

Cimbebasia



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THE GENUS *NEBALIA* IN SOUTH AND SOUTH WEST AFRICA (CRUSTACEA, LEPTOSTRACA)

BRIAN KENSLEY

South African Museum, Cape Town

(With 5 figures)

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ABSTRACT

Two species of the Leptostracan genus *Nebalia* are recorded from Sandwich Harbour, South West Africa. The description of one species viz. *N. capensis* Barnard is supplemented, and its distributional records from False Bay, Cape, to South West Africa are given. The second species, taken from the stomach contents of a fish, proved to be undescribed. The species is described and its affinities discussed. The unsatisfactory state of the world-wide taxonomy of the genus *Nebalia* is made apparent in the discussion.

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I. INTRODUCTION

During the course of an investigation into the biology of the lagoonal Sandwich Harbour in South West Africa, by Mr M. J. Penrith of the State Museum, Windhoek, and the present author, the stomach contents of fishes caught were examined. From the stomach of a kob *Argyrosoma hololepidotus* (total length 368 mm) caught on the 26 February 1976, numerous specimens of a leptostracan were removed. On examination, many of these proved to be in perfect condition, almost no deterioration due to digestion being detected. It was concluded that these crustaceans were taken inside the lagoon probably less than one hour before the fish was caught. Further investigation showed that these 'shrimps' belonged to the genus *Nebalia* but not to the only species previously recorded from Southern Africa, viz. *N. capensis* Barnard, which was also taken at Sandwich Harbour. This prompted a re-examination and a more detailed description of this latter species. At the same time, it was found that the taxonomic state of the genus *Nebalia* is still in need of a world-wide revision, as was noted by Calman (1917) and Cannon (1931). Such a revision is beyond the scope and resources of the author, and the present paper aims merely at recording and giving detailed descriptions of the species of *Nebalia*, with speculation regarding their taxonomic status.

II ORDER LEPTOSTRACA

Family NEBALIIDAE

Nebalia capensis Barnard

(Figs 1a, 2, 3)

Nebalia capensis Barnard, 1914: 444, pl. 39; Grindley & Kensley, 1966: 8; Day, Field & Penrith, 1970: 44.

Description: Carapace broadly oval, width three-quarters of greatest (lateral) length. Rostrum distally tapering, apically rounded, $2\frac{1}{8}$ times longer than wide.

Eye with small sensory papilla on dorsal surface in west coast specimens, lacking papilla in False Bay specimens.

Fourth segment of antennular peduncle armed with one distal spine and four to six setae in west coast specimens, two spines and six setae in False Bay specimens; movable scale oval in outline, almost twice longer than wide. Third and fourth antennular peduncle segments coalesced, armed with numerous stout spines, especially on dorsal surface, also several elongate setae; second peduncle segment armed with dorso-distal spinose process.

Mandible with triangular incisor process having single tooth on outer margin, and fine membranous border on inner margin; molar process stout, with rows of close-set teeth on upper distal surface; palp three-segmented, distal segment bearing row of elongate distally serrate spines on outer margin.

First maxilla with long sparsely setose palp, and two endites; lower endite distally tapered, bearing five plumose setae; upper endite broadly triangular, carrying row of distally serrate spines, some having a subterminal flange on the shaft.

Second maxilla exopod two-thirds length of endopod, consisting of single segment carrying several elongate setae; endopod of two segments, also carrying elongate setae; four endites present, most distal one smallest, bearing four elongate setae; three proximal endites armed with dense row of short distally curved setae.

Thoracic limbs essentially similar, with slender curved endopod obscurely segmented, bearing marginal setae; exopod lamellar, distally slightly bilobed, with marginal setae; epipod, both lobes apically rounded. First pleopod with broad protopod, endopod more slender than exopod, with setae on outer margin only, and with appendix interna at base; exopod with setae on medial margin, and row of close-set pectinate spines on outer margin, three elongate simple spines distally.

