

**ARETOPSIS AMABILIS DE MAN, AN ALPHEID SHRIMP COMMENSAL
OF PAGURID CRABS IN THE SEYCHELLE ISLANDS**

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In the course of a study of the shallow water shrimp fauna of the Seychelle Islands in 1966, several specimens of the rare alpheid shrimp *Aretopsis amabilis* De Man were obtained. This species was first collected in 1899 by the Siboga Expedition at Pulu Kanungan-Ketjil, East Borneo, and was subsequently described and placed in a new genus by De Man in 1910. The only subsequent record of the species refers to a single example collected from Okinawa, Rykyu Islands, and described by Miyake and Miya in 1967. A second species, *A. aegyptiaca* Ramadan has been described based upon material from the Red Sea, (Ramadan 1936; Holthuis, 1958), and should be considered a synonym of *A. amabilis* (Banner, personal communication).

A pair of specimens have been deposited in the collections of the British Museum (Natural History).

***Aretopsis amabilis* De Man (figs. 1-4)**

Restricted synonymy :

Aretopsis amabilis De Man, 1910, p. 311.

Aretopsis amabilis De Man, 1911, pp. 171-173; 1915, pl. 4, fig. 14 a-g.

Aretopsis amabilis Miyake and Miya, 1967, pp. 267-273, figs. 1-2.

Material Examined :

- (1) 1 ♂, 1 ovigerous ♀, Stn. 11A, Beau Vallon, Mahé, Seychelle Islands. 27 March 1966. Coral rock flats.
- (2) 1 ♂, 1 ovigerous ♀, Stn. 21, Port Launay, Mahé, Seychelle Islands. 26 April 1966. Coral reef.
- (3) 1 ♂, (1 ♀), Stn. 32, Anse Etoile, Mahé, Seychelle Islands. 21 June 1966. Coral reef. (The female from this station was lost shortly after collection).

Description. The specimens available in general agree closely with the previously published descriptions, apart from a few minor features noted below.

The rostrum shows minor variations in length and shape (fig. 3 a, b) and the infra-corneal tooth is bluntly rounded as shown by Miyake and Miya and less acute

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than shown in De Man's figure. The scaphocerite has a flattened hastate disto-lateral spine and far outreaches the antennal peduncle.

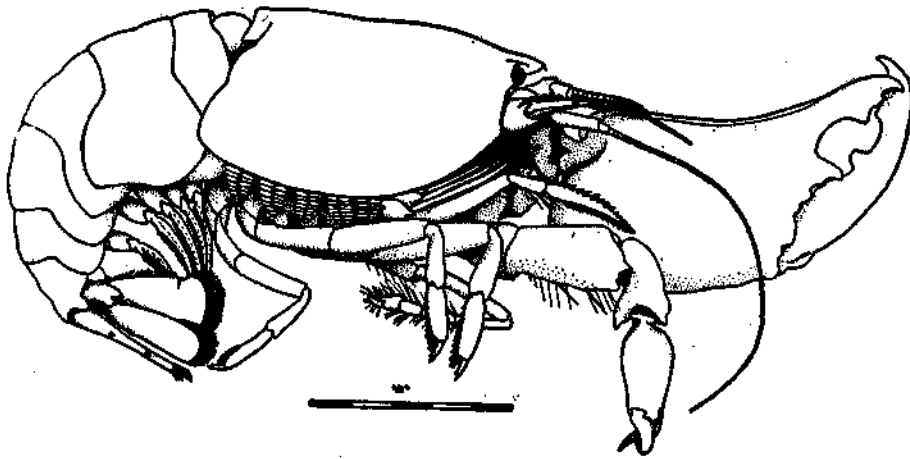


FIG. 1. *Aretopsis amabilis* De Man, male, Mahé, Seychelle Islands.

