New and Rare Stomatopod Crustacea from the Indo-West-Pacific Region

RAYMOND B. MANNING

SMITHSONIAN CONTRIBUTIONS TO ZOOLOGY • NUMBER 264

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ABSTRACT

Manning, Raymond B. New and Rare Stomatopod Crustacea from the Indo-West-Pacific Region. *Smithsonian Contributions to Zoology,* number 264, 36 pages, 16 figures, 1978.—Nineteen species of stomatopod crustaceans are reported. Five new genera are recognized: *Hoplosquilloides,* for *H. coronatus,* new species: *Keppelius,* for *Lysiosquilla hystricotelson* Barnard, 1958; *Pullosquilla,* for *Austrosquilla litoralis* Michel and Manning, 1971, *A. malayensis* Manning, 1968, and a new species, *P. thomassini; Busquilla,* for *Squilla quadraticauda* Fukuda, 1911, and *B. plantei,* new species; and *Tuleariosquilla,* for *T. parvula,* new species. Five other new species are described: *Alima orientalis, Clorida japonica, Cloridopsis aquilonaris, Harpiosquilla malagasiensis,* and *Neocoronida martensi.* Four species are redescribed: *Clorida minor* (Jurich, 1904); *Gonodactylus viridis* Serène, 1954; *Neocoronida trachurus* (von Martens, 1881); and *Parvisquilla multituberculata* (Borradaile, 1898). *Gonodactylus confinis* de Man, 1902, and *G. segregatus* Lanchester, 1903 are shown to be synonyms of *G. affinis* de Man, 1902; *Coronis spinosa* Wood-Mason, 1875 is a synonym of *Coronis tricarinata* Claus, 1871; and *Parvisquilla xishaensis* Liu, 1975 is a synonym of *Parvisquilla multituberculata* (Borradaile, 1898). Additional material of *Clorida latispina* Manning, 1968 and *C. malaccensis* Manning, 1968 is reported; *C. malaccensis* var. *moluccensis* Moosa, 1973 is a synonym of the latter.

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New and Rare Stomatopod Crustacea from the Indo-West-Pacific Region

Raymond B. Manning

Introduction

Visits to European museums in 1971 and to the Zoological Survey of India, Calcutta in 1972, and examination of collections received since then have resulted in the accumulation of a large amount of new information on Indo-West-Pacific stomatopods. Because some names are required by colleagues working in other fields, redescription of five known species, observations on types of several poorly known species, and descriptions of new taxa, including five new genera and nine new species, are presented here. More cohesive summaries of other Indo-West-Pacific stomatopods, at the generic or species-group levels are in preparation or in press; these include reviews of *Lysiosquilla* and the members of the *falcatus* group of *Gonodactylus* and redescriptions of types and descriptions of new species in *Oratosquilla*. A general review of stomatopod taxa at and above the generic level is also in preparation.

All measurements are in millimeters (mm). TL refers to total length, measured on the midline from the anterior margin of the rostral plate to the apices of the submedian teeth of the telson; CL refers to carapace length, measured on the midline, exclusive of rostral plate. Terms and measurements have been explained in earlier papers (see Manning, 1969a).

The descriptive accounts vary in complexity depending on the taxon involved; thus a diagnosis is given for a new *Alima* and a new *Cloridopsis*, genera in which relatively few distinguishing characteristics are known. Often, characters mentioned in generic diagnoses are not repeated in descriptions of species in that genus.

The following abbreviations are used to designate repositories:

BMNH	British Museum (Natural History), London
MNHNP	Muséum National d'Histoire Naturelle, Paris
MRAC	Musée Royal de l'Afrique Centrale, Tervuren, Belgium
MZC	University Museum of Zoology, Cambridge, England
SME	Station Marine d'Endoume, Marseille
SMF	Natur-Museum und Forschungsinstitut Senckenberg, Frankfurt am Main
USNM	National Museum of Natural History, Smithsonian Institution, Washington (USNM = former United States National Museum)
ZMB	Zoologisches Museum an der Humboldt-Universität zu Berlin
ZMH	Zoologisches Institut und Zoologisches Museum, Hamburg
ZSI	Zoological Survey of India, Calcutta
ZSM	Zoologisches Staatsammlung, Munich

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Raymond B. Manning, Department of Invertebrate Zoology, National Museum of Natural History, Smithsonian Institution, Washington, D.C. 20560.

for identification. H. Dingle, Department of Zoology, University of Iowa, and R. Caldwell, Department of Zoology, University of California, Berkeley, provided material from their field studies of stomatopods in Thailand and freely discussed their field observations. The following individuals also provided working space and/or material for study on loan at various times: P.L.G. Benoit, Musée Royal de l'Afrique Centrale, Tervuren (directly and indirectly through L. B. Holthuis, Rijksmuseum van Natuurlijke Historie, Leiden); H. Fechter, Zoologisches Staatsammlung, Munich; J. Forest, Muséum National d'Histoire Naturelle, Paris; C. B. Goodhart, University Museum of Zoology, Cambridge; H.-E. Gruner and G. Hartwich, Zoologisches Museum an der Humboldt-Universität zu Berlin; G. Hartmann, Zoologisches Institut und Zoologisches Museum, Hamburg; R. W. Ingle, Department of Zoology, British Museum (Natural History), London; K. K. Tiwari and H. C. Ghosh, Zoological Survey of India, Calcutta; and M. Türkay, Natur-Museum und Forschungsinstitut Senckenberg, Frankfurt am Main.

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All of the illustrations were prepared by my wife Lilly.

Family GONODACTYLIDAE Giesbrecht, 1910

Genus *Gonodactylus* Berthold, 1827

REMARKS.—*Gonodactylus,* one of the largest and most complex genera in the Stomatopoda, comprises four distinct species groups, three of which are restricted to the Indo-West-Pacific region. There the genus is represented by the *chiragra* group, composed of *Gonodactylus chiragra* (Fabricius, 1781) and its allies, including large species (TL 90 mm or more as adults) with large ocular scales and three mid-dorsal keels or carinae on the telson (note that *G. viridis* Serène, 1954, redescribed below, may belong here in spite of its small size and ocular scales); the *falcatus* group, including *G. falcatus* (Forskål, 1775) and similar species, comprising small to large species (TL 30–60 mm or more as adults) with small ocular scales and five mid-dorsal keels on the telson; and the *demanii* group, comprising *G. demanii* Henderson, 1893 and related species, encompassing small species (TL usually less than 50 mm as adults) with small ocular scales and the telson variously ornamented with longitudinal keels (usually three) and in some cases with spinules. In some species of the latter group the setation and shape of the uropod segments may be highly modified. It is possible that this group actually comprises species which should be assigned to two groups, one with *G. demanii,* and similar species, in which the telson and uropods are usually modified, and one with *G. affinis* and related species, in which the telson morphology more closely resembles that of members of the *chiragra* group.

The fourth aggregate of species in the genus, the *oerstedii* group, including *G. oerstedii* Hansen, 1895 and other American species, comprises small to large species with small ocular scales, three mid-dorsal keels on the telson, and an accessory or supplementary carina on the mesial side of the intermediate tooth of the telson.

Two species of the *demanii* group, *G. affinis* de Man, 1902, and *G. viridis* Serène, 1954, are treated below.

Gonodactylus affinis de Man, 1902

FIGURE 1

Gonodactylus chiragra var. *affinis* de Man, 1902:912.

Gonodactylus chiragra var. *confinis* de Man, 1902:912, pl. 27: fig. 66.

Gonodactylus chiragra var. *segregatus* a Lanchester, 1903:448, pl. 23: fig. 6.

Gonodactylus chiragra var. *segregatus* b Lanchester, 1903:448, pl. 23: figs. 7, 7a.

Gonodactylus chiragra var. H. *affinis.*—Borradaile, 1907:211 [key], 212.

Gonodactylus chiragra var. K. *confinis.*—Borradaile, 1907:211 [key].

Gonodactylus segregatus.—Manning, 1968a:51, fig. 16.—Manning and Serène, 1968:114 [listed].—Manning, 1971:80 [key].—Moosa, 1973:4 [listed], 8.

Gonodactylus confinis.—Manning, 1971:80 [key].

MATERIAL.—Ternate, Molucca Islands, Indonesia; Kükenthal, leg.; syntypes of *Gonodactylus chiragra* var. *affinis* de Man: 1 ♂, TL 21 mm; 2 ♀, TL 32–34 mm (SMF 5766). Same; Kükenthal, leg.; 1894; holotype of *Gonodactylus chiragra* var. *confinis* de Man: 1 ♂, TL 22 mm (SMF). Minikoi, Laccadive Islands; reef; syntype of *Gonodactylus chiragra* var. *segrega-*

tus a Lanchester: 1 ♀, TL 18 mm (MZC). Goidu, Goifurfehendu Atoll, Maldive Islands; reef; syntypes of *Gonodactylus chiragra* var. *segregatus* a Lanchester: 4 ♀, TL 10–15 mm (MZC). South Male Atoll, Maldive Islands; 25 fms (46 m); syntype of *Gonodactylus chiragra* var. *segregatus* a Lanchester: 1 ♂, TL 11 mm (MZC). Hulule, Male Atoll, Maldive Islands; reef; syntype of *Gonodactylus chiragra* var. *segregatus* a Lanchester: 1 juvenile, TL 8 mm (MZC). South Nilandu Atoll, Maldive Islands; 25 fms (46 m); syntype of *Gonodactylus chiragra* var. *segregatus* a Lanchester: 1 ♀, TL 13 mm (MZC). South Nilandu Atoll, Maldive Islands; 19 fms (33 m); syntypes of *Gonodactylus chiragra* var. *segregatus* b Lanchester: 2 ♂, TL 13–20 mm; 2 ♀, TL 14–15 mm; 1 juvenile, TL 9 mm (MZC).

One lot containing a single female from North Male Atoll in 27–35 fms (49–67 m) could not be located in the collection at Cambridge.

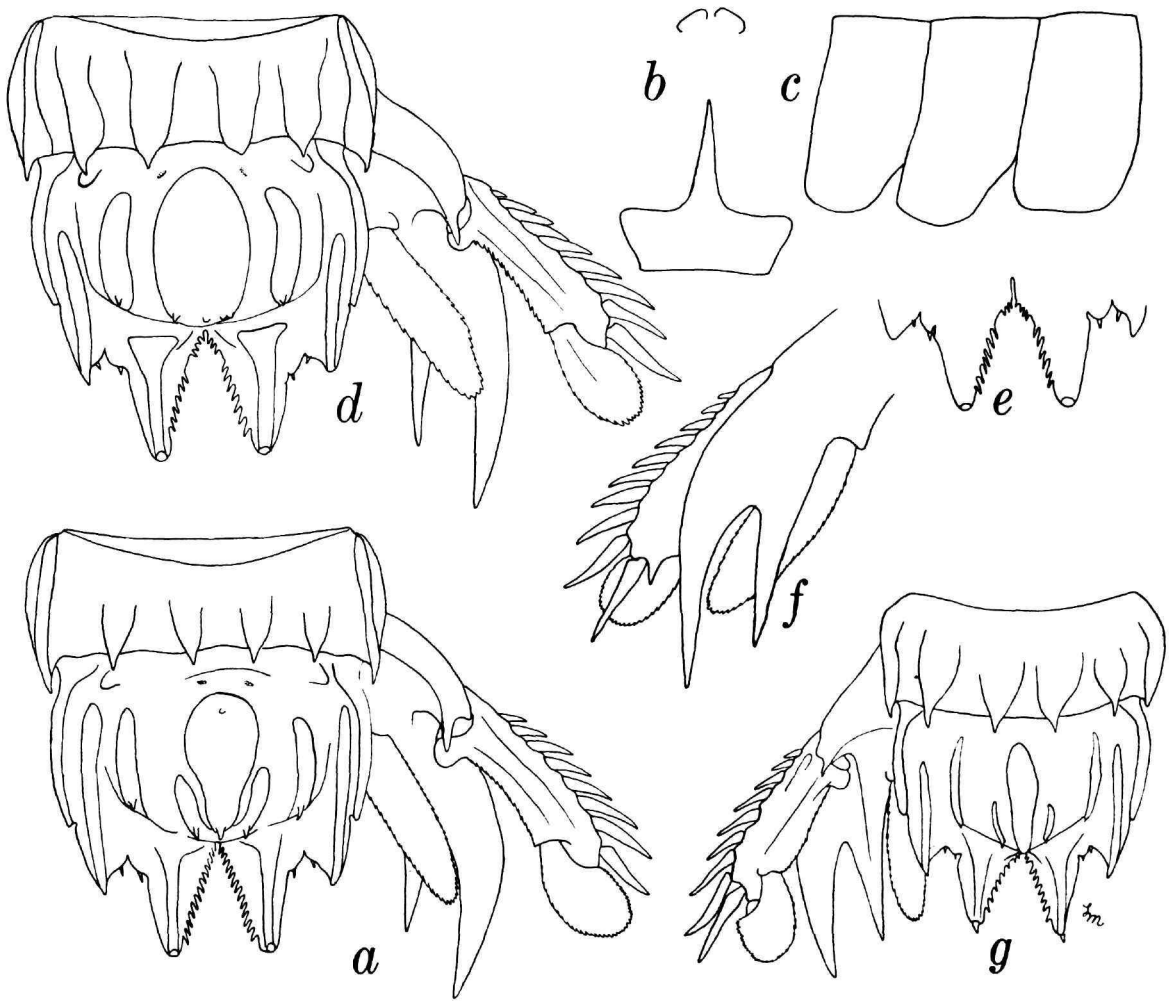

FIGURE. 1.—*Gonodactylus affinis* de Man, 1902: *a*, female syntype, TL 34 mm, Ternate, sixth abdominal somite, telson, and uropod. *Gonodactylus confinis* de Man, 1902, male holotype, TL 22 mm, Ternate: *b*, rostral plate and ocular scales; *c*, sixth, seventh and eighth thoracic somites, lateral view; *d*, sixth abdominal somite, telson, and uropod; *e*, submedian teeth of telson, ventral view; *f*, uropod, ventral view. *Gonodactylus segregatus* Lanchester, 1903, female syntype, TL 18 mm, Minikoi: *g*, sixth abdominal somite, telson, and uropod. (Setae omitted.)

REMARKS.—The identity of the taxa described as varieties *affinis, confinis,* and *segregatus* of *Gonodactylus chiragra* could not have been determined without examination of all of the types involved. Illustrations of some of the types (Figure 1) are provided here. In *G. affinis* the accessory median carinae of the telson are quite long and often fuse posteriorly with the median carina. The apices of the median, accessory median, and anterior submedian carinae each may be armed with a small spinule. de Man (1902) described these spines for *G. affinis* (a species that he believed to be distinct from *G. confinis*) in which the accessory median carinae are fused posteriorly with the highly inflated median carina. His *G. affinis* was based on four specimens, only three of which could be located, a male and two females. (The telson of one of the females is shown herein: Figure 1*a*) with relatively little inflation of the carinae of the telson, whereas his *confinis* was based on a male in which the carinae are strongly inflated (Figure 1*b–f*). Apparently both lots came from the same collection made at Ternate, Molucca Islands. The taxon described by Lanchester (1903) as *G. chiragra* var. *segregatus* as from several localities in the western Indian Ocean is based on young specimens and females with minimal inflation of the carinae of the telson (Figure 1*g*).

The configuration of the mid-dorsal carinae on the telson in this species superficially resembles that found in *G. falcatus* (Forskål) and its allies. Both de Man and Lanchester considered *G. affinis* to be a transitional form between "typical" *G. chiragra* (Fabricius) and "typical" *G. falcatus*. It is, in fact, not closely related to either but a member of a group of small species that occur in the Indo-West-Pacific region.

This is a very small species; the largest individual available does not exceed 34 mm in total length. Males as small as 22 mm may have well-developed secondary sexual characteristics.

DISTRIBUTION.—This species is known from Indonesia, where it was recorded from Ternate by de Man (1902) and from several localities in the Maluku region of Indonesia in 14–32 fms (26–59 m) (Moosa, 1973); Macclesfield Bank, South China Sea (Lanchester, 1903); from Goidu, Goifurfehendu Atoll, South Male Atoll in 25 fms (46 m), Hulule, Male Atoll, North Male Atoll in 27–35 fms (49–64 m), South Nilandu Atoll in 19–25 fms (33–46 m), and Minikoi, Laccadive Islands (all Lanchester, 1903); Seychelles, Amirante Island, Saya de Malha, and Wasin, British East Africa (Wasini, Kenya) (all Borradaile, 1907); and from Madagascar in 14 m and the Comoro Islands, intertidal zone (Manning, 1968a).

Gonodactylus viridis Serène, 1954

FIGURES 2*a–c*

Gonodactylus chiragra var. *viridis* Serène, 1954:6, 7, 10, 74, 75, 76, fig. 13–3.

?*Gonodactylus chiragra*.—Liu, 1975:188, figs. 3–4, 3–5 [part] [not *G. chiragra* (Fabricius, 1781)].

MATERIAL.—KoPhuket Island, Thailand, Andaman Sea; in shale and coral, shore to 1.5 m; R. Caldwell, leg.; Aug 1973: 3 ♂, TL 23–41 mm; 2 ♀, TL 33–43 mm (USNM 150597).

DESCRIPTION.—Rostral plate (Figure 2*a*) with width slightly greater than length or length and width subequal, apical spine relatively short; anterolateral angles broadly rounded, acute. Ocular scales (Figure 2*a*) small, breadth of both less than ⅓ plate width, triangular, apices angled or rounded. Sixth abdominal somite (Figure 2*b*) with 6 carinae, narrow in juveniles, inflated in adults, each usually with apical tubercle or spinule. Telson (Figure 2*b*) appearing broad, length and width subequal or width slightly greater, with 3 pairs of blunt marginal teeth, submedians with movable apices. Submedian, intermediate, and marginal carinae slender, unarmed dorsally. Median and anterior submedian carinae slender in juveniles and smaller females, very inflated in large males (Figure 2*c*), unarmed dorsally, usually unarmed posteriorly, each with posterior tubercle in smaller specimens. Accessory median carinae very short, not extending anteriorly beyond posterior third of median carina, separate in juveniles, fusing posteriorly to form anchor in adults. Knob indistinct or absent. Row of submedian and 2 intermediate denticles present, lateral denticles absent. Uropod (Figure 2*b*) with normal setation, proximal segment of exopod with 9–10 short, movable spines. Color completely faded in available material.