Second to fourth pleopods similar, endopod slightly longer than exopod, with triangular scale between bases of rami, exopod with five distal spines, and five pairs of spines on outer margin, setae on inner margin.

Fifth pleopod uniramous, two-segmented, distal segment twice length of proximal, with three strong terminal spines and several setae.

Sixth pleopod uniramous, consisting of single oval segment, with four strong distal spines.

Caudal furca triangular, with row of spines on outer margin, and fewer spines and row of setae on inner margin.

Second to seventh pleonal segments with dentate posterior margins, teeth short and broadly rounded.

Records and Material: False Bay, 26–29 metres, coarse sandy bottom SAM-A1499; False Bay, 39 metres, khaki sand bottom SAM-A15000; Mouille Point, Table Bay, intertidal SAM-A2618 (Syntypes); Table Bay sewerage outlet, intertidal SAM-A1574 (syntypes); Mouille Point, Table Bay, intertidal SAM-A6069; Lamberts Bay, 150 metres, sand bottom SAM-A15001; Orange River mouth SAM-A12094; Sandwich Harbour, 15 metres, algal mat bottom, 16 specimens SAM-A15002, SM-N50450.

Nebalia iltheoensis sp. nov.

(Figs 1b, 4, 5)

Description: Carapace oval, width two-thirds greatest (i.e. lateral) length. Rostrum distally broadly rounded, slightly more than twice longer than wide.

Eye lacking sensory papilla.

Fourth antennular peduncle segment armed with

five spines (distal spine strongest) and several setae; movable scale two and a half times longer than wide; flagellum of nine or ten segments.

Second antennal peduncle segment armed with disto-dorsal spinose process; third and fourth segments coalesced, with about nine spines on dorsal surface; and row of distal setae; flagellum very elongate, reaching backwards to end of caudal furci. Mandible with triangular incisor process having two distal teeth; molar process distally obliquely truncate, no teeth or spines apparent; palp three-segmented, distal segment armed with row of pectinate spines. First maxilla with long slender sparsely setose palp and two endites; proximal endite rounded, armed with eight short spines, distal endite broadly triangular, carrying about ten short spines and two plumose setae.

Second maxilla, exopod about two-thirds length of endopod, with slender setae on outer margin; endopod two-segmented, carrying several setae; four endites each carrying setae, first endite small, second broad with oblique distal margin, third and fourth endites rounded.

Thoracic limbs all similar, with curved setose endopod obscurely segmented, terminal segment bearing several elongate setae; exopod distally bilobed; epipod lamellar, bilobed, reaching to about two-thirds length of exopod.

Exopod of first pleopod two-thirds length of endopod, outer margin armed with row of spines, increasing in length distally, inner margin bearing setae; endopod with medial margin bearing close-set row of setae, appendix interna at base carrying three distal hooks.

Second to fourth pleopods similar, exopod with five pairs of spines on outer margin, several distal spines and setae on inner margin; triangular process between bases of exo- and endopod; endopod carrying marginal setae.

Fifth pleopod uniramous, two-segmented, proximal segment one third length of distal segment, latter carrying five distal spines and several setae.

Sixth pleopod uniramous, consisting of one relatively elongate segment with six spines and numerous setae.

Caudal furca slender, outer margin armed with row of spines, increasing in length distally, inner margin carrying elongate setae.

Second to seventh pleonal segments with dentate posterior margins, teeth truncate.

Material: 320 specimens taken from stomach contents of kob, *Argyrosoma hololepidotus* caught at Sandwich Harbour, South West Africa. Holotype South African Museum SAM-A14997; 10 paratypes South African Museum SAM-A14998; 10 paratypes State Museum, Windhoek SM-N50451.

