

TAXONOMY OF EUROPEAN SPECIES OF  
*AMPHIDUROS* AND *GYPTIS*  
(POLYCHAETA: HESIONIDAE)

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*Abstract.* — The taxonomy of the European species of *Amphiduros* Hartman, 1959, and *Gyptis* Marion & Bobretzky, 1875, is reviewed. *Amphiduros* is recorded for the first time from European waters. *Amphiduros fuscescens* (Marenzeller, 1875), new combination (originally described in *Oxydromus*), *G. propinqua* Marion & Bobretzky, 1875, and *G. rosea* (Malm, 1874) are redescribed based on available types and newly collected specimens from the vicinity of the type localities, and *A. fuscescens* is removed from synonymy with *G. propinqua*. Two new species are described: *G. mackiei* from Sweden and the Faroes, unique within the genus in having setae from segment 4 rather than segment 5, and *G. mediterranea* from southern France and Sicily, a species close to *G. rosea*. A key to the European species is included, and a checklist for species and subspecies described in or later referred to the two genera is appended.

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The genus *Amphiduros* Hartman, 1959, is only known for four species, all described from the Pacific. Examination of type and newly collected Mediterranean specimens of *Oxydromus fuscescens* Marenzeller, 1875, indicates that this species also belongs to *Amphiduros*, and constitutes the first record of the genus from Europe. Previously *O. fuscescens* has been treated as a junior synonym of *G. propinqua* Marion & Bobretzky, 1875 (Fauvel 1923, Hartman 1959).

Two European species of *Gyptis* Marion & Bobretzky, 1875 *sensu stricto* (excluding *Podarkeopsis* Laubier, 1961; see below) are recorded in the literature from this century: the type species *G. propinqua* Marion & Bobretzky, 1875, and *G. rosea* (Malm, 1874). The status of these two species is currently uncertain. For example, Eliason (1962) treated *G. propinqua* as a doubtful junior synonym of *G. rosea*, and Hartmann-Schröder (1971) referred Fauvel's (1923) description of *G. propinqua* to *G. rosea*. Haaland & Schram (1982) also treated *G. propinqua* as a possible junior synonym, but remarked that the larvae from the Oslofjord

differed from those described as *G. propinqua* by Bhaud (1971).

I believe that these synonymies are incorrect, and that the number of species occurring in the area is underestimated. This study aims to describe all the European species of *Gyptis* (including two new species) and the closely related *Amphiduros*, to resolve their synonymies and to provide a key facilitating their correct identification. Apart from the interpretation of tentacular cirri (see below), the generic delineations follow traditional ones (e.g., Fauchald 1977) and no phylogenetic considerations are made at this point; these will have to await future studies treating the relationships within family (Pleijel, in prep.). The study is based on museum specimens as well as newly collected material during trips to the northern part of the Swedish west coast, northwestern Iceland, eastern Sicily, and Banyuls-sur-Mer in southern France. A checklist for species originally or later referred to the two genera is appended. The list also serves as a record of other congeneric species examined in the course of this study.

Species belonging to *Podarkeopsis* are excluded. These are distinguished from *Gyptis* and *Amphiduros* by the presence of an anteriorly inserted median antenna (rather than medially on the dorsal surface of the prostomium), by ten terminal proboscideal papillae (rather than absence or a larger number), and by the presence of furcate notosetae (rather than absence). Species recorded from European waters which I consider belong to the *Podarkeopsis*-group are: *P. arenicolus* (La Greca, 1946), described from the Gulf of Naples, Italy; *P. galangau* Laubier, 1961, described from Banyuls-sur-Mer, southern France; *P. capensis* (Day, 1963), described from South Africa but recorded from southern England (Gibbs & Probert 1973) and the Tyrrhenian Sea, Italy (Gravina and Giangrande 1988); and *Gyptis helgolandica* Hilbig & Dittmer, 1979, described from Helgoland in the North Sea.

In hesionids the number of tentacular cirri has generally been considered diagnostic at the generic level (e.g., Fauchald 1977). *Gyptis* and *Amphiduros* are described as having eight pairs of tentacular cirri, but the character "number of tentacular cirri" probably conceals a mixture of several characters. In the literature the tentacular cirri appear to be defined by absence of parapodia, i.e. if parapodial lobes are absent they are named tentacular cirri, otherwise dorsal and ventral cirri. However, the tentacular cirri also differ from cirri in "normal" segments in the usually more pronounced cirrophores, and in being stouter and longer. Further, many adult hesionids have dorsal cirri on the first setigerous segment that are of the same shape as the preceding dorsal tentacular cirri. In considering these ambiguities I prefer to use the absence of notopodia on segment 4 to define *Gyptis* and *Amphiduros* and presently avoid the character "number of tentacular cirri." *Gyptis mackiei* (which has setigerous neuropodia on segment 4 and thus may be interpreted as having six pairs of tentacular cirri) will then also be included in *Gyptis*. Possible

reassignment will have to await future phylogenetic analyses.

### Materials and Methods

The collected specimens were relaxed, either with menthol or magnesium chloride (7% in distilled water), studied alive, preserved in formalin (5–10% in seawater) for a few days, rinsed in fresh water and transferred to 80% alcohol. For SEM specimens were similarly relaxed, preserved for a few hours in osmium tetroxide (1% in artificial seawater), rinsed in distilled water, transferred to 80% alcohol in a graded series, and subsequently critical-point dried. All drawings were made with a camera lucida; those of Figs. 1A, B, K, 4A–C, and 9A, B from live, relaxed specimens, and remaining ones from preserved specimens.

All measurements were carried out either on live, relaxed specimens or specimens relaxed prior to preservation. Width measurements were taken from median segments and include parapodia but exclude cirri and setae.

Institutions and museums are indicated by the following abbreviations: BIOFAR (Marine benthic fauna of the Faroe Islands, Kaldbak), BMNH (The Natural History Museum, London), LACM (Los Angeles County Museum of Natural History), NHMG (Göteborg Natural History Museum), NHMR (Natural History Museum, Reykjavik), NHMW (Naturhistorisches Museum Wien), NMCA (National Museum of Canada, Ottawa), NMW (National Museum of Wales, Cardiff), SMNH (Swedish Museum of Natural History, Stockholm), USNM (National Museum of Natural History, Smithsonian Institution, Washington, D.C.), ZMB (Universität Humboldt, Museum für Naturkunde, Berlin), ZMH (Universität Hamburg, Zoologisches Institut und Museum), ZMUU (Uppsala Universitet, Zoologiska Muséet). All material is deposited at SMNH unless otherwise indicated.

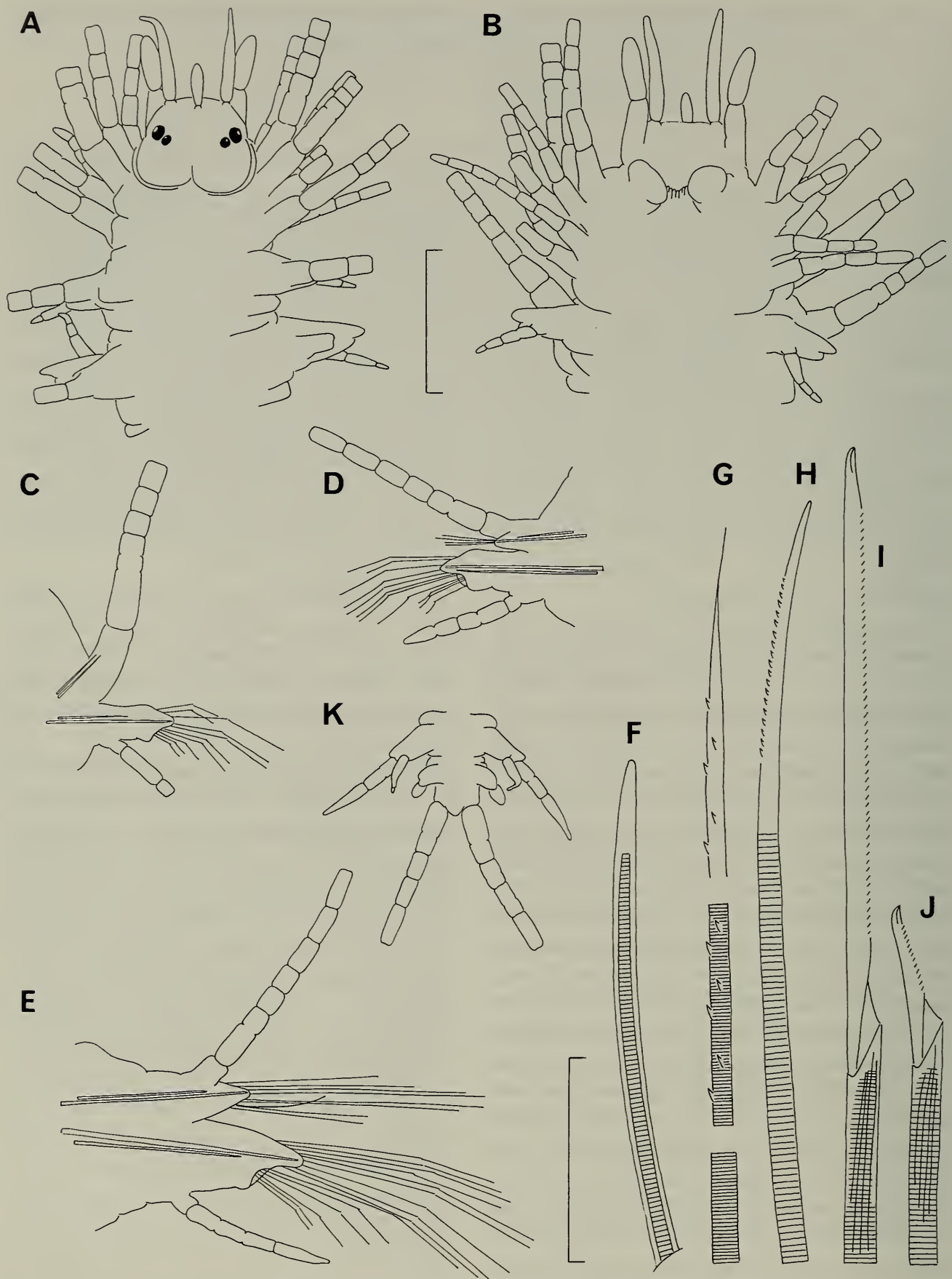


Fig. 1. *Gyptis propinqua*. A. Anterior end, dorsal view. Setae omitted. B. Anterior end, ventral view. Setae omitted. C. Parapodium segment five, posterior view. D. Parapodium segment six, anterior view, ca. half number of setae shown. E. Median parapodium, anterior view, ca. half number of setae shown. F. Acicular notoseta. G. Spiked capillary notoseta. H. Serrated capillary notoseta. I. Median neuroseta. J. Ventral neuroseta. Specimens from Koster area, Sweden. Scales A-E, K, 0.25 mm; F-J, 50  $\mu$ m.

*Gyptis* Marion & Bobretzky, 1875

*Gyptis* Marion & Bobretzky, 1875:50–51.

*Type species.*—*Gyptis propinqua* Marion & Bobretzky, 1875, either by monotypy or subsequent designation (see Remarks).

