

## NEW DATA ABOUT THE FAUNA OF ANTHURIDEAN ISOPODS (ISOPODA, ANTHURIDEA) FROM THE LIBYAN COAST AND THE SUEZ CANAL

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On décrit le mâle de l'espèce *Leptanthura muelleri* (Fam. Paranthuridae) et l'espèce *Natalanthura mediterranea* sp. n. (Fam. Anthuridae) des eaux littorales du nord-est de la Libye, ainsi que l'espèce *Cyathura francispori* sp. n. (Fam. Anthuridae) du Canal de Suez. On présente aussi la répartition géographique des espèces appartenant aux genres *Leptanthura* et *Natalanthura*.

In a previous paper I studied Anthuridean Isopods from the north-eastern Libyan littoral waters (Negoescu, 1980). Soon after, examining some more specimens collected by Dr. G. I. Müller in the same area as well as 5 specimens collected by Prof. Fr. D. Por in the Suez Canal, I found out new data concerning the fauna of Anthuridean Isopods from the Mediterranean basin. I have thus identified from the Libyan waters a species, *Natalanthura mediterranea* sp. n. and I have described the ♂ of the species *Leptanthura muelleri* Negoescu; I have also identified the species *Cyathura francispori* sp. n. of the Suez Canal.

### ANTHURIDAE

#### *Cyathura francispori* sp. n.

(Figs 1, 2)

*Material*: 5 ♀♀ Suez Canal, St. T-16, leg. Prof. Fr. D. Por.

*Diagnosis*. Body about 4–5 mm long. Pleon longer than pereonite VII. Telson with apex slightly excavated. Along the joints 2–5 of antennal peduncle a fold. Antennular flagellum 3-jointed; antennal flagellum one-jointed. *Lamina dentata* of mandible without serrations and *pars molaris* reduced; third joint of mandibular palp with two serrate setae. Inner margin of propodus of pereopod I without tooth. Uropodal exopod wide, subapically with an excavation.

*Description* of ♀ (Figs 1, 2)

Integument smooth. Body proportions:  $C < I = II = III = IV = V > VI > VII < \text{pleon} < \text{telson}$ . Cephalon longer than wide; anterolateral lobes exceed rostrum. Eyes present. Pleonites 1–5 fused, barely indicated

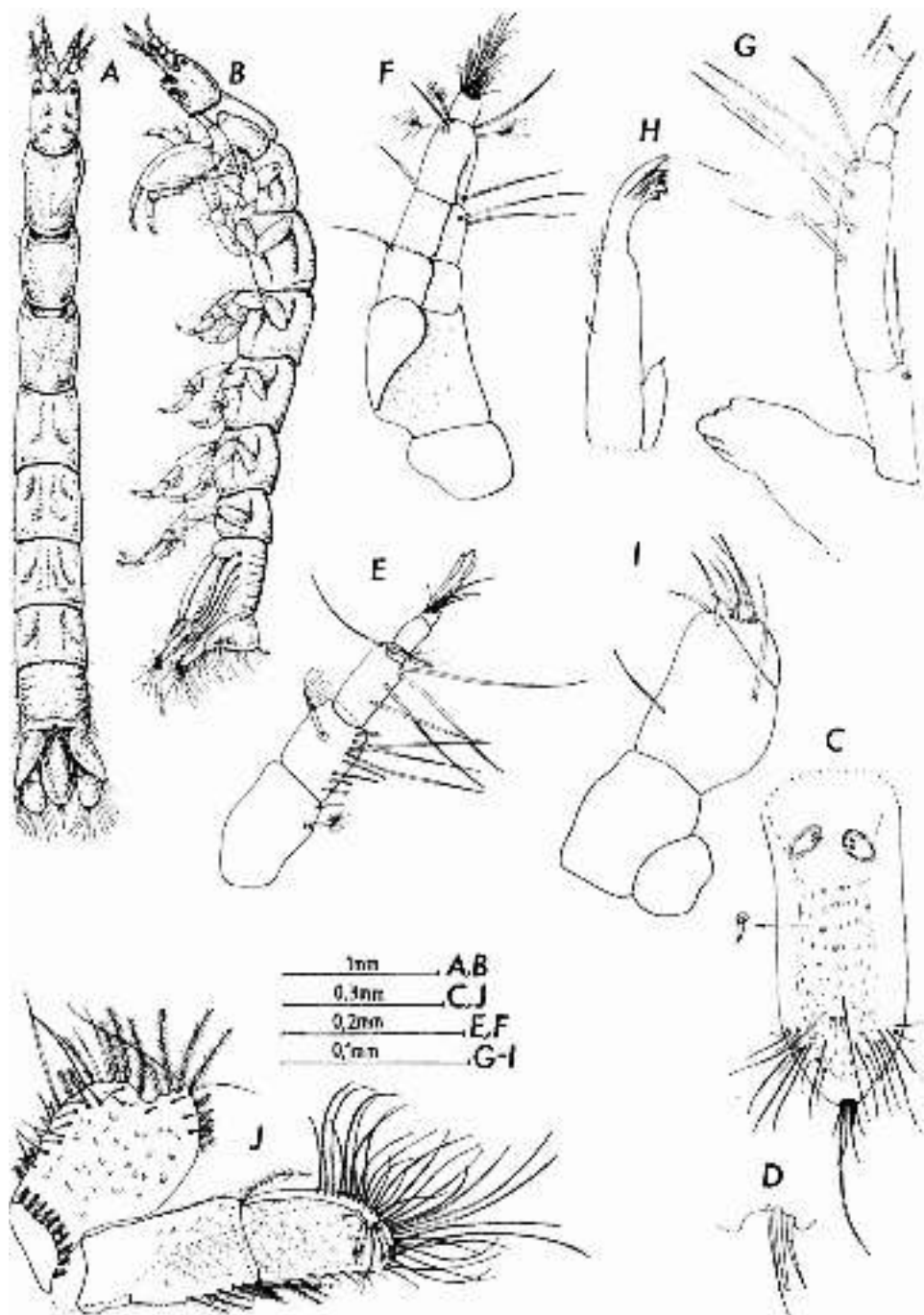


Fig. 1. — *Cyathura francispori* sp. n. ♀. A, dorsal view; B, lateral view; C, telson; D, apex of telson; E, antennula; F, antenna; G, mandible; H, maxilla 1; I, maxilliped; J, uropod (r.) (C—G, J holotype; A, B, H, I paratype)

