

PROCEEDINGS  
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TWO NEW SPECIES OF *GONODACTYLUS*  
(CRUSTACEA, STOMATOPODA), FROM  
ENIWETOK ATOLL, PACIFIC OCEAN

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In September and October of 1969 the Smithsonian Institution sponsored an expedition to Eniwetok Atoll in the Marshall Islands, with the support of the Atomic Energy Commission through the University of Hawaii and the Smithsonian Oceanography and Limnology Program. Participants included Porter Kier, Thomas Phelan, Erle Kaufman, Thomas Waller, and C. Allan Child from the National Museum of Natural History; Richard Grant and John Pojeta, U.S. Geological Survey; and C. E. Dawson, Gulf Coast Research Laboratory. Representative collections of marine organisms were made by hand, with 10 percent rotenone, and with dynamite in shallow water to a depth of about 115 feet. Forty stations were occupied; complete station data are on file in the Division of Crustacea, National Museum of Natural History, Smithsonian Institution.

Stomatopods were collected at nine stations (Table 1). Of the eight species collected, three, *Gonodactylus chiragra* (Fabricius), *G. falcatus* (Forskål), and *G. platysoma* Wood-Mason, have extensive ranges in the Indo-West Pacific region; they are known from scattered localities between Oceania and the western Indian Ocean (Manning, 1968). *Gonodactylus smithii* Pocock has been recorded from localities between the South China Sea and Australia to the western Indian Ocean (Manning, 1968); although it was not known from the central Pacific Ocean, its occurrence there is not unexpected inasmuch as it has been found in the coral habitat throughout its range.

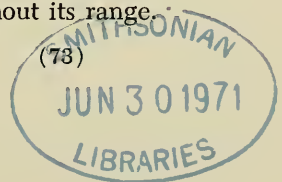


TABLE 1. Station data for Eniwetok Atoll Expedition and list of species collected.

Sta. no.	Date	Station data	Species
6-69	22 Sept.	11°25'27"N, 162°23'15"E Muri (David) Island, sand and rock tidepools ca. 100 yds. E of SW corner of island; low flood tide; 0-3 ft.; 10% rotenone; C. E. Dawson	<i>Gonodactylus chitragra</i> (Fabricius) 2♂, 1♀ <i>Gonodactylus smithii</i> Pocock 1♂ <i>Haptosquilla glyptocercus</i> (Wood-Mason) 3♀ <i>Gonodactylus falcatus</i> (Forskål) 1♀
7-69	23 Sept.	11°22'50"N, 162°10'30"E Grimem (Keith) Island, lagoon side, scattered small coral heads on 75 ft. bottom of coral sand; C. A. Child	<i>Gonodactylus platysoma</i> Wood-Mason 2♀ <i>Gonodactylus smithii</i> Pocock 1♂, 1♀
10-69	23 Sept.	11°21'43"N, 162°21'20"E Eniwetok (Fred) Island, NE end, ocean side tide flat and quarry, 100-200 yds. from shore; tide pools 1-4 ft. depth; 10% rotenone; C. E. Dawson	<i>Gonodactylus childi</i> n. sp. 2♀ <i>Gonodactylus smithii</i> Pocock 1♂, 1♀ <i>Haptosquilla glyptocercus</i> (Wood-Mason) 1♂, 1♀ <i>Gonodactylus micronesica</i> n. sp. 1♀
13-69	24 Sept.	11°21'43"N, 162°21'20"E Eniwetok (Fred) Island, NE end, ocean side, outlet to quarry; 200-300 yds. from shore; coral rock channel; 0-3 ft. depth; 10% rotenone; C. E. Dawson	<i>Gonodactylus platysoma</i> Wood-Mason 1♂ <i>Gonodactylus smithii</i> Pocock 1♂, 1♀ <i>Haptosquilla glyptocercus</i> (Wood-Mason) 1♂, 1♀ <i>Gonodactylus micronesica</i> n. sp. 1♀
15-69	25 Sept.	11°24'05"N, 162°19'05"E Parry (Elmer) Island, lagoon side, coral pinnacle due W, marked with buoy "Int Qk Fl R" on chart HO 6090; buoy marked "CR"; pinnacle of live corals of about 1 acre; stomatopod from 80-115 ft. depth; C. A. Child, T. Waller	<i>Gonodactylus platysoma</i> Wood-Mason 1♂
19-69	26 Sept.	11°27'40"N, 162°05'50"E Rigili (Leroy) Island; tide pools in lagoon reef edge; 2-4 ft.; 10% rotenone; C. E. Dawson	<i>Gonodactylus chitragra</i> (Fabricius) 1♂ <i>Haptosquilla glyptocercus</i> (Wood-Mason) 1♀
21-69	27 Sept.	11°21'43"N, 162°21'20"E Eniwetok (Fred) Island, outer reef rim and surge channels along northern third of island; 10% rotenone; C. E. Dawson	<i>Gonodactylus childi</i> n. sp. 5♂ <i>Haptosquilla glyptocercus</i> (Wood-Mason) 1♂
35-69	8 Oct.	11°32'47"N, 162°21'56"E Runit (Yvonne) Island; tide pool in rock tide flat ca. 100 ft. inside reef edge; surface to 3 ft. depth; 10% rotenone; C. A. Child	<i>Gonodactylus childi</i> n. sp. 8♂, 3♀ <i>Gonodactylus espinosus</i> Borradaile 1♀ <i>Gonodactylus platysoma</i> Wood-Mason 1♂ <i>Gonodactylus smithii</i> Pocock 2♂, 4♀ <i>Haptosquilla glyptocercus</i> (Wood-Mason) 1♂
38-69	10 Oct.	11°20'52"N, 162°20'36"E Eniwetok (Fred) Island; ocean side, surge channel and blow hole about 20 ft. behind outer reef edge, ca. 200 ft. N of end of runway; 0-2 ft. depth, surge channel habitat 15-20 ft. depth; 10% rotenone; C. A. Child	<i>Gonodactylus childi</i> n. sp. 8♂, 3♀ <i>Gonodactylus espinosus</i> Borradaile 1♀ <i>Gonodactylus platysoma</i> Wood-Mason 1♂ <i>Gonodactylus smithii</i> Pocock 2♂, 4♀ <i>Haptosquilla glyptocercus</i> (Wood-Mason) 1♂