*Diagnosis (provisional).*—Hesionids with two palps and two frontal antennae. Median antenna present, inserted dorsally on prostomium. Proboscis with terminal ring of papillae. Jaws absent. Segment 4 without notopodia or notosetae, with or without neuropodia with neurosetae. Segment 5 with or without notopodia or notosetae, with neuropodia and neurosetae. Following parapodia with well-developed noto- and neuropodia. Notosetae include one to several acicular and large number of capillary setae; furcate setae absent. Neurosetae numerous, all usually compound.

*Remarks.*—It is not obvious from Marion & Bobretzky's original description that *G. propinqua* should constitute the type species of the genus, but the matter is probably without practical significance because it has been designated subsequently, if not earlier then at least by Hartman (1965).

The name *Oxydromus* Grube, 1855 has variously been treated as confused (Marion & Bobretzky 1875), as a senior synonym to *Gyptis* (e.g., Fauvel 1923, Hartman 1959) or, more recently (Hartman 1965), as preoccupied (in Aves by *Oxydromus* Schlegel, 1854). However, examination of the type material for the type species for the genus, *O. fasciatus* Grube, 1855 (ZMB 3825), shows it to be a junior synonym to *Ophiidromus flexuosus* (delle Chiaje, 1827). Apart from possibly being a junior homonym the name is thus also a synonym of *Ophiidromus* Sars, 1862, and of no relevance to *Gyptis*.

Pending further investigations (see Introduction) the generic diagnosis is provisionally emended to include *G. mackiei*, a new species with neurosetae present on segment 4.

*Gyptis propinqua* Marion & Bobretzky, 1875  
Figs. 1–3, 12

*Gyptis propinqua* Marion & Bobretzky, 1875:51–54, pls. 5–6, fig. 15.

*Oxydromus propinquus.*—Fauvel, 1923: 241–242, fig. 90. [Not *Oxydromus propinquus* sensu Ushakov, 1955:196–197, fig. 58]

*Gyptis rosea.*—Hartmann-Schröder, 1971: 132–134, fig. 42.—Helgason et al., 1990: 205.

*Material examined.*—Iceland: ca. 200 specimens (NHMR), Breidafjörður, 65°05'N, 23°17'W, 43 m, van Veen grab and Agassiz trawl, shell gravel, 9 Aug 1979; 3 specimens (NHMR), Breidafjörður, 65°05'N, 23°16'W, 53 m, van Veen grab, shell gravel, 9 Aug 1979; 15 specimens, Breidafjörður, Selsker, 65°05.03'N, 23°16.91'W, 43 m, dredge, coarse shell gravel, 16 Jul 1991. Sweden: 7 specimens, Väderöarna, SE Norra Rågstuten, 58°32.2'N, 11°5.0'E, 12 m, dredge, shell sand and gravel, 7 Oct 1984; 1 specimen, Koster area, SW Yttre Vattenholmen, 58°52.5'N, 11°06.3'E, 50–100 m, dredge, mixed sediments, 7 January 1985; 1 specimen, Koster area, W Yttre Vattenholmen, 58°52.4'N, 11°06.5'E, 20–30 m, dredge, shell sand, 29 Aug 1985; 4 specimens, Koster area, SW Yttre Vattenholmen, 58°52.5'N, 11°06.3'E, 30 m, dredge, shell sand and gravel, 30 May 1989; 7 specimens, Koster area, E Yttre Vattenholmen, 58°52.6'N, 11°06.7'E, 20–30 m, dredge, coarse gravel, 29 Aug 1989; 16 specimens, Koster area, W Yttre Vattenholmen, 58°52.4'N, 11°06.5'E, 20–40 m, dredge, shell sand and gravel, 10 Sep 1989; 1 specimen, Koster area, Kostergrund, 58°52.5'N, 11°05.1'E, 20–40 m, dredge, mixed sediments, 11 Apr 1990; 4 specimens (all mounted for SEM), Koster area, W Yttre Vattenholmen, 58°52.4'N, 11°06.5'E, 30–60 m, dredge, shell sand and gravel, 13 Apr 1990; 2 specimens, Koster area, SW Yttre Vattenholmen, 58°52.5'N, 11°06.3'E, 40 m, dredge, mixed sediments, 28 Jun 1990; 2 specimens, Koster area, Kostergrund, 58°52.5'N, 11°05.1'E, 15 m, dredge, sand and gravel, 18 Oct 1990; 3 specimens, Koster area, SW Yttre Vatten-

holmen, 58°52.5'N, 11°06.3'E, 30–50 m, dredge, 6 Jun 1991; 4 specimens, Koster area, E Krugglö, 58°53.4'N, 11°05.9'E, 10–20 m, dredge, coarse shell gravel, 13 Jun 1991; 7 specimens, Koster area, E Yttre Vattenholmen, 58°52.6'N, 11°06.7'E, 30 m, dredge, shell gravel, 18 Jun 1991. Faroes: 1 specimen (BIOFAR), 61°54.78'N, 06°28.84'W, 77 m, epibenthic sledge, 20 Jul 1987; 4 specimens, Torshavn, Høgnabodi, 62°05'N, 06°33'W, 20–40 m, dredge, 21 Nov 1988. Italy: 1 specimen, Sicily, Acitrezza, 37°34.4'N, 15°11.7'E, 41 m, SCUBA, 17 May 1990; Sicily, Brucoli, 37°16.8'N, 15°11.7'E, 10 m, SCUBA, 21 May 1990. France: ca. 75 specimens (5 specimens mounted for SEM), Banyuls-sur-Mer, Cap d'Osne, 42°29.48'N, 03°08.29'E, 24 m, dredge, silty coarse sand with shell gravel, 9 Oct 1991; 4 specimens, Banyuls-sur-Mer, 42°29.48'N, 03°08.29'E, 18 m, dredge, sand and shell gravel, 13 Oct 1991; 3 specimens, Banyuls-sur-Mer, Ile Grosse, 42°29.0'N, 03°08.1'E, 10 m, SCUBA, gravel, 13 Oct 1991; 1 specimen, Banyuls-sur-Mer, Cap Oullestrell, 42°30.13'N, 03°08.18'E, 18 m, dredge, 14 Oct 1991; 1 specimen, Banyuls-sur-Mer, Ile Grosse, 42°29.0'N, 03°08.1'E, 10 m, SCUBA, gravel, 18 Oct 1991.

*Description.* — Body, excluding parapodia, cylindrical, posteriorly tapered; venter flattened, without distinct median longitudinal furrow. Median parapodia only slightly longer than anterior, posterior ones successively shorter, yielding outline of fairly equal width with tapering posterior end.

Prostomium about as wide as long, anteriorly straight, laterally and posteriorly with rounded lobes separated by deep posterior incision (Figs. 1A, 2A, B). Proximal parts of palps cylindrical; distal parts widest medially, anteriorly rounded (Fig. 1B). Proximal and distal parts of equal length. Paired antennae situated on small ceratophores, longer and thinner than palps, with pointed tips. Median antenna club-shaped, widest subdistally, inserted half-way between anterior pair of eyes and anterior

margin of prostomium on small, rather indistinct ceratophore. Anterior pair of eyes rounded to reniform, twice as large as posterior pair and situated further apart; posterior pair rounded, both pairs with lenses. Nuchal organs well-developed, lateral to prostomium but extending and almost coalescing mid-dorsally (Fig. 2A).

Large, distinct lip glands present (Figs. 1B, 2C, E). Proboscis smooth, cylindrical, sometimes with enlarged opening in preserved, unrelaxed specimens, divided in proximal and distal parts (not obvious on specimens with strongly extended proboscides), distal part smaller. Number of terminal papillae size-dependent (Fig. 12), usually numbering 35–50. Papillae long (ca. 125  $\mu\text{m}$ ) and thin with ciliated tips, arranged in single ring.

Tentacular cirri distinctly annulated, rings basally about two to three times as long as wide, distally usually shorter, tips rounded. Dorsal tentacular cirri of segment 2 longest, reaching to about segment 10–12; ventral tentacular cirri of segment 3 shortest, reaching to about segment 6. Cirri of segments 3 and 4 more ventrally displaced than anterior ones (Fig. 2D). Aciculae present in cirrophores of all tentacular cirri, two to three in dorsal ones and one in ventral ones. Anterior dorsal segmental delineations not distinct, several segments fused or reduced. Segment 4 with first dorsally fully distinguishable segment, often forming elevated ridge anteriorly (Fig. 2A).

Segment 5 (setiger 1) with from one to three notoaciculae within cirrophores of dorsal cirri, without setigerous lobes or setae (Fig. 1C). Dorsal cirri similar to those of segment 4. Neuropodia similar to following ones but slightly smaller. Ventral cirri similar to following ones. Segment 6 similar to median ones but slightly smaller (Fig. 1D).

Dorsal cirri of median segments distinctly annulated with about 10–15 rings; rings from one to three times as long as wide (Fig. 1E). Dorsal cirri longer than setae, slightly dif-



Fig. 2. SEM micrographs of *Gyptis propinqua*. A. Anterior end, dorsal view. B. Prostomium, dorsal view. C. Anterior end, ventral view. D. Anterior end, right side. E. Lip glands. F. Median parapodium, right side, antero-ventral view. A & F specimens from Koster area, Sweden, B–D specimens from Banyuls, southern France. Scale lines A–D, F, 0.1 mm; E, 50  $\mu$ m.

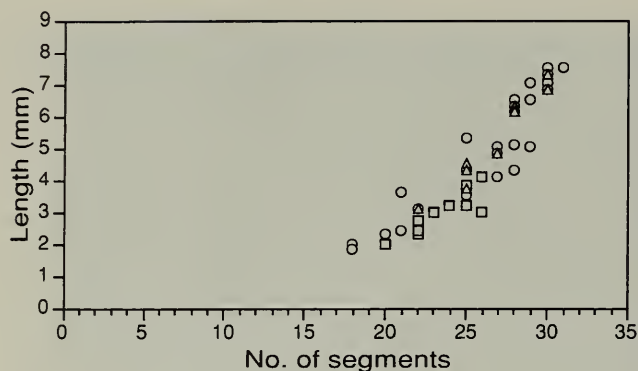


Fig. 3. *Gyptis propinqua*. Relationship between number of segments and length. Specimens from Banyuls, southern France (squares), Koster area, Sweden (circles), and Breidafjörður, northwestern Iceland (triangles).

ferentiated in length and orientation, those of segment 5, 8, 10, 12, 15, 17, 19, 21 and 23 slightly longer and oriented more dorsally than other ones (best observed on live specimens). Notopodial lobes conical, usually with two internal aciculae (one small and difficult to detect), and one emerging, anteriorly situated, dorsally bent smooth acicular seta (Fig. 1F). About 10–15 capillary setae inserted behind lobe, with smooth proximal parts and two alternating rows of teeth medially and subdistally (Fig. 1G). A few ventrally situated serrated capillaries usually present (Fig. 1H).

Neuropodia of median segments conical, slightly asymmetrical, usually with two internal aciculae (one larger than other) and 20–30 compound setae. Distal part of setal shafts internally reticulated (Fig. 1I, J). Blades of median and dorsal setae long, ventral ones very short. Ventral cirri annulated with about 5–10 rings, longer than neuropodial lobe, on distinct cirrophores situated far back on neuropodia (Fig. 2F).

Pygidium a rounded cone. Pygidial cirri long and annulated, median papilla absent (Fig. 1K).

Color: Live specimens transparent with dark brown pigmentation forming segmentally arranged transverse bands across dorsum that also connect laterally. First dorsally visible segment with distinct dark

brown band dorsally. Eyes orange-red. Specimens vary from dark to pale, depending on amount of pigmentation. Venter always unpigmented. Eggs uncolored. Mature males whitish. Pigmentation usually fades in alcohol.