MEASUREMENTS.—Males, TL 23–41 mm; females, TL 33–43 mm. Serène (1954) had more than 300 specimens available, all less than 40 mm long, including females 35 mm long with eggs. Other

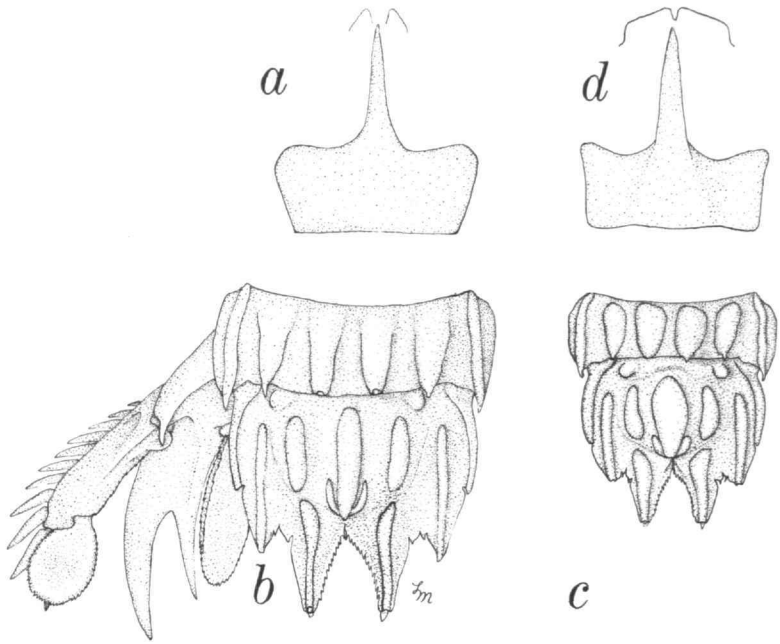

FIGURE 2.—*Gonodactylus viridis* Serène, 1954, female, TL 33 mm, Thailand: *a*, rostral plate and ocular scales; *b*, sixth abdominal somite, telson, and uropod. Male, TL 41 mm, Thailand: *c*, sixth abdominal somite and telson. *Gonodactylus chiragra* (Fabricius, 1781), female, TL 64 mm, Celebes: *d*, rostral plate and ocular scales. (Setae omitted.)

measurements of male, TL 41 mm: carapace length 11.0; rostral plate length 2.8, width 3.0; fifth abdominal somite width 8.5; telson length 7.2, width 7.2.

REMARKS.—R. Serène named this species as a variety of *G. chiragra* (Fabricius) in his account of the biology of Vietnamese stomatopods published in 1954, noting that a more complete account was in preparation. It was named, figured, and distinguished from *G. chiragra,* which it resembles in basic facies. Evidently it has not been recorded as a distinct taxon in more recent taxonomic papers. Apparently this species is easily recognized in the field (R. Caldwell and H. Dingle, pers. comm.), but, until the importance of the size of the ocular scales was recognized, it was extremely difficult to separate it from juveniles of *G. chiragra* on the basis of preserved material. It seems likely that some of the records of *G. chiragra* from the Indo-Malayan area should be referable to this species or to other small species of the *demanii* group, such as *G. incipiens* Lanchester, 1903 or *G. micronesica* Manning, 1971, which also have an unarmed telson and normal setation on the uropods.

The *G. chiragra*-like telson and the small ocular scales of *G. viridis* will distinguish it from all other members of the *demanii* group. The small ocular scales serve to distinguish it from *G. chiragra* even in juveniles. The differences in the rostral plates and ocular scales of this species and that of *G. chiragra* (and the difference in ocular scale size between members of the *chiragra* and *demanii* groups) are shown in Figures 2*a* and 2*d*.

Gonodactylus viridis also differs from *G. chiragra* in size: representatives of *G. viridis* are adult at a length of 35 mm, and no specimens are known to exceed 50 mm. *Gonodactylus chiragra* attains a length of 105 mm (Kemp, 1913), and specimens with total lengths of 70–90 mm are common.

It is with some hesitation that I assign the species to the *demanii* group, for the basic facies and the telson of *G. viridis* and *G. chiragra* are very

similar. Obviously additional study of this species, based on much more material than is now available, is needed.

Liu (1975) may have included *G. viridis* with material identified as *G. chiragra* in his account of some stomatopods from the Xisha Islands, China. His Figure 3 includes illustrations of the front and telson of *G. chiragra* (Figures 3–1, 3–2) as well as what appear to be those parts of *G. viridis* (Figures 3–4, 3–5). Unfortunately his account is in Chinese and I am unable to clarify his records.

Serène found this species in blocks of coral in the Bay of Nhatrang, and R. Caldwell collected material in shale and coral in shallow water in Thailand; it occurred together with *G. chiragra* there.

DISTRIBUTION.—Known with certainty from the Bay of Nhatrang, Viet Nam, and from KoPhuket Island, Thailand, in the Andaman Sea.

Hoplosquilloides, new genus

DEFINITION.—Size small, TL not exceeding 25 mm. Rostral plate (Figure 3*a*) sharply trispinous. Cornea (Figure 3*a*) elongate, not expanded laterally. Anterior margins of lateral plates of carapace (Figure 3*a*) convex, extending anteriorly beyond base of rostral plate. Ischiomeral articulation of claw subterminal. Propodus of claw with proximal movable spine. Dactylus of claw unarmed. Articulation of propodus and dactylus inflated. Mandibular palp present. Articulated anterolateral plates of abdomen (Figure 3*b*) present. Posterior margin of sixth abdominal somite (Figure 3*c*) concave medially. Telson (Figure 3*c,d*) of unusual shape, ornamentation bizarre, dorsal and marginal armature arranged in circle around almost vertical plane, anus opening in that plane above bases of marginal teeth. Posteroventral margin of telson produced into 2 primary pairs of long slender teeth, submedians with movable apices, inner and outer margins lined with long, slender, simple setae. Submedian denticles absent, replaced by simple setae. Proximal segment of uropodal exopod (Figure 3*e,f*) extending beyond articulation with distal segment. Movable spines on outer margin of proximal segment not markedly enlarged or strongly recurved. Endopod slightly curved mesially. Distal segment of uropodal exopod and uropodal endopod (Figure 3*e,f*) with strong fixed spines on mesial margin.

TYPE-SPECIES.—*Hoplosquilloides coronatus*, new species.

ETYMOLOGY.—The name is derived from the Greek *-oides*, meaning "like," in combination with the generic name *Hoplosquilla*. The gender is masculine.

REMARKS.—*Hoplosquilloides* is unique among stomatopods in having the anus situated dorsally (Figure 3*c*) rather than ventrally on the telson. This may well be an adaptation for burrowing, but this remains speculative, for live animals have not yet been observed. *Hoplosquilloides* shows closest affinities with *Hoplosquilla* Holthuis, 1964, represented by a single species from Ceylon, in that the uropod is armed with sharp, fixed spines. *Hoplosquilloides* differs from *Hoplosquilla* in that the mandibular palp is present and in the shape and armature of the telson, with the anus situated dorsally rather than ventrally. The telson in *Hoplosquilla* is typically gonodactylid, not highly modified as in this new genus.

Hoplosquilloides coronatus, new species

FIGURE 3

MATERIAL.—St. Gilles Reef, Reunion Island; outer slope, 35 m; M. Clausade, leg., sta RE–74–22; 1974; paratype: 1 ♀, TL 12 mm (SME). St. Gilles Reef, Reunion Island; outer slope, 35 m; M. Clausade, leg., sta RE–74–25; 1974; holotype: 1 ♀, TL 18 mm (MNHNP). Same; reef flat; M. Clausade, leg., sta RE–74–55; 1974; paratype: 1 ♀, TL 18 mm (USNM 156240). Grand Recif, Tulear, Madagascar; external slope, 21 m; B. Thomassin, leg., sta 230; 3 Oct 1969; paratype: 1 ♂, TL 13 mm (MNHNP). Grand Recif, Tulear, Madagascar; Antseteky transect; 21–33 m; Pichon, leg., sta D–8; 2 Sep 1971; paratype: 1 ♀, TL 23 mm (SME). Grand Recif, Tulear, Madagascar; Antseteky transect, 31 m, hard bottom; Pichon leg., sta. D–13; 2 Sep 1971; paratypes: 1 ♂, TL 17 mm; 2 ♀, TL 17–22.5 mm (USNM 156168).

DESCRIPTION.—Ocular scales (Figure 3*a*) low but distinct, rounded or flattened dorsally, separate mesially. Cornea (Figure 3*a*) elongate, diameter greater than that of stalk.

Rostral plate (Figure 3*a*) sharply trispinous, median spine noticeably longer than anterolaterals.

Mandibular palp three-segmented. 5 epipods present.

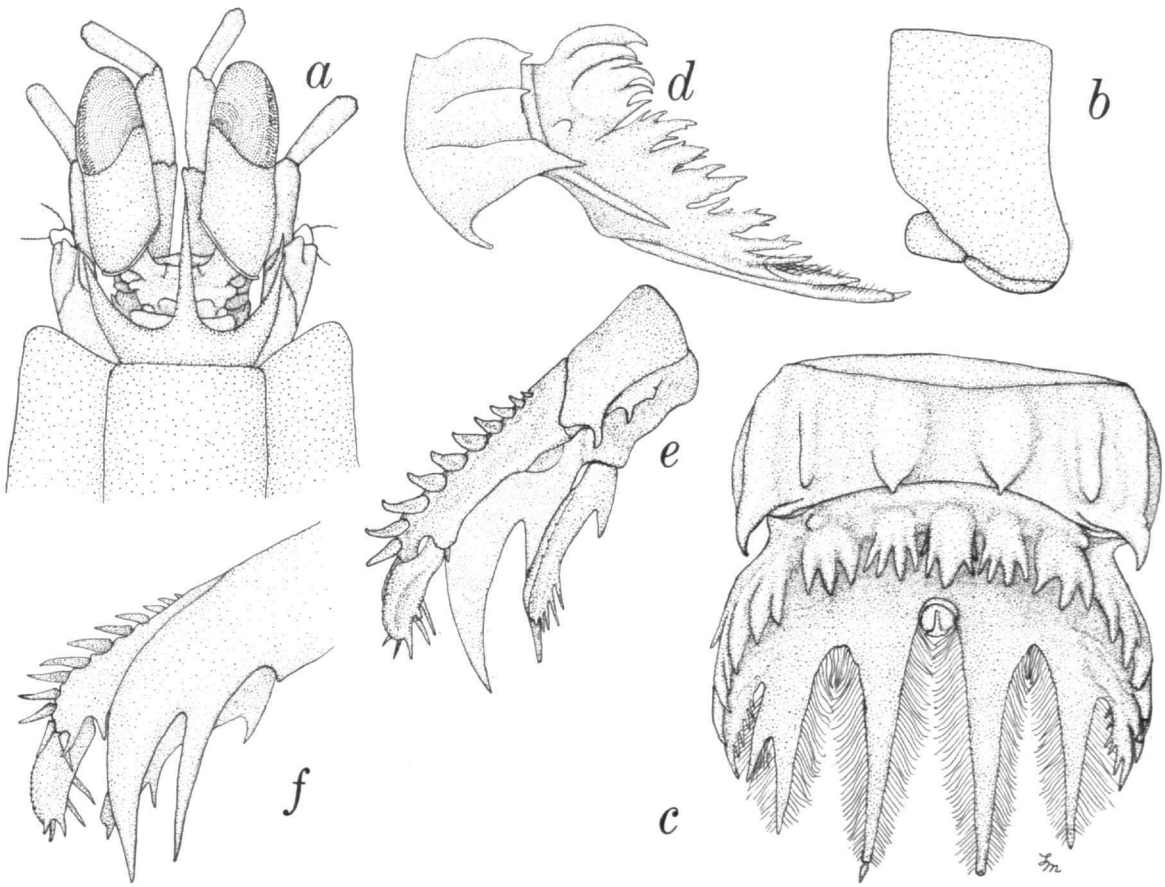

FIGURE 3.—*Hoplosquilloides coronatus*, new genus, new species, female paratype, TL 22.5 mm, Grand Recif: *a*, anterior portion of body; *b*, first abdominal somite, lateral view; *c*, sixth abdominal somite and telson; *d* sixth abdominal somite and telson, lateral view; *e*, uropod, dorsal view; *f*, uropod, ventral view. (Setae omitted in *e*, *f*.)

Exposed thoracic and anterior 5 abdominal somites smooth, unarmed, lacking sharp dorsal carinae, abdominal somites each with marginal carina. Sixth abdominal somite (Figure 3*c*) with 6 longitudinal bosses, submedians each with posterior spinule, intermediates bluntly pointed, laterals produced into slender posterolateral spine. Anterior surface of lateral bosses irregular, appearing eroded.

Telson (Figure 3*c*,*d*) much broader than long with short basal portion connected to long marginal teeth by curved vertical surface, appearing semicircular or oval in posterior view, margin framed by short, rounded bosses dorsally and laterally, by long marginal teeth ventrally. Each of dorsal bosses with at least 1 posterior tubercle or spine, some bosses apically bifurcate or with secondary spinules around apical spine. Short but distinct bluntly pointed lateral tooth present, carinate laterally. Posterior margin with ventral 2 pairs of projections longest, submedians with movable apices, intermediates slightly shorter, with fixed apices. Submedian, intermediate, and lateral denticles absent. Inner and outer margins of submedian

and intermediate marginal teeth completely lined with single series of long, simple setae. Anus (Figure 3*c*) visible in dorsal view, situated posterodorsally rather than ventrally, encircled dorsally and laterally by ridge connecting inner margins of submedian teeth.

Proximal segment of uropod (Figure 3*e,f*) with sharp, curved carina dorsally, terminating in sharp spine, 1–2 tubercles present dorsally lateral to carina. Proximal segment of uropodal exopod with 11–12 movable spines laterally, distalmost slightly recurved but not enlarged, and with fixed spine ventrally (Figure 3*f*) overhanging articulation with distal segment. Inner margin of proximal segment of exopod (Figure 3*e*) smooth, lacking setae, with sharp spine at inner, distal angle. Distal segment of uropodal exopod (Figure 3*et,f*) with normal setation laterally, lacking setae but with 3–5 fixed spines mesially, and dorsally with fixed spines on short carina. Uropodal endopod (Figure 3*e*) with normal setation (margin evenly fringed) on outer margin, inner margin lacking setae but with strong proximal spine and several slender fixed spines distally, margin smooth between spines.

COLOR.—Largely faded in preservative, but with tip of rostral plate red, anterior appendages mottled with dark pigment, and eyestalks brown with dark mottling. Carapace with row of dark spots across posterior third. Dactylus of claw orange or pink, less orange pigment on propodus and at merocarpal articulation. Posterior 3 thoracic somites each with dark spots arranged in band across somite, most prominent on sixth. All 6 abdominal somites with pair of submedian black spots, first somite also with larger, extra pair nearer to posterior margin, and first and fifth somites with median spot. Telson with anterior pair of small, dark spots.

MEASUREMENTS.—Males, TL 13–17 mm; females, TL 12–23 mm. Other measurements of female holotype, TL 18 mm: carapace length 3.8; fifth abdominal somite width 3.0; telson length 2.2, width 2.7.

REMARKS.—The specimens examined are remarkably uniform, the major variability observed being on the ornamentation of the telson. In the smaller specimens (TL 12–13 mm), the lateral projections are much less ornate than in the larger examples. There is also some minor variation in the size and position of the fixed spines on the margins of the uropod. The telson in all of the specimens appears to have a basic pattern of a median (dorsal) and seven lateral marginal projections, somewhat obscured by secondary ornamentation of the major projections.

ETYMOLOGY.—The specific name is from the Latin *corona,* "crown," and *-atus,* "having the shape of," alluding to the shape of the telson.

DISTRIBUTION.—Known only from Reunion Island and the Grand Recif, Tulear, Madagascar. It lives on coral reefs, from the reef flat to a depth of 35 m on the slope.

Family LYSIOSQUILLIDAE Giesbrecht, 1910

Genus *Heterosquilla* Manning, 1963

Heterosquilla tricarinata (Claus, 1871)

FIGURE 4

Coronis tricarinata Claus, 1871:128, 139 [pagination from Holthuis, 1967a; pp. 21, 31 on separate].

Coronis spinosa Wood-Mason, 1875:232.

Heterosquilla (Heterosquilla) tricarinata.—Holthuis, 1967a:11 [complete synonymy].—Manning and Serène, 1968:115 [listed].

Heterosquilla (Heterosquilla) spinosa.—Holthius, 1967a:11 [complete synonymy].—Manning and Serène, 1968:115 [listed].

MATERIAL.—Port Blair, Andaman Islands; J. Wood-Mason, don.; lectotype of *Coronis spinosa:* 1 ♀, TL 68 mm (ZSI 3082/5).

REMARKS.—In 1966 I suggested that *H. spinosa* from the Andaman Islands probably was distinct from *H. tricarinata* from New Zealand. This was based on differences between the accounts of material from the two areas, the most important being the absence of the inner spine on the basal prolongation of the uropod in *H. spinosa.* Examination of the lectotype of that species in 1972 revealed that the inner spine was broken on one side (Figure 4*e*), and for this reason it was shown as an inconspicuous lobe by Kemp (1913, pl. 8: fig. 94). I can find no other differences between the specimen from the Andaman Islands and accounts of material from New Zealand, and I believe that *Coronis spinosa* Wood-Mason, 1875 must be considered a synonym of *Coronis tricarinata* Claus, 1871. The specimen figured here is the lectotype of *Coronis spinosa.*

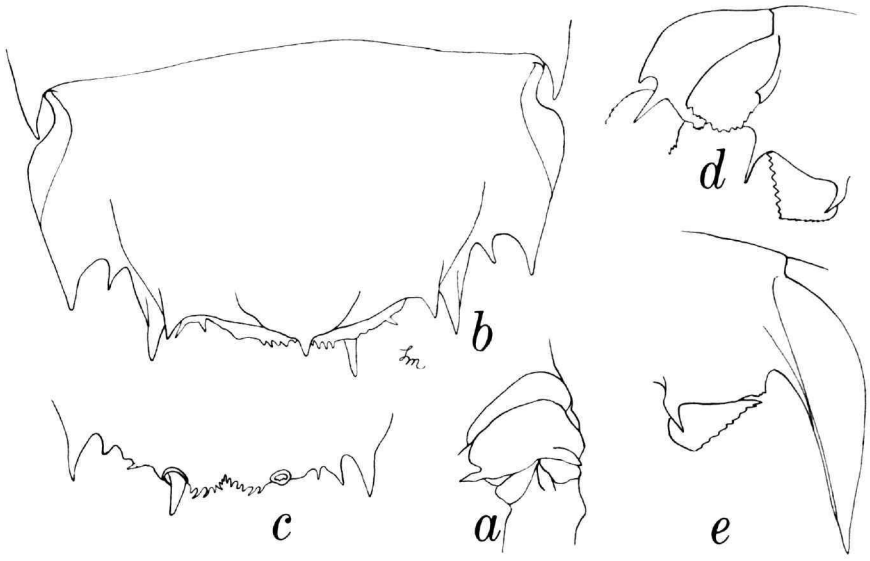

FIGURE 4.—*Heterosquilla tricarinata* (Claus, 1871), female lectotype, TL 68 mm, Andaman Islands: *a*, base of third walking leg, oblique ventral view; *b*, telson, dorsal view; *c*, posterior margin of telson, ventral view; *d*, basal part of right uropod, ventral view (basal prolongation broken); *e*, basal part of left uropod, ventral view (inner spine of basal prolongation broken).

