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## A NEW PARASITIC COPEPOD CRUSTACEAN OF UNCERTAIN AFFINITIES:

### *MEGALLECTO THIRIOTI* N. GEN., N. SP.

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#### ABSTRACT

A new genus and species of parasitic copepod, *Megallecto thirioti*, has been found in a horizontal plankton haul at 100 m depth in the eastern north Atlantic. Its host is very probably a pteropod mollusc belonging to the thecosome group. This copepod would appear to be related to *Micrallecto uncinata* Stock, 1971 and *Nannallecto fusi* Stock, 1973, but differs from both in its much larger size and in several important structural features.

#### INTRODUCTION

Although the early developmental stages of some lernaeid copepods have been reported from thecosome pteropods, these pelagic molluscs are not, so far, on record as hosts of poecilostome copepods. The monotypic genera *Micrallecto* and *Nannallecto*, putatively related to the present form, both occur on naked (gymnosome) pteropods from the western Atlantic. Their affinities are difficult to determine, but Stock (1971, 1973) has suggested that they should provisionally be included in the family Splanchnotrophidae.

The copepod described here was obtained in a horizontal plankton haul at 100 m depth, approximately 100 km west of Port Etienne on the Mauritanian coast of North Africa. Although found free, its structure clearly indicates a parasitic mode of life. Present in the same haul were thecosome pteropods - fifty specimens

of *Euclio pyramidata* Lesueur and one of *Diacria trispinosa* (Linnaeus). Bearing in mind the general resemblance of the new copepod to *Micrallecto* and *Nannallecto*, it seems reasonable to suppose that it too is associated with pteropods. In many morphological details, however, it differs markedly from both of the gymnosome parasites, thus necessitating the erection of a new genus. Although neither of the specimens obtained was carrying eggs, or showed any trace of reproductive organs, by analogy with Stock's genera it can safely be assumed that they are females.

*Megallecto* n. gen.

#### Diagnosis.-

Female. Shape generally similar to *Micrallecto* and *Nannallecto*, with a well demarcated ce-

phalosome and an inflated, unsegmented posterior body region. All head appendages present with the exception of ?maxillules. One pair of legs, biramous and considerably reduced, are present. No trace of caudal rami or their vestigial remnants.

Type-species.-

*M. thirioti* n. sp., probably associated with thecosome pteropods.

Etymology.-

*Megallecto*, gender feminine, from *megas* (great) and *Allecto* (one of the three furies, possessed of long claws); *thirioti*, after the name of the late Dr. Alain Thiriot, leader of the expedition which discovered this parasite.

*Megallecto thirioti* n. sp.

Material.-

2 ♀♀ (including 1 ♀ holotype). CINECA V expedition. Horizontal plankton haul 65, depth 100 m. Date 24-III-1974. Time 22h 24m. Position 21°25'N 17°54'W. Bottom sounding 1060 m. Ship "Jean Charcot". Holotype (as slide material) deposited with the Muséum National d'Histoire Naturelle, Paris, cat. nr. Cp. 154. Paratype deposited in the Zoölogisch Museum, Amsterdam, cat. no. Co. 102.718.

Description.-

Female. Body length of holotype 1.72 mm; maximum breadth also 1.72 mm. Length of paratype 2.48 mm, but breadth indeterminable, due to partial collapse of the extremely thin and feeble cuticle. Such cuticular distortion is also responsible for any apparent asymmetries shown in the figures. The body is divided into an anteriorly protuberant cephalosome and a much larger, almost globular, posterior portion, wholly lacking in segmentation (figs. 1,2). Overall, sclerotization is very weakly developed.

The head appendages are closely apposed, but for reasons of clarity are shown in fig. 2 as more widely separated than is actually the case. Their crowded appearance towards the front of the cephalosome is partly due to a 90° downward deflection affecting the anterior portion of

the head, and they give the impression of constituting a loosely organised oral cone. Antero-dorsally the cephalosome is covered by a small cephalic plate, prolonged anteriorly into a tiny ventrally projecting rostrum, the sides of which are sparsely ornamented by minute, feeble setae (fig. 3). Interpretation of the appendages is tentative: scarcity of material, the extremely delicate cuticle and a few anomalous structural features have all contributed to some uncertainty.

