

## The stomatopod Crustacea of Guam

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**Abstract**—Thirty-two species of stomatopod crustaceans are reported from Guam and 2 additional species from the Northern Marianas. Twenty-seven are recorded for the first time from the region. Three new species, *Chorisquilla kroppi*, *Mortensenenus paulay* and *Parvisquilla dominguez* are described. *Manningia zehntneri* Manning 1974, *Pullosquilla malayensis* (Manning 1968), *Haptosquilla tanensis* (Fukuda 1911a), and *Hoplosquilla said* Erdmann & Manning 1998, previously known only from their respective type localities, are reported for the first time since they were first described.

### Introduction

The Stomatopoda of Guam are known only from the accounts of Edmondson (1921), Manning (1967b, 1971b), Kropp & Dominguez (1990), Manning et al. (1990) and Ah Yong (2000) which together report a total of seven species: *Bathysquilla microps* (Manning 1961), *Indosquilla manihinei* Ingle & Merrett 1971, *Pseudosquilla ciliata* (Fabricius 1787), *Gonodactylus platysoma* Wood-Mason 1895, *Oratosquilla fabricii* (Holthuis 1941), *Mesacturus dicrurus* Kropp & Dominguez 1990, and *Gonodactylellus erdmanni* Ah Yong 2001 (as *G. incipiens* (Lanchester 1903)). The present report is based primarily on stomatopods collected by Roy Kropp (RK) and Jane Dominguez (JD) from coral reef habitats around Guam. Additional material from the Australian Museum, Raffles Museum, and collections made by Gustav Paulay are also included herein. In addition, several specimens of species collected from Pohnpei and Palau by RK and JD are also included in the account to document the presence of those species. Thirty-four species are reported below. Twenty-five species are reported for the first time from Guam and 2 additional species are reported from the Northern Marianas. Three species are described as new.

## Materials and Methods

Terminology and size descriptors follow Ahyong (2001). All measurements are in millimeters (mm). Total length (TL) is measured along the midline from the tip of the rostrum to the apices of the submedian teeth. Carapace length (CL) is measured along the midline and excludes the rostral plate. Other abbreviations used in this account include: antennule (A1); antenna (A2); abdominal somite (AS); thoracic somite (TS); median (MD); submedian (SM); intermediate (IM); lateral (LT); marginal (MG); maxilliped (MXP); pleopod (PLP). Specimens are deposited in the collections of the Australian Museum, Sydney (AM), the Florida Museum of Natural History, University of Florida (UF), Museum für Naturkunde, Humboldt-Universität, Berlin (ZMB), National Museum of Natural History, Smithsonian Institution, Washington D.C. (USNM), Swedish Museum of Natural History, Stockholm (SMNH), and Zoological Reference Collection, Raffles Museum, National University of Singapore (ZRC).

## Systematic Account

Bathysquilloidea Manning 1967a

Bathysquillidae Manning 1967a

*Bathysquilla microps* (Manning 1961)

*Lysiosquilla microps* Manning 1961: 693-696, figs.1-5 [type locality: SE of Tortugas, Florida Straits, 24°11.0'N, 83°21.5'E].

*Bathysquilla microps*. — Manning et al. 1990: 313-314, fig. 1. — Ahyong 2001: 12-14, fig. 7.

**Material:** USNM 228146, 1 female (TL 183 mm), between Agana and Agat, Guam, 641 m, JD, May 1982.

**Measurements:** Female ( $n = 1$ ) TL 183 mm.

**Remarks:** Previously reported from Guam by Manning et al. (1990).

**Distribution:** Tropical Western Atlantic and the Indo-West Pacific from Hawaii, the Philippines, Guam, and Australia.

Indosquillidae Manning 1995

*Indosquilla manihinei* Ingle & Merrett 1971

*Indosquilla manihinei* Ingle & Merrett 1971: 193-197, figs. 1-9 [type locality: S of Menai Id., Cosmoledo Atoll, Indian Ocean, 9°44'S, 47°30'E].

**Material:** USNM 228147, 1 female (TL 175 mm), Pagan, Mariana Ids., 18°05.2'N, 145°42.8'E, 250-320 fms, shrimp trap, TC 83-05 sta. 20, 24 Nov 1983; USNM 233477, 1 female (TL 220 mm), off Hospital Pt., Guam, 450 m, shrimp trap, L. Eldredge, Nov 1973-Apr 1974.

**Measurements:** Female ( $n = 2$ ) TL 175-220 mm.

**Remarks:** Previously reported from Guam by Manning et al. (1990).

**Distribution:** Indian Ocean eastwards to French Polynesia.

Eurysquilloidea Manning 1977  
 Eurysquillidae Manning 1977  
*Manningia zehntneri* Manning 1974

*Manningia zehntneri* Manning 1974: 69-72, fig. 1 [type locality: Mauritius].

**Material:** USNM 307137, 1 female (TL 106 mm), S of Atao Beach, Guam, reef kill, 22 Sep 1982.

**Measurements:** Female ( $n = 1$ ) TL 106 mm.

**Remarks:** The specimen agrees well with the type description of *M. zehntneri* and represents the second known specimen of the species. As determined from the specimen, *M. zehntneri* bears separate ocular scales and a single ventral papilla on the antennal protopod, as in other species of the genus. These features could not be determined from the dry holotype (Manning 1974). The present record is also significant as the first record of the species since its description, as well as the first record of the species from outside the Indian Ocean.

**Distribution:** Mauritius, Indian Ocean, and now from Guam.

Gonodactyloidea Giesbrecht 1910  
 Gonodactylidae Giesbrecht 1910  
*Gonodactylaceus falcatus* (Forskål 1775)

*Cancer falcatus* Forskål 1775: 96 [type locality: Djeddah, Red Sea, by neotype selection (Manning & Lewinsohn 1981)].

*Gonodactylus chiragra* var. *mutatus* Lanchester 1903: 450 [type locality: Furnadu Velu, Miladummadulu Atoll, Maldive Ids., 6°00'N, 73°10'E].

*Gonodactylus glaber* var. *rotundus* Borradaile 1907: 211-212, pl. 22: fig. 2 [type locality: Coetivy, Seychelle Ids., 7°08'S, 56°16'E, and Zanzibar, 6°10'S, 39°12'E].

*Gonodactylus insularis* Manning & Reaka 1982: 347-351, figs. 1, 2 [type locality: Kidrenen Id., Enewetak, 11°22'50"N, 162°10'30"E].

*Gonodactylus aloha* Manning & Reaka 1981a: 190-200, figs. 1-3 [type locality: Oahu, Hawaiian Ids.].

*Gonodactylus siamensis* Manning & Reaka 1981b: 479-482, fig. 1 [type locality: Sattahip, Gulf of Thailand, 12°40'N, 100°52'E].

*Gonodactylus takedai* Moosa 1989: 225-226, fig. 1 [type locality: Ogasawara Ids., Japan].

*Gonodactylaceus gravieri* Manning 1995: 42, 43, 46-48, fig. 13 [type locality: Poulo Condore, Vietnam].

*Gonodactylaceus falcatus*. — Manning 1995: 42. — Ahyong 2001: 35-38, fig. 17.

**Material:** USNM 304400, 2 males (TL 14-27 mm), 2 females (TL 16-31 mm), Family Beach, Apra Harbour, Guam, 1 m, rubble, RK & JD; USNM 304401, 1 female (TL 21 mm), Apra Harbour, Guam, 21 m, rubble, RK, 15 Mar 1984; USNM 304402, 1 male (TL 20 mm), 1 female (TL 40 mm), Guam, RK;

USNM 304410, 1 female (TL 22 mm), Western Shoals, Guam, 21 m, RK, 1 Feb 1980; USNM 304411, 1 female (TL 42 mm), Guam, RK, 25 May 1979; USNM 304412, 1 male (TL 27 mm), Tanapag, Saipan, RK, 7 Jan 1979; USNM 304413, 1 female (TL 31 mm), shoal at entrance to Sasa Bay, Guam, rubble, RK, 16 Oct 1980; USNM 304414, 2 males (TL 18-19 mm), 3 females (TL 32-33 mm), Family Beach Apra Bay, Guam, 1.2 m, reef flat, silty sand with *Padina*, *Halimeda* and some coral, RK, 27 Oct 1989; USNM 304417, 1 male (TL 12 mm), Double Reef, Guam, 12 m, RK, 3 Aug 1984; USNM 304418, 1 male (TL 22 mm), Family Beach, Apra Harbour, Guam, 0.9 m, RK, 20 Oct 1984; USNM 304419, 1 female (TL 17 mm), Western Shoals, Guam, from dead coral, RK, 1 Feb 1980; USNM 304420, 1 male (TL 17 mm), Western Shoals, Guam, from sponge, RK, 30 Aug 1979; USNM 304422, 1 female (TL 15 mm), Apra Harbour, Guam, 4.5 m, rubble, RK, 25 Sep 1984; USNM 304589, 1 female (TL 19 mm), Apra Harbour, Guam, 12-18 m, sandy mud, dredged, L. Eldredge & G. Vermeij, 30 Jul 1984; USNM 304590, 1 female (TL 13 mm), Apra Harbour, Guam, 3 m, rubble, RK, 14 Sep 1984; UF 243, 1 female (TL 36 mm), Ypao Beach, Guam, from *Acropora*, 27 Jul 1973; UF 966, 1 male (TL 34 mm), Sasa Bay, Guam, R. Myers; UF 248, 1 male (TL 35 mm), 1 female (TL 24 mm), Apra Harbour, Guam, 20 Nov 1976.

**Measurements:** Male ( $n = 11$ ) TL 12-35 mm, female ( $n = 15$ ) TL 13-33 mm.

**Remarks:** *Gonodactylaceus falcatus* was collected primarily from shallow rubble habitats from the shore to 12-18 m. As with Australian material studied by Ahyong (2001), the condition of the median carinule on AS6 in specimens from Guam is variable, being present in largest specimens and indistinct or absent in smaller specimens. Although Ahyong (2001) synonymized *G. takedai* with *G. falcatus*, the former species was inadvertently omitted from the synonymy list.

**Distribution:** Western Indian Ocean to Australia, Japan and the Central Pacific. A new record for Guam.

*Gonodactylaceus ternatensis* (de Man 1902)

*Gonodactylus glabrous* var. *ternatensis* de Man 1902: 914 [part, type locality: Ternate, Indonesia, 0°48'N, 127°20'E].

*Gonodactylaceus ternatensis*. — Manning 1995: 42, 51-55, pl. 1-2, figs. 8a, b, 9f, 10d, 11e, 17-19. — Ahyong 2001: 42-43, fig. 20.

**Material:** USNM 304416, 1 male (TL 24 mm), Western Shoals, Guam, 9 m, from *Pocillopora damicornis*, RK, 27 Apr 1979; USNM 304421, 1 female (TL 17 mm), Western Shoals, 17 m, RK, 1 Feb 1980; USNM 304423, 1 female (TL 14 mm), Cabras, Guam, 36 m, on dead *Acropora*, RK, 15 Jan 1981.

**Measurements:** Male ( $n = 1$ ) TL 24 mm, female ( $n = 2$ ) TL 14-17 mm.

**Distribution:** Andaman Sea, Indonesia, Australia, the South China Sea, Samoa, and now from Guam.

*Gonodactylellus erdmanni* Ahyong 2001

*Gonodactylus incipiens*. — Manning 1967b: 18 [part, not *G. incipiens* Lanchester 1903].

*Gonodactylellus erdmanni* Ahyong 2001: 51-53, fig. 24 [type locality: Townsville, Australia].

