

*NAUSHONIA LACTOALBIDA*, NEW SPECIES  
(DECAPODA: THALASSINIDEA: LAOMEDIIDAE), A MUD  
SHRIMP FROM INHACA ISLAND, MOÇAMBIQUE

*Matz Berggren*

A B S T R A C T

A new species of the rare burrowing mud shrimp genus *Naushonia* has been found at Inhaca Island, in southern Moçambique. This is the sixth species in the genus, the first one found in the southern hemisphere and the second one found in the Indian Ocean. It was obtained from the entrance of its burrow in low water on a tidal flat.

The species of the genus *Naushonia* have a confusing systematic history. Perhaps because of the subchelate first pereopods and simple second pereopods, de Man (1920) incorporated *Naushonia crangonoides* Kingsley, 1897, and *Coralliocrangon perrieri* Nobili, 1904, in the Crangonidae. Although the "linea thalassinica" was pointed out as a similarity between the two genera, no comments were made about the transverse suture of the uropods, which was used in the description of the family *Laomedidae* (see de Man, 1928). The reptant appearance with stiff antennae, a short and broad rostrum, and an unfortunate loss of all pereopods caused Rathbun (1901) to erect a new genus, *Homoriscus*, for the new species *H. portoricensis*. Using branchial structure and the above mentioned criteria, Chace (1939) synonymized these genera with *Naushonia*, in the subfamily *Naushoniinae*, family *Laomedidae*. The genus seems to be rare, and very few findings of specimens belonging to these species have been reported.

Four of the five species in this genus are found on American coastlines: *N. crangonoides*, east coast of the U.S.A. (Kingsley, 1897); *N. portoricensis* (Rathbun, 1901) Caribbean Sea (Rathbun, 1901); *N. macginitiei* (Glassell, 1938) Mexico and California (Glassell, 1938); *N. panamensis* Martin and Abele, 1982 Pacific coast of Panama (Martin and Abele, 1982). The fifth, *N. perrieri*, is known from the Red Sea and Somalia coast line (Nobili, 1904). The present finding is the first from the southern hemisphere and the second from the Indian Ocean.

MATERIAL AND METHODS

Collections were made using a Yabby pump, a small hand-held suction pump (Hailstone and Stephenson,

1961), in about 10 cm water depth (low water spring). Samples were taken on a tidal flat (sand/coral debris) in the vicinity of the Marine Biological Station, on the western side of the midpart of Inhaca Island, Moçambique, (approximately 26° S, 33° E). The difference in water level between high water spring and low water spring is about 3 m.

The abbreviation CL is used for postorbital carapace length (dorsal). Measurements were made with the aid of a digitizing tablet, on the mirror image from a stereomicroscope equipped with a drawing mirror.

RESULTS

*Naushonia lactoalbida*, new species  
Figs. 1-6

*Material Examined.*—Holotype ♀, CL = 5.45 mm, allotype ♂, CL = 3.25 mm, both collected 27 January 1990; paratype ♂, CL = 3.0 mm, paratype ♀, CL = 7.39 mm, collected 5 March 1988. All from Inhaca Island, Moçambique.

The holotype and allotype are deposited at the Rijksmuseum van Natuurlijke Historie, Leiden, The Netherlands, RMNH D41354 (holotype) and RMNH D41355 (allotype). One paratype is deposited in the collection of the National Museum of Natural History, Smithsonian Institution, Washington, U.S.A. (USNM 252559) and one in the collection of the Biological Faculty at the Universidade Eduardo Mondlane, Maputo, Moçambique.

*Description.*—Stout rather heavily built mud shrimp (Fig. 1).

Carapace (Fig. 2A, B) anteriorly spiny, with indistinct linea thalassinica; weakly produced anterior and posterior carinae separated by deep and distinct cervical groove. Postorbital tooth strong and simple. Anterolateral tooth acute and strong, with few smaller spines above and beneath at anterior margin. Few strong spines at anterolateral side of carapace. Anterior dorsal part of carapace armed with 4 lines of spines (2 pairs) between cervical groove and base of rostrum, mesial pair composed of slightly smaller spines than lateral irregular pair.

