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WITH COMPLIMENTS OF  
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INVERTEBRATE  
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On *Aphareocaris*, nom. nov. (*Aphareus*, Paulson), a Genus of the Crustacean  
Family Sergestidæ. By W. T. CALMAN, D.Sc., F.L.S.\*

(PLATE 16.)

[Read 19th June, 1913.]

THE genus *Aphareus* was established by Paulson in 1875, for a species which he described from a single specimen taken in the Red Sea. He placed it in the family Penæidæ, but did not further discuss its affinities. No further specimens appear to have been recorded, and, so far as I am aware, the genus has only been mentioned twice by later writers. Mr. Stebbing, in 1893, gave a definition of the genus, derived from Paulson's account, but transferred it to the tribe Stenopidea; Nobili, in 1906, gave a translation † of Paulson's description, reproduced some of his figures, and suggested that the proper place of the genus was in the family Sergestidæ.

Among a small collection of Crustacea from Thursday Island, Torres Straits, recently presented to the British Museum by Dr. J. R. Tosh, is a specimen of what I regard as a second species of the genus. It is a male, adult or nearly so, and was quite perfect; in view of the divergent opinions expressed as to the affinities of the genus, it seems worth while to give a somewhat detailed account of it.

Unfortunately, the name *Aphareus* is preoccupied for a genus of fishes, and it is therefore necessary to propose a new name for the Crustacean genus.

Genus APHAREOCARIS, nom. nov.

*Aphareus*, Paulson, *Izslayedovaniya Rakoobraznuikh Krasnagho Morya*.  
Chast I. Kiev, 1875, p. 117; Stebbing, *History of Crustacea* (Internat.  
Sci. Ser.), 1893, p. 212; Nobili, *Ann. Sci. Nat. ser. 9, Zool. iv.* 1906,  
p. 21; nec *Aphareus*, Cuvier et Valenciennes, *Hist. Nat. Poissons*, vi.  
1830, p. 485.

Génotype.—*Aphareus inermis*, Paulson, op. cit. p. 117, pl. xviii. figs. 3-3 n.

APHAREOCARIS ELEGANS, sp. nov.

*Description of male*.—Total length 20 mm. (Pl. 16. figs. 1-16.)

Body slender and compressed. *Carapace* just over one-fourth of total length, with a very short acute *rostrum* continued backwards as a short dorsal crest cut into two teeth; with a supra-orbital and a hepatic spine, the

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† I am much indebted to Dr. K. Andersen for a fresh translation of the passages in Paulson's Russian memoir. The additions to Nobili's version are, however, unimportant, and no light is thrown on the obscurities to which he calls attention.

latter placed at about one-fourth of the length of the carapace from the front margin; the antero-lateral margin sloping backwards from the base of the antennules to a very minute pterygostomial tooth; inter-regional grooves on surface of carapace very indistinct.

Anterior *abdominal somites* rounded dorsally, fifth and sixth obscurely carinate; pleural plates of first somite bilobed; sixth somite twice as long as fifth, measured along dorsal edge. *Telson* (Pl. 16. fig. 3) four-fifths of length of sixth somite, acutely pointed, with a longitudinal median dorsal groove, and with five pairs of small marginal spinules.

*Ocular peduncle* (fig. 2) about one-third of length of carapace, not reaching end of first segment of antennular peduncle, widening distally; corneal area occupying less than one-fourth of length of second segment, little wider than adjacent part of peduncle, dark brown with lighter periphery.

*Antennular peduncle* (fig. 2) about four-fifths of length of carapace, the first segment, measured along outer edge, about three times as long as second and four times as long as third; tooth of outer margin (stylocerite) rather behind the middle of its length, and a second tooth, or vertically compressed lobe, rising from the upper surface just in front of the statocyst and behind the stylocerite; second and third segments successively narrower. Inner flagellum shorter than peduncle; outer flagellum about  $3\frac{1}{2}$  times as long as peduncle, thickened at base, where it carries a brush of sensory filaments; no trace of clasping organ.

Flagellum of *antenna* (fig. 1) more than twice as long as the body, with an abrupt double bend at about three-sevenths of its length from the base; marginal setæ longer and more conspicuous distal to this bend. Antennal *scale* about two-thirds as long as carapace and three times as long as wide; outer margin nearly straight, its terminal tooth considerably surpassed by the rounded distal margin.

