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<b>Autor:</b>	Kirk-Spriggs, A.H.
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## The puparium of *Placopsidella cynocephala* KERTÉSZ (Diptera: Ephydriidae) and notes on its biology

A. H. KIRK-SPRIGGS

Department of Zoology, National Museum of Wales, Cathays Park, Cardiff CF1 3NP, Wales, United Kingdom

The puparium of *Placopsidella cynocephala* KERTÉSZ (Diptera: Ephydriidae: Psilopinae) is described and figured, from material developing in decaying tube worms in stacked coral found on the beach at Bacan, Indonesia. Other larvae found in the same situation are discussed.

During September 1985 when on the island of Bacan, Indonesia, I observed on a heap of stacked coral on the sandy beach at Labuha huge numbers of feeding *Placopsidella cynocephala* KERTÉSZ which almost blanketed the heap. This was stinking from the decay of the marine animals it contained. In the decaying matter of the tube worm (Polychaete) holes I observed large numbers of small Cyclorrhaphous larvae feeding. A sample of these was put into spirit and other larvae put into tubes of sawdust for pupation. Unfortunately only a single larva succeeded in pupating, from which a *P. cynocephala* emerged. It became evident when examining the puparium that the other larvae preserved in spirit represented an entirely different taxon, possibly a tethinid, which were also common in the same locality.

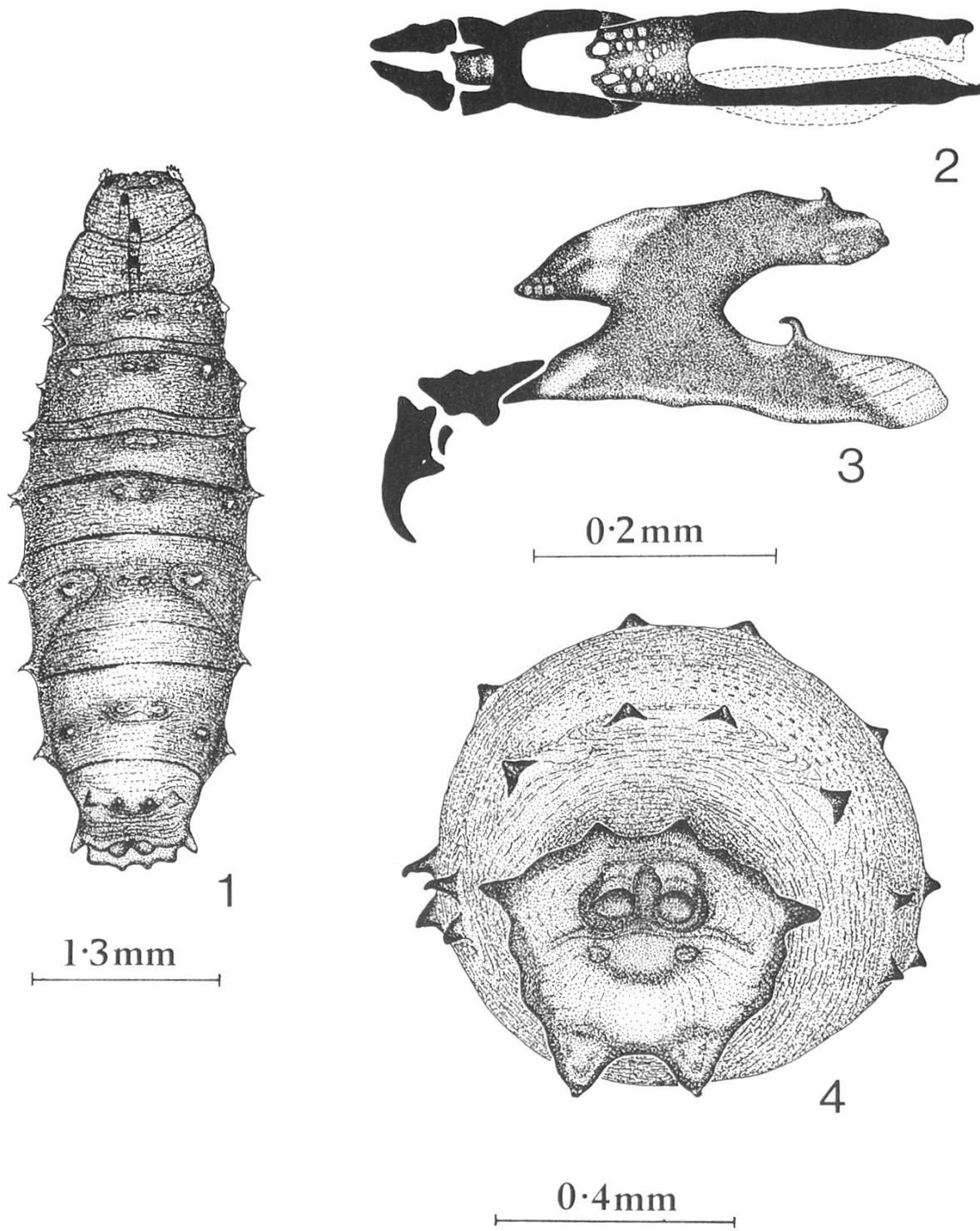
It is not unusual to find such heaps of coral in such situations. As burnt coral provides lime for house building it is possible that the coral had been stacked there with such a purpose in mind.