Measurements: Up to 7.5 mm long for 32 segments (see Fig. 3).

*Habitat*.—Coarse and fine shell gravel from 10–100 m.

*Distribution*.—Iceland, Faroes, Swedish west-coast, southern France, Sicily.

*Reproduction*.—Mature specimens found in May and June at Koster, Sweden, in July at Iceland. Eggs large, about 175  $\mu\text{m}$  in diameter. Bhaud (1971) described the larvae of *G. propinqua*.

*Remarks*.—Eliason (1962), Haaland & Schram (1982) and Helgason et al. (1990), treated *G. propinqua* as a possible junior synonym of *G. rosea*. The two most recent studies, however, commented on inconsistencies between different descriptions. Further, Hartmann-Schröder (1971) and Helgason et al. stated that Fauvel's (1923) description of *G. propinqua* referred to *G. rosea*. There is no remaining type material of *G. propinqua*, either at the museum in Paris, or at Station Marine d'Endoume in Marseille (J.-C. Dauvin and G. Bellan, in litt.); it is presumed lost. Nevertheless, newly collected material from Banyuls-sur-Mer was found to correspond well with the excellent original description based on specimens from Marseille. Comparison of the Banyuls specimens with both the type and newly collected material of *G. rosea* leaves no doubt that *G. propinqua* is a distinct and very different species (see key for the best diagnostic characters). Hartmann-Schröder's (1971) description and examination of the specimens of Helgason et al. (1990) shows both accounts of *G. rosea* actually refer to *G. propinqua*. By contrast, the accounts of *G. rosea* by Eliason (1962) and Haaland & Schram (1982) are considered correct and refer to *G. rosea* as described here. Fauvel's (1923) description of *G. pro-*

*pinqua* (as *Oxydromus propinquus*) is in good agreement with Marion & Bobretzky's species.

Ushakov (1955) reported *G. propinqua* (as *Oxydromus propinquus*) from the Sea of Okhotsk, but judging from his description this presumably represents a different species.

*Gyptis mackiei*, new species  
Figs. 4–5

*Material examined*.—Sweden: 1 specimen, Gullmarsfjord, Skår, 110 m, mud, 25 May 1963, (NHMG 12805c); 4 paratypes (SMNH 4395), Koster area, SW Yttre Vattenholmen, 58°52.1'N, 11°06.8'E, 100–140 m, detritus sledge, mud, 8 Aug 1987; 2 paratypes (SMNH 4396), Singlefjord, 59°04'N, 11°10'E, 80 m, detritus sledge, mud, 11 Apr 1990; holotype (SMNH 4397) and 2 additional specimens (used for dissection and SEM), Koster area, S Yttre Vattenholmen, 58°52.0'N, 11°06.6'E, 110–130 m, detritus sledge, mud, 1 Jan 1991; 1 specimen (mounted for SEM), Koster area, S Yttre Vattenholmen, 58°52.25'N, 11°06.30'E, 90–140 m, detritus sledge, mud, 19 Aug 1991; 3 paratypes (NMW.Z. 1992.007.1–2) and one additional specimen (mounted for SEM), Singlefjord, 59°04.5'N, 11°10.6'E, 78–84 m, detritus sledge, mud, 26 Aug 1991; 1 specimen (mounted for SEM), Singlefjord, 59°04.8'N, 11°10.8'E, 82–83 m, detritus sledge, mud, 15 Sep 1991. Skagerrak: 3 specimens, 58°08'N, 10°07'E, 295 m, grab, 27 Jun 1933; 1 specimen (ZMUU), 58°N, 09°33'E, 271 m, Agassiz trawl, 30 Jun 1933; 7 specimens (ZMUU), 58°02.5'N, 09°29.5'E, 478 m, Agassiz trawl, 30 Jun 1933; 1 specimen (ZMUU), 57°50'N, 08°51'E, 358 m, grab, 5 Jul 1933; 1 specimen (ZMUU), 57°41'N, 08°35'E, 191 m, grab, 6 Jul 1933; 6 specimens (ZMUU), 58°22'N, 10°34'E, 270 m, Agassiz trawl, 14 Jul 1933; 2 specimens (ZMUU), 58°30'N, 10°26'E, 300 m, Agassiz trawl, 15 Jul 1933. Faroes: 4 specimens (BIOFAR), 62°31.40'N, 05°02.30'W,

430 m, epibenthic sledge, 17 Jul 1987; 1 specimen (BIOFAR), 61°41.75'N, 05°47.71'W, 354 m, epibenthic sledge, 18 Jul 1987; 1 specimen (BIOFAR), 61°13.30'N, 04°46.50'W, 780 m, epibenthic sledge, 19 Jul 1987; 4 specimens (BIOFAR), 60°31.34'N, 08°25.07'W, 732 m, epibenthic sledge, 22 Jul 1987; 11 specimens (BIOFAR), 62°05.32'N, 10°06.71'W, 859 m, epibenthic sledge, 15 May 1988; 1 specimen (BIOFAR), 62°12.30'N, 03°59.54'W, 402 m, detritus sledge, 27 May 1989; 2 specimens (BIOFAR), 62°41.31'N, 10°03.90'W, 500 m, epibenthic sledge, 1 Jun 1989.

*Description*.—Body, excluding parapodia, cylindrical; venter flattened, without distinct longitudinal furrow. Median parapodia only slightly longer than anterior, posterior ones successively shorter, resulting body-outline of fairly constant width, tapering slowly posteriorly.

Prostomium rounded, as wide as long, anteriorly straight, posterior incision often indistinct (Fig. 4A), often more conspicuous on specimens with everted proboscis. Proximal parts of palps cylindrical, distal parts widest medially, anteriorly rounded (Fig. 4B); distal parts longer than proximal. Paired antennae without distinct ceratophores, as long as palps but thinner, with pointed tips. Median antenna widest medially, without distinctly pointed tip, inserted in front of anterior pair of eyes. Anterior pair of eyes rounded to reniform, slightly larger than posterior pair and situated farther apart; posterior pair rounded. Nuchal organs lateral to prostomium, not coalescing dorsally.

Large, distinct lip glands present (Fig. 4B). Proboscis short, smooth, divided into proximal and distal parts; distal part smaller (Fig. 4C). Terminal papillae 25–26 (observed in two specimens only; one 5.75 mm long for 26 segments, and one with posterior end missing), short (about 60–70  $\mu$ m) and blunt, distally ciliated, arranged in single ring.

Tentacular cirri distinctly annulated, rings from one to four times as long as wide, tips rounded. Dorsal ones of segment 2 longest



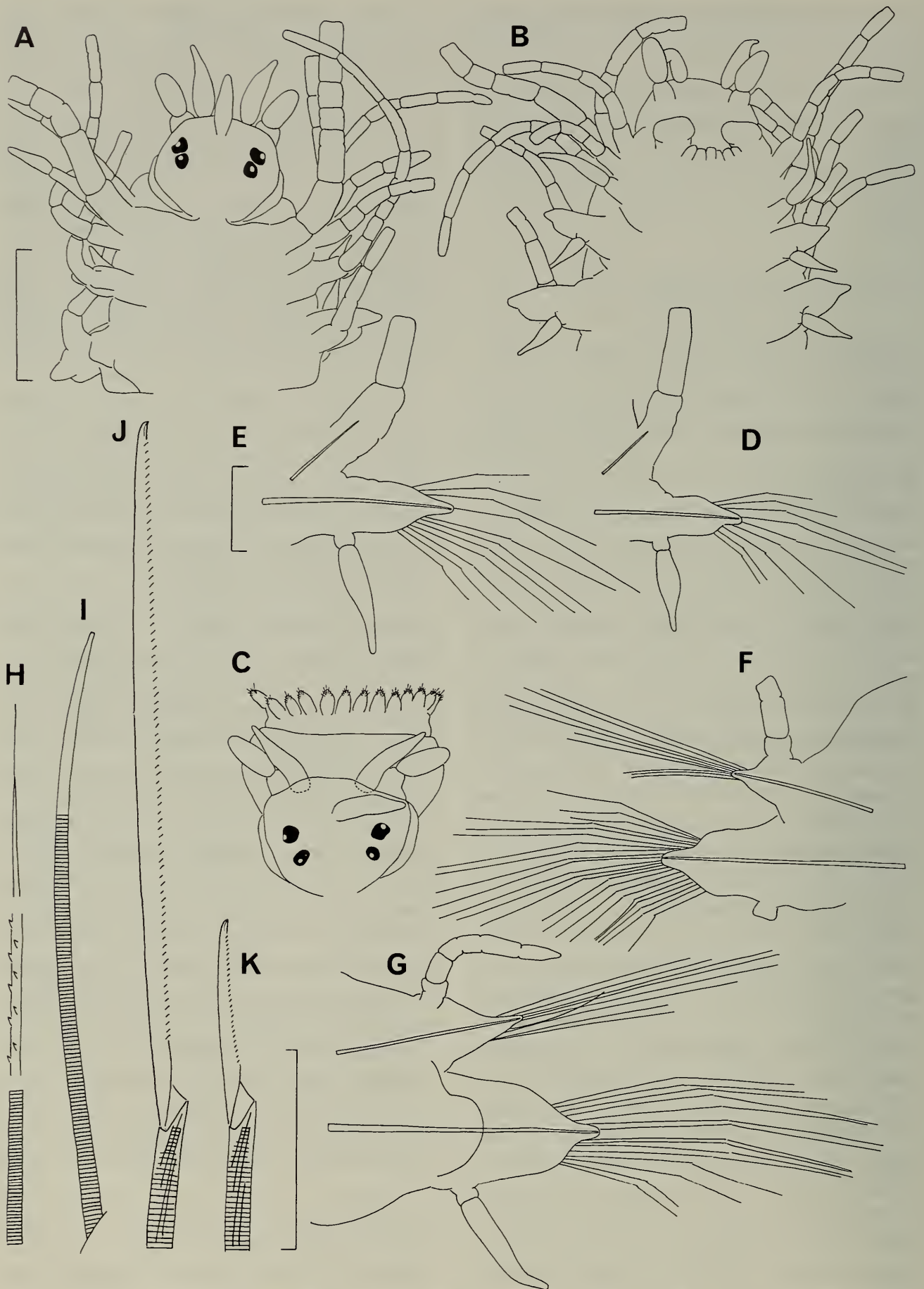


Fig. 4. *Gyptis mackiei*, new species. A. Anterior end, dorsal view. Setae omitted. B. Anterior end, ventral view. Setae omitted. C. Head end with protruded proboscis, dorsal view. D. Parapodium segment four, anterior view, ca. half number of setae shown. E. Parapodium segment five, anterior view, ca. half number of setae

and stoutest, reaching to about segment 12–16; ventral ones of segment 3 shortest, reaching to about segment 5, similar to following ventral cirri but larger. Single acicula present in all cirrophores of all dorsal tentacular cirri; not observed in ventral tentacular cirri (but may be present). Segment 1 reduced dorsally (possibly fused to segment 2), segment 2 fully developed.

Notopodia of segment 4 (setiger 1) with one notoacicula situated in cirrophores of dorsal cirri, without setigerous lobes or setae (Fig. 4D). Dorsal cirri similar to those of segment 3. Neuropodia similar to following ones but slightly smaller, with about 15 compound setae. Ventral cirri similar to following ones. Segment 5 similar to segment 4 but slightly larger (Fig. 4E).

