NOTES ON THE GONODACTYLUS SECTION OF THE FAMILY GONODACTYLIDAE (CRUSTACEA, STOMATOPODA), WITH DESCRIPTIONS OF FOUR NEW GENERA AND A NEW SPECIES

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The present report was stimulated by two separate studies, a review of the eastern Atlantic stomatopods and the preparation of a description of a new gonodactylid found in the collections of the Division of Crustacea, Smithsonian Institution. Examination of the eastern Atlantic Protosquilla folini (A. Milne-Edwards) as part of a revision of the stomatopods from that area revealed that it differs from all others in the genus in two features: the articulated anterolateral plates of the abdomen are absent and the submedian teeth of the telson lack denticles. These observations were noted in a report now in press on the stomatopods taken in the Gulf of Guinea in 1964 and 1965 during two cruises of the R/V John Elliott Pillsbury (Manning, in press).

Comparison of the new gonodactylid from Bougainville with other species formerly assigned to Protosquilla suggested that there were several previously unrecognized genera in that complex of species. This in turn led to this preliminary review of the genera allied to Gonodactylus.

All of the genera recognized herein were included by Kemp (1913) in the genus Gonodactylus, which, until very recently, included all species with a basally inflated, unarmed dactylus on the raptorial claw and the unusual ischiomeral articulation of the claw in which the merus projects posteriorly well beyond the articulation. Kemp recognized four separate groups in Gonodactylus and stated (p. 145): “... it seems that the
species here included in *Gonodactylus* fall into four natural groups of approximately equal value, but these do not, I believe, possess any greater claims to nomenclatorial distinction than do the groups in *Lysiosquilla* or in other genera.”

Kemp’s four groups were as follows:

Group I: This group contained the species now placed in *Gonodactylus* as restricted here.

Group II: This assemblage comprised six species with highly modified telson and uropods. One of these species had been assigned to *Mesacturus* by Miers (1880), but this name had been overlooked by all subsequent workers until Holthuis (1967) resurrected it. The species of this Group are assigned herein either to *Mesacturus* or to a new genus, *Gonodactylopsis*.

Group III: This group included most of the species which Brooks (1886) had assigned to *Protosquilla*. Brooks had used the apparent fusion of the telson and the sixth abdominal somite as the basic character of the genus; as Kemp and others noted, however, this character did not prove valid. Four genera are recognized herein for these species—*Protosquilla* Brooks and three new genera.

Group IV: Kemp assigned but one small, unique species to this group. Holthuis (1964) placed this species in *Hoplosquilla*, and this assignment is recognized here.

There are two basic telson types found among the genera treated; in all of the genera the telson is basically a flat plate ornamented with at least three rounded dorsal bosses, a median and two submedians. In the *Gonodactylus*-type telson, found in *Gonodactylus, Gonodactylopsis,* and *Hoplosquilla*, the telson and its dorsal carinae are inflated, and the posterior margin is produced into two or more pairs of usually widely-separated teeth (figure 1). In the *Protosquilla*-type telson, found in *Chorisquilla, Echinosquilla, Haptosquilla,* and *Protosquilla*, the marginal teeth, other than the submedians, are usually separated by short, narrow, incisions and the general outline is subquadrate (figure 6). *Mesacturus*, however, has two separate telson types, one (figure 3) somewhat resembling the *Gonodactylus*-type, the other (figure 2) with a bifurcate me-
dian posterior projection, possibly representing highly-modified submedian teeth, unique to the genus.

Manning (1968) noted that the Family Gonodactylidae could be separated into two broad sections, one characterized by a Gonodactylus mien and the other by a resemblance to Pseu-

dosquilla. The Gonodactylus section includes Gonodactylus, Hoplosquilla (the genera reported in more detail below), Odontodactylus, and Hemisquilla.

Evolution in this section of the family apparently has cul-

minated in five distinct groups of genera, all of which because of their similar morphology are believed to have arisen from a common ancestor. One line terminated in Hemisquilla, a genus which resembles Gonodactylus in basic facies, including basic telson shape, but which differs in lacking the subterminal ischiomeral articulation of the raptorial claw, in having a tri-

angular rather than trilobed rostral plate, and in frequenting different types of habitats. Hemisquilla, with one species extending northward to California, is basically a southern temperate genus, with populations in the south Atlantic, off Peru, Chile, and Australia; the Atlantic and Pacific species are distinct. Also it is found on level bottoms, as opposed to the other genera in this section, all of which occur typically in rough, rocky areas or on coral reefs.

Another line terminated in Odontodactylus, the only genus of this section with teeth on the raptorial claw. Manning (1967a) reviewed the species which occur in the Indo-West Pacific and western Atlantic regions. As in Gonodactylus and its allies, Odontodactylus usually occurs in rocky or coral reef habitats in tropical waters. The telson in Odontodactylus re-

sembles that found in the Pseudosquilla section of the family.