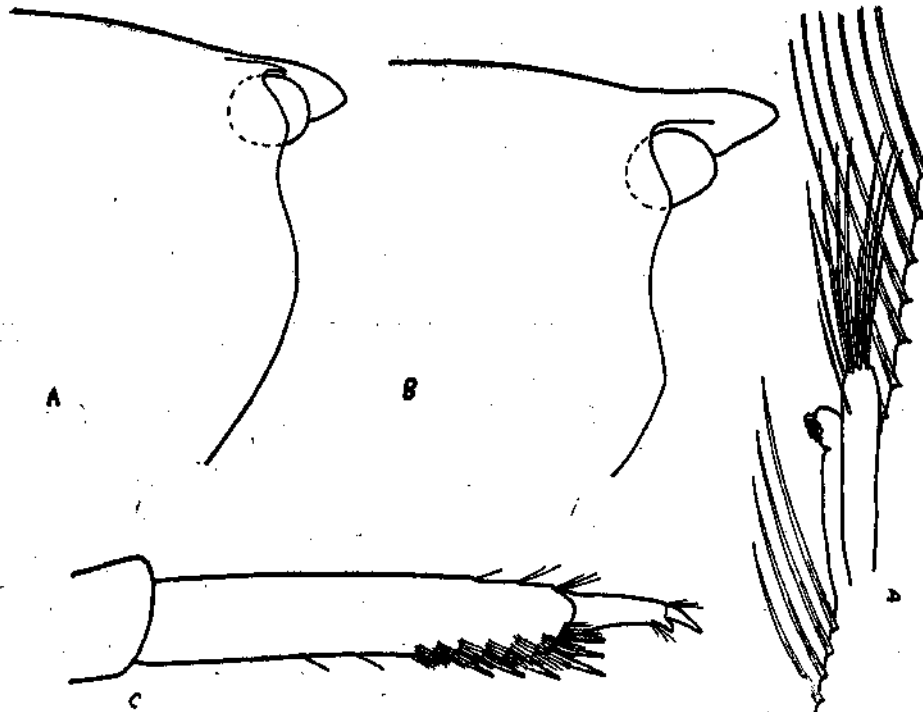


FIG. 2. *Aretopsis amabilis* De Man. (a) anterior carapace, female, Stn. 21. (b) anterior carapace, male, Stn. 51. (c) propod and dactylus of fifth pereopod. (d) appendix interna and appendix masculina of male second pleopod.

The right mandible has a robust molar process with a single blunt posterior tooth with a band of short setae along the postero-medial margin and a tuft of setae anteriorly. The incisor process is broad and hollowed with eleven small teeth of which the fifth is the largest. The palp is well-developed and consists of two segments. The proximal segment is subcylindrical and the distal is flattened with setose margins. The maxillula has a broad upper lacinia with twelve small simple spines along its truncated medial edge. The lower lacinia is slender and sparsely setose distally. The palp is well developed and distinctly bi-lobed. The inner lobe is small and bears a single long stout seta. The outer lobe is larger with two short simple setae. The upper endite of the maxilla is broadly rounded, simple and truncated along the medial edge with a border of short simple setae. The lower lacinia is very small with two short simple setae distally. The palp is elongated, slender and non-setose. The scaphocerite is well developed, elongated and slender. All maxillipeds bear well developed exopods with numerous plumose distal setae. The endopod of the first maxilliped has basal and coxal endites separated by a deep notch. The basal endite has a medial border of short simple setae and the coxal endite bears a few simple setae only. The palp is well developed with plumose setae along the medial border proximally and simple setae more distally. The caridean lobe is small but with a well developed lateral border of plumose setae. A large subrectangular epipod is present. The second maxilliped shows no special features. The terminal segment of the endopod is narrow with a row of simple setae along the medial border. The penultimate segment is elongated with a fringe of long simple setae along the antero-medial border. A feeble setose lobe is present on the proximal lateral border of the exopod and large sub-oval epipod is present. The terminal segment of the endopod of the third maxilliped is about 2.5 times the length of the penultimate segment and bears numerous transverse rows of short simple setae along the dorsal aspect, with longer setae ventrally. The antepenultimate segment is broad and flattened, sub-equal to the combined length of penultimate and terminal segments and sparsely setose. The coxa bears a lateral flattened plate-like epipod, with an acute anterior process, and a small slender hook-like epipod ventrally.