Recently MATHIS (1986) has revised the genus *Placopsidella*, dividing it into 8 species, 2 of which were new to science. The material listed above has been identified with the aid of the key to species and figures given in that publication.

### DESCRIPTION

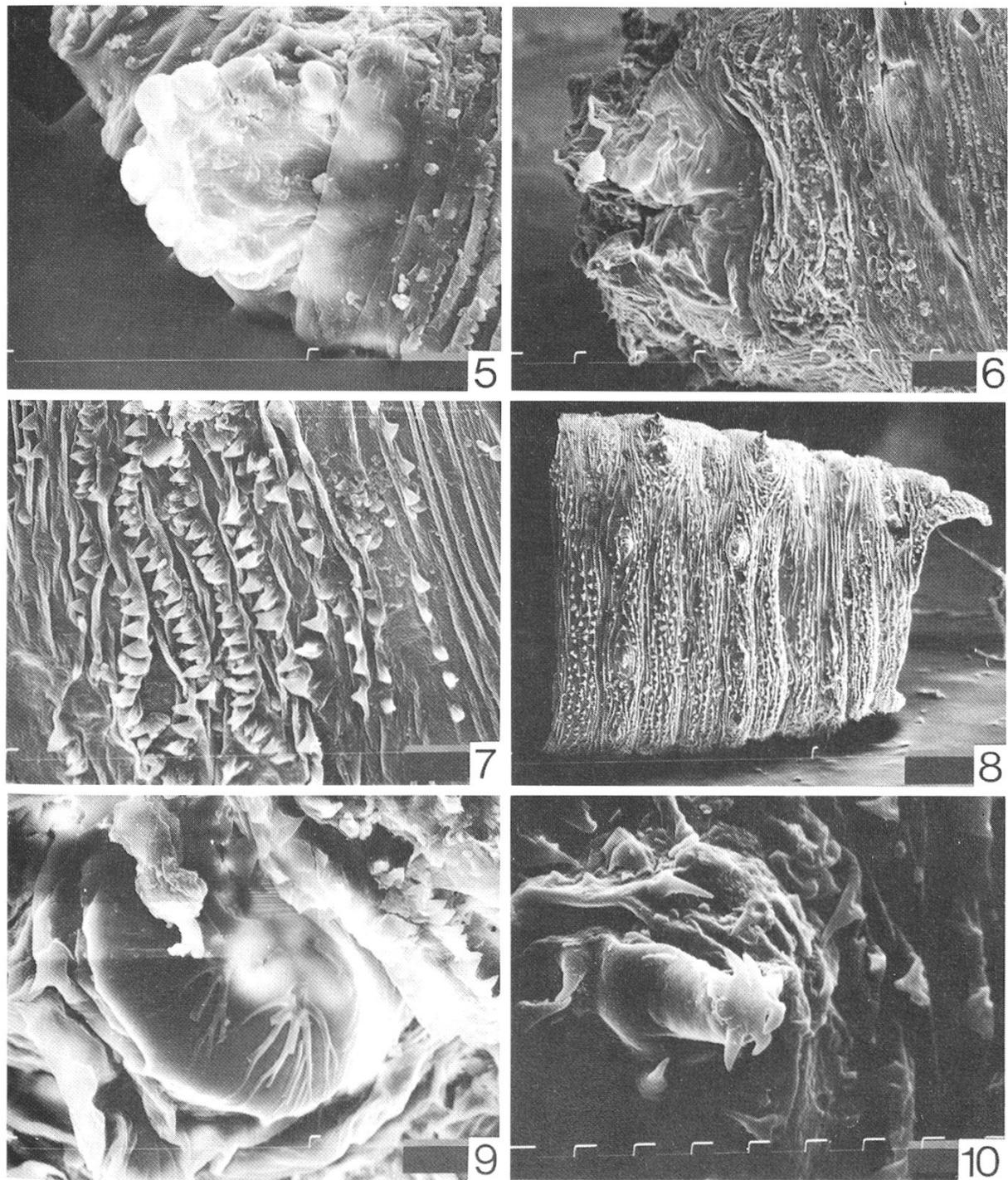
#### *Placopsidella cynocephala* KERTÉSZ (figs. 1–10)