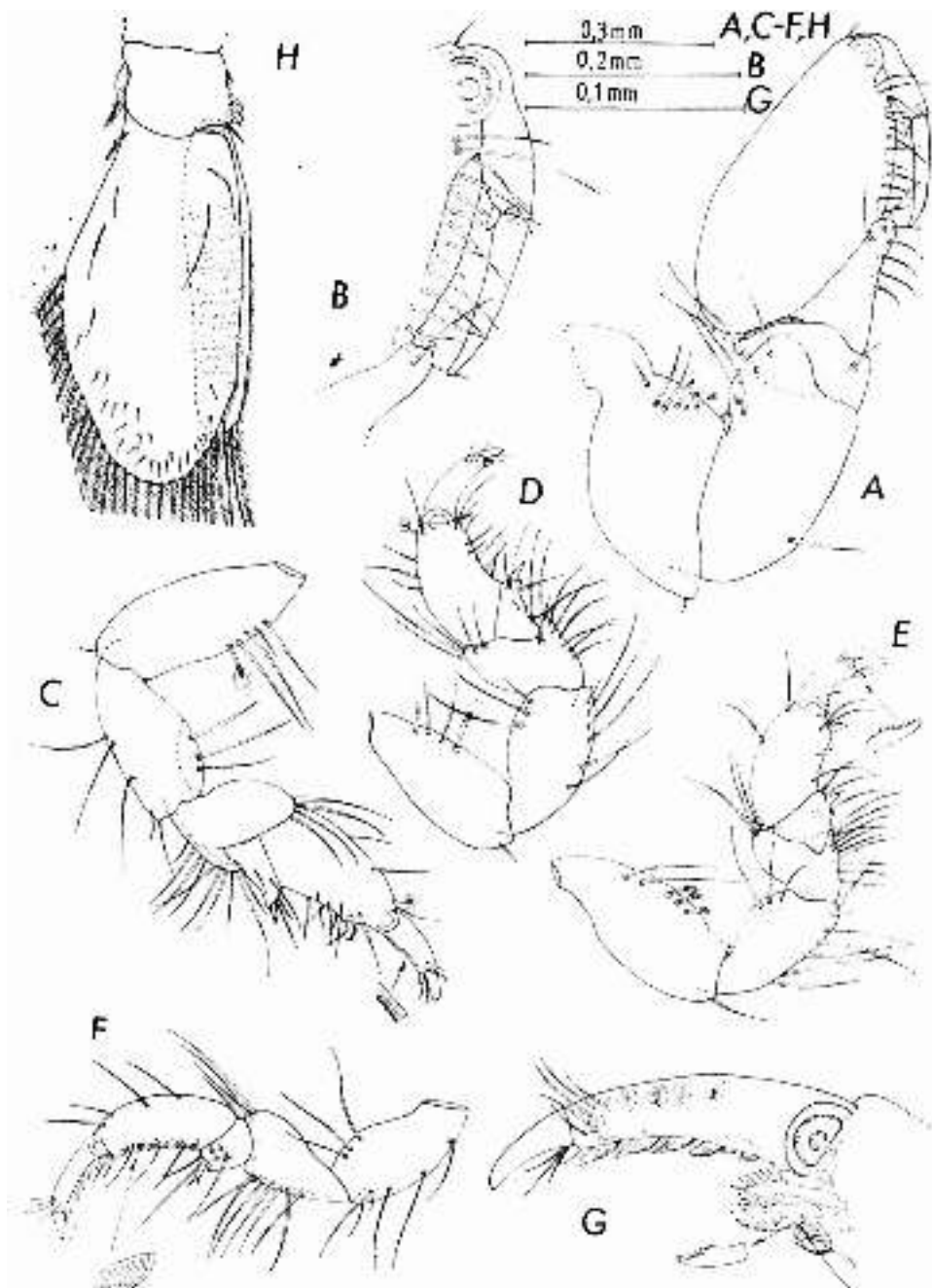


Fig. 2. — *Cyathura francispori* sp. n. ♀. A, pereopod I (r.); B, inner margin of propodus and dactylus of pereopod I (r.); C, pereopod II (r.); D, pereopod III (r.); E, pereopod IV (r.); F, pereopod VII (r.); G, distal extremity of propodus and dactylus of pereopod VII (r.); H, pleopod 1 (r.) (A—H holotype)

dorsolaterally and laterally; pleonite 6 free, with a middorsal incision (Fig. 1 A, B). Telson, dorsally convex, with straight, parallel margins converging distally into an apex slightly excavated, with 6 apical simple setae (Fig. 1 C, D). Dorsally medially on telson numerous grouped spinules; dorsally, on the distal extremity numerous simple setae. Statocysts present (Fig. 1 C). The joints 2 and 3 of antennular peduncle with numerous simple setae on the external side; antennular flagellum 3-jointed, the 2nd joint being the longest; 3 apical aesthetascs (Fig. 1 E). Along the 2–5 joints of antennal peduncle a fold into which antennula fits; antennal flagellum one-jointed, apically with a bunch of aesthetascs (Fig. 1 F). Mandible with: *pars incisiva* with 3 teeth; *lamina dentata* without serrations; *pars molaris* reduced; second joint of palp about twice longer than the first; 3rd joint, the smallest, apically with 2 serrated setae (Fig. 1 G). Lateral endite of maxilla 1 with 6 teeth and 2 hairs (Fig. 1 H). Maximum width of maxilliped at the level of joint 3; the 4th joint, small, triangular, with 5 setae; endite absent (Fig. 1 I). Pereopod I with: carpus distally rounded; inner margin of propodus slightly convex, bordered with articulate setae, without tooth; unguis as long as half of dactylus (Fig. 2 A, B). Pereopods II and III with: trapezoidal carpus having distal truncate extremity; propodus ovate (Fig. 2 C, D). Distally, innerly, on propodus of pereopod VII a serrated spine and 2 double serrated setae; on inner margin of dactylus 6–7 fringed scales (Fig. 2 F, G). All pereopods bear innerly, at the basis of unguis, a simple spine. Pereopods II–VII bear numerous simple setae on basis, merus, ischium, propodus; on the distal extremity of carpus, a spine; on propodus, distally innerly a serrated spine (Fig. 2 C–G). Exopod of pleopod 1, operculiform, bearing distally dorsally small spines; on the inner margin of protopodite 3 retinacles (Fig. 2 H). Uropodal exopod wide, not folding over telson; subapically, an excavation (Fig. 1 A, J). Distal article of uropodal endopod apically slightly rounded, on the inner margin bearing spines; along the endopod a fold in which exopod fits; endopod extends slightly beyond telson (Fig. 1 A). Dorsally, the uropod as well as telson bear small solitary or grouped spines (Fig. 1 J).