*Mandibular palp* (fig. 4) composed of three segments\*, the first very small, the second large and flattened, trapezoidal in outline, about three times as long, and, at its greatest width, three times as broad as the third segment.

*Maxillula* (fig. 5) resembling that of *Sergestes*.

*Maxilla* (fig. 6) remarkable for the reduction of the endites; only two are present and these are very small, with one or two minute apical setæ on each.

\* It is sometimes given as a general character of the tribe Penæidea that the mandibular palp is composed of only two segments (Spence Bate, Rep. 'Challenger' Macrura, pp. xxxiv & 226, 1888; Bouvier, Res. Camp. Sci. Monaco, xxxiii. Crust. Décap. (Pénéidés) p. 9, 1908). Krøyer, however, attributes three segments to the palp of *Sergestes* (Kgl. Danske Vid. Selsk. Skr. (5) iv. p. 225, 1856), while Boas describes it as three-segmented in *Sicyonia* and *Sergestes*, and as having the first segment obscurely or not at all defined from the second in *Penæus* (Kgl. Danske Vid. Selsk. Skr. (6) i. pp. 31, 34, 36, 1880). I find the small proximal segment quite distinct in *Sergestes robustus*, *Aceles indicus*, *Benthescymus investigatoris*, and *Sicyonia carinata*, as in the species here described; on the other hand, only two segments can be detected in the palp of several large species of *Penæus*.

*First maxilliped* (Pl. 16. fig. 7) resembling that of *Sergestes*, especially in the large size of the distal endite, which, however, does not extend so far as the tip of the exopod; the endopod is composed of four distinct segments.

*Second maxilliped* (fig. 8) distinctly of the Sergestid type, in the absence of exopod and the lengthening of the distal segments.

*Third maxilliped* (fig. 9) also of Sergestid type in its great size—it is longer by about two-thirds than the carapace, and extends well beyond the antennular peduncle—the absence of exopod, and the subdivision of the two distal segments, the terminal into four and the penultimate into three segments; it is strongly spinose.

First three pairs of *legs* (figs. 10–12) increasing successively in length and slenderness, all with well-developed chelæ. On the under side of the propodus of the first pair is a group of pectinate spines opposed to a similar group on the carpus\*; a trace of a similar arrangement is observable in the second pair. Propodus of third pair at least ten times as long as wide and nearly three-fourths as long as carpus.

Last two pairs of legs (figs. 13 & 14) each with the normal number of seven segments, the dactylus being short and slightly curved; the other segments are flattened, the ischium and merus fringed with very long setæ on both margins, the carpus and propodus only on the inner margin.

The *pleopods* of the first pair carry a petasma (figs. 15 & 16), the middle lobe of which has the terminal area beset with numerous invaginated hooks like those figured by S. I. Smith in *Sergestes robustus*. The remaining pleopods are biramous; those of the second pair have a spinose appendix masculina.

The *uropods* have the exopod longer than the endopod, which, again, longer than the telson; the marginal tooth of the exopod is about one-sixth of the total length from the tip.

The branchial system is much reduced. Unfortunately, the method of preservation (formalin followed by spirit) has left the branchiæ very transparent and difficult to see. It is possible, therefore, that one or two of the vestigial branchiæ may have been overlooked, but, with this reservation, the formula may be given as follows:—

	mxp. 1.	mxp. 2.	mxp. 3.	pe <sub>r</sub> . 1.	per. 2.	per. 3.	per. 4.	per. 5.
Pleurobranchiæ.....	—	?	1+r	1+r	1+r	1+r	2	—
Arthrobranchiæ.....	—	—	—	—	—	—	—	—
Podobranchiæ.....	ep.	1+ep.	—	—	—	—	—	—

\* Coutière has called attention to a similar apparatus in various Caridea and Penæidæ (C. R. Acad. Sci. Paris, cxli. p. 220, 1905). It has not been observed in Sergestidæ.

This is practically the formula given by S. I. Smith for *Sergestes japonicus*, Sp. Bate (*S. mollis*, Smith), but the branchiæ, and especially those of the penultimate somite, are much larger than in that species and, of the vestigial branchiæ, the posterior two at any rate show a certain amount of lobulation.