Segment 6 similar to median ones but slightly smaller (Fig. 4F).

Notopodia of median segments with annulated dorsal cirri with from three to seven rings, shorter than notosetae, with pointed tips (Fig. 4G). Dorsal cirri without obvious differentiation in length and orientation. Notopodial lobes conical, with one or two (usually one) internal aciculae (smaller one difficult to detect), and from one to three emerging, anteriorly situated dorsally bent acicular setae (Fig. 4I). About 20–30 capillary setae inserted behind lobe, with smooth proximal parts and two alternating rows of teeth medially and subdistally (Fig. 4H). Serrated notosetae not observed.

Neuropodia of median segments conical, with single internal acicula and about 30–50 compound setae. Distal part of setal shafts internally reticulated (Fig. 4J, K). Blades of median and dorsal setae long, ventral ones short. A few dorsally situated serrated capillary setae occasionally present. Ventral cirri smooth or indistinctly annulated, as long

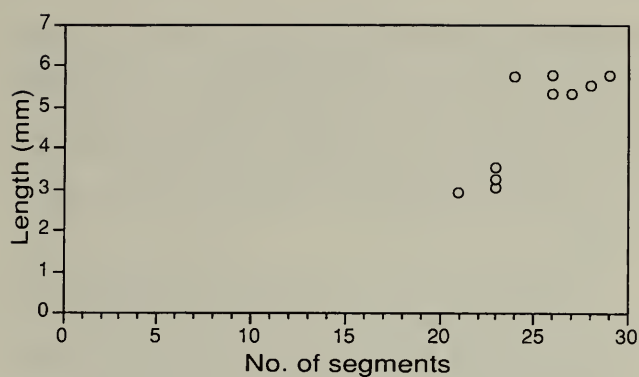


Fig. 5. *Gyptis mackiei*, new species. Relationship between number of segments and length. Specimens from Koster area, Sweden.

as or slightly longer than neuropodial lobe, on distinct cirrophores situated far back on the neuropodium.

Pygidium rounded. Pygidial cirri long, annulated, median papilla absent.

Color: Live specimens transparent with dark brown pigmentation forming transverse stripes dorsally on anterior and posterior sides of each segment, especially conspicuous on first dorsally visible segment. Eyes red. Eggs rose-colored, mature males whitish. Brown pigmentation fades in alcohol.

Measurements: Up to 5.75 mm long for 29 segments (see Fig. 5).

*Habitat.* — Found on mud bottoms from 78–859 m.

*Distribution.* — Northern part of Swedish west coast, Skagerrak, Faroes.

*Reproduction.* — Mature specimens found in January in Sweden; not fully mature specimens found in August. Eggs about 100  $\mu\text{m}$  in diameter.

*Remarks.* — In many hesionids the anterior parapodia are successively reduced during ontogeny (e.g., Blake 1975; Haaland and Shram 1983; Schram and Haaland 1984), and the first segment carrying setae and

← shown. F. Parapodium segment six, anterior view, ca. half number of setae shown. G. Parapodium segment 13, anterior view, ca. one third of setae shown. H. Acicular notoseta. I. Spiked capillary notoseta. J. Median neuroseta. K. Ventral neuroseta. A–C paratypes (NMW.Z. 1992.007.1–2), D–K specimen from Koster area, Sweden. Scales A–C, 0.25 mm; D–G, 0.1 mm; H–K, 50  $\mu\text{m}$ .

number of tentacular cirri should be compared between corresponding semaphoronts only. That the description above is based on adults is evidenced by the presence of sexual products in many of the specimens.

*Gyptis mackiei* is unique among hesionids in the character combination of "median antenna with dorsal insertion," and "neurosetae present but notosetae absent on segment 4 and 5." It is united with other species of *Gyptis* by the place of insertion of median antenna, by the presence of a large number of proboscideal papillae, by the absence of furcate setae, and by the absence of noto- but presence of neurosetae on segment 5.

*Gyptis mackiei* seems closely related to *G. propinqua* and the two species are rather similar in general appearance. In addition to the fourth setigerous segment *G. mackiei* differs in having a median antenna which is widest in its midregion rather than subdistally, in its prostomium being less deeply incised posteriorly, in having much shorter and more pointed dorsal cirri, and in having rose-colored rather than colorless eggs.

Eliason's specimens from Gullmarsfjord and of the Skagerrak-Expedition 1933 constitute a mixture of *G. rosea* and *G. mackiei*; they have now been relabelled.

*Etymology*.—This species is named for Andrew Mackie, friend and collaborator.

*Gyptis mediterranea*, new species

Figs. 6–8, 12

*Material examined*.—France: 3 paratypes (NMW.Z.1992.007.3), Banyuls-sur-Mer, 42°29.92'N, 03°09.22'E, 35 m, dredge, sandy mud with detritus, 3 Oct 1991; holotype (SMNH 4398), 7 paratypes (SMNH 4399, 4400), and 4 additional specimens mounted for SEM, Banyuls-sur-Mer, Cap Oullestrell, 42°30.17'N, 03°09.48'E, 40 m, dredge, mud, 7 Oct 1991; 13 paratypes (SMNH 4401), Banyuls-sur-Mer, 42°30.00'N, 03°11.75'E, 80 m, dredge, mud, 13 Oct 1991.

Italy: 1 specimen, eastern Sicily, Brucoli, 37°17'N, 15°13'E, 60 m, dredge, mud, 21 May 1990.

*Description*.—Body, excluding parapodia, cylindrical, tapering posteriorly; venter flattened without distinct median longitudinal furrow. Parapodia long, often directed anteriorly, median ones longest, yielding elliptical and flattened outline of animal.

Prostomium trapezoidal with rounded corners (Figs. 6A, 7A), with small posterior incision (often visible only in SEM). Proximal parts of palps cylindrical, distal parts thinner, narrowing to rounded ends. Proximal parts slightly longer than distal. Paired antennae slightly shorter and narrower than palps, with thin tips, situated on small ceratophores. Median antenna cylindrical, ending without well defined, prolonged tip, inserted on line between anterior pair of eyes. Anterior pair of eyes rounded, larger than posterior pair and situated farther apart, posterior pair rounded, both pairs with lenses. Nuchal organs lateral to prostomium, not dorsally coalescing (Fig. 7B).

Lip glands absent (Fig. 6B). Proboscis divided in proximal and distal parts. Proximal part larger and longer, with small, poorly defined papillae (Fig. 7A); distal part short and smooth. Number of terminal papillae size-dependent (Fig. 12), about 20–32. Papillae long (ca. 60–70  $\mu$ m) and thin with ciliated tips, arranged in single ring (Fig. 7C).

Tentacular cirri thin, annulated (not always obvious proximally) with rings (one to three times as long as wide), tips distinctly pointed. Dorsal tentacular cirri of segment 2 longest, reaching to about segment 10–12, ventral tentacular cirri of segment 3 shortest, reaching to about segment 5–6. Cirri of segment 3 and 4 more ventrally displaced than anterior ones. Aciculae present in all cirrophores of tentacular cirri (small accessory ones not observed but may be present). Segment 1 dorsally reduced, segments 2 and 3 dorsally fused.

Notopodia of segment 5 (setiger 1) with

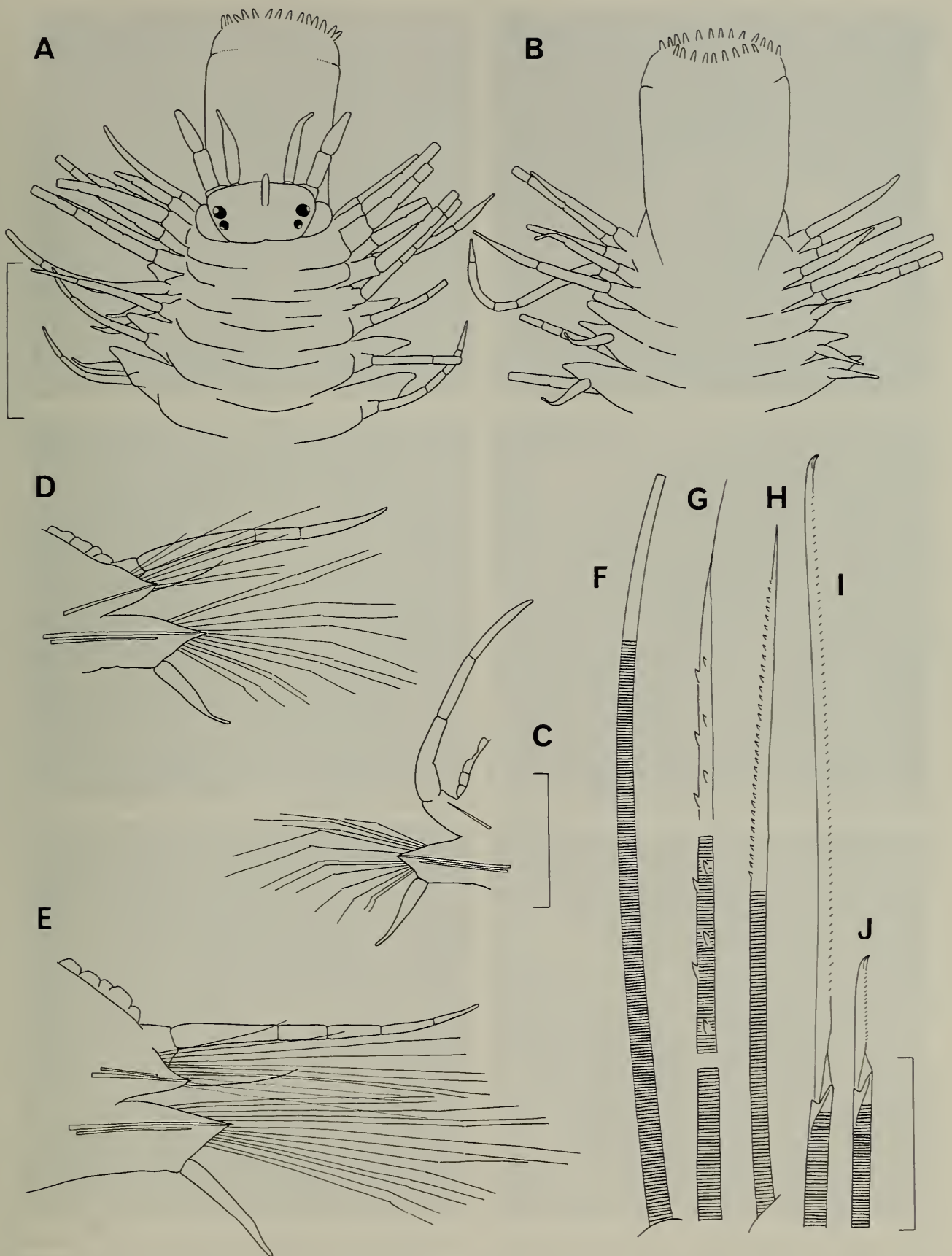


Fig. 6. *Gyptis mediterranea*, new species. A. Anterior end, dorsal view. Setae omitted. B. Anterior end, ventral view. Setae omitted. C. Parapodium segment five, anterior view. D. Parapodium segment six, anterior view, ca. half number of setae shown. E. Parapodium segment 14, anterior view, ca. half number of setae shown. F. Acicular notoseta. G. Spiked capillary notoseta. H. Serrated capillary notoseta. I. Median neuroseta. H. Serrated capillary notoseta. I. Median neuroseta. J. Ventral neuroseta. A–B holotype, C paratype (SMNH 4401), D–J paratype (SMNH 4399). Scales A–B, 0.5 mm; C–E, 0.25 mm; F–J, 50  $\mu$ m.