**Material:** USNM 304403, 1 male (TL 13 mm), 1 female (TL 25 mm), Tumon Bay, Guam, reef flat, RK; USNM 304404, 1 male (TL 12 mm), 1 female (TL 25 mm), Taragi Beach, Guam, outer reef flat, rubble, RK, 3 Nov 1979; USNM 304405, 2 males (TL 15-24 mm), 1 female (TL 23 mm), Piti Bay, Guam, mid moat, rubble, RK, 26 Jan 1984; USNM 304406, 1 female (TL 20 mm), Apra Harbour, Guam, 1.8 m, limestone pavement, RK, 20 Mar 1984; USNM 304407, 1 female (TL 12 mm), Agana Bay, Guam, outer moat, reef flat, rubble, 0.6 m, RK, 5 Mar 1984; USNM 304409, 1 female (TL 10 mm), Tweed's Cave, Guam, 13°34.9'N, 144°49.8'E, 9.1 m, R. Bolland, 25 Nov 1983; USNM 304415, 2 females (TL 15-17 mm), Saipan, RK; USNM 304452, 1 male (TL 15 mm), 1 female (TL 18 mm), off N coast Anae Id., Agat Bay, Guam, reef front on *Pocillopora elegans*, RK, 2 Jun 1986; USNM 304471, 1 female (TL 18 mm), Piti Bay, Guam, outer reef flat, low tide, under rocks in channel, RK, 25 Jun 1986; USNM 304473, 1 male (TL 14 mm), 1 female (TL 20 mm), Family Beach, Luminao, Guam, 1 m, outer reef flat, dead coral, RK, 14 Jun 1986; USNM 304474, 1 male (TL 18 mm), Piti Bay, Guam, near mouth of Tepungan channel, very low tide, 0.2 m, under partially consolidated boulders, RK, 25 May 1986; USNM 304476, 1 female (TL 18 mm), W of Camel Rock, Piti Bay, Guam, 0-3 m, outer reef flat, RK, 18 May 1986; USNM 304478, 1 female (TL 9 mm), Tanguisson Point, Guam, on dead branching coral at reef front near communications cable, 24 m, RK, 16 Jun 1986; USNM 304479, 1 male (TL 11 mm), Pago Bay, Guam, 0.2 m, outer reef flat, under rocks, RK, 24 May 1986; USNM 304535, 1 female (TL 19 mm) Anae Id., Guam, limestone substrate, RK, 4 Sep 1984; USNM 304555, 2 males (TL 13-19 mm), Luminao, 0.3-0.6 m, reef flat, rubble, RK; USNM 304556, 1 male (TL 8 mm), 1 female (TL 13 mm), off Gold Dome, Agana Bay, Guam, 7.5 m, rubble, RK, 7 May 1984; USNM 304557, 1 male (TL 15 mm), 1 female (TL 18 mm), Luminao, Guam, 0.3-0.6 m, reef flat, rubble, RK, 8 Oct 1984; USNM 304558, 1 male (TL 9 mm), 1 female (TL 11 mm), Luminao, reef flat, on dead *Pocillopora*, RK, 4 May 1980; USNM 304559, 2 males (TL 13-15 mm), 1 female (TL 16 mm), Luminao, outer moat, reef rock with coralline algae, RK, 11 Sep 1980; USNM 304560, 1 female (TL 21 mm), Tanguisson Pt., Guam, outer reef flat, RK, 10 Mar 1980; USNM 304563, 1 male (TL 11 mm), 1 female (TL 9 mm), Tumon Bay, Guam, 10.5 m, dead branching coral, RK, 8 Nov 1984; USNM 304564, 1 male (TL 18 mm), SW corner Cocos Lagoon, 1.5 m, rubble, just inside barrier reef, RK, 3 Oct 1984; USNM 304565, 1 male (TL 17 mm), off Gold Dome, Agana Bay, Guam, 12.6 m, rubble covered in pink-purple coralline algae, RK, 25 Apr 1984; USNM 304566, 1 male (TL 16 mm), Luminao, 0-2 m, reef flat corals, RK, 20 Oct 1984; USNM 304567, 1 female (TL 12 mm), Pago Bay, 1.8 m, rubble, RK, 28 Feb 1984; USNM 304568,

1 male (TL 14 mm), Tumon Bay, Guam, coral, RK; USNM 304569, 1 female (TL 17 mm), Pago Bay, Guam, turfy algae, RK, 31 Oct 1984; USNM 304570, 1 female (TL 10 mm), Luminao, reef rock & coral, RK, 28 Mar 1980; USNM 304571, 1 female (TL 17 mm), Merizo, Achang Bay, Guam, from intertidal *Enhalus* bed, RK, 4 Jul 1981; USNM 304572, 1 male (TL 14 mm), Ipan, Guam, reef flat, consolidated coralline algae behind algal ridge, RK, 23 Oct 1984; USNM 304574, 1 male (TL 13 mm), Luminao, Guam, reef flat, from clump of articulated coralline algae, RK, 27 Oct 1984; USNM 304575, 1 female (TL 8 mm), Pago Bay, Guam, reef flat in front of marine lab, algal turf mat, RK & JD, 12 Oct 1984; USNM 304576, 1 female (TL 15 mm), Tumon Bay, Guam, 10.5 m, rubble, RK, 8 Nov 1984; USNM 304577, 1 male (TL 14 mm), Pago Bay, turfy algae, RK, 20 Oct 1984; USNM 304578, 2 males (TL 20-21 mm), Luminao, Guam, 0.9 m, rubble, RK, 13 Oct 1984; USNM 304580, 1 male (TL 17 mm), SW corner Cocos Lagoon, 1.5 m, rubble, inside barrier reef, RK, 3 Oct 1984; USNM 304582, 1 male (TL 11 mm), 1 female (TL 8 mm), Guam, 0.3-0.6 m, reef flat, RK, 8 Oct 1984; USNM 304583, 1 male (TL 16 mm), 300 m N of boat basin, Agana Bay, Guam, 7.5 m, RK, 20 Feb 1984; USNM 304584, 1 female (TL 12 mm), off Gold Dome, Agana Bay, Guam, 12.6 m, rubble, RK, 24 Apr 1984; USNM 304585, 1 male (TL 15 mm), 1 female (TL 15 mm), Luminao, 0.3-0.6 m, reef flat, RK, 8 Oct 1984; USNM 304586, 3 males (TL 8-13 mm), off Gold Dome, Agana Bay, Guam, 12.6 m, rubble, RK, 25 Apr 1984; USNM 304587, 2 males (TL 14-17 mm), ½ mile N of Gaan Pt., Agat Bay, Guam, rubble, RK, 20 Mar 1984; USNM 304588, 2 males (TL 12-15 mm), 5 females (TL 14-16 mm), ½ mile N of Nimitz Beach, Agat Bay, Guam, 1.2-1.5 m, RK, 29 Mar 1984; USNM 304592, 1 female (TL 17 mm), Luminao, mixed coral, RK, 4 Sep 1980; USNM 304594, 1 female (TL 23 mm), Tumon Bay, 0-1 m, outer reef flat platform, consolidated rubble, RK, 23 Mar 1984; USNM 304595, 1 male (TL 15 mm), Pago Bay, Guam, middle reef flat in front of marine lab, algal turf mat, RK & JD, 20 Oct 1984; USNM 304596, 1 female (TL 11 mm), Luminao, Guam; USNM 304597, 1 male (TL 14 mm), 1 female (TL 15 mm), Luminao, Guam, reef flat, dead *Pocillopora*, RK, 5 Apr 1980; USNM 304598, 1 male (TL 19 mm), off Gold Dome, Agana Bay, Guam, 7.5 m, dead branching coral, RK, 20 Feb 1984; USNM 304599, 1 female (TL 8 mm), Luminao, Guam, from algae, RK, 8 Aug 1984; USNM 304600, 1 male (TL 11 mm), 1 female (TL 11 mm), Luminao, Guam, under rock, RK, 28 Mar 1980; USNM 304601, 1 male (TL 12 mm), 4 females (TL 9-12 mm), Piti Bay, Guam, reef flat, 0-1 m, RK; USNM 304602, 1 female (TL 15 mm), Asan Reef, Guam, reef flat, under rocks, RK, 16 May 1984; USNM 304603, 1 male (TL 11 mm), Luminao, outer reef moat, RK, 11 Sep 1980; USNM 304604, 1 female (TL 18 mm), Piti Bay, Guam, coral head, 31 Aug 1976; USNM 304605, 1 female (TL 23 mm), Apra Harbour, Guam, coral, W. Brown, Nov 1975; USNM 304606, 1 male (TL 14 mm), off Gold Dome, Agana Bay, Guam, 12.6 m, rubble, RK, 25 Apr 1984; USNM 304609, 1 male (TL 17 mm), Tumon Bay, 0-1 m, rubble, outer reef platform, RK, 23 Mar 1984; USNM 301610, 1 male (TL 14 mm), Pago Bay, Guam, RK, 16 Sep 1975;

USNM 304612, 1 female (TL 9 mm), Guam, from *Halimeda*, RK; USNM 304613, 1 female (TL 14 mm), Piti Bay, Guam, 1-1.5 m, rubble, reef flat, JD, 26 Jan 1984; USNM 304619, 3 males (TL 16-17 mm), 5 females (TL 9-19 mm), Agana Bay, Guam, 9 m, RK, 11 Sep 1984; USNM 304620, 1 male (TL 9 mm), 2 females (TL 17-20 mm), off Gold Dome, Agana Bay, 12.6 m, dead branching coral, RK, 25 Apr 1984; USNM 304622, 1 male (TL 12 mm), Guam, RK; USNM 304623, 1 female (TL 12 mm), N of power plant, Tanguisson Pt., Guam, 18 m, rubble, RK, 7 Feb 1984; USNM 304624, 1 female (TL 12 mm), near Camel Rock, Piti Bay, inner reef margin, under rocks, RK, 16 May 1984; USNM 304621, 4 females (TL 9-17 mm), off Piti Channel, Cabras Id., Guam, 12 m, RK, 31 May 1984; USNM 304625, 2 females (TL 14-16 mm), Piti Bay, Guam, 0-1 m, rubble, reef flat, RK, 24 Jan 1984; USNM 304627, 1 male (TL 11 mm), Piti 'Bomb Holes', Guam, 1-1.5 m, RK, 21 Jan 1984; USNM 304629, 1 male (TL 17 mm), off Gold Dome, Agana Bay, Guam, 10.5 m, RK, 3 Feb 1984; USNM 304631, 1 male (TL 20 mm), Ypao Beach, Guam, mid moat, reef rock, RK, 3 Oct 1979; USNM 304632, 1 female (TL 19 mm), Piti Bay, Guam, on *Pavona* sp., JD, 28 Jun 1980; USNM 304633, 1 male (TL 14 mm), Tanguisson Pt., Guam, 10.5 m, rubble, RK, 30 Oct 1979; USNM 304634, 1 female (TL 15 mm), Tanguisson Pt., Guam, 4.5 m, reef rock, RK, 30 Oct 1979; USNM 304635, 1 male (TL 10 mm), Tanguisson Pt., Guam, RK, 6 Mar 1980; USNM 304636, 1 male (TL 13 mm), N of power plant, Tanguisson Pt., Guam, 18 m, rubble, RK, 7 Feb 1984; USNM 304638, 1 female (TL 16 mm), entrance to Pitt Bay, Guam, 3 m, rubble, 24 Nov 1980; USNM 304639, 1 male (TL 19 mm), 1 female (TL 11 mm), Pago Bay, 16 Sep 1975; USNM 304641, 1 female (TL 11 mm), Pago Bay, Guam, 16 Sep 1975; USNM 304642, 1 male (TL 16 mm), 1 female (TL 17 mm), Gold Dome, Agana Bay, Guam, 0-0.6 m, outer moat, reef flat, RK, 5 Mar 1984; USNM 304643, 1 male (TL 17 mm), 1 female (TL 13 mm), Double Reef, Guam, 12 m, dead branching coral on sand, RK, 25 Aug 1984; USNM 304644, 2 females (TL 11-14 mm), Double Reef, Guam, 12 m, RK, 24 Aug 1984; USNM 304645, 1 male (TL 17 mm), 1 female (TL 16 mm), Piti Bay, Guam, reef flat, 0-1 m; USNM 304646, 1 female (TL 22 mm), Gold Dome, Agana Bay, Guam, 0-1 m, outer moat, reef flat, base of *Pavona*, 5 Mar 1984; USNM 304647, 2 males (TL 15-19 mm), N of power plant, Tanguisson Pt, Guam, 18 m, rubble, RK, 7 Feb 1984; USNM 304648, 2 females (TL 9-18 mm), Cabras Id., off Piti Channel, Guam, 12 m, RK, 31 May 1984; USNM 304649, 3 males (TL 9-16 mm), Cabras Id., off Piti Channel, Guam, 12 m, RK, 31 May 1984; USNM 304653, 1 female (TL 20 mm), S of Mushroom Id., Rota, on *Psammocora* sp., 1 Feb 1979.

**Measurements:** Male ( $n = 63$ ) TL 8-24 mm, female ( $n = 75$ ) TL 8-25 mm.

**Remarks:** Most specimens agree closely with *Gonodactylellus erdmanni*, recently described from Australia. Several specimens, however, differ in bearing more flattened, less projecting ocular scales and may represent a different species. Presently, those specimens are referred to *G. erdmanni* pending further study of *G. erdmanni*-like species in collaboration with Paul Barber (Harvard University). *Gonodactylellus erdmanni* is common in intertidal or shallow

subtidal reef habitats around Guam (0-12 m but usually 0-3 m) and was previously reported from Ritidian Point, Guam, as *G. incipiens* (see Manning 1967b).

**Distribution:** Australia, Indonesia, Vietnam, French Polynesia, and Guam.

*Gonodactylellus espinosus* (Borradaile 1898)

*Gonodactylus espinosus* Borradaile 1898: 35, figs. 5a-b, pl. 5 [type locality: Rotuma, Fiji Ids.].

*Gonodactylellus espinosus*. — Manning 1995: 56. — Ahyong 2001: 53-55, fig. 25.

**Material:** USNM 304445, 1 male (TL 22 mm), 2 females (TL 32-36 mm), Rarotonga, subtidal, 12 May 1984; USNM 304467, 1 male (TL 28 mm), W of Camel Rock, Piti Bay, Guam, under rocks near channel, RK, 23 Jun 1986; USNM 304468, 4 males (TL 12-17 mm), 2 females (TL 10-13 mm), Guam, on algae, V. Paul; USNM 304469, 1 female (TL 27 mm), W of Camel Rock, Piti Bay, Guam, outer reef flat, RK, 23 Jun 1986; USNM 304472, 1 male (TL 24 mm), Piti Bay, Guam, outer reef flat, low tide, under rocks in channel, RK, 25 Jun 1986; USNM 304637, 1 female (TL 23 mm), Neye Id., Agat Bay, Guam, consolidated coralline algae, RK, 29 Jan 1981.

**Measurements:** Male ( $n = 7$ ) TL 12-28 mm, female ( $n = 6$ ) TL 10-36 mm.

**Distribution:** Eastern Indian Ocean to French Polynesia; now from Guam.

*Gonodactylellus micronesicus* (Manning 1971a)

*Gonodactylus micronesica* Manning 1971a: 77-79, fig. 2 [type locality: W of Parry (Elmer) Id., Eniwetok Atoll, 11°24'05"S, 162°19'05"E].