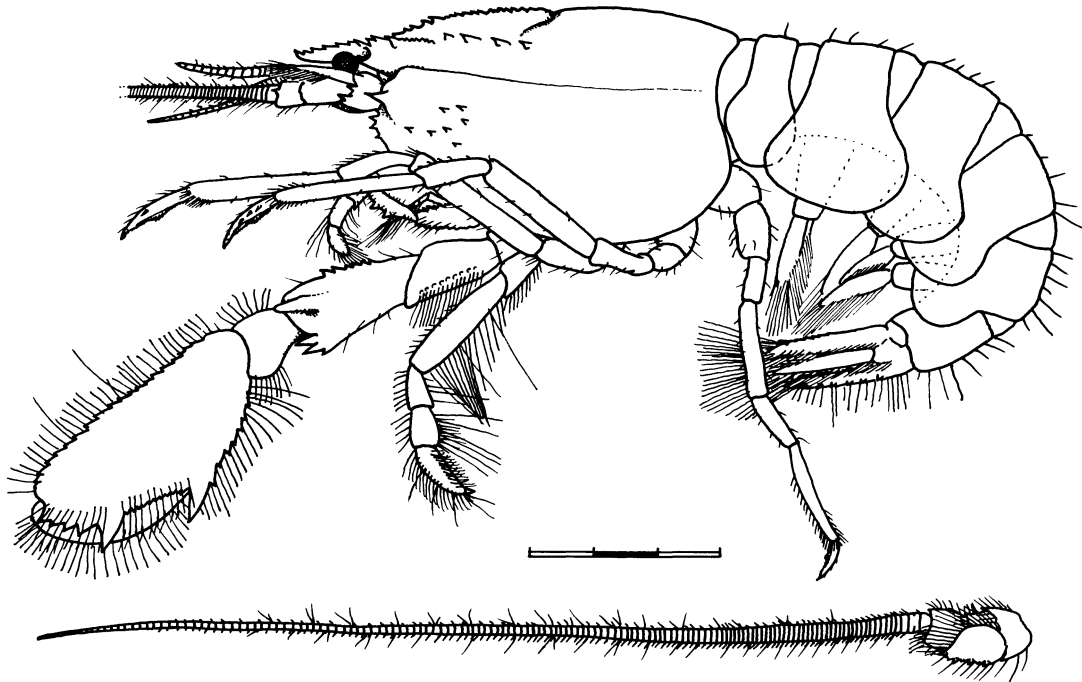


Fig. 1. *Naushonia lactoalbida*, new species, holotype female, Inhaca Island, Moçambique, CL = 5.45 mm. Scale bar = 3.0 mm. Antenna drawn separately.

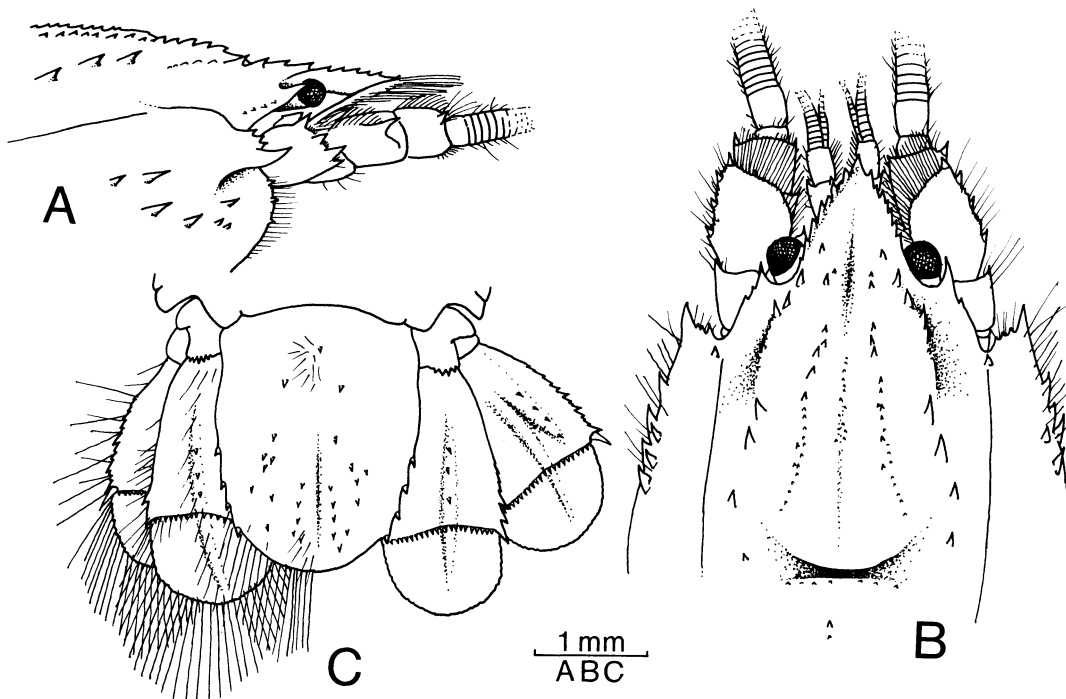


Fig. 2. *Naushonia lactoalbida*, new species, holotype female. A, anterior carapace and rostrum, lateral view; B, anterior carapace and rostrum, dorsal view; C, uropods and telson, setae omitted on right half, dorsal view.