The third line includes three of the genera recognized herein, all of which share the Gonodactylus-type telson, Gonodactylus, Gonodactylopsis, and Hoplosquilla. These three genera also have a subglobular cornea, rounded anterior exten-
sions of the lateral plates of the carapace, and subterminal articulation of the two segments of the uropodal exopod, with the proximal segment extending well beyond its articulation with the distal segment. Only Gonodactylopsis has a trispinous
rostral plate, similar to that found in *Protosquilla* and its allies; in *Gonodactylus* and *Hoplosquilla* the rostral plate usually is rounded anterolaterally. Of these genera, only *Hoplosquilla* lacks a mandibular palp.

In *Gonodactylus* proper, which will not be treated further here, three groups of species can be distinguished, one consisting of those species related to *G. chiragra*, which possess three dorsal bosses on the telson, another of species of diminutive size, such as *G. demanii*, and a third in which there are five dorsal bosses on the telson, as in *G. falcatus*. Some of the small Indo-West Pacific species of *Gonodactylus* were treated by Manning (1967b), but the remainder of the Indo-West Pacific species are in need of revision.

*Mesacturus*, to which only six species are assigned here, does not show a close relationship to the species of the *Gonodactylus* line or to the members of that line leading to *Protosquilla* and other genera. All of the species have telsons and uropods with unusual ornamentation and shape, as shown in figures 2 and 3. In most of the gonodactylids, the uropodal endopod normally is a straight, flattened paddle fringed with a single row of setae [exceptions are found in some species of *Gonodactylus* (see Manning, 1967b) and *Gonodactylopsis*, see below]. In species of *Mesacturus* the endopod is curved outward and the entire surface may be covered with setae.

The fifth group of genera share the *Protosquilla*-type telson, concave or straight anterior margins of the lateral plates of the carapace, a sharply trispinous rostral plate, and a terminal articulation of the segments of the uropodal exopod. One genus, *Haptosquilla*, has retained the rounded cornea found in *Gonodactylus*; it also differs from the other genera with the *Protosquilla*-type telson in having the submedian teeth separated by a narrow fissure so that the anterior portions of the inner edges of the teeth are appressed for much of their length. In the other genera, *Chorisquilla*, *Echinosquilla*, and *Protosquilla*, the cornea is broadened or even bilobed and the submedian teeth of the telson are not appressed. *Protosquilla*, an offshoot of *Chorisquilla*, differs from all other genera in the family in having the articulated anterolateral plates of the telson suppressed; it
also lacks submedian denticles, and the inner margins of the submedian teeth are lined with fine setae (fig. 4b). *Echinosquilla*, which also seems to be an offshoot of the *Chorisquilla* line, is unique in having erect dorsal spines on the uropodal endopod, fleshy apices on the dorsal spines of the telson, and in having both the submedian and intermediate margins of the telson lined with fixed spines.

Of these genera, excluding *Odontodactylus* and *Hemisquilla*, only *Gonodactylus* occurs in the Americas. The most common American species, *G. oerstedii* Hansen, is very similar to *G. chiragra* (Fabricius), the most common Indo-West Pacific species; *oerstedii* and all American species differ from *chiragra* and all Indo-West Pacific species of *Gonodactylus* in having an accessory carina on the inner surface of each intermediate carina on the telson. The American species all have arisen from a single species which must have been very close to *chiragra*.

Only *Protosquilla* occurs in the tropical waters of the eastern Atlantic region, where it is extremely abundant in suitable habitats. It would seem that this genus has replaced or excluded *Gonodactylus* from this area.

The remainder of the genera occur only in the Indo-West Pacific region, but relatively few of the species involved have wide ranges.

The key to genera of the *Gonodactylus* section given below will serve to distinguish all of the genera reported herein; *Odontodactylus* and *Hemisquilla* have been excluded from the key.

In the keys given below, taxa not further treated are set apart in brackets; within the brackets I have included the current name of the genus or species, reference to that taxon in Kemp (1913), if applicable, other pertinent references, and notes on geographic distribution. Original references cited by Kemp (1913) are not repeated here. An asterisk preceding a specific name indicates that I have examined specimens of that species.