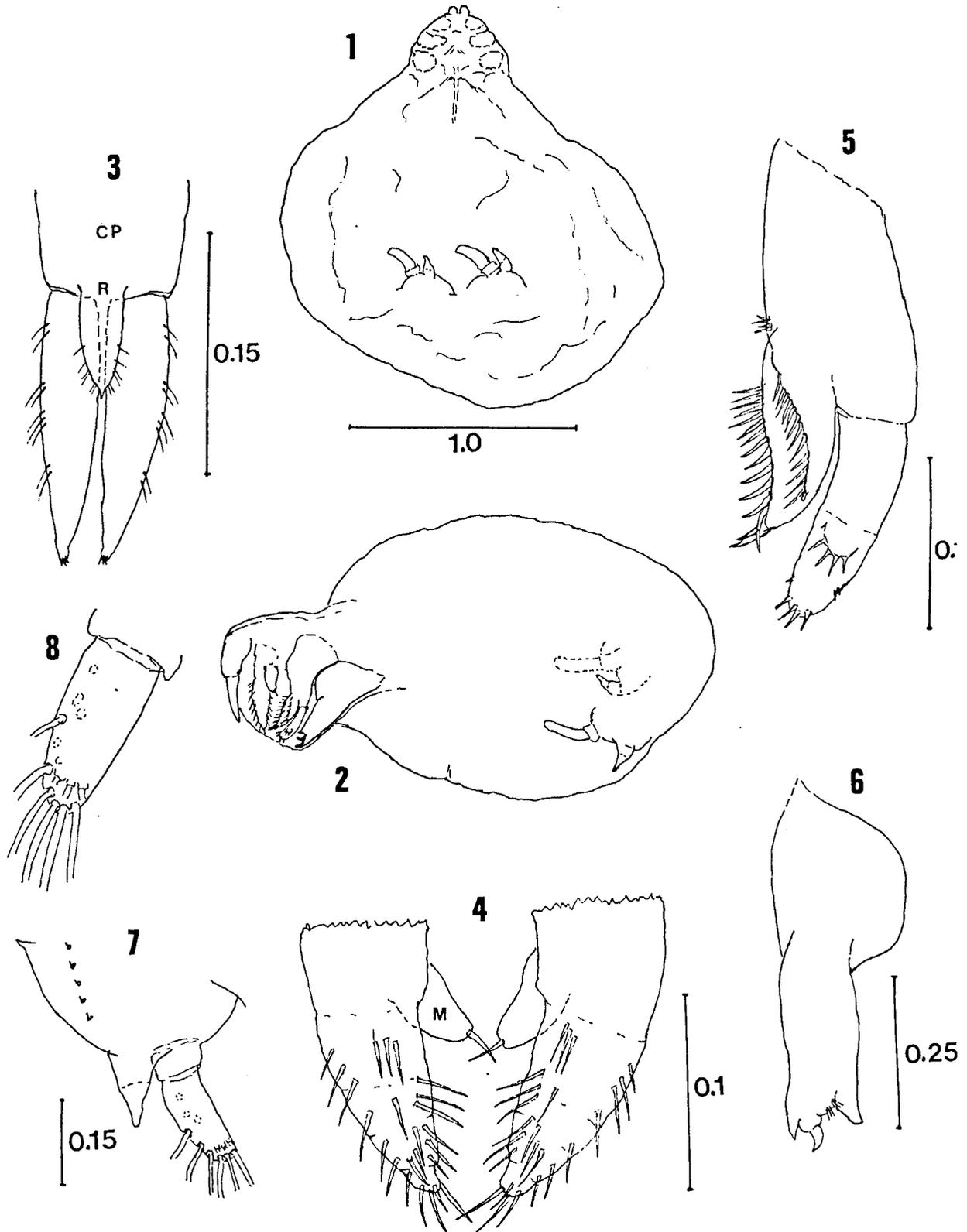
The first pair, in very close proximity to the rostrum and to each other, can be regarded as antennules with a fair degree of confidence (fig. 3). They are unimerous and digitiform, sparsely embellished by very delicate setae. Their distal tips end in a few minute spines.

