, 1906: 57-60, pl. 1 fig. 38, pl. 7 figs. 231-234.

TYPE LOCALITY: ARWIDSSON (1906) used specimens from several stations from off northern Norway, around Svalbard, and west Greenland, in order to describe this species, apparently without choosing a holotype. The locations are: 1) 80º40'N, 4º5'E, 610 meters, on fine mud; 2) 80ºN, 4º33'E, 1690 meters; 3) 77º25'N, 27º30'E, 160 meters, on yellow brownish mud; 4) Belsund (West Spitsbergen), east side of Enders Island, 42 meters, on black mud; 5) 75º58'N, 13º18'E, 350 meters, on grey mud; 6) 73º3'N, 18º30'E, 410 meters, on grey mud; 7) 72º10'N, 20º37'E, 355-410 meters, on mud; 8) 71º5'N, 20ºE, 225 meters, on mud with gravel; 9) 74º55'N, 17º59'W, 350 meters, on mud with some sand and stones; 10) 72º56'N, 24º49'W, 125 meters, on grey mud with some stones and sand; 11) Godhavn (West Greenland), 125 meters, on mud.

SELECTED REFERENCES: *Notoproctus oculatus* var. *arctica* — WESENBERG-LUND, 1948: 18-19, fig. 7*c-d*; WESENBERG-LUND, 1950*a*: 40, chart 49.

DISTRIBUTION: Davis Strait, West Greenland and East Greenland; Spitsbergen; Finmark, Norway; Denmark Strait; Barents Sea. On muddy bottoms. Between 42-2258 meters.

Notoproctus oculatus minor Arwidsson 1906

Notoproctus oculatus var. *minor* ARWIDSSON, 1906: 56-57, pl. 1 figs. 35-37.
TYPE LOCALITY: Örlandsbugten, in Skjörnfjord, Trondhejmsfjord (Norway), at 50 meters, on a bottom of shells and stones, and south Skjeghaugflua (Norway?), between 30-50 meters, on a bottom of shells.
SELECTED REFERENCES: *Notoproctus oculatus* var. *minor* — WESENBERG-LUND, 1948: 17-18, figs. 6, 7*a-b*; WESENBERG-LUND, 1950*a*: 40, chart 49.
DISTRIBUTION: Davis Strait, West Greenland; Norwegian west coast; North of Iceland. On bottoms of shells and stones. Between 30-932 meters.

*GENUS ***Petaloproctus*** Quatrefages 1866

Petaloproctus QUATREFAGES, 1866*b*: 247.
TYPE SPECIES: *Petaloproctus terricolus* Quatrefages 1866.
SYNONYMS: *Nicomachella* Levinsen 1884.

KEY TO SPECIES:

1a. Last 6-7 preanal chaetigers with a middorsal fleshy papilla or appendix, very prominent, ending in a lobe pointing backwards; 22 chaetigers; anal plate with a smooth margin, sometimes with a small midventral notch; anal cone present..***P. terricolus****
1b. Middorsal appendixes on last preanal chaetigers not present...**2**

2a (1b). 20 chaetigers; anal plate with a serrated margin; anal cone present..................................***P. tenuis***
2b (1b). 21 chaetigers; anal plate with a smooth margin; anal cone absent.................................***P. borealis***

Petaloproctus borealis Arwidsson 1906

Petaloproctus tenuis var. *borealis* ARWIDSSON, 1906: 118-122, pl. 3 figs. 85-90, pl. 8 figs. 268-272.
TYPE LOCALITY: ARWIDSSON (1906) used specimens from several stations in order to describe this species, apparently without choosing a holotype. The locations are: 1) Öresund, Knæhaken, 21-36 meters, under *Modiola*; 2) 56º30'N, 12º35'E, 21 meters, in shells and stones; 3) 1 to 1.5' north of the anterior position, 24 meters, among shells; 4) Gullmarfjord; 5) between Skarfsætet and Ellskär, 20 meters, under *Sabellaria* on shells; 6) Islandsberg, on *Cyprina* shells; 7) Gåsö rænna, WSW Löken, 25-27 meters, on *Cyprina* shells, generally under *Sabellaria*; 8) SW region of Flatholmen; 9) SE Tistholmen, around 50 meters; 10) Trondhjemsfjord, Sanönen, east side, 9-18 meters, among algae, shells, muddy sand; 11) Trondhjemsfjord, Skjörnfjord, Örlands Bay, 8-12 meters, in *Lithothamnion norvegicum* f. *nodulosa*; 12) Trondhjemsfjord, Örlands Bay, 40-90 meters, among shells; 13) Trondhjemsfjord, Rödberg, western bay, 35-70 meters, among stones and shells; 14) south Hafenpier, 35-70 meters, among stones and shells; 15) south the point of Hafenpiers, 54-90 meters, among stones, shells and sand; 16) about 2'20" east Rödberg, 18-70 meters, in shells, sand and stones; 17) Malvik, 9 meters, among shells; 18) Öresund, north Hallands Væderö.
SELECTED REFERENCES: *Petaloproctus tenuis* var. *borealis* — USCHAKOV, 1955*a*: 339, fig. 125*H*. *Petaloproctus tenuis borealis* — KIRKEGAARD, 1996: 212-213, fig. 110. *Petaloproctus borealis* — IMAJIMA & SHIRAKI, 1982*a*: 44-46, fig. 19; HARTMANN-SCHRÖDER, 1996: 470-471, fig. 229.
DISTRIBUTION: Pacific coast of North America; Okhotsk Sea; Japan; Northeastern Atlantic, including northern North Sea, Skagerrak, Kattegat, northern Øresund. On muddy bottoms. Between 8-250 meters, but recorded in Japan at 1680 meters.

Petaloproctus tenuis (Théel 1879)

Maldane tenuis THÉEL, 1879: 57, pl. 4 figs. 52-54.
TYPE LOCALITY: Möller Bay, west coast of Novaya Zemlya, Arctic Ocean, 8-35 meters, on sand and stones.
SELECTED REFERENCES: *Nicomachella tenuis* — LEVINSEN, 1884: 146-147. *Petaloproctus tenuis* — ARWIDSSON, 1906: 114-118, pl. 6 figs. 190*a*; DETINOVA, 2001: 417, fig. 1, map.

DISTRIBUTION: Arctic Ocean: East Greenland; Spitsbergen; Novaya Zemlya. On mud, sand, and stones. Between 3-40 meters.

****Petaloproctus terricolus*** Quatrefages 1866

Petaloproctus terricola QUATREFAGES, 1866*b*: 247.
TYPE LOCALITY: France.
SYNONYMS: [?] *Clymene spatulata* Grube 1855; *Maldane Cristagalli* Claparède 1869.
SELECTED REFERENCES: *Petaloproctus terricola* — SAINT-JOSEPH, 1894: 144-147, pl. 7 figs. 180-188; RIOJA, 1917*c*: 39; MCINTOSH, 1923*a*: 496-497, pl. 136 fig. 17; FAUVEL, 1926*c*: 475-476; FAUVEL, 1927*a*: 194-195, fig. 68*a-i*; RIOJA, 1931: 218-222, pl. 72. *Maldane Cristagalli* — CLAPARÈDE, 1869: 197-198, pl. 26 fig. 1. *Petaloproctus* (?) *Cristagalli* — ORLANDI, 1898: 273-274, pl. 5 fig. 26. [?] *Clymene spatulata* — GRUBE, 1855: 114-115, pl. 4 figs. 12-13.
REFERENCES FOR PORTUGAL: Present work (southwestern continental shelf).
MATERIAL: SEPLAT 6 — St. 173 (A.2647), off Arrifana, 130 m, sand: 1 posterior fragment, only with the 4 last chaetigers and the pygidium; this posterior region is exactly as the described by FAUVEL (1927*a*); the two chaetigers before the last one have a dorsal tubercle, located between the notopodia and directed backwards; notochaetae from third chaetiger before the end very long, as described.
DISTRIBUTION: English Channel; Atlantic coast of Europe; Mediterranean Sea; Adriatic Sea; Aegean Sea; Black Sea. On muddy sand and mud. On shallow water.

*GENUS ***Praxillella*** Verrill 1881

Praxillella VERRILL, 1881: 298.
TYPE SPECIES: *Praxilla prœtermissa* Malmgren 1865.
SYNONYMS: *Praxilla* Malmgren 1865 [not Reichenbach 1854 (Aves)]; *Iphianissa* Kinberg 1867.
REMARKS: VERRILL (1881) proposed the new name *Praxillella* to substitute the name *Praxilla* Malmgren 1865 [type species *Praxilla praetermissa* Malmgren 1865], previously employed in Aves by Reichenbach, in 1854. Later VERRILL (1900) designated as type species of *Praxillella* the species *Clymene gracilis* M. Sars 1861, and included it as a subgenus of *Euclymene* Verrill 1900, stating however that if *Euclymene* could not be distinguished as a subgeneric group, *Praxillella* should include the entire genus, as it was the oldest name. However, and according to the ICZN, the type species of the genus should remain as being *Praxilla praetermissa*, and this will be followed here.

The genus *Pseudoclymene* Arwidsson 1906, with *Clymene quadrilobata* M. Sars 1856 as the type species, was considered by some authors (*e.g.*: HARTMANN-SCHRÖDER, 1996; KIRKEGAARD, 1996) as a junior synonym of *Praxillella* Verrill 1881, while others considered it as valid (*e.g.*: MCINTOSH, 1915*b*; FAUCHALD, 1977*a*; DETINOVA, 2001). *Pseudoclymene* is here considered as a valid genus, but due to its great resemblance with specimens of *Praxillella*, its type species, *Pseudoclymene quadrilobata*, is included in the below key of *Praxillella* species.

KEY TO SPECIES:

1a. Prostomium prolonged forward as a finger-like projection; with 4 preanal achaetous segments, being the first 2 longer..**2**
1b. Prostomium bluntly rounded at the anterior margin...**3**

2a (1a). Middorsal notch between the cephalic borders absent; ocelli absent; neuropodia of the first 3 chaetigers with reduced rostrate uncini..***P. gracilis****
2b (1a). Distinct middorsal notch between the cephalic borders; ocelli present; neuropodia of the first 3 chaetigers with uncini with a prolonged main tooth..***P. gracilis borealis***

3a (1b). 17 chaetigers and 3 preanal achaetous segments, with the same size than the preceeding chaetous segments; neuropodia of the first 3 chaetigers with reduced rostrate uncini; anal funnel surrounded by about 25 long cirri, equal in size except for the ventral one, which is twice as long; glandular spots dispersed at chaetigers 4-8, and posteriorly to parapodia, as a half-moon................................***P. lophoseta***
3b (1b). More than 17 chaetigers...**4**

4a (3b). 18 chaetigers and 3 preanal achaetous segments; prostomium with ocelli; neuropodia of the first 3 chaetigers with reduced rostrate uncini; anal cone protrudes considerably, anus is clearly dorsally displaced; glandular spots dispersed at chaetigers 3-7..***P. affinis****
4b (3b). 19 chaetigers; anus terminal...**5**

5a (4b). 19 (?) chaetigers and 3 preanal achaetous segments; prostomium without ocelli; anal cone protudes considerably; 3 very long anal cirri; nuchal slits extend through most of the length of the cephalic plate; neuropodia of the first 3 chaetigers acicular...***P. trifila***
5b (4b). 19 chaetigers and 4-5 preanal achaetous segments; prostomium may or may not have ocelli; anal cone does not extend far beyond the anal cirri...**6**

6a (5b). 4-5 preanal achaetous segments; nuchal slits extend as far as its lateral wing incision; prostomium without ocelli; neuropodia of the first 3 chaetigers with reduced rostrate uncini; chaetigers 4-8 with a clear band in front of the parapodia..***P. praetermissa***
6b (5b). 5 preanal achaetous segments; nuchal slits short, only along the anterior third of the prostomium; prostomium with ocelli; neuropodia of the first 3 chaetigers as acicular spines; chaetigers 3-8 with glandular spots irregularly distributed...***Pseudoclymene quadrilobata***

****Praxillella affinis*** (M. Sars *in* G.O. Sars 1872)

Clymene affinis M. SARS *in* G.O. SARS, 1872*a*: 412.

TYPE LOCALITY: Islands Bollaerene, Oslofjorden, Norway, 20-30 fathoms (36.6-54.9 meters).

SELECTED REFERENCES: *Praxillella affinis* — ARWIDSSON, 1906: 177-183, pl. 4 figs. 145-152, pl. 9 figs. 297-301, pl. 12 figs. 364-366; ARWIDSSON, 1911*a*: 215; MCINTOSH, 1915*b*: 323, pl. 108 fig. 8; ARWIDSSON, 1922: 28; IMAJIMA & SHIRAKI, 1982*b*: 60-61; HARTMANN-SCHRÖDER, 1996: 456; KIRKEGAARD, 1996: 214-215, fig. 111; DETINOVA, 2001: 409, figs. 1-3, map. *Clymene (Praxillella) affinis* — FAUVEL, 1927*a*: 180-181, fig. 62*f-l*.

REFERENCES FOR PORTUGAL: DEXTER, 1992 (previous records: Ria Formosa); present work (southwestern continental shelf).

MATERIAL: SEPLAT 7 (2nd part) — St. 290 (A.3885), off Arrifana, 371 m, sand: 1 complete specimen, with 18 chaetigers, broken in 4 pieces; anterior fragment with prostomium and 9 chaetigers; cephalic rim well developed, divided by two postero-lateral and one posterior notch; first 3 chaetigers with 2, 2, and 3 ventral rostrate uncini, respectively, without gular bristles; pygidium with about 12 cirri, of which the mid-ventral one is the longest; pygidium preceeded by 3 achaetous segments; anus protuberant, with a dorsal anal valve; anterior middle fragment with 7 chaetigers; posterior middle fragment with 2 chaetigers.

DISTRIBUTION: West Atlantic, from Europe to South Africa; Ireland, North Sea, Skagerrak, Kattegat; Mediterranean Sea; Adriatic Sea; Aegean Sea; Red Sea; [?] Japan. On muddy sand and mud. Between 11-230 meters.

****Praxillella gracilis*** (M. Sars 1862)

Clymene gracilis M. SARS, 1862*c*: 91-92.

TYPE LOCALITY: Florø and Manger, Norway, between 20-40 fathoms (36.6-73.2 meters).

SELECTED REFERENCES: *Praxilla gracilis* — MALMGREN, 1867*a*: 100, pl. 11 fig. 63. *Clymene (Praxillellla) gracilis* — FAUVEL, 1927*a*: 178-179, fig. 62*m-p*; RIOJA, 1931: 204-206, pl. 66 figs. 4-8; MESNIL & FAUVEL, 1939: 4-5, fig. 1. *Praxillella gracilis* — ARWIDSSON, 1906: 183-191, pl. 4 figs. 153-155, pl. 5 figs. 156-158, pl. 9 figs. 302-307, pl. 12 fig. 367; MCINTOSH, 1915*b*: 324-327, text-fig. 134, pl. 101 fig. 5, pl. 109 fig. 12; WESENBERG-LUND, 1948: 39-41, fig. 19; WESENBERG-LUND, 1950*a*: 43, chart 52; BERKELEY & BERKELEY, 1952: 50, figs. 101-102; IMAJIMA & SHIRAKI, 1982*b*: 61-63, fig. 28; DETINOVA, 2001: 409-410, figs. 1-3, map.

REFERENCES FOR PORTUGAL: AMOUREUX, 1974*b* (as *Clymene (Praxillella) gracilis*; off Aveiro; off Porto); AMOUREUX, 1987 (off Aveiro; off Porto); DEXTER, 1992 (previous records: Ria Formosa); present work (southwestern continental shelf).

MATERIAL: SEPLAT 7 (2nd part) — St. 272 (A.3861), off Praia de Odeceixe, 305 m, muddy sand: 1 incomplete specimen with 13 chaetigers plus tube; cephalic rim well developed, with a middorsal cleft and a pair of deep postlateral incisions; prostomium subconical, extending into a finger-like projection; nuchal organs straight, long and parallel; first three neuropodia with one thick spine with fang curved almost at right angle to the shaft; the three have about 3 secondary teeth, and no gular bristles; remaining chaetigers with about 5 uncini in a single row; each uncinus with about 4 teeth in a row and small accessory teeth above the main fang; notopodial chaetae with slender capillaries with narrow wings and laterally shorter hirsute chaetae; proboscis everted, with big papillae on the proximal region.

DISTRIBUTION: Davis Strait, East Greenland; West Greenland; Spitsbergen; Siberia; west coast of Scandinavia; from North Sea and British Isles to Mediterranean Sea, including English Channel and European Atlantic coast; Adriatic Sea; Aegean Sea; Pacific coast of North America, from western Canada to Southern California; Japan. On muddy and sandy bottoms. Between 35-1895 meters, but recorded in Japan at 2500 meters.

Praxillella gracilis borealis Nolte 1912

Praxillella gracilis var. *borealis* NOLTE, 1912: 38-42, text-fig. 11, pl. 1 figs. 12-13, pl. 2 fig. 32, map.

TYPE LOCALITY: North Sea, 58º31'N, 1º18'W, at 113 meters, in fine grey sand with mud.

SELECTED REFERENCES: *Praxillella gracilis* var. *borealis* — ARWIDSSON, 1922: 25-28, text-figs. 9-13, pl. 1 figs. 20-21.

DISTRIBUTION: British Isles; North Sea; Adriatic Sea. Recorded at 113 meters. In sand with mud.

Praxillella lophoseta (Orlandi 1898)

Clymene lophoseta ORLANDI, 1898: 267-268, pl. 5 figs. 10-16.

TYPE LOCALITY: Gulf of Naples (Italy), at about 20 meters.

SELECTED REFERENCES: *Clymene lophoseta* — FAUVEL, 1926*c*: 474. *Clymene (Praxillella) lophoseta* — FAUVEL, 1927*a*: 181, fig. 62*q-u*.

REFERENCES FOR PORTUGAL: MONTEIRO-MARQUES, 1987 (as *Clymene (Praxillela) lophoseta*; continental shelf of Algarve); DEXTER, 1992 (as *Clymene (Praxillella) lophoseta*; previous records: continental shelf of Algarve).

DISTRIBUTION: Gulf of Naples, at about 20 meters; Adriatic Sea; Aegean Sea; Portugal.

REMARKS: FAUVEL (1927*a*) points the fact that this species is quite similar to *Praxillella affinis* (M. Sars *in* G.O. Sars 1872), being possibly the same species.

Praxillella praetermissa (Malmgren 1865)

Praxilla prœtermissa MALMGREN, 1865: 191-192.

TYPE LOCALITY: Bahüslan and Koster Island, Sweden, and Ramfjorden, Kalfjorden and Ulfsfjorden, Finmark, Norway, 20-100 fathoms (36.6-182.9 meters), in muddy bottoms.

SYNONYMS: [?] *Clymene intermedia* Ørsted 1843.

SELECTED REFERENCES: *Praxillella prœtermissa* — MALMGREN, 1867*a*: 100, pl. 11 fig. 62; FAUVEL, 1914*f*: 262-263, pl. 23 figs. 3-4; MCINTOSH, 1915*b*: 327-330, pl. 100 fig. 21, pl. 109 fig. 13; WESENBERG-LUND, 1948: 41-44, figs. 20-21; WESENBERG-LUND, 1950*a*: 43-44, chart 52. *Praxillella praetermissa* — ARWIDSSON, 1906: 192-204, pl. 4 figs. 136*a*-143, pl. 9 figs. 294-296, pl. 12, figs. 361-363; NOLTE, 1912: 42-46, pl. 1 figs. 14-16, map; ARWIDSSON, 1922: 28-29, pl. 1 figs. 22-23; DAY, 1967: 642-644, fig. 30.7.*i-l*; BANSE, 1981: 635-636, fig. 1; IMAJIMA & SHIRAKI, 1982*b*: 63-65, fig. 29; HARTMANN-SCHRÖDER, 1996: 456-458, fig. 222; KIRKEGAARD, 1996: 215-217, fig. 112; DETINOVA, 2001: 410-411, figs. 1-5, map. *Clymene (Praxillella) praetermissa* — FAUVEL, 1927*a*: 179-180, fig. 62*a-e*. *Clymene (Praxillella) Praetermissa* — RIOJA, 1931: 206-207, pl. 66 figs. 1-3.

REFERENCES FOR PORTUGAL: MONTEIRO-MARQUES, 1987 (as *Clymene (Praxillela) praetermissa*; continental shelf of Algarve); DEXTER, 1992 (as *Clymene (Praxillella) praetermisssa*; previous records: continental shelf of Algarve).

DISTRIBUTION: Davis Strait, West Greenland; East Greenland; Arctic Ocean; Spitsbergen; Kara Sea; Novaya Zemlya; White Sea; North Pacific; West European Atlantic, from Scandinavia, Iceland, and Ireland to Mediterranean Sea; Adriatic Sea, Marmara Sea; Aegean Sea; English Channel, North Sea, Skagerrak, Kattegat, Øresund, western Baltic Sea; from West Africa to South Africa; Japan. On bottoms of mud and sand with shells and algae, clean sand, or coarse sand. Between 10-4500 meters.

Praxillella trifila Hartman 1960

Praxillella trifila HARTMAN, 1960: 146, pl. 15 figs. 2, 4.

TYPE LOCALITY: San Nicolas Basin (off Southern California), 32º51'00"N, 119º01'12"W, in 1670 meters.

DISTRIBUTION: Offshore basins off southern California, 1600-2425 meters. [?] Catalonian coast of Spain, Mediterranean Sea, between 87-195 meters, in mud.

REMARKS: This species was described with base on fragmented material, reason why its author could not be sure about the number of chaetigers of the body.

This species was identified only once in European waters, with doubts, from the Mediterranean Sea. The record was made by DESBRUYÈRES, GUILLE & RAMOS (1974), as *Praxillella* cf. *trifila*, from the community of "*Vase du Large*", between 87-195 meters. However, this record should be considered, for the moment, as doubtful, as already stated by the authors of the record.

GENUS ***Praxillura*** Verrill 1880

Praxillura VERRILL, 1880: 178-179.
TYPE SPECIES: *Praxillura ornata* Verrill 1880.

Praxillura longissima Arwidsson 1906

Praxillura longissima ARWIDSSON, 1906: 27-32, pl. 1 figs. 1-7, pl. 7 figs. 208, 212, 214-215, 218.
TYPE LOCALITY: ARWIDSSON (1906) used specimens from six locations in and around Greenland Basin in order to describe this species, apparently without choosing a holotype. The six locations are: 1) 80º53'N 1º40'E (between Svalbard and Greenland), at 960 meters; 2) 80º40'N 4º5'E (between Svalbard and Greenland), at 605 meters; 3) 76º36'N 12º10'E (south Svalbard), at 1750 meters; 4) 74º55'N 17º59'W (south Shannon Island, East Greenland), at 350 meters, on mud with some sand; 5) 71º5'N 8º51'W (north Jan Mayen), at 800 meters, on mud with sand and stones; 6) 70º58'N 8º42'W (Walross Gap, north Jan Mayen), at 36 meters, on basaltic sand.
SYNONYMS: *Praxillura longissima var. minor* Arwidsson 1906; *Praxillura longissima var. paucimaculata* Arwidsson 1906.
SELECTED REFERENCES: *Praxillura longissima* — WESENBERG-LUND, 1948: 8-10, fig. 1; WESENBERG-LUND, 1950*a*: 39, chart 49; ELIASON, 1962*a*: 69-72, fig. 9. *Praxillura longissima* — HARTMANN-SCHRÖDER, 1996: 460-461, fig. 223; KIRKEGAARD, 1996: 218-220, fig. 114; DETINOVA, 2001: 413, fig. 5, map. *Praxillura longissima* var. *minor* — ARWIDSSON, 1906: 32-34, pl. 1 fig. 14, pl. 7 fig. 213. *Praxillura longissima* var. *paucimaculata* — ARWIDSSON, 1906: 34-39, pl. 1 figs. 8-13, pl. 7 figs. 209-211, 216-217.
DISTRIBUTION: Davis Strait; West Greenland; Kara Sea; Arctic Ocean and Northeastern Atlantic, from east Greenland and Svalbard, to Skagerrak, Kattegat, and northern Øresund; English Channel; Mediterranean Sea. On mud and sandy mud bottoms, with stones and shells. Between 18-215 meters, but reported to be present down to 2258 meters (WESENBERG-LUND, 1948) or 3000 meters (KIRKEGAARD, 1996).

GENUS ***Proclymene*** Arwidsson 1906

Proclymene ARWIDSSON, 1906: 128-129.
TYPE SPECIES: *Clymene mülleri* M. Sars 1856.

Proclymene muelleri (M. Sars 1856)

Clymene Mülleri M. SARS, 1851: 201.
TYPE LOCALITY: Finmark, Norway.
SELECTED REFERENCES: *Clymene Mülleri* — M. SARS, 1856: 13. *Proclymene Mülleri* — MCINTOSH, 1915: 307-310, pl. 99 fig. 2, pl. 109 fig. 3, pl. 110 fig. 2. *Proclymene mülleri* — ARWIDSSON, 1906: 129-136, pl. 3 figs. 91-97, pl. 8 figs. 273-275, pl. 11 fig. 350; HARTMANN-SCHRÖDER, 1996: 458-459; KIRKEGAARD, 1996: 220-222, fig. 115. *Proclymene Mulleri* — FAUVEL, 1927*a*: 186-188, fig. 65*a-g*.
DISTRIBUTION: North Atlantic, from Norway to northern North Sea (Shetlands), Skagerrak and Kattegat; Eastern Canada (Labrador). On muddy and sandy bottoms. Between 30-250 meters.

GENUS ***Pseudoclymene*** Arwidsson 1906

Pseudoclymene ARWIDSSON, 1906: 235-236.

TYPE SPECIES: *Clymene quadrilobata* M. Sars 1856.

Pseudoclymene quadrilobata (M. Sars 1856)

Clymene quadrilobata M. SARS, 1856: 15, pl. 2 figs. 18-22.

TYPE LOCALITY: Norway.

SELECTED REFERENCES: *Euclymene (Praxillella) quadrilobata* — VERRILL, 1900: 655. *Pseudoclymene quadrilobata* — ARWIDSSON, 1906: 236-242, pl. 6 figs. 181-186, pl. 10 figs. 321-329; MCINTOSH, 1915*b*: 336-338, pl. 108 fig. 10, pl. 109 fig. 5, pl. 111 fig. 6; DETINOVA, 2001: 411, fig. 1-2. *Praxillella quadrilobata* — HARTMANN-SCHRÖDER, 1996: 458; KIRKEGAARD, 1996: 217-218, fig. 113.

DISTRIBUTION: Northeast Atlantic: Shetlands; from Norway to Skagerrak; [?] South Africa. In muddy sand. Between 30-270 meters.

GENUS ***Rhodine*** Malmgren 1865

Rhodine MALMGREN, 1865: 189.

TYPE SPECIES: *Rhodine loveni* Malmgren 1865.

KEY TO SPECIES:

1a. Collar distinctly indented dorsally, with smooth margin; posterior collar has glands inside and out; 3rd chaetiger with a distinct glandular band ventrally, behind the parapodia.................................***R. loveni***
1b. Collar not indented dorsally, with crenulated margins on the rear segments; rear collar without glands; 3rd chaetiger has a distinct gladular band ventrally, in front of the parapodia................***R. gracilior***

Rhodine gracilior Tauber 1879

Rhodine loveni var. *gracilior* TAUBER, 1879: 123.

TYPE LOCALITY: Denmark.

SYNONYMS: *Rhodine loveni* var. *gracilior* Tauber 1879.

SELECTED REFERENCES: *Rhodine gracilior* — ARWIDSSON, 1906: 74-81, pl. 2 figs. 53-58, pl. 7 figs. 237-241, pl. 8 figs. 242-243; NOLTE, 1912: 19-23, text-figs. 4, 13-20, pl. 1 figs. 4, 25, pl. 2 fig. 26, map; MCINTOSH, 1915: 299-301, pl. 99 fig. 8, pl. 108 fig. 3, pl. 109 fig. 1; ARWIDSSON, 1922: 5; USCHAKOV, 1955: 335-336, fig. 123*E-I*; HARTMANN-SCHRÖDER, 1996: 471-473, fig. 230; KIRKEGAARD, 1996: 222-224, fig. 116; DETINOVA, 2001: 418-419, figs. 1-3, map. *Rhodine loveni* var. *gracilior* — FAUVEL, 1957: 215-218, fig. 1.

DISTRIBUTION: Arctic Ocean; Bering Sea; East Atlantic, from Norway, throught the west European coast, to the Mediterranean Sea, including North Sea, Skagerrak, Kattegat, Øresund and western Baltic Sea; Aegean Sea; West Africa to South Africa; [?] Persian Gulf. On sandy and muddy bottoms. Between 10-1000 meters.

Rhodine loveni Malmgren 1865

Rhodine loveni MALMGREN, 1865: 189.

TYPE LOCALITY: Vädefröarne and Koster Islands, Bahuslan, Sweden, at 40 fathoms (73.2 meters).

SYNONYMS: *Rhodine loveni* var. *robustior* Tauber 1879.

SELECTED REFERENCES: *Rhodine Lovéni* — MALMGREN, 1867*a*: 99, pl. 10 fig. 61. *Rhodine lovéni* — NOLTE, 1912: 15-19, text-figs. 21-22, 26-27, pl. 1 figs. 1-3, pl. 2 fig. 34, map. *Rhodine loveni* — ARWIDSSON, 1906: 64-74, pl. 2 figs. 39*a*-52, pl. 7 figs. 235-236, pl. 11 figs. 346-347; USCHAKOV, 1955*a*: 336, fig. 123 *J*; HARTMAN, 1966*b*: 72, pl. 23 figs. 9-11; IMAJIMA & SHIRAKI, 1982*a*: 32-35, fig. 13; HARTMANN-SCHRÖDER, 1996: 473-474, fig. 231; KIRKEGAARD, 1996: 224-226, fig. 117.

DISTRIBUTION: White Sea and Okhotsk Sea; North Pacific; Arctic Ocean; Northeastern Atlantic to Mediterranean Sea, including North Sea, Skagerrak, Kattegat, Øresund and western Baltic Sea; Aegean Sea; Antarctic; Japan. On muddy bottoms, mixed with sand and shells. Between 18-1650 meters.

FAMILY **NAUTILINIELLIDAE** Miura & Laubier 1990

AS: *NAUTILINIELLIDAE* MIURA & LAUBIER, 1990: 319.
TYPE GENUS: *Nautiliniella* Miura & Laubier 1990.
SYNONYMS: *NAUTILINIDAE* Miura & Laubier 1989 [not Stein 1850 (Mollusca, Cephalopoda)].
REMARKS: The family Nautiliniellidae was recently created to include species living as symbionts (quite probably as parasites) in the mantle cavities of deep-sea bivalves (as *Calyptogena*, *Acharax* or *Thyasira*). They and their hosts inhabit cold seeps and hydrothermal vents. The family was created and named by MIURA & LAUBIER (1989), as Nautilinidae, based on *Nautilina calyptogenicola* Miura & Laubier 1989. The same authors in a following paper (MIURA & LAUBIER, 1990) renamed the family and genus as Nautiliniellidae and *Nautiliniella*, because the earlier names were preoccupied in Mollusca (Cephalopoda), by Stein 1850 (Nautilinidae and *Nautilina*), and in Protozoa by Costa 1856 (*Nautilina*). One species described previously in the Pilargidae, *Pilargis mirasetis* Fauchald 1972, was later reexamined and transferred provisionally to the Nautiliniellidae by BLAKE (1993), in a new genus, *Santelma*. However, this placement was not argued by other authors, and the genus and species are generally considered as belonging probably to the Pilargidae.

The family includes at present 11 genera and 15 species, and has been found mainly at the Pacific Basin and Gulf of Mexico, but studies on cold seeps and hydrothermal vents on other regions of the world will quite probably reveal new records, species and genera in the near future. This is the case of *Natsushima bifurcata* Miura & Laubier 1990, recently recorded from the Gulf of Cádiz (RAVARA, CUNHA & RODRIGUES, 2007).

General accounts on the family can be found on BLAKE (1997*b*) and PLEIJEL (2001*c*), whereas GLASBY (1993) emended the family definition. BLAKE (1993) and MIURA & HASHIMOTO (1996) included comparative tables for the genera previously described, while DREYER, MIURA & VAN DOVER (2004) presented a key for all the known species. Other works include MIURA & LAUBIER (1989, 1990), BLAKE (1990, 1993), MIURA & OHTA (1991), MIURA & HASHIMOTO (1993, 1996), DESBRUYÈRES, SEGONZAC & BRIGHT (2006), and RAVARA, CUNHA & RODRIGUES (2007).

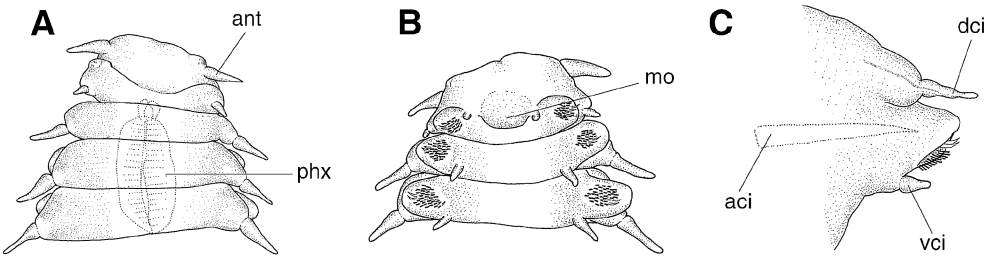

Figure legend: Family Nautiliniellidae. *Natsushima* specimen. **A**, anterior end, dorsal view; **B**, anterior end, ventral view; **C**, parapodium. **aci**, acicula; **ant**, antenna; **dci**, dorsal cirrus; **mo**, mouth; **phx**, pharynx; **vci**, ventral cirrus. (Adapted from BEESLEY, ROSS & GLASBY, 2000; after MIURA & LAUBIER, 1990).

GENUS ***Natsushima*** Miura & Laubier 1990

Natsushima MIURA & LAUBIER, 1990: 320-322.
TYPE SPECIES: *Natsushima bifurcata* Miura & Laubier 1990.

Natsushima bifurcata Miura & Laubier 1990

Natsushima bifurcata MIURA & LAUBIER, 1990: 322-324, fig. 2.
TYPE LOCALITY: Off Hatsushima, Sagami Bay, 34º00.0'N, 139º13.8'E (Honshu, Japan), at 1170 meters, on the mantle cavity of *Acharax johnsoni* Dall 1891 (Bivalvia) [originally misidentified as *Solemya* sp.; see MIURA & HASHIMOTO (1996: 266)].
SELECTED REFERENCES: *Natsushima bifurcata* — MIURA & HASHIMOTO, 1996: 265-266; RAVARA, CUNHA & RODRIGUES, 2007: 96-98, figs. 1-3.

DISTRIBUTION: Pacific Ocean: Sagami Bay (Honshu, Japan), 1114-1170 meters, on the mantle cavity of *Acharax johnsoni* Dall 1891. Moroccan Margin of the Gulf of Cádiz, Atlantic Ocean: Jesuz Baraza mud volcano, 1105 meters; Yuma mud volcano, 960-1030 meters; Ginsburg mud volcano, 920 meters; all inside the mantle cavity of *Acharax* sp.

REMARKS: Some small differences were found by RAVARA, CUNHA & RODRIGUES (2007) between the specimens from Japan and from the Gulf of Cádiz. This way, specimens from the Gulf of Cádiz are larger than the ones from the type locality, being the largest ones 2 to 3 times larger than the holotype, the chaetigers being broader and the parapodia, including cirri, thicker. Besides, specimens from the Gulf of Cádiz present 4 neuropodial hooks, instead of the 3 referred in the original description (RAVARA, CUNHA & RODRIGUES, 2007). In spite of these small differences, RAVARA, CUNHA & RODRIGUES (2007) didn't find morphological evidences strong enough to support the erection of a new species. However, the same authors point the possibility that both populations of *Natsushima bifurcata* represent cryptic species, but that the question can only be answered with more information on the reproductive patterns and especially by molecular analysis, which is not possible for the moment, due to the lack of suitable Japanese material for such analysis (RAVARA, CUNHA & RODRIGUES, 2007).

*FAMILY NEPHTYIDAE Grube 1850

As: *Nephthydea* Grube, 1850: 300-301.

Type genus: *Nephtys* Cuvier 1817.

Synonyms: *Nephthydidae* Malmgren 1867.

Remarks: The family Nephtyidae includes at present 4 genera, with 128 species, and 3 subspecies considered to be valid (Ravara, 2010; Ravara, Cunha & Pleijel, 2010; Dnestrovskaya & Jirkov, 2010). Of these, all the 4 genera and 22 species have been so far recorded from European and nearby waters, one of which remaisn unidentified. Three genera and 8 species, were found among the studied material.

Relevant bibliography on the family for the European waters is cited below. Particularly important taxonomic papers on the group include Hartman (1938, 1950), Fauchald (1963, 1968), Foret-Montardo (1969), Rainer & Hutchings (1977), San Martín (1982*b*), Nateewathana & Hylleberg (1986), the series of papers on European Nephtyidae by Rainer (1984, 1989, 1990, 1991), Imajima & Takeda (1985, 1987), Rainer & Kaly (1988), Jirkov & Paraketsova (1996), Hilbig (1997*b*), Mackie (2000), Dnestrovskaya & Jirkov (2001, 2010), and Ravara, Cunha & Pleijel (2010), among others. Particularly important is the recent revision of the family performed by Ascensão Ravara and collaborators (Ravara, 2010; Ravara, Cunha & Pleijel, 2010), including the first phylogenetic study of the group, based on molecular and morphologic data (Ravara *et al.*, 2010), with the synonymy of the genus *Dentinephtys* Imajima & Takeda 1987 with *Nephtys* Cuvier 1817, and the erection of a new genus, *Bipalponephtys* Ravara, Wiklund, Cunha & Pleijel 2010. This last genus was posteriorly synonymized with *Micronephthys* by Dnestrovskaya & Jirkov (2010).

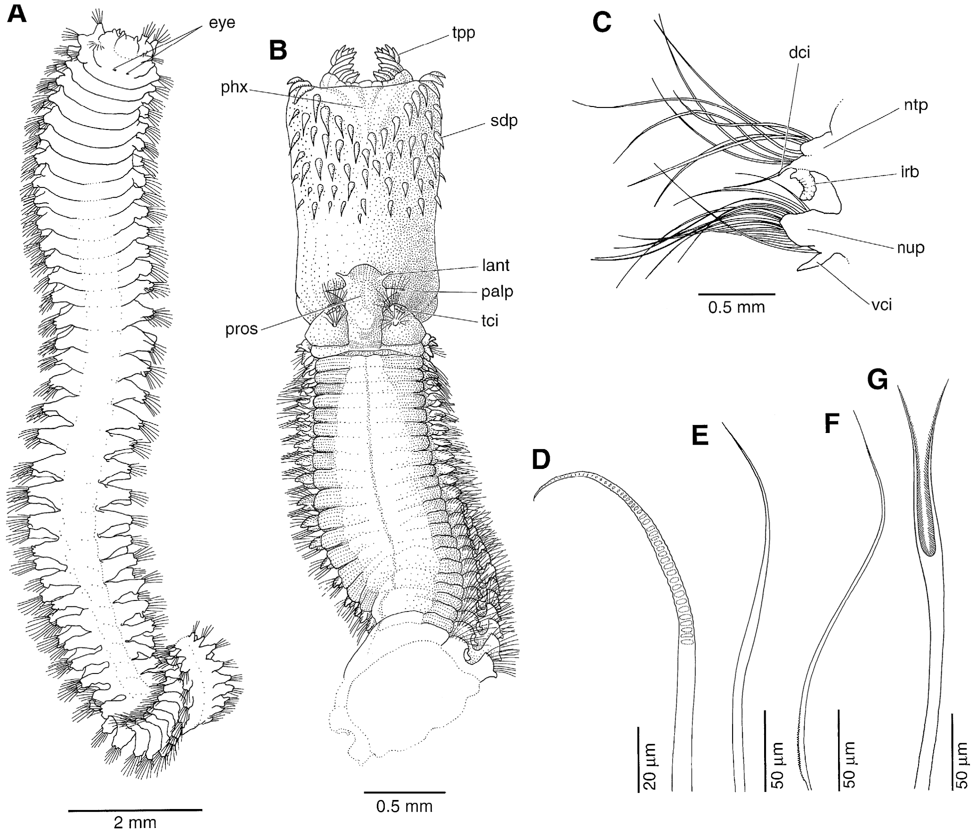

Figure legend: Family Nephtyidae. **A**, *Nephtys* specimen, entire animal, dorsal view. **B**, *Nephtys* specimen, anterior end with pharynx everted, dorsal view. **C**, *Nephtys* specimen, parapodium from chaetiger 15; **D**, **E**, chaetae of *Nepthys* specimen: **D**, barred notochaeta from parapodium of chaetiger 10; **E**, notochaeta from parapodium of chaetiger 10. **F**, *Nepthys* specimen, neurochaeta from parapodium of chaetiger 15. **G**, *Inermonephtys* specimen, lyrate chaeta from neuropodium of a posterior chaetiger. **dci**, dorsal cirri; **eye**, eyes; **irb**, inter-ramal branchia; **lant**, lateral antenna; **ntp**, notopodium; **nup**, neuropodium; **palp**, palp; **phx**, pharynx, everted; **pros**, prostomium; **sdp**, subterminal pharyngeal papillae; **tci**, tentacular cirrus; **tpp**, terminal pharyngeal papillae; **vci**, ventral cirri. (Adapted from Beesley, Ross & Glasby, 2000; drawings by K. Nolan).

KEY TO GENERA:

(adapted from RAVARA, CUNHA & PLEIJEL, 2010)

1a. Prostomium without antennae; nuchal organs digitiform; pharynx without papillae; jaws spindle-shaped; branchiae long, thin and involute; lyriform chaetae present..................................***Inermonephtys****
1b. Prostomium with antennae; nuchal organs rounded; pharyngeal papillae present; jaws conical, hook-like; branchiae involute, recurved, poorly developed or absent; lyriform chaetae present or absent...........**2**

2a (1b). Branchiae absent or present on a few chaetigers only, poorly developed, nearly straight; pre- and postchaetal lamellae rudimentary; lyriform chaetae may be present; body small-sized........***Micronephthys***
2b (1b). Branchiae well developed (lacking in some anterior segments), involute or recurved (curved to the exterior of the interramal arc); at least postchaetal lamellae well developed; lyriform chaetae may be present..**3**

3a (2b). Acicular lobes acutely pointed; neuropodial superior lobes may be present; pharynx with rows of more than 10 subterminal papillae, proximal papillae sometimes arranged in small groups, middorsal papilla absent, proximal region always smooth; branchiae involute or recurved; lyriform chaetae may be present..***Aglaophamus****
3b (2b). Acicular lobes conical, rounded or bilobed; neuropodial superior lobes absent; pharynx usually with rows of less then 10 subterminal papillae (usually up to 5-7), long middorsal papillae often present, proximal region smooth or covered with small warts; branchiae recurved; lyriform chaetae absent..***Nephtys****

*GENUS *Aglaophamus* Kinberg 1866

Aglaophamus KINBERG, 1866*b*: 239-240.
TYPE SPECIES: *Aglaophamus lyratus* Kinberg 1866.
SYNONYMS: *Aglaopheme* Kinberg 1866.

KEY TO SPECIES:

(from RAVARA, CUNHA & PLEIJEL, 2010)

1a. Prechaetal lamellae more or less distinctly bilobed, postchaetal lamellae longer than acicular lobes; neuropodial superior lobes distinctly present; branchiae involute, from chaetiger 2; pharynx with 14 rows of up to 34 subterminal papillae, extending over 2/3 of pharynx..***A. agilis****
1b. Prechaetal lamellae simple; postchaetal lamellae shorter or not much longer than acicular lobes; neuropodial superior lobes, if present, very small and difficult to observe; branchiae start at or posteriorly to chaetiger 5..**2**

2a (1b). Notopodial postchaetal lamellae poorly developed, rounded; branchiae involute, starting at chaetiger 11-13; pharynx with 20-22 rows of 6-11 subterminal papillae, extending to base of pharynx..***A. elamellatus***
2b (1b). Notopodial postchaetal lamellae well developed, bilobed at least in middle parapodia.................**3**

3a (2b). Branchiae involute, starting at chaetiger 11-13; pharynx with 22 rows of 2-17 short subterminal papillae extending over 1/2 length of pharynx...***A. malmgreni***
3b (2b). Branchiae recurved, starting at chaetiger 5-7; pharynx with 14 well defined rows of 10-15 subterminal papillae, extending to base of pharynx..***A. pulcher***

****Aglaophamus agilis*** (Langerhans 1880)

Nephthys agilis LANGERHANS, 1880*a*: 304-305, pl. 16 fig. 39.
SYNONYMS: *Nephthys rubella* Michaelsen 1896.
TYPE LOCALITY: Near Funchal (Madeira Island), between 10-20 fathoms (18.3-36.6 meters), in sand.
SELECTED REFERENCES: *Nephthys agilis* — FAUVEL, 1923*c*: 372-373, fig. 145*c-g*. *Aglaophamus agilis* — FRIEDRICH, 1964: 135-138, fig. 1; HARTMANN-SCHRÖDER, 1982*a*: 9; LABORDA, 2004: 412, fig. 151*A*; RAVARA, CUNHA & PLEIJEL, 2010: 7-11, figs. 1-2, table 3. *Nephthys rubella* — MICHAELSEN, 1896: 19-24, pl. 1 figs. 5-8; HEINEN, 1911: 31-33, fig. 9, map 1; FAUVEL, 1914*f*: 196-197; FAUVEL, 1923*c*: 373,

fig. 145*h-i*. *Aglaophamus rubella* — FAUCHALD, 1963: 20-21, figs. 1*E*, 2*A*, 3*H*, 8*B*, table 1; WOLFF, 1968: 6, fig. 12; HARTMANN-SCHRÖDER, 1974*d*: 205 [in part; in part = *Nephtys pulchra* Rainer 1991]; KIRKEGAARD, 1992: 327-329, fig. 159; HARTMANN-SCHRÖDER, 1996: 216-217, fig. 93. *Nephthys (Aglaophamus) rubella* — FORET-MONTARDO, 1969: 818-820, pls. 4, 6. *Aglaophamus rubellus* — LABORDA, 2004: 414-415, fig. 151*C*.

REFERENCES FOR PORTUGAL: BELLAN, 1960*a* (as *Nephthys rubella*; Setúbal Canyon; Cape São Vicente); [?] SOUSA-REIS *et al.*, 1982 (as *Aglaoptamus* c.f. *agilis*; Peniche region); PINTO, 1984 (as *Nephthys rubella*; Sado Estuary); MONTEIRO-MARQUES, 1987 (as *Nephthys rubella*; continental shelf of Algarve); DEXTER, 1992 (as *Aglaophamus rubella*; previous records: continental shelf of Algarve; Figueira da Foz); RAVARA, 1997 (as *Aglaophamus rubella*; off Aveiro); RAVARA, CUNHA & PLEIJEL, 2010 (off Aveiro; off Cascais); present work (southwestern continental shelf).

MATERIAL: SEPLAT 6 — St. 169 (A.2642), off Arrifana, 74 m, sand: 1 complete specimen in good condition, with 92 chaetigers for 55 mm long; interramal cirri from chaetiger 3. **St. 325 (A.2782)**, off Praia de Odeceixe, 78 m, sand: 1 specimen, almost complete, broken in 2 pieces, of 38 and 40 chaetigers; 45 mm in total length; interramal cirri from chaetiger 2. **SEPLAT 7 (2nd part) — St. 17 (A.4105)**, north Sines, 33 m, sand: 1 incomplete specimen, in poor condition; interramal cirri from chaetiger 2. **St. 43 (A.4064)**, north Sines, 39 m, sand: 2 specimens; (1) complete but broken in 2 pieces; 54 + 32 chaetigers, for almost 40 mm long; anal cirri lost; proboscis partially everted, with 14 rows of papillae (number of papillae per row not counted); interramal cirri from chaetiger 3; prostomium with 2 antennae and 2 palps well developed; postacicular neurolamellae with a small erect cirriform lobe on the dorsal side; (2) second specimen smaller, with about 40 chaetigers. **St. 44 (A.4063)**, north Sines, 27 m, sand: 2 incomplete specimens, one with 30 chaetigers and in good condition, the other with 13 chaetigers and in poor condition; both specimens with interramal cirri from chaetiger 2. **St. 45 (A.4062)**, north Sines, 28 m, sand: 1 incomplete specimen, in poor condition; interramal cirri from chaetiger 2. **St. 194 (A.3918)**, south Sines, 84 m, sand: 1 complete small specimen, broken in 3 pieces; 74 chaetigers for 21 mm long. **St. 316 (A.3844)**, off Arrifana, 82 m, sand: 1 complete specimen, broken in 2 pieces, with 29 and 38 chaetigers; interramal cirri from chaetiger 2. **FAUNA 1 — St. 56*A***, Gulf of Cádiz, off Cape Trafalgar, 24 m, rock and gravel: 2 incomplete specimens, with 34 and 18 chaetigers, in bad condition.

DISTRIBUTION: Arctic Ocean; Northeastern Atlantic Ocean, from Faroes and Norway to Mauritania; Skagerrak; Kattegat; North Sea; Madeira Island; Western Mediterranean Sea, from south Spain to Sicily; Adriatic Sea; Aegean Sea. In muddy, and fine to coarse sands, as well as in detritic muds. From lower intertidal to 1100 meters. [?] Bank Hyères (off Southern Azores), 1000-1550 meters.

REMARKS: According to RAVARA, CUNHA & PLEIJEL (2010), records from deeper locations should be considered with caution, as *Aglaophamus agilis* has been frequently confused with *A. malmgreni*. It is also possible that some of those records refer to specimens of *A. elamellatus*.

Aglaophamus elamellatus (Eliason 1951)

Nephthys elamellatus ELIASON, 1951: 133-134, fig. 2.

TYPE LOCALITY: Central Atlantic Ocean: NW Azores Archipelago, 40º33'N 35º24'W — 40º34'N 35º52'W, between 4540-4600 meters; near Canary Islands, 29º48'N 17º39'W — 30º05'N 17º18'W, between 4267-4255 meters.

SELECTED REFERENCES: *Nephthys elamellatus* — KIRKEGAARD, 1956: 68-69, fig. 7. *Aglaophamus elamellata* — KIRKEGAARD, 1980*b*: 85; KIRKEGAARD, 1995: 36, fig. 21; RAVARA, CUNHA & PLEIJEL, 2010: 11-14, figs. 2-3, tables 1, 3.

REFERENCES FOR PORTUGAL: RAVARA, CUNHA & PLEIJEL, 2010 (Nazaré Canyon; Cascais Canyon; Setúbal Canyon); RAVARA *et al.*, 2010 (as *Aglaophamus elamellata*; Setúbal Canyon).

DISTRIBUTION: Atlantic Ocean (West Portugal, Azores, Canary Islands, off West Africa); Indian Ocean (off East Africa, Sri Lanka); Pacific Ocean (Tasman Sea, Kermadec Trench). In mud. Between 970-7000 meters.

REMARKS: According to RAVARA, CUNHA & PLEIJEL (2010) the Indian and Pacific records of the species should be considered with caution

Aglaophamus malmgreni Théel 1879

Aglaophamus malmgreni THÉEL, 1879: 26-28, pl. 1 figs. 17^5, 17^{20}, 17^{40}, 17^{60}, pl. 2 fig. 17^{10}.

TYPE LOCALITY: The species was described from the Novaya Zemlya region, with base on specimens collected in fourteen different stations, without the designation of a type locality. The data of these 14 stations is as follows: 1) western region of Matotchkin, 73º19'N, 7-34 meters, in sand, muddy sand, and mud; 2) Strait of Kostin, 8-50 meters, in mud with stones and *Lithothamium*; 3) Kara Sea, 71º5'N, 63º20'E, 120-155 meters, in mud; 4) Kara Sea, 75ºN, 75º25'E, 36 meters, in muddy sand; 5) Kara Sea, 72º35'N, 77º30'E, 34 meters, in muddy sand; 6) Kara Sea, 75º40'N, 78º40'E, 45 meters, in muddy sand; 7) Kara Sea, 75º30'N, 64º10'E, 100 meters, in mud; 8) Kara Sea, 73º30'N, 57º55'E, 68-100 meters, in mud; 9) Kara Sea, 73º10'N, 57º45'E, 255 meters, in mud; 10) eastern region of the Strait of Matotchkin, 25 meters, in *Lithothamnium* and stones; 11) Kara Sea, 70º20'N, 62º40'E, 85 meters, in brown mud; 12) Kara Sea, 70º10'N, 64º40'E, 47 meters, in mud; 13) Kara Sea, 74º12'N, 75º45'E, 30 meters, in muddy sand; 14) Kara Sea, 74º30'N, 73º25'E, 28 meters, in mud with some sand.

SYNONYMS: *Nephthys atlantica* Hansen 1879; *Nephtys Grubei* McIntosh 1900.

SELECTED REFERENCES: *Nephthys Malmgreni* — AUGENER, 1913*a*: 206-207; FAUVEL, 1914*f*: 196; FAUVEL, 1923*c*: 371-372, fig. 145*k*. *Nephthys malmgreni* — HEINEN, 1911: 29-31, fig. 8, map 2 [in part]. *Aglaophamus malmgreni* — FAUCHALD, 1963: 17-19, figs. 1*F*, 2*F*, 3*G*, 4, 8*A*, 9, table 1; WOLFF, 1968: 6, fig. 13; HARTMANN-SCHRÖDER, 1974*d*: 205-206, fig. 26 [in part; in part = *Nephtys incisa* Malmgren 1865; in part = *Nephtys pulchra* Rainer 1991]; IMAJIMA & TAKEDA, 1985: 68-70 fig. 6; KIRKEGAARD, 1992: 326-327, fig. 158; HARTMANN-SCHRÖDER, 1996: 216; LABORDA, 2004: 412-414, fig. 151*B*; RAVARA, CUNHA & PLEIJEL, 2010: 14-17, figs. 2, 4, table 3. *Nephthys atlantica* — HANSEN, 1879: 4, pl. 3 figs. 1-4; HANSEN, 1882: 31, pl. 4 figs. 1-4. *Nephtys Grubei* — MCINTOSH, 1900*b*: 260-261; MCINTOSH, 1908*c*: 33. *Nephtys longisetosa* [not Ørsted 1842] — MALMGREN, 1865: 106, pl. 12 fig. 20.

REFERENCES FOR PORTUGAL: MCINTOSH, 1885*a* (as *Nephthys malmgreni*; off Setúbal); AMOUREUX, 1974*b* (as *Nephthys malmgreni*; off Aveiro; off Porto); CAMPOY, 1982 (previous records: Setúbal; Aveiro; Porto); MONTEIRO-MARQUES, 1987 (as *Nephthys malmgreni*; continental shelf of Algarve); DEXTER, 1992 (as *Nephtys malmgreni*; previous records: continental shelf of Algarve); RAVARA, CUNHA & PLEIJEL, 2010 (off Setúbal).

DISTRIBUTION: Arctic Ocean (Greenland, Svalbard, Barents Sea, Kara Sea, Novaya Zemlya, Laptev Sea); Norway; Sweden; North Sea; Skagerrak; [?] off Portugal; [?] Mediterranean Sea (including Adriatic Sea and Aegean Sea); from Gulf of St. Lawrence to Chesapeake Bay; [?] Red Sea; Sea of Japan; Bering Sea; Sea of Okhotsk; North Pacific. In clay and muddy bottoms. Between 7-3820 meters.

REMARKS: According to RAVARA, CUNHA & PLEIJEL (2010), the South European records, from the western coast of Portugal and Spain and the Mediterranean Sea require confirmation and must be considered with caution. The only material from South Europe examined by these authors was a single specimen from Portugal, in very poor condition, from which the identity could not be confirmed.

Aglaophamus pulcher (Rainer 1991)

Nephtys pulchra RAINER, 1991: 83-88, figs. 1*A-F*, 3*H*, table 1.

TYPE LOCALITY: Norway.

SELECTED REFERENCES: *Nephtys pulchra* — HARTMANN-SCHRÖDER, 1996: 232; ARVANITIDIS, 2000: 79; LABORDA, 2004: 410-411, fig. 150*C-D*. *Aglaophamus pulcher* — RAVARA, CUNHA & PLEIJEL, 2010: 17-20, figs. 2, 5, tables 2, 3. *Nephtys hystricis* — MCINTOSH, 1900*b*: 259-260 [in part]; MCINTOSH, 1908*c*: 27-29 [in part]. *Nephtys incisa* [not Malmgren 1865] — FAUCHALD, 1963: 15-16, figs. 7*B*, 9, table 1 [in part]. *Aglaophamus malmgreni* [not Théel 1879] — HARTMANN-SCHRÖDER, 1974*d*: 205-206 [in part]. *Aglaophamus rubella* [not Michaelsen 1896] — HARTMANN-SCHRÖDER, 1974*d*: 205 [in part].

REFERENCES FOR PORTUGAL: RAVARA, CUNHA & PLEIJEL, 2010 (off Nazaré; Nazaré Canyon; Cascais Canyon; Setúbal Canyon; off Sines); RAVARA *et al.*, 2010 (Nazaré Canyon).

DISTRIBUTION: North Atlantic, including coasts of Norway, Oslofjord and Skagerrak; Gulf of Biscay; Western Portugal; Gulf of Cádiz; Mediterranean Sea, off Catalonian coast of Spain, in canyons (personal observation); Aegean Sea. In mud and clay. Between 200-1030 meters.

*GENUS ***Inermonephtys*** Fauchald 1968

Inermonephtys FAUCHALD, 1968: 14-15.

TYPE SPECIES: *Nephtys (Aglaophamus) inermis* Ehlers 1887.

REMARKS: The genus *Inermonephtys* is generally described as lacking antennae. However, most species have been described as having small digitiform processes or papillae attached to the ventral region of the palps. Probably these digitiform processes represent the true antennae, which are displaced ventrally. The presence of such sense organs in a more ventrally position could be a way to balance the absence of proboscideal papillae.

KEY TO SPECIES:

1a. Neuropodial postacicular lamella reduced, almost rudimentary..***I. inermis***
1b. Neuropodial postacicular lamella elongate, conical...***I. foretmontardoi****

Inermonephtys inermis (Ehlers 1887)

Nephthys (Aglaophamus) inermis — EHLERS, 1887: 125-128, pl. 38 figs. 1-6.
TYPE LOCALITY: Off Alligator Reef (Florida), at 53 fathoms (96.9 meters).
SELECTED REFERENCES: *Nephthys inermis* — FAUVEL, 1923: 375-376, fig. 147 [in part]; AUGENER, 1932*c*: 679-680, fig. 3; HARTMAN, 1940*a*: 234, pl. 39 figs. 84-86, pl. 40 fig. 95. *Nephtys (Inermonephtys) inermis* — DAY, 1973: 42. *Inermonephtys inermis* — FAUCHALD, 1968: 16-17, pl. 4 figs. 31-35; GARDINER, 1976: 157-159, fig. 17*d-f*; TAYLOR, 1984*b*: 35.19-35.20, figs. 35.15-35.16; LABORDA, 2004: 418-419, fig. 152*D* [in part]. Not *Nephthys inermis* — AUGENER, 1932*c*: 663-664 [= *Micronephthys stammeri* (Augener 1932)]. Not *Inermonephtys inermis* — HARTMANN-SCHRÖDER, 1982*a*: 10.
DISTRIBUTION: West Indies; Gulf of Mexico; Florida; North Carolina; Puerto Rico; Vietnam; Gulf of California; Pacific coast of Panama. In sandy sediments of coastal and offshore waters. Intertidal to about 131 meters in the Gulf of Mexico region; between 160-450 meters in North Carolina.
REMARKS: In spite of the previous records, the species is not present in the European waters. See the *REMARKS* section under *Inermonephtys foretmontardoi*.

****Inermonephtys foretmontardoi*** Ravara, Cunha & Pleijel 2010

Inermonephtys foretmontardoi RAVARA, CUNHA & PLEIJEL, 2010: 21-23, fig. 6, table 4.
TYPE LOCALITY: Cape Finisterre, NW Spain, 42º44'N, 9º23'W, at 81 fathoms (148.13 meters).
SELECTED REFERENCES: *Nephthys (Aglaophamus) inermis* [not Ehlers 1887] — MCINTOSH, 1900*b*: 262; FORET-MONTARDO, 1969: 820-821, pls. 5-6; BELLAN, 1964*b*: 75. *Nephthys inermis* [not Ehlers 1887] — MARENZELLER, 1904*a*: 296, 305; FAUVEL, 1923*c*: 375-376 [in part]; FAUVEL, 1940: 11; BELLAN, 1959*a*: 326; BELLAN, 1960*a*: 13; BELLAN, 1961*a*: 169; BELLAN, 1964*a*: 275. [?] *Nephtys (Aglaophamus) inermis* — INTES & LE LŒUFF, 1975: 303. [?] *Inermonephtys inermis* — LABORDA, 2004: 418-419 [in part]. Not *Nephthys inermis* — FAUVEL, 1933*c*: 47-50, fig. 3.
REFERENCES FOR PORTUGAL: BELLAN, 1960*a* (as *Nephthys inermis*; Cape Espichel); MONTEIRO-MARQUES, 1979 (as *Nephthys inermis*; southern continental shelf of Algarve); CAMPOY, 1982 (as *Inermonephtys inermis*; previous records: Portugal); MONTEIRO-MARQUES, 1987 (as *Nephthys inermis*; continental shelf of Algarve); DEXTER, 1992 (as *Nephtys inermis*; previous records: continental shelf of Algarve); RAVARA, CUNHA & PLEIJEL, 2010 (southwestern continental shelf); present work (southwestern continental shelf).
MATERIAL: SEPLAT 6 — St. 110 (A.2591), off Carrapateira, 145 m, muddy sand: 1 incomplete specimen with 28 chaetigers, in good condition; chaetigerous region 20 mm long, after that the specimen is broken, revealing a portion of the gut, uncovered; 4 mm wide; parapodia as the described in FORET-MONTARDO (1969); proboscis inverted. **St. 158 (A.2632)**, off Arrifana, 130 m, sand: 2 fragments, one with 28 chaetigers and the other with 26 chaetigers; parapodia fit well the description by FORET-MONTARDO (1969) or *Nephtys inermis* Ehlers 1887; however, in the description and in the 2 fragments there is a postacicular lobe in the neuropodia, which is absent in the descriptions of *Inermonephtys inermis* from the Atlantic coast of the United States. **SEPLAT 7 (1st part) — St. 118 (A.3045)**, off Praia de Almograve, 113 m, sandy mud: 1 incomplete specimen, with about 55 chaetigers, for about 15 mm long; proboscis everted, without papillae; poor condition, looks like having been dried. **St. 127 (A.3054)**, off Praia de Almograve, 113 m, sandy mud: 1 incomplete specimen, with about 89 chaetigers, for about 25 mm long; poor condition, looks like having been dried. **St. 293 (A.3189)**, off Pessegueiro Island, 130 m, gravelly sand: 1 small specimen, apparently complete but broken in 2 pieces; posterior fragment in poor condition; anterior fragment with 27 chaetigers, posterior fragment with about 17 chaetigers; total length of the 2 pieces of about 14 mm, for about 1 mm wide; proboscis inverted; possible to observe the pair of ventral papillae (antennae?) in the palps. **MNHN, Paris — A 409**: "*Nephthys inermis* Ehlers Haute Adriatique", Collection Pierre Fauvel (Juin 1948); 2 specimens with proboscis everted, probably studied by Pierre Fauvel in his paper of 1940 (FAUVEL, 1940); 1) incomplete, very coiled, which makes difficult to count the number of chaetigers; 2) complete, with about 140 chaetigers for about 50 mm long, and 2 mm wide.
DISTRIBUTION: South England; NW Spain; Mediterranean Sea; Adriatic Sea; Aegean Sea; Portugal; [?] Ivory Coast. In muddy, sandy and detritic bottoms. Sublittoral to 450 meters.

REMARKS: *Inermonephtys inermis* was first described by EHLERS (1887), as *Nephtys (Aglaophamus) inermis*, with base on a single specimen collected in Florida. The species was later recorded from the southeastern coast of USA by DAY (1973), GARDINER (1976) and TAYLOR (1984*b*), while HARTMAN (1940*a*; 1950) recorded the species from the western coast of America (California and Panama), and FAUCHALD (1968) from Vietnam, stating however, that more than one species could be involved in the wide distribution of the species.

The species was first recorded in Europe by MCINTOSH (1900*b*), who identified *Nephthys (Aglaophamus) inermis* from Cape Finisterre, from a depth of about 160 meters, and later by MARENZELLER (1904*a*), as *Nephthys inermis*, from the Southern Adriatic Sea, near the Italian coast (42º2'0"N, 15º27'7"E), at 112 meters, in mud.

FAUVEL (1923*c*) included *Inermonephtys inermis* (as *Nephthys*) in his *Faune de France*, with base on the records by McIntosh, from Finisterre (France), and by Marenzeller, from the Adriatic, and used Ehlers' drawings to represent the European specimens. The same author recorded the species again from the Adriatic Sea (FAUVEL, 1940), and Bellan found it at the Alboran Sea (BELLAN, 1959*a*), Portugal (BELLAN, 1960*a*), south-eastern Aegean Sea (BELLAN, 1961*a*), northern Aegean Sea (BELLAN, 1964*a*), and Western Mediterranean Sea (BELLAN, 1964*b*).

FORET-MONTARDO (1969) was the first author to give a full illustrated description of the European specimens, with base on material collected at the western Mediterranean Sea. This description agrees with the specimens from Portugal found during the present work, and both differ from *Inermonephtys inermis* from the west coast of North and Central America in presenting a very developed postchaetal neuropodial lamellae. None of the other *Inermonephtys* species so far described (*I. gallardi* Fauchald 1968, *I. japonica* Imajima & Takeda 1985, *I. palpata* Paxton 1974, *I. patongi* Nateewhatana & Hylleberg 1986, *I. tetrophthalmos* Rainer & Kaly 1988, and *I. brasiliensis* Martin, Gil & Lana 2009) present such a developed postchaetal neuropodial lamellae, indicating that the European specimens represented a new species, described by Ascensão Ravara and collaborators (RAVARA, CUNHA & PLEIJEL, 2010).

Fauvel also recorded the species from the Gulf of Suez (FAUVEL, 1933*b*, 1933*c*). The Suez and Red Sea population may have continuity with the records found by MONRO (1937*c*), from the South Arabian Coast, Maldives and Gulf of Aden, but they can also form discontinuous populations. Monro's records were used by FAUVEL (1953*c*) to include the species in his *Fauna of India*, once again using the figures of the species published by EHLERS (1887), based on the population from the Gulf of Mexico.

I was able to revise the specimens from the Gulf of Suez identified by FAUVEL (1933*b*, 1933*c*), and from the Adriatic Sea (FAUVEL, 1940), and while the later represent the same species than the found in Portugal, the former is a different species from the European one, which seems to indicate that the new species has its eastern limit in the Adriatic Sea and Eastern Mediterranean. A research was also performed in order to locate the Western Mediterranean specimens identified by FORET-MONTARDO (1969), but this material is apparently lost (GERARD BELLAN, personal communication to DANIEL MARTIN, August 2001).

The specimen identified by HARTMANN-SCHRÖDER (1982*a*) from the region of Cape Blanc (Northwest Africa), doesn't represent the new species, as it is described as lacking a neuropodial postchaetal lamella. The record by INTES & LE LŒUFF (1975) also seems to be very dubious. This way, *I. foretmontardoi* would be present from Southern England to the Eastern Mediterranean Sea (including Adriatic and Aegean Seas).

GENUS *Micronephthys* Friedrich 1939

Micronephthys FRIEDRICH, 1939*a*: 123-125.
TYPE SPECIES: *Nephthys minuta* Theél 1879.

KEY TO SPECIES:

(adapted from: DNESTROVSKAYA & JIRKOV, 2001; DNESTROVSKAYA & JIRKOV, 2010; RAVARA, CUNHA & PLEIJEL, 2010)

1a. Branchiae present; lyrate chaetae absent...**2**
1b. Branchiae absent; lyrate chaetae present...**5**

2a (1a). Branchiae present...**3**

2b (1a). Branchiae absent; 12 rows of large subterminal papillae in the pharynx; sphaerical to oval dorsal and ventral cirri; entire animals 7 mm long for 39 chaetigers..***Micronephthys* sp.**

3a (2a). Pharyngeal unpaired dorsal papilla absent; two types of dentate chaetae (thin serrated and spinose 1.5-2 times thicker than serrated ones); branchiae on 14-15 chaetigers, from chaetiger 5-6 to chaetiger 19; entire animals 3 mm long for 33 chaetigers..................................***M. hartmannschroederae***
3b (2a). Pharyngeal unpaired dorsal papilla present; one type of dentate chaetae; branchiae on 3-13 chaetigers..**4**

4a (3b). Branchiae on 5-9 chaetigers, from chaetiger 6-8 to chaetiger 10-14; entire animals 11-13 mm long for 33 chaetigers..***M. minuta***
4b (3b). Branchiae on 8-14 chaetigers, from chaetiger 5-7 to chaetiger 12-18; entire animals 14-16 mm long for 34 chaetigers..***M. neotena***

5a (1b). First chaetiger with modified notochaetae, short and thick, articulated-like, each article bearing a median point; two pairs of coalescent eyes present at the level of chaetiger 3.........................***M. stammeri***
5b (1b). Modified chaetae absent; one pair of small subdermal eyes may be visible at the level of chaetiger 2–3..***M. sphaerocirrata***

Micronephthys hartmannschroederae Jirkov & Dnestrovskaja *in* Dnestrovaskaya & Jirkov 2001

Micronephthys hartmannschroederae DNESTROVSKAYA & JIRKOV, 2001: 190-192, fig. page 191.
TYPE LOCALITY: Kieler Bucht.
SELECTED REFERENCES: *Micronephthys hartmannschroederae* — DNESTROVSKAYA & JIRKOV, 2010: 109-110, figs. 1, 4, table 1.
DISTRIBUTION: Kieler Bucht. Probably widely distributed in the North Sea and boreal East Atlantic, according to DNESTROVSKAYA & JIRKOV (2010).

Micronephthys minuta (Théel 1879)

Nephthys minuta THÉEL, 1879: 28-31, pl. 2 fig. 18.
TYPE LOCALITY: The species was described from Novaya Zemlya, with base on specimens collected in two different stations, but a type locality was not designated. The data of these two stations is as follows: 1) Besimmennaïa Bay, 72º53'N, 52º53'E, 7-17 meters, in sand and clay; 2) western region of Matotchkin, 73º19'N, 7-34 meters, in sand, muddy sand, and clay.
SELECTED REFERENCES: *Nephthys minuta* — AUGENER, 1913*a*: 206; USCHAKOV, 1955*a*: 218, fig. 68*G*. *Micronephthys minuta* — FRIEDRICH, 1939*a*: 123-125, figs. 3-4; TAYLOR, 1984*b*: 35.5, figs. 35.1-35.2; JIRKOV & PARAKETSOVA, 1996: 831-833, fig. 1; DNESTROVSKAYA & JIRKOV, 2001: 192-193, fig. page 192; DNESTROVSKAYA & JIRKOV, 2010: 110-112, figs. 2, 4, table 1; RAVARA, CUNHA & PLEIJEL, 2010: 24-25, fig. 7. *Micronephthys* sp. aff. *minuta* — FOURNIER & POCKLINGTON, 1984: 261. Not *Micronephthys minuta* — PETTIBONE, 1963*a*: 188-190, fig. 47*b-c*; PARAPAR *et al.*, 1993*a*: 375-376, fig. 7.
DISTRIBUTION: Arctic Ocean: Spitsbergen, Novaya Zemlya, Barents Sea, White Sea, Sea of Okhotsk, Bering Sea, Chukchi Sea, Beaufort Sea; North Atlantic (off Long Island Sound to off Chesapeake Bay; Nova Scotia); north Japan Sea. In sandy and muddy bottoms, and foraminiferan ooze. Intertidal to 189 meters, but recorded in the North Atlantic between 1995-2359 meters. Recorded to be present in boreal, temperate, and tropical waters, but some of the records refer probably to similar species.

Micronephthys neotena (Noyes 1980)

Aglaophamus neotenus NOYES, 1980: 106-113, figs. 1-3.
TYPE LOCALITY: Coast of Maine (Northeastern U.S.A.), off Wentworth Point in the Damariscotta River, extendeding from the intertidal zone to a depth of about 10 meters, in soft, silty mud.
SELECTED REFERENCES: *Micronephthys neotenus* — JIRKOV & PARAKETSOVA, 1996: 833-835, fig. 2; DNESTROVSKAYA & JIRKOV, 2001: 193-194, fig. page 193; DNESTROVSKAYA & JIRKOV, 2010: 112-114, figs. 3-4, table 1. *Nephtys neotena* — OHWADA, 1985: 56, 57-58.
DISTRIBUTION: Coast of Maine, U.S.A. (Damariscotta River, Sheepscot River, and Orland River); Nova Scotia, Eastern Canada (Kennebecasis River, Saint John Estuary, and Minas Basin); Arctic Ocean; White Sea; Kola and other fjords of Kola Peninsula; Barents Sea. In a polyhaline environment, with salinities

ranging between 19 and 30‰. In mixtures of fine silt, clay, and sand grains, including a large amount of organic material. Between 3-318 meters.

Micronephthys sphaerocirrata (Wesenberg-Lund 1949)

Nephthys sphaerocirrata Wesenberg-Lund, 1949: 294-296, figs. 24-26.

Type locality: East of Kharg Island (Iranian Gulf), 29º14'N, 50º20'E, 13 meters, on shells and sand.

Selected references: *Micronephthys sphærocirrata* — Day, 1953: 431. *Nephtys (Micronephthys) sphaerocirrata* — Day, 1967: 347-349, fig. 15.3.*a-d*. *Micronephthys sphaerocirrata* — Campoy, 1982: 506; Laborda, 2004: 415-416; Dnestrovskaya & Jirkov, 2010: table 1; Ravara, Cunha & Pleijel, 2010: 25-27, figs. 7-8. Not *Micronephthys sphaerocirrata* — Fauchald, 1968: 17-18, pl. 4 figs. 36-40 [= *Micronephthys sphaerocirrata orientalis* Lee & Jae 1983]. Not *Nephtys (Micronephthys) sphaerocirrata* — Gibbs, 1971: 155 [= *Micronephthys stammeri* (Augener 1932)].

Distribution: Persian Gulf, 13 meters, on a bottom of sand and shells; South Africa, shallow water, in muddy sand; [?] Bay of Rosas (Spanish Mediterranean coast); [?] Adriatic Sea; [?] Aegean Sea. In fine and muddy sand. From shallow subtidal water to 500 meters.

Remarks: According to Fauchald (1968), the South African record of the species by Day (1953; later repeated in Day, 1967) refers to a species different from the one present in the Vietnamese material studied by him, but that it would be impossible to say which one of them, if either, was the true *M. sphaerocirrata*, without comparing both with the type material. Ravara, Cunha & Pleijel (2010) did this comparison, and determined that the South African specimens belonged to *M. sphaerocirrata*, while the Vietnamese specimens identified by Fauchald (1968) were referred to the subspecies *M. sphaerocirrata orientalis* Lee & Jae 1983. This subspecies differs from the stem subspecies by the number of pharyngeal papillae in each row (12-15 instead of 6-9/8-11) and the prominent preacicular lamellae.

The species has been recorded to be present in the Mediterranean Sea. However, according to Ravara, Cunha & Pleijel (2010), until a confirmation is made these records should be considered with caution.

Micronephthys stammeri (Augener 1932)

Nephthys stammeri Augener, 1932*c*: 678-679, fig. 3.

Type locality: Timavo (= Timava) region (Northern Italy, Adriatic Sea).

Synonyms: *Micronephthys maryae* San Martín 1982.

Selected references: *Micronephthys stammeri* — Banse, 1959*d*: 302-305, fig. 6; Dnestrovskaya & Jirkov, 2010: table 1; Ravara, Cunha & Pleijel, 2010: 27-30, figs. 7, 9. *Micronephthys maryae* — San Martín, 1982*b*: 428-433, figs. 1-3; Rainer & Kaly, 1988: 696-698, figs. 5, 7*b*; Laborda, 2004: 416-418, fig. 152*A-C*. *Nephthys inermis* [not Ehlers 1887] — Augener, 1932*c*: 663-664.

Distribution: Adriatic Sea: Timavo region (Northern Italy) and Rovinj region (Croatia); Black Sea; Western Mediterranean Sea: South Spain and Balearic Islands. Pacific Ocean (Japan, Marshal Islands); Western Australia. In sandy bottoms with many detritus, and near meadows of *Posidonia Oceanica*. Between 3-40 meters.

***Micronephthys* sp.**

Micronephthys minuta [not Théel 1879] — Parapar *et al.*, 1993*a*: 375-376, fig. 7.

Distribution: Western Mediterranean Sea: Ceuta (Northern Africa), Playa Benítez, 35º54'15"N (stated to be 36º54'15"N, but this latitude is certainly wrong), 05º19'54"W, in sand, at 23 meters.

Remarks: Ravara, Cunha & Pleijel (2010) considered the specimens recorded by Parapar *et al.* (1993*a*) as belonging to a different species from *Micronephthys minuta*. The specimens described by Parapar *et al.* (1993*a*) present 12 rows of large subterminal papillae in the pharynx, absence of branchiae, and sphaerical to oval dorsal and ventral cirri, against 18-20 rows of subterminal papillae in the pharynx, presence of branchiae, and dorsal and ventral cirri conical in *M. minuta* (Dnestrovskaya & Jirkov, 2010; Ravara, Cunha & Pleijel, 2010).

*GENUS ***Nephtys*** Cuvier 1817

Nephtys Cuvier 1817*b*: 173.

Type species: *Nephtys hombergii* Savigny *in* Lamarck 1818.

SYNONYMS: *Nephthys* Savigny *in* Lamarck 1818; *Diplobranchus* Quatrefages 1866; *Portelia* Quatrefages 1866.

REMARKS: For a detailed list of references for each European species, including misidentifications or records mixing several species under the same name, check the papers by RAINER (1984, 1989, 1990, 1991) and RAVARA, CUNHA & PLEIJEL (2010).

Two keys are presented below, one adapted from RAINER (1991), and another one given by RAVARA, CUNHA & PLEIJEL (2010).

KEY TO SPECIES:

(adapted from RAINER, 1991)

1a. Prechaetal lamellae of notopodia well developed, bilobed, with dorsal and medial portions extending beyond acicular lobes; interramal cirri from chaetigers 4-7........**2**

1b. Prechaetal lamellae rudimentary or simple; interramal cirri from chaetigers 3-14........**5**

2a (1a). Acicular lobes with medial bulb or papilla; postchaetal lamellae more than twice as long as acicular lobes; pharynx with median dorsal papillae long or short........**3**

2b (1a). Acicular lobes simple, rounded to conical; postchaetal lamellae well or poorly developed; pharynx with median dorsal papillae at least twice as long as subterminal papillae........**4**

3a (2a). Acicular lobes with low medial bulb; interramal cirri from chaetiger 4; prostomium broadest anteriorly or with parallel sides; ventral postchaetal lamellae broadly rounded with internal vascular structure; interramal region of posterior chaetigers with prominent raised ciliary pads; up to 110 chaetigers........***N. assimilis****

3b (2a). Acicular lobes with prominent medial bulb or papilla; interramal cirri from chaetiger 4, 5 or 6; prostomium narrowest anteriorly, with convex anterior margin; ventral postchaetal lamellae expanded medially, with acutely rounded distal margins; interramal region of posterior chaetigers with low ciliary pads; up to 145 chaetigers........***N. hombergii****

4a (2b). Postchaetal lamellae up to twice the length of acicular lobes, which lack a rugose area; interramal cirri from chaetigers 6 or 7, usually 7, reduced or absent in last 15 chaetigers; up to 70, occasionaly 75 chaetigers........***N. hystricis****

4b (2b). Postchaetal lamellae more than twice as long as acicular lobes, which have a rugose area near aciculae; interramal cirri from chaetiger 4, with basal papilla below dorsal cirrus; up to 85 chaetigers........***N. kersivalensis****

5a (1b). Prechaetal lamellae rudimentary; acicular lobes of anterior and middle chaetigers distinctly bilobed; pharynx with numerous warty processes or minute papillae; up to 140 chaetigers........**6**

5b (1b). Prechaetal lamellae rudimentary or moderately developed, acicular lobes of anterior and posterior chaetigers conical or rounded; pharynx with or lacking warty processes or minute papillae; up to 150 chaetigers........**7**

6a (5a). Interramal cirri from chaetigers 7-10, reduced or absent in last 20-30 chaetigers; up to 140 chaetigers........***N. ciliata***

6b (5a). Interramal cirri from chaetigers 5 or 6, not markedly reduced in posterior chaetigers; up to 90 chaetigers........***N. pente***

7a (5b). Postchaetal lamellae more than twice as long as acicular lobes; interramal cirri from chaetigers 3-5, usually from 3 or 4; postacicular chaetae with strongly denticulate distal region........**8**

7b (5b). Postchaetal lamellae less than twice as long as acicular lobes; interramal cirri from chaetigers 4-14; postacicular chaetae usually with spinulose or smooth margins........**9**

8a (7a). Postchaetal lamellae well-developed in notopodia and neuropodia; interramal cirri from chaetigers 4-5, usually from 4; prostomium broad, with straight or gently concave anterior margin; pharynx with numerous warty papillae; up to 150 chaetigers........***N. caeca***

8b (7a). Prechaetal lamellae of notopodia in middle and posterior chaetigers much shorter than in neuropodia; interramal cirri from chaetiger 3; prostomium broadest anteriorly, with strongly concave anterior margin; pharynx lacking warty papillae; up to 120 chaetigers........***N. longosetosa***

9a (7b). Interramal cirri foliaceous or cirriform, from chaetigers 8-14, reduced or absent in posterior chaetigers; up to 110 chaetigers..**10**
9b (7b). Interramal cirri cirriform, from chaetiger 4 to near end of body; up to 95 chaetigers; postacicular chaetae smooth or very finely denticulate, including geniculate chaetae...................................***N. cirrosa****

10a (9a). Interramal cirri foliaceous, usually present from chaetigers 8-10, well-defined from chaetigers 14-16, absent from last 30-50 chaetigers; postacicular chaetae with denticulate proximal region; up to 110 chaetigers..***N. paradoxa***
10b (9a). Interramal cirri cirriform, from chaetigers 8-10, reduced or absent in last 20-25 chaetigers; postacicular chaetae with spinulose or smooth margins; up to 70, occasionally 75 chaetigers.....***N. incisa****

KEY TO SPECIES:

(from RAVARA, CUNHA & PLEIJEL, 2010)

NOT INCLUDED IN THE KEY: *Nephtys pente* Rainer 1984.

1a. Notopodial acicular lobes rounded with rudimentary prechaetal lamellae; neuropodial acicular lobes conical with well developed prechaetal lamellae; branchiae from chaetiger 4 to near end of body; dorsal cirri in posterior chaetigers as long as branchiae; pharynx with 22 rows of 4–9 subterminal papillae extending to base of pharynx...***N. cirrosa****
1b. Noto- and neuropodial acicular lobes and prechaetal lamellae of similar shape and size; dorsal cirri always smaller than branchiae; pharynx subterminal papillae extending over 1/3 or 1/2 length of pharynx...**2**

2a (1b). Acicular lobes conical; prechaetal lamellae well developed, rounded or bilobed; postacicular chaetae finely spinulated; branchiae start at chaetigers 4–7...**3**
2b (1b). Acicular lobes rounded to bilobed; prechaetal lamellae rudimentary or poorly developed; postacicular chaetae coarsely spinulated; branchiae start at chaetigers 3–14...**7**

3a (2a). Acicular lobes with a papilliform outgrowth; postchaetal lamellae of neuropodia extending well beyond acicular lobes; pharynx middorsal papilla long or short..**4**
3b (2a). Acicular lobes without papilliform outgrowth; postchaetal lamellae well or poorly developed; pharynx middorsal papilla at least twice as long as subterminal papillae..**5**

4a (3a). Acicular lobes with low papilliform outgrouth; branchiae start at chaetiger 4; neuropodial postchaetal lamellae broadly rounded with internal vascular structure; interramal region of posterior chaetigers with prominent raised ciliary pads..***N. assimilis****
4b (3a). Acicular lobes with prominent papilliform outgrouth; branchiae start at chaetiger 4 or 5 (rarely 6); neuropodial postchaetal lamellae slender without vascular structure; interramal region of posterior chaetigers with ciliated patches...***N. hombergii****

5a (3b). Postchaetal lamellae more than twice as long as acicular lobes; acicular lobes with rugose area near aciculae; branchiae start at chaetiger 4 to near posterior end; conspicuous papilla-like projection present at the base of the branchiae..***N. kersivalensis****
5b (3b). Postchaetal lamellae shorter or no longer than twice the length of acicular lobes; acicular lobes without rugose area; branchiae start at chaetiger 5–10, absent from posterior chaetigers; basal projection of the branchiae reduced or absent..**6**

6a (5b). Postchaetal lamellae up to twice the length of acicular lobes; branchiae start at chaetigers 5–7, usually at chaetiger 6..***N. hystricis****
6b (5b). Postchaetal lamellae shorter than or as long as acicular lobes; branchiae start at chaetigers 9–10..***N. incisa****

7a (2b). Postchaetal lamellae more than twice as long as acicular lobes; branchiae start at chaetigers 3–5 (usually chaetiger 3 or 4), to near posterior end..**8**
7b (2b). Postchaetal lamellae equal in size or slightly shorter than acicular lobes; branchiae start at chaetigers 7–14, reduced in posterior chaetigers...**9**

8a (7a). Postchaetal lamellae well developed in notopodia and neuropodia; branchiae start at chaetiger 4 (rarely 5); pharynx proximal region with numerous warts..***N. caeca***
8b (7a). Notopodial postchaetal lamellae of median and posteror chaetigers much shorter than in neuropodia; branchiae start at chaetiger 3; pharynx proximal region smooth........................***N. longosetosa***

9a (7b). Branchiae cirriform, starting at chaetigers 7–11; acicular lobes of anterior and middle chaetigers distinctly bilobed; pharynx proximal region with numerous warts...***N. ciliata***
9b (7b). Branchiae foliaceous, start at chaetigers 9–14; acicular lobes rounded in anterior and median parapodia, conical in posterior parapodia; pharynx proximal region smooth............................***N. paradoxa***

****Nephtys assimilis*** Ørsted 1843

Nephtys assimilis ØRSTED, 1843*a*: 33, pl. 6 figs. 93 [reference in the text to fig. 95 is wrong], 100.
TYPE LOCALITY: Hellebæk, Øresund (Denmark). Neotype designated by RAINER (1989) from off Hornbæk Bay, Øresund, Denmark, at 18 meters.
SYNONYMS: [?] *Nephtys Cuvieri* Quatrefages 1866; *Nephtys hombergii* var. *vasculosa* McIntosh 1908 [in part]; *Nephthys breogani* Laborda & Viéitez 1984.
SELECTED REFERENCES: *Nephtys assimilis* — MALMGREN, 1865: 105-106, pl. 12 fig. 19; RAINER, 1989: 877-882, fig. 1; RAINER, 1991: 66-68, fig. 2*A*, table 1; HARTMANN-SCHRÖDER, 1996: 218-220, fig. 94; KIRKEGAARD, 1996: 451, fig. 249*a*; LABORDA, 2004: 396-398, fig. 146*A-B*; RAVARA, CUNHA & PLEIJEL, 2010: 30-34, figs. 10-11, table 5. *Nephtys breogani* — LABORDA, 1987: 132-141, figs. 4, 7-9, 13, 15. [?] *Nephtys Cuvieri* — QUATREFAGES, 1866*b*: 421-423. *Nephtys scolopendroides* — MICHAELSEN, 1896: 57 [in part]. *Nephtys hombergii* var. *vasculosa* — MCINTOSH, 1908*c*: 21-22 [in part]. *Nephtys caeca* — HEINEN, 1911: 10-13 [in part]. *Nephtys incisa* var. *bilobata* — HEINEN, 1911: 25, map 2 [in part]; FAUVEL, 1923*c*: 370-371, fig. 144*b*. *Nephthys Hombergii* [not Savigny *in* Lamarck 1818] — SAINT-JOSEPH, 1894: 3-16, pl. 1 figs. 1-13 [in part]. *Nephthys Hombergi* [not Savigny *in* Lamarck 1818] — AUGENER, 1913*a*: 197-199 [in part]. *Nephtys hombergii* [not Savigny *in* Lamarck 1818] — KIRKEGAARD, 1969: 47-51, figs. 20-22, tables 6-7 [in part]; HARTMANN-SCHRÖDER, 1971*a*: 215-217 [in part]; HARTMANN-SCHRÖDER, 1974*d*: 206-207 [in part]; HARTMANN-SCHRÖDER, 1977*a*: 88 [in part]. *Nephtys hombergii* [not Savigny *in* Lamarck 1818] — HARTMANN-SCHRÖDER, 1981: 31; HARTMANN-SCHRÖDER, 1982*a*: 10-11. *Nephthys breogani* — LABORDA & VIÉITEZ, 1984: 211-218, figs. 2-6. Not *Nephtys assimilis* — TREADWELL, 1914: 193; HARTMAN, 1940*a*: 239.
REFERENCES FOR PORTUGAL: RAVARA, 1997 (off Aveiro); RAVARA *et al.*, 2010 (off Cascais); RAVARA, CUNHA & PLEIJEL, 2010 (off Aveiro; Figueira da Foz, mouth of Mondego Estuary; off Cascais; Lagos); present work (southwestern continental shelf).
MATERIAL: SEPLAT 6 — St. 280 (A.2742), off Praia de Odeceixe, 270 m, sandy mud: 1 posterior fragment with 36 chaetigers; anal cirri at least 6 chaetigers long; vascular structure not visible, but the ciliated pads are quite clear. **SEPLAT 7 (2nd part) — St. 186 (A.3925)**, south Sines, 27 m, muddy sand: 1 incomplete specimen with 79 chaetigers; prostomium missing; vascular structure and ciliated pads visible. **St. 189 (A.3922)**, south Sines, 29 m, muddy sand: 1 complete specimen with 87 chaetigers, 27 mm long; parapodia as described; interramal cirri from chaetiger 4. **St. 318 (A.3843)**, near Arrifana, 54 m, sand: 4 specimens; internal vascular structure well visible in the posterior lamellae of the neuropodia; ciliated pads in the parapodia of the middle and posterior region; interramal cirri from chaetiger 4; (1) big specimen, incomplete, with 67 chaetigers for 60 mm long, first 3 chaetigers seen with difficulty, as the specimen is strongly contracted; (2) complete, with 115 chaetigers, 65 mm long, anal cirri short, about 3 chaetigers long; (3) complete, with 92 chaetigers and 30 mm long; (4) incomplete, with 50 chaetigers, plus one fragment with 29 chaetigers, probably from the same specimen.
DISTRIBUTION: North-eastern Atlantic, including Ireland, North Sea, Skagerrak, Øresund and western Baltic Sea; from English Channel to the Mediterranean Sea; Aegean Sea; Northwestern Africa. In sandy and muddy bottoms, especially in muddy sands with strong tidal currents. Intertidal to about 100 meters.

Nephtys caeca (Fabricius 1780)

Nereis caeca FABRICIUS, 1780: 304-305.
TYPE LOCALITY: West Greenland, in sandy littoral, under stones.
SYNONYMS: *Aonis caeca* Savigny *in* Lamarck 1818; *Nephthys margaritàcea* Johnston 1835; *Nephtys bononensis* Quatrefages 1866; *Nephtys oerstedii* Quatrefages 1866; *Portelia caeca* Quatrefages 1866; *Nephthys nudipes* Ehlers 1868; *Nephthys caeca* Var. *ciliata* McIntosh 1908.
SELECTED REFERENCES: *Nephthys cæca* — M. SARS, 1863: 302; MALMGREN, 1865: 104-105, pl. 12 fig. 18; SAINT-JOSEPH, 1894: 16-20, pl. 1 figs. 14-18. *Nephthys coeca* — MICHAELSEN, 1896: 25-27.

Nephthys caeca — EHLERS, 1868: 588-617, pl. 23 figs. 10-34; MÖBIUS, 1874: 168-169 [in part]; MCINTOSH, 1908*c*: 8-17; HEINEN, 1911: 10-13, fig. 1, maps 1, 4; FAUVEL, 1923*c*: 365-366, fig. 142. *Nephtys caeca* — FAUCHALD, 1963: 11-13, figs. 1*D*, 3*D*, 6*B*, table 1; WOLFF, 1968: 4, fig. 7; KIRKEGAARD, 1969: fig. 18; HARTMANN-SCHRÖDER, 1974*d*: 208; GARWOOD & OLIVE, 1981: 195-201, figs. 3, 4*A*, 5*B-C*, 7-11; RAINER, 1984: fig. 1*C*; IMAJIMA & TAKEDA, 1987: 63-67, figs. 12, 14; RAINER, 1991: 69-70, fig. 3*C*, table 1; KIRKEGAARD, 1992: 331-333, fig. 161; HARTMANN-SCHRÖDER, 1996: 220-221, fig. 95; LABORDA, 2004: 398-399, fig. 146*C*; RAVARA, CUNHA & PLEIJEL, 2010: 34-37, figs. 12-13. *Nephthys coeca* — AUGENER, 1913*a*: 191-193, pl. 6 figs. 24-25. *Nephthys caeca* var. *ciliata* — MCINTOSH, 1908*c*: 13-14, pl. 66 fig. 3; HEINEN, 1911: 13-16, fig. 2, map 1. *Néphtys margaritàcea* — JOHNSTON, 1835*b*: 341-243, fig. 33. *Nephthys nudipes* — EHLERS, 1868: 635-637, pl. 23 fig. 41. *Nephthys hombergi* — HEINEN, 1911: 16-20 [in part]. *Nephthys longisetosa* — HEINEN, 1911: 26-29 [in part]. *Nephthys hombergi* var. *ehlersi* — AUGENER, 1939: 137-138 [in part].

REFERENCES FOR PORTUGAL: BELLAN, 1960*a* (as *Nephthys caeca*; Cape São Vicente); CAMPOY, 1982 (previous records: 37º1.1'N – 9º4'W); MONTEIRO-MARQUES, 1987 (as *Nephthys caeca*; continental shelf of Algarve); DEXTER, 1992 (previous records: continental shelf of Algarve).

DISTRIBUTION: Arctic Ocean; North Atlantic, from the Arctic to the English Channel, including North Sea, Skagerrak, Kattegat, Øresund, and western and middle Baltic Sea; Mediterranean Sea to the Black Sea; Aegean Sea; from Gulf of St. Lawrence to Rhode Island; Northern Pacific Ocean to California; Sea of Okhotsk; Japan; Yellow Sea; China Sea. In gravel, and in muddy and sandy bottoms. From lower intertidal to 1000 meters.

Nephtys ciliata (O.F. Müller 1776)

Nereis ciliata O.F. MÜLLER, 1776: 17.

TYPE LOCALITY: Denmark.

SYNONYMS: *Nephtys borealis* Ørsted 1843.

