

PYCNOGONIDA OF THE WESTERN
PACIFIC ISLANDS, VIII.
RECENT COLLECTIONS FROM ISLANDS OF THE
GREAT BARRIER REEF, AUSTRALIA

C. Allan Child

Abstract.—Eleven pycnogonid species were known from the Great Barrier Reef of Australia, from Torres Strait to the vicinity of Gladstone. Fifteen species are added to the known number with nine species previously known from other localities and six species new to science. These were taken from islands in the northern section (Lizard Island) and the southern section (Heron Island) of the Barrier Reef. The six new species are *Ammothella prolixa*, *Tanystylum haswelli*, *Seguapallene crassa*, *Nymphon draconis*, *Anoplodactylus brucei*, and *Rhynchothorax vallatus*. The new species are described and figured, the distribution of all species is included without conclusions concerning distribution patterns due to the paucity of this material and other records of Barrier Reef species, and remarks on species affinities are included.

This report treats two small collections of about 100 specimens comprising fifteen named species plus two unnamed for lack of suitable material in eleven genera representing six families of the Pycnogonida. The collections were taken from two small island groups; Lizard Island (14°38'S) in the northern section of the Barrier Reef, and Heron Island (23°27'S) at the southern end of the Reef, plus one species taken at Orpheus Island approximately in the middle of the Reef archipelago. Collecting on Lizard and Heron Islands was greatly facilitated by the presence of marine laboratories on both islands, while a resort on Orpheus Island made collecting there much easier.

Among the fifteen named species reported herein from these islands are six new species; *Ammothella prolixa*, *Tanystylum haswelli*, *Seguapallene crassa*, *Anoplodactylus brucei*, *Nymphon draconis*, and *Rhynchothorax vallatus*. This high incidence of new species (40%) reflects the sparse amount of collecting done in these islands for such microorganisms.

This is not the first report on pycnogonids

from the Great Barrier Reef, although it is the first to treat Reef species exclusively. Haswell (1885) was the first to report on a species (*Nymphopsis armatus*) from the Queensland coast, although it was not strictly from a Barrier Reef locality. Carpenter (1892, 1893) was the next specialist to report on Reef species with four taken off Murray Island in Torres Strait. His species were; *Parapallene australiensis* (Hoek), *P. haddoni* Carpenter, *Rhopalorhynchus clavipes* Carpenter, and *Ascorhynchus tenuirostre* Carpenter.

His work was followed by that of Flynn (1918, 1919a, b, 1929) who redescribed the types of Haswell and described five other species from Australia, only four of which were taken in the Barrier Reef area. The new species described by Flynn (1929) from near the Barrier Reef are: *Ascorhynchus melwardi* Flynn (near Cape York, northernmost Queensland), *Nymphopsis armatus* Haswell (Lindeman Island, Whitsunday Passage), *Pallenopsis hoeki* (Miers) (near Cape York), and *Parapallene famelica* Flynn (Lindeman Island).

Other Australian species have been described and the distribution of known species extended, but since Flynn's 1929 paper, no other Barrier Reef species were described until Stock (1954) listed *Anoplodactylus longiceps* Stock from Lindeman Island. Clark (1963) described *Pycnogonum torresi* Clark from Torres Strait on the northernmost Barrier Reef and listed *Ascorhynchus minutum* Hoek from a coral reef off Port Curtin at Gladstone.

Staples (1982) described several species from the Calliope River at Gladstone, but there have been no reports of pycnogonids from the Barrier Reef itself since Clark's paper reporting on the total Australian pycnogonid fauna known at that time. Staples also noted that there were at the time twenty-eight species known from Queensland, but only eleven of these were taken on or in close proximity to the Great Barrier Reef.

This report adds fifteen species to the eleven species known for a total of twenty-six now known from the Reef. Only one of the previously known species from the Reef was taken in the collections represented in this report while nine species are known from the Australian mainland or from more distant localities and six are reported as new species. The most probable reason for this lack of similarity in collections is undoubtedly due to differences in collecting methods. While many specimens were previously taken over the years fortuitously by trawl or other macrocollecting devices, the Lizard and Heron Island collections were made for their microorganism contents, thereby greatly enriching our knowledge of these tiny organisms of the Great Barrier Reef.

The previously known species comprising most of this report have a tendency to be distributed in a northern array above the equator, suggesting only that there has been more collecting to the north than in most Australian and New Zealand waters. One species is known to be pantropical-temperate while two have a broad Indo-west Pa-

cific distribution. Another has only been taken before in New Zealand, while two are known from either one or both sides of Australia to Indonesia or the Philippines, and three are known only from the Philippines or from there plus other western Pacific localities. One species has been taken previously only in Japan and Korea, providing a very disjunct picture of its distribution. All are shallow water inhabitants.