*Gonodactylellus micronesicus*. — Manning 1995: 56. — Ahyong 2001: 56-58, fig. 27.

**Material:** USNM 304408, 1 female (TL 16 mm), Agana Bay, Guam, 9 m, rubble, RK, 3 Feb 1984; USNM 304477, 3 females (TL 12-16 mm), Agana Bay, Guam, 12 m, on dead coralline consolidated coral, RK, 30 May 1986; USNM 304552, 1 male (TL 18 mm), Agana Bay, Guam, 13 m, dead branching coral, RK; USNM 304554, 1 male (TL 17 mm), 1 female (TL 15 mm), Tumon Bay, Guam, 10.5 m, RK, 8 Nov 1984; USNM 304573, 1 female (TL 11 mm), Tumon Bay, Guam, 10.5 m, rubble, RK, 8 Nov 1984; USNM 304581, 1 male (TL 14 mm), Agana Bay, Guam, 9 m, rubble, RK, 23 Oct 1984; USNM 304591, 1 male (TL 15 mm), Apra Harbour, Guam, 3 m, rubble, RK, 14 Sep 1984; USNM 304593, 1 male (TL 14 mm), 1 female (TL 13 mm), Calalan Bank, Guam, 10 m, dead branching coral, RK, 16 Oct 1984; USNM 304628, 1 male (TL 14 mm), Pago Bay, Guam, 17 m, dead coral, RK, 17 Sep 1980; USNM 304630, 1 female (TL 15 mm), off Gold Dome, Agana Bay, Guam, 10.5 m, dead branching coral, RK, 3 Feb 1984.

**Measurements:** Male ( $n = 6$ ) TL 14-18 mm, female ( $n = 8$ ) TL 11-16 mm.



**Remarks:** *Gonodactylellus micronesicus* occupies similar substrates to *G. erdmanni* but generally occurs at greater depths in Guam (3-17 m, but usually deeper than 9 m). As with specimens reported by Ahyong (2001), the median carina of the telson is either unarmed or bears a small spine or tubercle.

**Distribution:** Enewetak, Guam, and Australia.

*Gonodactylus childi* Manning 1971a

*Gonodactylus childi* Manning 1971a: 75-77 [type locality: Runit (Yvonne) Id., Enewetak Atoll, 11°32'47"S, 162°21'56"E]. — Ahyong 2001: 67, fig. 33.

**Material:** USNM 304444, 1 male (TL 40 mm), Pago Bay, Guam, reef flat near intake channel, low tide, RK, 31 Oct 1984; USNM 304451, 1 male (TL 31 mm), 6 females (TL 18-30 mm), off N coast Ana'e Id., Agat Bay, Guam, reef front on *Pocillopora elegans*, RK, 2 Jun 1986; USNM 304458, 1 female (TL 32 mm), Togcha, Guam, fish kill, Jones et al., 27 Sep 1972; USNM 304459, 1 male (TL 40 mm), Pago Bay, Guam, outer reef flat, under algal mat, RK, 22 May 1986; USNM 304463, 1 female (TL 34 mm), 130 propelagic larvae, Shark's Hole, Guam, 1.2 m, from *Acanthastrea*, RK, 19 Feb 1984; USNM 304640, 1 male (TL 20 mm), Pago Bay, Guam, 16 Sep 1975.

**Measurements:** Male ( $n = 4$ ) TL 20-40 mm, female ( $n = 8$ ) TL 18-34 mm.

**Distribution:** Australia, Indonesia, and Enewetak to French Polynesia. A new record for Guam.

*Gonodactylus chiragra* (Fabricius 1781)

*Squilla chiragra* Fabricius 1781: 515 [type locality: restricted to Ambon, Indonesia, 3°43'S, 128°12'E, by neotype selection (Manning 1981: 217)].

*Gonodactylus chiragra*. — Ahyong 2001: 67-70, fig. 34.

**Material:** USNM 3044834, 1 male (TL 55 mm), Guam, RK, 15 Nov 1984; USNM 304486, 1 male (TL 42 mm), Pago Bay, Guam, 0.3-0.6 m, rocky area, inner reef flat, M. Belk, 3 Jul 1970; USNM 304489, 1 female (TL 60 mm), Pago Bay, Guam, seagrass, low tide, RK, 1 Jun 1984; UF 239, 1 male (TL 61 m), Pago Bay, Guam, reef flat, L. A. Ward, 23 Jan 1997.

**Measurements:** Male ( $n = 3$ ) TL 42-61 mm, female ( $n = 1$ ) TL 60 mm.

**Distribution:** Western Indian Ocean to French Polynesia. A new record for Guam.

*Gonodactylus platysoma* Wood-Mason 1895

*Gonodactylus platysoma* Wood-Mason 1895: 11, pl. 3, figs. 3-9 [type locality: restricted to Society Ids., French Polynesia, 17°00'S, 150°00'W, by lectotype selection (Ghosh & Manning 1988: 654)]. — Ahyong 2001: 71-72, fig. 35.

*Gonodactylus chiragra* var. *tumidus* Lanchester 1903: 447, 456, pl. 23: fig. 1 [type locality: Minikoi, Laccadive Ids. (= Lakshadweep), 8°17'S, 73°02'E].

*Gonodactylus chiragra* var. *acutus* Lanchester 1903: 447, 456, pl. 23: fig. 3 [type locality: Minikoi, Laccadive Ids. (= Lakshadweep), 8°17'S, 73°02'E]. — Edmondson 1921: 300-302.

**Material:** USNM 304455, 1 male (TL 54 mm), Agana Bay, Guam, outer reef flat at sewer island, 0.3 m, M. Dominguez, 8 Jun 1986; USNM 304464, 1 male (TL 58 mm), 1.7 km NE of Amantes Point, Tanguisson Beach, Guam, R. Bolland, 5 Sep 1983; USNM 304482, 1 female (TL 66 mm), Luminao, Guam, rubble & sand, RK, 12 Sep 1980; USNM 304483, 1 male (TL 83 mm), Guam, RK, 15 Nov 1984; USNM 304487, 1 male (TL 58 mm), Guam; USNM 304488, 1 female (TL 48 mm), Apra Harbour, Guam, from coral, W. Brown, Nov 1975; USNM 304490, 1 male (TL 67 mm), Asan Reef, Guam, inner reef margin with numerous crevices and turfy algae, low tide, JD, 16 May 1984; USNM 304491, 1 male (TL 65 mm), Luminao, Guam, outer reef flat, RK, 25 Aug 1980; USNM 304492, 1 female (TL 40 mm), Piti Bay, Guam, 0-1 m, mid reef flat, on rubble, B. Neill, 11 Aug 1984; USNM 304493, 1 male (TL 13 mm), Piti Bay, reef flat, 0-1 m, on rubble & dead branching coral, RK, 26 Jun 1984; UF 233, 1 female (TL 65 mm), Pago Bay, Guam, found dead floating, S. Shelton, 12 Sep 1997; UF 245, 1 female (TL 52 mm), Ipao Beach, Guam, S. Shook, 27 May 1967; UF 242, 1 male (TL 52 mm), Pago Bay, Guam, reef flat, B. Smith, Feb 1998.

**Measurements:** Male ( $n = 8$ ) TL 13-83 mm, female ( $n = 5$ ) TL 40-66 mm.

**Remarks:** Previously reported from Guam by Edmondson (1921) as *Gonodactylus chiragra* var. *acutus* Lanchester 1903.

**Distribution:** French Polynesia to Okinawa, Australia, Indo-Malayan region to the western Indian Ocean.

#### *Gonodactylus smithii* Pocock 1893

*Gonodactylus Smithii* Pocock 1893: 475, pl. 20B [type locality: Arafura Sea].

*Gonodactylus chiragra* var. *anancyrus* Borradaile 1900: 395, 397, 401 [type localities: Talili Bay (4°12'S, 152°08'E), New Britain and Lifu (20°53'S, 167°13'E), Loyalty Ids.].

*Gonodactylus minikoiensis* Ghosh 1990: 201, 202, fig. 1 [type locality: Minikoi, 8°17'S, Lakshadweep, 73°02'E].

*Gonodactylus arabica* Ghosh 1990: 201, 205, figs. 2, 3e [type locality: Kavaratti, Lakshadweep, 10°33'N, 72°38'E].

*Gonodactylus smithii*. — Ahyong 2001:72-75, fig. 36.

**Material:** USNM 304453, 1 male (TL 30 mm), Family Beach, Luminao, Guam, 1 m, outer reef flat, from dead coral, RK, 14 Jun 1986; USNM 304461, 1 male (TL 45 mm), Pago Bay, Guam, reef moat, intertidal algal ridge, from circular holes in algal crust, RK, 20 Jun 1986; USNM 304466, 1 female (TL 28 mm), W of Camel Rock, Piti Bay, Guam, under rocks near channel, RK, 23 Jun 1986; USNM 304480, 1 female postlarva (TL 7 mm), reef front off marine lab,

Tanguisson Pt, Guam, 3 m, on dead *Pocillopora*, RK, 15 May 1986; USNM 304533, 1 male (TL 30 mm), Tanguisson Pt., Guam, outer reef flat, RK, 10 Mar 1980; USNM 304534, 1 female (TL 9 mm) Anae Id., Guam, limestone substrate, RK, 4 Sep 1984; USNM 304536, 1 female (TL 14 mm), Pago Bay, Guam, reef flat, RK, 21 Sep 1984; USNM 304537, 1 female (TL 9 mm), Toguan Bay, Guam, on *Platygyra pini*, RK, 14 Feb 1984; USNM 304538, 1 female (TL 56 mm), W of Camel Rock, Asan Reef, Guam, intertidal, under rocks, RK, 3 Jun 1981; USNM 304607, 1 female (TL 10 mm), Luminao, Guam; USNM 304608, 1 female (TL 13 mm), off Pelagi Islets, Agat Bay, Guam, 16.5 m, on *Pocillopora*, RK, 18 Jun 1981; UF 235, 1 female (TL 20 mm), Asan Reef, Guam, 0-0.1 m, G. Paulay, 24 May 1997; UF 238, 1 female (TL 26 mm), Pago Bay, Guam, outer reef flat behind lab, in *Sargassum cristaefolium*, R. Dickinson, Apr 1976.

**Measurements:** Male ( $n = 3$ ) TL 30-45 mm, female ( $n = 9$ ) TL 9-56 mm, female postlarva ( $n = 1$ ) TL 7 mm.

**Distribution:** Western Indian Ocean to Australia, the South China Sea, Indonesia, Japan, French Polynesia, and now from Guam.

*Hoplosquilla said* Erdmann & Manning 1998

*Hoplosquilla said* Erdmann & Manning 1998: 623-624, fig. 1h [type locality: Biak/Padaido, Indonesia].

**Material:** USNM 306080, 2 females (TL 6-10 mm), off Gold Dome, Agana Bay, Guam, 18 m, rubble, RK, 3 Feb 1984.

**Measurements:** Female ( $n = 2$ ) TL 6-10 mm.

**Remarks:** Both specimens bear a well developed rostral plate and telson ornamentation agreeing well the type material in the USNM. The inner margins of the uropodal endopods and distal segment of the uropodal exopods bear three and two teeth respectively.

**Distribution:** Indonesia and now from Guam.

Odontodactylidae Manning 1980

*Odontodactylus scyllarus* (Linnaeus 1758)

*Cancer Scyllarus* Linnaeus 1758: 633 [type locality: Rinca, Greater Sunda Id., Indonesia, restricted by neotype designation (Ahyong 2001)].

*Gonodactylus Bleekeri* A. Milne Edwards 1868: 65, footnote [type locality: Batavia, Indonesia (= Jakarta, 6°10'S, 106°48'E)].

*Gonodactylus elegans* Miers 1884: 566, 575, pl. 52: fig. b [type localities: Providence Id. (9°14'S, 51°02'E) and Providence Reef (9°23'S, 51°03'E), Seychelles].

*Odontodactylus scyllarus*. — Ahyong 2001: 85, fig. 41.

**Material:** USNM 304435, 1 female postlarva (TL 25 mm), Toguan Bay, Guam, 9 m, under rock in channel, B. Smith; USNM 304440, 1 female (TL 92 mm), Sella Bay, 1.2 m, Guam, coll H. Kami; USNM 304441, 1 male (TL 120

mm), Ana'e Id., Guam, T. Nugent, 9 May 1986; USNM 304442, 1 male (TL 136 mm), Guam; USNM 304462, 1 female (TL 30 mm), Tweed's Cave, 0.5 km N of Pt Guam, Guam, 13°34.9'N, 149°49.8'E, 51.8 m, R. Bolland, 23 Apr 1983; USNM 304496, 1 male (TL 36 mm), Toguan Bay, Guam, 13.5 m, shallow burrow in silty mud, RK, 9 Aug 1984.

**Measurements:** Male ( $n = 3$ ) TL 36-136 mm, female ( $n = 2$ ) TL 30-92 mm, female postlarva ( $n = 1$ ) TL 25 mm.

**Remarks:** The specimens bear posterolateral spines on AS(3)4-5 and two small teeth on the inner margin of the dactyli of the raptorial claws as in material reported by Ah Yong (2001). Manning (1967c) reported 2 or 3 teeth on the inner margin of the dactyli of the raptorial claws in *O. scyllarus*. The modified endopod of pleopod 1 is undeveloped and the penes have not reached full length in the 36 mm male.