SELECTED REFERENCES: *Nephthys ciliata* — MALMGREN, 1865: 104, pl. 12 fig. 17; EHLERS, 1868: 629-632, pl. 23 fig. 36; HEINEN, 1911: 21-23, fig. 5, map 4 [in part]; FAUVEL, 1923*c*: 371, fig. 145*a-b*. *Nephtys ciliata* — FAUCHALD, 1963: 5-8, figs. 1*B*, 2*E*, 3*A*, 5*B*, 9, table 1; WOLFF, 1968: 4, fig. 9; RAINER, 1984: fig. 1*H*; IMAJIMA & TAKEDA, 1987: 67; RAINER, 1991: 70-71, fig. 3*A*, table 1; KIRKEGAARD, 1992: 333-334, fig. 162; HARTMANN-SCHRÖDER, 1996: 221-222, fig. 96; LABORDA, 2004: 399-400, fig. 146*D*; RAVARA, CUNHA & PLEIJEL, 2010: 37-38, figs. 13-14. *Nephthys Hombergi* — AUGENER, 1913*a*: 197-199, 202-203 [in part]. Not *Nephthys ciliata* — AUGENER, 1913*a*: 192-197 [in part = *Nephtys longosetosa* Ørsted 1842; in part = *Nephtys pente* Rainer 1984]. Not *Nephthys ciliata* — MCINTOSH, 1908*c*: 23-27; KIRKEGAARD, 1969: 46, fig. 19 [= *Nephtys pente* Rainer 1984]. Not *Nephthys ciliata* form. *longosetosa* — AUGENER, 1939: 137. *Nephthys hombergi* var. *ehlersi* — AUGENER, 1939: 137-138 [in part; in part = *Nephtys caeca* (Fabricius 1780)]. *Nephtys borealis* — ØRSTED, 1843*a*: 32, text-fig. 8.

DISTRIBUTION: Arctic and North Atlantic, including coasts of Greenland, Iceland, Norway, Skagerrak, Kattegat, and the western and middle Baltic Sea; North Sea; English Channel; [?] Mediterranean Sea to the Black Sea; [?] Adriatic Sea; from Hudson Bay to Massachusetts; North Pacific Ocean (Alaska; Bering Sea; Sea of Okhotsk; Japan). In muddy sand, in shallow waters of the Baltic, and in deeper waters further north. From lower intertidal to 950 meters.

REMARKS: According to RAVARA, CUNHA & PLEIJEL (2010) the records of this species from the Mediterranean Sea require confirmation.

**Nephtys cirrosa* Ehlers 1868

Nephthys cirrosa EHLERS, 1868: 624-626, pl. 23 figs. 6, 37-38.

TYPE LOCALITY: Coast of England ("*Englisch Küste*").

SYNONYMS: *Nephthys ehlersi* Heinen 1911; *Nephthys cirrosa longicornis* Jakubova 1930.

SELECTED REFERENCES: *Nephthys cirrosa* — SAINT-JOSEPH, 1894: 20-22, pl. 1 fig. 19; MCINTOSH, 1908*c*: 36-39; AUGENER, 1913*a*: 199-202; FAUVEL, 1923*c*: 369, fig. 144*c-h*; FORET-MONTARDO, 1969: 812-814, pls. 2, 6-7; HARTMANN-SCHRÖDER, 1974*d*: 208-209. *Nephtys cirrosa* — WOLFF, 1968: 4, fig. 5; KIRKEGAARD, 1969: 46-47, fig. 19; RAINER, 1984: fig. 1*E-F*; LABORDA, 1987: 132-141, figs. 1, 3, 6, 11-12; RAINER, 1991: 72-73, fig. 3*F*, table 1; KIRKEGAARD, 1992: 334-336, fig. 163; HARTMANN-SCHRÖDER, 1996: 222-223, fig. 97; LABORDA, 2004: 400-402, fig. 147*A-C*; RAVARA, CUNHA & PLEIJEL, 2010: 41-45, figs. 15-16. *Nephthys ehlersi* — HEINEN, 1911: 34-36, pl. 1 figs. 1-2, map 1. *Nephthys cirrosa longicornis* — JAKUBOVA, 1930: 871. *Nephthys longisetosa* — HEINEN, 1911: 26-29 [in part].

REFERENCES FOR PORTUGAL: AMOUREUX & CALVÁRIO, 1981 (as *Nephthys cirrosa*; Tagus Estuary; Peniche); SOUSA-REIS *et al.*, 1982 (as *Nephthys cirrosa*; Peniche region); CALVÁRIO, 1984 (as *Nephthys cirrosa*; Tagus Estuary); COSTA, GAMITO & OLIVEIRA, 1984 (as *Nephthys cirrosa*; Sado Estuary); MONTEIRO-MARQUES, 1984 (as *Nephthys cirrosa*; Praia da Falésia); PINTO, 1984 (as *Nephthys cirrosa*; Sado Estuary); MONTEIRO-MARQUES, 1987 (as *Nephthys cirrosa*; continental shelf of Algarve); QUINTINO & GENTIL, 1987 (Lagoon of Albufeira; Lagoon of Óbidos); CANCELA DA FONSECA, COSTA & BERNARDO, 1989 (as *Nephthys cirrosa*; Lagoon of Santo André); QUINTINO, RODRIGUES & GENTIL, 1989 (Lagoon of Óbidos); DEXTER, 1992 (previous records: Ria Formosa; Ria de Alvor; continental shelf of Algarve; Mira Estuary; Sines; Sado Estuary; Arrábida; Lagoon of Albufeira; Tagus Estuary; Peniche; Lagoon of Óbidos; Figueira da Foz; Mondego Estuary; Ria de Aveiro); PARDAL, MARQUES & BELLAN, 1993 (as *Nephthys cirrosa*; Mondego Estuary); MOREIRA, FIGUEIRA & CUNHA, 1994 (as *Nephthys cirrosa*; Ria de Aveiro); PARDAL, MARQUES & BELLAN, 1994 (Mondego Estuary); RAVARA, 1997 (off Aveiro); CANCELA DA FONSECA *et al.*, 2006 (Aljezur; Odeceixe); RAVARA, CUNHA & PLEIJEL, 2010 (Vila Praia de Âncora; off Aveiro; Ria de Aveiro; Figueira da Foz, Mondego Estuary; Trafaria; Sado Estuary; Setúbal, Troia Peninsula; Sines; Vila Nova de Milfontes; Ria do Alvôr; Portinho de Ferragudo); RAVARA *et al.*, 2010 (Vila Nova de Milfontes); present work (southwestern continental shelf).

MATERIAL: SEPLAT 6 — St. 12 (A.2517), off Ponta Ruiva, 35 m, sand: 2 specimens, 1 complete, with 87 chaetigers for 30 mm long, the other incomplete; notopodial prechaetal lamellae bilobed. **St. 103 (A.2585)**, off Carrapateira, 29 m, sand: 3 specimens in good condition, apparently all complete, but broken in 2 pieces; one of them is very small, probably a juvenile. **St. 105 (A.2587)**, off Carrapateira, 50 m, sand: 1 complete specimen, with 92 chaetigers for 17 mm long; anal cirri present, but broken; interramal cirri from chaetiger 4; proboscis partially everted. **St. 135 (A.2614)**, off Praia de Vale Figueiras, 37 m, sand: 2 incomplete specimens, in good condition, plus one fragment. **St. 165 (A.2638)**, off Arrifana, 36 m, sand: 1 fragment with 30 chaetigers. **St. 166 (A.2639)**, near Arrifana, 23 m, sand: 2 specimens; (1) complete, in very good condition, 87 chaetigers for 35 mm long; proboscis everted, with 22 rows of papillae; (2) apparently complete, broken in 3 pieces, with 37, 39, and 26 chaetigers plus pygidium. **St. 259 (A.2724)**, off Praia do Vale dos Homens, 58 m, sand: 1 incomplete specimen in good condition, but very stiff; prechaetal notolamellae clearly bilobed; proboscis everted. **St. 264 (A.2729)**, off Praia da Esteveira, 64 m, sand: 2 incomplete specimens. **St. 398 (A.2833)**, near Zambugeira do Mar, 29 m, sand: 1 specimen, broken in 3 pieces; proboscis partially everted. **SEPLAT 7 (1st part) — St. 122 (A.3049)**, near Praia de Almograve, 23 m, sand: 1 fragment with 13 chaetigers. **SEPLAT 7 (2nd part) — St. 15 (A.4107)**, near Lagoa de Santo André, 23 m, sand: 2 specimens (1) complete, with 86 chaetigers and 40 mm long; anal cirri lost; (2) one posterior fragment with 44 chaetigers; anal cirri present, very thin, 17 chaetigers long. **St. 16 (A.4106)**, near Lagoa de Santo André, 23 m, sand: 2 specimens, smaller one broken in 3 pieces; postacicular chaetae short and sharply bented, well visible. **St. 73 (A.4034)**, north Sines, 21 m, sand: 1 complete specimen with about 100 chaetigers, and about 65 mm long; prechaetal lobe bilobed; proboscis partially everted; some papillae visible, but very difficult to count them; anal cirrus present, being very long. **St. 188 (A.3923)**, south Sines, 17 m, sand: 5 specimens, 2 complete (one of which almost breaking in 2 pieces), and 3 incomplete, plus 2 posterior fragments. **St. 194 (A.3918)**, south Sines, 84 m, sand: 2 fragments. **St. 258 (A.3880)**, south Cape Sardão, 38 m, sand: 1 incomplete specimen, in good condition, with 36 chaetigers, plus one fragment with 16 chaetigers. **St. 316 (A.3844)**, off Arrifana, 82 m, sand: 1 specimen, in very poor condition, plus one posterior fragment with pygidium; interramal cirri from chaetiger 4; sharply bented postacicular chaetae. **St. 318 (A.3843)**, near Arrifana, 54 m, sand: 1 complete specimen with 75 chaetigers, 30 mm long; prechaetal lamellae bilobed. **FAUNA 1 — St. 56*A***, Gulf of Cádiz, off Cape Trafalgar, 24 m, rock and gravel; 2 fragments of a specimen, with 10 and 19 chaetigers. **St. 61*A***, Gibraltar Strait, Tarifa, 39-44 m, rock: 1 incomplete specimen with 36 chaetigers; proboscis everted, pharyngeal papillae extending to the base of the proboscis; parapodia bilobed; first parapodia with a rudimentary dorsal cirrus and a slender ventral cirrus as long as the prostomial palps; interramal cirri from chaetiger 5.

DISTRIBUTION: North-eastern Atlantic, from the North Sea to the Ivory Coast; Irish Sea; Mediterranean Sea; Adriatic Sea; Aegean Sea; Black Sea. In clean to muddy coarse and fine sands, more common in clean, fine sand. From lower intertidal to 170 meters.

REMARKS: RAVARA, CUNHA & PLEIJEL (2010) confirmed the existence of two forms of *Nephtys cirrosa* (designated Form A and Form B), something already detected by HEINEN (1911) and RAINER (1991). They can be identified as follows:

Form A – Originally described as *Nephtys cirrosa* by EHLERS (1868). Acicular lobes rounded to bilobed, notopodial prechaetal lamellae rudimentary, and pharyngeal middorsal papilla subequal in size to the other subterminal papillae. Mostly present in North European waters.

Form B – Originally described as *Nephthys ehlersi* by HEINEN (1911). Acicular lobes rounded to conical, notopodial prechaetal lamellae well developed and bilobed, and pharyngeal middorsal papilla longer than the other subterminal papillae. Besides, this form usually has larger postchaetal lamellae and orange pigmentation in prostomium. Mostly present in South European waters.

RAVARA, CUNHA & PLEIJEL (2010) suggested further investigation with molecular analysis in order to elucidate the presence of two distinct species. Was this the case, then the name *Nephtys ehlersi* would have to be reinstated to designate the specimens ascribed presently to Form B.

****Nephtys hombergii*** Savigny *in* Lamarck 1818

Nephthys Hombergii SAVIGNY *in* LAMARCK, 1818: 314.

TYPE LOCALITY: Hâvre de Grace (= Le Havre), French coast of the English Channel.

SYNONYMS: *Nereis scolopendroides* Delle Chiaje 1822; *Nephthys neapolitana* Grube 1840; *Nephthys Macandrewi* Baird 1873.

SELECTED REFERENCES: *Nephthys Hombergii* — SAVIGNY, 1822: 34-35; SAINT-JOSEPH, 1894: 3-16, pl. 1 figs. 1-13 [in part; in part = *Nephtys assimilis* Ørsted 1843]; FAUVEL, 1923*c*: 367, fig. 143*a-d* [in part]. *Nephthys hombergii* — MCINTOSH, 1908*c*: 17-23 [in part]; HEINEN, 1911: 16-20, figs. 3-4, maps 1, 4 [in part]; DITLEVSEN, 1929: 20-21; FORET-MONTARDO, 1969: 810-812, pls. 1, 6-7 [at least, in part]. *Nephthys Hombergi* — AUGENER, 1913*a*: 197-199, 202, fig. 26 [in part; in part = *Nephtys assimilis* Ørsted 1843]. *Nephtys hombergi* — FAUCHALD, 1963: 3-5, figs. 1*G*, 2*D*, 3*E*, 5*A*, 9, table 1 [in part]; WOLFF, 1968: 4, fig. 6; KIRKEGAARD, 1992: 336-338, fig. 164 [in part]. *Nephtys hombergii* — HARTMANN-SCHRÖDER, 1971*a*: 215-217, fig. 70*a-b* [in part]; HARTMANN-SCHRÖDER, 1974*d*: 206-207 [in part]; HARTMANN-SCHRÖDER, 1977*a*: 88 [in part; in part = *Nephtys assimilis* Ørsted 1843]; RAINER, 1984: fig. 1*B*; LABORDA, 1987: 132-141, figs. 2, 5, 10, 14, 16; RAINER, 1991: 73-75, fig. 2*B*, table 1; KIRKEGAARD, 1996: 450, fig. 249*b*; HARTMANN-SCHRÖDER, 1996: 224-225, fig. 98; LABORDA, 2004: 402-403, fig. 147*D-E*; RAVARA, CUNHA & PLEIJEL, 2010: 45-48, figs. 11, 17, table 5. *Nereis scolopendroides* — DELLE CHIAJE, 1822: pl. 28 figs. 8, 13, 22-27; DELLE CHIAJE, 1827: 401-403, 424-425, 432. *Nephtys scolopendroides* — AUDOUIN & MILNE-EDWARDS, 1833*b*: 260; MICHAELSEN, 1896: 57 [in part]. *Nephthys Neapolitana* — GRUBE, 1840: 71. *Nephthys Macandrewi* — BAIRD, 1873: 94. *Nephthys hombergii* var. *kersivalensis* — MCINTOSH, 1908*c*: 20-21 [in part]. *Nephtys hombergii* var. *vasculosa* — MCINTOSH, 1908*c*: 21-22 [in part]. Not *Nephtys hombergii* — HARTMANN-SCHRÖDER, 1981: 31; HARTMANN-SCHRÖDER, 1982*a*: 10-11 [= *Nephtys assimilis* Ørsted 1843]. Not *Nephtys hombergii* var. *kersivelensis* — HARTMANN-SCHRÖDER, 1971*a*: 217, fig. 70*c*.

REFERENCES FOR PORTUGAL: BELLAN, 1960*a* (as *Nephthys hombergi*; Cape Roca; Cape Espichel; Setúbal Canyon; Cape São Vicente; Cape Santa Maria); [?] AMOUREUX, 1974*b* (as *Nephthys? hombergii*; off Aveiro; off Porto); HARTMANN-SCHRÖDER, 1977*a* (Bay of Setúbal); MONTEIRO-MARQUES, 1979 (as *Nephthys hombergii*; southern continental shelf of Algarve); AMOUREUX & CALVÁRIO, 1981 (as *Nephthys hombergi*; Peniche; Lagoon of Óbidos); CAMPOY, 1982 (as *Nephtys hombergi*; previous records: Aveiro; Porto; Portuguese coast); SOUSA-REIS *et al.*, 1982 (as *Nephthys hombergi*; Peniche region); CALVÁRIO, 1984 (as *Nephthys hombergii*; Tagus Estuary); COSTA, GAMITO & OLIVEIRA, 1984 (as *Nephthys hombergii*; Sado Estuary); MONTEIRO-MARQUES, 1984 (as *Nephthys hombergii*; Praia da Falésia); PINTO, 1984 (as *Nephthys hombergii*; Sado Estuary); MONTEIRO-MARQUES, 1987 (as *Nephthys hombergii*; continental shelf of Algarve); QUINTINO & GENTIL, 1987 (Lagoon of Óbidos); CANCELA DA FONSECA, COSTA & BERNARDO, 1989 (as *Nephthys hombergii*; Lagoon of Santo André); QUINTINO, RODRIGUES & GENTIL, 1989 (Lagoon of Óbidos); DEXTER, 1992 (previous records: Ria Formosa; Ria de Alvor; continental shelf of Algarve; Mira Estuary; Sines; Sado Estuary; Arrábida; Lagoon of Óbidos; Tagus Estuary; Peniche; Figueira da Foz; Ria de Aveiro); PARDAL, MARQUES & BELLAN, 1993 (as *Nephthys hombergii*; Mondego Estuary); PARDAL, MARQUES & BELLAN, 1994 (as *Nephtys hombergi*; Mondego Estuary); SPRUNG, 1994 (as *Nephtys hombergi*; Ria Formosa); SALDANHA, 1995 (Portugal); RAVARA, 1997 (off Aveiro); MUCHA & COSTA, 1999 (as *Nephthys hombergi*; Ria de Aveiro and/or Sado Estuary); RAVARA, CUNHA & PLEIJEL, 2010 (Vila Praia de Âncora; Matosinhos; Ria de Aveiro; off Aveiro; Figueira da Foz, Mondego Estuary; Foz do Arelho; off Cascais; Sado Estuary; Vila Nova de Milfontes; Portinho de Ferragudo, Ria Formosa, Praia de Faro and Ilha da Armona); RAVARA *et al.*, 2010 (Ria de Aveiro); present work (southwestern continental shelf).

MATERIAL: SEPLAT 6 — St. 206 (A.2674), off Arrifana, 155 m, sand: 1 specimen, with about 11 chaetigers. **St. 250 (A.2715)**, off Praia da Amoreira, 181 m, sand: 1 incomplete specimen with 73 chaetigers, 50 mm long; proboscis everted; interramal cirri from chaetiger 6. **St. 286 (A.2747)**, off Praia de Odeceixe, 135 m, sand: 1 complete specimen with 120 chaetigers for 50 mm long; anal cirrus 10 chaetigers long; interramal cirri from chaetiger 6. **St. 321 (A.2778)**, off Praia de Odeceixe, 126 m, sand: 1 incomplete specimen, in good condition; dark colored, maybe due to the fixation process; interramal cirris from chaetiger 6. **SEPLAT 7 (1st part) — St. 25 (A.2960)**, off Zambugeira do Mar, 126 m, sand: 1 specimen, in very poor condition, plus one fragment. **St. 44 (A.2977)**, off Zambugeira do Mar, 230 m, muddy sand: 1 specimen in poor condition, very stiff, with 48 chaetigers for 30 mm long, plus 2 fragments; proboscis partially everted; interramal cirri from chaetiger 6; dorsum with characteristic brown color. **St. 69 (A.2998)**, off Cape Sardão, 160 m, sand: 1 fragment with about 22 chaetigers. **St. 76 (A.3005)**, off Cape Sardão, 152 m, sand: 1 specimen in poor condition; interramal cirri from chaetiger 6. **St. 94 (A.3022)**, off Cape Sardão, 125 m, muddy sand: 2 incomplete specimens; interramal cirri from chaetiger 6. **St. 95 (A.3023)**, off Cape Sardão, 110 m, muddy sand: 1 incomplete specimen with 72 chaetigers and 40 mm long, plus one fragment with 21 chaetigers; interramal cirri from chaetiger 6. **St. 104 (A.3032)**, off Praia de Almograve, 250 m, muddy sand: 1 complete specimen in a very good condition; proboscis everted; interramal cirri from chaetiger 6; anal cirri about 5 chaetigers long. **St. 140 (A.3067)**, off Praia de Almograve, 330 m, muddy sand: 1 small incomplete specimen, with 30 chaetigers for 9 mm long. **St. 196 (A.3018)**, off Vila Nova de Milfontes, 147 m, muddy sand: 1 specimen in very poor condition; interramal cirri from chaetiger 6. **St. 201 (A.3113)**, off Vila Nova de Milfontes, 240 m, sand: 1 specimen in poor condition, plus one fragment. **St. 228 (A.3132)**, off Vila Nova de Milfontes, 138 m, muddy sand: 1 specimen in poor condition, broken in 2 pieces; interramal cirri from chaetiger 6. **St. 229 (A.3133)**, off Vila Nova de Milfontes, 148 m, muddy sand: 1 specimen, in poor condition, plus one fragment; interramal cirri from chaetiger 6. **St. 234 (A.3138)**, off Vila Nova de Milfontes, 237 m, muddy sand: 1 complete specimen, in poor condition, with 101 chaetigers for 35 mm long. **St. 242 (A.3146)**, off Praia do Malhão, 176 m, sand: 1 incomplete specimen in good condition; interramal cirri from chaetiger 6. **St. 243 (A.3147)**, off Praia do Malhão, 162 m, sand: 1 incomplete specimen, in poor condition. **St. 247 (A.3151)**, off Praia do Malhão, 130 m, muddy sand: 1 incomplete specimen, in poor condition, plus 3 fragments; interramal cirri from chaetiger 6. **St. 294 (A.3190)**, off Pessegueiro Island, 145 m, muddy sand: 1 small incomplete specimen, in poor condition; interramal cirri from chaetiger 6. **St. 298 (A.3194)**, off Porto Covo, 205 m, sand: 1 incomplete specimen, in poor condition. **St. 312 (A.3208)**, off Porto Covo, 108 m, muddy sand: 1 complete specimen, in poor condition, with 119 chaetigers for 75 mm long. **SEPLAT 7 (2nd part) — St. 9 (A.4099)**, off Lagoa de Santo André, 125 m, sand with shells: 1 big specimen, incomplete; interramal cirri from chaetiger 6. **St. 22 (A.4082)**, north Sines, 122 m, sand: 1 incomplete specimen plus a posterior fragment; interramal cirri from chaetiger 6. **St. 24 (A.4084)**, north Sines, 130 m, sand: 1 incomplete specimen with 35 chaetigers; interramal cirri from chaetiger 6. **St. 38 (A.4069)**, north Sines, 120 m, sand with shells: 1 complete specimen with 125 chaetigers, about 100 mm long; one anal cirrus present; interramal cirri from chaetiger 6. **St. 75 (A.3004)**, off Cape Sardão, 140 m, sand: 1 incomplete specimen in poor condition, with 32 chaetigers and 20 mm long; interramal cirri from chaetiger 6; dorsum brown colored. **St. 83 (A.4024)**, near Sines, 145 m, sand: 1 incomplete specimen, anterior end, including the head, missing; 115 chaetigers and about 90 mm long, one anal cirrus. **St. 131 (A.3978)**, off Sines, 115 m, muddy sand: 1 incomplete specimen, in very good condition; proboscis everted, with 22 rows of papillae; interramal cirri from chaetiger 5. **St. 132 (A.3977)**, off Sines, 130 m, muddy sand: 1 specimen, complete but broken in two pieces, of 56 and 33 chaetigers; total length of about 70 mm; dorsum brown; interramal cirri from chaetiger 6. **St. 189 (A.3922)**, south Sines, 29 m, muddy sand: 1 fragment with about 14 chaetigers. **St. 305 (A.3848)**, NW Arrifana, 120 m, sand: 1 incomplete specimen, in good condition; interramal cirri from chaetiger 5. **FAUNA 1 — St. 57*A***, Gulf of Cádiz, off Cape Trafalgar, 76-80 m, gravel and stones: 1 complete specimen, with about 115 chaetigers and 140 mm long; anterior margin of the prostomium convex; interramal cirri from chaetiger 6.

DISTRIBUTION: Northeastern Atlantic, from the Barents Sea to the Mediterranean Sea, including the North Sea, Skagerrak, Kattegat and outer Baltic Sea; Adriatic Sea; Aegean Sea; Black Sea; [?] South Africa. In many kinds of bottoms, mainly in muddy and clayey sand. Intertidal to about 400 meters.

REMARKS: RAINER (1989) revised a number of polychaete collections from the North Sea and Danish waters, and found that the apparently intraspecific variation of *Nephtys hombergii* Savigny *in* Lamarck 1818, in taxonomic features such as the segment in which interramal cirri first occur, and the form and size of pre- and postchaetal lamellae, was the result of the presence of three morphologically similar species to which the same name was normally applied: *N. hombergii*, *N. assimilis* Örsted 1843, and *N. kersivalensis* McIntosh 1908.

RAVARA, CUNHA & PLEIJEL (2010) suggested that both the northernmost as well as the southernmost records of *N. hombergii* should be considered with caution, as well as the references from deeper locations (below 150 meters), as the species appears to be typical of shallower waters, where it can be very abundant in estuarine and coastal habitats. Some morphological differences were also found by the same authors among the studied material. This way, specimens from southern localities (South Portugal, Madeira Island and Mediterranean Sea) present, in relation to specimens from northern localities (from Sweden to Northern Portugal) the neuropodial postchaetal lamellae broader and some times slightly bilobed, the branchiae shorter and thicker, and in some specimens the papilliform outgrowth of the acicular lobes larger, giving the acicular lobes an almost bilobed appearance. In what concerns the specimens from South Africa, they are even more distinct, with much longer postchaetal lamellae and a very reduced papilliform outgrowth on acicular lobes. RAVARA, CUNHA & PLEIJEL (2010) considered the need of further investigation, specially using molecular analysis, to clarify if there is more than one species involved in the present distribution of the species, with a particularly emphasis being given to the South African specimens.

****Nephtys hystricis*** McIntosh 1900

Nephthys Hystricis MCINTOSH, 1900*b*: 259-260.

TYPE LOCALITY: Deep water off Bergen (Norway) (lectotype designated by RAINER, 1990). Originally described by MCINTOSH (1990*b*) with base on specimens from Berehaven and Valentia (Ireland), off Bergen (Norway), off Cape Sagres (Portugal), and the Mediterranean Sea.

SELECTED REFERENCES: *Nephthys Hystricis* — MCINTOSH, 1908*c*: 27-29, pl. 57 figs. 8-9, pl. 66 fig. 10. *Nephtys hystricis* — RAINER, 1990: 362-366, fig. 1; RAINER, 1991: 75-76, fig. 2*C*, table 1; HARTMANN-SCHRÖDER, 1996: 225, fig. 99; LABORDA, 2004: 403-405, fig. 148*A-B*; RAVARA, CUNHA & PLEIJEL, 2010: 48-52, figs. 18-19, table 5. *Nephtys hombergii* var. *kersivalensis* — MCINTOSH, 1908*c*: 20-21 [in part]. *Nephthys malmgreni* — HEINEN, 1911: 29-31 [in part]. *Nephthys incisa* [not Malmgren 1865] — HEINEN, 1911: 23-25 [in part]; FAUVEL, 1914*f*: 198-199, pl. 18 fig. 3; FAUVEL, 1923*c*: 369-370, fig. 144*a*. *Nephtys incisa* [not Malmgren 1865] — FAUCHALD, 1963: 15-16, figs. 1*H*, 2*C*, 3*B*, 7*B*, 9, table 1 [in part]; WOLFF, 1968: 4, fig. 10; KIRKEGAARD, 1969: 51-52, fig. 23 [in part]; HARTMANN-SCHRÖDER, 1971*a*: 217-218, fig. 70*d-e*; HARTMANN-SCHRÖDER, 1974*d*: 207 [in part]; KIRKEGAARD, 1992: 338-339, fig. 165. *Nephthys incisa* var. *bilobata* — HEINEN, 1911: 25 [in part]; FAUVEL, 1923*c*: 370-371, fig. 144*b*. Not *Nephthys Hystricis* — FAUVEL, 1923*c*: 373-375, fig. 146*a-e* [= *Nephtys incisa* Malmgren 1865]. Not *Nephthys hystricis* — FAUVEL, 1914*f*: 200-201; FORET-MONTARDO, 1969: 816-817, pls. 3 figs. 1-7*b*, 6 [= *Nephtys incisa* Malmgren 1865]. Not *Nephtys hystricis* — WOLFF, 1968: 6, fig. 11 [= *Nephtys incisa* Malmgren 1865]; DAY, 1967: 345.

REFERENCES FOR PORTUGAL: MCINTOSH, 1900*b* (as *Nephthys hystricis*; off Cape Sagres); MCINTOSH, 1908*c* (as *Nephthys hystricis*; publication not seen; off Cape Sagres); RIOJA, 1918*b* (previous records: off Cape Sagres); BELLAN, 1960*a* (as *Nephthys hystricis*; Cape São Vicente); AMOUREUX, 1974*b* (as *Nephthys incisa bilobata*; off Aveiro); CAMPOY, 1982 (some as *Nephtys incisa bilobata*; previous records: off Cape Sagres; Aveiro); MONTEIRO-MARQUES, 1987 (as *Nephthys hystricis*; continental shelf of Algarve); RAINER, 1990 (off Cape Sagres); DEXTER, 1992 (previous records: continental shelf of Algarve); RAVARA, CUNHA & PLEIJEL, 2010 (off Cape Sagres); present work (southwestern continental shelf).

MATERIAL: SEPLAT 6 — St. 312 (A.2771), off Praia de Odeceixe, 310 m, muddy sand: 1 complete specimen, broken in 2 pieces, with 51 + 25 chaetigers, about 40 mm of total length; proboscis partially everted, rows of papillae not counted; interramal cirri from chaetiger 6; about last 20 chaetigers without interramal cirri; anal cirrus lost. **SEPLAT 7 (1st part) — St. 61 (A.2991)**, off Cape Sardão, 290 m, muddy sand: 2 specimens in a very poor condition; bigger specimen broken in 4 fragments; interramal cirri from chaetiger 6. **St. 62 (A.2992)**, off Cape Sardão, 384 m, muddy sand: 2 specimens in a very poor condition, plus 2 fragments, one of which posterior; interramal cirri from chaetiger 6. **St. 82 (A.3011)**, off Cape Sardão, 305 m, sandy mud: 1 specimen, in a very poor condition, plus one fragment; interramal cirri from chaetiger 6. **St. 138 (A.3065)**, off Praia de Almograve, 356 m, sandy mud: 1 incomplete specimen with 63 chaetigers; interramal cirri from chaetiger 6. **St. 169 (A.3091)**, off Vila Nova de Milfontes, 300 m, muddy sand: 1 specimen in a very poor condition; interramal cirri from chaetiger 6. **St. 170 (A.3092)**, off Vila Nova de Milfontes, 365 m, sandy mud: 3 incomplete specimens, plus 2 posterior fragments. **[?] St. 187**, 350 m, rest of data unknown: 1 specimen. **St. 204 (A.3116)**, off Vila Nova de Milfontes, 410 m, sandy mud: 1 incomplete specimen, in poor condition; interramal cirri from chaetiger 6. **St. 238 (A.3142)**, off Praia do Malhão, 347 m, sandy mud: 1 incomplete specimen, with 34 chaetigers; interramal cirri from chaetiger 6. **St. 239 (A.3143)**, off Praia do Malhão, 302 m, muddy sand: 3 incomplete specimens, in poor condition, plus one fragment; interramal cirri from chaetiger 6. **SEPLAT 7 (2nd part) — St. 31 (A.4076)**, north Sines, 327 m, sand: 1 incomplete specimen with 32 chaetigers, in good condition, plus one fragment with 10 chaetigers; interramal cirri from chaetiger 6. **St. 58 (A.4049)**, north Sines, 365 m, sand: 2 incomplete specimens, plus 3 fragments. **St. 60 (A.4047)**, north Sines, 320 m, muddy sand: 2 incomplete specimens, plus one posterior fragment; interramal cirri from chaetiger 6. **St. 61 (A.4046)**, north Sines, 285 m, sand: 1 incomplete specimen. **St. 142 (A.3967)**, off Sines, 277 m, sand 1 posterior fragment, with 41 chaetigers; one anal cirrus present. **St. 265 (A.3866)**, off Cape Sardão, 227 m, muddy sand: 3 specimens, interramal cirri from chaetiger 6; 2 of the specimens big, incomplete, one with 16 chaetigers, and the other with 38 chaetigers for 18 mm long; one smaller specimen, complete, with 68 chaetigers for 25 mm long, proboscis partially everted. **St. 274 (A.3862)**, off Praia de Odeceixe, 327 m, muddy sand: 1 complete specimen in good condition, with 64 chaetigers and about 15 mm long for 1.5 mm wide; pygidium with one anal cirrus; interramal cirrus from chaetiger 6. **FAUNA 1 — St. 47*P***, Gulf of Cádiz, off Cádiz, 370-380 m, pelagic: 3 incomplete specimens, plus 2 fragments, one with pygidium; interramal cirri from chaetiger 6. **St. 76*A***, Gulf of Cádiz, off Isla Cristina, 535-546 m, muddy sand: 1 incomplete specimen, with about 25 chaetigers, in poor condition; interramal cirri from chaetiger 5; tips of aciculae strongly curved.

DISTRIBUTION: North-eastern Atlantic, including the North Sea and Skagerrak, from Norway to the Gulf of Cádiz (Spain); Mediterranean Sea; Adriatic Sea; Aegean Sea; Black Sea. In mud and sandy mud. Between 100-800 meters.

****Nephtys incisa*** Malmgren 1865

Nephthys incisa MALMGREN, 1865: 105, pl. 12 fig. 21 [in part].

TYPE LOCALITY: Väderöarne, Bohuslän (Sweden), at 60 fathoms (109.7 meters), in mud, and Koster Island (Sweden). Bohuslän Väderöarne (Skagerrak coast, Bohuslän, Sweden), 107 meters, argillaceous bottom (lectotype designated by RAINER, 1990).

SELECTED REFERENCES: *Nephthys incisa* — MICHAELSEN, 1896: 58-59 [in part]; MCINTOSH, 1908*c*: 38-40; HEINEN, 1911: 23-25, fig. 6, maps 2, 4 [in part]; AUGENER, 1913*a*: 203-204 [in part; in part = *Nephtys kersivalensis* McIntosh 1908]; FORET-MONTARDO, 1969: 814-816, pl. 3 figs. 8-12*b*, pl. 6. *Nephtys incisa* — FAUCHALD, 1963: 15-16, figs. 7*B*, 9, table 1 [in part]; KIRKEGAARD, 1969: 51-52, fig. 23 [in part]; HARTMANN-SCHRÖDER, 1982*a*: 11; RAINER, 1984: fig. 1*G*; RAINER, 1990: 366-370, fig. 2; RAINER, 1991: 76-78, fig. 3*G*, table 1; HARTMANN-SCHRÖDER, 1996: 225-229, fig. 100; LABORDA, 2004: 405, fig. 148*C-D*; RAVARA, CUNHA & PLEIJEL, 2010: 52-53, figs. 19-10. *Nephthys Hystricis* [not McIntosh 1900] — MCINTOSH, 1908*c*: 27-29 [in part]; FAUVEL, 1923*c*: 373-375, fig. 145*h-i*. *Nephthys hystricis* [not McIntosh 1900] — FAUVEL, 1914*f*: 200-201; FORET-MONTARDO, 1969: 816-817, pl. 3 figs. 1-7*b*, pl. 6. *Nephtys hystricis* [not McIntosh 1900] — WOLFF, 1968: 6, fig. 11. Not *Nephthys incisa* — FAUVEL, 1914*f*: 198-199, pl. 18 fig. 3; FAUVEL, 1923*c*: 369-370, fig. 144*a* [= *Nephtys hystricis* McIntosh 1900]. Not *Nephtys incisa* — WOLFF, 1968: 4, fig. 10; HARTMANN-SCHRÖDER, 1971*a*: 217-218, fig. 70*d-e*; HARTMANN-SCHRÖDER, 1974*d*: 207 [in part]; KIRKEGAARD, 1992: 338-339, fig. 165 [= *Nephtys hystricis* McIntosh 1900]. *Nephthys* sp. nr. *incisa* — MCINTOSH, 1900*b*: 262. *Aglaophamus malmgreni* [not Théel 1879] — HARTMANN-SCHRÖDER, 1974*d*: 205-206 [in part].

REFERENCES FOR PORTUGAL: FAUVEL, 1913*a* (as *Nephthys incisa*; off Lagos); FAUVEL, 1914*f* (as *Nephthys incisa*; off Lagos); BELLAN, 1960*a* (as *Nephthys incisa*; off Cascais; Cape Santa Maria); CAMPOY, 1982 (previous records: Aveiro; Portuguese coast); MONTEIRO-MARQUES, 1987 (as *Nephthys incisa*; continental shelf of Algarve); DEXTER, 1992 (previous records: continental shelf of Algarve; Sines; Arrábida); RAVARA, CUNHA & PLEIJEL, 2010 (off Cascais; off Cape Sagres).

MATERIAL: FAUNA 1 — St. 14*A*, Alborán Sea, off Castell de Ferro, Granada, 285-290 m, mud: 1 incomplete specimen with 28 chaetigers; interramal cirri from chaetiger 9. **St. 48*A***, Gulf of Cádiz, off Doñana, 62 m, mud: 1 incomplete specimen with 55 chaetigers and about 50 mm long; first chaetiger reduced; interramal cirri from chaetiger 9. **St. 51*A***, Gulf of Cádiz, Placer de los Mártires, off Chiclana de la Frontera, 27-28 m, rock and mud: 1 incomplete specimen with about 30 chaetigers, in poor condition. **St. 67*A***, Gulf of Cádiz, off Chipiona, 55-56 m, mud: 1 incomplete specimen with 31 chaetigers, 30 mm long; interramal cirri from chaetiger 9.

DISTRIBUTION: Eastern Atlantic from Iceland to off north-west Africa, including the North Sea, Skagerrak and Kattegat; Mediterranean Sea to the Bosphorus; Adriatic Sea; Aegean Sea; [?] north-western and western Atlantic. In soft substrata, ranging from gravel and mud to soft silts. Shallow subtidal to 930 meters, but also reported from 1700 meters.

****Nephtys kersivalensis*** McIntosh 1908

Nephtys hombergii var. *kersivalensis* MCINTOSH, 1908*c*: 20-21 [in part].

TYPE LOCALITY: Connemara, Ireland.

SYNONYMS: *Nephthys Hombergii* forma *Ehlersii* Fage & Legendre 1927.

SELECTED REFERENCES: *Nephtys hombergi kersivalensis* — FAUCHALD, 1963: 5. *Nephtys hombergii* var. *kersivalensis* — HARTMANN-SCHRÖDER, 1971*a*: 217, fig. 70*c*. *Nephtys kersivalensis* — RAINER, 1989: 882-886, fig. 2; RAINER, 1991: 78-80, fig. 2*D*, table 1; HARTMANN-SCHRÖDER, 1996: 229, fig. 101; LABORDA, 2004: 406, fig. 149*A-C*; RAVARA, CUNHA & PLEIJEL, 2010: 55-57, figs. 11, 21, table 5.

Nephthys Hombergii forma *Ehlersii* — FAGE & LEGENDRE, 1927: 124-126, fig. 15. *Nephthys incisa* [not Malmgren 1865] — MICHAELSEN, 1896: 58-59 [in part]; AUGENER, 1913*a*: 203-204 [in part]; FAUCHALD, 1963: 15-16, figs. 7*B*, 9, table 1 [in part].

REFERENCES FOR PORTUGAL: RAVARA, CUNHA & PLEIJEL, 2010 (Sado Estuary; Lagos); present work (southwestern continental shelf).

MATERIAL: SEPLAT 6 — St. 19 (A.2521), off Praia de Castelejo, 118 m, muddy sand: 1 small incomplete specimen, maybe a juvenile, plus one fragment; interramal cirri from chaetiger 4. **St. 108 (A.2589)**, off Carrapateira, 123 m, muddy sand: 1 incomplete specimen, in good condition, about 30 mm long. **St. 109 (A.2590)**, off Carrapateira, 132 m, muddy sand: 1 incomplete specimen in poor condition, with 54 chaetigers; prostomium damaged; interramal cirri from chaetiger 4. **St. 238 (A.2706)**, off Praia da Amoreira, 157 m, sand: 1 incomplete specimen, in good condition. **St. 323 (A.2780)**, off Praia de Odeceixe, 107 m, sand: 1 complete specimen, small size (maybe a juvenile), in good condition; 74 chaetigers for 22 mm long; parapodia compared with parapodia of specimen from St. 28 (A.2962), being identical; interramal cirri from chaetiger 4; anal cirri broken; rugose area near the parapodia not seen. **St. 338 (A.2792)**, off Praia de Odeceixe, 155 m, muddy sand: 2 specimens with interramal cirri from chaetiger 4; (1) complete, with 93 chaetigers, about 40 mm long, anal cirrus present, being 10 chaetigers long; (2) incomplete, with 47 chaetigers. **St. 355 (A.2807)**, off Praia da Amália, northern Azinheira do Mar, 135 m, sand: 1 incomplete specimen, with 44 chaetigers; interramal cirri from chaetiger 4. **SEPLAT 7 (1st part) — St. 28 (A.2962)**, off Zambugeira do Mar, 88 m, muddy sand: 1 complete specimen, in good condition, with 99 chaetigers, 70 mm long; interramal cirri from chaetiger 4, with basal papilla below dorsal cirrus; anal cirrus about 12 chaetigers long. **St. 31 (A.2964)**, off Zambugeira do Mar, 127 m, sand: 1 incomplete specimen in poor condition; interramal cirri from chaetiger 4. **St. 52 (A.2983)**, off Cape Sardão, 125 m, muddy sand: 1 small complete specimen, in good condition, with 85 chaetigers and 30 mm long. **St. 75 (A.3004)**, off Cape Sardão, 140 m, sand: 1 incomplete specimen, in poor condition. **St. 94 (A.3022)**, off Cape Sardão, 125 m, muddy sand: 1 incomplete specimen. **St. 115 (A.3042)**, off Praia de Almograve, 140 m, muddy sand: 1 incomplete specimen with 32 chaetigers, in good condition; interramal cirri from chaetiger 4. **St. 151 (A.3079)**, off Praia de Almograve, 89 m, sandy mud: 1 complete specimen in good condition, with 83 chaetigers for 35 mm long; interramal cirri from chaetiger 4; as in many of the other studied specimens, the postacicular lamellae seem bigger than what is pictured in RAINER (1991). **St. 208 (A.3120)**, off Vila Nova de Milfontes, 217 m, muddy sand: 1 apparently incomplete specimen in poor condition, broken in 2 pieces with 38 chaetigers and 21 chaetigers with pygidium; interramal cirri from chaetiger 4. **St. 229 (A.3133)**, off Vila Nova de Milfontes, 148 m, muddy sand: 1 complete specimen, in poor condition; interramal cirri from chaetiger 4. **St. 230 (A.3134)**, off Vila Nova de Milfontes, 154 m, sand: 1 incomplete specimen with 37 chaetigers; interramal cirri from chaetiger 4. **St. 232 (A.3136)**, off Vila Nova de Milfontes, 182 m, sand: 1 incomplete specimen, with 41 chaetigers, plus one fragment with 18 chaetigers; interramal cirri from chaetiger 4. **St. 233 (A.3137)**, off Vila Nova de Milfontes, 212 m, sand: 1 incomplete specimen, in poor condition, plus 2 fragments. **St. 245 (A.3149)**, off Praia do Malhão, 147 m, muddy sand: 1 complete specimen with 86 chaetigers, 26 mm long; proboscis everted; anal cirri present; interramal cirri from chaetiger 4. **St. 265 (A.3167)**, off Praia do Malhão, 175 m, sand: 1 complete specimen with 78 chaetigers and 27 mm long; anal cirrus present, 5 chaetigers long. **St. 266 (A.3169)**, off Praia do Malhão, 180 m, sand: 1 incomplete specimen, in poor condition, with 48 chaetigers and 26 mm long; rugose area in the parapodia not seen; interramal cirri from chaetiger 4. **SEPLAT 7 (2nd part) — St. 6 (A.4096)**, off Lagoa de Santo André, 136 m, sand with shells: 1 posterior end with 39 chaetigers, with anal cirrus 4 chaetigers long. **St. 7 (A.4097)**, off Lagoa de Santo André, 132 m, sand with shells: 1 fragment. **St. 10 (A.4100)**, off Lagoa de Santo André, 118 m, sand: 2 specimens, 1 complete, and the other represented by a fragment. **St. 21 (A.4081)**, north Sines, 116 m, sand with shells: 1 posterior fragment, with about 30 chaetigers and a pygidium. **St. 26 (A.4086)**, north Sines, 140 m, sand: 1 specimen, in poor condition; interramal cirri from chaetiger 4. **St. 51 (A.4056)**, north Sines, 125 m, sand: 2 incomplete specimens, small sized, maybe juveniles. **St. 122 (A.3985)**, off Sines, 138 m, sand: 1 complete specimen, in very good condition. **St. 148 (A.3961)**, near Sines, 133 m, muddy sand: 1 incomplete specimen with 32 chaetigers; the postacicular lamellae seem to be bigger than the normally described; interramal cirri from chaetiger 4. **St. 211 (A.3901)**, south Sines, 140 m, muddy sand: 1 incomplete specimen, with about 33 chaetigers; interramal cirri from chaetiger 4. **St. 259 (A.3867)**, off Cape Sardão, 173 m, sand: 1 incomplete specimen, in good condition, plus 2 fragments.

DISTRIBUTION: North-eastern Atlantic: Outer Hebrides; Ireland; North Sea; Kattegat; English Channel; Western France; Portugal; Mediterranean Sea. In silty, muddy, or clean sand, and gravel. Shallow subtidal to 295 meters.

Nephtys longosetosa Ørsted 1842

Nephthys longosetosa ØRSTED, 1842: 123.

TYPE LOCALITY: Greenland.

SYNONYMS: *Nephthys Johnstoni* Ehlers 1874; *Nephthys emarginata* Malm 1874.

SELECTED REFERENCES: *Nephthys longosetosa* — ØRSTED 1843*b*: 195-196, figs. 75-76. *Nephthys longisetosa* — MICHAELSEN, 1896: 57-58; HEINEN, 1911: 26-29, fig. 7, maps 2, 4; FAUVEL, 1923*c*: 367-369, fig. 143*f-h*. *Nephtys longosetosa* — FAUCHALD, 1963: 8-11, figs. 1*C*, 3*F*, 6*A*, table 1; WOLFF, 1968: 4, fig. 8; KIRKEGAARD, 1969: 52-55, figs. 24-26, table 8; GARWOOD & OLIVE, 1981: 195-201, figs. 1-2, 4*B*, 5*A*, 6-8; RAINER, 1984: fig. 1*D*; IMAJIMA & TAKEDA, 1987: 60-61, figs. 10, 14; RAINER, 1991: 80-81, fig. 3*D*, table 1; KIRKEGAARD, 1992: 339-341, fig. 166; HARTMANN-SCHRÖDER, 1996: 229-230, fig. 102; RAVARA, CUNHA & PLEIJEL, 2010: 57-58, figs. 13, 22. *Nephtys longesetosa* — LABORDA, 2004: 406-408, fig. 149*D*. *Nephthys emarginata* — MALM, 1874: 77. *Nephthys Johnstoni* — EHLERS, 1874: 293-294; EHLERS, 1875: 38-40, pl. 3 figs. 3-4; MCINTOSH, 1908*c*: 34-36. Not *Nephthys longisetosa* — MCINTOSH, 1908*c*: 29-32. *Nephthys ciliata* [not O.F. Müller 1776] — AUGENER, 1913*a*: 193-197 [in part; in part = *Nephtys pente* Rainer 1984].

REFERENCES FOR PORTUGAL: MONTEIRO-MARQUES, 1987 (as *Nephthys longoseta*; continental shelf of Algarve); DEXTER, 1992 (previous records: continental shelf of Algarve); PARDAL, MARQUES & BELLAN, 1993 (as *Nephthys longosetosa*; Mondego Estuary); PARDAL, MARQUES & BELLAN, 1994 (Mondego Estuary).

DISTRIBUTION: Arctic (Greenland) and North Atlantic, including North Sea, Skagerrak, Kattegat, Øresund, and western Baltic; from English Channel to the Mediterranean Sea; Aegean Sea; Black Sea; from Gulf of St. Lawrence to Rhode Island; North Pacific, including Bering Sea, Sea of Okhotsk, Japan, Yellow Sea, China Sea, and from Alaska to California; [?] Strait of Magellan. In a wide variety of sediments, but most common in well-sorted fine to medium sands. Lower intertidal down to 1000 meters.

Nephtys paradoxa Malm 1874

Nephthys paradoxa MALM, 1874: 77, pl. 1 fig. 2.

TYPE LOCALITY: Koster, Bohuslän (Sweden).

SYNONYMS: *Nephthys pansa* Ehlers 1874; *Nephthys phyllobranchia* McIntosh 1885; [?] *Nephtys schmitti* Hartman 1938.

SELECTED REFERENCES: *Nephthys paradoxa* — HEINEN, 1911: 36; AUGENER, 1913*a*: 204-206; FAUVEL, 1914*f*: 199-200; FAUVEL, 1923*c*: 375, fig. 146*f-i*; AUGENER, 1928*a*: 701-702; BELLAN, 1960*a*: 13; BELLAN, 1961*b*: 265; FORET-MONTARDO, 1969: 818. *Nephtys paradoxa* — FAUCHALD, 1963: 13-15, figs. 1*A*, 2*B*, 3*C*, 7*A*, table 1; WOLFF, 1968: 4, fig. 4 KIRKEGAARD, 1969: 55, fig. 19; HARTMANN-SCHRÖDER, 1974*d*: 207-208; HARTMANN-SCHRÖDER, 1977*a*: 88; RAINER, 1984: fig. 1*A*; IMAJIMA & TAKEDA, 1987: 50-52, figs. 5-6; RAINER, 1991: 81-82, fig. 3*E*, table 1; KIRKEGAARD, 1992: 341-342, fig. 167; HARTMANN-SCHRÖDER, 1996: 230-231; LABORDA, 2004: 408-410, fig. 150*A-B*; RAVARA, CUNHA & PLEIJEL, 2010: 58-61, figs. 16, 23. *Nephthys pansa* — EHLERS, 1874: 293; EHLERS, 1875: 40-42, pl. 3 figs. 1-2. *Nephthys phyllobranchia* — MCINTOSH 1885*a*: 164-165, pl. 26 fig. 10, pl. 27 fig. 3, pl. 14*A* figs. 12-13. [?] *Nephtys schmitti* — HARTMAN, 1938: 152-153, fig. 65; HILBIG, 1997*b*: 342-343, fig. 13.11. [?] *Nephthys brachycephala* [not Moore 1903] — USCHAKOV, 1955*a*: 216, fig. 69*F-G* [for details check FAUCHALD, 1963: 14-15]. *Nephthys hombergii* [not Savigny *in* Lamarck 1818] — HEINEN, 1911: 16-20 [in part].

REFERENCES FOR PORTUGAL: BELLAN, 1960*a* (as *Nephthys paradoxa*; Cape Espichel; Setúbal Canyon); AMOUREUX, 1974*b* (as *Nephthys paradoxa*; off Porto); HARTMANN-SCHRÖDER, 1977*a* (off Cape Sardão); CAMPOY, 1982 (previous records: southern Portuguese coast; Porto); AMOUREUX, 1987 (as *Nephthys paradoxa*; off Porto). MONTEIRO-MARQUES, 1987 (as *Nephthys paradoxa*; continental shelf of Algarve); DEXTER, 1992 (previous records: continental shelf of Algarve; Arrábida); PARDAL, MARQUES & BELLAN, 1993 (as *Nephthys paradoxa*; Mondego Estuary).

DISTRIBUTION: Arctic Ocean; North Atlantic, from Greenland and Iceland to the Mediterranean Sea, including the northern North Sea, Skagerrak and Kattegat; Adriatic Sea; Aegean Sea; Black Sea; from Gulf of St. Lawrence to Delaware; North Pacific; Bering Strait; Bering Sea; Sea of Okhotsk; Japan; Australia; off Guatemala; off Peru; off Chile; Magellan Strait. In muddy bottoms. Between 10-8000 meters.

REMARKS: RAVARA, CUNHA & PLEIJEL (2010) suggested the existence of a *Nephtys paradoxa*-species complex, which would explain the worldwide distribution of the species. Besides some slight variations these authors could not find consistent differences among the examined specimens, affirming that the taxonomical status of the species complex could probably be resolved only by molecular analyses.

Nephtys pente Rainer 1984

Nephtys pente RAINER, 1984: 901-905, fig. 2.

TYPE LOCALITY: Süderfahrt, 54º33'N, 10º48'E, Kiel Bay (Germany), 21 meters.

SYNONYMS: *Nephtys zatsepini* Jirkov 1986.

SELECTED REFERENCES: *Nephtys pente* — RAINER, 1991: 82-83, fig. 3*B*, table 1; KIRKEGAARD, 1992: 342-343, fig. 168; HARTMANN-SCHRÖDER, 1996: 231-232, fig. 103. *Nephtys zatsepini* — JIRKOV, 1986*a*: 39-42. *Nephthys caeca* [not Fabricius 1780] — MÖBIUS, 1874: 168-169 [in part]. *Nephthys ciliata* [not O.F. Müller 1776] — MARENZELLER, 1889: 127 [in part]; MICHAELSEN, 1896: 58 [in part]; MCINTOSH, 1908*c*: 23-27; HEINEN, 1911: 21-23 [in part]; AUGENER, 1913*a*: 193-197 [in part, in part = *Nephtys longosetosa* Ørsted 1842]. *Nephtys ciliata* [not O.F. Müller 1776] — KIRKEGAARD, 1969: 46, fig. 19. *Nephthys incisa* — HEINEN, 1911: 23-25 [in part].

DISTRIBUTION: North-eastern Atlantic, between the North Sea and the Arctic (Greenland to the Murman coast), including the Baltic Sea and Spitsbergen. Mainly in silty sand. From shallow subtidal to 380 meters.

*FAMILY **NEREIDIDAE** Lamarck 1818

AS: *NEREIDES* LAMARCK, 1818: 310.

TYPE GENUS: *Nereis* Linnaeus 1758.

SYNONYMS: *LYCORIDEA* Grube 1850; *NEREIDAE* Johnston 1865; *ARETIDEA* Kinberg 1866; *LEONNATIDEA* Kinberg 1866; *NICONIDEA* Kinberg 1866; *PISENOIDEA* Kinberg 1866; *NOTOPHYCIDAE* Knox & Cameron 1970.

REMARKS: The Nereididae is, after the Syllidae and the Polynoidae, the family with the biggest number of described species, about 535 in 43 genera (HUTCHINGS *et al.*, 2000). They occur in a wide range of habitats, from abyssal to intertidal depths, mainly in marine habitats, but also in brackish water, freshwater environments, and even in damp terrestrial locations. They also occur in a wide range of substrata, with some living as symbionts on hermit crab shells.

In spite of the big diversity of taxa, the basic morphology of the group is quite uniform, with some exceptions, and the taxonomy of the family is based largely in characters like the presence, shape and disposition of paragnaths in the pharynx, the shape and number of ligules or lobes in parapodia, or the shape and disposition of the chaetae on the parapodia along the body.

The pharynx can stay in a inverted position upon the fixation process, making impossible the observation of the paragnaths, requiring the dissection of the worm. Many times the size of the worms is also an impediment in order to mount the whole specimen to observe structures as the chaetae. It is easier to remove the parapodia and observe it under the microscope. For these reasons, while studying Nereididae various dissections are expected to be done, and the use of scalpels or iris scissors are highly recommended.

The pharynx of the Nereididae is a muscular eversible structure that plays an important role in the taxonomy of the group, being normally divided in several regions. When fully everted, it is divided in two rings, the maxillary ring (the distal ring, bearing the maxilla), and the oral ring (the proximal region, near the mouth). Each of these rings are divided again in areas, which are denoted by Roman numeration: the maxillary ring is composed dorsally by the central area I, and the lateral areas II, and ventrally by the central area III, and the lateral areas IV; the oral ring is divided dorsally by the central area V and the lateral areas VI, and ventrally by the central area VII, and the lateral areas VIII. The distribution, number and shape of paragnaths or papillae (or both) in these areas has a high taxonomic value. It must be noted, however, that a certain variability in the number of paragnaths is expected to occur. Besides, paragnaths in the areas VII and VIII tend to form a single group or band.

The bibliography concerning the family is quite extensive, and will not be discussed here in detail. There is a big number of publications describing new taxa, or concerning the Nereididae from certain geographical regions (or both). In the case of the European waters, the pertinent publications are cited below.

Recent taxonomic papers on Nereididae involving revisions of some groups include: BANSE (1977*b*), with the creation of the subfamily Gymnonereidinae; PAXTON (1983), on the genus *Micronereis*; HARTMANN-SCHRÖDER (1985*a*), on the genus *Ceratonereis*; GLASBY (1999), on the subfamily Namanereidinae; QIU & QIAN (2000), on the genus *Leonnates*; and BAKKEN (2007), on the genus *Pseudonereis*. Particularly important are the first phylogenetic analysis on the family made by FITZHUGH (1987), followed by GLASBY (1991), and the most recent phylogenetic studies of nereidids with paragnaths by BAKKEN & WILSON (2005), and of the whole family by SANTOS *et al.* (2005). The subfamilies considered in the key below are the proposed by FITZHUGH (1987). However, it is clear that this division doesn't reflect the phylogeny of the group as known at present, as demonstrated by the work of SANTOS *et al.* (2005) who, for instance, restricted again the subfamily Gymnonereidinae to those groups with double ventral cirri, as originally defined by BANSE (1977*b*).

Useful information on the family can also be found at the personal web page of Dr. Torkild Bakken [http://folk.ntnu.no/vmzotbak/polychaeta/nereididae/index.htm], with a good systematic account, as well as contributions to the history and phylogeny of the family, and an extensive list of references concerning the group (consulted in February 2009).

Nine species of Nereididae are considered to be Lessepsian migrants in the Eastern Mediterranean Sea (BEN-ELIAHU, 1991*a*; ÇINAR, ERGEN & DAĞLI, 2002), being reported mainly from the coasts of Israel, but also from Egypt (Alexandria, Sinai, Port Said), Turkey and Cyprus. However, more potential Lessepsian migrants are already known to occur at the Suez Canal (BEN-ELIAHU, 1991*a*), and the number of species introduced in the Eastern Mediterranean throught this way could be increased in the future.

At present, 18 genera are know to occur in the European and nearby waters, being represented by 62 species and 2 subspecies. Of these, one belongs to a species-group, two species still need confirmation, another one remains unnamed, and one record is doubtful. Besides, one species, *Perinereis* *aibuhitensis* is being commercially distributed in European waters, and it was already confirmed that it can survive in the wild in some brackish environments.

Four genera, represented by 5 species were found among the studied material.

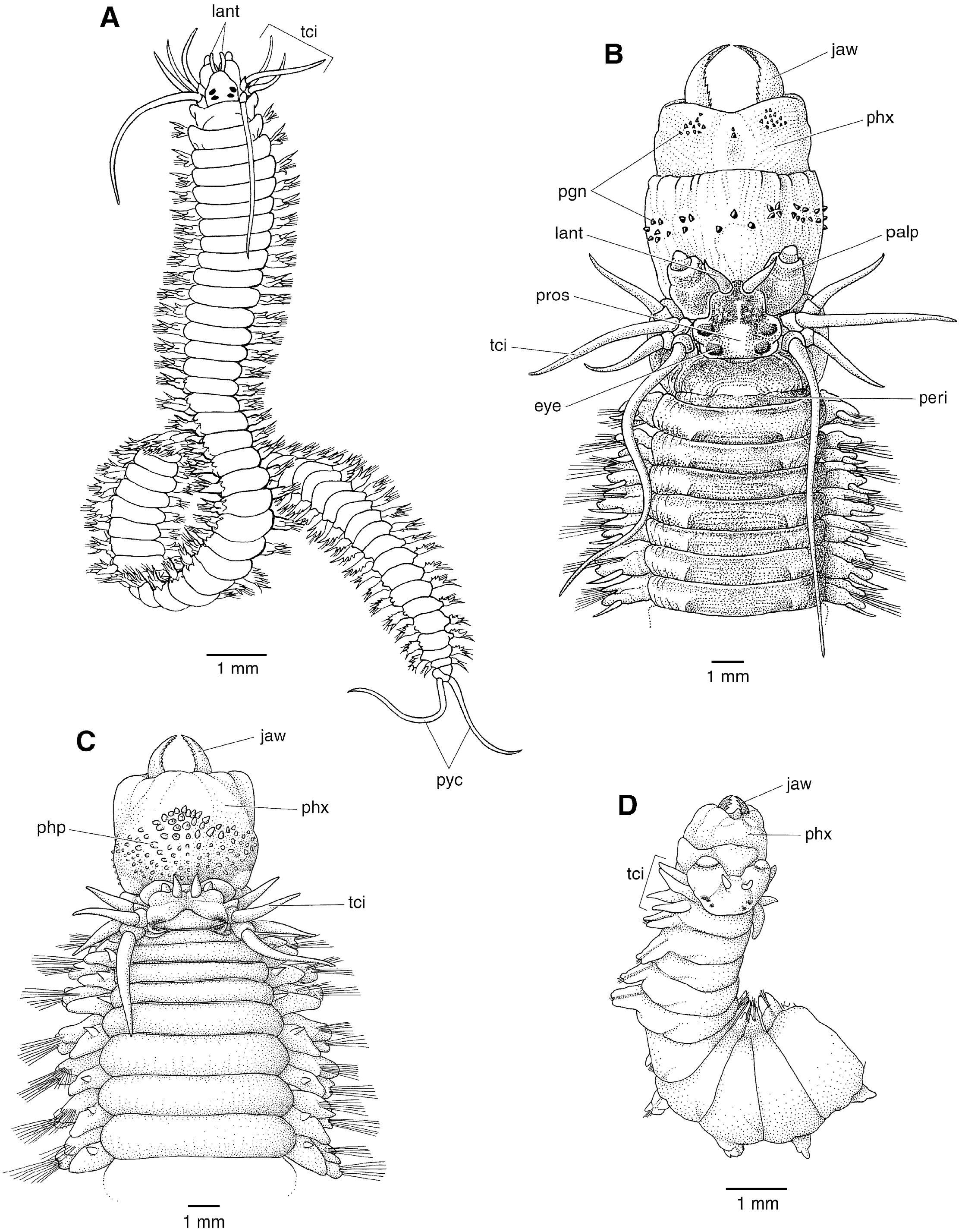

Figure legend: Family Nereididae. **A**, *Platynereis* specimen, entire animal. **B**-**D**, anterior ends with pharynx everted, dorsal views: **B**, *Neanthes* specimen; **C**, *Australonereis* specimen; **D**, *Namanereis* specimen. **eye**, eye; **jaw**, jaw; **lant**, lateral antenna; **palp**, palp, articulated; **peri**, peristomium; **png**, pharyngeal paragnaths; **php**, pharyngeal papillae; **phx**, pharynx, everted; **pros**, prostomium; **pyc**, pygidial cirri; **tci**, tentacular cirri (4 pairs). (Adapted from BEESLEY, ROSS & GLASBY, 2000; drawings by K. Nolan).

KEY TO SUBFAMILIES AND GENERA:

(adapted from: FAUCHALD, 1977*a*; FITZHUGH, 1987; HUTCHINGS & REID, 1990; BAKKEN & WILSON, 2005)

1a. Parapodia with reduced notopodia or without ligules; pharynx lacking paragnaths and papillae; 3-4 pairs of tentacular cirri..**Subfamily NAMANEREIDINAE**................**2**
1b. Parapodia fully biramous in median and posterior region, with lobes and chaetae; pharynx with or without paragnaths or papillae; 4 pairs of tentacular cirri...**3**

2a (1a). Antennae short, subconical; dorsal cirri anteriorly with cylindrical cirrophores, posteriorly cirrophores are flattened (leaf-like); notochaetae usually present; pygidium usually button-shaped, multi-incised; mature individuals with numerous, spherical oocytes in each segment......................***Namalycastis***
2b (1a). Antennae relatively long in relation to prostomium size, usually cirriform, rarely subconical, subspherical in *N. quadraticeps*; dorsal cirri lacking cirrophores, short and similar in length throughout; notochaetae usually absent; pygidium with two large lateral regions and dorsally a smaller pointed one; mature individuals with few, ovoid oocytes in each segment (spherical in *N. quadraticeps*)....***Namanereis***

3a (1b). Eversible pharynx with jaws, but without chitinous paragnaths; pharyngeal papillae present or absent..**Subfamily GYMNONEREIDINAE**...............**4**
3b (1b). Eversible pharynx with jaws and with chitinous paragnaths; pharyngeal papillae sometimes present in addition to paragnaths..**Subfamily NEREIDINAE**...............**7**

4a (3a). Ventral cirri double, at least in some chaetigers; median body region with dorsal cirri on elongated vascularized cirrophores, with or without mid-dorsal transversal flaps; eversible pharynx with soft papillae only..***Ceratocephale***
4b (3a). Ventral cirri single; median body region without dorsal cirri on elongated vascularized cirrophores, and without mid-dorsal transversal flaps; eversible pharynx with or without papillae............**5**

5a (4b). Eversible pharynx smooth, without papillae...**6**
5b (4b). Eversible pharynx with soft papillae in the oral or basal ring only; notopodial homogomph falcigers absent...***Websterinereis***

6a (5a). Notopodial homogomph falcigers present in posterior chaetigers.............................***Rullierinereis***
6b (5a). Notopodial homogomph falcigers absent...***Sinonereis***

7a (3b). Eversible pharynx with both papillae and paragnaths, distributed as papillae in the oral ring and paragnaths in the maxillay ring...***Leonnates***
7b (3b). Papillae absent, paragnaths present...**8**

8a (7b). Antennae absent..***Micronereis***
8b (7b). Two antennae present...**9**

9a (8b). Paragnaths present on one pharyngeal ring only..**10**
9b (8b). Paragnaths present on both pharyngeal rings..**12**

10a (9a). Paragnaths present on the oral or basal ring only (can be easily lost); notopodial homogomph falcigers can be present or absent..***Eunereis***
10b (9a). Paragnaths present on the maxillary or distal ring only, in patches and bands, all conical........**11**

11a (10b). Prostomium with anterior margin indented; dorsal notopodial ligule normally markedly reduced on posterior chaetigers; prechaetal notopodial lobe and acicular process absent; dorsal cirrus mid-dorsally to subterminally attached to dorsal notopodial ligule on posterior chaetigers, arising from basal cirrophore; basal cirrophore cylindrical throughout; notoaciculae present on chaetigers 1 and 2; notochaetae: sesquigomph spinigers and falcigers present, blade in falcigers distally bifid or with a single distal tooth; neurochaetae, dorsal bundle: sesquigomph spinigers present, heterogomph falcigers present or absent; neurochaetae, ventral bundle: sesquigomph falcigers with blades distally bifid or with a single distal tooth, heterogomph spinigers and heterogomph falcigers present, later with long blades, terminally bifid or with a single terminal tooth..***Ceratonereis***

11b (10b). Prostomium with entire anterior margin; dorsal notopodial ligule similar in size on anterior and posterior chaetigers; prechaetal notopodial lobe present, smaller than dorsal notopodial ligule on anterior chaetigers, usually reduced or absent posteriorly; dorsal cirrus basally attached to dorsal notopodial ligule on posterior chaetigers, lacking basal cirrophore; notoaciculae absent from chaetigers 1 and 2; notochaetae: homogomph spinigers; neurochaetae, dorsal bundle: homogomph spinigers present, sesquigomph spinigers and falcigers present or absent; neurochaetae, ventral bundle: sesquigomph falcigers present or absent, homogomph spinigers present, heterogomph falcigers present or absent, homogomph falcigers on anterior chaetigers absent, on posterior chaetigers present or absent...***Composetia****

12a (9b). All paragnaths conical...**13**
12b (9b). Cones and in addition either transverse or pectinate paragnaths present on the pharynx...........**16**

13a (12a). Middle and posterior neuropodia with one homogomph falciger, or a single simple chaetae (fused falciger) [best seen in the posteriormost region of the body]...***Hediste***
13b (12a). Homogomph falcigers, if present, in notopodial positions; single falcigers absent..................**14**

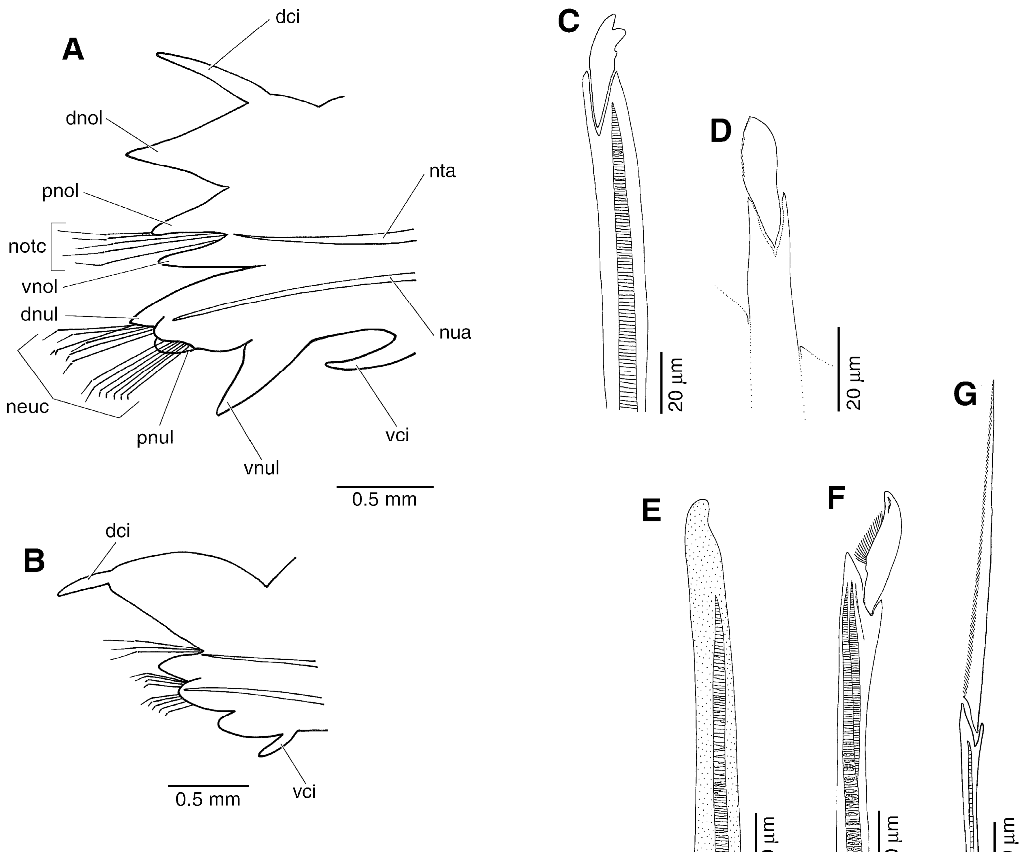

Figure legend: Family Nereididae. **A**, *Neanthes* specimen, parapodium from chaetiger 20, anterior view. **B**, *Pseudonereis* specimen, parapodium from chaetiger 74, anterior view. **C**, **D**, notochaetae: **C**, *Nereis* specimen, homogomph falciger from median parapodium; **D**, *Nereis* specimen, homogomph falciger from posterior parapodium;**E-G**, neurochaetae from median parapodia: **E**, *Simpliseta* specimen, simple falciger; **F**, *Nereis* specimen, heterogomph falciger; **G**, *Neanthes* specimen, heterogomph spiniger from parapodium of chaetiger 13. **dci**, dorsal cirrus; **dnol**, dorsal notopodial ligule; **dnul**, dorsal neuropodial ligule; **neuc**, neurochaetae; **notc**, notochaetae; **nta**, notoacicula; **nua**, neuroacicula; **pnol**, pre-chaetal notopodial ligule; **pnul**, post-chaetal neuropodial ligule; **vci**, ventral cirrus; **vnol**, ventral notopodial ligule; **vnul**, ventral neuropodial ligule. (Adapted from BEESLEY, ROSS & GLASBY, 2000; drawings by K. Nolan).

14a (13b). Notopodial homogomph falcigers present in posterior chaetigers....................................***Nereis***
14b (13b). Notopodial homogomph falcigers absent...**15**

15a (14b). Dorsal notopodial ligule may be markedly elongate, broader (leaflike) on posterior chaetigers..***Alitta***
15b (14b). Dorsal notopodial ligule similar in size on anterior and posterior chaetigers or markedly reduced in posterior chaetigers..***Neanthes****

16a (12b). Paragnaths include pectinate bars and usually small patches of cones; transverse smooth bars absent..***Platynereis****
16b (12b). Paragnaths include transverse smooth bars, patches of cones and sometimes pectinate bars...**17**

17a (16b). Superior notopodial lobes greatly expanded in posterior chaetigers; pectinate bars usually present...***Pseudonereis***
17b (16b). Superior notopodial lobes not expanded in any chaetigers; pectinate bars absent.....***Perinereis****

GENUS *Alitta* Kinberg 1866

Alitta KINBERG, 1866*a*: 172.
TYPE SPECIES: *Nereis virens* Sars 1835.
SYNONYMS: *Nectoneanthes* Imajima 1972.
REMARKS: KHLEBOVICH, KOMENDANTOV & SHKLYAREVICH (1980) studied the validity of the species *Alitta virens* (Sars 1835), *A. grandis* (Stimpson 1853), and *A. brandti* Malmgren 1865 (all as *Nereis*). These species are morphologically similar, resulting in misidentifications of their populations. As a result, it was showed that *A. brandti* from the Far Eastern Seas and California had a greater number of paragnaths in all groups than populations of *A. virens* from the White Sea, and of *A. grandis* from Isefjord (Denmark), the Thames Estuary (U.K.), and New Brunswick (Canada). Specimens from the last three populations had been described by several authors as being *A. virens*, from which they are undistinguishable by the number of paragnaths. However, they differ by the mode of reproduction and larval behaviour, being included in the species *A. grandis*.

KEY TO SPECIES:

(adapted from KHLEBOVITCH, 1996)

1a. Group VI with few paragnaths, usually one or two; paragnath distribution as I: 1-2; II: 2-10; III: 5-10; IV: 5-20; V: 0; VI: 1-2; VII-VIII: up to 25, in two rows..**2**
1b. Group VI with numerous paragnaths, always more than 3..**3**

2a (1a). For spawning, specimens of both sexes swim to the surface; larvae with pelagic stage....***A. virens***
2b (1a). For spawning, only males swim to the surface, females stay in the burrows; larvae without pelagic stage..***A. grandis***

3a (1b). Well developed, leaflike, notopodial dorsal ligule of the posterior region with the dorsal cirrus inserted almost in a terminal position of the superior margin; paragnath distribution (from NÚÑEZ, 2004): I: 2-5; II: up to 20; III: up to 15; IV: 20-25; V: up to 6; VI: 6-11; VII-VIII: numerous, in two or three rows..***A. succinea***
3b (1b). Well developed, leaflike, notopodial dorsal ligule of the posterior region with the dorsal cirrus inserted between the base and the middle of the superior margin; paragnath distribution (from KHLEBOVICH, 1996): I: 2-6; II: 8-15; III: 15-25; IV: 30-50; V: 1-4; VI: 3-7; VII-VIII: 60-100 in three or more rows...***A. brandti***

Alitta brandti Malmgren 1865

Alitta Brandti MALMGREN, 1865: 183-184.
TYPE LOCALITY: Sea of Okhotsk, Siberia.
SYNONYMS: *Nereis diamusy* Izuka 1912.
SELECTED REFERENCES: *Nereis brandti* — KHLEBOVICH, KOMENDANTOV & SHKLYAREVICH, 1980: 1621, tables 1, 4. *Alitta brandti* — KHLEBOVICH, 1996: 113-114, pl. 21; BAKKEN & WILSON, 2005: 515.

Nereis (Alitta) virens plenidentata — MOORE, 1909*a*: 244-245. *Neanthes brandti* — HARTMAN, 1948*b*: 25; HARTMAN & REISH, 1950: 16; HARTMAN, 1968: 523-524, fig. 1. *Nereis virens* [not Sars 1835] — GRUBE, 1851: 6, pl. 1 figs. 2, 4-4*a*, 5-6; JOHNSON, 1901: 398-399, pl. 3 figs. 26-30 [in part]; IMAJIMA, 1972: 110-113, figs. 33-34, 37. *Nereis (Allita) virens* — MOORE, 1908: 344. *Nereis dyamusi* — IZUKA, 1912: 169-171, pl. 18 figs. 1-7.

DISTRIBUTION: Pacific Ocean, from East Kamchatka to Korea and South Hokkaido, in the Asian coast, and from Alaska to California in the American coast. In sandy and muddy sediments. Shore to shallow water.

REMARKS: *Alitta brandti* is not known to occur in European waters, but it is included here due to its close similarity with *A. virens*, *A. succinea*, and *A. grandis*.

Alitta grandis (Stimpson 1853)

Nereis grandis STIMPSON, 1853: 34, pl. 2 fig. 24.

TYPE LOCALITY: Grand Manan Island, at the mouth of the Bay of Fundy, Northeastern America. At low water, under stones.

SYNONYMS: *Nereis southerni* Abdel-Moez & Humphries 1955

SELECTED REFERENCES: *Nereis grandis* — KHLEBOVICH, KOMENDANTOV & SHKLYAREVICH, 1980: 1621, table 1. *Alita grandis* — KHLEBOVICH, 1996: 112-113, pl. 20. *Nereis southerni* — ABDEL-MOEZ & HUMPHRIES, 1955: 147-153, figs. 1-6. *Nereis virens* [not M. Sars 1835] — BRAFIELD & CHAPMAN, 1967: 619-627; BASS & BRAFIELD, 1972: 701-726; E. RASMUSSEN, 1973: 83-87; SNOW & MARSDEN, 1974: 513-527. *Nereis (Neanthes) virens* — PETTIBONE, 1963*a*: 170-174, fig. 44*f* [in part?].

DISTRIBUTION: North Atlantic. Atlantic coast of Canada (Bay of Fundy, New Brunswick); Kattegat coast of Denmark; Thames Estuary. In soft bottoms. Shore to shallow waters.

REMARKS: *Nereis southerni* Abdel-Moez & Humphries 1955, described as a new species with base on the persistent absence of paragnaths on area V, different arrangements of paragnaths on area III, and the presence of heterogomph falcigers in the neuropodia, and considered as closely resembling *N. kerguelensis*, was considered by subsequent authors as being a variety of *Nereis virens* sensu lato (CHAMBERS & GARWOOD, 1992). Finally, KHLEBOVICH, KOMENDANTOV & SHKLYAREVICH (1980) showed that it was a different species from *Nereis virens* and a junior synonym of *Nereis grandis*, described by STIMPSON (1853) from the Bay of Fundy, in the northeast coast of America.

Probably the best known population of *Alitta grandis* is the one from Isefjord (Denmark), studied since the 1940's. According to E. RASMUSSEN (1973), the first record of a swarming occurrence is from the 2nd April 1949, north of Frederikssund, when people were alarmed by a mass occurrence of dense swarms of nereidid worms. Since then swarming events have been recorded in the region, and the species was found to be the dominating nereidid worm in the shallow sandy substrata or mixed bottom layers of the zone, apart from the most brackish areas where *Hediste diversicolor* dominates. However, the species was never found in the pure mud flats.

In spite of the apparently sudden appearance of the species in the late 1940's in the Danish waters (only one population was known for a long time), E. RASMUSSEN (1973) considered the species to be already present in the area, but that it was scarce. The great increase and spread of the species was explained by Rasmussen by the change in the composition of the substratum of the shallows, owing to the destruction of the eelgrass *Zostera marina*. Without the protective influence of the meadows, the bottoms of the shallows would have become coarser, loosing its previous silty composition. Besides, the comparatively higher temperatures (from April to October) would also favoured its existence.

E. RASMUSSEN (1973) also noted that only sexually mature males swim during the spawning, instead of both sexes as previously described (PETTIBONE, 1963*a*), while the females remained in their burrows. Besides, Rasmussen could not find pelagic larvae of the species, suggesting that it should have an entirely nonpelagic development, similar to the described for *Hediste diversicolor*.

Alitta succinea (Leuckart 1847)

Nereis succinea LEUCKART, 1847: 154-156, pl. 2 figs. 9, 11.

TYPE LOCALITY: North Sea, stated as being rare in Helgoland, and very frequent at Cuxhaven.

SYNONYMS: *Nereis limbata* Ehlers 1868; *Nereis oxypoda* Marenzeller 1879; *Neanthes Perrieri* Saint-Joseph 1898; *Nereis glandulosa* Ehlers 1908; *Nereis reibischi* Heinen 1911; *Nereis alotopalpis* Wesenberg-Lund 1949; [?] *Nereis singularis* Wesenberg-Lund 1949.

SELECTED REFERENCES: *Alitta succinea* — BAKKEN & WILSON, 2005: 516-517. *Nereis succinea* — EHLERS, 1868: 570-572, pl. 22 figs. 18-22; HORST, 1909*b*: 216-218, figs. 1-4; HEINEN, 1911: 60, text-fig. 21; FAUVEL, 1936*a*: 310, 312-313. *Nereis (Neanthes) succinea* — FAUVEL, 1923*c*: 346-347 [in part; in part = *Nereis lamellosa* Ehlers 1868], fig. 135*h-k*, *m*; HARTMAN, 1945: 17-20, pl. 3 figs. 1-2; BANSE, 1954: 160-171; SMITH, 1963: 437-439; PETTIBONE, 1963*a*: 165-170, figs. 44*a-e*, 45*a-d*, table 2; DAY, 1967: 321, fig. 14.9.*a-e*; LIÑERO-ARANA & REYES-VÁSQUEZ, 1979: 8, pl. 6 figs. 1-11; HARTMANN-SCHRÖDER, 1996: 207-209, fig. 90. *Neanthes succinea* — IMAJIMA, 1972: 108-110, figs. 32, 37; CAMPOY, 1982: 495-496; WILSON, 1984: 218-221, fig. 4; WILSON, 1988*b*: 5-7; KIRKEGAARD, 1992: 306-308, fig. 151; KHLEBOVICH, 1996: 103-104, pl. 14; NÚÑEZ, 2004: 359-361, fig. 132. *Nereis limbata* — EHLERS, 1868: 567-570; VERRILL, 1874*c*: 590, pl. 11 fig. 51; WEBSTER, 1879*a*: 235, pl. 6 figs. 70-75; VERRILL, 1881: pl. 5 fig. 3; WEBSTER, 1886: 139, pl. 6 figs. 21-22; FAUVEL, 1936*a*: 310. *Nereis (Neanthes) Perrieri* — SAINT-JOSEPH, 1898: 288-292, pl. 15 figs. 69-77; FAUVEL, 1936*a*: 310. *Nereis glandulosa* — EHLERS, 1908: 74-75, pl. 8 figs. 1-6; EHLERS, 1913: 497, pl. 28 figs. 12-16; FAUVEL, 1936*a*: 311. *Nereis reibischi* — HEINEN, 1911: 53-56, pl. 1 figs. 7-10. *Nereis (Alitta) oxypoda* — MARENZELLER, 1879: 120-122, pl. 2 fig. 3. *Nereis oxypoda* — MONRO, 1934: 362-363 [in part; specimen collected by Chen]; MONRO, 1938*c*: 614, figs. 1-5. *Nereis (Neanthes) oxypoda* — IBAÑEZ, 1972: 24-26, fig. 1. *Nectoneanthes oxypoda* — IMAJIMA, 1972: 113-117, figs. 35-37; WU, SUN & YANG, 1985: 164-167, figs. 92-93; KHLEBOVICH, 1996: 115-116, pl. 22. *Nereis alotopalpis* — WESENBERG-LUND, 1949: 281-283, figs. 15-17. *Nectoneanthes alatopalpis* — WU, SUN & YANG, 1981: 152-153, fig. 94*A-F*; WU, SUN & YANG, 1985: 168-170, fig. 94*A-F*.

REFERENCES FOR PORTUGAL: AMOUREUX & CALVÁRIO, 1981 (as *Neanthes succinea*; Tagus Estuary); CALVÁRIO, 1984 (as *Nereis succinea*; Tagus Estuary); DEXTER, 1992 (as *Neanthes succinea*; previous records: Mira Estuary; Tagus Estuary); PARDAL, MARQUES & BELLAN, 1993 (as *Nereis succinea*; Mondego Estuary); SALDANHA, 1995 (as *Nereis succinea*; Portugal).

DISTRIBUTION: North Sea; English Channel; Skagerrak; Kattegat; Baltic Sea; Mediterranean Sea; Adriatic Sea; Aegean Sea; Black Sea; West Africa; South Africa; South Atlantic; East coast of North America, from the Gulf of St. Lawrence to Florida; Gulf of Mexico; West Indies; Panama; Venezuela; Guyana; west coast of North America; Persian Gulf; China; Japan; Australia. On muddy and sandy bottoms, and in sabellarid reefs. Mainly at shallow water in estuaries, but recorded from the intertidal to about 50 meters.

Alitta virens (M. Sars 1835)

Nereis virens M. SARS, 1835: 58-60, pl. 10 fig. 27.

TYPE LOCALITY: Bergens Fjord (Norway).

SYNONYMS: [?] *Nereis Yankiana* Quatrefages 1866.

SELECTED REFERENCES: *Nereis virens* — EHLERS, 1868: 559-563, pl. 22 figs. 29-32; HEINEN, 1911: 60-61, text-fig. 22; KHLEBOVICH, KOMENDANTOV & SHKLYAREVICH, 1980: 1621, tables 1-4. CHAMBERS & GARWOOD, 1992: 41-43, figs. 20, 22, 27, 33, 38, 46, 55, 69. *Alitta virens* — KINBERG, 1866*a*: 172; MALMGREN, 1865: 183-184; MALMGREN, 1867*a*: 56, pl. 3 fig. 19; KHLEBOVICH, 1996: 109-112, pl. 19, table 4; BAKKEN & WILSON, 2005: 517. *Nereis (Alitta) virens* — MCINTOSH, 1910: 331, pl. 50 fig. 12, pl. 53, pl. 61 figs. 2-2a, 3-5, pl. 73 fig. 2-2b, pl. 81 fig. 7. *Nereis (Neanthes) virens* — FAUVEL, 1923*c*: 348-349, fig. 134*g-k*; PETTIBONE, 1963*a*: 170-174, fig. 44*f* [in part?]; E. RASMUSSEN, 1973: 83-87; HARTMANN-SCHRÖDER, 1996: 209-210, fig. 91. *Neanthes virens* — CAMPOY, 1982: 490-491; KIRKEGAARD, 1992: 308-310, fig. 152; NÚÑEZ, 2004: 357-359 [not fig. 131 = *Alitta brandti* Malmgren 1865]. *Nereis grandis* [not Stimpson 1853] — KIRKEGAARD, 1992: 302-304, fig. 149. *Nereis kerguelensis* [not McIntosh 1885] — COMELY, 1973: 23, fig. 1. Not *Neanthes virens* — IMAJIMA, 1972: 110-113, figs. 33-34 [= *Alitta brandti* Malmgren 1865].

REFERENCES FOR PORTUGAL: CARVALHO, 1929 (as *Nereis (Neanthes) virens*; Sines); CAMPOY, 1982 (as *Neanthes virens*; previous records: Sines); NÚÑEZ, 2004 (as *Neanthes virens*; previous records: Sines).

DISTRIBUTION: Iceland; Norway; North Sea; English Channel; British Isles; Barents Sea; White Sea; [?] Western Mediterranean. In muddy and sandy sediments. Mainly in estuaries, and at shallow water.

REMARKS: CHAMBERS & GARWOOD (1992) state the fact that the significance of the differences found in the arrangement of the paragnaths and in the mode of reproduction between different populations of *Alitta virens* sensu lato are poorly understood. As commented above, KHLEBOVICH, KOMENDATOV & SHKLYAREVICH (1980) distinguished *Alitta brandti* Malmgren 1865 from *A. virens* with base on the biggest number of paragnaths in all groups of the former. Besides, *Alitta grandis* (Stimpson 1853) was also distinguished from *A. virens* sensu stricto with base in the mode of reproduction and larval behaviour, as morphologically both species seem to be indistinguishable. Some European records (Isefjord, Denmark; some localities in England, like the Thames Estuary) and Canada (New Brunswick) were attributed to *N. grandis*.

Neuropodial heterogomph falcigers were described as normally absent in *A. virens* (*e.g.*, FAUVEL, 1923*c*), but they are present, in spite of being limited to relatively few anterior chaetigers in large worms, and being easily overlooked (CHAMBERS & GARWOOD, 1992). This has led to identifications of specimens of *A. virens* as *N. kerguelensis*. As stated by CHAMBERS & GARWOOD (1992), the description of *N. kerguelensis* by FAUVEL (1923*c*) does not agree with the original description given by MCINTOSH (1885*a*), and consequently all the European records need to be checked. Part of these identifications could refer to *Alitta grandis*.

GENUS ***Ceratocephale*** Malmgren 1867

Ceratocephale MALMGREN, 1867*a*: 60-61.

TYPE SPECIES: *Ceratocephale loveni* Malmgren 1867.

SYNONYMS: *Ceratocephala* Malmgren 1867 [not Warder 1838 (Trilobita)]; *Chaunorhynchus* Chamberlin 1919.

REMARKS: NÚÑEZ (2004) considered the first published name of this genus as being *Ceratocephala* Malmgren 1867. This name was already preoccupied in Trilobita, and for this reason it was replaced for the next available name, which would be, according to him, *Chaunorhynchus* Chamberlin 1919. However, this is not correct, as the first published name of the genus is *Ceratocephale* Malmgren 1867.

The paper "Malmgren 1867" was published three times in the same year, with some differences between each publication. BANSE (1977*b*: 613-614) comments on the double publication of the work in the same year, as a book (1867*a*), and in a journal (1867*b*), being the later usually the quoted publication. As noted by BANSE (1977*b*), the two publications differ in some spellings (*e.g.*, *Ceratocephale* in the first publication, against *Ceratocephala*, in the second), pagination and other details, like the units in the text for length mesurements. Quoting directly BANSE (1977*b*): "*The second publication appeared in the* Reports of the Proceedings of the Academy in Stockholm*; the title page of the Proceedings for 1867 states that they were issued in 1868 but the last page of Malmgren's article was printed in 1867. An indication of the priority is the date, 5 April 1867, of the foreword of the book, whereas the paper was read at the Academy meeting of 10 April 1867.* (...) *We assume that the book became available first and was hence also printed first* (...)." This way, Malmgren's book should be quoted when citing the first publication date of the taxa therein described. There is also a publication which differs from the book only by its cover, which is written in Swedish, instead of Latin. For this reason, *Ceratocephale* became available first than *Ceratocephala*.

According to the actual International Code of Zoological Nomenclature (Fourth Edition), two generic names only are homonyms if they have the same spelling (Article 53.2). This way, and as confirmed later in Article 56.2, even if the difference between two genus-group names is only one letter, they are not homonyms. Thus, *Ceratocephale* is not to be considered as preoccupied in Trilobita, as *Ceratocephala*, and can be used in Nereididae.

KEY TO SPECIES:

1a. Double neuropodial cirri from chaetiger 3..***C. loveni***
1b. Double neuropodial cirri from chaetiger 1..**2**

2a (1b). Cirrophore enlarged from chaetiger 8 (from chaetiger 9 in Capbreton specimen); chaetae as homogomph and sesquigomph spinigers..***C. pacifica***
2b (1b). Cirrophore enlarged from chaetiger 9; chaetae as homogomph spinigers...................***C. andaman***

Ceratocephale* cf. *andaman Hylleberg & Nateewathana 1988

Ceratocephale andaman HYLLEBERG & NATEEWATHANA, 1988: 4-7, fig. 2.

TYPE LOCALITY: West of Thai Muang, Phang-nga (Thailand, Andaman Sea), at 54 meters.

SELECTED REFERENCES: *Ceratocephale* cf. *andaman* — NÚÑEZ, AGUIRREZABALAGA & CEBERIO, 2000: 30-32, fig. 4. *Chaunorhynchus andaman* — NÚÑEZ, 2004: 307-309, fig. 111.

DISTRIBUTION: Andaman Sea (16-68 meters); Capbreton Canyon, Bay of Biscay (1007-1040 meters).

REMARKS: The only specimen collected at Capbreton Canyon resembles closely the original description, except in that it presents dorsal cirrophores from chaetiger 9 to 31, against dorsal cirrophores present from chaetiger 9 to 30, and bifid ventral cirri from the first chaetiger to chaetiger 37 (last chaetiger in the incomplete and only known specimen), against bifid ventral cirri present only to the 26th chaetiger in the original description (NÚÑEZ, AGUIRREZABALAGA & CEBERIO, 2000).

Ceratocephale loveni Malmgren 1867

Ceratocephale Lovéni MALMGREN, 1867*a*: 61-62, pl. 5 fig. 33.

TYPE LOCALITY: Skagerrak coast of Sweden, at Bohuslän: off Kosteröarna (Koster Island), at 100 fathoms (183 meters), and near Lindö. On mud, between 50-100 fathoms (91.5-183 meters).

SYNONYMS: *Ceratocephale Websteri* Verrill 1880; *Ceratocephala borealis* Wesenberg-Lund 1950; *Ceratocephale hartmanae* Banse 1977.

SELECTED REFERENCES: *Ceratocephale loveni* — HEINEN, 1911: 62-63, pl. 1 figs. 11-15, map 3; PETTIBONE, 1963*a*: 152-154, fig. 42*a-b*; HARTMAN, 1965*b*: 83; HARTMANN-SCHRÖDER, 1974*d*: 200-202, figs. 19-22; AMOUREUX, 1982*a*: 42, fig. 6; CHAMBERS & GARWOOD, 1992: 26-28, figs. 12, 24, 40, 51, 63; KIRKEGAARD, 1992: 291-292, fig. 144; HARTMANN-SCHRÖDER, 1996: 195; KHLEBOVICH, 1996: 84-85, pl. 4; HILBIG, 1997*a*: 297-299, fig. 12.2; NÚÑEZ, AGUIRREZABALAGA & CEBERIO, 2000: 26-27, fig. 2. *Ceratocephale Loveni* — BANSE, 1977*b*: 614-617. *Ceratocephala loveni* — USCHAKOV, 1958*b*: 82, fig. 3. *Ceratocephala lovéni* — ELIASON, 1962*b*: 252-253. *Chaunorhynchus loveni* — HARTMAN, 1942*a*: 49, figs. 83-84; NÚÑEZ, 2004: 305-307, fig. 110. *Ceratocephale Websteri* — VERRILL, 1880: 172-173. *Ceratocephala borealis* — WESENBERG-LUND, 1950*a*: 18-19, text-figure in page 19, pl. 5 figs. 19-21, pl. 6 figs. 23-25, chart 25; MCINTYRE, 1961: 354. *Ceratocephale hartmanae* — BANSE, 1977*b*: 617-619, fig. 2*b-f*. *Ceratocephale fauveli* [not *Ceratocephale sibogae fauveli* Hartmann-Schröder 1962 = *Gymnonereis fauveli* (Hartmann-Schröder 1962)] [not *Ceratocephale fauveli* Gallardo 1967 = *Tambalagamia fauveli* Pillai 1961] — HARTMAN, 1967: 62. *Ceratocephale loveni pacifica* — HARTMAN, 1968: 501 [in part; in part = *Ceratocephale pacifica* Hartman 1960]. [?] *Ceratocephale* near *loveni* — MCINTOSH, 1902*b*: 258-260, pl. 6 figs. 1-4. Not *Ceratocephale loveni* — DAY, 1973: 38 [= *Ceratocephale oculata* Banse 1977].