Keppelius, new genus

DEFINITION.—Size very small, maximum length less than 30 mm. Body smooth, strongly depressed, loosely-articulated. Cornea (Figure 5*a*) subglobular, expanded laterally beyond stalk and set slightly obliquely on it. Rostral plate (Figure 5*a*) subrectangular, anterior margin with three projections. Antennal protopod with at most 1 ventral papilla. Carapace short, narrowed anteriorly, carinae and spines absent, cervical groove scarcely indicated on lateral plates. Exposed thoracic somites lacking carinae; eighth thoracic somite lacking median ventral keel. Mandibular palp absent, 5 epipods present. Claw (Figure 5*b*) stout, dactylus with 7 or more teeth, outer margin with basal notch; propodus stout, fully pectinate, with 4 movable spines proximally; dorsal ridge of carpus undivided, terminating in acute lobe; merus slender, unarmed; ischiomeral articulation terminal; ischium three-fourths length of merus, unarmed. Endopods of pereopods two-segmented, distal segment subcircular on anterior 2 legs, more ovate on third. Abdomen without longitudinal carinae or spines, articulated anterolateral plates small; sixth abdominal somite (Figure 5*c*) smooth dorsally, with posterolateral spines and curved, ventrally-directed process anterior to each uropod. Telson (Figure 5*c*,*d*) broader than long, posterior part of surface covered with posteriorly-directed spines, marginal armature, obscured by dorsal spines, including long, movable submedian teeth and other fixed teeth and denticles. Basal segment of uropod (Figure 5*c*) with sharp inner and outer edges, inner terminating in distal, dorsal spine; proximal segment of uropodal exopod (Figure 5*c*) with spatulate spines on outer margin, rounded lobe with stiff setae on inner, distal margin; endopod (Figure 5*c*) oval, with strong proximal fold on outer margin; inner spine of basal prolongation of uropod the longer (Figure 5*e*).

TYPE-SPECIES.—*Lysiosquilla hystricotelson* Barnard, 1958.

ETYMOLOGY.—It is a pleasure to name this genus for the late Keppel H. Barnard, South African Museum, Capetown. It is based on the only stomatopod described by him. The gender is masculine.

REMARKS.—*Keppelius* shares numerous features with *Acanthosquilla* Manning, 1963, *Nannosquilla*

Manning, 1963, and *Pullosquilla*, new genus. It differs from *Acanthosquilla* in the configuration of the dorsal spines on the telson. In *Acanthosquilla* these spines are arranged in a transverse row across the telson surface, whereas in *Keppelius* there are many more spines covering a vertical shelf just above the posterior margin of the telson. *Keppelius* lacks distinguishable primary marginal teeth (intermediate, lateral, and marginal) on the telson, for all of the fixed marginal teeth and denticles are subequal in size. Finally, in *Keppelius* the movable outer spines on the uropodal exopod are spatulate rather than slender. *Keppelius* differs from *Pullosquilla* in lacking an ischial spine on the claw and in having a rectangular rather than a triangular rostral plate. *Keppelius* agrees with *Nannosquilla* in basic facies, but lacks an ornamental eave above the marginal armature of the telson and also differs in having five rather than four epipods, a dorsal spine on the antennal protopod, and one antennal papilla.

Keppelius contains only the type-species; it is redescribed below.

Keppelius hystricotelson (Barnard, 1958)

FIGURE 5

Lysiosquilla hystricotelson Barnard, 1958:20, fig. 7.—Manning, 1963:319 [listed; transferred to *Nannosquilla*].

Nannosquilla hystricotelson.—Holthuis, 1967a:25 [synonymy]; 1967b:25, 40 [listed].—Tirmizi and Manning, 1968:5 [listed].—Manning and Serène, 1968:116 [listed].—Manning, 1969b:3 [list; key].—Makarov, 1971:154 [listed].—Thomassin, 1974: 303.

MATERIAL.—Mombasa, Kenya; on reef exposed at S entrance to harbor; poisoned; A. J. Bruce, leg; *Anton Bruun* Cr. 9; 15 Nov 1964: 1 ♀, TL 23 mm (USNM 168779). Tulear, Madagascar; B. Thomassin, leg., sta 469: 1 ♂, CL 3.8 mm (MNHNP). Near Songoritelo Reef, Madagascar; B. Thomassin, leg., sta 444; 19 Oct 1962: 1 ♂, TL 19 mm; 1 ♀, TL 20 mm (USNM 139073). Nosy Bé, Madagascar; E beach; infralittoral, in grass; B. Thomassin, leg., sta 851; 13 Jul 1972: 1 ♂, TL 20.5 mm; 1 ♀ TL 23 mm (USNM 156175); and 1 ♂, TL 18 mm; 1 ♀ TL 24 mm (SME). Nosy Bé, Madagascar; W beach; in grass; B. Thomassin, leg., sta 880; 14 Jul 1972: 1 ♀, 1 carapace (MNHNP).

DIAGNOSIS.—Ocular scales fused into bilobed plate. Antennal protopod with sharp antero-internal spine (Figure 5*a*). Antennular peduncle less than half as long as carapace. Antennal scale (Figure 5*a*) about ¼ as long as carapace. Dactylus of claw (Figure 5*b*) with 7–10 (usually 8) teeth, proximal notch on outer margin flanked by sharp proximal and obtuse distal prominences. Basal segments of pereopods unarmed. Sixth abdominal somite (Figure 5*d*) with 2 large, posteriorly directed spines on ventral surface; marginal armature of telson (Figure 5*c,d*), on each side of midline, consisting of: 5–9 (usually 6–7) submedian denticles (arranged in inverted, V-shaped row), 1 movable submedian tooth, and 7 fixed lateral teeth and denticles. Proximal segment of uropodal exopod (Figure 5*c,e*) with 3–4 blunt, movable spines on outer margin, distal 2 spatulate, and 1 stiff, spinelike seta on inner, distal angle.

COLOR.—Faded in most specimens examined, but some with traces of light anterior and darker posterior bands on carapace and with small chromatophores scattered over remainder of body in no particular pattern.

MEASUREMENTS.—Males, TL 18–20.5 mm; females, TL 20–24 mm. Barnard's type, a male, was 25 mm long. Other measurements of a female, TL 23 mm: carapace length 4.0; cornea width 0.7; rostral plate length 1.5, width 1.6; antennal scale length, 0.9; fifth abdominal somite width 4.0; telson length 2.2, width 3.4.

REMARKS.—This species, with its broad rostral plate, produced anteriorly into three sharp projections, and characteristically ornamented telson, can readily be distinguished from all other lysiosquillids. It may be confused with species of *Acanthosquilla* that have more than 5 spines on the dorsal surface of the telson, but in them the telson bears fewer dorsal spines as well as a different configuration of marginal teeth. The ventral antennal papilla is not visible in all specimens.

Thomassin (1974) found this species in sea grass beds of the fringing reef flat at Songoritelo, Madagascar. Like the species of *Pullosquilla* discussed below, *K. hystricotelson* is a shallow water species living on reef flats in grass beds on sand. The specimen reported by Holthuis (1967b) came from dead coral near Massawa, Ethiopia.

DISTRIBUTION.—Western Indian Ocean, where it has been recorded from a few localities between the type-locality, Delagoa Bay, Moçambique (Barnard, 1958) and Massawa, Ethiopia (Holthuis, 1967b), including Songoritelo, Madagascar (Thomassin, 1974), and the other localities reported above: Mombasa, Kenya, and Tulear and Nosy Bé, Madagascar.

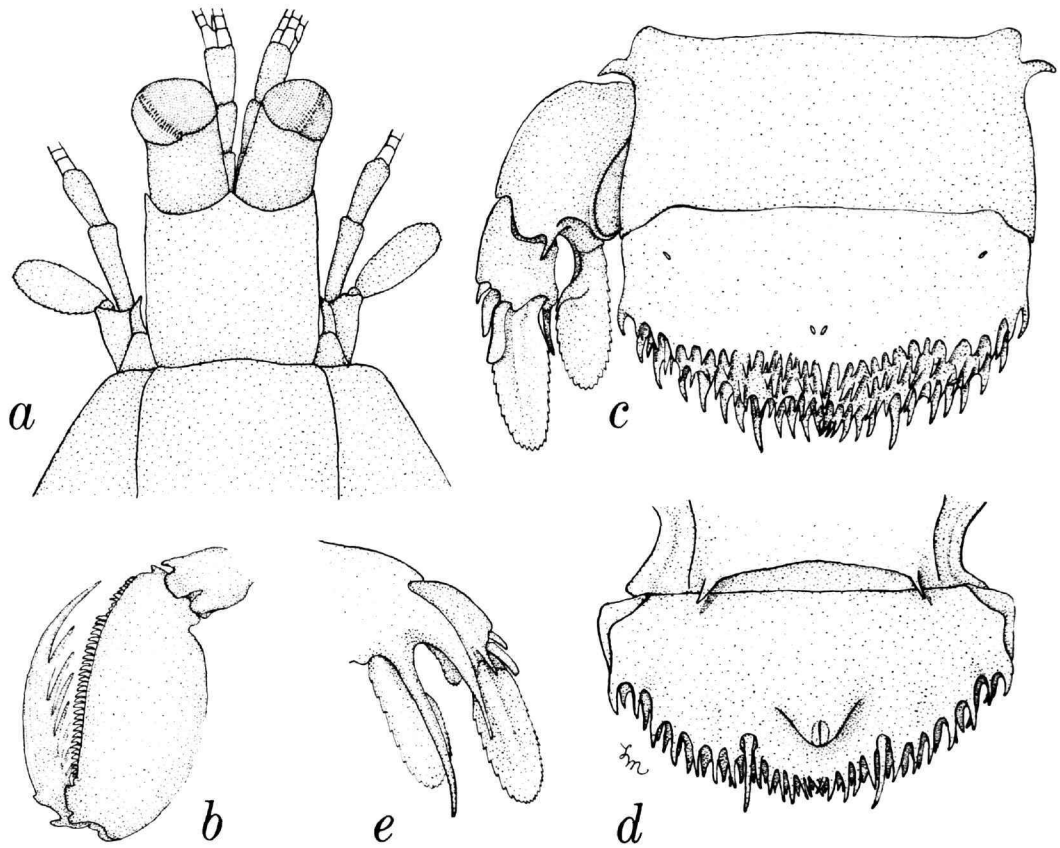

FIGURE 5.—*Keppelius hystricotelson* (Barnard, 1958), female, TL 23 mm, Mombasa: *a*, anterior part of body; *b*, carpus, propodus, and dactylus of claw; *c*, sixth abdominal somite, telson, and uropod, dorsal view; *d*, sixth abdominal somite and telson, ventral view; *e*, uropod, ventral view. (Setae omitted.)

Genus *Neocoronida* Manning, 1976

Neocoronida was established by Manning (1976a) for two species of lysiosquillids that previously had been assigned to *Coronida* Brooks, 1886: *N. trachurus* (von Martens, 1881), from the Palau Islands and Mauritius in the Indo-West-Pacific region, and *N. cocosiana* (Manning, 1972), from Cocos Island in the eastern Pacific. Examination of two syntypes of *N. trachurus* has revealed that they are not conspecific. *Neocoronida trachurus* sensu stricto, from the western Indian Ocean, and *N. martensi*, new species, from the Palau Islands, are described and illustrated below.

Key to Species of *Neocoronida*

1. Dorsal tubercles of telson all sharp, stellate ..... ***N. trachurus*** (von Martens, 1881)
   Dorsal tubercles of telson all rounded dorsally 2
2. Rostral plate pentagonal, with slight apical projection. Ventral surface of telson tuberculate ..... ***N. martensi***, new species
   Rostral plate ovate, rounded anteriorly. Ventral surface of telson smooth ..... ***N. cocosiana*** (Manning, 1972)

Neocoronida martensi, new species

FIGURE 6

Gonodactylus trachurus von Martens, 1881:93 [part].

MATERIAL.—Palau Islands, Caroline Islands, western Pacific; Pütze, leg., holotype [paralectotype of *Neocoronida trachurus* (von Martens, 1881)]: 1 ♀, TL 45 mm (ZMB 6159).

DESCRIPTION.—Size small, only known specimen 45 mm long.

Eye (Figure 6*a*) elongate, triangular, cornea noticeably broader than and set obliquely on stalk. Eye extending about to end of first segment of antennular peduncle. Ocular scales (Figure 6*a*) low, broad, separate. Anterior margin of ophthalmic somite produced into median spinule.

Antennular peduncle about 4/5 as long as carapace. Antennular processes (Figure 6*a*) produced into blunt projections, appearing sharp in dorsal view, visible lateral to rostral plate. Shorter ramus of ventral flagellum with 21 segments in holotype.

Antennal scale (Figure 6*a*) more than half as long as carapace. Proximal segment of antennal peduncle longer than distal segment, extending beyond eye. Protopod with blunt anterointernal projection and 1 ventral papilla.

Rostral plate (Figure 6*a*) pentagonal, broader than long, unarmed. Lateral margins slightly convex, anterolateral angles broadly rounded, concave anterior margins converging on obtusely-pointed apex. Low obscure median carina present.

Dactylus of claw with 4 teeth, outer margin inflated, notched basally. Dorsal ridge of carpus

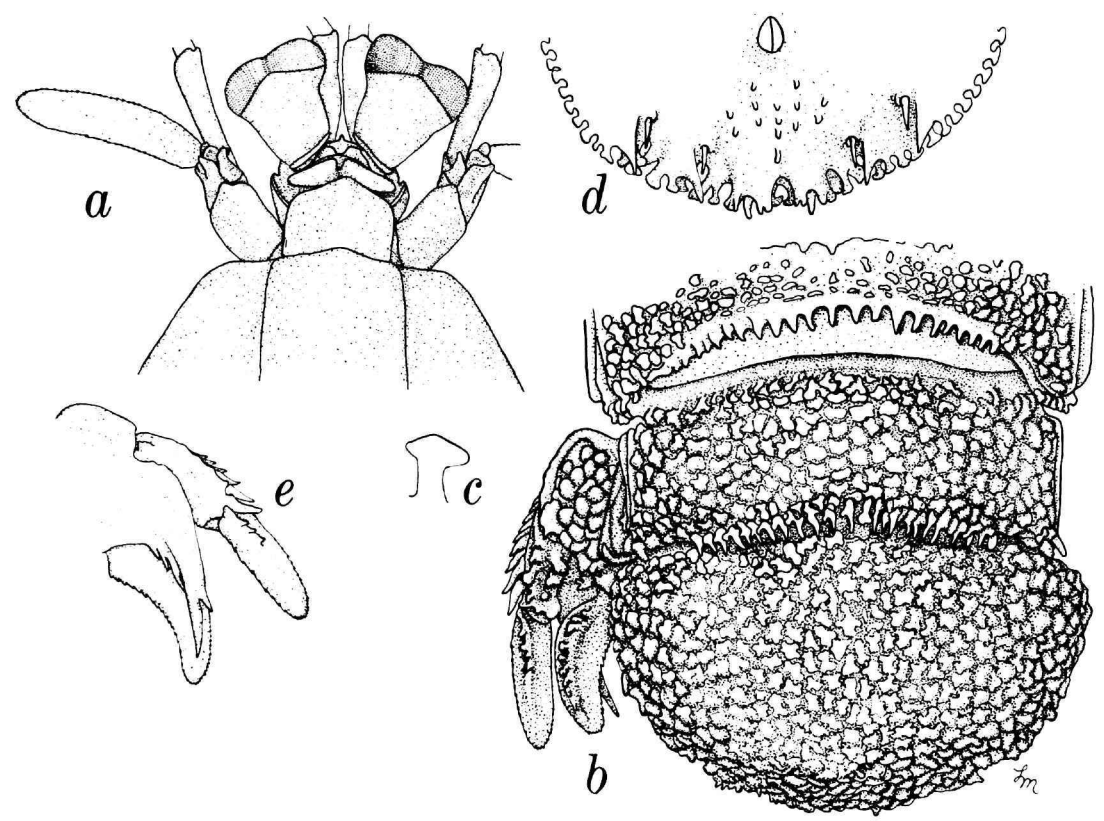

FIGURE 6.—*Neocoronida martensi*, new species, female holotype, TL 45 mm, Palau Islands: *a*, anterior part of body; *b*, posterior part of body; *c*, tubercle of telson, lateral view; *d*, telson, ventral view; *e*, uropod, ventral view. (Setae omitted.)

low, terminating in blunt projection proximal to distal margin.

Mandibular palp present. 5 epipods present.

Lateral process of fifth thoracic somite rounded, compressed anteroposteriorly, appearing acute in dorsal view. Fifth somite also with small ventral spinule on each side. Lateral processes of sixth and seventh thoracic somites broadly rounded. Eighth thoracic somite without noticeable median ventral keel. Endopods of perepods slender, two-segmented.

Anterior 4 abdominal somites smooth dorsally, lacking tubercles or spines. Anterior portion of fifth somite smooth, remainder of surface (Figure 6*b*) with rounded dorsal tubercles, more numerous laterally. Fifth somite with 4 pairs of longitudinal grooves, lateralmost longest, between margin and longitudinal carina above margin; posterior margin lined with subequal tubercles or spinules, posterolateral angles lacking spines. Sixth somite (Figure 6*b*) completely covered with stalked, plate-like tubercles, margins irregular, surface smooth (Figure 6*c*); lateral margin forming broad, carinate ridge, and with blunt posterolateral projection; posterior margin lined with spinules; acute but blunt projections present ventrolaterally anterior to articulation of each uropod.