Amongst the *Nebalia* specimens from the kob, were about 20 amphipods, all the mud-dwelling *Ampelisca brevicornis* and *Ampelisca palmata*, and one cumacean, *Upselaspis caparti*. It can thus safely be supposed that the leptostracans inhabit the green mud found on the bottom of Sandwich Harbour, along with the amphipods and cumaceans. (By contrast, the specimens of *N. capensis* were taken, along with numerous amphipods and polychaetes, from the algal mat just inside the lagoon mouth at about 5 metres depth).

Discussion: That the present species differs from *N. capensis* Barnard, is readily apparent from a comparison of the accompanying figures. The taxonomic status of both these species, however, is less easily defined. Thiele (1904) divided the genus *Nebalia* into two species groups, viz. *N. bipes* of the Northern Hemisphere, and the austral *N. longicornis*, and established several subspecies for both, on the basis of rostral proportions, armature of the fourth segment of the antennular peduncle, and the form of the eye. Calman (1917) and Cannon (1931) both note the variability of rostral proportions and its inadequacy in separating species. That the form of the eye, and especially the presence or absence of a sensory papilla is of little specific importance, is shown by *N. capensis*, with west coast specimens possessing the papilla and False Bay specimens lacking it. *N. longicornis magellanica* Thiele, 1904, is characterised by the presence of the eye papilla, and a single spine and several setae on the fourth antennular peduncle segment. This subspecies has been recorded from the Magellan straits, South Falkland Islands, South Georgia, Adelie Land, and New Zealand. Pillai (1959) records *N. longicornis* from the Krusadai Islands, India. While not giving his material subspecific status, the antennular armature agrees with *magellanica*.

N. longicornis soror Thiele, 1904, from Cuba differs from *magellanica* in possessing a somewhat longer eyestalk, and lacks a sensory papilla. *N. capensis* also possesses a single (west coast) or two (False Bay) spines on the fourth antennular peduncle segment, and an ocular papilla (west coast) but differs from *magellanica* in the mandibular structure (with its dentate incisor and molar process) and in the general proportions of the thoracic limbs, first maxillae, antennae, and caudal furci. There is no doubt that *N. capensis* is closely related to *N. longicornis magellanica*, but until the *longicornis*-complex is sorted out, the Cape population should remain as a separate species.

In general proportions and especially in the length of the antennal flagellum and carapace shape, the specimens from Sandwich Harbour kob agree closely with Thomson's figure (1879, plate 19, figures 7–9). The armature of the fourth antennular peduncle segment of *N. ilheoensis*, with its five spines and few setae agrees more closely with *N. bipes*

valida Thiele from Alaska. However, the Sandwich Harbour material lacks the pectinate spines of the antennular scale seen in *N. bipes* (Thiele, 1904, plate 4, figure 72), and also lacks the spinose protopodites of pleopods three and four of *N. bipes*.

In view of this lack of agreement with both *N. bipes* and *N. longicornis* the best course to be followed is to regard the Sandwich Harbour material as a separate species until the necessary world-wide revision of the genus establishes the true relationships of the various populations thus far recorded.

The specific name *ilheoensis* is taken from the old Portuguese name for Sandwich Harbour, Port D'Ilheo.

III. ACKNOWLEDGEMENTS

I am grateful to Mr M. J. Penrith of the State Museum, Windhoek, for drawing my attention to the Sandwich Harbour Leptostracans which he collected, to Dr Nigel Christie of the Zoology Department, University of Cape Town, for the Lamberts Bay specimen, and to the Department of Nature Con-

servation of South West Africa for permission to work at Sandwich Harbour.