Rostrum broadly triangular with faint midgroove over two-thirds of length, reaching to distal third of third antennular segment, partly hiding eyestalks in dorsal view (cornea visible). Lateral edges of rostrum with spines pointed forward and upward.

Abdomen longer than carapace, with ventrally rounded pleura on segments 1–5, segment 1 narrower than rest; pleura of segment 2 overlapping ventrolaterally pleura of both segments 1 and 3 (Fig. 1). With scattered setae, more dense at posterior half.

Telson broadly rounded distally, with 4 lateral spines on posterior half, 1.3 times longer than broadest part; small spines scattered on dorsal side more dense on posterior half. Posterior half with faint groove in middle; many plumose marginal setae distally, some setae submarginal and tuft of setae middorsally at anterior one-fifth of telson length (Fig. 2C). Uropods with spiny, transverse sutures not complete to the opposite side, forming a shallow V on uropods. Exopod with variable sizes of lateral spines at distal two-thirds of length proximal to suture, ending in large movable spine; upper surface with low, branched ridge, lateral ending proximal to suture with 4 small spines, mesial ridge continuing to distal margin. Endopod with 2 or 3 lateral spines proximal to suture, low middorsal ridge with 3 spines. Both exopod and endopod with many setae, both marginally and on ridges.

Antennular peduncle (Fig. 3D, E) slender with plumose setae on inner side. First segment with subterminal dorsolateral spine and terminal midventrolateral spine, statolith opening on ventral side closed by plumose setae. Second segment with subterminal ventrolateral spine, proximal width 1.2 times length, third segment 2.4 times longer than proximal width and 2.3 times longer than second. Upper flagellum slender, with 13 segments; lower flagellum longer, more robust, with 17 segments.

Antenna (Fig. 3F) with robust basicerite with 3 lateral spines on outer side and acute subterminal lateral spine on inner side; carapocerite exceeding scaphocerite by half its length, 1.4 times wider than long and with strong lateral terminal tooth on outer side. Scaphocerite well developed, with 4 spines on straight outer side, with small teeth between; inner side convex with terminal lateral plumose setae. Flagellum stiff and

straight, 2.4 times longer than dorsal post-orbital carapace length, subequal to total body length (Fig. 1).

Mandible robust (Fig. 3A–C), molar and incisor processes fused, with finely toothed incisor part ending in large acute tooth; molar part with strong chewing surface. Large 2-segmented palp with many setae and small spine proximally.

Maxillule (Fig. 4A) with palp having long, subterminal, fingerlike process and some setae; upper lacinia expanded posteriorly with setae and row of about 13 spines distally.

Maxilla (Fig. 4B) with fingerlike palp with lateral and distal setae; distal endite deeply bilobed with setae, upper lobe twice size of lower; medial endite fingerlike with apical setae; proximal endite large, square with both sub- and terminal and lateral setae. Scaphognathite 2.7 times longer than wide with marginal setae; posterior lobe well developed, wide, vaguely quadrate; anterior lobe rhomboid with truncate distal tip having 9 very long setae, inner posterior lateral margin with small spines.

First maxilliped (Fig. 4C) with 2-lobed basipodite, proximal lobe with shallow notch; both proximal and distal lobe with many marginal plumose setae. Endopodite 2-segmented with distal segment expanded and triangular in shape. Exopodite 11-segmented with proximal segment expanded distally with plumose setae on outer margin; last 9 segments with long plumose setae, together about same length as second segment. Epipodite large, slightly bilobed with small curved marginal hooks.

Second maxilliped (Fig. 4D) with 5-segmented endopodite; second segment longest, all with plumose setae. Exopodite 12-segmented; proximal segment 0.6 of exopodite, with short plumose setae; last 10 segments having long plumose setae. Epipodite long and narrow, spinose, with podobranch and two arthrobranches.