Very little can be inferred from these distributional bits and pieces and no clear pictures of distribution can be taken from such small groups of species. The only clear picture we get from the data in this report is that the Great Barrier Reef is apparently rich in species judging by this small sampling from two of the hundreds of islands. The presence of six previously undescribed species out of the fifteen in these collections suggests that very little collecting of minute forms has been done in these localities, and that intensive collecting over most of the length of the Barrier Reef might increase the number of new and known species by tenfold.

Systematics

Family Ammotheidae Dohrn

Genus *Achelia* Hodge

Achelia assimilis (Haswell)

Ammothea assimilis Haswell, 1884:1026-1027, pl. LIV, figs. 5-9.

Achelia (Ignavogriphus) assimilis.—Fry & Hedgpeth, 1969:106, figs. 152, 153, 156, tab. 13, 14 [literature].

Achelia assimilis.—Child, 1988b:2

Material examined.—Heron Island: southern reef flat, on alcyonarian, coll. A. J. Bruce, 16 Jan 1977 (1 juv); rubble on SW reef crest, coll. N. Bruce, 2 Jun 1978 (1 juv); rubble on reef flat, coll. N. Bruce, 6 Jun 1978 (2 m).

Lizard Island: off Casuarina Beach, coral with *Halimeda* and red algae clumps, 2 m, coll. B. Kensley, sta. K-L1, 27 May 1980 (2

juv); southern tip, coral rubble on patch reef, 1 m, sta. JDT/LIZ-3, 23 Jan 1989 (1 ♂, 1 juv); S of Lizard Head Peninsula, rubble in 2 m, sta. JDT/LIZ-14, 29 Jan 1989 (6 ♂, ♀); Lizard Head, rubble bank in 2 m, sta. JDT/LIZ-15, 31 Jan 1989 (10 ♂, ♀, juv); Lizard Head, small rubble in sand, 2 m, sta. JDT/LIZ-19, 2 Feb 1989 (4 ♂, ♀).

Distribution. — Haswell's long-known species has been taken in many southern hemisphere localities along with records from Indonesia and the Philippines. It has a mainly littoral to shallow depth range.

Remarks. — There may possibly be more than one species hiding under the umbrella of this name. It is an extremely variable species with figures in the literature having almost no tubercles to specimens figured with extreme tuberculation.

Genus *Ammothella* Verrill

Ammothella prolixa, new species

Fig. 1

Material examined. — Lizard Island: Watson's Bay, SW border, reef and sand flat rubble in 1–7 m, sta. JDT/LIZ-7, 25 Jan 1989 (1 ♂, holotype, 1 ♀, 2 juv, paratypes).

Other material. — Orpheus Island, just off Townsville: cove S of resort, rubble in 1–2 m, sta. JDT/OPH-1, 12 Feb 1989 (2 ♀).

Lizard Island: North Point, rubble at bottom of cliff, 12 m, sta. JDT/LIZ-13, 28 Jan 1989 (1 ♀); S of Lizard Head Peninsula, rubble in 2 m, sta. JDT/LIZ-14, 29 Jan 1989 (1 ♀, 1 juv); off Casuarina Beach, coral with *Halimeda* clumps and red algae, 2 m, sta. K-L1, 27 May 1980 (1 juv).

Description. — Size very small, leg span 8 mm. Trunk and lateral processes slender, elongate, fully segmented, glabrous except for tiny paired or single dorsodistal tubercles on lateral processes. Lateral processes 2 to 2.5 times longer than their maximum diameters, constricted proximally, swollen distally, separated by slightly more than twice their diameters distally. Neck moderately narrow, expanded distally, without

setae or tubercles. Ocular tubercle very slender proximally, expanded to club-shape distally, slightly more than 4 times longer than maximum diameter, eyes fully distal, large, well pigmented. Abdomen very long, slender, longer than proboscis, erect, curving toward posterior, armed with median and distal fields of tubular and pointed spines. Median field with 6 tubular spines, 2 dorsal are longer than those lateral and ventral, and 2 shorter lateral pointed spines. Distal field with 2 long tubular spines and 2 shorter pointed spines, with 2 very short setae lateral to anus.

Proboscis with extreme basal and distal constrictions and very swollen median section, originating from extended proximoventral pedestal on trunk anterior.