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**Key to Genera of Gonodactylus Section of Family Gonodactylidae Giesbrecht, 1910**

1. Anterior margins of lateral plates of carapace convex, extending well anterior to base of rostral plate (fig. 1) 2
   Anterior margins of lateral plates of carapace straight or slightly concave, not extending anteriorly past base of rostral plate (fig. 7) 5

2. Mandibular palp absent; inner margin of endopod and distal segment of exopod of uropod with sharp, fixed spines
   
   [Hoplosquilla Holthuis, 1964; monotypic; Hoplosquilla acanthurus (Tattersall, 1906); Kemp, 1913; Ceylon].
   Mandibular palp present; inner margin of endopod and distal segment of exopod of uropod with setae, not fixed spines 3

3. Rostral plate not trispinous, anterolateral angles rounded or acute but not spiniform
   [Gonodactylus Berthold, 1827; about 26 species; pantropical except eastern Atlantic].
   Rostral plate sharply trispinous 4

4. Distalmost spines on outer margin of proximal segment of uropodal exopod enlarged, strongly recurved (fig. 3); propodus of claw lacking movable spine proximally on inner margin; apex of uropodal endopod curved outward
   Mesacturus, p. 150.
   Distalmost spines on outer margin of proximal segment of uropodal exopod not enlarged or strongly recurved (fig. 1); propodus of claw with proximal movable spine on inner margin; apex of uropodal endopod curved inward
   Gonodactylopsis, p. 149.

5. Abdomen without articulated anterolateral plates (fig. 4a); inner edge of submedian teeth of telson lined with setae, not denticles
   Protosquilla, p. 153.
   Abdomen with articulated anterolateral plates (fig. 4c); inner edge of submedian teeth of telson lined with denticles or teeth 6

6. Dorsal spines of telson with fleshy apices; uropodal endopod with erect dorsal spines (fig. 5)
   Echinosquilla, p. 155.
   Dorsal spines of telson, if present, lacking fleshy apices; uropodal endopod unarmed dorsally
   7

7. Cornea flattened; posterior margin of telson divided into 2 halves by V-shaped median emargination (fig. 6); submedian denticles of telson long, slender
   Chorisquilla, p. 157.
   Cornea subglobular; posterior margin of telson divided into 2 halves by narrow median fissure, with anterior edges appressed (fig. 7); submedian denticles of telson short, broad
   Haptosquilla, p. 159.
**Gonodactylopsis** new genus

*Figure 1*

*Diagnosis:* Rostral plate sharply trispinous; cornea subglobular; anterior margins of lateral plates of carapace convex, extending anteriorly beyond base of rostral plate; ischiomeral articulation of claw not terminal; 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 present; posterior margin of sixth abdominal somite straight or convex; telson of *Gonodactylus*-type, with 2 or 3 pairs of marginal teeth, submedians with movable apices; submedian denticles present in 1 species, absent in other; proximal segment of uropodal exopod extending beyond articulation with distal segment, movable spines on outer margin of proximal segment of uropodal exopod straight or slightly curved; uropodal endopod curved inward, setation unusual; uropodal exopod and endopod without fixed spines on inner margin.

*Number of species:* Two, distinguished in the key, below.

*Range:* Indo-West Pacific region.

*Type-species:* *Gonodactylus herdmani* Tattersall, 1906.

*Gender:* Feminine.

*Etymology:* The name is derived from the combination of *Gonodactylus* and -opsis, Greek, meaning like, referring to the resemblance of this genus to *Gonodactylus*.

*Remarks:* Gonodactylopsis resembles both *Gonodactylus* and *Mesacturus* in having the anterior margins of the lateral plates of the carapace sloping forward beyond the base of the rostral plate and in having the proximal segment of the uropodal exopod extending beyond the articulation with the distal segment. It differs from *Gonodactylus* in having the rostral plate sharply trispinous; in none of the species of *Gonodactylus* does the shape of the rostral plate approach that of *Gonodactylopsis*. *Gonodactylopsis* lacks the enlarged, recurved spines on the outer margin of the uropodal exopod that are characteristic of *Mesacturus*.

*Gonodactylopsis* also resembles *Hoplosquilla*, but differs in having a mandibular palp and in lacking fixed spines on the inner margins of the uropodal exopod and endopod.

*Gonodactylopsis* can be distinguished from the genera with the Protosquilla-type telson, each of which also has a trispinous rostral plate, by the subterminal articulation of the segments of the uropodal exopod.

The uropodal endopod of *Gonodactylopsis* is curved inward, not outward as in *Mesacturus*, and the marginal setation is incomplete.

Both of the species assigned to this genus are extremely rare.

**Key to species of Gonodactylopsis**

1. Submedian denticles of telson absent; dorsal surface of telson with 3 longitudinal keels and a few rounded tubercles

   *[Gonodactylopsis herdmani* (Tattersall, 1906); Kemp, 1913; Ceylon]*.
Submedian denticles of telson present; dorsal surface of telson with 3 longitudinal keels and large, sharp spinules

*Gonodactylopsis drepanophora* (de Man, 1902); Kemp, 1913; Ternate, Molucca Islands; off Timor.