One species, *G. espinosus* Borradaile, is known to occur in the central Pacific Ocean, where it has been recorded from several localities between Palmyra Island and the Tuamotu Archipelago (Manning, 1967), and another, *Haptosquilla glyptocercus* (Wood-Mason), is largely restricted to the Pacific Ocean; it has also been taken in the Andaman Islands (Manning, 1969).

Two of the species of *Gonodactylus* in the collection apparently represent undescribed species. One, represented by a large series of specimens, was taken in shallow water at several stations. The other, represented by a single specimen, was taken at the deepest station, at a depth of 80–115 feet. Illustrations and descriptions of both of these latter two species are given below, and a key to the species of the *demanii* section of the genus is presented.

Terms used in the descriptive accounts and measurements have been discussed in detail in earlier papers (Manning, 1967, 1968). The illustrations were drawn by my wife Lilly. All specimens are in the Division of Crustacea, National Museum of Natural History, Smithsonian Institution (USNM).

***Gonodactylus childi* new species**

(Figure 1)

*Holotype*: 1 ♂, 32 mm; Runit (Yvonne) Island, Eniwetok Atoll; station 35-69; USNM No. 135624.

*Paratypes*: 2 ♀, 15–19 mm; Eniwetok (Fred) Island, Eniwetok Atoll; station 13-69; USNM No. 135626.—4 ♂, 15–23 mm; data as for holotype; USNM No. 135625.—8 ♂, 9–16 mm; 3 ♀, 14–19 mm; Eniwetok (Fred) Island, Eniwetok Atoll; station 38-69; USNM No. 135627.

