Polychaetes of the Family Acoetidae (= Polyodontidae) from the Levant and the Central Mediterranean with a description of a new species of *Eupanthalis*

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ABSTRACT

Five species of Acoetidae are present along the Mediterranean coast of Israel: *Eupolyodontes cornishii* Buchanan, 1894, a new record for the Mediterranean and, probably, only the second finding of this species since its description from the mouth of the Congo River (Africa); *Euarche tubifex* Ehlers, 1887, also found off Sicily; *Polyodontes maxillosus* (Ranzani, 1817), comparatively rare; *Panthalis oerstedi* Kinberg, 1856 found in deeper waters off the Mediterranean coast of Israel than previously recorded; and *Eupanthalis glabra*, n.sp., from Israel and Cyprus. The new *Eupanthalis* species can be distinguished from another Mediterranean species, *E. kinbergi* McIntosh, 1876, by its smooth rather than papillate palps. The relationship of body size and depth, and differences in body size between Levant and central Mediterranean populations are discussed.

RÉSUMÉ

Polychètes de la famille des Acoetidae de la Méditerranée levantine et centrale avec la description d'une nouvelle espèce du genre *Eupanthalis*

Cinq espèces de la famille des Acoetidae sont présentes le long des côtes méditerranéennes israéliennes : *Eupolyodontes cornishii* Buchanan, 1894 nouvelle pour la Méditerranée et, probablement, retrouvée pour la deuxième fois depuis sa description originale dans l'estuaire du Congo (Afrique); *Euarche tubifex* Ehlers, 1887 également trouvée en Sicile; *Polyodontes maxillosus* (Ranzani, 1817), comparativement rare; *Panthalis oerstedi* Kinberg, 1856 trouvée plus profondément que lors des récoltes précédentes; et *Eupanthalis glabra*, n. sp., trouvé en Israël et à Chypre. Cette nouvelle espèce d'*Eupanthalis* se distingue de l'autre espèce méditerranéenne, *E. kinbergi* McIntosh, 1876, par ses palpes lisses dépourvus de papilles. Des relations entre les dimensions du corps et la profondeur de récolte ainsi que les différences de taille entre les populations levantines et celles de Méditerranée centrale sont discutées.

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INTRODUCTION

The present paper reports on aphroditoid polychaetes of the family Acoetidae Kinberg, collected between 1968 and 1991 in the Levant Basin off the Mediterranean coasts of Israel and Sinai, and off Cyprus, and in the central Mediterranean off Sicily. Acoetid scaleworms are among the largest polychaete species. They are characterized by parapodial organs (spinning glands) which produce fibers to build permanent felt-like tubes packed with clay (Fig. 7a). Acoetids are carnivorous and have powerful jaws (Figs 2d,e; 6b; 9b). Some species are rarely recorded. Some penetrate to bathyal depths.

A single worm, belonging to the giant species, *Eupolyodontes cornishii*, was collected off Ashqelon in 55 m by E. GILAT and G. SACHNIN in 1969. The identification to species was made by comparison with the holotype. The recent revision of the family Acoetidae by PETTIBONE (1989) enables an appreciation of the rarity and importance of this find (BEN-ELIAHU & FIEGE, 1991); it appears to be the second record since the holotype was described by BUCHANAN (1894) from the mouth of the Congo River. Recently, J. NUÑEZ has found *E.* cf. *cornishii* off Tenerife (NUÑEZ, pers. comm.).

PETTIBONE's revision (1989) led to recognition of a second, undescribed, Mediterranean species of *Eupanthalis* along the coastal shelves of Israel and Cyprus, and it is described below as *Eupanthalis glabra*, sp. nov.

A gradual accumulation of acoetid material has come from increasingly deeper sampling off the Mediterranean coast of Israel, carried out by different projects and institutions: the joint project "Biota of the eastern Mediterranean and Red Sea" of the Hebrew University of Jerusalem and Smithsonian Institution (H. STEINITZ, F.D. POR and W. ARON [discussed in POR *et al.*, 1972]); the Sea Fisheries Research Station, Haifa (E. GILAT); Tel Aviv University (Ch. LEWINSOHN, M. TOM and B. GALIL); the 'Meteor' V expedition (M. TÜRKAY) obtained some particularly rich samples of Acoetidae (for stations, see WEIKERT, 1988). Subsequent deep sampling cruises of pollution monitoring off the northern Israeli coast carried out by S. PISANTY and D. GOLANI (Israel Department of Fisheries and Hebrew University of Jerusalem, respectively); and B. GALIL (The Israel Oceanographic and Limnological Research, Ltd.), have occasionally brought up *Panthalis oerstedi* (BEN-ELIAHU, 1990; BEN-ELIAHU *et al.*, 1991). The combined data provide depth distribution profiles of these species along the Mediterranean coast of Israel.

Recently, the 'Poseidon' 172–4 expedition of the Geologisch–Paläontologisches Institut und Museum, Univ. Kiel to presumed hydrothermically active sites off Sicily (PUTEANUS, 1990), collected *Euarche tubifex*.

MATERIALS AND METHODS

The samples: samples are listed in Table 1; for Levant sites, see fig. 1 and for Sicilian sites see PUTEANUS, 1990. Abbreviations in the sample codes are as follows: (I) Israel or Cyprus. (TAU) Tel Aviv University; (SFR) Sea Fisheries Research Station, Haifa; (SLMB) sample of "Biota of the Red Sea and eastern Mediterranean" (POR *et al.*, 1972); (SMF) Senckenberg–Museum, Frankfurt; (GPK) Geologisch–Paläontologisches Institut und Museum, Univ. Kiel; (IOLR) Israel Oceanographic and Limnological Research, Co., Ltd.

Repository of specimens is as follow: I-coded material is at the Hebrew University of Jerusalem (HUJ); S-coded material is at the Senckenberg Museum, Frankfurt (SMF). Also, (AMS) Australian Museum, Sydney; (BMNH) Natural History Museum, London; (MNHNP) Muséum National d'Histoire Naturelle, Paris; and (USNM) National Museum of Natural History, Washington.

Measurement of preserved specimens: for population length comparisons, we used H+10 (the prostomium and tentacular segment plus following 10 setigerous segments), which enabled using fragmented as well as complete specimens as suggested by K. FAUCHALD (pers. comm.).

The following data were recorded: (1) Condition of specimen: complete/ anterior fragment/ middle fragment/ posterior fragment; (2) length in mm per number of segments (seg.); (3) length of H+10 in mm; (4) width in mm to edge of parapodia without setae, measured at widest part of body; (5) proboscis length (only if extended) measured from base of prostomium and (6) t, number of teeth on each of the 4 jaws. In addition, for *Eupanthalis glabra*, n. sp., relative length of head appendages, as follows: tentacular cirri/ lateral antenna, tentacular cirri/ palps, lateral antenna/ prostomium, palps/ height of prostomium, tentacular cirri/ height of prostomium, length of proboscis/ height of prostomium; nuchal fold present, absent or not visible due to position of head when preserved.

