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Postilla

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STOMATOPOD CRUSTACEA COLLECTED BY THE YALE SEYCHELLES EXPEDITION, 1957-1958

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Although small in size and number of species, the collection contains several rare species as well as several new records from the Seychelles. Of particular interest is the discovery of an undescribed species allied to *Gonodactylus fimbriatus* Lenz and *G. brevisquamatus* Paul'son. In all, ten species in three genera are represented, with all but two of the species in *Gonodactylus*.

In the following account, complete synonymies are given only for the relatively rare species. In the case of common species, reference is made to the synonymies compiled by Kemp, 1913, and Holthuis, 1941, as well as more recent papers. The species are arranged as in Kemp, 1913. In addition to the material collected in the Seychelles proper, several specimens were collected in the Maldives, at Ceylon, etc., during the expedition, and these have been included in the account. Comparative notes and sketches of *G. fimbriatus* and *G. brevisquamatus* have been added in order to clarify their relationship to the new *Gonodactylus*.

[1] Contribution No. 404 from The Marine Laboratory, University of Miami.

The measurement following the number of specimens is in all cases total length, measured from the apices of the submedian spines of the telson to the anterior margin of the rostral plate. All of the material has been deposited in the Yale Peabody Museum (YPM).

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The illustrations of the new species were drawn by my wife, Lilly Manning.

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Pseudosquilla ciliata (Fabricius, 1787)

Pseudosquilla ciliata, Kemp, 1913:96; Holthuis, 1941:261.

MATERIAL. 1 ♂, 51.3 mm; YSE Sta. 9; seined offshore, Point Elizabeth, north of Trincomalee, Ceylon; N. Mahadeva; 22 August 1957; YPM 4326.

Lysiosquilla maculata (Fabricius, 1793)

Lysiosquilla maculata, Kemp, 1913:111, pl. 8, figs. 86-91; Holthuis, 1941: 269, fig. 5.

MATERIAL. 1brk. ♂, 164.8 mm; Seychelles; collected by local inhabitants; YPM 4342.

Gonodactylus chiragra (Fabricius, 1781)

Gonodactylus chiragra, Kemp, 1913:155, pl. 9, fig. 107; Holthuis, 1941:277, fig. 7.

MATERIAL. 1 ♀, 51.2 mm; YSE Sta. 12; Foul Pt., Ceylon; W. D. Hartman; 28 August 1957; YPM 4328.

1 ♂, 46.7 mm; YSE Sta. 17; Funadu Is., N. Male Atoll, Maldives; shoreward edge of reef, living in cavities in coral; W. D. Hartman; 19 September 1957; YPM 4329.

1 ♂, 41.0 mm, 1 ♀, 23.1 mm; YSE Sta. 28; seaward reef, Île du Coin, Peros Banhos Atoll, Chagos Archipelago; A. J. Kohn, W. D. Hartman; 23 October 1957; YPM 4333.

1 ♀, 15.2 mm; YSE Sta. 35B; northwest of Moyenne Is., Seychelles; A. J. Kohn; 20 January 1958; YPM 4456.

1 ♂, 37.7 mm; YSE Sta. 41; seaward reef, Menai Is., Cosmoledo Atoll; A. J. Kohn; 10 December 1957; YPM 4338.

1 juv., 6.8 mm; YSE Sta. 53; Pasquère, Praslin Is., Seychelles; W. D. Hartman; 19 January 1958.

Gonodactylus platysoma Wood-Mason, 1895

Gonodactylus chiragra var. *platysoma,* Kemp, 1913:162, text-fig. 1; Holthuis, 1941:281.

Material. 1 ♀, 86.1 mm; YSE Sta. 25C; Gan Is., Addu Atoll. Maldives; A. J. Kohn; 18 October 1957; YPM 4331.

1 ♀, 46.8 mm; YSE Sta. 27; lagoon side, Île du Coin, Peros Banhos Atoll, Chagos Archipelago; W. D. Hartman; 22 October 1957; YPM 4332.

Gonodactylus spinosus Bigelow, 1893

Gonodactylus spinosus Bigelow, 1893:101; Bigelow, 1894:493; Nobili, 1906:330; Borradaile, 1907:210; Bigelow, 1926:519, figs. 1, 2.