*Affinities.*—The genus *Aphareocaris* resembles *Sergestes* in the following, among other less important characters :—

- (1) The reduction of the branchial system, and the insertion on the body-wall of those branchiæ which correspond to the arthrobranchiæ of the Penæidæ.
- (2) The absence of exopodites from all the thoracic limbs except the first maxillipeds.
- (3) The form of the second and third maxillipeds and particularly the subdivision of the two distal segments of the latter.
- (4) The flattened form and long marginal setæ of the last two pairs of legs.

It differs from *Sergestes* and the other Sergestidæ, and resembles the Penæidæ, in the following points :—

- (1) The first three pairs of legs are chelate and none of their segments are subdivided.
- (2) The last two pairs of legs possess the full number of seven segments.
- (3) The antennule of the male is without a prehensile apparatus.

These resemblances to the Penæidæ are all of a general character, serving to indicate the primitive position of *Aphareocaris* with respect to the more specialized genera of Sergestidæ, but not in any way counterbalancing the important and positive characters by which it is linked to that family. It seems, therefore, that Nobili was justified in his suggestion that the genus should be placed among the Sergestidæ. Of an affinity with the Stenopidea, as suggested by Mr. Stebbing, I can find no evidence.

*Specific characters.*—Paulson's specimen may be presumed to have been a female, since he makes no mention of a petasma. It is, therefore, a matter of analogy and conjecture whether the differences from the specimen now described are individual, sexual, or specific. There seems a reasonable probability, however, that some at least of the following belong to the last category.

Rostral crest with one tooth. Penultimate segment of third maxilliped divided into four parts. Chela of third leg not more slender than that of second, about six times as long as wide, and less than two-thirds as long as carpus. *A. inermis* (Paulson), Red Sea.

Rostral crest with two teeth. Penultimate segment of third maxilliped divided into three parts. Chela of third leg much more slender than that of second, at least ten times as long as wide, and nearly three-fourths as long as carpus.

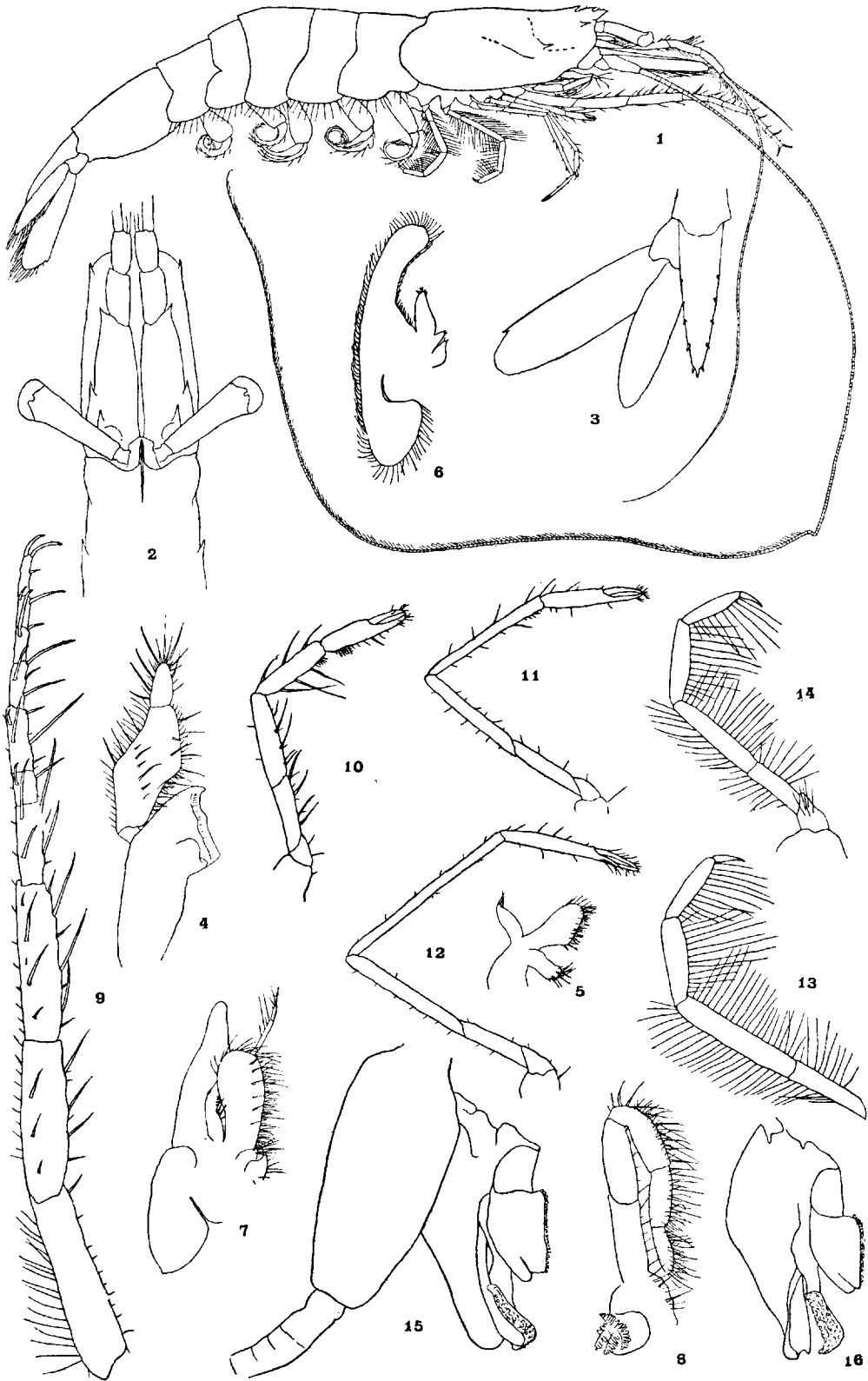
*A. elegans*, sp. n., Torres Straits.