TABLE 1. — Samples collected off Mediterranean coast of Israel, Cyprus and Sicily

1I-IOLR. Haifa, 33°01'N, 34°34.2'E, L3; 1356 m, beam trawl L3; 5.XI.1990; very rich in rocks and porous metal either volcanic or industrial slag broken up; coll. S. Pisanty & D. Golani.
2I–IOLR. Haifa, L1- 33°02'01"N, 34° 29 E; 1,470 m, L1; 16.XII.1992; coll. B. Galil.
3I-IOLR. Atlit; 200 m, beam trawl; 30.I.1990; coll. B. Galil.
4I-IOLR. Atlit; 500 m, beam trawl; 31.I.1990; coll. B. Galil.
5I-IOLR. Atlit; 1,000 m, beam trawl; 31.I.1990, coll. B. Galil.
6I-SFR1610. Tantura, Gilat st. 17; 110m, dredge A; 3.IV.1968; coll. E. Gilat.
7I-SLMB113. Off Alexander River; 123 m, beam trawl; 26.IX.68, coll. G. Sachnin & M. Rapaport.
8S-SMF. Jaffa, 32°02.38'N, 34°35.05'E — 32°00.95'N, 34°34.52'E,'Meteor' V St. 50; 95-103 m, beam trawl; 26.I.1987; coll. M. Türkay.
9S-SMF. Jaffa, 32°00.53'N, 34°33.98'E,'Meteor' V St. 50; 110 m, grab; 26.I.1987; coll. M. Türkay.
10S-SMF. Jaffa, 32°01'N, 34°31.4'E — 31°58.9'N, 34°27.3'E, "Meteor" V St. 51; 309 m, beam trawl; 26.I.1987; coll. M. Türkay.
11S-SMF. Jaffa, 32°19.96'N, 34°31.46'E - 32°19.75'N, 34°31.26'E, 'Meteor' V St. 56; 694-700 m, beam trawl; 27-28.I.1987; coll. M. Türkay.
12I-TAU. Palmachim; 35 m; 24-26.XI.1977; coll. B. Galil.
13I-TAU. Palmachim; 35 m; 5-6.XI.1987; coll. B. Galil.
14I-SLMB156. Nabi Yunis (Ashdod); 128 m, beam trawl; 20.XII.1968; coll. G. Sachnin & M. Rapaport.
15I-SLMB157. Nabi Yunis (Ashdod); 128 m, dredge B; 20.XII.1968; coll. G. Sachnin & M. Rapaport.
16I-TAU. Nitsanim; 35 m; 28.II.1987; coll. B. Galil.
17I-TAU. Nitsanim; 80 m; 2.IV.1977; coll. B. Galil.
18I-TAU. Nitsanim; 80 m; 1.VII.1977; coll. B. Galil.
19I-SFR1718. Ashqelon; 201 m, beam trawl; 30.X.1968; coll. G. Sachnin.
20I-SFR. 1742-Ashqelon; 55 m, knife dredge; 7.IV.1969; G. Sachnin.
21I-SLMB6046. Sinai, Gaza; 36.6 m, beam trawl; 7.1.70; coll. G. Sachnin.
22I-SLMB6021. el Arish; 137 m, dredge B; 27.VIII.1969, coll. G. Sachnin.
23I-SLMB6023. el Arish; 183 m, dredge B; 24.IX.1969, coll. G. Sachnin.
24I-SLMB6024. el Arish; 183 m, beam trawl, 27.VIII.1969, coll. G. Sachnin.
25I-SLMB178. Sinai, Katib el Galss (Bardawil); 91.5 m, beam trawl; 4.II.1968, coll. E. Gilat.
26I-SLMB1545. Cyprus, Famagusta F; 100-110 m, dredge A; 16.II.1968, coll. A. Lurie.
27S-GPK. Graham Bank, 37°09.135'-37°08.90'N, 12°42.90'-12°43.23'E, "Poseidon" 172-4; 185-178 m, Chain dredge; 2.V.1990; coll. M. Türkay; #645.
28S-GPK. Cimotoe, 37°00.43'-37°00.45'N, 12°39.06'-12°39.11'E, "Poseidon" 172-4; 198-158 m, chain dredge; 7.V.1990; coll. M. Türkay, #718.
29S-GPK. Cimotoe, 37°00.20'-36°059.82'N, 12°39.08'-12°38.58'E, "Poseidon" 172-4; 224-230 m, chain dredge; 2.V.1990; coll. M. Türkay, #629.
30S-GPK. Cimotoe, 36°59.82'-36°058.37'N, 12°39.28'-12°39.90'E, "Poseidon" 172-4; 237- 220 m, chain dredge; 2.V.1990, M. Türkay; #630.
31S-GPK. Cimotoe, 36°059.38'N, 12°38.74'E, "Poseidon" 172-4; 214-230 m, Van Veen grab; 1.V.1990; coll. M. Türkay; #620.

Statistics were computed by the SAS statistical package. Description of new species gives: holotype parameter (population mean ± s.d. [range], for N, number of individuals). To conform with PETTIBONE (1989), the text refers to segments rather than setigers; in Aphroditoidea the first parapodium bearing setae is the 2nd segment.

Scanning Electron Microscopy (SEM): samples were dehydrated via graded ethanol series, critical–point dried using CO_2 and examined in a CAMSCAN–SEM (CS 24).

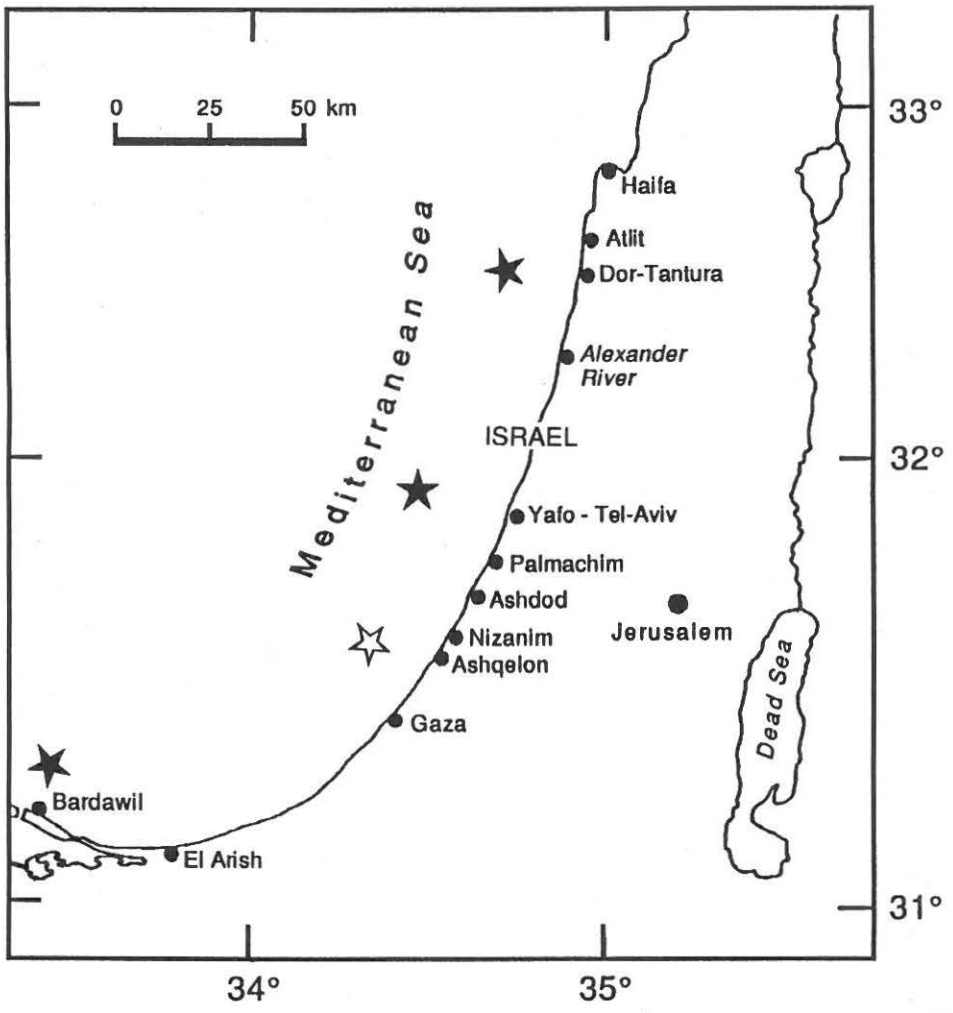

FIG. 1. — Sampling sites off Israel (Haifa to Ashqelon) and northern Sinai (Gaza - Bardawil). Black star, *Eupanthalis glabra*; white star, *Eupolyodontes cornishii*.