The second appendages initially gave the impression of being somewhat flattened leaf-like structures. However, phase-contrast microscopy revealed hints of podomere formation (perhaps as many as five articles) and they are therefore interpreted here as antennae (fig. 4). The articulations shown are approximate only. Although setation is quite profuse, the exact distribution of the setae is likewise tentative.

The basal origins of the third appendages are difficult to distinguish from those of the antennae. The appendages themselves appear to represent small, lobate mandibles, each possessing a single apical seta (fig. 4).

The fourth pair are clearly the dominant cephalic appendages and are almost certainly involved with prehension. They are very likely maxillae, maxillules seemingly being absent. Each maxilla (fig. 5) is relatively massive, but its segmentation is rather obscure. Distally it is bifurcate, one branch ending in a spatulate manner with a rim of spines (some of them curved) and setae. The other branch comprises an elongate, gently curved lamella, its distal tip bearing six rather delicate setal elements. Four similar elements adorn the lamella a short distance behind the tip.

The last oral appendage conforms positionally to a maxilliped (fig. 6). Its basal extent is difficult to determine since it grades almost imperceptibly into the surrounding body



Figs. 1-8. *Megallecto thirioti* n. gen., n. sp. 1, female holotype, ventral view; 2, female paratype, lateral view; the right leg (in dotted outline) can be seen through the transparent body; 3, face view of antennules, rostrum (R) and part of cephalic plate (CP); 4, face view of antennae and mandibles (M) (cephalic plate, rostrum and antennules removed); 5, maxilla; 6, maxilliped; 7, leg; 8, distal segment of pereopodal endopod. All scales in mm.

cuticle. Medianly a small, slightly curved claw is apparent, situated in a terminal notch. However, in the material available, details of this distal extremity cannot be easily seen, and the illustration provided may not be wholly accurate. Immediately behind the maxilliped lies what can probably be regarded as a lower lip with a pronounced median cleft and backwardly projecting sides.

Deeply set within the oral complex is a small oval patch of rugose tissue. Although at first interpreted as paragnath development, it seems more likely to represent a site of powerful muscle attachment, perhaps concerned with the operation of a buccopharyngeal pump. In both alcohol-fixed specimens (before treatment with lactic acid) a complicated scaffolding of muscles supplying the various appendages could be easily seen.

From the ventral surface of the posterior body region, on either side of the mid-line and about two-fifths from the anterior extremity, two very small and digitiform structures project inwards. They possibly represent minute sclerites, presumably concerned with muscle attachment. Set slightly beyond the mid-point of the body are a pair of undoubted legs (figs. 1, 7, 8). These are biramous, the rami emerging from a domed swelling (modified protopodite?). The rami differ greatly, one being bimerous with a long, rectangular distal segment bearing about twelve setae which, although quite lengthy, are so hyaline that their precise extent is difficult to make out. The other ramus, less obviously bimerous, is conical and only about half the length of the first. It is bereft of setae and terminates in a roughened point. The basal mound from which the rami arise is ornamented by at least five very small setae set in a line equidistant from each other. The rami are curiously aligned, apparently arising one behind the other, rather than side by side in the usual exopod-endopod relationship. This effect might, however, be due to local cuticular collapse. By analogy with a number of other associated copepods (e.g. the ascidicolous enterocolines) the smaller conical element is here interpreted as the exopod and the larger setiferous blade as the endopod.

No indications of caudal rami or their vestiges could be found.