Third maxilliped (Fig. 5A) with endopodite of 5 segments. First segment ischium with mixture of large and small teeth on inner border. Second segment with 2 median teeth on outer border, 2 apical teeth, and many long and short setae. Third segment with 1 apical tooth and some long setae. Segments 4 and 5 with plumose setae. Exopodite with 11 segments, first segment subequal in length with distal 10; segments

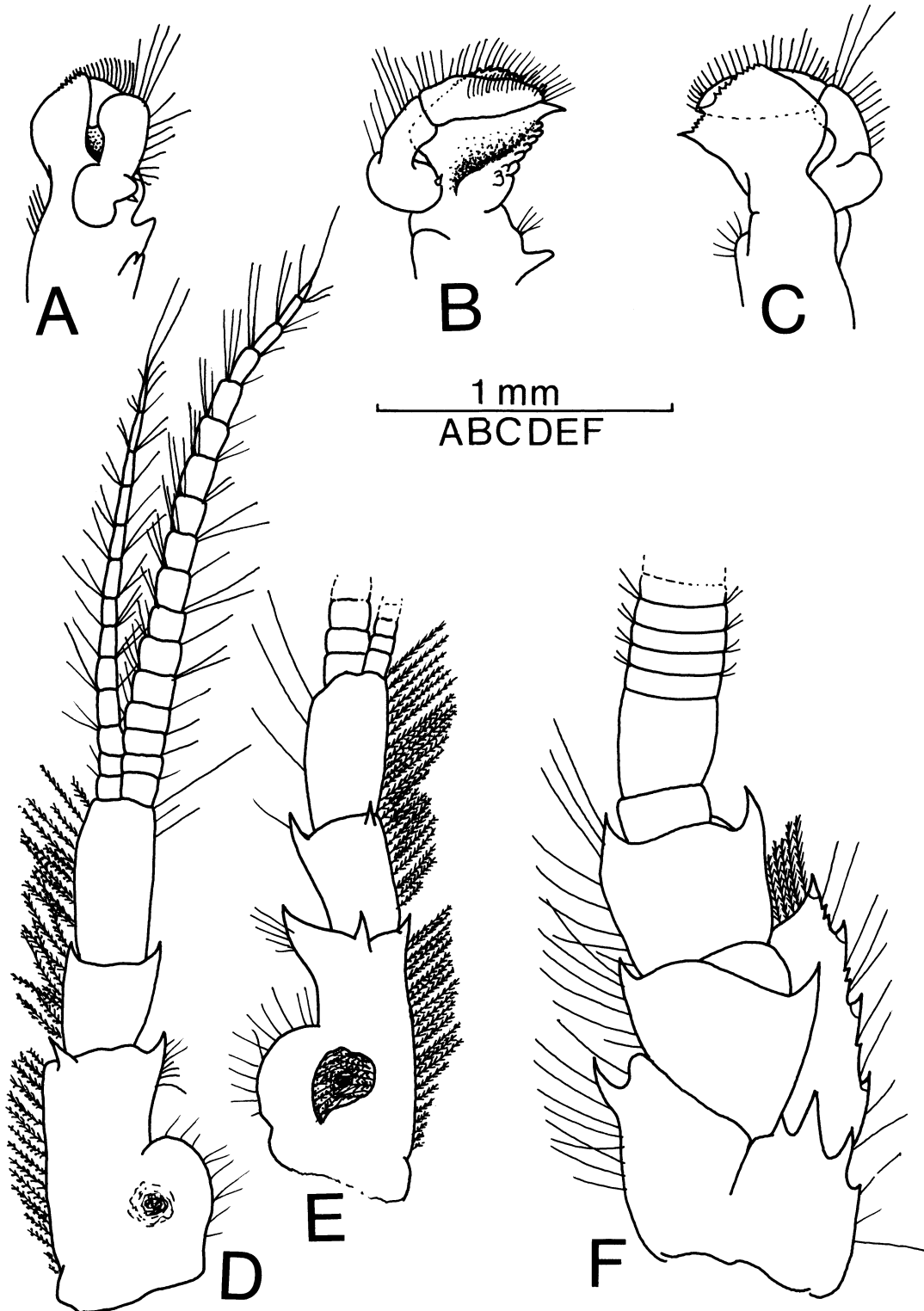


Fig. 3. *Naushonia lactoalbida*, new species, holotype female, left side. A–C, mandible; D, antennule, dorsal view; E, antennule, peduncle, ventral view; F, antenna, peduncle, ventral view.

