



Biota Neotropica
ISSN: 1676-0611
cjoly@unicamp.br
Instituto Virtual da Biodiversidade
Brasil

Rizzo, Alexandra Elaine; Zacagnini Amaral, Antonia Cecilia
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Biota Neotropica, vol. 7, núm. 1, enero-abril, 2007, pp. 39-42
Instituto Virtual da Biodiversidade
Campinas, Brasil

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First occurrence of the family Paracalydoniidae (Annelida: Polychaeta) in the South Atlantic Ocean

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Biota Neotropica v7 (n1) – <http://www.biotaneotropica.org.br/v7n1/pt/abstract?article+bn01107012007>

Data Received 20/06/06

Revised 20/12/06

Accepted 08/02/07

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Abstract

Rizzo, A.E. & Amaral, A.C.Z. **First occurrence of the family Paracalydoniidae (Annelida: Polychaeta) in the South Atlantic Ocean.** *Biota Neotrop.* Jan/Apr 2007 vol. 7, no. 1 <http://www.biotaneotropica.org.br/v7n1/pt/abstract?article+bn01107012007> ISSN 1676-0603.

Paracalydoniid polychaetes belonging to the genus *Paracalydonia* Fauvel 1913 were collected during the REVIZEE Program/South Score/Benthos (“Avaliação do Potencial Sustentável dos Recursos Vivos na Zona Econômica Exclusiva”) on the outer shelf and continental slope off the south-southeastern coast of Brazil between 156 and 400 m depth. This new report extends the known geographic distribution of the family, which had previously been recorded in the North Atlantic as far as the Gulf of Mexico. *Paracalydonia* is here treated as monotypic; *P. mortenseni* Augener 1924 and *P. weberi* Horst 1923 are considered synonyms of *Paracalydonia paradoxa* Fauvel 1913.

Keywords: *Paracalydonia paradoxa*, Revizee Program, geographic distribution, Brazil.

Resumo

Rizzo, A.E. & Amaral, A.C.Z. **Primeira ocorrência da família Paracalydoniidae (Annelida: Polychaeta) no Oceano Atlântico Sul.** *Biota Neotrop.* Jan/Apr 2007 vol. 7, no. 1 <http://www.biotaneotropica.org.br/v7n1/pt/abstract?article+bn01107012007> ISSN 1676-0603.

Poliquetas paracalydonídeos pertencentes ao gênero monotípico *Paracalydonia* Fauvel 1913 foram coletados durante o Programa REVIZEE/Score Sul/Bentos (“Avaliação do Potencial Sustentável dos Recursos Vivos na Zona Econômica Exclusiva”) na plataforma externa e talude continental na costa sul-sudeste do Brasil entre 156 e 400 m de profundidade. Esta nova ocorrência amplia grandemente a distribuição geográfica dos representantes da família, a qual tinha sido previamente registrada no Atlântico Norte até o Golfo do México. *Paracalydonia* é tratado aqui como monotípico; *P. mortenseni* Augener 1924 e *P. weberi* Horst 1923 são considerados sinônimos de *Paracalydonia paradoxa* Fauvel 1913.

Palavras-chave: *Paracalydonia paradoxa*, Programa Revizee, distribuição geográfica, Brasil.

Introduction

The small burrowing worms of the polychaete family Paracalydoniidae are included in a single genus, *Paracalydonia*, described by Fauvel (1913). The genus was originally assigned to family Phyllococidae, but in the original description of the type species, *Paracalydonia paradoxa*, Fauvel noted the presence of aberrant characters for a phyllococid, and stated that this species could be an intermediate form between this group and the nephtyids. Later on, the genus was transferred to the subfamily Lacydoniinae of the Phyllococidae (Fauvel 1914, 1923). After the establishment of the family Lacydoniidae by Bergström (1914), some workers continued to group *Paracalydonia* and *Lacydonia* together as members of this family (Hartman 1965, 1968, Day 1967, Gallardo 1967, Uschakov 1974, Amoureux 1976, Fauchald 1977, Gathof 1984). However, Pettibone (1963) established the family Paracalydoniidae to contain the genus *Paracalydonia* and others have followed this concept (Blake 1997, Fauchald & Rouse 1977, Redondo & San Martín 1997). Pettibone (1963) considered lacydoniids as related to the Phyllococidae and Alciopidae and paracalydoniids as being more similar to the Nephtyidae. Blake (1997), after examining one specimen of *P. paradoxa*, adopted Pettibone's position retaining the Paracalydoniidae as a separate family. Blake (1997) noted that the similarities of *P. paradoxa* to the nephtyids in the shape of the parapodia, which have long prechaetal and postchaetal lamellae, and in the wide space between the notopodium and neuropodium. Members of *Lacydonia*, on the other hand, have short pointed parapodia, and lack postchaetal and prechaetal lamellae. Blake (1997) treated the species of *Lacydonia* as being most similar to the phyllococids and hesionids, rather than with the paracalydoniids. The last classification, Paracalydoniidae Pettibone 1963, is employed herein.