Telson (Figure 6*b,d*) broader than long, posterior margin strongly convex, dorsal surface completely covered with stalked, plate-like tubercles (Figure 6*c*), margins irregular, surface smooth. Posterior armature of telson as illustrated. Ventral surface of telson (Figure 6*d*) with median patch of tubercles between anal pore and posterior margin.

Uropod (Figure 6*b,e*) broad, flattened, anterior margin of basal segment carinate. Dorsal surface of basal segment ornamented with numerous rounded tubercles, all simple, and with short dorsal carina bearing minute apical spine. Each segment of uropod with dorsal tubercles, tubercles also present on ventral surface of distal segment of exopod. Outer margin of proximal segment of exopod with 9 short, movable spines, posteromesial lobe of proximal segment not markedly projecting, lacking stiff setae. Distal segment of uropodal exopod longer than proximal. Endopod curved mesially, lacking strong proximal fold laterally. Spines of basal prolongation (Figure 6*e*) flattened, inner longer, with 3 slender, fixed spines on inner margin.

COLOR.—Completely faded in holotype.

MEASUREMENTS.—Unique female holotype, TL 45 mm. Other measurements: carapace length 7.4; cornea width 2.4; antennular peduncle length 6.1; antennal scale length 4.1; rostral plate length 1.6, width 2.1; fifth abdominal somite width 9.4; telson length 5.6, width 9.1.

REMARKS.—This species is known only from the holotype, which also is the paralectotype of *Neocoronida trachurus* (von Martens, 1881). *Neocoronida martensi* resembles *N. trachurus* in most respects, differing in that the raised, plate-like tubercles on the sixth abdominal somite and telson are completely smooth dorsally, and the dorsal tubercles of the fifth abdominal somite and uropods are larger, rounder, and smoother. The new species more closely resembles *N. cocosiana* (Manning), from Cocos Island in the Eastern Pacific, especially in the form of the plate-like tubercles, but that species has a rounded rostral plate and the ventral surface of the telson is smooth.

ETYMOLOGY.—The species is named for the German carcinologist E. von Martens, who discovered *N. trachurus* and considered the specimen herein designated as the holotype of *N. martensi* as one of its members.

DISTRIBUTION.—Known only from the type-locality, the Palau Islands. The depth range and habitat have not been recorded.

Neocoronida trachurus (von Martens, 1881)

FIGURE 7

Gonodactylus trachurus von Martens, 1881:93 [part].
Coronida trachurus.—Holthuis, 1967a:8 [references to 1967]; 1967b:40 [Red Sea references].—Makarov, 1971:153 [listed].
Coronida trachura.—Manning and Serène, 1968:115 [listed].—Tirmizi and Manning, 1968:4 [listed].

MATERIAL.—Red Sea; Jousseaume, leg.; 1898: 1 ♂, TL 33 mm (MNHNP). Between Grande Pass and Johny Channel, Aldabra Island; 42 m; 23 May 1953: 1 ♂, TL 36 mm (USNM 169780); 1 ♀, TL 36 mm (MNHNP). Mauritius; G. Schneider, leg.; lectotype: 1 ♂, TL 47 mm (ZMB 6365). Mauritius; no other data: 2 ♂ (1 broken), TL 32 mm (MNHNP). Mauritius; no other data: 4 specimens, not measured (ZSI 4271/4).

DESCRIPTION.—Size small to moderate, total length less than 50 mm. Eye (Figure 7*a*) elongate, triangular, cornea bilobed, noticeably broader than and set obliquely on stalk. Eyes extending about to end of first segment of antennular peduncle. Ocular scales low, broad, separate. Anterior margin of

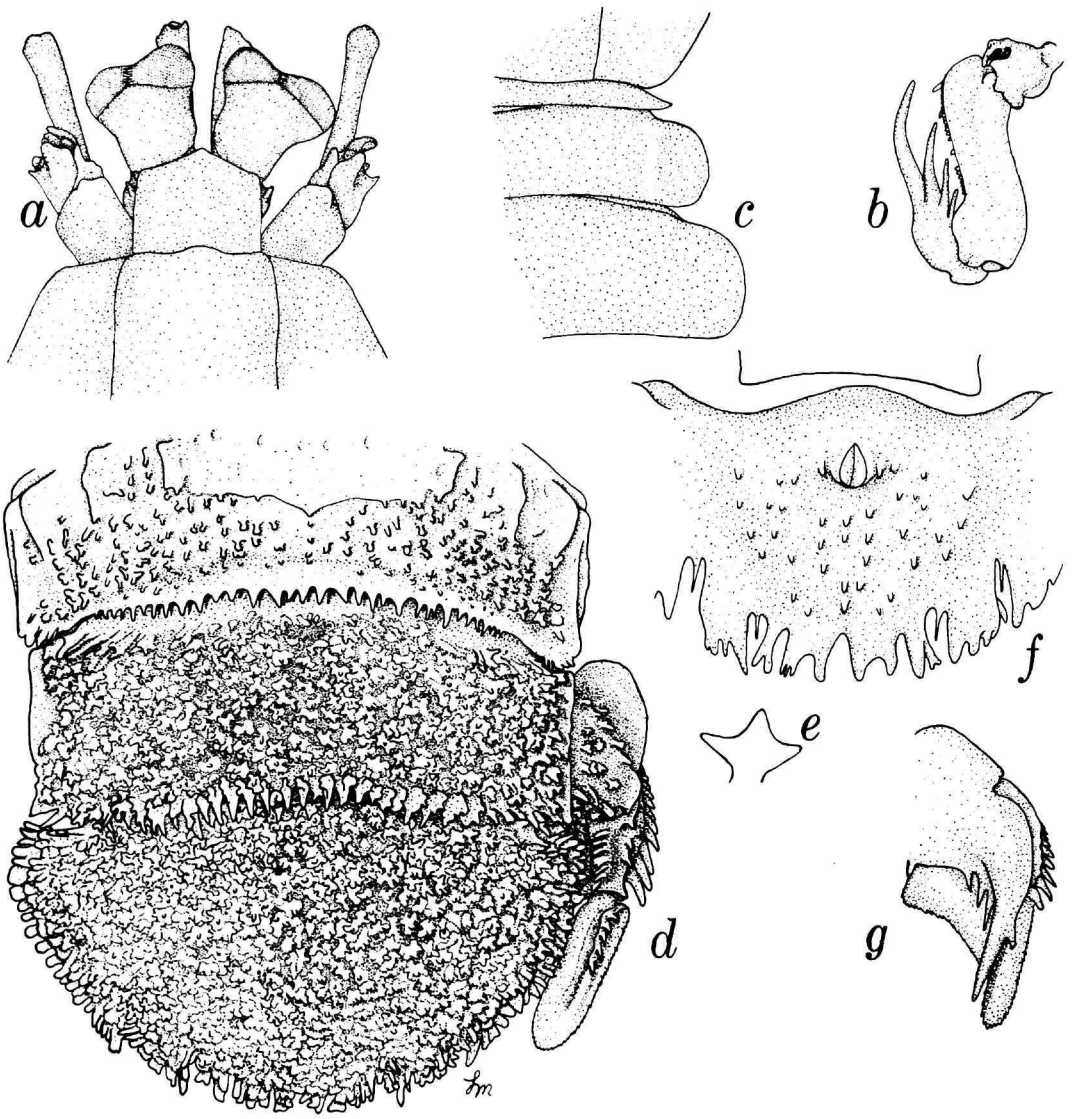

FIGURE 7.—*Neocoronida trachurus* (von Martens, 1881), male lectotype, TL 47 mm, Mauritius; *a*, anterior part of body; *b*, carpus, propodus, and dactylus of claw; *c*, lateral processes of fifth, sixth, and seventh thoracic somites; *d*, posterior part of body; *e*, tubercle of telson, lateral view; *f*, telson, ventral view; *g*, uropod, ventral view. (Setae omitted.)

ophthalmic somite produced into median spinule or tubercle.

Antennular peduncle about 2/3 as long as carapace. Antennular processes (Figure 7*a*) produced into blunt projections, appearing sharp in dorsal view, visible lateral to rostral plate. Shorter ramus of antennular flagellum with 16–19 segments.

Antennal scale about half as long as carapace. Proximal segment of antennal peduncle longer than distal, extending beyond eye. Antennal protopod with blunt antero-internal projection and 1 ventral papilla.

Rostral plate (Figure 7*a*) pentagonal, broader than long, unarmed. Lateral margins straight or

slightly concave, anterolateral angles broadly rounded, concave anterior margins converging on obtusely-pointed apex. Low median carina present or absent.

Dactylus of claw (Figure 7*b*) with 4 teeth, outer margin inflated, notched basally. Dorsal ridge of carpus low, terminating in blunt projection proximal to distal margin.

Mandibular palp present. 5 epipods present.

Lateral process of fifth thoracic somite (Figure 7*c*) rounded, compressed anteroposteriorly, appearing acute in dorsal view, Fifth somite also with small ventral spinule or rounded tubercle on each side. Lateral processes of sixth and seventh somites (Figure 7*c*) broadly rounded, that of sixth somite with rounded tubercles mesial to lateral margin. Eighth somite with low, rounded median prominence ventrally, lacking distinct ventral keel. Endopods of pereopods slender, two segmented.

Anterior 4 abdominal somites smooth dorsally, lacking tubercles or spines. Anteromedian portion of fifth somite (Figure 7*d*) smooth, remainder of surface completely covered with variously-shaped tubercles; several short, longitudinal carinae present above lateral margin, largest fusing posteriorly into marginal carina; posterior margin (Figure 7*d*) lined with sharp tubercles or spinules, increasing in size mesially. Sixth somite (Figure 7*d*) completely covered with stalked, stellate, or spinous tubercles (Figure 7*e*); lateral margin forming irregular carina terminating in blunt posterolateral projection; posterior margin (Figure 7*d*) lined with sharp tubercles and spinules; blunt projections present ventrolaterally anterior to articulation of each uropod.

Telson (Figure 7*d,f*) broader than long, posterior margin strongly convex, dorsal surface completely covered with stalked, stellate tubercles (Figure 7*e*). Posterior armature of telson as illustrated (Figure 7*d,f*). Ventral surface of telson (Figure 7*f*) with median patch of tubercles between anal pore and posterior margin.

Uropod (Figure 7*d,g*) broad, flattened, anterior margin of basal segment carinate, dorsal surface covered with simple and stellate tubercles and with short dorsal carina terminating in blunt spine. Each segment of uropod with dorsal tubercles, tubercles also present on ventral surface of distal segment of exopod. Outer margin of proximal segment of exopod (Figure 7*d*) with 8–10 short, movable spines, posteromesial lobe of proximal segment not markedly projecting, stiff setae not discernible. Distal segment of uropodal exopod (Figure 7*d*) longer than proximal. Endopod (Figure 7*g*) curved mesially, lacking strong proximal fold laterally. Spines of basal prolongation (Figure 7*g*) flattened, inner longer, with 1–4 slender, fixed spines on inner margin.

COLOR.—Faded in most specimens, but in those from Aldabra body completely covered with numerous small dark chromatophores; pigment concentrated on posterolateral angles of carapace, median area of the sixth thoracic somite, and anterolateral plates of abdomen. Each somite with faint median and 2 lateral dark patches, body appearing striped in dorsal view.

MEASUREMENTS.—Males, TL 32–47 mm; only female measured, TL 36 mm. Other measurements of male lectotype, TL 47 mm: carapace length 9.0; cornea width 2.5; antennular peduncle length ca. 6.6; rostral plate length 2.0, width 2.5; fifth abdominal somite width 10.7; telson length 6.5, width 10.6.

REMARKS.—*Neocoronida trachurus,* which apparently is restricted to localities in the western Indian Ocean, is readily distinguishable from the other two species of the genus by the presence of sharply stellate stalked tubercles on the sixth abdominal somite and telson; the other two species both have stalked tubercles which are rounded dorsally.

Although von Martens (1881:93) mentioned two specimens from Mauritius, only one, a female 47 mm long, could be located. It is herein selected as the lectotype of *Gonodactylus trachurus.* The paralectotype of *G. trachurus* is also the holotype of *Neocoronida martensi,* described above.

DISTRIBUTION.—Western Indian Ocean, where it has been recorded from the Red Sea, Aldabra Island, and Mauritius. Its depth range and habitat have not been recorded.

Genus *Parvisquilla* Manning, 1973

Parvisquilla Manning, 1973:209.

DEFINITION.—Size very small, maximum length less than 20 mm. Body smooth, compact, depressed. Eye (Figure 8*a*) elongate, cornea faintly bilobed. Rostral plate (Figure 8*a*) very short, broadly rounded anteriorly. Antennular somite (Figure 8*a*) elongate, not overreached by rostral plate. Antennal

protopod lacking discernible papillae. Carapace strongly narrowed anteriorly, carinae and spines absent, cervical groove not discernible, gastric grooves very fine, poorly-marked. Exposed thoracic somites (Figure 8*d*) lacking longitudinal carinae; eighth thoracic somite lacking median ventral keel. Mandibular palp absent, 2 epipods present. Propodi of third and fourth (Figure 8*b*) thoracic appendages broader than long, lacking distinct ventral beading or ribbing. Claw (Figure 8*c*) stout, dactylus with 4–5 teeth, outer margin of dactylus inflated basally, with 3 proximal projections; propodus stout, proximal margin incompletely pectinate, with 3 movable spines proximally; dorsal ridge of carpus undivided, terminating in sharp spine; merus stout, unarmed; ischium much shorter than merus, unarmed. Endopods of pereopods 1–segmented, slender. Abdomen depressed but compact, smooth; articulated anterolateral plates absent; sixth abdominal somite (Figure 8*e*) ornamented with irregular ridges and tubercles. Telson (Figure 8*e,f*) broader than long, completely covered with raised, rounded tubercles or irregular ridges; marginal armature of telson including submedian teeth with movable apices and other fixed teeth and denticles. Uropod (Figure 8*e,g*) stout, proximal segment with prominent outer ridge; outer margin of proximal segment of exopod completely lined with blunt spines, inner margin setose; endopod lacking prominent fold proximally on outer margin; basal prolongation (Figure 8*g*) flattened, produced into 2 short blunt spines, inner longer.

TYPE-SPECIES.—*Squilla multituberculata* Borradaile, 1898.

REMARKS.—This genus was established by me for two species previously assigned to *Coronida,* and, through an error in interpretation on my part, was transferred from the family Lysiosquillidae to the family Squillidae. The propodus of the third and fourth maxillipeds, in situ, appeared to be squillid in shape, slender and lacking the beading or ribbing characteristic of lysiosquillids. Subsequently I dissected one of the maxillipeds of *P. multituberculata* to prepare the illustration presented here (Figure 8*b*) to find that it was typically lysiosquillid in shape but lacked the ventral ribbing typical of members of the Lysiosquillidae. Further, a better light source revealed that the gastric grooves, although very faint, are indeed present. Borradaile (1898, pl. 6: fig. 7), Edmondson (1921, fig. 2) and Liu (1975, pl. 1: fig. 1) all omitted the gastric grooves in their figures.

Parvisquilla, which appears to be related to *Coronida* and *Neocoronida,* must be referred to the Family Lysiosquillidae. It agrees with these genera in having a stout claw with a basally-inflated dactylus. Its distinctive features include the greatly elongated antennular somite, the very short rostral plate, the exterior projections on the dactylus of the claw, and the suppressed mandibular palp.

Two species are assigned to *Parvisquilla,* and one of these, *P. multituberculata,* is redescribed below. The other species, *P. sinuosa* (Edmondson, 1921), is known only from Hawaii.

Key to Species of *Parvisquilla*

Telson covered with irregular pattern of linear, curved, and scroll-like carinae ..... ***P. sinuosa*** (Edmondson, 1921)

Telson covered with erect, rounded tubercles ..... ***P. multituberculata*** (Borradaile, 1898)

Parvisquilla multituberculata (Borradaile, 1898)

FIGURE 8

Squilla multituberculata Borradaile, 1898:38, pl. 6: fig. 7; 1899:403.—Manning, 1963:322 [listed]; 1973:299 [listed].

Coronida multituberculata.—Kemp, 1913:132.—Gravier, 1927: 36 [discussion].—Holthuis, 1967a:8 [synonymy].—Manning and Serène, 1968:115 [listed].

Squilla tuberculata.—Gravier, 1927:36 [error for *S. multituberculata*].

Parvisquilla multituberculata.—Manning, 1973:299 [discussion].

Parvisquilla xishaensis Liu, 1975:183, 196, pl. 1: figs. 1–6.

MATERIAL.—Eva Island, Tonga Islands; 21°22'S, 174°56'W; *Albatross,* leg.; 1899–1900: 1 ♀, TL 13 mm (USNM 125330). Apia, Samoa; no other data: 2 ♀, TL 11–12 mm (ZSM). Moorea, Society Islands; reef flat; M. Clausade, leg., sta MO–73–15; 1973: 1 ♀, TL 13 mm (SME).

DESCRIPTION.—Size very small, TL of adults 13 mm or less. Body strongly depressed, surface smooth.

Eye (Figure 8*a*) small, cornea bilobed, set obliquely on and not markedly broader than stalk.