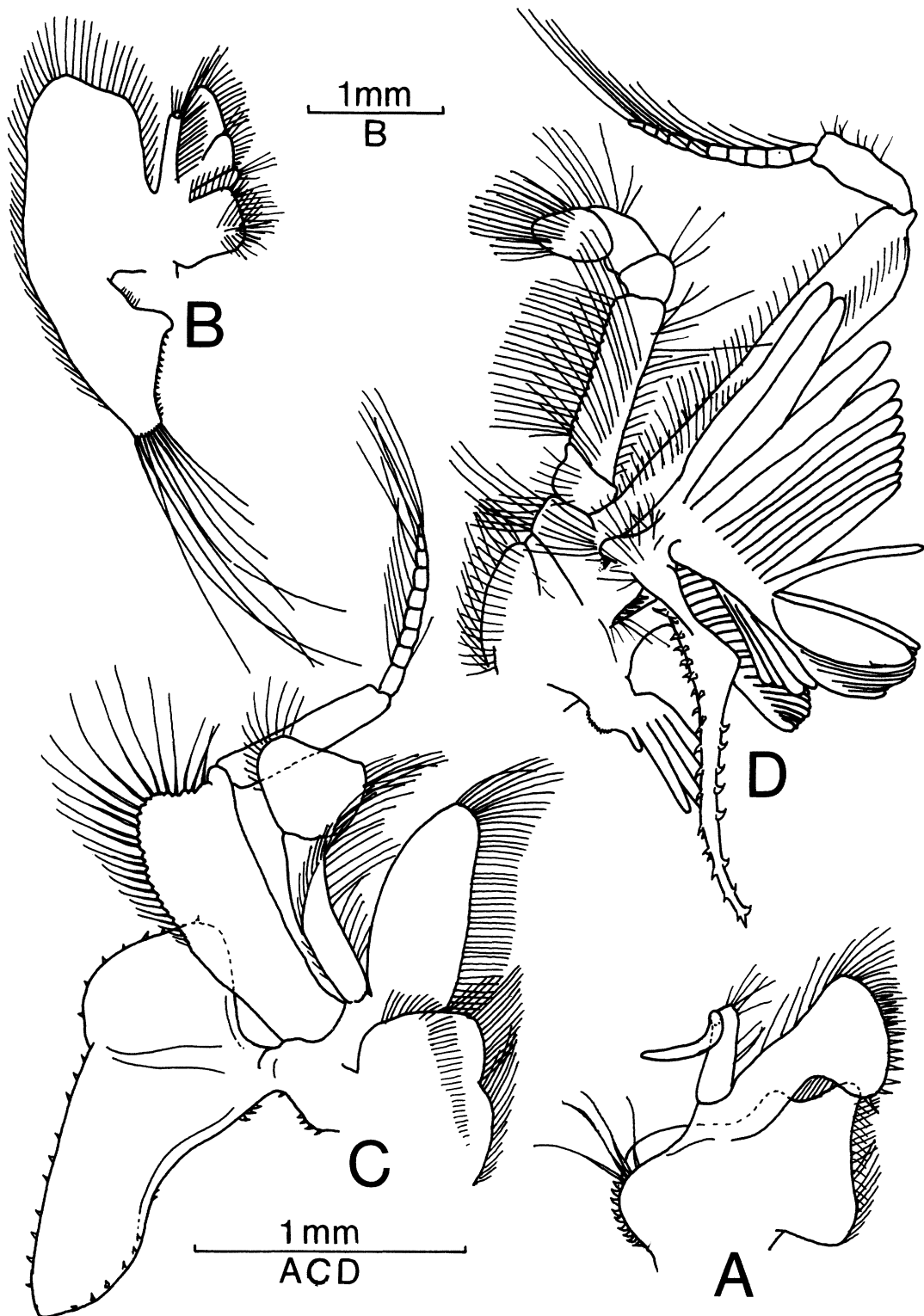


Fig. 4. *Naushonia lactoalbida*, new species, holotype female, left side. A, maxillule; B, maxilla; C, first maxilliped; D, second maxilliped.