**Distribution:** Western Indian Ocean to Australia, Indonesia, Japan, and now from Guam.

Protosquillidae Manning 1980  
*Chorisquilla gyrosa* (Odhner 1923)

*Gonodactylus gyrosus* Odhner 1923: 11-13, figs. 4-5 [type locality: Tekariaria, Aranuka, Gilbert Islands].

*Chorisquilla gyrosa*. — Manning 1969: 158.

**Material:** SMNH-Type-2538, male holotype (TL 29 mm), Tekariaria, Aranuka, Gilbert Islands, S. Bock, 31 Oct 1917; USNM 304448, 1 male (TL 28 mm), off Alupat Id., Agana Bay, Guam, 7.8 m, rubble, RK, 5 Jun 1984; USNM 304449, 1 male (TL 18 mm), Neye Id., Agat Bay, Guam, from corals, RK, 29 Jan 1981.

**Measurements:** Male ( $n = 2$ ) TL 18-29 mm.

**Remarks:** The Guam specimens of *C. gyrosa* agree closely with the holotype from the Gilbert Islands. All specimens bear a 2-segmented mandibular palp as in other species of *Chorisquilla*, but unlike other congeners, the proximal movable propodal spine is absent. The holotype and larger Guam specimen bear a posterolateral tooth on AS4 & 5 whereas the smallest specimen bears a posterolateral tooth only on AS5.

**Distribution:** Gilbert Islands to the Seychelles and Mauritius. A new record for Guam.

*Chorisquilla kroppi* sp. nov.  
(Fig. 1)

**Material:** HOLOTYPE: USNM 304499, 1 male (TL 19 mm), Tumon Bay, Guam, 10.5 m, RK, 3-8 Nov 1984. PARATYPES: USNM 304494, 1 female (TL 23 mm), Pohnpei; USNM 304497, 1 male (TL 18 mm), Tanguisson Pt., Guam,

10 m, rubble, RK, Mar 1979; USNM 304498, 1 male (TL 17 mm), N of power plant, Tanguisson Pt., Guam, rubble, 18 m, rubble, RK, 7 Feb 1984.

**Diagnosis.** AS5 laterally carinate and corrugated; smooth proximomedially, distomedially with short, shallow pits. AS6 anterior margin without transverse row of short, slender, posteriorly directed spines; dorsally ornamented with numerous long spines in 3 transverse rows, with additional interspersed spines laterally. Telson with 2 pairs of primary teeth, apices spiniform; dorsal surface entirely covered with long spines, obscuring MD and SM bosses; MD boss circular to ovate, SM bosses extending posteriorly beyond apex of median excavation. Uropodal protopod dorsally with single slender proximal spine and shorter spine above proximal exopod articulation.

**Description.** Eye extending beyond A1 peduncle segment 1. A1 peduncle 0.71-0.78CL.

A2 protopod dorsal process with blunt apex. A2 scale 0.46-0.50CL.

Rostral plate with median spine extending anteriorly to level of, but not anteriorly beyond, cornea. Carapace with anterior margin of lateral plates concave.

Raptorial claw dactylus with indistinct basal notch; propodus with 1 movable spine proximally and sparsely distributed pectinations on opposable margin.

Mandibular palp 2-segmented. MXP1-5 with epipod.

TS6-7 with truncate lateral margins. TS8 with rounded lateral margin.

AS1-3 posterolateral angle blunt; smooth dorsally. AS4 posterolateral angle blunt or acute; smooth dorsally; laterally with shallow groove above MG carina. AS5 smooth proximomedially, distomedially with short, shallow, irregular pits; laterally corrugated; posterior margin unarmed; with posterolateral spine.

AS6 anterior margin without transverse row of short, slender, posteriorly directed spines; dorsally with numerous long spines arranged in transverse 3 rows, lateral portions with additional spines interspersed between rows; dorsal spines obscuring low SM, IM and LT bosses.

Telson with 2 pairs of primary teeth (SM, IM); with 10-13 spiniform SM denticles, 2 spiniform IM denticles and 1 small spiniform LT denticle. Dorsal surface entirely covered with long spines, obscuring MD and SM bosses; MD boss ovate, SM bosses low, extending posteriorly beyond apex of median excavation; lateral margin with 7-10 slender spines in specimens; ventral surface with low, short, postanal swelling.

Uropodal protopod without lobes between terminal spines; protopod unarmed dorsally except for spine above proximal exopod articulation. Uropodal exopod proximal segment with 9 or 10 movable spines on outer margin and fixed distal, ventral spine. Uropodal endopod with dorsal carina laterally; without ventral carinae; length 3.43-4.36 breadth.

**Colour in alcohol.** Carapace with scattered brown chromatophores; with narrow, brown transverse bands across margins of thoracic and abdominal segments.

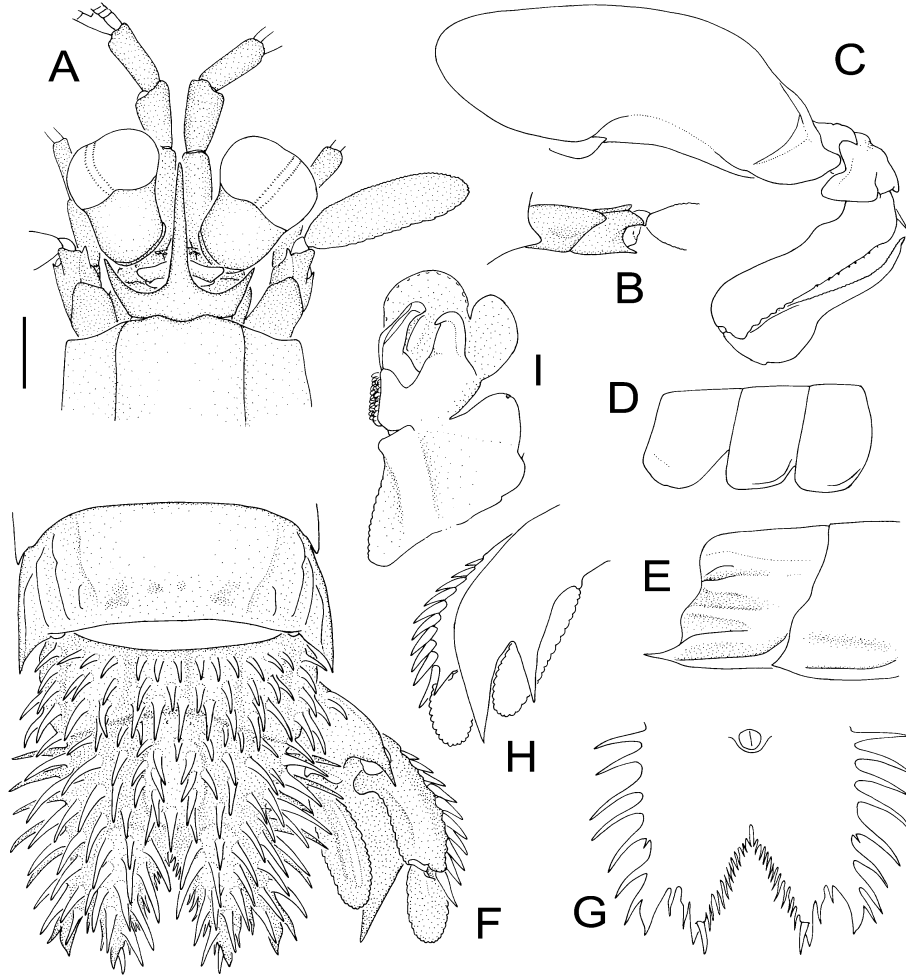


Figure 1. *Chorisquilla kroppi* sp. nov. (USNM 304499, male holotype TL 19 mm). A, anterior cephalon, dorsal. B, raptorial claw, right lateral. C, antennal protopod, right lateral. D, TS6-8, right lateral. E, AS4-6, telson & uropod, dorsal. F, AS4-5, telson & uropod, right lateral. G, uropod, right ventral. H, telson, ventral. I, PLP1 endopod, right anterior. Scale A-H = 1 mm, I = 0.5 mm.

**Measurements:** Male ( $n = 3$ ) TL 17-19 mm, female ( $n = 1$ ) TL 23 mm. Other measurements of holotype: CL 3.9 mm, A1 peduncle 2.8 mm, A2 scale 1.8 mm.

**Etymology.** Named for Roy Kropp, who collected the type material, and together with Jane Dominguez collected the majority of specimens used in this study.

**Remarks:** Ahyong (2001) removed *C. hystrix* (Nobili 1899) from the synonymy of *C. spinosissima* (Pfeffer 1888) showing that the two species differ in colour pattern (whether banded or uniformly mottled), in the morphology of the mid-dorsal surface of AS5 (whether with carinae or shallow pits), in the presence of one or two dorsal spines on the proximal segment of the uropod in adults. An additional difference not mentioned by Ahyong (2001) is the density of dorsal spines on AS6. In *C. hystrix*, three rows of dorsal spines are present medially on AS6, with additional spines interspersed between the rows laterally. In *C. spinosissima*, four or five rows of dorsal spines are present medially on AS6, again with additional spines interspersed between the rows laterally. Both species bear a transverse row of short, posteriorly directed spines along the anterior margin of AS6. This row of spines may be concealed by the posterior margin of AS5 and is best observed by flexure of the posterior abdominal segments. The anterior spine row is shown for *C. spinosissima* by Ahyong (2001: fig. 46d), but the corresponding row of spines is not visible in the figure of *C. hystrix* owing to the position of the abdominal segments during illustration.

The present new species most closely resembles *C. hystrix*, sharing a similar colour pattern, similar number of rows of dorsal spines on AS6 and a single dorsal spine on the proximal margin of the uropodal protopod. *Chorisquilla kroppi* differs from *C. hystrix* and resembles *C. spinosissima* in having short shallow pits on the mid-dorsum of AS5 instead of the distinct broad pits intervened by carinae. *Chorisquilla kroppi* differs from both *C. hystrix* and *C. spinosissima* in lacking the row of short anteriorly directed spines along the anterior margin of AS6.

In all specimens of *C. kroppi* studied here, the lateral denticle is present on the telson as in size matched *C. hystrix* and *C. spinosissima* reported by Ahyong (2001). In all males of *C. kroppi* examined, the petasma is well developed.

As indicated by Ahyong (2001), *C. spinosissima* and *C. hystrix* occur primarily in the Indian and western Pacific Oceans respectively, overlapping off northern Australia to the South China Sea. Presently, *C. kroppi* is known only from the northwestern Pacific and overlaps with neither *C. spinosissima* nor *C. hystrix*. Kemp's (1915) record of *C. spinosissima* from Palawan, Philippines, requires verification for it could be referable to any of the three species discussed here. The large size of Kemp's specimens (TL 31-34 mm), however, suggests that they are probably referable to *C. spinosissima* sensu stricto.

**Distribution:** Known only from Guam and Pohnpei in the northwestern Pacific Ocean.

*Echinosquilla guerini* (White 1861)

*Gonodactylus guerini* White 1861: 43, pl. 7 [type locality: Fiji].

*Echinosquilla guerini*. — Manning 1969: 155-157. — Ahyong 2001: 99, fig. 48.

**Material:** USNM 304424, 1 female (TL 48 mm), Agana Bay, Guam, limestone substrate beneath alpheid burrows, RK.

**Measurements:** Female ( $n = 1$ ) TL 48 mm.

**Distribution:** Western Indian Ocean to Australia, French Polynesia, Hawaii, and now from Guam.

*Haptosquilla glyptocercus* (Wood-Mason 1875)

*Gonodactylus glyptocercus* Wood-Mason 1875: 232 [type locality: Nicobar Ids., Andaman Sea, 8°00'N, 93°30'E].

?*Protosquilla cerebralis* Brooks 1886: 22, 72, pl. 14: figs. 2, 3, pl. 16: figs. 2, 3 [type locality: Levuka, Fiji, 17°42'S, 178°50'E].

*Haptosquilla glyptocercus*. — Manning 1969: 159. — Ahyong 2001: 104-105, fig. 50.

**Material:** USNM 191085, 1 male (TL 22 mm), 1 female (TL 28 mm), Guam, M. L. Reaka, 1973; USNM 120271, 3 males (TL 16-19 mm), 8 females (TL 12-24 mm), Ritidian Pt., Guam, R. Baker, 12 Jul 1945; USNM 304450, 4 males (TL 15-20 mm), 9 females (TL 15-73 mm), off N coast Ana'e Id., Agat Bay, Guam, reef front on *Pocillopora elegans*, RK, 2 Jun 1986; USNM 304465, 1 female (TL 22 mm), Luminao, outer reef flat; USNM 304539, 1 male (TL 25 mm), Family Beach, Apra Harbour, Guam, rubble, RK, 20 Oct 1984; USNM 304457, 2 females (TL 24-25 mm), Togcha, Guam, fish kill, Jones et al., 27 Sep 1972; USNM 304540, 1 male (TL 19 mm), Pago Bay, Guam, 7.5 m, RK, 9 Nov 1984; USNM 304541, 1 female (TL 33 mm), Pago Bay, Guam, 0.6 m, rubble & algae, RK & JD, 28 Mar 1984; USNM 304542, 1 female (TL 20 mm), Pago Bay, Guam, 1.5 m, reef flat, rubble, RK, 16 Feb 1984; USNM 304543, 1 female (TL 19 mm), Apra Harbour, harbour side of breakwater, 1 m, RK, 31 Jan 1984; USNM 304544, 1 female (TL 12 mm), Guam, RK; USNM 304545, 1 male (TL 14 mm), Cocos Id., Guam, 1.8 m, coral head, K. Kaufman, 17 Oct 1971; USNM 304546, 1 male (TL 16 mm), Apra Harbour, Guam, harbour side of breakwater, rubble, RK, 31 Jan 1984; USNM 304547, 1 male (TL 18 mm), Luminao, Guam, 0.3-0.6 m, reef flat, RK, 8 Oct 1984; USNM 304548, 1 male (TL 13 mm), SW corner Cocos Lagoon, Guam, 1.5 m, rubble, inside barrier reef, RK, 3 Oct 1984; USNM 304549, 1 female (TL 18 mm), Piti Bay, Guam, 0-1 m, reef flat, rubble & dead branching coral, RK, 24 Jan 1984; USNM 304550, 1 female (TL 13 mm), Luminao, Guam, intertidal, RK, 25 Aug 1980; UF 237, 1 female (TL 29 mm), Adelup, Guam, reef flat, 60 m from shore, K. Lofdah, 31 Mar 1998; UF 234, 1 female (TL 31 mm), Togcha Reef, Guam, low tide, H. Larson, 23 Aug 1972; UF 247, 1 female (TL 19 mm), Guam, H. Riaka; UF 250, 1 female (TL 25 mm), Pago Bay, Guam, reef flat, R. Tsuda et al., 21 Mar 1968; UF 253, 1 female (TL 36 mm), Lates Pt., Guam, fore reef, 10 m, G. Paulay, Jul 1999.