Gonodactylus chiragra spinosus, Lanchester, 1903:454, pl. 23, fig. 14.

Gonodactylus demani spinosus, Kemp, 1913:165, pl. 9, fig. 112; Tattersall, 1921:361; Kemp and Chopra, 1921:311; Ramadan, 1936:9; Dollfus, 1938:215, fig. 17; Chopra, 1939:172.

Material. 1 ♀, 17.2 mm; YSE Sta. 30A; Bird Is., Seychelles; W. D. Hartman; 6 November 1957; YPM 4334.

Remarks. As first pointed out by Kemp and Chopra (1921) and confirmed by Bigelow (1926), *G. spinosus* differs from *G.*

demani in having the inner branch of the uropod setose on all margins; in *G. demani* the inner margin is devoid of setae.

There is no reason to maintain *spinosus* as a variety or subspecies of *G. demani*, Varietal status does not have nomenclatural significance, and as both *spinosus* and *demani* are sympatric in the Red Sea as well as in other areas, they cannot be regarded as subspecies. No overlap or variation has been shown in the main character used to separate the two, so they must be regarded as distinct species.

Chopra (1939) records this species from Mauritius to the Gulf of Suez, Red Sea, and Persian Gulf, and from Zanzibar to the Sea of Java, and Borradaile (1907) reported it from the Seychelles.

Gonodactylus falcatus (Forskål, 1775)

Cancer falcatus Forskål, 1775:96.

Gonodactylus glabrous Brooks, 1886:62, pl. 14, fig. 5, pl. 15, figs. 7-9; Kemp, 1913:167, pl. 9, fig. 113.

Gonodactylus falcatus, Holthuis, 1941:284, fig. 9a.

MATERIAL. 1 ♂, 40.1 mm; YSE Sta. 9; seined offshore, Point Elizabeth, north of Trincomalee, Ceylon; N. Mahadeva; YPM 4327.

1 ♂, 28.3 mm; YSE Sta. 22; Hulule Is., N. Male Atoll, Maldives; W. D. Hartman; 5 October 1957; YPM 4358.

3 ♀ ♀, 29.7-35.9 mm; YSE Sta. 36; in coral cavities, Anse à la Mouche (northern reef), Mahé Is., Seychelles; W. D. Hartman; 24 November 1957; YPM 4335.

2 ♀ ♀, 35.0-43.3 mm; YSE Sta. 36; Anse à la Mouche (northern reef), Mahé Is., Seychelles; A. J. Kohn; 22 December 1957; YPM 4336, 4337.

Gonodactylus crinitus, new species

Figure 1

Holotype. 1 ♀, 27.5 mm; YSE Sta. 33; Beau Vallon, Mahé Is., Seychelles; A. J. Kohn; 1 February 1958: YPM 4459.

Paratypes. 1 ♀, 26.4 mm; data as in holotype; YPM 5510.

♀ ♀, 28.2-28.8 mm; YSE Sta. 55; La Passe, Silhouette Is., Seychelles; A. J. Kohn; 6 February 1958; YPM 4340.