Chelifores slender, slightly longer than proboscis, lightly spinose. First scape segment only half length of second segment, first armed with single lateral seta distally, second with short proximal tubular spine, 2 median tubular spines and 1 long pointed spine, one distal tubular spine with 4 long pointed spines on inflated terminus of scape. Chela with atrophied movable finger on bulbous palm lacking immovable finger but with single long lateral seta.

Palp very long, slender, segments only moderately armed with ventral setae. First segment not longer than wide, armed with single lateral seta longer than segment diameter. Second segment almost as long as fourth, the longest segment, second armed with 2 moderately long lateral setae. Fourth with 3 long lateral and distal setae, several shorter endal setae, and a lateral elevated pore at median length. Fifth and sixth segments subequal, half length of fourth, armed moderately with short setae, some slightly longer than segment diameter. Seventh and eighth increasingly shorter, with few ventral setae, ninth longer, almost as long as fifth and sixth segments, armed with moderate number of short ventral and distal setae. Entire palp about 1.5 times longer than proboscis.

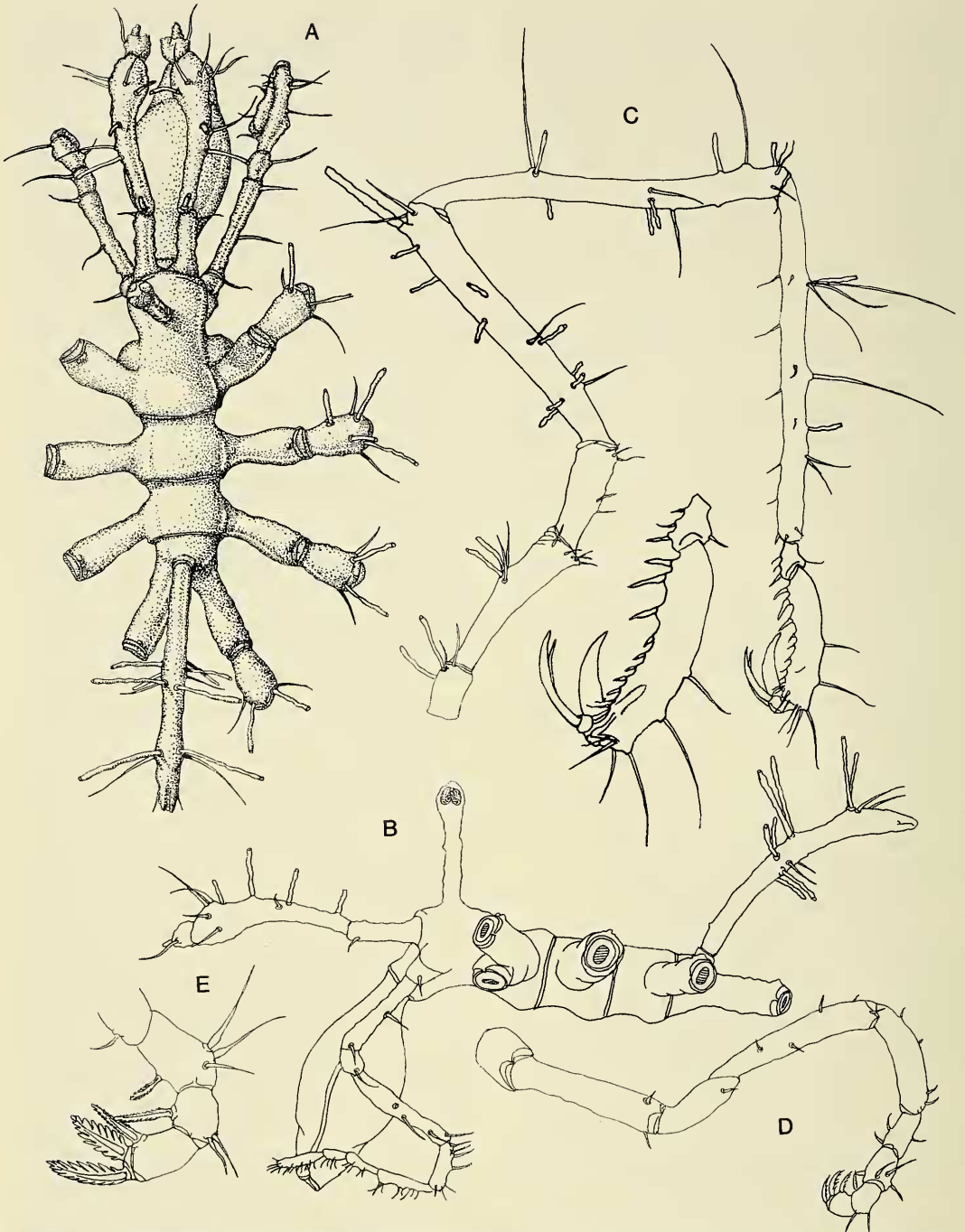


Fig. 1. *Ammothella proluxa*, new species, holotype male: A, Trunk, dorsal view; B, Trunk, lateral view; C, Third leg, with enlargement of terminal segments; D, Oviger; E, Strigilis segments, enlarged.