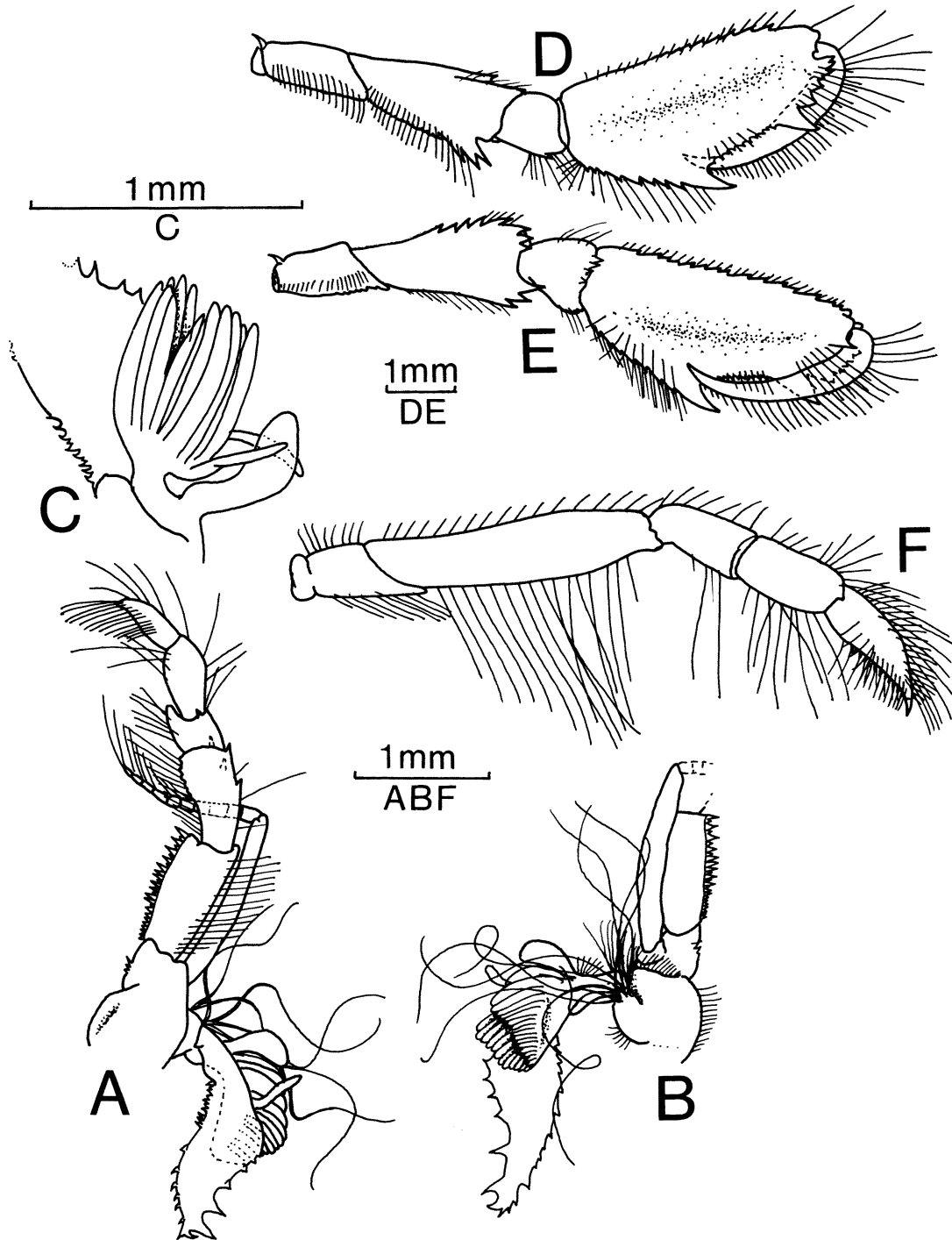


Fig. 5. *Naushonia lactoalbida*, new species, holotype female, left side (except E). A, third maxilliped, inner side; B, third maxilliped, outer side (epipodite, mastigobranch, and podobranch); C, podobranch; D, first pereopod, outer side; E, first pereopod, inner side (right pereopod); F, second pereopod.

2–11 with long plumose setae. Epipodite, small anterior lobe with about 12 long plumose whiplike setae (Fig. 5B). Mastigobranch long, rather broad with serrate margin; podobranch present. Proximal to “true” branchia of podobranch unknown process or malformed branchia (Fig. 5C) and 2 arthrobranchs.

First pereopods large, subchelate, and subequal, in both male and female, in size and shape (Fig. 5D, E). Ischium with strong spine proximally on dorsal side and row of setae medioventrally, 2.5 times longer than greatest width. Merus with 7 dorsal teeth on upper half and on ventral side 2 terminal and 1 subterminal tooth, 2 times longer than greatest width. Carpus with 4 small terminal teeth on inner side, about as long as wide. Propodus 2 times longer than greatest width, 1.5 times longer than merus, with serrated ventral margin, 1 large midventral tooth, and 1 subterminal tooth with 4 smaller teeth distally; dorsal side with serrated margin; setae along margins. Dactylus long and slender with many setae and serrated ventral margin, subequal in length to merus.

Second pereopod (Fig. 5F) short, reaching to proximal part of propodus of first pereopod. Merus nearly equal in length to carpus, propodus, and dactylus together, with very long setae on inner margin. Carpus and propodus subequal to long setae on inner margin. Dactylus 1.5 times longer than carpus, with 12 small spines on inner margin, strong terminal spine, and many long and short setae.