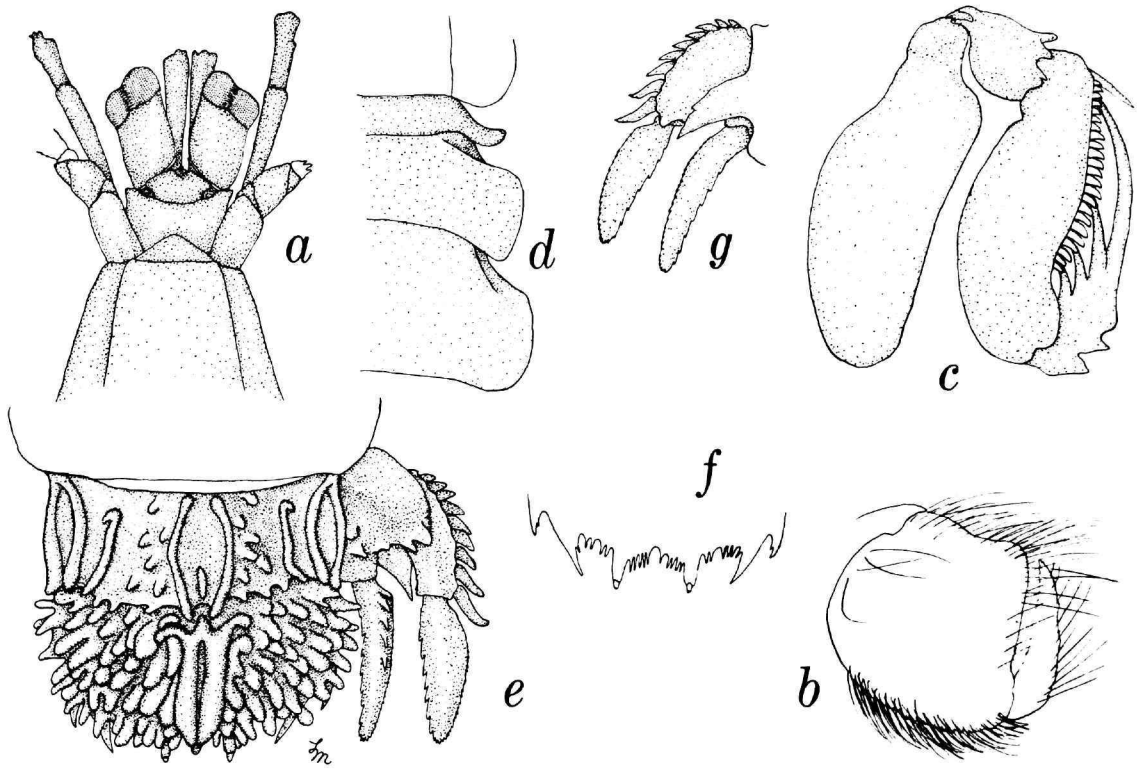

FIGURE 8.—*Parvisquilla multituberculata* (Borradaile, 1898), female, TL 13 mm, Tonga Islands: *a*, anterior part of body; *b*, propodus and dactylus of fourth maxilliped; *c*, claw; *d*, lateral processes of fifth, sixth, and seventh thoracic somites; *e*, sixth abdominal somite, telson, and uropod; *f*, margin of telson, ventral view; *g*, uropod, ventral view. (Setae omitted, except *b*.)

Eyes extending almost to end of first segment of antennular peduncle. Ocular scales (Figure 8*a*) broad, truncate, separate mesially. Anterior margin of ophthalmic somite produced into median spinule.

Antennular peduncle as long as carapace. Antennular processes produced into broad, blunt lobes directed almost anteriorly. Antennular somite (Figure 8*a*) elongate, much longer than rostral plate.

Antennal protopod elongate, extending beyond antennular processes. Antennal scale very short, ovate. Proximal segment of antennal peduncle longer than distal.

Rostral plate (Figure 8*a*) triangular, about twice as wide as long, very short, not extending to level of articulation of antennal peduncle, lacking carinae or spines.

Carapace very small, strongly narrowed anteriorly, lacking carinae and spines. Gastric grooves present, scarcely visible at magnifications of less than × 50. Anterior margins almost straight, anterolateral angles bluntly rectangular, not projecting anteriorly. Carapace not concealing chelae, epipods, or fifth thoracic somite.

Claw (Figure 8*c*) stout, large, almost all of ischium and merus visible in dorsal view. Dactylus sinuous, inflated basally, armed with 4 teeth; outer margin with 3 angular projections proximally, proximal largest, distalmost more obtuse than basal 2. Propodus deep, proximal ¾ pectinate. Dorsal ridge of carpus terminating in sharp tooth.

Mandibular palp absent. 2 epipods present.

Exposed thoracic somites (Figure 8*d*) lacking dorsal carinae or spines. Lateral process of fifth somite forming a rounded lobe, oblique to body line, compressed antero-posteriorly; blunt ventral

spine also present on each side. Lateral processes of sixth to eighth somites broad, truncate, flattened or rounded laterally. Pereopods stout, short, endopods composed of 1 segment.

Abdomen smooth, broad, depressed, loosely-articulated, anterior 5 somites lacking spines or longitudinal carinae. Anterolateral plates of abdomen absent. Fifth somite with irregular depression laterally. Sixth somite (Figure 8*e*) highly sculptured dorsally, with 4 pairs of longitudinal carinae, submedians armed, intermediates curving laterally, each terminating in blunt lobe, laterals converging with and fusing with marginals; median tubercle and 6 rounded tubercles present lateral to submedian carina. Posterolateral angles with rounded projection. Submedian area of posterior margin lined with rounded tubercles.

Telson (Figure 8*e,f*) about 2 times broader than long, with broad, inflated, longitudinally-sulcate median boss, remainder of dorsal surface covered with large, erect, rounded tubercles. 3 pairs of sharp marginal teeth present, submedians with movable apices. Denticles slender, sharp, small, 3–5, 4–7, 1. Ventral surface smooth.

Uropod (Figure 8*e,g*) broad, basal segment with line of rounded tubercles extending to broad, rounded distal lobe. Anterolateral margin strongly convex, produced into broad, compressed, laterally carinate lobe overhanging articulation of exopod. Proximal segment of exopod shorter than distal, outer margin completely lined with 9–10 blunt spines, increasing in size distally, distal 3 slightly recurved; dorsal surface with sharp tubercles. Distal segment elongate-triangular, margin completely lined with setae. Endopod curved mesially, margin completely lined with setae, with line of 4 sharp tubercles dorsally. Basal prolongation very short, scarcely overreaching proximal segment of exopod, produced into 2 blunt spines, inner longer.

MEASUREMENTS.—Only females examined, TL 11–13 mm. Borradaile (1898) reported a male and 2 females, 12–13 mm long. The female recorded by Liu (1975) was 13.6 mm long. Other measurements of female, TL 13 mm: carapace length 2.0; cornea width 0.4; antennular peduncle length 2.0; rostral plate length 0.2, width 0.4; fifth abdominal somite width 2.2; telson length 1.0, width 2.0.

REMARKS.—*Parvisquilla multituberculata* differs from the other member of the genus, *P. sinuosa*, from Hawaii, primarily in having the telson ornamented with rounded tubercles rather than irregular carinae arranged in a scroll-like pattern.

The few specimens of this species examined are all quite uniform, varying only in the numbers of marginal denticles on the telson.

I can find no differences between the material of *P. multituberculata* reported herein and the species recently described from the Xisha Islands, *P. xishaensis* Liu, 1975. Liu's species must be considered a synonym of *P. multituberculata* (Borradaile).

DISTRIBUTION.—Pacific Ocean, from Sandal Bay, Lifu, Loyalty Islands (Borradaile, 1898; Kemp, 1913), Shi Island, Xisha Islands, Guangdong [Kwangtung] Province, China (Liu, 1975), and now from the Tonga Islands, Samoa and Moorea, Society Islands. Liu's specimen was taken on a coral reef. The depth range for the species has not been recorded.

Pullosquilla, new genus

DEFINITION.—Size very small, TL less than 30 mm. Body smooth, depressed, loosely-articulated. Cornea (Figure 9*a*) subglobular. Rostral plate (Figure 9*a*) triangular, unarmed anteriorly. Antennal protopod with ventral papilla. Carapace strongly narrowed anteriorly, carinae and spines absent, position of cervical groove indicated on lateral plates only. Exposed thoracic somites lacking longitudinal carinae; eighth thoracic somite lacking median ventral keel. Mandibular palp absent, 4 or 5 epipods present. Propodi of third and fourth thoracic appendages broader than long, beaded or ribbed ventrally. Claw (Figure 9*b*) stout, dactylus with 10 or more teeth; propodus broad, superior margin completely pectinate, with 4 movable spines proximally; dorsal ridge of carpus undivided, terminating in spine; ischiomeral articulation terminal, ischium almost as long as merus, with strong inferodistal spine on outer face. Endopods of pereopods two-segmented, distal segment ovate or subcircular on anterior 2 legs, slenderer on third. Abdomen depressed, smooth, loosely-articulated, anterolateral plates present; sixth somite unarmed dorsally; articulated anterolateral plates present; sixth somite unarmed posterolaterally, with curved, ventrally-directed process anterior to articulation of each uropod. Telson (Figure 9*c, d*) broader than long, smooth dorsally, dorsal surface produced into

false eave overhanging marginal armature, obscuring most or all of marginal armature in dorsal view; marginal armature including row of submedian denticles, 1 movable submedian tooth, and 7 or more (?) fixed lateral teeth and denticles. Uropod (Figure 9*c, e*) flattened, proximal segment with distal, dorsal spine; proximal segment of uropodal exopod shorter than distal, with slender, movable spines on outer margin and stiff setae on inner, distal margin; endopod with strong proximal fold on outer margin; spines of basal prolongation flattened, triangular in cross-section, inner longer.

TYPE-SPECIES.—*Austrosquilla litoralis* Michel and and Manning, 1971.

ETYMOLOGY.—The name is derived from the Latin *pullus,* "young animal," in combination with the name *Squilla,* alluding to the immature appearance of the species in the genus. The gender is feminine.

REMARKS.—*Pullosquilla* includes three species, one of which is described as new below; all three species occur only in the Indo-West-Pacific region. A key to the species is provided below, and additional records are given for *P. litoralis.*

Pullosquilla shares the armed ischium of the claw with *Austrosquilla* Manning, 1966, and, because of this feature, two of the species now assigned to *Pullosquilla* had previously been placed in *Austrosquilla.* It seems likely that this feature developed independently in these genera, for in most other features *Pullosquilla* more closely resembles the American genus *Nannosquilla* Manning, 1963. These two genera share the small size as adults, the loosely-articulated body, and having the telson being produced into a false eave which obscures the marginal armature. *Pullosquilla* differs from *Nannosquilla* in having a triangular rather than a rectangular rostral plate, a papilla on the antennal protopod, and a spine on the ischium of the claw. The ischium and merus of the claw are much more elongate in *Pullosquilla* than in *Nannosquilla.*

Key to Species of *Pullosquilla*

1. Sixth adbominal somite with 2 large ventral spines. Ventral surface of telson almost completely covered with spinules (Dactylus of claw with 12–15 teeth. 5 epipods present. Proximal segment of uropodal exopod with 3 outer spines and 2–4 inner stiff setae) ..... ***Pullosquilla thomassini,*** new species

   Sixth abdominal somite unarmed ventrally. Ventral surface of telson unarmed 2

2. Dactylus of claw with 10–13 teeth. 5 epipods present. Proximal segment of uropodal exopod with 3 outer spines and 2–5 inner stiff setae ..... ***Pullosquilla litoralis*** (Michel and Manning, 1971)

   Dactylus of claw with 16–21 teeth. 4 epipods present. Proximal segment of uropodal exopod with 4 outer spines and 3 inner stiff setae ..... ***Pullosquilla malayensis*** (Manning, 1968c)

Pullosquilla litoralis (Michel and Manning, 1971)

Austrosquilla litoralis Michel and Manning, 1971:237, fig. 1.
Austrosquilla littoralis.—Thomassin, 1974:300, 301, 307.

MATERIAL.—Tiahura reef complex, Moorea, Society Islands; B. Thomassin, leg., sta TIA-3; 1973: 1 ♂, TL 13 mm; 2 ♀, TL 8.5–15 mm (SME). Data same; sta. TIA-19: 1 ♂, TL 9 mm; 1 ♀, CL 2.5 mm (MNHNP). Data same; sta TIA-22: 1 ♀, TL 19 mm (MNHNP). Data same; sta TIA-23: 2 ♂, TL 10–11 mm; 3 ♀, TL 11–13 mm (USNM 169781). Aldabra Island; J. Gamble: 1 ♂, TL 15 mm; 2 ♀, TL 15–17 mm (BMNH). Reef, Songoritelo, Madagascar; micro-atoll flat; B. Thomassin, leg., sta 264; 26 Oct 1969: 1 ♀, TL 10.5 mm (SME). Grand Recif, Tulear, Madagascar; B. Thomassin, leg.; 1965: 1 ♂, TL 13 mm; 3 ♀, TL 13.5–15 mm; 2 juveniles, TL 9.5 mm (1 Cl 1.8 mm) (in 6 lots; USNM 136294–136299) (2 ♂, 2 ♀ SME).

REMARKS.—This species, originally described from a single female taken on a sand beach in the Marquesas Islands, is included here to document its occurrence off Madagascar and Aldabra Island in the western Indian Ocean, to demonstrate its abundance there and at Moorea, and to record its co-occurrence with another species of the genus, described below, at the same station on the Tiahura reef complex, Moorea. Both species occur on that reef as well as in similar habitats on the Grand Recif, Tulear, Madagascar.

The specimens reported here generally agree well with the original description. There may be 10–13 teeth on the dactylus of the claw. The proximal segment of the uropodal exopod has three movable

spines laterally and two to five, usually three, stiff setae on the inner distal angle. Some of the smaller specimens, such as the female, TL 8.5 mm, from Tiahura, probably are postlarvae, for the eave on the telson is not yet formed and the submedian denticles of the telson are marginal and visible in dorsal view. At 10–11 mm the eave is poorly formed but visible, and it attains the adult configuration at a length of 13 mm.

This species apparently prefers sandy habitats in relatively shallow water, on sand beaches or reef flats. Thomassin (1974), the first to record its occurrence at Tulear, found it in coarse and medium sands of the holes, couloirs, and patches of the inner reef flat; he noted (p. 301) that they "reach their greatest abundance in the inner part of the moat, 250 m behind the boulder tract, generally in scattered coral-growth flats." He also found the species in the sandy bottom of a sea grass bed channel opening into the lagoon at Tulear.

DISTRIBUTION.—Nuka Hiva, Marquesas Islands; Tiahura, Moorea, Society Islands; Songoritelo and Tulear, Madagascar; and Aldabra Island. It occurs in shallow water on sandy bottoms.

Pullosquilla thomassini, new species

FIGURE 9

MATERIAL.—Tiahura reef complex, Moorea, Society Islands; B. Thomassin, leg., sta TIA-3; 1973; paratypes: 1 ♂, TL 10 mm (USNM 156276); 1 ♀, TL 13 mm (SME). Tulear, Madagascar; sand flats; IIOE: no other data; paratype: 1 ♀, TL 17 mm (USNM 156254). Grand Recif, lagoon enclave, Grande Vasque (N zone), Tulear, Madagascar; 7–8 m; muddy sand; B. Thomassin, leg., sta 773; 6 Jun 1972; paratype: 1 ♂, CL 2.6 mm (MNHNP). Plage de la Batterie, Tulear, Madagascar; quartzy sand; B. Thomassin, leg., sta 822; 22 Jun 1972; paratypes: 1 ♀, TL 18 mm (SME); 1 juvenile, TL 11 mm, 1 abdomen (USNM 156196). Internal creek, internal slope, Grand Recif, Tulear, Madagascar; 7 m; coarse sand; B. Thomassin, leg., sta 839; 7 Jul 1972: 1 ♂, TL 15 mm (holotype; MNHNP); 1 ♀, TL 16 mm (paratype; USNM 156194).

DESCRIPTION.—Cornea (Figure 9*a*) set slightly obliquely on stalk, overhanging stalk laterally. Eyes reaching about to end of antennular peduncle. Ocular scales fused into single, slender erect projection. Antennular peduncle slightly more than 1/3 carapace length. Antennal scale (Figure 9*a*) about 1/4 carapace length; antennal protopod apparently lacking papillae. Rostral plate (Figure 9*a*) triangular, almost cordiform, unarmed, apex depressed. Dactylus of claw (Figure 9*b*) with 12–15 teeth. 5 epipods present. Basal segments of pereopods each with inconspicuous posterior spine. Ventral surface of sixth abdominal somite (Figure 9*d*) with 2 strong spines on posterior margin. Telson (Figure 9*c, d*) broader than long, subrectangular, dorsal surface posteriorly produced into false eave (shape of eave variable, often trilobed, with small, rounded, median lobe), margin of eave with 12–22 small spines, fewer in smaller specimens; eave obscuring much of marginal armature in dorsal view; marginal armature consisting of transverse row of 13–17 submedian denticles, and, lateral to these, 1 movable submedian tooth and 4 curved, fixed lateral teeth, each flanked anteromesially by slender denticle; midventral surface of telson (Figure 9*d*) completely covered by numerous sharp fixed spines and tubercles. Basal segment of uropod (Figure 9*c*) with outer and dorsal carinae, dorsal carina terminating in 2 strong distal spines; proximal segment of uropodal exopod (Figure 9*c, e*) much shorter than distal, with 3 movable, spatulate spines, arranged in almost transverse row on distal margin; inner distal angle of proximal segment of exopod with 2–4 (usually 3) stiff setae; distal segment of exopod and endopod very slender, curved mesially, mesial margins strongly serrate for insertion of setae; inner spine of basal prolongation of uropod longer.

COLOR.—Faded in most specimens, but sometimes marked with numerous dark chromatophores scattered over body. In some specimens dark pigment concentrated laterally, occasionally with darker spots on sixth thoracic, fifth and sixth abdominal somites, and on telson.

MEASUREMENTS.—Males, TL 10–15 mm; females, TL 13–18 mm. Other measurements of female, TL 17 mm: carapace length 3.1; cornea width 0.9; rostral plate length 1.3, width 1.2; antennal scale length 0.8; fifth abdominal somite width 3.2; telson length 1.7, width 3.0.

REMARKS.—This species with its ventrally spined sixth abdominal somite, armed false eaves, and spinulose ventral surface of the telson, can be distinguished easily from the other two species of the genus, *P. malayensis* and *P. litoralis*. Like the latter species, *P. thomassini* occurs both in Oceania and in the western Indian Ocean, and the two species have been taken together.