Oviger typical of genus, longest segments with 1 to several short lateral setae. Second and fourth segments longest, second almost as long as fourth. Strigilis weak, seventh segment armed with 3 long ectal setae and 1 endal denticulate spine smaller than those of more distal segments. Eighth with 2 ectal setae and 1 endal denticulate spine, ninth without ectal setae but 1 endal denticulate spine. Tenth segment a tiny knob with 2 very broad denticulate spines having at least 8 serrations per side.

Legs slender, well armed with tubular and pointed spines. First and second coxae with paired dorsolateral tubular spines, paired lateral long pointed spines, and fringe of short setae laterally and ventrally on second coxae. Third coxae without long spines but with several short ventral setae. First tibiae the longest segment, longer than second tibiae which are longer than femorae. All major segments with 3–9 tubular spines randomly placed and 4–8 long pointed spines, those on dorsal tibiae up to 6 times longer than diameter of segment. Femoral cement gland tube placed dorsodistally, a robust cylinder almost twice femoral diameter. Tarsus very short, subtriangular, with 2 setae and 1 spine ventrally. Propodus moderately short, slightly curved, with 3 well separated heel spines, 6 small sole spines, and few dorsal and distal setae longer than segment diameter. Claw relatively short, only little over half propodal length, auxiliary claws almost as long as main claw.

Female: very similar to male but of slightly larger size. Oviger second and fourth segments notably shorter than those of male. Sexual pores on all second coxae ventrodorsally.

Measurements (holotype, in mm).—Trunk length (chelifore insertion to tip 4th lateral processes), 0.85; trunk width (across 2nd lateral processes), 0.59; proboscis length, 0.53; abdomen length, 0.62; third leg, coxa 1, 0.12; coxa 2, 0.35; coxa 3, 0.31; femur, 0.74; tibia 1, 0.85; tibia 2, 0.8; tarsus, 0.09; propodus, 0.31; claw, 0.14.

Distribution.—The species is known from the type locality, Lizard Island, in the northern sector of the Barrier Reef, and from Orpheus Island, in the middle section of the Reef, all in shallow depths to 12 m.

Etymology.—This species is named (Latin: stretched out, long) for its elongate slender trunk and appendages.

Remarks.—This species was at first glance reminiscent of *Ammothella elegantula* Stock, another slender attenuated species. Further examination brought many small differences to light, such as the very slender proboscis of *A. elegantula*, its abdomen without large spines, the lack of any tubular spines on Stock's species, the long lateral spines of the lateral processes and the similar spines of the first two coxae, the broad neck, and the very short terminal palp segments, all characters quite different from this new species.

This species is another addition to the *appendiculata-rugulosa* group of species in this genus, species having tubular and pointed spines, long ocular tubercles, long curved abdomina with spine fields, and legs with similar segment length ratios and spination. This species group is larger, with 18 species, than the group of 15 species without these spines. Of the 18 species having tubular spines, this species is closest to the known Pacific species; *A. indica* Stock, *A. alcalai* Child, and possibly *A. pacifica* Hilton. It can be compared least with *A. pacifica* of the three because Hilton's species is much more compact with lateral process setae, shorter ocular tubercle and abdomen, and many more tubular spines on each major leg segment.

The new species is very similar to the more slender *A. indica*, particularly in a comparison of the legs, ovigers, and palps of both species. The differences are found in the more widely separated lateral processes of the new species along with its shorter oviger segments, fewer tubular leg spines, lack of a tubular spine on the first scape segments, rounded ocular tubercle

apex, a shorter propodus, and fewer denticulate spines on the female oviger, while having a denticulate spine on the eighth male oviger segment which is lacking on that of *A. indica*.