Some of the studied specimens show algal filaments attached on antennae, mouth parts, pereopods, telson, uropods.

Size: ♀ length 4–5 mm.

Colour of specimens preserved in formalin, yellowish; eyes brown-reddish.

*Derivatio nominis.* The species is named for Professor Francis Dov Por of the Hebrew University of Jerusalem, who collected the material.

*Remarks.* The incomplete description of some species of genus *Cyathura* makes it difficult to establish affinities between species: “*C. pusilla*, *C. siamensis*<sup>1</sup>, *C. indica*, *C. crucis*, *C. eremophila* and *C. estuaria* are forms for which the existing indications are too rough to enable any observations to be made about them at any level, at least until reliable data are available”. (Argano 1972, p. 25). The species *francispori* differs from the other species of genus *Cyathura* in: pleon, longer than pereonite VII, with traces of segmentation visible dorso-laterally and laterally; mandible with *lamina dentata* devoid

<sup>1</sup> Kensley (1978 b) introduced *Cyathura siamensis* in the new genus *Caenanthura*.

of serrations and reduced *pars molaris*; joint 3 of mandibular palp smaller than joint 1, with 2 serrated apical setae; aspect of maxilliped. This species shows external morphological features resembling those of the tropical-American-Pacific species *munda* Menzies (Menzies, 1951); the segmentation of pleon laterally visible; aspect of telson and uropods; aspect of 3rd joint of mandibular palp and of maxillipe d. The lack of tooth or protuberance on inner margin of propodus of pereopod I makes it approach the cave freshwater species belonging to the *specus* group: *curassavica* Stork, *sbordonii* Argano and *specus* Bowman (Argano, op. cit.) as well as the south-African species *estuarina* Barnard and the Indian one, *pusilla* Stebbing.

*Types.* Holotype ♀ under nr. 636; 4 paratypes (♀♂) under nr. 637 a-d in the collection of types of the "Grigore Antipa" Natural History Museum.

*Type locality.* Suez Canal, St. T-16.

### *Natalanthura mediterranea* sp. n.

(Figs 3–5)

*Material:* 2 juvs, Libya, St. 192, St. 296, leg. Dr. G. I. Müller.

*Diagnosis.* First 5 pleonites free; 6 fused with telson. Margins of telson straight. Antennular flagellum 4-jointed. Antennal flagellum 7-jointed. *Lamina dentata* of mandible with 10–11 serrations. Pleopod 1 without retinacles. Margins of uropod straight.

*Description of juvenile* (Figs 3, 4)

Integument indurate, bearing fine small hairs. Body proportions:  $C < I < II < III = IV = V > VI > VII < \text{pleon} < \text{telson}$ . The same width all along the body. Cephalon about as long as wide. Eyes big. The first 5 pleonites free; 6 fused with telson (Fig. 3 A). Telson rectangular, with ciliated margins, middorsally all along a wide ridge bordered by hairs; apex wide, slightly rounded, with 4 pairs of setae (Fig. 3 B). Statocysts are not present. Antennular flagellum 4-jointed; 2nd joint, the longest, with 3 aesthetascs; 3rd and 4th joint each with one aesthetasc (Fig. 3 C). Antennal flagellum 7-jointed (Fig. 3 D). Mandible with: *pars incisiva* with 3 teeth; *lamina dentata* with 11 serrations in the right mandible (Fig. 3 E) and 10 in the left one (Fig. 3 F); *pars molaris*, fingerlike process, finely striated, developed in the right mandible (Fig. 3 E) and reduced in the left one (Fig. 3 F). The 3rd joint of mandibular palp, the shortest, with 3 sub-apical plumose setae; 2nd joint, the longest, with groups of cilia (Fig. 3 E). Lateral endite of maxilla 1 with 4 teeth (Fig. 3 G.). On the joints of maxilliped short setules; the 2nd joint 4 times longer than the 3rd or 4th, which are equal; the 5th joint is the smallest. Endite of maxilliped, with acute apex, exceeds in length the half of the 4th joint. Epipodite pyriform (Fig. 3 H, I). Pereopods I–VI resemble; VII incompletely developed. Pereopods I–III with small, triangular carpus; propodus slightly ovate, with ciliated margins and distally innerly a flagellate spine (Fig. 4 A–C). Pereopods IV–VI distally innerly each with a spine on carpus and propodus (Fig. 4 D–F). All pereopods at basis of unguis bear an inner spine; the length of unguis represents 1/3 of the length of dactylus (Fig. 4 A–F). Pleopod 1 operculiform; retinacles absent (Fig. 3 J). Uropodal exopod, oval, slightly