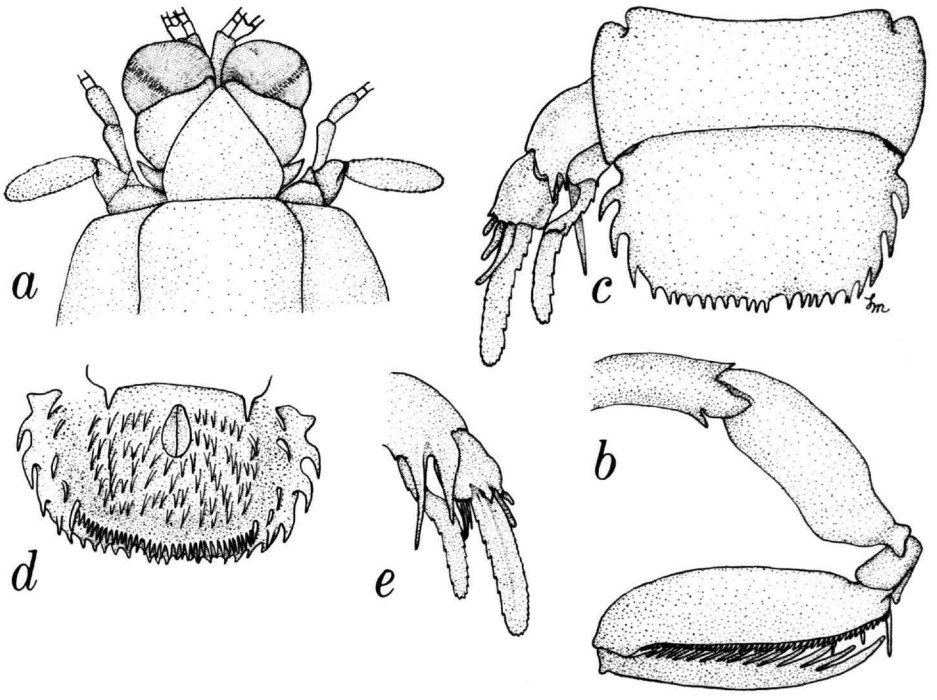

FIGURE 9.—*Pullosquilla thomassini*, new genus, new species, female paratype, TL 17 mm, Tulear: *a*, anterior part of body; *b*, claw; *c*, sixth abdominal somite, telson, and uropod; *d*, telson, ventral view; *e*, uropod, ventral view. (Setae omitted.)

ETYMOLOGY.—This species is named for B. Thomassin, Station Marine d'Endoume, Marseille, who collected most of the material reported above and made it available to me for study.

DISTRIBUTION.—Tiahura, Moorea, Society Islands, and localities around Tulear, Madagascar, on reef flats in grass and sand. Shallow water to a depth of 8 meters.

Family SQUILLIDAE Latreille, 1803

Genus *Alima* Leach, 1817

Alima orientalis, new species

FIGURE 10

MATERIAL.—Takao, Formosa (Taiwan); Jun 1903; holotype: 1 ♀, TL 52 mm (ZSM). Mahe, Seychelles Islands; Mission Zoologique; Jul–Sep 1966; paratype: 1 ♂, TL 33.5 mm (MRAC 52.236).

DESCRIPTION.—Size moderate, TL less than 60 mm. Surface of body rough. Eye (Figure 10*a*,*b*) large, cornea stout, set almost transversely on stalk; corneal indices 381–414. Rostral plate (Figure 10*a*) as long as broad (juvenile) or broader than long (adult), narrowed and with median carina anteriorly, apex broadly rounded. Anterolateral spines of carapace strong, extending to base of rostral plate. Median carina of carapace (Figure 10*a*) lacking distinct anterior bifurcation, intermediate carinae of carapace not extending to anterior margin. Dactylus of claw with 5 teeth, outer margin of dactylus flattened; dorsal ridge of carpus of claw undivided, unarmed. Mandibular palp absent. 4 epipods present. Posterior 3 thoracic and abdominal somites with unarmed submedian and intermediate carinae. Lateral process of fifth thoracic somite (Figure 10*c*) bilobed, sharp, anteriorly-directed anterior lobe set slightly below broadly rounded posterior lobe. Lateral processes of sixth

and seventh thoracic somites (Figure 10*c*) not strongly bilobed, rounded laterally, process of sixth somite with angled projection on anterior margin. Anterior 5 abdominal somites with 8 carinae, sixth somite with 6; abdominal carinae spined as follows: submedian 6, intermediate 5–6, lateral (4) 5–6, marginal (1–3) 4–5. Telson about as broad as long, with low prelateral lobes, denticles 4, 7–9, 1, outer submedians (Figure 10*d*) and outer intermediates larger than remainder; ventral surface of telson with long postanal keel. Uropod with 7–8 movable spines on outer margin of proximal segment of exopod, distalmost not extending to midlength of distal segment; 1 rounded lobe present between spines of basal prolongation of uropod (Figure 10*e*).

COLOR.—Largely faded in both specimens, but posterior 3 thoracic and all abdominal somites with dark posterior line, interrupted at intermediate and lateral carinae on abdominal somites. Telson with pair of large black spots anteriorly.

MEASUREMENTS.—Only male known, TL 33.5 mm; only female known, TL 52 mm. Other measurements of female holotype, TL 52 mm: carapace length 12.0; cornea width 2.9; rostral plate length 1.1, width 1.8; fifth abdominal somite width 11.5; telson length 8.5, width 9.3.

REMARKS.—*Alima orientalis* most closely resembles *A. hieroglyphica* (Kemp, 1911) (see Manning, 1969a:135, fig. 40, for recent account), especially in the broad eyes, carinate rostral plate, shape and armature of the claw, and in having only one lobe between the spines of the basal prolongation of the uropod. The new species differs from *A. hieroglyphica* in having larger eyes, a more prominent anterior projection on the lateral process of the sixth abdominal somite, in lacking spines on the submedian carinae of the fifth abdominal somite, and in having rounded rather than triangular dark patches on the telson.

The smaller paratype differs from the holotype in having larger eyes, a narrower rostral plate, slenderer lateral processes on the sixth and seventh thoracic somites, and more spines on the abdominal carinae. The first three of these differences can be attributed to age. The spines of the abdominal carinae of the holotype appear to have been worn down.

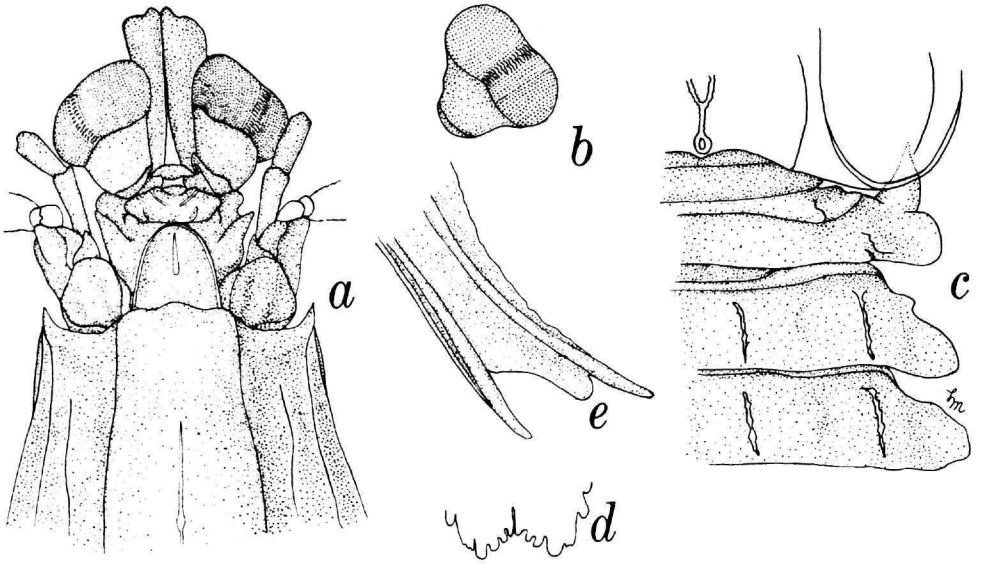

FIGURE 10.—*Alima orientalis*, new species, female holotype, TL 52 mm, Formosa: *a*, anterior part of body; *b*, eye; *c*, lateral processes of fifth, sixth, and seventh thoracic somites; *d*, submedian teeth of telson, ventral view (apices broken); *e*, basal prolongation of uropod, ventral view. (Setae omitted.)

ETYMOLOGY.—The name is from the Latin *orientalis,* "of the east," alluding to the distribution of the species.

DISTRIBUTION.—Indo-West-Pacific region, from Formosa and the Seychelles Islands. The depth range and habitat are unknown.

Busquilla, new genus

DEFINITION.—Eye (Figure 11*a,b*) very large, about one-third carapace length, cornea bilobed, set very obliquely on stalk. Inner margin of eyestalk longer than outer. Carapace with normal complement of carinae, median carina lacking anterior bifurcation (Figure 11*a*). Anterolateral angles of carapace armed. Mandibular palp present. 4 epipods present. Dactylus of claw with 5 teeth. Lateral processes of fifth, sixth, and seventh thoracic somites (Figure 11*c*) bilobed, posterior lobe much larger than anterior on both sixth and seventh somites. Abdomen with 8 carinae on anterior 5 somites, submedians low, indistinct anteriorly. Telson flattened, lacking supplementary dorsal carinae, 3 pairs of marginal teeth present, submedians with fixed apices (Figure 11*f*). Prelateral lobes present. Basal prolongation of uropod (Figure 11*g*) unarmed on inner margin.

TYPE-SPECIES.—*Busquilla plantei,* new species.

ETYMOLOGY.—The name is derived with the Latin prefix *bu-,* meaning "large," in combination with the generic name *Squilla,* alluding to the enormous eyes in representatives of this genus.

REMARKS.—*Busquilla* includes two species, one of which, *B. quadraticauda* (Fukuda, 1911), previously was assigned to *Oratosquilla* Manning, 1968. This new genus is clearly related to *Oratosquilla,* differing in having much larger eyes, in lacking the anterior bifurcation of the median carina of the carapace, and in the structure of the lateral processes of the fifth, sixth, and seventh thoracic somites. These processes in *Busquilla,* although similar to those of *Oratosquilla,* differ in that on the fifth somite the two lobes are separate as well as situated in different planes, and on the sixth and seventh somites the anterior lobes are much smaller than they are in corresponding species of *Oratosquilla.* As in some species of *Oratosquilla,* there are five rather than six teeth on the dactylus of the claw.

Busquilla plantei, new species

FIGURE 11

MATERIAL.—Passe Lokobe, Madagascar; sand with *Cerithiopsis;* 17 m; R. Plante, leg.; May 1969; holotype: 1 ♂, TL 53 mm (MNHNP). Grand Recif, Tulear, Madagascar; platform between the buoys; B. Thomassin, leg., sta 631; 13 Apr 1972; paratype: 1 ♂, TL 65.5 mm (USNM 156192).

DESCRIPTION.—Size moderate, TL to 65.5 mm. Carapace and body smooth, even under magnification.

Eye (Figure 11*a,b*) very large, cornea bilobed, set very obliquely on stalk. Eyes extending beyond end of first segment of antennular peduncle. Ocular scales subquadrate, inclined laterally, separated mesially. Anterior margin of ophthalmic somite with median spinule. Corneal indices 250–291.

Antennular peduncle longer than carapace. Dorsal processes of antennular somite produced into anterolaterally-directed spines.

Rostral plate (Figure 11*a*) slightly broader than long, lateral margins converging on rounded apex. Median carina absent.

Anterior width of carapace more than half median length. Anterolateral spines (Figure 11*a*) very short, not extending to base of rostral plate. Median carina almost completely absent anterior to dorsal pit. Intermediate carinae parallel with laterals, not extending to anterior margin.

Dactylus of claw with 5 teeth, outer margin sinuate, with low, obtuse projection basally. Dorsal ridge of carpus (Figure 11*d*) irregular but undivided, terminating in acute, rounded tooth. Inferodistal angle on outer face of merus unarmed (Figure 11*d*).

Mandibular palp present. 4 epipods present.

Exposed thoracic somites lacking distinct submedian carinae, unarmed intermediate carinae present on posterior 3 somites. Lateral process of fifth somite (Figure 11*c*) obscurely bilobed, lobes separated by some distance, anterior lobe consisting of very small, anteroventrally-directed spine, originating anterior to and ventral to minute, laterally-directed posterior lobe. Lateral processes of sixth and seventh somites bilobed (Figure 11*c*), posterior lobes larger, triangular, apices blunt.

Anterior 4 abdominal somites with very low, indistinct submedian carinae, scarcely discernible from medial longitudinal surface wrinkles; submedian carinae of fifth somite (Figure 11*e*) distinct,

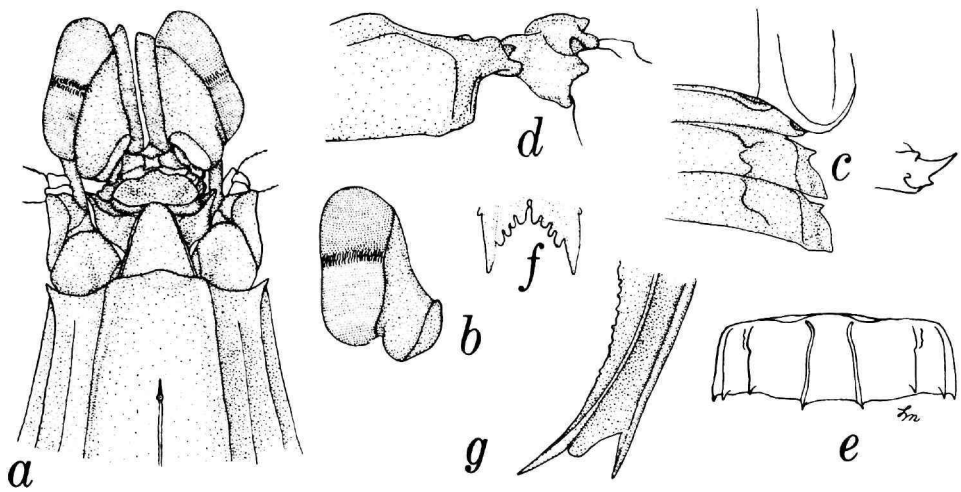

FIGURE 11.—*Busquilla plantei*, new genus, new species, male holotype, TL 53 mm, Madagascar: *a*, anterior part of body; *b*, eye; *c*, lateral processes of fifth, sixth, and seventh thoracic somites (insert shows enlargement of lateral process of fifth somite); *d*, carpus of claw; *e*, fifth abdominal somite; *f*, submedian teeth of telson, ventral view; *g*, basal prolongation of uropod, ventral view. (Setae omitted.)

divergent. Abdominal carinate spined as follows: submedian 5–6, intermediate (3)4–6, lateral (1)2–6, marginal 1–5. Sixth somite with spinule ventrolaterally anterior to articulation of each uropod, ventral surface with low median prominence on posterior margin.

Telson flattened, length and width equal, with 3 pairs of marginal teeth. Prelateral lobes present, shorter than margin of lateral teeth. Denticles rounded, 3–4, 8–9, 1. Ventral surface with short postanal keel.

Uropod broad, proximal segment of exopod shorter than distal, with 8 movable spines on outer margin, distalmost short, not extending to midlength of distal segment. Lobe on outer margin of inner spine of basal prolongation of uropod (Figure 11*g*) large, rounded, margin concave.

COLOR.—Body covered with numerous small, dark chromatophores. Posterior margin of posterior 3 thoracic and all 6 abdominal somites with dark posterior line. Fifth abdominal somite with large dark spot on posterior margin between lateral and marginal carinae. Articular points between sixth abdominal somite and telson dark. Posterior end of median carina and bases of submedian teeth of telson dark. Uropod with large black spot on exopod, covering distal half of proximal segment and inner half of distal segment. Distal half of uropodal endopod with few black chromatophores.

MEASUREMENTS.—Males only examined, TL 53–65.5 mm. Other measurements of male holotype, TL 53 mm: carapace length 11.0; anterior width of carapace 6.8; cornea width 4.4; antennular peduncle length 13.1; rostral plate length 2.0, width 2.3; telson length 11.0, width 11.0.

REMARKS.—*Busquilla plantei* differs from *B. quadraticauda* (Fukuda, 1911) in lacking a median carina on the rostral plate, in having much more divergent submedian carinae on the fifth abdominal somite, and in having fewer armed carinae on the abdomen; the intermediates of the second somite are unarmed in *B. plantei*. Kemp (1913, 55, pl. 4: figs. 45–47) mentioned the median carina on the rostral plate of his specimen of *B. quadraticauda* but did not show it in his figure.

ETYMOLOGY.—This species is named for the collector of the holotype, R. Plante, Station Marine d'Endoume, Marseille, France.

DISTRIBUTION.—Known only from two localities off Madagascar.

Genus *Clorida* Eydoux and Souleyet, 1842

Clorida japonica, new species

FIGURE 12

MATERIAL.—Sanuki, Shikoku, Japan; 13 Mar 1897; holotype: 1 ♂, TL 44 mm (ZMH K.7353).