REFERENCES FOR PORTUGAL: AMOUREUX, 1987 (off Aveiro; off Porto).

DISTRIBUTION: Capbreton Canyon; continental slope between Brittany and SW Ireland; North Sea; off Shetland; coast of Norway; Skagerrak; Northern Kattegat, until Anholt Island; Iceland; West of Greenland; Gulf of St. Lawrence; off Northeastern North America, from Nova Scotia to Virginia; off Bermuda; off Northeastern South America (Suriname; Brazil); Cape Horn; Chile (off Valparaiso); Mexico to California; Gulf of Alaska; Sea of Okhotsk. On mud and clay, sometimes mixed with sand, and also in fine sand. Between 31-5000 meters, seldom above 100 meters.

Ceratocephale* cf. *pacifica (Hartman 1960)

Ceratocephale loveni pacifica HARTMAN, 1960: 94-96, pl. 8.

TYPE LOCALITY: West Cortes Basin (off Southern California), at 1668 meters, on silt with bitumen, *Cyclamina* and other foraminifers.

SELECTED REFERENCES: *Ceratocephale loveni pacifica* — HARTMAN, 1968: 501 [in part; in part = *Ceratocephale loveni* Malmgren 1867]. *Ceratocephale Pacifica* — BANSE, 1977*b*: 617, fig. 2*a*. *Ceratocephale pacifica* — KHLEBOVICH, 1996: 85-86, pl. 5 figs. 4-5; HILBIG, 1997*a*: 299-301, fig. 12.3. *Ceratocephale ?pacifica* — HUTCHINGS & REID, 1990: 82-84, fig. 7, tables 7, 9. *Ceratocephale* cf. *pacifica* — NÚÑEZ, AGUIRREZABALAGA & CEBERIO, 2000: 28-30, fig. 3. *Chaunorhynchus pacificus* — NÚÑEZ, 2004: 309-311, fig. 112.

DISTRIBUTION: Western Mexico to central California (840-2580 meters); Australia: Victoria, Bass Strait (1200-2350 meters). Capbreton Canyon, Bay of Biscay (960 meters).

REMARKS: The Capbreton Canyon specimen presents some differences concerning the original description. The enlarged dorsal cirrophores extend from chaetiger 9, rather than from chaetiger 8, and the bifid ventral cirri are present from chaetiger 1 to about 20, instead from chaetiger 1 to chaetiger 25 (NÚÑEZ, AGUIRREZABALAGA & CEBERIO, 2000).

GENUS ***Ceratonereis*** Kinberg 1866

Ceratonereis KINBERG, 1866*a*: 170.

TYPE SPECIES: *Ceratonereis mirabilis* Kinberg 1866.

SYNONYMS: *Unanereis* Day 1962; [?] *Solomononereis* Gibbs 1971.

REMARKS: In their phylogenetic analysis of nereidids with paragnaths, BAKKEN & WILSON (2005) found that *Unanereis macgregori* Day 1962, the type species of the genus *Unanereis* Day 1962, was nested in a polytomy with *Ceratonereis* spp. and *Solomononereis* spp., in the unweighted result with a bootstrap support of 74%, and that it was nested with *Ceratonereis mirabilis* in a clade sister to *C. perkinsi*, in the reweighted result. As the clade did not have bootstrap support, those authors did not transferred *Unanereis* to *Ceratonereis*, stating that this would also ensure taxonomic stability. The transfer of *Unanereis macgregori* to *Ceratonereis* would leave the other species in the genus, *U. zhgali* Ben Amor 1980 in question, as the original description of the species by BEN AMOR (1980) does not give enough information.

However, and as stated below, *Unanereis zhgali* is here considered to be synonymous with *Composetia costae* (see *REMARKS* section under *Composetia costae*). On the other hand, BAKKEN & WILSON (2005) questioned the nesting of *Unanereis macgregori* with *Ceratonereis mirabilis* due to the presence of a single median antenna and an entire anterior margin of the prostomium in the first, as opposed to a pair of frontal antennae and an indented anterior margin in the second. The presence of a single median antenna in *U. macgregori* and *U. zhgali* is surely the result of the accidental loss of the second antenna, with or without the posterior cicatrization of the wound, in case it occurred before the collection of the worms. Besides, it is difficult to be sure if *U. macgregori* really has the anterior margin of the prostomium entire when there is a single specimen available with an injuried anterior region, as the loss of the antenna could have affected the shape of the anterior margin of the prostomium where the antennae are inserted. This way, and with base on the anterior studies by BAKKEN & WILSON (2005), the genus *Unanereis* is here considered to be a junior synonym of *Ceratonereis*.

BAKKEN & WILSON (2005) also comment the possibility that a second genus, *Solomononereis* Gibbs 1971, could be a junior synonym of *Ceratonereis*.

Ceratonereis mirabilis Kinberg 1865

Ceratonereis mirabilis KINBERG, 1866*a*: 170.

TYPE LOCALITY: Atlantic Ocean off Brazil at latitude 9ºS, at 18 fathoms (33 meters).

SYNONYMS: *Nereis gracilis* Webster 1884.

SELECTED REFERENCES: *Ceratonereis mirabilis* — AMOUREUX, 1977*a*: 1050; PERKINS, 1980: 4-11, figs. 1-4; HARTMANN-SCHRÖDER, 1985*a*: 43, fig. 23; BAKKEN & WILSON, 2005: 519. *Nereis gracilis* [HOMONYM; not Hansen 1882] — WEBSTER, 1884: 313-314, pl. 9 figs. 29-35.

DISTRIBUTION: Brazil; Curaçao; Tortugas; Cuba; Bahamas; Barbados; Florida; Gulf of Mexico; Puerto Rico; Bermuda. In corals, rocks, and other hard substrata. Between 12-68 meters. The species is also considered as a Lessepsian migrant in the Levantine Coast of the Mediterranean (BEN-ELIAHU, 1991*a*; ÇINAR, ERGEN & DAĞLI, 2002), and has been recorded from El-Arīsh (Sinai, Egypt), and Haifa (Israel), between 4-180 meters.

*GENUS ***Composetia*** Hartmann-Schröder 1985

Ceratonereis (Composetia) HARTMANN-SCHRÖDER, 1985*a*: 49.

TYPE SPECIES: *Nereis costae* Grube 1840.

REMARKS: Check the above key of genera for distinctive characters between *Ceratonereis* and *Composetia*.

KEY TO SPECIES:

1a. Three notopodial lobes in the anterior parapodia..***C. costae****
1b. Two notopodial lobes in the anterior parapodia..**2**

2a (1b). Eyes absent..***C. anoculata***
2b (1b). Eyes present...**3**

3a (2b). Homogomph falciger notochaetae present (from parapodia 21-27)..................................***C. vittata***
3b (2b). Homogomph falciger notochaetae absent..***C. hircinicola****

Composetia anoculata (Amoureux 1982)

Ceratonereis anoculata AMOUREUX, 1982*a*: 42-43, fig. 7.

TYPE LOCALITY: The species was described with base on 17 syntypes collected at 3 different localities, from SW the British Isles: 47º33'4"N, 7º19'W, at 1175 meters, on muddy sand (6 specimens); 48º21'N, 9º39'5"W, at 1175 meters, on mud (3 specimens); 48º28'N, 9º50'W, at 1300 meters, on mud (8 specimens).

DISTRIBUTION: Known from the type locality.

****Composetia costae*** (Grube 1840)

Nereis Costae GRUBE, 1840: 74-75.

TYPE LOCALITY: Gulf of Naples.

SYNONYMS: *Nereis (Ceratonereis) guttata* Claparède 1868; *Nereis (Ceratonereis) Kinbergiana* Claparède 1870; *Ceratonereis brunnea* Langerhans 1884; *Ceratonereis punctata* Saint-Joseph 1906; *Unanereis zghali* Ben Amor 1980.

SELECTED REFERENCES: *Nereis Costae* — EHLERS, 1868: 523-525, pl. 22 figs. 1-4. *Nereis (Ceratonereis) Costæ* — FAUVEL, 1914*f*: 185-188, pl. 15 figs. 1-8. *Nereis (Ceratonereis) Costae* — FAUVEL, 1923*c*: 349-350, fig. 136*a-f*; FAUVEL, 1936*c*: 37. *Ceratonereis Costae* — LANGERHANS, 1880*a*: 280-281, pl. 15 fig. 11. *Ceratonereis costae* — NÚÑEZ, BACALLADO & BRITO, 1981: 166-167, fig. 4; CAMPOY, 1982: 473-475, SARDÁ, 1985: 75, table 1. *Ceratonereis (Composetia) costae* — NÚÑEZ, 2004: 332-334, fig. 120. *Composetia costae* — KHLEBOVICH, 1996: 123. *Nereis (Ceratonereis) guttata* — CLAPARÈDE, 1868: 475-476, pl. 9 fig. 6, pl. 10 fig. 3. *Nereis (Ceratonereis) Kinbergiana* — CLAPARÈDE, 1870: 453-454, pl. 8 fig. 3. *Ceratonereis brunnea* — LANGERHANS, 1884: 255, pl. 15 fig. 13. *Ceratonereis punctata* — SAINT-JOSEPH, 1906: 219-221, pl. 4 figs. 90-93, pl. 5 figs. 94-95. *Unanereis zghali* — BEN AMOR, 1980: 13-14, fig. 1.

REFERENCES FOR PORTUGAL: CARVALHO, 1929 (as *Nereis (Ceratonereis) Costae*; Sines); SALDANHA, 1974 (as *Nereis costae*; coast of Arrábida); CAMPOY, 1982 (as *Ceratonereis costae*; previous records: Sines; Arrábida); SALDANHA, 1995 (as *Ceratonereis costae*; Portugal); NÚÑEZ, 2004 (as *Ceratonereis (Composetia) costae*; previous records: Portuguese coast).

MATERIAL: FAUNA 1 — St. 33*A*, Alborán Sea, Alborán Island, 34-44 m, laminarians on rocks: 1 incomplete specimen. **St. 58*A***, Gulf of Cádiz, 33-34 m, detritic with rocks: 1 complete specimen, with about 65 chaetigers for 30 mm long; everted proboscis. **St. 61*A***, Gibraltar Strait, Tarifa, 39-44 m, rock: 2 specimens; (1) complete, with 65 chaetigers, 30 mm long, oral ring without paragnaths, maxillary ring with paragnaths in areas II, III, and IV, 2 first chaetigers uniramous; (2) incomplete, proboscis everted, in poor condition.

DISTRIBUTION: From the Gulf of Biscay to South Africa; Madeira and Porto Santo Islands; Canary Islands; Morocco; Mediterranean Sea; Adriatic Sea; Aegean Sea; Black Sea; Mexico, Western Atlantic; Red Sea; Indian Ocean (Mozambique, Madagascar, Somalia, Sri Lanka); Indo-Pacific; Salomon Islands; Marshall Islands; Australia. On sand, hard substrata, under stones, amongst algae, vermetids, mussels, calcareous bottoms, maërl. Littoral to about 100 meters.

REMARKS: BEN AMOR (1980) described *Unanereis zghali* with base on two specimens collected one meter deep on a vertical rock colonized by *Astroides calycularis* and *Corallina mediterranea*, on the Îlot de la Cathédrale, SW Island of Zembra (Tunisia). The specimens were attributed to the genus *Unanereis* with base on the presence of a single median antenna, and separated from *U. macgregori* Day 1962, the type and single species of the genus, with base of the reduced number of paragnaths present on areas II, III, and IV of the proboscis, the shorter length of the tentacular and dorsal cirri, and on the presence of three notopodial lobes in the parapodia, instead of two. As stated by BEN AMOR (1980), the distribution and position of the paragnaths, the length of the tentacular and dorsal cirri, and the shape of the chaetae approached the new species from *Composetia costae* (as *Ceratonereis*). The single differences with this species were the presence of a single median antenna and the presence of conical paragnaths only in the maxillary ring of the pharynx. However, the presence of conical paragnaths only in the maxillary ring of the pharynx is typical of the genus *Ceratonereis*, including *C. costae* (*e.g.*, BAKKEN & WILSON, 2005), while the presence of a single median antenna is quite probably the result of the accidental loss of the second antenna by specimens of *C. costae*. Besides, this species was also found on the course of the same study that provided the two specimens of *U. zhagali* (ZGHAL & BEN AMOR, 1980). For these reasons, *U. zhagali* is here considered as a junior synonym of *C. costae*, being represented by damaged specimens which accidentally lost one of their median antennae.

****Composetia hircinicola*** (Eisig 1870)

Nereis hircinicola EISIG, 1870: 103-105, pl. 11 figs. 3-4.

TYPE LOCALITY: Mediterranean Sea.

SYNONYMS: *Nereis (Ceratonereis) Ehlersiana* Claparède 1870.

SELECTED REFERENCES: *Nereis (Ceratonereis) hircinicola* — FAUVEL, 1923*c*: 350-351, fig. 139*g-n*; FAUVEL, 1936*c*: 37. *Ceratonereis (Composetia) hircinicola* — NÚÑEZ, 2004: 334-336, fig. 121. *Ceratonereis hircinicola* — IMAJIMA, 1972: 67-69, figs. 14, 17; CAMPOY, 1982: 475; SARDÁ, 1985: 75, table 1. *Nereis (Ceratonereis) Ehlersiana* — CLAPARÈDE, 1870: 452-453, pl. 8 fig. 2; FAUVEL, 1913*a*: 65-67.

MATERIAL: FAUNA 1 — St. 33*A*, Alborán Sea, Alborán Island, 34-44 m, laminarians on rocks: 5 incomplete specimens, plus one fragment; one of the incomplete specimens has 37 chaetigers for 18 mm long; paragnaths in the same groups as *C. costae*, but in the anterior chaetigers there is only 2 dorsal ligules, instead of 3, as in *C. costae*. **St. 60*A***, Gibraltar Strait, Tarifa, 12-16 m, sand, stones, photophile algae: 1 incomplete specimen, in poor condition.

DISTRIBUTION: Mediterranean Sea and Gibraltar Strait (12-100 meters); Adriatic Sea; Aegean Sea; Brazil; South Africa; Madagascar; Singapur; Japan. In hard bottoms, amongst and inside sponges. From shallow water to bathyal depths.

Composetia vittata (Langerhans 1884)

Ceratonereis vittata LANGERHANS, 1884: 254-255, pl. 15 fig. 12.

TYPE LOCALITY: Madeira, in corals at big depth ("*in größerer Tiefe auf Korallen vorkommen*").

SYNONYMS: *Nereis (Ceratonereis?) rolasiensis* Augener 1918.

SELECTED REFERENCES: *Ceratonereis vittata* — FAUVEL, 1916*c*: 86-87, pl. 6 figs. 9-11, pl. 9 figs. 16-20; MONRO, 1930: 111; NÚÑEZ, 1995: 78-79, fig. 2; NÚÑEZ, 2004: 336-338, 122. *Nereis (Ceratonereis?) rolasiensis* — AUGENER, 1918: 200-203, text-fig. 16, pl. 3 figs. 64-65, pl. 4 fig. 78.

DISTRIBUTION: Mediterranean Sea; Azores; Madeira; Canary Islands; Gulf of Guinea; Brazil; Indian Ocean. On algae and corals (*Dendrophyllia ramea*). Between 18-350 meters.

GENUS ***Eunereis*** Malmgren 1865

Eunereis MALMGREN, 1865: 182-183.

TYPE SPECIES: *Nereis longissima* Johnston 1840.

Eunereis longissima (Johnston 1840)

Nereis longissima JOHNSTON, 1840*c*: 178-179, fig. 9.

TYPE LOCALITY: Coast of County Down, Northern Ireland.

SYNONYMS: [?] *Heteronereis paradoxa* Ørsted 1843; *Nereis regia* Quatrefages 1850; *Nereis edenticulata* Quatrefages 1866; *Rullierinereis tenerifensis* Núñez *in* Núñez, Brito & Bacallado 1984.

SELECTED REFERENCES: *Nereis longissima* — JOHNSTON, 1865: 164-166, text-fig. 33; EHLERS, 1868: 525-529; MCINTOSH, 1910: 325, pl. 61 figs. 1-1b, pl. 73 figs. 1-1a, pl. 81 figs. 6-6a; HEINEN, 1911: 57-58, text-fig. 18; CHAMBERS & GARWOOD, 1992: 35-38, figs. 5, 11, 27, 34, 44, 56, 67. *Ceratonereis longissima* — MALAQUIN, 1890*c*: 384. *Nereis (Eunereis) longissima* — SAINT-JOSEPH, 1898: 304-310, pl. 16 figs. 88-100, pl. 17 fig. 101; FAUVEL, 1914*f*: 188-189; FAUVEL, 1923*c*: 351, fig. 138*a-d*; FAUVEL, 1936*c*: 37-38; HARTMANN-SCHRÖDER, 1974*d*: 202-203; HARTMANN-SCHRÖDER, 1996: 200-201, fig. 87. *Eunereis longissima* — MALMGREN, 1865: 183; MALMGREN, 1867*a*: 57-58, pl. 5 fig. 32; SARDÁ, 1983: 18-21, fig. 3; SARDÁ, 1985: 75, table 1; KIRKEGAARD, 1992: 294-295, fig. 146; KHLEBOVICH, 1996: 140, pl. 42 figs. 1-4; NÚÑEZ, AGUIRREZABALAGA & CEBERIO, 2000: 34-36, fig. 6; NÚÑEZ, 2004: 321-324, fig. 116; BAKKEN & WILSON, 2005: 523-524, fig. 9. *Nereis regia* — QUATREFAGES, 1850*a*: 339; QUATREFAGES, 1866*b*: 538; GRUBE, 1869: 100; GRUBE, 1874*b*: 69. *Nereis edenticulata* — QUATREFAGES, 1866*b*: 538, pl. 7 figs. 1-2. [?] *Heteronereis paradoxa* — ØRSTED, 1843*b*: 177, figs. 50, 63-64, 66 [epitok]. [?] *Eunereis paradoxa* — MALMGREN, 1867*a*: 58. *Rullierinereis tenerifensis* — NÚÑEZ *in* NÚÑEZ, BRITO & BACALLADO, 1984: 16-18, fig. 2, cuadro nº 1. *Rullierinereis* cf. *gallardoi* [not Pettibone 1971] — NÚÑEZ, BACALLADO & BRITO, 1981: 164-166, fig. 3.

REFERENCES FOR PORTUGAL: DEXTER, 1992 (as *Nereis longissima*; previous records: Sado Estuary); RAVARA, 1997 (as *Nereis longissima*; off Aveiro).

DISTRIBUTION: Northeast Atlantic Ocean; Greenland; Iceland; Faroes; Norway; British Isles; English Channel; North Sea; Kattegat; Skagerrak; northern Øresund; from the Bay of Biscay to the Mediterranean Sea; Adriatic Sea; Aegean Sea; Black Sea; Azores; Canary Islands. On a variety of sediment types, from clean sand to mud, especially on muddy bottoms, amongst *Zostera* or algae. Intertidal to 2500 meters.

REMARKS: This species is normally described as having paragnaths only on group VI. However, CHAMBERS & GARWOOD (1992) examined some individuals identified as *Nereis longissima* which showed small numbers of paragnaths also in groups I, II, and IV. According to the same authors, the paragnaths of the species are normally very pale and few in number, being easily dislodged or overlooked, which could have led to the belief that they were absent in the maxillary rings. However, in the more recent description of *Eunereis longissima* given by BAKKEN & WILSON (2005), with base on material from Sweden, England, and Denmark, the species is described has having 2-7 conical paragnaths only in area VI of the oral ring. This distribution of paragnaths is here considered as the characteristic of the species.

The same authors (CHAMBERS & GARWOOD, 1992) drew attention to the fact that *Nereis elitoralis* Eliason 1962 is morphologically similar to *N. longissima*. The main differences would be that *N. elitoralis* has paragnaths on groups IV, VI and VII-VIII, and dorsal cirri much longer than the parapodial ligules in the posterior chaetigers. The significance of the paragnath arrangement was stated to be unclear, considering the variation in *N. longissima*, while the relative length of the dorsal cirri and the parapodial ligules of the posterior chaetigers was considered to not separate clearly the specimens of *N. longissima* from *N. elitoralis*, being large specimens of *N. longissima* indistinguishable from *N. elitoralis* in this respect (CHAMBERS & GARWOOD, 1992).

Later, MACKIE & GARWOOD (1995) found *Eunereis longissima* and *N. elitoralis* occurring in the material of the same study performed at the Irish Sea. They concluded that, contrary to the conclusions of CHAMBERS & GARWOOD (1992), the relative length of the dorsal cirri was a distinguishing feature in order to separate the two species (being longer in *N. elitoralis*). Moreover, adult specimens of *N. elitoralis* didn't have a dorsal supra-acicular ligule on the parapodia of the first three chaetigers, while in nereidids these are usually lacking only in the first two uniramous parapodia. Finally, from the available drawings of both species, it also seems that the notopodial dorsal ligule is generally slightly longer than the notopodial ventral ligule in *N. elitoralis*, while in *E. longissima* the notopodial dorsal ligule is slightly shorter than the notopodial ventral ligule.

GENUS ***Hediste*** Malmgren 1867

Hediste MALMGREN, 1867*a*: 48-49.

TYPE SPECIES: *Nereis diversicolor* O.F. Müller 1776.

KEY TO SPECIES:

1a. Notopodial dorsal ligule becomes narrower posteriorly, bearing the dorsal cirrus at its base; paragnath distribution (from NÚÑEZ, 2004): I – 1-4 (occasionally 0), II – up to 16 in 2 or 3 oblique rows, III – transversal cluster of up to 46, IV – up to 19, V – 0, VI – 3-9, VII-VIII – 2 irregular rows of up to 34; simple neuropodial chaetae (fused falciger) in posterior neuropodia with blunt tip..............***H. diversicolor***

1b. Notopodial dorsal ligule becomes enlarged and flattened posteriorly, bearing the dorsal cirrus at its apex; paragnath distribution (from DAY, 1967): I – 1, II – a close-set wedge, III – a few scattered points, IV – a wedge, V – 0, VI – a rosette of 8-10 points, VII-VIII – a continuous row two to three deep; simple neuropodial chaetae (fused falciger) in posterior neuropodia with pointed tip...........................***H. gilchristi***

Hediste diversicolor (O.F. Müller 1776)

Nereis diversicolor O.F. MÜLLER, 1776: 217.

TYPE LOCALITY: Denmark.

SYNONYMS: *Nereis brevimanus* Johnston 1840; *Nereis Sarsii* Rathke 1843; *Nereis depressa* Leuckart 1847.

SELECTED REFERENCES: *Nereis diversicolor* — ØRSTED, 1843*a*: 23, pl. 4 figs. 66, 68, 73 [reference to fig. 75 in text is wrong]; JOHNSTON, 1865: 152-154, 341; QUATREFAGES, 1866*b*: 508; MARENZELLER, 1874: 466-470, pl. 7 fig. 3; SAINT-JOSEPH, 1906: 216; MCINTOSH, 1910: 312, pl. 52 figs. 4-4*a*, pl. 60 figs. 11-11*a*, pl. 71 figs. 5-5*b*, pl. 72 figs. 5-5*b*; HEINEN, 1911: 46-49, pl. 1 figs. 3-6, map 5; FAUVEL, 1923*c*: 344, fig. 133*a-f*; FAUVEL, 1936*c*: 36; CHAMBERS & GARWOOD, 1992: 28-30, figs. 5, 21, 27, 35, 39, 41, 52, 64. *Hediste diversicolor* — MALMGREN, 1867*a*: 49-50, pl. 4 fig. 28; CAMPOY, 1982: 471-472; SARDÁ, 1985: 75, table 1; KIRKEGAARD, 1992: 295-298, fig. 147; KHLEBOVICH, 1996: 117-119, pl. 24; NÚÑEZ, 2004: 388-390, fig. 144; BAKKEN & WILSON, 2005: 525. *Nereis (Nereis) diversicolor* — SAINT-JOSEPH, 1898: 295-298, pl. 15 figs. 78-81. *Nereis (Hediste) diversicolor* — REGNARD, 1913: 76-79, fig. 1; HARTMANN-SCHRÖDER, 1996: 201-204, fig. 88. *Nereis brevimanus* — JOHNSTON, 1840*c*: 170-171, text-fig. 1. *Nereis bravimana* — JOHNSTON, 1965: 147-148, 341, text-fig. 23. *Nereis Sarsii* — RATHKE, 1843: 161-163, pl. 8 figs. 6-8. *Nereis depressa* — LEUCKART, 1847: 156, pl. 2 figs. 10, 12.

REFERENCES FOR PORTUGAL: CARVALHO, 1929 (as *Nereis diversicolor*; Buarcos); GALHANO, 1970 (as *Nereis diversicolor*; Cabedelo; Areinho); AMOUREUX & CALVÁRIO, 1981 (as *Nereis diversicolor*; Tagus Estuary; Lagoon of Óbidos); CAMPOY, 1982 (previous records: Buarcos; Cabedelo; Areinho); CALVÁRIO, 1984 (as *Nereis diversicolor*; Tagus Estuary); MARQUES *et al.*, 1984 (as *Nereis diversicolor*; Mondego Estuary); QUINTINO & GENTIL, 1987 (as *Nereis diversicolor*; Lagoon of Albufeira; Lagoon of Óbidos); CANCELA DA FONSECA, COSTA & BERNARDO, 1989 (Lagoon of Santo André); QUINTINO, RODRIGUES & GENTIL, 1989 (as *Nereis diversicolor*; Lagoon of Óbidos); DEXTER, 1992 (as *Nereis (Hediste) diversicolor*; previous records: Ria Formosa; Ria de Alvor; Lagoon of Carrapateira; Sado Estuary; Lagoon of Albufeira; Tagus Estuary; Lagoon of Óbidos; Mondego Estuary; Ria de Aveiro; Minho Estuary); PARDAL, MARQUES & BELLAN, 1993 (Mondego Estuary); FIDALGO E COSTA, 1994 (Odeceixe); MOREIRA, FIGUEIRA & CUNHA, 1994 (Ria de Aveiro); PARDAL, MARQUES & BELLAN, 1994 (Mondego Estuary); SPRUNG, 1994 (as *Nereis diversicolor*; Ria Formosa); FIDALGO E COSTA & CANCELA DA FONSECA, 1995 (Carrapateira); SALDANHA, 1995 (Portugal); FIDALGO E COSTA & CANCELA DA FONSECA, 1998 (as *Nereis (Hediste) diversicolor*; Aljezur Estuary); FIDALGO E COSTA, SARDÁ & CANCELA DA FONSECA, 1998 (as *Nereis diversicolor*; Carrapateira; Aljezur; Odeceixe; previous records: Estuary of Mira; Lagoon of Santo André; Estuary of Mondego; Ria de Aveiro); ABRANTES, PINTO & MOREIRA, 1999 (as *Nereis diversicolor*; Ria de Aveiro); AMARAL & COSTA, 1999 (Sado Estuary); CABRAL *et al.*, 1999 (as *Nereis diversicolor*; Mondego Estuary); LILLEBØ *et al.*, 1999 (as *Nereis diversicolor*; Mondego Estuary); MUCHA & COSTA, 1999 (as *Nereis diversicolor*; Ria de Aveiro and/or Sado Estuary); FIDALGO E COSTA, 2003 (as *Nereis diversicolor*; estuaries of Odeceixe, Aljezur and Carrapateira); CANCELA DA FONSECA *et al.*, 2006 (Aljezur; Odeceixe); VIRGILIO *et al.*, 2009 (Ria de Aveiro).

DISTRIBUTION: Northwest Atlantic, from the Gulf of St. Lawrence to Massachusetts; Greenland; Northeast Atlantic, from Iceland to the Mediterranean Sea; Baltic Sea; Adriatic Sea; Aegean Sea; Black Sea; Caspian Sea. On estuaries and coastal lagoons, on both low or fluctuating salinities, on muddy and sandy bottoms. Intertidal to about 50 meters.

Hediste gilchristi (Day 1967) nov. comb.

Nereis (Nereis) gilchristi DAY, 1967: 315, fig. 14.8.*w*.

TYPE LOCALITY: Agulhas Bank, 34º32'S, 21º15'E (South Africa), at 62 meters.

SELECTED REFERENCES: *Nereis (Nereis)* sp. — DAY, 1960: 323-324, fig. 8*a*.

DISTRIBUTION: Agulhas Bank, South Africa. Known from 62 meters. The species is also known as a Lessepsian migrant in the Levantine Coast of the Mediterranean (BEN-ELIAHU, 1991*a*; ÇINAR, ERGEN & DAĞLI, 2002), being known from Sinai (Egypt), at 10 meters.

REMARKS: According to the description of the species, *Nereis gilchristi* should be placed in the genus *Hediste*.

GENUS ***Leonnates*** Kinberg 1866

Leonnates KINBERG, 1866*a*: 168.

TYPE SPECIES: *Leonnates indicus* Kinberg 1865.

KEY TO SPECIES:

(adapted from QIU & QIAN, 2000)

1a. Falcigers present on all neuropodia; group III with 2-8 papillae, which can be scleritised or not; group VI with 4-18 papillae (group I without paragnaths; group II with 4-18 paragnaths; group IV with 3-18 paragnaths; group V without papillae; groups VII-VIII with 15-112 papillae in 2-5 rows)..........***L. indicus***
1b. Falcigers not present on anterior neuropodia; group III with paragnaths (may be absent in some specimens of *L. persicus*); group VI with one papilla...**2**

2a (1b). In all parapodia, ventral neuropodial ligule slightly shorter than neuropodial acicular ligules; group I with 0-1 paragnaths; group II with 2-4 paragnaths; group III with 0-3 paragnaths; group IV with 2-4 paragnaths; group V without papillae; groups VII-VIII with 18-42 papillae in 2-4 rows......***L. persicus***
2b (1b). In middle and posterior parapodia, ventral neuropodial ligule much longer than neuropodial acicular ligules; group I without paragnaths; group II with 3-6 paragnaths; group III with 4-21 paragnaths

group IV with 5-11 paragnaths; group V without papillae; groups VII-VIII with 5-7 papillae in a single row...***L. decipiens***

Leonnates decipiens Fauvel 1929

Leonnates decipiens FAUVEL, 1929: 180-182, fig. 1.

TYPE LOCALITY: Krusadai and Pamban (Gulf of Manaar), and Suez Canal.

SYNONYMS: *Leonnates decipiens* var. *manilensis* Pillai 1965.

SELECTED REFERENCES: *Leonnates decipiens* — FAUVEL, 1953*c*: 171-172, fig. 87; DAY, 1967: 330, fig. 14.11.*n-s*; WU, SUN & YANG, 1981: 65-67, fig. 37; HUTCHINGS & REID, 1991: 52; QIU & QIAN, 2000: 1123-1127, figs. 6, 7*A-B*, table 2. *Leonnates decipiens* var. *manilensis* — PILLAI, 1965: 144-148, figs. 13-14. *Leonnates jousseaumei* [not Gravier 1899] — FAUVEL, 1927*b*: 427, fig. 106*F-H*.

DISTRIBUTION: Congo; Senegal; Mozambique; Suez Canal; Gulf of Manaar; Sri Lanka; Philippines; Singapore; China; Australia. Among oysters, sandy mud sediments, coral rubble, and sandy substrata. Between 0-40 meters. The species is also known as a Lessepsian migrant in the Levantine Coast of the Mediterranean (BEN-ELIAHU, 1991*a*; ÇINAR, ERGEN & DAĞLI, 2002), and has been recorded from Rafah (Palestinian Gaza Strip), and Haifa (Israel), between 2-18 meters.

Leonnates indicus Kinberg 1866

Leonnates indicus KINBERG, 1866*a*: 168.

TYPE LOCALITY: Knoll, Singapore.

SYNONYMS: *Leonnates virgatus* Grube 1874; *Leonnates Jousseaumi* Gravier 1899.

SELECTED REFERENCES: *Leonnates indicus* — QIU & QIAN, 2000: 1113-1120, figs. 1-3, table 1. *Leonnates virgatus* — GRUBE, 1874*b*: 68. *Nereis (Leonnates) virgata* — GRUBE, 1878*c*: 63-64, pl. 4 fig. 7. *Leonnates Jousseaumi* — GRAVIER, 1899: 234-237, figs. 1-5. *Leonnates Jousseaumei* — GRAVIER, 1902: 160-164, text-figs. 162-165, pl. 11 figs. 34-37; FAUVEL, 1919*a*: 400-401. *Leonnates jousseaumei* — HORST, 1924: 150; FAUVEL, 1930*b*: 19, fig. 5*A-E*; MONRO, 1931*a*: 43-44, fig. 4*a*; FAUVEL, 1932*b*: 85; MONRO, 1939*c*: 403; FAUVEL, 1953*c* 169-170, fig. 86*d-f*; DAY, 1967: 330-331, fig. 14.11.*t*; WU, SUN & YANG, 1981: 67-68, fig. 38; HUTCHINGS & REID, 1991: 52-53.

DISTRIBUTION: Suez Gulf and Canal; Red Sea; Persian Gulf; Arabian Sea; Madagascar; Bay of Bengal; Singapore; Philippines; Indonesia; Malaysia; Hainan, China; Australia. Among coral debris, or among corals and sponges. Between 1-64 meters. The species is also known as a Lessepsian migrant in the Levantine Coast of the Mediterranean (ÇINAR, ERGEN & DAĞLI, 2002), where it was recorded from the coast of Israel.

Leonnates persicus Wesenberg-Lund 1949

Leonnates persicus WESENBERG-LUND, 1949: 275-277, figs. 11-12.

TYPE LOCALITY: Two miles west of Mujgam (26º57'N, 53º26'E), Persian Gulf, at 20 meters, in clay with a little of sand.

SELECTED REFERENCES: *Leonnates persica* — DAY, 1957: 76-78, fig. 3*l*; DAY, 1967: 328-330, fig. 14.11.*g-m*; WU, SUN & YANG, 1981: 68-69, figs. 39-40; KHLEBOVICH, 1996: 100, pl. 12. *Leonnates persicus* — QIU & QIAN, 2000: 1129-1133, figs. 8*B-C*, 9*A-C*, 10-11, table 3; ÇINAR, ERGEN & DAĞLI, 2002: 812-815, figs. 1-3.

DISTRIBUTION: Persian Gulf; Mozambique; China. In clay, clay with sand or silt, or in sandy mud. Can support flutuations of the salinity between 19.3‰ and 32.5‰. Intertidal to 58 meters. The species is also known as a Lessepsian migrant in the Levantine Coast of the Mediterranean (BEN-ELIAHU, 1991*a*; ÇINAR, ERGEN & DAĞLI, 2002), and has been recorded from El-Arīsh (Sinai, Egypt), Haifa (Israel), and Izmir Bay (Turkey), in muddy substrata, between 10-46 meters.

GENUS *Micronereis* Claparède 1863

Micronereis CLAPARÈDE, 1863: 57.

TYPE SPECIES: *Micronereis variegata* Claparède 1863.

SYNONYMS: *Notophycus* Knox & Cameron 1970; *Phyllodocella* Fauchald & Belman 1972; *Quadricirra* Banse 1977.

REMARKS: The epitokous specimens of this genus show sexual dimorphism. Males of some species have copulatory hooks on the neuropodia of chaetiger 3, which help them to hold to the female during coupling. Accessory parapodial cirri can also present. As both the hooks and the accessory parapodial cirri can be absent (*e.g.* in *M. eniwetokensis* Reish 1961), the safest way to differenciate males from females is to rely on the presence of sexual products. The following key is based only on the morphological characters of the males.

KEY TO SPECIES:
(MALES ONLY)

(adapted from PAXTON, 1983)

1a. Males with prolonged type of jaws, with proximal teeth; epitokous males without accessory parapodial cirri and without simple chaetae; shafts of spinigers without septa........................***M. variegata***
1b. Males with shortened type of jaws; epitokous males with accessory cirri on lower part of notopodia and upper part of neuropodia, and with simple chaetae with widened middle portion; shafts of spinigers with weak septa..***M. bansei***

Micronereis bansei (Hartmann-Schröder 1979)

Quadricirra bansei HARTMANN-SCHRÖDER, 1979*b*: 121-122, figs. 227-237.
TYPE LOCALITY: Gantheaume Point (Broome, Western Australia), cliff with rocky terraces near the lighthouse, in *coralligène*, at the lower eulittoral.
SELECTED REFERENCES: *Micronereis bansei* — PAXTON, 1983: 11-12, figs. 1, 14-27. *Micronereis variegata* [not Claparède 1863] — FAUVEL, 1927*b*: 433, fig. 107; GRAVIER, 1934: 351, fig. 3; [?] AMOUREUX, RULLIER & FISHELSON, 1978: 81-82. *Quadricirra* sp. — BANSE, 1977*a*: 127, pl. 2 figs. *c*, *d*.
DISTRIBUTION: Australia (Western Australia; Queensland; New South Wales); Suez Canal (Port Said, Egypt, Eastern Mediterranean); [?] Sinai Peninsula. In *coralligène* and sand among algae on rocks, on low water.
REMARKS: According to PAXTON (1983), the specimens recorded by AMOUREUX, RULLIER & FISHELSON (1978) from the Sinai Peninsula belong probably to this species. The authors stated that the specimens had shortened jaws and lacked accessory parapodial cirri. As *M. bansei* is known to occur at Port Said (Suez Canal, Egypt), there is the possibility that the specimens from the Sinai Peninsula are females of *M. bansei*.

Micronereis variegata Claparède 1863

Micronereis variegata CLAPARÈDE, 1863: 57-58, pl. 11 figs. 5-7.
TYPE LOCALITY: Near St. Vaaste la Hougue (Normandie, Northern France).
SYNONYMS: *Micronereis siciliensis* Cantone 1971.
SELECTED REFERENCES: *Micronereis variegata* — CLAPARÈDE, 1864: 582, pl. 8 figs. 4-4; SAINT-JOSEPH, 1888: 268; RACOVITZA, 1893: 1390-1392; MCINTOSH, 1910: 260, pl. 86 fig. 63; REGNARD, 1913: 91-105, 109, figs. 3-11; FAUVEL, 1923*c*: 332-333, fig. 128*a-f*; FAUVEL, 1936*c*: 33; RULLIER, 1954*a*: 195-234, figs. 1-43; BANSE, 1977*a*: 121; NÚÑEZ, BACALLADO & BRITO, 1981: 163-164, fig. 2; PAXTON, 1983: 6-7, figs. 1-2; SARDÁ, 1985: 75, table 1; CHAMBERS & GARWOOD, 1992: 61, fig. 74; NÚÑEZ, 2004: 319-321, fig. 115. *Micronereis siciliensis* — CANTONE, 1971: 926-929, figs. 4-9. [?] *Micronereis* sp. — VILLALBA & VIÉITEZ, 1988: 179-181, figs. 3, 4*A*. Not *Micronereis variegata* — FAUVEL, 1927*b*: 433, fig. 107; GRAVIER, 1934: 351, fig. 3; [?] AMOUREUX, RULLIER & FISHELSON, 1978: 81-82 [= *Micronereis bansei* (Hartmann-Schröder 1979)]. Not *Micronereis variegata* — RAMSAY, 1914*b*: 243, figs. 2-5, 7; BERKELEY, 1924: 290; BERKELEY & BERKELEY, 1948: 60, fig. 89 [= *Micronereis nanaimoensis* Berkeley & Berkeley 1953].
DISTRIBUTION: English Channel; Irish Sea (Isle of Man); Northeastern Atlantic Ocean (France; [?] Galicia); Mediterranean Sea (France; Sicily); Adriatic Sea; Aegean Sea; Canary Islands; Morocco. Amongst algae, *Posidonia*, and gorgoneans. Littoral zone, at shallow water.
REMARKS: The male described by VILLALBA & VIÉITEZ (1988) from Ría de Pontevedra (Galicia), is very similar to *M. variegata* Claparède 1863. The main difference resides in the shape of the jaws, in relation to the jaws drawn by PAXTON (1983). I think that the differences found are probably due to the variability of the species or to the degree of development of the specimens, and that probably the specimen found in Galicia belongs to this species. However, and while waiting for further data on the variability of the buccal apparatus of the genus *Micronereis*, I keep the Galician specimen as being doubtful.

GENUS *Namalycastis* Hartman 1959

Namalycastis HARTMAN, 1959*b*: 163.
TYPE SPECIES: *Lycastis abiuma* Grube 1872.

KEY TO SPECIES:

(adapted from GLASBY, 1999)

1a. Supra-neuroacicular falcigers in parapodia of chaetiger 10 with smooth blades..............***N. brevicornis***
1b. Supra-neuroacicular falcigers in parapodia of chaetiger 10 with serrated blades............***N. hawaiiensis***

Namalycastis brevicornis (Audouin & Milne Edwards 1833)

Lycastis brevicornis AUDOUIN & MILNE EDWARDS, 1833*b*: 223-226, pl. 14 figs. 6-12.
TYPE LOCALITY: Coast of Noirmoutier Island (France, Northeastern Atlantic Ocean).
SELECTED REFERENCES: *Lycastis brevicornis* — AUDOUIN & MILNE EDWARDS, 1834: 201-204, pl. 4^B figs. 6-12; GRUBE, 1870*a*: 312-313; FAUVEL, 1923*c*: 331-332, fig. 128*g-l* [figures as *Lycastis brevipalpa*]. *Namalycastis brevicornis* — GLASBY, 1999: 40-42, figs. 1*c*, 14-15, table 4.
DISTRIBUTION: Northeastern Atlantic Ocean (Noirmoutier Island and La Rochelle, France); Southwestern Atlantic Ocean (French Guiana; Marajó Island, Brazil); [?] Hawaiian Islands. It is known to occur on shallow water, at the coast (Noirmoutier), and on a beach in brackish to freshwater (Marajó Island). Probably it inhabits salt farm areas of the north-east of Noirmoutier Island (GLASBY, 1999).

Namalycastis hawaiiensis (Johnson 1903)

Lycastis hawaiiensis JOHNSON, 1903: 210-212, pl. 16 figs. 11-13, pl. 17 figs. 17-23.
TYPE LOCALITY: The type description was based on three syntypes, two collected in a freshwater “spring near Honolulu” (exact locality unknown), and the other in an unknown locality in the Hawaiian Islands. The neotype designated by GLASBY (1999), was collected in Manoa Stream, near Dole Street Bridge, Honolulu (Oahu, Hawaiian Islands), 21º19’N, 157º50’W, in freshwater, on mud and detritus.
SELECTED REFERENCES: *Lycastis hawaiiensis* — HORST, 1909*a*: 2-4, fig. 145. *Namalycastis hawaiiensis* — GLASBY, 1999: 49-52, figs. 1*c*, 4*a*, 19, 20, table 4. *Lycastis ranauensis* — FEUERBORN, 1931: 639-651, figs. 6-10; SCHMIDT, 1935: 3-10, figs. 1-2. *Namalycastis abiuma* [not *Namlycastis abiuma* (Grube, 1872)] — BAILEY-BROCK, 1987*b*: 297-298, fig. 3.II.71*a-c*.
DISTRIBUTION: Hawaiian Islands (Oahu, Kauai, Hawaii); Indonesia (Java, Sumatra); New Guinea; Palau Islands; Hong Kong; Japan (Ryukyu Islands); Truk Islands (= Chuuk Islands). In occurs in streams, swamps, aquaculture ponds and coastal anchialine ponds, in fresh to very slightly saline waters, on mud to muddy sand. It can be found in the top few centimeters of sediment, or on the surface of sediment under leaf litter, stones, coconut shells or other debris near the edge of the water (GLASBY, 1999). It can occur from a few hundred meters from the sea, where the water is slightly brackish, to as far as 400-450 km upstream (as occurs in Sumatra).
REMARKS: There was an attempt to introduce the species into Skutari (= Skadarsko or Skhodrës) Lake, Montenegro/Albania (FEUERBORN, 1935). The possibility that some specimens remain in the lake is the reason why the species is included here.

GENUS *Namanereis* Chamberlin 1919

Namanereis CHAMBERLIN, 1919*a*: 194.
TYPE SPECIES: *Lycastis quadriticeps* Blanchard 1849.
SYNONYMS: *Lycastopsis* Augener 1924; *Lycastella* Feuerborn 1931; *Cryptonereis* Gibbs 1971; *Lycastilla* Solís-Weiss & Espinasa 1991.

KEY TO SPECIES:

(adapted from GLASBY, 1999)

1a. Eyes present (2 pairs)..**2**
1b. Eyes absent...***N. hummelincki***

2a (1a). Sesquigomph spinigers present in supra-acicular fascicle......................***N. littoralis* species group**

2b (1a). Sesquigomph spinigers absent...***N. pontica***

Namanereis hummelincki (Augener 1933)

Lycastopsis hummelincki AUGENER, 1933*a*: 352-355, fig. 1.

TYPE LOCALITY: Fontein (Bonaire, 12º15'N, 68º27'W), in a spring in a karst region, with a salinity of 0.9‰.

SELECTED REFERENCES: *Lycastopsis hummelincki* — WESENBERG-LUND, 1958: 12-14, figs. 5-8; MARCUS, 1960: 58-60, figs. 29-32; KIRKEGAARD, 1980*a*: 9-11. *Namanereis hummelincki* — HARTMAN, 1959*b*: 163; HARTMANN-SCHRÖDER, 1973: 96-97, figs. 18-20 [in part; in part = *Namanereis stocki* Glasby 1999]; HARTMANN-SCHRÖDER, 1980*a*: 398-399; [?] HARTMANN-SCHRÖDER, 1988: 181-182; GLASBY, 1999: 86-89, figs. 1*c*, 36, 37, table 5. Not *Namanereis hummelincki* — HARTMANN-SCHRÖDER, 1977*b*: 58-60, figs. 21-24 [= in part *Namanereis cavernicola* (Solís-Weiss & Espinasa 1991); in part *Namanereis stocki* Glasby 1999 (see GLASBY, 1999)].

DISTRIBUTION: Caribbean Islands (Barbados; Blanquilla; Bonaire; Cuba; Curaçao; Hispaniola; Jamaica); [?] Canary Islands (Fuerteventura). On fresh and brackish water, on shallow gutters, puddles, small basins, and cisterns, often in limestone areas with clayish mud-muddy sand sediment and decaying plant material and detritus, on salinity ranges between 0.1-10‰. It was found at about 3 km upstream, in Jamaica. In Fuerteventura it was found at a distance from the sea ranging between 0.3 to 9.3 km, but these records need confirmation.

REMARKS: The species is included here, but HARTMANN-SCHRÖDER's (1988) record of the species from Fuerteventura (Canary Islands) needs confirmation (GLASBY, 1999). Other records by the same author from Cuba (HARTMANN-SCHRÖDER, 1973; HARTMANN-SCHRÖDER, 1977*b*) included different species from *N. hummelincki*.

Namanereis littoralis (Grube 1872)

Lycastis littoralis GRUBE, 1872*a*: 47-48.

TYPE LOCALITY: Santa Catarina Island (Brazil), 27º35'S, 48º31'W.

SYNONYMS: *Lycastopsis beumeri* Augener 1924.

SELECTED REFERENCES: *Lycastopsis beumeri* — AUGENER, 1924*a*: 42; WESENBERG-LUND, 1958: 14-17, figs. 9-11 [in part]. *Namanereis littoralis* — HARTMAN, 1959*b*: 162. *Namanereis littoralis* — GLASBY, 1999: 89-91, figs. 1*c*, 38, 39, table 5.

DISTRIBUTION: Santa Catarina Island (Brazil); Habana (Cuba).

REMARKS: A large amount of material is supposed to be conspecific with this species, but due to the great variation found, they were included under the informal taxon of "species group" (see below), while waiting for verification and further studies (GLASBY, 1999; see *REMARKS* under *Nemanereis littoralis* species group). The redescription of the type material of *N. littoralis* by GLASBY (1999) will supposedly help in future taxonomic decisions concerning the species, as it can stabilize its definition. Only the synonymy of *Lycastopsis beumeri* Augener 1924, from Cuba, with this species is certain for the moment (GLASBY, 1999).

Namanereis littoralis (Grube 1872) **species group** Glasby 1999

Namanereis littoralis species group — GLASBY, 1999: 91-94, figs. 1*c*, 8*d*, 39, table 5.

SELECTED REFERENCES: For a complete list of references see GLASBY (1999). Here I will only present the references concerning European records of specimens which can be included in *Namanereis littoralis* species group Glasby 1999: *Lycastopsis littoralis* — GIBBS & SAIZ-SALINAS, 1996: 618-621, figs. 1-2. *Namanereis littoralis* — NÚÑEZ, 2004: 302-304, fig. 109. *Lycastoides pontica* [not *Namanereis pontica* (Bobretzky 1871)] — LA GRECA, 1949*a*: 164-165, figs. 13-18; BANSE, 1959*d*: 302, fig. 5. *Namanereis quadraticeps* [not *Namanereis quadraticeps* (Gay *in* Blanchard 1849)] — MARINOV, 1966: 72-73, fig. 3*a-f*; KATZMANN, 1972: 127. [?] *Namalycastis brevicornis* [not *Namalycastis brevicornis* (Audouin & Milne-Edwards 1833)] — AMOUREUX & CALVÁRIO, 1981: 148; CALVÁRIO, 1984: 201.

REFERENCES FOR PORTUGAL: AMOUREUX & CALVÁRIO, 1981 (as *Namalycastis brevicornis*; Tagus Estuary); CALVÁRIO, 1984 (as *Namalycastis brevicornis*; Tagus Estuary); DEXTER, 1992 (as *Lycastis (Namalycastis) brevicornis*; previous records: Sines; Tagus Estuary); GIBBS & SAIZ-SALINAS, 1996 (as *?Lycastopsis littoralis*; Seixal, Tagus Estuary); GLASBY, 1999 (previous records: Tagus Estuary); NÚÑEZ, 2004 (previous records: Seixal, Tagus Estuary).

DISTRIBUTION: Cosmopolitan: Iberian Peninsula (Ria de Bilbao; [?] Seixal, Tagus Estuary); Adriatic Sea; Bosphorus; Black Sea; Northeastern USA (Virginia; Massachusetts); Caribbean Sea (Aruba; Bahamas; Bonaire; Curaçao; Hispaniola; Jamaica; Los Roques; St. Barthélemy; St. Eustatius; St.

Marteen; Tortuga; Virgin Islands); Uruguay; Chile; California; British Columbia; Hawaiian Islands; Australia (New South Wales); Japan; Far Eastern Russia; Sea of Japan; Yellow Sea. In the upper littoral zone of coastal areas, on a variety of substrata (rocks, mud, muddy sand, coarse gravelly sand, gravel), often associated with decaying vegetable matter (detritus) and freshwater runoff. It can be found on lagoons, ponds, and harbours, in seawater or brackish water which salinity can vary between 36 to 130‰, but also on almost freshwater.

REMARKS: GLASBY (1999) created this informal taxon rancking of "species group" to include a series of specimens from different populations which approximate the description of the holotype of *Nemanereis littoralis* (Grube 1872), but encompassing a variation which is bigger than the normal for a species of Namanereidinae. This variation includes forms which can not be distinguished by unique features. However, and as stated by the same author, it may be possible in the future to identify good species from the variant forms of the "species group" using molecular techniques (*e.g.* DNA sequencing) and/or statistical analysis of morphometric data (GLASBY, 1999).

Namanereis pontica (Bobretzky 1871)

Lycastis pontica BOBRETZKY, 1871*a*: 1-3, pl. 14 figs. 1-5.

TYPE LOCALITY: Sevastopol' Bay (Black Sea).

SYNONYMS: *Lycastoides pontica neapolitana* La Greca 1950.

SELECTED REFERENCES: *Lycastoides pontica neapolitana* — LA GRECA, 1950: 2-3; COGNETTI, 1962: 4. *Lycastopsis pontica neapolitana* — TENERELLI, 1964: 237-239, fig. 5. *Namanereis pontica* — KHLEBOVICH, 1996: 81-82, pl. 3; GLASBY, 1999: 98-100, figs. 1*c*, 42, 43, table 5. Not *Lycastoides pontica* — LA GRECA, 1949*a*: 164-165, figs. 13-18; BANSE, 1959*d*: 302, fig. 5 [= *Namanereis littoralis* (Grube 1872) species group (see GLASBY, 1999)]. Not *Lycastopsis pontica* — PETTIBONE, 1963*a*: 150-152, fig. 41 [= *Namanereis littoralis* (Grube 1872) species group (see GLASBY, 1999)]. Not *Namanereis pontica* — HARTMANN-SCHRÖDER, 1973: 95-96, figs. 14-17; HARTMANN-SCHRÖDER, 1980*a*: 399, fig. 30 [= *Namanereis littoralis* (Grube 1872) species group (see GLASBY, 1999)]. Not *Lycastopsis pontica* — LANA, 1984: 111-113, figs. 107-108; LANA, 1987: 1061 [= *Namanereis amboinensis* (Pflugfelder 1933)].

DISTRIBUTION: Black Sea (Sevastopol' Bay); [?] Adriatic Sea; [?] Azov Sea; Mediterranean Sea (Livorno, Gulf of Naples, Gulf of Catania). Known to occur amongst dead *Zostera* on the shore, in the surf zone, and in coastal coarse sand.

*GENUS ***Neanthes*** Kinberg 1866

Neanthes KINBERG, 1866*a*: 171.

TYPE SPECIES: *Neanthes Vaalii* Kinberg 1866.

SYNONYMS: *Nereilepas* Malmgren 1867; *Praxithea* Malmgren 1867.

REMARKS: The diagnosis of the genus was emended by HARTMAN (1940*a*).

KEY TO SPECIES:

1a. Anterior biramous notopodia with 2 ligules: a dorsal notopodial ligule and a ventral notopodial ligule, the ventral notopodial ligule having normally a small bulb at the basis, where the acicula finishes............**2**
1b. Anterior biramous notopodia with 3 ligules: a dorsal notopodial ligule, a ventral notopodial ligule and a pre-chaetal notopodial ligule..**6**

2a (1a). Dorsal cirrus of the anterior parapodia longer than the dorsal notopodial ligule; dorsal notopodial ligule of the same length or longer than the ventral notopodial ligule; all eyes of about the same size.......**3**
2b (1a). Dorsal cirrus of the anterior parapodia shorter than the dorsal notopodial ligule; dorsal notopodial ligule shorter than the ventral notopodial ligule; prostomium with 2 pairs of eyes, being the anterior pair much bigger than the posterior one; group I without paragnaths, group VI with 2 paragnaths in each side...***N. heteroculata***

3a (2a). Posterior chaetigers with dorsal notopodial ligules well developed (foliaceous), wider and longer than the ventral notopodial ligules; group III with paragnaths..**4**
3b (2a). Posterior chaetigers with dorsal and ventral notopodial ligules of about the same size; group III with or without paragnaths...**5**

4a (3a). Prostomium with 2 eyes; dorsal notopodial ligules of the last chaetigers well developed, wider and longer than notopodial ventral ligules; group I with 3 paragnaths, group VI with 4 paragnaths in a cross; not known as a commensal species..***N. bioculata***
4b (3a). Prostomium with 4 eyes; dorsal notopodial ligules of mid-body and posterior chaetigers much wider and longer than notopodial ventral ligules; group I with 1-2 paragnaths, group VI with patches of 6-12 paragnaths; usually found in gastrop shells, as a commensal of hermit crabs.....................***N. fucata****

5a (3b). Group III with paragnaths..***N. willeyi***
5b (3b). Group III without paragnaths...***N. flavipes***

6a (1b). Groups of the oral ring (V, VI, VII-VIII), form a continuous belt of paragnaths...........***N. caudata***
6b (1b). Groups of the oral ring do not form such continuous belt of paragnaths......................................**7**

7a (6b). Group VI with few paragnaths, usually one (can vary between 0-5); groups VII-VIII with a single row of about 7-8 paragnaths..***N. kerguelensis***
7b (6b). Group VI with about 2-13 paragnaths, in 1-3 rows; groups VII-VIII form 1-2 rows of paragnaths...**8**

8a (7b). Groups VII-VIII with two irregular rows of paragnaths, the distal one with 5-8 big paragnaths, and the proximal one with numerous small paragnaths...**9**
8b (7b). Groups VII-VIII with one single row of 3-7 big paragnaths...**10**

9a (8a). Group I without paragnaths; group VI with about 10-13 (sometimes less) paragnaths, in 2-3 rows...***N. nubila***
9b (8a). Group I with 2 paragnaths (vary between 1-4); group VI with 4-5 paragnaths...***N. japonica rabatensis***

10a (8b). Group II with 6-8 paragnaths in one row; group III with a central aglomeracion of up to 14 paragnaths, plus two smaller lateral groups of up to 4 paragnaths; group VI with up to 6 paragnaths in 1-2 rows; fixed material brownish orange colored, with intersegmental clear spots, forming a mid-dorsal line...***N. rubicunda***
10b (8b). Group II with 6-9 paragnaths in 2 rows; group III with 5-8 paragnaths; group VI with 2-5 paragnaths in a single line; colour pale, with touches of brown on the prostomium, a well marked and characteristic bar across the dorsum of chaetiger 2 and a pair of small spots on each of the following anterior segments...***N. agulhana***

Neanthes agulhana Day 1963

Nereis (Neanthes) agulhana DAY, 1963*b*: 406-407, fig. 6*d-j*.
TYPE LOCALITY: South Coast of the Cape Province (South Africa), 34º3'S, 25º59' E, at 84 meters, on a rocky bottom.
SELECTED REFERENCES: *Nereis (Neanthes) agulhana* — DAY, 1967: 318, fig. 14.8.*a-f*. *Neanthes agulhana* — KIRKEGAARD, 1983*a*: 226-227, fig. 6; SARDÁ, 1984*c*: 414, plate in page 415; SARDÁ, 1985: 75, table 1; NÚÑEZ, 2004: 363-365, fig. 134. *Nereis (Neanthes)* cf. *kerguelensis* — DAY, 1960: 321.
DISTRIBUTION: South coast of the Cape Province (South Africa), at 49-201 meters, on sandy mud and rocky bottoms; São Tomé e Príncipe Archipelago, West Africa; Strait of Gibraltar, at 3 meters, on *Corallina officinalis*; Formentera Island, at shallow water.

Neanthes bioculata Hartmann-Schröder 1975 **stat. nov.**

Nereis (Neanthes) bioculata HARTMANN-SCHRÖDER, 1975: 61-62, figs. 22-25.
TYPE LOCALITY: Northeastern Atlantic Ocean (off Galicia), 45º 55.4' N, 14º 7.9' W, at 5260 meters.
SELECTED REFERENCES: *Neanthes bioculata* — CAMPOY, 1982: 490; NÚÑEZ, 2004: 349-350, fig. 127.
DISTRIBUTION: Known from the type locality.

Neanthes caudata (Delle Chiaje 1822)

Spio caudatus DELLE CHIAJE, 1822: pl. 28 fig. 11.
TYPE LOCALITY: Gulf of Naples.
SYNONYMS: *Nereis acuminata* Ehlers 1868; *Nereis (Neanthioides) Bolivari* Rioja 1918.

Selected references: *Neanthes caudata* — Fauvel, 1913*a*: 60-61, fig. 11; Imajima, 1972: 105-108, figs. 31, 37; Campoy, 1982: 493-495; Sardá, 1985: 75, table 1; Núñez, 2004: 352-354, fig. 129. *Nereis (Neanthes) caudata* — Fauvel, 1913*a*: 60-61; Fauvel, 1923*c*: 347-348, fig. 135*a-e*; Núñez, Bacallado & Brito, 1981: 170, fig. 7. *Nereis (Nereilepas) caudata* — Claparède, 1868: 478-482, pl. 10 fig. 1, pl. 11 fig. 3. *Nereis acuminata* — Ehlers, 1868: 552-554, pl. 22 figs. 23-28. *Nereis (Neanthioides) Bolivari* — Rioja, 1918*b*: 67-71, fig. 16.
References for Portugal: Gamito, 1989 (as *Nereis caudata*; Ria Formosa).
Distribution: Eastern Atlantic, from the English Channel to the Mediterranean Sea; Adriatic Sea; Aegean Sea; Canary Islands; South Africa; Western Atlantic, from Massachusetts to Gulf of Mexico and Cuba; Red Sea; Pacific Ocean, from South California and Mexico, and from Japan to New Zealand. On mud and sand, on rocks with many calcareous tubes, and among algae and *Posidonia* and *Zostera* meadows. Mainly mesolittoral and infralittoral, but recorded to about 500 meters.

Neanthes flavipes (Ehlers 1868) nov. comb.

Nereis flavipes Ehlers, 1868: 549-552, pl. 21 figs. 26-30.
Type locality: Hvar Island (= Lesina), Kvarner Gulf (= Quarnero), Croatia, Adriatic Sea.
Selected references: *Nereis flavipes* — Fauvel, 1923*c*: 341-342, fig. 131*a-d*.
Distribution: Adriatic Sea.
Remarks: This species is here included in the subgenus *Neanthes*, as according to Fauvel (1923*c*) it doesn't show homogomph falcigers.

**Neanthes fucata* (Savigny 1822)

Lycoris fucata Savigny, 1822: 31.
Type locality: Probably Atlantic French coast ("*Espèce de l'Océan*").
Synonyms: *Nereis fimbriata* O.F. Müller 1776 [epitok]; *Nereis Podophylla* Audouin & Milne-Edwards 1833 [epitok]; *Nereis bilineata* Johnston 1839; *Nereis buccinicola* Leach *in* Johnston 1865; *Nereis imbecilis* Johnston 1865; *Heteronereis glaucopis* Malmgren 1865; *Nereis fucata inquilina* Wirén 1888.
Selected references: *Lycoris fucata* — Savigny *in* Lamarck, 1818: 313 [*nomen nudum*]. *Nereilepas fucata* — Johnston, 1865: 158-161, text-fig. 30, pl. 15 fig. 4; Malmgren, 1867*a*: 53-56, pl. 3 fig. 18. *Nereis (Nereilepas) fucata* — McIntosh, 1910: 336, pl. 52 fig. 6, pl. 61 figs. 6-6*a*, pl. 73 figs. 3-3*c*, pl. 81 figs. 8-8*b*; Regnard, 1913: 91. *Nereis (Nereis) fucata* — Saint-Joseph, 1898: 300-304, pl. 16 figs. 83-87; Fauvel, 1914*f*: 173-174; Rioja, 1918*b*: 73-75, fig. 17. *Nereis fucata* — Audouin & Milne-Edwards, 1833*b*: 210-211; Audouin & Milne-Edwards, 1834: 188-189; Johnston, 1840*c*: 175-176, text-fig. 7; Ehlers, 1868: 546-549, pl. 21 figs. 41-44; Wirén, 1888: 1-13, pls. 1-3; Heinen, 1911: 49-51, text-fig. 15, map 3; Fauvel, 1923*c*: 344-346, fig. 134*a-f*; Fauvel, 1936*c*: 36; Chambers & Garwood, 1992: 31-33, figs. 2, 16, 26, 30, 42, 53, 65. *Nereis (Neanthes) fucata* — Hartmann-Schröder, 1996: 204-206, fig. 89. *Neanthes fucata* — Campoy, 1982: 491-492; Kirkegaard, 1992: 299-301, fig. 148; Núñez, 1995: 77, fig. 5*I*; Khlebovich, 1996: 104-105, pl. 15; Núñez, 2004: 354-356, fig. 130. *Nereis Podophylla* [not *Lycoris podophylla* Savigny *in* Lamarck 1818 = indeterminable, according to Hartman (1959*a*)] — Audouin & Milne-Edwards, 1833*b*: 211-212, pl. 15 fig. 13; Audouin & Milne-Edwards, 1834: 189-190, pl. 4^{A} fig. 13. *Nereis bilineata* — Johnston, 1839*b*: 295, pl. 6 fig. 4. *Nereis imbecilis* — Johnston, 1865: 156. *Nereis fimbriata* — O.F. Müller, 1776: 217; Johnston, 1865: 155-156, text-fig. 27. *Heteronereis glaucopis* — Malmgren, 1865: 109, 181, pl. 11 figs. 16-16*A*; Malmgren, 1867*a*: 60, pl. 4 fig. 27.
References for Portugal: Carvalho, 1929 (as *Nereis fucata*; Sines); Dexter, 1992 (as *Nereis fucata*; previous records: Ria Formosa; Mira Estuary); Núñez, 2004 (previous records: Portuguese coast); Cancela da Fonseca *et al.*, 2006 (Aljezur).
Material: FAUNA 1 — St. 0*A*, Galicia, off Cies Islands, Ria de Vigo, 82-96 m, unknown substrate: 1 big specimen, broken in two, with about 82 + 56 chaetigers; it has a pygidium, with a terminal anus and a pair of ventral anal cirri (one missing); total length of about 110 mm, width about 5 mm; integument smooth; prostomium with a pair of antennae, a pair of biarticulate palps about the same length than the antennae, and 2 pairs of eyes (faint in alcohol); peristomium achaetous, about twice as long as the first chaetiger, with 4 pairs of tentacular cirri originating from short cirrophores, and of about the same length; pharynx with a pair of denticulate jaws, oral and maxillary rings with prominent conical paragnaths, absent only in group V, group I (1), group II (small patches of 8), groups III (small patches of 5), group IV (patches of 12-14), group VI (patches of 6), groups VII-VIII (a row of large paragnaths with irregular rows of smaller paragnaths towards the mouth); parapodia of the first 2 chaetigers uniramous, with 3 ligules: a notopodial ligule, a neuropodial acicular ligule, and a ventral neuropodial ligule); notopodial

and ventral neuropodial ligules of similar shape and length, neuropodial acicular ligule slightly shorter and more conical, dorsal cirrus slightly longer than the parapodial ligules, as the ventral cirrus; remaining parapodia biramous, with 4 ligules: a dorsal notopodial ligule, a notopodial acicular ligule, a neuropodial acicular ligule, and a ventral neuropodial ligule; dorsal notopodial ligule is the largest, becoming leaf-like in mid-body and posterior chaetigers; remaining ligules changing little along body length; notopodial acicular and ventral neuropodial ligules of similar shape, being the first slightly larger; neuropodial acicular ligule has a sharply tapering tip, and it is the shortest; dorsal cirri generally longer than the parapodial ligules, originating about halfway along the dorsal edge of the dorsal notopodial ligule; ventral cirri first shorter and then as long or longer than the ventral neuropodial ligule; notopodial chaetae homogomph spinigers; neuropodial chaetae homogomph spinigers and heterogomph falcigers above, heterogomph spinigers and falcigers below the aciculum; chaetae of the first 2 chaetigers not observed, but according to CHAMBERS & GARWOOD (1992) are homogomph spinigers and heterogomph falcigers above, and heterogomph spinigers and falcigers below the aciculum. **St. 58*A***, Gulf of Cádiz, 33-34 m, detritic with rocks: 1 complete specimen (broke in 3 pieces during study), in poor condition due to bad fixation, with about 88 chaetigers, 75 mm long, 3 mm wide; two anal cirri present; tentacular cirri fell during manipulation of the specimen; dorsal notopodial ligule not so large as in the anterior specimen; heterogomph neuropodial spinigers not observed; proboscis everted; group I (1), group II (8-6), group III (7), group IV (12-13), group V (0), group VI (5-5), groups VII-VIII (as described above).

DISTRIBUTION: Northwest Atlantic; North Sea; British Isles; English Channel; Skagerrak; Kattegat; Mediterranean Sea; Adriatic Sea; Black Sea; Canary Islands. Living as a commensal with hermit crabs (pagurids), inside gastropod shells, between 10-500 meters, occasionally deeper. It may also be found in empty shells of gastropods, in soft bottoms, and meadows of *Posidonia*.

REMARKS: HARTMANN-SCHRÖDER (1996) considers *Heteronereis glaucopis* Malmgren 1865 as a synonym of *Nereis zonata* Malmgren 1867 [today considered to be a junior synonym of *Nereis pulsatoria* (Savigny 1822)], instead of a synonymy of *Nereis fucata* (Savigny 1822), as others authors (*e.g.*: FAUVEL, 1923*c*; HARTMAN, 1959*a*).

Neanthes heteroculata Hartmann-Schröder 1981

Nereis (Neanthes) heteroculata HARTMANN-SCHRÖDER, 1981: 30-31, figs. 9-13.

TYPE LOCALITY: Bay of Biscay, 46º35.0'N, 7º45.5'W, at 4700 meters.

SELECTED REFERENCES: *Neanthes heteroculata* — NÚÑEZ, 2004: 350-352, fig. 127. [?] *Nereis longisetis* — MCINTOSH, 1885*a*: 222-223, pl. 35 fig. 4, pl. 16*A* figs. 12-13, 19; FAUVEL, 1923*c*: 361-362; CAMPOY, 1982: 503. [?] *?Nereis (Nereis) longisetis* — FAUVEL, 1914*f*: 174.

DISTRIBUTION: Bay of Biscay (46º35.0'N, 7º45.5'W), at 4700 meters; [?] off Gibraltar Strait (36º23'N, 11º18'W), at 1525 fathoms (2789 meters), on *Globigerina* ooze; [?] South of Pico Island, Azores (38º20'N, 28º4'45"W).

REMARKS: *Nereis longisetis* was described by McIntosh with base on a single fragmentary and injured specimen, collected off the Gibraltar Strait. Some important features are unknown or doubtful, and the distribution of the paragnaths is uncertain as "*the proboscis is injured, and all that can be said about the paragnathi is that they are few and scattered*" (MCINTOSH, 1885*a*). FAUVEL (1914*f*) studied some specimens collected near Azores, which showed an anterior pair of eyes much bigger than the posterior one (epigamy?), as well as long falciger chaetae, but their poor condition didn't allow to determine if they were identical with *N. longisetis*. Later the species was considered by FAUVEL (1923*c*), and followed by CAMPOY (1982), as *incertae sedis*.

I consider here the species as being a possible senior synonym of *Nereis heteroculata*, described by HARTMANN-SCHRÖDER (1981). Some features, like the shape of the parapodia and prostomium are quite similar, and the same seems to be true concerning the composition of the chaetae. The depth where both species were collected also approaches. However, a definitive statement requires a comparison between the type material, and probably new material from off the Gibraltar Strait region is also needed.

Neanthes japonica rabatensis Mohammad 1989

Neanthes japonica rabatensis MOHAMMAD, 1989: 475-481, figs. 1-2, tables 1-2.

TYPE LOCALITY: Bou Regret estuary, about one kilometer east of Moulay Hassan Bridge (approximate position: 34ºN, 7ºW), Rabat (Atlantic coast of Morocco), at the intertidal zone, in silty black mud, polluted with organic matter.

DISTRIBUTION: Known from the type locality.

Neanthes kerguelensis (McIntosh 1885)

Nereis kerguelensis MCINTOSH, 1885*a*: 225-227, pl. 35 figs. 10-12, pl. 16*A* figs. 17-18.

TYPE LOCALITY: Off Kerguelen Island, in 10 to 100 fathoms (18-182 meters).

SYNONYMS: *Nereis uncinata* Ehlers 1908; *Nereis kerguelensis* var. *oligodonta* Augener 1913.

SELECTED REFERENCES: *Nereis kerguelensis* — EHLERS, 1897: 65-66, pl. 4 figs. 81-93; FAUVEL, 1923*c*: 342-344, fig. 133*g-m*. *Nereis (Nereis) Kerguelensis* — FAUVEL, 1914*f* 167-169, pl. 12 figs. 1-4. *Neanthes kerguelensis* — HARTMANN-SCHRÖDER, 1962*c*: 394-395, 436; CAMPOY, 1982: 492-493; WILSON 1984: 216-218, 226, fig. 3, table 3; NÚÑEZ, 2004: 361-363, fig. 133; BAKKEN & WILSON, 2005: 528. *Nereis kerguelensis* var. *oligodonta* — AUGENER, 1913*b*: 164-166. *Nereis uncinata* — EHLERS, 1908: 72-73, pl. 9 figs. 1-5.

DISTRIBUTION: From the Bay of Biscay to Morocco; Mediterranean Sea; Adriatic Sea; Aegean Sea; Azores; Canary Islands; Madeira; Hawaii; Australia; New Zealand; southern South America (Chile; Argentina); Falkland Islands; South Georgia; South Orkneys; South Shetland Islands; Kerguelen Island; South Atlantic, off Bouvet Island. On rocks, gravel, mud and sandy and coralligenous bottoms. Intertidal to 749 meters, but recorded from Azores at 5005 meters.

REMARKS: CHAMBERS & GARWOOD (1982) indicate that the description of *Neanthes kerguelensis* given by FAUVEL (1914*f*, 1923*c*), and which has served as a reference for the biggest part of the posterior identifications of the species in the European region, does not fit the original description by MCINTOSH (1885*a*), from the Southern Indian Ocean. As a result, they suggest that all records of *N. kerguelensis* from the Northeast Atlantic should be revised.

According to the same authors, part of the confusion arose from the fact that FAUVEL (1923*c*) described *Nereis (Neanthes) virens* (now in the genus *Allita*), without neuropodial heterogomph falcigers, which is not true, as they can be present but limited to relatively few anterior chaetigers in large animals, and are easily overlooked (PETTIBONE, 1963*a*; E. RASMUSSEN, 1973; CHAMBERS & GARWOOD, 1982; see also the genus definition of *Alitta* in BAKKEN & WILSON, 2005). This would have led to erroneous identifications of *Alitta virens* as *Neanthes kerguelensis*. However, nothing is said of the fact that FAUVEL (1923*c*) described *N. kerguelensis* as having the dorsal notopodial ligule not leaflike, while in *Alitta virens* it is well developed and leaflike, something very conspicuous and easily observed. It is possible that the European records of *N. kerguelensis* refer to a different species from McIntosh's species, but probably they are not conspecific with *Alitta virens*.

Neanthes nubila (Quatrefages 1866)

Nereis nubila QUATREFAGES, 1866*b*: 505

TYPE LOCALITY: France.

SYNONYMS: *Heteronereis Schmardaei* Quatrefages 1866; *Praxithea irrorata* Malmgren 1867.

SELECTED REFERENCES: *Neanthes nubila* — NÚÑEZ, 2004: 367-368, fig. 136. *Praxithea irrorata* — MALMGREN, 1867*a*: 51, pl. 4 fig. 24; SAINT-JOSEPH, 1895: 215-220, pl. 12 figs. 33-36, pl. 13 figs. 37-39. *Nereis (Praxithea) irrorata* — SAINT-JOSEPH, 1888: 263-266, pl. 11 fig. 131; REGNARD, 1913: 82-85. *Nereis irrorata* — SAINT-JOSEPH, 1906: 219; HEINEN, 1911: 56-57, text-fig. 17; FAUVEL, 1923*c*: 340-341, fig. 132 [in part; not *Nereis rubicunda* Ehlers 1868]; FAUVEL, 1936*c*: 35; CHAMBERS & GARWOOD, 1992: 33-35, figs. 23, 27, 37, 43, 54, 66. *Nereis (Nereis) irrorata* — SAINT-JOSEPH, 1898: 299-300, pl. 16 fig. 82; FAUVEL, 1914*f*: 170-173 pl. 13 figs. 9-28 [in part; in part = *Neanthes rubicunda* (Ehlers 1868)]. *Nereis (Neanthes) irrorata* — NÚÑEZ, BACALLADO & BRITO, 1981: 170-171, fig. 8; HARTMANN-SCHRÖDER, 1996: 206-207. *Neanthes irrorata* — CAMPOY, 1982: 488-490; SARDÁ, 1985: 75, table 1; KIRKEGAARD, 1992: 304-306, fig. 150. *Heteronereis Schmardaei* — QUATREFAGES, 1866*b*: 569, pl. 7 fig. 11 [epitok]. *Nereis schmardaei* — MCINTOSH, 1910: 291, pl. 50 fig. 17, pl. 60 fig. 8, pl. 72 figs. 2-2*b*, pl. 81 figs. 2-2*c*.

REFERENCES FOR PORTUGAL: CARVALHO, 1929 (as *Nereis irrorata*; Vila Nova de Milfontes; Sines; Granja); AMOUREUX & CALVÁRIO, 1981 (as *Nereis irrorata*; Peniche); CAMPOY, 1982 (as *Neanthes irrorata*; previous records: Vila Nova de Milfontes; Sines; Granja); MONTEIRO-MARQUES *et al.*, 1982 (as *Nereis irrorata*; Ponta do Surdão); DEXTER, 1992 (as *Nereis irrorata*; previous records: Mira Estuary); NÚÑEZ, 2004 (previous records: Portuguese coast).

DISTRIBUTION: Arctic Ocean; North Pacific; Northwest Atlantic; Skagerrak; Kattegat; North Sea; English Channel; Isle of Man; North coast of France; Azores; Canary Islands; Mediterranean Sea; Adriatic Sea; Aegean Sea. On muddy and sandy bottoms, in reefs of sabellarids, among mussels, algae, *Posidonia*, *Zostera*, ascideans and sponges. Lives inside muddy tubes. Intertidal to about 40 meters.

Neanthes rubicunda (Ehlers 1868)

Nereis rubicunda EHLERS, 1868: 529-533, pl. 21 figs. 5-9.
TYPE LOCALITY: At the coast near Rijeka (= Fiume), among stones and at bottoms "richly covered" (by algae?), Kvarner Gulf (= Quarnero), and also from Korčula Island (= Curzola), Croatia, Adriatic Sea.
SYNONYMS: *Nereis (Lycoris) gisserana* Horst 1924; [?] *Nereis irrorata rufescens* Harmelin 1964.
SELECTED REFERENCES: *Lycoris rubicunda* — LANGERHANS, 1880*a*: 286-287, pl. 15 fig. 22. *Nereis (Praxithea) rubicunda* — MALAQUIN, 1890*c*: 386. *Nereis rubicunda* — SAINT-JOSEPH, 1906: 216-219, pl. 4 figs. 83-89. *Nereis irrorata* var. *rubicunda* — FAUVEL, 1923*c*: 341. *Neanthes rubicunda* — NÚÑEZ, 1995: 77-78, figs. 4*E*, 5*G*; NÚÑEZ, 2004: 365-367, fig. 135. *Nereis (Lycoris) gisserana* — HORST, 1924: 151-152, pl. 30 figs. 6-7; MONRO, 1939*c*: 394, fig. 302*A-F*. *Nereis gisserana* — FAUVEL, 1953*c*: 190-191, fig. 96*e-i*. [?] *Nereis irrorata rufescens* — HARMELIN, 1964: 75, pl. 3. *Neanthes aff. gisserana* — NÚÑEZ, BRITO & BACALLADO, 1984: 18-23, figs. 3-4. *Nereis irrorata* — FAUVEL, 1914*f*: 170-173, pl. 13 figs. 9-28 [in part; not Malmgren 1867].
DISTRIBUTION: Azores Islands (Horta); Canary Islands (Tenerife); Madeira Island; Mediterranean Sea; Adriatic Sea; Indian Ocean; Malay Archipelago; Maldive and Amirantes Islands. On sandy, detritic and hard bottoms, among algae, and inside sponges. Between 3-540 meters.

Neanthes willeyi (Day 1934)

Nereis willeyi DAY, 1934: 39-40, fig. 6.
TYPE LOCALITY: Table Bay, South Africa.
SELECTED REFERENCES: *Nereis (Neanthes) willeyi* — DAY, 1967: 320, fig. 14.8.*l-p*. *Nereis (Neanthes) capensis* [not *Arete capensis* Kinberg 1866] — WILLEY, 1904: 261, pl. 13 fig. 10, pl. 14 figs. 9-10.
DISTRIBUTION: South Africa; Suez Canal; Persian Gulf. On rocky shores. Intertidal to sublittoral. The species is also known as a Lessepsian migrant in the Levantine Coast of the Mediterranean (BEN-ELIAHU, 1991*a*; ÇINAR, ERGEN & DAĞLI, 2002), being known from Port Said (Egypt).

GENUS *Nereis* Linnaeus 1758

Nereis LINNAEUS, 1758: 644, 654.
TYPE SPECIES: *Nereis pelagica* Linnaeus 1758.
SYNONYMS: *Heteronereis* Ørsted 1843; *Lycastis* Savigny 1818 [in part]; *Lycoris* Lamarck 1818 [in part]; *Thoosa* Kinberg 1866; *Nossis* Kinberg 1866.

KEY TO SPECIES:

1a. Dorsal cirri of the anterior parapodia shorter, as long as, or slightly longer than the parapodial ligules..**2**
1b. Dorsal cirri of the anterior parapodia much longer than the parapodial ligules....................................**3**

2a (1a). Posterior parapodia with the notopodial dorsal ligule well developed, leaflike, with the dorsal cirrus inserted almost in a terminal position; maxillary ring with paragnaths in all groups (I - 2; II - oblique double row of about 15; III - 1; IV - double arc of about 24); group VI with 6-14 paragnaths; groups VII-VIII with a superior row of about 10 big paragnaths, followed by four irregular rows of about 40 paragnaths..***N. lamellosa***
2b (1a). Posterior parapodia with notopodial ligules not leaflike, similar to the anterior parapodia; maxillary ring with paragnaths only in group IV (normally an arc of 4-6 paragnaths); group VI with 1-3 paragnaths; groups VII-VIII normally with a single row of 3-6 paragnaths..............................***N. elitoralis***

3a (1b). Groups VII-VIII with a single row of 5-10 big paragnaths..**4**
3b (1b). Groups VII-VIII with several rows of paragnaths..**7**

4a (3a). Homogomph falcigers in posterior notopodia with blades with a hooked tip, and serrate cutting edges..**5**
4b (3a). Homogomph falcigers in posterior notopodia with blades with 2-3 big teeth, cutting edges not serrate..**6**

5a (4a). Homogomph notopodial falcigers with long blade, with cutting edge very serrated; group II with about 8 paragnaths in oblique rows; group III with a transversal group of about 9 paragnaths; group IV with an oblique group of about 9 paragnaths; group VI with a single row of 2-6 paragnaths on each side.....***N. rava***
5b (4a). Homogomph notopodial falcigers with short blade, with cutting edge scarcely serrated (2-3 spines); group II with 5-7 paragnaths in oblique rows; group III with a transversal group of 8-10 paragnaths; group IV with 5-7 paragnaths in a arc; group VI with 5-8 paragnaths in a transversal short group on each side.....***N. periviscerales***

6a (4b). Group II without paragnaths; group III with 2 unequal paragnaths side by side; group IV with 3 paragnaths in a transverse row; group VI with a row of 5 paragnaths in a single transverse row on each side.....***N. usticensis***
6b (4b). Group II with an arc of 3-9 paragnaths on each side; group III with 1 paragnath to a single row of 4-5 paragnaths (sometimes as a cluster); group IV with arcs of about 8-12 paragnaths on each side; group VI with a cluster of 2-6 paragnaths on each side.....***Nereis* sp.**

7a (3b). Blades of homogomph falciger chaetae of posterior notopodia with 2-3 big teeth.....**8**
7b (3b). Blades of homogomph falciger chaetae of posterior notopodia without big teeth, with serrate or smooth edges.....**9**

8a (7a). Groups V and VI not clearly delimited, forming a continuous irregular band; group V with up to 8 paragnaths, and group VI with up to 9 paragnaths; group VII-VIII forming a broad band of up to 5 irregular rows of numerous paragnaths, more or less with the same size.....***N. funchalensis***
8b (7a). Groups V and VI clearly delimited; group V without paragnaths, group VI with a cluster of 6-10 paragnaths; group VII-VIII as a broad band with an anterior row of large paragnaths and two to three posterior rows of smaller paragnaths.....***N. persica***

9a (7b). Blades of homogomph falciger chaetae with a well developed serration on the edge; group VII-VIII composed by several rows of subequal teeth.....***N. splendida***
9b (7b). Blades of homogomph falciger chaetae with weakly serrated, or smooth edges; distal paragnaths of group VII-VIII bigger than the paragnaths closer to the mouth.....**10**

10a (9b). Group VI composed of four large paragnaths; group VII-VIII composed of irregular rows of paragnaths, decreasing in size towards the mouth; ligules of anterior notopodia relatively short and rounded; usually found intertidally or at shallow depths.....***N. pelagica***
10b (9b). Group VI composed of 5-9 small paragnaths in an irregular arrangement; group VII-VIII composed of a single distinct row of slightly larger paragnaths, plus irregular rows of smaller ones towards the mouth; ligules of anterior notopodia pointed; usually found subtidally.....***N. pulsatoria***

Nereis elitoralis Eliason 1962

Nereis elitoralis ELIASON, 1962*b*: 250-252, fig. 13.

TYPE LOCALITY: Skagerrak, 58º38’N, 10º40’E, at 126 meters, on a bottom of clay, silt and rocks.

SELECTED REFERENCES: *Nereis elitoralis* — FAUCHALD, 1974*b*: 13; KHLEBOVICH, 1996: 136, pl. 37. *Nereis (Eunereis) elitoralis* — HARTMANN-SCHRÖDER, 1971*a*: 207; HARTMANN-SCHRÖDER, 1974*d*: 203-205, figs. 23-25. *Eunereis elitoralis* — KIRKEGAARD, 1992: 293-294, fig. 145. *Nereis (Nereis) elitoralis* — HARTMANN-SCHRÖDER, 1996: 196-197, fig. 85.

DISTRIBUTION: Skagerrak; Norway (Kvinnheradfjorden); Norwegian Deep. On muddy bottoms, with rocks. Between 56-540 meters.

REMARKS: See the *REMARKS* section under *Eunereis longissima*.

Nereis funchalensis (Langerhans 1880)

Lycoris funchalensis LANGERHANS, 1880*a*: 287-289, pl. 15 fig. 23.

TYPE LOCALITY: Madeira Island, on rocky seashore.

SYNONYMS: *Nereis moroccensis* Amoureux 1976.

SELECTED REFERENCES: *Nereis (Neanthes) funchalensis* — FAUVEL, 1914*f*: 166-167, pl. 15 figs. 9-11, GRAVIER & DANTAN, 1924: 464-468, figs. 1-8. *Nereis funchalensis* — FAUVEL, 1927*b*: 409-410, fig. 138*h-n*; FAUVEL, 1950*a*: 353; KIRKEGAARD, 1983*a*: 229-230, fig. 7; SARDÁ, 1985: 75, fig. 3, table 1; ACERO & SAN MARTÍN, 1986: 15-17, fig. 9*A-B*; NÚÑEZ, 1995: 75, fig. 1; NÚÑEZ, RIERA & BRITO, 2000:

117; NÚÑEZ, 2004: 378-380, fig. 140. *Nereis (Nereis) funchalensis* — NÚÑEZ, BACALLADO & BRITO, 1981: 167-169, fig. 5. *Nereis moroccensis* — AMOUREUX, 1976*a*: 344-348, figs. 5-10. *Nereis jacksoni* [not Kinberg 1866] — NÚÑEZ, 1990: 436-438, fig. 140.
DISTRIBUTION: Azores; Madeira Island; Canary Islands; Cape Verde; Morocco (Cape Spartel); Senegal; Mediterranean Sea (Alboran, Malaga, Argelia); Black Sea; Red Sea. Amongst algae covering rocks, mussels, calcareous bottoms, sponges, corals, and among *Posidonia* and *Cymodocea*. Intertidal to about 50 meters.

Nereis lamellosa Ehlers 1868

Nereis lamellosa EHLERS, 1868: 564-567, pl. 22 figs. 10-17.
TYPE LOCALITY: Lastovo Island (= Lagosta), Croatia, Adriatic Sea.
SELECTED REFERENCES: *Nereis lamellosa* — FAUVEL, 1936*a*: 311, 313; FAUVEL, 1936*c*: 36-37; CAMPOY, 1982: 498-499; NÚÑEZ, 2004: 370-373, fig. 137. *Nereis (Nereis) lamellosa* — DAY, 1960: 322; DAY, 1967: 314-315, fig. 14.7.*a-e*; DAY, 1973: 39, fig. 5*k-o*; GARDINER, 1976: 151, fig. 15*g-k*. *Nereis (Neanthes) succinea* [not Leuckart 1847] — RIOJA, 1918*b*: 61-65, fig. 15. *Nereis succinea* — FAUVEL, 1923*c*: 346-347 [in part], fig. 131*f-g*, *l*.
REFERENCES FOR PORTUGAL: BELLAN, 1960*a* (Cape Santa Maria); NÚÑEZ, 2004 (previous records: Portuguese coast).
DISTRIBUTION: Adriatic Sea; Aegean Sea; Mediterranean Sea; Northern Spain; Portugal; Morocco; Senegal; Ivory Coast; South Africa; North Carolina; Gulf of California. On rocks, mud, sand, gravel, shells and coral. Intertidal to 140 meters.

Nereis pelagica Linnaeus 1758

Nereis pelagica LINNAEUS, 1758: 654.
TYPE LOCALITY: "*Habitat in Pelago*" (LINNAEUS, 1758), probably in Western Europe.
SYNONYMS: *Nereis verrucosa* O.F. Müller 1776; *Nereis renalis* Johnston 1840; *Heteronereis arctica* Ørsted 1842; *Heteronereis assimilis* Ørsted 1842; *Nereis grandifolia* Rathke 1843; *Nereis Renaudi* Quatrefages 1866.
SELECTED REFERENCES: *Nereis (Nereis) pelagica* — SAINT-JOSEPH, 1898: 293-295; SAINT-JOSEPH, 1906: 215; REGNARD, 1913: 74-76; RIOJA, 1918*b*: 76-77, fig. 18; GILLANDT, 1979: 42-43, fig. 13. *Nereis pelagica* — JOHNSTON, 1839*b*: 290, pl. 6 figs. 1-2; JOHNSTON, 1840*c*: 172-174, text-fig. 3; JOHNSTON, 1865: 148-152, text-figs. 24-26, pl. 15 figs. 1-2; MALMGREN, 1867*a*: 47-48, pl. 5 fig. 35; MALAQUIN, 1890*c*: 385; SAINT-JOSEPH, 1895: 221-223, pl. 13 fig. 40; MCINTOSH, 1910: 267, pl. 52 figs. 1-2, pl. 60 figs. 6-6*a*, pl. 71 figs. 7-7*i*, pl. 80 figs. 25-25*b*; HEINEN, 1911: 43-46, text-figs. 12-14, maps 3, 5; FAUVEL, 1923*c*: 336-337, fig. 130*a-f*; WESENBERG-LUND, 1950*a*: 19-20, pl. 6 figs. 26*a*, 27*a*; PETTIBONE, 1954: 264-265, fig. 30*A-B*; HARTMANN-SCHRÖDER, 1962*c*: 406-407, 436; IMAJIMA, 1972: 142-146, figs. 48-49; CAMPOY, 1982: 499-500; SARDÁ, 1985: 75, fig. 3, table 1; CHAMBERS & GARWOOD, 1992: 38-39, figs. 1, 3, 5-6, 17-18, 26, 31, 45, 57, 68; KIRKEGAARD, 1992: 311-313, fig. 153; KHLEBOVICH, 1996: 127-128, pl. 29; NÚÑEZ, 2004: 381-383, fig. 141; BAKKEN & WILSON, 2005: 529-530. *Nereis (Nereis) pelagica* — FAUVEL, 1914*f*: 174-177, pl. 14 figs. 18-28; HARTMANN-SCHRÖDER, 1996: 197-199, fig. 86. *Nereis verrucosa* — O.F. MÜLLER, 1776: 217. *Nereis longissima* [not Johnston 1840] — HAMOND, 1966: 402-403. *Nereis renalis* — JOHNSTON, 1840*c*: 176-178, fig. 8; JOHNSTON, 1865: 163-164, text-fig. 32. *Heteronereis grandifolia* — MALMGREN, 1865: 108-109, pl. 11 figs. 15, 16*B-C*; MALMGREN, 1867*a*: 60.
REFERENCES FOR PORTUGAL: NOBRE, 1903*a* (mouths of rivers Douro and Leça; Viana do Castelo, mouth of river Lima); MACHADO, 1942 (northern coast of Portugal); AMOUREUX & CALVÁRIO, 1981 (Peniche); CAMPOY, 1982 (previous records: northern Portugal).
DISTRIBUTION: Arctic Ocean; North Sea; English Channel; Skagerrak; Kattegat; Øresund; Baltic Sea; Atlantic coast of Europe; Mediterranean Sea; Adriatic Sea; Aegean Sea; West Africa; South Africa; Western Atlantic, from the Bay of Hudson to Florida; South Pacific; Australia; New Zealand; Japan; from Bering Strait to Panama; Chile. Mainly on hard bottoms, among algae, rhizopodes of laminarians, and mussels. Intertidal to about 1267 meters.

Nereis perivisceralis Claparède 1868

Nereis perivisceralis CLAPARÈDE, 1868: 471-472, pl. 12 fig. 1.
TYPE LOCALITY: Port-Vendres, Mediterranean coast of France.
SELECTED REFERENCES: *Nereis perivisceralis* — NÚÑEZ, 2004: 383-385, fig. 142. *Nereis zonata x rava* — AMOUREUX, 1976*a*: 341-342, fig. 4. Intermédiaires entre *N. rava* et *N. zonata* — BELLAN, 1978: 60.

Distribution: Azores; Morocco; Mediterranean Sea (Balearic, Chafarinas, Hormigas and Columbretes Islands; Alboran Island). Among algae, on hard bottoms, and also on *Posidonia* meadows. Intertidal to 66 meters.

Nereis persica Fauvel 1911

Nereis zonata var. *persica* Fauvel, 1911*a*: 385-392, pl. 19 figs. 10-16, 18-23, pl. 20 figs. 24-25.
Type locality: Bushehr (= Bouchir, Iran) and Bahréin, Persian Gulf.
Selected references: *Nereis zonata-persica* — Pruvot, 1930: 47-50, pl. 3 figs. 65-68. *Nereis zonata-persica* — Fauvel, 1953*c*: 187-188, fig. 95*f-h*. *Nereis persica* — Day, 1967: 314, fig. 14.6.*q-v*; Hartman, 1974*a*: 214, fig. 5*c-e*.
Distribution: Persian Gulf; Red Sea; Arabian Sea; South Africa; Mozambique; New Caledonia; Vietnam. Intertidal to 72 meters. The species is also known as a Lessepsian migrant in the Levantine Coast of the Mediterranean (Ben-Eliahu, 1991*a*; Çinar, Ergen & Dağli, 2002), and has been recorded from Haifa (Israel), between 3-180 meters.