*Description*: Rostral plate with long apical spine, basal portions of plate rounded anterolaterally (Fig. 1a). Ocular scales small, erect, flattened dorsally. Mandibular palp and five epipods present. Lateral processes of sixth and seventh thoracic somites rounded, process of sixth somite broader than that of seventh somite (Fig. 1b). Carinae of sixth abdominal somite inflated, each usually with small apical spine. Telson broader than long, with three pairs of marginal teeth, submedians with movable apices. Intermediate teeth of telson well developed, apices sharp. Lateral teeth of telson distinct, apices not projecting laterally much beyond outline of telson. Telson without dorsal spinules or tubercles. Median carina inflated in both sexes (at all sizes available for study), usually completely obscuring accessory median carinae and knob; occasionally portion of accessory median carinae marked by posterolateral dimples on median carina (Fig. 1c). Accessory median carinae, if dis-

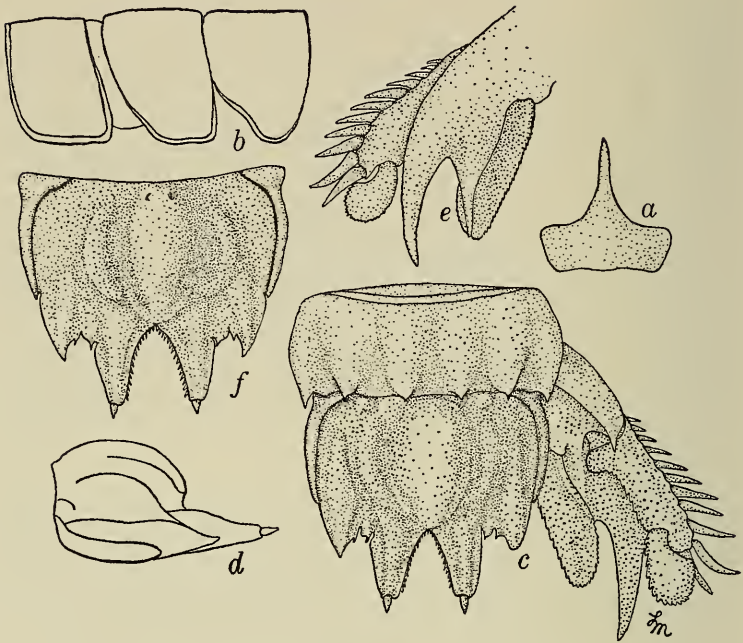


FIG. 1. *Gonodactylus childi* new species. Male paratype, TL 16 mm, station 38-69: *a*, rostral plate; *b*, outline of lateral processes of fifth, sixth, and seventh thoracic somites, left side; *c*, sixth abdominal somite, telson, and uropod; *d*, outline of telson, lateral view; *e*, uropod, ventral view. Female paratype, TL 19 mm, station 38-69: *f*, telson. Setae omitted.

tinct, not extending anteriorly beyond posterior fourth of median carina. Anterior submedian carinae inflated, posterior portion unarmed, curved mesially, with posterior depression in some specimens. Carinae of submedian and intermediate teeth of telson inflated; marginal carinae sharper. Telson with 14-15 submedian and two sharp intermediate denticles, intermediates recessed anteriorly, inner set on rounded lobe. Ventral surface of telson lacking carinae. Uropod with 10-11 slender, movable spines on outer margin of proximal segment of exopod, distalmost overreaching distal segment; proximal segment of exopod with distal fixed spine ventrally. Margins of uropod with complete complement of setae, arranged in one series. Spines of basal prolongation of uropod subequal in length, inner slenderer.

*Color*: Some specimens marked with black chromatophores on posterior portion of carapace, sixth thoracic somite, first and to lesser extent remainder of abdominal somites, and with four anterior black spots on

telson. Dactylus of raptorial claw blue. Display spot on merus of claw white, merus with scattered black chromatophores proximal to display spot. Abdomen, telson, and uropods with indistinct blue markings in preservative. Proximal segment of uropodal exopod with distal yellow spot. All pigment faded in most specimens.

*Size:* Males, total length 9–32 mm; females, total length 14–19 mm. Other measurements, in mm, of male holotype: total length 32, carapace length 6.5, fifth abdominal somite width 4.8, telson length 3.4, telson width 4.1.