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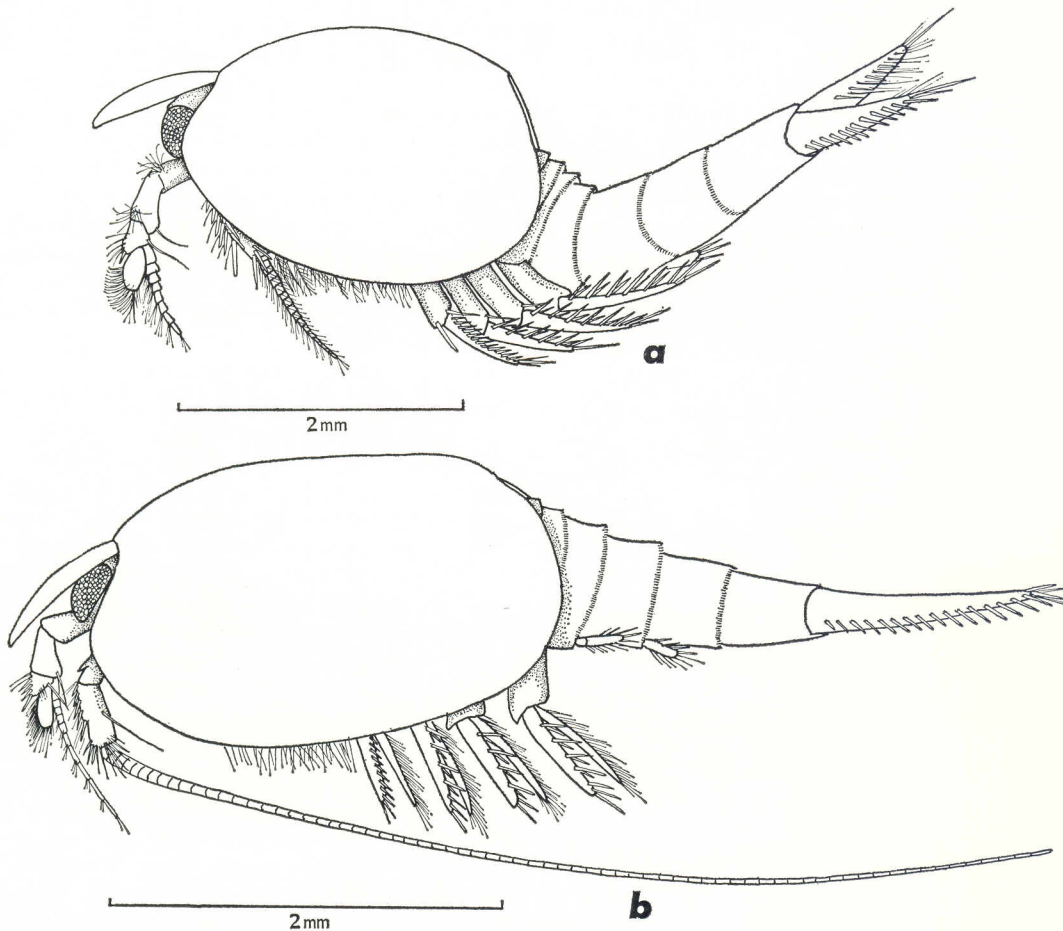


Figure 1. a. *Nebalia capensis* Barnard — b. *Nebalia ilheoensis* sp. nov.