Paracalydoniidae contains only the type species, *P. paradoxa* Fauvel 1913, described from the Mediterranean. *Paracalydonia mortenseni* Augener 1924, described from New Zealand, was considered synonymous with *P. weberi* Horst 1923 from Indonesia by Augener (1927) and Uschakov (1974) considered all these taxa as a single species. According to Fauvel (1932), *P. paradoxa* has simple chaetae on the inferior part of the neuropodium, whereas in *P. weberi* such chaetae are absent. Wilson (2000) followed this concept and referred new material from Australia to *P. weberi*. However, Uschakov (1972) found specimens with and without simple chaetae on the neuropodium, and moreover he found no correlation between the presence or absence of these chaetae and the length of the specimens, depth, or geographic position. Blake (1997) pointed out that re-examination of type specimens of the three described species would be required, in order to confirm or reject these synonymies. In the absence of such a revision, this paper follows Uschakov (1974) and refers all records to a single species, *P. paradoxa*. We report herein the first record of the Paracalydoniidae in the South Atlantic Ocean.

Material and Methods

Specimens of paracalydoniids were collected during the program REVIZEE/South Score/Benthos sampling cruises of the R/V "W. Besnard", on the outer shelf and continental slope off Brazil, from Ilha Grande Bay, state of Rio de Janeiro (230 43.60' S and 420 06.50' W) to Tramandaí, state of Rio Grande do Sul (290 14.672' S and 470 50.669' W); water depths were 60 to 808 m. The samples were collected with van Veen and box-corer grabs and a dredge. The polychaetes were sorted from the sediment, washed, fixed with 4% formalin, stored in 70% ethanol, and identified (further details in Amaral & Rossi-Wongtschowski 2004).

Measurements and line drawings were made using ZEISS optical microscopy and stereomicroscopy. The material examined was

deposited in the Museu de Zoologia da Universidade de São Paulo (MZUSP), in the Polychaeta Collection.

Results and Discussion

1. Systematics

Paracalydoniidae Pettibone 1963

Paracalydonia Fauvel 1913:54-55

Paracalydonia Fauvel 1913

Type species: *Paracalydonia paradoxa* Fauvel 1913, by monotypy.

Diagnosis: Prostomium blunt with four short frontal antennae. Peristomial segment achaetous, appendages absent. Proboscis muscular, unarmed. First chaetiger uniramous, following chaetigers biramous. Parapodia well developed with postchaetal and prechaetal lamellae; slightly ciliated interramal border. Notochaetae simple, capillary; neurochaetae compound, spinigers.

Paracalydonia paradoxa Fauvel 1913

Paracalydonia paradoxa Fauvel 1913: 54, Figura 10, Fauvel 1923: 198, Figure 74e-I, Hartman & Barnard 1960: pl. 6, Figures 1-3, Pettibone 1963: 184, Figure 46, Hartman 1965: 65, Day 1967: 350, Figure 15.3e-h, Gallardo 1967: 59 pl. XI, Figures 4-6; Hartman 1968: 329, Figure. 1-3, Uschakov 1974: 216, pl. XXXIV 4-9, Amoureux 1976: 11, Gathof 1984: 34-5, Figure. 34-3 a-I, Blake 1997: 352, Figure. 14.1, Redondo & San Martín 1997: 228, Figures 1a-g, Rouse & Pleijel 2001: 130-131, Figure. 31.1-31.2.