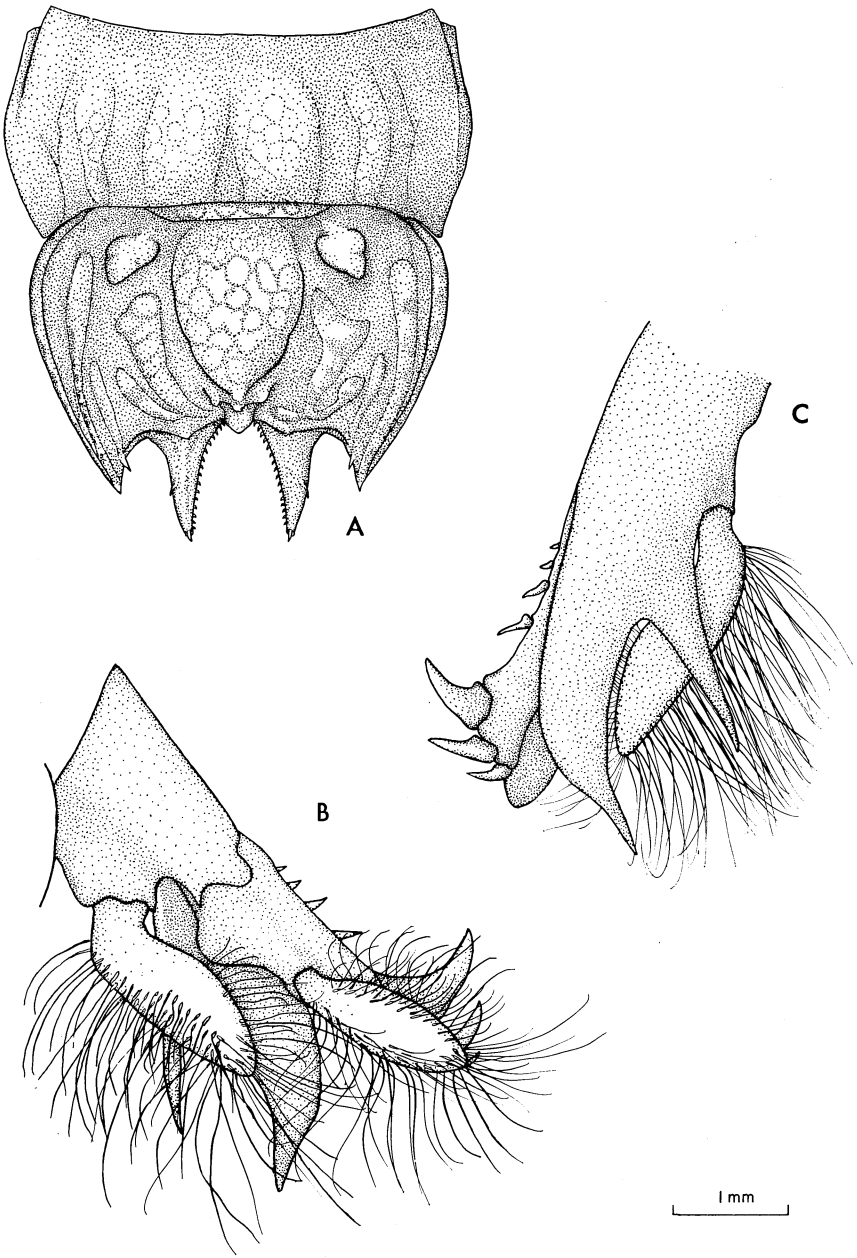

Figure 1. *Gonodactylus crinitus,* n. sp. Female paratype, Mahé Is., Seychelles. A. Sixth abdominal somite and telson. B. Dorsal view of right uropod. C. Ventral view of right uropod. Telson length = 2.9 mm.

Description. Rostral plate with three sharp anterior spines; median spine elongate, extending beyond base of eyes; lateral spines broader, shorter, extending to base of eyes; rostral width at anterolateral angles greater than median length.

Carapace with anterolateral margins distally truncate and extending well beyond base of rostral plate; lateral margins of carapace sinuate; posterior breadth greater than anterior.

Mandibular palp two- or three-segmented; five epipods present; antennal scale extending to or beyond middle of cornea.

First five abdominal somites wtih an impressed pit on upper median portion of pleuron; second to fifth somites with "reversed-L-shaped" groove anterolaterally; sixth abdominal somite with six longitudinal carinae, submedians broader than intermediates and all are swollen, with irregular margins.

Telson with eleven dorsal carinae and four posterior spines, submedians with movable tips; anterior pair of tubercles present; median carina swollen, with irregular margins; posterior margin of telson with a prominent median tubercle; above and anterior to this tubercle lie a pair of submedian tubercles: three carinae between median carina and carina of intermediate tooth; first pair not extending to anterior margin, flattening and widening anteriorly, converging posteriorly; second pair much shorter than first, converging posteriorly, not extending anteriorly past middle of telson; first and second pair (lateral to median carina) may fuse posteriorly in a transverse carina that runs toward median distal tubercle; third pair thinner, lying mesial to posterior portion of the carina of the intermediate tooth; carinae of intermediate tooth long, well-defined, extending almost to anterior margin of telson; marginal carinae sharp, fusing posteriorly with carina of intermediate tooth; a transverse, raised ridge, biconcave posteriorly, extends from base of third pair of carinae to base of carina of submedian tooth and from there to under the median tubercle; submedian teeth with movable apices and with 13-17 minute denticles on inner margin and a spinule on outer margin; intermediate teeth with a spinule on inner margin.