Nereis pulsatoria (Savigny 1822)

Lycoris pulsatoria Savigny, 1822: 33.
Type locality: European Seas ("*Espèce des mers d'Europe*").
Synonyms: *Nereis zonata* Malmgren 1867; *Nereis cylindrata* Ehlers 1868.
Selected references: *Nereis Pulsatoria* — Audouin & Milne-Edwards, 1833*b*: 216-217, pl. 13 figs. 8-13 (plates in Audouin & Milne-Edwards, 1832); Audouin & Milne-Edwards, 1834: 194-195, pl. 4 figs. 8-13. *Nereis pulsatoria* — Núñez, 2004: 385-387, fig. 143. *Nereis zonata* — Malmgren, 1867*a*: 46-47, pl. 5 fig. 34; Malaquin, 1890*c*: 385-386; Ehlers, 1908: 68-69; Fauvel, 1914*f*: 177-185, pl. 14 figs. 1-17; Fauvel, 1923*c*: 338-339, fig. 130*g-n* [in part]; Wesenberg-Lund, 1950*a*: 20, pl. 6 figs. 26*b*, 27*b*, chart 25; Imajima, 1972: 146-149, figs. 50-51; Liñero-Arana & Reyes-Vásquez, 1979: 7-8, pl. 5 figs. 1-13; Campoy, 1982: 501-503; Sardá, 1985: 75, fig. 3, table 1; Acero & San Martín, 1986: 15, fig. 9*C-D*; Chambers & Garwood, 1992: 44-46, figs. 19, 26, 32, 47, 58, 70; Kirkegaard, 1992: 314-315, fig. 154; Khlebovich, 1996: 131-132, pl. 34; Bakken & Wilson, 2005: 530. *Nereis (Nereis) zonata* — Núñez, Bacallado & Brito, 1981: 169-170, fig. 6; Hartmann-Schröder, 1996: 199-200. *Nereis cylindrata* — Ehlers, 1868: 506-508, pl. 21 figs. 37-40. [?] *Nereis (Nereis) procera* [not *Nereis procera* Ehlers 1868] — Saint-Joseph, 1888: 266-268, pl. 11 fig. 132. [?] *Lycoris procera* [not *Nereis procera* Ehlers 1868] — Langerhans, 1880*a*: 285-286, pl. 15 fig. 21.
References for Portugal: Bellan, 1960*a* (as *Nereis zonata*; Cape Santa Maria); Campoy, 1982 (as *Nereis zonata*; previous records: Portuguese coast); Núñez, 2004 (previous records: Portuguese coast).
Distribution: Arctic Ocean; Eastern Atlantic, from Greenland to Mauritania; North Sea; Skagerrak; Kattegat; Irish Sea; English Channel; Canary Islands; Mediterranean Sea; Adriatic Sea; Aegean Sea; Black Sea; Red Sea; Persian Gulf; Western Atlantic, from Labrador to the Caribbean Sea and Venezuela; Pacific Ocean, from Bering Sea to Japan, and from Oregon to California. Amongst algae, sponges, on rocks with sand, and under stones, in muddy sediments. Intertidal to 1000 meters, but recorded from Cape Verde at 3899 meters.

Nereis rava Ehlers 1868

Nereis rava Ehlers, 1868: 517-523, pl. 21 figs. 10-25.
Type locality: In mud at the harbour of Rijeva (= Fiume), Hvar Island (= Lesina), at Kvarner Gulf, and also Korčula Island (= Curzola), Croatia, Adriatic Sea.
Selected references: *Nereis (Nereis) rava* — Fauvel, 1914*f*: 169-170, pl 13 figs. 1-8; Fauvel, 1916*c*: 77-78, pl. 5 fig. 19. *Nereis rava* — Fauvel, 1923*c*: 339-340, fig. 131*e-l*; Fauvel, 1936*c*: 35; Bellan, 1978: 60 [in part; in part = *N. perivisceralis* Claparède 1868]; Campoy, 1982: 500-501; Sardá, 1985: 75, fig. 3, table 1; Khlebovich, 1996: 138-139; Núñez, Riera & Brito, 2000: 119-120, fig. 1; Núñez, 2004: 373-375, fig. 138.
References for Portugal: Dexter, 1992 (previous records: Sines); [?] Amoureux & Calvário, 1981 (as *Nereis* cf *rava*; Peniche); Monteiro-Marques *et al.*, 1982 (Ponta do Baleal); Núñez, 2004 (previous records: Portuguese coast).
Distribution: From the North Sea to Cape Verde Islands; Mediterranean Sea; Adriatic Sea; Aegean Sea; Black Sea; Azores; Madeira; Canary Islands. In soft and hard grounds, among algae, *Posidonia*, associated to *Dendrophyllia cornigera*, and on coralligenous bottoms. From shallow water to about 1685 meters.

Nereis splendida Grube 1840

Nereis splendida GRUBE, 1840: 75-76.

TYPE LOCALITY: Gulf of Naples.

SYNONYMS: *Nereis falsa* Quatrefages 1866; *Nereis (Nereilepas) parallelogramma* Claparède 1868; *Nereis lucipeta* Ehlers 1908.

SELECTED REFERENCES: *Nereis splendida* — NÚÑEZ, 2004: 375-378, fig. 139. *Nereis falsa* — QUATREFAGES, 1866*b*: 505. *Nereis falsa* — FAUVEL, 1923*c*: 337-338, fig. 129*e-m*; FAUVEL, 1936*c*: 35; DAY, 1967: 317, fig. 14.7.*k-o*; LIÑERO-ARANA & REYES-VÁSQUEZ, 1979: 6, pl. 3 figs. 1-13; CAMPOY, 1982: 497-498; SARDÁ, 1985: 75, fig. 3, table 1. *Nereis (Nereis) falsa* — DAY, 1962: 639. *Nereis (Neanthes) falsa* — IBAÑEZ, 1972: 24; AMOUREUX, 1976*a*: 339-340, fig. 2. *Nereis (Nereilepas) parallelogramma* — CLAPARÈDE, 1868: 477-478, pl. 9 fig. 7, pl. 10 fig. 2; CLAPARÈDE, 1870: 448-451, pl. 2 fig. 7, pl. 7 fig. 2. *Nereis lucipeta* — EHLERS, 1908: 69-71, pl. 8 figs. 7-13.

DISTRIBUTION: Eastern Atlantic, from English Channel to South Africa; Mediterranean Sea; Adriatic Sea; Aegean Sea; Black Sea; Western Atlantic, from North Carolina to Venezuela; Cape Horn; Peru; Madagascar; Red Sea. On hard grounds, among algae, mussels, reefs of *Sabellaria*, maërl, coralligenous and detritic bottoms. Intertidal to shallow water (mesolittoral and infralittoral), to about 65 meters.

REMARKS: According to AMOUREUX (1976*a*), the original diagnosis of *Nereis falsa* by Quatrefages is very vague, and the actual diagnosis of this species, synonymized with *N. splendida*, is largely based on FAUVEL (1923*c*).

Nereis usticensis Cantone, Catalano & Badalamenti 2003

Nereis usticensis CANTONE, CATALANO & BADALAMENTI, 2003: 12-15, figs. 2-3, table 2.

TYPE LOCALITY: Punta Parrino, Ustica Island (Italy, Tyrrhenian Sea), at 5 meters, in a hard bottom covered with *Cystoseira*.

DISTRIBUTION: Ustica Island (Italy, Tyrrhenian Sea), at 5 meters, in hard bottoms covered with *Cystoseira*.

***Nereis* sp.**

Nereis jacksoni (?) [not Kinberg 1866] — HARMELIN, 1964: 79-81, pl. 5. *Nereis jacksoni* [not Kinberg 1866] — SAN MARTÍN *et al.*, 1982: 177-179, fig. 3; SARDÁ, 1984*c*: 402, plate in page 403; SARDÁ, 1985: 75, fig. 3, table 1; ACERO & SAN MARTÍN, 1986: 15, fig. 9*E-F*.

DISTRIBUTION: Western Mediterranean Sea, intertidal to shallow water, among algae.

REMARKS: *Nereis jacksoni* was first described by KINBERG (1866*a*: 169, as *Nereis Jacksoni*), from rocky intertidal shores at Port Jackson, Australia, and redescribed by HUTCHINGS & TURVEY (1982: 129-130, fig. 14) with base on the holotype, and later by WILSON (1985: 134-135, fig. 3), based on new material. Other Australian records of the species were revised and assigned to a variety of species other than *N. jacksoni* by HUTCHINGS & TURVEY (1982), who also suggested that still unrevised records of the species from Australia and New Zealand may not be conspecific. The same is probably true for the worldwide records of the species (*e.g.*, Red Sea, South Africa, Madagascar, New Caledonia). The Mediterranean specimens show some differences in relation with *N. jacksoni* in what concerns the number and distribution of the paragnaths in the pharynx.

NÚÑEZ (2004) stated that the records of *Nereis jacksoni* from the Gulf of Cádiz and Mediterranean Sea refer to juveniles of *Nereis funchalensis*, a species very close to *N. jacksoni*, with which it could be synonymous. Though, NÚÑEZ (2004) maintained both species as valid, depending the suggested synonymy on the comparison of the reproductive methods and the *Heteronereis* phases.

Until a further study is performed, I prefer to maintain the Mediterranean records of *Nereis jacksoni* separated from *Nereis funchalensis*, as a different form, as it is not shown that they are juveniles of the second species. This way, it will be possible to detect more records of this form, and to know whether they occur together with bigger size specimens of *N. funchalensis* or not.

*GENUS ***Perinereis*** Kinberg 1866

Perinereis KINBERG, 1866*a*: 175.

TYPE SPECIES: *Perinereis Novæ Hollandiæ* Kinberg 1866.

SYNONYMS: *Lycoris* Lamarck 1818 [in part]; *Mastigonereis* Schmarda 1861; *Arete* Kinberg 1866; [?] *Naumachius* Kinberg 1866; *Hedyle* Malmgren 1867; *Lipephila* Malmgren 1867; *Lipephile* Malmgren 1867; *Stratonice* Malmgren 1867; *Gnatholycastis* Ehlers 1920.

KEY TO SPECIES:

1a. Group V of the pharynx missing..***P. tenuisetis***
1b. All groups complete..**2**

2a (1b). Dorsal notopodial ligules not enlarged..**3**
2b (1b). Dorsal notopodial ligules enlarged, foliaceous, in posterior parapodia..**9**

3a (2a). Group VI with transversal paragnaths on each side..**4**
3b (2a). Group VI with conical paragnaths with broad base ("obtusely conical paragnaths") on each side..**8**

4a (3a). Group VI with a long transversal paragnath on each side, which can be divided on several shorter ones; group V with one big conical paragnath..**5**
4b (3a). Group VI only with one single short tranversal paragnath on each side; group V with 2-3 conical paragnaths..**6**

5a (4a). Group III with lateral patches of paragnaths present; tentacular cirri short, arriving to about chaetigers 2-3..***P. oliveirae***
5b (4a). Group III as a single cluster, without lateral patches of paragnaths; tentacular cirri long, arriving to about chaetiger 11..***P. floridana***

6a (4b). Groups VII-VIII with a double range of conical paragnaths..**7**
6b (4b). Groups VII-VIII with a single range of 4 conical paragnaths..***P. taorica***

7a (6a). Notopodial dorsal ligule of about the same length or slightly longer than the notopodial ventral ligule; paragnath distribution: I – 1, II – 4-7, III – 3-7 in a central group, plus 1 paragnath on each side, IV – 12-18 (but varies between 7-24), V – 3, VI – 1 single transverse, VII-VIII – 16-45, conical with circular base, in 2 rows..***P. rullieri***
7b (6a). Notopodial dorsal ligule longer than the notopodial ventral ligule; paragnath distribution: I – 0-2, II – 6-16, III – 4-11 in a single group, IV – 6-27, V – 3, VI – 1 single transverse, VII-VIII – up to 42, elyptical, in 2 rows..***P. cultrifera****

8a (3b). Group VI with two conical paragnaths with broad base ("obtusely conical paragnaths") on each side..***P. aibuhitensis***
8b (3b). Group VI with 4-17 cones on each side, forming a clear row..***P. nuntia***

9a (2b). Groups V-VI and VII-VIII with numerous tiny paragnaths, accompanying the bigger ones, forming a continuous band..***P. marionii***
9b (2b). Groups V-VI and VII-VIII without tiny paragnaths..**10**

10a (9b). Group VI with a single long transversal paragnath on each side; group V with one big paragnath and 5 to 12 (normally 10) smaller ones, grouped or in a irregular row..***P. macropus***
10b (9b). Group VI with an arc of 4 to 12 conical paragnaths, that can be mixed with bigger and flattened ones, sometimes doubled by a posterior row of smaller paragnaths; group V with 3 to 7 big paragnaths, with normally 4 to 12 smaller ones..***P. macropus conodonta***

Perinereis aibuhitensis Grube 1878

Nereis (Perinereis) aibuhitensis GRUBE, 1878*c*: 89-90, pl. 5 fig. 3.
TYPE LOCALITY: Aibuhit, Philippines.
SYNONYMS: *Neanthes linea* Treadwell 1936; *Neanthes orientalis* Treadwell 1936.
SELECTED REFERENCES: *Nereis (Perinereis) aibuhitensis* — HORST, 1924: 168-169, pl. 33 figs. 4-6. *Perinereis aibuhitensis* — FAUVEL, 1953*c*: 209-210, fig. 107*a*; WU, SUN & YANG, 1981: 171, figs. 107-109; WU, SUN & YANG, 1985: 189-193; HYLLEBERG, NATEEWATHANA & BUSSARAWIT, 1986: 3-5, figs.

2, 9-10; HUTCHINGS, REID & WILSON, 1991: 245-247, 272, fig. 2; KHLEBOVICH, 1996: 147, pl. 46; CHOI & LEE, 1997: 519-527, figs. 2-6, tables 1-5. *Nereis aibuhitensis* — MONRO, 1934: 361-362. *Nereis (Neanthes) linea* — TREADWELL, 1936: 268-270, fig. 19*a-e*. *Nereis (Neanthes) orientalis* — TREADWELL, 1936: 270-272, fig. 19*f-i*.

DISTRIBUTION: Arabian Sea (Goa); Bay of Bengal (Vishakhapatnam, India); Andaman Sea (Phuket; Andaman Islands); Indonesia; Philippine Islands; China; Yellow Sea (Korea); NW Australia. On mangroves, mudflats, marine fish-ponds, or at the sea-shore, among oyster encrusted rocks and rocky reefs. It can be found under the bark of dead trees.

REMARKS: According to HUTCHINGS, REID & WILSON (1991), the type material of this species included specimens belonging to two different species. One agreed well with the original description by Grube and was designated as lectotype, while the other was not identified to species.

This species is commercialy exploited as a living fish bait. It doesn't belong to the European Fauna but it is imported in living conditions from far eastern countries, especially from Korea and China. It is included here as it is possible that runaway worms could establish new populations in wild conditions. In fact, *Perinereis aibuhitensis* has been successfully reared in captivity at the INIAP/IPIMAR Tavira Pilot Aquaculture Station (South Portugal), both from wild imported specimens and from individuals born and grown in experimental circumstances, within the range of environmental conditions prevalent in the Ria Formosa coastal lagoon (a Natural Park in south Portugal). According to the preliminary results this species also seems to be able to reproduce in coastal lagoons and estuaries of south Portugal (FIDALGO E COSTA *et al.*, 2006).

The impact of the eventual introduction of *Perinereis aibuhitensis* could include competitive displacement or predation of native species. *Hediste diversicolor*, for instance, lives in the upper littoral zone, in the same range of salinity, with the same spawning period, and identical production/biomass ratio and secondary production as *Perinereis aibuhitensis* (CHOI & LEE, 1997; FIDALGO E COSTA, SARDÁ & CANCELA DA FONSECA, 1998; FIDALGO E COSTA, 2003).

****Perinereis cultrifera*** (Grube 1840)

Nereis cultrifera GRUBE, 1840: 74, fig. 6.

TYPE LOCALITY: Naples, Mediterranean Sea.

SYNONYMS: *Nereis margaritacea* Leach 1816; [?] *Lycoris lobulata* Savigny *in* Lamarck 1818; *Nereis Beaucoudrayi* Audouin & Milne-Edwards 1833; *Nereis viridis* Johnston 1840; *Nereis lobata* Grube 1850; *Nereis cærulea* Johnston 1865; *Nereis fulva* Quatrefages 1866; *Nereis incerta* Quatrefages 1866; *Nereis Ventilabrum* Quatrefages 1866.

SELECTED REFERENCES: *Nereis cultrifera* — EHLERS, 1868: 461-503, pl. 18 figs. 31-37, pl. 19, pl. 20 figs. 1-3, pl. 21 figs. 31-36; HORST, 1889*b*: 162-163; MCINTOSH, 1910: 280, pl. 52 fig. 3, pl. 60 fig. 7-7*a*, pl. 71 fig. 8-8*d*, pl. 72 fig. 1-1*c*, pl. 81 fig. 1-1*a*; HEINEN, 1911: 58-59, text-fig. 20. *Nereis (Lipephile) cultrifera* — CLAPARÈDE, 1868: 472-474, pl. 11 fig. 2; CLAPARÈDE, 1870: 439-444, pl. 7 fig. 1; SAINT-JOSEPH, 1888: 260-261, pl. 11 figs. 128-129. *Perinereis cultrifera* — LANGERHANS, 1880*a*: 289; SAINT-JOSEPH, 1898: 317-320, pl. 17 figs. 113-114, pl. 18 figs. 115-116; SAINT-JOSEPH, 1906: 221-222; FAUVEL, 1914*f*: 190-193, pl. 16 figs. 1-13; FAUVEL, 1923*c*: 352-354, fig. 137; FAUVEL, 1936*c*: 38; IMAJIMA, 1972: 88-91, figs. 24, 27; PILATO, 1974: 27-36, figs. 1-4; NÚÑEZ, BACALLADO & BRITO, 1981: 172-173, fig. 9; CAMPOY, 1982: 480-483, pl. 67; SARDÁ, 1985: 75, table 1; HUTCHINGS, REID & WILSON, 1991: 253-254, 271, fig. 8; CHAMBERS & GARWOOD, 1992: 46-48, figs. 1, 15, 25, 36, 48, 59, 71; KIRKEGAARD, 1992: 315-317, fig. 155; HARTMANN-SCHRÖDER, 1996: 211; KHLEBOVICH, 1996: 145-146, pl. 45; NÚÑEZ, 2004: 339-342, fig. 123; BAKKEN & WILSON, 2005: 532. *Nereis (Perinereis) cultrifera* — AUGENER, 1913*a*: 167; REGNARD, 1913: 79-82. [?] *Lycoris lobulata* — SAVIGNY *in* LAMARCK, 1818: 312; RATHKE, 1837: 415, pl. 7 figs. 2, 9-15. *Nereis Lobulata* — AUDOUIN & MILNE-EDWARDS, 1833*b*: 213, pl. 15 figs. 7-8; AUDOUIN & MILNE-EDWARDS, 1834: 191-192, pl. 4^A figs. 7-8. *Nereis lobata* — GRUBE, 1850: 298. *Heteronereis lobulata* — JOHNSTON, 1865: 161-163, 341, text-fig. 31 [in part; epitok form]. *Hedyle lobulata* — MALMGREN, 1865: 182 [epitok]; MALMGREN, 1867*a*: 58. *Nereilepas lobulatus* — QUATREFAGES, 1866*b*: 560. *Nereis Margaritacea* — LEACH, 1816: 451; AUDOUIN & MILNE-EDWARDS, 1833*b*: 217-218; AUDOUIN & MILNE-EDWARDS, 1834: 195 [not *Nereis Margarita* Montagu 1804 = indeterminable (see HARTMAN, 1959*a*, p. 264)]. *Lycoris margaritacea* — SAVIGNY *in* LAMARCK, 1818: 312. *Nereis margaritacea* — JOHNSTON, 1839*b*: 294, pl. 6 fig. 3. *Heteronereis margaritacea* — JOHNSTON, 1865: 166-167. *Lipephile margaritacea* — MALMGREN, 1867*a*: 50. *Nereis Beaucoudrayi* — AUDOUIN & MILNE-EDWARDS, 1833*b*: 214-215, pl. 13 fig. 1-7 (plates in AUDOUIN & MILNE-EDWARDS, 1832); AUDOUIN & MILNE-EDWARDS, 1834: 192-193, pl. 4 figs. 1-7; KEFERSTEIN, 1862: 94-97, pl. 8 figs. 1-6, 12. *Nereis cærulea* [not Linnaeus 1761 = questionable (see HARTMAN, 1959*a*, p. 254)] — JOHNSTON, 1865: 154-155, 341. *Nereis bilineata* [not Johnston 1839] — QUATREFAGES, 1866*b*: 535, pl.

7 figs. 3-10. *Nereis fulva* — QUATREFAGES, 1866*b*: 507. *Nereis incerta* — QUATREFAGES, 1866*b*: 12, pl. 7 figs. 3-10. *Nereis Ventilabrum* — QUATREFAGES, 1866*b*: 517. *Nereis viridis* — JOHNSTON, 1840*c*: 171-172, text-fig. 2; QUATREFAGES, 1866*b*: 359.

REFERENCES FOR PORTUGAL: HORST, 1889*b* (Vila Nova de Milfontes); NOBRE, 1903*a* (as *Lipephile cultrifera*; Leixões Harbour; Viana do Castelo); CARVALHO, 1929 (Vila Nova de Milfontes; Sines; Granja); SALDANHA, 1974 (coast of Arrábida); AMOUREUX & CALVÁRIO, 1981 (Tagus Estuary; Peniche); CAMPOY, 1982 (previous records: Vila Nova de Milfontes; Sines; Arrábida; Granja; Leixões Harbour; Viana do Castelo); MONTEIRO-MARQUES *et al.*, 1982 (Cape Carvoeiro; Cape Papoa; Ponta do Baleal; Ponta do Surdão); CALVÁRIO, 1984 (Tagus Estuary); DEXTER, 1992 (previous records: Mira Estuary); PARDAL, MARQUES & BELLAN, 1993 (Mondego Estuary); SALDANHA, 1995 (Portugal); NÚÑEZ, 2004 (previous records: Vila Nova de Milfontes).

MATERIAL: FAUNA 1 — St. 33*A*, Alborán Sea, Alborán Island, 34-44 m, laminarians on rocks: 1 incomplete specimen with 38 chaetigers, 33 mm long; proboscis with 2 paragnaths in group I and 1 in group V; groups VI with one complete bar in one of them and one bar divided in two in the other; parapodia as described in CHAMBERS & GARWOOD (1992).

DISTRIBUTION: Mediterranean Sea; Adriatic Sea; Aegean Sea; Black Sea; Azores; Madeira; Canary and Selvagens Islands; Bay of Biscay; English Channel; North Sea; Scotland; Skagerrak; Kattegat; West and South Africa; NW Pacific; Indian Ocean. Intertidal to about 40 meters, on rocky shores, under stones and boulders, in crevices, usually where there is accumulation of sediment, among algae, and on *Zostera* beds, in muddy sand. According to HUTCHINGS, REID & WILSON (1991) many of the worldwide records of the species require confirmation.

REMARKS: *Lycoris lobulata* Savigny *in* Lamarck 1818, described from Nice (France), is questionably referred to *Perinereis cultrifera* by several authors. It is quite difficult to know if these two species are synonymous, and even in the case that it was demonstrated that their synonymy is correct, probably it would be better to give priority to the later name, as it has been widely used by most authors for more than 100 years.

HUTCHINGS, REID & WILSON (1991) studied and described 19 possible syntypes of *Perinereis cultrifera*, collected at Naples.

Perinereis floridana (Ehlers 1868)

Nereis floridana EHLERS, 1868: 503-506.

TYPE LOCALITY: Captive Key, Florida.

SELECTED REFERENCES: *Perinereis floridana* — LANGERHANS, 1880*a*: 289-290, pl. 15 fig. 24; HORST, 1889*b*: 184; [?] GRAVIER, 1902: 185-188, text-figs. 185-189, pl. 11 fig. 48. *Nereis (Lipephile) Floridana* — SAINT-JOSEPH, 1888: 261-263, pl. 11 fig. 130. *Nereis (Perinereis) floridana* — [?] HORST, 1924: 173. *Perinereis cultrifera floridana* — KHLEBOVICH, 1996: 146.

DISTRIBUTION: Florida; Madeira Island (at the coast, in sand under stones); English Channel (at the coast near the waymark of Rochardien, near Saint-Malo, France); [?] Red Sea; [?] Indonesia.

Perinereis macropus (Claparède 1870)

Nereis (Lipephile) macropus CLAPARÈDE, 1870: 444-448, pl. 8 fig. 1.

TYPE LOCALITY: Gulf of Naples, Mediterranean Sea.

SELECTED REFERENCES: *Perinereis macropus* — HORST, 1889*b*: 163-164, pl. 7 fig. 12; FAUVEL, 1913*a*: 67-70, fig. 12; FAUVEL, 1923*c*: 356-357, fig. 139*a-e*; FAUVEL, 1924*a*: 389-392, figs. 1*a-e*, 2*l*; FAUVEL, 1927*a*: 410-411, fig. 139*l* [epitok]; FAUVEL, 1936*c*: 39; BEN-ELIAHU, 1975*b*: 182; AMOUREUX, 1976*a*: 343; CAMPOY, 1982: 486-487; SARDÁ, 1985: 75, table 1; NÚÑEZ, 2004: 346-348, fig. 126.

DISTRIBUTION: Western Mediterranean Sea (Naples; Monaco); Mediterranean coast of Israel; Morocco (Cape Negro and Cape Spartel). On rocky shores, on crevices, under stones and among algae. Intertidal to shallow water.

Perinereis macropus conodonta Fauvel 1924

Perinereis macropus var. *conodonta* FAUVEL, 1924*a*: 389-392, fig. 2*a-k*.

TYPE LOCALITY: Adjim, El Ataya, Ouled and Sidi Bouéras, Gulf of Gabés, Tunisia (Mediterranean Sea). Near the shore, on shallow water.

SELECTED REFERENCES: *Perinereis macropus* var. *conodonta* — FAUVEL, 1927*a*: 411, figs. 139*a-k*.

DISTRIBUTION: Known from the type locality.

Perinereis marionii (Audouin & Milne-Edwards 1833)

Nereis Marionii Audouin & Milne-Edwards, 1833*b*: 207-209, pl. 13 figs. 1-6.

Type locality: Department of Vendée, French Atlantic coast of Bay of Biscay.

Synonyms: *Nereis crassipes* Quatrefages 1866; *Perinereis longipes* Saint-Joseph 1898.

Selected references: *Nereis Marionii* — Audouin & Milne-Edwards, 1834: 185-187, pl. 4^{A} figs. 1-6; Grube, 1870*a*: 304-305; Fauvel, 1911*b*: 559, figs. 1-3. *Perinereis Marionii* — Rioja, 1918*b*: 78-80, fig. 19; Fauvel, 1923*c*: 355-356, fig. 139*f-m*; Fauvel, 1924*a*: 392-393, figs. 1*f-m*, 2*m*; Fauvel, 1927*a*: 411, fig. 139*m*; Fauvel, 1936*c*: 38-39. *Perinereis marionii* — Núñez, Bacallado & Brito, 1981: 174-175, fig. 11; Núñez, 2004: 344-346, fig. 125. *Perinereis marioni* — Campoy, 1982: 485-486; Sardá, 1985: 75, table 1. *Stratonice Marioni* — Malmgren, 1867*a*: 56. *Nereis crassipes* — Quatrefages, 1866*b*: 550; Grube, 1870*a*: 305-306. *Perinereis longipes* — Saint-Joseph, 1898: 314-317, pl. 17 figs. 107-112.

References for Portugal: Amoureux & Calvário, 1981 (Peniche); Castro & Viegas, 1981 (as *Perinereis marioni*; Tagus Estuary); Monteiro-Marques *et al.*, 1982 (Cape Carvoeiro; Cape Papoa; Ponta do Baleal; Ponta do Surdão); Dexter, 1992 (previous records: Sines).

Distribution: Northeast Atlantic, from the English Channel to the Mediterranean Sea; Morocco; Canary Islands; West Africa. On rocky shores, on crevices, under stones and among calcareous algae, mussels or sabellarian reefs. Intertidal to shallow water.

Perinereis nuntia (Savigny *in* Lamarck 1818)

Lycoris nuntia Savigny *in* Lamarck, 1818: 312-313.

Type locality: Gulf of Suez, Red Sea.

Synonyms: *Nereis (Lycoris) Quatrefagesi* Grube 1878; *Perinereis heterodonta* Gravier 1899; *Nereis (Perinereis) heterodonta* var. *mictodontoides* Augener 1913; *Perinereis nuntia* "typique" Fauvel 1919; *Perinereis nuntia* Variété *brevicirris* Fauvel 1919; *Perinereis nuntia* Variété *Djiboutiensis* Fauvel 1919; *Nereis (Perinereis) rumphii* Horst 1919; *Perinereis broomensis* Hartmann-Schröder 1979; *Perinereis weijhouensis* Wu Sun & Yang 1981.

Selected references: *Lycoris nuntia* — Savigny, 1822: 33, pl. 4 fig. 2. *Nereis (Neanthes) nuntia* — Gravier, 1902: 164-167; Fauvel, 1911*a*: 382-383. *Perinereis nuntia* — Wilson & Glasby, 1993: 266-268, figs. 2-3, 11; Glasby & Hsieh, 2006: 563-565, fig. 6, tables 1, 3. *Perinereis nuntia* typique — Fauvel, 1919*a*: 415-416. *Perinereis nuntia* var. *typica* — Khlebovitch, 1963: 58. *Perninereis nuntia typica* — Wu, Sun & Yang, 1985: 213, fig. 120*c*. *Perinereis nuntia* var. *brevicirris* [not Grube 1867] — Fauvel, 1919*a*: 417-418. *Nereis (Lycoris) Quatrefagesi* — Grube, 1878*c*: 79-80. *Perinereis quatrefagesi* — Hylleberg, Nateewathana & Bussarawit, 1986: 5-8, figs. 3-4. *Perinereis heterodonta* — Gravier, 1899: 242-244, figs. 16-19; Gravier, 1902: 179-182, text-figs. 179-181, pl. 11 fig. 46; Fauvel, 1911*a*: 394-395. *Perinereis nuntia* var. *heterodonta* — Fauvel, 1919*a*: 419-420. *Perinereis nuntia* var. *Djiboutiensis* — Fauvel, 1919*a*: 420-421. *Nereis (Perinereis) heterodonta* var. *mictodontoides* — Augener, 1913*b*: 177-178. *Nereis (Perinereis) rumphii* — Horst, 1919: 60; Horst, 1924: 166-168, pl. 33 figs. 1-3. *Perinereis broomensis* — Hartmann-Schröder, 1979*b*: 117-118, figs. 211-215; Hartmann-Schröder, 1980*b*: 60. *Perinereis weijhouensis* — Wu, Sun & Yang, 1981: 181-183, figs. 114-115; Wu, Sun & Yang, 1985: 201-204, figs. 114-115.

Distribution: Widespread throughout the Indo-Pacific: Indonesia; Red Sea; Persian Gulf; Gulf of Aden; Thailand; Malaysia; Indonesia; Timor; Singapore; Philippines; Taiwan; China; Fiji; Australia. On rocky beaches, in sand under boulders and stones, sandy beaches, and mangroves. Intertidal to shallow water. The species is also known as a Lessepsian migrant in the Levantine Coast of the Mediterranean (Ben-Eliahu, 1991*a*; Çinar, Ergen & Dağli, 2002), where it was recorded at Port Said (Egypt).

Perinereis oliveirae Horst 1889

Perinereis Oliveirae Horst, 1889*b*: 164-167, pl. 7 figs. 1-5.

Type locality: Portugal: next to Buarcos (near Figueira da Foz), Granja (probably Praia da Granja, near Vila Nova de Gaia), and Sines.

Selected references: *Perinereis Oliveirae* — Saint-Joseph, 1898: 310-314, pl. 17 figs. 102-106; Fauvel, 1923*c*: 354-355, fig. 138*e-k*; Fauvel, 1936*c*: 38. *Nereis (Perinereis) Oliveirai* — Augener, 1913*a*: 168. *Perinereis Oliveirœ* — Fauvel, 1914*f*: 189-190, pl. 15 figs. 12-15. *Perinereis oliveirae* — Núñez, Bacallado & Brito, 1981: 173-174, fig. 10; Campoy, 1982: 484-485; Sardá, 1985: 75, table 1; Núñez, 2004: 342-344, fig. 124.

References for Portugal: Horst, 1889*b* (Buarcos; Praia da Granja; Sines); Rioja, 1918*b* (as *Perinereis Oliveirœ*; previous records: Buarcos; Praia da Granja; Sines); Carvalho, 1929 (as *Perinereis*

Oliveiræ; Sines; Buarcos); AUGENER, 1933*b* (as *Nereis (Perinereis) oliveirae*; Coimbra, probably to refer Buarcos); SALDANHA, 1974 (coast of Arrábida); AMOUREUX & CALVÁRIO, 1981 (Peniche); CAMPOY, 1982 (previous records: Buarcos; Praia da Granja; Sines); MONTEIRO-MARQUES *et al.*, 1982 (Cape Carvoeiro; Cape Papoa; Ponta do Baleal; Ponta do Surdão); DEXTER, 1992 (previous records: Sines); NÚÑEZ, 2004 (previous records: Buarcos; Praia da Granja; Sines).

DISTRIBUTION: Northeastern Atlantic (Gulf of Gascony; Portugal); Canary Islands; Mediterranean Sea; Aegean Sea; West Africa. On rocky shores, in the crevices and among algae or mussels, and in mixed bottoms. Intertidal to shallow water.

REMARKS: As stated by HORST (1889*b*) in the original description of *Perinereis oliveirae*, this species is very close to *P. floridana* as described by LANGERHANS (1880*a*), and it is possible that at least Langerhans' specimens are conspecific with *P. oliveirae*. For the moment, the species can be separated according to the above key.

Perinereis rullieri Pilato 1974

Perinereis rullieri PILATO, 1974: 25-36, figs. 1-4.

TYPE LOCALITY: In several places of the eastern coast of Sicily, from Acitrezza to Augusta.

DISTRIBUTION: Eastern coast of Sicily; Adriatic Sea.

Perinereis taorica Langerhans 1881

Perinereis taorica LANGERHANS, 1881: 110-111, pl. 4 fig. 15.

TYPE LOCALITY: Puerto de la Orotava (= Puerto de la Cruz), Tenerife Island (Canary Islands), on coarse sand. A neotype was designated by NÚÑEZ (1993), from Puerto de la Cruz (Tenerife), at 0 meters, collected from coarse black sand and stones.

SELECTED REFERENCES: *Perinereis taorica* — NÚÑEZ, 1993: 32-34, figs. 1-2, tables 1-2.

DISTRIBUTION: Tenerife Island (Canary Islands). On coarse sand with stones. Midlittoral zone.

Perinereis tenuisetis Fauvel 1915

Perinereis (Arete) tenuisetis FAUVEL, 1915: 6-9, fig. 5.

TYPE LOCALITY: Siracusa Harbour, Sicily (Mediterranean Sea). Known from a single epitok specimen, an *Heteronereis* male, captured at the surface during the night.

SELECTED REFERENCES: *Perinereis (Arete) tenuisetis* — FAUVEL, 1916*c*: 88-92, pl. 7 figs. 1-10, pl. 9 fig. 15; FAUVEL, 1923*c*: 357-358, fig. 140.

DISTRIBUTION: Known from the type locality. One single record.

*GENUS ***Platynereis*** Kinberg 1866

Platynereis KINBERG, 1866*a*: 177.

TYPE SPECIES: *Platynereis magalhaensis* Kinberg 1866.

SYNONYMS: *Pisenoe* Kinberg 1866; *Iphinereis* Malmgren 1865; *Leontis* Malmgren 1867; *Nectonereis* Verrill 1874; *Uncinereis* Chamberlin 1919.

KEY TO SPECIES:

1a. Paragnaths only on group IV..***P. coccinea***
1b. Paragnaths on groups III, IV, VI and VII-VIII...**2**

2a (1b). Homogomph falciger notochaetae absent..***P. australis***
2b (1b). Homogomph falciger notochaetae present..**3**

3a (2b). Tentacular cirri with indistinct annulation; always one single row of 5 pectinate bars in groups VII-VIII; homogomph falciger notochaetae with a shaft with enlarged end and obliquely placed blade, which is rather short, without serrations, ending with a rounded-off tooth from which originates a filament that terminates on the end of the shaft..***P. nadiae***
3b (2b). Tentacular cirri smooth; one or two parallel rows of 3-7 pectinate bars in groups VII-VIII; homogomph falciger notochaetae with an upright long blade, placed on the end of the shaft, with

serrations, generally with an additional short tooth located upon the principal one, and with a filament that arises from the main tooth and terminates in the middle of the blade...**4**

4a (3b). Mature specimens show epitokous *Heteronereis* condition; separated sexes; eggs small (150-180 µm in diameter); spermatozoa round-headed; development by pelagic nectochaeta larvae......***P. dumerilli****
4b (3b). Mature specimens atokous, without *Heteronereis* condition; hermaphrodite; eggs large (280-300 µm in diameter, but up to 540 µm in diameter according to SOUTHWARD, 1956); spermatozoa long-headed; direct development of larvae, which develop in thick-walled brood tubes...............***P. massiliensis***

Platynereis australis (Schmarda 1861)

Heteronereis australis SCHMARDA, 1861: 101-102, text-figs. *a-c*, *K*, pl. 31 fig. 242.

TYPE LOCALITY: In the harbour of Auckland, New Zealand.

SYNONYMS: *Mastigonereis quadridentata* Schmarda 1861; *Nicon Loxechini* Kinberg 1866; *Pisenoe maculata* Kinberg 1866; *Platynereis magalhaensis* Kinberg 1866; *Platynereis patagonica* Kinberg 1866; *Platynereis antarctica* Kinberg 1866; *Nereis (Platynereis) eatoni* McIntosh 1876.

SELECTED REFERENCES: *Nereis australis* — BENHAM, 1909: 238, pl. 9 fig. 1; RAMSAY, 1914*c*: 46; BENHAM, 1921: 67-68. *Nereis (Platynereis) australis* — AUGENER, 1932*a*: 36. *Platynereis australis* — KNOX, 1951: 223-225, pl. 49 figs. 34-40; HARTMANN-SCHRÖDER, 1962*b*: 108; HARTMANN-SCHRÖDER, 1962*c*: 427-432, 437, figs. 44-47; HARTMAN, 1964: 102, pl. 31 figs. 6-7; HARTMANN-SCHRÖDER, 1965*b*: 148; DAY, 1967: 305, fig. 14.4.*m*; IMAJIMA, 1972: 82-85, figs. 21-22; ROZBACZYLO & BOLADOS, 1980: 216-218, fig. 4; HUTCHINGS & REID, 1991: 54-55. *Pisenoe maculata* — KINBERG, 1866*a*: 176. *Platynereis Magalhaensis* — KINBERG, 1866*a*: 177; KINBERG, 1910: 53, pl. 20 fig. 6; FAUVEL, 1916*b*: 434-436, pl. 8 figs. 21-22. *Platynereis magalhaensis* — GRAVIER**,** 1907: 28-29; MONRO, 1930: 106-107, fig. 37; FAUVEL, 1936*e*: 24; MONRO, 1936: 137-138, fig. 24; MONRO, 1939*d*: 118; HARTMAN, 1948*a*: 9-10, 60-61; FAUVEL, 1950: 759-760; WESENBERG-LUND, 1962: 85-88 figs. 33-34; HARTMAN, 1953: 28; HARTMAN, 1954: 36; HARTMAN, 1964: 102-103, pl. 31 figs. 8-9. *Nereis magalhaensis* — EHLERS, 1897: 63-65, pl. 5 figs. 106-107; EHLERS, 1901*a*: 104; EHLERS, 1901*b*: 259; EHLERS, 1913: 495-496; FAUVEL, 1941: 281-283. *Nereis (Platynereis) magalhaensis* — EHLERS, 1904: 26-28, pl. 3 figs. 16-20, pl. 4 figs. 1-2; AUGENER, 1932*b*: 105. *Platynereis antarctica* — KINBERG, 1866*a*: 177. *Platynereis patagonica* — KINBERG, 1866*a*: 177. *Nereis eatoni* — MCINTOSH, 1876*a*: 320; MCINTOSH, 1879: 260, pl. 15 figs. 10-12. *Nereis (Platynereis) eatoni* — MCINTOSH, 1885*a*: 223-224, pl. 35 figs. 5-6. *Mastigonereis quadridentata* — SCHMARDA, 1861: 111, text-figs. *a-c*, *K*, pl. 31 fig. 251. *Nicon Loxechini* — KINBERG, 1866*a*: 178. *Nereis loxechini* — EHLERS, 1913: 497. *Nereis (Platynereis) dumerilii* [not Audouin & Milne-Edwards 1833] — MONRO, 1926: 322. Not *Nereis loxechini* — EHLERS, 1908: 73; BENHAM, 1921: 65-67, pl. 8 figs. 67-75 [both records probably refer to an unnamed species (see HARTMAN, 1948*a*: 61)].

DISTRIBUTION: Subantarctic and Antarctic areas: New Zealand (Auckland); Macquarie Island; Japan; Kerguelen and Crozet Islands; Saint Paul Island; Island of Amsterdam; Marion, Macquire and Ross Islands; South Africa; Graham Land; Falkland Islands; South Georgia; off Brazil; Patagonia; Tierra del Fuego; Argentina; Uruguay; Chile (from Iquique to the Cape Horn); Strait of Magellan; [?] off Iceland; [?] Adriatic Sea. Intertidal to 672 meters, on rocky bottoms, sand with boulders, sand, gravel, mud, rock pools, empty shells, amongst holfasts of kelp and other algae.

REMARKS: This species is recorded to be present near the mouth of Po River (Adriatic Sea, Italy), by CASTELLI *et al.* (1995). However, the same authors state that the record is doubtful, and probably refers to an unknown species.

Platynereis coccinea (Delle Chiaje 1827)

Spio coccineus DELLE CHIAJE, 1827: 426.

TYPE LOCALITY: Gulf of Naples.

SYNONYMS: [?] *Heteronereis Oerstedi* Quatrefages 1866.

SELECTED REFERENCES: *Nereis (Leontis) coccinea* — CLAPARÈDE, 1868: 464-467, pl. 10 fig. 4. *Platynereis coccinea* — FAUVEL, 1914*f*: 194-195, pl. 17 figs. 1-13; FAUVEL, 1916*c*: 94-96, pl. 8 figs. 11-13; FAUVEL, 1923*c*: 360-361, fig. 141*g-n*; CAMPOY, 1982: 479; NÚÑEZ, 1995: 80, fig. 3; NÚÑEZ, 2004: 324-326, fig. 117. [?] *Heteronereis Oerstedi* — QUATREFAGES, 1866*b*: 571, pl. 2 figs. 14-15, figs. 1-7.

REFERENCES FOR PORTUGAL: AMOUREUX & CALVÁRIO, 1981 (Peniche); MONTEIRO-MARQUES *et al.*, 1982 (Cape Carvoeiro); DEXTER, 1992 (previous records: Ria Formosa).

DISTRIBUTION: Atlantic Ocean, from the Isle of Man to the Gulf of Guinea; Azores; Sargassum Sea; Mediterranean Sea; Adriatic Sea; Aegean Sea. Amongst algae, serpulids, sponges, coral, and bryozoans. Intertidal to about 100 meters.

**Platynereis dumerilii* (Audouin & Milne-Edwards 1833)

Nereis Dumerilii AUDOUIN & MILNE-EDWARDS, 1833*b*: 218-219, pl. 13 figs. 10-12.

TYPE LOCALITY: In the surroundings of La Rochelle, French coast of the Bay of Biscay.

SYNONYMS: *Heteronereis fucicola* Ørsted 1843; *Nereilepas variabilis* Ørsted 1843; *Nereis zostericola* Ørsted 1843; *Nereis agilis* Keferstein 1862; *Nereis megodon* Quatrefages 1866; *Heteronereis Malmgreni* Claparède 1868; *Nereis peritonealis* Claparède 1868.

SELECTED REFERENCES: *Nereis Dumerilii* — AUDOUIN & MILNE-EDWARDS, 1834: 196-197, pl. 4^{A} figs. 10-12; JOHNSTON, 1840*c*: 174-175, text-fig. 5; JOHNSTON, 1865: 156-158, 341, text-figs. 28-29; GRUBE, 1870*a*: 308-309; MCINTOSH, 1910: 303, pl. 52 fig. 5, pl. 60 figs. 10-10*c*, pl. 72 fig. 4-4*l*, pl. 81 fig. 4-4*c*. *Leontis Dumerili* — MALMGREN, 1867*a*: 52-53, pl. 4 fig. 25. *Nereis (Leontis) Dumerilii* — CLAPARÈDE, 1870: 408-434, 437-438, pls. 3 figs. 1-5, pl. 4 figs. 1-6, pl. 5 figs. 1-2, pl. 6; SAINT-JOSEPH, 1888: 253-259, pl. 11 figs. 125-127. *Leontis Dumerilii* — LANGERHANS, 1880*a*: 281-285, pl. 15 figs. 12-20. *Nereis dumerili* — HEINEN, 1911: 51-53, text-fig. 16. *Platynereis Dumerilii* — SAINT-JOSEPH, 1898: 210; SAINT-JOSEPH, 1906: 222-223; FAUVEL, 1914*f*: 193; FAUVEL, 1923*c*: 359-360, fig. 141*a-f* [in part; in part = *Platynereis massiliensis* (Moquin-Tandon 1869)]; FAUVEL, 1936*c*: 40; HAUENSCHILD, 1951: 107-127, text-figs. 1, 2*b-b1*, 3*b*, 5*b*, 6, pl. 1 figs. 1, 4, 6, 8-9, pl. 2 figs. 6-7. *Nereis (Platynereis) Dumerili* — REGNARD, 1913: 85-90, fig. 2. *Platynereis dumerili* — SOUTHWARD, 1956: 263; E. RASMUSSEN, 1973: 78-79. *Platynereis dumerilii* — PETTIBONE, 1963*a*: 154-160, fig. 43, table 1; IMAJIMA, 1972: 80-82, figs. 20, 22; LIÑERO-ARANA & REYES-VÁSQUEZ, 1979: 10, pl. 9 figs. 1-15; NÚÑEZ, BACALLADO & BRITO, 1981: 175-177, fig. 12; CAMPOY, 1982: 476-479; SARDÁ, 1985: 75, table 1; CHAMBERS & GARWOOD, 1992: 49-51, figs. 6*a*, 7, 8, 9, 10, 14, 26, 49, 61, 72; KIRKEGAARD, 1992: 318-321, fig. 156; HARTMANN-SCHRÖDER, 1996: 211-214, fig. 92; KHLEBOVICH, 1996: 141-143, pl. 43; NÚÑEZ, 2004: 326-329, fig. 118. *Nereis agilis* — KEFERSTEIN, 1862: 97-99, pl. 8 figs. 8-11. *Nereis peritonealis* — CLAPARÈDE, 1868: 467-471, pl. 9 fig. 5. *Heteronereis Malmgreni* — CLAPARÈDE, 1868: 483-486, pl. 9 fig. 1. *Iphinereis fucicola* — MALMGREN, 1865: 182; MALMGREN, 1867*a*: 58-59, pl. 5 figs. 29-30.

REFERENCES FOR PORTUGAL: CARVALHO, 1929 (as *Platynereis Dumerilii*; Sines); SALDANHA, 1974 (coast of Arrábida); [?] HARTMANN-SCHRÖDER, 1977*a* (as *Platynereis* cf. *dumerilii*; off Cape Sardão); AMOUREUX & CALVÁRIO, 1981 (Peniche); CAMPOY, 1982 (previous records: Sines; Arrábida); MONTEIRO-MARQUES *et al.*, 1982 (Cape Carvoeiro; Cape Papoa; Ponta do Baleal; Ponta do Surdão); MONTEIRO-MARQUES, 1987 (continental shelf of Algarve); QUINTINO & GENTIL, 1987 (Lagoon of Albufeira; Lagoon of Óbidos); QUINTINO, RODRIGUES & GENTIL, 1989 (Lagoon of Óbidos); DEXTER, 1992 (previous records: continental shelf of Algarve; Mira Estuary; Sines; Arrábida; Lagoon of Albufeira; Lagoon of Óbidos); SALDANHA, 1995 (Portugal); CANCELA DA FONSECA *et al.*, 2006 (Aljezur); present work (southwestern continental shelf).

MATERIAL: SEPLAT 7 (2nd part) — St. 156 (A.3955), near Sines, 29 m, stones: 1 complete specimen in poor condition, with about 62 chaetigers for 15 mm long; proboscis inverted, but possible to see group VI; parapodia of first 2 chaetigers uniramous with 3 ligules; remaining parapodia biramous; parapodia of chaetigers 5-9 with ligules reduced in length to low mounds, those of chaetigers 3 and 4 and posterior to 9 with longer and more pointed ligules; notopodial chaetae homogomph spinigers; neuropodial chaetae homogomph spinigers and heterogomph falcigers above and heterogomph spinigers and falcigers below the aciculum; anal cirri very long. **FAUNA 1 — St. 32*A***, Alborán Sea, Alborán Island, 28 m, laminarians on rocks: 1 complete specimen with 63 chaetigers, and about 20 mm long. **St. 33*A***, Alborán Sea, Alborán Island, 34-44 m, laminarians on rocks: 5 incomplete specimens. **St. 60*A***, Gibraltar Strait, Tarifa, 12-16 m, sand, stones, photophile algae: 86 specimens (5 complete, 81 incomplete, plus 4 fragments), many in poor condition; many specimens are juveniles; possible to see the paragnaths in the groups III and IV.

DISTRIBUTION: Iceland; Norway; Skagerrak; Kattegat; Baltic Sea; North Sea; English Channel; Northeastern Atlantic; Madeira; Azores; Canary Islands; Mediterranean Sea; Adriatic Sea; Aegean Sea; Black Sea; Cape Verde Islands; Gulf of Mexico; Venezuela; Brazil; South Africa; Persian Gulf; Indopacific. Amongst algae and *Zostera marina*, rocky bottoms, and shell gravel. Intertidal to 4850 meters, but normally in shallow waters.

Platynereis massiliensis (Moquin-Tandon 1869)

Nereis massiliensis MOQUIN-TANDON, 1869: 869-870.

TYPE LOCALITY: Marseille (French Mediterranean), near the coast, among *Ulva* algae.

SELECTED REFERENCES: *Nereis massiliensis* and *Nereis (Leontis) Dumerilii* Forme hermaphrodite — CLAPARÈDE, 1870: 434-437, pl. 3 fig. 6, pl. 4 fig. 7, pl. 5 fig. 3. *Platynereis massiliensis* — HAUENSCHILD, 1951: 107-127, text-figs. 1, 2*a-a1*, 3*a*, 4, 5*a*, pl. 1 figs. 2-3, 5, 7, pl. 2 figs. 1-5;

SOUTHWARD, 1956: 263; HAMOND, 1966: 403; E. RASMUSSEN, 1973: 79-80; KIRKEGAARD, 1992: 321; HARTMANN-SCHRÖDER, 1996: 214; KHLEBOVICH, 1996: 143.

DISTRIBUTION: Eastern North Atlantic; Southern North Sea; Kattegat; Western Mediterranean Sea. Near the coast, amongst algae. Shallow water.

REMARKS: This species is morphologicaly indistinguishable from *P. dumerilii*, but shows a different method of reproduction. *P. massiliensis* reproduces in a atokous condition, being a protandric hermaphrodite, while its sibling species *P. dumerilii* is a gonochoristic species which displays the typical epitokous metamorphosis with one single spawning crisis at the end of life (PFANNENSTIEL, GRÜNIG & LÜCHT, 1987; see also: HAUENSCHILD, 1951; E. RASMUSSEN, 1973; GRANT, 1989).

Platynereis nadiae Abbiati & Castelli 1992

Platynereis nadiae ABBIATI & CASTELLI, 1992: 152-153, figs. 1-5.

TYPE LOCALITY: Specimens were collected from two sites: Le Formiche and Cala dell'Ergastolano, along the northern coast of Capraia (43º2'N, 9º49'E), a small island in the Tuscan Archipelago (Tyrrhenian Sea). The former station is exposed and the latter sheltered, and specimens were found on rocky bottoms in the midlittoral and upper sublittoral zones, amongst algae. Is was not stated to which of the two sites belongs the holotype.

SELECTED REFERENCES: *Platynereis nadiae* — NÚÑEZ, 2004: 329-331, fig. 119.

DISTRIBUTION: North-west of the Island of Capraia, in the Tyrrhenian Sea, on rocky bottoms in the upper sublittoral; Chafarinas Islands, Western Mediterranean, in the same kind of bottom, amongst algae.

GENUS ***Pseudonereis*** Kinberg 1866

Pseudonereis KINBERG, 1866*a*: 174.

Type species: *Pseudonereis gallapagensis* Kinberg 1866.

Pseudonereis anomala Gravier 1902

Pseudonereis anomala GRAVIER, 1902: 191-197, text-figs. 194-202, pl. 12 figs. 50-52.

TYPE LOCALITY: Djibouti, Gulf of Aden.

SYNONYMS: *Nereis (Pseudonereis) rottnestiana* Augener 1913; *Nereis nichollsi* Kott 1951; *Pseudonereis rottnestiana* forma *seriodentata* Hartmann-Schröder 1979.

SELECTED REFERENCES: *Pseudonereis anomala* — FAUVEL, 1953*c*: 217, fig. 110*e-g*; LAUBIER, 1966*d*: 13; DAY, 1967: 333, fig. 14.12.*g-j*; BEN-ELIAHU, 1975*b*: 181; HUTCHINGS & GLASBY, 1985: 108-109; HYLLEBERG, NATEEWATHANA & BUSSARAWIT, 1986: 13-14, figs. 7, 9-10; ÇINAR & ERGEN, 2005: 316-320, figs. 2-4; KAMBOUROGLOU & NICOLAIDOU, 2006: 97-98, fig. 1; BAKKEN & WILSON, 2005: 534; BAKKEN, 2007: 148-152, figs. 2-3, tables 1-2. *Nereis (Pseudonereis) anomala* — HORST, 1924: 187. *Nereis (Pseudonereis) rottnestiana* — AUGENER, 1913*b*: 184-187, text-fig. 20, pl. 3 fig. 46. *Nereis nichollsi* — KOTT, 1951: 93-95, fig. 2*a-k*. *Pseudonereis rottnestiana* forma *seriodentata* — HARTMANN-SCHRÖDER, 1979*b*: 118-119, figs. 216-219; HARTMANN-SCHRÖDER, 1980*b*: 61.

DISTRIBUTION: Red Sea; Gulf of Aden; Arabian Sea; Persian Gulf; tropical Indian Ocean; Thailand; Indonesia; China; around Australia except in the northern region; Aegean Sea; South Ionian Sea; Levant Basin. Intertidal to shallow water, mainly on hard bottoms. In the Mediterranean Sea it has been found in a variety of shallow bottoms, ranging between 0-4 meters, and also near and inside harbours.

REMARKS: *Pseudonereis anomala* is considered to be a Lessepsian migrant (BEN-ELIAHU, 1991*a*), and was first recorded to be present in the Mediterranean by FAUVEL (1937), in Alexandria. Posteriorly, it was found along the Israeli coast, Lebanon coast, Cypriot coast, Turkish Levant coast (see references in ÇINAR & ERGEN, 2005), and Greek Aegean coast and Ionian Sea (KAMBOUROGLOU & NICOLAIDOU, 2006). BEN-ELIAHU (1991*a*) found *P. anomala* to be the most abundant of the migrants in the Suez Canal, and she stated this species as being the most widely-distributed migrant nereidid in the Eastern Mediterranean, attaining greater numbers and larger body sizes in the Mediterranean than in the Red Sea. Besides, BEN-ELIAHU (1991*a*) also pointed the fact that a native nereidid species, *Perinereis cultrifera* (Grube 1840), was apparently being excluded from some habitats by the invasive *Pseudonereis anomala*. The dispersal and colonization success of *Pseudonereis anomala* seems to rely in great part on its reproductive mode, with the formation of pelagic *Heteronereis* and planktotrophic larvae (BEN-ELIAHU, 1991*a*; ÇINAR & ERGEN, 2005). KAMBOUROGLOU & NICOLAIDOU (2006) also suggested that the expansion of *P. anomala* has been at least facilitated by the shipping activity, based on the new findings of the species in harbour environments, some of which very polluted (ÇINAR & ERGEN, 2005;

KAMBOUROGLOU & NICOLAIDOU, 2006). However, the biggest part of the Mediterranean records of the species refer to shallow water habitats other that docks.

GENUS *Rullierinereis* Pettibone 1971

Rullierinereis PETTIBONE, 1971*b*: 31-33.
TYPE SPECIES: *Leptonereis zebra* Rullier 1963.

KEY TO SPECIES:

1a. Upper notopodial ligules absent on biramous parapodia of middle and posterior regions of body; eyes in square arrangement, poorly pigmented..***R. ancornunezi***
1b. Upper notopodial ligules present throughout the body; eyes absent..................................***R. anoculata***

Rullierinereis ancornunezi Núñez & Brito 2006

Rullierinereis ancornunezi NÚÑEZ & BRITO, 2006: 147-149, figs. 1-3.
TYPE LOCALITY: Lanzarote, Canary Islands (Coordinates UTM: X648254, Y3235253), 18 meters, in fine sand.
DISTRIBUTION: Lanzarote, Tenerife and La Gomera (Canary Islands). In fine to medium sand, sometimes mixed with maërl. Between 18-55 meters.

Rullierinereis anoculata Cantone 1982

Rullierinereis anoculata CANTONE, 1982: 103-106, figs. 1-2.
TYPE LOCALITY: Gulf of Catania (Italy), at 14.5-18 meters, on a bottom of silt, mud, and sand.
SELECTED REFERENCES: *Rullierinereis anoculata* — TENA *et al.*, 1991: 30-32, fig. 2.
DISTRIBUTION: Mediterranean Sea: Valencia outer harbour (Spain); Gulf of Catania (Italy). In muddy bottoms. Between 14.5-18 meters.

GENUS *Sinonereis* Kinberg 1866

Sinonereis WU & SUN, 1979: 95.
TYPE SPECIES: *Sinonereis heteropoda* Wu & Sun 1979.
SYNONYMS: *Nicon* Kinberg 1866 [not Gray 1847 (Mammalia)].

Sinonereis heteropoda Wu & Sun 1979

Sinonereis heteropoda WU & SUN, 1979: 95.
TYPE LOCALITY: Huanghai Sea.
SYNONYMS: *Nicon sinica* Wu & Sun 1979.
SELECTED REFERENCES: *Sinonereis heteropoda* — NÚÑEZ, 2004: 312-314, fig. 113. *Nicon sinica* — WU & SUN, 1979: 99, fig. 182; WU, SUN & YANG, 1981: 60, fig. 31; MIURA, 1990: 11, figs. 1-2; NÚÑEZ, AGUIRREZABALAGA & CEBERIO, 2000: 32-34, fig. 5.
DISTRIBUTION: Huanghai Sea, South China Sea; Japan; Capbreton Canyon, Bay of Biscay (917-954 meters). Between 20-954 meters.

GENUS *Websterinereis* Pettibone 1971

Websterinereis PETTIBONE, 1971*b*: 19-20.
TYPE SPECIES: *Nereis tridentata* Webster 1880.

Websterinereis glauca (Claparède 1870)

Nereis (Leptonereis) glauca CLAPARÈDE, 1870: 454-455, pl. 7 fig. 3.
TYPE LOCALITY: Gulf of Naples (Mediterranean Sea).

SYNONYMS: *Leonnates pusillus* Langerhans 1880; *Nereis (Leptonereis) Vaillanti* Saint-Joseph 1888.
SELECTED REFERENCES: *Leptonereis glauca* — RAMSAY, 1914*a* 245-249, pl. 1; FAUVEL, 1914*f*: 163-166, pl. 12 figs. 5-23; FAUVEL, 1923*c*: 333-334, fig. 129*a-d*; FAGE & LEGENDRE, 1927: 90-94, figs. 9-10; FAUVEL, 1936*c*: 33-34, fig. 1. *Websterinereis glauca* — PETTIBONE, 1971*b*: 27-30, figs. 14-16; NÚÑEZ, BRITO & BACALLADO, 1984: 14-16, fig. 1; CHAMBERS & GARWOOD, 1992: 52-53, figs. 13, 27*d*, 33*a*, 50, 62, 73; KIRKEGAARD, 1992: 321-324, fig. 157; HARTMANN-SCHRÖDER, 1996: 214-215; KHLEBOVICH, 1996: 97-98; QIU & QIAN, 2000: 1141-1142; NÚÑEZ, 2004: 314-317, fig. 114. *Laeonereis glauca* — HARTMANN-SCHRÖDER, 1971*a*: 191-192; CAMPOY, 1982: 469-470; SARDÁ, 1985: 75, table 1. *Leonnates pusillus* — LANGERHANS, 1880*a*: 279-280, pl. 14 fig. 10. *Nereis (Leptonereis) Vaillanti* — SAINT-JOSEPH, 1888: 246-253, pl. 10 figs. 113-123, pl. 11 fig. 124. *Leptonereis vaillanti* — MCINTOSH, 1910: 464, pl. 86 fig. 9-9*a*.
REFERENCES FOR PORTUGAL: SALDANHA, 1974 (as *Leptonereis glauca*; coast of Arrábida); BELLAN, 1960*a* (as *Leptonereis glauca*; Setúbal Canyon); AMOUREUX & CALVÁRIO, 1981 (Peniche); MONTEIRO-MARQUES *et al.*, 1982 (as *Leptonereis glauca*; Ponta do Surdão); MONTEIRO-MARQUES, 1987 (as *Leptonereis glauca*; continental shelf of Algarve); DEXTER, 1992 (as *Leptonereis glauca*; previous records: continental shelf of Algarve; Mira Estuary; Sado Estuary); BOAVENTURA *et al.*, 2006 (Ancão, Algarve).
DISTRIBUTION: Mediterranean Sea (France; Naples; Algeria); Adriatic Sea; Aegean Sea; Black Sea; Madeira and Canary Islands; Morocco; Bay of Biscay; English Channel; British Isles; northern Øresund; West Africa. On mud, stones, rocks, and amongst algae, ascidiae and sponges. Intertidal or shallow subtidal zone to about 1232 meters.
REMARKS: QIU & QIAN (2000) revised the type material of *Leonnates pusillus* Langerhans 1880, from Madeira Island. PETTIBONE (1971*b*) had considered *L. pusillus* as being the male heteronereidid of *W. glauca*, but QIU & QIAN (2000) found that atokous specimens were also present among Langerhans' sample. A definitive elucidation on the identity of the specimens was not possible, due to their small size, fragility and condition, but QIU & QIAN (2000) didn't find any reason for not accepting the synonymy of *L. pusillus* with *Websterinereis glauca* (Claparède 1870).

ADDENDUM

As a supporting taxonomic tool, here are presented the keys of Nereididae from the Scottish waters as created by CHAMBERS & GARWOOD (1992). Two alternative keys were provided, the first for specimens with the pharynx everted (the ideal situation), and the second for specimens without the pharynx everted, in order to avoid the dissection of the specimen. Note however than only part of the Nereididae occurring in the European waters are present in the below keys. Names have been updated.

KEY TO NEREIDIDAE WITH PHARYNX EVERTED:
(adapted from CHAMBERS & GARWOOD, 1992)

1a. Paragnaths visible only with difficulty, few in number and pale in colour; or paragnaths absent and papillae present..**2**
1b. Paragnaths well developed and present in all or almost all groups..**4**

2a (1a). Pharynx with a few pale paragnaths (easily dislodged), when present, most easily seen in group VI..***Eunereis longissima***
2b (1a). Pharynx with papillae present..**3**

3a (2b). Prostomial antennae with distinct cirrophores; anterior chaetigers characterized by dense bundles of numerous chaetae; biramous parapodia with 3 ligules; ventral cirri double............***Ceratocephale loveni***
3b (2b). Prostomial antennae without cirrophores; anterior chaetigers not bearing dense chaetal bundles; biramous parapodia with 4 ligules..***Websterinereis glauca***

4a (1b). Paragnaths in the form of numerous small elements arranged in rows (pectinate bars)..***Platynereis dumerilii***

4b (1b). Paragnaths exclusively or predominantly single cones..**5**

5a (4b). Paragnaths of group VI as single elongate bars...***Perinereis cultrifera***
5b (4b). Paragnaths of group VI conical, of varying number...**6**

6a (5b). Dorsal cirri of the first 20 parapodia much longer than the parapodial ligules...............................**7**
6b (5b). Dorsal cirri of anterior parapodia as long as or only slightly shorter than the parapodial ligules..**9**

7a (6a). Dorsal notopodial ligule becoming much wider and longer than the notopodial acicular ligule in the posterior region; usually found in gastropod shells as a commensal of hermit crabs....***Neanthes fucata***
7b (6a). Dorsal notopodial ligule of similar dimensions to the notopodial acicular ligule along the length of the body...**8**

8a (7b). Group VI composed of four large paragnaths; group VII-VIII composed of irregular rows of paragnaths decreasing in size towards the mouth...***Nereis pelagica***
8b (7b). Group VI composed of 5-9 small paragnaths in an irregular arrangement; group VII-VIII composed of a single distinct row of slightly larger paragnaths plus irregular rows of smaller ones towards the mouth..***Nereis pulsatoria***

9a (6b). Postchaetal lobes of neuropodial acicular ligules present on all parapodia; neuropodial chaetae include homogomph and heterogomph spinigers with or without heterogomph falcigers.........................**10**
9b (6b). Postchaetal lobes of neuropodial acicular ligules on anterior parapodia only; neuropodial chaetae include homogomph and heterogomph spinigers, heterogomph falcigers and stout acicular chaetae..***Hediste diversicolor***

10a (9a). Paragnaths of group VI with few paragnaths, usually one, never more than two; neuropodial chaetae above aciculum are all homogomph spinigers...***Alitta virens***
10b (9a). Paragnaths of group VI with numerous paragnaths, always more than 3; neuropodial chaetae above aciculum include homogomph spinigers and heterogomph falcigers.......................***Neanthes nubila***

KEY TO NEREIDIDAE WITHOUT PHARYNX EVERTED:

(adapted from CHAMBERS & GARWOOD, 1992)

1a. Chaetal bundles of anterior most parapodia noticeably dense; prostomial antennae and dorsal cirri arising from distinct cirrophores; biramous parapodia with only 3 ligules; ventral cirri double from chaetiger 3...***Ceratocephale loveni***
1b. Chaetal bundles of anterior most parapodia no more dense than those of other parapodia; prostomial antennae and dorsal cirri not arising from cirrophores; biramous parapodia with 4 ligules; ventral cirri always single..**2**

2a (1b). Dorsal cirri of anterior parapodia extending well beyond the parapodial ligules...........................**3**
2b (1b). Dorsal cirri of anterior parapodia shorter than or as long as parapodial ligules.............................**6**

3a (2a). Ligules of parapodia of chaetigers 5-9 reduced to low mounds in contrast to those of other parapodia, which have well developed ligules; tentacular cirri long extending back to chaetiger 16...***Platynereis dumerilii***
3b (2a). Ligules of parapodia of chaetigers 5-9 not markedly different from those of other anterior parapodia...**4**

4a (3b). Dorsal notopodial ligules of mid-body and posterior chaetigers much wider and longer than notopodial acicular ligules; commensal with hermit crabs...***Neanthes fucata***
4b (3b). Dorsal notopodial ligules of similar dimensions to notopodial acicular ligules; free living...........**5**

5a (4b). Ligules of anterior parapodia relatively short and rounded; usually found intertidally..***Nereis pelagica***
5b (4b). Ligules of anterior parapodia more pointed; usually found subtidally................***Nereis pulsatoria***

6a (2b). Notopodial acicular ligule distinctly bilobed in anterior chaetigers..**7**
6b (2b). Notopodial acicular ligule never bilobed...***Eunereis longissima***

7a (6a). Parapodia of chaetigers 1 and 2 with a proeminent lobe behind the chaetae on the acicular ligule..**8**
7b (6a). Parapodia of chaetigers 1 and 2 without a lobe behind the chaetae on the acicular ligule...***Perinereis cultrifera***

8a (7a). Parapodia of anterior chaetigers with low rounded ligules, contrasting with the elongate ligules of mid-body parapodia..***Neanthes nubila***
8b (7a). Parapodia of anterior chaetigers with ligules not differing markedly from those of the mid-body..**9**

9a (8b). Maximum body size 35 mm for 60 chaetigers; no paragnaths; living in fully marine conditions...***Websterinereis glauca***
9b (8b). Body size usually greatly exceeding 35 mm, with more than 70 chaetigers; prominent paragnaths present; living in areas of reduced or variable salinity..**10**

10a (9b). Neuropodial acicular ligule with distinct post-chaetal lobe on all chaetigers; dorsal notopodial ligule large and flattened; all chaetae compound...***Alitta virens***
10b (9b). Neuropodial acicular ligule with distinct post-chaetal lobe on anterior chaetigers only; dorsal notopodial ligule not markedly larger than notopodial acicular ligule; stout simple chaetae (fused falciger); accompanying compound chaetae in posterior neuropodia...........................***Hediste diversicolor***

FAMILY **NERILLIDAE** Levinsen 1883

AS: *NERILLIDAE* LEVINSEN, 1883: 250.

TYPE GENUS: *Nerilla* E.O. Schmidt 1848.

REMARKS: The family Nerillidae includes at present 46 species and 1 subspecies, in 15 genera, 8 of which monotypic. From these, 13 genera and 31 species are present in European and nearby waters, both marine and continental. Two species are known but were not formally described yet.

Two of the most important recent publications on the systematics and taxonomy of Nerillidae are WORSAAE (2005*b*) and WESTHEIDE (2008). WORSAAE (2005*b*) performed a preliminary phylogenetic analysis of all the described taxa, plus 2 undescribed species, using morphological characters, and presented an emended diagnosis of the family, a key to genera, and a detailed account on the valid genera. Three genera were synonymised and four new combinations made. The publication by WESTHEIDE (2008) is the second edition of the work originally published in 1990 (WESTHEIDE, 1990). It is a detailed taxonomic account on the Nerillidae occurring in the British and North European waters, but many of the species treated there can also occur in Southern Europe. The publication includes numerous keys and descriptions, and is profusely illustrated.

The Nerillidae has been the subject of many studies in the last years, and in addition to the abovementioned publications, there are other recent important contributions to the knowledge of the family. Papers with the description of new taxa include SAPHONOV & TZETLIN (1988, 1997), TZETLIN & LARIONOV (1988), TZETLIN & SAPHONOV (1992), WESTHEIDE & PURSCHKE (1996), NÚÑEZ, OCAÑA & BRITO (1997), SKULARI (1997), MÜLLER, BERNHARD & JOUIN-TOULMOND (2001), MÜLLER (2002), WORSAAE & KRISTENSEN (2003), WORSAAE, STERRER & ILIFFE (2004), or WORSAAE, MARTÍNEZ & NÚÑEZ (2009), while new records of already known taxa can be find, for instance, at BAILEY-BROCK (1999), MORSELLI, MARI & SARTO (1995), SÄRKKÄ & MÄKELÄ (1998), or SAMBUGAR (2005), referring the last three to new records of *Troglochætus beranecki* Delachaux 1921 in European continental waters. On the other hand, SCHMIDT & WESTHEIDE (1998) used molecular methods to confirm the distinction between three morphologically similar species of *Nerilla*, described previously. MÜLLER, BERNHARD & JOUIN-TOULMOND (2001) included a comparative table with the main characters of the hitherto 16 described genera of Nerillidae, and WORSAAE, STERRER & ILIFFE (2004) a table comparing the new genus *Longipalpa* with 6 relevant genera, while an update of the systematics and evolution of the group is given in WORSAAE & KRISTENSEN (2005).

The phyllogenetic position of the Nerillidae among the polychaetes was analysed in WORSAAE *et al.* (2005), while the phyllogeny of the family was studied by WORSAAE (2005*a*), based on morphological, molecular, and combined data of 13 nerillid species from 11 genera. This last study showed that some characters normally used in generic diagnoses of the Nerillidae, such as the number of antennae and the presence or absence of compound chaetae, may have less systematic importance than what was previously thought, corroborating previous observations by TENERELLI (1967). On the other hand, characters as the shape of the appendages, ciliation patterns, and numbers and distribution of gonoducts, were shown by WORSAAE (2005*a*) to contain systematic information. WORSAAE (2005*a*) also found well-supported sister group relationships, some of which indicated a need for the revision and possible synonymization of several genera, which was done in WORSAAE (2005*b*).

KEY TO GENERA:

(from WORSAAE, 2005*b*)

REMARKS: From the actual 15 genera of Nerillidae considered to be valid by WORSAEE (2005*b*), only one is not known to be present in the European waters. For this reason, all 15 genera are maintained in the following key, as originally published by WORSAAE (2005*b*). *Longipalpa* Worsaae, Sterrer & Iliffe 2004 is so far only known from caves in Bermuda and Yucatan (Mexico) (WORSAAE, 2005*b*).

1a. Nine body segments..**2**
1b. Seven or eight body segments...**5**

2a (1a). Compound chaetae...**3**
2b (1a). Capillary chaetae...**4**

3a (2a). Double interramal cirri...***Leptonerilla***

3b (2a). Single interramal cirri..***Mesonerilla***

4a (2b). Antennae, pygidial cirri, and interramal cirri on segment 1 annulated..................................***Nerilla***
4b (2b). No annulated appendages...***Meganerilla***

5a (1b). Eight body segments..**6**
5b (1b). Seven body segments...**13**

6a (5a). Compound chaetae present..**7**
6b (5a). Compound chaetae absent...**10**

7a (6a). Compound chaetae in all chaetigers..**8**
7b (6a). Compound chaetae in middle chaetigers only...***Nerillidopsis***

8a (7a). Three antennae...**9**
8b (7a). No antennae..***Thalassochaetus***

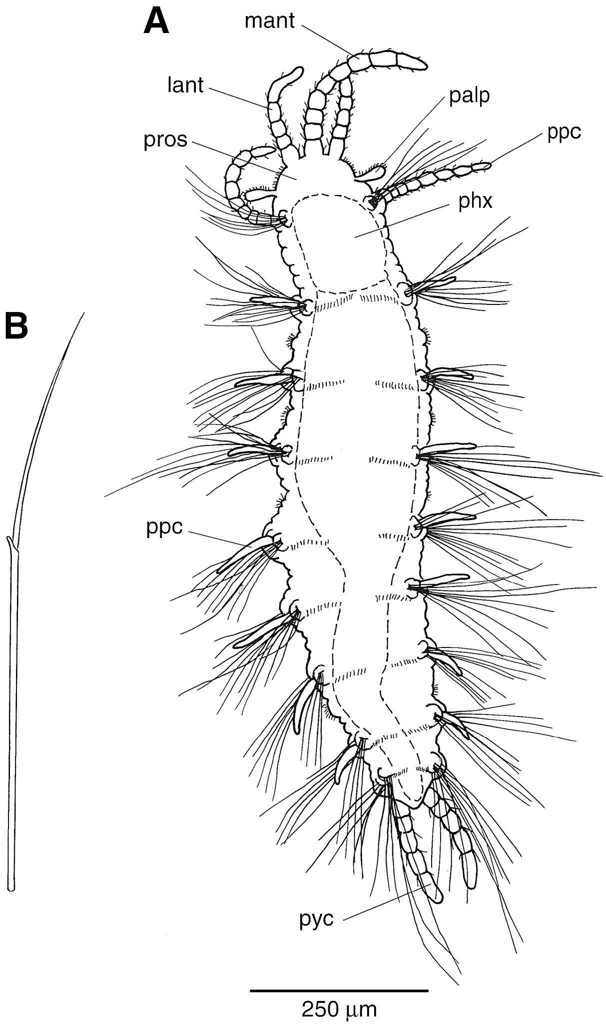

Figure legend: Family Nerillidae. **A**, *Nerilla* specimen, entire animal, dorsal view. **B**, *Mesonerilla* specimen, compound chaeta. **lant**, lateral antenna; **mant**, median antenna; **palp**, palp; **phx**, pharynx; **ppc**, parapodial cirrus; **pros**, prostomium; **pyc**, pygidial cirrus. (Adapted from BEESLEY, ROSS & GLASBY, 2000; drawings by A. Murray).

9a (8a). Antenna longer than prostomial width..***Micronerilla***
9b (8a). Antennae shorter than prostomial width, palps equals body length; [not known from European waters]...***Longipalpa***

10a (6b). Antennae present..**11**
10b (6b). Antennae absent...**12**

11a (10a). Three antennae..***Trochonerilla***
11b (10a). Two lateral antennae..***Nerillidium***

12a (10b). Palps present..***Troglochaetus***
12b (10b). Palps absent..***Afronerilla***

13a (5b). Compound chaetae...**14**
13b (5b). Capillary chaetae...***Psammoriedlia***

14a (13a). Three wrinkled antennae..***Aristonerilla***
14b (13a). No antennae or palps, prostomial lateral horns present..***Paranerilla***

GENUS *Afronerilla* Faubel 1978

Afronerilla FAUBEL, 1978: 259.
TYPE SPECIES: *Afronerilla hartwigi* Faubel 1978.

Afronerilla hartwigi Faubel 1978

Afronerilla hartwigi FAUBEL, 1978: 259-260, figs. 2-3.
TYPE LOCALITY: Sublittoral coast of Mauritania, NW Africa (25º52.5'N, 15º58'W), at 20-30 meters.
DISTRIBUTION: Known from the type locality.

GENUS *Aristonerilla* Müller 2002

Aristonerilla MÜLLER, 2002: 132.
TYPE SPECIES: *Micronerilla brevis* Saphonov & Tzetlin 1997.

Aristonerilla brevis (Saphonov & Tzetlin 1997)

Micronerilla brevis SAPHONOV & TZETLIN, 1997: 219-221, figs. 2-3.
TYPE LOCALITY: Karelian shore of the White Sea, Kandalaksha Bay, Velikaja Salma Strait (66º33'N, 33º08'E), between 16-20 meters, in coarse shelly sediments.
SELECTED REFERENCES: *Aristonerilla brevis* — MÜLLER, 2002: 132-133, figs. 1-3, table 1; WESTHEIDE, 2008: 92.
DISTRIBUTION: Karelian shore of the White Sea, Kandalaksha Bay, Velikaja Salma Strait, between 12-20 meters, in coarse shelly sediments. Also found in the organic-filter system of a marine aquarium in the AquaZoo (Düsseldorf, Germany), which is a mixture of coral sand imported from the Pacific and shell fragments from the Bay of Brest (France).
REMARKS: MÜLLER (2002) identified the specimens found at the Düsseldorf aquarium as *Aristonerilla brevis* (Saphonov & Tzetlin 1997), in spite of finding some differences. These different characters of the Düsseldorf specimens in relation to the White Sea population are: 1) no buccal elements (against 2 pairs of buccal pieces); 2) red eyes (against colourless); 3) enteronephridia present only in the hindgut (against presence in the midgut and hindgut); 4) some morphometric differences; 5) different environmental conditions. According to MÜLLER (2002), morphometric differences as well as the differences in the eye-structure are not significant, while the structure of the pharyngeal organ and the distribution of the enteronephridia require detailed studies using TEM microscopy of specimens of both populations. This way, MÜLLER (2002) considered, for the moment, both populations as belonging to the same species, stating that the question could be solved by means of DNA studies.

GENUS ***Leptonerilla*** Westheide & Purschke 1996

Leptonerilla WESTHEIDE & PURSCHKE, 1996: 586.
TYPE SPECIES: *Leptonerilla diplocirrata* Westheide & Purschke 1996.

Leptonerilla diatomeophaga (Núñez *in* Núñez, Ocaña & Brito 1997)

Mesonerilla diatomeophaga — NÚÑEZ *in* NÚÑEZ, OCAÑA & BRITO, 1997: 256, fig. 4.

TYPE LOCALITY: Natural lagoon of the Jameos del Agua, Corona lava tube, Lanzarote (Canary Islands), in a carpet of diatoms on lapilli, at 0.5-2 meters.

SELECTED REFERENCES: *Leptonerilla diatomeophaga* — WORSAAE, MARTÍNEZ & NÚÑEZ, 2009: 197-198, figs. 1-2, table 1.

DISTRIBUTION: Canary Islands: Jameos del Agua, Corona lava tube, Lanzarote Island, in a carpet of diatoms on lapilli, at 0.5-2 meters; Agua Dulce marine cave, Los Abrigos (El Médano), Tenerife Island, from the sponge *Neophrissospongia nolitangere* (Schmidt 1870), 10 meters. Selvagem Pequena, Selvagens Archipelago (Portugal), in maërl, at 16 meters.

GENUS ***Meganerilla*** Boaden 1961

Meganerilla BOADEN, 1961: 556.
TYPE SPECIES: *Meganerilla swedmarki* Boaden 1961.
SYNONYMS: *Xenonerilla* Müller, Bernhard & Jouin-Toulmond 2001.

KEY TO SPECIES:

(adapted from WESTHEIDE, 1990)

1a. With small median antenna; eyes lacking..***M. clavata***
1b. Without antennae...**2**

2a (1b). Ventral conical lobe with few terminal cilia present on each parapodium of segments 2-8; chaetae serrated; eyes absent; maximum length 1005 µm..***M. cesari***
2b (1b). Parapodia without ventral conical lobes; chaetae smooth (?); usually with two eyes; maximum length 2100 µm...***M. swedmarki***

Meganerilla cesari Worsaae, Martínez & Núñez 2009

Meganerilla cesari WORSAAE, MARTÍNEZ & NÚÑEZ, 2009: 202-206, figs. 1, 6-8, tables 1-2.

TYPE LOCALITY: Montaña de Arena, the Corona lava tube, 29º09.43'N, 13º25.51'W, Lanzarote (Canary Islands), calcareous sand accumulation at 40 meters depth.

DISTRIBUTION: Known from the type locality.

Meganerilla clavata Magagnini 1966

Meganerilla clavata MAGAGNINI, 1966: 331-333, fig. 1, table.

TYPE LOCALITY: Bloscon (near Roscoff), at 15-20 meters, in *Amphioxus*-sand.

SELECTED REFERENCES: *Meganerilla clavata* — JOUIN, 1967*b*: 152-153; JOUIN, 1968*a*: 45-48, figs. 6-7, table 1; JOUIN *in* CABIOCH, L'HARDY & RULLIER, 1968: 8; WESTHEIDE, 1990: 78, fig. 23; WESTHEIDE, 2008: 88, fig. 53; WORSAAE, MARTÍNEZ & NÚÑEZ, 2009: table 2.

DISTRIBUTION: Roscoff area (Térénès, Bloscon, and Primel), Northern France (English Channel). In coarse sand and *Amphioxus* sand. Between 10-20 meters.

Meganerilla swedmarki Boaden 1961

Meganerilla swedmarki BOADEN, 1961: 553-556, figs. 1-3.

TYPE LOCALITY: Bonden Island (West Sweden, Skagerrak), in marine coarse shell-gravel deposits, rich in organic debris, between 8-22 meters.

SELECTED REFERENCES: *Meganerilla swedmarki* — MAGAGNINI, 1966: table; WESTHEIDE, 1990: 80, fig. 24; HARTMANN-SCHRÖDER, 1996: 586; KIRKEGAARD, 1996: 243-245, fig. 130; SAPHONOV & TZETLIN, 1997: 221-223, fig. 4*A*; WESTHEIDE, 2008: 90, figs. 52, 54; WORSAAE, MARTÍNEZ & NÚÑEZ, 2009: table 2.
DISTRIBUTION: North Sea (Southeastern Scotland, near Dunbar); Skagerrak (West coast of Sweden, near Gullmarfjord); White Sea (Kandalaksha Bay, Velikaja Salma Strait); Arctic Ocean; Disko Island, West Greenland. In sandy bottoms. Intertidal area down to 22 meters.

GENUS ***Mesonerilla*** Remane 1949

Mesonerilla REMANE, 1949: 45.
TYPE SPECIES: *Mesonerilla lüderitzi* Remane 1949.
REMARKS: TENERELLI (1967) discussed the validity of certain characters used to define species in the genus *Mesonerilla*, as the number and size of the antennae, and the presence or absence of chaetae on the oral segment (see *REMARKS* section under *Mesonerilla intermedia*). As these characters were shown to vary inside the same population, it is recommended to assure that descriptions of new taxa are based on fully developed specimens, and also that morphological differences found inside that population are as well described. This variability can difficult the identification of not fully developed specimens.

KEY TO SPECIES:
(adapted from WESTHEIDE, 1990)

1a. Buccal segment achaetous..**2**
1b. Buccal segment with chaetae..**3**

2a (1a). Chaetae of identical size and shape in all chaetigers; anal cirri inflated..................***M. armoricana***
2b (1a). Chaetae in segments 5-9 of different size; anal cirri not strikingly inflated.................***M. roscovita***

3a (1b). With two antennae..***M. biantennata***
3b (1b). With three antennae..**4**

4a (3b). Buccal cirri of similar length as following, but broader......................................***Mesonerilla* sp. 2**
4b (3b). Buccal cirri shorter than following ones..**5**

5a (4b). Buccal cirri short and cylindrical; dorsal hood can be present on posterior segments...................**6**
5b (4b). Buccal cirri very short, bead-like; cirri of remainder parapodia shorter than chaetae; last segment without a dorsal hood; hermaphroditic..***M. fagei***

6a (5b). Buccal cirri 0.3-0.5 as long as cirri of segment 2; cirri of remainder parapodia as long as chaetae; gonochoristic; females with conspicuous dorsal hood on last segment (segment 9); large rounded esophageal glands in segment 2 and parapodial glandular areas in segments 3-6 not present, or at least not described..***M. intermedia***
6b (5b). Buccal cirri shorter than above; all cirri shorter than chaetae; reproduction unknown or not described; dorsal brooding hood with ciliated rim at segment 8 observed on 3 specimens; large rounded esophageal glands in segment 2; parapodial glandular areas in segments 3-6..................***Mesonerilla* sp. 1**

Mesonerilla armoricana Swedmark 1959

Mesonerilla armoricana SWEDMARK, 1959: 35, fig. 5, plate 1 fig. *D*.
TYPE LOCALITY: Bloscon (Roscoff), in *Amphioxus*-sand, at 15-20 meters.
SELECTED REFERENCES: *Mesonerilla armoricana* — JOUIN, 1967*b*: 150-151; JOUIN, 1968*a*: 32-37, table 1; JOUIN *in* CABIOCH, L'HARDY & RULLIER, 1968: 8; WESTHEIDE, 1990: 58, fig. 13; WESTHEIDE, 2008: 66, fig. 37; WORSAAE, MARTÍNEZ & NÚÑEZ, 2009: 198-199, figs. 1, 3, table 1.
DISTRIBUTION: Roscoff area (English Channel); Portaferry (Irish Sea). In coarse sand. Between 10-20 meters. Montaña de Arena, the Corona lava tube, on calcareous sand accumulation at 40 meters depth, Lanzarote, Canary Islands. Off Tenerife (Canary Islands), in coarse sand and sandy patches between rocks, 10-25 meters.

Mesonerilla biantennata Jouin 1963

Mesonerilla biantennata JOUIN, 1963: 4057-4059, figs. *A-C*.

TYPE LOCALITY: Baie de Morlaix (Roscoff region), at the Rater dune, at 20 meters, in sand, and also near Térénez (Roscoff region), in coarse sand, just below the low level of spring tides.

SELECTED REFERENCES: *Mesonerilla biantennata* — JOUIN, 1967*b*: 152; JOUIN, 1968*a*: 41-45, figs. 4-5, table 1; JOUIN *in* CABIOCH, L'HARDY & RULLIER, 1968: 8; WESTHEIDE, 1990: 62, fig. 15; WESTHEIDE, 2008: 70, fig. 39.

DISTRIBUTION: Roscoff area (English Channel). In coarse sand. From low tide to about 20 meters.

Mesonerilla fagei Swedmark 1959

Mesonerilla fagei SWEDMARK, 1959: 37, figs. 3*D*, 6, plate 1 fig. *E*.

TYPE LOCALITY: Bloscon (Roscoff), in *Amphioxus*-sand, at 15-20 meters.

SELECTED REFERENCES: *Mesonerilla fagei* — JOUIN, 1967*b*: 150-151; JOUIN, 1968*a*: 32-37, fig. 2, table 1; JOUIN *in* CABIOCH, L'HARDY & RULLIER, 1968: 8; WESTHEIDE, 1990: 60, fig. 14; BAILEY-BROCK, 1999: 301-303, fig. 2; WESTHEIDE, 2008: 68, fig. 38.

DISTRIBUTION: Roscoff area (English Channel); Portaferry (Irish Sea); O'ahu Island, Hawai'i. In coarse sand. Between 10-20 meters.

Mesonerilla intermedia Wilke 1953

Mesonerilla intermedia WILKE, 1953: 211-215, figs. 1-2, table in page 213.

TYPE LOCALITY: Cape Posillipo, Bay of Naples, between a riff of rocks and the coast, in a coarse bottom with small stones and fragments of shells, at 2 meters.

SELECTED REFERENCES: *Mesonerilla intermedia* — JOUIN, 1967*b*: 151-152; TENERELLI, 1967: 271-276, figs. 1-7; JOUIN, 1968*a*: 37-41, fig. 3, table 1; WESTHEIDE, 1990: 54, figs. 3A, 11; WESTHEIDE, 2008: 62, fig. 35.

DISTRIBUTION: Mediterranean Sea (Bay of Naples); near Roscoff and Isles of Scilly, English Channel; east coast of North America (Massachusetts). In coarse and gravelly sand. From low water line to about 5 meters.

REMARKS: WESTHEIDE (1990, 2008) pointed to the necessity of revising the specific status of the three known populations of the species, as the Scilly Islands specimens show shorter and stronger antennae and cirri, with their brood hood having a conical outer posterior margin.

TENERELLI (1967), while studing a population of *M. intermedia* from the Gulf of Catania, in Italy, remarked the existence of morphological differences among the individuals. These differences concerned mainly the number and length of the antennae and the presence or absence of chaetae on the oral segment. When those specimens were reared, TENERELLI (1967) remarked that after some days all of them had developed the chaetae on the oral segment and three well developed antennae. Based on these results TENERELLI (1967) questioned the validity of the species *Mesonerilla roscovita*, *M. fagei*, and *M. biantennata*, whose distinction from *M. intermedia* is based on the number and length of the antennae and on the presence or absence of chaetae on the oral segment, and suggested the synonymy of those three species with *Mesonerilla intermedia*. However, the same author highlighted the necessity to rear some specimens of each one of these three species before synonymizing them, in order to assure that the distinctive characters of each one of them are not stable. However, the possible synonymy between the four species was not supported by the studies of WORSAAE (2005*a*, 2005*b*), according to which the genus *Mesonerilla* appears to be polyphyletic, and while *M. roscovita* is not the sister group of *M. intermedia*, *M. biantennata* branches off more basally than the other studied *Mesonerilla*, in the analyses with implied weighting. All four species were considered as being valid by WORSAAE (2005*b*).

Mesonerilla roscovita Lévi 1953

Mesonerilla roscovita LÉVI, 1953: 65-68, figs. 1-2.

TYPE LOCALITY: Roscoff, just in the border of the turret of Duslen, in a narrow pocket of coarse sand, at shallow water.

SELECTED REFERENCES: *Mesonerilla roscovita* — SWEDMARK, 1959: 34-35, figs. 1*b-c*, 3*C*, plate 1 fig. *F*; JOUIN, 1967*b*: 150-151; JOUIN, 1968*a*: 32-37, fig. 1, table 1; JOUIN *in* CABIOCH, L'HARDY & RULLIER, 1968: 8; WESTHEIDE, 1990: 56, fig. 12; WESTHEIDE, 2008: 64, fig. 36.

DISTRIBUTION: Roscoff area (English Channel); Portaferry (Irish Sea). In coarse sand, *Amphioxus*-sand, and shelly bottoms. Between 15-65 meters

Mesonerilla sp. 1

Mesonerilla sp. 1 WORSAAE, MARTÍNEZ & NÚÑEZ, 2009: 199-200, figs. 1, 4, table 1.
DISTRIBUTION: Interstitially in all sections of the Corona lava tunnel, Lanzarote (Canary Islands), from lapilli patches in Cueva de los Lagos (2-3 meters) and Jameos del Agua anchialine lagoon (9 meters), and from coarse calcareous sand in Montaña de Arena, Túnel de la Atlántida (40 meters).

Mesonerilla sp. 2

Mesonerilla sp. 2 WORSAAE, MARTÍNEZ & NÚÑEZ, 2009: 200-201, figs. 1, 5, table 1.
DISTRIBUTION: Corona lava tunnel, Lanzarote (Canary Islands), Montaña de Arena, túnel de la Atlántida, calcareous sand accumulation, 40 meters.

GENUS *Micronerilla* Jouin 1970

Micronerilla JOUIN, 1970*c*: 182.
TYPE SPECIES: *Micronerilla cirrata* Jouin 1970.

Micronerilla minuta (Swedmark 1959)

Mesonerilla minuta SWEDMARK, 1959: 37-40, fig. 7, plate 1 fig. *C*.
TYPE LOCALITY: Baie de Camaret (Finistère, Bretagne, France), in dead *Lithothamnium calcareum* sediment, at 15-20 meters.
SYNONYMS: *Micronerilla cirrata* Jouin 1970.
SELECTED REFERENCES: *Micronerilla minuta* — WESTHEIDE, 1990: 64, fig. 16; MÜLLER, 2002: table 1; WESTHEIDE, 2008: 72, fig. 40. *Micronerilla cirrata* — JOUIN, 1970*c*: 182.
DISTRIBUTION: Known from the type locality.

GENUS *Nerilla* E.O. Schmidt 1848

Nerilla E.O. SCHMIDT, 1848: 38-40.
TYPE SPECIES: *Nerilla antennata* E.O. Schmidt 1848.
SYNONYMS: *Dujardinea* Quatrefages 1866.
REMARKS: According to WESTHEIDE (1990) and WORSAAE (2005*b*), the taxonomy of the genus *Nerilla* is unsatisfactory and needs to be revised, as most species are distinguished by morphometric and meristic differences. In what concerns the species recorded in Europe, there is no consensus about the validity of *N. mediterranea*, being sometimes considered as a subspecies of *N. antennata* (*e.g.* REMANE, 1932), or only as a variation of the main species (*e.g.* FAUVEL, 1927*a*). In addition, in the paper by SCHLIEPER (1925) where *Nerilla mediterranea* is described, the drawing of figure 2, which represents a picture of the new species according to GOODRICH (1912), was interchanged with the drawing of figure 3, representing a picture of *Nerilla rotifera* according to QUATREFAGES (1866*b*), which added a certain dosis of confusion to the matter. Moreover, there are intermediate forms between the two described species, which have been proposed to represent *N. inopinata*, a species described from the Pacific coast of the U.S.A. (GRAY, 1968). Other two species described from Europe, *N. stygicola* Ax 1957 and *N. marginalis* Tilzer 1970 differ from each other and from the previously referred species mainly with base on characters like length of appendages. The appendages' length seems to be a poor taxonomic character in *Nerilla*, as it is subject to variation due, for instance, contraction during the preservation process (BAILEY-BROCK, 1999). *Dujardinia rotifera* Quatrefages 1866, still another species described from Europe, has been also considered to be a possible synonym of *N. antennata*. Its identity is mainly based on its remarkable size, but this big size could be the consequence of an error of scale, and the species, instead of being 8-10mm long, would be 0.8-1mm, which is the normal size in the genus. SCHMIDT & WESTHEIDE (1998), by means of molecular techniques, showed that besides the described slight differences in the morphological characters, studied populations of *N. antennata* Schmidt 1848 from the North Sea, *N. mediterranea* Schlieper 1925 from the Atlantic coast of Spain and the Mediterranean coast of Italy, and *N. inopinata* Gray 1968 from the Pacific coast of USA and the Chinese coast of the Strait of Taiwan, were also clearly distinct genetically.