Puparium (fig. 1) overall length 3.37 mm; breadth at widest point (mid-length) 0.94 mm. Shape, thickened centrally, convex, slightly dorso-ventrally flattened, anteriorly and posteriorly truncate; surface very slightly shining, colour pale tan-brown, either side laterally with a series of two protuberances, the more ventral of which is scale-like and the more dorsal having a fan of seven long pointed spicules (fig. 10); situated dorso-laterally is another spike-like protuberance and situated on either side of mid-line dorsally is a less prominent protuberance, all these others lacking the apical spicules present on the latero-dorsal protuberance, all the above situated on the abdominal segments; ten spicular zones present, encircling the puparium, those on the ventral surface (fig. 7) closely grouped together, more so on the first few anterior rows; rows on dorsal surface with



Figs. 1–4. *Placopsidella cynocephala* puparium (1) whole puparium, dorsal aspect; (2) pupal cephalopharyngeal skeleton from above; (3) the same, in profile; (4) posterior end of puparium from behind.

spicules (fig. 8) not contiguous at their bases but widely spaced, encircling lateral and dorsal protuberances; all spicules of the coarse-pointed type. Anterior spiracles (fig. 5) of the fan type, consisting of 8 short digitations on a semicircular base, distance between them 0.24 mm. Posterior spiracles (figs. 4 and 9) with the usual three spiracular openings (not visible in figure 4), darkened, short. Anal plate (fig. 6) membranous and of indistinct form. Cephalopharyngeal skeleton (figs. 2



Figs. 5–10. *Placopsidella cynocephala* puparium (5) anterior spiracle, left side in profile; (6) anal plate, ventral aspect (7) ventral spicular zone eight; (8) dorsal spicular zones; (9) posterior spiracle, from above (10) latero-dorsal protuberance, from above. Scales: peak lines at base of each photograph 5, 6, 7, 9 = 100 µm; 8 = 1000 µm; 10 µm.

and 3); mandibular sclerite completely black with a single tiny window situated at mid-length, unserrated with anterior half sickle-shaped; hypostomal sclerite black, with a small scale-like dentary sclerite; pharyngeal sclerite brown/black in colour, ventral wing paler in colour at its posterior end, having regular longitudinal grooves (pharyngeal sieving mechanism), both dorsal and ventral wings with a forwardly-directed spur, which is shorter in the dorsal wing and more curved

forward and longer in the ventral; dorsal hood (fig. 2) having its surface pale in colour with rows of holes giving a lacey appearance.

#### MATERIAL EXAMINED

Adult and associated puparium of the following: 1 ♂ Indonesia: Maluku Utara, Bacan, Labuha, 26.IX.1985, ex rotten tube worms in stacked coral on beach (A. H. KIRK-SPRIGGS). Deposited in the collections of the National Museum of Wales NMW.Z.1985.078. A specimen in British Museum (Natural History) New Guinea; ex logs, 31.VII.1968 (P. W. HOWARD) has a puparium mounted with it. This puparium in my opinion is not that from which the adult fly emerged, but is probably of a chloropid.

#### DISTRIBUTION

This species is widespread, occurring in Australia, Belau, Federated States of Micronesia, Gilbert Islands, Guam, Indonesia, Kiribati, Malaysia, Marshall Islands, Papua New Guinea, and the Philippines, and appears to be a coastal species.

#### BIOLOGY

Little is known of the biology of *Placopsidella*. Tenorio (1980: 270–271), gives information on the biology of *P. marquesana* (Malloch, 1933: 13) (as *P. cynocephala*) and gives figures of female ventral receptacle, larva and puparium (reproduced in MATHIS, 1986: 14). He states that this species occurs commonly in seaweed and other debris especially sugarcane on beaches of the Hawaiian Islands. It is not known, however, as Mathis points out, whether the flies were feeding on the seaweed itself or as scavengers on crustacea or other animals among the seaweed.

MATHIS, 1986: 10) gives a review of the biological information of *P. cynocephala* where he sights material from Cape York Peninsula (Australia) “breeding in dead mussels *Fluviolanahus subtortus* (BUNKER)” and specimens collected at Ulebaehel Island (Belau) taken from barnacles attached to a stick. Further to this BOHART & GRESSITT (1951: 87) found this species being attracted in small numbers to traps baited with echinoderms and sea-cucumbers on the island or Guam.

The present record is from a very similar breeding medium. This would strongly suggest that this species develops in dead marine invertebrates which have become stranded. Furthermore the pharyngeal sieving mechanism of the pharyngeal sclerite indicate bacterial feeding. Such a protein-rich substance in such temperature would have a high bacterial content.

#### COMMENTS

The immature stages of this species show close affinities to those of *P. marquesana*, having very similar pupal shape and spiracular formation. The cephalopharyngeal skeleton, however, varies greatly in the shape of the mandibular, dentary and hypostomal sclerites, the pharyngeal sclerite in *P. marquesana* lacks the

hook on the upper wing and from the figures given by Tenorio, 1980: 350–351 lacks the pharyngeal sieving mechanism on the lower wing.

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