*Discussion:* *Gonodactylus childi* is the sixth species of the *demanii* section of the genus to be recorded from the Pacific Ocean. It resembles *G. confinis* de Man, *G. espinosus* Borradaile, *G. micronesica* n. sp., and *G. incipiens* Lanchester and differs from *G. demanii* Henderson in lacking numerous dorsal spinules and tubercles on the telson. It differs from *G. espinosus* in having the intermediate teeth of the telson distinctly separated from the lateral margin, with the intermediate denticles recessed anteriorly; *G. espinosus* also has several series of setae rather than a single series on the uropodal endopod. *Gonodactylus childi* differs from *G. confinis* and *G. incipiens* in the shape of the anterior submedian carinae of the telson. In the latter two species the anterior submedians are broadly inflated and oval in shape; the inner edge of the anterior submedians almost extends to the lateral edge of the median carina. In *G. childi*, the anterior submedians, although inflated, are narrow and elongate, distinctly separated from the median carina, and they curve posteriorly toward the apex of the median carina. The median carina of the telson is not flask-shaped but is broadly oval in all three species; only in *G. confinis* is the swollen median carina armed posteriorly with three small but distinct spinules. *Gonodactylus childi* differs from *G. micronesica*, described below, in having shorter accessory median and intermediate carinae on the telson and in lacking the strong apical spine on the median carina of the telson.

As in some of the other small species of the *demanii* section of the genus, the lateral process of the sixth thoracic somite is broader and more truncate than that of the seventh somite, and, as in several of these species, the height of the telson, seen in lateral view, is comparatively great. The telson height in *G. childi* is equal to one-half of the median length.

The species is named for C. Allan Child, Division of Crustacea, National Museum of Natural History, who made special efforts to collect stomatopods during the expedition.

#### ***Gonodactylus micronesica* new species**

(Figure 2)

*Holotype:* 1 ♀, 18 mm; Parry (Elmer) Island, Eniwetok Atoll; station 15-69; USNM No. 135628.

*Description:* Rostral plate with long apical spine, basal portion of plate rounded anterolaterally (Fig. 2a). Ocular scales small, erect. Mandibular

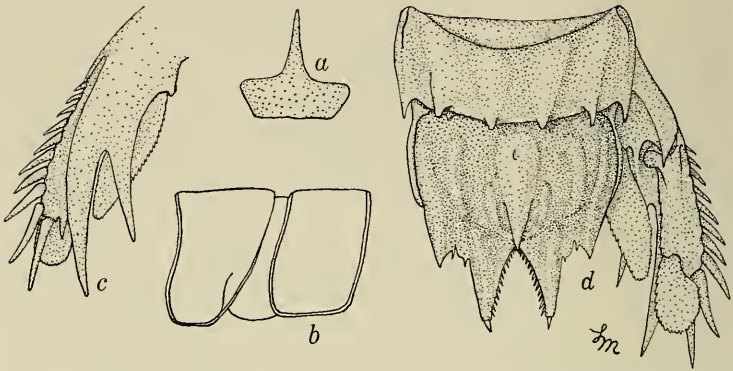


FIG. 2. *Gonodactylus micronesica* new species. Female holotype, TL 18 mm, station 15-69: *a*, outline of rostral plate; *b*, outline of lateral processes of sixth and seventh thoracic somites, right side; *c*, uropod, ventral view; *d*, sixth abdominal somite, telson, and uropod. Setae omitted.

palp and five epipods present. Lateral processes of sixth and seventh thoracic somites rounded, process of sixth somite broader than that of seventh somite (Fig. 2*b*). Carinae of sixth abdominal somite inflated anteriorly, each with strong posterior spine. Telson about as broad as long, with three pairs of marginal teeth, submedians with movable apices. Intermediate teeth of telson well developed, apices sharp. Lateral teeth distinct (on one side only in this specimen), apices not projecting laterally much beyond outline of telson. Telson without dorsal spinules or tubercles. Median carina flask-shaped, not markedly inflated in female, terminating in strong apical spine. Accessory median carinae well-defined, extending anteriorly almost to midlength of telson, posteriorly curving mesially to fuse under apex of median carina. Anterior submedian carinae slender, unarmed, curved posteriorly toward median carina. Carinae of submedian and intermediate teeth sharp, slender, intermediate carinae extending anteriorly to base of median carina; marginal carinae sharp. Telson with 13-14 submedian and two sharp intermediate denticles, intermediates recessed anteriorly, inner set on rounded lobe. Ventral surface of telson lacking carinae. Uropod with 10-11 slender, movable spines on outer margin of proximal segment of exopod, distalmost overreaching distal segment; proximal segment of exopod with distal fixed spine ventrally. Margins of uropod with complete complement of setae, arranged in one series. Spines of basal prolongation of uropod slender, outer longer.

*Color:* Faded.