**Mesacturus** Miers, 1880

Figures 2, 3

**Diagnosis**: Rostral plate sharply trispinous; cornea subglobular; anterior margins of lateral plates of carapace convex, extending anteriorly beyond base of rostral plate; ischiomeral articulation of claw not terminal; propodus of claw lacking proximal movable spine; dactylus of claw unarmed; articulation of propodus and dactylus inflated; mandibular palp present, three-segmented; articulated anterolateral plates of abdomen present; posterior margin of sixth abdominal somite straight; telson of unusual shape, ornamentation bizarre in some species; submedian marginal teeth of telson, if present, with movable apices; submedian denticles usually present; proximal segment of uropodal exopod extending beyond articulation with distal segment, distalmost spines in outer margin of proximal segment enlarged, strongly recurved, uropodal endopod abnormal in shape and setation, usually curved outward, lacking dorsal spines; uropodal exopod and endopod lacking fixed spines on inner margin.
Number of species: Six, distinguished in the key given below.

Range: Indo-West Pacific region.

Type-species: Gonodactylus furcicaudatus Miers, 1880, by monotypy.

Remarks: Mesacturus can be distinguished from all other genera by the enlarged, strongly recurved distal spines on the outer margin of the proximal segment of the uropodal exopod. In addition, the unusual shape of the telson and the bizarre setation and shape of the uropods are helpful in recognizing the members of the genus.

Two general types of telson shape are found in the genus. In one (figure 2) the basal portion of the telson is broader than long and bears a slender, bifurcate posterior projection which arises from the middle of the posterior margin; the presence of a movable spine at the apex of each bifurcation suggests that these are modified submedian teeth. In the other type (figure 3) the shape is reminiscent of that found in Gonodactylus, but the dorsal bosses are more numerous and often more elongate. The telson and uropods of members of this genus are highly specialized but their functions are unknown.

Serène (1952) has shown that M. spinosocarinatus (Fukuda, 1910) has as its synonyms Gonodactylus strigatus Hansen, 1926, and G. demanii var. pruvotae Gravier, 1930.

Key to species of Mesacturus

1. Telson abnormal in shape, with narrow basal portion and slender, bifurcate median projection extending posteriorly (fig. 2) ............. 2
   Telson normal in shape, length and width subequal, without bifurcate process (fig. 3) .................................................. 3
Fig. 3. *Mesacturus crinitus* (Manning, 1962). a, last abdominal somite and telson; b, uropod, ventral view; c, uropod, dorsal view (from Manning, 1962).
2. Posteromedian bifurcate process of telson slender, smooth, bifurcate for all of its length

*Mesacturus furcicaudatus* (Miers, 1880); Kemp, 1913; Komai, 1940; Borodino Islands, south of Japan; Makatea, Polynesia; Banda Sea; off Lucipara Group, Indonesia].
Posteromedian bifurcate process of telson broad, spinous and heavily setose, with apical bifurcation only

*Mesacturus kempi* (Odhner, 1923); Ellice Islands].

3. Intermediate marginal teeth of telson small; lateral teeth present, small; dorsal surface of telson with 9 crowded longitudinal ridges

*Mesacturus spinosocarinatus* (Fukuda, 1910); Kemp, 1913; Serène, 1949, 1952; Japan; New Caledonia; near Saleyer, south of Celebes, Indonesia; Viet Nam; Queensland, Australia].
Intermediate marginal teeth of telson well-developed; lateral teeth absent; dorsal surface of telson not ornamented with 9 crowded longitudinal ridges

4. Numerous intermediate denticles present on telson, 6–10 in 2 series on submedian tooth and 6–8 on intermediate tooth

*Mesacturus fimbriatus* (Lenz, 1905); Kemp, 1913; Manning, 1962; Zanzibar, Seychelles Islands].

5. Uropodal endopod completely setose ventrally; proximal segment of uropodal exopod with dorsal patch of setae

*Mesacturus brevisquamatus* (Paul'son, 1875); Kemp, 1913; Manning, 1962; Red Sea].
Uropodal endopod lacking ventral setae; proximal segment of uropodal exopod without dorsal patch of setae

*Mesacturus crinitus* (Manning, 1962); Seychelles Islands].

Protosquilla Brooks, 1886

Figure 4a–b

**Diagnosis:** Rostral plate sharply trispinous; cornea flattened; anterior margins of lateral plates of carapace straight or concave, not extending anteriorly beyond base of rostral plate; ischiomeral articulation of claw not terminal; propodus of claw lacking proximal movable spine; dactylus of claw unarmed; articulation of propodus and dactylus inflated; mandibular palp present, two-segmented; articulated anterolateral plates of abdomen absent (fig. 4a); posterior margin of sixth abdominal somite concave medially; posterior margin of telson divided into 2 halves by V-shaped median emargination; telson of *Protosquilla*-type, with 3 pairs of marginal teeth; telson lacking submedian denticles, inner margin of each submedian tooth lined with long, fine, fixed setae (fig. 4b); proximal segment of uropodal exopod articulating terminally with distal segment, movable spines on outer margin of proximal segment straight or slightly curved; uropodal endopod elongate, with normal complement of setae, lacking fixed spines on inner margins.
Number of species: One.