## EXPLANATION OF PLATE 16.

- |         |                                      |                            |   |
|---------|--------------------------------------|----------------------------|---|
| Fig. 1. | <i>Aphareocaris elegans</i> , sp. n. | Male (holotype) from side. | × 5.                                    |
| 2.      | ”                                    | ”                          | Anterior part of body from above.       |
| 3.      | ”                                    | ”                          | × 10.                                   |
| 4.      | ”                                    | ”                          | Telson and uropod.                      |
| 5.      | ”                                    | ”                          | × 10.                                   |
| 6.      | ”                                    | ”                          | Right mandible.                         |
| 7.      | ”                                    | ”                          | × 14.                                   |
| 8.      | ”                                    | ”                          | Maxillula.                              |
| 9.      | ”                                    | ”                          | × 14.                                   |
| 10.     | ”                                    | ”                          | Maxilla.                                |
| 11.     | ”                                    | ”                          | × 14.                                   |
| 12.     | ”                                    | ”                          | First maxilliped.                       |
| 13.     | ”                                    | ”                          | × 14.                                   |
| 14.     | ”                                    | ”                          | Second maxilliped.                      |
| 15.     | ”                                    | ”                          | × 15.                                   |
| 16.     | ”                                    | ”                          | Third maxilliped.                       |
| 17.     | ”                                    | ”                          | × 15.                                   |
| 18.     | ”                                    | ”                          | First leg.                              |
| 19.     | ”                                    | ”                          | × 15.                                   |
| 20.     | ”                                    | ”                          | Second leg.                             |
| 21.     | ”                                    | ”                          | × 15.                                   |
| 22.     | ”                                    | ”                          | Third leg.                              |
| 23.     | ”                                    | ”                          | × 15.                                   |
| 24.     | ”                                    | ”                          | Fourth leg.                             |
| 25.     | ”                                    | ”                          | × 15.                                   |
| 26.     | ”                                    | ”                          | Fifth leg.                              |
| 27.     | ”                                    | ”                          | × 15.                                   |
| 28.     | ”                                    | ”                          | Peduncle of first pleopod with petasma. |
| 29.     | ”                                    | ”                          | × 20.                                   |
| 30.     | ”                                    | ”                          | Petasma with the lobes drawn apart.     |
| 31.     | ”                                    | ”                          | × 20.                                   |







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APHAREOCARIS.