*Size:* Only specimen examined, female holotype, total length 18 mm.

Other measurements, in mm: carapace length 3.3, fifth abdominal somite width 2.4, telson length 2.0, telson width 2.1.

*Discussion:* *Gonodactylus micronesica* is the Pacific counterpart of *G. segregatus* Lanchester from the central and western Indian Ocean (Manning, 1968). The new species differs from *G. segregatus* in lacking posterior spinules on the accessory median and anterior submedian carinae of the telson. As in *G. segregatus* the accessory median carinae and the intermediate carinae of the telson are slender and elongate.

The name is derived from the general area of the type-locality, Micronesia.

Key to species of *demanii* section of *Gonodactylus*

1. Inner margin of uropodal endopod largely or completely devoid of setae, margin smooth ..... 2  
    Inner margin of uropodal endopod completely fringed with setae, margin serrate at insertion of setae ..... 5
2. Ventral surface of each submedian tooth of telson with 2 longitudinal carinae .....  
    ..... *Gonodactylus bicarinatus* Manning, 1968; Madagascar  
    Ventral surface of each submedian tooth of telson with at most 1 longitudinal carina ..... 3
3. Uropodal endopod very broad, width more than  $\frac{1}{2}$  length .....  
    ..... *Gonodactylus crosnieri* Manning, 1968; Madagascar, Comoro Islands
- Uropodal endopod slender, width not exceeding  $\frac{1}{3}$  length ..... 4
4. Rostral plate with sharp anterolateral angles. Inner margin of uropodal endopod completely devoid of setae .....  
    ..... *Gonodactylus hendersoni* Manning, 1967; Burma to Hawaii  
    Rostral plate with rounded anterolateral angles. Inner margin of uropodal endopod with 1-10 proximal setae .....  
    --- *Gonodactylus demanii* Henderson, 1893; western Indian Ocean
5. Telson with dorsal spinules or spines ..... 6  
    Telson smooth dorsally ..... 7
6. Telson broader than long, dorsal spinules large. Lateral marginal teeth prominent .....  
    --- *Gonodactylus lanchesteri* Manning, 1967; western Indian Ocean  
    Telson as long as broad, dorsal spinules small. Lateral marginal teeth obscure .....  
    ..... *Gonodactylus spinosus* Bigelow, 1893; western Indian Ocean
7. Proximal segment of uropodal exopod lacking fixed distal spine on ventral surface .....  
    ..... *Gonodactylus choprai* Manning, 1967; western Indian Ocean  
    Proximal segment of uropodal exopod with fixed distal spine on ventral surface ..... 8
8. Apices of intermediate marginal teeth of telson appressed to outer margin of submedian teeth, intermediate denticles set posterior to apex of teeth. Uropodal setae in several series on

- margin of endopod -----  
 --- *Gonodactylus espinosus* Borradaile, 1898; central Pacific Ocean
- Apices of intermediate marginal teeth of telson separate, not appressed to outer margin of submedian tooth, intermediate denticles recessed anteriorly. Uropodal setae in 1 series on endopod ----- 9
9. Accessory median carinae of telson long, extending anteriorly to midlength of median carina ----- 10  
 Accessory median carinae of telson, if visible, short, not extending anteriorly beyond posterior  $\frac{1}{4}$  of median carina ----- 11
10. Accessory median and anterior submedian carinae of telson each with posterior spinule -----  
 --- *Gonodactylus segregatus* Lanchester, 1903; central and western Indian Ocean
- Accessory median and anterior submedian carinae of telson unarmed posteriorly ----- *Gonodactylus micronesica* new species
11. Median carina very inflated, obliterating accessory medians, with 3 posterior spinules -----  
*Gonodactylus confinis* De Man, 1902; Ternate, Molucca Islands, Indonesia
- Median carina variously inflated, unarmed posteriorly ----- 12
12. Anterior submedian carinae of telson oval, broadly inflated, lateral surface of submedians not widely separated from lateral margin of median carina -----  
 --- *Gonodactylus incipiens* Lanchester, 1903; central Pacific Ocean
- Anterior submedian carinae of telson slender, curved posteriorly toward median carina, lateral surface of submedians distinctly separated from lateral surface of median carina -----  
 ----- *Gonodactylus childi* new species

## LITERATURE CITED

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