The first pereopods show a considerable range of variation in the morphology of the major chela according to the size and sex of the specimens (fig. 4, a-h). In the simplest form the fingers have straight cutting edges, meeting throughout the entire length, with an entire edge on the fixed finger and a series of small blunt teeth along the edge of the dactylus. In the most specialized form the fingers become excavated proximally, with two blunt teeth on the dactylus and a long slender process on the fixed finger. A small tooth is also present at the proximal end of the distal halves of the cutting edges. The distal cutting edge of the dactylus is armed with small blunt teeth and that of the fixed finger is irregular. In the minor first pereopod the cutting edge of the dactylus is denticulate throughout its length. The cutting edge of the fixed finger is entire. The merus is provided with one or two long slender spines.

The first and second pereopods lack small exopods and the ambulatory pereopods lack ventral spines on the ischium as reported by Miyake and Miya. The distal ventro-lateral region of the propod of the fifth pereopod bears numerous transverse rows of short setae. In the females an appendix interna only is present on the endopod of the second pleopod. In the males, the appendix masculina exceeds the length of the appendix interna and bears numerous long simple terminal setae.

Colouration. The body generally is a deep red colour with a broad white dorsal stripe extending posteriorly from the rostrum throughout the length of the body.



FIG. 3. *Aretopsis amabilis* De Man, male, Stn. 32. (a) mandible. (b) maxillula. (c) maxilla. (d) first maxilliped. (e) second maxilliped. (f) third maxilliped.