SYSTEMATIC SECTION

Genus *Eupanthalis* McIntosh, 1876

PETTIBONE, 1989: 24.

Eupanthalis glabra, new species

(FIGS 2-5)

MATERIAL EXAMINED. — Samples: 6I (FIG. 2a); 7I; 8S, Holotype and 66 paratypes; 9S; 14I; 15I; 22I; 23I; 25I; 26I (Table 1). Total: 76 specimens, Cyprus, 1; Israel, 75.

REPOSITORY. — Holotype (HUJ). Paratypes: 23 (HUJ); 24 (SMF 4430); 2 (AMS: W208889, W20890); 7 (BMNH ZB 1992.305–311); 9 (USNM 157612, 157613, 157614); 2 (MNHNP: UC343-A922, 344-A922). Topotype: 1 (SMF 4431).

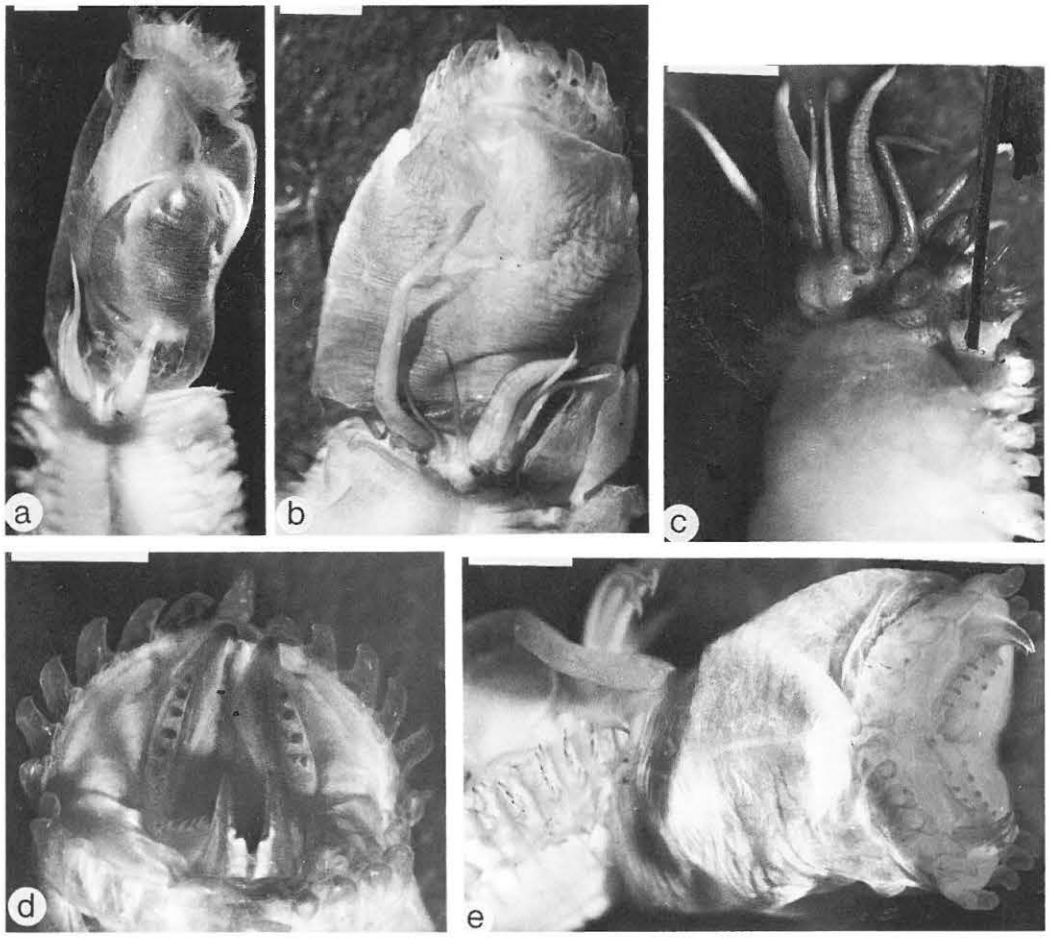

FIG. 2. — *Eupanthalis glabra*, n. sp.: **a,** anterior end with fully everted proboscis (from Cyprus); **b-e** (from Israeli coast): **b,** anterior end with fully everted proboscis (holotype); **c,** dorsolateral view of anterior end (paratype); **d,** frontal view of proboscis; **e,** lateral view of same. (Scales, **a–e** = 1 mm)

DESCRIPTION. — Body elongate. Largest, complete specimen, 65 mm, 64 seg.; H+10, 2.3 mm; width, 3.5 mm. Holotype (Figs 2b, 3a–j) anterior fragment with pharynx fully extended, 32mm /50 seg. (H+10, 3.0 mm), width 4.0 mm. Population, H+10, 2.8 ± 0.6 mm [2.0- 4.0 mm], N= 20 ; width, 3.5 ± 0.4 mm [2.8-4.0], N= 20.

FIG. 3. — *Eupanthalis glabra*, holotype: **a,** head; **b,** left elytrigerous parapodium from segment 2, anterior view; **c,** left cirrigerous parapodium from segment 3, anterior view; **d,** right parapodium from segment 48, anterior view; **e,** upper neuroseta from segment 2 (1st parapodium); **f,** lower neuroseta of same; **g,** upper neuroseta of segment 3; **h,** middle aristate acicular neuroseta from same; **i,** aristate acicular setae with subdistal tuft from segment 10; **j,** capillary setae with circlets of spines (type b) from same. (Scales: **a** = 1 mm; **b–d,** 100 µm; **e–j,** 50 µm).

Elytra smooth, elongate-oval, delicate; first pair covering prostomium, second and third covering dorsum, remainder leaving middorsum uncovered. Posterior elytra very delicate, with lateral pouches.

Prostomium oval, bilobed, with median longitudinal groove (Figs 2c; 3a; 4a-b), with two pairs of sessile eyes, anterior pair much larger or only slightly larger than posterior pair. Lateral antennae with short ceratophores on anterior side of prostomium, with tapered styles, 1.7 (1.7 ± 0.3 [1.3-2.2], N=17) times longer than prostomium. Palps ventro-lateral to antennae, stout, tapered, smooth, 5.0 (3.4 ± 0.9 mm [2.2-5.3 mm], N=19) times longer than prostomium (Figs 2a-c; 3a).