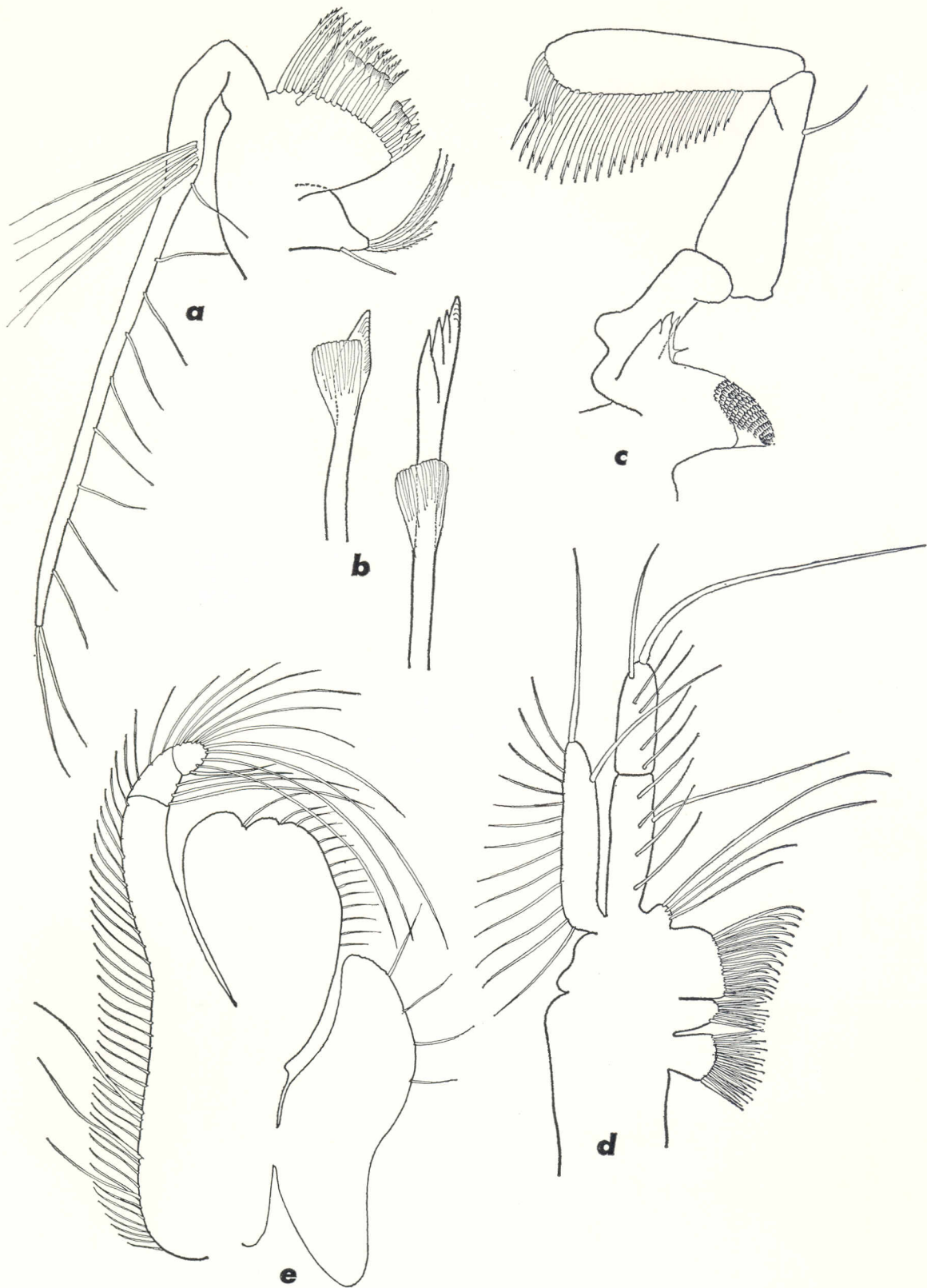


Figure 2. *Nebalia capensis* — a. first maxilla — b. two spines from first maxilla enlarged — c. mandible — d. second maxilla — e. thoracic limb