KEY TO SPECIES:

1a. Antennae short, with few segments; first pair of cirri shorter or of about the same length than the cirri of the following segments; second pair of cirri shorter than the chaetae of the same segment; anal cirri shorter than chaetae of chaetiger 9; chaetiger 1 with 1-3 chaetae per parapodium; following chaetigers with about 8 chaetae per parapodium (from AX, 1957: figs. 1-2)..***N. stygicola***
1b. Antennae long, with many segments...**2**

2a (1b). First pair of cirri (chaetiger 1) only slightly longer than those of the following segment (chaetiger 2); cirri of the second chaetiger as long as, or longer than, the chaetae of the same segment; anal cirri longer than chaetae of chaetiger 9; chaetiger 1 with 4-6 chaetae per parapodium; following chaetigers with about 10-16 chaetae per parapodium...***N. mediterranea***
2b (1b). First pair of cirri (chaetiger 1) twice as long as the cirri of the following segment (chaetiger 2); cirri of the second chaetiger always shorter than the chaetae of the same segment.....................................**3**

3a (2b). Eyes absent; interramal cirri after chaetiger 1 of about the same length than segment width; anal cirri longer than chaetae of chaetiger 9...***N. taurica***
3b (2b). Eyes present, as a double pair...**4**

4a (3b). Interramal cirri after chaetiger 1 shorter than segment width; anal cirri as long as, or longer than chaetae of chaetiger 9; chaetiger 1 with 6-9 chaetae per parapodium; following chaetigers with about 9-16 chaetae per parapodium..***N. antennata***
4b (3b). Interramal cirri after chaetiger 1 of about the same length than segment width; anal cirri shorter than chaetae of chaetiger 9; chaetiger 1 with 3-8 chaetae per parapodium; following chaetigers with 4-7 chaetae per parapodium (from TILZNER, 1970: fig. 1*a*)...***N. marginalis***

Nerilla antennata E.O. Schmidt 1848

Nerilla antennata E.O. SCHMIDT, 1848: 38-40, pl. 3 fig. 8.

TYPE LOCALITY: Faroe Islands.

SYNONYMS: *Dujardinea rotifera* Quatrefages 1866; *Dujardinia rotifera suchumica* Czerniavsky 1881.

SELECTED REFERENCES: *Nerilla antennata* — CLAPARÈDE, 1863: 48-50, pl. 12 figs. 16-20; BEAUCHAMP, 1910*b*: 13-21, figs. 1-3; SOUTHERN, 1914: 16; SCHLIEPER, 1925: 229-230, 233, figs. 1, 4; FAUVEL, 1927*a*: 434-435, fig. 146*a-b* [in part; not "varieté *mediterranea*" = *Nerilla mediterranea* (Schlieper 1925)]; REMANE, 1932: 27, figs. 4, 9; REMANE, 1949: 48-49; SWEDMARK, 1959: 28-29; JOUIN, 1968*a*: 48, table 1; JOUIN *in* CABIOCH, L'HARDY & RULLIER, 1968: 7; TILZER, 1970: table 1; HAMOND, 1972: 342; E. RASMUSSEN, 1973: 59, fig. 15; GELDER, 1974: 631-637, 638-640, figure in page 632, table; WESTHEIDE, 1990: 50-52, fig. 10; HARTMANN-SCHRÖDER, 1996: 587-588, fig. 287; KIRKEGAARD, 1996: 245-246, fig. 131; [?] BAILEY-BROCK, 1999: 300-301, fig. 1; WESTHEIDE, 2008: 56-59, fig. 29. *Nerilla rotifera* — SCHLIEPER, 1925: 231-232, 233, fig. 3 [drawing interchanged with fig. 2]. *Nerilla mediterranea* [not Schlieper 1925] — TENERELLI, 1964: 230-231, pl. 1 fig. 2. *Nerilla rotifera* — GELDER, 1974: 631, 638, figure in page 632, table. *Dujardinea rotifera* — QUATREFAGES, 1866*b*: 67. *Dujardinia rotifera suchumica* — CZERNIAVSKY, 1881*b*: 385.

DISTRIBUTION: Faroe Islands; Baltic Sea; North Sea; Roscoff area (English Channel); Ireland and Irish Sea; Mediterranean Sea; Black Sea; Puget Sound, North Pacific; Lüderitz Bay, Namibia; SE Atlantic; India; [?] O'ahu Island (Hawai'i). In intertidal sands. Also found in sands of marine aquaria, in the layer of debris which covers the bottom of seawater tanks (WESTHEIDE, 1990).

REMARKS: *Dujardinia rotifera* Quatrefages 1866 was described from the French coast of the English Channel. It was described as being 8-10 mm long, which is a considerable size for a *Nerilla*, and was never found again or redescribed. FAUVEL (1927*a*) considered it as a synonymy of *N. antennata*, while WESTHEIDE (1990) refers that its specific identity is based only on its considerable size. It is possible that there was an error of scale in the original description, being the real length of the species 0.8-1 mm.

TENERELLI (1964) identified as *Nerilla mediterranea* numerous specimens collected in the infralittoral coarse sand at Brucoli (Gulf of Catania, Italy), distinguishing them from *N. antennata*. He also commented the difficulty in knowing if this last species is also present in the Mediterranean Sea, due to the lack of consensus between authors on if both species are valid or if *N. mediterranea* is only a variety of *N. antennata*. However, the specimen pictured by TENERELLI (1964: plate 1 fig. 2) seems to represent a specimen of *N. antennata*, with the first pair of cirri more than twice longer than the following one, and with the cirri of the second chaetiger shorter than the chaetae of the same segment. Besides, it is also possible to observe that chaetae are numerous, being apparently more than 6 per parapodia.

Specimens from Hawai'i were stated to be different from the description of *N. antennata* in having smooth chaetae on chaetiger 1 (BAILEY-BROCK, 1999), and considered to belong probably to a separate species, resembling the North Pacific species *Nerilla inopinata* Gray 1968 (W. WESTHEIDE, pers. comm. *in* BAILEY-BROCK, 1999).

Nerilla marginalis Tilzer 1970

Nerilla marginalis TILZER, 1970: 221-225, fig. 1, table 1.

TYPE LOCALITY: "Pozzo di Vestre", a marine influenced marginal cave, near Rovinj, Istra (= Istria), Croatia.

SELECTED REFERENCES: *Nerilla marginalis* — GELDER, 1974: 632, 638, figure in page 632, table.

DISTRIBUTION: Known from the type locality.

Nerilla mediterranea Schlieper 1925

Nerilla mediterranea SCHLIEPER, 1925: 230-231,233, fig. 2 [drawing interchanged with fig. 3].

TYPE LOCALITY: Collected in a sea water tank of the Stazione Zoologica, at Naples.

SELECTED REFERENCES: *Nerilla mediterranea* — GELDER, 1974: 631, 637-638, figure in page 632, table; JOUIN, 1968*a*: table 1; TILZER, 1970: table 1. *Nerilla antennata mediterranea* — REMANE, 1932: 27. *Nerilla antennata* Var. *mediterranea* — FAUVEL, 1927*a*: 434, fig. 146*c-f*. *Nerilla antennata* [not O. Schmidt 1848] — GOODRICH, 1912: 398-417, plates 38-41.

DISTRIBUTION: Mediterranean Sea; NE Atlantic; Brazil.

REMARKS: In addition to the length of the tentacular and following cirri as a distinctive character between *N. mediterranea* and *N. antennata*, WIESER (1957: key in page 280) added the distribution of the lateral cilia between the parapodia. According to WIESER (1957), in *N. mediterranea* there is always only one lateral tuft of cilia between the parapodia, while in *N. antennata* most segments carry two to four tufts.

Nerilla stygicola Ax 1957

Nerilla stygicola AX, 1957: 65-68, figs. 1-2.

TYPE LOCALITY: Asiatic bank of the Bosphorus, close to Poyrazköy, near the Black Sea (Turkey), in the interstitial coastal water, 1.5 meters above the water line, 40 cm below the surface of a sediment of coarse sand and gravel, in a salinity of 11.2‰.

SELECTED REFERENCES: *Nerilla stygicola* — TILZER, 1970: table 1; GELDER, 1974: 632, 638-639, figure in page 632, table.

DISTRIBUTION: Known from the type locality.

Nerilla taurica Skulari 1997

Nerilla taurica SKULARI, 1997: 71-73, figs. 1-3.

TYPE LOCALITY: Sevastopol (Ukraine), in the Black Sea.

DISTRIBUTION: Known from the type locality.

GENUS ***Nerillidium*** Remane 1925

Nerillidium REMANE, 1925: 17.

TYPE SPECIES: *Nerillidium gracile* Remane 1925.

SYNONYMS: *Bathynerilla* Faubel 1978; *Akessoniella* Tzetlin & Larionov 1988.

KEY TO SPECIES:

(from WESTHEIDE, 2008)

1a. Parapodial cirri absent on chaetigers 1 and 8..**2**
1b. Parapodial cirri present on all segments..***N. marinum***

2a (1a). Antennae considerably longer than palps..**3**

2b (1a). Antennae and palps of nearly the same length..***N. mediterraneum***

3a (2a). Body of same width in anterior and posterior segments; parapodial cirri elongate, club-shaped...***N. troglochaetoides***
3b (2a). Body increasing in width posteriorly; parapodial cirri short and ovoid..........................***N. gracile***

Nerillidium gracile Remane 1925

Nerillidium gracile Remane, 1925: 17, fig. 3.
Type locality: Helgoland (North Sea, Germany).
Selected references: *Nerillidium gracile* — Fauvel, 1927*a*: 437, fig. 148*c*; Remane, 1932: 27, fig. 24; Swedmark, 1959: 29-31, figs. 1*a*, 2*a*, 3*A*, plate 1 fig. *B*; Jouin, 1967*a*: 102-108, fig. 5; Jouin, 1968*a*: table 1; Jouin *in* Cabioch, L'Hardy & Rullier, 1968: 7; von Nordheim, 1984: 12, 16-18, figs. 4*D*, 7*C*, table 4; Westheide, 1990: 68, fig. 18; Hartmann-Schröder, 1996: 588-589, fig. 288; Kirkegaard, 1996: 246-247, fig. 132; Saphonov & Tzetlin, 1997: 223, fig. 4*B*; Westheide, 2008: 78, fig. 47.
Distribution: Helgoland (North Sea); Roscoff coast (English Channel); Portaferry (Irish Sea); Tromsø (Northern Norway); Velikaja Salma Strait and Cheremshiha Island (Kandalaksha Bay, White Sea). On coarse sand and shelly bottoms. Between 1-20 meters, occasionally in lower parts of tidal sandy beaches.

Nerillidium marinum (Faubel 1978)

Bathynerilla marina Faubel, 1978: 257-258, fig. 1.
Type locality: North Sea, east of Aberdeen (Scotland), at 57º12'N, 01º37'W, at 80 meters, in coarse shelly bottoms (up to 70% of shells).
Selected references: *Nerillidium marinum* — Westheide, 1990: 76, fig. 22; Hartmann-Schröder, 1996: 589; Westheide, 2008: 84, fig. 50.
Distribution: Known from the type locality.

Nerillidium mediterraneum Remane 1928

Nerillidium mediterraneum Remane, 1928: 58-60, fig. 1.
Type locality: Donna Anna, Gulf of Naples (Mediterranean Sea), in *Amphioxus*-sand.
Selected references: *Nerillidium mediterraneum* — Remane, 1932: 28; Remane, 1949: 47-48, figs. 5-6; Gerlach, 1953: 250-251, pl. 278 fig. 4; Jouin, 1967*a*: 102-108, fig. 5; Jouin *in* Cabioch, L'Hardy & Rullier, 1968: 7; Westheide, 1990: 72, fig. 20; Westheide, 2008: 82, fig. 49.
Distribution: Roscoff area (English Channel); Arcachon (French Atlantic coast); Gulf of Naples and France (Mediterranean Sea); [?] Lüderitz Bay, Namibia. On coarse and *Amphioxus*-sand. Between 6-10 meters.

Nerillidium troglochaetoides Remane 1925

Nerillidium troglochaetoides Remane, 1925: 17, fig. 4.
Type locality: Helgoland (North Sea, Germany), on shelly sand.
Selected references: *Nerillidium troglochaetoides* — Fauvel, 1927*a*: 437, fig. 148*d*; Remane, 1932: 27-28, fig. 25; Swedmark, 1959: 31-33, figs. 2*b*, 3B_1-B_2, 4*A*; Jouin, 1967*a*: 102-108, fig. 5; Jouin, 1968*a*: table 1; Jouin *in* Cabioch, L'Hardy & Rullier, 1968: 7; von Nordheim, 1984: 12, 16-18, figs. 4*C*, 7*B*, table 4; Westheide, 1990: 70, fig. 19; Hartmann-Schröder, 1996: 589-590, fig. 289; Kirkegaard, 1996: 247-248, fig. 133; Westheide, 2008: 80, fig. 48.
Distribution: Helgoland (North Sea); Roscoff area (English Channel); Portaferry (Irish Sea); Skagerrak. On *Amphioxus*-sand or shelly bottoms. Between 5-22 meters.

GENUS ***Nerillidopsis*** Jouin 1966

Nerillidopsis Jouin, 1966*b*: 412.
Type species: *Nerillidopsis hyalina* Jouin 1966.

Nerillidopsis hyalina Jouin 1966

Nerillidopsis hyalina Jouin, 1966*b*: 412-414, figs. *B-C*.

TYPE LOCALITY: Bloscon (Roscoff), in shelly sand (organogenic sand), at 15-20 meters.
SELECTED REFERENCES: *Nerillidopsis hyalina* — JOUIN, 1967*a*: 98-108, figs. 1-3, 5; JOUIN, 1968*a*: table 1; JOUIN *in* CABIOCH, L'HARDY & RULLIER, 1968: 8; WESTHEIDE, 1990: 66, fig. 17; WESTHEIDE, 2008: 74, fig. 41.
DISTRIBUTION: Roscoff area (English Channel). In coarse sand and shelly bottoms. Between 10-60 meters.

GENUS ***Paranerilla*** Jouin & Swedmark 1965

Paranerilla JOUIN & SWEDMARK, 1965: 216.
TYPE SPECIES: *Paranerilla limicola* Jouin & Swedmark 1965.

KEY TO SPECIES:

1a. Dorsal ciliation covering totally the prostomium and segment 1 (except for a narrow non-ciliated gap with a small non-ciliated pit in the middle, along the border line between prostomium and segment 1), and seen as ciliary plates on segments 2-6; ventral transverse ciliary bands on the parapodia of segment 1 connect with the ventral ciliation of the pharyngel area...***P. cilioscutata***
1b. Prostomium and segment 1 only partly ciliated, and as narrow double or single ciliary bands on segments 2-6; ventral transverse ciliary bands on the parapodia of segment 1 do not connect with the ventral ciliation of the pharyngel area..***P. limicola***

Paranerilla cilioscutata Worsaae & Kristensen 2003

Paranerilla cilioscutata WORSAAE & KRISTENSEN, 2003: 26-33, figs. 3-6, 9, table 2.
TYPE LOCALITY: Northeast Water Polynya, Northeast Greenland (80º16.54'N, 8º40.83'W), at 289 meters, on muddy sediments.
DISTRIBUTION: Independence Fjord, Northeast Water Polynya, and Fram Strait, all at Northeast Greenland (between 77º09.00'N and 82º11'N, and between 8º40.42'W and 15º56.85'W), at 32-515 meters, in muddy sediments.

Paranerilla limicola Jouin & Swedmark 1965

Paranerilla limicola JOUIN & SWEDMARK, 1965: 202-217, figs. 1-6.
TYPE LOCALITY: Gullmar Fjord, about 500 meters north Rödbergsskär (Kristineberg, Sweden, Skagerrak), in muddy bottoms, at 50-70 meters.
SELECTED REFERENCES: *Paranerilla limicola* — STERRER, 1968: 65-67, 1 figure; HARTMANN-SCHRÖDER, 1996: 590; WORSAAE & KRISTENSEN, 2003: 33-36, figs. 7-8.
DISTRIBUTION: Known from the type locality, Gullmar Fjord (near Rödbergsskär, 58º16'N, 11º28'E), at 48-70 meters, in muddy sediments. Besides, the species is known from muddy locations along the Norwegian coast (Fanafjord an Raunefjord), bewteen 120-270 meters, and from the northern Adriatic Sea (25 meters).

GENUS ***Psammoriedlia*** Kirsteuer 1966

Psammoriedlia KIRSTEUER, 1966: 292.
TYPE SPECIES: *Psammoriedlia ruperti* Kirsteuer 1966.
SYNONYMS: *Bathychaetus* Faubel 1978.

Psammoriedlia heptapous (Faubel 1978)

Bathychaetus heptapous FAUBEL, 1978: 260-261, fig. 4.
TYPE LOCALITY: NW North Sea, Fladengrund (58º28.2'N, 00º11.8'W), at 126 meters, in muddy sand mixed with fine gravel.
SELECTED REFERENCES: *Bathychaetus heptapous* — WESTHEIDE, 1990: 82, fig. 25; HARTMANN-SCHRÖDER, 1996: 586. *Psammoriedlia heptapous* — WESTHEIDE, 2008: 92, fig. 55.
DISTRIBUTION: Known from the type locality.

GENUS *Thalassochaetus* Ax 1954

Thalassochaetus AX, 1954: 71-72.
TYPE SPECIES: *Thalassochaetus palpifoliaceus* Ax 1954.

Thalassochaetus palpifoliaceus Ax 1954

Thalassochaetus palpifoliaceus AX, 1954: 65-71, figs. 1-5.
TYPE LOCALITY: Vodrup Flak, North of Kiel Bay (Denmark), in coarse sand to gravel, at about 12 meters.
SELECTED REFERENCES: *Thalassochaetus palpifoliaceus* — HARTMANN-SCHRÖDER, 1996: 590-591, fig. 290; SAPHONOV & TZETLIN, 1997: 223-224, fig. 4*C-D*.
DISTRIBUTION: Kieler Bight (Baltic Sea), sublittoral to 12 meters; Kandalaksha Bay, Velikaja Salma Strait (White Sea), in the tidal zone. In coarse sand, shelly and gravel sediments.

GENUS *Trochonerilla* Tzetlin & Saphonov 1992

Trochonerilla TZETLIN & SAPHONOV, 1992: 251.
TYPE SPECIES: *Trochonerilla mobilis* Tzetlin & Saphonov 1992.

Trochonerilla mobilis Tzetlin & Saphonov 1992

Trochonerilla mobilis TZETLIN & SAPHONOV, 1992: 251-254, figs. 1-2.
TYPE LOCALITY: Aquarium system of the Moscow Zoo, in the 5-8 cm thick layer of gravel from the bottom of an artificial seawater tank (volume 3000 litres; 35‰; at about 20º C).
SELECTED REFERENCES: *Trochonerilla mobilis* — WESTHEIDE, 2008: 92.
DISTRIBUTION: Described from the aquarium system of the Moscow Zoo (volume 3000 litres), and two smaller aquaria (volume 70 litres) in the Department of Invertebrate Zoology of Moscow State University, occurring in the 5-8 cm thick layer of gravel from the bottom, with artificial seawater (35‰; at about 20º C). Also known from artificial marine aquaria at the University of Osnabrück (Germany), and Charlottenlund (Denmark).
REMARKS: According to TZETLIN & SAPHONOV (1992), the natural locality of this species is unknown, but it is possible that it was transferred to the seawater system of the Moscow Zoo from the Sea of Japan. Two other species of interstitial polychaetes (*Ophryotrocha dimorphica* Zavarzina & Tzetlin 1986 and *Nerilla jouini* Saphonov & Tzetlin 1988) were previously found in the same aquarium system first, and only latter at the Bay of Peter the Great (Sea of Japan).

GENUS *Troglochaetus* Delachaux 1921

Troglochaetus DELACHAUX, 1921: 4-10.
TYPE SPECIES: *Troglochaetus beranecki* Delachaux 1921.

KEY TO SPECIES:

1a. Marine species; chaetae present in the first segment; two anal cirri present, in form of extended lobes..***T. simplex***
1b. Freshwater species; chaetae absent in the first segment; anal cirri present, as two small buds, not extended..***T. beranecki***

Troglochaetus beranecki Delachaux 1921

Troglochætus beranecki DELACHAUX, 1921: 4-10, text-fig. 1, plate 1 figs. 1-3.
TYPE LOCALITY: Ver Cave, near Neuchâtel (Switzerland), in the Areuse gorges, in freshwater.
SELECTED REFERENCES: *Troglochaetus beranecki* — ANDRÉ, 1925: 49-51, figs. 5-6; REMANE, 1928: 57-58, 60 fig. 2; FAUVEL, 1927*a*: 436, fig. 147; JOUIN, 1973: 576-579, fig. 1*A-B*; HARTMANN-SCHRÖDER,

1996: 591-592, fig. 291; MORSELLI, SARTO & MARI, 1998: 215-216, figs. 1-2; SAMBUGAR, 2005: 146-147, fig. 1.

DISTRIBUTION: Interstitial inhabitant of coarse sands and pebbles, of phreatic and hyporheic caves, wells and springs of fluvial systems in Europe and North America, at both low and high altitudes (PENNAK, 1971; HARTMANN-SCHRÖDER, 1996; SÄRKKÄ & MÄKELÄ, 1998). Since its description from Switzerland, it has been reported from Austria, Czech Republic, Finland, France, Germany, Hungary, Italy, Poland, Roumania, and Slovakia (*e.g.*: DELACHAUX, 1927; HERTZOG, 1930; STAMMER, 1937; NOLL, 1939; ANKELL, 1943; ANDRÁSSY, 1956; PLEŞA, 1957; KULHAVY, 1959; HUSMANN, 1962; PICARD, 1962; TILZER, 1968; ROSOL & KUBICEK, 1971; PLEŞA, 1977; ROSOL, 1984; MORSELLI, MARI & SARTO, 1995; SÄRKKÄ & MÄKELÄ, 1998; SAMBUGAR, 2005), and also from Colorado, U.S.A. (PENNAK, 1971) and eastern North America (STRAYER *et al*, 1995). According to HARTMANN-SCHRÖDER (1996) the species could be more widespread in Europe than what was known.

Troglochaetus simplex (Lévi 1953)

Nerillidium simplex LÉVI, 1953: 68-69, fig. 3.

TYPE LOCALITY: North-eastern coast of Callot Peninsula (Roscoff), in coarse sand, at shallow water.

SELECTED REFERENCES: *Nerillidium simplex* — SWEDMARK, 1959: 33-34, figs. 2*c*, 4*B*, plate 1 fig. *A*; JOUIN, 1966*b*: 414, fig. *A*; JOUIN, 1967*a*: 102-108, fig. 5; JOUIN, 1968*a*: table 1; JOUIN *in* CABIOCH, L'HARDY & RULLIER, 1968: 7; WESTHEIDE, 1990: 74, fig. 21. *Troglochaetus simplex* — WESTHEIDE, 2008: 86, fig. 51.

DISTRIBUTION: Roscoff area (English Channel); Portaferry (Irish Sea). On coarse and shelly sand. Between 10-65 meters.

*FAMILY **OENONIDAE** Kinberg 1865

AS: *OENONIDEA* KINBERG, 1865: 571.
TYPE GENUS: *Oenone* Savigny *in* Lamarck 1818.
SYNONYMS: *LAIDEA* Kinberg 1865; [?] *LARANDIDAE* Kinberg 1865; *ARABELLIDAE* Hartman 1944.
REMARKS: The Oenonidae resemble closely the lumbrinerids in the overall body-construction, but differ in several characters, some of which can be easily observed externally. At first sight, and especially in fixed material, free living oenonids can be separate from lumbrinerids for being characteristically long and stiff, and normally with a darker coloration than lumbrinerids present in the same sample. Observing closely, the oenonids don't have the typical hooded hooks of the biggest part of the lumbrinerids, showing only limbate capillaries (sometimes accompanied by acicular chaetae or spines). These capillaries can be strongly geniculate and serrated or covered with superficial spines. Besides, the cuticle of many species is rigid and has an iridescent shimmer. Their prostomium is normally flattened dorsoventrally (being normally conical or globular in lumbrinerids). A longitudinal median groove, eyes, or antennae are present in some taxa.

From a phylogenetic point of view, the biggest difference between the oenonids and lumbrinerids is the arrangement of the maxillary apparatus. Oenonids have normally long and narrow maxillary carriers, which are in a number of three, instead of two. As the oenonids (as well as the lumbrinerids) don't have many external features, the arrangement of the jaw pieces is one of the most important taxonomic characters in the family (HILBIG, 1995*b*), and the dissection of the specimens is normally required to achieve a positive identification. As explained by HILBIG (1995*b*), the pharynx should always be dissected from the dorsum, being normally useful to remove the whole pharyngeal bulb and place it on a slide to view the more delicate pieces. However, some morphological details are size dependent, and care must be taken while identifying juveniles (COLBATH, 1987). Some species have the maxillary apparatus highly modified and reduced, probably as a consequence of living as internal parasites of other invertebrates (see below).

The Oenonidae are present worldwide, but are never abundant. Some species are parasitic as juveniles, becoming free-living as adults or remaining as parasites throughout its life (PETTIBONE, 1957*c*). Oenonids are known to be internal parasits of other polychaetes, echiurans or bivalves, and many times can be found either through transparence of the body wall of the hosts, or by dissection. Many specimens can be found when the body of the host results broken as a consequence of the processing and fixation of the samples (see figure 2*A* in PETTIBONE, 1957*c*).

Important publications on the family include HARTMAN (1944*b*), PETTIBONE (1957*c*), FAUCHALD (1970), COLBATH (1989), ORENSANZ (1990), and HILBIG (1995*b*).

The family Oenonidae includes at present about 14 genera with 80 described species considered to be valid. From these, 8 genera and 16 species, one of which unnamed, are known from the European and nearby waters. Two genera, each one represented by a single species, were present in the studied material.

KEY TO GENERA:

(adapted from FAUCHALD, 1977*a*)

1a. Parapodia with conspicuous, foliaceous notopodia; prostomium with three antennae along posterior margin........**2**
1b. Notopodia absent or reduced to a small papilla, sometimes with fascicle of delicate internal aciculae; prostomium without appendages........**3**

2a (1a). One distinct peristomial segment present........***Oenone***
2b (1a). Two distinct peristomial segments present........***Halla***

3a (1b). Acicular spines present, at least in middle and posterior parapodia; four or five pairs of jaws present........**4**
3b (1b). Acicular spines absent; maxillary apparatus present, but often reduced........**5**

4a (3a). Maxilla I distally falcate; small denticles if present restricted to basal part; generally, one stout projecting acicular spine on the parapodia........***Drilonereis****

4b (3a). Maxilla I dentate along entire cutting edge; generally, two stout projecting acicular spines on the parapodia...***Notocirrus****

5a (3b). Five pairs of maxillae present; free-living...***Arabella***
5b (3b). Two or three pairs of maxillae present; free-living or endoparasitic...6

6a (5b). Mandibles fused and horseshoe-shaped; chaetae projecting from the lobe; endoparasitic...***Oligognathus***
6b (5b). Mandibles two triangular plates...7

7a (6b). Maxillary carriers anteriorly bilobed and fused along most of their lengths; chaetae and acicula projecting from lobe; free-living or endoparasitic...***Labrorostratus***
7b (6b). Maxillary carriers anteriorly rounded and fused along their whole length; chaetae and acicula not projecting from lobe; endoparasitic...***Haematocleptes***

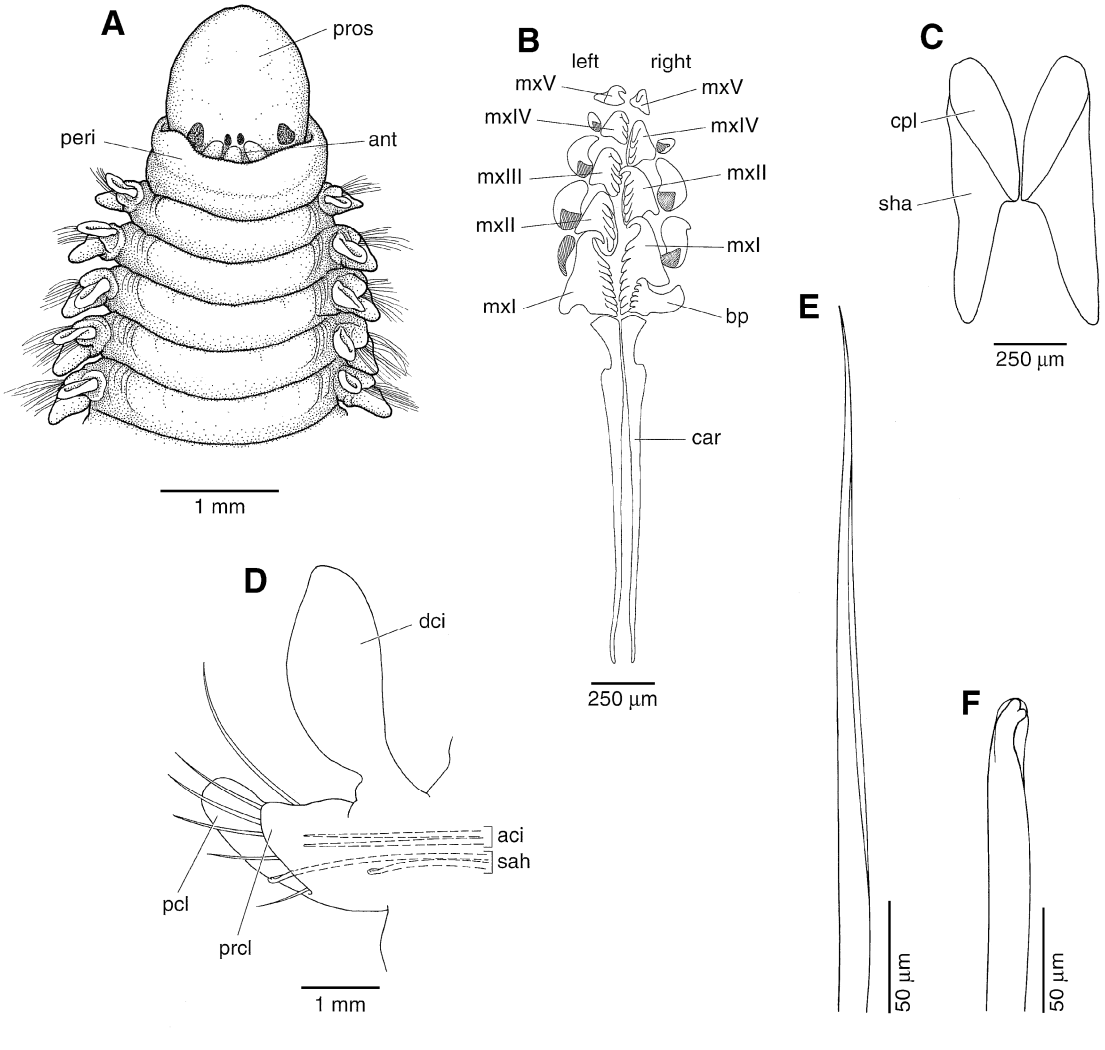

Figure legend: Family Oenonidae. *Oenone* specimen. **A**, anterior end, dorsal view. **B**, **C**, jaw parts: **B**, maxillae, dorsal view; **C**, mandibles, ventral view. **D**, parapodium from chaetiger 45, anterior view. **E**, **F**, chaetae from parapodium of chaetiger 45: **E**, simple limbate chaeta; **F**, subacicular hook. **aci**, acicula; **ant**, antenna; **bp**, basal plate; **car**, carrier; **cpl**, cutting plate; **dci**, dorsal cirrus; **mxI-V**, maxillary plates I-V; **pcl**, postchaetal lobe; **peri**, peristomium; **prcl**, prechaetal lobe; **pros**, prostomium; **sah**, subacicular hooks; **sha**, shaft. (Adapted from BEESLEY, ROSS & GLASBY, 2000; drawings by A. Murray).

GENUS *Arabella* Grube 1850

Arabella GRUBE, 1850: 293.
TYPE SPECIES: *Nereis iricolor* Montagu 1804.
SYNONYMS: *Aracoda* Schmarda 1861; *Maclovia* Grube 1872; *Cenothrix* Chamberlin 1919.

KEY TO SPECIES:

1a. Dorsal cirrus well developed, digitiform, longer than the prechaetal lobe; eyes absent; wings of the capillary chaetae finely striated; maxillae I as hooked forceps, toothed at the base..............***A. longicirrata***
1b. Dorsal cirrus reduced, short and papilliform...**2**

2a (1b). Four eyes disposed in a transversal line, in the posterior edge of the prostomium; chaetae winged, some strongly curved and finely toothed at the base of the wing..**3**
2b (1b). Eyes absent; chaetae without toothed wings; maxillae I as hooked forceps, toothed at the base...***A. coeca***

3a (2a). Maxillae I as hooked forceps, toothed at the base..***A. iricolor***
3b (2a). Maxillae I as toothed plates...***A. geniculata***

Arabella coeca Fauvel 1940

Arabella coeca FAUVEL, 1940: 18-21, fig. 4.
TYPE LOCALITY: Rovigno, High Adriatic Sea, on muddy bottoms.
SELECTED REFERENCES: *Arabella coeca* — RAMOS, 1976*b*: 248; CANTONE, 1996: 100. *Arabella* spec. (?) — FAUVEL, 1934: 40.
DISTRIBUTION: High Adriatic Sea; Rovigno. On muddy bottoms.

Arabella geniculata (Claparède 1868)

Notocirrus geniculatus CLAPARÈDE, 1868: 459-460, pl. 6 fig. 6.
TYPE LOCALITY: Gulf of Naples, Italy.
SELECTED REFERENCES: *Notocirrus geniculatus* — MARION & BOBRETZKY, 1875: 15-16, pl. 1 fig. 2. *Arabella geniculata* — FAUVEL, 1923*c*: 439-440, fig. 175*i-l*; BELLAN, 1964*b*: 104; RAMOS, 1976*b*: 248; CAMPOY, 1982: 624-625; CANTONE, 1996: 100. *Maclovia geniculata* — FAUVEL, 1911*c*: 40-41.
REFERENCES FOR PORTUGAL: CARVALHO, 1929 (Sines); CAMPOY, 1982 (previous records: Sines).
DISTRIBUTION: Mediterranean Sea (Gulf of Naples, Monaco, Gulf of Marseille); Adriatic Sea; Aegean Sea. On various kinds of bottoms: coralligenous bottoms, muddy bottoms, maërl, sandy bottoms, and among *Halophila stipulacea*. Shallow water to 125 meters.

Arabella iricolor (Montagu 1804)

Nereis iricolor MONTAGU, 1804: 82.
TYPE LOCALITY: Milton, South coast of Devonshire (England), under a stone amongst rocks.
SYNONYMS: *Oenone maculata* Milne-Edwards 1836; *Lumbriconereis quadristriata* Grube 1840; *Lumbriconereis splendida* Leidy 1855; *Lumbriconereis longissima* Grube 1857; *Aracoda caerulea* Schmarda 1861; *Lumbrineris tricolor* Johnston 1865; *Lumbrineris dubia* Quatrefages 1866; *Lumbrineris gigantea* Quatrefages 1866; *Lumbriconereis opalina* Verrill 1874; *Arabella maculosa* Treadwell 1900; [?] *Arabella setosa* Treadwell 1921; *Arabella dubia* Treadwell 1922.
SELECTED REFERENCES: *Maclovia iricolor* — FAUVEL, 1911*c*: 26-27; FAUVEL, 1914*f*: 159-160. *Arabella iricolor* — MCINTOSH, 1910: 395-400, pl. 54 fig. 4, pl. 62 figs. 8-8*c*, pl. 74 figs. 5-5*c*, pl. 83 figs. 2-2*a*; ANNENKOVA, 1938: 169; FAUVEL, 1923*c*: 438-439, fig. 175*a-h*; FAUVEL, 1933*d*: 37; HARTMAN, 1942*a*: 55; HARTMAN, 1944*b*: 173 [in part]; HARTMAN, 1945: 27; BERKELEY & BERKELEY, 1948: 97, figs. 147-149; HARTMAN, 1951*b*: 63; FAUVEL, 1953*c*: 274-275, fig. 140*a-h*; USCHAKOV, 1955*a*: 243-244, fig. 81; HARTMAN, 1956: 247, 288; RIOJA, 1958: 269; FAUVEL & RULLIER, 1959*b*: 950; WESENBERG-LUND, 1962: 118; PETTIBONE, 1963*a*: 269-271, fig. 71*a-e* [not *Aracoda semimaculata* Moore 1911 in the synonymy list (= *Arabella semimaculata* (Moore 1911)]; BELLAN, 1964*b*: 104; FAUCHALD, 1970: 125-128, pl. 20 figs. *a-d*; GARDINER, 1976: 206-207, fig. 27*r-u*, 28*a*; RAMOS, 1976*b*: 248-249; CAMPOY, 1982: 623-624; UEBELACKER, 1984*h*: 42.5, figs. 42.1-42.2; GEORGE & HARTMANN-SCHRÖDER, 1985: 152, fig. 50; CANTONE, 1996: 100. *Arabella (Arabella) iricolor* — ORENSANZ, 1974*b*: 384-386, text-fig. 1, pl. 1; HILBIG, 1995*b*: 320-321, fig. 12.1. *Lumbrineris dubia* — QUATREFAGES,

1866*b*: 363. *Lumbrineris gigantea* — QUATREFAGES, 1866*b*: 360. *Arabella (Maclovia) gigantea* — SAINT-JOSEPH, 1888: 230-233, pl. 9 figs. 92-95. *Maclovia gigantea* — SAINT-JOSEPH, 1895: 209, pl. 12 figs. 28-30. *Lumbriconereis opalina* — VERRILL, 1874*c*: 342, 594, pl. 13 figs. 69-70. *Lumbriconereis quadristriata* — GRUBE, 1840: 79. *Arabella quadristriata* — EHLERS, 1868: 399-405, pl. 17 figs. 15-24. *Zygolobus quadristriata* — CLAPARÈDE, 1864: 576, pl. 4 fig. 5. *Lumbrinerus St.-Hilairii* — DELLE CHIAJE, 1828: 179, pl. 42 fig. 4. *Arabella St-Hilairii* — SAINT-JOSEPH, 1906: 214-215, pl. 4 fig. 82. *Notocirrus Hilairii* — CLAPARÈDE, 1868: 460-461, pl. 9 fig. 4. *Lumbrineris tricolor* — JOHNSTON, 1865: 142-143, 341, text-fig. 22. *Lumbriconereis splendida* — LEIDY, 1855: 147. *Aracoda caerulea* — SCHMARDA, 1861: 115, text-figs. *a*, *c*, *f*, *OK*, *UK*, pl. 32 fig. 253. *Arabella iricolor* var. *caerulea* — DAY, 1953: 439, fig. 6*n*. *Lumbriconereis longissima* — GRUBE, 1857: 158. *Arabella maculosa* — VERRILL, 1900: 651. *Arabella dubia* [not Hansen 1882; homonym] — TREADWELL, 1922: 160-161, text-fig. 52, pl. 7 figs. 11-12, pl. 8 figs. 8-9. [?] *Arabella setosa* — TREADWELL, 1921: 113-114, text-figs. 421-424, pl. 9 figs. 10-11.

REFERENCES FOR PORTUGAL: CARVALHO, 1929 (Sines); AUGENER, 1933*d* (Buarcos, Coimbra); SALDANHA, 1974 (coast of Arrábida); AMOUREUX & CALVÁRIO, 1981 (Peniche); CAMPOY, 1982 (previous records: Arrábida; Sines); MONTEIRO-MARQUES *et al.*, 1982 (Ponta do Baleal); MONTEIRO-MARQUES, 1987 (continental shelf of Algarve); DEXTER, 1992 (previous records: continental shelf of Algarve; Sado Estuary).

DISTRIBUTION: English Channel to France; Mediterranean Sea; Adriatic Sea; Aegean Sea; Azores; Red Sea; Persian Gulf; Indian Ocean; Strait of Magellan; West and South Africa; West Coast of USA; Bermuda; Gulf of Mexico; West Indies; Vancouver Island to California (intertidal); Mexico; Argentina; north Japan Sea to Japan; China. On rocky bottoms, amongst debris, oyster shells, bryozoans, ascidians and other colonial animals, sea grasses and algae, muddy and sandy bottoms. Intertidal to 250 meters.

Arabella longicirrata Hartmann-Schröder 1979

Arabella longicirrata HARTMANN-SCHRÖDER, 1979*a*: 87-88, figs. 63-66.

TYPE LOCALITY: Off Portugal, 37°14.7’N, 9°01.5’W, at 114-117 meters.

REFERENCES FOR PORTUGAL: HARTMANN-SCHRÖDER, 1979*a* (western continental shelf of Algarve).

DISTRIBUTION: Known from the type locality.

*GENUS ***Drilonereis*** Claparède 1870

Drilonereis CLAPARÈDE, 1870: 399.

TYPE SPECIES: *Lumbriconereis filum* Claparède 1868.

SYNONYMS: *Arabes* Ehlers 1920.

REMARKS: According to FAUCHALD (1970), the main diagnostic characters in the genus *Drilonereis* are the presence or absence of proximal teeth on maxillae I, the presence or absence of mandibles, and the relative development of the postchaetal lobes. Other characters include the number of teeth on the different jaw-pieces and the structure of simple chaetae.

The following key is based in the published information on the three species so far recorded from European waters. However, the discrimination between these species is not unambiguous. It is not clear whether the recorded variability is the result of different stages of development of the studied specimens, together with the lost of some maxillary pieces as a consequence of natural processes or of the dissection, or if several species are involved.

KEY TO SPECIES:

(adapted from GEORGE & HARTMANN-SCHRÖDER, 1985; data from: RAMOS, 1976*b*, GARDINER, 1976, UEBELACKER, 1984*h*)

1a. Anterior tooth of maxillae II strongly hooked and twice as long as other teeth; MV present, with one tooth; mandibles absent; [MI with 7 short basal teeth; MII with 5 teeth; MIII to MV with one single tooth each; unpaired piece of maxillary carriers long, slender]..***D. brattstroemi***

1b. Anterior tooth of maxillae II only slightly hooked, not twice as long as the other teeth; MV absent; mandibles present or absent..**2**

2a (1b). MI basally smooth or with 2-3 teeth; unpaired piece of maxillary carriers oval or hexagonal; mandibles pointed posteriorly or absent; [MII with 3-10 similar teeth; MIII with 1-3 teeth; MIV with one tooth]..***D. filum****
2b (1b). MI with 3-6 distinct basal teeth (sometimes stated as being smooth basally); unpaired piece of maxillary carriers long, slender; mandibles oval; [MII with 6-8 equal teeth; MIII with one tooth; MIV with one tooth]..***D. magna***

Drilonereis brattstroemi Fauchald 1972

Drilonereis brattstroemi FAUCHALD, 1972*b*: 96-97, fig. 2*F*.

TYPE LOCALITY: Sognefjorden (Norway), southwest of the mouth of Vadheimsfjorden, 61º08'15"N, 05º45'30"E, 1272 meters, clay with brownish top layer.

SELECTED REFERENCES: *Drilonereis brattstroemi* — FAUCHALD, 1974*b*: 28; GEORGE & HARTMANN-SCHRÖDER, 1985: 154, fig. 51; HARTMANN-SCHRÖDER, 1996: 269.

DISTRIBUTION: Norwegian west coast, at Sognefjorden and Hardangerfjorden. In coarse sand, slag, mud, and on rocks. Between 150-1272 meters.

****Drilonereis filum*** (Claparède 1868)

Lumbriconereis Filum CLAPARÈDE, 1868: 454-455, pl. 9 fig. 1.

TYPE LOCALITY: Gulf of Naples, Italy.

SYNONYMS: *Drilonereis versicolor* Grube 1878; *Drilonereis macrocephala* Saint-Joseph 1888; *Lumbrinereis variegatus* Bidenkap 1895; *Drilonereis longa* var. *elisabethae* McIntosh 1910; *Drilonereis norvegica* Sömme 1927; [?] *Lumbrinereis cluthensis* Clark 1953.

SELECTED REFERENCES: *Lumbriconereis filum* — CLAPARÈDE, 1870: 399-400, pl. 2 fig. 4. *Drilonereis filum* — SAINT-JOSEPH, 1888: 227-228, pl. 9 figs. 90-91; FAUVEL, 1911*c*: 25-26; FAUVEL, 1914*f*: 158-159; FAUVEL, 1923*c*: 436, fig. 174*a-h* [in part; not *Drilonereis longa* Webster 1879 in the synonymy list]; USCHAKOV, 1955*a*: 244, fig. 82; ELIASON, 1962*b*: 255-258, fig. 14; ORENSANZ, 1974*b*: 395-397, fig. 1, pl. 6; RAMOS, 1976*b*: 249-251, figs. 1-2, table 1; CAMPOY, 1982: 620-621; GEORGE & HARTMANN-SCHRÖDER, 1985: 156, fig. 52; KIRKEGAARD, 1992: 378-379, fig. 184; CANTONE, 1996: 100; HARTMANN-SCHRÖDER, 1996: 269. *Drilonereis macrocephala* — SAINT-JOSEPH, 1888: 225-227, pl. 9 figs. 86-89; FAUVEL, 1923*c*: 436-437, fig. 174*i-m*. *Drilonereis longa* var. *elisabethae* — MCINTOSH, 1910: 393. *Lumbrinereis cluthensis* — CLARK, 1953: 945-947, figs. *A-H*. *Lumbrineris cluthensis* — GEORGE & HARTMANN-SCHRÖDER, 1985: 124, fig. 38.

REFERENCES FOR PORTUGAL: CARVALHO, 1929 (Sines); BELLAN, 1960*a* (off Cape Roca; Cape Espichel); AMOUREUX, 1974*b* (off Aveiro; off Porto); HARTMANN-SCHRÖDER, 1977*a* (Bay of Setúbal); MONTEIRO-MARQUES, 1979 (southern continental shelf of Algarve); AMOUREUX & CALVÁRIO, 1981 (Peniche); CAMPOY, 1982 (previous records: Sines; Aveiro; Porto; Portuguese coast); SOUSA-REIS *et al.*, 1982 (Peniche region); AMOUREUX, 1987 (off Aveiro; off Porto); MONTEIRO-MARQUES, 1987 (continental shelf of Algarve); DEXTER, 1992 (previous records: continental shelf of Algarve; Sado Estuary; Arrábida; Peniche); present work (southwestern continental shelf).

MATERIAL: SEPLAT 7 (1st part) — St. 137 (A.3064), off Praia de Almograve, 300 m, muddy sand: 1 fragment with 33 chaetigers, in poor condition; it was compared with material from the thesis of Daniel Martin, being the segments thinner in the present material. **St. 179 (A.3100)**, off Vila Nova de Milfontes, 140 m, gravelly sand: 1 posterior fragment with 145 chaetigers; first 140 chaetigers present a projecting stout acicula; last 5 chaetigers have only capillary chaetae; last segments and pygidium as in RAMOS (1976*b*), without chaetae; 3 anal cirri visible. **St. 301 (A.3197)**, off Porto Corvo, 360 m, mud: 1 middle fragment in poor condition, without prostomium or pygidium, with 82 chaetigers; parapodia as described; it was compared with material from the thesis of Daniel Martin, being the segments thinner in the present material. **St. 308 (A.3204)**, off Porto Covo, 160 m, sand: 1 posterior fragment with about 105 segments; parapodia as described; what seems to be the pygidium is a tube, annulated and without any chaetae, being probably a regenerating pygidium; it was compared with material from the thesis of Daniel Martin, being the segments thinner in the present material. **SEPLAT 7 (2nd part) — St. 36 (A.4071)**, north Sines, 128 m, gravelly sand: 1 small fragment with 12 chaetigers; it was compared with material from the thesis of Daniel Martin, being the segments thinner in the present material. **St. 176 (A.3934*A*)**, off Sines, 157 m, sand: 1 fragment with 41 segments; the points of the small aciculae are emergent; it was compared with material from the thesis of Daniel Martin, being the segments thinner in the present material. **St. 272 (A.3861)**, off Praia de Odeceixe, 305 m, muddy sand: 1 fragment with 126 chaetigers; it was compared with material from the thesis of Daniel Martin, being the segments thinner in the present material. **FAUNA 1 — St. 69*A***, Gulf of Cádiz, off mouth of Guadiana, 110-112 m, mud: 1 middle fragment with 11 chaetigers; parapodia with rudimentary dorsal cirri; prechaetal lobe short, round; postchaetal lobe tongue-shaped; several slender aciculae in the notopodia; neuropodia with several slender and one stout projecting acicula; curved winged capillary chaetae, wings without teeth, being sometimes short and broad; it was compared with material from the thesis of Daniel Martin, being the segments thinner in the present material.

DISTRIBUTION: Wide in the northern hemisphere, excluding the Arctic; Portugal; Mediterranean Sea; Adriatic Sea; Aegean Sea; Black Sea. On sandy and muddy bottoms, gravel, rocky bottoms, among *Posidonia* and *Dendropoma*. Subtidally to about 2000 meters. Besides the free living form there is an endoparasitic form in the cirratulid *Aphelochaeta filiformis* (GEORGE & HARTMANN-SCHRÖDER, 1985).

REMARKS: Different descriptions present this species either with Maxilla I proximally dentate or smooth, with or without mandibles (see RAMOS, 1976*b*: table 1), and with prostomium short or long. Besides, FAUVEL (1923*c*) states that MV are present in the species, while all the other authors stated that they were absent. All these descriptions broaden the description of the species in such a way that different taxa could be, and probably are, involved (DAY, 1965; FAUCHALD, 1970; RAMOS, 1976*b*). A redescription of the species is warranted in order to stabilise the whole genus. Quite probably some of the species presently considered as junior synonyms of *D. filum* are valid (see the list above).

The species *Lumbrinereis cluthensis* Clark 1953, described from the Firth of Clyde, West coast of Scotland, in fine mud, at 90 meters, is probably a member of the family Oenonidae (EIVIND OUG, personal communication, June 2010). The species is here considered as a member of the genus *Drilonereis*, being possibly a junior synonym of *D. filum*. The species was described as having one spine-like hooked chaeta per parapodium, without hoods or teeth, being accompanied by winged capillary chaetae, without denticulations, while the parapodial aciculae are black. This combination of features is not present in any of the described genera of the family Lumbrineridae, but is very typical of the genus *Drilonereis*.

CLARK (1953) stated that his new species *Lumbrinereis cluthensis* and *Scoletoma rovignensis* (Fauvel 1940) (referred by Clark as *Lumbriconereis atlantica* sensu Fauvel 1934) could be the same species. However, both taxa would differ by the presence of five teeth in MII in *L. cluthensis* (against four in *S. rovignensis*), and the presence of two types of chaetae in each rami in *L. cluthesis* (against one type in *S. rovignensis*). Besides, the hooks are hooded in *S. rovignensis*, while the hood is absent in *L. cluthensis*. However, *S. rovignensis* could belong also to the family Oenonidae (EIVIND OUG, personal communication, June 2010), quite probably to the genus *Drilonereis*.

Drilonereis magna Webster & Benedict 1887

Drilonereis magna WEBSTER & BENEDICT, 1887: 725-726, pl. 4 figs. 60-63.

TYPE LOCALITY: Eastport, Maine (USA). In sand, at low water.

SYNONYMS: *Drilonereis cylindrica* Hartman 1951.

SELECTED REFERENCES: *Drilonereis magna* — PETTIBONE, 1963*a*: 273-274, fig. 71*h* [in part, not *Drilonereis falcata* Moore 1911]; GARDINER, 1976: 210-211, fig. 28*i-k*; UEBELACKER, 1984*h*: 42.17, figs. 42.13-42.14. *Drilonereis cylindrica* — HARTMAN, 1951*b*: 64-65, pl. 16 figs. 3-5. Not *Drilonereis magna* — HARTMAN, 1945: 27; HARTMAN, 1951*b*: 63-64.

DISTRIBUTION: Off Newfoundland to South Carolina (50-1100 meters); North Carolina (muddy or sandy intertidal flats); Gulf of Mexico (22-54 meters, in medium and fine sand); Washington (195.5 meters); Southern California to western Mexico; South Africa. Intertidal to about 1100 meters.

REMARKS: This species is cited by NEAT Check-list as being present in the British Isles. However, I wasn't able to find the reference of this record. FAUCHALD (1970: Appendix G) refers to the species as having the Maxilla I proximally smooth, while GARDINER (1976) and UEBELACKER (1984*h*) describe it as being proximally dentate, with 5-6, and 3-4 basal teeth, respectively. The original description by WEBSTER & BENEDICT (1887) doesn't give much details on the structure of the maxillary apparatus, while the very schematic and simple drawing of the jaws represent MI as being basally smooth.

GENUS ***Haematocleptes*** Wirén 1886

Hæmatocleptes WIRÉN, 1886: 4.

TYPE SPECIES: *Hæmatocleptes terebellidis* Wirén 1886.

Haematocleptes terebellidis Wirén 1886

Hæmatocleptes Terebellidis WIRÉN, 1886: 3-7, pls. 1-2.

TYPE LOCALITY: Interior region of the Gullmarfjord, Skagerrak, West coast of Sweden, at 130 meters, in a bottom of mud. Endoparasitic in the peri-intestinal blood sinus of *Terebellides stroemi* Sars 1835.
SELECTED REFERENCES: *Haematocleptes terebellidis* — PETTIBONE, 1957*c*: 172, figs. *a-e* in page 172, table 1; GEORGE & HARTMANN-SCHRÖDER, 1985: 158, fig. 53; KIRKEGAARD, 1992: 379-380, fig. 185; HARTMANN-SCHRÖDER, 1996: 269-270.
DISTRIBUTION: Gullmarfjord (Skagerrak, off Sweden), at 130 meters. Endoparasitic of *Terebellides stroemi* Sars 1835.

GENUS ***Halla*** A. Costa 1844

Halla A. COSTA, 1844: 63.
TYPE SPECIES: *Nereis parthenopeia* Delle Chiaje 1828.
SYNONYMS: *Cirrobranchia* Ehlers 1868.

KEY TO SPECIES:

1a. Antennae subequal; inferior lip anteriorly pleating or folded; mandibles with the anterior border without incision; maxillar carriers in two pieces; color in life orange, with dorsal cirri red; can reach 700 or 800 chaetigers, and 50-80 cm long (FAUVEL, 1923*c*)..***H. parthenopeia***
1b. Median antenna bigger than the lateral pair; inferior lip with an anterior median incision; mandibles with the anterior border with a strong incision; maxilar carriers in one piece, fused at the base; color in life sulphurous yellow; can reach 100 segments or more, and be over 3 cm long (LANGERHANS, 1880*a*)...***H. sulfurea***

Halla parthenopeia (Delle Chiaje 1828)

Lysidice parthenopeia DELLE CHIAJE, 1828: 175.
TYPE LOCALITY: Naples, Mediterranean Sea.
SYNONYMS: *Plioceras euniciformis* Quatrefages 1866.
SELECTED REFERENCES: *Cirrobranchia parthenopeia* — EHLERS, 1868: 408-421, pl. 17 figs. 25-34, pl. 18 figs. 27-30. *Halla parthenopeia* — CLAPARÈDE, 1868: 447-452, pl. 7 fig. 3, pl. 31 fig. 4; FAUVEL, 1923*c*: 426-427, fig. 169; CAMPOY, 1982: 594-596, pl. 78; COLBATH, 1989: 122, figs. 1*e*, 2*a-b*; CANTONE, 1996: 101. *Plioceras euniciformis* — QUATREFAGES, 1866*b*: 380.
DISTRIBUTION: Mediterranean Sea; Gulf of Cádiz; Atlantic; California; Japan. In muddy bottoms, detritic, and coralligenous. Near the coast, down to 40 meters.

Halla sulfurea Langerhans 1880

Halla sulfurea LANGERHANS, 1880*a*: 298-299, pl. 16 fig. 32.
TYPE LOCALITY: Madeira. Deep water ("*Tiefe lebend*").
DISTRIBUTION: Known from the type locality.
REMARKS: LANGERHANS (1880*a*) doesn't indicate how many specimens he studied, but states that the specimen he described was immature.

GENUS ***Labrorostratus*** Saint-Joseph 1888

Labrorostratus SAINT-JOSEPH, 1888: 218-221.
TYPE SPECIES: *Labrorostratus parasiticus* Saint-Joseph 1888.

KEY TO SPECIES:

1a. Maxilla I with 4 teeth; Maxilla II with 4 teeth; hooded acicular chaetae absent; 3 acicula per parapodium; parasitic on Syllidae..***L. parasiticus***
1b. Maxilla I with 3 teeth; Maxilla II with 3 teeth; hooded acicular chaetae present; 1 aciculum per parapodium; free living..***L. jonicus***

1c. Maxilla I with 2 teeth (?); Maxilla II with 2 teeth (?); hooded acicular chaetae absent; 2 acicula per parapodium, one big and one small; parasitic on Syllidae...***Labrorostratus* sp.**

Labrorostratus jonicus Tenerelli 1961

Labrorostratus jonicus TENERELLI, 1961*a*: 213-217, figs.1-4, 6-7, plate 1.

TYPE LOCALITY: Ciclopi Island (Gulf of Catania), at 20-60 meters, amongst algae in a hard bottom.

SELECTED REFERENCES: *Labrorostratus jonicus* — RAMOS, 1976*b*: 251; CANTONE, 1996: 100.

DISTRIBUTION: Known from the type locality.

Labrorostratus parasiticus Saint-Joseph 1888

Labrorostratus parasiticus SAINT-JOSEPH, 1888: 221-224, pl. 9 figs. 77-85.

TYPE LOCALITY: English Channel, Dinard, Anse St. Martin, near Cherbourg, living as a parasite inside the body of a specimen of *Odontosyllis ctenostoma* Claparède 1868.

SELECTED REFERENCES: *Labrorostratus parasiticus* — CAULLERY & MESNIL, 1916*a*: 160-161, fig. 1; FAUVEL, 1923*c*: 440-441, fig. 176*m-r*; PETTIBONE, 1957*c*: 172, figs. *a-e* at the top of page 173. table 1; GEORGE & HARTMANN-SCHRÖDER, 1985: 160, fig. 54.

DISTRIBUTION: English Channel: Dinard, Anse St. Martin, near Cherbourg. Endoparasitic. Lives in the body cavity of *Odontosyllis ctenostoma* Claparède 1868, *Syllis prolifera* Krøhn 1852, *Eusyllis blomstrandi* Malmgren 1867, *Pionosyllis lamelligera* Saint-Joseph 1887, and *Grubea clavata* (Claparède 1863). Also found free-living amongst calcareous algae *Lithothamnion*.

***Labrorostratus* sp.** San Martín & Sardà 1986

Labrorostratus sp. SAN MARTÍN & SARDÀ, 1986: 143-145, fig. 1, table 1.

DISTRIBUTION: Spain: Cap Enderocat (Mallorca), inside a specimen of *Syllis columbretensis* (Campoy 1982), on photophilic algae; Torre de la Sal (Casares, Málaga), inside a specimen of *Pseudobrania clavata* (Claparède 1863), and inside a specimen of *Sphaerosyllis hystrix* Claparède 1863.

*GENUS ***Notocirrus*** Schmarda 1861

Notocirrus SCHMARDA, 1861: 116.

TYPE SPECIES: *Notocirrus chilensis* Schmarda 1861.

****Notocirrus scoticus*** McIntosh 1869

Notocirrus scoticus MCINTOSH, 1869: 417-418, pl. 16 fig. 17.

TYPE LOCALITY: Lochmaddy, between 6-9 fathoms (11-16.5 meters), and several parts of the Hebridean Seas.

SELECTED REFERENCES: *Notocirrus scoticus* — SOUTHWARD, 1956: 265-266, fig. 1*K-P*; GEORGE & HARTMANN-SCHRÖDER, 1985: 162, fig. 55; CANTONE, 1996: 100. *Notocirrus* cf. *scoticus* — RAMOS, 1976*b*: 251-256, figs. 3-6, table 2; CAMPOY, 1982: 621-622.

REFERENCES FOR PORTUGAL: RAVARA, 1997 (off Aveiro); GIL & SARDÁ, 1999 (southwestern continental shelf); present work (southwestern continental shelf).

MATERIAL: SEPLAT 7 (1st part) — St. 263 (A.3165), southwestern Pessegueiro Island, 153 m, muddy sand: 1 incomplete specimen with 47 chaetigers; maxillary apparatus not studied; maxillary carriers as described. **SEPLAT 7 (2nd part) — St. 185 (A.3926)**, near Sines, 37 m, sandy mud: 1 complete specimen, with 61 chaetigers; posterior region seems to be regenerating; last segments without chaetae; maxillary carriers visible; MI not as hooked forceps; this specimen has only one acicular chaetae per parapodium, as described in RAMOS (1976*b*). **St. 186 (A.3925)**, south Sines, 27 m, muddy sand: 1 incomplete specimen, without anterior region; 43 chaetigers; last segments without chaetae; pygidium without anal cirri; parapodia with two acicular chaetae. **St. 197 (A.3915)**, south Sines, 130 m, muddy sand: 1 incomplete specimen with 36 chaetigers; segments resemble a chain of beads; the body was made diaphanous by some method prior to my observation; prostomium conical, eyes not visible, two nuchal slits present; peristomium consists of two achaetous rings, with the anterior one forming the lower lip on the ventral side; all chaetigers have essentially the same length and width than the peristomium; parapodia with a ventral, very small prechaetal lobe, and a well developed postchaetal lobe; notopodia reduced to a small papilla; capillary chaetae broadly winged; at the first chaetigers chaetae are smooth, but then turn to be serrated; two stout aciculae per parapodium, projecting through the epidermis; one dorsal acicula, very small, internal and slightly curved; mandibles large, X-shaped; maxillary carrier very long, without an unpaired piece; maxillae: MI=11+7; MII=7+11; MIII=6+7; MIV=6+6; MV=1+1; .

Distribution: Irish Sea; Hebridean Sea; British Isles; Portugal; Western Mediterranean; Aegean Sea. On sand, mud, and pebbles with or without fragments of shells, and also on clay. Subtidally, between 5-198 meters.

Remarks: Fauvel (1923*c*: 451) considered *Notocirrus scoticus* McIntosh 1869 as a doubtful species. However, Day (1960) revised the type material and pointed to some errors in the original description, confirming it as a valid *Notocirrus* species. He also found many difficulties in quoting the dental formula, saying that it would depend "*on the inclusion or omission of minute or partially formed denticles on the maxillary plates quite apart from the individual variation*" (Day, 1960: 368). As *Notocirrus* species are distinguished mainly on the basis of the maxillary formula, Day (*op. cit.*) stated that "*one becomes sceptical as to whether there really are several species and not one world-wide one*" (p. 370) and also that "*it is probable that further work will reveal that the maxillae are more variable than has been suspected and a number of species will be sunk in the synonymy*" (p. 368).

According to Ramos (1976*b*), probably all the *Notocirrus* species should be reduced to two: *N. chilensis* Schmarda 1861 (with bidentate aciculae), and *N. scoticus* McIntosh 1869 (polymorphic and cosmopolite). However, her specimens from the Mediterranean Sea were described as *N.* cf. *scoticus*, due to the impossibility in finding one *Notocirrus* species defined by other characteristics than the maxillary formula, apart from *N. chilensis* (Ramos, *op. cit.*).

The present specimens fit well the general description of the species, although the maxillary formula showed some variation in relation to other described formulas (see table). This may be due either to a natural variability in this structure or to the difficulty in counting some of the plates. Moreover, some of the maxillary formulas found suggest that they were probably observed from the ventral side. The jaws of the eunicean polychaetes should always be observed from the dorsal side and the maxillary formulas given from the posterior to the anterior end, the left jaw being mentioned first in each formula (Fauchald, 1977*a*).

Notocirrus scoticus resembles *Arabella geniculata* (Claparède 1868), as pointed by Fauvel, (1923*c*: 451). The buccal apparatus is very similar and both species have MI toothed along their length. However, *A. geniculata* can be distinguished by the lack of the stout aciculae. Instead, it has very fine acicular chaetae that finish in a very fine tip, which hardly project from the parapodia.

Table of maxillary formulas of *Notocirrus scoticus* McIntosh 1869

1 – formula of studied material; 2 – Day (1960, from McIntosh's 1910 drawings); 3 – Day (1960, from type material); 4 – Ramos (1976*b*, from text page 253, as *N.* cf. *Scoticus*); 5 – Ramos (1976*b*, from text page 256, as *N.* cf. *scoticus*); 6 – Ramos (1976*b*, from figure 3.*c*, as *N.* cf. *scoticus*); 7 – Ramos (1976*b*, from table 2, as *N.* cf. *scoticus*); 8 – Campoy (1982, as *N.* cf. *scoticus*); 9 – George & Hartmann-Schröder (1985).

	MI	MII	MIII	MIV	MV
1	11+7	7+11	6+7	6+6	1+1
2	7+8	12+7	6+7	5+?	1+?
3	7+8	6+7	5+5	3+4	?+?
4	7+11	13+8	8+6	4+5	1+1
5	10+7	8+13	6+8	6+6	1+1
6	10+7	7+12	6+7	6+5	1+1
7	7+10	13+8	8+6	5+5	1+1
8	7+11	13+8	8+6	4+5	1+3
9	8+7	9-12+5-7	5-7+5-7	5-7+8	1+1

GENUS ***Oenone*** Savigny *in* Lamarck 1818

Oenone Savigny *in* Lamarck, 1818: 326.

Type species: *Aglaura fulgida* Savigny *in* Lamarck 1818.

Synonyms: *Aglaura* Savigny *in* Lamarck 1818 [not Péron & Lesueur 1809 (Cnidaria)]; *Aglaurides* Ehlers 1868.

Oenone fulgida (Savigny *in* Lamarck 1818)

Aglaura fulgida SAVIGNY *in* LAMARCK, 1818: 326.

TYPE LOCALITY: Gulf of Suez, Red Sea.

SYNONYMS: *Aglaurides Érythrœensis* Gravier 1900; *Aglaurides Erythrœensis* var. *symmetrica* Fauvel 1914.

SELECTED REFERENCES: *Aglaurides fulgida* — FAUVEL, 1917: 240-254, pl. 5 figs. 52-55; HARTMAN, 1944*b*: 185-186, pl. 14 figs. 303-307; FAUVEL, 1953*c*: 250-251, fig. 125*a-f*. *Oenone fulgida* — CROSSLAND, 1924: 86-92, figs. 106-111; EBBS, 1966: 539-545, figs. 11-12; DAY, 1967: 426, fig. 17.14.*a-g*; FAUCHALD, 1970: 143-146, pl. 24; KNOX & GREEN, 1972*b*: 434, figs. 8-10; GARDINER, 1976: 211, figs. 28*l-o*, 29*a*; COLBATH, 1989: 118, fig. 1*e*. *Œnone lucida* — SAVIGNY, 1822: 56, pl. 5 fig. 3. *Aglaurides Érythrœensis* — GRAVIER, 1900: 278-282, text-figs. 154-159, pl. 14 figs. 99-103. *Aglaurides Erythrœensis* var. *symmetrica* — FAUVEL, 1914*d*: 68; FAUVEL 1914*f*: 131-137, pl. 7 figs. 1-4, pl. 8 figs. 38-41. *Aglaurides symmetrica* — FAUVEL, 1917: 244-245, 252-253; FAUVEL, 1919*a*: 388-389.

DISTRIBUTION: Circumtropical. Red Sea, from Suez to Djibouti; Natal; Mozambique; Madagascar; tropical Indo-west-Pacific; Australia; New Zealand to Japan; North Carolina; Florida; Gulf of Guinea; [?] Italy. In many kinds of bottoms, can appear associated with corals. Intertidal to 90 meters.

REMARKS: This species was recorded in the Italian waters. However, CASTELLI *et al.* (1995) state that the presence of the species in those waters is dubious, and probably the specimens attributed to it belong to an undescribed species.

GENUS ***Oligognathus*** Spengel 1882

Oligognathus SPENGEL, 1882: 16.

TYPE SPECIES: *Oligognathus Bonelliae* Spengel 1882.

KEY TO SPECIES:
(from PETTIBONE, 1957*c*):

1a. Chaetae of one kind, simple, arched, limbate, striated; prostomium with four eyes; up to 100 mm long, more than 200 segments; bright orange yellow in life; parasitic in body cavity of echiuroid, *Bonellia viridis*....................***O. bonelliae***

1b. Chaetae of two kinds: capillary, flexible, and stouter, wide, tapering to fine tips; prostomium without eyes; up to 8 mm long, 50 segments; colorless, transparent in life; parasitic in body cavity of spionid, *Microspio mecznikowiana*....................***O. parasiticus***

Oligognathus bonelliae Spengel 1882

Oligognathus Bonelliae SPENGEL, 1882: 15-50, pl. 2 figs. 1-2, 5-17, 19-20, pl. 3 figs. 21-31, 34-37, 43, pl. 4 figs. 44, 51-52, 55.

TYPE LOCALITY: Naples, Mediterranean Sea. Endoparasitic, living in the body cavity of *Bonellia viridis* Rolando 1821.

SELECTED REFERENCES: *Oligognathus Bonelliae* — FAUVEL, 1923*c*: 442, fig. 176*g-l*. *Oligognathus bonelliae* — PETTIBONE, 1957*c*: 173, figs. *a-e* at the bottom of page 173, table 1; CANTONE, 1996: 100.

DISTRIBUTION: Naples, Mediterranean Sea; Adriatic Sea; Aegean Sea. Endoparasitic, living in the body cavity of *Bonellia viridis* Rolando 1821.

Oligognathus parasiticus Cerruti 1909

Oligognathus parasiticus CERRUTI, 1909*a*: 198-201, pl. 3.

TYPE LOCALITY: Naples, Mediterranean Sea. Endoparasitic, living in the body cavity of *Microspio mecznikowiana* (Claparède 1869).

SELECTED REFERENCES: *Oligognathus parasiticus* — FAUVEL, 1923*c*: 442, fig. 176*a-f*; PETTIBONE, 1957*c*: 173, figs. *a-f* at the top of page 174, table 1; CANTONE, 1996: 100.

DISTRIBUTION: Naples, Mediterranean Sea. Endoparasitic, living in the body cavity of *Microspio mecznikowiana* (Claparède 1869).

*FAMILY **ONUPHIDAE** Kinberg 1865

AS: *ONUPHIÆA* KINBERG, 1865: 559.

TYPE GENUS: *Onuphis* Audouin & Milne Edwards 1833.

REMARKS: The family Onuphidae includes at present 22 genera, with about 270 described species and 8 subspecies considered to be valid.

The family is presently divided in two subfamilies (PAXTON, 1986*a*, 2000*b*): Onuphinae and Hyalinoeciinae. In Onuphinae the parapodia have generally dorsal cirri with internal aciculae, subacicular hooks in a ventral position, lower limbate chaetae absent posterior to the origin of the subacicular hooks, and four pygidial cirri. In the Hyalinoeciinae, the dorsal cirri lack internal aciculae, subacicular hooks are in a median position in the fascicle, lower limbate chaete occur to the end of the body, and two pygidial cirri are present. European representatives of Onuphinae include *Aponuphis*, *Diopatra*, *Epidiopatra*, *Longibrachium*, *Onuphis*, *Paradiopatra*, and *Rhamphobrachium*, while the Hyalinoeciinae include *Hyalinoecia*, *Leptoecia*, and *Nothria*.

Recent taxonomic papers on the Onuphidae are quite numerous. From these it is possible to emphasize, among many others, the works by KUCHERUK (1978), with a generic discussion of the family and the erection of the genera *Aponuphis*, *Neonuphis*, and *Notonuphis*, as well as the reestablishment of the *Leptoecia*, FAUCHALD (1982), with a revision of the genera *Onuphis*, *Nothria*, and *Paradiopatra*, as well as the erection of *Kinbergonuphis*, *Mooreonuphis*, and *Sarsonuphis*, KUCHERUK (1985) and JIRKOV & YERMOLAEV (1989), both on *Nothria*, PAXTON (1986*a*), probably the most important of them, with a generic revision of the whole family and keys for some genera, PAXTON (1986*b*), with the revision of the *Rhamphobrachium* complex (which also includes the genera *Brevibrachium* and *Longibrachium*, and keys for the three genera), LECHAPT (1997), with the description of two new species of *Hyalinoecia* and a comparative key for all the known species in the genus, PAXTON (1998), on the *Diopatra chilensis* complex, or PAXTON (2005), with the erection of the genus *Fauchaldonuphis*.

In the European and nearby waters, 10 genera, including 37 species, two of which unnamed, are known to occur. In the studied material 4 genera were found, represented by 8 species.

KEY TO GENERA:

(adapted from PAXTON, 1986*a*)

1a. Tentacular cirri present.........**2**
1b. Tentacular cirri absent.........**7**

2a (1a). Branchial filaments arranged spirally.........***Diopatra***
2b (1a). Branchial filaments arranged otherwise or absent.........**3**

3a (2b). Modified parapodia with extensile chaetae (shafts extending back through at least 5 segments), usually with spiny shafts and distally recurved.........**4**
3b (2b). Modified parapodia with short chaetae (shafts limited to one segment), usually without spiny shafts, distally uni- to tridentate.........**5**

4a (3a). Three pairs of modified parapodia (with 3 chaetae each) with spiny shafts and distally recurved.........***Rhamphobrachium***
4b (3a). Four pairs of modified parapodia (with 4 or more chaetae each) with spiny shafts and distally curved.........***Longibrachium***

5a (3b). Chaetiger 1 and its parapodia usually enlarged; scoop-shaped pectinate chaetae; modified parapodia with large, auricular prechaetal and subulate postchaetal lobes.........***Nothria****
5b (3b). Chaetiger 1 not enlarged; flat pectinate chaetae.........**6**

6a (5b). Pseudocompound hooks of modified parapodia with long, pointed hoods; ceratophores of antennae with usually 3-5 (rarely up to 9) rings.........***Paradiopatra****
6b (5b). Pseudocompound hooks of modified parapodia with short or without hoods; ceratophores of antennae with 10-25 rings.........***Onuphis***

7a (1b). Branchial filaments arranged spirally.........***Epidiopatra***

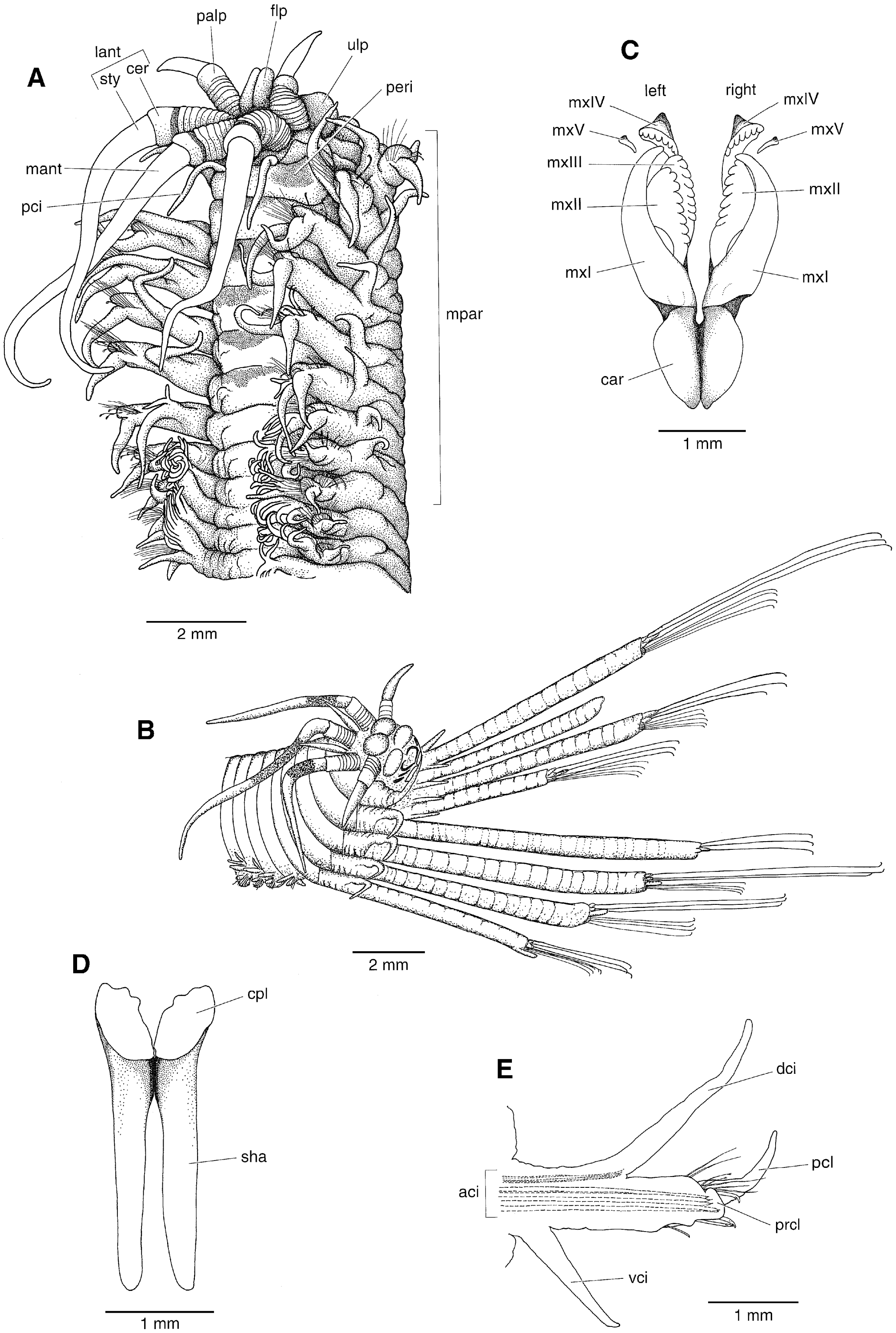

Figure legend: Family Onuphidae. **A**, *Hirsutonuphis* specimen, dorso-lateral view. **B**, *Longibrachium* specimen, anterior end, dorso-lateral view. **C**, **D**, jaw parts of *Hirsutonuphis* specimen: **C**, maxillae, dorsal view; **D**, mandible, ventral view. **E**, parapodium of *Hirsutonuphis* specimen from chaetiger 3, anterior view. **aci**, aciculae; **car**, carrier; **cer**, ceratophore; **cpl**, cutting plate; **dci**, dorsal cirrus; **flp**, frontal lip; **lant**, lateral antenna; **mant**, median antenna; **mpar**, modified parapodia; **mxI-V**, maxillary plates I-V; **palp**, palp; **pci**, peristomial cirrus; **pcl**, postchaetal lobe; **peri**, peristomium; **prcl**, prechaetal lobe; **sty**, style; **ulp**, upper lip; **vci**, ventral cirrus; **vgp**, ventral glandular pad. (Adapted from BEESLEY, ROSS & GLASBY, 2000; drawings A, C-E, by A. Murray, B, by H. Paxton).

7b (1b). Branchiae absent or as single filaments..**8**

8a (7b). Ceratophores of antennae with 10-20 rings; anterior 5-7 chaetigers with pseudocompound hooks; modified parapodia without large, auricular prechaetal lobes..***Aponuphis****

8b (7b). Ceratophores of antennae with 2-5 rings; anterior 1-3 chaetigers with pseudocompound hooks; modified parapodia with large, auricular prechaetal lobes...**9**

9a (8b). Frontal palps well developed; tough, quill-like tubes..***Hyalinoecia****

9b (8b). Frontal palps reduced or absent; fragile flattened tubes, with lateral supports; anterior hooks with short, blunt hoods; ceratophores of antennae short (1/3 to 1/2 length of prostomium)..................***Leptoecia***

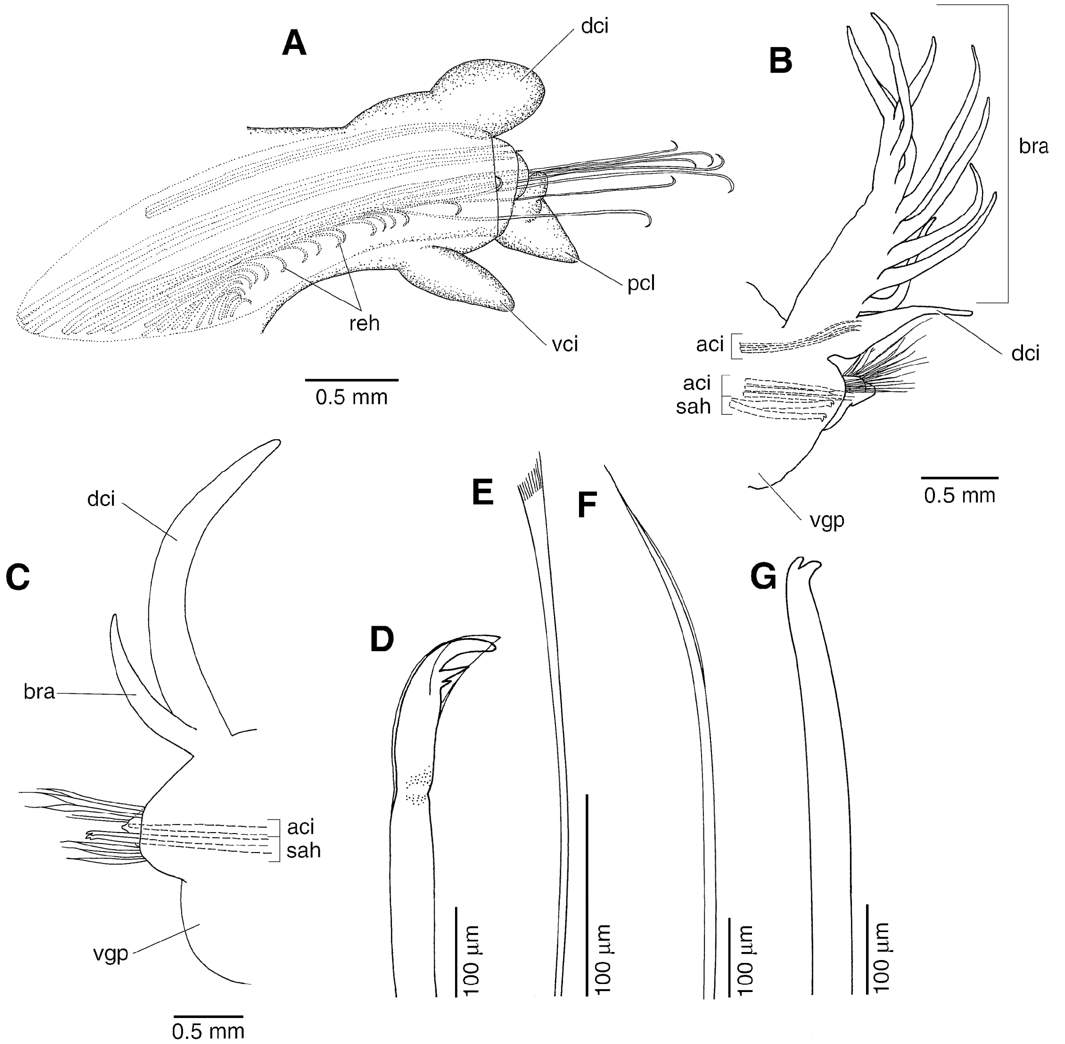

Figure legend: Family Onuphidae. **A**, parapodium from chaetiger 1 of *Brevibrachium* specimen, anterior view. **B**, posterior parapodium of *Hirsutonuphis* from chaetiger 30, anterior view. **C**, parapodium of *Hyalinoecia* specimen from chaetiger 29, anterior view. **D**, pseudocompound hook from chaetiger 3 of *Hirsutonuphis* specimen. **E**-**G**, chaetae from chaetiger 31 of *Hirsutonuphis*: **E**, pectinate chaeta; **F**, limbate chaeta; **G**, subacicular hook. **aci**, aciculae; **bra**, branchiae; **dci**, dorsal cirrus; **pcl**, postchaetal lobe; **reh**, replacement hook; **sah**, subacicular hook; **vci**, ventral cirrus; **vgp**, ventral glandular pad. (Adapted from BEESLEY, ROSS & GLASBY, 2000; drawings B-G, by A. Murray, A, by H. Paxton).

*GENUS ***Aponuphis*** Kucheruk 1978

Aponuphis KUCHERUK, 1978: 91.

TYPE SPECIES: *Hyalinoecia bilineta* Baird 1870.

REMARKS: Among the genus *Aponuphis* Kucheruk 1978 the species are normally separated with base on the segment where branchiae start and on the coloration pattern. Whether all the described species are valid or some are mere subspecies has been a matter of dispute. FAUVEL (1923*c*) considered *A. grubii* and *A. rigida* as varieties of *A. bilineata*, and *A. fauveli* and *A. brementi* as valid species. Later, FAUVEL (1928) described *A. ornata* as a variety of *A. bilineata*. BELLAN (1961*d*, 1964*b*) considered all the described species and varieties, as well as a new variety of an abranchiated and uncoloured *Aponuphis*, as being subspecies or "ecological forms" of *A. bilineata*, presenting dichotomic keys in both papers. PAXTON (1986*a*), in view of the observed differences involved, considered Bellan's oppinion very conservative, and retained all the species until more conclusive evidence of their conspecificity was available. In the meanwhile, CANTONE & BELLAN (1994) described a new species of *Aponuphis*, namely *A. willsiei*.

KEY TO SPECIES:

1a. Branchiae and pigmentation absent..***A. willsiei***
1b. Branchiae and pigmentation present..**2**

2a (1b). First branchia in the first chaetiger...***A. fauveli****
2b (1b). First branchia after the first chaetiger..**3**

3a (2b). First branchia in the second chaetiger...***A. brementi****
3b (2b). First branchia after the second chaetiger...**4**

4a (3b). First branchia in the 4th-5th chaetiger...**5**
4b (3b). First branchia in the 7th chaetiger...***A. rigida***

5a (4a). Chaetae from the first chaetigers clearly bidentate; 2 longitudinal dark bands in the dorsum..***A. bilineata****
5b (4a). Chaetae from the first chaetigers tridentate..**6**

6a (5b). 3 brown longitudinal bands in the dorsum, reducing to one after chaetiger 25................***A. grubii***
6b (5b). Transversal dark bands in the dorsum..***A. ornata****

****Aponuphis bilineata*** (Baird 1869)

Hyalinoecia bilineata BAIRD, 1869: 358.

TYPE LOCALITY: Off the coast of Cornwall, England.

SYNONYMS: [?] *Hyalinoecia rubra* Langerhans 1880.

SELECTED REFERENCES: *Hyalinoecia bilineata* — RIOJA, 1918*b*: 44-45, fig. 11; FAUVEL, 1923*c*: 422-424, fig. 167*i-p*; GEORGE & HARTMANN-SCHRÖDER, 1985: 78, fig. 17. *Aponuphis bilineata* — PAXTON, 1986*a*: 53-54, fig. 33*a-h*.

REFERENCES FOR PORTUGAL: BELLAN, 1960*a* (as *Hyalinoecia bilineata*; Cape Espichel; Setúbal Canyon); AMOUREUX, 1974*b* (as *Hyalinoecia bilineata*; off Aveiro); AMOUREUX & CALVÁRIO, 1981 (as *Hyalinoecia bilineata*; Peniche); CAMPOY, 1982 (as *Hyalinoecia bilineta* forma *bilineata*; previous records: Portuguese coast); SOUSA-REIS *et al.*, 1982 (as *Hyalinoecia bilineata*; Peniche region); MONTEIRO-MARQUES, 1987 (as *Hyalinoecia bilineata*; continental shelf of Algarve); DEXTER, 1992 (as *Hyalinoecia bilineata*; previous records: Ria Formosa; continental shelf of Algarve; Sines; Arrábida; Peniche; Figueira da Foz); RAVARA, 1997 (as *Hyalinoecia bilineata*; off Aveiro); present work (southwestern continental shelf).

MATERIAL: SEPLAT 6 — St. 90 (A.2574), off Carrapateira, 284 m, sand: 1 incomplete specimen; branchiae from chaetiger 5; compound chaetae from the first chaetigers clearly bidentate, not tridentate. **SEPLAT 7 (2nd part) — St. 11 (A.4101)**, off Lagoa de Santo André, 97 m, sand with shells: 2 incomplete specimens, with branchiae from chaetiger 4/5 and bidentate pseudocompound chaetae.

DISTRIBUTION: Widespread in the eastern parts of the North Atlantic, from the English Channel to the Mediterranean Sea; Adriatic Sea; Aegean Sea; [?] Cuba; [?] British Columbia. On sand, mud, gravel, and boulders. Between 10-1250 meters.

***Aponuphis brementi* (Fauvel 1916)**

Hyalinoecia Brementi FAUVEL, 1916*a*: 5-10, figs. 2-3.

TYPE LOCALITY: Baie de Roquebrune, near Monaco, in 35-40 meters.

SELECTED REFERENCES: *Hyalinoecia Brementi* — FAUVEL, 1923*c*: 424-426, fig. 168.

REFERENCES FOR PORTUGAL: MONTEIRO-MARQUES, 1979 (as *Hyalinoecia brementi*; southern continental shelf of Algarve); AMOUREUX, 1987 (as *Hyalinoecia brementi*; off Aveiro); MONTEIRO-MARQUES, 1987 (as *Hyalinoecia brementi*; continental shelf of Algarve); DEXTER, 1992 (as *Hyalinoecia brementi*; previous records: continental shelf of Algarve); present work (southwestern continental shelf).

MATERIAL: SEPLAT 6 — St. 62 (A.2553), off Carrapateira, 127 m, muddy sand: 1 incomplete specimen with 38 chaetigers; branchiae from chaetiger 2, as single filaments; antennae with long ceratophores; ventral cirri subulate on the anterior 5 chaetigers, on the sixth there is a transition to globular cirri, which occur already on the chaetiger 7; pseudocompound hooks on the first 7 chaetigers, tridentate; posterior podial lobe cirriform on the first 11 chaetigers; ventral bidentate subacicular hooks from chaetiger 12. **St. 237 (A.2705)**, off Praia da Amoreira, 148 m, sand: 1 incomplete specimen, plus one middle fragment and tube. **St. 307 (A.2768)**, off Praia de Odeceixe, 246 m, sandy mud: 1 incomplete specimen plus one middle fragment; 2nd chaetiger with one short branchia in one side and without branchia in the other. **St. 323 (A.2780)**, off Praia de Odeceixe, 107 m, sand: 1 incomplete specimen, partially still inside the tube; tube membranous, incrusted with sand; branchiae from the second chaetiger; pseudocompound tridentate hooks up to chaetiger 7; ventral cirri as in specimen from St. 62 (A.2553); subacicular hooks from chaetiger 12. **SEPLAT 7 (1st part) — St. 105 (A.3033)**, off Praia de Almograve, 275 m, muddy sand: 1 incomplete specimen; in one parapodium of the first chaetiger it is possible to see the absence of branchiae; they are already present at the third chaetiger, but the second chaetiger has all the cirri broken. **[?] St. 186**, 159 m, rest of data unknown: 1 incomplete specimen. **St. 260 (A.3162)**, southwestern Pessegueiro Island, 127 m, muddy sand: 1 specimen in poor condition, plus 3 middle fragments. **FAUNA 1 — St. 44*A***, Gulf of Cádiz, off Cádiz, 25-26 m, mud: 2 juvenile specimens, incomplete, with typical colour pattern; one with branchiae from chaetiger 3, but the other with buds of branchiae already at chaetiger 2.

DISTRIBUTION: Mediterranean Sea and Iberian Atlantic; Adriatic Sea. At moderate shelf depths.

REMARKS: *A. fauveli* (Rioja 1918) seems to be a junior synonym of *A. brementi*. The two species appear to be differentiated only with base in the starting chaetiger number of the branchiae, the first one in *A. fauveli*, and the second in *A. brementi*, being the colour pattern very similar, if not identical. The difference in the starting chaetiger of the branchiae could be related with intraspecific variability, or be size dependent.

***Aponuphis fauveli* (Rioja 1918)**

Hyalinœcia Fauveli RIOJA, 1918*b*: 45-48, fig. 12.

TYPE LOCALITY: Sandbank of Enmedio, Santander (Cantabric, Spain), at shallow water.

SELECTED REFERENCES: *Hyalinoecia Fauveli* — FAUVEL, 1923*a*: 424, fig. 167*a-h*; FAUVEL, 1936*c*: 52.

REFERENCES FOR PORTUGAL: BELLAN, 1960*a* (as *Hyalinoecia fauveli*; Cape Espichel); AMOUREUX, 1974*b* (as *Hyalinoecia fauveli*; off Aveiro; off Porto); CAMPOY, 1982 (as *Hyalinoecia bilineata* forma *fauveli*; previous records: Aveiro; Porto; Portuguese coast); AMOUREUX, 1987 (as *Hyalinoecia fauveli*; off Aveiro); HARTMANN-SCHRÖDER, 1977*a* (as *Hyalinoecia fauveli*; Bay of Setúbal); MONTEIRO-MARQUES, 1979 (as *Hyalinoecia fauveli*; southern continental shelf of Algarve); MONTEIRO-MARQUES, 1987 (as *Hyalinoecia fauveli*; continental shelf of Algarve); DEXTER, 1992 (as *Hyalinoecia fauveli*; previous records: Sines; Arrábida); RAVARA, 1997 (as *Hyalinoecia fauveli*; off Aveiro); present work (southwestern continental shelf).

MATERIAL: SEPLAT 6 — St. 62 (A.2553), off Carrapateira, 127 m, muddy sand: 6 incomplete specimens in good condition, some still partially inside the tubes; subacicular bidentate hooks in 3 of them, from chaetigers 12 (2) and 13; plus 7 middle fragments. **St. 108 (A.2589)**, off Carrapateira, 123 m, muddy sand: 1 specimen, almost complete. **St. 110 (A.2591)**, off Carrapateira, 145 m, muddy sand: 2 incomplete specimens, partially still inside the tubes; tubes membranous, with incrusted sand. **St. 158 (A.2632)**, off Arrifana, 130 m, sand: 2 specimens, one complete, and one incomplete, still inside the tube, plus one fragment. **St. 162 (A.2635)**, off Arrifana, 84 m, muddy sand: 1 specimen, still inside the tube, plus one middle fragment, also with tube. **St. 191 (A.2663)**, off Arrifana, 125 m, sand: 1 incomplete specimen, very long, partially still inside the tube. **St. 203 (A.2670)**, off Arrifana, 127 m, muddy sand: 1 incomplete specimen in good condition, partially still inside the tube, plus one middle fragment. **St. 250 (A.2715)**, off Praia da Amoreira, 181 m, sand: 1 incomplete specimen in good condition, plus tube. **St.**

269 (A.2733), off Praia da Amoreira, 132 m, sand: 1 incomplete specimen, plus one middle fragment and one tube. **St. 302 (A.2763)**, off Praia de Odeceixe, 138 m, sand: 1 incomplete specimen, in good condition, with 54 chaetigers; branchiae as single filaments from chaetiger 1; pseudocompound tridentate chaetae up to chaetiger 6; two hooded bidentate chaetae from chaetiger 17, dorsal one bigger and more projected than the ventral one; ventral cirri subulate up to chaetiger 6; from chaetiger 7 they turn to globular; plus one middle fragment with 39 chaetigers. **St. 434 (A.2849)**, south Cape Sardão, 113 m, muddy sand: 1 incomplete specimen in good condition; first 6 chaetigers with pseudocompound tridentate hooded hooks; with tube; plus one middle fragment. **SEPLAT 7 (1st part) — St. 28 (A.2962)**, off Zambugeira do Mar, 88 m, muddy sand: 1 incomplete specimen in good condition. **St. 43 (A.2976)**, off Zambugeira do Mar, 255 m, muddy sand: 1 specimen in poor condition, partially still inside the tube; tube translucid and membranous, with incrusted pieces of shells, Foraminifera, and grains of black sand; plus one middle fragment. **St. 96 (A.3024)**, off Cape Sardão, 112 m, sandy mud: 3 incomplete specimens in poor condition, plus 2 middle fragments and tubes. **St. 117 (A.3044)**, off Praia de Almograve, 125 m, sandy mud: 2 specimens, one complete, the second incomplete and still inside the tube, plus one posterior region with pygidium. **[?] St. 186**, 159 m, rest of data unknown: 2 incomplete specimens, one still inside the tube, plus 2 fragments. **St. 229 (A.3133)**, off Vila Nova de Milfontes, 148 m, muddy sand: 1 incomplete specimen plus tube. **St. 257 (A.3159)**, southwestern Pessegueiro Island, 67 m, sand: 1 incomplete specimen, in good condition, plus one fragment. **St. 281 (A.3181)**, off Pessegueiro Island, 105 m, muddy sand: 1 specimen in poor condition, plus one middle fragment. **SEPLAT 7 (2nd part) — St. 22 (A.4082)**, north Sines, 122 m, sand: 2 incomplete specimens, partially still inside the tube, with colour patterns: one pair of brown spots in the peristomium and in the first 5 chaetigers, and than 2 pairs of spots; plus one middle fragment. **St. 36 (A.4071)**, north Sines, 128 m, gravelly sand: 1 incomplete specimen still inside the tube, plus one middle fragment; colour pattern still present. **St. 51 (A.4056)**, north Sines, 125 m, sand: 1 incomplete specimen, in good condition; colour patterns present: two brown spots in the peristomium and at the 4 first chaetigers, then at the fifth occur two more brown spots, just behind the parapodia; plus 4 middle fragments. **St. 254 (A.3877)**, off Cape Sardão, 74 m, sand: 1 incomplete specimen. **FAUNA 1 — St. 38*A***, Alborán Sea, off Punta de la Chullera, 60-62 m, mud: 4 specimens; one incomplete adult with 63 chaetigers; branchiae from chaetiger 1; it has the characteristic colour pattern, with one pair of brown spots in the peristomium and the first 4 chaetigers, and then 2 pairs of spots; one 5th spot occurs just in the middle of the dorsal region; 3 juveniles, with the same colour pattern, but with the first pair of branchiae occurring always posteriorly to the first chaetiger, at first being poorly developed; plus 2 middle fragments.