Uropods with penultimate segment of outer branch not setose, extending beyond distal segment; penultimate segment armed with seven lateral spines, first four small, movable, last three fixed, large, antepenultimate by far the largest; last three with tips corneous and strongly recurved; distal segment of outer branch elongate, paddle-shaped, dorsal margin setose on either side, median strip not setose, ventral margin not setose; inner branch elongate, outer margin convex, tapering to tip, inner half of dorsal margin setose, with proxi-

mal third of outer half without setae, ventral margin without setae; basal prolongation with proximal spine slender, almost as long as distal spine; distal spine recurved dorsally, outer margin concave distally.

Color. Largely faded in preservative; carapace and body mottled green and white; eyestalks with scattered dark chromatophores; mottling very pronounced on sixth abdominal somite and telson, carinae of telson appearing banded with white and green.

Measurements. Holotype: total length, 27.5 mm; carapace length 5.6 mm; telson length, 2.9 mm; telson width, 3.6 mm. Female paratype, YSE Sta. 33: total length, 26.4 mm; carapace length, 5.0 mm; telson length, 2.9 mm; telson width, 3.4 mm.

Discussion. *G. crinitus* is closely related to both *G. fimbriatus* Lenz and *G. brevisquamatus* Paul'son, but differs from both in having 11 dorsal carinae on the telson, lacking setation on the dorsal surface of the proximal segment of the uropod, and lacking ventral setation on the ventral surface of the uropod. Differences between the three species are summarized in Table 1.

G. fimbriatus has been synonymized with *G. brevisquamatus* since the remarks of Kemp (1913) and Tattersall (1921) based on an unpublished account by Patience in which the two were synonymized. The two species have not been directly compared since that time. Tattersall's action was followed by Kemp and Chopra (1921), Ramadan (1936), and Dollfus (1938). Serène (1949) kept the two species separate in his discussion of the position of *G. strigatus* Hansen. The two species are very closely related and in my opinion they are distinct. An adequate series might show that they deserve only subspecific status.

Four specimens of *G. fimbriatus* (all ♀ ♀, total length 21.4-30.7 mm; Zanzibar; Cooke, col.; MCZ 7817) and one of *G. brevisquamatus* (♀, 27.2 mm; Tella Tella Kebira, Sudanese Red Sea; C. Crossland, col.; B. M. (N. H.) registry 1936.9.30. 1-2) were examined; the latter specimen was one of those examined by Tattersall (1921). The following notes were taken from this material.

TABLE 1. Comparison of

Gonodactylus brevisquamatus Paul'son, *G. fimbriatus* Lenz, and *G. crinitus* n. sp.

	G. brevisquamatus	*G. fimbriatus*	*G. crinitus*
Telson			
Dorsal Carinae	9	9	11
Submedian denticles	± 14, in one series	10-12 in 2 series	13-17 in one series
Intermediate denticles	1 on submedian, 1 on intermediate tooth	6-10 in 2 series on submedian, 6-8 on intermediates	1 on submedian, 1 on intermediate
Uropods			
Exopod, prox. seg.	with a dorsal patch of setae	with a dorsal patch of setae	no dorsal patch of setae
Exopod, distal seg.	broadly rounded distally, outer and inner margins about equally convex; setose proximally on dorsal margin, all of dorsal setae short	tapering distally, outer margin much more convex than inner; setose proximally on dorsal margin, all of dorsal setae short	tapering distally outer and inner margins about equally convex; non-setose prox. on dorsal margin, all of dorsal setae long
Endopod	short, rounded distally; completely setose ventrally	short, bluntly truncate distally; completely setose ventrally	elongate, tapering distally; no ventral setae
Basal prolongation	outer spine much larger than inner	outer spine much larger than inner	inner outer spine slightly larger than