First (tentacular) *segment* distinct dorsally; nuchal lobe observed on holotype (Figs 3a, 4b); tentaculophores lateral to prostomium, each with aciculum, without setae, with dorsal and ventral tentacular cirri subequal in length, 2.2 (2.2 ± 0.4 [1.6-3.3], N= 20) times longer than prostomium, 1.3 (1.3 ± 0.3 [1.0-2.1], N= 17) times longer and stouter than lateral antennae, and 0.4 (0.7 ± 0.2 [0.4-1.0], N= 19) shorter than palps (Figs 2a-c; 3a; 4b).

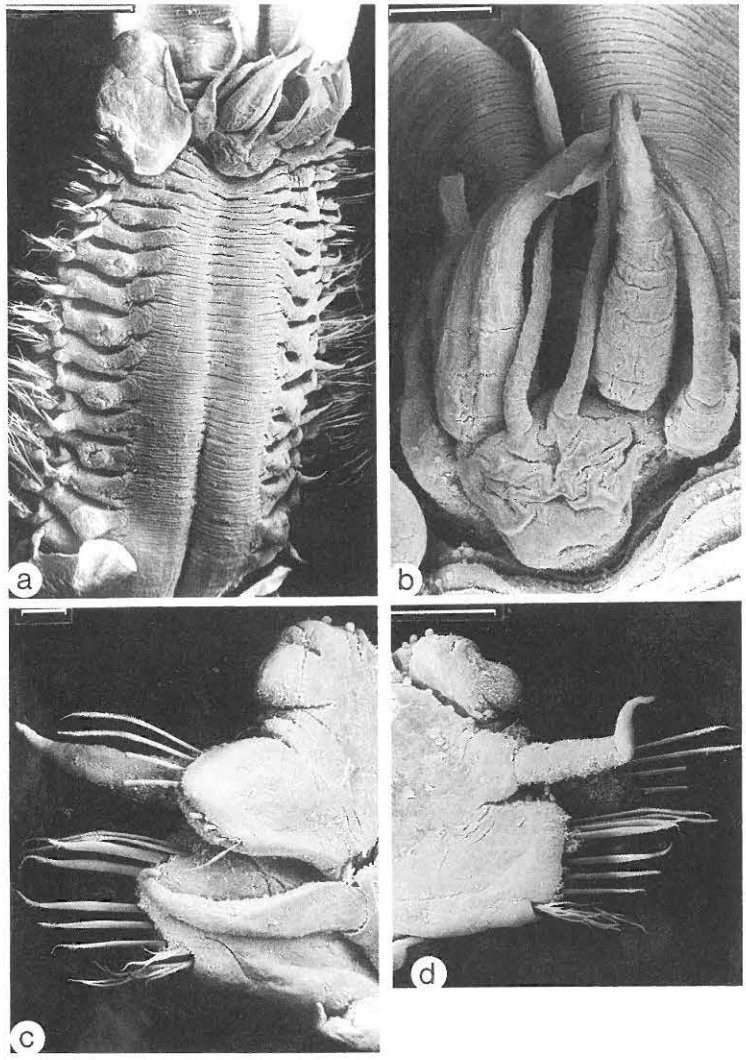

FIG. 4. — *Eupanthalis glabra*, scanning electron micrographs: **a,** anterior end, dorsal view. **b,** same, view more frontal. **c,** right parapodia of segments 2 and 3, anterior view. **d,** right parapodium of segment 3 , posterior view. (Scales: **a** = 1000 µm; **b, d** = 300 µm; **c** = 100 µm).

Second segment (first setiger) with first pair of elytrophores; parapodia modified, paw-like, sometimes directed anteriorly, with ventral buccal cirri similar to tentacular cirri, 2.5-3 (N= 2) times longer than following ventral cirri

(Figs 3b-c; 4c-d); notopodium small, rounded acicular lobe on anterodorsal side of larger neuropodium; neuropodium without notosetae, with bilobed presetal acicular lobe.

Extended proboscis 6.9 (7.3 ± 1.8 [5.2-10.3], N=19) times longer than prostomium (Figs 2a-b-e). Distal border of proboscis with 13 pairs of conical papillae, middorsal and midventral ones very slightly enlarged both on wide bases with lateral curved tips (Fig. 2d-e); two pairs of strong honey-colored hooked jaws, each with 2-6 teeth (holotype with 4,3,3,3 teeth), with opposite pattern of dentition in upper left and lower right jaws *vis a vis* lower left and upper right jaws (Figs 2d-e).

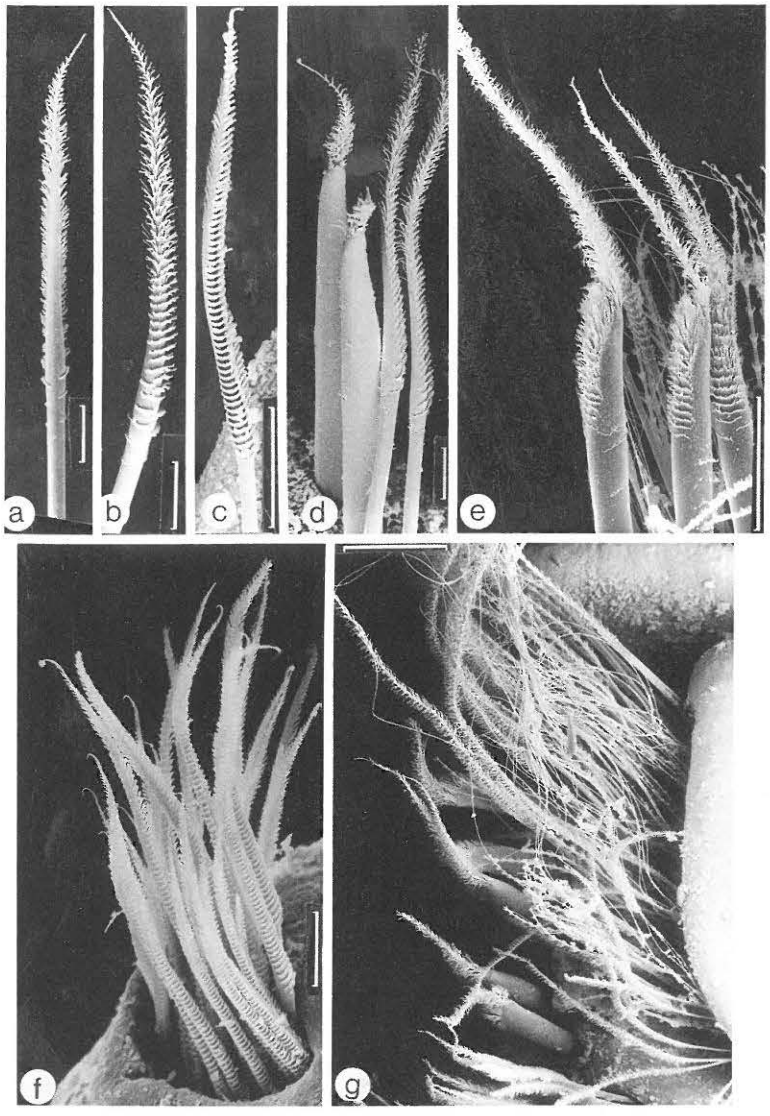

FIG. 5. — *Eupanthalis glabra*, scanning electron micrographs: **a–c**. Neurosetae of segment 2: **a**, upper, posterior view; **b**, same, anterior view; **c**, lower, anterior view; **d,** neurosetae of segment 3: left, middle aristate acicular; right, upper lanceolate; **e**, neurosetae of segment 10: left, middle aristate acicular with subdistal brush; right, upper, type b capillary; **f,** lower neuroseta of segment 4; **g**, setae of segment 10 from anterior, showing fine fibers of spinning gland. (Scales: **a–d**, **f** = 30 µm; **e**, **g** = 100 µm).