**Measurements:** Male ( $n = 14$ ) TL 13-25 mm, female ( $n = 32$ ) TL 12-36 mm.

**Remarks:** *Haptosquilla glyptocercus* is presently recognized as a widespread coral reef species ranging from the eastern Indian Ocean to the Central-Western Pacific. However, *H. glyptocercus* may be a composite (Ahyong



2001) and is presently under further study in collaboration with Paul Barber (Harvard University).

**Distribution:** Eastern Indian Ocean to Australia and the Central-West Pacific.

*Haptosquilla tanensis* (Fukuda 1911a)  
(Figs 2A-H)

*Protosquilla tanensis* Fukuda 1911a: 173, pl. 1 [type locality: Pago Bay, Guam, restricted by present neotype selection]; 1911b: 285, pl. 11, figs. 1-2.

*Haptosquilla tanensis*. — Manning 1969: 161.

**Material:** NEOTYPE: USNM 304475, male (TL 19 mm), Pago Bay, Guam, intertidal reef, near algal crest from small holes in algal crust, RK, 20 Jun 1986.

**Diagnosis.** Rostral plate sharply trispinous, each spine slender. Mandibular palp 2-segmented. AS5 smooth, without distinct pitting on posteromedian half. AS6 with submedian and intermediate bosses. Telson with 3 pairs of fixed primary teeth; dorsal surface with distinct pits between and on surface of bosses; submedian denticles present in adults; SM bosses elongate, extending posteriorly beyond midlength, but not to posterior margin. Proximal segment of uropodal exopod with blunt lobe above articulation of distalmost movable spine.

**Description.** Eye with cornea extending to end of A1 peduncle segment 2.

A1 peduncle 0.68 CL. A2 protopod with apex of dorsal lobe blunt. A2 scale 0.49 CL.

Rostral plate sharply trispinous with median spine not extending anteriorly to base of cornea; lateral spines slender, directed anterolaterally; lateral margins faintly convex, divergent anteriorly.

Carapace with anterior margin of lateral plates slightly concave; anterolateral margin angular.

Raptorial claw dactylus with basal notch; propodus without movable spine proximally.

Mandibular palp 2-segmented. MXP1-5 with epipod.

PLP1 endopod in adult males with lateral lobe on posterior endite.

AS1-4 smooth dorsally and laterally, with marginal carina indicated laterally; blunt posterolaterally. AS5 smooth dorsally, with anterior transverse row of 4 shallow minute pits; with marginal carina and shallow oblique groove laterally; blunt posterolaterally. AS6 with distinct SM, IM and LT bosses, each irregularly eroded.

Telson broader than long; with 3 pairs of blunt primary teeth, separated by shallow V; MD boss short irregularly pitted and eroded; SM bosses elongate, pitted and eroded, corrugated around margins, anteriorly continuous with median boss; SM bosses demarcated from MG carina by distinct groove; MG carina pitted dorsally and strongly eroded on inner margin, laterally with irregular longitudinal grooves and pits, posterior third demarcated by irregular dorsal groove.

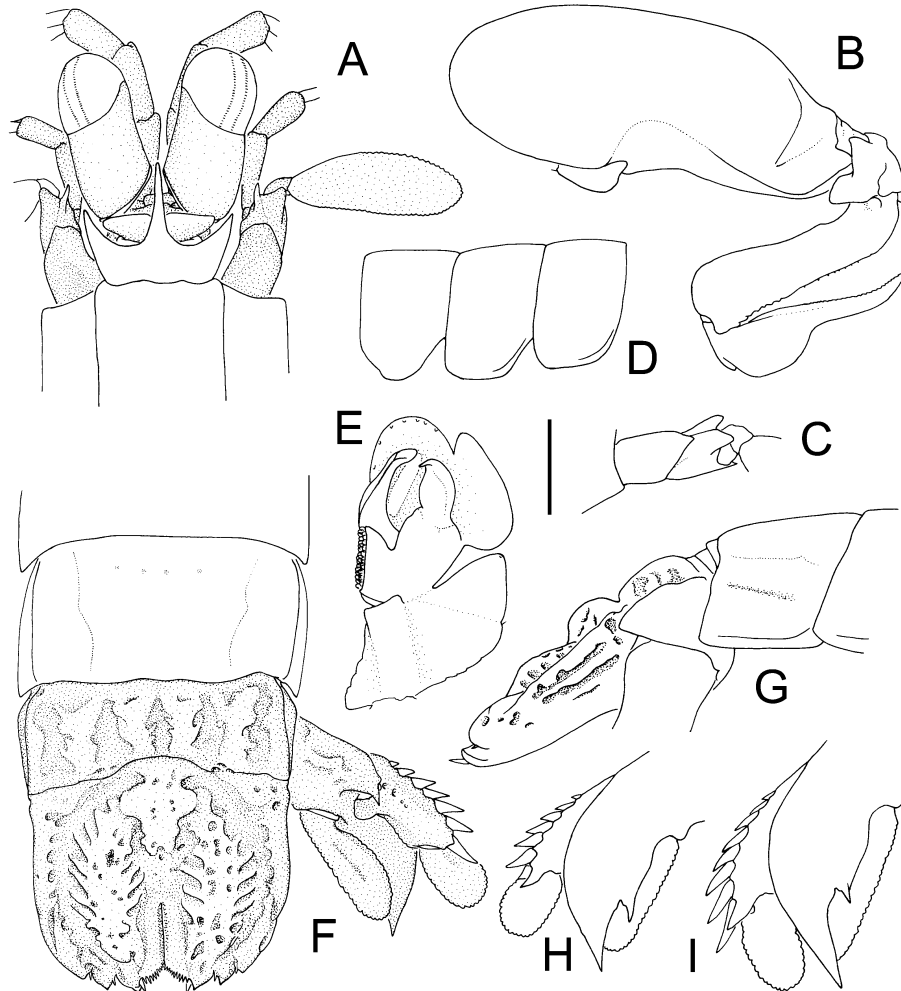


Figure 2. A-H, *Haptosquilla tanensis* (Fukuda) (USNM 304475, male neotype, TL 19 mm). A, anterior cephalon, dorsal. B, raptorial claw, right lateral. C, antennal protopod, right lateral. D, TS6-8, right lateral. E, PLP1 endopod, right anterior. F, AS4-6, telson & uropod, dorsal. G, AS4-6, telson & uropod, right lateral. H, uropodal protopod, right ventral. I, *Haptosquilla glabra* (Lenz) (AM P12158, male TL 20 mm), uropodal protopod, right ventral. Scale: A-D, F-I = 1 mm, E = 0.5 mm.

Uropodal protopod eroded or pitted proximally; unarmed dorsally except for dorsal spine above proximal exopod articulation. Uropodal exopod proximal segment with slight proximal pitting; outer margin with 7 movable spines, distalmost extending beyond midlength of distal segment; with blunt lobe lateral to distal movable spine. Uropodal endopod with median sulcus; without ventral carinae; length 2.91 breadth.

**Measurements:** Measurements of neotype: TL 19 mm, CL 3.8 mm, A1 peduncle 2.6 mm, A2 scale 1.9 mm.

**Remarks:** The present specimen represents the first record of the species since it was first described from Japan by Fukuda (1911a). The specimen generally agrees well with Fukuda's account including the distinct pitting on the dorsum of the telson and uropodal protopod. It differs from Fukuda's figure, however, in having shallower dorsal pits on the telson and in lacking pits in the median line between the two submedian bosses. These differences, however, are likely to be size related in view of the fact that Fukuda's specimen measured 30.5 mm TL.

*Haptosquilla tanensis* closely resembles *H. glabra* Lenz 1905, and *H. moosai* Erdmann & Manning 1998, but differs from both in bearing strongly eroded inner surfaces of the marginal carina and surface of the telson as well as on the margins of the dorsal bosses, and in bearing a broader uropodal protopod (compare Figs. 2H, I). *Haptosquilla moosai* also differs from *H. tanensis* and *H. glabra* in bearing distinct mid-posterodorsal pitting on AS5. In *H. tanensis* and *H. glabra*, the mid-dorsal surface of AS5 is smooth, with at most a transverse row of four minute, shallow, well spaced pits anteriorly. Although *Haptosquilla glabra* lacks the strongly eroded inner margins of the marginal carina and surface around the telson bosses, the margins of the bosses vary from smooth or irregular to pitted. Additionally, the groove between the marginal carina and submedian bosses of the telson is deep and distinct in *H. tanensis* and *H. moosai* instead of shallow in *H. glabra*. Further study is required to evaluate variation and possible heterogeneity in *H. glabra*. Unfortunately, no specimens of *H. tanensis* from Japan are available for study. Therefore, in view of the similarity between *H. tanensis*, *H. glabra* and *H. moosai*, and the possibility of heterogeneity of *H. glabra*, the present specimen is herein selected as the neotype for *H. tanensis* to fix its identity. Although the neotype is not from Japan, Guam is in the same general region, namely, the northwestern Pacific.

**Distribution:** Japan and now from Guam.

#### Pseudosquillidae Manning 1977

##### *Pseudosquilla ciliata* (Fabricius 1787)

*Squilla ciliata* Fabricius 1787: 333 [type locality: Exmouth Gulf, Western Australia, restricted by neotype selection (Ahyong 2001)].

*Squilla stylifera* Lamarck 1818: 189 [type locality: unknown].

*Squilla quadrispinosa* Eydoux & Souleyet 1842: 362, pl. 5: fig 1 [type locality: Sandwich Ids. (= Hawaii), 24°00'N, 167°00'E].

*Pseudosquilla ciliata* var. *occidentalis* Borradaile 1900: 398, 402 [type locality: West Indies].

*Pseudosquilla ciliata*. — Edmondson 1921: 288-290. — Ahyong 2001: 112-115, fig. 55.

**Material:** USNM 304428, 1 female (TL 50 mm), Pago Bay, Guam, under rock, RK & JD, 2 Mar 1984; USNM 304433, 1 female (TL 23 mm), Pago Bay, Guam, RK, 22 Jun 1970; USNM 304434, 1 male (TL 22 mm), Agat, Guam, 14 m, dead branching coral in mud, RK, 23 May 1984; USNM 304437, 1 female (TL 20 mm), Agat, Guam, 14 m, rubble on silt & anoxic mud, RK, 23 May 1984; USNM 304438, 1 male (TL 23 mm), Western Shoals, Guam, RK, 30 Aug 1979; USNM 304456, 1 female (TL 52 mm), Togcha, Guam, fish kill, Jones et al., 27 Sep 1972.

**Measurements:** Male ( $n = 2$ ) TL 22-23 mm, female ( $n = 4$ ) TL 20-52 mm.

**Remarks:** Previously reported from Guam by Edmondson (1921).

**Distribution:** Indo-West Pacific and both sides of the Atlantic.

*Pseudosquillana richeri* (Moosa 1991)

*Pseudosquilla richeri* Moosa 1991: 175-176, fig. 5 [type locality: New Caledonia, 18°27.2'S, 163°02.3'E].

*Pseudosquillana richeri*. — Ah Yong et al. 2000: 306-310, figs. 2, 3. — Ah Yong 2001: 115, fig. 56.

**Material:** USNM 304432, 1 female (TL 19 mm), ½ mile W of Pelagi Islets, Agat Bay, Guam, raised reef, 20-35 m, 1975; USNM 304439, 1 male (TL 20 mm), Western Shoals, Guam, 20 m, rubble, RK, 1 Feb 1980.

**Measurements:** Male ( $n = 1$ ) TL 20 mm, female ( $n = 1$ ) TL 19 mm.

**Remarks:** The species was fully redescribed by Ah Yong et al. (2000).

**Distribution:** Western Indian Ocean to French Polynesia. A new record for Guam.

*Raoulserenea hieroglyphica* (Manning 1972)

*Pseudosquilla hieroglyphica* Manning 1972: 2-6, 9, fig. 1 [type locality: Latoback Id., Rongerik Atoll, Pacific Ocean].

*Raoulserenea pygmaea* Caldwell & Manning 2000: 101-106, fig. 1 [type locality: Moorea, Society Ids., French Polynesia].