Paracalydonia weberi Horst 1923, Fauvel 1953: 129, Figure 65e-f, Wilson 2000:141-143, Figure 1.81a-e.

Paracalydonia mortenseni Augener 1927:241.

Material Examined: 18 specimens: MZSP770 (1), 25° 53' 58" S and 45° 42' 13" W, off Santos, SP, Sta. 6651, subtidal, depth 256 m, 15.xii.1997; MZSP771 (1), 25° 41' 827" S and 45° 11' 686" W, off Santos, SP to Ilha Grande Bay, RJ, Sta. 6685, subtidal, depth 282 m, 13.i.1998; MZSP772 (1), 27° 00' 88" S and 46° 40' 21" W, off Santos, SP to Paranaguá Bay, PR, Sta. 6690, subtidal, depth 280 m, 18.i.1998; MZSP773 (1), 25° 37' 05" S and 45° 50' 14" W, off Santos, SP to Paranaguá Bay, PR, Sta. 6707, subtidal, depth 156 m, 21.i.1998; MZSP774 (1), 24° 11' 60" S and 43° 26' 20" W, off from Ilha Grande Bay, RJ to Cabo Frio, RJ, Sta. 6738, subtidal, depth 330 m, 14.ii.1998; MZSP775 (1), 21° 49' 59" S and 40° 03' 68" W, off from Cabo Frio, RJ to Cabo de São Tomé, RJ, Sta. 6774, subtidal, depth 235 m, 02.iii.1998; MZSP776 (2), 22° 02' 55" S and 40° 01' 94" W, off from Cabo Frio, RJ to Cabo de São Tomé, RJ, Sta. 6774, subtidal, depth 400 m, 02.iii.1998; MZSP777 (1), 22° 55' 53" S and 40° 40' 08" W, off from Cabo Frio, RJ to Cabo de São Tomé, RJ, Sta. 6768, subtidal, depth 280 m, 01.iii.1998; MZSP778 (2), 23° 44' 20" S and 42° 29' 80" W, off from Ilha Grande Bay, RJ to Cabo Frio, RJ, Sta. 6749, subtidal, depth 325 m, 16.ii.1998; MZSP778 (5), 23° 30' 00" S and 41° 08' 85" W, off from Cabo Frio, RJ to Cabo de São Tomé, RJ, Sta. 6760, subtidal, depth 400 m, 28.ii.1998; MZSP778 (2), 23° 09' 53" S and 40° 56' 79" W, off from Cabo Frio, RJ to Cabo de São Tomé, RJ, Sta. 6765, subtidal, depth 257 m, 01.iii.1998.

Description: Eight complete specimens, with lengths 4.0-19 mm and widths of the 10th chaetiger 0.25-0.9 (without parapodia), and 36-66 chaetigers. Ten incomplete specimens measuring 4.5-11.4 mm long and 0.3-1 mm wide, with 25-50 chaetigers. Coloration whitish on small specimens, yellowish on larger and

rosaceous pharyngeal region on preserved specimens in alcohol; brownish punctiform pigment on prostomium, sub-distal end of the lamellae, and ventrally and dorsally in intersegmentary region. Prostomium subconical, wider than long, slightly blunt; four very small antennae not articulate, all of nearly the same length. A pair of ocellary patches may be present on dorsal region, between prostomium and first segment (Figure 1a). A pair of nuchal organs on latero-dorsal depression. Proboscis retracted, not observed. Anterior segments uni-annulated; bi-annulated from chaetiger 15-16th. Parapodia gradually increasing towards posterior region, becoming elongated and slender, similar along length of body. First segment achaetous, fused to prostomium, cirri absent. First chaetiger uniramous with neuropodium and neurochaetae; other chaetigers biramous. Notopodia slightly shorter and widely separated from the neuropodia; each one bearing an aciculum. Notopodium and neuropodium with one postchaetal and one prechaetal lamella, both rounded; one dorsal and one ventral cirrus, both digitiform (Figure 2a, b). Prechaetal lamella larger than the postchaetal, with a median incision (Figure 2a, b). Notopodial lower part and neuropodial upper part subtriangular and distally rounded, both faced to the interramal space. Dorsal cirri up to 1/4 length of ventral cirri. Ventral cirri almost reaching the length of neuropodial prechaetal lamellae. Notochaetae simple, capillary, from 6 to 11 in number (Figure 1d). Neuropodia with 18-20 spiniger neurochaetae with heterogomph shaft sub-distally robust, tapering distally (Figure 1b, c). One or two simple capillary neurochaetae positioned on inferior bundle. Capillary and spiniger chaetae marginally serrated. Pygidium rounded, with a pair of slender cirri.