Dorsal cirrus on segment 3 with short cirrophore on posterodorsal side of notopodium, with long tapered style, 1.7-2.3 (N= 4) times height of parapodium, 1.8-2.3 (N= 2) times longer than ventral cirrus (Figs 3c; 4c-d).

Beginning with segment 9, notopodium wider, rounded flattened, on anterodorsal side of neuropodium, with internal spinning glands. Middle parapodia with dorsal cirri short, slightly shorter than height of parapodium, 1.5 times shorter than tapered ventral cirri (Fig. 3d).

Far posterior region with notopodia reduced to conical lobes; neuropodia more elongate, narrower, cirri longer than in anterior region. Integument of posterior region very thin. Parapodial branchial tubercles (as in Fig. 8a) not present. Pygidium small, rounded, between few posterior small segments with two anal cirri.

Notosetae present from segment 9 to 19-22, very fine setae with one spiny margin emerging from lower side of notopodium (Fig. 5g). Neurosetae show some anterior–posterior transition in anterior–most parapodia. Neurosetae in three groups (upper with shafts above aciculum; middle with shafts above and below aciculum; lower with shafts below aciculum). Upper neurosetae of two types: *type a* longer, slender, somewhat lanceolate with spinous margins (Figs 3e, g; 5a-b-d), present throughout body; increasingly finer and longer posteriorly (in segment 2 ca. 1.7 times thicker than in segment 3); *type b* very fine, shorter, with circlets of few widely spaced spines (Figs 3j; 5e), lacking in anterior and posterior parapodia.

Middle neurosetae acicular with tips slightly hooked, bearing distal hairy aristae, on segments 3-8 without subdistal tufts of spines (Figs 3h; 5d); from segment 9 on with subdistal tuft (Figs 3i; 5e).

Lower neurosetae curved, with proximal spines on one margin, tapering distally to circumferential, close-set spines (Figs 3f; 5c-f).

Second segment (first setiger, Figs 3b; 4c): upper neurosetae, somewhat lanceolate with spinous margins, more massive than in following parapodia, 6 (6-7, 6.3 ± 0.6, N= 4 [Figs 3e; 5a-b]). Lower, 6 (1-6, 3.5 ± 2.1, N= 4 [Figs 3f; 5c]).

Third segment (Figs 3c; 4d): upper neurosetae, 2 (1-2, 1.8 ± 0.4, N= 5), 0.3 (0.3-0.6) times as thick as in 2nd segment (Figs 3g; 5d, right). Middle aristate acicular neurosetae, 6 (5-6, 5.6 ± 0.5, N= 5, lacking subdistal spines (Figs 3h; 5d, left), 2.2 (4) times as thick as upper. Lower neurosetae, 35 (14-35, 18.4 ± 9.3, N= 5 [Figs 3c. 4d], with fine shafts ca. 1/4 those of upper neurosetae.

From and including segment 9: upper neurosetae, *type a*, 18 [13-21, 16.4 ± 2.9] N= 7); *type b*, 31 [25-42, 32.1 ± 5.5] N=7 (Figs 5e-g). Middle acicular neurosetae with subdistal spines, 7 [1-7, 5.7 ± 1.9, N= 6] (Figs 3i; 5e). Lower neurosetae, 16 [7-16, 12.3 ± 3.3] N= 7 (Fig. 5f).

DISTRIBUTION. — Cyprus (100-110 m), Israel (91.5-183 m [Fig. 1]); note the narrow depth range (Fig. 11).

ETYMOLOGY. — From the Latin, "glaber" meaning smooth, referring to the smooth palps.

REMARKS. — PETTIBONE (1989: 241) redescribed *Eupanthalis kinbergi* according to McINTOSH (1876) and supplemented the description of the holotype, whose palps were missing, with that of a specimen from Naples. McINTOSH did not mention the palps.

As the present material shows, there are two species of *Eupanthalis* in the Mediterranean, one with papillated palps and one with smooth palps. Unfortunately, since the palps are missing on the holotype and not mentioned by McINTOSH, there is no possibility of ascertaining whether or not *E. kinbergi* indeed had papillated palps. We propose that the name *kinbergi* be retained for the species with the papillated palps, as redescribed in PETTIBONE (1989) and the new name, *glabra*, be applied to the Levant species with smooth palps. Another difference between these species is the color of the jaws, dark in *E. kinbergi*, honey-colored in *E. glabra*. *E. glabra* is of much smaller size than *E. kinbergi*. The presence or absence of a nuchal lobe is a difficult character to determine in this preserved material; it appears to be present in *E. glabra* (Figs 2a–c; 3a; 4b).

PETTIBONE (1989) refers to two additional species with smooth palps; *E. edriopthalma* (POTTS, 1910) from the Western Indian Ocean and *E. elongata* (TREADWELL, 1931) from the Philippine Islands; both species have the tentacular cirri about as long as the palps (in *E. glabra*, the tentacular cirri are shorter than the palps); both species lack a nuchal lobe. *E. edriopthalma* has much shorter palps relative to the height of the prostomium than *E. glabra* (syntypes of *E. edriopthalma* with palps 1.1 ± 0.2 [1.0-1.3, N= 2]) times longer than prostomium). Within the type sample containing 67 individuals, the *E. glabra* population showed considerable variability in the relative lengths of the head appendages (length of palps *vis a vis* the antennae and the tentacular cirri, see Figs 2a–c). It may also be related to the degree of contraction when preserved. None of the 19 individuals measured showed the short condition as in *E. edriopthalma*.

E. elongata has different neurosetae on segment two and dark jaws (PETTIBONE, 1989). It also has longer antennae relative to the prostomium [N= 1]; only one of 19 specimens of *E. glabra* measured showed the long condition as in *E. elongata*.

The present study points to the difficulty of comparing populations in which variability has been found with species descriptions based on few specimens. This problem is particularly acute in deep-water species with sparse material.

Euarche tubifex Ehlers, 1887

(FIGS 6; 8e)

Euarche tubifex - PETTIBONE, 1989: 14-18, Fig. 15.
Eupanthalis kinbergi - FAUVEL, 1923: 100-101, Figs. 38i-q; AMOUREUX, 1976: 1049
[Not *Eupanthalis kinbergi* McIntosh, 1876]

MATERIAL EXAMINED: samples: 3I, 3x; 8S; 12I; 13I; 16I; ?16I, 3x; 17I; 21I; 27S, 1x (SMF 4428); 28S, 1x (SMF 4427); 29S, 4x (SMF 4426); 30S, 2x (SMF 4429); 31S (SMF 4425) (Table 1).

Total: 11 specimens from Israel, H+10 length, 5.5 ± 2.2 mm [3-10 mm], N= 9). Largest, AF, 78 mm, 69 segments (H+10, length, 10 mm); width, 9 mm (from sample I12). Nine specimens from Sicily, H+10 length, 9.00 ± 1.32 mm [8-11 mm], N= 9). Largest, AF, 85 mm, 63 segments (H+10, 11mm); width, 15 mm; with eggs.