Ambulatory pereopods (III–V) long and slender. Third pereopod (Fig. 6A, B) reaching to end of antennular flagellum. Ischium 3 times longer than wide, with dense setae on proximal third. Merus 5.7 times longer than greatest width, sparsely setose. Carpus 3.9 times longer than greatest width, 0.4 length of merus with many short setae on outer margin. Propodus 10 times longer than wide, subequal to merus, distal end with many setae. Dactylus 0.5 times length of propodus, 5.9 times longer than wide, with strong terminal spine and 1 lateral moveable spine. Ventral border with proximal three-quarters with comblike lamella. In first quarter of length, about 15 teeth successively becoming larger, ending in about 0.4 width of dactylus, remaining three-quarters with about 40 subequal teeth about half lon-

gest proximal one in length. Lamella constructed of strong midrib ending in tip and becoming thinner on both sides (Fig. 6G). Fourth (Fig. 6C, D) and fifth (Fig. 6E, F) pereopods similar to third but somewhat shorter, dactyli of fourth with 5 lateral moveable spines and fifth without spines.

*Color.*—In life, milky white.

*Habitat.*—In burrow or hole in sand/coral gravel on tidal flat.

*Etymology.*—The name is derived from Latin for its color in life; *lacteus* = milky, *albidus* = somewhat white.

#### DISCUSSION

The species of *Naushonia* are generally very similar (Goy and Provenzano, 1979), but show differences in detail, especially in the telson, uropods, and antennal scales. The anterior part of the carapace and the first pereopods are also used to distinguish the different species of *Naushonia* (Martin and Abele, 1982).

The general appearance of *N. lactoalbida* seems to be more spiny than in the other species in the genus. The fusion of the two first segments of the mandibular palp was previously known only in *N. crangonoides*. No other species shows a serrated margin between the midventral and subterminal tooth of the propodus of the first pereopod. The outer edge of the antennal scale is straight, with four large spines and small spines in between. Such intermediate spines are found only in *N. lactoalbida*. A telson with four lateral marginal spines, and lateral margins of both exopod and endopod of uropods serrated, are other characters unique to *N. lactoalbida*. The comblike ventral lamella, on the edge of the dactylus, has not been mentioned in descriptions of other species in the genus; therefore, it is considered also as a unique character for *N. lactoalbida*.

As pointed out by Martin and Abele (1982), it is difficult to distinguish the completeness of the suture of the uropods. Although *N. lactoalbida* seems to have incomplete sutures, it is a doubtful character. Therefore, the new species is included in a key modified from Martin and Abele (1982) based on characters other than the suture of the uropods (below).