DISTRIBUTION: Iberian Peninsula coast, from Asturias to Catalonia; Adriatic Sea; Atlantic coast of Morocco. On sandy bottoms. From shallow water to 224 meters.

REMARKS: See the *REMARKS* section under *Aponuphis brementi*.

Aponuphis grubii (Marenzeller 1886)

Onuphis Grubii MARENZELLER, 1886: 21.

TYPE LOCALITY: Jan Mayen.

SELECTED REFERENCES: *Hyalinoecia bilineata* Var. *Grubii* — FAUVEL, 1923*c*: 424, fig. 167*q*.

REFERENCES FOR PORTUGAL: AMOUREUX, 1987 (as *Hyalinoecia grubii*; off Aveiro).

DISTRIBUTION: Known from the type locality.

****Aponuphis ornata*** (Fauvel 1928)

Hyalinoecia bilineata Variété *ornata* FAUVEL, 1928: 12-13, fig. 1*f-g*.

TYPE LOCALITY: Atlantic coast of Morocco. The species was originally described from specimens collected at four stations, but apparently no holotype was designated. The data of these stations is as follows: St. 56, 33º30'20"N, 8º24'30"W, 55 meters, in muddy sand with *Ditrupa*; St. 68, 30º34'40"N, 9º48'30"W, 43 meters, in mud; St. 117, 30º40'25"N, 9º55'W, 58 meters, in sand; St. 119, 30º36'N, 9º55'10"W, 47 meters, in sand with algae.

SELECTED REFERENCES: *Hyalinoecia bilineata* Variété *ornata* — FAUVEL, 1936*c*: 52, fig. 3.

REFERENCES FOR PORTUGAL: Present work (southwestern continental shelf).

MATERIAL: SEPLAT 6 — St. 82 (A.2566), off Carrapateira, 185 m, sand: 1 specimen in poor condition. **St. 93 (A.2577)**, off Carrapateira, 198 m, sand: 3 incomplete specimens with branchiae from chaetiger 5; 2 of the specimens with the 3rd tooth of the pseudocompound chaetae very poorly developed, while the other has it clearly developed, but smaller than the second one. **St. 108 (A.2589)**, off Carrapateira, 123 m, muddy sand: 1 incomplete specimen plus one fragment. **St. 110 (A.2591)**, off Carrapateira, 145 m, muddy sand: 2 incomplete specimens in good condition; branchiae from chaetiger 5; one of the specimens with subacicular bidentate hooks starting at chaetiger 10; pseudocompound chaetae with hooded terminal blades generally trifid, being the third tooth smaller than the second, in spite of sometimes these teeth being also quite big; colour patterns missing, probably faded away; plus 7 middle fragments and one posterior fragment with pygidium, with 2 long and 1 short anal cirri (another short cirrus missing). **St. 225 (A.2691)**, off Arrifana, 70 m, sand: 1 incomplete specimen in good condition, with branchiae from chaetiger 4, plus one middle fragment. **St. 290 (A.2751)**, off Praia de Odeceixe, 85 m, sand: 2 specimens, one bigger, broken in several pieces, with branchiae from chaetiger 4, and one smaller, with branchiae from chaetiger 4, incomplete. **St. 327 (A.2784)**, off Praia de Odeceixe, 47 m, sand: 1 incomplete specimen with branchiae from chaetiger 4. **SEPLAT 7 (1st part) — St. 72 (A.3001)**, off Cape Sardão, 132 m, gravelly sand: 1 specimen. **St. 144 (A.3071)**, off Praia de Almograve, 170 m, shelly sand: 1 incomplete specimen; branchiae from chaetiger 5. **St. 174 (A.3096)**, off Vila Nova de Milfontes, 238 m, muddy sand: 1 incomplete specimen. **St. 259 (A.3161)**, southwestern Pessegueiro Island, 113 m, sandy mud: 1 specimen, in very poor condition; branchiae from chaetiger 5. **St. 298 (A.3194)**, off Porto Covo, 205 m, sand: 1 specimen. **St. 315 (A.3211)**, off Porto Covo, 58 m, gravelly sand: 2 incomplete specimens, with branchiae from chaetiger 5, plus 2 middle fragments; pseudocompound chaetae with the third tooth reduced or even absent. **SEPLAT 7 (2nd part) — St. 11 (A.4101)**, off Lagoa de Santo André, 97 m, sand with shells: 2 incomplete small specimens, with branchiae from chaetiger 6 and tridentate pseudocompound chaetae. **St. 22 (A.4082)**, north Sines, 122 m, sand: 3 incomplete specimens, one with branchiae from chaetiger 5 and 2 from chaetiger 6, plus 9 middle fragments and 3 posterior fragments with pygidia; probably some of the fragments belong to the specimen of *A. fauveli* found in the same station. **St. 25 (A.4085)**, north Sines, 134 m, sand: 1 incomplete specimen with branchiae from chaetiger 6; pseudocompound chaetae with the 3rd tooth weakly marked; plus 2 middle fragments and one posterior, with pygidium. **St. 36 (A.4071)**, north Sines, 128 m, gravelly sand: 1 incomplete specimen with branchiae from chaetiger 5. **St. 51 (A.4056)**, north Sines, 125 m, sand: 2 incomplete specimens; the bigger one has branchiae from chaetiger 5, while the smaller one has them from chaetiger 6; plus one middle fragment and one posterior fragment with pygidium. **St. 160 (A.3950)**, near Sines, 90 m, gravelly sand: 1 incomplete specimen with branchiae from chaetiger 5. **St. 176 (A.3934*A*)**, off Sines, 157 m, sand: 1 incomplete specimen with branchiae from chaetiger 5. **St. 185 (A.3926)**, near Sines, 37 m, sandy mud: 4 juvenile specimens, all incomplete; one with branchiae from chaetiger 6; one specimen seems to be abranchiate. **St. 186 (A.3925)**, south Sines, 27 m, muddy sand: 1 incomplete specimen, plus one middle fragment and one posterior fragment with pygidium; pygidium with 2 long and 2 short anal cirri, besides 2 very short appendices with a triangular shape; branchiae from chaetiger 4. **St. 210 (A.3902)**, off Porto Covo, 163 m, sand: 1 incomplete specimen, very small, first branchiae in chaetiger 6; plus one middle fragment. **St. 211 (A.3901)**, south Sines, 140 m, muddy sand: 1 small specimen, apparently a juvenile; branchiae vestigial in chaetiger 5 and present in the 6th; plus 2 middle fragments. **St. 254 (A.3877)**, off Cape Sardão, 74 m, sand: 1 incomplete specimen with branchiae from chaetiger 5. **St. 316 (A.3844)**, off Arrifana, 82 m, sand: 1 incomplete specimen with branchiae from chaetiger 5, plus one middle fragment; 3rd tooth in the pseudocompound chaetae weakly marked. **FAUNA 1 — St. 33*A***, Alborán Sea, Alborán Island, 34-44 m, laminarians on rocks: 1 complete specimen; branchiae from chaetiger 5; the third tooth, whenever present, is very small; without colour pattern.

DISTRIBUTION: Atlantic coast of Morocco, between 47-145 meters, on mud, muddy sand, and sand. Portuguese coast, mainly in sandy bottoms, between 37-238 meters; Alborán Sea, among laminarians on rocks, between 34-44 meters.

REMARKS: The present specimens were compared with fresh material collected off Algarve (Southern Portugal), which showed the typical collor pattern of *A. ornata*, for which reason were identified as belonging to this species, unless the first chaetigers presented clearly bidentate pseudocompound hooks, instead of tridentate. Whether *A. ornata* and *A. bilineata* are the same species or not, requires further investigation.

Aponuphis rigida (Claparède 1868)

Hyalinoecia bilineata var. *rigida* CLAPARÈDE, 1868: 441-442, pl. 8 fig. 2.

TYPE LOCALITY: Gulf of Naples.

SELECTED REFERENCES: *Hyalinoecia bilineata* Var. *rigida* — FAUVEL, 1923*c*: 424.

DISTRIBUTION: From the English Channel to the Mediterranean Sea (Naples); Madeira Island.

Aponuphis willsiei Cantone & Bellan 1994

Aponuphis willsiei CANTONE & BELLAN, 1994: 2729, figs. 1-7.

Type locality: Cantone & Bellan (1994) designated a holotype, but didn't give the exact type locality. The specimens used for the description of the species were collected at the circalittoral zone of the Gulf of Marseille (Mediterranean Sea), in rhizomes of *Posidonia oceanica*, and on clean medium and coarse sand.
Distribution: The species is only known from the type locality (Gulf of Marseille).
Remarks: The absence of branchiae and pigmentation on this species can suggest that it was based on juvenile specimens of other species. However, the holotype was described as being 22 mm long and 1 mm wide, for 108 chaetigers, while one of the paratypes was 16 mm and 0.8 mm wide, for 98 chaetigers (Cantone & Bellan, 1994). These sizes suggest that they were adult specimens when collected.

GENUS *Diopatra* Audouin & Milne-Edwards 1833

Diopatra Audouin & Milne-Edwards, 1833*a*: 229.
Type species: *Diopatra amboinensis* Audouin & Milne Edwards 1833.

Key to Species:

(key and data from Pires *et al.*, 2010)

1a. Antennae with transverse brown bands; parapodia 5-20 with ventral lobes; 12-16 rings on ceratophores..........**2**
1b. Antennae without transverse brown bands; ventral lobes absent; 6-11 rings on ceratophores..........**3**

2a (1a). Antennae with 4-8 transverse brown bands; small species, up to 10 cm long, 4.5 mm wide; subacicular hooks starting from chaetiger 8-13 [12-15 rings on ceratophores; pectinate chaetae with 5-10 teeth; nuchal grooves crescentic; branchial filaments disappear around chaetiger 32-55]..........***D. micrura***
2b (1a). Antennae with single median brown band; large species, up to 40 cm long, 9 mm wide; subacicular hooks starting from chaetiger 19-25 [14-16 rings on ceratophores; pectinate chaetae with 5-10 teeth; nuchal grooves rounded; branchial filaments disappear around chaetiger 56-70 (48-54 in specimens from Arcachon Bay)]..........***D. neapolitana***

3a (1b). Dorsum with mid-dorsal brown patch, forming a line along the anterior region of the body; nuchal grooves crescentic; parapodia with single postchaetal lobes; pectinate chaetae with 11-20 teeth [small species, up to 10 cm long, 3.5 mm wide; 6-9 rings on ceratophores; subacicular hooks starting from chaetiger 13-15; branchial filaments disappear around chaetiger 26-41]..........***D. marocensis***
3b (1b). Dorsum without pigment; nuchal grooves rounded; parapodia 1-5 with double postchaetal lobes; pectinate chaetae with 25-32 teeth [measurements of complete specimens not reported; 9-11 rings on ceratophores; subacicular hooks starting from chaetiger 15-17; branchial filaments disappear around chaetiger 49-58]..........***Diopatra* sp.**

Diopatra marocensis Paxton, Fadlaoui & Lechapt 1995

Diopatra marocensis Paxton, Fadlaoui & Lechapt, 1995: 950-954, figs. 1-2.
Type locality: Sidi Boulbra, Morocco (Atlantic coast), 30º55'N, 09º31'W, at 25 meters, in fine sand.
Selected references: *Diopatra marocensis* — Fadlaoui, Lechapt & Retière, 1995: 958-963, figs. 2-6, tables 1-2; Rodrigues *et al.*, 2009: 611-615, figs. 2*B-C*, 3, table 1; Arias, Anadón & Paxton, 2010: 67, fig. 1. [?] *Diopatra cuprea* [not *Diopatra cuprea* Bosc 1802] — Monro, 1924*b*: 193-196, figs. 1-6. [?] *Diopatra neapolitana* [not *Diopatra neapolitana* Delle Chiaje 1841] — Amoureux, 1976*b*: 22.
References for Portugal: Rodrigues *et al.*, 2009 (Ria de Aveiro; Lagoon of Óbidos; Guia, Cascais; off Olhão); Berke *et al.*, 2010 (Lagoon of Óbidos).
Distribution: South Moroccan Atlantic coast (31º58' to 31º52'N, 9º26' to 9º36' W); Portugal; Asturias, Northern Spain; possibly also Strait of Gibraltar, and Madeira Island. In fine to medium sand, with different amounts of mud. Intertidal to 50 meters.
Remarks: *Diopatra marocensis* is characterized by depositing the eggs in the parental tube, where they undergo direct development and remain until the juveniles reach 32-34 chaetigers (Paxton, Fadlaoui & Lechapt, 1995). Brooding in the parental tube is not common in *Diopatra*, and is known for only three species (*Diopatra variabilis* Southern 1921, from India, *D. lilliputiana* Paxton 1993, and *D. gigova* Paxton 1993, both from Western Australia) and two unidentifiable reports from the Indo-Pacific (Indonesia) (Paxton, 1993; Paxton, Fadlaoui & Lechapt, 1995). In the area considered for this study,

D. marocensis is the only one to brood in the parental tube, as *D. neapolitana* has pelagic larvae (CAZAUX, 1970). MONRO (1924*b*) reported *D. cuprea* from Madeira Island, but this species is not a brooding species (see ALLEN, 1959), and the record was based on a misidentification. This way, the records by MONRO (1924*b*, as *D. cuprea*), from Madeira Island, and AMOUREUX (1976*b*, as *D. neapolitana*) from the Strait of Gibraltar, of post-larvae present in adult tubes, could refer to *D. marocensis*.

Diopatra marocensis was found again only 15 years after its description, by RODRIGUES *et al.* (2010), in several localities in Portugal, BERKE *et al.* (2010), also from Portugal, and ARIAS, ANADÓN & PAXTON (2010), in Northern Spain.

BERKE *et al.* (2010) considered the presence of *Diopatra marocensis* in Portugal as the result of a non-native introduction, probably through the bait trade. As the species broods larvae in the tube and has no planktonic larvae, these authors rejected the possibility of an introduction through ballast water. However, these statements are basely speculative, and are neither supported by the available data nor by any convincing argument. *D. marocensis* was originally described from the Atlantic coast of Morocco, but this does not mean that the species is endemic from Morocco. In fact, the coasts of the Iberian Peninsula, which include Portugal and Spain, are included in what would be the natural distributional range of a species occurring in the Atlantic coast of Morocco, as all are included in the same zoogeographic region. Moreover, ARIAS, ANADÓN & PAXTON (2010) reported the species from the Estuary of Villaviciosa, in Asturias (Northern Spain), with base on specimens some of which were collected back in May 1976, 19 years before the description of the species. Obviously, had the species been described from Asturias when first collected in 1976, and it would not imply that its presence in the Moroccan Atlantic coast was the result of an introduction. Finally, the argument of an introdution through the bait trade is not convincing, as there are no reports of a commercial bait trade of *Diopatra* or other polychaete worms from Morocco to the Iberian Peninsula, or if such trade exists, at least it is not clearly referred in the text. For this reason, the statement that *D. marocensis* is a species introduced in Portugal, as supported by BERKE *et al.* (2010), is here considered to be erroneous, without fundament, and merely speculative, and the presence of the species in Portugal and Spain is regarded as being inside the natural range of distribution of the species.

Diopatra micrura Pires, Paxton, Quintino & Rodrigues 2010

Diopatra micrura PIRES *et al.*, 2010: 22-31, figs. 2-6, tables 2-3.

TYPE LOCALITY: Ria de Aveiro (Portugal), 40º38'28.896"N, 08º44'0.276"W, intertidal, in silty fine sand (fines content 24.7%; organic matter 4.3%).

REFERENCES FOR PORTUGAL: PIRES *et al.*, 2010 (Ria de Aveiro; off Nazaré; Guia, Cascais; near mouth of Guadiana River).

DISTRIBUTION: Portugal, western and southern coasts: Ria de Aveiro, near the mouth, intertidal, in silty fine sand; on the shelf off Aveiro, 13-18 meters, in clean very fine sand; on the shelf off Nazaré, 37.2 meters, in silty fine sand; Guia, Cascais, off the Tagus Estuary, 26-60 meters, in clean and silty fine to coarse sand; shelf near the Guadiana River mouth, 10-12 meters, in silty and very silty fine sand.

Diopatra neapolitana Delle Chiaje 1841

Diopatra neapolitana DELLE CHIAJE, 1841*a*: 97-98.

TYPE LOCALITY: Naples, Italy.

SYNONYMS: [?] *Diopatra brevicirris* Grube 1856; [?] *Diopatra madeirensis* Langerhans 1880.

SELECTED REFERENCES: *Diopatra neapolitana* — SAINT-JOSEPH, 1898: 243-254, pl. 13 figs. 31-33, pl. 14 figs. 34-39; FAUVEL, 1923*c*: 419-420, fig. 166*a-h*; PAXTON, 1986*a*: 38-41; RODRIGUES *et al.*, 2009: 611-615, figs. 2*A*, *D-E*, 4, table 1. [?] *Diopatra brevicirris* — GRUBE, 1856: 55. [?] *Diopatra madeirensis* — LANGERHANS, 1880*a*: 290-291, pl. 15 fig. 25.

REFERENCES FOR PORTUGAL: CARVALHO, 1929 (Buarcos); AUGENER, 1933*d* (Aniro (?), Coimbra; maybe it refers to Aveiro); AMOUREUX & CALVÁRIO, 1981 (Tagus Estuary); CAMPOY, 1982 (previous records: Buarcos); CALVÁRIO, 1984 (Tagus Estuary); QUINTINO & GENTIL, 1987 (Lagoon of Óbidos); QUINTINO, RODRIGUES & GENTIL, 1989 (Lagoon of Óbidos); DEXTER, 1992 (previous records: Ria Formosa; Ria de Alvor; Mira Estuary; Sado Estuary; Arrábida; Lagoon of Albufeira; Tagus Estuary; Figueira da Foz; Ria de Aveiro); SPRUNG, 1994 (Ria Formosa); SALDANHA, 1995 (Portugal); RAVARA, 1997 (off Aveiro); MUCHA & COSTA, 1999 (as *Diopatra napolitana*; Ria de Aveiro and/or Sado Estuary); RODRIGUES *et al.*, 2009 (Ria de Aveiro); BERKE *et al.*, 2010 (Olhão; Faro; Odeceixe; Setúbal; Praia da Barra, Aveiro; Porto; Ofir; Esposende; Darque; Viana do Castelo).

DISTRIBUTION: Mediterranean Sea; Adriatic Sea; Aegean Sea; Atlantic western coast of France (Arcachon and St.-Jean-de-Luz); [?] Madeira Island. In sandy bottoms. Shallow water to 35 meters.

REMARKS: According to PAXTON, FADLAOUI & LECHAPT (1995), *Diopatra brevicirris* Grube 1857 and *Diopatra madeirensis* Langerhans 1880, both species described from Madeira Island, could be synonymous with *D. neapolitana*, reported from Madeira by BELLAN (1969: 43). Both species are characterized by having long branchiae, as *D. neapolitana*.

The distribution of *Diopatra neapolitana* along the Southwestern European coasts was analysed by BERKE *et al.* (2010) in an paper somewhat speculative, where polychaete range shifts are related with climate changes without sound arguments, or interpreted in the most suitable way. The distribution of the species was related with sea surface temperatures (SSTs), and shifts on this distribution with anomalies on these SSTs. Namely, it was stated that *D. neapolitana* was absent from sites where average August SSTs remain below 19ºC. This way, BERKE *et al.* (2010) explained the not finding of the species in northern Portugal by the presence of an upwelling phenomena in the region during Summer. However, a similar phenomena occurs in the southwestern region of Portugal, where upwelling is particularly intense during the months of July, August, and September, but no discontinuity in the distribution of the species was registered. The distribution of the species is also stated to be contracting southwards in the Bay of Biscay, where it seems to be replaced by an undescribed species, *Diopatra* sp. (see below), which is extending northwards from Arcachon, with northernmost records from Dunquerque (France) and Island of Sylt (Germany).

BERKE *et al.* (2010) based part of their conclusions in the fact that in the Atlantic coast of France the only species present in their surveys was the undescribed species of *Diopatra*, referred to as *Diopatra* sp. A, while no specimens of *Diopatra neapolitana* were found. On the other hand, specimens collected intertidally in the same region and originally studied by QUATREFAGES (1866*b*) and SAINT-JOSEPH (1898), and now deposited in the collections of the Paris Museum of Natural History, all refer to *D. neapolitana*, as well as other bibliographic references for the area with enough detail in order to recognize the species (see BERKE *et al.*, 2010). However, and as in similar cases, the fact that a species is not found during a survey does not mean that it is not present in the sampled region. Even in intensive or exhaustive surveys, some species can still remain undiscovered. The occurrence of up to three species of *Diopatra* in the same area, living or not in distinct habitats, as in the region of Aveiro (Portugal), or in the estuary of Villaviciosa (Asturias, Spain) reveal that in *Diopatra* sympatric species do occur.

The fact that *D. neapolitana* was not found in the Atlantic coast of France does not imply necessarily that it is no longer present there, only that it was not found. In the same way, the fact that the undescribed species *Diopatra* sp. A was not present in the studied collection of the Paris Musem does not mean that the species was not present in the region previously to its recent discovery. The dimension of the sample studied is not representative neither of the region covered nor of the period of time it is supposed to represent. The suggestion that *Diopatra* sp. A is an introduced species via ship traffic through the Gironde Estuary is also not reasonable, being most likely that the species was present in the region, in low numbers or not, but simply that it was not sampled ot detected. The fact that collectors as Quatrefages, Saint-Joseph, or Fauvel did not find the species does not mean the species was not present in the area, and erroneous identifications are not to be discarded, even by these aurhors (personal observations). A good example of the commented above is the recent discovery of *Diopatra micrura* in Portugal, by PIRES *et al.* (2010). New species, sometimes of big dimensions, are expected to be unveiled even in well studied areas, with the application of new sample and study techniques, or just by the revision of existing material using new species concepts. The discovery and description of *Mesochaetopterus rogeri* in the Mediterranean coast of Spain illustrates well this point (MARTIN *et al.*, 2008).

Finally, the ascription of the supposed range shifts in the distribution of *D. neapolitana* and *Diopatra* sp. A to climate change, as defended by BERKE *et al.* (2010), seems to be at least precipitated and not enough supported by arguments or data. Very little is known about the natural range shifts in the distribution of species of Onuphidae in order to make such a statement, and in the present case this is even more evident, when a previously unknown species is involved. Stochastic events can be present, and probably are, at least in part. Climate change is a fashionable aspect of science nowadays, but should be used with caution as an argument in areas where our ignorance concernig many natural phenomena is still huge.

***Diopatra* sp.**

SELECTED REFERENCES: *Diopatra* sp. A — BERKE *et al.*, 2010: 224, 226-228, figs. 1-2, 3*A-B*, *E*; PIRES *et al.*, 2010: 17, figs. 7-8, table 3.

DISTRIBUTION: Atlantic coast of France, between Arcachon Bay and Dunquerque, and List (Island of Sylt, Germany), at the North Sea. Intertidal, in sand.
REMARKS: The formal description of this species in currently being prepared by Kristian Fauchald, Sarah Berke and Sarah Woodin (BERKE *et al.*, 2010).

GENUS *Epidiopatra* Augener 1918

Epidiopatra AUGENER, 1918: 355.
TYPE SPECIES: *Epidiopatra hupferiana* Augener 1918.
REMARKS: Juvenile specimens of *Diopatra* have been confused with *Epidiopatra* specimens, and the validity of the latter genus was questionaed by DAY (1960; who, in spite of which, described a new species of *Epidiopatra*), and INTES & LE LŒUFF (1975) (PAXTON, 1986*a*). However PAXTON (1986*a*) showed that not only the species of *Epidiopatra* are not juveniles of *Diopatra*, but also that they represent a valid genus, with such neotenic and specialized structures as the absence of tentacular cirri and the construction of opaque tough tubes, respectively.

Epidiopatra hupferiana monroi Day 1957

Epidiopatra hupferiana var. *monroi* DAY, 1957: 92-93.
TYPE LOCALITY: False Bay (Cape), South Africa.
SELECTED REFERENCES: *Epidiopatra hupferiana monroi* — DAY, 1960: 353-355; DAY, 1967: 411, fig. 17.9.*g-k*; CANTONE, FASSARI & BRIGANDI, 1978: 63-64, fig. 2.
DISTRIBUTION: South Africa (Cape, Natal); Mozambique (Inhaca Island); Italy, at the western Sicilian coast; Tunisia. Intertidal to shallow waters.
REMARKS: This species was first recorded from the Mediterranean Sea by CANTONE, FASSARI & BRIGANDI (1978), from Tunisian waters, and later by CANTONE & FASSARI (1982), from the Western Sicilian coast, in Italy. *Epidiopatra hupferiana monroi* can be distinguished from the stem species, *E. hupferiana hupferiana* Augener 1918, by the presence of three to four pairs of branchiae in the first, against the presence of 15-20 pairs in the stem form.

The Tunisian record is based on a single complete specimen with 36 chaetigers, but no data on measurements of the specimen are given. There is the possibility that the Mediterranean records refer to juveniles of *Diopatra*.

*GENUS *Hyalinoecia* Malmgren 1867

Hyalinoecia MALMGREN, 1867*a*: 67.
TYPE SPECIES: *Nereis tubicola* O.F. Müller 1776.
SYNONYMS: Néréitube Blainville 1828 [invalid vernacular name]; *Paronuphis* Ehlers 1887.
REMARKS: A comparative table between 10 *Hyalinoecia* taxa is given in LECHAPT (1997).

KEY TO SPECIES:

1a. First chaetiger twice as long as the second one, which in turn is twice as long as the following ones; branchiae from about chaetiger 12, simple; tube oval in transverse section, thick, opaque, described as being made of mucus covered by numerous small debris, mainly small sand grains................***H. edwardsi***
1b. First chaetiger as long as, or slightly longer, than the following ones; tube round in transverse section, quill-like, with internal valves, of a translucent horny substance, without external covering of foreign particles..**2**

2a (1b). Hooks of the modified parapodia (first two parapodia) straight, bidentate, with the round teeth close together; frontal antennae globular; black eyespots absent; branchiae begin at about chaetiger 20-21..***H. robusta***
2b (1b). Hooks of the modified parapodia (first two parapodia) with slightly curved tips, bidentate, with the teeth clearly separated; frontal antennae pear-shaped or ovoid; black eyespots present; branchiae begin at about chaetiger 24-25...***H. tubicola****

Hyalinoecia edwardsi Roule 1898

Hyalinecia edwardsi ROULE, 1898*a*: 193-194.

TYPE LOCALITY: Between Azores and the Iberian Peninsula, at 4255 meters.

SELECTED REFERENCES: *Hyalinoecia Edwardsi* — ROULE, 1906: 45-51, pl. 1 fig. 7, pl. 5 figs. 40-46, pl. 8 figs. 74-80; CAMPOY, 1982: 550.

DISTRIBUTION: Deep sea, between Azores and Portugal. Known from the type locality.

REMARKS: This species was described with base on two macerated broken specimens. The tubes were described as being made of mucus with numerous small debris attached close together, mainly small sand grains (ROULE, 1898*a*, 1906). The description of the tube seems to separate the species from the genus *Hyalinoecia*, characterized by presenting quill-like tubes, horny and translucent, without externally attached foreign particles. Besides, CAMPOY (1982) states that the description of the species is not clear in some aspects, and that it is similar to some *Nothria* species, in spite of missing tentacular cirri. It is possible that the poor condition of the available specimens conditioned the original description. A definitive statement on the position of this species will depend on the revision of the type material, apparently deposited at the Muséum National d'Histoire Naturelle, in Paris (SOLÍS-WEISS *et al.*, 2004), and/or on the collecting of new material from the same area than the types.

Hyalinoecia robusta Southward 1977

Hyalinoecia robusta SOUTHWARD, 1977: 175-178, pl. 1, pl. 2 figs. *a-b*.

TYPE LOCALITY: Bay of Biscay, 43º45.5'N, 03º47.7'W, at 1800 meters, on mud.

SYNONYMS: [?] *Hyalinoecia platybranchis* Grube 1878.

SELECTED REFERENCES: *Hyalinoecia robusta* — WINSNES, 1985: 21, figs. 3*F*, 4; DETINOVA, 1985*a*: 114. [?] *Hyalinoecia platybranchis* — GRUBE, 1878*a*: 90.

DISTRIBUTION: Off Iceland, 1576-1800 meters; Bay of Biscay, between 1500-2300 meters; Canary Islands, off Gomera, at 1100 meters; Strait of Denmark; [?] Cape Verde. On muddy bottoms.

REMARKS: *H. platybranchis* Grube 1878, collected near the Cape Verde Islands, from an unspecified depth, could be the same species than *H. robusta*, as the animal was described as lacking eyes and with branchiae starting at chaetiger 18. However SOUTHWARD (1977) preferred not to use that name, as due to the lack of pertinent information on the description and the impossibility to study the type material, it was impossible to be certain that the specimens belonged to the same species.

SOUTHWARD (1977) also checked the possible finding of specimens of *H. robusta* by previous authors, recorded as *H. tubicola*. This way, SOUTHWARD (*op.cit.*) found that ROULE (1906) had separated his records of *H. tubicola* from the Northeast Atlantic into two groups: smaller oculated specimens from shallower waters, and larger blind specimens, from greater depths (between 835 and 2015 meters). The records of *H. tubicola* by FAUVEL (1914*f*), from the North Atlantic, also fell into shallow (48-248 meters) and deep (1098-2320 meters) water groups, with a single record between 250 and 1000 meters (a trawl performed between 150-932 meters, at the Gulf of Gascony).

MANGUM & RHODES (1970), also described some specimens from the west side of the Atlantic, collected at 1125-1350 meters, as blind and with branchiae from chaetiger 19-22. These specimens were clearly different from *H. artifex* Verrill 1880, a west Atlantic species found at depths between 350-600 meters (SOUTHWARD, 1977). Besides, some North Atlantic deep-water records (between 1802-2448 meters) of *H. tubicola* in the North Atlantic and Denmark Strait by WESENBERG-LUND (1950*a*: 27), could belong to *H. robusta*. WINSNES (1985) confirmed posteriorly the presence of *H. robusta* in the Denmark Strait, but didn't state the depth where the specimens were collected.

Other records as *H. tubicola* from the East North Atlantic could include both species. AMOUREUX (1973*a*: 440) refers the presence of *H. tubicola* at the continental slope off northern Spain. The reference to the depths is somewhat vague, but one specimen is referred to present branchiae from chaetiger 20, while the rest presented branchiae from chaetigers 23-26. The same author identified later as *H. tubicola* specimens from the Bank Le Danois (off Asturias), some collected between 450-600 meters on sandy bottoms, and other at depths greater than 1500 meters, on muddy bottoms (AMOUREUX, 1974*c*: 114). Finally, HARTMANN-SCHRÖDER (1977: 90) also refers the presence of *H. tubicola* from off Portugal and the Gorringue Bank, being some specimens from depths between 72-90 meters, and the rest from 1370-1430 meters.

As a result of the above, SOUTHWARD (1977) suggested that *H. robusta* could occur from the Bay of Biscay to Cape Verde Islands, mainly off the continental slope, and also in deep-water on the west side of the Atlantic.

*_Hyalinoecia tubicola_ (O.F. Müller 1776)

Nereis tubicola O.F. MÜLLER, 1776: 18.

TYPE LOCALITY: Norway.

SYNONYMS: *Onuphis sicula* Quatrefages 1866; [?] *Onuphis (Paronuphis) gracilis* Ehlers 1887.

SELECTED REFERENCES: *Hyalinoecia tubicola* — MALMGREN, 1867*a*: 67-68, pl. 8 fig. 49; EULENSTEIN, 1913: 144-148, 163, figs. 1*b*, 3, 7-8; FAUVEL, 1923*c*: 421-422, fig. 166*i-q*; MANGUM & RHODES, 1970: 3-6, figs. 1*A*, 2; SOUTHWARD, 1977: 178-179, pl. 2 figs. *c-k*; GEORGE & HARTMANN-SCHRÖDER, 1985: 80, fig. 18; WINSNES, 1985: 21, figs. 1, 3*F*, 4; KIRKEGAARD, 1992: 354-356, fig. 173; HARTMANN-SCHRÖDER, 1996: 253-254. *Onuphis sicula* — QUATREFAGES, 1866*b*: 352. [?] *Onuphis (Paronuphis) gracilis* — EHLERS, 1887: 78-82, pl. 21 figs. 5-13.

REFERENCES FOR PORTUGAL: FAUVEL, 1911*c* (as *Hyalinœcia tubicola*; off Faro); FAUVEL, 1914*f* (as *Hyalinœcia tubicola*; off Faro); BELLAN, 1960*a* (Cape Espichel; Cape Sagres); AMOUREUX, 1974*b* (off Aveiro; off Porto); HARTMANN-SCHRÖDER, 1977*a* (off Cape Sardão; Bay of Setúbal); HARTMANN-SCHRÖDER, 1979*a* (western continental shelf of Algarve); MONTEIRO-MARQUES & ANDRADE, 1981 (southwestern continental shelf); CAMPOY, 1982 (previous records: Aveiro; Porto; Portuguese coast); MONTEIRO-MARQUES, 1987 (continental shelf of Algarve); DEXTER, 1992 (previous records: continental shelf of Algarve); SALDANHA, 1995 (Portugal); RAVARA, 1997 (off Aveiro); MACHADO & CANCELA DA FONSECA, 2007 (Algarve); present work (southwestern continental shelf).

MATERIAL: SEPLAT 6 — St. 84 (A.2567), off Carrapateira, 185 m, sand: 1 small incomplete specimen, maybe a juvenile, plus tube. **St. 249 (A.2714)**, off Praia da Amoreira, 218 m, sand: 1 complete specimen in poor condition, still inside the tube. **SEPLAT 7 (1st part) — St. 83 (A.3012)**, off Cape Sardão, 340 m, sandy mud: 1 incomplete specimen with 29 chaetigers; branchiae from chaetiger 24, hooded hooks from 25; tube missing. **St. 166 (A.3088)**, off Vila Nova de Milfontes, 203 m, sand: 1 incomplete specimen with about 60 chaetigers; branchiae from chaetiger 22, hooded hooks from 25; tube present. **[?] St. 186**, 159 m, rest of data unknown: 1 complete juvenile, still inside the tube. **St. 233 (A.3137)**, off Vila Nova de Milfontes, 212 m, sand: 1 complete specimen broken in two, with the anterior part still inside the tube, which has valves; anterior fragment with 36 chaetigers, posterior one with 110, total length of about 90 mm; branchiae from chaetiger 24, hooded hooks from 25. **St. 275 (A.3177)**, off Pessegueiro Island, 173 m, sand: 1 incomplete specimen with 32 chaetigers; branchiae from chaetiger 24, hooded hooks from 25; plus a middle fragment with 26 chaetigers, and another one inside the tube; tube present. **SEPLAT 7 (2nd part) — St. 35 (A.4072)**, north Sines, 135 m, gravelly sand: 1 incomplete specimen in poor condition, with 77 chaetigers for 30 mm long; branchiae from chaetiger 23; hooded hooks from about the same chaetiger; specimen inside the tube, translucent and very hard. **St. 165 (A.3944)**, off Sines, 163 m, gravelly sand: 1 complete specimen, broken in two pieces; anterior fragment with 75 chaetigers, posterior fragment with 38 chaetigers, performing a total of 113 chaetigers, 60 mm long, 4 mm wide; branchiae from chaetiger 24; hooded hooks from chaetiger 25; 2 long anal cirri; frontal antennae pear-shaped; eyes not seen; acicular chaetae of the first two chaetigers with slightly curved tips, with the two teeth well separated and with a small hood. **St. 194 (A.3918)**, south Sines, 84 m, sand: 1 juvenile specimen, very small, incomplete and broken in two; eyes present and chaetae of the first chaetiger bidentate; some of the anterior chaetae pseudocompound; tube quill-like. **FAUNA 1 — St. 2*A***, Gulf of Cádiz, off Chiclana de la Frontera, 116-118 m, detritic: 1 incomplete specimen, still inside the tube. **St. 4*A***, Alborán Sea, between Rincón de la Victoria and Vélez-Málaga, 60 m, sand with mud: 2 specimens, one complete; complete specimen with about 125 chaetigers and 50 mm long, eyes not seen, branchiae and hooded hooks from chaetiger 24. **St. 13*A***, Alborán Sea, off Cape Sagra, Motril, 62 m, coarse gravel: 8 specimens, 3 incomplete and 5 complete. **St. 21*A***, Alborán Sea, off Marbella, 130-164 m, detritic: 1 complete specimen, broken in two; both pieces still inside the tube. **St. 23*A***, Alborán Sea, Placer de las Bóvedas, off San Pedro de Alcántara, 30-32 m, coralligenous: 17 specimens, 10 complete, 7 incomplete; biggest part of the worms still inside the tubes; plus two middle fragments and one posterior fragment with tube. **St. 26*A***, Alborán Sea, Djibouti Bank, off Nerja, 296-297 m, sand and mud: 1 incomplete specimen, still inside the tube. **St. 37*A***, Alborán Sea, off Punta de la Chullera, 95-100 m, coarse gravel: 187 specimens, 163 incomplete and 24 complete; biggest part still inside their tubes; plus 28 middle fragments, and 31 posterior fragments with pygidia; specimens present a red area just below the neuropodia, from chaetiger 6/7 to about chaetiger 21. **St. 48*A***, Gulf of Cádiz, off Doñana, 62 m, mud: 1 complete specimen, plus tube. **St. 57*A***, Gulf of Cádiz, off Cape Trafalgar, 76-80 m, gravel and stones: 2 incomplete specimens inside the tubes. **St. 76*A***, Gulf of Cádiz, off Isla Cristina, 535-546 m, muddy sand: 2 incomplete specimens, inside the tubes, plus one middle fragment, and one posterior fragment with pygidium.

DISTRIBUTION: Norway; Sweden; Faroes; western coasts of British Isles; from the northern North Sea to the Mediterranean Sea; Adriatic Sea; Aegean Sea; [?] Gulf of Mexico. Occurs on muddy sand, muddy gravel or sand with gravel. Restricted to the continental shelf from 30 meters to about 250 meters, but it can also occur at deeper waters, as 546 meters. Records from other areas of the world or depths need confirmation, as refer possibly to other species.

GENUS *Leptoecia* Chamberlin 1919

Leptoecia CHAMBERLIN, 1919*a*: 264, 319-320.
TYPE SPECIES: *Leptoecia abyssorum* Chamberlin 1919.
SYNONYMS: *Parhyalinoecia* Hartmann-Schröder 1975; *Neonuphis* Kucheruk 1978.

Leptoecia apalpata (Hartmann-Schröder 1975)

Parhyalinoecia apalpata HARTMANN-SCHRÖDER, 1975: 65-68, figs. 32-38.
TYPE LOCALITY: Off Portugal, 42º04.1'N, 14º55.6'W, at 5275 meters.
SELECTED REFERENCES: *Leptoecia apalpata* — PAXTON, 1986*a*: 30-32, fig. 18*a-c*.
DISTRIBUTION: Known from the type locality.

GENUS *Longibrachium* Paxton 1986

Longibrachium PAXTON, 1986*a*: 43-44.
TYPE SPECIES: *Rhamphobrachium atlanticum* Day 1973.

KEY TO SPECIES:

1a. Lower bundles of chaetae of chaetigers 5-15 only with simple limbate chaetae; modified parapodia only with large hooks; maxilla VI absent..***L. atlanticum***
1b. Lower bundles of chaetae include pseudocompound falcigers in chaetiger 5, and pseudocompound to compound limbate chaetae in chaetigers 5-15; modified parapodia with large and small hooks; maxilla VI present...***L. falcigerum***

Longibrachium atlanticum (Day 1973)

Rhamphobrachium atlanticum DAY, 1973: 55-56, fig. 8.
TYPE LOCALITY: Off Beaufort, North Carolina (U.S.A.), 34º 34'N, 76º 25'W, 19 meters, on coarse sand.
SELECTED REFERENCES: *Rhamphobrachium atlanticum* — GARDINER, 1976: 195-196, fig. 25*h-i*. *Longibrachium atlanticum* — PAXTON, 1986*a*: 43-44, fig. 26*a-e*; PAXTON, 1986*b*: 80-81; CANTONE, LANERA & SORDINO, 1997: 261-264, figs. 2-3.
DISTRIBUTION: Western North Atlantic: North Carolina, Florida and [?] Alabama, U.S.A., in 18-120 meters. Tyrrhenian Sea, Italy, in 15-18 meters. Blanes, Catalonian coast of Spain, at about 35 meters, in sand (personal observation). In sandy and muddy bottoms.
REMARKS: CANTONE, LANERA & SORDINO (1997) refer some differences between the described specimen from the Tyrrhenian Sea and the previous available descriptions of *Longibrachium atlanticum*. This way, the Italian specimen is described as having a pair of small eyes at the bases of the posterior lateral antennae, which were not described for the holotype and paratype specimens. However, these eyes were observed in non-type material collected at Florida and North Carolina (PAXTON, 1986*b*). On the other hand, all the oculated specimens were smaller than the type material, which lead CANTONE, LANERA & SORDINO (1997) to suggest that the presence of eyes could be a juvenile character, lost later in the adults. Another difference is the presence of 7 spiny hooks in the modified parapodia 4, instead of the 4 modified chaetae reported previously by PAXTON (1986*a*, *b*). Finally, the maxillary formula described by CANTONE, LANERA & SORDINO (1997) is different from the previous ones, presenting less teeth in maxillae MII, MIII, and MIV.

Longibrachium falcigerum Paxton & Gillet 2004

Longibrachium falcigerum PAXTON & GILLET, 2004: 60-62, figs. 1-2.
TYPE LOCALITY: North Atlantic Ocean, Southern Azores: Meteor Seamount, 30º12.01'N, 28º24.64'W, at 585-615 meters.

DISTRIBUTION: North Atlantic Ocean, Southern Azores: Meteor and Plato seamounts, between 495-695 meters, in bioclastic sand and sponges, or in pteropod sand and coral.

REMARKS: The presence of lower pseudocompound to compound limbate chaetae was considered to be a plesiomorphic character of the family Onuphidae by PAXTON (1986*a*), and is also present in the close genus *Rhamphobrachium* Ehlers, 1887.

*GENUS ***Nothria*** Malmgren 1866

Nothria MALMGREN, 1867*a*: 66.

TYPE SPECIES: *Onuphis conchylega* Sars, 1835.

SYNONYMS: *Northia* Johnston 1865 [not Gray 1847 (Mollusca)].

KEY TO SPECIES:

1a. Pseudocompound hooks in the first 3 chaetigers; branchiae from chaetiger 9-10.................................**2**
1b. Pseudocompound hooks in the first 2 chaetigers; branchiae present from chaetiger 11-13..................**3**

2a (1a). Branchiae from chaetiger 9 or 10; eyes present; pectinate chaetae from chaetiger 2; median antenna reaches chaetiger 6-10, usually 7..***N. britannica***
2b (1a). Branchiae from chaetiger 10; eyes absent; pectinate chaetae from chaetiger 3; median antenna reaches chaetiger 12-14..***N. maremontana****

3a (1b). Digitiform postchaetal lobes in all chaetigers; intrafascicular hooks from about chaetiger 14 (13-15)...***N. hyperborea***
3b (1b). Digitiform postchaetal lobes limited to first 14 or 15 chaetigers; intrafascicular hooks from about chaetiger 12...***N. conchylega***

Nothria britannica (McIntosh 1903)

Onuphis britannica MCINTOSH, 1903*a*: 555.

TYPE LOCALITY: MCINTOSH (1903*a*) stated that the species was collected in Zetlandic Seas, between 90-100 fathoms (165-182.9 meters). FAUCHALD (1982) redescribed the species with base on fourteen syntypes collected at St. Magnus Bay, Shetland, in 182 meters.

SELECTED REFERENCES: *Onuphis britannica* — MCINTOSH, 1910: 404-407, pl. 51 figs. 6-6*a*, pl. 63 figs. 7-7*d*, pl. 65 fig. 13, pl. 75 fig. 5, pl. 84 figs. 3-3*c*; BELLAN, 1964*b*: fig. 4. *Nothria britannica* — FAUCHALD, 1982: 91-93, fig. 15*b*, table 30; JIRKOV & YERMOLAEV, 1989: table 3.

DISTRIBUTION: British Isles. Between 165-183 meters.

REMARKS: There are few records of this species. FAUVEL (1923*c*) synonymised this species with *N. conchylega* (M. Sars 1835). However, and as noted by FAUCHALD (1982), this is a valid species, which can be clearly separated from *N. conchylega* (see above key).

Nothria conchylega (M. Sars 1835)

Onuphis conchylega M. SARS, 1835: 61-63, pl. 10 fig. 28*a-e*.

TYPE LOCALITY: Florø and Bergenfjord (Norway), 8-10 fathoms (15-19 meters), in sandy bottoms.

SYNONYMS: *Onuphis Eschrichtii* Ørsted 1843; *Nothria conchyphila* Verrill 1885.

SELECTED REFERENCES: *Onuphis conchylega* — MCINTOSH, 1910: 410; EULENSTEIN, 1913: 136-140, 162-163, figs. 4-6, 7-8, pls. 1-2; FAUVEL, 1923*c*: 415-417, fig. 164; BELLAN, 1964*b*: 85-86, fig. 4. *Nothria conchylega* — FAUCHALD, 1982: 89-90, fig. 23*b*, table 29; WINSNES, 1985: 20, figs. 3*A*, 4; PAXTON, 1986*a*: 25-27, fig. 15*a-j*; JIRKOV & YERMOLAEV, 1989: table 3; KIRKEGAARD, 1992: 356-358, fig. 174; HARTMANN-SCHRÖDER, 1996: 254-256, fig. 115. *Onuphis (Nothria) conchylega* — HARTMANN-SCHRÖDER, 1971*a*: 246-248, fig. 82; GEORGE & HARTMANN-SCHRÖDER, 1985: 82, fig. 19 [in part; not *Onuphis britannica* McIntosh 1903, in the synonymy list]. *Onuphis Eschrichtii* — ØRSTED, 1843*b*: 172, pl. 3 figs. 33-41, 45 [see FAUVEL, 1914*f*: 127-128]. *Nothria conchyphila* — VERRILL, 1885*b*: 524-525 [in part].

REFERENCES FOR PORTUGAL: MCINTOSH, 1885*a* (off Cape São Vicente); RIOJA, 1918*b* (as *Onuphis conchylega*; previous records: Cape São Vicente); BELLAN, 1960*a* (as *Onuphis conchylega*; Cape Espichel); AMOUREUX, 1974*b* (as *Nothria lepta*, *Nothria conchylega*; off Aveiro); HARTMANN-

SCHRÖDER, 1977*a* (as *Onuphis (Nothria) conchylega*; off Cape Sardão); CAMPOY, 1982 (previous records: Cape São Vicente; 38º21'6"N – 9º18'6"W); SOUSA-REIS *et al.*, 1982 (as *Nothria conchilega*; Peniche region); MONTEIRO-MARQUES, 1987 (as *Onuphis conchylega*; continental shelf of Algarve); DEXTER, 1992 (as *Onuphis conchylega*; previous records: continental shelf of Algarve; Arrábida; Peniche).

DISTRIBUTION: Spitsbergen; Iceland; Greenland; Faroes; Norway; Denmark; Skagerrak; from the North Sea to the Mediterranean Sea; Adriatic Sea; Aegean Sea; Northeastern United States; [?] cosmopolitan. On bottoms of sand, gravel, mud, and various mixtures of mud, sand, broken shells and rocks. From low water to 500 meters; [?] 4020 meters.

Nothria hyperborea (Hansen 1878)

Onuphis hyperboräa HANSEN, 1878: 5-6, pl. 4 figs. 1-9.

TYPE LOCALITY: Northern Atlantic Ocean: 62º44'N, 1º48'E, at 753 meters, on clay, and 64º36'N, 10º22'W, at 547 meters, on sand and ooze.

SELECTED REFERENCES: *Onuphis hyperborea* — HANSEN, 1882: 32-33, pl. 4 figs. 5-13. *Nothria hyperborea* — FAUCHALD, 1982: 93-95, fig. 15*a*, table 32; PAXTON, 1986*a*: 27; JIRKOV & YERMOLAEV, 1989: 10-11, figs. *a-d*, table 3.

DISTRIBUTION: Norwegian Sea, between Norway and Iceland, at 547-753 meters, on muddy bottoms.

REMARKS: As in the case of *N. britannica* this species was synonymised with *N. conchylega* by FAUVEL (1923), and later found to be a valid species by FAUCHALD (1982), being clearly separable from *N. conchylega* (see above key).

****Nothria maremontana*** André & Pleijel 1989

Nothria maremontana ANDRÉ & PLEIJEL, 1989: 11-14, figs. 1-3, table 1.

TYPE LOCALITY: Seine Seamount (off Portugal), 33º48'2"N, 14º24'2"W, at 450-455 meters.

REFERENCES FOR PORTUGAL: Present work (southwestern continental shelf).

MATERIAL: SEPLAT 7 (1st part) — [?] St. 186, 159 m, rest of data unknown: 1 incomplete specimen, with about 22 chaetigers; branchiae from chaetiger 9; pseudocompound hooks in the first 3 chaetigers; subacicular hooks from chaetiger 9; pectinate chaetae from chaetiger 3; cirriform ventral cirri to chaetiger 2; maximum number of rings in ceratophores of 4; outer lateral antennae reaches chaetiger 1, inner lateral antennae reaches chaetiger 7, and median antenna reaches chaetiger 10; eyes not seen; very similar to the description of *Nothria britannica*, with which it is probably synonymous; due to the absence of eyes, the occurrence of the first pectinate chaetae (chaetiger 3), and the size of the antennae, the specimen was identified as *N. maremontana*.

DISTRIBUTION: Seine and Josephine Seamounts (off Portugal), at 255-455 meters.

REMARKS: This species could be a junior synonym of *Nothria britannica*.

GENUS ***Onuphis*** Audouin & Milne Edwards 1833

Onuphis AUDOUIN & MILNE EDWARDS, 1833*a*: 225.

TYPE SPECIES: *Onuphis eremita* Audouin & Milne-Edwards 1833.

KEY TO SPECIES:

(adapted from FAUCHALD, 1982)

1a. All branchiae simple and strap-like..**2**
1b. Branchiae bifid or pectinate..**4**

2a (1a). Branchiae starting on chaetiger 1; all pseudocompound hooks tridentate; ventral cirri cirriform in first 5-7 chaetigers..**3**
2b (1a). Branchiae first present from chaetiger 5; all pseudocompound hooks tridentate; ventral cirri cirriform in first 4 chaetigers..***Onuphis* sp. nov.**

3a (2a). Cirriform postchaetal lobes distinct in first 10 chaetigers..***O. opalina***
3b (2a). Cirriform postchaetal lobes distinct in first 12 chaetigers..***O. rullieriana***

4a (1b). Branchiae pectinate, with up to 5-7 branchial filaments (first 15-20 chaetigers with simple branchiae)..**5**
4b (1b). Branchiae bifid (first 20-25 chaetigers with simple branchiae); ventral cirri cirriform in the first 3-4 chaetigers; digitiform postchaetal lobes disappearing at chaetiger 7-8; tubes encrusted with small stones and shell fragments..*O. falesia*

5a (4a). Pseudocompound hooks present in the first 3 chaetigers; pseudocompound hooks tridentate; branchiae pectinate, with up to 6-7 branchial filaments (first 18-20 chaetigers with simple branchiae); ventral cirri cirriform in the first 6 chaetigers; digitiform postchaetal lobes distinct in at least 60 chaetigers; tubes encrusted with sand grains..*O. eremita*
5b (4a). Pseudocompound hooks present in the first 2 chaetigers; pseudocompound hooks bi- and tridentate; branchiae pectinate, with up to 5-6 branchial filaments (first 15 chaetigers with simple branchiae); ventral cirri present at the first chaetiger, but its total number is unknown; digitiform postchaetal lobes present at first chaetiger, but its total number is unknown; tubes unknown....*O. pancerii*

Onuphis eremita Audouin & Milne Edwards 1833

Onuphis eremita AUDOUIN & MILNE EDWARDS, 1833*a*: 226-228, pl. 10 figs. 1-5.
TYPE LOCALITY: Near La Rochelle, Atlantic coast of France, on shallow sandy areas.
SELECTED REFERENCES: *Onuphis eremita* — FAUVEL, 1923*c*: 414-415, fig. 163; FAUCHALD, 1982: 39-40, fig. 12*a*, table 10; PAXTON, 1986*a*: 56-58, figs. 3, 6-8, 10. *Onuphis (Onuphis) eremita* — GEORGE & HARTMANN-SCHRÖDER, 1985: 86, fig. 21. *Onuphis Pancerii* [not Claparède 1868] — RIOJA, 1918*b*: 39-43, figs. 10*a-h*.
REFERENCES FOR PORTUGAL: BELLAN, 1960*a* (as *Onuphis emerita*; Cape Roca); MONTEIRO-MARQUES, 1987 (continental shelf of Algarve); DEXTER, 1992 (previous records: continental shelf of Algarve; Sines).
DISTRIBUTION: Atlantic coast of France and other western European intertidal areas; Mediterranean Sea; Adriatic Sea; Aegean Sea; [?] Pacific Ocean; [?] Indian Ocean. On sandy bottoms and on mixed bottoms with sand, mud, shells and gravel. From shallow subtidal zones to depths of more than [?] 1500 meters.

Onuphis falesia Castelli 1982

Onuphis falesia CASTELLI, 1982: 45-47, figs. 1-11.
TYPE LOCALITY: Gulf of Follonica (Italy), on infralittoral sandy bottoms.
DISTRIBUTION: Known from the type locality.
REMARKS: Figures 3 and 4 in CASTELLI's description (1982) were interchanged.

Onuphis opalina (Verrill 1873)

Nothria opalina VERRILL, 1873: 102.
TYPE LOCALITY: Atlantic Ocean off New England, off Georges Bank, at 200 meters, and at Georges Bank, at 273 meters.
SELECTED REFERENCES: *Nothria opalina* — VERRILL, 1874*b*: 381, pl. 4 fig. 4; HARTMAN, 1944*e*: 340, pl. 17 [49] fig. 19. *Onuphis (Nothria) opalina* — PETTIBONE, 1963*a*: 245, fig. 64. *Onuphis opalina* — FAUCHALD, 1982: 50-51, fig. 14*b*, table 16; WINSNES, 1985: 20-21, figs. 3*B*, 4.
DISTRIBUTION: From the Gulf of St. Lawrence to off Chesapeake Bay; SE Iceland. On muddy bottoms. Between 26-2295 meters.

Onuphis pancerii Claparède 1868

Onuphis Pancerii CLAPARÈDE, 1868: 438-440, pl. 8 fig. 1.
TYPE LOCALITY: Gulf of Naples, probably at shallow water (as the fishermen used it as bait).
SELECTED REFERENCES: *Onuphis Pancerii* — CLAPARÈDE, 1870: 387, pl. 5 fig. 5. Not *Onuphis Pancerii* — RIOJA, 1918: 39-43, figs. 10*a-h* [= *Onuphis eremita* Audouin & Milne-Edwards 1833].
DISTRIBUTION: Known from the type locality.
REMARKS: *Onuphis pancerii* Claparède 1868 is normally considered as being a junior synonym of *Onuphis eremita*, but taking into account the more restrictive definition of the later accepted today, it could be a valid Mediterranean species. *O. pancerii* was described by CLAPARÈDE (1868) from the Gulf of Naples, where it was referred as being very common [being named by the Napolitan fishermen as "*Esca di palo canita*" (CLAPARÈDE, 1869: 202)], but also normally misidentified as *Diopatra neapolitana*.

The original description of *O. pancerii* doesn't refer some important taxonomic characters used today, but it can be separated from *O. eremita* in the following way:

O. pancerii	***O. eremita***
- 2 chaetigers with pseudocompound hooks;	- 3 chaetigers with pseudocompound hooks;
- bi and tridentate pseudocompound hooks;	- tridentate pseudocompound hooks.

Besides, in the original description Claparède pictured the species as having the right maxilla III present, something that would be unique in the family (CLAPARÈDE, 1868: pl. 9 fig. 2*H*). However, the same author rectified that lapsus in a posterior work, given a corrected drawing of the maxillae (CLAPARÈDE, 1869: pl. 5 fig. 5). As stated by the author (CLAPARÈDE, 1869: 387), "*Le dessin* [from the publication of 1868] *avait été fait à Genève d'après une préparation de Naples. Je suis frappé de l'absence du paragnathe droit, absence que je n'avais pas remarquée à Naples. Persuadé que le paragnathe avait disparu par un accident de la préparation, je l'ai rétabli à tort dans le dessin du côté droit.*"

After its description, *O. panceri* was only referred once, by RIOJA (1918*b*), who identified as such some specimens collected at Santander. He compared his specimens with one specimen from the *Stazione Zoologica Anton Dohrn*, in Naples, and found both populations to be similar, but presenting differences in relation to Claparède's description. The description given by RIOJA (1918*b*) fits quite well the description of *O. eremita*, except in the fact that the pseudocompound hooks of chaetigers 1-3 are stated to be bi- and tridentate, instead of only tridentate. FAUVEL (1923*c*) referred the population from Santander to the species *O. eremita*, and considered *O. pancerii* as being a junior synonym of *O. eremita*.

A search for specimens that could fit the original description of *Onuphis pancerii* Claparède 1868 was performed at the collections of the *Stazione Zoologica Anton Dohrn*, in Naples, but all the specimens found belonged to *O. eremita*. However, only one of the studied lots was from South Italy (namely from Salerno).

A definitive statement on the validity of *O. pancerii* will depend on the finding of new material, both fresh or deposited in collections, that could fit the original description, as no type material is known to exist. Particularly important would be the study of topotype material from the Gulf of Naples. However, it also possible that the original description by Claparède included several errors or misinterpretations of the morphology of the worms, and that it is a junior synonym of *O. eremita*. It seems possible to discard the possibility that the species was described with base on specimens not fully developed, as Claparède described the worms as being 12 cm long, for 4-5 mm wide and 130 chaetigers.

Onuphis rullieriana (Amoureux 1977)

Nothria rullieriana AMOUREUX, 1977*b*: 399-402, fig. 1.

TYPE LOCALITY: Atlantic Ocean, SW British Isles, 48º39'03"N, 10º36'05"W, 1400 meters, on soft mud with denser lumps.

SELECTED REFERENCES: *Onuphis rullieriana* — FAUCHALD, 1982: 51-53, fig. 15*f-g*, table 17; AGUIRREZABALAGA, CEBERIO & PAXTON, 2002: 27-28.

DISTRIBUTION: Eastern Atlantic Ocean, SW British Isles, at slope depths and deep water, on muddy bottoms.

REMARKS: According to FAUCHALD (1982), this species is very similar to *O. iridiscens* (Johnson 1901), from the British Columbia, and to *O. opalina* (Verrill 1873), from New England. The biggest difference between them is the distribution of the digitiform postchaetal lobes: they are distinct in 10 chaetigers in *O. opalina*, in 12 chaetigers in *O. rullieriana*, and in 16 chaetigers in *O. iridescens*. As stated by FAUCHALD (1982), the value of this character can be questionated, as it could be size depending.

Onuphis **sp. nov.**

Onuphis (Nothria) geophiliformis [not *Nothria geophiliformis* Moore 1903] — IBÁÑEZ, 1972: 26-28, fig. 2.

REFERENCES FOR PORTUGAL: DEXTER, 1992 (as *Nothria geophiliformis*; previous records: Ria de Alvor); MUCHA & COSTA, 1999 (as *Onuphys geophyliformis*; Ria de Aveiro and/or Sado Estuary); present work (Faro, Ria Formosa).

DISTRIBUTION: Sandbank of Cabezuela (Cádiz, Atlantic South Spain), Ria Formosa (Faro, South Portugal) and Ria de Alvor (near Portimão, South Portugal), in intertidal sand banks, in coastal lagoon tidal salt marshes.

REMARKS: The specimens described by IBÁÑEZ (1972) as *Onuphis (Nothria) geophiliformis* (Moore 1903) seems to belong to an undescribed species. IBÁÑEZ (1972) apparently based his identification in

USCHAKOV (1955*a*) and DAY (1967), especially in the keys presented in both works. However, as can be seen in the following table, differences exist between *O. geophiliformis* (Moore 1903), as redescribed by FAUCHALD (1982) with base on type material, *O. geophiliformis* sensu Ibáñez 1972, and *O. geophiliformis* sensu Day 1967. Specimens of the 3 populations could belong to different species, which seems to be supported by the different geographical origins. Another species, *Onuphis similis* (Fauchald 1968), presents features which approaches it to the previous populations.

Further specimens of *Onuphis geophiliformis* sensu Ibañez 1972 were found at the Ria Formosa (Faro, Southern Portugal), by Margarida Machado (University of Algarve), in a habitat very similar to the originally one where it was found by IBÁÑEZ (1972), and their description as a new species of *Onuphis* is being currently prepared (GIL & MACHADO, *in prep.*).

TABLE *Onuphis* sp.

SPECIES (REFERENCE)	***O. geophiliformis*** **(FAUCHALD, 1982)**	***O. geophiliformis*** **(IBÁÑEZ, 1972)**	***O. geophiliformis*** **(DAY, 1967)**	***O. similis*** **(FAUCHALD, 1982)**
Branchiae from chaetiger no.	3 to 6 (mean = 5)	5	4-5	6
Pseudocompound hooks in chaetiger no. (no. of teeth)	3 (tridentate)	4 (tridentate)	6 (tridentate)	4 (tridentate)
Subacicular hooks from chaetiger no.	10-12 (mean = 10.75)	9	9-10	8 or 9 (mean = 8.75)
Ventral cirri cirriform in the first (no.) chaetigers	4 or 5 (mean = 4.95)	4	5 (subulate)	6
Pectinate chaetae from chaetiger	?	8	after the 10th	?
Locality	Senday Bay (Off Japan)	Cádiz (Spain)	Cape (South Africa)	Baja California (Off Mexico)

*GENUS ***Paradiopatra*** Ehlers 1887

Diopatra (Paradiopatra) EHLERS, 1887: 73, 75.
TYPE SPECIES: *Diopatra (Paradiopatra) fragosa* Ehlers 1887.
SYNONYMS: *Sarsonuphis* Fauchald 1982.

KEY TO SPECIES:

1a. Branchiae absent..2
1b. Branchiae present..5

2a (1a). Pseudocompound hooks distally unidentate...*P. hartmanae*
2b (1a). Pseudocompound hooks bi- and/or tridentate...3

3a (2b). Pseudocompound hooks present in the first 2 chaetigers...4
3b (2b). Pseudocompound hooks present in the first 3 chaetigers; pseudocompound hooks both bi- and tridentate..*P. hispanica**

4a (3a). All pseudocompound hooks tridentate; subacicular hooks present from chaetiger 14-16; ceratophores without projections or papillae...*P. fiordica*
4b (3a). Pseudocompound hooks bi- and tridentate; subacicular hooks from chaetiger 11; ceratophores papillate..*P. capbretonensis*

5a (1b). Branchiae present before chaetiger 17; branchiae with up to 4 filaments; pseudocompound hooks in the first 3 chaetigers; subacicular hooks from chaetiger 9..6
5b (1b). Branchiae first present from chaetiger 17; at least 4 branchial filaments present; pseudocompound hooks in the first 4 chaetigers; subacicular hooks from chaetiger 10................*P. iberica*

6a (5a). Branchiae present from chaetiger 9-16 (normally around 12), with up to 4 branchial filaments; digitiform ventral cirri in the first 2 chaetigers...*P. quadricuspis*

6b (5a). Branchiae present from chaetiger 6-10 (normally around 7), sometimes later in the Portuguese population, with up to 3 branchial filaments; digitiform ventral cirri in the first 3 chaetigers..***P. calliopae****

Paradiopatra capbretonensis Aguirrezabalaga, Ceberio & Paxton 2002

Paradiopatra capbretonensis AGUIRREZABALAGA, CEBERIO & PAXTON, 2002: 23-27, fig. 4.
TYPE LOCALITY: Capbreton Canyon, Bay of Biscay, 43º42.01'N, 2º18.52'W, at 990 meters.
DISTRIBUTION: Capbreton Canyon, Bay of Biscay**,** between 505-1113 meters.

****Paradiopatra calliopae*** Arvanitidis & Koukouras 1997

Paradiopatra calliopae ARVANITIDIS & KOUKOURAS, 1997: 53-58, figs. 1-2, tables 1-2.
TYPE LOCALITY: Off Mount Athos coast (Greece), 40º20'25"N, 24º18'05"E, at 80-300 meters, on silty sand to silt bottom.
REFERENCES FOR PORTUGAL: AMOUREUX, 1987 (as *Nothria* cf. *lepta*; off Aveiro); present work (southwestern continental shelf).
MATERIAL: SEPLAT 6 — St. 94 (A.2578), off Carrapateira, 156 m, muddy sand: 1 specimen partially inside the tube; branchiae from chaetiger 15. **St. 108 (A.2589)**, off Carrapateira, 123 m, muddy sand: 1 specimen, partially still inside the tube; branchiae from chaetiger 10. **St. 177 (A.2651)**, off Arrifana, 195 m, sand: 1 specimen, partially still inside the tube; branchiae from chaetiger 13, subacicular hooks from chaetiger 9; AIII shorter than AII; plus one middle fragment. **St. 187 (A.2657)**, off Arrifana, 160 m, muddy sand: 1 specimen partially inside the tube; branchiae from chaetiger 11. **St. 188 (A.2660)**, off Arrifana, 147 m, sand: 1 specimen partially inside the tube; possible to see part of the maxillary apparatus. **St. 198 (A.2666)**, near Arrifana, 43 m, sand: 1 incomplete specimen plus tube; branchiae from chaetiger 12; possible to see the digitate postchaetal lobes in the first 8 chaetigers. **St. 208 (A.2676)**, off Arrifana, 205 m, sand: 1 specimen partially inside the tube; branchiae from chaetiger 11. **St. 245 (A.2712)**, off Praia da Amoreira, 372 m, sandy mud: 2 specimens, one still inside the tube, the other incomplete; no branchiae observed, but all the other characters fit the description of *P. calliopae*. **St. 303 (A.2764)**, off Praia de Odeceixe, 154 m, muddy sand: 1 specimen partially inside the tube. **St. 312 (A.2771)**, off Praia de Odeceixe, 310 m, muddy sand: 1 specimen, partially inside the tube; branchiae from chaetiger 16. **SEPLAT 7 (1st part) — St. 43 (A.2976)**, off Zambugeira do Mar, 255 m, muddy sand: 3 specimens, all incomplete and in bad condition, plus one fragment. **St. 44 (A.2977)**, off Zambugeira do Mar, 230 m, muddy sand: 1 specimen in poor condition, partially inside the tube; branchiae from chaetiger 11. **St. 64 (A.2994)**, off Cape Sardão, 300 m, muddy sand: 1 specimen in poor condition, partialy inside the tube. **St. 176 (A.3098)**, off Vila Nova de Milfontes, 170 m, sand: 1 specimen in poor condition, inside the tube; branchiae from chaetiger 12. **[?] St. 186**, 159 m, rest of data unknown: 1 complete specimen, partially still inside the tube; branchiae from chaetiger 9; pseudocompound hooks from chaetiger 9; last chaetigers without branchiae; 4 anal cirri; digitate postchaetal lobes in the first 8 chaetigers. **St. 204 (A.3116)**, off Vila Nova de Milfontes, 410 m, sandy mud: 1 specimen in poor condition, partially still inside the tube. **St. 260 (A.3162)**, southwestern Pessegueiro Island, 127 m, muddy sand: 2 specimens in poor condition, one still inside the tube, while the other doesn't have tube and is incomplete, with branchiae from chaetiger 12. **St. 281 (A.3181)**, off Pessegueiro Island, 105 m, muddy sand: 1 specimen in poor condition, partially inside the tube; branchiae from chaetiger 11. **SEPLAT 7 (2nd part) — St. 2 (A.4092)**, off Lagoa de Santo André, 345 m, sand: 1 small specimen, probably a juvenile, partially still inside the tube; one antenna AI bifurcated; no branchiae seems to be present, but all the other characters seem to be of *P. calliopae*. **St. 7 (A.4097)**, off Lagoa de Santo André, 132 m, sand with shells: 1 specimen still inside the tube; branchiae from chaetiger 10, at first very small; subacicular hooks from chaetiger 9. **St. 10 (A.4100)**, off Lagoa de Santo André, 118 m, sand: 3 specimens, plus 2 middle fragments, one posterior fragment with pygidium with 4 anal cirri (2 long, 2 short), and tubes; (1) apparently complete, partially inside the tube; branchiae from chaetiger 9; subacicular hooks from chaetiger 9; digitate postchaetal lobe from chaetiger 8; 2 branchial filaments at chaetigers 18-26; last branchiae at chaetiger 30; pectinate chaetae present already at chaetiger 16; (2) incomplete, with branchiae from chaetiger 12; AI reaching chaetiger 1, AII reaching about chaetiger 8, AIII reaching chaetiger 6; (3) incomplete, with branchiae from chaetiger 12. **St. 36 (A.4071)**, north Sines, 128 m, gravelly sand: 1 complete specimen with 54 chaetigers, plus about 15 chaetigers in a regenerated posterior fragment, with 4 anal cirri; branchiae from chaetiger 14. **St. 51 (A.4056)**, north Sines, 125 m, sand: 1 specimen, broken in several pieces; it was still inside the tube; branchiae from chaetiger 13; first subacicular hooks from chaetiger 9; pseudocompound hooks at chaetigers 1-3; ventral digitiform cirri to chaetiger 3; pectinate chaetae from chaetiger 13; last digitate postchaetal lobe at about chaetiger 7/8; eyespots present; 650 µm wide; antennae coiled, which makes difficult to compare the

relative sizes between them. **St. 196 (A.3916)**, off Sines, 125 m, muddy sand: 1 incomplete specimen, plus one middle fragment. **St. 266 (A.3865)**, off Cape Sardão, 175 m, sand: 4 specimens, 2 still inside the tubes, plus 6 middle fragments; one specimen with branchiae from chaetiger 12, subacicular hooks from chaetiger 9, AII longer than AIII; one specimen with branchiae from chaetiger 11, subacicular hooks from chaetiger 9. **St. 282 (A.3850)**, off Arrifana, 265 m, muddy sand: 1 small specimen, incomplete, plus one fragment with many detritus attached.

DISTRIBUTION: Off Mount Athos coast (Greece), 80-300 meters, on silty sand to silt bottoms; Gulf of Taranto (Ionian Sea), 200-800 meters, on muddy or silty bottom; Adriatic Sea; Western Mediterranean Sea; continental shelf of Portugal, between 43-410 meters, in muddy and sandy bottoms.

REMARKS: *Nothria lepta* (Chamberlin 1919) was described from the Pacific Ocean, off Panama, and most likely it does not occur in Europe. The numerous records of *Onuphis lepta* and *Nothria lepta* from the European and nearby waters (check ARVANITIDIS & KOUKOURAS, 1997, for references), refer probably to *Paradiopatra calliopae*, in spite of the fact that most of these records are not accompanied by notes that enable a definitive identification.

However, some doubts remain concerning the fact that if the species described as *Onuphis lepta* by BELLAN (1964*b*) is the same species than *Paradiopatra calliopae*. BELLAN (1964*b*) refers the presence of the subacicular hooks from chaetiger 10, while ARVANITIDIS & KOUKOURAS (1997) state that they start at chaetiger 9, being this character invariant. From BELLAN's (1964*b*) description and drawings it is possible to state that his specimens have scoop-shaped pectinate chaetae, which is typical of *Nothria* species, while the pectinate chaetae of *Paradiopatra calliopae* are flat.

Paradiopatra fiordica (Fauchald 1974)

Nothria fiordica FAUCHALD, 1974*b*: 15-18, fig. 1.

TYPE LOCALITY: Ytre Samlafjord, southwest of Jonanes, Hardangerfjorden (Norway), 60º17'00"N, 06º13' 10"E, at 840-842 meters, on fine mud.

SELECTED REFERENCES: *Sarsonuphis fiordica* — FAUCHALD, 1982: 70, fig. 20*b*, table 23; WINSNES, 1985: 21, figs. 3*C*, 4. *Onuphis (Nothria) fiordica* — GEORGE & HARTMANN-SCHRÖDER, 1985: 84, fig. 20. *Paradiopatra fiordica* — HARTMANN-SCHRÖDER, 1996: 256-257.

REFERENCES FOR PORTUGAL: [?] RAVARA, 1997 (as *Onuphis (Nothria)* cf. *fiordica*; off Aveiro).

DISTRIBUTION: Norway, on various fjords; SE Iceland. On muddy bottoms, sometimes on fine sand or clay. Between 0-20 meters, and 150-880 meters.

Paradiopatra hartmanae (Kirkegaard 1980)

Nothria hartmani KIRKEGAARD, 1980*b*: 87-88, fig. 2*a-d*.

TYPE LOCALITY: Northern Atlantic Ocean, off Bretagne, 47º30'N, 9º34'W, 4250-4265 meters.

SELECTED REFERENCES: *Sarsonuphis hartmanae* — FAUCHALD, 1982: 73-74, fig. 22.

DISTRIBUTION: Northern Atlantic Ocean, off Bretagne, between 47º30' - 47º36'N, and 9º27' - 9º45'W, at 3820-4265 meters.

*****Paradiopatra hispanica*** (Amoureux 1972)

Nothria hispanica AMOUREUX, 1972*b*: 76-77, figs. 2-3.

TYPE LOCALITY: The description of the new species was based on 51 specimens collected at 21 stations, from the Northeast Atlantic Ocean, but apparently a holotype was not designated by AMOUREUX (1972*b*). The zone includes several areas: west of Bretagne, between 47º50'N and 48ºN, and 7º45'W and 8º05'W, at 200-900 meters, on several types of sediment; west of Galicia, between 43º23'N and 44º11'N, and 8º24'W and 9º04'W, at 200-1000 meters, mainly on muddy sand; between 44º11'N and 42º08'N and 8º40'W and 9º40'W, at 200-1000 meters, on several types of sediment; between 43º20'N and 44º20'N and 8º20'W and 9º40'W, at 300-1000 meters, on several types of sediment; and finally SW Bretagne, around 47º10'N and 5º40'W.

SELECTED REFERENCES: *Sarsonuphis hispanica* — FAUCHALD, 1982: 74. *Paradiopatra hispanica* — AGUIRREZABALAGA, CEBERIO & PAXTON, 2002: 20-23, fig. 2.

REFERENCES FOR PORTUGAL: AMOUREUX, 1974*b* (as *Nothria hispanica*; off Aveiro; off Porto); CAMPOY, 1982 (as *Nothria hispanica*; previous records: Aveiro; Porto); AMOUREUX, 1987 (as *Nothria hispanica*; off Aveiro; off Porto); present work (southwestern continental shelf).

MATERIAL: SEPLAT 7 (1st part) — St. 204 (A.3116), off Vila Nova de Milfontes, 410 m, sandy mud: 1 incomplete specimen with 89 chaetigers; without branchiae; ventral cirri cirriform in the first 3 chaetigers and transitional in chaetiger 4 to the glandular pads present in the rest of the segments; bidentate subacicular hooks present from chaetiger 14; digitiform postchaetal lobes present to about chaetiger 7 (they reduce their size along the chaetigers); pseudocompound hoks with long, pointed hoods in chaetiger 1 and 2, probably broken at chaetiger 3; they are all tridentate, but the third tooth can be very small. **SEPLAT 7 (2nd part) — St. 29*A* (A.4090)**, north Sines, 435 m, muddy sand: 1 incomplete specimen, partially still inside the tube; subacicular hooks from chaetiger 13; pseudocompound hooks in the first 3 chaetigers, tridentate with the 3rd tooth small.

DISTRIBUTION: Atlantic Ocean from off Ireland to Portugal. In sandy and muddy bottoms. At slope depths.

Paradiopatra iberica (Hartmann-Schröder 1975)

Onuphis (Onuphis) iberica HARTMANN-SCHRÖDER, 1975: 63-65, figs. 26-31.

TYPE LOCALITY: Atlantic Ocean, off Iberian Peninsula, 42º17.2'N, 14º46.3'W, at 5270 meters.

SELECTED REFERENCES: *Sarsonuphis iberica* — FAUCHALD, 1982: 74, fig. 10*f*.

DISTRIBUTION: Atlantic Ocean, off Iberian Peninsula: 42º17.2'N, 14º46.3'W, at 5270 meters; 42º04.1'N, 14º55.6'W, 5275 meters.

Paradiopatra quadricuspis (M. Sars *in* G.O. Sars 1872)

Onuphis quadricuspis M. SARS *IN* G.O SARS, 1872: 407-408 [in part; in part = *Paradiopatra fiordica* (Fauchald 1974)].

TYPE LOCALITY: Drøbak, Christianafjord (Oslofjord, Norway), in 50-120 fathoms (91.4-219.5 meters).

SYNONYMS: *Diopatra socialis* Ehlers 1874.

SELECTED REFERENCES: *Onuphis quadricuspis* — M. SARS, 1869: 254 [*nomen nudum*]; EULENSTEIN, 1913: 140-144, 163, figs. 1*a*, 2; FAUVEL, 1923*c*: 418-419, fig. 165*f-p*; BELLAN, 1964*b*: 89, fig. 4. *Onuphis (Onuphis) quadricuspis* — HARTMANN-SCHRÖDER, 1971*a*: 245-246; GEORGE & HARTMANN-SCHRÖDER, 1985: 88, fig. 22. *Sarsonuphis quadricuspis* — FAUCHALD, 1982: 66-68, fig. 20*e*, table 22; WINSNES, 1985: 21, figs. 3*D*, 4. *Paradiopatra quadricuspis* — PAXTON, 1986*a*: 36-38, fig. 22*a-i*; KIRKEGAARD, 1992: 358-360, fig. 175; HARTMANN-SCHRÖDER, 1996: 257; ARVANITIDIS & KOUKOURAS, 1997: 52-53, table 2; AGUIRREZABALAGA, CEBERIO & PAXTON, 2002: 23, fig. 3. *Diopatra socialis* — EHLERS, 1874: 296; EHLERS, 1875: 46-49, pl. 3 figs. 5-10.

REFERENCES FOR PORTUGAL: BELLAN, 1960*a* (as *Onuphis quadricuspis*; Cape Espichel; Setúbal Canyon; off Cape Santa Maria); AMOUREUX, 1974*b* (as *Onuphis quadricuspis*; off Aveiro; off Porto); CAMPOY, 1982 (as *Onuphis quadricuspis*; previous records: Aveiro; Porto; Portuguese coast); [?] AMOUREUX, 1987 (as *Onuphis* cf *quadricuspis*; off Aveiro; off Porto).

DISTRIBUTION: Northern and central Atlantic; English Channel; Norway; Denmark; Skagerrak and northern parts of the North Sea; Mediterranean Sea; Aegean Sea (400-850 meters); [?] North Pacific. On sandy and muddy bottoms, and mixtures of both with gravel and pebbles. From 40 to about 2000 meters.

GENUS ***Rhamphobrachium*** Ehlers 1887

Rhamphobrachium EHLERS, 1887: 70.

TYPE SPECIES: *Rhamphobrachium Agassizii* Ehlers 1887.

SYNONYMS: *Paranorthia* Moore 1903.

REMARKS: PAXTON (1986*a*) found that during the development of *Rhamphobrachium*, the number of anterior modified parapodia changes from two, in juveniles, to three, in adults, which should be taken into account when identifying specimens of this genus.

The genus *Rhamphobrachium* was divided in two subgenera by PAXTON (1986*b*): the nominal subgenus *Rhamphobrachium* Ehlers 1887, characterized by all limbate chaetae simple, subacicular hooks reaching a maximum number of 3-6 per parapodium on chaetigers 15-30, and maxilla VI present; and a new subgenus, *Spinigerum* Paxton 1986, characterized by lower limbate chaetae pseudocompound to compound, number of subacicular hooks per parapodium not exceeding 2, and maxilla VI absent. However, similar variations in the genus *Longibrachium*, especially in what concerns the species *L. falcigerum* Paxton & Gillet 2004, weren't associated with the placement of the species in different subgenera (being, for instance, *L. falcigerum* the only species in the genus to present lower limbate chaetae pseudocompound to compound). The division of the genus *Rhamphobrachium* in two subgenera will not be considered here.

KEY TO SPECIES:

(adapted from PAXTON, 1986*b*)

1a. Tentacular cirri inserted close together; all limbate chaetae simple; falcigers absent; maximum of 3-6 subacicular hooks on chaetigers 15-30; Mx VI present; branchiae from chaetiger 16-17; postchaetal lobes of modified parapodia long and subulate; early unmodified parapodia with well developed, subulate postchaetal lobes, latter decreasing in size and absent from chaetiger 10; recurved hooks weakly pseudocompound..***R. agassizii***
1b. Tentacular cirri inserted far apart; lower limbate chaetae compound (= spinigers); falcigers present on chaetiger 4 only, or absent; maximum of 2 subacicular hooks per parapodium; Mx VI absent; branchiae from chaetiger 11-13; postchaetal lobes of modified parapodia long and subulate; early unmodified parapodia with short, rounded postchaetal lobes, latter absent from about chaetiger 12; recurved hooks weakly pseudocompound..***R. brevibrachiatum***

Rhamphobrachium agassizii Ehlers 1887

Rhamphobrachium Agassizii EHLERS, 1887: 70-73, pl. 17 figs. 1-5, pl. 18 figs. 1-9 [in part; in part = *Rhamphobrachium brevibrachiatum* (Ehlers 1874)].
TYPE LOCALITY: Florida (U.S.A.), off Carysfort Reef, 642 meters.
SELECTED REFERENCES: *Rhamphobrachium Agassizii* — FAUVEL, 1914*f*: 126-127; TREADWELL, 1939*b*: 258-259, fig. 76. *Rhamphobrachium (Rhamphobrachium) agassizii* — PAXTON, 1986*a*: 44-45, fig. 27; PAXTON, 1986*b*: 85-86.
DISTRIBUTION: Florida (U.S.A.); Puerto Rico; Azores; Morocco; Cape Verde; [?] Ivory Coast. In sandy and muddy bottoms. Between 40 (?)-2165 meters.
REMARKS: PAXTON (1986*b*) designated a lectotype for the species. From the five syntypes collected in four different stations, only one agreed with the description and illustrations given by EHLERS (1887), and it was choosen as lectotype. All the other four specimens belonged to *R. brevibrachiatum*.

Rhamphobrachium brevibrachiatum (Ehlers 1874)

Diopatra brevibrachiata EHLERS, 1874: 295.
TYPE LOCALITY: West of the English Channel, 48º50'N, 11º07'W (11º09'W), at 725 fathoms (1325.8 meters), in muddy sand.
SYNONYMS: *Onuphis Jourdei* Marion 1883.
SELECTED REFERENCES: *Diopatra brevibrachiata* — EHLERS, 1875: 49-52, pl. 3 figs. 11-21; BELLAN, 1959*b*: 157-159, 2 plates between pages 168 and 169. *Rhamphobrachium brevibrachiatum* — BELLAN, 1964*b*: 89-93, figs. 5-7; GEORGE & HARTMANN-SCHRÖDER, 1985: 90, fig. 23. *Onuphis (Diopatra) brevibrachiata* — MCINTOSH, 1903*b*: 133-135, pl. 10 figs. 5-10. *Onuphis brevibrachiata* — MCINTOSH, 1910: 407, pl. 63 figs. 8-8*a*, 10-10*a*, pl. 75 figs. 6-6*a*, pl. 84 figs. 4-4*c*; FAUVEL, 1923*c*: 417-418, fig. 165*a-e*. *Rhamphobrachium (Spinigerium) brevibrachiatum* — PAXTON, 1986*b*: 89-92, fig. 9*a-g*. *Onuphis Jourdei* — MARION, 1883*b*: 44.
REFERENCES FOR PORTUGAL: AMOUREUX, 1974*b* (off Porto); CAMPOY, 1982 (previous records: Porto); RAVARA, 1997 (off Aveiro).
DISTRIBUTION: From the English Channel to the Mediterranean Sea; Adriatic Sea; Aegean Sea; off Florida, Virginia and South Carolina, U.S.A.; [?] NE South America. On muddy sand. Between 120-1470 meters.
REMARKS: BELLAN (1964*b*) puts in synonymy *Onuphis Jourdei* Marion 1883 with *Rhamphobrachium brevibrachiatum* (Ehlers 1875), with base on the short description given by MARION (1883*b*). In this description Marion refers the presence "(...) *dans les trois premiers segments, de longues soies se terminant en un bec recourbé, comme un baton de montagne dont le sommet de la hampe serait hérissé de pointes et garni d'une corne de chamois*" (MARION, 1883*b*: 44). This description fits perfectly the chaetae of the first three chaetigers of *R. brevibrachiatum*. Previously to BELLAN (1964*b*), *Onuphis jourdei* was synonymized with *Nothria conchylega* (Sars 1835) (as *Onuphis conchylega*) by FAUVEL (1923*c*), in what was followed by LAUBIER & PARIS (1962). FAUCHALD (1982), probably unaware of Bellan's work (he doesn't cite it), used the synonymy suggested by FAUVEL (1923*c*). PAXTON (1986*b*) in her revision of the genus *Rhamphobrachium* doesn't mention this synonymy.

*FAMILY **OPHELIIDAE** Malmgren 1867

AS: *OPHELIIDÆ* MALMGREN, 1867*a*: 73.

TYPE GENUS: *Ophelia* Savigny 1822.

SYNONYMS: *OPHELIACEA* Grube 1850; *OPHELIADAE* Williams 1852.

REMARKS: The family Opheliidae groups worms with a fusiform-shaped body, with poorly developed parapodia, without head appendages, and with a ventral longitudinal groove present along the whole body or only in the posterior part of it. The family was divided in three subfamilies, Travisiinae, Opheliinae and Ophelininae, by HARTMANN-SCHRÖDER (1971*a*), mainly with base in the division of the body in differentiated regions, presence and relative length of the ventral groove, presence and distribution of branchiae, and shape of the anal region. The phylogeny of the Opheliidae was later studied using a phenetic approach by BELLAN, BELLAN-SANTINI & DAUVIN (1990), showing the separation of the family into the 3 main groups previously designated by HARTMANN-SCHRÖDER (1971*a*): one plesiomorphic group (Travisiinae, now included in the Scalibregmatidae), and two apomorphic groups (Opheliinae and Ophelininae), which can be easily recognized by the presence of a ventral groove only in the posterior part of the body (Opheliinae) or along the whole body (Ophelininae). Though, normally this general separation is not used by most authors.

FAUCHALD (1977*a*) recognized 11 genera in the Opheliidae, *Ammotrypanella* McIntosh 1878, *Antiobactrum* Chamberlin 1919, *Armandia* Filippi 1861, *Didymenides* Chamberlin 1919, *Euzonus* Grube 1866, *Kesun* Chamberlin 1919, *Ophelia* Savigny 1822, *Ophelina* Ørsted 1843, *Polyophthalmus* Quatrefages 1850, *Trachytrypane* McIntosh 1878, and *Travisia* Johnston 1840, and posteriorly HUTCHINGS & MURRAy (1984) described one new genus, *Lobochesis*. The genus *Travisia* was later transferred to the Scalibregmatidae, together with two junior synonyms, *Kesun* and *Didymenides* (see chapter on Scalibregmatidae for further comments), while *Lobochesis* was synonymized with *Euzonus* by SANTOS, NONATO & PETERSEN (2004). The synonymy between *Ammotrypanella* and *Ophelina* was suggested by LEVINSEN (1884), and STØP-BOWITZ (1945*a*), and later sustained by BELLAN, BELLAN-SANTINI & DAUVIN (1990). However, SCHÜLLER (2008) revised the genus *Ammotrypanella*, redescribing its type species, *A. arctica* McIntosh 1878, with base on type and newly collected material, and describing three new species. BREWER, SIERWALD & BOND (2011) demonstrated that the name *Euzonus* was also being used in Diplopoda (Arthropoda), where it had priority, and suggested *Pectinophelia* Hartman 1938 as the next available generic name for the polychaete group. However, BLAKE (2011) showed that *Thoracophelia* Ehlers 1897 had priority over *Pectinophelia*, and that it should be used as the next available to replace *Euzonus* in ophelids. Finally, EIBYE-JACOBSEN (2002) remarked the fact that the genera *Armandia* and *Ophelina* differ mainly by the presence (*Armandia*) against absence (*Ophelina*) of lateral segmental eyes, and that it was highly doubtful that both genera represented monophyletic groups, as among other motives segmental eyes were also present in *Polyophthalmus*, a genus without branchiae. However, a definitive statement on the possible synonymy of both genera was not done, as it is required a phylogenetic analysis of the family in order to determine the polarity of the major characters (EIBYE-JACOBSEN, *op. cit.*). This way, the family Opheliidae includes at present 8 genera, with 139 species and 2 subspecies considered to be valid. Seven of these genera, with 29 described taxa are known to occur in the European and nearby waters, as well as at least one possible undescribed new species. Only one species was found among the studied material.

No comprehensive monography on the group was ever published, but good taxonomic accounts, with a resume of the previous works, can be found in BLAKE (2000*e*) and ROUSE (2001*b*). Besides the publications cited above and below, recent taxonomic accounts on the group include SAITO, TAMAKI & IMAJIMA (2000), EIBYE-JACOBSEN (2002*a*), ELÍAS & BREMEC (2003) and ELÍAS *et al.* (2003). FASSARI (1998) gives a key for all the species so far recorded in Italy, which include about all the species present in the Mediterranean Sea.

KEY TO GENERA:

(adapted from FAUCHALD, 1977*a*)

1a. Ventral groove present only in the posterior part of the body..**2**
1b. Ventral groove present along the whole body..**3**

2a (1a). Three body-regions, including inflated head, inflated anterior region and narrow posterior region; branchiae only in posterior region..***Thoracophelia***

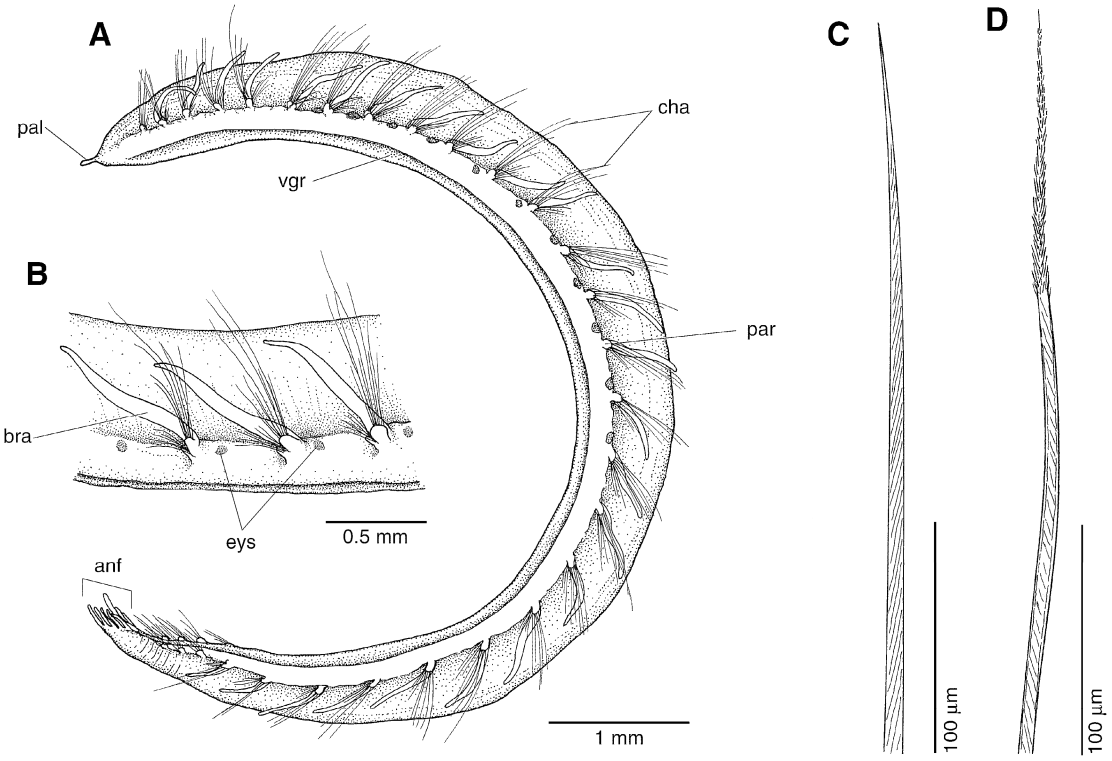

Figure legend: Family Opheliidae. **A**-**C**, *Armandia* specimen: **A**, entire animal, latero-ventral view; **B**, mid-segments showing branchiae and parapodia, lateral view; **C**, capillary chaeta from parapodium of chaetiger 9. **D**, *Travisia* specimen, capillary chaeta from parapodium of chaetiger 18. **anf**, anal funnel; **bra**, branchia; **cha**, chaetae; **eys**, eye spots; **pal**, palpode; **par**, parapodium. (Adapted from BEESLEY, ROSS & GLASBY, 2000; drawings by A. Murray).

2b (1a). Body not clearly regionated, inflated anteriorly and grooved posteriorly; branchiae, if present, from chaetigers 8-10...***Ophelia***

3a (1b). Branchiae absent; anal tube short..4
3b (1b). Branchiae present; anal tube long..5

4a (3a). Lateral eyes absent...***Trachytrypane***
4b (3a). Lateral eyes present..***Polyophthalmus***

5a (3b). Lateral eyes present..***Armandia***
5b (3b). Lateral eyes absent...6

6a (5b). Branchiae, if present, along the whole body..***Ophelina****
6b (5b). Branchiae always present, limited only to the posterior end of body...................***Ammotrypanella***

GENUS *Ammotrypanella* McIntosh 1878

Ammotrypanella MCINTOSH, 1878*a*: 505.