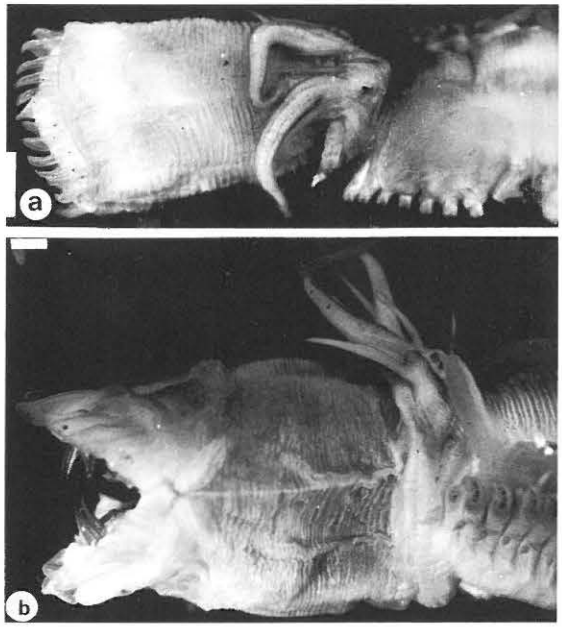

FIG. 6. — *Euarche tubifex*: **a,** specimen from Israel, dorsal view of anterior, proboscis fully extended; **b**, specimen from Sicily, lateral view of same. (Scales: **a**, **b** = 1 mm)

REMARKS. — A decapod belonging to the family Pandalidae (M. TÜRKAY, pers. comm.) was removed from the gut of a Sicilian specimen.

DISTRIBUTION. — Sicily (158-237 m), Israel (35 - 200 m). Worldwide (PETTIBONE, 1989): Caribbean, Northwest Atlantic from Florida to North Carolina, Gulf of Mexico, Panama (Pacific), Southwest Atlantic to South Brazil, Northeast Atlantic from West to Northwest Africa, Mediterranean, Arabian Sea, 13 to 450 m.

Eupolyodontes cornishii Buchanan, 1894

(FIGS 1; 7; 8a–c)

Eupolyodontes cornishii Buchanan 1894: 438, pl. 227: Figs 1-8. - PETTIBONE, 1989: 36, Figs 20-22.

MATERIAL. — Sample 20I (Table 1). Anterior fragment, 74 setigers, 230 mm (H+10, 22.7 mm); width, 27.8 mm, fragment of tube. Permanent mounts HUJ-#361, 367; SMF–SEM #30.

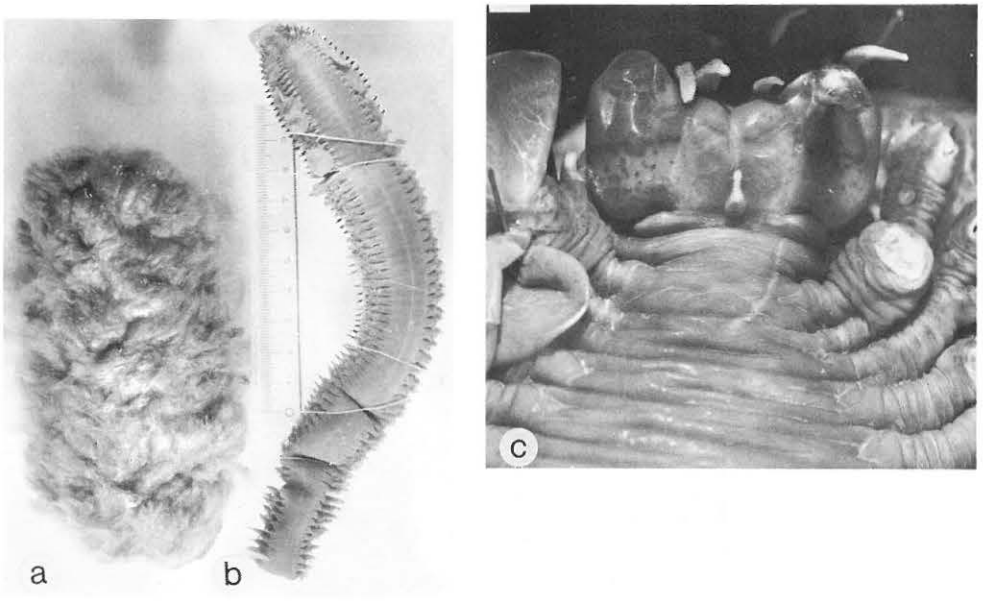

FIG. 7. — *Eupolyodontes cornishii*: **a**, tube after washing out interwoven clay; **b**, anterior fragment, dorsal view, with most elytra missing; **c**, anterior end, dorsal view, with left 1st elytrum pinned back, 1st right elytrum missing. (Scale: **c** = 1 mm).

ADDITIONAL MATERIAL STUDIED. — Africa, off Congo River, 79–86 m, holotype (BMNH 1893.12.8.1).

REMARKS. — The anterior fragment was inside the tube (Figs 7a,b). In her review of the Acoetidae, PETTIBONE (1989) cites only the holotype; she considered another record of a New Caledonia specimen, deposited at the Paris Museum (FAUVEL, 1897) as doubtful. The present material was collected in 1969 (BEN-ELIAHU & FIEGE, 1991) and may be only the second record of *E. cornishii* since that of BUCHANAN in 1894. J. NUÑEZ has recently found *E.* cf. *cornishii* from Tenerife from 200 m depth, based on a fragment of some middle setigers (J. NUÑEZ, pers. comm.).

There are some minor differences from the holotype redescribed by PETTIBONE, mainly in characters which fall within species variability; the description was based on a single specimen. The palps are short, but subequal in length to the ventral tentacular cirri, and slightly surpass the prostomium. Notosetae were observed on the tentacular segment and on segment 2 but not on segments 3 and 4.

Parapodial branchiae begin on segment 8 (rather than 6); most branchiae are simple, some with one branch (Y-shaped. Fig. 8a), fewer with double-Y or with single and Y, best-developed between segments 17-31, and continuing to the end of the fragment. The upper neurosetae (Fig. 8c, cf. Fig 22Ba of PETTIBONE, 1989) show a slight swelling ("neck") at the proximal tuft and are somewhat recurved distally. This was confirmed on the holotype.

DISTRIBUTION. — Israel (55 m). Worldwide (BUCHANAN, 1894): Africa, mouth of Congo River, 35m from land, 79–86m; Tenerife, (200 m) (NUÑEZ, pers. comm.) (55 – 200 m).