DESCRIPTION.—Eye (Figure 12*a*, *b*) flask-shaped, broad, cornea small, bilobed, much narrower than adjacent stalk; basal half of mesial margins of eye straight, subparallel; cornea width ⅓ eye length, stalk width slightly more than ½ eye length. Rostral plate (Figure 12*a*) short, broader than long, triangular, lacking median carina. Anterolateral

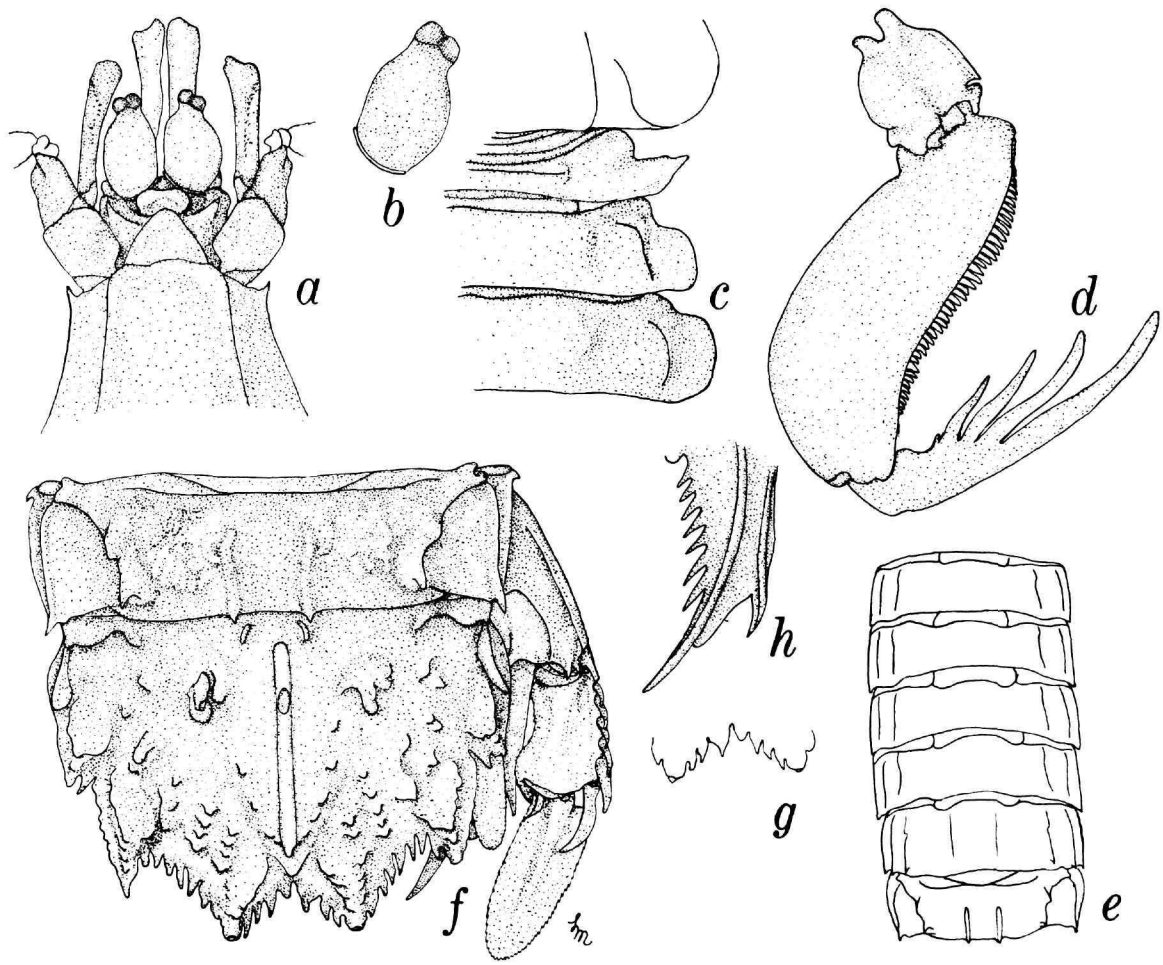

FIGURE 12.—*Clorida japonica*, new species, male holotype, TL 44 mm, Japan: *a*, anterior part of body; *b*, eye; *c*, lateral processes of fifth, sixth, and seventh thoracic somites; *d*, carpus, propodus, and dactylus of claw; *e*, abdomen; *f*, sixth abdominal somite, telson, and uropod; *g*, submedian teeth of telson, ventral view; *h*, basal prolongation of uropod, ventral view (rounded lobe between uropod spines foreshortened in this view; it curves dorsally). (Setae omitted.)

margins of carapace slightly sinuous, anterolateral angles armed. Mandibular palp present. 4 epipods present. Dactylus of claw (Figure 12*d*) with 4 teeth, proximal with indication of fifth tooth at base. Lateral process of fifth thoracic somite (Figure 12*c*) consisting of blunt, laterally directed spine, ventral spine absent. Lateral processes of sixth and seventh thoracic somites (Figure 12*c*) rounded anterolaterally and posterolaterally, process of seventh somite more truncate. Thoracic somites lacking submedian carinae. Anterior 4 abdominal somites lacking submedian carinae, fifth somite with low, unarmed submedian carinae (Figure 12*e*). Abdominal carinae spined as follows: submedian 6, intermediate 5–6, lateral 5–6, marginal 5. Sixth abdominal somite (Figure 12*f*) lacking supplementary spinules on posterior margin, dorsal surface rugose lateral to submedian carinae. Telson (Figure 12*f*) with prelateral lobes well-marked dorsally, dorsal ornamentation as illustrated; low, long postanal keel present ventrally. Marginal denticles of telson sharp, 3–4, 7, 1, outer margin of intermediate tooth tuberculate. Uropodal exopod (Figure 12*f*) with 6–7 movable spines on outer margin of proximal segment, distalmost slender, not extending to midlength of distal segment. Basal prolongation of uropod (Figure 12*h*) with 7–8 slender fixed spines on inner margin, lobe between apical spines small, rounded.

COLOR.—Largely faded in holotype, but rostral plate dark; carapace with diffuse patch of dark pigment medially, margin outlined in black pigment; each body segment with dark posterior line.

MEASUREMENTS.—Only known specimen, male holotype, TL 44 mm. Other measurements: carapace length 8.6; cornea width 0.8; eye length 2.4; eyestalk width 1.3; rostral plate length 1.1, width 1.7; antennular peduncle length 8.3; fifth abdominal somite width 10.8; telson length 6.8, width 9.8.

REMARKS.—*Clorida japonica* belongs to the section of the genus that includes species with a mandibular palp and traces of submedian carinae on at least some of the anterior five abdominal somites; it shares the latter feature with *C. verrucosa* (Hansen, 1926) and *C. merguiensis* (Tiwari and Biswas, 1952) (see Manning, 1976b for recent accounts of these species.) It differs from both of them in having a much broader eye, a much shorter rostral plate, fewer spines on the abdominal carinae (none of the carinae of the anterior four somites are armed), and in lacking ventral spines on the fifth abdominal somite. It also resembles *C. depressa* (Miers, 1880), but that species has all five marginal carinae of the abdomen armed and lacks submedian carinae on the anterior five abdominal somites as well as a postanal keel.

ETYMOLOGY.—The name is derived from the type-locality in Japan.

DISTRIBUTION.—Known only from the type-locality, Sanuki, Shikoku Island, Japan (probably Sanuki Province, now Kagawa Prefecture).

Clorida latispina Manning, 1968

Squilla latreillii.—Gravier, 1930:524 [not *C. latreillei* Eydoux and Souleyet, 1842].
Clorida latispina Manning, 1968c:247, fig. 3.

MATERIAL.—Cap St. Jacques, Tonkin, Viet Nam; 30 Sep 1926: 1 ♂, TL 67 mm (MNHNP).

REMARKS.—This specimen was identified by Gravier (1930) as *C. latreillei*. It agrees in most respects with the original account of *C. latispina*, differing only in having four rather than two or three submedian denticles on the telson. As in the types of *C. latispina*, submedian carinae are not present on the thoracic somites anterior to the eighth.

DISTRIBUTION.—Indo-Malayan area, from off Hong Kong in 34 fms (62 m), Tonkin, and Khota Bharu, Malaysia.

Clorida malaccensis Manning, 1968

Clorida malaccensis Manning, 1968c:244, fig. 2.
Clorida malaccensis var. *moluccensis* Moosa, 1973:4 [listed], 19, fig. 3.

MATERIAL.—Nosy Mitsio, Madagascar; 42 m; muddy sand; R. Plante, leg.; 22 Jun 1970: 1 specimen, fragmented (SME).

REMARKS.—This single specimen, represented by the anterior half of the carapace and a claw, is clearly identifiable with *C. malaccensis*, previously known from two localities in Indo-Malaya. There are five teeth on the claw, and all features present, including the color pattern, agree with the holotype.

I believe that Moosa's subspecies should be synonymized with *C. malaccensis*. His material is said to have four rather than five teeth on the claw,

although the proximal small tooth which he stated (p. 21) to be absent is shown in his fig. 3c. The ocular scales in his specimens are slightly different in shape, but there appear to be no other differences.

DISTRIBUTION.—Indo-West-Pacific region, from the Strait of Malacca, the type-locality (Manning, 1968c); from off Aru, Indonesia (05°37′S, 134°10′E), in 55–66 m on mud and fine shelly grit, and the Arafura Sea (04°52′S, 135°25′E), in 90 m on mud and sand (both Moosa, 1973); and now from Madagascar, in 42 m on muddy sand.

Clorida minor (Jurich, 1904)

FIGURE 13

Squilla minor Jurich, 1904:364, pl. 25; figs. 4–4a [p. 6, pl. 1: figs. 4–4a on separate].—Kemp, 1913:40 [discussion].—Manning, 1968b:131 [listed; transferred to *Squilloides*].

Squilloides minor.—Manning and Serène, 1968:118 [listed].

Clorida fallax.—Manning, 1970:1430 [not *Clorida fallax* (Bouvier, 1914)].

MATERIAL.—Zanzibar; *Valdivia* sta 244; 50 m; syntypes: 1 ♂, TL ca. 20 mm; 1 ♀, TL ca. 16 mm (ZMB). Madagascar; 23°21′50″S, 43°38′20″E; 10 m; muddy sand; R. Derijard, leg., sta D–2; 14 Aug 1963: 1 ♂, TL 23 mm (USNM 127457).

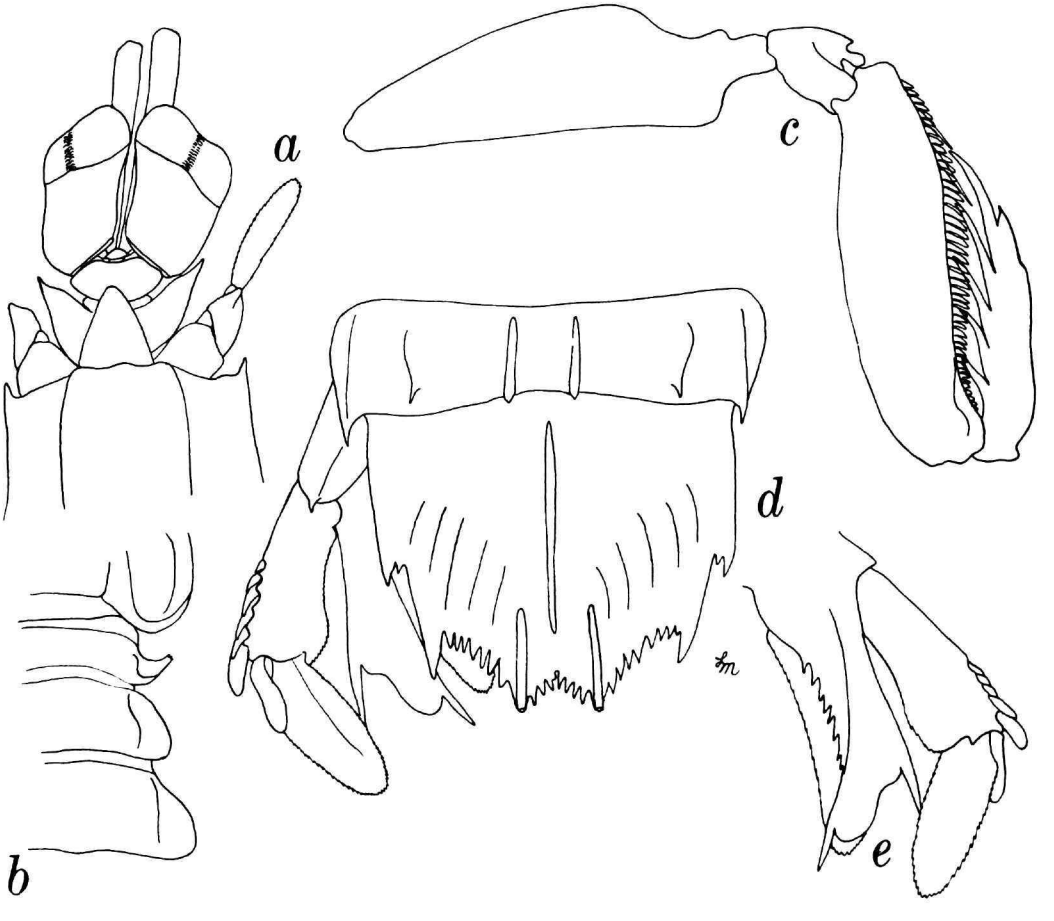

FIGURE 13.—*Clorida minor* (Jurich, 1904), male syntype, TL ca. 20 mm, off Zanzibar: *a*, anterior part of body; *b*, lateral processes of fifth, sixth, and seventh thoracic somites; *c*, claw (tip of dactylus broken or deformed); *d*, sixth abdominal somite, telson, and uropod; *e*, uropod, ventral view. (Setae omitted.)

Madagascar; 23°21'56"S, 43°38'09"E; 14 m; sandy mud; R. Derijard, leg., sta D-55; 28 Sep 1963: 1 ♀, CL 4.9 mm (MNHNP). Nosy Mitsio, Madagascar; 40 m; sand; R. Plante, leg.: 1 ♂, TL 16.5 mm (SME).

DESCRIPTION.—Eye (Figure 13*a*) short and stout, cornea bilobed, broader than and set obliquely on stalk; mesial margin of eye sinuous; cornea width about ⅔ eye length, stalk width more than half but less than ⅔ eye length. Rostral plate (Figure 13*a*) short, length and width subequal, lacking median carina. Anterolateral margins of carapace (Figure 13*a*) straight or slightly concave, anterolateral angles armed. Mandibular palp absent. 4 epipods present. Dactylus of claw (Figure 13*c*) slender, with 6 teeth. Lateral process of fifth thoracic somite (Figure 13*b*) consisting of short, anterolaterally-directed spine; prominent ventral spine also present. Lateral processes of sixth and seventh thoracic somites (Figure 13*b*) broadly rounded posterolaterally. Posterior 3 thoracic and anterior 5 abdominal somites lacking submedian carinae. Abdominal carinae spined as follows: submedian 6, intermediate 6, lateral 6, marginal 5; posterolateral margin of fifth somite angled, not broadly rounded as in *C. fallax*, usually armed with minute spinule. Sixth abdominal somite (Figure 13*d*) lacking supplementary spinules on posterior margin, dorsal surface, lateral to submedian carinae, rugose. Telson (Figure 13*d*) lacking prelateral lobes laterally (lobes formed dorsally, not distinct laterally), dorsal ornamentation as illustrated; accessory median carinae of telson reduced to line of small tubercles, scarcely visible in some specimens. Ventral surface of telson with short postanal keel. Marginal denticles of telson sharp, 3–4, 7–8, 1. Uropodal exopod (Figure 13*d, e*) with 6–8 movable spines on outer margin of proximal segment, distal 2 spatulate, distalmost not extending to midlength of distal segment. Basal prolongation of uropod (Figure 13*e*) with 6–9 slender fixed spinules on inner margin and 2 broad, rounded lobes between apical spines, inner much the larger.

COLOR.—Carapace with dark pigment anteriorly, U-shaped dark patch near midlength, and broader, darker band across posterior third. Merus of claw with dark patch dorsally. Exposed thoracic and abdominal somites with squarish dark patch on midline. Fifth thoracic somite with dark spot on lateral process, remainder of thoracic and abdominal somites dark laterally. Telson with dark patch along median carina and at bases of intermediate and lateral marginal teeth. Distal segment of exopod and distal ⅔ of endopod black.

MEASUREMENTS.—Males, TL 16.5–23 mm; only intact female, TL ca. 16 mm. Other measurements of male, TL 23 mm: carapace length 4.6; cornea width 1.2; eye length 1.5; eyestalk width 0.9; rostral plate length 1.0, width 0.7; fifth abdominal somite width 5.0; telson length 3.1, width 4.0.

REMARKS.—*Clorida minor*, which was assigned by me (1968b) to *Squilloides* on the basis of Jurich's incomplete account, is a distinctive species of *Clorida* that closely resembles *C. fallax* (Bouvier, 1914) (see Manning, 1968a:8, fig. 2). *Clorida minor* differs from *C. fallax* in numerous features: the claw is slenderer and the dactylus is armed with six rather than four teeth; the posterolateral angle of the fifth abdominal somite is angled and usually spined rather than broadly rounded; the accessory median carinae of the telson are formed by lines of tubercles; the ventral surface of the telson is ornamented with a postanal keel only; and there are six to eight rather than five movable spines on the uropodal exopod.

DISTRIBUTION.—Western Indian Ocean, from Zanzibar and Madagascar, in depths between 10 and 50 m.

Genus *Cloridopsis* Manning, 1968

Cloridopsis aquilonaris, new species

FIGURE 14

Squilla scorpio.—Balss, 1910:8 [part] [not *Cloridopsis scorpio* (Latreille, 1828)].

Chloridella scorpio.—Schmitt, 1931:133 [part] [not *Cloridopsis scorpio* (Latreille, 1828)].

MATERIAL.—Okayama Sea, Japan; Doflein, leg., no. 2389; 1904–1905; paratypes: 2 ♂, TL 66.5–84 mm; 1 ♀, TL 69.5 mm (ZSM). Mui Hua, Foochow, China; A. S. Pearse, leg.; Apr 1930; holotype: 1 ♀, TL 88 mm (USNM 168778). Same data; paratypes: 7 ♂, TL 62–93 mm; 6 ♀, TL 46–89 mm (USNM 120326). Foochow, China; R. Kellogg, leg.; 1924; paratypes: 1 ♂, TL 78 mm; 1 ♀ TL 77 mm (USNM 58745).

DIAGNOSIS.—Size moderate, total length of adults less than 100 mm. Eye (Figure 14*a, b*) slender, stalk width about ½ eye length, inner margin of stalk not expanded; cornea broader than stalk. Corneal indices 559–707. Rostral plate (Figure 14*a*) short, as broad as or broader than long, with median carina. Mandibular palp present. 2 epipods pres-

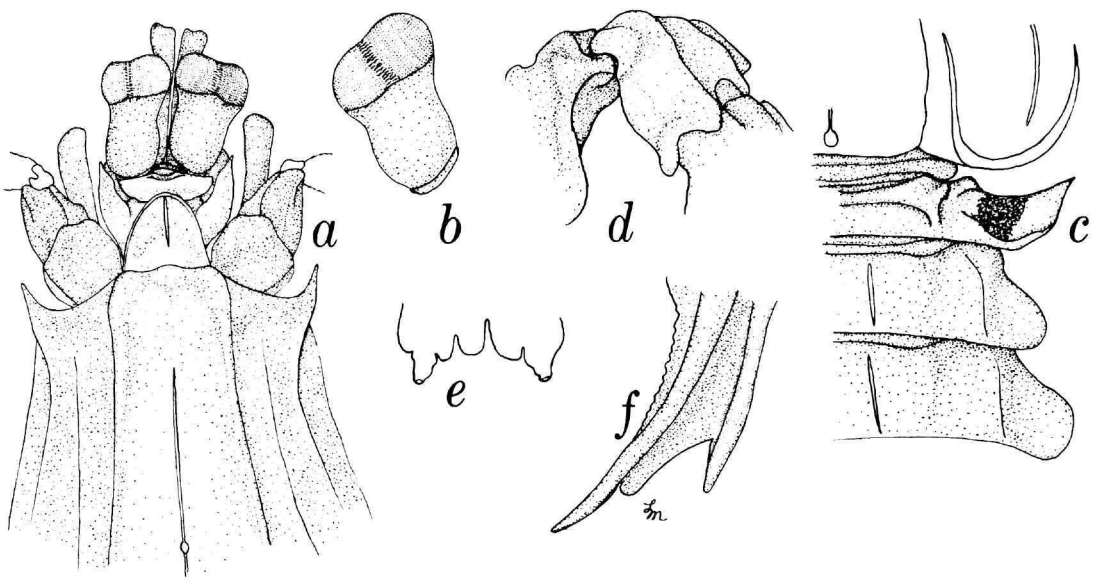

FIGURE 14.—*Cloridopsis aquilonaris*, new species, male paratype, TL 84 mm, Okayama Sea: *a*, anterior part of body; *b*, eye; *c*, lateral processes of fifth, sixth, and seventh thoracic somites; *d*, carpus of claw; *e*, submedian teeth of telson, ventral view; *f*, basal prolongation of uropod, ventral view. (Setae omitted.)

ent. Dactylus of claw with 5–6 (usually 5) teeth. Lateral process of fifth thoracic somite (Figure 14*c*) in form of broad, blunt spine, slightly inclined ventrally, directed anterolaterally, with prominent black spot basally. Abdominal carinae spined as follows: submedian 6, intermediate 5–6, lateral 5–6, marginal 3–5. Telson denticles blunt (Figure 14*e*), 1–3, 3–5, 1. Ventral surface of telson lacking postanal keel. Uropod with 6–7 spines on proximal segment of exopod, distalmost short.