According to the literature, all species

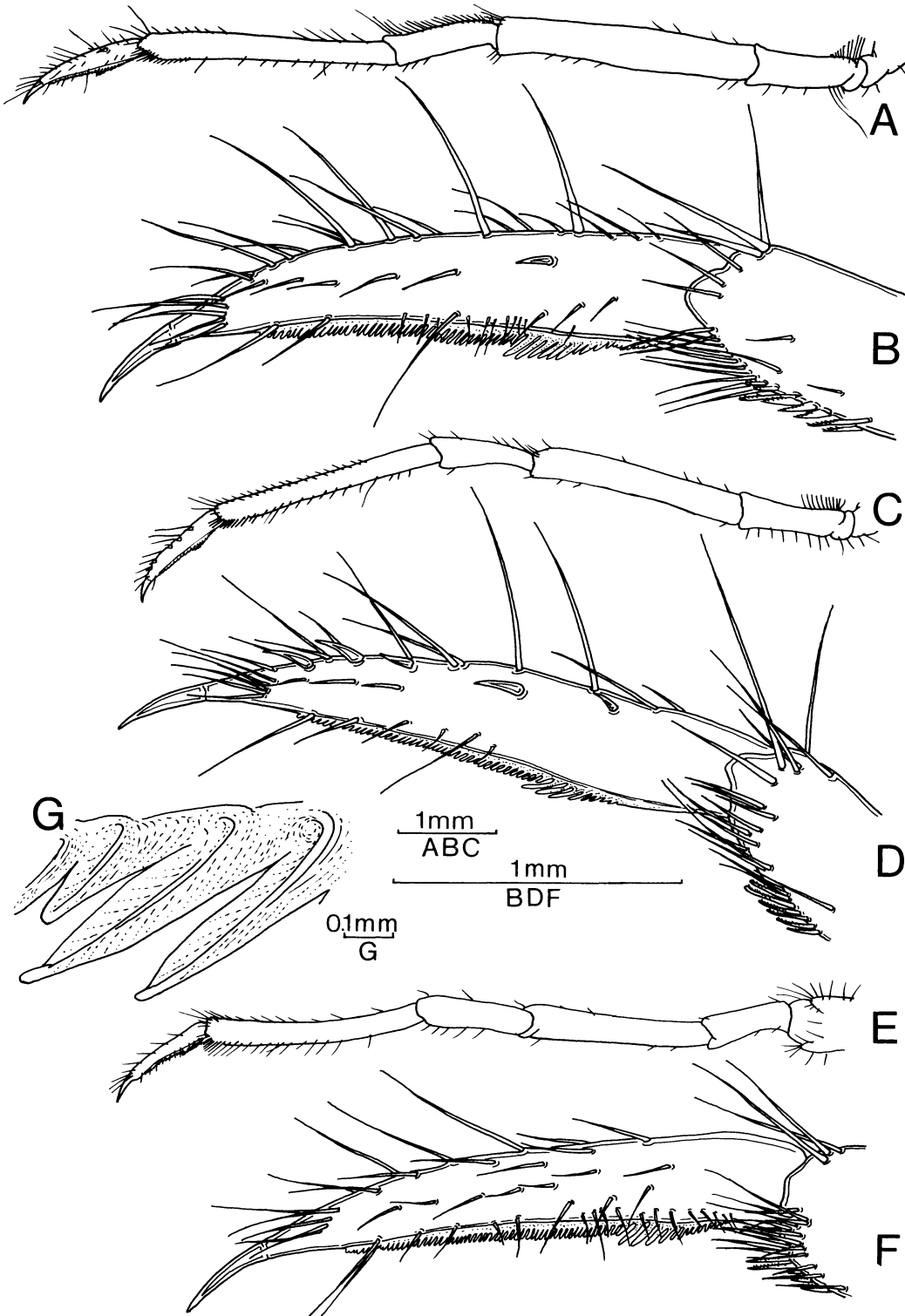


Fig. 6. *Naushonia lactoalbida*, new species, holotype female, left side. A, third pereiopod; B, third pereiopod, dactylus; C, fourth pereiopod; D, fourth pereiopod, dactylus; E, fifth pereiopod; F, fifth pereiopod, dactylus; G, fourth pereiopod, part of comblike ventral lamella edge on dactylus.



seem to have been found in burrows in a sandy or muddy substrate.

Before this discovery, four of the five species in this genus were found along the American coastline on both sides of the continent and the fifth on the northeast coast of Africa. With this record from the southern hemisphere, the question arises as to whether this unusual distribution is due to a higher sampling intensity along the American coast. Alternatively, the genus may be of American origin and may not have reached further than the African coast. Only more sampling can answer this question.

KEY TO THE KNOWN SPECIES OF  
*NAUSHONIA* (MODIFIED FROM  
MARTIN AND ABELE, 1982)

- |                                                                                                                                                                       |                        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| 1. Rostrum acute to broadly rounded .....                                                                                                                             | 2                      |
| - Rostrum truncate, with serrate anterior margin .....                                                                                                                |                        |
| ..... <i>N. perrieri</i>                                                                                                                                              |                        |
| 2. Postorbital spine simple .....                                                                                                                                     | 5                      |
| - Postorbital spine bifid or trifid .....                                                                                                                             | 3                      |
| 3. Antennal scale with 10 or more marginal teeth; uropodal lateral branch with 5 outer spines; telson without lateral spines .....                                    | <i>N. crangonoides</i> |
| - Antennal scale with fewer than 10 marginal teeth; uropodal lateral branch with 2 outer spines; telson with lateral spines .....                                     | 4                      |
| 4. Telson with 1 lateral tooth; antennal scale with terminal teeth strongly curved medially .....                                                                     |                        |
| ..... <i>N. portoricensis</i>                                                                                                                                         |                        |
| - Telson with 3 lateral teeth; antennal scale with terminal teeth straight, not curved medially .....                                                                 |                        |
| ..... <i>N. macginitiei</i>                                                                                                                                           |                        |
| 5. Propodus of first pereopod with 2 strong ventral teeth at proximal end; dactylus of first pereopod with proximal superior teeth; telson with 1 lateral spine ..... | <i>N. panamensis</i>   |
| - Propodus of first pereopod without 2 strong proximal ventral teeth; dactylus of first pereopod without proximal superior teeth; telson with 4 lateral spines .....  | <i>N. lactoalbida</i>  |

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Address: Estação Biologia Marítima, Ilha de Inhaca, Universidade Eduardo Mondlane, Maputo, Moçambique; (present address) Kristinebergs Marin Biologiska Station, S-450 34 Fiskebäckskil, Sweden.