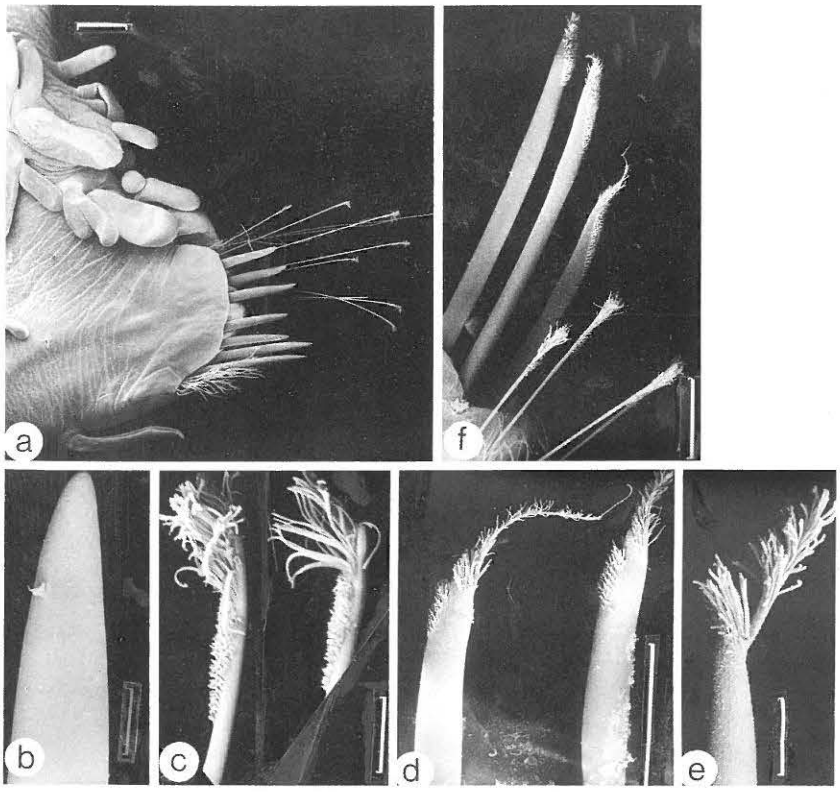

FIG. 8. — Scanning electron micrographs: **a–c**, *Eupolyodontes cornishii*: **a**, 20th right parapodium, posterior view; note parapodial branchiae; **b**, middle acicular neuroseta; **c**, upper neurosetae; **d**, *Polyodontes maxillosus*, middle acicular neurosetae; **e**, *Euarche tubifex*: middle acicular neuroseta from 3rd segment, anterior view; **f**, *Panthalis oerstedi*, tip of 9th right neuropodium, left, middle acicular neurosetae; right, upper neurosetae. (Scales: **a** = 1,000 µm; **b–d**, **f** = 100 µm; **e** = 60 µm).

Panthalis oerstedi Kinberg, 1856

(Figs 8f; 9a–c)

Panthalis oerstedi Kinberg, 1856: 387 - PETTIBONE, 1989: 53-56, Figs 32-34; BEN-ELIAHU *et al.*, 1991: 62-64.

MATERIAL EXAMINED. — Samples 1I; 2I; 3I; 4I, 5x; 5I, 6x; 8S, 1x (SMF 4407); 10S, 6x (SMF 4417); 11S, 8x (SMF 4418) ; 19I, 10x; 23I; 24I, 4x (Table 1). Total: 44 specimens, largest, anterior fragment, 18mm, 32 segments, H+10, 5 mm; width, 6.2 mm. Large complete specimen, 35 mm, 71 segments (H+10= 5.5); width 5 mm. H+10, 2.5 - 5.5 mm [3.6 ± 0.8], N= 41.

REMARKS. — Body broadens after about segment 16 and then narrows. Many individuals of sample 5I with opaque dark brown bodies in body cavity, presumably parasites (Figs 9a,c). Figure 9c shows the long filament of the spinning gland in the body cavity. The depth range is extented to 1,470 m.

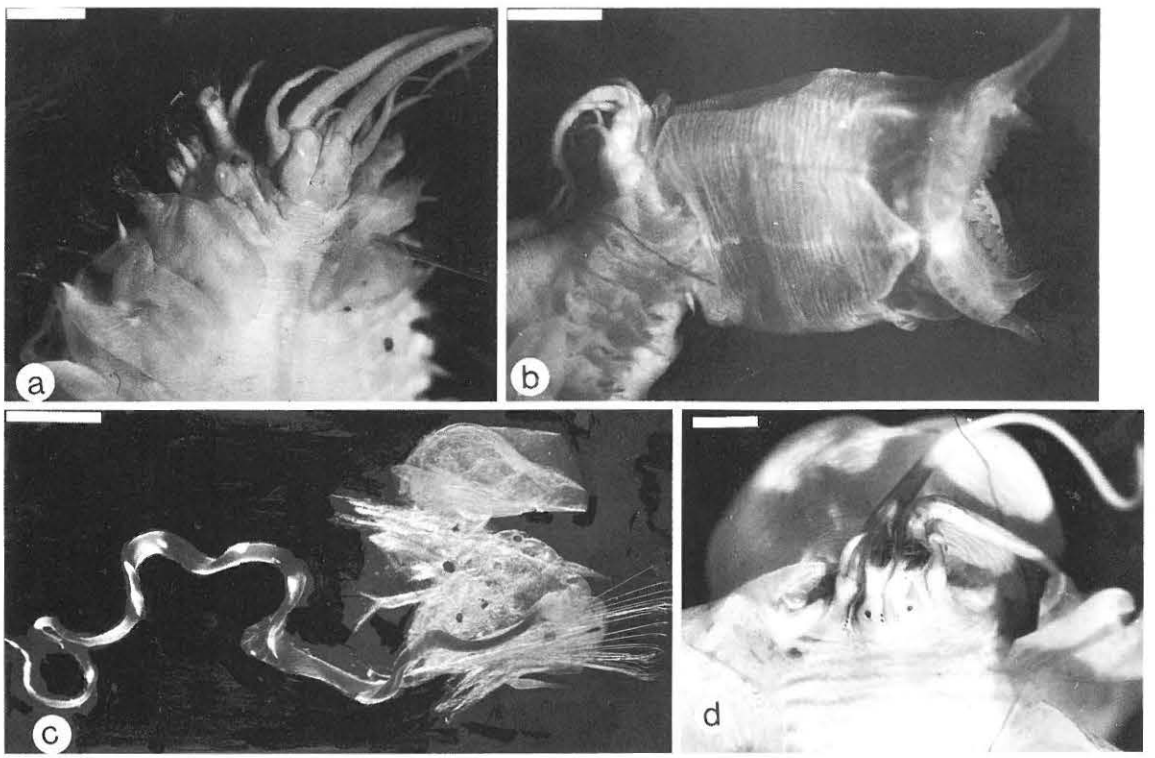

FIG. 9. **a-c.** — *Panthalis oerstedi*; **a,** dorsal view of anterior; **b**, lateral view of anterior end with proboscis fully extended; **c**, parapodium with elytron and long filament of spinning gland in body cavity; dark circles presumed to be cysts of parasite; **d.** *Polyodontes maxillosus*: dorsal view of anterior end. (Scales: **a–d** = 1 mm).

DISTRIBUTION. — Israel (95 m - 1470 m). Worldwide (PETTIBONE, 1989: 56): Sweden, Norway, North Atlantic to Mediterranean, Northwest Africa (11 -760 m); the depth range is broad, 11 – 1,470 m.

Polyodontes maxillosus (Ranzani, 1817).

(Figs 8d; 9d)

Polyodontes maxillosus. — PETTIBONE, 1989: 101–103, Figs 70–72.

MATERIAL EXAMINED. — Samples 6I; 8S (SMF 4421); 12I (Table 1). Total: three specimens, largest, anterior fragment, 43 mm, 52 segments (H+10, 5 mm); width, 3 mm. H+10, 3.6-5 mm [(4.2 ± 0.7) N= 3).

DISTRIBUTION. — Israel (35-110 m). Worldwide (PETTIBONE, 1989): North Atlantic off Spain, Adriatic, Red Sea, low water to 280 m.

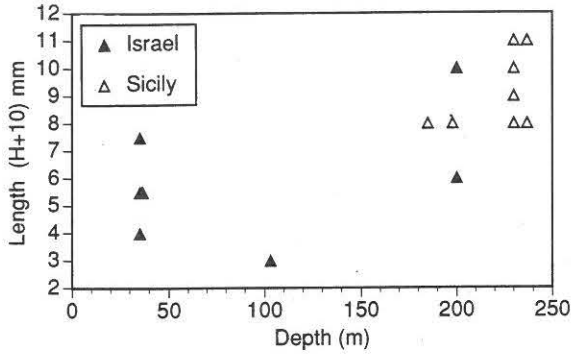

FIG. 10. — Lengths of specimens of *Euarche tubifex* (H+10 parameter) vs. depth.