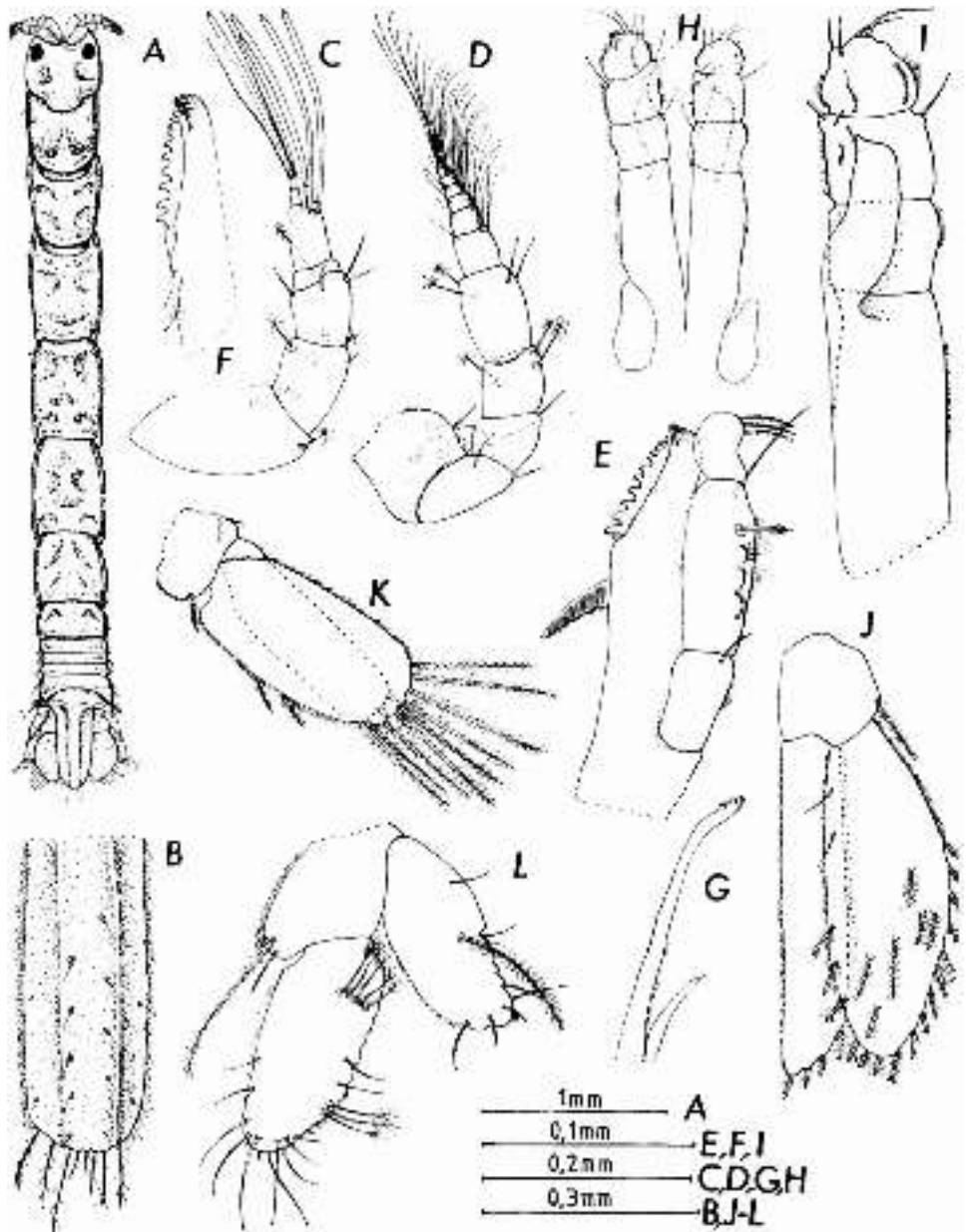


Fig. 3. — *Natalanthura mediterranea* sp. n. juv. A, dorsal view; B, telson; C, antennula (r.); D, antenna (r.); E, mandible (r.); F, *pars incisiva*, *lamina dentata* and *pars molaris* of left mandible; G, maxilla 1 (r.); H, maxillipeds; I, maxilliped; J, pleopod 1 (l); K, pleopod 2 (r.); L, uropod (r.) (A holotype; B—L paratype)