Range: Eastern Atlantic Ocean, from the Cape Verde Islands to the Congo.

Type-species: Gonodactylus folini A. Milne-Edwards, 1867, by subsequent designation by Holthuis, 1967, p. 36.

Remarks: Protosquilla differs from all other genera in the Gonodactylidae in having the articulated anterolateral plates of the abdomen totally suppressed (fig. 4a) and in having the submedian denticles of the telson replaced by long, thin setae (fig. 4b). It is the only representative of the Gonodactylus section of the family to occur in the eastern Atlantic Ocean where it seems to have completely replaced or excluded members of the genus Gonodactylus.
Its striking similarity in features other than the two mentioned above to *Chorisquilla trigibbosa* (Hansen, 1926) suggests that it may have been derived from a similar species.

*Protosquilla elongata* Brooks, 1886, based on a postlarva, is a synonym of *Protosquilla folini* (A. Milne-Edwards, 1867).

**Echinosquilla** new genus

*Figures 4c–d, 5*

_Diagnosis:_ Rostral plate sharply trispinous; cornea flattened; anterior margins of lateral plates of carapace straight or concave, not extending anteriorly beyond base of rostral plate; ischiomeral articulation of claw not terminal; propodus of claw with proximal movable spine; dactylus of claw unarmed; articulation of propodus and dactylus of claw inflated; mandibular palp present, three-segmented; articulated anterolateral plates of abdomen very small; posterior margin of sixth abdominal somite concave medially; posterior distal margin of telson divided into 2 halves by V-shaped median emargination; telson of *Protosquilla*-type, with 2 pairs of marginal teeth, submedians with movable apices; submedian denticles absent, inner margin of each submedian tooth lined with long, large, fixed spines; proximal segment of uropodal exopod articulating terminally with distal segment, movable spines on outer margin of proximal segment straight or slightly curved; uropodal endopod elongate, with normal complement of setae, dorsal spines present; uropodal exopod and endopod lacking fixed spines on inner margin.

_Number of species:_ One.

_Range:_ Indo-West Pacific region, from scattered localities including Japan, Hawaii, Marquesas and Fiji Islands, in the Pacific Ocean, and Mauritius Island and Cosmoledo Atoll in the Indian Ocean.

_Type-species:_ *Gonodactylus guerini* White, 1861, by monotypy.

_Gender:_ Feminine.

_Etymology:_ The name is derived from the Latin, echinus, sea urchin, in combination with the generic name *Squilla*.

_Remarks:_ *Echinosquilla* can be distinguished from all other gonodactylids by the fleshy apices on the dorsal spines of the telson and the erect spines on the uropodal endopod. The wide submedian cleft of the telson as well as most of its general features suggest a close relationship with *Chorisquilla*; none of the species assigned to that genus have numerous long denticles lining the submedian and intermediate areas of the telson margin (figure 4d).

The single species assigned to *Echinosquilla, E. guerini*, is widely distributed in the Indo-West Pacific region. It occurs in moderate depths, from less than 2 m to over 218 m. It has been suggested by Carié (1915) that the species uses the telson and uropods to block the entrance to its burrow; Carié pointed out the general resemblance of the telson to the echinoid *Echinometra*.

Brooks’ figure of *E. guerini*, published in 1886, is included here be-
Fig. 5. *Echinosquilla guerini* (White, 1861). (from Brooks, 1886).
cause it portrays the basic facies of the species very well; unfortunately, the erect spines on the uropodal endopod are not clearly illustrated.

**Chorisquilla** new genus

Figure 6

*Diagnosis:* Rostral plate usually sharply trispinous; cornea flattened; anterior margins of lateral plates of carapace straight or concave, not extending anteriorly beyond base of rostral plate; ischiomeral articulation of claw not terminal; 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 very small; posterior margin of sixth abdominal somite concave medially; telson of Protosquilla-type, posterior margin divided into two halves by V-shaped median emargination; telson with 2 or 3 pairs of
marginal teeth, submedians with movable apices; submedian denticles of telson long, slender, movable; proximal segment of uropodal exopod articulating terminally with distal segment, movable spines on outer margin of proximal segment straight or slightly curved; uropodal endopod elongate, with normal complement of setae, lacking dorsal spines; uropodal exopod and endopod lacking fixed spines on inner margin.

*Number of species:* Eight, distinguished in the key given below.