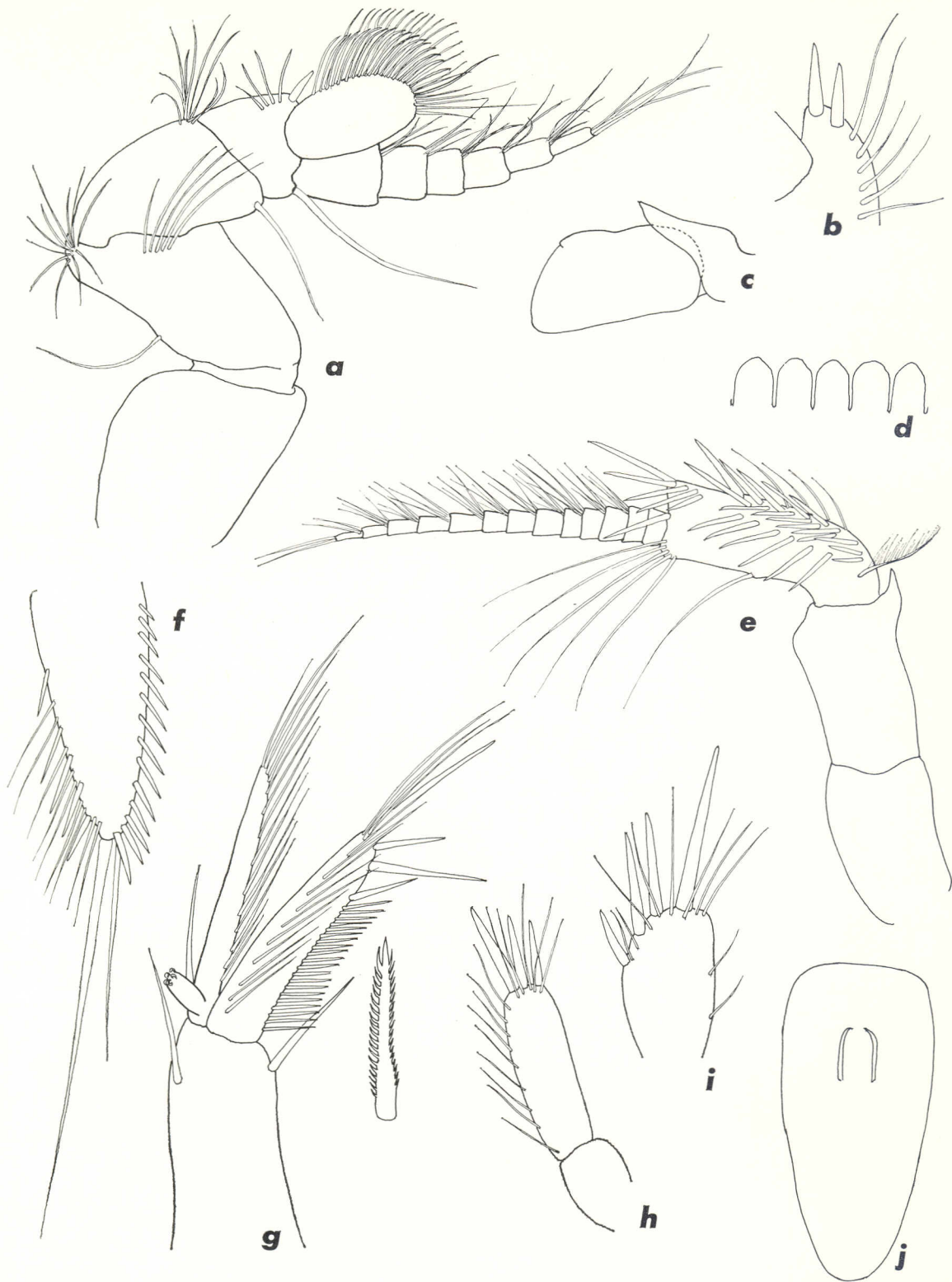


Figure 3. *Nebalia capensis* — a. antennule — b. fourth antennular peduncle segment from False Bay specimen — c. eye — d. teeth from posterior pleonal margin — e. antenna — f. caudal furca — g. first pleopod — h. fifth pleopod — i. sixth pleopod — j. rostrum