KEY TO THE LEVANT ACOETIDAE

1 Eyes stalked (ommatophores); 3 antennae (Figs 7; 9) **2**
Eyes not stalked, sessile; 2–3 antennae (Figs 2a–c; 6) **4**

2 Parapodia branchiae absent (Fig. 9d); palps well–developed (Fig. 9a-d); acicular neurosetae aristate (Fig. 8d–f) **3**
Parapodial branchiae present (Fig. 8a); palps reduced (Fig. 7c); neuroacicular; setae not aristate (Fig. 8b); of giant size..... *E. cornishii*

3 Ommatophores white; sessile eyes absent (Fig. 9a); upper neurosetae penicillate (Fig. 8f) ..... *P. oerstedii*
Ommatophores black; sessile eyes present (Fig. 9d); upper neurosetae tapered (Fig. 8d) ..... *P. maxillosus*

4 Two antennae (Fig. 2a–c; Fig. 4a-b) **5**
Three antennae (Fig. 6a-b) ..... *E. tubifex*

5 Palps papillated ..... *E. kinbergi* [1]
Palps smooth (Fig. 4a-b) ..... *E. glabra*

DISCUSSION

Mediterranean biogeographers have reported reduced body size (dwarfing) in several different groups in the Levant marine fauna (sponges, echinoderms, sipunculids and polychaetes [e.g., LAUBIER, 1966]). However, the observation on dwarfing in the Levant has yet to be analyzed properly. The present paper describes differences in length of specimens of *Euarche tubifex* from the Israeli and Sicilian coasts. The Israeli population was of smaller size than the Sicilian one (Israel, H+10, 5.50 ± 2.17 mm [range, 3-10 mm], N= 9, vs. Siciliy, H+10, 9.00 ±

[1] Not found in Levant. Reported from Italy (PETTIBONE, 1989).

1.32 mm [range 8-11 mm], N= 9) and the difference between the means was significant (t-test, t= - 4.1384, p = 0.0008, Fig. 10). Information concerning the age of the specimens is lacking. In addition, the depth ranges sampled may not be comparable: the Israeli *E. tubifex* population came from a broader range, beginning in shallower depths than the Sicilian one (35-200 m : 158-237 m, Israel : Sicily, respectively).

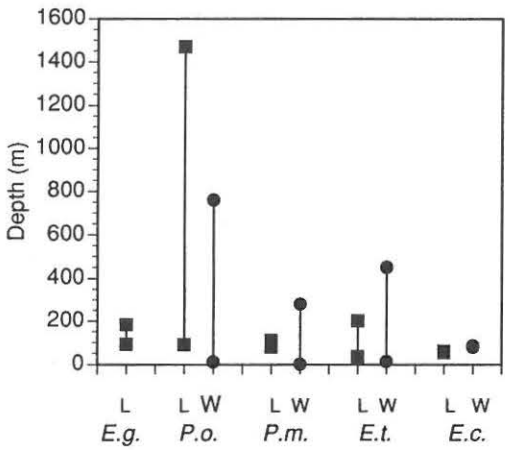

FIG. 11. — Levant (L) and worldwide (W, from PETTIBONE, 1989) depth distribution of acoetid species: E.g., *Eupanthalis glabra*; P.o., *Panthalis oerstedi*; P.m., *Polyodontes maxillosus*; E.t., *Euarche tubifex*; E.c., *Eupolyodontes cornishii*.

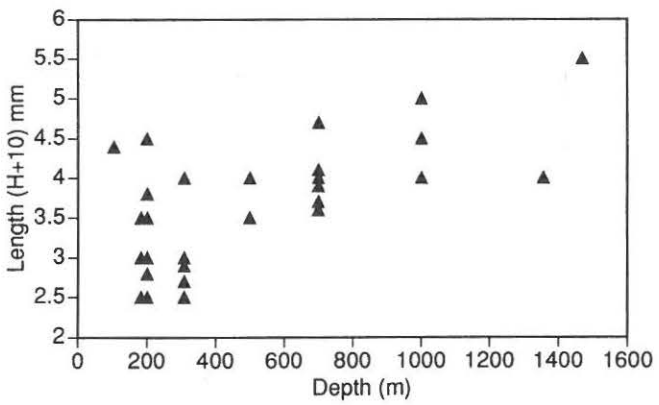

FIG. 12. — Length of specimens of *Panthalis oerstedi* (H+10 parameter) vs. depth.

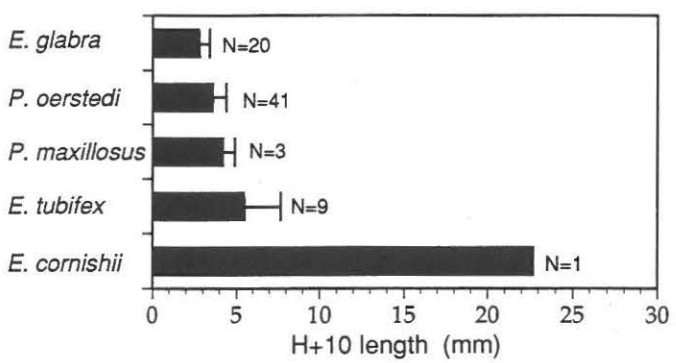

FIG. 13. — Lengths (H+10) of Israeli Acoetidae, mean ± s.d; N, number measured.

To evaluate whether populations from different depths can be compared requires determining whether a positive correlation exists between depth and body size, as in gastropod populations from intertidal and subtidal depths (KOHN, 1971; KOHN & NYBAKKEN, 1975). Two species are rare, *Eupolyodontes cornishii*, found only once, and *Polyodontes maxillosus*, found only three times. One species, *Eupanthalis glabra*, appears to have a very restricted depth range (from 90-183 m, Fig. 11). Thus, the proposed correlations for body size and depth could only be carried out for *Euarche tubifex* (Israel), and *Panthalis oerstedi*.

For *Panthalis oerstedi*, the deepest species (Fig. 11), and one with a great depth range (95 - 1470 m), the Spearman correlation between length of specimens and depth was highly significant ($r = 0.60500$, $p = 0.0001$, $N = 41$, Fig. 12). However, in the Israeli *Euarche tubifex* population, it was *not* significant ($r = 0.32154$, $p = 0.3988$, $N = 9$); the largest specimens were from the greatest depth (Fig. 10), however, the smaller worms were not only from the shallowest depth. The small depth range (165 m) or the small samplesize ($N = 9$) may contribute to this lack of significance. Unfortunately, on the basis of these results, body sizes of individuals from different *areas* which come from different depths cannot be made.

A comparison of the body sizes of the five Israeli species is given in Fig. 13. Depth distributions of the five species along the Israeli coast are compared with their worldwide distributions given in PETTIBONE, 1989 (Fig. 11). Three of the species' ranges begin in deeper waters in the Levant than elsewhere. This has previously been reported for Levant serpulid species (BEN-ELIAHU, 1991). All four of the smaller species (Figs 11; 13) are present and appear abundant at 100 m. As noted above, the Levant population of *P. oerstedi* is recorded from 1,470 m, 700 m deeper than elsewhere (Fig. 11); the species appears to be abundant from 200 m.

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