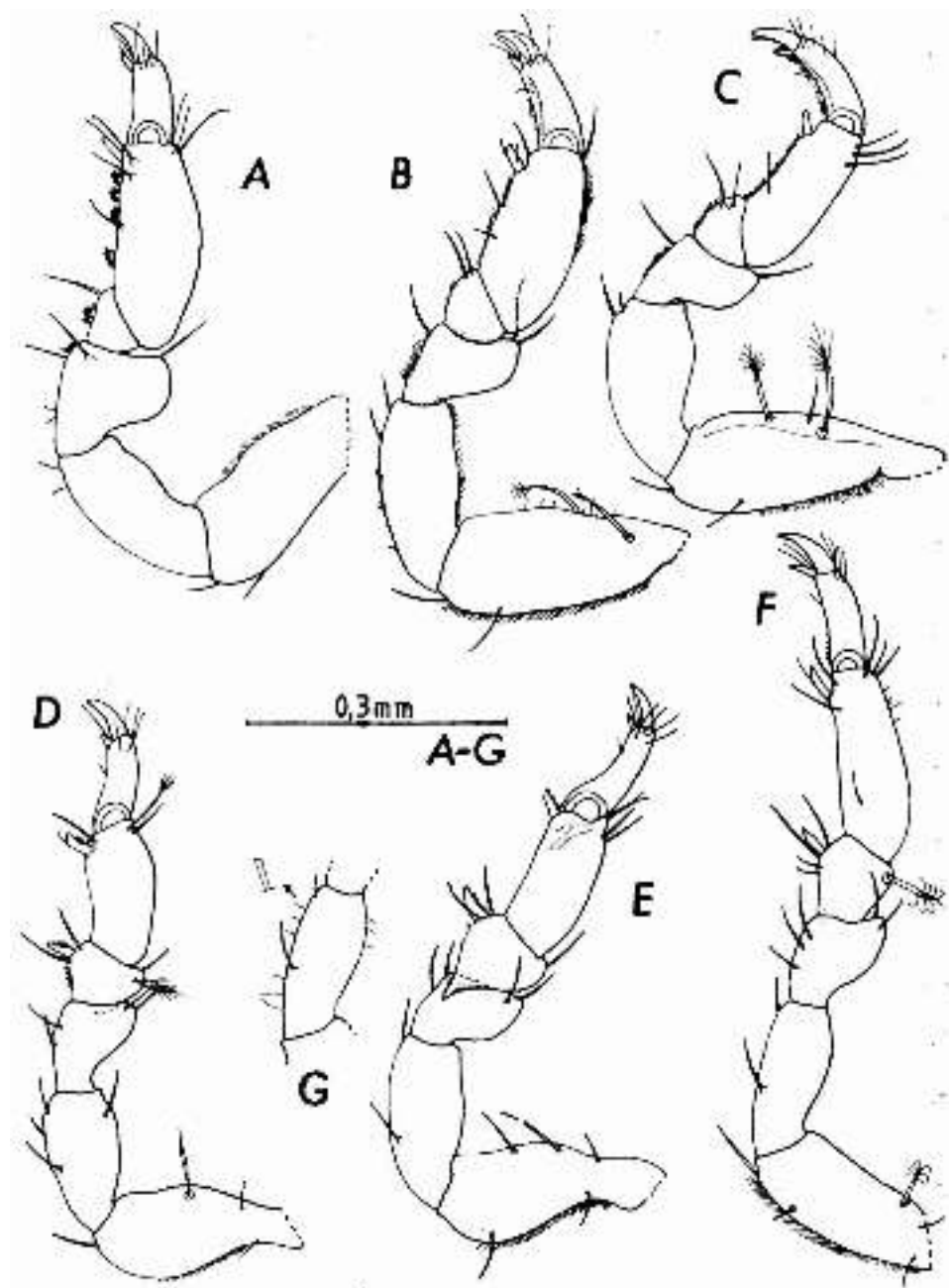


Fig. 4. — *Natalanthura mediterranea* sp. n. juv. A, pereopod I (r.); B, pereopod II (r.); C, pereopod III (r.); D, pereopod IV (r.); E, pereopod V (r.); F, pereopod VI (r.); G, algal filaments on pereopod (A—G paratype)

narrowed towards the apex, not folding over telson (Fig. 3 A, L). Uropodal endopod, with apex slightly rounded, is twice longer than wide (Fig. 3 L).

The two studied specimens show short algal filaments attached on pereopods (Fig. 4 G).

*Size* : juvenile's length about 4 mm.

*Colour* of specimens preserved in formalin, light reddish-brown; eyes dark brown.

*Derivatio nominis*. The specific name of this species belonging to a genus signalled for the first time in this basin is taken from the Mediterranean Sea.

*Remarks*. *Natalanthura mediterranea* sp. n., the only species of this genus known so far in the Mediterranean (Fig. 5), shows external morphologic features similar to the known species of the genus: *foveolata* Kensley from the south-western Indian Ocean and *fijiensis* Kensley from the south-western Pacific Ocean<sup>1</sup>. In contrast with *foveolata* that shows "Integument indurate and obviously pitted..." (Kensley, 1978 a, b) this new species is lacking an obvious ornamentation; the body has the same width all along; it bears aesthetascs on the last 3 joints of antennular flagellum; antennal flagellum 7-jointed; *lamina dentata* of mandible with 10—11 serrations; length of endite of maxilliped; telson and uropods without dentated margins; pleopod 1 devoid of retinacles. *Natalanthura mediterranea* differs from *fijiensis* in: reduced ornamentation of integument, proportions of pereonites, first 5 pleonites free (in *fijiensis*, pleonites 1—5 are fused) (Kensley, 1979);

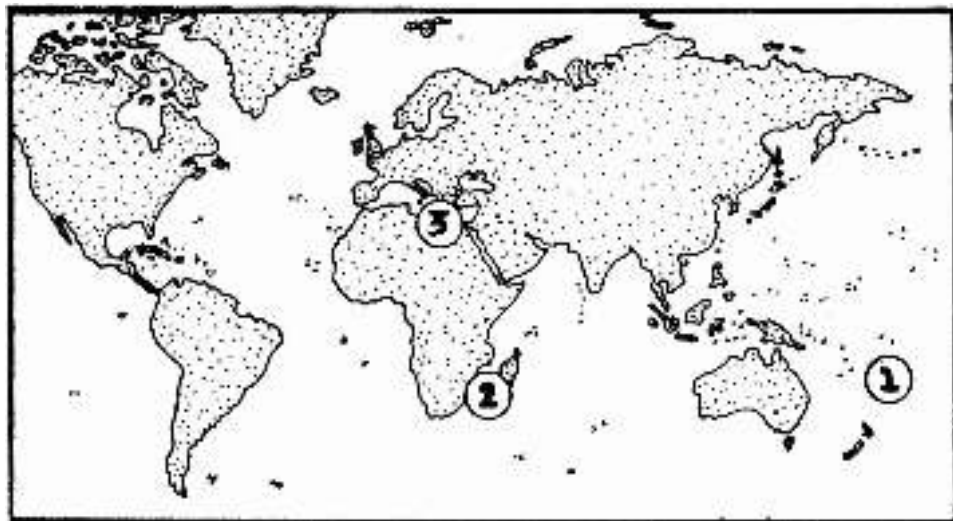


Fig. 5. — The distribution of the species of genus *Natalanthura* throughout the globe: 1, *fijiensis* Kensley; 2, *foveolata* Kensley; 3, *mediterranea* sp. n.

<sup>1</sup> Kensley (1979) mentions *Natalanthura* sp. in Honduras Gulf (Belize) which I took into account in one of my papers (Negoescu, 1981); later, the author informed me (in litt.) that in fact his specimens belonged to another genus and species (*Apanthuroides millae*).



number of joints of flagellum of antennula and antenna; endite of maxilliped. The slight ornamentation of integument of the studied specimens could be explained by the fact that they are juveniles.

*Types.* Holotype juv. under nr. 638; paratype (1 juv.) under nr. 639 in the collection of types of the "Grigore Antipa" Natural History Museum.

*Type locality.* Libya, St. 192, 32°41'N, 23°00'E, 70 m depth, sand with *Caulerpa*, *Codium*, decapods, etc., 5.III.1976.

### PARANTHURIDAE

*Leptanthura muelleri* Negoescu, 1980

(Figs 6–8)

The ♂ specimen that I found in the material studied in the present paper helped me in completing the description of species *Leptanthura muelleri* that I previously described from the Libyan littoral waters (Negoescu, 1980).

*Material:* 1 adult ♂, Libya, st. 116, leg. Dr. G. I. Müller.