*Range:* Indo-West Pacific region.

*Type-species:* Gonodactylus excavatus Miers, 1880.

*Gender:* Feminine.

*Etymology:* The name is derived from the Greek, choris, meaning apart, in combination with the generic name Squilla. The name alludes to the separate submedian teeth of the telson.

*Remarks:* Chorisquilla and the closely related Protosquilla and Echinosquilla share the flat, Protosqiiilla-type telson and numerous other features with Haptosquilla. Chorisquilla can be distinguished from Haptosquilla by the flattened or bilobed cornea, by the presence of the proximal movable spine on the propodus of the claw, and by the shape of the telson the posterior margin of which in Chorisquilla is divided into two halves by a V-shaped median emargination (fig. 6). Chorisquilla lacks the fleshy apices on the dorsal surface of the telson, the numerous long submedian and intermediate denticles, and the erect spines on the uropodal endopod which are both characteristic of Echinosquilla. The articulated anterolateral plates of the abdomen will distinguish Chorisquilla from Protosquilla.

Gonodactylus tweediei Serène, 1950, is here synonymized with G. trigibbosus Hansen, 1926; Hansen's species appears to be based on a juvenile and the the two major differences, relative shape of the rostral plate and the dorsal bosses of the telson, exhibited by the two nominal species can be attributed to differences in age.

Although the submedian denticles of the telson appear to be movable in the species I have examined, C. spinosissima and C. trigibbosa, some of the illustrations in the literature seem to show that the denticles in other species may be fixed (vide Serène, 1947, pl. 4).

**Key to species of Chorisquilla**

1. Telson with 2 pairs of marginal teeth .................................. 2

   Telson with 3 pairs of marginal teeth .................................. 6

2. Dorsal surface of telson with numerous long spinules ..........

   °[Chorisquilla spinosissima (Pfeffer, 1888); Kemp, 1913; Holthuis, 1941; scattered localities between Japan, Australia, and the Red Sea].

   Dorsal surface of telson not armed with numerous long spinules .... 3

3. Dorsal surface of telson with numerous longitudinal ridges extending to posterior margin .................................................................

   °[Chorisquilla gyrosa (Odhner, 1923); Gilbert Islands, Arno Atoll,
Marshall Islands; Andaman Islands; Seychelles Islands; Diego Garcia, Indian Ocean.
Dorsal surface of telson not ornamented with numerous longitudinal ridges 4

Submedian dorsal bosses of telson each extending to apex of submedian teeth

[Chorisquilla quinquelobata (Gordon, 1935); Christmas Island, Indian Ocean].
Submedian dorsal bosses of telson not extending to apices of submedian teeth

5

Submedian bosses of telson extending posteriorly beyond apex of median excavation in posterior margin; surface of all 3 dorsal bosses smooth; intermediate teeth of telson poorly-defined

[Chorisquilla excavata (Miers, 1880); Bonin Islands; South China Sea; Indonesia; Viet Nam; Andaman Islands].
Submedian bosses of telson not extending posteriorly beyond apex of median excavation on posterior margin; surface of all 3 dorsal bosses tuberculate; intermediate teeth of telson well-defined

[Chorisquilla tuberculata (Borradaile, 1907); Komai, 1938; Japan and Providence Island, Indian Ocean].

6. Dorsal surface of telson densely setose but not spinulose

"[Chorisquilla trigibbosa (Hansen, 1926); Serène, 1952 (as Gonodactylus tweediei); Saleyer, Indonesia; Queensland, Australia; Lord Howe Island].
Dorsal surface of telson with numerous spinules

7

Telson with pyriform median and submedian bosses; dorsal spinules straight

[Chorisquilla brooksii (de Man, 1887); Kemp, 1913; Serène, 1947; Tidore and Tenimber Islands, Indonesia; South China Sea; Viet Nam].
Telson with subcircular median and submedian bosses; dorsal spinules recurved posteriorly

[Chorisquilla hystrix (Nobili, 1899); Kemp, 1913; Beagle Bay, British New Guinea].

Haptosquilla new genus

Figure 7

Diagnosis: Rostral plate trispinous; cornea subglobular; anterior margins of lateral plates of carapace straight or concave, not extending anteriorly beyond base of rostral plate; ischiomeral articulation of claw not terminal; propodus of claw usually lacking proximal movable spine; dactylus of claw unarmed; articulation of propodus and dactylus of claw inflated; mandibular palp usually present; articulated anterolateral plates of abdomen well-developed; posterior margin of sixth abdominal somite concave medially; telson of Protosquilla-type, divided into 2 halves by narrow median fissure, with anterior edges appressed; telson with 3 or 4
Fig. 7. *Haptosquilla pulchella* (Miers, 1880). a, anterior portion of body; b, last two abdominal somites, telson, and uropod (from Kemp, 1913).