TYPE SPECIES: *Ammotrypanella arctica* McIntosh 1878.

REMARKS: The possible synonymy between *Ophelina* Ørsted 1843, and *Ammotrypanella* McIntosh 1878, was first suggested by LEVINSEN (1884), and later by STØP-BOWITZ (1945*a*). According to

Bellan, Bellan-Santini & Dauvin (1990: 179), "*En dehors de la présence de cirres anaux dorsaux, caractère éminemment fluctuant, chez* Ophelina*, ce genre ne se distingue du genre monospécifique* Ammotrypanella *que par des caractères liés aux branchies, limitées à la partie postérieure du corps dans ce dernier. Or la présence de branchies est, elle aussi, fluctuante dans le genre* Ophelina*; la distinction entre les deux genres apparaît donc d'ores et déjà sérieusement remise en question*". This way, both genera would seem to be separated merely by "*branchiae present and limited to the posterior end only*" in *Ammotrypanella*, against "*branchiae presently, rarely absent, on most setigers*", in *Ophelina* (Fauchald, 1977*a*). Besides, *Ammotrypanella arctica*, the type species of *Ammotrypanella*, was considered as belonging to *Ophelina* by Levinsen (1884, as *Ammotrypane*), and Støp-Bowitz (1945*a*, 1948*c*).

Taking into account the original description of *Ammotrypanella arctica* by McIntosh (1878*a*), the type species of the genus, it could seem that the presence on the branchiae limited to the posterior end would be a consequence of the poor condition of the specimen, which would have lost the rest of the branchiae: "*The specimens* [collected during the voyage of the 'Valorous'] *were not quite in* (...) *good preservation* (...). *No group of marine Invertebrates is more difficult to preserve in a satisfactory manner than the Annelida*" (McIntosh, 1878*a*: 499), and "*Toward the posterior end* [of *Ammotrypanella arctica*] (...) *slender cirri still remain on several feet.* (...) *The condition of the specimen is unfavourable for minute work*" (McIntosh, 1878*a*: 505). In spite of this, another distinctive character pointed by McIntosh is that "*The succeeding segments* [to the cephalic lobe] *are somewhat narrow* (...) *and each has a tuft of simple silky bristles, which in dorsal view* (...) *project prominently outward and backward in the first seven or eight segments*" (McIntosh, 1878*a*: 505).

Schüller (2008) revised the genus *Ammotrypanella*, redescribing the type species, *A. arctica*, with base on the holotype and on new material, and describing three new species, being all the newly collected material from the Southern Ocean deep sea. According to Schüller (2008), the holotype of *A. arctica*, collected at the Davis Strait (Western Greenland), is in poor condition, but all the diagnostic characters are present. The newly found specimens, all from the Southern Ocean and Antarctic Peninsula, also presented the same diagnostic features. Besides, the three species described as new, all of them with base on numerous specimens, also fitted the generic diagnosis of *Ammotrypanella*, the main distinctive characters of which are the presence of parapodial branchiae only in the third quarter of the body, and prolonged bent chaetae in tufts, in the anterior parapodia. The known species in the genus are distinguished among them mainly by characters related with the anal tube, like the shape of its posterior margin and the presence or absence of a ventral cirrus.

This way, the genus *Ammotrypanella* is considered to be a valid genus, in spite of being close to *Ophelina*, with its main characters being prolonged, bent chaetae in tufts in the anterior parapodia, in combination with a limitation of branchiae to the posterior body region (Schüller, 2008).

Ammotrypanella arctica McIntosh 1878

Ammotrypanella arctica McIntosh, 1878*a*: 505, pl. 65 fig. 12.

Type locality: In the middle of North Atlantic, off northwest British Isles, 55º10'N, 25º58'W, in 1785 fathoms (3264.4 meters), on a bottom of *Globigerina*-ooze.

Synonyms: [?] *Ophelina opistobranchiata* Wirén 1901; [?] *Ophelina Helgolandiae* Augener 1913.

Selected references: *Ammotrypanella arctica* — Hartman & Fauchald, 1971: 132-133; Detinova, 1985*a*: 123, fig. 3*ж*; Schüller, 2008: 57, fig. 3*C-E*. *Ophelina arctica* — Støp-Bowitz, 1948*c*: 23. [?] *Ophelina opisthobranchiata* — Wirén, 1901: 253; Augener, 1928*a*: 747; Støp-Bowitz, 1945*a*: 53, map on page 59; Støp-Bowitz, 1948*c*: 20. Not *Ammotrypanella arctica* — Fauvel, 1914*f*: 246-247, pl. 22 figs. 14-19 [= probably *Ophelina* sp., according to Schüller (2008)].

Distribution: Off northwest British Isles; Iceland; [?] Spitsbergen; northwest Atlantic; Scotia Sea; Weddell Sea. In muddy bottoms. Between 2132-5023 meters.

Remarks: The specimen described by Fauvel (1914*f*) as *Ammotrypanella arctica* is bigger than the holotype by McIntosh (1878*a*) (50 mm against about 20 mm, 44 chaetigers against about 30), but besides this, Fauvel considered it to be identical to McIntosh's specimen. However, Fauvel (1914*f*) described his specimen as having branchiae from the second chaetiger, being these present until near the last segments. These branchiae are also described as being very short and almost rudimentary in the anterior chaetigers, developing then, but remaining always small, curved, and acuminate. Only in a few segments, about 8-10 after chaetiger 20, they reach a length of about the distance between two consecutive chaetigers, and then they reduce again the size very quickly, remaining almost as rudimentary. The anal funnel was described by McIntosh (1878*a*) as having a smooth rim, while in the specimen identified by Fauvel (1914*f*) it was described as being weakly scalloped. As pointed by

SCHÜLLER (2008), the presence of branchiae in the anterior and median body regions discards Fauvel's specimen from the genus *Ammotrypanella*, suggesting its placement in the genus *Ophelina*.

When AUGENER (1913*a*) described *Ophelina helgolandiae*, from Spitsbergen, he stated that his species was close to *Ammotrypanella arctica* McIntosh 1878, and to *Ophelina opisthobranchiata* Wirén 1901, and probably identical to one of the two, or maybe to the two. STØP-BOWITZ (1945*a*) commented the great similarity between *O. helgolandiae* and *A. arctica*, especially with base on the description of this second species given by FAUVEL (1914*f*). However, STØP-BOWITZ (1945*a*) preferred to maintain both species as separate and valid, while waiting for a possibility to study the original material. Though, both *Ophelina helgolandiae* Augener 1913, and *Ammotrypanella arctica* sensu Fauvel 1914, present rudimentary or poorly developed branchiae in the anterior region of the body, that becomes more developed in the posterior region, which discards them as belonging to the genus *Ammotrypanella*, as stated above. Later, STØP-BOWITZ (1948*c*) considered again *A. arctica* as being very close to *O. helgolandiae* and also to his new species, *O. groenlandica*, from which it would be separated mainly by the shape of the anal funnel. However, they can also be separated by the number of chaetigers of the body, and by the presence of well developed branchiae along the biggest part of the body in *O. groenlandica*. Both *Ophelina helgolandiae* and *O. groenlandica* are here considered as belonging to the genus where they were originally described

In what concerns *O. opisthobanchiata*, STØP-BOWITZ (1945*a*) considered that the fact that both *O. helgolandica* and *O. opisthobranchiata* were based on material collected from deep water near Spitsbergen, made possible the synonymy of both species. However, in the same work and in a posterior one (STØP-BOWITZ, 1945*a*, 1948*c*), the species was treated as a possible junior synonym of *O. cylindricaudata* (Hansen 1878). As the species is clearly described as having branchiae only in the posterior region of the body, it is considered here as a possible synonymy of *A. arctica*.

GENUS ***Armandia*** Filippi 1861

Armandia FILIPPI, 1861: 215.

TYPE SPECIES: *Armandia cirrhosa* Filippi 1861.

REMARKS: AMOUREUX (1983*a*) presents a comparative table for 20 valid species of *Armandia*, using Tebble's formula created to distinguish the different taxa of *Ophelia* (see *REMARKS* section under this genus), while SAITO, TAMAKI & IMAJIMA (2000) analized the variability of characters in *Armandia*.

KEY TO SPECIES:

1a. 33 chaetigers..***A. polyophthalma***
1b. 26-27 chaetigers...***A. cirrhosa***

Armandia cirrhosa Filippi 1861

Armandia cirrhosa FILIPPI, 1861: 219, 1 plate.

TYPE LOCALITY: Trieste, Adriatic Sea.

SYNONYMS: *Armandia oligops* Marenzeller 1874.

SELECTED REFERENCES: *Armandia cirrosa* — FAUVEL, 1927*a*: 136-137, fig. 48*f*; SARDÁ, 1984*a*: 127-129, fig. 2; FASSARI, 1998: 47. *Armandia oligops* — MARENZELLER, 1874: 470-472, pl. 7 fig. 4; LANGERHANS, 1880*b*: 101, pl. 4 fig. 13.

REFERENCES FOR PORTUGAL: DEXTER, 1992 (previous records: Arrábida).

DISTRIBUTION: Mediterranean Sea; Adriatic Sea; Aegean Sea; Portugal; Madeira Island. Shallow water, on sandy bottoms.

Armandia polyophthalma Kükenthal 1887

Armandia polyophthalma KÜKENTHAL, 1887: 540, pl. 33 figs. 27-38.

TYPE LOCALITY: Gulf of Naples.

SYNONYMS: *Armandia Dollfusi* Saint-Joseph 1894; *Armandia flagellifera* Southern 1914.

SELECTED REFERENCES: *Armandia polyophthalma* — FAUVEL, 1927*a*: 135-136, fig. 48*a-e*; MARQUES, 1942: 45, fig. 1*h*; FASSARI, 1998: 47. *Armandia Dollfusi* — SAINT-JOSEPH, 1894: 114-117, pl. 6 figs. 148-151. *Armandia flagellifera* — SOUTHERN, 1914: 132-133, pl. 14 fig. 31.

References for Portugal: Marques, 1942 (Portimão); Bellan, 1960*a* (Setúbal Canyon); Monteiro-Marques, 1984 (Praia da Falésia); Monteiro-Marques, 1987 (continental shelf of Algarve); Dexter, 1992 (previous records: continental shelf of Algarve; Sado Estuary; Arrábida).
Distribution: Mediterranean Sea; Adriatic Sea; Aegean Sea; European Atlantic coast, from the English Channel to Portugal; Ireland. In coarse sand. Intertidal to 20 meters.

GENUS *Ophelia* Savigny 1822

Ophelia Savigny, 1822: 38.
Type species: *Ophelia bicornis* Savigny 1822.
Synonyms: *Neomeris* Costa 1844; *Pseudophelia* Katzmann 1973.
Remarks: The revision provided by Tebble (1952, 1953) sets the basis of the actual taxonomy of the *Ophelia*, providing a series of criteria to describe new and redescribe old taxa. Tebble (1952, 1953) defines a series of morphological characters which are now used as diagnostic characters: disposition of the body segments, branchial fenestrations (nephridiopores), and structure of the posterior region. Particularly important was the significance of the relative positions and numbers of branchiate and abranchiate chaetigers, for which Tebble (1952) created the formula "$x_a + x_b + x_a + x_n$", where x is the number of segments, and successively *a* is the number of anterior abranchiate chaetigers, *b* the number of branchiate chaetigers, *a* the number of posterior abranchiate chaetigers, and *n* the number of posterior achaetous segments (see also, for instance, Bellan & Dauvin, 1991). This formula was posteriorly used for characterizing species of *Armandia* by Amoureux (1983*a*), and of *Euzonus*, by Probert (1976) and Santos, Nonato & Petersen (2004). Tebble (*op. cit.*) also demonstrated the taxonomic relevance of the longitudinal ridges developed in the posterior dorsal region of the body.

Besides Tebbles' papers, another important revisionary work on the genus is the one by Bellan & Dauvin (1991), where is provided a data matrix of characters versus the 32 species hitherto known and considered as valid. Other important comparative tables for species of *Ophelia*, in spite of being less complete, can be found in Amoureux & Dauvin (1981), for 26 species, in Hartmann-Schröder & Parker (1995), for eight species, and in Bellan & Costa (1987), for four abranchiate species. A phenetic and phylogenetic study of the Western Mediterranean *Ophelia* was also performed by Bellan-Santini, Dauvin & Bellan (1992).

Katzmann (1973*c*) created the new genus *Pseudophelia*, which main and only distinctive character from the genus *Ophelia* was the absence of branchiae. Katzmann (1973*c*) included in his new genus the newly described species *P. translucens*, and the previously described *O. anomala* Day 1961. However, besides this last species, the genus *Ophelia* included another abranchiate form, *Ophelia profunda* Hartman 1965, and two other forms were later described, *O. laubieri* Bellan & Costa 1987, and *O. amoureuxi* Bellan & Costa 1987. The designation of the genus *Pseudophelia* to include the abranchiate forms of *Ophelia* was never followed by other authors, and Bellan, Bellan-Santini & Dauvin (1990: 176) considered it as a junior synonym of *Ophelia* Savigny 1822. The genus *Ophelia* is nowadays defined as having cirriform branchiae present or absent (*e.g.*, Blake, 2000*e*; Maciolek & Blake, 2006).

In the genus *Ophelia* the number of pairs of branchiae has taxonomic value. However, it was shown that at least some species exhibit a morphological polymorphism in what concerns the number of branchial pairs, which can fluctuate around a median number (Britton-Davidian & Amoureux, 1982), and that as a consequence, some specific misidentifications are expected to occur.

Dauvin, Bellan-Santini & Bellan (1993) discussed the allotopy of the genus *Ophelia* in the region of Roscoff. Normally, several species of *Ophelia* occur in the same geographic region or area (sympatric species), but as it was found in several studies performed in the same area (see Dauvin, Bellan-Santini & Bellan, 1993, for details), the different species of *Ophelia* normally do not overlap in the same habitat, and seem to exclude each other, even if they can tolerate the same ecological conditions (like type of substrata or depth). This way, Dauvin, Bellan-Santini & Bellan (1993) described for the region of Roscoff, and from the mediolittoral to the circalittoral the following distribution of *Ophelia* species: *O. bicornis* in the median mediolittoral; *O. rathkei* in the inferior mediolittoral and superior infralittoral; *O. neglecta* in the median and inferior exposed infralittoral, and slightly deep infralittoral (2 meters); *O. roscoffensis* after the inferior zone of the exposed infralittoral down to more than 50 meters; and *O. celtica* in the infralittoral bottoms of about 25 meters, but also known to occur in the circalittoral, at 130 meters, in the Celtic Sea.

This way, the strong allotopy of the *Ophelia* species must be taken into account when studying the group, as different species can be present in the same area, replacing each other according to different conditions of the habitat (like depth). This can also explain the great variety described in several publications of the genus.

KEY TO SPECIES:

1a. Cirriform branchiae present..........**2**
1b. Branchiae absent..........**9**

2a (1a). More than 20 pairs of branchiae..........**3**
2b (1a). Less than 20 pairs of branchiae..........**4**

3a (2a). About 39 chaetigers in total; 10 anterior abranchiate chaetigers; 2-4 dorsal longitudinal pads in the posterior region of the body (last 4 chaetigers); 7 posterior abranchial chaetigers..........***O. limacina***
3b (2a). About 31-32 chaetigers in total; 8 anterior abranchiate chaetigers; posterior longitudinal pads absent; 1 posterior abranchial chaetiger..........***O. roscoffensis***

4a (2b). 9 anterior abranchiate chaetigers (18 pairs of branchiae; 5 postbranchial chaetigers; total number of chaetigers of about 32)..........***O. neglecta***
4b (2b). 10 (or more) anterior abranchiate chaetigers..........**5**

5a (4b). 8-10 pairs of branchiae; 10-12 anterior abranchial chaetigers (4-5 postbranchial chaetigers; total number of chaetigers of about 23-24; anal segment with 8-10 dorsal small papillae, and one big ventral papilla, normally simple, but sometimes more or less bilobed, or divided in two papillae..........***O. rathkei***
5b (4b). More than 10 pairs of branchiae; 10 anterior abranchial chaetigers; always two ventral anal papillae..........**6**

6a (5b). About 29 chaetigers; 16 pairs of branchiae; 3 postbranchial chaetigers..........***O. celtica***
6b (5b). More than 30 chaetigers..........**7**

7a (6b). About 32 chaetigers..........**8**
7b (6b). About 35-36 chaetigers; 19-20 pairs of branchiae; 6 postbranchial chaetigers..........***O. borealis***

8a (7a). 13 pairs of branchiae; 9 postbranchial chaetigers; 5 pairs of nephridiopores..........***O. barquii***
8b (7a). 14 pairs of branchiae; 8 postbranchial chaetigers; 6 pairs of nephridiopores..........***O. radiata***
8c (7a). 15 pairs of branchiae; 7 postbranchial chaetigers; 6 pairs of nephridiopores..........***O. bicornis***

9a (1b). Body with 24 chaetigers (rarely 25); anal segment with two well developed ventral papillae and 10 smaller dorsal papillae..........***O. laubieri***
9b (1b). Body with 28 chaetigers..........**10**

10a (9b). Anal segment with two well developed ventral papillae and 12 smaller dorsal papillae; worms 8-10 mm long..........***O. amoureuxi***
10b (9b). Anal segment with two well developd ventral papillae and 6-9 smaller dorsal papillae; worms 4.5-5 mm long..........***O. translucens***

Ophelia amoureuxi Bellan & Costa 1987

Ophelia amoureuxi BELLAN & COSTA, 1987: 831-832, fig. 2, pl. 1 figs. 3-4, table.
TYPE LOCALITY: Îles d'Hyères, south of Île de Port Cros (France, Mediterranean Sea), at 1.07 maritime miles of the Îlot de la Gabinière, at about 90-95 meters, on a detritic bottom of *coralligène* with sand and gravel.
SELECTED REFERENCES: *Ophelia amoureuxi* — BELLAN & DAUVIN, 1991: table 2; FASSARI, 1998: 46, 47.
DISTRIBUTION: Known from the type locality.

Ophelia barquii Fauvel 1927

Ophelia variata Var. *Barquii* FAUVEL, 1927*a*: 131.

TYPE LOCALITY: Agay (Provence, France), Western Mediterranean Sea.

SELECTED REFERENCES: *Ophelia barquii* — BELLAN & DAUVIN, 1991: table 2. *Ophelia barqui* — FASSARI, 1998: 46, 47.

DISTRIBUTION: Western Mediterranean Sea: coast of France; Tyrrhenian coast of Italy; Corsica; Sardinia; Sicily; Aegean Sea. Upper intertidal zones of sandy beaches.

REMARKS: PILATO, BELCASTRO & CASSIBBA (1978) proposed the separation between two sympatric species of *Ophelia* from a Sicilian sandy beach with base on the number of nephridiopore pairs: five pairs in *O. barquii*, and six pairs in *O. bicornis*. These observations have been recently confirmed through several studies combining genetic with morphological traits (MALTAGLIATI, CASU & CASTELLI, 2004, MALTAGLIATI *et al.*, 2005).

Ophelia bicornis Savigny 1822

Ophelia bicornis SAVIGNY, 1822: 38-39.

TYPE LOCALITY: Near La Rochelle, western Atlantic coast of France.

SYNONYMS: [?] *Ophelia taurica* Bobretzky 1881.

SELECTED REFERENCES: *Ophelia bicornis* — AUDOUIN & MILNE-EDWARDS, 1833*c*: 406, pl. 17 figs. 7-9; FAUVEL, 1927*a*: 130, fig. 46*a-f*; BELLAN, 1964*b*: 124-140, figs. 9-10, maps. 1-3 [in part; in part = *Ophelia barquii* Fauvel 1927, and *Ophelia radiata* (Delle Chiaje 1827)]; BELLAN & DAUVIN, 1991: table 2; FASSARI, 1998: 46, 47 [in part; in part = *Ophelia radiata* (Delle Chiaje 1827)].

REFERENCES FOR PORTUGAL: ANDRADE, 1984 (Mira Estuary); QUINTINO & GENTIL, 1987 (Lagoon of Óbidos); QUINTINO, RODRIGUES & GENTIL, 1989 (Lagoon of Óbidos); DEXTER, 1992 (previous records: Ria Formosa; Ria de Alvor; Mira Estuary; Lagoon of Albufeira).

DISTRIBUTION: English Channel; Atlantic coast of Europe; Mediterranean Sea; Adriatic Sea; Aegean Sea; Black Sea. In coarse sand. On shallow water.

REMARKS: The ecology and distribution of *Ophelia bicornis* in the European waters have been studied in several occasions (*e.g.*: AMOUREUX, 1962; HARRIS, 1991*a*, 1991*b*, 1993).

The validity of *Ophelia bicornis* and *Ophelia radiata* as separated taxa was discussed by AMOUREUX (1977*c*), and the two taxa were considered to be morphotypes of one single species, *O. bicornis*. However, BRITTON-DAVIDIAN & AMOUREUX (1982) using biochemical analysis showed that the two species were valid, being genetically isolated taxa. Besides, the same authors also showed that both species exhibit a morphological polymorphism in what concerns the number of branchiae, refuting the possibility of the existence of hybrids between them.

Ophelia borealis Quatrefages 1866

Ophelia borealis QUATREFAGES, 1866*b*: 273.

TYPE LOCALITY: Greenland.

SELECTED REFERENCES: *Ophelia borealis* — TEBBLE, 1952: 553-560, figs. 1-3, tables 1-2; BELLAN & DAUVIN, 1991: table 2; KIRKEGAARD, 1996: 228-229, fig. 119. *Ophelia limacina* [not Rathke 1843] — [?] HARTMANN-SCHRÖDER, 1996: 424-425, fig. 207 [in part].

DISTRIBUTION: Due to the confusion with *O. limacina*, it is difficult to know the exact distribution of the species. According to BELLAN & DAUVIN (1991), it can be found in the North Sea, Irish Sea, eastern part of the English Channel, north and south part of the Bay of Biscay, and the Bering Sea, intertidal to 75 meters, in sand. KIRKEGAARD (1996) refers it as being present from Greenland to the Norwegian coast, England, English Channel, Denmark, North Sea, Skagerrak, Kattegat, Bælt, Øresund, and western Baltic Sea. On sandy bottoms. Between 1-500 meters.

REMARKS: TEBBLE (1952) distinguished between *Ophelia borealis* and *O. limacina*, two very close species, many times considered as being synonymous. This way, *O. borealis* would present 10 prebranchial chaetigers, typically 20 (16-20) branchial chaetigers, 6 (6-10) postbranchial chaetigers, 36 (34-36) total number of chaetigers, a dorsolateral circlet of anal papillae long and thin, and chaetae of posterior chaetigers long, concealing the anal segment, and *O. limacina* 10 prebranchial chaetigers, typically 22 (18-23) branchial chaetigers, 7 (6-10) postbranchial chaetigers, 39 (38-39) total number of chaetigers, a dorsolateral circlet of anal papillae short and blunt, and chaetae of posterior chaetigers short (TEBBLE, 1952).

BELLAN & DAUVIN (1991) also separated both species, according to the following characters used in the analysis: *O. borealis* would present 16-20 branchiae, 3-6 posterior abranchiate chaetigers, lateral groove with origin before the branchiae, branchial fenestration present, branchiate and posterior abranchiate chaetigers with long chaetae, and number of perianal papillae between 11-19; and *O. limacina* ≥ 21 branchiae, 7-11 posterior abranchiate chaetigers, lateral groove with origin at the same level than branchiae, branchial fenestration absent, branchiate and posterior abranchiate chaetigers with short chaetae, and number of perianal papillae ≤ 10.

PETTIBONE (1956) examined material from Greenland, Labrador, Canadian Arctic, Arctic Alaska, Washington, Oregon, and Central California, and found all kind of gradations from the typical *O. limacina* to the typical *O. borealis*. Besides, *O. assimilis* Tebble 1953, a species described from central California, seemed to fall in the variable series, and was also considered as a junior synonym of *O. limacina* by PETTIBONE (1956). However, it is possible that there were several species involved in the study by PETTIBONE (1956), which would contribute to the great range of variability found, as the variation range of the characters normally used to define the species can overlap. This way, and for instance, the specimens studied by PETTIBONE (1956) collected at Labrador would be intermediate between *O. borealis* and *O. bicornis*, as they presented 33 chaetigeous segments, 10 prebranchial and 7 postbranchial achaetigerous segments, and 16 pairs of branchiae. With some differences they approach *Ophelia rullieri*, a species described by BELLAN (1975) from the coast of Québec, in Canada, and stated to have 10 prebranchial and 5-6 postbranchial achaetigerous segments, and 17 pairs of branchiae.

I prefer to maintain both species separated as valid taxa, as defined by TEBBLE (1952), until further evidence on their synonymy is eventually found. On the other hand, *O. assimilis* is also considered as a valid species, as defined originally, by BLAKE (2000*e*).

In many publications *Ophelia borealis* and *O. limacina* are treated as synonymies and in the descriptions the morphological variation described seem to (and probably do) include specimens belonging to both species (*e.g.* HARTMANN-SCHRÖDER, 1996).

Ophelia celtica Amoureux & Dauvin 1981

Ophelia celtica AMOUREUX & DAUVIN, 1981: 189-192.

TYPE LOCALITY: Celtic Sea: 49º57'N, 9º49'W, at 129 meters on median to coarse sand; 49º27'N, 8º55'W, at 128 meters, on median to coarse sand.

SELECTED REFERENCES: *Ophelia celtica* — BELLAN & DAUVIN, 1991: table 2.

DISTRIBUTION: Celtic Sea; off the Pointe de Primel (Bay of Morlaix); off Cornwall. On sandy bottoms. Between 25-129 meters.

Ophelia laubieri Bellan & Costa 1987

Ophelia laubieri BELLAN & COSTA, 1987: 830-831, fig. 1*a*, pl. 1 figs. 1-2, table.

TYPE LOCALITY: South border of the estuary of Sado (Portugal), 38º28', 8º53'W, at the level of the infralittoral, on fine and medium sands.

SELECTED REFERENCES: *Ophelia laubieri* — BELLAN & DAUVIN, 1991: table 2.

REFERENCES FOR PORTUGAL: BELLAN & COSTA, 1987 (Sado Estuary); MUCHA & COSTA, 1999 (Ria de Aveiro and/or Sado Estuary).

DISTRIBUTION: Known from the type locality.

REMARKS: *Ophelia laubieri* is very similar to *O. translucens* (Katzmann 1973), described previously from the Adriatic Sea, and eventually it could be proved to be a junior synonym of this last species.

Ophelia limacina (Rathke 1843)

Ammotrypane limacina RATHKE, 1843: 190-192, 202-205, pl. 10 figs. 4-8, pl. 11 fig. 14.

TYPE LOCALITY: Molde, Norway.

SELECTED REFERENCES: *Ophelia limacina* — MCINTOSH, 1908*a*: 375; FAUVEL, 1914*f*: 241-243, pl. 22 figs. 1-2 [in part; not *Ophelia borealis* in the synonymy list]; MCINTOSH, 1915*b*: 9-14, text-fig. 98, pl. 88 fig. 1, pl. 95 figs. 1-1*d*, pl. 103 fig. 1 [in part]; FAUVEL, 1927*a*: 132, fig. 46*i*-*l* [in part; not *Ophelia borealis* in the synonymy list]; STØP-BOWITZ, 1945*a*: 32-38, fig. 2, maps on page 60 and 61; STØP-BOWITZ, 1948*c*: 12-14, fig. 3; TEBBLE, 1952: 561-565, fig. 4, tables 3-4; BELLAN & DAUVIN, 1991: table 2; HARTMANN-SCHRÖDER, 1996: 424-425, fig. 207 [in part; not *Ophelia borealis* in the synonymy list]; FASSARI, 1998: 46, 47. [?] *Ophelia radiata* [not Delle Chiaje 1828] — MCINTOSH, 1908*a*: 385-387, pl. 17 figs. 1-4. [?] *Ophelia borealis* [not Quatrefages 1866] — ELIASON, 1962: 65.

DISTRIBUTION: Greenland; Spitsbergen; Arctic Ocean; Norway; Denmark; Mediterranean Sea. In sand. Between 10-110 meters. Due to the confusion with *O. borealis*, it is difficult to know the exact distribution of the species. According to BELLAN & DAUVIN (1991), it can be found in the Arctic, north-east Pacific, North Atlantic, [?] Black Sea, and coast of Japan.

Ophelia neglecta Schneider 1892

Ophelia neglecta SCHNEIDER, 1892: 95-103, pl. 14.

TYPE LOCALITY: Le Pouliguen (near Nantes, Loire-Atlantique), Atlantic west coast of France.
SYNONYMS: [?] *Ophelia denticulata* Verrill 1875.
SELECTED REFERENCES: *Ophelia neglecta* — FAUVEL, 1927*a*: 132, fig. 46*g-h*; BELLAN & DAUVIN, 1991: table 2.
REFERENCES FOR PORTUGAL: AMOUREUX & CALVÁRIO, 1981 (Peniche; Lagoon of Óbidos); SOUSA-REIS *et al.*, 1982 (Peniche region); ANDRADE, 1984 (Mira Estuary); MONTEIRO-MARQUES, 1987 (continental shelf of Algarve); DEXTER, 1992 (previous records: Ria Formosa; Ria de Alvor; continental shelf of Algarve; Peniche; Figueira da Foz); RAVARA, 1997 (off Aveiro).
DISTRIBUTION: English Channel; European Atlantic coast; Bay of Biscay; Mediterranean Sea. In coarse sand. On shallow water.
REMARKS: TEBBLE (1953) considered *Ophelia neglecta* Schneider 1892, as a junior synonym of *O. denticulata* Verrill 1875, from New England. However, the European species has been considered as valid by numerous authors (*e.g.* BELLAN & DAUVIN, 1991), and this will be followed here.

The species was recorded to be present in the Catalan coasts by AMOUROUX (1974*a*) and CAMPOY (1982).

Ophelia radiata (Delle Chiaje 1827)

Lumbricus radiatus DELLE CHIAJE, 1827: 329.
TYPE LOCALITY: Naples, Italy.
SYNONYMS: *Neomeris urophylla* Costa 1844; *Ophelia coarctada* Milne-Edwards 1849; *Ophelia neapolitana* Quatrefages 1866.
SELECTED REFERENCES: *Ophelia radiata* — CLAPARÈDE, 1869: 24-34, pl. 26 fig. 1, pl. 29 fig. 1; RIOJA, 1917*c*: 25-26, fig. 4; FAUVEL, 1927*a*: 130-131; BELLAN & DAUVIN, 1991: table 2.
REFERENCES FOR PORTUGAL: DEXTER, 1992 (previous records: Figueira da Foz).
DISTRIBUTION: European Atlantic coast; English Channel to Mediterranean Sea; Adriatic Sea; Aegean Sea. On sand. At shallow water, in the upper limit of the water.

Ophelia rathkei McIntosh 1908

Ophelia Rathkei MCINTOSH, 1908*a*: 375-376.
TYPE LOCALITY: Valencia Harbour, S.W. Ireland.
SYNONYMS: *Ophelia cluthensis* McGuire 1935; *Ophelia remanei* Augener 1939.
SELECTED REFERENCES: *Ophelia rathkei* — TEBBLE, 1952: 567-569, table 5; BELLAN & DAUVIN, 1991: table 2; HARTMANN-SCHRÖDER, 1996: 425-426, fig. 208; KIRKEGAARD, 1996: 230, fig. 120. *Ophelia cluthensis* — MCGUIRE, 1935: 45-46. *Ophelia remanei* — AUGENER, 1939: 142-143, fig. 3.
REFERENCES FOR PORTUGAL: ANDRADE, 1984 (Mira Estuary).
DISTRIBUTION: Northeastern Atlantic (British Isles); Brittany; English Channel; North Sea; Kattegat; Bælt; western Baltic Sea to Kieler Bight. On sandy and muddy bottoms. Intertidal to 33 meters.
REMARKS: Details on the ecology and distribution of this species can be found in CHASSÉ & PICARD (1968) and WOLFF (1969*a*).

Ophelia roscoffensis Augener 1910

Ophelia limacina var. *roscoffensis* AUGENER, 1910: 237-238.
TYPE LOCALITY: Belle Isle, Roscoff, Northern France.
SELECTED REFERENCES: *Ophelia limacina* Var. *roscovensis* — FAUVEL, 1927*a*: 133. *Ophelia roscoffensis* — TEBBLE, 1952: 565-567, fig. 5; BELLAN & DAUVIN, 1991: table 2. *Ophelia roscovensis* — BELLAN, 1964*b*: 140-141. [?] *Ophelia roscoffensis* — DAY, 1967: 572-573, fig. 25.1.*i*. *Ophelia limacina* — FAUVEL, 1914*f*: 241-243, pl. 22 figs. 1-2 [in part; specimen from Belle-Ile].
REFERENCES FOR PORTUGAL: BELLAN, 1960*a* (as *Ophelia limacina*; Cape Espichel); BELLAN, 1964*b* (as *Ophelia roscovensis*; Cape Espichel).
DISTRIBUTION: English Channel; Bay of Biscay; Portugal; Gibraltar; Western Mediterranean Sea; [?] South Africa; [?] Ivory Coast. In *Amphioxus*-sand.
REMARKS: DAY (1967) identified doubtfully as *Ophelia roscoffensis* South African specimens with 20-21 pairs of branchiae, and three to four posterior abranchiate chaetigers. The species was recorded in the Western Mediterranean, in the region of Marseille, by BELLAN (1964*b*).

Ophelia translucens (Katzmann 1973)

Pseudophelia translucens KATZMANN, 1973*c*: 25-28, figs. 1-4.

TYPE LOCALITY: Near Zlarin Island (Croatia, Adriatic Sea), at 20-40 meters, at sandy mud bottoms.
SYNONYMS: [?] *Ophelia amoureuxi* Bellan & Costa 1987.
SELECTED REFERENCES: — FASSARI, 1998: 46, 47
DISTRIBUTION: Known from the type locality.
REMARKS: Check the *REMARKS* section under *Ophelia laubieri*.

*GENUS ***Ophelina*** Ørsted 1843

Ophelina ØRSTED, 1843*a*: 45-46.
TYPE SPECIES: *Ophelina acuminata* Ørsted 1843.
SYNONYMS: *Ammotrypane* Rathke 1843; *Urosiphon* Chamberlin 1919.
REMARKS: The relation between *Ophelina* and its type species, *O. acuminata* Ørsted 1843, and *Ammotrypane* and its type, *A. aulogaster* Rathke 1843, was clearly explained by MACIOLEK & BLAKE (2006: 104) and is transcripted here: "*Chamberlin (1919*[a]*:385) pointed out that the type of* Ophelina *Oersted (1843*[a]*),* O. acuminata *Oersted, is identical with the type of* Ammotrypane *H. Rathke (1843),* A. aulogaster *H. Rathke. Chamberlin used* Ammotrypane *as the valid genus, as did Hartman (e.g. 1967) and other authors. However, Støp-Bowitz (1945*[a]*) noted that Marenzeller (1892*[b]*) determined that Oersted's work had been published before Rathke's, and therefore* Ammotrypane *was the junior synonym of* Ophelina*. Hartmann-Schröder (1971*[a]*) and Fauchald (1977*[a]*) recognized* Ophelina *as the valid name for the genus, and subsequent authors have followed this version of the synonymy*". However FAUCHALD (1974*a*: 257), in his worldwide revision of the Sphaerodoridae pointed that RATHKE (1843) was published a few months before ØRSTED (1843*a*), and this is applied today to the Sphaerodoridae, where *Sphaerodorum flavum* Ørsted 1843 is considered as the junior synonym of *Sphaerodorum gracilis* (Rathke 1843) (described originally as *Ephesia gracilis*). This way, the genus *Ammotrypane* Rathke 1843 would include *Ophelina* Ørsted 1843 as a junior synonym, and the species *Ammotrypane aulogaster* Rathke 1843 would have priority over *Ophelina acuminata* Ørsted 1843. However, I think that it is worth to wait for a comprehensive work on the group, probably including other genera as *Armandia* and *Polyophthalmus*, before introducing these changes, as it will imply numerous new combinations.

The species *Ammotrypane (Ophelina) kükenthali* was described as new by MCINTOSH (1908*a*), with base on a single specimen collected in the North Atlantic, during the "*Porcupine*" Expedition of 1870, in 795 fathoms (1454 meters). The species seems to belong to the genus *Ophelina*, but according to its own author (MCINTOSH, 1908*a*: 385), "*neither bristles nor pigment-specks are present. Posteriorly the body somewhat abruptly narrows to the short, cylindrical, caudal process, which has a smooth edge posteriorly* [...]*; but as both seem to have been more or less dried, there is uncertainty on this point. The slender, smooth, glistening body, and the absence of bristles as well as of anal cirri and papillae on the caudal process are features of moment*". A similar description, again without illustrations, can be found in MCINTOSH (1915*b*: 25). Due to the lack of further information on the morphology of the species, and also to the possibility that the species doesn't belong to the Opheliidae, it is not considered below.

KEY TO SPECIES:

(adapted from HARTMANN-SCHRÖDER, 1996)

1a. Without branchiae..**2**
1b. With branchiae..**3**

2a (1a). Annal funnel very short, of about the same length than the last chaetiger, ending in very short papillae; 18 chaetigers; 10 mm long, 0.75 mm wide..***O. abranchiata***
2b (1a). Annal funnel cylindric, very long and annulated, with a long medioventral cirrus, without papillae; normally 17 chaetigers (very seldom 16, or 18); 6.5 mm long, 0.2-0.3 mm wide......***Ophelina* sp.**

3a (1b). Branchiae absent in the middle segments or, if present, much smaller than the rest; anal funnel cylindrical..**4**
3b (1b). Branchiae present in all chaetigers, with the exception of chaetiger 1 and, normally, some chaetigers in posterior region of the body; anal funnel cylindrical, crater- or spoonshaped........................**5**

4a (3a). Posterior segments not clearly contracted; anal funnel slightly to clearly longer than wider, distal (caudal) region slightly enlarged, with a small mediodorsal fold and a medioventral cirrus; 28-34 chaetigers..***O. cylindricaudata****
4b (3a). Posterior segments strongly contracted; anal funnel approximately three times as long as the width at the base, distal (caudal) region not enlarged, with 4 short papillae; 24-27 chaetigers....***O. minima***

5a (3b). Anal funnel spoonshaped, aperture ventral, with papillae and cirri; 50 chaetigers....***O. acuminata***
5b (3b). Anal funnel cylindrical or cratershaped; more than 50 or around 30 chaetigers, or less................**6**

6a (5b). Anal funnel cratershaped, with unpaired cirrus and papillae; 55-61 chaetigers..........***O. norvegica***
6b (5b). Anal funnel cylindrical..**7**

7a (6b). Anal funnel without papillae, smooth or faintly and irregularly ringed, with the dorsal beak more prominent than the ventral one; 24-28 chaetigers...***O. breviata***
7b (6b). Anal funnel with papillae...**8**

8a (7b). Anal funnel only with small papillae...**9**
8b (7b). Anal funnel with a midventral unpaired cirrus, attached to the lower part or to the interior of the funnel, in addition to the papillae...**11**

9a (8a). 22-24 chaetigers...**10**
9b (8a). 33 chaetigers...***O. helgolandiae***

10a (9a). Eyes absent; chaetae long, hirsute..***O. margaleffi***
10b (9a). Eyes present; chaetae short, not hirsute...***O. modesta***

11a (8b). Anal funnel with approximately 20 short, round papillae, and a midventral unpaired cirrus attached to the basis of the anal funnel; 35 chaetigers.......................................***O. delapidans longicephala***
11b (8b). Anal funnel with two big ventral papillae, and a midventral unpaired cirrus; 26 chaetigers...***O. groenlandica***

Ophelina abranchiata Støp-Bowitz 1948

Ophelina abranchiata STØP-BOWITZ, 1948*c*: 22-23, fig. 7.

TYPE LOCALITY: Eastern Greenland, 72º28'N, 21º48'W, at 180 meters, on mud with some stones.

SELECTED REFERENCES: *Ophelina abranchiata* — [?] KATZMANN, 1973*e*: 445, fig. 4; DETINOVA, 1985*a*: 124; FASSARI, 1998: 46, 47.

REFERENCES FOR PORTUGAL: AMOUREUX, 1987 (off Aveiro; off Porto).

DISTRIBUTION: Eastern Greenland and off Iceland, between 180-2951 meters; Portugal. Also recorded from the Adriatic Sea, between 20-230 meters, but this record is considered as dubious.

REMARKS: See the *REMARKS* section under *Ophelina* sp.

Ophelina acuminata Ørsted 1843

Ophelina acuminata ØRSTED, 1843*a*: 46.

TYPE LOCALITY: Øresund (Denmark), between Landskrone and Hveen Island, in a rocky bottom.

SYNONYMS: *Ammotrypane aulogaster* Rathke 1843; *Ammotrypane Ingebrigtsensii* Kükenthal 1887; *Ammotrypane pallida* Hartman 1960.

SELECTED REFERENCES: *Ophelia acuminata* — ØRSTED, 1844*a*: 111, pl. 3 figs. 24-26; JOHNSTON, 1865: 215-216, figs. 39-40. *Ophelina acuminata* — STØP-BOWITZ, 1945*a*: 38-44, fig. 3, maps on page 60 and 61; STØP-BOWITZ, 1948*c*: 14-17, fig. 4; HOBSON & BANSE, 1981: 62, fig. 13*f*; HARTMANN-SCHRÖDER, 1996: 427, fig. 209; KIRKEGAARD, 1996: 232-233, fig. 122; FASSARI, 1998: 46, 47; BLAKE, 2000*e*: 158-159, fig. 7.5. *Ammotrypane aulogaster* — FAUVEL, 1914*f*: 243-245, pl. 22, figs. 5-7; MCINTOSH, 1915: 15-18, text-fig. 99, pl. 95 fig. 3, pl. 103 fig. 3; FAUVEL, 1927*a*: 133, fig. 47*a-e*; BERKELEY & BERKELEY, 1952: 92, figs. 186-187; HARTMAN, 1969: 319-320, fig. 1. *Ammotrypane Ingebrigtsensii* — KÜKENTHAL, 1889: 147-148. *Ammotrypane pallida* — HARTMAN, 1960: 133-135, pl. 14 fig. 3; HARTMAN, 1969: 321-322, fig. 1.

REFERENCES FOR PORTUGAL: AMOUREUX, 1974*b* (as *Ammotrypane aulogaster*; off Aveiro; off Porto); BELLAN, 1960*a* (as *Ammotrypane aulogaster*; Cape Espichel); AMOUREUX, 1987 (as *Ophelina* *aulogaster*; off Aveiro). Dexter, 1992 (as *Ammotrypane aulogaster*; previous records: Ria Formosa; Arrábida).

Distribution: Arctic Ocean; Spitsbergen; Greenland; Iceland; North Sea; English Channel; Bay of Biscay; Skagerrak; Kattegat; northern Öresund; European Atlantic coast; Mediterranean Sea; Adriatic Sea; Aegean Sea; Newfoundland; California; [?] South Africa; [?] New Caledonia; [?] Australia. On sandy and muddy bottoms; among *Laminaria*. From eulittoral to about 1500 meters.

Ophelina breviata (Ehlers 1913)

Ammotrypane breviata Ehlers, 1913: 523-524, pl. 39 figs. 1-7.

Type locality: Kaiser Wilhelm II Land, Antarctica, in 385 meters.

Selected references: *Ammotrypane breviata* — Hartman, 1966*b*: 47-49, pl. 15 figs. 1-3. *Ophelina breviata* — Macioleck & Blake, 2006: 105.

Distribution: Antarctic waters, 20-385 meters; northern California, 3000 meters; [?] Bay of Biscay.

Remarks: *Ophelina breviata* was recorded in the Guipuzcoan coast (Bay of Biscay), by Aguirrezabalaga *in* Ariño (1987). It is also cited in the ERMS database of MarBEF (http://www.marbef.org/data/erms.php). However, *O. breviata* is tipically an Antarctic species, and it is possible that the European records refer to misindentifications.

****Ophelina cylindricaudata*** (Hansen 1878)

Ammotrypane cylindricaudatus Hansen, 1878: 8-9, pl. 6 figs. 1-8.

Type locality: The species was described with base on specimens collected at two different stations located off Norway, in the North Atlantic, during the Norwegian North-Atlantic Expedition of 1876-1878. The data of the two stations is as follows: 63°10’N, 4°00’E, at 763 meters, and 64°2’N, 5°35’E, at 911 meters.

Selected references: *Ammotrypane cylindricaudatus* — G.A. Hansen, 1882: 36-37, pl. 6 figs. 20-27; McIntosh, 1908*a*: 384-385; Fauvel, 1914*f*: 245-246, pl. 22 fig. 10; McIntosh, 1915*b*: 18-19, pl. 95 figs. 4-4*a*, pl. 103 figs. 14-14*a*; Fauvel, 1927*a*: 133-134, fig. 47*f-g*. *Ophelina cylindricaudata* — Støp-Bowitz, 1945*a*: 49-53, fig. 5; Støp-Bowitz, 1948*c*: 18-20, fig. 5; Hartmann-Schröder, 1996: 428, fig. 210; Kirkegaard, 1996: 234, fig. 123; Fassari, 1998: 46, 47.

References for Portugal: Ravara, 1997 (off Aveiro); Gil & Sardá, 1999 (southwestern continental shelf); present work (southwestern continental shelf).

Material: SEPLAT 6 — St. 173*A* (A.2646), off Arrifana, 130 m, sand: 1 complete female, with eggs, with 29 chaetigers; length 9 mm (including anal tube), width 0.4 mm; prostomium with acuminate tip, eyes not seen (probably faded in alcohol); nuchal organs light brown; branchiae cirriform, missing in the middle of the body (probably fell, as some scars seem to be present); at least 4 postbranchial chaetigers; parapodia from the first chaetiger as rounded lobes, with papilliform postchaetal lobe, without prechaetal lobe except in the first chaetiger; ventral cirri absent; anal lobe long, cylindrical, opening terminally, with a midventral short cirrus, inserted internally, dorsal margin expanded, lateral margins smooth; chaetae smooth, capillary (some very thin); last chaetigers with bristle-like chaetae. **St. 185 (A.2657)**, off Arrifana, 246 m, sand: 1 female with eggs, 29 chaetigers, anal tube missing; eyes not seen; branchiae bigger in the anterior and posterior regions of body (particularly in the posterior region, where the four last pairs of branchiae are thicker); first and posteriormost four chaetigers without branchiae; prostomium, parapodia and chaetae as described; first chaetiger with a prechaetal lobe. **SEPLAT 7 (2nd part) — St. 274 (A.3862)**, off Praia de Odeceixe, 327 m, muddy sand: 1 female with eggs, 28 chaetigers; anal tube missing; parapodia seem to have a small ventral lobe on the anterior region; rest of the specimens as described.

Distribution: Arctic Ocean; Spitsbergen; North Pacific Ocean; North Atlantic to the Mediterranean Sea; Adriatic Sea; Aegean Sea; Norwegian Deep; North Sea; Skagerrak; Kattegat; Kara Sea; Antarctic Ocean. On coarse sand to fine mud, including mixed bottoms. Between 7-4663 meters.

Remarks: According to Fauvel (1914*f*, 1927*a*), branchiae are missing in the middle of the body of this species. However, Støp-Bowitz (1945*a*) stated that the branchiae in the middle of the body are very variable, being sometimes slightly reduced, others very small or even absent. They are present in SEPLAT specimens, being smaller than the ones from the anterior and posterior regions. The same was observed by Day (1973), Uebelacker (1984*b*) and Hartmann-Schröder (1996).

O. cylindricaudata can be separated from *O. acuminata* Ørsted 1843 (= *Ammotrypane aulogaster* Rathke 1843), also present in Portuguese waters, by the presence of 28-34 chaetigers (against about 50) and an anal tube with a dorsal margin expanded, lateral margins smooth and a midventral internally inserted short cirrus (against an anal tube hood-shaped, opening ventrally, and with dorsal and lateral margins covered with papillae, two big basal papillae and a long internally inserted midventral cirrus).

According to STØP-BOWITZ (1945*a*, 1948*c*), *Ophelina opisthobranchiata* Wirén 1901 is probably a junior synonym of *O. cylindricaudata* (Hansen 1878). The species was briefly described by WIRÉN (1901: 253), only stating "*Eine neue Opheliide,* Ophelina opisthobranchiata *(aus großer Tiefe, Spitzbergen 1898), hat Kiemen nur am hinteren Körpertheil, vorn lange bogenförmige Borsten*". However, it has also been suggested that this species could represent an *Ammotrypanella* (see REMARKS above, under *Ammotrypanella arctica*).

Ophelina delapidans longicephala Hartmann-Schröder 1977

Ophelina delapidans longicephala HARTMANN-SCHRÖDER, 1977*a*: 94, figs. 63-65.

TYPE LOCALITY: Gorringe Bank (Southwest Portugal), 36º42.1'N, 11º09.0'W, at 72 meters.

DISTRIBUTION: Known from the type locality.

Ophelina groenlandica Støp-Bowitz 1948

Ophelina grœnlandica STØP-BOWITZ, 1948: 20-21, fig. 6.

TYPE LOCALITY: Eastern Greenland, southeast the Island of Clavering (74º35'N, 18º33'W), at 18-21 meters, on sandy mud with algae.

DISTRIBUTION: Eastern Greenland: SE Island Clavering (74º35'N, 18º33'W), at 18-21 meters, on sandy mud with algae; and south Island Pendulum (74º10'N, 20º8'W), 24-40 meters, in mud with shells and pebbles.

Ophelina helgolandiae Augener 1913

Ophelina Helgolandiae AUGENER, 1913*a*: 174-176, pl. 5 figs. 9-11.

TYPE LOCALITY: Spitsbergen Sea, at 1000 meters. "*Spitzbergenmeer. Coll. Römer u. Schaudinn, Stat. 41, 1000 m.*" (AUGENER, 1913*a*: 174). Later STØP-BOWITZ (1948*c*: 17) specified better the type locality: "*Svalbard, côte septentrionale: 81º20'N., 20º30'E. (1000 m., vase bleue, quelques cailloux, Römer et Schaudinn st. 41* (...).*)*".

SELECTED REFERENCES: *Ophelina helgolandiae* — AUGENER, 1928*a*: 747-748.*Ophelina Helgolandiae* — STØP-BOWITZ, 1945*a*: 48-49; STØP-BOWITZ, 1948*c*: 17.

DISTRIBUTION: Known from the type locality.

REMARKS: AUGENER (1913*a*) stated that the number of anal papillae present was low, and assumed that probably this number was originally higher. The number of remaining anal papillae apparently was not specified, but the given figure of the anal funnel pictures 4 small papillae.

Ophelina margaleffi Sardá, Gil, Taboada & Gili 2009

Ophelina margaleffi SARDÀ *et al.*, 2009: 11, fig. 4.

TYPE LOCALITY: Western Mediterranean Sea, submarine canyon of Foix (off Barcelona, Spain, 41º02'N, 01º56'E), at 990 meters, collected by a sediment trap located 30 meters above bottom.

DISTRIBUTION: Western Mediterranean Sea, submarine canyons of Planier (off Marseille), Lacaze-Duthiers (off Banyuls-sur-Mer) and Foix (off Barcelona), at 560-1195 meters., collected by sediment traps located 30 and 500 meters above bottom.

Ophelina minima Hartmann-Schröder 1974

Ophelina cylindricaudata minima HARTMANN-SCHRÖDER, 1974*d*: 245-246.

TYPE LOCALITY: Skagerrak, 57º56'N, 9º20'E, at 230 meters, on mud.

SELECTED REFERENCES: *Ophelina cylindricaudata minima* — HARTMANN-SCHRÖDER, 1996: 429; KIRKEGAARD, 1996: 234.

DISTRIBUTION: Skagerrak; Norwegian Deep. On mud. Between 255-645 meters.

Ophelina modesta Støp-Bowitz 1958

Ophelina modesta STØP-BOWITZ, 1958: 213-215, fig. 1.

TYPE LOCALITY: Norway, on the eastern side of the Oslofjord, in the region limited by Slevik and Hankø at south, and Degeruddypet (north of Drøbak) at north, on shallow water.

SYNONYMS: *Ammotrypane sarsi* Eliason 1962.

SELECTED REFERENCES: *Ophelina modesta* — HARTMANN-SCHRÖDER, 1996: 429; KIRKEGAARD, 1996: 235, fig. 124; FASSARI, 1998: 46, 48. *Ammotrypane sarsi* — ELIASON, 1962*b*: 274-275, fig. 20.

REFERENCES FOR PORTUGAL: QUINTINO & GENTIL, 1987 (Lagoon of Óbidos); QUINTINO, RODRIGUES & GENTIL, 1989 (Lagoon of Óbidos); DEXTER, 1992 (previous records: Lagoon of Albufeira).
DISTRIBUTION: Oslofjord, at shallow water; Skagerrak (Gullmarfjord, Kosterfjord), at 140-510 meters, on muddy bottoms; [?] Guipuzcoan coast (Bay of Biscay), at 100 meters, on a muddy bottom; Adriatic Sea.
REMARKS: *Ophelina modesta* was recorded to be present at Punta Endata (Guipúzcoa, Northern Spain), at 100 meters deep in a bottom of mud and shell fragments (CAMPOY, 1982; AGUIRREZABALAGA, 1984). However, the the southermost record of the species seems to be the Adriatic Sea.

Ophelina norvegica Støp-Bowitz 1945

Ophelina norvegica STØP-BOWITZ, 1945*a*: 45-48, fig. 4, map on page 59.
TYPE LOCALITY: Hjeltefjorden, near Bergen, West Norway.
SELECTED REFERENCES: *Ophelina norvegica* — STØP-BOWITZ, 1948*c*: 17; HARTMANN-SCHRÖDER, 1996: 430; KIRKEGAARD, 1996: 235-236, fig. 125; FASSARI, 1998: 47.
REFERENCES FOR PORTUGAL: AMOUREUX, 1987 (off Aveiro).
DISTRIBUTION: Northeastern Atlantic, from Ireland to Brittany; Norwegian coast from Narvik to Oslofjord; Swedish Skagerrak; Adriatic Sea. In muddy bottoms, mixed with rocks, stones, shells or sand. Between 30-550 meters, more frequent at 200-400 meters.

Ophelina sp.

?Ammotrypane abranchiata ELIASON, 1962*b*: 273-274, fig. 19.
DISTRIBUTION: Skagerrak, 241-681 meters, on mud.
SELECTED REFERENCES: *Ophelina abranchiata* [? not Støp-Bowitz 1948] — HARTMANN-SCHRÖDER, 1996: 427; KIRKEGAARD, 1996: 231-232, fig. 121.
REMARKS: ELIASON (1962*b*) identified as *Ophelina abranchiata* Støp-Bowitz 1948, a great number of abranchiate opheliids (381) collected at the Skagerrak. The specimens from the Skagerrak showed some differences in relation to the original description, which led ELIASON (1962*b*) to identify them with some doubts. This way, the specimens from the Skagerrak showed a well developed cylindrical anal cylinder, annulated and with a very long midventral cirrus, which was not present in the holotype of *O. abranchiata*. Besides, the holotype was bigger (10 mm long, 0.75 mm wide, for 18 chaetigers) than the specimens from the Skagerrak (being the biggest ones 6.5-7 mm long, 0.2-0.3 mm wide, for 17 chaetigers). It is not clear if the holotype of *O. abranchiata* had lost its anal funnel, as STØP-BOWITZ (1948*c*) describes the presence of small papillae. Besides, there is a difference of size between the holotype of *O. abranchiata* and the population from the Skagerrak. For this reason, I prefer to maintain here both as separated taxa, until more evidence on their possible synonymy is available.

GENUS *Polyophthalmus* Quatrefages 1850

Polyophthalmus QUATREFAGES, 1850*b*: 9.
TYPE SPECIES: *Naïs picta* Dujardin 1839.
SYNONYMS: *Aloysina* Claparède 1864; *Armandiella* McIntosh 1915.

Polyophthalmus pictus (Dujardin 1839)

Naïs picta DUJARDIN, 1839: 293-294, pl. 7 figs. 9-12.
TYPE LOCALITY: Mediterranean Sea (probably at the French coast).
SYNONYMS: *Polyophthalmus agilis* Quatrefages 1850; *Polyophthalmus dubius* Quatrefages 1850; *Polyophthalmus Ehrenbergi* Quatrefages 1850; *Polyophthalmus pallidus* Claparède 1869; [?] *Polyophthalmus pictus pontica* Czerniavsky 1881; *Armandia Robertianæ* McIntosh 1908.
SELECTED REFERENCES: *Naïs picta* — DUJARDIN, 1838: 650 [*nomen nudum*]. *Polyophthalmus pictus* — CLAPARÈDE, 1864: 465-482, pl. 1 figs. 1-2; FAUVEL, 1914*f*: 247-248, pl. 22 figs. 8-9; MCINTOSH, 1908*a*: 377-378; MCINTOSH, 1915*b*: 21-24, text-fig. 96, pl. 88 fig. 2, pl. 100 fig. 11; FAUVEL, 1927*a*: 137-138, fig. 48*l-n*. *Polyopthalmus pictus* — FASSARI, 1998: 47. *Polyophthalmus agilis* — QUATREFAGES, 1850*b*: 10-11. *Polyophthalmus dubius* — QUATREFAGES, 1850*b*: 12. *Polyophthalmus Ehrenbergi* — QUATREFAGES, 1850*b*: 9-10, pl. 2 figs. 1, 2, 2*b*, 4, 6. *Polyophthalmus pallidus* — CLAPARÈDE, 1869: 34-35, pl. 31 fig. 7. *Armandiella Robertianæ* — MCINTOSH, 1908*a*: 376-377; MCINTOSH, 1915*b*: 19-21, pl. 95 fig. 5, pl. 102 fig. 15.

REFERENCES FOR PORTUGAL: MONTEIRO-MARQUES, 1987 (continental shelf of Algarve); DEXTER, 1992 (previous records: continental shelf of Algarve).

DISTRIBUTION: Northeast Atlantic; from the English Channel to the Mediterranean Sea; Adriatic Sea; Aegean Sea; Black Sea; Selvagens Islands; Cape Verde. On rocky and detritic bottoms, and among algae. On shallow water.

REMARKS: This species was named for the first time by DUJARDIN (1838: 650), as a *nomen nudum*, since his brief description of the species was too vague in order to enable its recognition: "[La espèce] *nommée* Naïs picta*, est couverte dans toute sa longueur de nombreux points noirs analogues à ceux des espèces précédentes.*" The description of the species was published one year later, by the same author (DUJARDIN, 1839). The larval development of the species was studied by GUÉRIN (1971), with base on the population from the Gulf of Marseille.

GENUS ***Thoracophelia*** Ehlers 1897

Thoracophelia EHLERS, 1897: 101.

TYPE SPECIES: *Thoracophelia furcifera* Ehlers 1897.

SYNONYMS: *Euzonus* Grube 1866 [not Menge 1854 (Arthropoda, Diplopoda)]; *Pectinophelia* Hartman 1938; *Lobochesis* Hutchings & Murray 1984.

REMARKS: A comparative table for all the 17 species of *Thoracophelia* (as *Euzonus*) and its synonymies considered to be valid is presented in SANTOS, NONATO & PETERSEN (2004). A smaller table, comparing only five species with mainly bifurcate branchiae, is provided in PROBERT (1976). Both tables include Tebble's formula (see comments under the genus *Ophelia*). Finally, BLAKE (2011) presented an updated list of the valid species in the genus *Thoracophelia*.

Thoracophelia flabelliferus Ziegelmeier 1955

Thoracophelia flabellifera ZIEGELMEIER, 1955: 251-257, figs. 1-2, tables 1-2.

TYPE LOCALITY: German Bight, 54º42.5'N, 8º5.0'E, abeam of Hörnum (Sylt) at 13 meters, on a bottom of coarse sand.

SELECTED REFERENCES: *Euzonus flabelligerus* — HARTMANN-SCHRÖDER, 1996: 423-424, fig. 206; KIRKEGAARD, 1996: 227-228, fig. 118. *Euzonus flabelliferus* — MISAKA & SATO, 2003: table 1; SANTOS, NONATO & PETERSEN, 2004: table 1.

DISTRIBUTION: North Sea; White Sea. On coarse sand. Upper sublittoral, to 15 meters.

GENUS ***Trachytrypane*** McIntosh 1878

Trachytrypane MCINTOSH, 1878*a*: 505.

TYPE SPECIES: *Trachytrypane jeffreysii* McIntosh 1878.

Trachytrypane jeffreysii McIntosh 1878

Trachytrypane Jeffreysii MCINTOSH, 1878*a*: 505, pl. 65 fig. 10.

TYPE LOCALITY: North Atlantic, 59º10'N, 50º25'W, at 1750 fathoms (3200.4 meters), on a bottom of mud.

SELECTED REFERENCES: *Tachytrypane Jeffreysii* — FAUVEL, 1914*f*: 248-249; FAUVEL, 1927*a*: 135, fig. 47*h*; STØP-BOWITZ, 1948*c*: 24; [?] KATZMANN, 1973*f*: 114. *Tachytrypane jeffreysii* — KIRKEGAARD, 1980*b*: 91; FASSARI, 1998: 47.

REFERENCES FOR PORTUGAL: AMOUREUX, 1987 (off Porto).

DISTRIBUTION: North Atlantic to Southern Greenland; Bay of Biscay; Portugal; [?] Adriatic Sea (400 meters); [?] Aegean Sea. On muddy bottoms. Between 3100-4265 meters.

*FAMILY **ORBINIIDAE** Hartman 1942

AS: *ORBINIIDAE* HARTMAN, 1942*a*: 57.

TYPE GENUS: *Orbinia* Quatrefages 1866.

SYNONYMS: *ARICIEA* Quatrefages 1866; [?] *ANTHOSTOMEA* Kinberg 1867; *ARICIIDAE* Malmgren 1867; *PHYLONIDAE* Støp-Bowitz 1948.

REMARKS: The name of the family was changed from Ariciidae to Orbiniidae by HARTMAN (1942*a*), as the type genus of the family, *Aricia* Savigny 1822, was preoccupied in Lepidoptera. The next available name was *Orbinia* Quatrefages 1866.

The first important monography on the group was made by EISIG (1914). More recently, the family was the subject of two other important works, published in the same year. The first one is the paper by HARTMAN (1957), who provided a checklist of all the hitherto described species, emmended or redescribed numerous taxa, described new ones, and divided the family in two subfamilies, the Orbiniinae and the Protoariciinae. The second one is the paper by PETTIBONE (1957*a*), mainly on American orbiniids, with the description of several new species.

Recent important taxonomic papers on the Orbiniidae include, among others, DAY (1973), with an overview on the subfamily Orbiniinae and the synonymy between *Scolaricia* and *Scoloplos*, DAY (1977), with the description of the new genus *Leitoscoloplos*, as well as new species from the Australian and New Zealand regions, MACKIE (1987), with the revision of the genus *Leitoscoloplos* and a comparative table for all its species and subspecies, SOLÍS-WEISS & FAUCHALD (1989), with the description of new taxa, including the new genera *Pettibonella* and *Pararicia*, a key for all the genera in the subfamily Protoariciinae, and a preliminary phylogenetic analysis of the protoariciin genera, BUZHINSKAJA (1992) and GILLET (1999*b*), both with descriptions of new species of *Orbiniella* and keys or comparative tables for all hitherto known species in the genus, and BLAKE (2000*a*), with the description of the new genus and species *Methanoaricia dendrobranchiata*, from methane seeps in the Gulf of Mexico, and the raise of *Leodamas* to a full genus. New taxa are also described in BLAKE (1985), BLAKE & HILBIG (1990), BADALAMENTI & CASTELLI (1991), LEÓN-GONZÁLEZ & RODRÍGUEZ (1996), BRANCH (1998), EIBYE-JACOBSEN (2002*b*), KELAHER & ROUSE (2003), LÓPEZ, CLADERA & SAN MARTÍN (2003, 2006), and NARAYANASWAMY & BLAKE (2005). An important synopsis of the family and contribution to the North American Pacific orbiniids is given is BLAKE (1996*a*). The phylogenetic interrrelationships of the family were studied by BLAKE (2000*a*) and BLEIDORN (2005).

The separation of the Orbiniidae in two subfamilies by HARTMAN (1957) was based mainly on the presence of one (subfamily Protoariciinae) or two (subfamily Orbiniinae) achaetous peristomial rings, besides the size of the worms (less than 15 mm long in the first, more than 20 mm long in the second). However, BLAKE (1996*a*) stated that this division was not valid, as apparently some species described and assigned to the subfamily Protoariciinae were actually juveniles of Orbiniinae, probably from already described species. Besides, studies on the larval morphology and development of orbiniids suggested that, at least in some genera, two achaetous rings are established early in the development, with the transition to a single ring occurring late in the development. Some cases of adult specimens with two achaetous peristomial rings but clearly belonging to Orbiniinae are known. In order to avoid further confusion, BLAKE (1996*a*) recommended that the chaetae of specimens having two achaetous peristomial rings should be compared with local adults, in order to establish whether the specimens are their juveniles. The same would apply to specimens reported to be abranchiate. This situation would be mainly present in those genera with a blunt-tipped, rounded, or truncated prostomium, especially in *Naineris*, as in the genera with pointed or conical prostomium, the single achaetous peristomiam ring is established early in the development.

As a consequence of his phylogenetic analysis of the family, BLAKE (2000*a*) proposed a new classification based on the increasing modification of the body's structure and chaetae, instead of the presence of one or two achaetous peristomial rings. This way, the subfamilly Protoariciinae is considered to be not valid, while two new subfamilies were designated, the Methanoariciinae (including only *Methanoaricia dendrobranchiata*), and the Microrbiniinae. The genera previously included in the Protoariciinae would be included both on the Orbiniinae or Microrbiniinae, depending on other morphological characters than the peristomial rings. These results were not supported by the phylogenetic analysis performed by BLEIDORN (2005), with base on molecular data. According this study, *Methanoaricia dendrobranchiata* is closely related with *Orbinia* and *Scoloplos*, instead of being a sister taxon to all other orbiniids, and no support was found for the hypothesis that taxa of Protoariciinae represent juveniles. Instead, it was found a strong support for a progenetic origin of *Protoaricia oerstedi*.

I agree with BLAKE (1996*a*) in that at least part of the described species included in the Protoariciinae probably represent juveniles of Orbiniinae species, and also in that the number of peristomial achaetous rings probably is not a good taxonomic character. However this character is used in

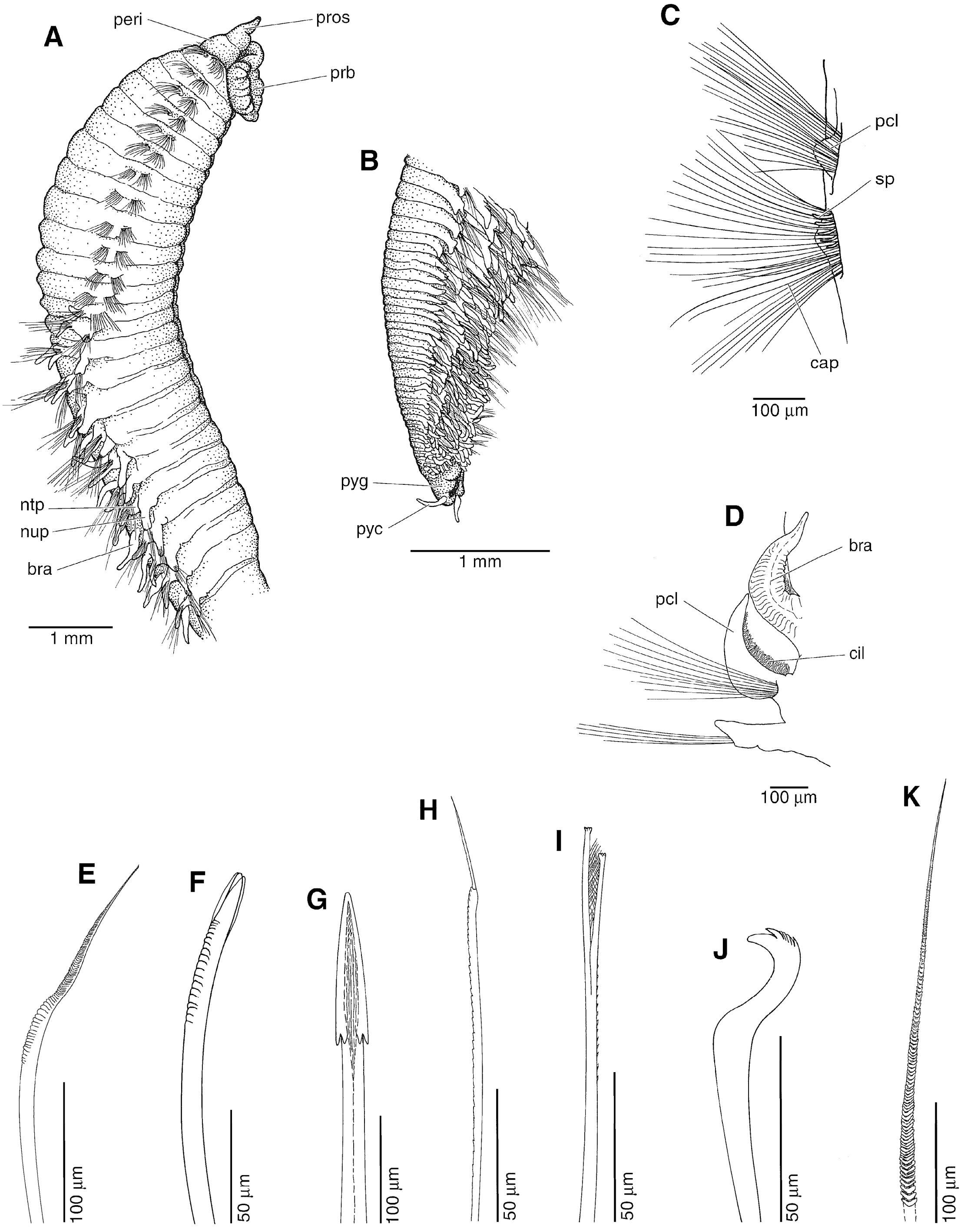

Figure legend: Family Orbiniidae. **A**, *Scoloplos* specimen, anterior end, lateral view. **B**, *Scoloplos* specimen, posterior end, dorso-lateral view. **C**, **D**, parapodia of *Scoloplos* specimen: **C**, anterior thoracic parapodium from chaetiger 4, anterior view; **D**, mid-abdominal parapodium of from chaetiger 28, anterior view. **E**-**K**, chaetae: **E**, *Nainereis* specimen, subuluncini from thoracic neuropodium of chaetiger 9; **F**, *Nainereis* specimen, hooded spine from thoracic neuropodium of chaetiger 9; **G**, *Phylo* specimen, arrow-shaped spine from thoracic neuropodium of chaetiger 14; **H**, *Orbinia* specimen, flail-tipped chaeta from abdominal neuropodium; **I**, *Phylo* specimen, furcate abdominal chaeta; **J**, *Proscoloplos* specimen, 'swan-shaped' hook from abdominal neuropodium; **K**, *Scoloplos* specimen, crenulate capillary from abdominal neuropodium of chaetiger 28. **bra**, branchia; **cap**, capillary chaetae; **cil**, cilia; **ntp**, notopodium; **nup**, neuropodium; **pcl**, postchaetal lobe; **peri**, peristomium; **prb**, proboscis; **pros**, prostomium; **pyc**, pygidial cirrus; **pyg**, pygidium, **sp**, spine. (Adapted from BEESLEY, ROSS & GLASBY, 2000; drawings by A. Murray).

the following key, as it still characterizes some genera. Nevertheless, and as stated by Blake, the small orbiniid specimens with two achaetous peristomial rings should be carefully compared with local adults.

AMOUREUX (1987) recorded the genus *Haploscoloplos* from off Portugal, without naming a species. The genus was established by MONRO (1933*b*) for those species of *Scoloplos* which lacked thoracic neuropodial hooks. However, it was found later that the type species of the genus, *Scoloplos cylindrifer* Ehlers 1904, had such hooks, and *Haploscoloplos* became a junior synonym of *Scoloplos*. Taking this into consideration DAY (1977) designated the new genus *Leitoscoloplos* to accommodate those species which truly lacked thoracic neuropodial hooks (MACKIE, 1987). It is very likely that AMOUREUX (1987) had material belonging to the genus *Leitoscoloplos*, but it is impossible to be sure without revising the material originally studied by him.

The family includes at present 20 genera, with about 160 species and 20 described subspecies considered to be valid. In the European and nearby waters, 9 genera with 24 species (two of which doubtful) and 4 subspecies have been recorded. In the studied material, only one species of Orbiniidae was identified.

KEY TO GENERA:
(adapted from FAUCHALD, 1977*a*)

1a. Two achaetigerous anterior segments..**2**
1b. A single achaetigerous anterior segment...**3**

2a (1a). Abdominal neurochaetae all crenulated capillaries; prostomium rounded....................***Protoaricia***
2b (1a). Abdominal neurochaetae include acicular hooks; prostomium pointed....................***Schroederella***

3a (1b). Prostomium rounded or truncate..***Naineris****
3b (1b). Prostomium more or less pointed...**4**

4a (3b). All thoracic parapodia only with slender crenulated, pointed chaetae; acicular spines absent in abdominal neuropodia...***Leitoscoloplos***
4b (3b). Some thoracic neuropodia with chaetae of another kind...**5**

5a (4b). Thoracic neuropodia of two abruptly different kinds..**6**
5b (4b). Thoracic neuropodia not abruptly different...**7**

6a (5a). Anterior 3-4 thoracic neuropodia with modified brushlike tipped chaetae; posterior thoracic neuropodia without thick modified spines..***Califia***
6b (5a). Anterior 3-4 thoracic neuropodia without modified chaetae; posterior thoracic neuropodia with thick, modified spines associated with a glandular pouch...***Phylo***

7a (5b). Some thoracic segments with rows of ventral papillae; papillae sometimes also on the thoracic posterior parapodial postchaetal ridges (more than 4)..***Orbinia****
7b (5b). Without ventral rows of papillae; none or few papillae on the thoracic posterior parapodial postchaetal ridges (less than 4)...**8**

8a (7b). Branchiae first present from middle or posterior thoracic chaetigers or from abdominal chaetigers (8-26); thoracic neuropodial uncini few, small, inconspicuous or poorly conspicuous and accompanied by numerous capillaries; abdominal neuropodia with imbedded, non-projecting aciculae..***Scoloplos***
8b (7b). Branchiae first present from anterior thoracic chaetigers (4-6); thoracic neuropodial uncini numerous and prominent, and accompanying capillaries few or entirely absent; abdominal neuropodia with projecting aciculae...***Leodamas***

GENUS ***Califia*** Hartman 1957

Califia HARTMAN, 1957: 305-306.

TYPE SPECIES: *Califia calida* Hartman 1957.

Califia schmitti (Pettibone 1957)

Scoloplos (Scoloplos) schmitti PETTIBONE, 1957*a*: 164, fig. 3.

TYPE LOCALITY: Deep Atlantic off the east coast of North America, 37º12'N, 74º20'W, 788 fathoms (1441.1 meters), on blue mud.

SELECTED REFERENCES: *Califia schmitti* — PETTIBONE, 1963*a*: 287-288, fig. 74*d*; KIRKEGAARD, 1983*b*: 595.

DISTRIBUTION: North West Atlantic: 37º12'N, 74º20'W, 788 fathoms (1441.1 meters), on blue mud; 39º35'N 71º31'W, 1061 fathoms (1940.6 meters), on green mud; 40º42'N 66º33'W, 810 fathoms (1481.3 meters), on grey mud (PETTIBONE, 1957*a*). North East Atlantic: 48º28.7'N 10º20.3'W, at 1900 meters, on soft mud (KIRKEGAARD, 1983*b*).

REMARKS: So far, it seems that KIRKEGAARD's (1983*b*) record of *Califia schmitti* is the only one of this species for European waters. It represents the eastward extension of the distribution of *C. schmitti*, previously known from the bathyal region of north west Atlantic.

Usually DAY (1973) is pointed as the author of *Califia schmitti* as a new combination, arguing its transference from *Scoloplos (Scoloplos)* into Hartman's genus. However, in her "*Catalogue of the Polychaetous Annelids of the World*", published in 1959, Olga Hartman included already *Scoloplos (Scoloplos) schmitti* in the genus *Califia*.

GENUS *Leitoscoloplos* Day 1977

Leitoscoloplos DAY, 1977: 218-219.

TYPE SPECIES: *Haploscoloplos bifurcatus* Hartman 1957.

REMARKS: *Leitoscoloplos bifurcatus* Hartman 1957 was cited in ARIÑO (1987) in is Catalogue of species from the Iberian Peninsula. However this seems to be the result of an error. The species is cited by RAMOS (1976*c*) in a key, but not as a record, and later it was erroneously included in several checklists concerning the Iberian Fauna. As it is an erroneous record, *L. bifurcatus* is not considered here.

KEY TO SPECIES:
(data from MACKIE, 1987)

1a. Prostomium blunt; 9 thoracic chaetigers; branchiae from chaetiger 13-15; thoracic neuropodial postchaetal lobes slender triangular-digitate..***L. kerguelensis***

1b. Prostomium sharp; 14-15 thoracic chaetigers; branchiae from chaetiger 10 (9-11); thoracic neuropodial postchaetal lobes mammiform...***L. mammosus***

Leitoscoloplos kerguelensis (McIntosh 1885)

Scoloplos kerguelensis MCINTOSH, 1885*a*: 355-356, pl. 43 figs. 6-8, pl. 22*A* fig. 19.

TYPE LOCALITY: Off London River, Kerguelen (48º50'S, 69º18'E), at 110 fathoms (200 meters).

SELECTED REFERENCES: *Leitoscoloplos kerguelensis* — MACKIE, 1987: 3-4, fig. 2. [?] *Haploscoloplos kerguelensis* — FAUCHALD, 1972*a*: 166-167, pl. 34 figs. *a-b*; [?] RAMOS, 1976*c*: 1-3, figs. 1-2.

DISTRIBUTION: Kerguelen region. In volcanic mud. Between 20-220 meters.

REMARKS: MACKIE (1987) revised the species, under the scope of a generic revision. The only European record of this species, by DESBRUYÈRES, GUILLE & RAMOS (1974), and later described in detail by RAMOS (1976*c*), is based on an incomplete specimen from the Mediterranean Sea. According to MACKIE (1987), this specimen shows some differences in relation to the type material, and therefore the record was considered to be doubtful.

Leitoscoloplos mammosus Mackie 1987

Leitoscoloplos mammosus MACKIE, 1987: 9-10, fig. 9, tables 3, 6.

TYPE LOCALITY: Upper basin of Loch Creran, west coast of Scotland, 25 meters.

SELECTED REFERENCES: [?] *Haploscoloplos* sp. — HARTMAN, 1948*b*: 32-33, fig. 8*d-f*; HARTMAN, 1957: 279, pl. 28 figs. 4-6.

DISTRIBUTION: Known from the type locality. MACKIE (1987) identified tentatively as *L. mammosus* one specimen collected at Murchison Sound, NW Hayes Peninsula, Greenland, at 100 meters.

GENUS *Leodamas* Kinberg 1866

Leodamas KINBERG, 1866*b*: 252.
TYPE SPECIES: *Leodamas verax* Kinberg 1866.
SYNONYMS: *Branchetus* Chamberlin 1919.
REMARKS: In the phylogenetic analysis of the family Orbiniidae performed by BLAKE (2000*a*), *Leodamas* consistently grouped with *Naineris*, *Protoaricia*, and *Phylo*, all genera with heavy thoracic neuropodial spines, rather than with *Scoloplos*, to which *Leodamas* was normally referred to as a subgenus. According to this, BLAKE (2000*a*), treated the subgenus *Leodamas* as a full genus, which is followed here.

KEY TO SPECIES:

1a. Branchiae from chaetiger 5; 12-15 thoracic chaetigers; abdominal notopodia with projecting aciculae, in addition to the neuropodial..***L. thalassae***
1b. Branchiae from chaetiger 6; 19-26 thoracic chaetigers; abdominal notopodia without projecting aciculae...**2**

2a (1b). Thoracic uncini smooth or poorly crenulated; 19-26 thoracic uncini; abdominal notopodial postchaetal lobes of about the same length of the branchiae..***L. chevalieri***
2b (1b). Thoracic uncini clearly crenulated; 20-21 thoracic uncini; abdominal notopodial postchaetal lobes of about 2/3 the length of the branchiae...***L. chevalieri candiensis***

Leodamas chevalieri (Fauvel 1901)

Aricia Chevalieri FAUVEL, 1901: 83-86, figs. 23-28.
TYPE LOCALITY: Estuary of Casamance River, Senegal, at 6 Km from the mouth, in intertidal fine sand, slightly muddy, around rotten wood and other debris.
SELECTED REFERENCES: *Aricia Chevalieri* — GRAVIER, 1906*d*: 167-170, text-figs. 334-335, pl. 2 figs. 193-195; FAUVEL, 1919*a*: 428-429. *Scoloplos chevalieri* — EISIG, 1914: 418-421. *Scoloplos (Leodamas) chevalieri* — AMOUREUX, 1976*b*: 23.
DISTRIBUTION: Tanger (Morocco), at 27 meters; Casamance, Senegal; Djibouti and Gulf of Tadjourah. In muddy sand.

Leodamas chevaleri candiensis Harmelin 1969

Scoloplos (Leodamas) chevalieri candiensis HARMELIN, 1969: 308-310, pl. 1 figs. 6-10.
TYPE LOCALITY: The subspecies was described with base on 6 specimens collected in three different stations. However, the diagnosis of the taxon was based on one single specimen, "*qui est le plus complet et le mieux développé*" (HARMELIN, 1969: 308). Harmelin's statement is here considered as the designation of a type. The collection data of this specimen is as follows: Kalo-Limniones (Creta, Mediterranean Sea), among *Cymodocea nodosa*, at 7 meters.
DISTRIBUTION: Aegean Sea: Kalo-Limniones (Creta), among the sea-grasses *Cymodocea nodosa* and *Halophila stipulacea*, between 7-11 meters.

Leodamas thalassae Amoureux 1982

Scoloplos (Leodamas) thalassae AMOUREUX, 1982*b*: 180-182, fig. 1.
TYPE LOCALITY: European continental slope, off west Brittany, 48º39.30'N, 10º36.50'W, at 1400 meters, in a muddy bottom.
DISTRIBUTION: European continental slope, off west Brittany, in mud and sandy mud, between 850-1400 meters.

*GENUS *Naineris* Blainville 1828

Naineris BLAINVILLE, 1828: 490.

TYPE SPECIES: *Nais quadricuspida* Fabricius 1780.
SYNONYMS: *Theodisca* F. Müller 1858; *Anthostoma* Schmarda 1861; *Lacydes* Kinberg 1866.

KEY TO SPECIES:

1a. Thoracic neuropodial postchaetal lobe with tip located at the upper part of the neuropodia, above the neurochaetae; thoracic neuropodia with uncini and subuluncini...**2**
1b. Thoracic neuropodial postchaetal lobe with tip located at the middle part of the neuropodia, at the same level of the neurochaetae; thoracic neuropodia provided with uncini, but no subuluncini; thoracic uncini ridged or ornamented along their free length...***N. quadricuspida***

2a (1b). Prostomium rounded; pharynx large, divided into lobes; thoracic uncini smooth or nearly so..***N. laevigata****
2b (1b). Prostomium square; pharynx large, with a frilly edge but not divided into lobes; thoracic uncini crenulated..***N. quadraticeps***

****Naineris laevigata*** (Grube 1855)

Aricia laevigata GRUBE, 1855: 112-113, pl. 4 figs. 6-8.
TYPE LOCALITY: Nice, Mediterranean Sea, and apparently other localities not specified at the Mediterranean and/or the Adriatic Seas.
SYNONYMS: *Anthostoma ramosum* Schmarda 1861; *Theodisca anserina* Claparède 1864; *Theodisca liriostoma* Claparède 1869; *Aricia platycephala* McIntosh 1885.
SELECTED REFERENCES: *Naineris laevigata* — HARTMAN, 1957: 297-298, pl. 35; DAY, 1967: 539-540, fig. 23.2.*a-f*; TAYLOR, 1984*a*: 1.7-1.8, figs. 1.3-1.4; BADALAMENTI & CASTELLI, 1994: 191-192. *Nainereis laevigata* — SAINT-JOSEPH, 1898: 360-363, pl. 21 figs. 168-175; EISIG, 1914: 450-488, text-figs. 2*E*, 9, 11*M-N*, 20*E*, 22, pl. 10 figs. 3*a-d*; pl. 23 figs. 1-10, pl. 24 figs. 1-17, pl. 25 figs. 1-21, table at page 502, table inserted at page 526; FAUVEL, 1927*a*: 22-23, fig. 7; RIOJA, 1931: 26-29, pl. 6. *Nainereis lævigata* — RIOJA, 1918*a*: 64-67, fig. 3. *Scoloplos (Nainereis) lævigata* — MESNIL & CAULLERY, 1898: 142, 143; SAINT-JOSEPH, 1906: 167-169, pl. 2 figs. 42-43. *Aricia Latreillii* [not Audouin & Milne Edwards 1833] — GRUBE, 1840: 69-70. *Aricia platycephala* — MCINTOSH, 1885: 353-354, pl. 43 figs. 1-3, pl. 22*a* figs. 16-17. *Scoloplos (Nainereis) platycephala* — MESNIL & CAULLERY, 1898: 143. *Anthostoma ramosum* — SCHMARDA, 1861: 62, text-figs. *a-c*, pl. 27 fig. 217. *Theodisca anserina* — CLAPARÈDE, 1864: 504-505, pl. 4 fig. 6. *Scoloplos (Nainereis) anserina* — MESNIL & CAULLERY, 1898: 141, 143. *Naineris anserina* — FAUVEL, 1909: 2. *Theodisca liriostoma* — CLAPARÈDE, 1869: 50-52, pl. 24 fig. 3; LO BIANCO, 1893: 25-26. *Scoloplos (Nainereis) liriostoma* — MESNIL & CAULLERY, 1898: 141, 143.
REFERENCES FOR PORTUGAL: AMOUREUX & CALVÁRIO, 1981 (Peniche); MONTEIRO-MARQUES *et al.*, 1982 (Ponta do Surdão); PARDAL, CALDEIRA & MARQUES, 1992 (previous records: Peniche).
MATERIAL: FAUNA 1 — St. 33*A*, Alborán Sea, Alborán Island, 34-44 m, laminarians on rocks: 3 specimens, all incomplete; (1) with about 62 chaetigers, 16 mm long, 4 mm wide; thorax with 25 chaetigers; anterior region somehow more flattened than posterior region; branchiae from chaetiger 4; prostomium anteriorly rounded; proboscis not observed; thoracic and abdominal parapodia as described; chaetae as described, with subuluncini; forked chaetae present in thoracic and abdominal parapodia; (2) smaller specimen, with 94 chaetigers for 12 mm long; thorax with about 21 chaetigers; branchiae from chaetiger 6; proboscis everted, with several lobes; (3) with 40 chaetigers, about 24 thoracic; branchiae from chaetiger 6; anterior region flattened; proboscis partially everted.
DISTRIBUTION: Cantabric Sea; Western Mediterranean Sea; Adriatic Sea; Aegean Sea; Black Sea; Antillean Islands; Gulf of Mexico; Bermuda; Jamaica; Brazil; South Africa; Persian Gulf; Sri Lanka; Pacific Ocean; Hawaiian Islands; California. In muddy or sandy bottoms, under stones, and among algae. Intertidal to about 30 meters.

Naineris quadraticeps Day 1965

Naineris quadraticeps DAY, 1965: 21-23, fig. 2*a-h*.
TYPE LOCALITY: Abiad Bay, Entedebir Island, Dahlak Archipelago, Eritrea (Southern Red Sea), in intertidal coral sands.
SELECTED REFERENCES: *Naineris quadraticeps ?* — HARMELIN, 1969: 307-308, pl. 1 figs. 1-5.

DISTRIBUTION: Abiad Bay, Entedebir Island, Eritrea (Southern Red Sea), in intertidal coral sands; Cape Messa-Vuno, Santorin Island (Aegean Sea, Eastern Mediterranean Sea), in a meadow of *Halophila stipulacea*, at 36 meters.
REMARKS: HARMELIN (1969) identified, with some doubts, two specimens collected at Santorin Island (Eastern Mediterranean Sea) as *Naineris quadraticeps*. The specimens are said to be incomplete, in poor condition, and juveniles. HARMELIN (1969) considered that the specimens were close to the species described from the Red Sea by DAY (1965), in spite of some minor differences, which he considered to be due to the juvenile condition of the specimens. This way, the Mediterranean specimens showed about 23 thoracic segments and a narrow thoracic notopodial postchaetal lobe, while in the Red Sea population the thorax was described has having 30-40 segments and the thoracic notopodial postchaetal lobe with a median wide expansion on the external margin. However, Harmelin's doubts are more related with the differences found in the ecology of the two populations, suggesting that the migration of the species from the Red Sea to the Mediterranean Sea would have been accompanied by a change on its biotope.

Naineris quadricuspida (Fabricius 1780)

Nais quadricuspida FABRICIUS, 1780: 315-316.
TYPE LOCALITY: Paamiut/Frederikshaab region, Western Greenland, under stones near the littoral.
SYNONYMS: *Scoloplos minor* Örsted 1842; *Theodisca mamillata* Cunningham & Ramage 1888.
SELECTED REFERENCES: *Scoloplos quadricuspida* — ØRSTED, 1843*b*: 200, figs. 106-110. *Naidonereis quadricuspida* — EHLERS, 1875: 59-60, pl. 4 fig. 28; MCINTOSH, 1905*a*: 48-49. *Scoloplos (Nainereis) quadricuspis* — MESNIL & CAULLERY, 1898: 143. *Nainereis quadricuspida* — FAUVEL, 1909: 16-17; MCINTOSH, 1910: 517; FAUVEL, 1914*f*: 231-232, pl. 20 figs. 12-16; EISIG, 1914: 488-498, text-fig. 2*F*, pl. 26 figs. 1-18, table at page 502, table inserted at page 526; FAUVEL, 1927*a*: 23-24, fig. 8. *Naineris quadricuspida* — HARTMANN-SCHRÖDER, 1996: 292; KIRKEGAARD, 1996: 12, fig. 1. *Scoloplos minor* — ØRSTED, 1842: 125. *Theodisca mamillata* — CUNNINGHAM & RAMAGE, 1888: 642, pl. 38, fig. 8. *Nainereis mamillata* — MCINTOSH, 1910: 519, pl. 65 fig. 5, pl. 86 fig. 2, pl. 87 fig. 5. Not *Naidonereis quadricuspida* — EHLERS, 1875: 59-60 [see EISIG, 1914: 496, 521-522].
DISTRIBUTION: Arctic Ocean; White Sea; Greenland; Iceland; North Atlantic, from Irish Sea and North Sea to Skagerrak, and from Gulf of St. Lawrence to Massachusetts; Japan; North Pacific; Alaska; [?] Adriatic Sea. On muddy bottoms, laminarians, *Lithothamniun*, or under stones. Intertidal to 2000 meters.

*GENUS ***Orbinia*** Quatrefages 1866

Orbinia QUATREFAGES, 1866*b*: 288.
TYPE SPECIES: *Aricia Cuvierii* Audouin & Milne Edwards 1833.
SYNONYMS: *Aricia* Savigny 1822 [not *Aricia* Reichenbach 1817 (Lepidoptera)].

KEY TO SPECIES:

1a. Interramal abdominal cirri absent (may be rudimentary in *O. bioreti*); abdominal notopodial forked chaetae present or absent..........**2**
1b. Interramal abdominal cirri present, well developed; abdominal notopodial forked chaetae present......**4**

2a (1a). 17-21 thoracic chaetigers; abdominal notopodial forked chaetae present......................***O. armandi***
2b (1a). More than 21 thoracic chaetigers; abdominal notopodial forked chaetae present or absent...........**3**

3a (2b). Abdominal notopodial forked chaetae present; 34-39 (normally 35-38) thoracic chaetigers..........***O. cornidei***
3b (2b). Abdominal notopodial forked chaetae absent; 34-39 thoracic chaetigers.........................***O. bioreti***

4a (1b). 22-24 thoracic chaetigers; subpodial papillae at parapodia 17-35, maximum.............***O. sertulata****
4b (1b). 30-34 thoracic chaetigers; subpodial papillae at parapodia 22-55, maximum................***O. latreillii***

Orbinia armandi (McIntosh 1910)

Aricia Armandi MCINTOSH, 1910: 508, pl. 87 figs. 19-20.
TYPE LOCALITY: St. Magnus Bay, Shetland Islands, at 80 fathoms (146.3 meters).

SELECTED REFERENCES: *Aricia Armandi* — EISIG, 1914: 361-362. *Orbinia armandi* — KIRKEGAARD, 1969: 71, chart fig. 38. *Orbinia (Orbinia) armandi* — HARTMANN-SCHRÖDER, 1974*d*: 223-224, fig. 44; HARTMANN-SCHRÖDER, 1996: 293.

DISTRIBUTION: Shetland Islands; North Sea; Skagerrak. In fine to coarse sand. Sublittoral to about 36 meters.

REMARKS: KIRKEGAARD (1969) suggested that this species could represent a young stage of another species.

Orbinia bioreti (Fauvel 1919)

Aricia Bioreti FAUVEL, 1919*b*: 34-35, fig. 2.

TYPE LOCALITY: Sarodrano (Tuléar Province), Madagascar.

SELECTED REFERENCES: *Aricia Bioreti* — FAUVEL, 1919*a*: 430-433, pl. 16 figs. 52-56; FAUVEL, 1927*a*: 13-14, fig. 3*a-d*.

REFERENCES FOR PORTUGAL: MONTEIRO-MARQUES, 1987 (as *Aricia bioreti*; continental shelf of Algarve); DEXTER, 1992 (as *Aricia bioreti*; previous records: Arrábida).

DISTRIBUTION: Atlantic coast of France; Portugal; Madagascar. In sand. At shallow water.

REMARKS: In his original description, FAUVEL (1919*b*: 35) states that the species from Madagascar was quite similar to a specimen observed by him from Noirmoutier (Atlantic coast of France), considering the specimens from both populations as being conspecific. The French specimen differed from the African ones only in small details, like having a slightly bigger number of chaetigers in the thoracic region (39 against 37-38), and a more marked reduction of the interramal cirri FAUVEL (1919*a*: 432).

Orbinia cornidei (Rioja 1934)

Orbinia cornidei RIOJA, 1934: 433-437, figs. 1-15.

TYPE LOCALITY: Marín, Ria de Pontevedra, Northwest Spain (near Placeres, at Puntapared, and near the Island of Tambo), at shallow water, on muddy sand and fine sand.

DISTRIBUTION: Galicia (Spain), at shallow water, on muddy and fine sand.

Orbinia latreillii (Audouin & Milne-Edwards 1833)

Aricia Latreillii AUDOUIN & MILNE-EDWARDS, 1833*c*: 398-399.

TYPE LOCALITY: La Rochelle, Charente, Atlantis coast of France [information from SOLÍS-WEISS *et al.*, 2004].

SYNONYMS: *Aricia longithorax* Eisig 1914.