*Description of ad. ♂* (Figs 6, 7)

Integument smooth. Body carinated ventrally. Body proportions:  $C < I < II = III = IV = V = VI > VII = \text{pleon} > \text{telson}$  (Fig. 6 A). Cephalon as long as wide; anterolateral lobes exceed the acute rostrum. Eyes present. Pleonite 6 the longest (Fig. 6 A). Telson, dorsally convex, with straight, ciliated margins, parallel over 2/3 of its length and converging in the distal third in a truncate apex bearing 4 apical setae, the median ones plumose (Fig. 6 B). Statocyst present (Fig. 6 B). Antennular flagellum 5-jointed, with bunch of aesthetascs (Fig. 6 C). Antennal flagellum of 5 minute joints (Fig. 6 D). The 3rd joint of mandibular palp, the smallest, with 2 apical setae (Fig. 6 E). Lateral endite of maxilla 1 with 13 serrations on the inner margin and 3 barbs on the outer one (Fig. 6 F). The last two joints of maxilliped, minute (Fig. 6 G). On the inner margin of propodus of pereopod I, which is the strongest, 7 spines like the fingers of a hand and one flagellate spine (Fig. 6 H, I); at pereopods II and III, 4 and, respectively, 3 serrated spines (Fig. 7 A, B); at pereopods IV and V, 2 spines (Fig. 7 C, D) and at pereopods VI and VII, one distal spine (Fig. 7 E, F). Dactylus of pereopod VII bordered by fringed lobes (Fig. 7 F). In all pereopods, distally innerly on carpus 2 flagellate spines. Exopod of pleopod 1 operculiform; retinacles absent (Fig. 6 J). *Appendix masculina* hook-shaped, extending much beyond pleopod 2 (Fig. 7 G). Uropodal exopod cordiform, with straight margins (Fig. 7 H); distal article of uropodal endopod, with narrow and rounded apex, is narrower and shorter than the proximal article (Fig. 7 I).

*Size:* ad. ♂ length 5.5 mm.

*Colour* of specimen preserved in formalin, whitish.

*Sexual dimorphism.* The male of species *Leptanthura muelleri* differs from the female in the antennula flagellum and in pleopod 2.

*Remarks.* The aspect of *appendix masculina* clearly distinguishes *Leptanthura muelleri* from the other species of the genus. This species shows affinities with the species *tenuis* (Sars), *agulhasensis* Kensley, *diemenensis* (Haswell), *kapala* Poore (Negoescu, 1980).

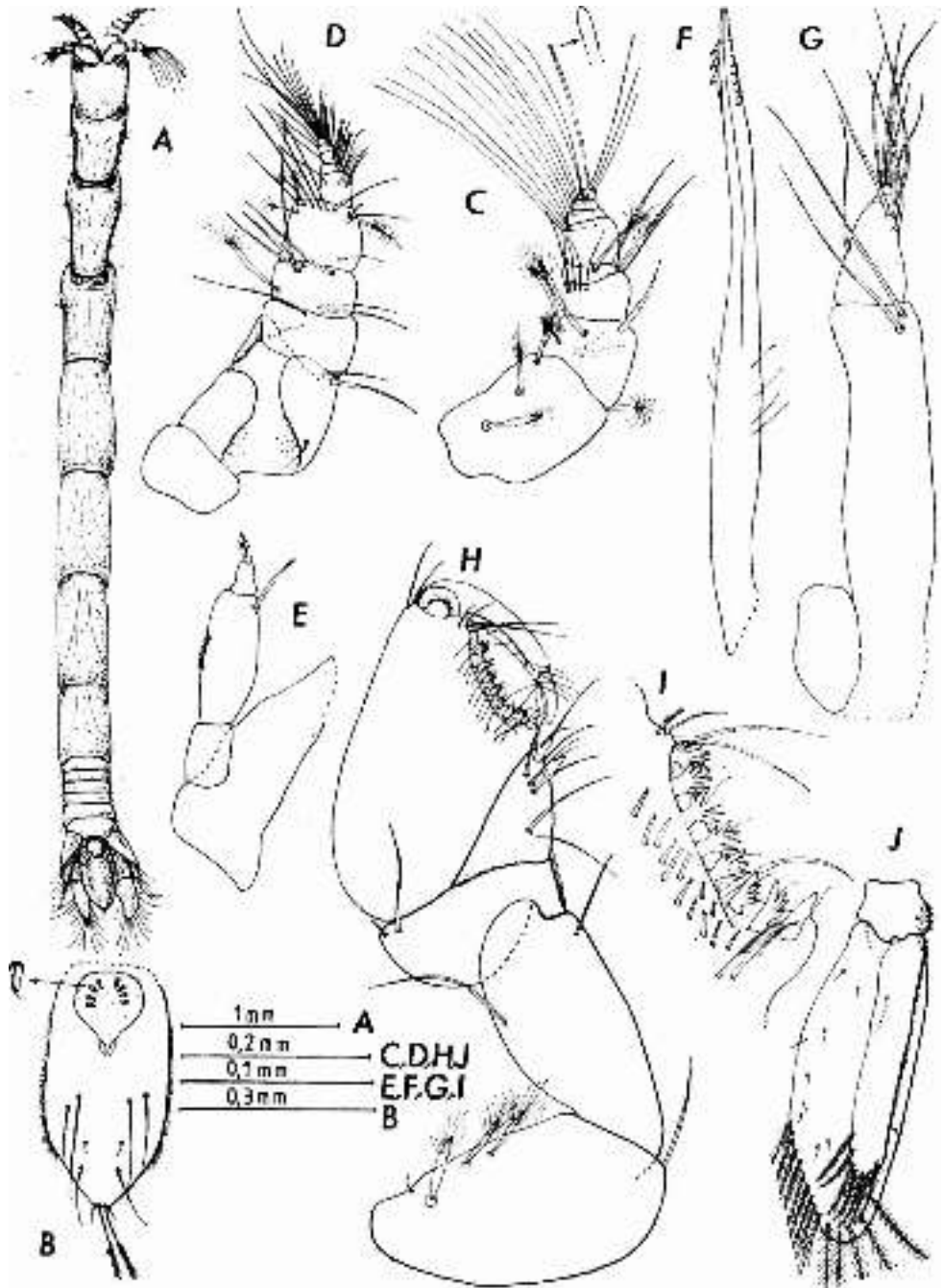


Fig. 6. — *Leptanthura muelleri*. ♂. A, dorsal view; B, telson; C, antennula (l); D, antenna (l); E, mandibular palp; F, maxilla 1; G, maxilliped; H, pereopod I (l); I, inner margin of propodus of pereopod I (l); J, pleopod 1 (r.)