Discussion: *Paralacydonia paradoxa* is a eurybathic species, rarely collected, but with a wide geographic distribution. Uschakov (1974) pointed out some differences among populations regarding the presence or absence of eyes or ocellary patches and

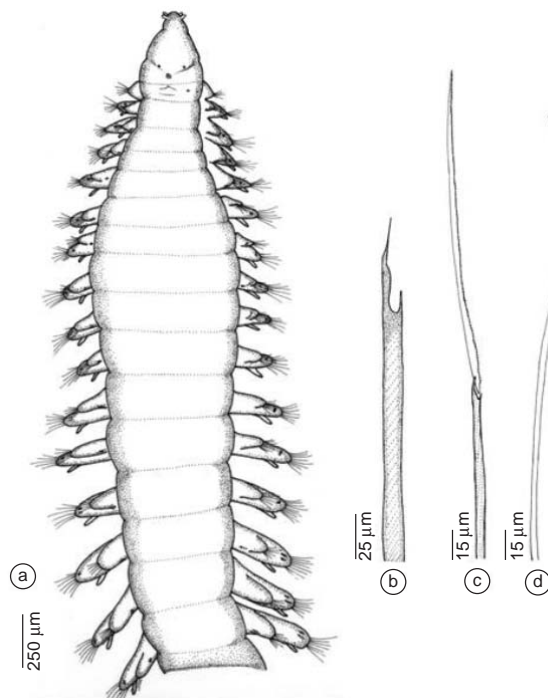


Figure 1. *Paralacydonia paradoxa* (MZSP773) – a) Anterior region, dorsal view; b) Detail of the shaft of a spiniger neurochaeta; c) Spiniger neurochaeta; and d) Capillary notochaeta.

pigmentation pattern. Disagreement related to the nature of first segment and the terminology of the prostomial appendices is a constant issue in the literature. Wilson (2000), based on personal observations and following Fauvel (1914), stated that the first segment contains a neuropodium with neurochaetae and reduced ventral cirrus, and that Pettibone's interpretation was mistaken. According to Day (1967), Gathof (1984) and Blake (1997), this segment corresponds to the peristomial ring, which is uniramous. In SEM Figure 31.2 provided by Rouse & Pleijel (2001), it is evident that the first segment is distinctly achaetous and the cirri are absent, while the second segment has neuropodia and neurochaetae, and from the third segment on the segments become biramous, even reduced, with capillary notochaetae and spiniger neurochaetae, and the peristomium is limited ventrally at the mouth. However, each of these authors has examined different specimens, and no reassessment of the validity of the described species of *Paralacydonia* based on redescription of all original material has yet been undertaken. Since the original description, the four prostomial appendices have been constantly referred to as antennae (Fauvel 1913, Hartman & Barnard 1960, Pettibone 1963, Hartman 1965, Gallardo 1967, Redondo & San Martín 1997). According to Wilson (2000), the affinities with the sister-group Glyceridae-Goniadidae suggest that the four prostomial appendices are homologous with those of Glyceriformia and do not represent antennae and palps, as suggested by Rouse & Pleijel (2001).