G. fimbriatus and *G. brevisquamatus* are very similar in general appearance. They differ primarily in the number and arrangement of submedian and intermediate spinules on the telson (Table 1) and in the shape of the uropod segments. A ventral view of the uropod of each species is shown in Figure 2; setation is omitted for clarity. In *G. brevisquamatus*, the distal segment of the outer branch is broadly rounded and the inner branch tapers distally. In *G. fimbriatus*, the distal segment

of the outer branch tapers and the inner branch is truncate distally. Both are similar in lateral spination of the proximal segment of the outer branch. The inner spine of the basal prolongation is comparatively longer in *G. brevisquamatus*. Both species have a pair of short submedian carinae on the ventral surface; these carinae converge anteriorly but do not meet.

Figure 2. A. *G. brevisquamatus* Paul'son, Red Sea, ventral view of right uropod; B. *G. fimbriatus* Lenz, Zanzibar, ventral view of right uropod. Smaller lateral spines present in both species; they are obscured by the basal prolongation in 2A.

The setation of the uropods is characteristic in both. The proximal segment of the outer branch bears a prominent, circular patch of setae on the dorsal surface. The ventral surface of the uropods is completely setose, with a thick, circular, proximal patch of strong setae.

G. fimbriatus has been reported from Zanzibar (Lenz, 1905: 38, pl. 47, fig. 11; 1910:572) and Coëtivy, Seychelles (Borradaile, 1907:211). Serène (1949:231, 235) mentioned a specimen from the Mergui Archipelago, perhaps from Kemp's (1913:175) reference to Patience's material.

Other than Patience's questionable record of *G. brevisquamatus* from the Mergui Archipelago, that species is known only from the Red Sea. Patience's specimens may actually have belonged to *G. fimbriatus* rather than *G. brevisquamatus*. The following papers record *G. brevisquamatus:* Paul'son, 1875: 127, pl. 21, fig. 3; Nobili, 1906:331; Kemp, 1913:174, pl. 10, figs. 115, 116; Tattersall, 1921:362, pl. 27, figs. 5, 6; Kemp and Chopra, 1921:311; Ramadan, 1936:10; Dollfus, 1938:222, fig. 21.

Remarks. The curious arrangement of setae and spines on the uropods of *G. brevisquamatus* and *G. fimbriatus* is perhaps worthy of further mention. The large, recurved spines on the uropod may be used by the animal to "lock" itself in its burrow. The uropods are curved ventrally, so that the telson and uropods together form half of a circle. The inner branches of the uropods recurve dorsally. The setae of the uropods are so arranged that, when viewed from behind the animal, they appear as a rounded "basket," as if they were utilized as a filtering apparatus. All of the specimens of *G. fimbriatus* had the setose areas loaded with detritus and sand which had to be washed away before the uropod structure could be observed.

The significance of these structures is not readily apparent. The mouthparts and raptorial claws appear unmodified, and it seems unlikely that these species are filter-feeders. Observations on these species in the field would be most welcome.

Characters based on the relative length of the rostral plate or antennal scale in relation to the eye must be used with some caution in the stomatopods. Such characters vary according to

the state of contraction or expansion of the body at preservation. In future work, more attention should be given to the shape of the uropods and their investment of setae. These characters coupled with the configuration of the telson are apparently diagnostic in this group of *Gonodactylus* (Group II of Kemp, 1913).

Name. The specific name is from the Latin, "crinitus," fringed, and refers to the setation of the uropods.

Gonodactylus lenzi Holthuis, 1941

Protosquilla glabra Lenz, 1905:388, pl. 47, fig. 13; Lenz, 1910: 572 [listed only].

Gonodactylus glaber, Kemp, 1913:182, pl. 10, fig. 121; Kemp, 1915:186; Roxas and Estampador, 1930:124, pl. 3, fig. 5; Roxas, 1930:18; Chopra, 1934:42; Gravier, 1937:208; Serène, 1947:385, fig. 1, pl. 2.