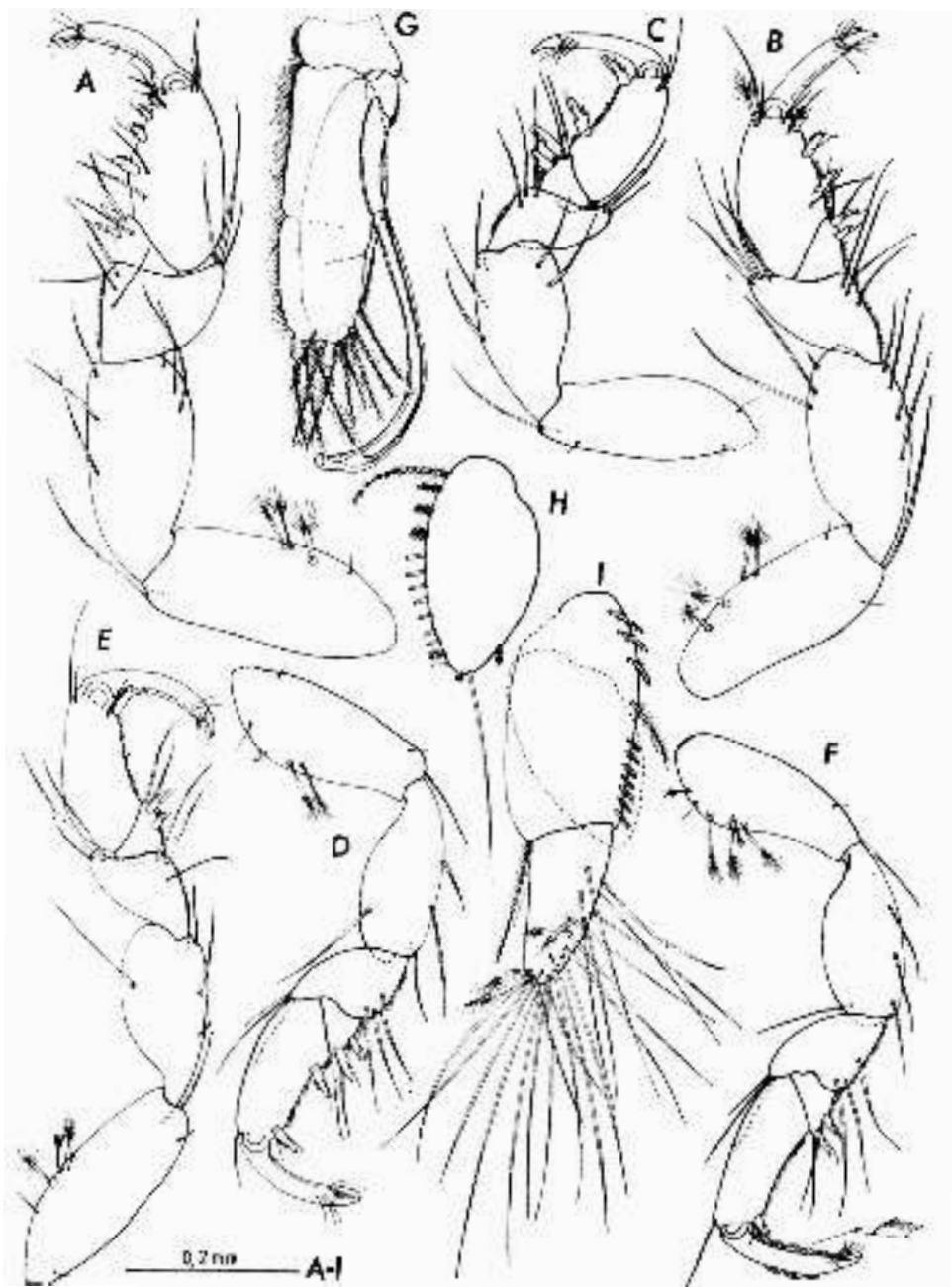


Fig. 7. — *Leptanthura muelleri*. ♂. A, pereopod II (l); B, pereopod III (l); C, pereopod IV (l); D, pereopod V (l); E, pereopod VI (l); F, pereopod VII (r.); G, pleopod 2 (r.); H, exopod of uropod (l); I, endopod of uropod (l)