*Raoulserenea hieroglyphica*. — Manning 1995: 116. — Ah Yong 2001: 119-121, fig. 58.

**Material:** USNM 304427, 1 female (TL 20 mm), Asan Reef, Guam, under intertidal rocks, RK, 3 Jan 1981.

**Measurements:** Female ( $n = 1$ ) TL 20 mm.

**Remarks:** Although the colour is faded, the specimen agrees well with the holotype in bearing an overall reticulated colour pattern with the paired 'eye-spots' surrounded by an entire light ring.

**Distribution:** Western Indian Ocean to Australia, New Caledonia, Marshall Islands, and French Polynesia. A new record for Guam.

*Raoulserenea komaii* (Moosa 1991)

*Pseudosquilla komaii* Moosa 1991: 171-173, fig. 4 [type locality: Chesterfield Ids., New Caledonia, 19°03.00'S, 158°53.93'E].

*Raoulserenea komaii*. — Manning 1995: 116. — Ahyong 2001: 121-122, fig. 59.

**Material:** USNM 304430, 1 female (TL 56 mm), Hospital Point, Guam, from stomach of moray eel, Donaldson & Myers, Apr 1981; AM P61156, 1 female (TL 95 mm), Ascuncion, N Mariana Ids., 1-6 m, in holes and coral along rock wall, P. Schupp, 7 Jun 1992; UF 981, 2 males (TL 35-56 mm), Ascuncion, N Mariana Ids., 16 m, reef slope in corals over sand, P. Schupp, 1 Jun 1992; UF 965, 1 female (TL 50 mm), Maug, N Mariana Ids., 13 m, outer reef slope in holes, P. Schupp, 2 Jun 1992; UF 959, 1 female (TL 58 mm), Agrihan, Mariana Ids., reef slope, in corals, 20 m, P. Schupp, 30 May 1992; UF 984, 1 male (TL 41 mm), Agrihan, Mariana Ids., bottom of coral wall in coral, 29 m, P. Schupp, 29 May 1992; UF 978, 1 male postlarva (TL 35 mm), Maug Id. Mariana Ids., 13 m, reef slope, in holes in coral, P. Schupp, 3 Jun 1992. UF 236, 1 female (TL 41 mm), outer SW end Orote Peninsula, Guam, 20-25 m, reef slope under rock, G. Paulay, 27 Feb 1998; UF 244, 1 female (TL 54 mm), S Anae Id., Guam, 20 m, fore reef, under rock, G. Paulay, 25 Aug 1999.

**Measurements:** Male ( $n = 3$ ) TL 35-56 mm, female ( $n = 6$ ) TL 41-95 mm, male postlarva ( $n = 1$ ) TL 35 mm.

**Remarks:** The specimens agree well with the holotype from New Caledonia (Muséum National d'Histoire Naturelle, Paris) in bearing a reticulated colour pattern on the body and a distinct white border surrounding the paired 'eye-spots' on the carapace.

**Distribution:** Cocos-Keeling Islands, New Caledonia, and French Polynesia. A new record for Guam.

*Raoulserenea oxyrhyncha* (Borradaile 1898)

*Pseudosquilla oxyrhyncha* Borradaile 1898: 37, pl. 6: figs. 9-9d [type locality: Rotuma, Fiji]. — Holthuis 1941: 264-266, fig. 4.

*Raoulserenea oxyrhyncha*. — Manning 1995: 116. — Ahyong 2001: 123-125, fig. 61.

**Material:** USNM 304426, 1 female (TL 34 mm), Gun Beach, Guam, 14 m, RK; USNM 304429, 1 male (TL 34 mm), Calalan Bank, Guam, 23 m, RK, 23 Aug 1984; USNM 304431, 1 male postlarva (TL 31 mm), Agana Bay, Guam, 13 m, RK, 25 Apr 1984; USNM 304435, 1 female (TL 31 mm), Okat, Kosrae, reef flat, T. Smalley, 1 Jun 1979.

**Measurements:** Male ( $n = 1$ ) TL 34 mm, female ( $n = 2$ ) TL 31-34 mm, male postlarva ( $n = 1$ ) TL 31 mm.

**Remarks:** The present specimens bear a uniform colour pattern with a pair of large, dark, diffuse 'eye-spots' on the carapace, unlike the holotype which bears subtle mottling on the body and several pale blotches surrounding the dark 'eye-spots' on the carapace.

**Distribution:** Cocos-Keeling Islands, Papua New Guinea, Fiji, and the Central Pacific. A new record for Guam and Kosrae.

Takuidae Manning 1995

*Mesacturus dicrurus* Kropp & Dominguez 1990

*Mesacturus dicrurus* Kropp & Dominguez 1990: 372-375, figs. 1-2 [type locality: Pago Bay, Guam].

**Material:** USNM 244236, holotype male (TL 22 mm), Pago Bay, Guam, from consolidated coralline algae at seaweed edge of erosion bench, RK, 7 Jun 1986; USNM 244237, 1 paratype female (TL 13 mm), type locality, 1984; USNM 244238, 2 paratype males (TL 12-17 mm), SSW side Saipan, in coral heads, A. H. Banner, 1945; USNM 244239, 1 paratype male (TL 22 mm), 1 paratype female (TL 23 mm), Saipan, A. H. Banner, 25 Dec 1944; USNM 304450, 1 female (TL 15 mm), Guam.

**Measurements:** Male ( $n = 4$ ) TL 12-22 mm, female ( $n = 2$ ) TL 22-23 mm.

**Remarks:** Kropp & Dominguez (1990) gave a full account of the species.

**Distribution:** Known only from Guam and Saipan.

Lysiosquilloidea Giesbrecht 1910

Coronididae Manning 1980

*Mortensenenus paulay* sp. nov.

(Fig. 3)

**Material:** HOLOTYPE: AM P61155, male (TL 22 mm), Maug Id., Northern Mariana Ids., 18 m, from coral wall inside corals and holes, P. Schupp, 3 Jun 1992.

**Diagnosis.** Rostral plate quadrate; biconcave anteriorly. AS6 with posterolateral spine. Telson inflated, broader than long; anterior surface smooth; posterior surface with eroded appearance and blunt, irregular tubercles or short transverse carinae; without distinct MD and SM lobes. Uropodal exopod proximal segment with angular keel on proximal half of lower outer margin; endopod length about twice breadth.

**Description.** Dorsal integument smooth, polished. Eye elongate, not extending beyond A1 peduncle segment 2; cornea bilobed, slightly broader than stalk. Ophthalmic somite anterior margin flattened. Ocular scales narrower than high, fused into bilobed plate.

A1 peduncle 0.52CL; upper flagellum with 17-18 segments, shorter ventral flagellum 6 segments; longer ventral flagellum 16 segments. A1 somite dorsal processes spiniform; directed anteriorly; concealed by rostral plate. A2 protopod with ventral papilla. A2 scale slender, length 1.60CL; entire margin setose.

Rostral plate quadrate; slightly broader than long; biconcave anteriorly.

Carapace narrowed anteriorly; anterolateral angles broadly rounded, produced anteriorly beyond base of rostral plate; posterior margin unarmed.

Raptorial claw dactylus with 4 teeth; strongly inflated proximally, with basal notch; carpus dorsal margin smooth; propodus opposable margin with three movable spines proximally, proximal two-thirds pectinate.

Mandibular palp 3-segmented. MXP1-5 with epipod.

MXP5 basal segment unarmed; merus with broad flange on inner margin.

TS5 lateral process obsolete. TS6-8 lateral process rounded. TS8 without sternal keel.

Pereiopods 1-3 with unarmed basal segments.

PLP1 endopod posterior endite with narrow lateral lobe.

AS6 smooth medially; laterally with low, irregular, longitudinal bosses; with posterolateral spine; with short, triangular projection anterior to uropod articulation; sternum posterior margin unarmed.

Telson inflated, broader than long; anterior surface smooth; posterior surface with eroded appearance and blunt, irregular tubercles or short transverse carinae; without distinct MD and SM lobes; upper posterolateral and posterior margins forming eave partially overhanging primary teeth; primary armature of telson consisting of (on either side of midline): 7-8 SM denticles, 1 movable SM tooth, 4 large triangular teeth with inner three intervened by small denticle; ventral surface smooth, lacking carinae or tubercles.

Uropodal protopod produced anteriorly in basal portion; with blunt dorsal tooth proximally and with small tooth above articulation with exopod; with two flattened terminal spines, inner longer, margins unarmed. Uropodal exopod proximal segment with 7-8 movable spines on outer margin, distalmost spine exceeding midlength of distal segment; distal margin with slender ventral spine; with angular keel on lower outer margin of proximal half. Uropodal endopod about twice as long as broad.

**Measurements:** Measurements of holotype: TL 22 mm, CL 4.4 mm, A1 peduncle 2.3 mm, A2 scale 1.6 mm.

**Colour in alcohol.** Completely faded.

**Etymology.** Named for Gustav Paulay, Florida Museum of Natural History, University of Florida, who invited this contribution and made collections available for study.

**Remarks:** *Mortensenenus paulay* is the second species of the genus to be recognized. It differs from *M. minus* Manning 1990, described from Mauritius, chiefly in dorsal telson ornamentation and in bearing posterolateral spines on AS6. The dorsal surface of the telson in *M. paulay* bears irregular tubercles and shallow sculpture, but lacks the three broad posterodorsal lobes that are present in *M. minus*. Additionally, the outer margin of the proximal segment of the uropodal exopod in *M. paulay* differs from *M. minus* in bearing an angular keel on the lower outer margin and in bearing 7-8 instead of 6 movable spines; the latter difference, however will likely prove to be variable.

The holotype is an adult male as indicated by the well-developed penes and endopod of pleopod 1. The specimen is unusual, however, in bearing two penes on one side and one on the other.

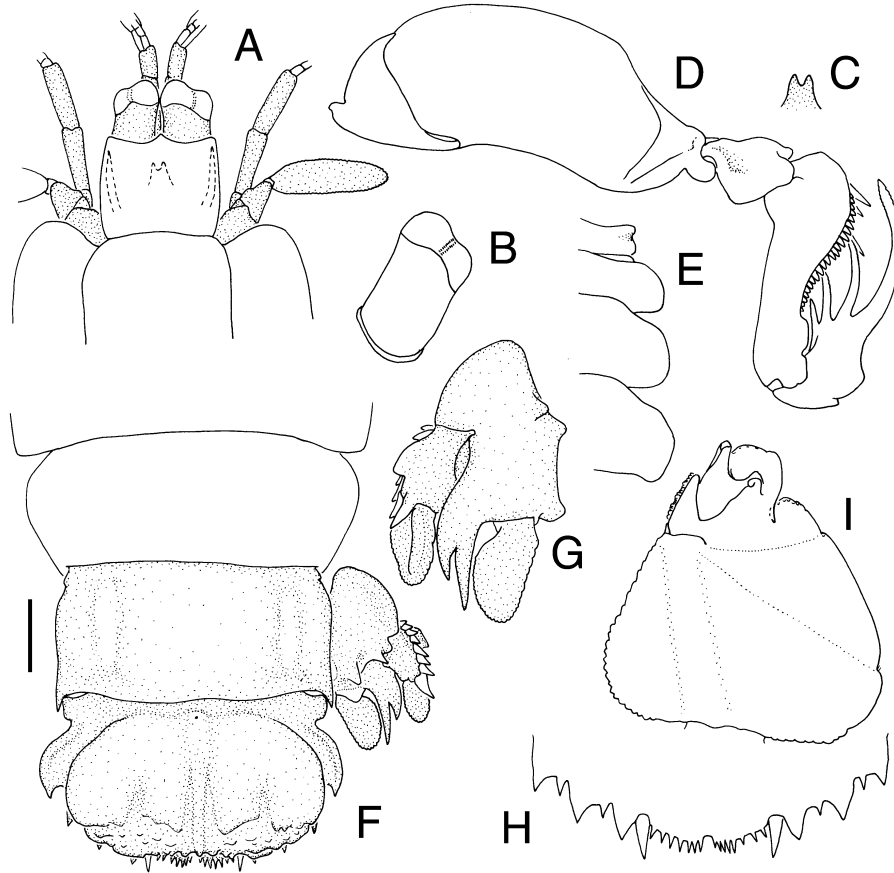


Figure 3. *Mortensenenus paulay* sp. nov. (AM P61155, male holotype TL 22 mm). A, anterior cephalon, dorsal. B, eye, right dorsal. C, ocular scales, dorsal. D, raptorial claw, right lateral. E, TS6-8, right dorsal. F, AS4-6, telson & uropod, dorsal. G, uropodal protopod, right ventral. H, telson, posterior ventral. I, PLP1 endopod, right anterior. Scale A, D-G = 1 mm, B, C, H = 0.5 mm, I = 0.7 mm.

**Distribution:** Known only from the type locality.

Key to species of *Mortensenenus*

1. AS6 with posterolateral spine. Telson without distinct MD and SM lobes.  
Uropodal exopod proximal segment with angular keel on proximal half of lower outer margin  
*M. paulay*
- AS6 without posterolateral spine. Telson with distinct MD and SM lobes.  
Uropodal exopod proximal segment without angular keel on proximal half of lower outer margin  
*M. minus*



*Neocoronida martensi* Manning 1978

*Neocoronida martensi* Manning 1978: 12-13, fig. 6 [type locality: Palau, Caroline Islands, western Pacific Ocean].