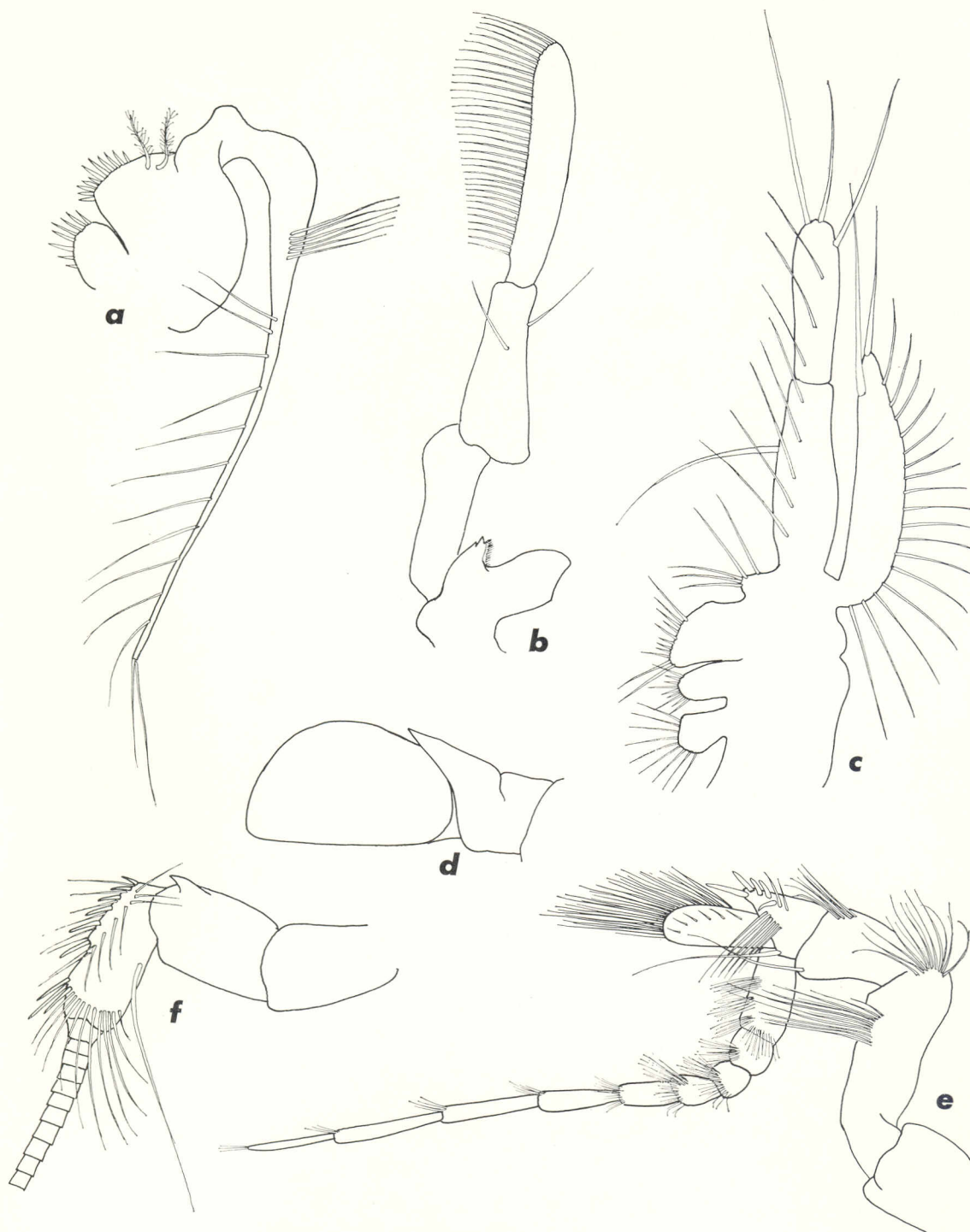


Figure 4. *Nebalia iltheoensis* — a. first maxilla — b. mandible — c. second maxilla — d. eye — e. antennule — f. antenna