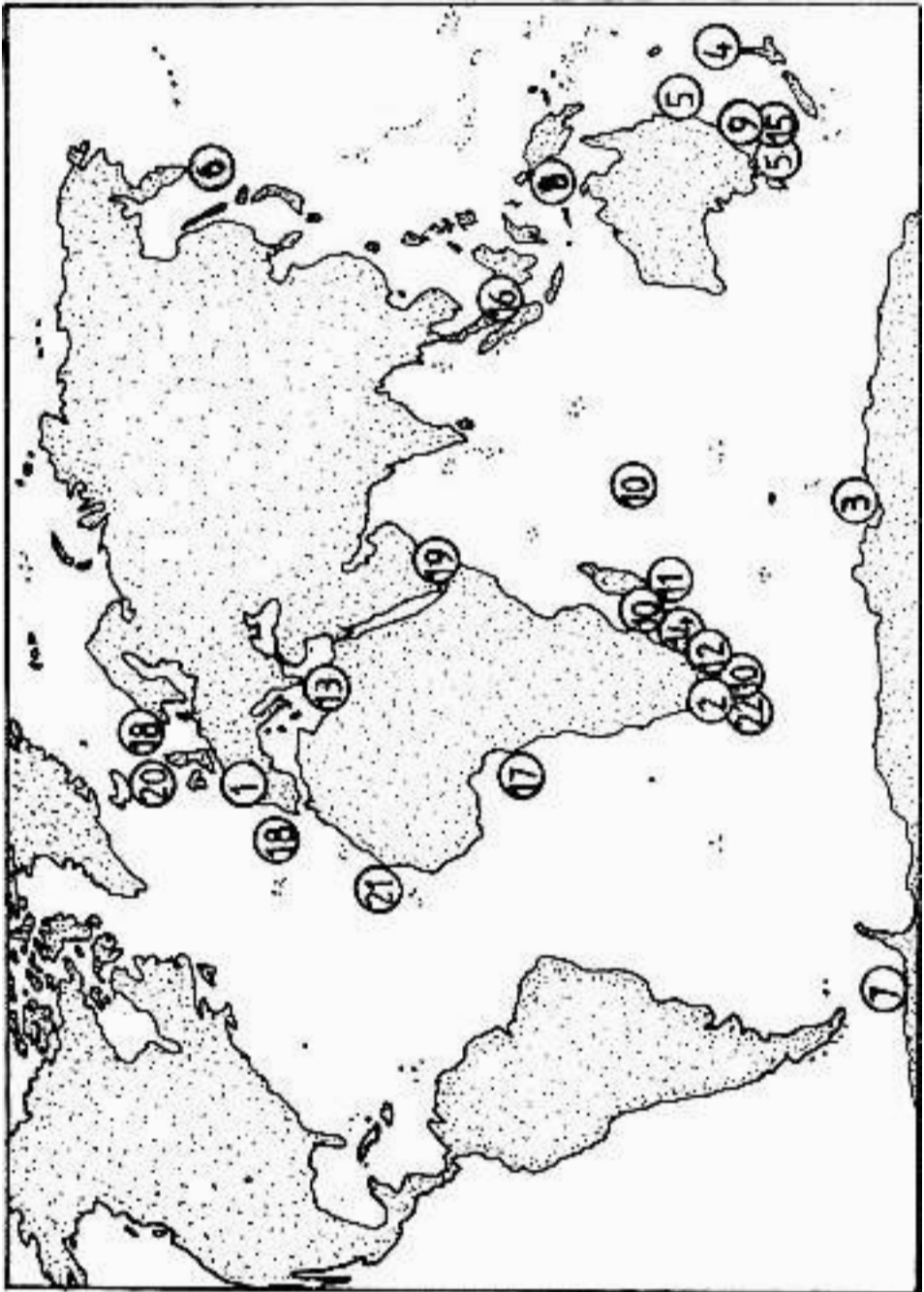


Fig. 8. — The distribution of the species of genus *Leptanthura* throughout the globe: 1, *affinis* (Bonnier); 2, *agulhasensis* Kensley; 3, *antarctica* Kusakin; 4, *chiltoni* (Beddard); 5, *diemenensis* (Haswell); 6, *elegans* Birstein; 7, *glacialis* Hodgson; 8, *hendili* Wolff; 9, *kapala* Poore; 10, *laevigata* (Stimpson); 11, *ligula* Roman; 12, *minuta* Kensley; 13, *muelleri* Negoescu; 14, *natalensis* Kensley; 15, *nunana* Poore; 16, *orientalis* Barnard; 17, sp. (Menzies); 18, *tenuis* (Sars); 19, *thalassae* Negoescu; 20, *thori* Barnard; 21, *truncata* Richardson; 22, *urospinosa* Kensley.

The species of genus *Leptanthura* are known from the Atlantic Ocean, the Mediterranean Sea, the Indian Ocean and the western Pacific Ocean (Fig. 8) (Roman, 1979; Poore, 1980; Negoescu, 1980).

### CONCLUSIONS

The present paper brings new data about the Anthuridean Isopods from the north-eastern Libyan littoral waters: the description of the ♂ of species *Leptanthura muelleri* Negoescu and of the new species *Natalanthura mediterranea*.

The specimens from the Suez Canal belong to a new species, *Cyathura francispori*. Given the level of the present knowledge concerning the world fauna of Anthuridean Isopods in general and of Anthuridean Isopods of the Mediterranean Sea in particular, I cannot state precisely whether this species is an immigrant from the Mediterranean Sea or from the Indian Ocean: "Unfortunately many uncertainties exist in the interpretation of present day distributions, due in large part to (a) inadequate knowledge of pre-Canal faunas and (b) infrequent assessment, in space and time, of existing faunas. Since over half of the species reported here<sup>1</sup> were not previously known from the Canal, the apparent recent enrichment of the isopod fauna may be significant, indicating the need for continued work in the Suez waterway and adjacent areas" (Glynn, 1972, p. 297). Emphasis should be laid on the fact that, at present, a single species of genus *Cyathura*, i. e. *carinata* (Kröyer), is mentioned in the Mediterranean and the species *carinata* (Kröyer), *indica* Barnard, *pusilla* Stebbing, *rudloei* Kensley and *villosa* Roman in the Indian Ocean.

The algal filaments observed both on the specimens of *Natalanthura mediterranea* and on those of *Cyathura francispori* indicate a possible case of symbiosis, which I also previously signalled in the specimens of *Leptanthura muelleri* (Negoescu, 1980); or a consequence of the sedentary life in a muddy substratum of these benthic crustaceans.

Through the present study, I underline once more the kinship of the fauna of Mediterranean Anthuridean Isopods with the Indo-west-Pacific and tropical -American-Atlantic and -Pacific ones.

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<sup>1</sup> The author mentions 10 species of Isopods in the Suez Canal (subord. Gnathiidea, Flabellifera, Valvifera and Asellota).

DATE NOI PRIVIND FAUNA DE IZOPODE ANTURIDE (ISOPODA, ANTHURIDEA) DE PE COASTA LIBIANĂ ȘI DIN CANALUL SUEZ

REZUMAT

Din apele litorale din nord estul Libiei este descrisă specia *Natalanthura mediterranea* sp. n. (Fam. Anthuridae) și masculul speciei *Leptanthura muelleri* Negoescu (Fam. Paranthuridae), iar din Canalul Suez specia *Cyathura francispori* sp. n. (Fam. Anthuridae). În completare este reprezentată răspindirea pe glob a speciilor din genurile *Natalanthura* și *Leptanthura*.

Pe exemplare de *Natalanthura mediterranea* și *Cyathura francispori* este semnalată prezența de filamente algale, care indică un posibil caz de simbioză sau o consecință a vieții sedentare.

Prezentul studiu vine să sublinieze, odată în plus, înrudirea speciilor de izopode anturide din bazinul mediteranean cu speciile indo-vest-pacifice și cu cele tropical-american-atlantice și tropical-american-pacifice.

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