#### DISCUSSION

The systematic position of this poecilostomatoid remains for the moment enigmatic. Its general form, feeble sclerotization, reduced legs and probable association with a pteropod host, suggest relationship with *Micrallecto* and *Nannallecto* which, with some reservations, Stock (1971, 1973) provisionally assigned to the Splanchnotrophidae. This poorly-known assemblage are internal parasites of nudibranchs. As well as the type-genus *Splanchnotrophus* Hancock & Norman, 1863, the family has also been credited with *Briarella* Bergh, 1876, *Ismaila* Bergh, 1867 and *Chondrocarpus* Basset-Smith, 1903 - but information on the last-named is so limited that no reliable conclusions can be drawn as to its affinities.

In recently describing *Ismaila occulta*, Ho (1981) was inclined to confirm its status as a splanchnotrophid. As regards *Briarella*, however, Izawa (1976) has made out a good case for its provisional inclusion in his family Philoblennidae, currently represented by two species, *Philoblenna arabici* from the mantle of a cypraeid and *P. tumida* from the mantle groove of limpets. It would appear then, that at present we may consider only *Splanchnotrophus* and *Ismaila* as unequivocal members of the family, though more thorough investigation is obviously desirable.

Ho (1981) has remarked on the difficulties which confronted Stock, in placing *Nannallecto* in this family, due to its aberrant mandible and atypical possession of maxillipeds. He has also pointed out that the mandible of *I. occulta* is very different from that of *Splanchnotrophus* as described in detail by Laubier (1964). However, the appendage regarded here as a mandible in *Megallecto* is quite similar to its counterpart in *Ismaila*. On the other hand, the presumptive maxilla of *Megallecto* bears little resemblance to any appendage possessed by putative candidates for the Splanchnotrophidae.

The structural features of *M. thiriotti* thus

shed little light on the problem of delimiting the splanchnotrophid assemblage or on the possible inter-relationships of its presumed genera. Although it is difficult to suggest alternative criteria it may be that as far as the copepod parasites of invertebrates are concerned, we perhaps rely too heavily on the presence, absence or modification of cephalic appendages to deny kinship. So great is the range of possible invertebrate hosts, so diverse their lifestyles and so varied the substrates which they offer to potential associates, that novel opportunities for exploitation must surely evoke novel solutions to ensure survival. The urgent problems of maintaining contact and obtaining food might place a high premium on an essentially opportunistic evolution of the structures involved - namely, the cephalic appendages. This could perhaps result in the bewildering divergence well displayed by the copepod associates of gastropods.

When more information (especially as regards males) becomes available, it might be possible to unite many of these forms in a superfamilial context. Such a concept would probably embrace the splanchnotrophids *sensu stricto*, the philoblenids, the ventriculinids and the pteropod-infesting genera - but for the present this must remain in the realm of speculation.

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#### REFERENCES

- HO, J.S., 1981. *Ismaila occulta*, a new species of poecilostomatoid copepod parasitic in a dendronotid nudibranch from California. *J. Crust. Biol.*, 1 (1): 130-136.
- IZAWA, K., 1976. A new parasitic copepod, *Philoblenna arabici* gen. et sp. nov., from a Japanese gastropod, with proposal of a new family Philobennidae (Cyclopoida: Poecilostoma). *Publ. Seto mar. biol. Lab.*, 23 (3-5), 229-235.
- LAUBIER, L., 1964. La morphologie des pièces buccales chez les Splanchnotrophidae (Copépodes parasites de mollusques). *Crustaceana*, 7 (3): 167-174.
- STOCK, J.H., 1971. *Micralletto uncinata* n. gen., n. sp., a parasitic copepod from a remarkable host, the pteropod *Pneumoderma*. *Bull. zoöl. Mus. Univ. Amsterdam*, 2 (9): 77-81.
- , 1973. *Nannalletto fusii* n. gen., n. sp., a copepod parasitic on the pteropod *Pneumodermopsis*. *Bull. zoöl. Mus. Univ. Amsterdam*, 3 (4): 21-24.

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