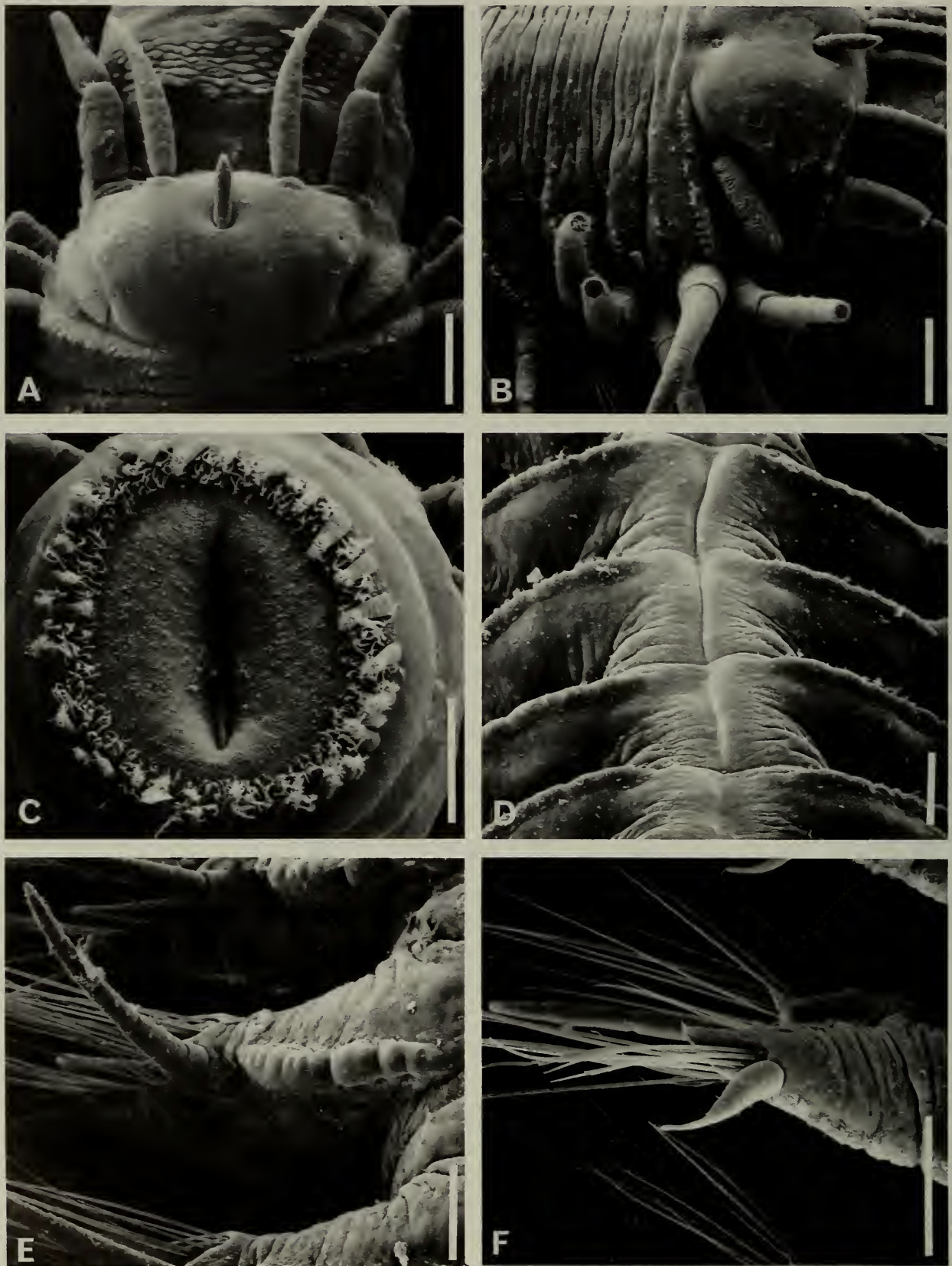


Fig. 7. SEM micrographs of *Gyptis mediterranea*, new species. A. Anterior end, dorsal view. B. Anterior end, right side. C. Terminal ring of proboscis, anterior view. D. Anterior-dorsal view of dorsum, median segments. E. Median parapodium, left side, postero-dorsal view. F. Median parapodium, right side, antero-ventral view. Specimens from Banyuls, southern France. Scale lines, 0.1 mm.

one notoacacula in cirrophores of dorsal cirri, without setigerous lobes or setae. Dorsal cirri similar to those of segment 4. Neuropodia similar to following ones but slightly smaller and with fewer setae (Fig. 6C). Ventral cirri similar to following ones. Segment 6 similar to median ones but slightly smaller (Fig. 6D).

Elevated dorsal ridges present across posterior side of each segment (Fig. 7D, E), less distinct on anterior segments and more pronounced on median and posterior ones. In one specimen the ridges are provided with distinct cylindrical papillae (length ca. 15  $\mu\text{m}$ ).

Notopodia of median segments with more or less distinctly annulated dorsal cirri (smooth proximally), with about five rings, about three times as long as wide. Dorsal cirri shorter than setae, inserted posteriorly to those (Fig. 6E). All dorsal cirri thin, of approximately similar length, but those of segment 5, 8, 10, 12, 15, 17, 19, 21, and 23 oriented slightly more dorsally than other ones (best observed on live specimens). Notopodial lobes conical, with one or two internal aciculae (small one difficult to detect) and from zero to four emerging, dorsally bent acicular setae, situated anteriorly to other setae (Fig. 6F); tapering but terminated bluntly, often with fine spines distally. Large number of long capillary setae inserted behind lobe, median ones twice as long as dorsal and ventral ones, with smooth proximal parts and two alternating rows of medial and subdistal teeth (Fig. 6G). A few serrated notosetae usually present, situated ventrally (Fig. 6H).

Neuropodia of median segments conical, usually with two internal aciculae, one large and one small, about 20–40 compound setae, and, occasionally, one or two dorsally serrated capillaries. Distal part of setal shafts with transverse striation internally. Blades thin, dorsal side from distinctly serrated to almost smooth, median and dorsal ones long (Fig. 6I), ventral ones shorter (Fig. 6J). A few additional serrated capillary setae often

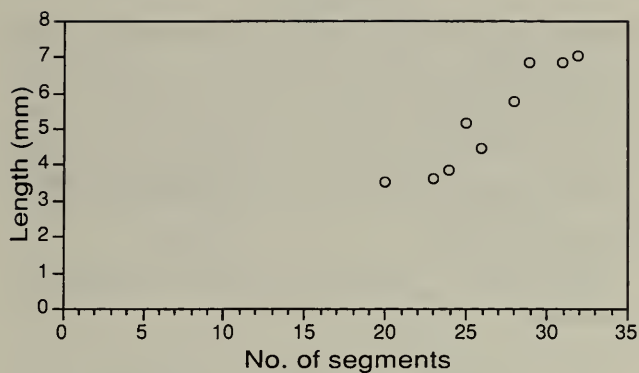


Fig. 8. *Gyptis mediterranea*, new species. Relationship between number of segments and length. Specimens from Banyuls, southern France.

present, situated dorsally. Ventral cirri smooth with fine tapering tips (Fig. 7F), without cirrophores, situated distally on neuropodium.

Pygidium rounded. Pygidial cirri annulated, longer than dorsal cirri, with pointed tips, median papilla absent.

Color: Live specimens transparent. Eyes red. Small brown pigment spots may be present ventrally on posterior side of parapodia. Eggs colorless. Preserved specimens white, brown spots retained.

Measurements: Up to 7 mm long for 32 segments (see Fig. 8).

*Habitat.* — Mud and sandy mud from 35–80 m.

*Distribution.* — Presently known only from southern France and eastern Sicily.

*Reproduction.* — Several of the specimens collected in Banyuls in October were mature females with an egg size of 50–60  $\mu\text{m}$  in diameter. No males observed.

*Remarks.* — Within *Gyptis* *G. rosea* and *G. mediterranea* are unique in having distally inserted ventral cirri. They share with *G. hians* Fauchald & Hancock, 1981, the elliptical and flattened body-shape, but the latter differs in having ventral cirri inserted subdistally, and in having the distal part of setal shafts internally reticulated rather than striated.

*Gyptis mediterranea* differs from *G. rosea* in being smaller, having red rather than black eyes, having a median antenna without ex-

tended tip, having a smaller number of terminal proboscis papillae (even when adjusted for size; see Fig. 12), having shorter dorsal cirri, having much more pronounced dorsal ridges, and in having colorless rather than pink eggs.

*Etymology.*—Named for the Mediterranean Sea.

*Gyptis rosea* (Malm, 1874)

Figs. 9–12

*Ophiodromus roseus* Malm, 1874. (p. 82)

*Gyptis rosea.*—Haaland & Schram, 1982.—

Eliason, 1962 (p. 238–240, fig. 9), in part.

[Not *Gyptis rosea* sensu Hartmann-Schröder, 1971:132–134, fig. 42.—Helgason et al., 1990:205]

*Material examined.*—Sweden: Holotype (NHMG 901), Gullmarsfjord, 45 fathoms, mud; 2 specimens (NHMG 12805a & b), Gullmarsfjord, Skår, 110 m, mud, 25 May 1963; 1 specimen, Singlefjord, 59°04.9'N, 11°10.8'E, 80 m, detritus sledge, mud, 27 Dec 1988; 2 specimens, Singlefjord, 59°04.9'N, 11°10.8'E, 80 m, detritus sledge, mud, 14 Jun 1989; 2 specimens, Koster area, W Svartskär, 58°54.5'N, 11°05.0'E, 100–150 m, dredge, mud, 22 Sep 1989; 6 specimens (2 mounted for SEM), Singlefjord, 59°04.9'N, 11°10.8'E, 80 m, detritus sledge, mud, 11 Apr 1990; 1 specimen, Koster area, S Yttre Vattenholmen, 58°52.1'N, 11°06.9'E, 50–100 m, dredge, mud, 1 Oct 1990; 3 specimens (mounted for SEM), Singlefjord, 59°04.9'N, 11°10.8'E, 83 m, detritus sledge, mud, 26 Feb 1991; 1 specimen, Koster area, S Yttre Vattenholmen, 58°52.1'N, 11°06.9'E, 80–140 m, dredge, mud, 17 Aug 1991; 5 specimens, Singlefjord, 59°04.5'N, 11°10.6'E, 82–84 m, detritus sledge, mud, 2 Sep 1991; 2 specimens (1 mounted for SEM), Koster area, S Yttre Vattenholmen, 58°52.0'N, 11°06.6'E, 100–110 m, detritus sledge, mud, 7 Sep 1991; 5 specimens, Singlefjord, 59°04.8'N, 11°10.8'E, 82–83 m, detritus sledge, mud, 15 Sep 1991. Skagerrak: 3 specimens

(ZMUU), 58°08'N, 10°07'E, 295 m, grab, 27 Jun 1933; 2 specimens (ZMUU), 58°2.5'N, 09°29.5'E, 478 m, grab, 30 Jun 1933; 1 specimen (ZMUU), 58°02.5'N, 09°29.5'E, 427 m, grab, 1 Jul 1933; 1 specimen (ZMUU), 58°21'N, 08°56'E, 225 m, grab, 2 Jul 1933; 1 specimen (ZMUU), 58°02.7'N, 08°13.5'E, 241 m, grab, 4 Jul 1933; 4 specimens (ZMUU), 57°50'N, 08°51'E, 358 m, grab, 5 Jul 1933; 1 specimen (ZMUU), 57°45'N, 08°07'E, 421 m, grab, 6 Jul 1933; 3 specimens (ZMUU), 57°52'N, 08°01'E, 510 m, Agassiz trawl, 6 Jul 1933; 2 specimens (ZMUU), 57°58'N, 06°44'E, 384 m, grab, 7 Jul 1933; 1 specimen (ZMUU), 58°59.5'N, 06°27'E, 290 m, dredge, 12 Jul 1933; 6 specimens (ZMUU), 58°22'N, 10°34'E, 270 m, Agassiz trawl, 14 Jul 1933; 5 specimens (ZMUU), 58°30'N, 10°26'E, 300 m, Agassiz trawl, 15 Jul 1933; 1 specimen (ZMUU), 58°30'N, 10°32.5'E, 175 m, Agassiz trawl, 15 Jul 1933; 1 specimen, 57°59'N, 08°40'E, 500 m, RP-sledge, 15 Mar 1990; 1 specimen, 57°49.5'N, 08°12.5'E, 500 m, RP-sledge, 15 Mar 1990.