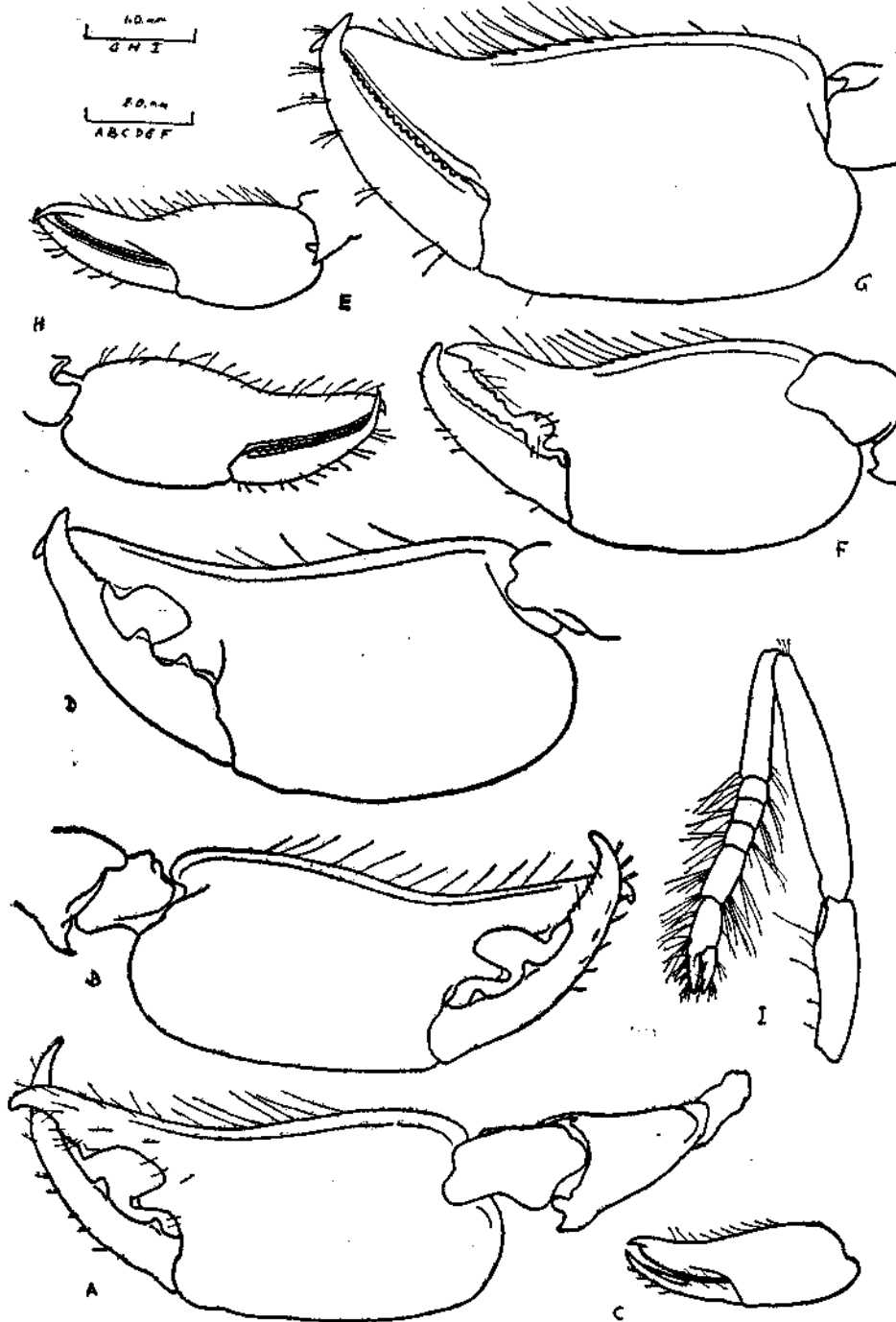


FIG. 4. *Aretopsis amabilis* De Man. Second pereiopods. Female, Stn. 21. (a) major chela, lateral aspect. (b) major chela, medial aspect. (c) minor chela, medial aspect. Male, Stn. 21. (d) major chela. (e) minor chela. Female, Stn. 11A. (f) major chela. Male, Stn. 3Z. (g) major chela. (h) minor chela. (i) Female, Stn. 11A, second pereiopod.

The white dorsal stripe is separated from the red of the rest of the body by a narrower zone of orange which also extends along the peduncles of the antennae. The first pereopods are also deep red with orange along the uppermost edge of the chela and carpus. The second to fifth pereopods are orange.

Measurements. Carapace lengths :

(1) ♂ 4.5 mm., ♀ 5.5 mm. (2) ♂ 6.5 mm., ♀ 7.5 mm. (3) ♂ 4.4 mm.

Hosts :

1. *Dardanus sanguinolentus* (Quoy and Gaimard).
2. *Dardanus megistos* (Herbst).
3. *Dardanus megistos* (Herbst).

Remarks. Alpheid shrimps are known to live in association with a wide variety of marine invertebrates, including commonly many sponges, coelenterates, and echinoderms. Some species have been reported to be associated with a bivalve and a gastropod mollusc (Balss, 1959) and one species is reported to live with an annelid (Edmondson, 1946). Other species are associated with fishes of the family Gobiidae (Miya and Miyake, 1969).

The occurrence of the alpheid shrimp *Aretopsis amabilis* in association with a pagurid crab appears to be the only known instance of a shrimp/decapod association, although some porcellanids have been reported in a similar relationship. The habitat would probably account for the apparent rarity of the shrimp.

Tattersall (1962) has reported the presence of mysids in association with pagurids of the genus *Dardanus*, (although none were found in the Seychelle material examined) and has suggested that they are faecal feeders and help to keep the cavity of the gastropod shell clean. It is probable that the specimens of *Aretopsis* will occupy a similar role. The mouth parts of *Aretopsis*, which have not been previously described and illustrated, show no special features and are typical of the family Alpheidae.

The earlier records of *Aretopsis* do not include any indication of a commensal association but this is probably due to incomplete data being recorded with the specimens. Generally the earlier records have been of isolated specimens but Holthuis, reporting on thirteen specimens, noticed that they were probably living in pairs and there seems no reason to doubt that his specimens were also derived from gastropod shells occupied by pagurids.

The range of variation shown by the Seychelle specimens of *Aretopsis amabilis* supports Dr. Banner's conclusions that *A. aegyptiaca* Ramadan should be regarded as a synonym of De Man's species.

ACKNOWLEDGEMENTS

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