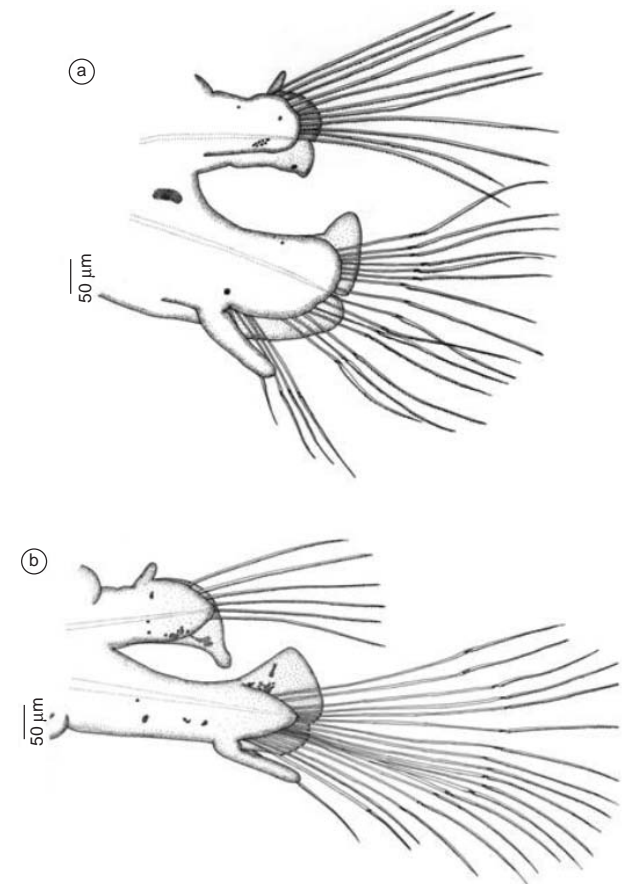


Figure 2. *Paralacydonia paradoxa* (MZSP773) – a) Parapodium 13, posterior view; and b) Parapodium 50, posterior view (ciliated interramal border not represented).

Occurrence: Pacific Ocean – from California to southern Ecuador; Indo-Pacific – Japan, Yellow Sea, Tonkin Gulf, Nha Trang, Indonesia, southeast Australia, New Zealand, Mozambique; Mediterranean – Monaco, San Antonio and Valencia, Morocco; Atlantic Ocean – New England (Massachusetts), Gulf of Mexico, and Brazil (states of Rio de Janeiro, São Paulo and Paraná). At depths from 7 to 5498 m; this species was collected between 156 and 400 m depth off south-southeastern Brazil.

Acknowledgments

This work was supported by the CNPq (Conselho Nacional de Desenvolvimento Científico e Tecnológico, Process 141504/98-6) and the State of São Paulo Research Foundation (FAPESP), as part of the BIOTA/FAPESP – The Biodiversity Virtual Institute Program (www.biotasp.org.br). Our thanks to MMA (Ministério do Meio Ambiente, dos Recursos Hídricos e da Amazônia Legal) for financial support of the program REVIZEE. We appreciate the facilities and assistance of the Departamento de Zoologia, Instituto de Biologia, UNICAMP. We are much indebted to anonymous referees for their constructive comments. Janet W. Reid revised the English text.