*Description.*—Body, excluding parapodia, cylindrical, tapered posteriorly; venter flattened, with distinct median longitudinal furrow. Parapodia long, median ones longest, resulting in elliptical and flattened outline of animal.

Prostomium rounded rectangular to trapezoidal, almost twice as wide as long (Fig. 9A), with small posterior incision (often not visible except in SEM; Fig. 10A). Proximal parts of palps cylindrical, distal parts thinner, anteriorly rounded; proximal and distal parts of equal length. Paired antennae without ceratophores, as long as palps but thinner, with prolonged tips. Median antenna similar in shape to frontal ones but smaller, inserted just in front of anterior pair of eyes. Anterior and posterior pairs of eyes small, rounded; anterior pair slightly larger. Nuchal organs lateral to prostomium, not coalescing dorsally.

Lip glands absent. Proboscis divided into proximal and distal parts (not obvious on

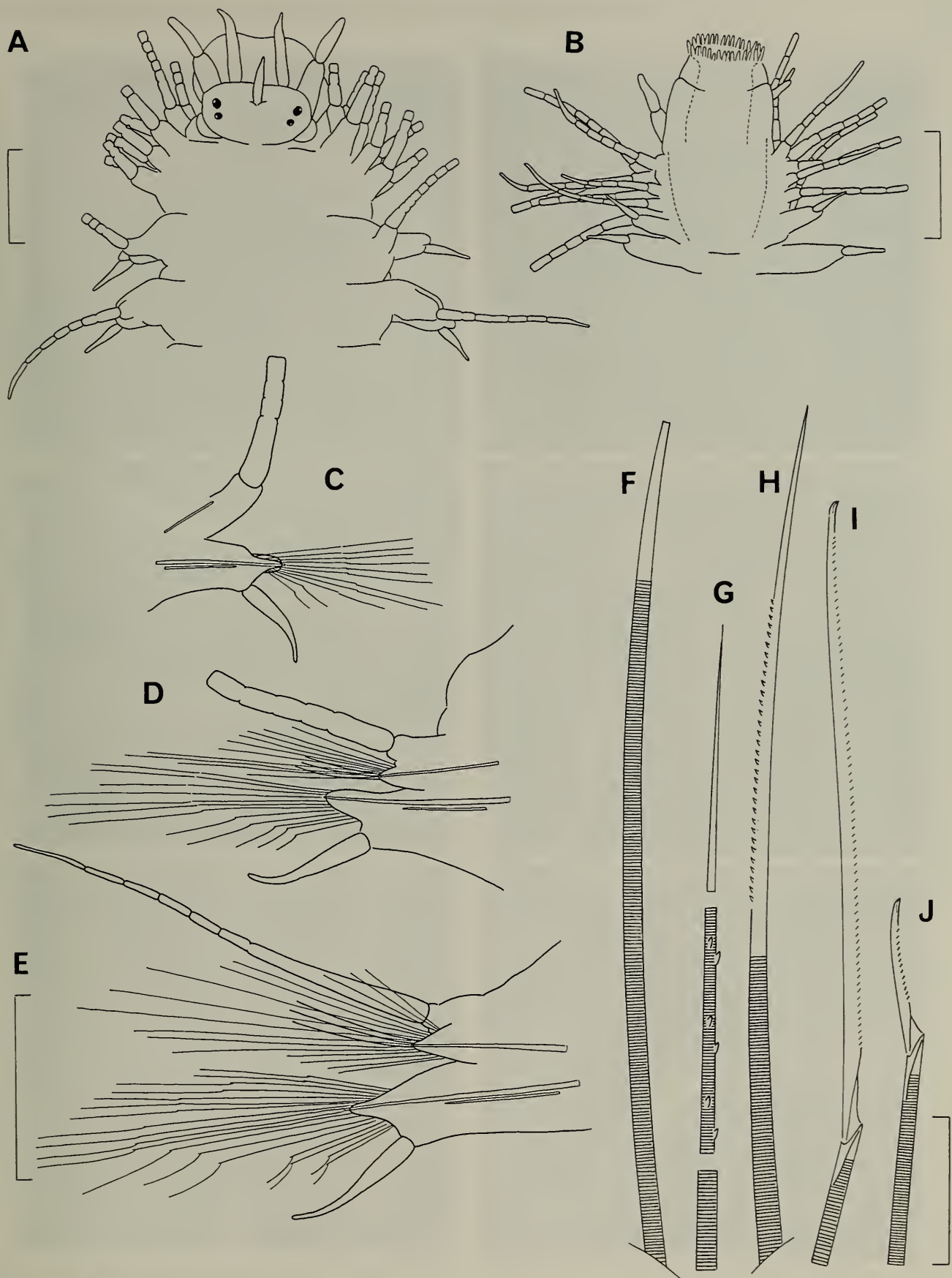


Fig. 9. *Gyptis rosea*. A. Anterior end, dorsal view. Proboscis partly everted. Setae omitted. B. Anterior end with proboscis everted (some papillae lacking), ventral view. Setae omitted. C. Right parapodium, segment 5, posterior view. Full number of setae (ca. 30) not shown. D. Right parapodium, segment 6, anterior view. Full number of notosetae (ca. 25) or neurosetae (ca. 40) not shown. E. Right parapodium, segment 21, anterior view. Full number of notosetae (ca. 40) or neurosetae (ca. 40) not shown. F. Acicular notoseta. G. Spiked capillary notoseta. H. Median neuroseta. I. Ventral neuroseta. Specimens from Singlefjord and Koster area. Scales A-B, 0.5 mm; C-E, 0.25 mm; F-I, 50  $\mu$ m.



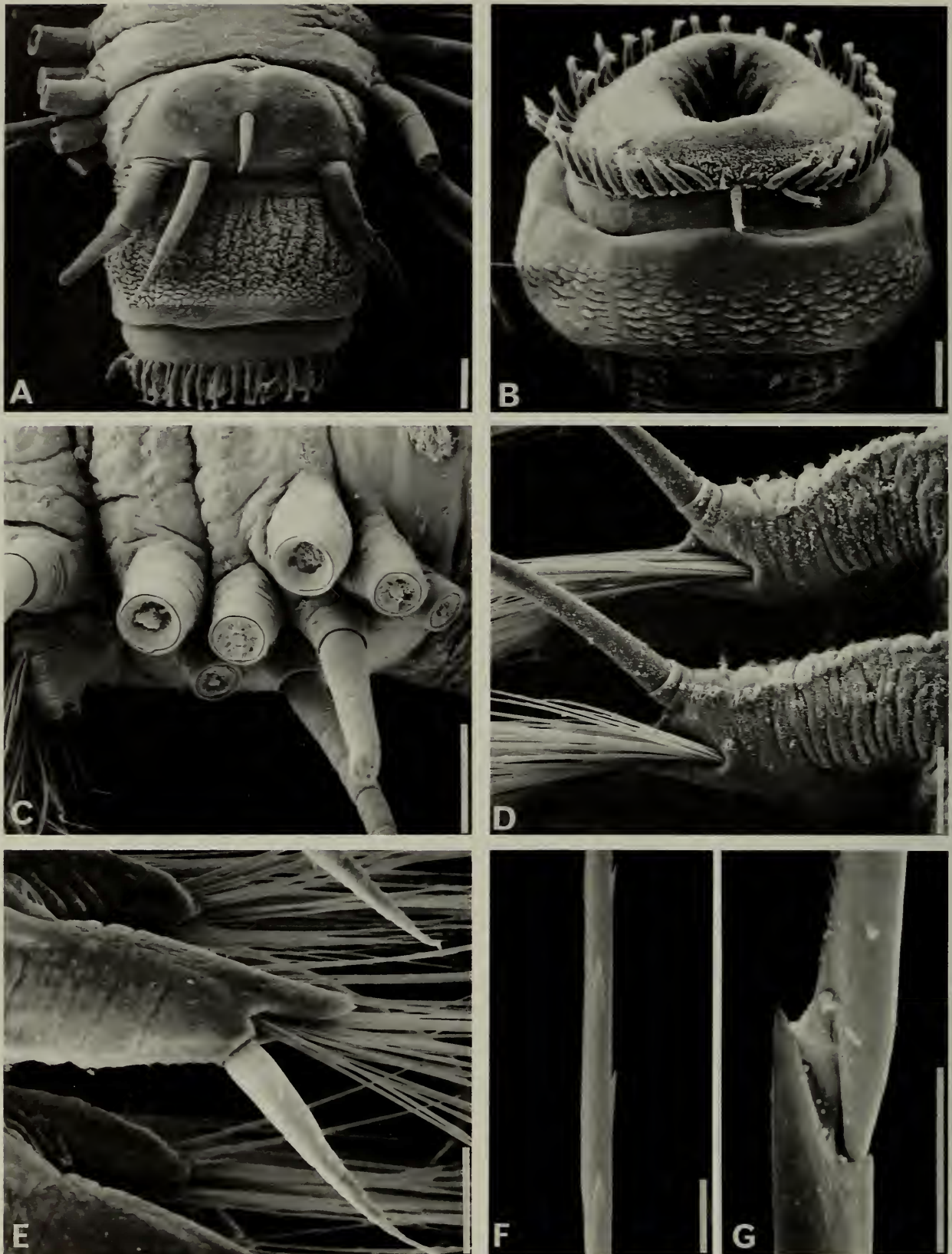


Fig. 10. SEM micrographs of *Gyptis rosea*. A. Anterior end, dorsal view. B. Distal part of proboscis, ventral view. C. Insertion of tentacular cirri, right side. D. Parapodia from segment 25-26, right side, antero-dorsal view. E. Parapodium from segment 11, left side, antero-ventral view. F. Spiked capillary notoseta from median segment. G. Articulation between shaft and blade of median neuroseta from segment 18. Specimens from Singlefjord, Sweden. Scales A-E, 0.1 mm; F-G, 10  $\mu$ m.

specimens with strongly extended proboscides) (Fig. 9B). Proximal part larger and longer, covered with poorly defined, diffusely distributed papillae, about 30–40  $\mu\text{m}$  in diameter (Fig. 10A) (surface appearing slightly rugose in lower magnifications); distal part short and smooth. Number of terminal papillae size-dependent (Fig. 12), about 35–80. Papillae long and thin with ciliated tips (Fig. 10B), arranged in single ring (may appear as several rings in specimens with proboscis incompletely protruded).