**Material:** ZMB 6159, female holotype (TL 45 mm), Palau, Pütze; AM P61154, 1 female (TL 38 mm), Maug Id., Northern Mariana Ids., 18 m, from coral wall inside corals and holes, P. Schupp, 3 Jun 1992.

**Measurements:** Female ( $n = 1$ ) TL 38-45 mm.

**Remarks:** The specimen agrees well with the holotype re-examined for this study.

**Distribution:** Palau and now from Maug Island, Northern Mariana Islands.

## Lysiosquillidae Giesbrecht 1910

*Lysiosquillina maculata* (Fabricius 1793)

*Squilla maculata* Fabricius 1793: 511 [type locality: Manado, Indonesia, restricted by neotype selection (Ahyong 2001)].

*Lysiosquilla Miersii* de Vis 1883: 321 [type locality: Moreton Bay, Queensland, Australia, 27°15'S, 153°14'E].

*Lysiosquillina maculata*. — Manning 1995: 134-137, figs. 68c, 70a, b, 71a, b, 72a, b, 74-77, 78a, 80a. — Ahyong 2001: 137-139, fig. 67.

**Material:** USNM 304425, 1 male (TL 297 mm), Tumon Bay, Guam, 0.6 m, gill net, F. Lastimoza, 22 Feb 1984; USNM 304443, 1 male (TL 170 mm), Cocos Lagoon, Guam, 2.4 m, G. Roberto, 16 Jun 1986; ZRC 2000.0736, 1 male (TL 262 mm), Guam, G. Paulay, 1995.

**Measurements:** Male ( $n = 3$ ) TL 170-297 mm.

**Distribution:** Western Indian Ocean to Australia, Japan, French Polynesia and Hawaii. A new record for Guam.

## Nannosquillidae Manning 1980

*Pullosquilla malayensis* (Manning 1968)

*Austrosquilla malayensis* Manning 1968: 241-244, fig. 1 [type locality: Pulau Bidan, Penang, Malaysia].

*Pullosquilla malayensis*. — Manning 1978: 19. — Ahyong 2001: 164-165.

**Material:** USNM 304529, 3 males (TL 16-17 mm), 8 females (TL 15-19 mm), Double Reef, Guam, 12 m, rubble bottom, 3 Aug 1984; USNM 304530, 7 males (TL 16-18 mm), 2 females (TL 17-19 mm), Ngargol Id., cove at Peduliaes Cape, Palau, 2.4-3.0 m, RK, 15 Jul 1984; USNM 304531, 3 males (TL 15-16 mm), 2 females (TL 16-17 mm), Ngargol Id., cove at Peduliaes Cape, Palau, 2.4 m, RK, 1 Jul 1984; USNM 304657, 3 males (TL 16-17 mm), 2 females (TL 14-18 mm), Ngargol Id., cove at Peduliaes Cape, Palau, 3.9-5.4 m, sand, RK, 23 Jun 1984.

**Measurements:** Male ( $n = 16$ ) TL 15-18 mm, female ( $n = 14$ ) TL 14-19 mm.

**Remarks:** Until now, *P. malayensis* was known only from Malaysia. In contrast to the type description, all specimens bear five instead of four epipods. As indicated by Ah Yong (2001), however, some epipods on the type specimens are damaged accounting for the lower number of epipods reported in the type description. The dactyli of the raptorial claws are armed with 15-26 teeth, and the proximal segment of the uropodal exopod bears four (rarely three) movable spines on the outer margin.

As remarked by Ah Yong (2001), *P. malayensis* most closely resembles *P. pardus* Moosa 1991, from New Caledonia and Australia. In addition to distinguishing characters given by Ah Yong (2001), *P. pardus* differs from all other species of *Pullosquilla* in the length of the inner spine of the uropodal protopod. In *P. pardus*, the inner spine of the uropodal protopod is as long as or shorter than the outer spine, whereas in all other species of the genus, the inner spine is distinctly longer than the outer spine.

**Distribution:** Malaysia and now from Guam and Palau.

*Pullosquilla litoralis* (Michel & Manning 1971)

*Austrosquilla litoralis* Michel & Manning 1971: 237, fig. 1 [type locality: Atiheu Bay, Nuku Hiva Id., Marquesas Ids.].

*Pullosquilla litoralis*. — Manning 1978: 19-20. — Ah Yong 2001: 165-168, fig. 82.

**Material:** USNM 304502, 2 males (TL 10 mm), 1 female (TL 13 mm), off Alupat Id., Agana Bay, Guam, 10.5 m, coarse sand, coll RK, 23 Oct 1984; USNM 304503, 6 females (TL 12-16 mm), Piti Bomb Holes, Guam, 1.5-2 m, sandy areas around bomb hole, RK & JD, 13 Mar 1984; USNM 304506, 3 males (TL 13-15 mm), Double Reef, Guam, inner sand patch, RK, 3 May 1984; USNM 304507, 1 male (TL 11 mm), 1 female (TL 11 mm), Taleyfac, Guam, 1.5 m, muddy sand, RK & JD, 6 Apr 1984; USNM 304508, 1 male (TL 12 mm), 2 females (TL 9-10 mm), Piti Bomb Holes, Guam, 1.4 m, sand slope, RK, 5 Apr 1984; USNM 304510, 1 female (TL 11 mm), Guam, from plankton, RK, 7 May 1981; USNM 304513, 1 male (TL 13 mm), 2 females (TL 14-16 mm), 2 batches of eggs, NW corner Cocos Lagoon, Guam, 1 m, sand at edge of seagrass, RK, 26 Apr 1984; USNM 304514, 3 males (TL 14-16 mm), 2 females (TL 16-18 mm), Agana Bay, Guam, mid moat, reef platform, sand, RK, 19 May 1984; USNM 304515, 1 male (TL 10 mm), Toguan Bay, Guam, 7.5 m, black, coarse sand, RK; USNM 304516, 1 male (TL 11 mm), 1 female (TL 14 mm), Cocos Lagoon, Guam, 2.4-3.0 m, in sand near barrier reef, RK, 6 Mar 1984; USNM 304518, 1 male (TL 15 mm), 2 females (TL 13-14 mm), Family Beach, Apra Harbour, 1.2 m, sand patch between rubble, RK, 29 Apr 1984; USNM 304519, 1 male (TL 11 mm), 1 female (TL 11 mm), off Alipat Island, Agana Bay, Guam, 10.5 m, margin of sand patch, RK, 25 Apr 1984; USNM 304522, 3 males (TL 10-14 mm), Piti Bomb Holes, Guam, 0.6 m, sandy patches between corals on reef flat, RK;

USNM 304526, 1 female (TL 13 mm), Guam, RK; USNM 304527, 1 male (TL 15 mm), base of breakwater, Luminao, Guam, 1.2 m, RK, 24 May 1984.

**Measurements:** Male ( $n = 25$ ) TL 10-16 mm, female ( $n = 20$ ) TL 11-18 mm.

**Remarks:** The specimens examined here agree well with published accounts (Michel & Manning 1971, Manning 1978, Ahyong 2001) and were collected from the shore to a depth of 10.5 m.

**Distribution:** Western Indian Ocean to Australia and French Polynesia. A new record for Guam.

*Pullosquilla thomassini* Manning 1978

*Pullosquilla thomassini* Manning 1978: 20-21, fig. 9 [type locality: Grand Recif, Tulear, Madagascar]. — Ahyong 2001: 168, fig. 84.

**Material:** USNM 304500, 1 male (TL 13 mm), 3 females (TL 10-12 mm), Piti Bomb Holes, Guam, 1.2-1.5 m, sand slope, RK, 5 Apr 1984; USNM 304501, 1 male (TL 12 mm), 1 female (TL 12 mm), Piti Bomb Holes, Guam, 3 m, sand slope, RK, 5 Apr 1984; USNM 304504, 1 male (TL 10 mm), 3 females (TL 10-12 mm), ½ mile N of Nimitz Beach, Agat Bay, Guam, 15 m, RK & JD, 29 Mar 1984; USNM 304505, 1 female (TL 12 mm), Taleyfac Channel, Guam, 7.5 m, sand, RK & JD, 20 Mar 1984; USNM 304509, 1 male (TL 9 mm), 1 female (TL 10 mm), Taleyfac, Guam, 1.5 m, muddy sand, RK & JD, 6 Apr 1984; USNM 304511, 1 female (TL 12 mm), Piti Bomb Holes, Guam, 7.5 m, sand, RK, 18 May 1984; USNM 304512, 1 female (TL 10 mm), ½ mile N of Nimitz Beach, Agat Bay, Guam, 6 m, from burrow in sand, RK, 29 Mar 1984; USNM 304517, 1 male (TL 14 mm), Family Beach, Apra Harbour, Guam, 4.5 m, sand channel, RK, 29 Apr 1984; USNM 304520, 1 male (TL 14 mm), Family Beach, Apra Harbour, Guam, 2.4-4.8 m, sand in channel, RK, 29 Apr 1984; USNM 304521, 2 males (TL 12-13 mm), Cetti Bay, Guam, 15 m, RK, 26 Apr 1984; USNM 304523, 2 females (TL 10-12 mm), Cetti Bay, Guam, 18-20 m, coarse, 'peppery' sand, RK, 14 Sep 1984; USNM 304524, 3 males (TL 10-12 mm), 3 females (TL 12-13 mm), Family Beach, Apra Harbour, 2 m, sand hole on reef flat, RK, 29 Apr 1984; USNM 304528, 1 female (TL 17 mm), Double Reef, Guam, 12 m, RK, 3 Aug 1984; USNM 304532, 2 males (TL 14-15 mm), 1 female (TL 15 mm), Ngargol Id. Palau, cove at Peduliaes Cape, 2.4 m, RK, 1 Jul 1984.

**Measurements:** Male ( $n = 13$ ) TL 9-15 mm, female ( $n = 18$ ) TL 10-17 mm.

**Remarks:** *Pullosquilla thomassini* is a common species around Guam where it burrows in sand from the shallow sublittoral zone to a depth of about 20 m.

**Distribution:** Western Indian Ocean to Australia and French Polynesia. A new record for Guam and Palau.

Squilloidea Latreille 1802

Squillidae Latreille 1802

*Leptosquilla schmeltzii* (A. Milne-Edwards 1873)

*Squilla schmeltzii* A. Milne Edwards 1873: 11, pl. 2, fig. 7 [type locality: Upolu, Samoa].

*Leptosquilla schmeltzii*. — Miers 1880: 13.

**Material:** USNM 304446, 1 male (TL 12 mm), Agfayan Bay, Guam, 13 Jun 1972.

**Measurements:** Male ( $n = 1$ ) TL 12 mm.

**Remarks:** The present specimen is unusual in bearing eight teeth on the dactylus of the only extant raptorial claw. *Leptosquilla schmeltzii* usually bears six or seven teeth on the dactyli of the raptorial claws (Holthuis 1941, Moosa 1991).

**Distribution:** Western Indian Ocean to Indonesia and Samoa. A new record for Guam.

*Oratosquilla fabricii* (Holthuis 1941)

*Squilla oratoria*. — Edmondson 1921: 287. — Townsley 1953: 404-406, figs. 2-3. [not *Squilla oratoria* de Haan 1844].

*Squilla fabricii* Holthuis 1941: 249-253, fig. 1 [type locality: Telok Dalam, Eil Nias, Indonesia].

*Squilla calumnia* Townsley 1953: 410, figs. 8, 9 [type locality: Hilo, Hawaii].

*Oratosquilla calumnia*. — Manning 1971b: 4-6, fig. 1.

*Oratosquilla fabricii*. — Ahyong 2000: 926-930, fig. 1.

**Material:** USNM 304447, 1 male (TL 69 mm), Agfayan Bay, Guam, 13 Jun 1972.

**Measurements:** Male ( $n = 1$ ) TL 69 mm.

**Remarks:** Ahyong (2000) showed that *Oratosquilla calumnia*, a species previously reported from Guam, is a junior synonym of *O. fabricii*.

**Distribution:** The South China Sea, Indonesia, New Caledonia, Guam and Fiji to the Central Pacific.

*Parvisquilla dominguez* sp.nov.

(Figs 4, 5)

**Material:** HOLOTYPE: USNM 304525, male (TL 10 mm), Piti Bay, Luminao, Guam, 0-1 m, from base of mixed corals, JD, 24 Jan 1984.

PARATYPE: USNM 306090, 1 juvenile male (TL 9 mm), type locality.

**Diagnosis.** AS6 without dorsal carinae or tubercles but with low longitudinal SM, IM and LT swellings. Telson with indistinct, paired MD carina; dorsolaterally with scattered low tubercles and larger, widely spaced, projecting tubercles along lower margins above primary teeth. Uropodal protopod without dorsal spines or tubercles.