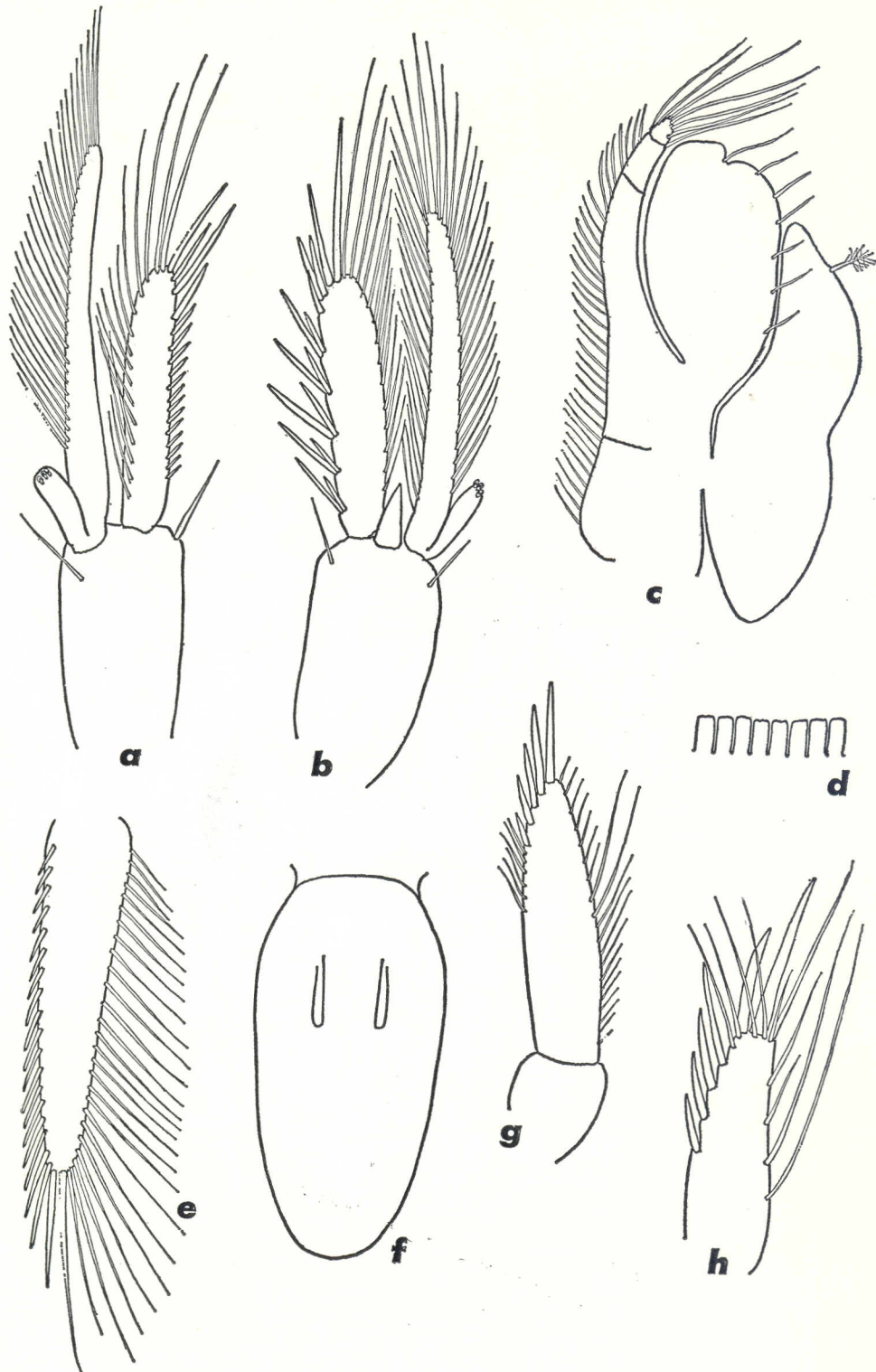


Figure 5. *Nebalia ilheoensis* — a. first pleopod — b. second pleopod — c. thoracic limb — d. teeth from posterior pleonal margin — e. caudal furca — f. rostrum — g. fifth pleopod — h. sixth pleopod