References

- AMARAL, A.C.Z. & ROSSI-WONGTSCHOWSKI, C.L.D.B. 2004. Biodiversidade bentônica da região sudeste-sul do Brasil – Plataforma Externa e Talude Superior. Série Documentos Revizee – Score Sul. Ulhôa Cintra Ed., São Paulo, p.1-216.
- AMOUREUX, L. 1976. Annélides Polychètes récoltés par J. Stirn en 1969, sur les côtes marocaines du détroit de Gibraltar. Cuad. Cienc. Biol. Univ. Granada, 5:5-33.
- AUGENER, H. 1927. Polychaeten von Curaçao. Bijdragen tot de Kennis der Fauna von Curaçao. Resultaten eener Reis van Dr C.J. van der Horst in 1920. Zool. Genoots 'Natura artis Magistra', 25:39-82.
- BERGSTRÖM, E. 1914. Zur systematik der polychaetenfamilie der Phyllocidociden. Zool. Bidr. Upps., 3:37-224.
- BLAKE, J.A. 1997. Introduction to the Polychaeta, 37-108 pp. In: Oligochaeta and Polychaeta: Phyllocidocida (Phyllocidocidae to Paracalydoniidae), eds: Blake, J.A., Hilbig, B., Scott, P.H. vol. 4, Santa Barbara Museum of Natural History, California, 1:369.
- DAY, J.H. 1967. A monograph on the Polychaeta of Southern Africa. Part I. Errantia. London: British Museum (Natural History), 656(1):1-458.
- FAUCHALD, K. 1977. The polychaete worms. Definitions and keys to the orders, families and genera. Nat. Hist. Mus. Los Angel. Cty Sci. Ser., v.28, 188p.
- FAUCHALD, K. & ROUSE, G. 1997. Polychaete systematics: Past and present. Zool. Scr., 26(2):71-138.
- FAUVEL, P. 1913. Campagne du "Pourquoi-Pas" (Islande et Jan Mayen 1912). Bull. Mus. Hist. Nat., Paris, 19:80-93.
- FAUVEL, P. 1914. Annélides polychètes non-pélagiques provenant des campagnes de l'Hirondelle et de la Princesse-Alice 1885-1910. Résult. Camp. scient. Prince Albert I, v. 46, p.1-432.
- FAUVEL, P. 1923. Polychètes errantes. Kraus Reprint (Reprinted in 1975), Nendeln, Liechtenstein.
- FAUVEL, P. 1932. Polychètes nouvelles de Che-Foo (China). Bull. Mus. Hist. Nat., Paris, 4 (2):536-538.
- FAUVEL, P. 1953. The fauna of India, including Pakistan, Ceylon, Burma and Malaya. Annelida, Polychaeta. The Indian Press, Allahabad.
- GALLARDO, V. 1967. Polychaeta from the Bay of Nha Trang, South Viet Nam. In: Scientific results of marine investigations of the South China Sea and the Gulf of Thailand 1959-1961. University of California Press, La Jolla, California, p. 35-279.
- GATHOF, J.M. 1984. Family Lacydoniidae Bergström, 1914. Chapter 34, pages 34-1 to 34-5. In: J.M. Uebelacker and P.G. Johnson (eds). Taxonomic guide to the polychaetes of the northern Gulf of Mexico. Vol. 5. B.A. Vittor & Associates, Inc. Mobile, Alabama.
- HARTMAN, O. 1965. Deep-water benthic Polychaetous Annelids off New England to Bermuda and other North Atlantic areas. University of Southern California Press, Los Angeles, California.
- HARTMAN, O. 1968. Atlas of the errantiate polychaetous annelids from California. Allan Hancock Foundation. University of Southern California, Los Angeles.
- HARTMAN, O. & BARNARD, J. 1960. The benthic fauna of the deep basins off Southern California. University of Southern California Press, Los Angeles, California.
- HORST, R. 1923. On three remarkable Annelida Polychaeta. Zool. Meded., 7:221-224.
- PETTIBONE, M.H. 1963. Marine polychaete worms of the New England region. I Aphroditidae through Trochochaetidae. Bull. U.S. Natn. Mus. 227:1-356.
- REDONDO, M.S. & SAN MARTIN, G. 1997. Anélidos poliquetos de la costa comprendida entre el Cabo de San Antonio y el puerto de Valencia (Mediterráneo occidental). Publ. Espec. Inst. Esp. Oceanogr., 23:225-233.
- ROUSE, G.W. & PLEIJEL, F. 2001. Polychaetes. Oxford University Press, p.1-354.
- USCHAKOV, P.V. 1972. Polychaetes of the suborder Phyllocidociformia of the polar basin and northwestern part of the Pacific (Family Phyllocidocidae, Alciopidae, Tomopteridae, Typhloscolecidae and Lacydoniidae). Fauna of the USSR. Vol.1 Academia Nauk SSSR. Leningrad, p. 1-272.
- USCHAKOV, P.V. 1974. On the problem of classification of Polychaete and worms of the primary type of parapodium. Trud. Inst. Zool., Akad. Nauk SSSR 53:210-228. (In Russian.)
- WILSON, R.S. 2000. Family Paracalydoniidae. Pp. 141-143. In Beesley, P.L., Ross, G.J.B. & Glasby, C.J. (eds) Polychaetes & Allies: The Southern Synthesis. Fauna of Australia. Vol. 4A Polychaeta, Myzostomida, Pogonophora, Echiura, Sipuncula. CSIRO Publishing: Melbourne xii 465p.

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Biota Neotropica, Vol.7 (number 1): 2007
<http://www.biotaneotropica.org.br/v7n1/pt/abstract?article+bn01107012007>

Data Received 20/06/06 - Revised 20/12/06 - Accepted 08/02/07

ISSN 1676-0603