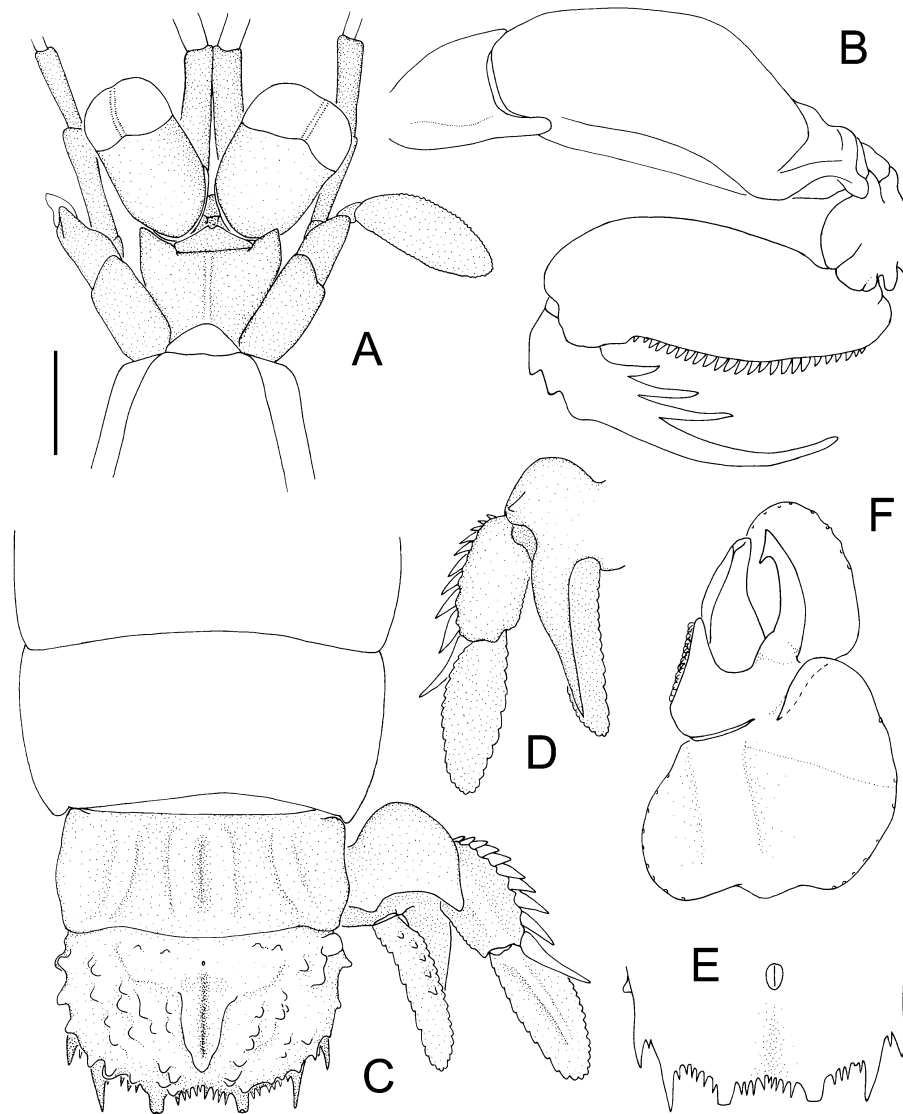


Figure 4. *Parvisquilla dominguez* sp. nov. (USNM 304525, male holotype TL 10 mm). A, anterior cephalon, dorsal. B, raptorial claw, right lateral. C, AS4-6, telson & uropod, dorsal. D, uropod, right ventral. E, telson, ventral. F, PLP1 endopod, right anterior. Scale A-E = 0.5 mm, F = 0.25 mm.

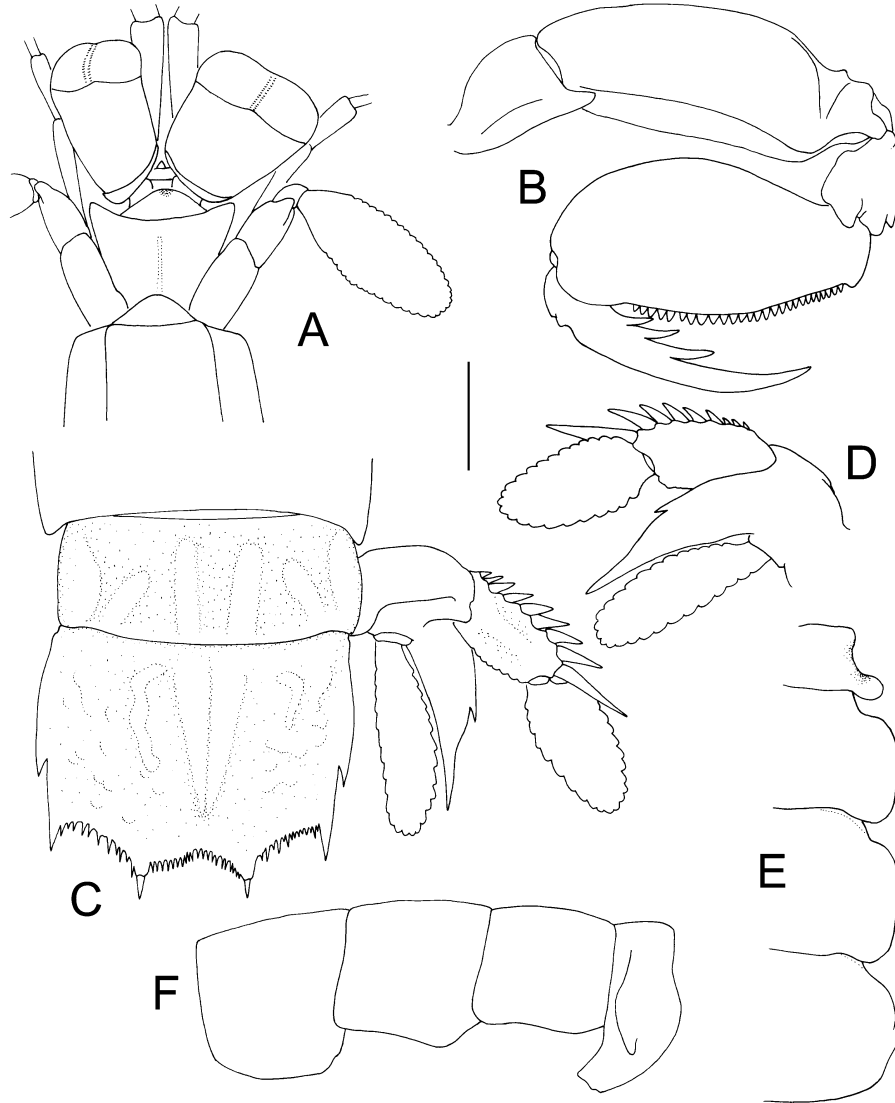


Figure 5. *Parvisquilla dominguez* sp. nov. A-D (USNM 306090, juvenile male paratype TL 9 mm). A, anterior cephalon, dorsal. B, raptorial claw, right lateral. C, AS5-6, telson & uropod, dorsal. D, uropod, right ventral. E, F (USNM 304525, male holotype TL 10 mm). E, TS5-8, right dorsal. F, TS5-8, right lateral. Scale = 0.5 mm.

**Description of holotype.** Dorsal integument smooth, polished. Eye with cornea broadened, but not distinctly bilobed, not extending beyond A1 peduncle segment 1. Ophthalmic somite anterior margin triangular. Ocular scales broad, truncate. A1 somite elongate, extending anteriorly well beyond apex of rostral plate, with median carina. A1 peduncle 1.00CL. A1 somite dorsal processes low,

angular. A2 protopod lacking spines or papillae. A2 scale slender, 0.78 CL; entire margin setose.

Rostral plate triangular, broader than long; apex rounded; lacking carinae.

Carapace strongly narrowed anteriorly; anterolateral angles blunt; posterior margin unarmed.

Raptorial claw dactylus with 4 teeth; outer margin with two proximal notches, margin distal to distalmost notch slightly inflated; carpus dorsal margin with short distal tooth; propodus pectinate, with 3 movable spines proximally; merus outer inferodistal angle unarmed.

Mandibular palp absent; MXP2 & 3 with epipod. MXP5 basal segment lacking ventrally directed spine; merus with broad convex flange on inner margin.

Pereiopods 1-3 basal segment unarmed; endopod segments fused, slender, setose distally.

TS5-8 lacking dorsal carinae. TS5 lateral process a short lobe produced diagonally.

TS6-8 lateral process broadly rounded. TS8 without sternal keel.

PLP1 endopod distal endite without lateral lobe; hook process elongate, with pointed apex, as long as tube process.

AS1-5 without dorsal carinae. AS5 with blunt posterolateral projection.

AS6 without sinuous dorsal carinae or tubercles; with positions of SM, IM and LT bosses indicated by slight dorsal swellings; with triangular ventrolateral projection anterior to uropodal articulation; sternum posterior margin unarmed.

Telson thick, inflated; with indistinct, paired MD carina; dorsolaterally with scattered low tubercles and larger, well spaced, projecting tubercles along lower margins above primary teeth; SM and IM teeth slender, distinct; SM teeth with movable apices; LT tooth and prelateral lobe absent; denticles spiniform, SM 4-5, IM 6, LT 1. Telson ventral surface smooth, lacking carinae or tubercles.

Uropodal protopod terminating in a single flattened spine, extending posteriorly well beyond midlength but not beyond apex of endopod; with blunt angular projection above exopodal articulation; without dorsal spines or tubercles; without ventral spine or tubercle anterior to endopod articulation. Protopod inner margin smooth.

Uropod exopod proximal segment unarmed dorsally; inner margin straight; outer margin with 9 movable spines, distalmost reaching to about midlength of distal segment; distal margin unarmed; endopod with 5 dorsal tubercles.

**Colour in life.** Completely white; carapace with scattered white chromatophores (based on collector's notes).

**Etymology.** Named for Jane Dominguez who collected the types as well as many specimens used in this study. Used as a noun in apposition.

**Measurements:** Male holotype ( $n = 1$ ) TL 10 mm, juvenile male ( $n = 1$ ) TL 9 mm. Other measurements of holotype: CL 1.8 mm, A1 peduncle 1.8 mm, A2 scale 1.4 mm.

**Remarks:** *Parvisquilla dominguez* sp. nov. is the third species of the genus to be recognized. It differs from *P. sinuosa* (Edmondson 1921) and resembles *P. multituberculata* (Borradaile 1898) in lacking sinuous carinae on the telson. *Parvisquilla dominguez*, however, primarily differs from *P. multituberculata* in lacking distinct carinae and tubercles on AS6, and in having only low, sparsely distributed tubercles on the dorsum of the telson instead of the dense covering of upright, elongate tubercles. *Parvisquilla dominguez* also differs from *P. multituberculata* in lacking irregular tubercles and spines on the dorsum of the uropodal protopod.

The paratype (Fig. 5A-D) is a juvenile and is significant for displaying more obviously squilloid features in the flattened, quadrate telson with more than four intermediate denticles. Further, the paratype differs from the holotype in having more trapezoid eyes, the cervical groove is present (but faint), the propodus of the raptorial claw is relatively deeper, the anterior margin of the uropodal protopod is less strongly convex, and a small spine is present on the outer margin of the terminal spine of the uropodal protopod. The dorsal ornamentation of AS6 and the telson of the juvenile are rudimentary in comparison to that of the adult. These morphological changes between juvenile and adult in *P. dominguez* are similar to those evident in growth series of Indonesian *P. multituberculata* in the USNM collected by the second author. In *P. multituberculata*, however, the dorsal ornamentation of AS6 and the telson is distinctly more pronounced than in *P. dominguez*.

Accounts of *Parvisquilla multituberculata* (see Manning 1978, Liu 1975) suggest that the terminal spine of the uropodal protopod is short with a small outer spinule. Both of the aforementioned accounts studied females only. Examination of a male and females of *P. multituberculata* in the collections of the AM suggests that the uropodal protopod form is sexually dimorphic. Unfortunately, the single male available is in poor condition, but bears the long, slender uropodal protopod, apparently without the small outer spinule. The females bear a short uropodal protopod with a small spinule on the outer margin. Thus, the long, slender terminal spine of the uropodal protopod in the holotype of *P. dominguez* appears to be a sex related feature. The sexual dimorphism in the form of the uropodal protopod reported here in *Parvisquilla multituberculata* is unique in the Stomatopoda. Additional specimens of both sexes of all three species of the genus are required to assess the generality of such sexual dimorphism within *Parvisquilla*.

Species of *Parvisquilla* live in deep crevices inside coral heads and combined with their diminutive size, are seldom encountered. The three species can be distinguished in the key below.

**Distribution:** Known only from the type locality, Piti Bay, Guam.



Key to species of *Parvisquilla*

1. Telson with sinuous, scroll-like carinae, without upright tubercles or processes *P. sinuosa*
- Telson without sinuous, scroll-like carinae; with numerous upright tubercles or low sparsely distributed tubercles 2
2. Telson with dense covering of elongate, upright tubercles. Uropodal protopod with dorsal tubercles or blunt spines *P. multituberculata*
- Telson with sparse covering of low tubercles. Uropodal protopod without dorsal tubercles or blunt spines *P. dominguez*

**Discussion**

Prior to this study, seven stomatopod species were known from Guam. Thirty-four species arrayed in five superfamilies, 12 families and 22 genera are now known from the area. Most species are widespread in the Indo-West Pacific. *Manningia zehntneri*, *Pullosquilla malayensis*, *Haptosquilla tanensis*, and *Hoplosquilla said*, previously known only from their respective type localities, are reported for the first time since they were first described. Moreover, the discovery of *M. zehntneri* and *P. malayensis* from Guam, previously known from Mauritius and western Malaysia respectively, mark significant range extensions for these species suggesting that they may be widespread in the Indo-West Pacific. The rediscovery of *H. tanensis*, previously known only from Japan shows also that the species is more widely distributed than formerly believed. Conversely, four species are presently known only from Guam or its immediate environs: *Chorisquilla kroppi* sp. nov., *Mesacturus dicrurus*, *Mortensenenus paulay* sp. nov. and *Parvisquilla dominguez* sp. nov. Whether or not these four species are true endemics remains to be determined through further sampling outside of Guam.

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