COLOR.—Posterior margin of carapace, posterior 3 thoracic somites, and all abdominal somites with dark posterior line. Lateral process of fifth thoracic somite (Figure 14*c*) with prominent black spot at base. Second abdominal somite with dark, rectangular patch medially. Bases of teeth of telson dark. Uropodal exopod with dark patch distally on proximal segment.

MEASUREMENTS.—Males, TL 62–93 mm; females, TL 46–89 mm. Other measurements of male holotype, TL 88 mm: carapace length 18.8; cornea width 2.9; rostral plate length 1.8, width 1.8; fifth abdominal somite width 21.0; telson length 16.5; width 18.5.

REMARKS.—*Cloridopsis aquilonaris* is very similar to both *C. scorpio* (Latreille, 1828) and *C. immaculata* (Kemp, 1913) (see Kemp, 1913, for accounts of these species). It resembles *C. immaculata* and differs from *C. scropio* in having a short rostral plate, and it resembles *C. scorpio* and differs from *C. immaculata* in having a prominent black spot at the base of the lateral process of the fifth thoracic somite. It further differs from *C. scorpio* in that the lateral process of the fifth thoracic somite is blunter, deflected ventrally, and directed anterolaterally rather than anteriorly. As in other species, in males the chelae are heavier and the carinae of the sixth abdominal somite and telson are noticeably inflated.

Cloridopsis aquilonaris is the northern counterpart of *C. scorpio*. The specimens from Japan identified as *C. scorpio* by Balss (1910) proved to be *C. aquilonaris*, as did part of the material from China identified as *C. scorpio* by Schmitt (1931). Both species occur off China. It seems likely that some or all records of *C. scorpio* from Japan (Komai, 1927) may be referable to *C. aquilonaris*.

ETYMOLOGY.—The name is from the Latin *aquilonaris*, "northern," alluding to the distribution of the species in relation to *C. scorpio*.

DISTRIBUTION.—Known only from China and Japan.

Genus *Harpiosquilla* Holthuis, 1964

Harpiosquilla malagasiensis, new species

FIGURE 15

MATERIAL.—Tamatave, Madagascar; von Rosenberg leg.; holotype: 1 ♀, TL 196 mm (ZMH K.7364).

DESCRIPTION.—Size large, total length of adult almost 200 mm. Cornea (Figure 15*a, b*) large, corneal index 327 in holotype. Rostral plate (Figure 15*a, c*) short, length and width subequal, apex rounded, lacking apical projection. Carapace with median carina. Dactylus of claw (Figure 15*e*) with 8 teeth; opposable margin of propodus of claw with 1–2 smaller spines and several minute denticles between largest spines. Fifth thoracic somite (Figure 15*d*) rounded laterally, irregular, unarmed. Posterior 3 thoracic somites with submedian and intermediate carinae, none armed. Ventral keel of eighth thoracic somite broadly rounded. Anterior 3 abdominal somites with distinct submedian carinae, submedians very low, scarcely discernible, on fourth and fifth somites. Abdominal carinae spined as follows: submedian 6, intermediate 2–6, lateral 1–6, marginal 1–5. Telson denticles 4–5, 11, 1; marginal carina of telson (Figure 15*f*) about 3 times as long as lateral carina. Postanal keel of telson extending about ⅗ distance from anal pore to posterior margin. Uropodal exopod (Figure 15*f*) with 9 movable spines on outer margin of proximal segment.

COLOR.—Completely faded.

MEASUREMENTS.—Only known specimen, female holotype, TL 196 mm. Other measurements: carapace length 38.3; cornea width 11.7; rostral plate length 5.9, width 6.0; raptorial propodus length 51.2; telson length 33.1, width 34.1.

REMARKS.—This new species belongs to the section of *Harpiosquilla* which includes those species with a short rostral plate lacking a distinct anterior projection: *H. annandalei* (Kemp, 1911), *H. japonica* Manning, 1969c, *H. stephensoni* Manning, 1969c, and *H. intermedia* Manning and Michel, 1973. (See Manning, 1969c; Manning and Michel, 1973). *Harpiosquilla malagasiensis* most closely resembles *H. intermedia,* but it differs from it in having a much shorter rostral plate, less prominent submedian carinae on the fifth abdominal somite, and a comparatively longer marginal carina on the telson. These differences are not known to change with age or sex.

ETYMOLOGY.—The specific name is derived from the type-locality, Madagascar (Malagasy Republic).

DISTRIBUTION.—Known only from the type-locality.

Tulеariosquilla, new genus

DEFINITION.—Size very small, adults TL 15 mm or less. Eye (Figure 16*a, b*) large, cornea strongly bilobed, noticeably broader than stalk. Inner margin of eye slightly longer than outer. Ocular scales (Figure 16*a*) low, separate. Antennular somite (Figure 16*a*) elongate. Carinae of carapace reduced, median and intermediate carinae absent. Anterolateral angles of carapace (Figure 16*a*) unarmed, lateral plates very small, gastric grooves scarcely indicated. Mandibular palp absent. 3 epipods present. Dactylus of claw (Figure 16*d*) with 4 teeth. Lateral processes of fifth, sixth, and seventh thoracic somites (Figure 16*c*) single. Anterior 5 abdominal somites lacking submedian carinae, sixth somite (Figure 16*e*) only with submedian carinae. Telson (Figure 16*e*) flattened, dorsal carinae reduced; 3 pairs of marginal teeth present, submedian with movable apices. Prelateral lobes absent. Inner margin of basal prolongation of uropod (Figure 16*f*) smooth, unarmed.

TYPE-SPECIES.—*Tulеariosquilla parvula*, new species.

ETYMOLOGY.—The generic name has been derived from a combination of the type-locality, Tulear, with the generic name *Squilla*. The gender is feminine.

REMARKS.—*Tulеariosquilla* is based on two specimens of an unusually small squillid which appears to be fully mature at a length of 13.5–14 mm. As in *Leptosquilla* Miers, 1880, *Tulеariosquilla* has an elongated antennular somite which is not overreached by the rostral plate and the mandibular palp has been suppressed. *Tulеariosquilla* differs from *Leptosquilla* in numerous features, the most important of which are: the eye is very large and the cornea is bilobed, the ocular scales are separate, there are only 4 teeth on the claw and 3 epipods, and the inner margin of the basal prolongation of

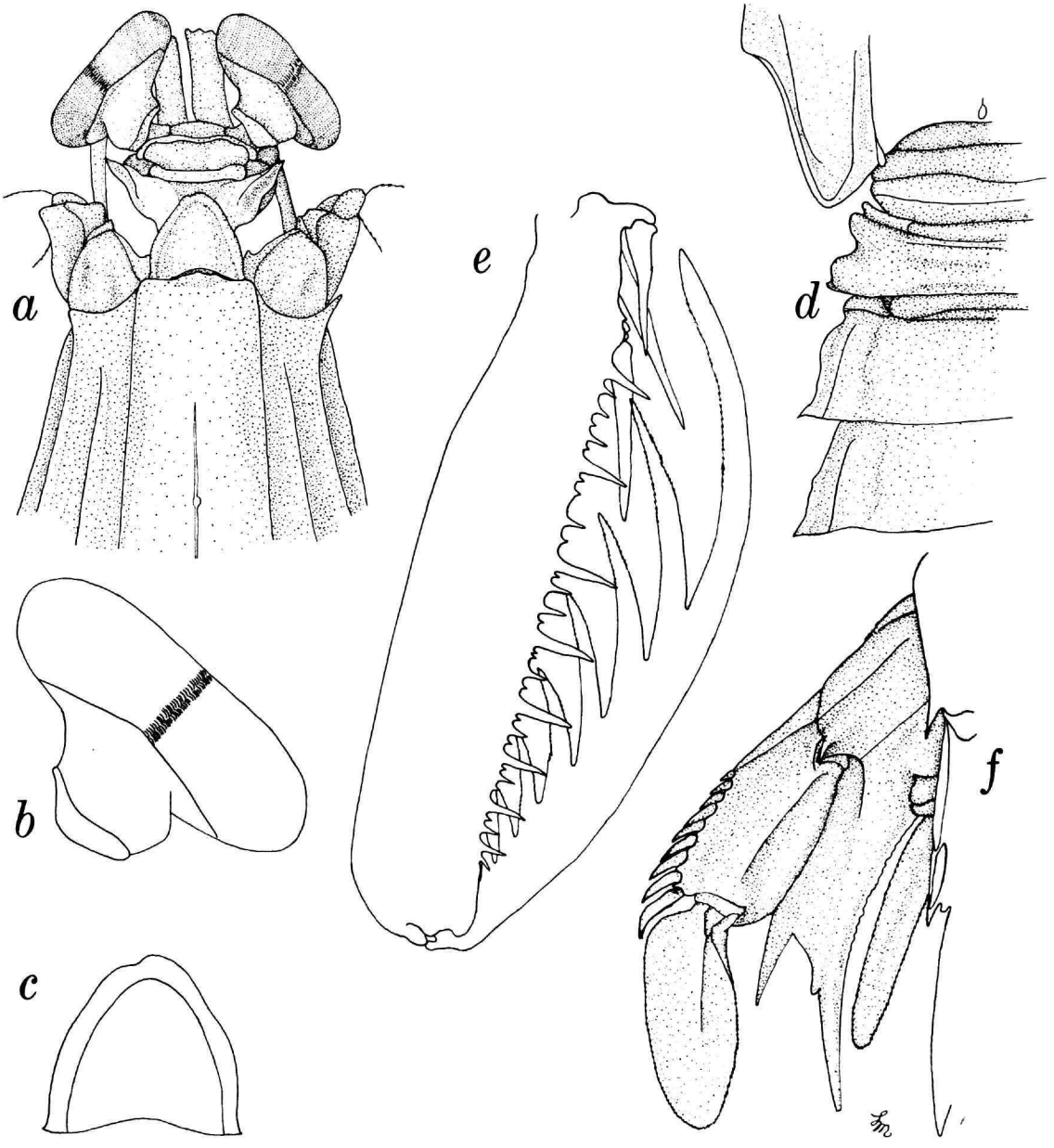

FIGURE 15.—*Harpiosquilla malagasiensis*, new species, female holotype, TL 196 mm, Madagascar: *a*, anterior part of body; *b*, eye; *c*, rostral plate; *d*, lateral processes of fifth, sixth, and seventh thoracic somites; *e*, propodus and dactylus of claw; *f*, uropod. (Setae omitted.)

the uropod is completely smooth. I suspect that the similarities between these genera are superficial and that they are not closely related.

The elongated antennular somite has appeared, presumably independently, in four stomatopod genera representing three families: *Eurysquilloides* Manning, 1963 (Family Gonodactylidae), *Parvisquilla* Manning, 1973 (Family Lysiosquillidae), and *Leptosquilla* Miers, 1880 and *Tulеariosquilla,* new genus (Family Squillidae). Its significance is unknown.

Tulеariosquilla parvula, new species

FIGURE 16

MATERIAL.—Songoritelo Reef, near Tulear, Madagascar; micro-atoll platform; B. Thomassin, leg., sta 265; 26 Oct 1969: 1 ♂, TL 13.5 mm (holotype, MNHNP); 1 ♂, TL 14 mm (paratype, USNM 156191).

DESCRIPTION.—Eye (Figure 16*a, b*) large, cornea strongly bilobed, set almost transversely on stalk. Eyes not extending to end of first segment of antennular peduncle. Ocular scales (Figure 16*a*) low, separate. Anterior margin of ophthalmic somite unarmed, emarginate. Corneal index 338.

Antennular somite (Figure 16*a*) elongate, enlarged, almost as wide as anterior margin of carapace. Dorsal processes of antennular somite reduced to acute anterolateral angles of somite. Antennular peduncle almost as long as carapace.

Antennal protopod elongate, extending anteriorly to or beyond antennular somite. Antennal peduncle almost overreaching eye. Antennal scale very small.

Rostral plate (Figure 16*a*) triangular, slightly broader than long, rounded anteriorly, lacking carinae or spines, not extending anteriorly to midlength of antennular somite.

Carapace short, strongly narrowed anteriorly, lateral plates not covering chelipeds in dorsal view. Carinae reduced, traces of reflected marginals scarcely visible posteriorly; no other carinae visible. Gastric grooves very faint, cervical groove absent. Anterolateral angles (Figure 16*a*) unarmed.

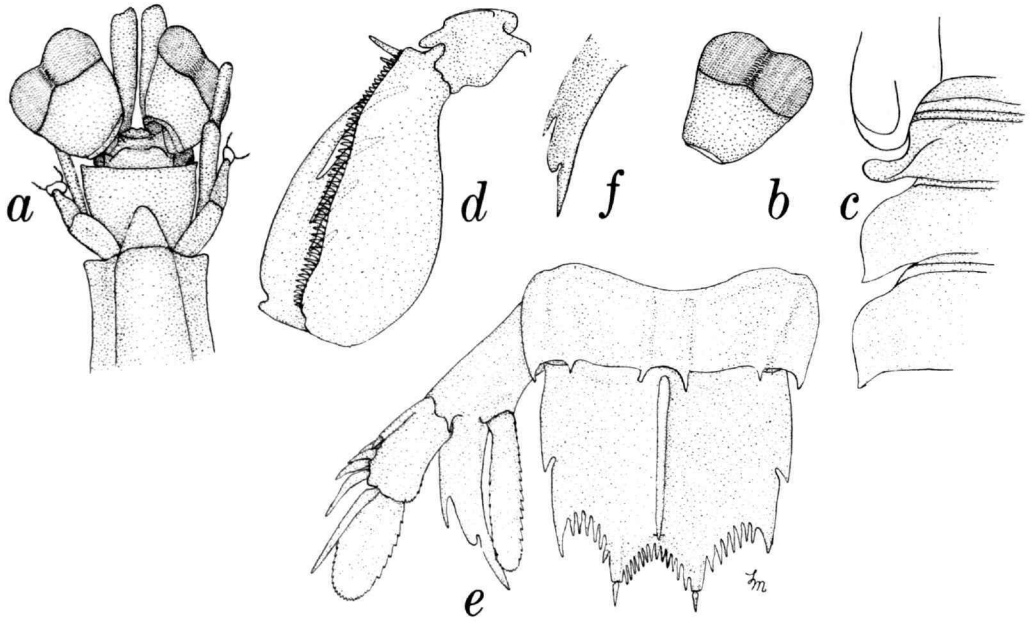

FIGURE 16.—*Tulеariosquilla parvula,* new genus, new species, male holotype, TL 13.5 mm, Tulear: *a,* anterior part of body; *b,* eye; *c,* lateral processes of fifth, sixth, and seventh thoracic somites; *d,* carpus, propodus, and dactylus of claw; *e,* sixth abdominal somite, telson, and uropod; *f,* basal prolongation of uropod, ventral view. (Setae omitted.)

Claw (Figure 16*d*) large, merus very stout, completely visible in dorsal view. Dactylus with 4 teeth, outer margin flattened, with prominent basal notch. Propodus deep, superior margin fully pectinate. Dorsal ridge of carpus undivided, terminating in obtuse blunt lobe.

Exposed thoracic somites (Figure 16*c*) lacking longitudinal carinae. Lateral process of fifth thoracic somite forming rounded, spatulate lobe; blunt ventral spin present on each side beneath lateral process. Lateral processes of sixth and seventh thoracic somites rounded laterally, pointed posteriorly, unarmed. Ventral keel of eighth thoracic somite inconspicuous. Male copulatory tubes well-developed.

Anterior 5 abdominal somites lacking submedian carinae, intermediates apparently absent also, low unarmed lateral carinae present on each somite. Fifth somite bluntly pointed posterolaterally. Sixth somite (Figure 16*e*) with 3 pairs of spines dorsally, submedians and laterals with low carinae.

Telson (Figure 16*e*) broader than long, median carina sharp, terminating in slender spine. Submedian teeth only with short, inconspicuous dorsal carina, remainder of surface smooth. Denticles sharp, 6–7, 6–7, 0. Ventral surface of telson smooth.

Proximal segment of uropodal exopod (Figure 16*e*) shorter than distal, with 5–6 sharp, movable spines on outer margin, distalmost extending almost to end of distal segment. Basal prolongation of uropod (Figure 16*f*) produced into 2 spines, inner much longer, with broad, rounded lobe on outer margin; inner margin of basal prolongation smooth, with no trace of serrations or tubercles.

COLOR.—Almost completely faded, but with traces of large brown and smaller white chromatophores in longitudinal row on each side of abdomen. Apex of median carina and posterior margin of telson darker than surface.

MEASUREMENTS.—Males only known, TL 13.5–14 mm. Other measurements of male holotype: carapace length 2.7; cornea width 0.8; antennular peduncle length 2.6; rostral plate length 0.4, width 0.3; telson length 1.6, width 2.0.

REMARKS.—Although initially I identified these specimens as postlarval squillids, closer examination revealed the presence of well-developed copulatory tubes, indicating that they are fully mature. The combination of characters is so unique that *T. parvula* should be recognized without difficulty.

DISTRIBUTION.—Known only from the type-locality, Songoritelo reef, near Tulear, Madagascar.

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