Pairs of marginal teeth, submedians with movable apices; submedian denticles short, broad, movable; proximal segment of uropodal exopod articulating terminally with distal segment, movable spines on outer margin of proximal segment straight or slightly curved; uropodal endopod elongate, with normal complement of setae, lacking dorsal spines; uropodal exopod and endopod lacking fixed spines on inner margins.

**Number of species:** Thirteen, including one new species described herein; they may be distinguished by means of the key given below.

**Range:** Indo-West Pacific region.

**Type-species:** *Gonodactylus pulchellus* Miers, 1880.

**Gender:** Feminine.

**Etymology:** The name is from the Greek, hapto, to touch, in combination with the generic name *Squilla*. The name alludes to the appressed submedian teeth of the telson.

**Remarks:** The appressed submedian lobes of the telson will distinguish *Haptosquilla* from other members of the Gonodactylidae. The rounded cornea in the species of *Haptosquilla* will also serve to distinguish them from members of *Chorisquilla*, *Echinosquilla*, and *Protosquilla*, in which the cornea is either broadened or bilobed.

The rostral plate of most species of *Haptosquilla* is sharply trispinous. However, in *H. nefanda* (Kemp) the anterolateral spines are not well developed; they are sharp and acute but not spiniform.

*Haptosquilla glyptocercus* (Wood-Mason, 1875) has as its synonym *Protosquilla cerebralis* Brooks, 1886. *H. lenzi* (Holthuis, 1941) was proposed as a replacement name for the preoccupied *Gonodactylus glaber* Kemp, 1913, itself an emendation of *Protosquilla glabra* Lenz, 1905.
Hapto squid (Odhner, 1923) and H. pulchra (Hansen, 1926) may prove to be synonyms upon further study; *pulchra* is almost certainly based upon a juvenile.

**Key to species of Hapto squid**

1. Telson with 3 pairs of marginal teeth .......................... 2
   Telson with 4 pairs of marginal teeth .......................... 4

2. Median portions of fifth and sixth abdominal somites wrinkled; dorsal submedian bosses of telson extending to posterior margin
   *Hapto squid glyptocercus* (Wood-Mason, 1875); Brooks, 1886; Kemp, 1913; Scattered localities between Japan and Australia; Andaman Islands.
   Median portion of fifth abdominal somite smooth; dorsal submedian bosses of telson not extending to posterior margin .......................... 3

3. Dorsal surface of telson smooth between bosses
   *Hapto squid lenzi* (Holthuis, 1941); Kemp, 1913; Philippine Islands, Viet Nam, to the Indian Ocean and the Red Sea.
   Dorsal surface of telson with well-marked depressions between bosses
   [Hapto squid tanensis (Fukuda, 1911); Kemp, 1913; Japan].

4. Telson with prominent median boss only on dorsal surface, submedian bosses replaced by short, rounded ridges .......................... 5
   Telson with prominent median and submedian bosses on dorsal surface
   [Hapto squid pulchra (Hansen, 1926); Viet Nam; Borneo Bank].

5. Dorsal ornamentation of telson not extending to posterior margin, posterior three of dorsal surface smooth
   [Hapto squid pulchra (Hansen, 1926); Viet Nam; Borneo Bank].
   Dorsal ornamentation of telson extending to posterior margin
   [Hapto squid hamifera (Odhner, 1923); Fiji Islands].

6. Submedian bosses of telson extending to posterior margin
   [Hapto squid ectypa (Müller, 1887); Kemp, 1913; Bonin Islands; Ceylon; Mauritius].
   Submedian bosses of telson short, not extending to posterior margin
   [Hapto squid ectypa (Müller, 1887); Kemp, 1913; South Pacific; Fiji Islands, Loyalty Islands, Australasian waters, and Viet Nam].

7. Median portion of fifth abdominal somite corrugated .......................... 8
   Median portion of fifth abdominal somite smooth .......................... 10

8. Submedian bosses of telson extending beyond mid-length of telson but not reaching posterior margin
   *Hapto squid stoliurus* (Müller, 1887); Kemp, 1913; Western Australia and Malay Archipelago to Philippine Islands.
   Submedian bosses of telson not extending posteriorly beyond mid-length of telson
   [Hapto squid trispinosa (Dana, 1852); Kemp, 1913; South Pacific; Fiji Islands, Loyalty Islands, Australasian waters, and Viet Nam].

9. Rostral plate sharply trispinous; submedian bosses of telson oval at base
   [Hapto squid trispinosa (Dana, 1852); Kemp, 1913; South Pacific; Fiji Islands, Loyalty Islands, Australasian waters, and Viet Nam].
Anterolateral angles of rostral plate acute but not sharply spinous; submedian bosses of telson circular at base

*Haptosquilla tuberosa* (Pocock, 1893); Kemp, 1913; Macclesfield Bank, South China Sea; Viet Nam.