Tentacular cirri thin, annulated (not always obvious proximally) with median rings about three times as long as wide, tips distinctly pointed. Dorsal tentacular cirri of segment 2 longest, reaching to about segment 12–18; ventral tentacular cirri of segment 3 shortest, reaching to about segment 5–7. Cirri of segment 3 and 4 more ventrally displaced than anterior ones (Fig. 10C). Single acicula present in all cirrophores of tentacular cirri except ventral ones of segment 3 and 4, which have double ones (smaller ones difficult to detect).

Anterior segmental delineations not very distinct. Segment 1 reduced dorsally except for small middorsal part (Fig. 10A), segments 2 and 3 appearing fused dorsally, following segments fully developed.

Notopodia of segment 5 (setiger 1) with one notoacicula situated in cirrophore of dorsal cirrus, but without setigerous lobes or setae. Dorsal cirri similar to those of segment 4. Neuropodia similar to following ones but shorter (Fig. 9C). Ventral cirri similar to following ones. Segment 6 similar to median ones but smaller (Fig. 9D).

Notopodia of median segments with more or less distinctly annulated dorsal cirri (smooth proximally), with about eight to ten rings; median rings about three times as long as wide (Fig. 9E). Dorsal cirri thin, longer than notosetae, inserted posteriorly to those (Fig. 10D). All dorsal cirri of similar length, those of segment 5, 8, 10, 12, 15, 17, 19, 21, 23 and 26 oriented slightly more dor-

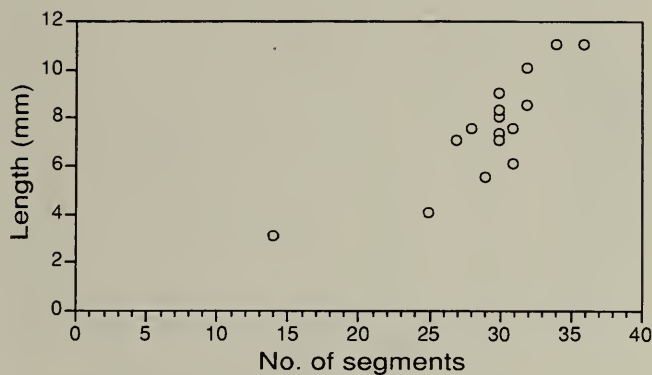


Fig. 11. *Gyptis rosea*. Relationship between number of segments and length. Specimens from Koster area and Singlefjord, Sweden.

sally than other ones (best observed on live specimens). Notopodial lobes conical, usually with two internal aciculae (one small and difficult to detect) and from one to six (usually from three to five) emerging, dorsally bent acicular setae, situated anteriorly to other setae (Fig. 9F), tapering but terminated bluntly, occasionally with fine spines distally. Large number of long capillary setae inserted behind lobe, median ones twice as long as dorsal and ventral ones, with smooth proximal parts and two alternating rows of teeth medially and subdistally (Figs. 9G, 10F). A few serrated notosetae situated ventrally occasionally present (Fig. 9H).

Neuropodia of median segments conical to rounded, usually with two internal aciculae, one large and one small, and about 40–50 compound setae (Fig. 10G). Distal part of setal shafts with internal transverse striation. Blades thin, dorsal side varying from distinctly serrated to almost smooth; median and dorsal ones long (Fig. 9I), ventral ones short (Fig. 9J). A few additional serrated capillary setae may occur dorsally (difficult to detect). Ventral cirri smooth with fine, evenly tapering tips (Fig. 10E), situated distally on neuropodium, without cirrophores.

Pygidium rounded. Pygidial cirri very long, annulated, median papilla absent.

Color: Live specimens transparent, stomach yellowish to orange. Mature females

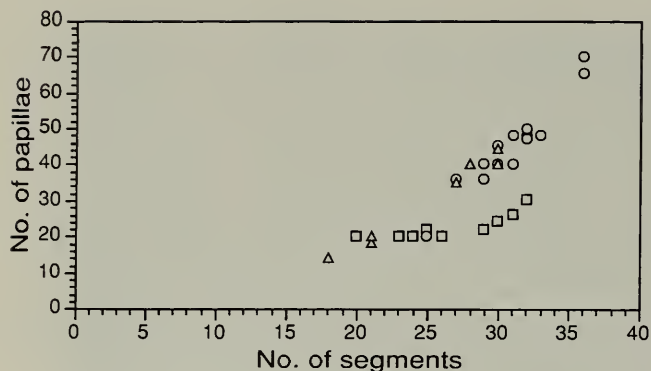


Fig. 12. Relationship between number of segments and number of terminal proboscideal papillae in *Gyptis propinqua* (triangles), *G. mediterranea*, new species (squares), and *G. rosea* (circles).

pink-orange. Eyes dark brownish-black. Dark brown pigment spots may be present dorsally and ventrally on posterior side of parapodia. Preserved specimens yellowish-white. Brown pigment usually retained.

Measurements: Up to 11 mm long for 36 segments (see Fig. 11).

*Habitat*.—Mud bottoms from 50–510 m.

*Distribution*.—Presently known only from Skagerrak, Oslofjord and northern part of Swedish west coast.

*Reproduction*.—Females with eggs found in Sweden in April and August, the former immature. Mature eggs bright pink-orange, small, about 50–60  $\mu\text{m}$  in diameter. The holotype is full of eggs which may explain Malm's choice of specific name; "rosea" indicating the color of the live mature female.

*Remarks*.—Eliason's specimens from Gullmarsfjord and the Skagerrak-Expedition of 1933 constitute a mixture of *G. rosea* and *G. mackiei*, and have not been re-labelled. His description (Eliason 1962), however, clearly is based on specimens of *G. rosea*. Haaland & Schram (1982) provided descriptions of both adults and juvenile stages from Oslofjord. For previous synonymy with *G. propinqua*, see Remarks for that species.

#### *Amphiduros* Hartman, 1959

*Amphiduros* Hartman, 1959:182 (replacement name for *Amphidromus* Hesse, 1925).

*Type species*.—*Amphidromus setosus* Hesse, 1925, by subsequent designation (Hartman 1959:182).

*Diagnosis (provisional)*.—Hesionids with two palps and two frontal antennae. Median antenna present, inserted dorsally on prostomium. Proboscis without terminal papillae. Jaws absent. Segment 5 without notopodia or notosetae, with neuropodia and neurosetae. Following parapodia with well-developed noto- and neuropodia and large number of noto- and neurosetae. Furcate notosetae absent.

*Remarks*.—*Amphiduros* is presently separated from *Gyptis* solely on the absence of terminal ring of proboscideal papillae. One of the states (presence or absence of papillae) is presumably ancestral, and the genus defined on that state may be paraphyletic unless supported by other characters. The matter warrants further investigation.

#### *Amphiduros fuscescens* (Marenzeller, 1875), new combination Fig. 13

*Oxydromus fuscescens* Marenzeller, 1875:  
143–146, pl.2, fig. 1.

*Material examined*.—Italy: 1 syntype, (NHMW 2446), Trieste, St. Servola, 3–4 m, stones with bore-holes; 1 specimen, eastern Sicily, Acitrezza, 37°33.5'N, 15°11.1'E, 42–45 m, dredge, muddy sand, 5 Apr 1990; 1 specimen, eastern Sicily, Brucoli, 37°17.1'N, 15°12.6'E, 24 m, SCUBA, mixed bottom with gravel, boulders and algae, 23 Apr 1990. France: 1 specimen (NMW), Banyuls-sur-Mer, Ile Grosse, 42°29.0'N, 03°08.1'E, 10 m, SCUBA, shell gravel, 13 Oct 1991; 1 specimen, Banyuls-sur-Mer, Ile Grosse, 42°29.0'N, 03°08.1'E, 10 m, SCUBA, shell gravel, 13 Oct 1991; 2 specimens, Banyuls-sur-Mer, Cap Oullestrel, 42°30.22'N, 03°08.30'E, 18 m, dredge, shell gravel, 15 Oct 1991. Israel: 4 specimens, Elat, 28°30'N, 34°34'E, 4 m, SCUBA, 8 Mar 1986.

*Description*.—Body, excluding parapodia, cylindrical, venter flattened, with distinct median longitudinal furrow (in larger

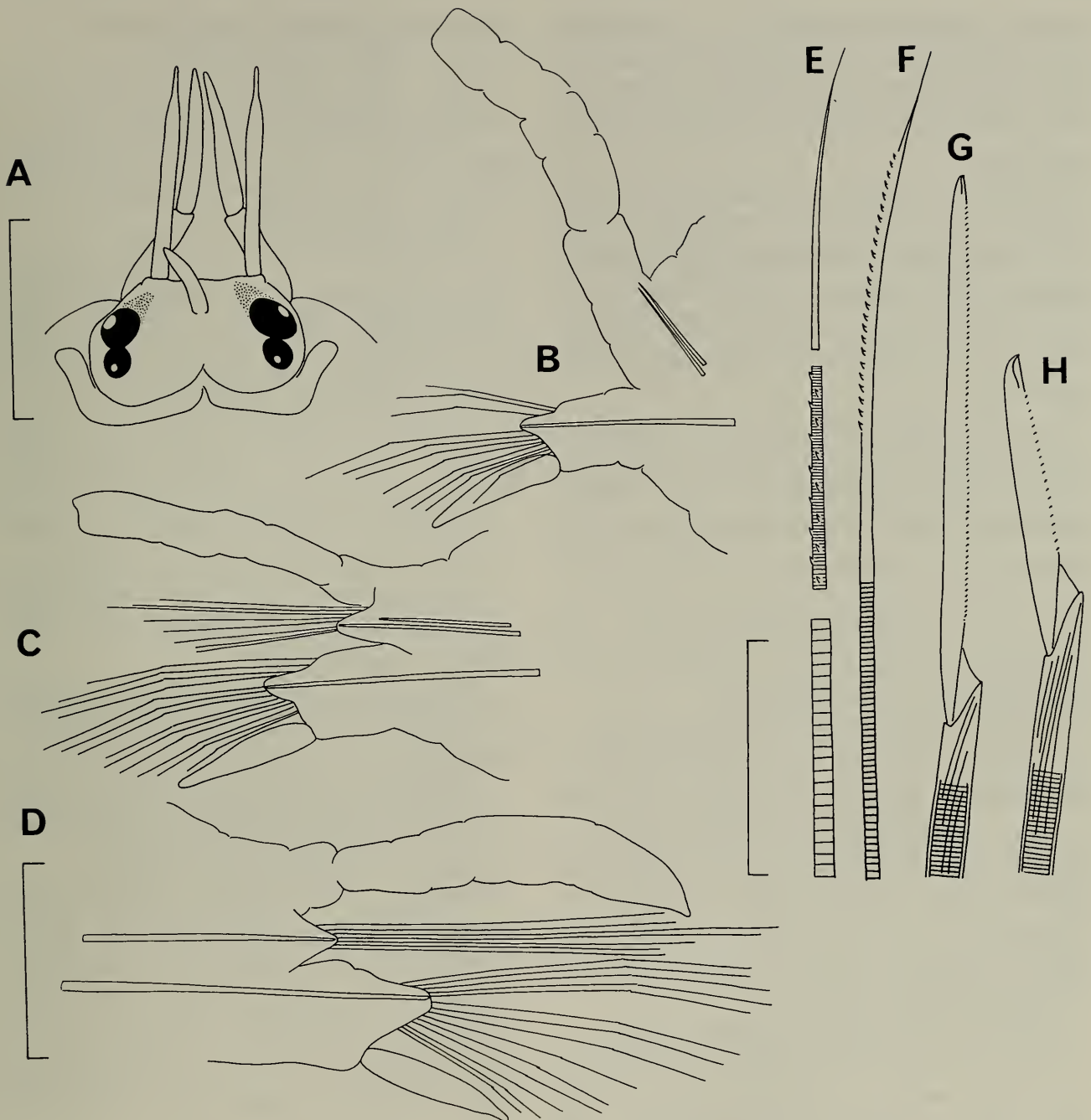


Fig. 13. *Amphiduros fuscescens*. A. Prostomium, dorsal view. B. Parapodium segment 5, anterior view, ca. half number of setae shown. C. Parapodium segment 6, anterior view, ca. half number of setae shown. D. Parapodium segment 14, anterior view, ca. one-third of number of setae shown. E. Spiked capillary notoseta. F. Serrated capillary notoseta. G. Median neuroseta. H. Ventral neuroseta. A & E-H specimens from eastern Sicily, B-D specimens from Banyuls, southern France. Scales A, 0.5 mm; B-D, 0.25 mm; E-H, 50  $\mu$ m.

specimens only). Median parapodia only slightly longer than anterior ones, posterior ones successively shorter, resulting body-outline of fairly equal width with slowly tapered posterior end.