Gonodactylus lenzi Holthuis, 1941:288; Tiwari and Biswas, 1952: 362; Serène, 1954:6 [larval stages, p. 34 *et seq.*].

MATERIAL. 1 ♂, 25.7 mm; YSE Sta. 33; Beau Vallon, Mahé Is., Seychelles; inhabiting dead corals; A. J. Kohn; 1 February 1958; YPM 4458.

REMARKS. The specimen agrees with Kemp's account in almost all respects. The posterior spines of the telson are of equal size. The corrugations of the lateral margins of the telson are not visible, but the three central bosses of the telson are faintly corrugated.

The specimen figured by Serène (1947) has the bosses of the telson much more inflated than in the present specimen; both Serène and Gravier (1937) commented on the variability of the median bosses of the telson.

The color pattern in preservative is striking. The antennular flagella are banded purple and white. The rostral plate, ophthalmic somite and the two distal segments of the raptorial claw are bluish with scattered dark chromatophores. The body is cream colored and densely covered with dark chromatophores which are aggregated in dark patches on the posterior portion of the carapace, sixth and seventh thoracic somites,

and second to fourth abdominal somites. Kemp (1913) found these patches on the first, fourth, and fifth abdominal somites. The fifth and sixth abdominal somites, telson, and uropods are outlined in blue.

This species has not previously been recorded from the Seychelles. The records in the literature are: Zanzibar (Lenz, 1905); Ceylon (Lenz, 1910); Andamans (Kemp, 1913; Tiwari and Biswas, 1952); Nicobars (Chopra, 1934); Bay of Batavia (Holthuis, 1941); Poulo Condore Islands (Gravier, 1937); Nhatrang, Viet Nam (Gravier, 1937; Serène, 1947, 1954); Philippines (Kemp, 1913; Roxas, 1930; Roxas and Estampador, 1930).

Gonodactylus gyrosus Odhner, 1923

Gonodactylus gyrosus Odhner, 1923:11, pl. i, figs. 4, 5; Ward, 1942:56; Tiwari and Biswas, 1952:362, fig. 5; Holthuis, 1953:61.

MATERIAL. 1 ♀, 41.5 mm; YSE Sta. 55; La Passe, Silhouette Is., Seychelles; A. J. Kohn; 6 February 1958; YPM 4341.

REMARKS. The rostral plate of this specimen is somewhat shorter than that illustrated by Tiwari and Biswas (1952), as the median spine does not exceed the cornea. The cornea is noticeably bilobed, and the eyes are comparatively shorter.

The color pattern is similar to that shown by Tiwari and Biswas. The background color is cream, with many dark chromatophores in patterns on the anterior part of the body. The fifth abdominal somite is lined anteriorly and posteriorly with green. The sixth abdominal somite and telson are mottled green and white.

The mandibular palp is present, apparently two-segmented.

This species has not previously been recorded from the Seychelles. The records in the literature are: Arno Atoll, Marshall Is. (Holthuis); Gilbert Islands (Odhner); Andamans (Tiwari and Biswas); Diego Garcia, Chagos Archipelago (Ward).

Gonodactylus guerini White, 1861

Gonodactylus guerini White, 1861:43, pl. 6; Bigelow, 1931:139 [and synonymy]; Townsley, 1953:423, figs. 20, 21a-f; Serène, 1954: 52 [discussion only].

MATERIAL. 1 ♀, 35.5 mm; YSE Sta. 41A; anchorage off Menai Is., Cosmoledo Atoll; 25 fms.; W. D. Hartman; 12 December 1957; YPM 4447.

REMARKS. The specimen agrees well with the description given by Bigelow (1931). The right submedian elevation of the telson bears a curved row of six instead of five spines as in Bigelow's material.

The color is as noted by Bigelow, with two dark transverse bands on the carapace; each of the thoracic and abdominal somites are banded. The spines of the telson are flushed with pink.

Bigelow gave a complete synonymy, which will not be repeated here, and recorded the following distribution: Hawaii, Marquesas, Fiji, and Mauritius, in depths ranging from a few feet to 60 fms. Townsley (1953) reported on other Hawaiian specimens in depths of 50 to 120 fms. The present specimen extends the range 900 miles to the north of Mauritius.

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