10. Mandibular palp absent

[**Haptosquilla proxima** (Kemp, 1915); Philippine Islands].

Mandibular palp present, two-segmented

11. Ocular scales produced laterally, extending nearly to lateral rostral spine; anterior margins of carapace concave, anterolateral angles subacute

*Haptosquilla pulchella* (Miers, 1880); Kemp, 1913; Philippine Islands and Australia to western Indian Ocean.

Ocular scales small, squarish, not produced laterally; anterior margins of carapace straight, anterolateral angles rectangular

12. Anterolateral angles of rostral plate acute, blunt; dorsal bosses of telson smooth, non-setose

*Haptosquilla nefanda* (Kemp, 1911); Kemp, 1913; Philippine Islands; Indonesia; Nicobar Islands; Andaman Islands; and Burma.

Anterolateral angles of rostral plate acute, sharp; dorsal bosses of telson with short, scattered setae

*Haptosquilla setifera* new species

Figure 8

**Haptosquilla setifera** new species

Figure 8

*Holotype*: 1 ♂, 14.0 mm; Bougainville, Solomon Islands; 1945; SI Div. Crustacea 125346.

*Paratype*: 1 ♀, 14.4 mm; data as in holotype; SI Div. Crustacea 125347.

*Description*: Ocular scales small, subquadrate, lateral angles not markedly produced outward.

Rostral plate with median spine slenderer and longer than laterals; lateral spines acute, sharp, short.

Anterior margins of lateral plates of carapace straight, anterolateral angles rectangular, not produced anteriorly.

Mandibular palp present, two-segmented.

Outer margin of dactylus of claw notched proximally; propodus of claw with slender movable spine proximally.

First 4 abdominal somites smooth, ornamented with at most an inverted L-shaped groove anterolaterally; fifth somite with 3 pairs of setae.

Fig. 8. *Haptosquilla setifera* new species, holotype. a, anterior portion of body; b, last two abdominal somites, telson, and uropod (setae omitted).
Gonodactylid stomatopods
longitudinal swellings, outermost sharpest, median area smooth; sixth somite with 3 pairs of inflated carinae, each with posterior spine; surface of carinae irregular, wrinkled and pitted, several short setae present.

Telson broader than long, of Protosquilla-type, with 3 oval dorsal bosses, not widely separate, submedians short, extending posteriorly about to apex of median cleft; dorsal bosses and surface of telson with broad, shallow pits, bosses irregular in outline; few short, fine setae present on bosses, dorsal surface of telson, and telson margin setae not so thick so as to obscure surface ornamentation; 4 pairs of blunt marginal teeth present, submedians with movable apices; numerous short, movable submedian denticles present, and 1 fixed denticle present between each of remaining marginal teeth.

Uropod with 9 slender spines on outer margin of proximal segment of exopod, distalmost extending almost to end of distal segment; inner spine of basal prolongation smaller and shorter than outer.

Color: Largely faded in both specimens, although the female shows traces of small black chromatophores arranged in a transverse band on each somite.

Measurements: Male holotype, TL 14.0 mm, carapace length 2.5 mm, fifth abdominal somite width 2.5 mm, telson length 2.1 mm, width 2.5 mm. Female paratype, TL 14.4 mm, carapace length 2.6 mm, fifth abdominal somite width 2.6 mm, telson length 2.3 mm, width 2.6 mm.

Discussion: Both of the specimens upon which this description is based are obviously juveniles but the distinguishing features which they exhibit are not among those which might be expected to change with age. Even at this size this new species is distinguishable from all other species now in the genus.

Haptosquilla setifera is closely related to H. nefanda (Kemp), H. pulchella (Miers), and H. proxima (Kemp). The presence of short setae on the dorsal bosses of the telson and the sharp anterolateral spines of the rostral plate will separate setifera from nefanda. The new species differs from pulchella in having many fewer setae on the telson, irregularly oval pitted bosses on the telson (in pulchella the bosses are smooth and round), truncated ocular scales, and rectangular anterolateral angles on the carapace; H. setifera is readily distinguishable from even the smallest specimen of pulchella (TL 19 mm) available for comparison. The mandibular palp will separate setifera from proxima, in which the palp has been suppressed.

None of the other specimens of several species of Haptosquilla which I have examined have a proximal movable spine on the upper margin of the propodus of the claw. It may be characteristic of juveniles in this genus.

Distribution: Known only from the type-locality, Bougainville, Solomon Islands.

Etymology: The name is derived from the Latin, seta, referring to the short hairs present on the dorsal surface of the telson.
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