SELECTED REFERENCES: *Aricia Latreillii* — SAINT-JOSEPH, 1894: 85-91, pl. 5 figs. 109-118; MESNIL & CAULLERY, 1898: 142; MCINTOSH, 1910: 502, pl. 56 fig. 1; FAUVEL, 1927*a*: 11-12, fig. 2; RIOJA, 1931: 20-21. *Aricia Latreillei* — EISIG, 1914: 340-343. *Orbinia (Orbinia) latreillii* — HARTMANN-SCHRÖDER, 1996: 293. *Orbinia latreillii* — KIRKEGAARD, 1996: 14-15, fig. 2; BADALAMENTI & CASTELLI, 1994: 193. *Aricia longithorax* — EISIG, 1914: 324-327, text-fig. 11*F*, pl. 18 figs. 15-26, tables inserted at pages 364 and 526.

REFERENCES FOR PORTUGAL: AMOUREUX & CALVÁRIO, 1981 (as *Orbinia latreilli*; Peniche); SOUSA-REIS *et al.*, 1982 (as *Orbinia latreilli*; Peniche region); DEXTER, 1992 (as *Orbinia latreilli*; previous records: Peniche); PARDAL, CALDEIRA & MARQUES, 1992 (previous records: Peniche); RAVARA, 1997 (off Aveiro).

DISTRIBUTION: Eastern North Atlantic to the Mediterranean Sea; Aegean Sea; Black Sea; North Sea; English Channel. In muddy and sandy bottoms. In shallow water.

*__*Orbinia sertulata*__ (Savigny 1822)

Aricia sertulata SAVIGNY, 1822: 36.

TYPE LOCALITY: La Rochelle, western Atlantic coast of France.

SYNONYMS: *Aricia Cuvierii* Audouin & Milne-Edwards 1833; *Aricia Cuvieri* Var. *perpapillata* Eisig 1914.

SELECTED REFERENCES: *Aricia Sertulata* — AUDOUIN & MILNE-EDWARDS, 1833*c*: 399-400. *Orbinia (Orbinia) sertulata* — HARTMANN-SCHRÖDER, 1996: 293-294, fig. 130. *Orbinia sertulata* — KIRKEGAARD, 1996: 15-17, fig. 3. *Aricia Cuvierii* — AUDOUIN & MILNE-EDWARDS, 1833*c*: 397-398, pl. 15 figs. 5-13 [plate in AUDOUIN & MILNE-EDWARDS, 1832]; LO BIANCO, 1893: 24-25. *Aricia Cuvieri* — SAINT-JOSEPH, 1894: 91-92; MESNIL & CAULLERY, 1898: 142; MCINTOSH, 1905*a*: 44; MCINTOSH, 1910: 497; FAUVEL, 1914*f*: 223-224; FAUVEL, 1927*a*: 12-13, fig. 3*e-l*; RIOJA, 1931: 22, pls. 1-2. *Aricia cuvieri*

— SAINT-JOSEPH, 1906: 167; HARTMAN, 1957: 256-257, pl. 20; BADALAMENTI & CASTELLI, 1994: 192-193. *Aricia Cuvieri* Varietas *typica* — EISIG, 1914: 327-334, text-figs. 11*G*, 21*B*, pl. 15 figs. 18-19, pl. 17 figs. 1-20, tables inserted at pages 364 and 526. *Aricia Cuvieri* Varietas *perpapillata* — EISIG, 1914: 334-338, text-fig. 3*A-B*, pl. 11 fig. 10, pl. 15 fig. 20, pl. 18 figs. 1-14, tables inserted at pages 364 and 526; FAUVEL, 1927*a*: 13.

REFERENCES FOR PORTUGAL: FAUVEL, 1907*b* (as *Aricia Cuvieri*; Berlengas); FAUVEL, 1914*f* (as *Aricia Cuvieri*; Berlengas); RIOJA, 1917*c* (as *Aricia Cuvieri*; previous records: Berlengas); CARVALHO, 1929 (as *Aricia Cuvieri*; Sines); BELLAN, 1960*a* (as *Aricia cuvieri*; cape Espichel; Setúbal Canyon); MONTEIRO-MARQUES, 1979 (as *Aricia cuvieri*; southern continental shelf of Algarve); AMOUREUX & CALVÁRIO, 1981 (as *Orbinia cuvieri*; Peniche); SOUSA-REIS *et al.*, 1982 (as *Orbinia cuvierii*; Peniche region); MONTEIRO-MARQUES, 1987 (as *Aricia cuvieri*; continental shelf of Algarve); DEXTER, 1992 (as *Orbinia (Aricia) cuvieri*; previous records: continental shelf of Algarve; Sines; Peniche); PARDAL, CALDEIRA & MARQUES, 1992 (as *Orbinia cuvieri*; previous records: Peniche; Cape Espichel; Sines; Cape Sardão; Algarve); RAVARA, 1997 (as *Orbinia cuvieri*; off Aveiro); present work (southwestern continental shelf).

MATERIAL: SEPLAT 7 (2nd part) — St. 174 (A.3936), off Sines, 250 m, muddy sand: 3 fragments of a big specimen, with 21, 62, and 46 chaetigers; identified by comparison with specimen from St. 5*A*. **FAUNA 1 — St. 0*A***, Galicia, off Cies Islands, Ria de Vigo, 82-96 m, unknown substrate: 1 middle (abdominal) fragment with 76 chaetigers; identified by comparison with the specimen from St. 5*A*. **St. 5*A***, Alborán Sea, off Veléz-Málaga, 67-68 m, mud: 1 incomplete specimen in good condition; 88 chaetigers, 55 mm long, 4 mm wide; prostomium sharply pointed, without eyes; thorax with 20 chaetigers; branchiae from chaetiger 5; one notocirrus; neuropodia with numerous papillae, posterior to the chaetae, which are spines greatly curved and disposed in about 3 rows; capillary chaetae on both rami, longer on the notopodia; these chaetae are crenulated; ventral papillae in chaetiger 17 to 28; abdominal parapodia and abdominal chaetae as described.

DISTRIBUTION: Arctic Ocean; Greenland; Northeastern Atlantic, from Norway to the Mediterranean Sea and Adriatic Sea; Black Sea; English Channel; North Sea; Irish Sea; Skagerrak, Kattegat; Öresund to Kiel Bight; West Africa; Indian Ocean. In sand, muddy sand, and mud, and also in the sediment between brown algae and oyster banks. From infralittoral to about 240 meters.

GENUS ***Phylo*** Kinberg 1866

Phylo KINBERG, 1866*b*: 251.

TYPE SPECIES: *Phylo felix* Kinberg 1866.

REMARKS: Some authors (*e.g.* HARTMANN-SCHRÖDER, 1996) consider *Phylo* Kinberg 1866 as a subgenus of *Orbinia* Quatrefages 1866. Both genera are here considered as being valid and independent.

The genus definition was emended by HARTMAN (1948*a*).

KEY TO SPECIES:

(adapted from FAUVEL, 1924*b*)

1a. Subpodial (or ventral papillae) absent, thoracic neuropodial postchaetal papillae present; notopodial postchaetal lobe sometimes notched..***P. norvegica***

1b. Subpodial (or ventral papillae) and thoracic neuropodial postchaetal papillae present; notopodial postchaetal lobe entire..**2**

2a (1b). Interramal abdominal cirri absent..***P. kupfferi***

2b (1b). Interramal abdominal cirri present..**3**

3a (2b). Branchiae from chaetiger 4-6; thoracic thick neuropodial modified spines on 3-4 chaetigers..***P. grubei***

3b (2b). Branchiae from chaetiger 6-9; thoracic thick neuropodial modified spines from the 11th or 12th to the last thoracic chaetiger..**4**

4a (3b). Branchiae from chaetiger 6-7; 20-23 thoracic chaetigers; ventral papillae between chaetigers 16-27, in a single row..***P. foetida ligustica***

4b (3b). Branchiae from chaetiger 9 (sometimes 8)..**5**

5a (4b). 20-22 thoracic chaetigers; ventral papillae between chaetigers 15-16 to 22-23, in a double row in some segments...***P. foetida adjimensis***
5b (4b). 23-26 thoracic chaetigers; ventral papillae between chaetigers 18-29, in a single row....***P. foetida***
5c (4b). 25-26 thoracic chaetigers; ventral papillae between chaetigers 17-29, sometimes reaching chaetigers 34-39, in several rows...***P. foetida imitans***
5d (4b). 30-32 thoracic chaetigers; ventral papillae between chaetigers 17-18 to 31-37, in a double row in some segments...***P. foetida atlantica***

Phylo foetida (Claparède 1869)

Aricia foetida CLAPARÈDE, 1869: 46-49, pl. 20 fig. 2.
TYPE LOCALITY: Gulf of Naples.
SYNONYMS: *Aricia foetida* Var. *typica* Fauvel 1924.
SELECTED REFERENCES: *Aricia foetida* — LO BIANCO, 1893: 24, pl. 2 fig. 6; SAINT-JOSEPH, 1894: 92-94, pl. 4 figs. 105-108; EISIG, 1914: 279-317, text-figs. 1*B-C*, 2*A*, 3*C*, 4-7, 11*A-C*, 13, 15, 17-19, 20*A*, 21*A*, 23-24, pl. 10 fig. 1, pl. 11 figs. 1-9, 11-15, pl. 12 figs. 1-31, pl. 13 figs. 1-18, pl. 14 figs. 1-11, tables at pages 191 and 193, tables inserted at pages 364 and 526; FAUVEL, 1927*a*: 14-15, fig. 4; RIOJA, 1931: 16-18, pls. 3-4. *Aricia fœtida* — MESNIL & CAULLERY, 1898: 142; FAUVEL, 1924*b*: 520, 522-523. *Aricia foetida* Var. *typica* — FAUVEL, 1924*b*: 524-525. *Aricia foetida* Var. *foetida (typica)* — FAUVEL, 1927*a*: 16. *Aricia foétida* var. *typica* — RIOJA, 1931: 20. *Phylo foetida* — BADALAMENTI & CASTELLI, 1994: 193-194.
REFERENCES FOR PORTUGAL: QUINTINO & GENTIL, 1987 (Lagoon of Albufeira; Lagoon of Óbidos); QUINTINO, RODRIGUES & GENTIL, 1989 (Lagoon of Óbidos); DEXTER, 1992 (as *Orbinia (Phylo) foetida*; previous records: Ria Formosa; Lagoon of Albufeira; Lagoon of Óbidos); PARDAL, CALDEIRA & MARQUES, 1992 (previous records: Lagoon of Óbidos; Lagoon of Albufeira).
DISTRIBUTION: English Channel; Atlantic coast of Europe; Mediterranean Sea; Adriatic Sea; Aegean Sea; [?] Madagascar; tropical Africa. In muddy and sandy bottoms. Shallow water, between 1-6 meters.

Phylo foetida adjimensis (Fauvel 1924)

Aricia foetida Var. *adjimensis* FAUVEL, 1924*b*: 521, 522, 525.
TYPE LOCALITY: Adjim (Tunisia), in littoral mud.
SELECTED REFERENCES: *Aricia foetida* Var. *adjimensis* — FAUVEL, 1927*a*: 16.
DISTRIBUTION: Known from the type locality.

Phylo foetida atlantica (Fauvel 1924)

Aricia foetida Var. *atlantica* FAUVEL, 1924*b*: 521, 522, 525.
TYPE LOCALITY: French coast of the English Channel (Saint-Vaast, Cherbourg, Dinard, Terrénès), and Cantabric Sea (Noirmoutier, Ré, Yeu, Arcachon, Santander), in clean sand and muddy sand.
SELECTED REFERENCES: *Phylo foetida* Var. *atlantica* — FAUVEL, 1927*a*: 16. *Aricia foétida* var. *Atlántica* — RIOJA, 1931: 20, pl. 3.
DISTRIBUTION: English Channel; Cantabric Sea; Western Mediterranean Sea. In clean and muddy sand, at low tide.

Phylo foetida imitans (Eisig 1914)

Aricia imitans EISIG, 1914: 317-321, text-fig. 11*D*, pl. 15 figs. 1-9, pl. 16 figs. 1-16, tables inserted at pages 364 and 526.
TYPE LOCALITY: Gulf of Naples, at the coast of Posillipo, near Donn'Anna, Villa Rendel, and Villa Capella, in sand, at 8 meters.
SELECTED REFERENCES: *Aricia foetida* Var. *imitans* — FAUVEL, 1924*b*: 520, 522, 525; FAUVEL, 1927*a*: 16.
DISTRIBUTION: Known from the type locality.

Phylo foetida ligustica (Orlandi 1896)

Aricia ligustica ORLANDI, 1896: 154, pl. 2 figs. 3-12.
TYPE LOCALITY: Gulf of Genova, Mediterranean Sea.
SYNONYMS: *Aricia ramosa* Eisig 1914.
SELECTED REFERENCES: *Phylo foetida* — FAUVEL, 1907*b*: 1-4. *Phylo foetida* Var. *ligustica* — FAUVEL, 1924*b*: 520-521, 522, 524; FAUVEL, 1927*a*: 16. *Aricia ligustica* — RIOJA, 1917*a*: 178-179. *Aricia foétida*

var. *ligústica* — RIOJA, 1931: 20. *Aricia ramosa* — EISIG, 1914: 321-324, text-fig. 11*E*, pl. 15 figs. 10-17, pl. 16 figs. 17-36, tables inserted at pages 364 and 526. *Phylo ligustica* — BADALAMENTI & CASTELLI, 1994: 194.

DISTRIBUTION: Mediterranean Sea. In muddy and sandy bottoms. Between 15-30 meters.

Phylo grubei (McIntosh 1910)

Aricia Grubei MCINTOSH, 1910: 505, pl. 85 fig. 8, pl. 87 fig. 1.

TYPE LOCALITY: Off Ireland, at 422 fathoms (772 meters), on a bottom of sand, stones and coral.

SELECTED REFERENCES: *Aricia Grubei* — FAUVEL, 1914*f*: 223; EISIG, 1914: 360-361, text-fig. 16, tables inserted at pages 364 and 526; FAUVEL, 1927*a*: 16-17, fig. 5*a-g*. *Phylo grubei* — BADALAMENTI & CASTELLI, 1994: 194.

DISTRIBUTION: Off Brittany and off south Ireland; Mediterranean Sea; Adriatic Sea; Aegean Sea; Cape Verde Archipelago. In bottoms of muddy sand and stones, with coral. Between 150-772 meters.

Phylo kupfferi (Ehlers 1874)

Aricia Kupfferi EHLERS, 1874: 296.

TYPE LOCALITY: West of the English Channel: 48º50'N, 11º07'W (11º09'W), at 725 fathoms (1325.8 meters), in muddy sand; 54º54'N, 10º59'W, at 1366 fathoms (2498 meters), in mud.

SELECTED REFERENCES: *Aricia Kupfferi* — EHLERS, 1875: 57-59, pl. 4 figs. 1-9; MESNIL & CAULLERY, 1898: 142; MCINTOSH, 1905*a*: 50; EISIG, 1914: 353-357; FAUVEL, 1927*a*: 18, fig. 5*h-l*. *Orbinia (Phylo) kupfferi* — HARTMANN-SCHRÖDER, 1996: 295. *Phylo kupfferi* — BADALAMENTI & CASTELLI, 1994: 194-195; KIRKEGAARD, 1996: 17-18, fig. 4.

REFERENCES FOR PORTUGAL: BELLAN, 1960*a* (as *Aricia koupfferi*; Cape Espichel; Cape Santa Maria); PARDAL, CALDEIRA & MARQUES, 1992 (previous records: Cape Espichel; coast of Alentejo).

DISTRIBUTION: Arctic Ocean; North Atlantic to the Mediterranean Sea; Adriatic Sea; Aegean Sea; northern North Sea; Skagerrak; Falkland Islands; Persian Gulf. On mud or muddy sand bottoms. Between 140-2500 meters.

Phylo norvegica (M. Sars *in* G.O. Sars 1872)

Aricia norvegica M. SARS *in* G.O. SARS, 1872*a*: 408.

TYPE LOCALITY: Norway: at "*Bollærene*" and Drøbak, frequent between 50-60 fathoms (91.4-109.7 meters), but abundant between 100-120 fathoms (183-219.5 meters); Lofoten Archipelago, between 90-100 fathoms (164.6-183 meters).

SYNONYMS: *Aricia grœnlandica* McIntosh 1878.

SELECTED REFERENCES: *Aricia norvegica* — MESNIL & CAULLERY, 1898: 142; MCINTOSH, 1905*a*: 44-45; MCINTOSH, 1910: 506, pl. 65 fig. 3, pl. 85 fig. 9, pl. 87 fig. 2; FAUVEL, 1914*f*: 223; EISIG, 1914: 348-353; FAUVEL, 1927*a*: 17-18, fig. 5*m-p*. *Phylo norvegica* — STØP-BOWITZ, 1948*b*: 66; KIRKEGAARD, 1996: 18-20, fig. 5. *Phylo norvegicus* — FAUCHALD, 1972*b*: 97-98, fig. 3*A*; BADALAMENTI & CASTELLI, 1994: 195. *Orbinia (Phylo) norvegica* — HARTMANN-SCHRÖDER, 1996: 295, fig. 131. *Aricia grœnlandica* — MCINTOSH, 1878*a*: 504, pl. 65 fig. 5-9.

DISTRIBUTION: Stated to be cosmopolitan. Arctic Ocean; Antarctic; North Sea; Skagerrak to Kattegat; Galicia; Mediterranean Sea; Adriatic Sea; Japan; off NE North America; California; Brazil; Indian Ocean. In muddy or mixed bottoms, seldom in pure sand. Between 20-2900 meters.

GENUS ***Protoaricia*** Czerniavsky 1881

Protoaricia CZERNIAVSKY, 1881*b*: 371.

TYPE SPECIES: *Aricia oerstedii* Claparède 1864.

SYNONYMS: *Theostoma* Eisig 1914; *Scoloplosia* Rullier 1972.

Protoaricia oerstedi (Claparède 1864)

Aricia Œrstedi CLAPARÈDE, 1864: 502-503, pl. 4 fig. 7.

TYPE LOCALITY: Port-Vendres, Mediterranean coast of France.

SYNONYMS: [?] *Aricia capsulifera* Bobretzky 1870; *Aricia acustica* Langerhans 1880.

SELECTED REFERENCES: *Theostoma örstedi* — EISIG, 1914: 506-517, text-figs. 1*D*, 2*G*, 11*O*, 14, 20*F*, pl. 10 figs. 4*a-b*, pl. 27 figs. 1-18, table at page 508, table inserted at page 526. *Theostoma Œrstedi* —

FAUVEL, 1927*a*: 24-26, fig. 8*h-s*. *Theostoma Oerstedi* — RIOJA, 1931: 30-32, pl. 7. *Aricia Œrstedi* — MARION & BOBRETZKY, 1875: 68. *Scoloplos (Nainereis) Œrstedi* — MESNIL & CAULLERY, 1898: 143. *Aricia acustica* — LANGERHANS, 1880*b*: 88-89, pl. 4 fig. 1. *Scoloplos (Nainereis) acustica* — MESNIL & CAULLERY, 1898: 143; FAUVEL, 1907*b*: 9-15, figs. 1-2. *Nainereis acustica* — FAUVEL, 1914*f*: 228-231, pl. 20 figs. 17-31. *Protoaricia oerstedi* — BADALAMENTI & CASTELLI, 1994: 196. *Aricia capsulifera* — BOBRETZKY, 1870: 248. [?] *Theostoma capsuliferum* — EISIG, 1914: 517-518, table at page 508, table inserted at page 526.

REFERENCES FOR PORTUGAL: AMOUREUX & CALVÁRIO, 1981 (Peniche); MONTEIRO-MARQUES *et al.*, 1982 (Ponta do Baleal); PARDAL, CALDEIRA & MARQUES, 1992 (as *Protoaricia oerstedii*; previous records: Peniche).

DISTRIBUTION: Northeastern Atlantic (Azores Archipelago; Madeira, Canary Islands, coast of Europe); Western Mediterranean Sea; Adriatic Sea; Aegean Sea; Black Sea. On rocks, among algae, ascideans or mussels. Intertidal to shallow water.

GENUS *Schroederella* Laubier 1962

Schroederella LAUBIER, 1962*a*: 232.

TYPE SPECIES: *Schroederella pauliana* Laubier 1962.

Schroederella laubieri Badalamenti & Castelli 1990

Schroederella laubieri BADALAMENTI & CASTELLI, 1991: 95-98, figs. 1-2.

TYPE LOCALITY: Bay of Carini, north-west coast of Sicily (Mediterranean Sea), at a depth of 18 meters, in a SFBC biocoenosis with a *Cymodocea nodosa* meadow.

SELECTED REFERENCES: *Schroederella laubieri* — BADALAMENTI & CASTELLI, 1994: 197.

DISTRIBUTION: Mediterraean Sea: Ligurian Sea; Island of Elba; NW Sicily. In coarse sand. Between 9-18 meters.

GENUS *Scoloplos* Blainville 1828

Scoloplos BLAINVILLE, 1828: 493.

TYPE SPECIES: *Lumbricus armiger* O.F. Müller 1776.

SYNONYMS: *Scolaricia* Eisig 1914; *Haploscoloplos* Monro 1933.

REMARKS: The definition of the genus was emended by PETTIBONE (1963*a*).

DAY (1973) redescribed the type species of the genus *Scolaricia*, *S. typica* Eisig 1914, with base on specimens from Marseille, and discussed the status of the genus. The diagnostic characters of the genus *Scolaricia*, according to EISIG (1914), included the presence of a notch in the thoracic neuropodial flange, the absence of stomach-papillae, the presence of only one foot-papilla on the last few thoracic segments, and the lamellar expansion at the base of the abdominal neuropodia. He didn't mention the presence of flail chaetae, but this kind of chaetae was stated as being typical of the genus by FAUVEL (1927*a*), in which was followed by other authors. However, DAY (1973) pointed the fact that none of these structures were peculiar to *Scolaricia*. His examination of *S. typica* showed that the notches in the thoracic neuropodia were neither obvious nor deep , being instead depressions on either side of the origin of the single foot-papilla, and also occur in species of *Scoloplos*. Other characters, as the flail chaetae or the lamellar expansion at the base of the abdominal neuropodia also occur in species of the genus *Scoloplos*, with varying degrees of development. For all this, DAY (1973) considered *Scolaricia* as a synonym of *Scoloplos*, and this synonymy is followed here.

KEY TO SPECIES:

1a. Abdominal neurochaetae with flail-tip chaetae; gills from chaetigers 14-25..**2**

1b. Abdominal neurochaetae without flail-tip chaetae; gills between chaetigers 9-13 as small papillae, and then increasing quickly in size..**3**

2a (1a). 24 thoracic chaetigers; gills from chaetiger 25; thoracic notopodial postchaetal lobe absent or vestigial in the anterior region, small and truncated in the posterior region; thoracic neuropodial ridge

entire, without any notch or indentation; thoracic neuropodial postchaetal lobe median to the neuropodium; heads of crochets faintly but distinctly striated..***S. hassi***
2b (1a). 18-21 thoracic chaetigers; gills from chaetiger 14-16; thoracic notopodial postchaetal lobe well developed; thoracic neuropodial ridge divided in two by a notch; thoracic neuropodial postchaetal lobe superior to the neuropodium; heads of crochets smooth...***S. typicus***

3a (1b). With 1-2 extra subpodial papillae on last few thoracic and first few abdominal neuropodia; thoracic neuropodia usually with crotchets ending in blunt tips in addition to numerous neurochaetae ending in capillary tips; 15-20 (usually 17-18) thoracic chaetigers...***S. armiger***
3b (1b). Without extra subpodial papillae on transitional segments or only on last thoracic neuropodia; thoracic neurochaetae ending in capillary tips, hooks if present are few and occur among the capillaries, being difficult to observe; 14-17 (usually 15) thoracic chaetigers...***S. acutus***

Scoloplos acutus (Verrill 1874)

Anthostoma acutum VERRILL, 1874*c*: 599-600.
TYPE LOCALITY: Off Gay Head (Northeast coast of North America), at 19 fathoms (37.4 meters), in soft mud, and also from the deeper parts of Vineyard Sound.
SYNONYMS: *Haploscoloplos alaskensis* Hartman 1948; *Haploscoloplos panamensis* Hartman 1957.
SELECTED REFERENCES: *Scoloplos acutus* — VERRILL, 1881: 301; PETTIBONE, 1963*a*: 293-294, fig. 74*g*; ZHADAN, 1998: 187-189, figs. 2-3, 4*в-г*, table 2. *Haploscoloplos alaskensis* — HARTMAN, 1948*b*: 30-32, fig. 8*a-c*. *Scoloplos armiger alaskensis* — MACKIE, 1987: 20-22, fig. 21. *Haploscoloplos panamensis* [not Monro 1933] — HARTMAN, 1957: 277, pl. 28 figs. 1-3. *Scoloplos armiger* [not O.F. Müller 1776] — MCINTOSH, 1905*a*: 45-47; FAUVEL, 1907*b*: 4-9 [in part; specimen from Station 1074]; FAUVEL, 1914*f*: 224-228, pl. 20 figs. 10-11 [in part; specimen from Station 1074].
DISTRIBUTION: Alaska; Northeast coast of USA; Spitsbergen; Barents Sea; White Sea. In muddy bottoms. From shore to 388 meters.
REMARKS: See the *REMARKS* section under *Scoloplos armiger*.

Scoloplos armiger (O.F. Müller 1776)

Lumbricus armiger O.F. MÜLLER, 1776: 215.
TYPE LOCALITY: Norway.
SYNONYMS: *Aricia Mülleri* Rathke 1843; *Scoloplos elongatus* Quatrefages 1866; *Aricia arctica* Hansen 1879; [?] *Scoloplos Jeffreysii* McIntosh 1905.
SELECTED REFERENCES: *Lumbricus armiger* — O.F. MÜLLER, 1788: 22, pl. 22 figs. 4-5. *Aricia armiger* — MICHAELSEN, 1896: 70. *Scoloplos armiger* — ØRSTED, 1843*a*: 37-38, pl. 1 fig. 9 [reference in the text to fig. 8 is wrong], pl. 7 figs. 106-107, 109; CUNNINGHAM & RAMAGE, 1888: 642, pl. 38 fig. 7; SAINT-JOSEPH, 1894: 94-96, pl. 5 figs. 119-120; MCINTOSH, 1910: 510, pl. 56 fig. 7; FAUVEL, 1907*b*: 4-9 [in part; specimen from Station 2455^{bis}]; FAUVEL, 1914*f*: 224-228, [in part; specimen from Station 2455^{bis}; not pl. 20 figs. 10-11 = *Scoloplos acutus* (Verrill 1874)]; EISIG, 1914: 367-403, text-figs. 1*A*, 2*B*, 11*H-I*, 20*B*, 21*C*, pl. 18 figs. 27-46, pl. 19 figs. 1-7, pl. 20 figs. 1-8, table at pages 424-425, table inserted at page 526; RIOJA, 1917*c*: 22-23, fig. 3; FAUVEL, 1927*a*: 20-21, fig. 6*k-q*; RIOJA, 1931: 24-25, pl. 5; HARTMAN, 1957: 280-281, pl. 29; PETTIBONE, 1963*a*: 292-293, fig. 76*h-i*; MACKIE, 1987: 21-22, table 5; BADALAMENTI & CASTELLI, 1994: 196; HARTMANN-SCHRÖDER, 1996: 297-298, fig. 132; KIRKEGAARD, 1996: 20-22, fig. 6; ZHADAN, 1998: 186-187, figs. 1, 3, 4*а-б*, 5, 7, table 2. *Scoloplos (Scoloplos) armiger* — MESNIL & CAULLERY, 1898: 142. *Aricia Mülleri* — RATHKE, 1843: 176-180, pl. 8 figs. 9-15; SAINT-JOSEPH, 1898: 356-360, pl. 20 fig. 167. *Scoloplos (Scoloplos) Mülleri* — MESNIL & CAULLERY, 1898: 141, 142; MCINTOSH, 1905*a*: 45-46. *Aricia arctica* — HANSEN, 1879: 269, pl. 2 figs. 1-8; HANSEN, 1882: 34, pl. 5 figs. 20-26. [?] *Scoloplos Jeffreysii* — MCINTOSH, 1905: 47-48.
REFERENCES FOR PORTUGAL: COSTA, GAMITO & OLIVEIRA, 1984 (Sado Estuary); PINTO, 1984 (Sado Estuary); QUINTINO & GENTIL, 1987 (Lagoon of Albufeira; Lagoon of Óbidos); QUINTINO, RODRIGUES & GENTIL, 1989 (Lagoon of Óbidos); DEXTER, 1992 (previous records: Ria Formosa; Ria de Alvor; Mira Estuary; Sines; Sado Estuary; Lagoon of Albufeira; Lagoon of Óbidos; Figueira da Foz; Ria de Aveiro); PARDAL, CALDEIRA & MARQUES, 1992 (previous records: Aveiro; Óbidos Lagoon; Albufeira Lagoon; Mira Estuary); MOREIRA, FIGUEIRA & CUNHA, 1994 (Ria de Aveiro); SALDANHA, 1995 (Portugal); CANCELA DA FONSECA *et al.*, 2006 (Aljezur; Odeceixe).
DISTRIBUTION: Normally considered as cosmopolitan, but probably this is not the case. Arctic Ocean; Novaya Zemlya; White Sea; Spitsbergen; Iceland; Greenland; Davis Strait; NE coast of America; North Sea; Irish Sea; Norway; Skagerrak; Kattegat; Öresund; Baltic Sea; English Channel; Cantabric Sea;

Mediterranean Sea; Adriatic Sea; Aegean Sea; [?] Kerguelen; Magellan Strait; Antarctic Ocean. In muddy bottoms, with coarse or fine sand, mixed bottoms, with stones or *Zostera*, or in sediments among *Mytilus*, oyster banks, or *Sabellaria* reefs. Intertidal to about 2455 meters.

REMARKS: FAUVEL (1907*b*), while studing two specimens of different morphotypes from Spisbergen, considered *Scoloplos armiger* (O.F. Müller 1776) in a different sense than what is considered today. This way, he considered that specimens without crotchets or hooks at the thoracic neuropodia (besides other differences) represented the true *Scoloplos armiger*, while the specimens that showed that kind of hooks together with capillary chaetae, belonged to *Scoloplos muelleri* (Rathke 1843), with *Aricia arctica* Hansen 1879 as a junior synonym. However, in the same paper Fauvel also supported MCINTOSH (1905*a*) oppinion in that chaetae with blunt tips (hooks) were normal chaetae with worn tips. Finally, FAUVEL (1907*b*) stated that it was possible to find transitional specimens between the two extreme morphotypes, considering the rest of the observed differences as resulting from the habitat of the specimens. As a consequence, FAUVEL (1907*b*) considered *Scoloplos armiger* (O.F. Müller 1776) and *Scoloplos muelleri* (Rathke 1843) as synonyms, suggesting the variety *Mulleri* for the morphotype with short blunt chaetae.

I was not able to check the original description of *Scoloplos armiger* by O.F. MÜLLER (1776), but it is interesting to note that previous to FAUVEL (1907), other authors had already considered as *S. armiger* the form without thoracic neuropodial hooks with blunt tips (*e.g.*: SAINT-JOSEPH, 1894; MCINTOSH 1905*a*).

Another species described from the North Atlantic, *Scoloplos acutus* (Verrill 1874) was also synonymized with *S. armiger*, by WEBSTER & BENEDICT (1887), in which was followed by authors like FAUVEL (1927*a*) or HARTMAN (1944*e*), while other authors considered both species as being separate species (*e.g.*, PETTIBONE, 1963*a*). CURTIS (1969) sustained that *S. acutus* was the juvenile stage of *S. armiger*, stating that the presence of short blunt hooks and subpodial papillae at the thoracic neuropodia was size related. More recently, ZHADAN (1998) defended the validity of both species, and this validity is followed here.

Today, it is accepted that *S. armiger* and *S. muelleri*, together with *Aricia arctica* Hansen 1879, represent the same species, *S. armiger*, a species characterized by having short blunt hooks at the thoracic neuropodia, while the morphotype with the neurochaetae ending in capillary tips is considered to represent *Scoloplos acutus* (Verrill 1874), a more septentrional species. For more details about how to separate both species, check the above key.

KRUSE (2003) studied poecilogony in a population of *Scoloplos armiger* from the North Sea, and its ecological and genetic aspects (see also: KRUSE, REUSCH & SCHNEIDER, 2003; KRUSE & REISE, 2003; KRUSE, STRASSER & THIERMANN, 2004). In this case, in addition to the direct holobenthic development from egg cocoons, it was also found the presence of pelagic larvae. According to the studies performed (KRUSE, REUSCH & SCHNEIDER, 2003), it was found that the two developmental modes of reproduction were spatially segregated: females of an intertidal population produced egg cocoons, but no pelagic larvae, while 13 out of 15 females of an adjacent subtidal population produced pelagic larvae but no egg cocoons. Furthermore, the performed molecular genetic analysis (RAPD-PCR) on intertidal and subtidal populations from the North Sea showed that the genetic diversity was significantly higher within subtidal than within intertidal populations, which was consistent with a wider dispersion by pelagic larvae and a smaller effective population size when the development is holobenthic, being the total genetic divergence not related to distance but to the intertidal/subtidal division. This way, it was suggested that *S. armiger* is represented by two sibling species in the North Sea. In a posterior study (KRUSE & REISE, 2003), crossbreeding experiments between the two populations showed that they were reproductively isolated, as couples with males and females from different habitats had no offspring. Besides, in was also found that intertidal males had spermatozoa with heads twice as long as those from subtidal males, and also a significantly shorter flagellum. The authors suggested that the different sperm morphology could cause the reproductive faillure at the fertilization stage. Finally, juveniles hatching from cocoons had shorter anal cirri than the ones metamorphosed from pelagic larvae. The presence of at least two sympatric *Scoloplos armiger*-like taxa was also reinforced by the finding of furcate chaetae in abdominal segments of individuals of the subtidal populations, which are lacking in intertidal individuals (ALBRECHT, 2004).

All these results supported the idea of the presence of two sympatric sibling species of *Scoloplos armiger*, designated by KRUSE & REISE (2003) as "*type I*" and "*type S*", and which can be determined as follows:

Type I	***Type S***
- living in intertidal areas;	- living in subtidal areas;
- eggs cocoons present; no pelagic larvae;	- eggs cocoons absent; pelagic larvae present;
- elongated sperm heads;	- short sperm heads;
- shortened sperm flagella;	- long sperm flagella;
- hatched juveniles with shorter anal cirri;	- hatched juveniles with longer anal cirri;
- adults with abdominal furcate chaetae absent (according to ALBRECHT, 2004).	- adults with abdominal furcate chaetae present (according to ALBRECHT, 2004).

The putative cosmopolitan distribution of *Scoloplos armiger* was studied by BLEIDORN *et al.* (2006), using mitochondrial sequences. For this study, a phylogenetic analysis of a fragment of the mitochondrial genome of individuals of *Scoloplos armiger*-like populations from the Eastern North Atlantic and Pacific regions was carried out. As a result, five different clades of *Scoloplos* cf. *armiger* were obtained, two from the Pacific region and designated as “Malibu clade” and “San Diego clade”, and three from the Eastern North Atlantic, nominated “type locality clade”, “subtidal clade” and “intertidal clade”. Each one of these clades characterized a different species, revealing that *Scoloplos armiger* represents a species complex and not a cosmopolitan species. This way, three different species would be present in Northern Europe, one living in intertidal flats and producing egg-cocoons, and two from subtidal areas of the North Sea and Baltic Sea. These two genetic types can live in sympatry, but in the Norwegian region, which includes the type locality, only one of them seems to be present. No morphological or developmental difference between these two types as been found, so far, but the mixing of two subtidal cryptic species could explain part of the high genetic diversity found by KRUSE, REUSCH & SCHNEIDER (2003).

At present, the description of the “intertidal clade” as a new species is in preparation, while it is suggested that the name *Scoloplos armiger* should be restricted to the “type locality clade” (BLEIDORN *et al.*, 2006). Besides, the future study of other *Scoloplos armiger*-like populations, from regions as the Mediterranean Sea, may still reveal the presence of other valid species in the European waters.

Scoloplos haasi (Monro 1937)

Scolaricia haasi MONRO, 1937*a*: 83-86, fig. 1.

TYPE LOCALITY: At the shore between Jaffa and Acre, Palestine (today, Israel), Eastern Mediterranean Sea.

DISTRIBUTION: One single specimen is known from the shore of the Mediterranean coast of Israel, between Acre and Jaffa; Aegean Sea.

Scoloplos typicus (Eisig 1914)

Scolaricia typica EISIG, 1914: 428-440, text-figs. 2*C-D*, 10, 11*K-L*, 20*C-D*, 21*D*, pl. 10 fig. 2, pl. 19 figs. 8-16, pl. 21 figs. 1-19, pl. 22 figs. 1-9, table inserted at page 526.

TYPE LOCALITY: Gulf of Naples, at Posillipo, in front of Villa Rendel and Donn’Anna, in the sand, at 8 meters (juveniles found at 1 meter).

SYNONYMS: *Scolaricia lucia* Eisig 1914.

SELECTED REFERENCES: *Scolaricia typica* — FAUVEL, 1927*a*: 19-20, fig. 6*a-i*; RULLIER & AMOUREUX, 1969: 397; DAY, 1973: 84-86; BADALAMENTI & CASTELLI, 1994: 195. *Scolaricia lucia* — EISIG, 1914: 261 [error for *Scolaricia typica*].

REFERENCES FOR PORTUGAL: AMOUREUX & CALVÁRIO, 1981 (as *Scolaricia typica*; Lagoon of Óbidos); GAMITO, 1989 (as *Scolaricia typica*; Ria Formosa); DEXTER, 1992 (as *Scolaricia typica*; previous records: Ria Formosa; Sines); PARDAL, CALDEIRA & MARQUES, 1992 (as *Scolaricia typica*; previous records: Aveiro; Óbidos Lagoon; Ria Formosa).

DISTRIBUTION: Portugal; Western Mediterranean Sea; Adriatic Sea; Aegean Sea. In sand. Infralittoral to 30 meters.

REMARKS: The single specimen found by RULLIER & AMOUREUX (1969) from the Gulf of Taranto differs from the original description by presenting branchiae from chaetiger 25, instead of chaetiger 15.

*FAMILY **OWENIIDAE** Rioja 1917

AS: *OWENIIDAE* RIOJA, 1917*c*: 40.
TYPE GENUS: *Owenia* Delle Chiaje 1844.
SYNONYMS: *AMMOCARIDAE* Malmgren 1867.
REMARKS: The family Oweniidae Rioja 1917 gathers a group of polychaetes with reduced parapodia and with capillary chaetae and uncini, which occur in neuropodial patches. The anterior region of the body can include a branchial crown (with feeding and repiratory functions), a pair of palps, or no appendages at all. They live inside characteristic tubes of cemented sand grains, from which it is normally very hard to remove them.

Oweniids occur worldwide, and five genera, including about 51 described species, are recognised: *Galathowenia* Kirkegaard 1959 (with 12 species), *Myriochele* Malmgren 1867 (13 species), *Myrioglobula* Hartman 1967 (3 species), *Myriowenia* Hartman 1960 (one species), and *Owenia* delle Chiaje 1844 (22 species). There is no consensus on the number of valid species, depending on authors and the synonymies considered by them.

The separation between genera is based chiefly in the structure of the anterior region of the body, mainly prostomium and associated structures, and number of thoracic chaetigers. Types of notopodial capillary chaetae have been normally used to separate *Galathowenia* (one type, long) from *Myriochele* (two types, long and short). The presence of the two kinds of notopodial capillary chaetae (long and short) found by PARAPAR (2003*b*) in *Galathowenia australis* (Grube 1866), while redescribing the species based on type material, invalidated the use of this character, presence *versus* absence of short capillary notochaetae, in order to separate the genera *Galathowenia* (previously though to lack them) from *Myriochele* (being these chaetae a prevalent trait in the genus). As stated by PARAPAR (2003*b*), the presence of the short notochaetae may be widespread in *Galathowenia*, and may have been overlooked in many species. This way, the separation between *Galathowenia* and *Myriochele* is now also largely based in the morphology on the anterior region of the body (see key below).

The recent taxonomic bibliography on the group is quite extensive, and reflects the current interest on the cosmopolitan species concept, and its refutation. Numerous studies have dealed recently with the suposed cosmopolitan condition of *Owenia fusiformis* and its denial, with the ressurrection and redescription of old species, as well as the description of new ones (BLAKE, 2000*c*; KOH & BHAUD, 2001, 2003; KOH, BHAUD & JIRKOV, 2003; FORD & HUTCHINGS, 2005; MARTIN *et al.*, 2006), while other studies on the matter have been presented only as abstracts and are still unpublished (PATTI, GAMBI & PALUMBI, 2001; SENE-SILVA, 2004; SENE-SILVA & LANA, 2004). Tables with distinguishing characters between populations or species of *Owenia* can be found in KOH & BHAUD (2003), KOH, BHAUD & JIRKOV (2003), and FORD & HUTCHINGS (2005).

Recent taxonomic publications dealing with other genera of Oweniidae include HARTMANN-SCHRÖDER & ROSENFELDT (1989), CANTONE & DI PIETRO (1998, 2001), AGUIRREZABALAGA, GIL & VIÉITEZ (2000), BLAKE (2000*c*), FIEGE, KRÖNCKE & BARNICH (2000), and PARAPAR (2001, 2003*a*, 2003*b*, 2003*c*).

The latest regional studies on Oweniidae cover areas as the Antarctic waters (BLAKE, 1984; CANTONE & DI PIETRO, 1998, 2001; HARTMANN-SCHRÖDER & ROSENFELDT, 1989; PARAPAR, 2001, 2003*a*, 2003*b*), Arctic and Northern Europe (NILSEN & HOLTHE, 1985; KOH, BHAUD & JIRKOV, 2003; PARAPAR, 2003*c*), Australia (FORD & HUTCHINGS, 2005), California (BLAKE, 2000*c*), Eastern Canadian Arctic (BLAKE & DEAN, 1973), Gulf of Mexico (MILLIGAN, 1984), Iberian Peninsula and Mediterranean Sea (MARTIN, 1989; AGUIRREZABALAGA, GIL & VIÉITEZ, 2000; FIEGE, KRÖNCKE & BARNICH 2000), and Japan (IMAJIMA & MORITA, 1987). The biggest part of these papers include dichotomic keys or comparative tables for species.

In European waters, 4 of the five genera are known to occur, represented by 10 confirmed species, one of which is still unnamed and in need of a formal description. *Ops digitata* Carrington 1865, a species described from England and which was normally considered as synonymous with *O. fusiformis*, could also be valid, according to the results of KOH & BHAUD (2003), but its ressurrection still needs confirmation.

Three genera, represented each one for a single species, were present in the studied material.

KEY TO GENERA:

(adapted from: NILSEN & HOLTHE, 1985; BLAKE, 2000*c*)

1a. Head bearing tentacular crown of small, branched gill-like structures; mouth terminal; tube typically with shell fragments arranged like roof tiles...***Owenia****

1b. Head without tentacular crown; encrustations of tube normally not arranged like roof tiles.................**2**

2a (1b). One single thoracic chaetiger..***Myrioglobula***

2b (1b). Two or three thoracic chaetigers...**3**

3a (2b). Mouth terminal, continued ventrally as an elongate ventral slit surrounded by thin, membranous lips...***Galathowenia****

3b (2b). Mouth terminal or shifted ventrally, without elongate oral slit and overlapping oral lips...***Myriochele****

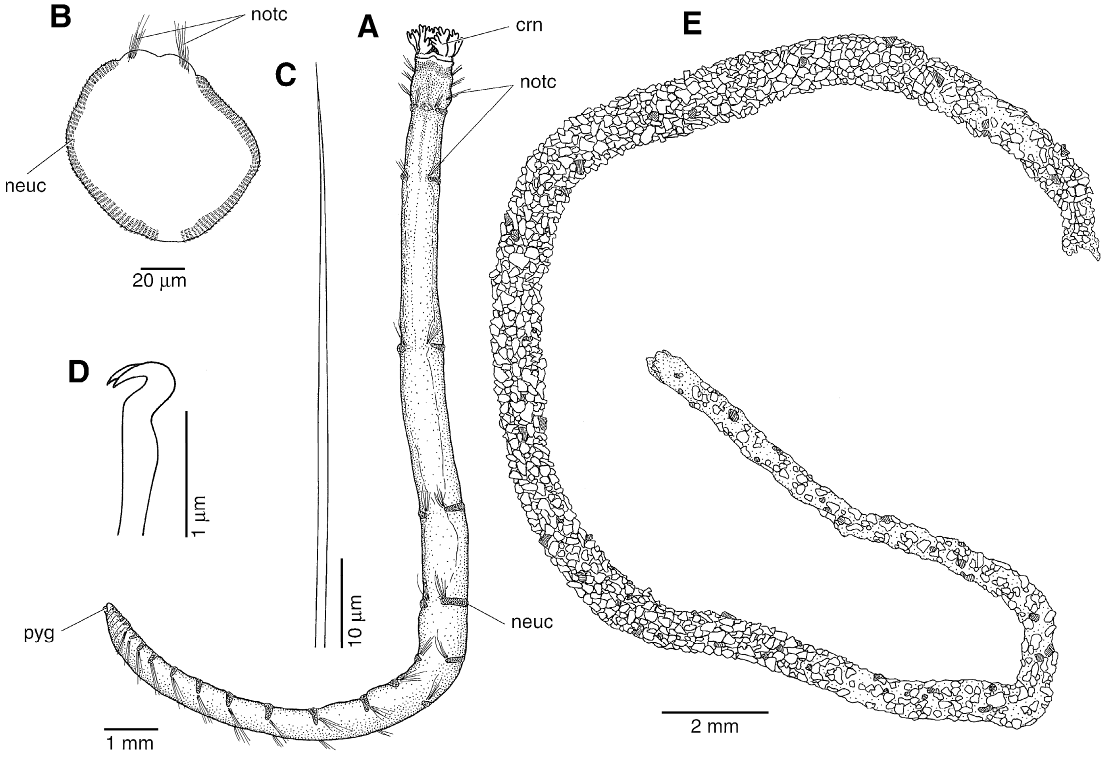

Figure legend: Family Oweniidae. *Owenia* specimen. **A**, entire animal, dorsal view. **B**, transverse section of body showing chaetal distribution. **C**, capillary notochaeta from parapodium of chaetiger 10. **D**, neurochaetal hook from parapodium of chaetiger 10. **E**, tube. **crn**, crown; **neuc**, neurochaetal 'patch'; **notc**, notochaetae; **pyg**, pygidium. (Adapted from BEESLEY, ROSS & GLASBY, 2000; drawings by A. Murray).

*GENUS ***Galathowenia*** Kirkegaard 1959

Galathowenia KIRKEGAARD, 1959: 67.

TYPE SPECIES: *Galathowenia africana* Kirkegaard 1959.

SYNONYMS: *Clymenia* Ørsted 1844 [not Münster 1834 (Ammonoidea)]; *Psammocollus* Grube 1866 [supressed and placed on the Official Index of Rejected and Invalid Generic Names in Zoology, according to the Opinion 1636 of the ICZN (1991)].

REMARKS: PARAPAR (2003*b*) suggests the existence of two groups of species in the genus *Galathowenia*, characterized by the presence/absence of eye-spots and thoracic constriction (TC), relative length of the three thoracic segments (RLTS) and shape of pygidial lobes. This way, the first group would include *G. africana*, *G. eurystoma*, *G. haplosoma*, and *G. oculata*, and would be characterized by the presence of eyes, no TC, RLTS = 1:1:1, and the presence of two blunt lobes in the pygidium. The second group would include *G. fragilis*, *G. longicollaris*, *G. pygidialis*, and *G. scotiae*, and would be characterized by the absence of eyes, the presence of TC, RLTS different from 1:1:1, and a larger number of short pygidial cirri (no data for *G. longicollaris*). It was not possible to assign three species to any of these two groups (*G. australis*, *G. joinvillensis*, and *G. piltzi*), and they could form a third group, lacking eyes or TC.

KEY TO SPECIES:

(adapted from PARAPAR, 2003*c*)

1a. Eyes absent; thorax with a fine transverse slit between first and second chaetigers, which represents a line of breakage between head region and first chaetiger from the rest of the body; relative length of thoracic segments (RLTS) 1:2:1; scales of capillary chaetae short; bidentate uncini with one tooth on the top of the other..***G. fragilis*.............2**
1b. A pair of ventrolateral eye-spots present; with no thoracic transverse slit; relative length of thoracic segments (RLTS) 1:1:1; scales of capillary chaetae slender; teeth of bidentate uncini located side by side, at different levels..**3**

2a (1a). The longest chaetigers are the fifth and the sixth; pygidium with 5-6 lobes, 1-2 dorsal, 2 lateral and 2 ventral..***G. fragilis* (Northern European population)**
2b (1a). The longest chaetigers are the sixth to eighth; pygidium with 3-5 lobes, 1-3 small, dorsal, and 2 larger, ventral..***G. fragilis* (Mediterranean population)**

3a (1b). Pygidium with two blunt rounded lobes..***G. oculata***
3b (1b). Pygidium with three elongated, cirrus-like, lobes.........................***G. oculata sensu* Martin 1989***

Galathowenia fragilis (Nielsen & Holthe 1985)

Myriochele fragilis NILSEN & HOLTHE, 1985: 25-27, figs. 9-10.
TYPE LOCALITY: Norwegian Sea, 69º29'N, 15º26'E, at 1100 meters.
SELECTED REFERENCES: *Myriochele fragilis* — FIEGE, KRÖNCKE & BARNICH, 2000: 98-102, fig. 1, table 2. *Galathowenia fragilis* — PARAPAR, 2003*c*: 278-281, figs. 1*C*, 2*B-D*, 3*B*, 4-5. [?] *Galathowenia wilsoni* [not Blake 1984] — IMAJIMA & MORITA, 1987: 98, figs. 7, 8*e-f*.
DISTRIBUTION: Norwegian Sea and Arctic Sea, between 800-2600 meters. Aegean Sea, Ierapetra Basin, South of Creta, between 4159-4264 meters. [?] Pacific coast of Japan and Tsushima Strait, 56-1050 meters. In silty sediments.
REMARKS: According to PARAPAR (2003*c*), judging from the description and illustrations given by IMAJIMA & MORITA (1987), the material from the Japanese waters identified as *G. wilsoni* appears to be *G. fragilis*.

Some morphological differences were found by FIEGE, KRÖNCKE & BARNICH (2000) between the Atlantic and the Mediterranean populations of *Galathowenia fragilis*. For more information of these differences, see the above key and the *REMARKS* section under *Galathowenia oculata* sensu Martin 1989.

Galathowenia oculata (Zachs 1923)

Myriochele oculata ZACHS, 1923*a*: 171-174, figs. 1-3.
TYPE LOCALITY: White Sea, mainly at Dwina Bay, but recorded as having been found at the Mourman Sea , from the meridian of Kola to 75ºN, and also at Kola fjord.
SYNONYMS: *Clymenia tenuissima* Ørsted 1844 [*nomen oblitum*].
SELECTED REFERENCES: *Myriochele oculata* — USCHAKOV, 1955: 348, fig. 128*H-I*; BLAKE & DEAN, 1973: 36-37, fig.1; HOBSON & BANSE, 1981: 77, fig. 18*a-b*; NILSEN & HOLTHE, 1985: 23-25, figs. 7-8; HARTMANN-SCHRÖDER, 1996: 475, fig. 232. *Galathowenia oculata* — KIRKEGAARD, 1983*b*: 604-605; IMAJIMA & MORITA, 1987: 94-97, figs. 6, 8*c-d*; KIRKEGAARD, 1996: 275-276, fig. 154; BLAKE, 2000*c*: 103-104, fig. 5.1; PARAPAR, 2003*c*: 281-282, figs. 1*D*, 2*A*, *C-D*, 3*C*, 6*C-F*. *Clymenia tenuissima* — ØRSTED, 1844*b*: 79 [*nomen oblitum*].

DISTRIBUTION: Boreal-Arctic waters: Chuckchi Sea; Kara Sea; Polar Sea; Barents Sea; White Sea; Baffin Land; Norwegian Sea; Norwegian fjords and coast; Atlantic Ocean SW the British Isles; North Sea; Skagerrak; Kattegat; Øresund; Japan Sea; Bering Sea; British Columbia; Washington to Southern California. In all types of sediments, but mainly in coarse and sandy bottoms. Between 12-2500 meters.

REMARKS: The complex nomenclatural history of this species is resumed in NILSEN & HOLTHE (1989). The situation was solved through the Opinion 1636 of the ICZN (ICZN, 1991), by which *Clymenia tenuissima* Ørsted 1844, an older obscure synonym, was considered to be a *nomen oblitum*, and *Psammocollus* Grube 1866, a generic named not used for over 50 years, placed on the Official Index of Rejected and Invalid Generic Names in Zoology.

BLAKE & DEAN (1973) synonymized *Galathowenia africana* Kirkegaard 1959 with *Myriochele oculata* Zachs 1923, but this synonymy was later reconsidered by BLAKE (1984), and the species *G. africana* ressurrected.

****Galathowenia oculata*** sensu Martin 1989

SELECTED REFERENCES: *Myriochele oculata* [not Zachs 1923] — COGNETTI-VARRIALE, 1979: 265-267, fig. 2. *Galathowenia oculata* [not Zachs 1923] — MARTIN, 1989: 49-51, figs. 3-6. *Myriochele heeri* [not Malmgren 1867] — DUMITRESCO, 1962: 64, fig. 3*f-i*. *Myriochele* sp. — GIBBS, 1969*a*: 324-325.

REFERENCES FOR PORTUGAL: GIL & SARDÁ, 1999 (as *Galathowenia oculata*; southwestern continental shelf); AGUIRREZABALAGA, GIL & VIÉITEZ, 2000 (as *Galathowenia oculata*; southwestern continental shelf); present work (southwestern continental shelf).

MATERIAL: SEPLAT 6 — St. 12 (A.2517), off Ponta Ruiva, 35 m, sand: 1 specimen; tube 4.8 cm long; the specimen broke into several pieces during the study; some fragments are still inside the tube; prostomium visible. **St. 64 (A.2554)**, off Carrapateira, 89 m, sand: 1 specimen, broken in two but complete; it has a constriction around the neck, but all the other features are of *Galathowenia oculata*; eyes not seen; pygidium seems to have 4 lobes. **St. 286 (A.2747)**, off Praia de Odeceixe, 135 m, sand: 1 specimen, complete, in good condition; eyes not visible (probably fainted in alcohol); head long, with a truncated anterior end; mouth terminal (opened in this specimen), ciliated internally; thoracic region with 3 chaetigers, with scamous capillary chaetae; abdominal region with 23 chaetigers; at the fourth chaetiger appear the neuropodial tori, together with the capillary scamous chaetae; hooks with two teeth arranged side by side at different levels; pygidium with 3 lobes (anal cirri); tube cemented with sand grains and sponge spicules, without any particular orientation, but presenting a regular surface. **SEPLAT 7 (2nd part) — St. 21 (A.4081)**, north Sines, 116 m, sand with shells: 2 specimens, incomplete, plus 3 fragments (one with eggs) and one posterior region with pygidium. **St. 23 (A.4083)**, north Sines, 127 m, sand: 1 specimen, complete but broken in two pieces; both fragments are still partially inside the tube. **St. 24 (A.4084)**, north Sines, 130 m, sand: 1 specimen, partially inside the tube. **St. 26 (A.4086)**, north Sines, 140 m, sand: 3 specimens, still inside the tubes; anterior regions visible. **St. 28 (A.4088)**, north Sines, 180 m, sand: 2 specimens; one of the specimens incomplete, partially inside the tube; it has a constriction just below the prostomium, but it could be due to the fixation (as the short length of the first 3 chaetigers); the second specimen is a mature female, complete, with 23 chaetigers; it has a pygidium with 3 anal cirri. **St. 35 (A.4072)**, north Sines, 135 m, gravelly sand: 2 specimens, one incomplete, with eggs; complete specimen has 3 anal cirri, and is still partially inside the tube. **St. 38 (A.4069)**, north Sines, 120 m, sand with shells: 1 specimen, broken in two fragments; total length 22 mm; pygidium with 3 anal cirri. **St. 39 (A.4068)**, north Sines, 110 m, sand with shells: 2 specimens, partially still inside the tubes; one of them broke in two pieces; second specimen complete. **St. 109 (A.3998)**, off Sines, 146 m, sand: 1 fragment with 5 chaetigers, inside the tube. **St. 168 (A.4083)**, off Sines, 267 m, sand: 1 incomplete specimen, in poor condition. **St. 178 (A.3933)**, off Sines, 130 m, sand: 1 specimen. **St. 189 (A.3922)**, south Sines, 29 m, muddy sand: 1 very small specimen; anterior part inside the tube; head is broken, almost falling off. **St. 210 (A.3902)**, off Porto Covo, 163 m, sand: 1 fragment with 7 chaetigers; neuropodial hooks as described. **St. 214 (A.3898)**, off Sines, 115 m, muddy sand: 1 incomplete specimen; eyes visible. **St. 283 (A.3851)**, off Arrifana, 245 m, muddy sand: 4 incomplete specimens, plus one fragment with 4 chaetigers. **FAUNA 1 — St. 51*A***, Gulf of Cádiz, Placer de los Mártires, off Chiclana de la Frontera, 27-28 m, rock and mud: 1 specimen, in poor condition, prostomium damaged.

DISTRIBUTION: English Channel (Plymouth Sound), Portugal; Mediterranean Sea; Adriatic Sea; Aegean Sea; Black Sea. On bottoms with mud and shells, sand, or silty sand. Between 5-267 meters.

REMARKS: MARTIN (1989) revised the Iberian and Western Mediterranean records of *Myriochele heeri* Malmgren 1867, based in descriptions and deposited material, and considered that all of them were specimens of *G. oculata*, with the exception of the record of *M. heeri* by COGNETTI-VARRIALE (1979), from the Gulf of Follonica. *G. oculata* can be separated from *M. heeri* by the truncated anterior end of head region (against rounded anterior end of head region), by the presence of a terminal mouth (against mouth in the ventral side of the head), notopodial fascicles with capillary chaetae only (against capillary and aciculate chaetae) and by the uncini with the two teeth arranged side by side, at different levels (against uncini with one upper and one lower tooth).

The specimens studied by me fit the description given by COGNETTI-VARRIALE (1979, as *Myriochele*) and MARTIN (1989) and probably some of the previous records of *M. heeri* in Portuguese waters refer to the same species I have found (GIL & SARDÁ, 1999). However, and as noted by BLAKE (2000*c*), *Galathowenia oculata* has the anus terminal and surrounded by two rounded lobes (ZACHS, 1923*a*; NILSEN & HOLTHE, 1985; BLAKE, 2000*c*; PARAPAR, 2003*c*), while *Galathowenia oculata* sensu Martin 1989 shows three elongated cirrus-like pygidial lobes (see COGNETTI-VARRIALE, 1979: fig. 2*e*; MARTIN, 1989: figs. 3*E*, 6*C*), which are also present in the present specimens from SEPLAT and FAUNA 1 Cruises. The Portuguese and Spanish specimens probably belong to a different species from *G. oculata*.

At present, twelve species of *Galathowenia* are considered to be valid (CANTONE & DI PIETRO, 2001; PARAPAR, 2001, 2003*b*, 2003*c*; KOH, BHAUD & JIRKOV, 2003): *G. africana* Kirkegaard 1959, from off Cabinda, West Africa; *G. australis* (Grube 1866), from Saint Paul Island (South Indian Ocean); *G. eurystoma* (Caullery 1944), from Indonesia and Philippines; *G. fragilis* (Nilsen & Holthe 1985), from the Norwegian Sea; *G. haplosoma* (Gibbs 1972), from the Cook Islands (Central Pacific); *G. joinvillensis* (Hartmann-Schröder & Rosenfeldt 1989), from Joinville Island (Antarctica); *G. lobopygidiata* (Uschakov 1950), from the Okhotsk Sea; *G. longicollaris* (Hartmann-Schröder & Rosenfeldt 1989), from Bransfield Strait (Antarctica); *G. oculata* (Zachs 1923), from the White Sea; *G. piltzi* Blake 2000, from Santa Maria Basin, California; *G. pygidialis* (Hartman 1960), from California and Baja California, Mexico; *G. scotiae* (Hartman 1978), from the Weddell Sea, Antarctica. Two other species, *G. wilsoni* (Blake 1984), and *G. terranovensis* (Cantone & Di Pietro 1998), were considered to be junior synonyms of *G. scotiae* (Hartman 1978) by PARAPAR (2001).

Ten of the above *Galathowenia* species, which pygidium is known, show a different structure from the three elongated cirrus-like pygidial lobes of *G. oculata sensu* Martin 1989. The pygidial structure is unknown in *G. eurystoma* and *G. longicollaris*, but the relative length of the thoracic chaetigers (CAULLERY, 1944*a*; HARTMANN-SCHRÖDER & ROSENFELDT, 1989), as well as the zoogeographical regions of both species seem to discard them as the species to which belong the studied Iberian specimens, representing these probably a still unamed taxon.

The presence of small oculated oweniids in Southern Europe was first reported in 1962. LAUBIER & PARIS (1962) recorded from the region of Banyuls-sur-Mer (Mediterranean Sea), on mud at depths between 30-300 meters, specimens which presented red eyes, confirmed by histological cuts. They were identified as *Myriochele heeri*, but the presence of eyes made them to state that "*il est possible qu'il s'agisse de la seule espèce de* Myriochele *possédant des yeux,* M. oculata *Zachs, 1923*" (LAUBIER & PARIS, 1962: 52). LAUBIER (1962*c*: 153) also reports, with some doubts in what concerns the species, the presence of one oculated specimen of *Myriochele heeri* in the Lagoon of Venice, referring also the numerous specimens of *M.* cf. *heeri* found by him in the region of Banyuls (probably the specimens referred in LAUBIER & PARIS, 1962). Finally, DUMITRESCO (1962) reported the finding of oculated specimens of *Myriochele heeri* in the Black Sea, between 73-83 m, on muddy bottoms. However, she already highlights the presence of 3 pygidial digitiform appendices in the Black Sea specimens (DUMITRESCO, 1962: fig. 3*h*), against its absence in the descriptions by MALMGREN (1867*a*) and FAUVEL (1927*a*).

A *Myriochele* sp. species with small red eye-spots and three well-developed cirri on the pygidium was also recorded to be present in silty sand at the Plymouth Sound, between 5-12 meters, by GIBBS (1969*a*), who approached his specimens to the ones described by DUMITRESCO (1962) from the Black Sea, stating that they "*may represent a new species with a more southerly distribution* (than the boreal species *M. heeri* and *G. oculata*)" (GIBBS, 1969*a*: 325).

THOMASSIN & PICARD (1972) were the first to use SEM in order to study the microstructure of the Oweniidae chaetae. They studied in detail both the morphology and the distribution of the uncini of specimens of *Myriochele* sp. collected at the Gulf of Marseille. They stated that these specimens could present 3 or 6 pygidial lobes. This could mean that two morphotypes of *Myriochele*-like specimens were present: one with three pygidial lobes, close to the species already detected by DUMITRESCO (1962), GIBBS (1969*a*), COGNETTI-VARRIALE (1979), MARTIN (1989), GIL & SARDÁ (1999) and on this work, and another type with 6 pygidial lobes, which identification is unknown.

The finding of *Galathowenia fragilis* (as *Myriochele*) by FIEGE, KRÖNCKE & BARNICH (2000) in the deep sea of Ierapetra Basin (Eastern Mediterranean), indicates that at least another species of *Galathowenia* is present in Southern Europe. Some differences were found between the Norwegian Sea population of *G. fragilis* described by NILSEN & HOLTHE (1985), and the Mediterranean one found by

FIEGE, KRÖNCKE & BARNICH (2000). A detailed comparison was made by FIEGE, KRÖNCKE & BARNICH (2000: table 2), and the main differences are that the longest chaetigers in the Mediterranean population are the sixth to eight (instead of fifth and sixth in the Atlantic), and the number of pygidial lobes are of 3-5 (instead 5-6). However, due to the poor knowledge of the group, in need of a revision, FIEGE, KRÖNCKE & BARNICH (2000) considered that the differences could represent interpopulational variability, instead of a new species.

Finally, the specimens recorded by COGNETTI-VARRIALE (1979) at the depth of 8 meters from the Gulf of Follonica, as *Myriochele heeri*, could still represent another species of *Galathowenia*, from shallow water, as the described prostomium seems to be more close to this genus than to *Myriochele* (compare fig. 1*a* of COGNETTI-VARRIALE, 1979 with fig. 3*B-C* of NILSEN & HOLTHE, 1985). This species is described as having a small cirrus protuding from the pygidium, which would separate this form from all the other morphotypes discussed previously.

From the stated above results that in the European southern waters seem to occur, at least, 4 types of *Galathowenia*-like worms: *Galathowenia oculata* sensu Martin 1989, from shallow waters, oculated and with 3 pygidial lobes; *Galathowenia fragilis* sensu Fiege *et al.* 2000, from deep waters, blind and with 3-5 pygidial lobes; *Myriochele* sp. sensu Thomassin & Picard 1972, from shallow waters (oculated?), and with six pygidial lobes; and *Myriochele heeri* sensu Cognetti-Varriale 1979, from shallow waters, blind, and with a single pygidial lobe. The two latter forms are poorly known and described, and were not considered in the above key.

*GENUS ***Myriochele*** Malmgren 1867

Myriochele MALMGREN, 1867*a*: 101.
TYPE SPECIES: *Myriochele Heeri* Malmgren 1867.

KEY TO SPECIES:

(adapted from: NILSEN & HOLTHE, 1985; PARAPAR, 2003*c*)

1a. Head region anteriorly rounded; uncini with one tooth on the top of the other; tube with firmly cemented sand grains or sponge spicules, often in a helical pattern..***M. heeri***
1b. Head region subconical, with rounded tip and dorsolateral sulcus; uncini with teeth side by side, at different levels; tube with loosely fixed foreign objects, without a regular pattern.............***M. danielsseni****

****Myriochele danielsseni*** Hansen 1879

Myriochele Danielsseni HANSEN, 1879: 270, plate 2 figs. 9-11.
TYPE LOCALITY: Norwegian Sea, 69º46'N, 16º15'E, 1187 meters.
SELECTED REFERENCES: *Myriochele Danielsseni* — WOLLEBÆK, 1912: 32-33, pl. 2 figs. 5-8. *Myriochele danielsseni* — NILSEN & HOLTHE, 1985: 22-23, figs. 5-6, 12*A*; [?] IMAJIMA & MORITA, 1987: 91-94, figs. 5, 8*a-b*; HARTMANN-SCHRÖDER, 1996: 475; AGUIRREZABALAGA, GIL & VIÉITEZ, 2000: 58-66, figs. 2-5, table 1, plate 1; PARAPAR, 2003*c*: 283-284, fig. 1*F*.
REFERENCES FOR PORTUGAL: AGUIRREZABALAGA, GIL & VIÉITEZ, 2000 (southwestern continental shelf); present work (southwestern continental shelf).
MATERIAL: SEPLAT 6 — St. 64 (A.2554), off Carrapateira, 89 m, sand: 2 specimens, one complete, still inside the tube, with a pygidium with two lobes, and the second with the posterior region still inside the tube. **St. 142*R* (A.2620)**, off Praia de Vale Figueiras, 126 m, sand: 6 specimens; longest tube 4.5 cm long; 3 specimens were kept inside the tubes without being removed; one specimen was partially removed, but broke; a second specimen was regenerating the anterior end; a third one was removed from the tube but broke in two pieces; it has 17 chaetigers, 8.8 mm long and 0.3 mm wide, with the longest segment being the 8th; constriction present between chaetigers 3-4; this specimen was kept inside a smaller vial. **St. 150 (A.2625)**, off Praia de Vale Figueiras, 377 m, sand: 1 complete specimen, with 17 chaetigers, 8.6 mm long, and 0.4 mm wide; length of tube of 2.5 cm; acicular chaetae from chaetiger 3 to 7; chaetigers 6 and 7 are longer than the rest; pygidium bilobed. **St. 154 (A.2628)**, off Praia de Vale Figueiras, 256 m, sand: 7 specimens, all still inside the tubes; longest tube 3 cm long; tubes very attached to the body wall of the worms, while the worms are very fragile; some of the specimens are broken; constriction of the body at the 4th chaetiger. **St. 158 (A.2632)**, off Arrifana, 130 m, sand: 1 specimen, 10.1 mm long, 0.37 mm wide; poor condition, broken in 3 pieces; acicular chaetae from chaetiger 3; 17 chaetigers in total (3 thoracic and 14 abdominal); chaetigers 6-8 longer than the rest. **St. 192 (A.2664)**,

off Arrifana, 110 m, sand: 1 specimen, complete but broken in two fragments, still inside the tube; poor condition; acicular notochaetae from chaetiger 3. **St. 234 (A.2702)**, off Praia da Amoreira, 110 m, sand: 1 specimen, in poor condition; anterior region missing; difficult to count the number of chaetigers, as the inner layer of the tube is sticked to the worm; pygidium bilobed; tube and chaetae as in the other specimens. **SEPLAT 7 (2nd part) — St. 283 (A.3851)**, off Arrifana, 245 m, muddy sand: 14 specimens, plus 2 fragments; one specimen, broken in two pieces (with 15 and 4 chaetigers), is 8 mm long and 0.35 mm wide; there are other 4 complete specimens, 4 anterior ends, one anterior end with prostomium and first chaetiger missing, one complete specimen with the anterior end damaged, one apparently complete specimen with 19 chaetigers and 10 mm long, ovigerous, two specimens still inside the tubes, without being removed, and one posterior end; tubes are about 0.5 mm wide, tapering posteriorly; two specimens seem to have a narrower and longer anterior end. **St. 305 (A.3848)**, NW Arrifana, 120 m, sand: 1 specimen, in poor condition, 9.5 mm long, 0.3 mm wide; tube at least 3 cm long, with a thin and translucent layer encrusted with foraminiferans, sand grains, pieces of shells, and sponge spicules; they are arranged in a loose pattern, like roof tiles (but not in a such perfect way as in *O. fusiformis*); eyes not seen, head region with dorsolateral sulcus; thorax with 3 chaetigers; the first one has very long and narrow weakly spinous capillary chaetae, as the second one, which has these chaetae shorter; abdomen with 14 chaetigers, being the 5-7 the longest ones (the 6th is the longest one of them all); acicular notochaetae from chaetiger 5; uncini with distal teeth arranged side by side, nearly at the same or somewhat different levels; pygidium with 2 lobes.

DISTRIBUTION: Polar Sea; Iceland; Norwegian Sea; Skagerrak; North Sea; Bay of Biscay; Portugal; [?] Japan. In sandy and muddy sand bottoms. Between 15-1700 meters.

REMARKS: The specimens identified during this work were studied in detail by AGUIRREZABALAGA, GIL & VIÉITEZ (2000). They can be easily distinguished from the following species by the presence of uncini with teeth side by side, at different levels. Short acicular notochaetae with fine tips are normally present from chaetiger 3, and pygidial projections absent, being the anus located between two blunt lobes. The head region presents a dorsolateral sulcus, and the third and especially the fourth notopodia are displaced dorsally, in relation to the first two chaetigers.

According to BLAKE (2000*c*), the Japanese record by IMAJIMA & MORITA (1987), belongs probably to *Myriochele striolata* Blake 2000, described from Central and South California, at shallow shelf waters.

The present Portuguese specimens represent so far the southernmost record of the species.

Myriochele heeri Malmgren 1867

Myriochele Heeri MALMGREN, 1867*a*: 101-102, pl. 7 fig. 37.

TYPE LOCALITY: Spitsbergen, at Safe Bay, and Greenland, at Omenak, in 250 fathoms (457.2 meters).

SYNONYMS: *Myriochele Sarsii* Hansen 1883.

SELECTED REFERENCES: *Myriochele Heeri* — MCINTOSH, 1915*b*: 365-366, pl. 110 fig. 10, pl. 101 fig. 7; WOLLEBÆK, 1912: 31-32, pl. 2 figs. 1-4. *Myriochele heeri* — FAUVEL, 1927*a*: 204-205, fig. 71*h-m* [in part; not *Myriochele danielsseni* Hansen 1879 in the synonymy list]; WESENBERG-LUND, 1950*a*: 46; USCHAKOV, 1955: 348; HARTMAN, 1966*b*: 73, pl. 24 fig. 1; BLAKE & DEAN, 1973: 37, fig. 2; BLAKE, 1984: 112; DETINOVA, 1985*a*: 126-127; NILSEN & HOLTHE, 1985: 21-22, figs. 3-4, 11*c-e*; DAUVIN, 1986: 245; IMAJIMA & MORITA, 1987: 90-91, figs. 3, 4*e-h*; PARAPAR, 2003*c*: 283, figs. 1*E*, 2*C-D*, 3*D*.

REFERENCES FOR PORTUGAL: [?] AMOUREUX, 1987 (as *Myriochele* cf *heeri*; off Aveiro; off Porto); DEXTER, 1992 (previous records: Ria Formosa; Figueira da Foz); RAVARA, 1997 (off Aveiro).

DISTRIBUTION: Iceland; Norwegian Sea; Lofoten; Faroes; Norway; North Sea; Skagerrak; Portugal; South Atlantic Ocean, east of South Georgia; Antarctic; Barents Sea; Polar Sea; Kara Sea; East and West Greenland; Baffin Land; Sea of Okhotsk; Pacific coast of Japan. Between 90-2951 meters. In European waters, its known southern limit seems to be located at Roscoff (DAUVIN, 1986). The southern records of the species, from the Mediterranean, Adriatic and Black Sea, need confirmation.

GENUS ***Myrioglobula*** Hartman 1967

Myrioglobula HARTMAN, 1967: 149.

TYPE SPECIES: *Myrioglobula antarctica* Hartman 1967.

Myrioglobula islandica Parapar 2003

Myrioglobula islandica PARAPAR, 2003*c*: 284-287, figs. 1*F*, 2 7-8.

TYPE LOCALITY: Northeast Atlantic, Denmark Strait, 64.435ºN, 28.237ºW, between 1162-1212 meters, in silty sand with gravel.

DISTRIBUTION: Northeast Atlantic, Denmark Strait, west Iceland, in coarse bottoms of sandy gravel and sand with gravel and stones. Between 1187-1407 meters.

*GENUS ***Owenia*** Delle Chiaje 1844

Owenia DELLE CHIAJE, 1844: 31.

TYPE SPECIES: *Owenia fusiformis* Delle Chiaje 1844.

SYNONYMS: *Ammochares* Grube 1846; *Mitraria* J. Müller 1851 [larvae]; *Ops* Carrington 1865.

REMARKS: The genus *Owenia* includes nowadays 22 described species, but there isn't a consensus on how many of these are valid. The so far described taxa, with type locality, are:

Ammochares aedificator Andrews 1891 (North Carolina); *Ammochares artifex* Verrill 1885 (off Cape Code, Massachusetts); *Ammochares assimilis* Sars 1851 (Norway); *Ammochares brasiliensis* Hansen 1882 (Rio de Janeiro, Brazil); *Ammochares occidentalis* Johnston 1901 (Washington); *Ammochares orientalis* Grube 1878 (Philippine Islands); *Ammochares Ottonis* Grube 1846 (Mediterranean Sea); *Ammochares Sundevalli* Kinberg 1867 (La Plata, South America); *Ammochares tegula* Kinberg 1867 (off Brazil); *Ammochares tenuis* Haswell 1883 (Port Jackson, Australia); *Ops digitata* Carrington 1865 (England); *Owenia australis* Ford & Hutchings 2005 (Australia); *Owenia bassensis* Ford & Hutchings 2005 (Australia); *Owenia borealis* Koh, Bhaud & Jirkov 2003 (Iceland); *Owenia brachyfera* Marion 1876 (Mediterranean Sea); *Owenia caudisetosa* Hartmann-Schröder 1959 (El Salvador); *Owenia fusiformis* Delle Chiaje 1844 (Naples, Mediterranean Sea); *Owenia fusiformis collaris* Hartman 1955 (Southern California); *Owenia gomsoni* Koh & Bhaud 2001 (South Korea); *Owenia johnstoni* Blake 2000 (California); *Owenia lobopygidiata* Uschakov 1950 (Okhotsk Sea, 110-1366 m); *Owenia mirrawa* Ford & Hutchings 2005 (Australia); *Owenia persica* Martin, Koh, Bhaud, Dutrieux & Gil 2006 (Persian Gulf); *Owenia petersenae* Koh & Bhaud 2003 (New Zealand); *Owenia polaris* Koh, Bhaud & Jirkov 2003 (Finmark). Three other binomins exist, but more than being synonymies, they result from errors when writing the names of previously described species: *Owenia filiformis* Claparède 1869 (error for *Owenia fusiformis* Delle Chiaje 1844), *Owenia assimilator* Caullery 1944 (error for *Ammochares aedificator* Andrews 1891), and *Owenia petersoni* Ford & Hutchings 2005 (error for *Owenia petersenae* Koh & Bhaud 2003). The majority of the described taxa is now considered as being (or almost certainly being) valid species of *Owenia*, probably with the exception of the species described from the Mediterranean Sea posteriorly to *O. fusiformis*, which would be synonymous with this. *Ammochares tenuis* Haswell 1883 was considered to be a 'species inquirenda' according to FORD & HUTCHINGS (2006), while SENE-SILVA (2004) considered it to be valid.

The belief that *O. fusiformis* was a cosmopolitan species was discussed by GRAVIER (1906*b*), who identified as *O. fusiformis* some specimens collected at Madagascar, in spite of some differences: "*Ils n'en diffèrent guère que par le nombre et les dimensions relatives des branchies et par les longueurs relatives des premiers segments abdominaux*" (GRAVIER, 1906*b*: 295). The species would then be present in the Mediterranean, Northern Europe to Greenland and Arctic Sea, Atlantic coast of Europe, Chile, Philippines [as *O. orientalis*, following EHLERS (1901*a*)], Madagascar, and probably in Japan, ranging from shallow water to depths of 3200 m, at the Davis Strait.

In spite of being considered as a cosmopolitan species, CAULLERY (1944*a*) noted the existence of differences between populations of cold and warm waters. These differences would be at least physiological, but quite probably also morphological, in spite of being hard to detect, and would reflect the existence of different races. In fact, Caullery describes already some differences found between specimens collected during the *Siboga* Expedition. These comments were supported by THOMASSIN & PICARD (1972), who compared specimens identified as *O. fusiformis* from a population in Marseille with another in Madagascar, finding differences in the microstructure of the uncini, but also in the shape and composition of the tubes, and ecology of the species. All this would point to the fact that the two populations weren't probably co-specific (THOMASSIN & PICARD, 1972). NILSEN & HOLTHE (1985) also doubted from the fact that the cosmopolitan *O. fusiformis* represented a single species. In the meantime, HARTMAN (1955*b*) described a subspecies of *O. fusiformis* from California, *O. fusiformis collaris* (raised to the specific level later (HARTMAN, 1969), differing from the stem species by having a high, thoracic, membranous collar, and uncini with much longer teeth and lacking a shoulder, while HARTMANN-SCHRÖDER (1959) described a new species from El Salvador, *O. caudisetosa*, and USCHAKOV (1950) *O. lobopygidiata* from Okhotsk Sea, a species later transferred to *Galathowenia* (see below).

However DAUVIN & THIÉBAUT (1994), using characters of many populations distributed worldwide (characters as the thoracic collar, latero-ventral eye-spots, presence or absence of pygidial papillae, colouring of the thoracic region, tube structure, ecological and biological features, and bathymetric distribution), synonymized all taxa but *O. lobopygidiata* Uschakov 1950 under *O. fusiformis*, considering the differences found, macroscopical and microscopical, as well as ecological and the bathymetric distribution, as interpopulational variability, not allowing the identification of different species. This way, *O. fusiformis* would be a cosmopolitan species, being absent only in Antarctic waters, and living in sandy and muddy-sandy bottoms, from shallow waters to 2325 m (with the denser populations between 0-40 m), being replaced at bathyal depths by *O. lobopygidiata*. The type material of *O. lobopygidiata* was later revised by KOH, BHAUD & JIRKOV (2003), who found no trace of branchial crown. The types were very well preserved, and that absence was taken as definite. The head of *O. lobopygidiata* was identical to the head of *Galathowenia* as described by other authors (NILSEN & HOLTHE, 1985; PARAPAR, 2001), and the species was finally transferred to that genus by KOH, BHAUD & JIRKOV (2003).

The idea that *Owenia fusiformis* was in reality a complex of different species, was first demonstrated by BLAKE (2000*c*), being followed by a series of papers by Byoung-Seoul Koh and collaborators (KOH & BHAUD, 2001, 2003; KOH, BHAUD & JIRKOV, 2003; MARTIN *et al.*, 2006), in which new species are described, and old ones ressurrected.

BLAKE (2000*c*) examined specimens of *Owenia* from several widely distributed areas, including sites near the type locality of *Owenia fusiformis* (Naples, Mediterranean Sea), Denmark, North Sea, Greenland, Georges Bank, Massachusetts Bay in New England, and from several locations in California. In addition to the characters used by DAUVIN & THIÉBAUT (1994, see above), Blake used other features, such as the presence or absence of body pigmentation, distribution of methyl green staining patterns along the body, development of glandular ridges on the dorsum of the thorax, relative lengths of anterior abdominal chaetigers among themselves and with the overall length of the thoracic region, position of the notopodial fascicles on the thoracic region, and arrangement of internal nephridia (see full list of characters in table 5.1 of BLAKE, 2000*c*). In addition, BLAKE (2000*c*) noted differences in the pygidial structure, development of grooves along the posterior region, and in the degree of development and elaboration of the tentacular crown. The data was analysed using parsimony with NONA, and the analysis turned noticeable the existence of several distinct forms of *Owenia*, that probably constituted closely related, but distinct species. As a result, BLAKE (2000*c*) ressurrected *Owenia collaris* Hartman 1955, and described one new species, *O. johnsoni* Blake 2000, both from Californian waters. *O. occidentalis* (Johnson 1901), from Puget Sound, and *O. artifex* (Verrill 1885), from New England were also suggested to be valid species. However, BLAKE (2000*c*) didn't include details on the uncinal morphology, as well as on the nature of the pygidial papillae, as the analysis of both structures required scanning electron microscopy (SEM), and it was beyond the scope of the work. Particular emphasis was placed in the usefulness of the methyl green staining reaction in the study of the material, as it revealed patterns of distribution of glands, thought to be valuable characters to describe and separate individual species.

SEM was used by KOH & BHAUD (2001) in order to study a Korean population of *Owenia*, and compare it with the Mediterranean *O. fusiformis*. These authors introduced independently from BLAKE (2000*c*) some new characters to separate taxa in *Owenia*, as the details in the branchial crown, and did a detailed analysis of the morphology of the worms, especially of their hard structures, as the uncini, by using SEM, and following the pioneer work by THOMASSIN & PICARD (1972). As a consequence, another new species, *O. gomsoni*, was described from Korean waters. In a subsequent paper, KOH & BHAUD (2003) went further in the utilization of the SEM, introducing still new criteria to define taxa in *Owenia*, particularly through the use of morphologic details of hard structures as the uncini and capillary chaetae (see, for instance, fig. 2 in KOH & BHAUD, 2003), and developed the criteria introduced by BLAKE (2000*c*), as the methyl green staining patterns, defining as much as 40 characters. The validity of *O. collaris*, *O. johnsoni*, and *O. gomsoni* were confirmed, as well as *O. borealis* and *O. polaris*, both described as new by KOH, BHAUD & JIRKOV (2003). Besides, another new species was described, *O. petersenae*, from New Zealand, and *O. brasiliensis* Hansen 1882, and *O. assimilis* (Sars 1851) reinstated. With base in the characters already in use plus additional ones, together with the application of new techniques like statistical analysis of morphometric data, further new species were characterized, and later described, by FORD & HUTCHINGS (2005), who established the new species *O. australis*, *O. bassensis* and *O. mirrawa* from Australia, and by MARTIN *et al.* (2006), who described *O. persica* from the Persian Gulf.

KEY TO SPECIES:

1a. Ratio of branchial crown lenght to the thoracic length of 1:1; external edge of the collar straight, vertical with one direction; profile view of hooks (angle L1/ L2, being L1 the direction of the front edge of the shaft, and L2 the direction of the lower edge of the teeth) of 60º; tooth orientation in the first abdominal torus form an angle of 0º to 5º with the body's longitudinal axis, pointing directly to the anterior region...***O. fusiformis****
1b. Ratio of branchial crown length to the thoracic length of 1:2; external edge of collar oblique, with or without angle; profile view of hooks (angle L1/ L2, being L1 the direction of the front edge of the shaft, and L2 the direction of the lower edge of the teeth) different from 60º; tooth orientation in the first abdominal torus forming an angle normally different of 0º with the body's longitudinal axis....................**2**

2a (1b). External edge of collar oblique with one direction, without angle at the level of the short lateral notch; tooth orientation in the first abdominal torus form an angle of 90º or more with the body's longitudinal axis, with some hooks pointing to the posterior region of the body; profile view of hooks (angle L1/ L2) of 45º..***O. assimilis***
2b (1b). External edge of collar oblique, with an open angle (120º) at the lateral notch; tooth orientation in the first abdominal torus form an angle between 0º and 45º with the body's longitudinal axis; profile view of hooks (angle L1/ L2) of 85-90º...**3**

3a (2b). Ventral face of the thoracic region with 6-9 transversal slits; edge of the collar folded; tooth orientation in the first abdominal torus form an angle between 0º and 25º with the body's longitudinal axis; profile view of hooks show no or a short shoulder (common base of the teeth is larger than the shaft or has the same diameter)...***O. polaris***
3b (2b). Ventral face of the thoracic region without transversal slits; edge of the collar smooth; tooth orientation in the first abdominal torus form an angle of 45º with the body's longitudinal axis; profile view of hooks show a long shoulder (common base of the teeth is smaller than the shaft).........***O. borealis***

Owenia assimilis Sars 1851

Ammochares assimilis SARS, 1851: 201-202.
TYPE LOCALITY: Tromsø and Bergen (Norway), at 20-30 fathoms (35-55 meters).
SELECTED REFERENCES: *Ammochares assimilis* — MALMGREN, 1867*a*: 101, pl. 11 fig. 65. *Owenia assimilis* — WOLLEBÆK, 1912: 30-31, pl. 1 figs. 1-6; KOH & BHAUD, 2003: 66-93, especially 88, fig. 17.1.*B*; KOH, BHAUD & JIRKOV, 2003: 183, 186, figs. 1, 4*B1-B6*, *C1-C6*, 5*D-D1*, *E-E1*, table 2.
DISTRIBUTION: Greenland; Spitsbergen; Jan Meyen; Iceland; Norway. Between 2-460 meters.

Owenia borealis Koh, Bhaud & Jirkov 2003

Owenia borealis KOH, BHAUD & JIRKOV, 2003: 178-180, figs. 1, 3*A1-A6*, 5*A-A1*, table 2.
TYPE LOCALITY: Off East Iceland, 65º27'N, 12º39'W, at 135 meters, in a bottom of muddy sand.
SELECTED REFERENCES: *Owenia borealis* — KOH & BHAUD, 2003: 66-93 (especially 87), figs. 1, 3*E*, 4*E*, 5*E*, 6*E*, 7*E*, 8*E*, 9*K-L*, 11, 17.1.*C*, table 1.
DISTRIBUTION: Off Iceland; Norwegian Sea. Found in regions of the northern part of the NE Atlantic influenced by a northern branch of the Gulf Stream. Between 41-1350 meters.

****Owenia fusiformis*** Delle Chiaje 1844

Owenia fusiformis DELLE CHIAJE, 1844: 31-32.
TYPE LOCALITY: Mediterranean Sea.
SYNONYMS: *Ammochares Ottonis* Grube 1846; *Owenia filiformis* Claparède 1869; *Owenia brachyfera* Marion 1876.
SELECTED REFERENCES: *Owenia fusiformis* — SAINT-JOSEPH, 1898: 397-405, pl. 22 figs. 203-208; MCINTOSH, 1915*b*: 356-364, text-fig. 135, pl. 92 fig. 6, pl. 101 fig. 8, pl. 110 fig. 9; FAUVEL, 1927*a*: 203-204, fig. 71*a-f*; NILSEN & HOLTHE, 1985: 19-21, figs. 1-2; [?] IMAJIMA & MORITA, 1987: 87-90, figs. 2, 4*a-d*; MARTIN, 1989: 48-50, fig. 2; HARTMANN-SCHRÖDER, 1996: 476-478, fig. 233; KIRKEGAARD, 1996: 276-278, fig. 155; KOH & BHAUD, 2001: 81-84, figs. 2*D-F*, *H*, 3, 4*B*, 5*D-G*, 6*D-F*, table 1; KOH & BHAUD, 2003: 66-93, figs. 1, 3*A*, 4*A*, 5*A*, 6*A*, 7*A*, 8*A*, 9*E-H, J*, 10*A-B*, 11, 13*A1-I1*, 14*A1-C1*, 15*A1-A6*, 17.1.*A*, table 1; KOH, BHAUD & JIRKOV, 2003: 183-186, figs. 3*C1-C6*, 5*C-C1*, table 2; FORD & HUTCHINGS, 2005: table 2; MARTIN *et al.*, 2006: table 1. *Owenia filiformis* — CLAPARÈDE, 1869: 186-191, pl. 26 fig. 5.

REFERENCES FOR PORTUGAL: BELLAN, 1960*a* (Cape Roca; Cape Sagres); AMOUREUX, 1974*b* (off Aveiro; off Porto); MONTEIRO-MARQUES, 1979 (southern continental shelf of Algarve); AMOUREUX & CALVÁRIO, 1981 (Peniche); SOUSA-REIS *et al.*, 1982 (Peniche region); COSTA, GAMITO & OLIVEIRA, 1984 (Sado Estuary); MONTEIRO-MARQUES, 1987 (continental shelf of Algarve); QUINTINO & GENTIL, 1987 (Lagoon of Albufeira; Lagoon of Óbidos); QUINTINO, RODRIGUES & GENTIL, 1989 (Lagoon of Óbidos); DEXTER, 1992 (previous records: Ria Formosa; Ria de Alvor; continental shelf of Algarve; Mira Estuary; sado Estuary; Arrábida; Lagoon of Albufeira; Peniche; Lagoon of Óbidos; Figueira da Foz; Ria de Aveiro); MOREIRA, FIGUEIRA & CUNHA, 1994 (Ria de Aveiro); SPRUNG, 1994 (Ria Formosa); RAVARA, 1997 (off Aveiro); MUCHA & COSTA, 1999 (Ria de Aveiro and/or Sado Estuary); AGUIRREZABALAGA, GIL & VIÉITEZ, 2000 (southwestern continental shelf); present work (southwestern continental shelf).

MATERIAL: SEPLAT 6 — St. 135 (A.2614), off Praia de Vale Figueiras, 37 m, sand: 1 specimen, still inside the tube; anterior region was damaged during the study. **St. 237 (A.2705)**, off Praia da Amoreira, 148 m, sand: 1 fragment, partially inside the tube. **St. 273 (A.2737)**, off Praia da Amoreira, 200 m, muddy sand: 1 specimen, still inside the tube; anterior region visible. **St. 338 (A.2792)**, off Praia de Odeceixe, 155 m, muddy sand: 1 incomplete specimen, including tentacular crown and prostomium; partially inside the tube. **SEPLAT 7 (1st part) — St. 52 (A.2983)**, off Cape Sardão, 125 m, muddy sand: 1 incomplete specimen, partially inside the tube; tentacular crown and prostomium visible. **SEPLAT 7 (2nd part) — St. 22 (A.4082)**, north Sines, 122 m, sand: 1 specimen, partially still inside the tube; a pair of lateroventral eye-spots at the base of the crown. **St. 39 (A.4068)**, north Sines, 110 m, sand with shells: 1 specimen, still inside the tube; the tentacular crown can be seen. **St. 51 (A.4056)**, north Sines, 125 m, sand: 1 specimen, still inside the tube. **St. 187 (A.3924)**, south Sines, 17 m, sand: 1 specimen; no pigment or eyes visible; incomplete, with only 3 abdominal chaetigers; with tube. **St. 283 (A.3851)**, off Arrifana, 245 m, muddy sand: 1 specimen, incomplete, plus 4 fragments; they are all inside fragments of the tube. **FAUNA 1 — St. 0*A***, Galicia, off Cies Islands, Ria de Vigo, 82-96 m, unknown substrate: 4 specimens plus one empty tube; 3 specimens are still inside the tubes; one specimen removed form the tube, incomplete. **St. 27*A***, Alborán Sea, Djibouti Bank, off Nerja, 288-297 m, sand with mud: 1 empty tube. **St. 28*R***, Alborán Sea, Djibouti Bank, off Nerja, 308 m, sand with mud: 1 empty tube.

DISTRIBUTION: Normally recorded to be world-wide: circumpolar in Arctic seas; Bering Sea; Sea of Okhotsk; Alaska; Vancouver Island; Faroes; Norwegian coast; Atlantic Ocean SW the British Isles; South West Africa; Mediterranean Sea; Adriatic Sea; Aegean Sea; Black Sea; Red Sea; Indian Ocean; Japan. This distribution is however incorrect, as for the moment, the distribution of *Owenia fusiformis* is only confirmed in the Western Mediterranean and Southwestern Portugal. KOH & BHAUD (2001) found differences between specimens from the Spanish and French Mediterranean, and the Spanish and French Atlantic, as well as between specimens from the Western Mediterranean and the Adriatic Sea. However, the same authors stated that it was too early in order to assert that those differences implied differentiation at the species level. The specimens found in the southwestern coast of Portugal in the present study fit the redescription of the species, reason why the species is also recorded here as being present in southwestern Portugal.

REMARKS: Probably the above *SELECTED REFERENCES* include records and descriptions of *Owenia fusiformis* based on specimens belonging to other species occurring in European waters (*O. assimilis*, *O. borealis*, *O. polaris*, older species still synonymized with *O. fusiformis*, or still undescribed species).

In the synonymy list are included only species described from the Mediterranean Sea, and which are believed to be synonymous with *O. fusiformis*. Another species, *Ops digitata* Carrington 1865, was described from England and could be valid, reason why it is not considered here as synonymous with *O. fusiformis*.

The methyl green staining pattern was studied on several specimens of *O. fusiformis* collected at different times of the year at Blanes (Mediterranean coast of Spain), in order to check if the pattern could change throughout the year, as a consequence of the physiological conditions of the worms. It was observed that the stainning pattern remained constant all over the year, and that it was identical to the described by KOH & BHAUD (2003). The staining pattern of the Blanes population was compared with the pattern of specimens collected at the southwestern coast of Portugal, and in both cases the pattern was identical.

Owenia polaris Koh, Bhaud & Jirkov 2003

Owenia polaris KOH, BHAUD & JIRKOV, 2003: 181, figs. 1, 3*B1-B6*, fig. 4*A1-A6*, 5*B-B1*, table 2.

TYPE LOCALITY: Off Finmark, Northern Norway, 71º30'N, 30º00'E, at 330 meters, in mud.

SELECTED REFERENCES: *Owenia polaris* — KOH & BHAUD, 2003: 66-93, especially 87, figs. 1, 3*F*, 4*F*, 5*F*, 6*F*, 7*F*, 8*F*, 9*M-N*, 10*E-F*, 11, 17.1.*D*, table 1.

DISTRIBUTION: Arctic shelf; Barents Sea; Norwegian Sea, outside the Atlantic waters. Between 12-930 meters.