Prostomium wider than long, anteriorly straight, laterally and posteriorly with rounded lobes separated by deep posterior incision (Fig. 13A). Palps long and thin,

proximal parts cylindrical, distal parts tapering to a point. Proximal and distal parts of equal length. Paired antennae situated on small ceratophores, as long as palps, slightly more slender, with drawn-out tips tapering to a point. Median antenna pointed, much shorter than paired ones, inserted on line between anterior side of anterior pair of eyes. Eyes very large with lenses; anterior eyes

twice as large as posterior. Eye pigment poorly delineated, spreading across anterior part of prostomium. Nuchal organs lateral to prostomium, coalescing dorsally, large and distinct.

Lip glands absent. Proboscis smooth, divided in proximal and distal parts; proximal part slightly larger. Terminal ring of papillae lacking, dense ciliation present. One small specimen (anterior end, 3.0 mm for 11 segments) with (probably) 10 papillae in terminal ring.

No specimen observed with complete tentacular cirri, but dorsal ones of segments 3 and 4 much stouter than others. Ventral tentacular cirri shorter and thinner than dorsal. Cirri of segments 3 and 4 more ventrally displaced than anterior ones. Tentacular cirri without obvious annulation, all situated on long and large cirrophores with several (2–6) internal aciculae.

Anterior segmental delineations uncertain, segment 1 probably reduced dorsally. Notopodia of segment 5 (setiger 1) with two notoaciculae situated in cirrophores of dorsal cirri, but without setigerous lobes or setae (Fig. 13B). Dorsal cirri as stout as those of segment 4. Neuropodia and ventral cirri similar to following ones. Segment 6 similar to median ones (Fig. 13C).

Notopodia of median segments with short dorsal cirri, lacking apparent annulation; subdistally widened and tapering to a point (Fig. 13D). Notopodial lobes conical, with one or two internal aciculae, without emerging acicular setae. Large number of capillary setae (ca. 20–30) inserted behind lobe, with smooth proximal parts and double rows of small teeth medially and subdistally (Fig. 13E). A few, ventrally situated serrated notosetae present (Fig. 13F).

Neuropodia of median segments conical, with one or two internal aciculae and a large number of stout compound neurosetae. Distal part of setal shafts internally reticulated. Blades of median (Fig. 13G) and dorsal setae much longer than ventral (Fig. 13H). Ventral cirri smooth, tapering to a point; inserted distally without cirrophores.

Pygidium rounded. Pygidial cirri not observed, median papilla absent.

Color: Live specimens with white pigment spots distally on dorsal cirri. Eyes orange. Eggs dark red. Preserved specimens yellowish, white pigment spots and red color of eggs disappear.

Measurements: No entire, non-regenerating Mediterranean specimens observed. Measurements for most complete specimens: length 15 mm, width 3.3 mm for 28 segments (posterior end lacking); length 6.2 mm, width 1.5 mm for 27 segments (regenerating). Two of the Gulf of Aqaba specimens (see Remarks) are complete: length 14 mm, width 3.2 mm for 40 segments; length 10 mm, width 2.4 mm for 37 segments.

*Habitat.*—Stones and coarse shell gravel from 2–45 m. One specimen from Sicily found in muddy sand.

*Distribution.*—Southern France, eastern Sicily, northern Adriatic, Gulf of Aqaba (see Remarks).

*Reproduction.*—Females with eggs found in May at Sicily and March in Gulf of Aqaba, about 100–110  $\mu\text{m}$  in diameter.

*Remarks.*—The newly collected specimens are in good agreement with Marenzeller's type. According to his original description this species should have black rather than orange eyes. What is remaining of eye pigment on his type, however, suggests reddish (or orange) rather than black eyes.

The Gulf of Aqaba specimens are in good condition and could not be distinguished from Mediterranean ones. Common Mediterranean and Red Sea distribution may, however, not be very common, and until further material is available these specimens are labelled *Amphiduros* cf. *fuscescens*.

Fauvel (1923) and Hartman (1959) synonymized *A. fuscescens* (as *Oxydromus*) with *Gyptis propinqua*. This is obviously incorrect, and the species differ in many respects, most notably size, proboscideal papillation, and annulation, shape and length of dorsal and ventral cirri.

Key to European Species of  
*Amphiduros* and *Gyptis*

- 1. Prostomium wider than long, lip glands absent, ventral cirri inserted distally ..... 2
- Prostomium as wide as long, lip glands present, ventral cirri inserted subdistally ..... 4
- 2. 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 notosetae present ..... 3
- Eyes large with poorly delineated pigment, adults without terminal papillae on proboscis, dorsal cirri subdistally widened, not annulated, acicular notosetae absent *A. fuscescens*
- 3. 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 setae, distinct elevated dorsal ridges absent ... *G. rosea*
- Median antenna without delineated tip, eyes red, proboscis of adults with less than 35 papillae in terminal ring, dorsal cirri not reaching farther than setae, distinct elevated dorsal ridges present ..... *G. mediterranea*
- 4. Median antenna widest subdistally, adults (> ca. 20 segments) with neurosetae from segment five, dorsal cirri much longer than setae ..... *G. propinqua*
- Median antenna widest medially, adults with neurosetae from segment four, dorsal cirri much shorter than setae ..... *G. mackiei*

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#### Appendix

Checklist of species and subspecies of *Amphiduros* and *Gyptis*, with notes on material examined.

*Amphiduros axialensis* Blake & Hilbig, 1990. Hydrothermal vents of northeast Pacific, Juan de Fuca Ridge. Type material NMCA. No material examined.

*A. fuscescens* (Marenzeller, 1875), new combination. As *Oxydromus fuscescens*. Muggia, Trieste, Adriatic. Syntype (NHMW) and non-types (SMNH, NMW) examined.

*A. izukai* (Hessle, 1925). As *Amphidromus izukai*. Japan. Syntype (ZMUU) examined. Synonymous to *A. setosus* (Hessle, 1925).

*A. pacificus* Hartman, 1961. California. Holotype (LACM) and non-types (LACM) examined.

*A. setosus* (Hessle, 1925). As *Amphidromus setosus*. Japan. Syntype (ZMUU) examined. Synonymous to *A. izukai* (Hessle, 1925).

*Gyptis brunnea* (Hartman, 1961). As *Oxydromus brunnea*. California. Holotype (LACM) examined.

*G. helgolandica* Hilbig & Dittmer, 1979. North Sea. Non-types (SMNH) examined. Belongs to *Podarkeopsis*.

*G. hians* Fauchald & Hancock, 1981. Off Oregon. Holotype (LACM), paratypes (LACM) and non-types (LACM) examined.

*G. incompta* Ehlers, 1912 (complementary description based on other specimens in Ehlers 1913). Kaiser Wilhelm II Land or Victoria Land, Antarctic. Type material lost? Non-types (ZMH, SMNH) examined.

*G. lobata* (Hessle, 1925). As *Oxydromus lobatus*. Japan. Syntype (ZMUU) examined. Synonymous to *G. pacifica*.

*G. maraunibinae* Gibbs, 1971. Solomon Islands. Holotype (BMNH) examined. Belongs to *Podarkeopsis*.

*G. ophiocomae* Storch & Niggemann, 1967. Red Sea. Type material in author's collection (Storch). Non-type (SMNH) examined.

*G. pacifica* (Hessle, 1925). As *Oxydromus pacificus*. Japan. Syntype (ZMUU) examined. Synonymous to *G. lobata*.

*G. propinqua* Marion & Bobretzky, 1875. Marseille, France. No type material. Non-types (SMNH) examined.

*G. raluensis* (Augener, 1927). As *Oxydromus raluensis*. New Guinea. Syntype (ZMH) examined.

*G. rosea* (Malm, 1874). As *Ophiidromus roseus*. Gullmarsfjorden, Sweden. Holotype (NHMG) and non-types examined (NHMG, NHMR).

*G. vittata* Webster & Benedict, 1887. Maine, U.S. Syn-types (USNM) examined.

*Ophiidromus roseus* Malm, 1874. See *Gyptis rosea*.

*Oxydromus arenicolus* La Greca, 1946. No type material? No material examined. Belongs to *Podarkeopsis*.

*O. arenicolus glabrus* Hartman, 1961. Holotype (LACM) examined. Belongs to *Podarkeopsis*.

*O. aucklandicus* Willey, 1902. Auckland Islands. Type material lost. No material examined. Genus uncertain (not *Gyptis* or *Amphiduros*). *Nomen dubium*.

*O. brevipalpa* Hartmann-Schröder, 1959. Type material ZMH. No material examined. Belongs to *Podarkeopsis*.

*O. brunnea* Hartman, 1961. See *Gyptis brunnea*.

*O. capensis* Day, 1963. Holotype (BMNH) examined. Belongs to *Podarkeopsis*.

*O. fasciatus* Grube, 1855. Trieste, Italy, or Villefranche, southern France. Syntype (ZMB) examined. Junior synonym to *Ophiidromus flexuosus* (Delle Chiaje, 1827).

*O. flaccidus* Grube, 1857. St. Croix, West Indies. Type material probably lost. No material examined. *Nomen dubium*.

*O. fuscescens* Marenzeller, 1875. See *Amphiduros fuscescens*, new combination.

*O. heteroculatus* Hartmann-Schröder, 1965. Valdivia, Chile. Type material ZMH. No material examined. Genus uncertain (not *Gyptis* or *Amphiduros*).

*O. lobatus* Hessle, 1925. See *Gyptis lobatus*.

*O. longisetis* Grube, 1857. St. Croix, West Indies. Type material probably lost. No material examined. *Nomen dubium*.

*O. pacificus* Hessle, 1925. See *Gyptis pacifica*.

*O. pallidus* Claparède, 1864. No type material. Non-types (SMNH) examined. Belongs to *Podarke*.

*O. raluensis* Augener, 1927. See *Gyptis raluensis*.