This new species appears to be closest to *A. alcalai*, recently described from the Philippines (Child 1988a:2–4, fig. 1). The lateral processes of the new species are placed farther apart than in *A. alcalai* (and are farther apart than those of all other species discussed herein), but both species have small lateral process dorsodistal tubercles. The tubular and pointed spines of *A. alcalai* are predominantly much shorter than those placed in corresponding positions on *A. prolixa*, and the distal palp segments are notably shorter than those of the new species.

The one character which separates this new species from almost all others of the *appendiculata-rugulosa* group is that of the anteroventral extension of the trunk which acts as a pedestal for the proboscis base. In most species, the proboscis originates directly from the flat trunk anterior between and ventral to the palp and chelifore insertions, and there is no anterior trunk extension or pedestal present.

Ammothella stauromata Child

Ammothella stauromata Child, 1982:271–273, fig. 1; 1988a:5, 7; 1988c:809–810.

Material examined.—Lizard Island: S of Lizard Head Peninsula, rubble in 2 m, sta. JDT/LIZ-14, 29 Jan 1989 (1 ♂, 2 ♀).

Distribution.—This species is known from Enewetak Atoll, Marshall Islands, the northern and southern Philippines, and American Samoa, in depths of 0–3 m.

This additional record further extends the broadening distribution known for this species to a more southern locality. Few specimens have been taken in any known locality, but *A. stauromata* appears to have a particularly wide western Pacific islands distribution. It has not yet been taken in the Indian Ocean.

Remarks.—The only other species of *Ammothella* with large mediandorsal trunk tubercles found in Australia is *A. thetidis* Clark, a species with many striking differences from *A. stauromata*. Clark's species lacks the mediandorsal tubercle on the posterior rim of the first trunk segment, a tubercle which is present on this species. Clark's species is apparently blind while this species has prominent eyes, the proboscis of Clark's species is bulbous and without constrictions while that of this species has a modified tripartite shape similar to proboscides of many species of *Ascorhynchus*. This species has elongate palp segments in comparison with those of Clark's, and there are large paired first coxae tubercles on this species while Clark's is without these tubercles. There are a number of other small differences between the two species.

There are few other *Ammothella* species known with large dorsal tubercles, and this species shares even fewer characters with these other species than with *A. thetidis*.

Genus *Eurycyde* Schioedte
Eurycyde setosa Child

Eurycyde setosa Child, 1988a:8–10, fig. 3.

Material examined.—Lizard Island: S of Lizard Head Peninsula, rubble in 2 m, sta. JDT/LIZ-14, 29 Jan 1989 (1 ♂, 1 ♀).

Distribution.—This species was recently described from a male collected in the northern Philippines at Batan Island, in 0–4 m. This second and third specimen greatly extend its known distribution southerly to the northern Great Barrier Reef, but within the known depth range of the type.

This is perhaps another of the growing list of species with known distribution along a corridor extending from Australia and New Zealand north to at least the Philippines and sometimes to Japan. There are undoubtedly many more species sharing this extremely rich corridor and their capture must await extended and close collecting on the Barrier Reef, New Guinea, and particularly in In-

onesia and the Philippines where the benthic microfauna remains little known.

Remarks.—These two specimens have only slight differences from the type specimen, a male. The major difference is in the first coxae tubercles which in this male are slightly shorter and bear only very few tiny setae instead of the longer and heavily setose tubercles of the type. It should be noted that the coxae tubercles of the female are only slightly smaller than those of the male, although the female is a good bit larger in most measurements than the male.

The abdomen of the type is missing, but can be described from the two specimens in hand. It is only slightly longer than the ocular tubercle, is swollen distally, and armed with six long distal feathered spines, each longer than the abdomen itself, and placed in a dorsolateral fan arrangement with one slightly shorter feathered spine placed ventrally and more proximal than the dorsolateral fan. There are also two short lateral setae adjacent to the anus. The remaining characters agree very well with the type male.

Genus *Tanystylum* Miers

Tanystylum haswelli, new species

Fig. 2

Material examined.—Lizard Island: Lizard Head, rubble bank in 2 m, sta. JDT/LIZ-15, 31 Jan 1989 (1 ♂, holotype).

Description.—Size very tiny, leg span 6 mm. Trunk subcircular in dorsal outline, slightly wider than long, unsegmented. Lateral processes contiguous, even squeezed together. Ocular segment anterior rim extending only slightly beyond lateral process rims, armed with single lateral setae, ocular tubercle slightly posterior to anterior rim of segment, little wider than tall, with small slender apical tubercle anteriorly and two low bumps posterolaterally. Eyes large, darkly pigmented.

Proboscis widest at base, moderately inflated, tapering gradually to cylindrical tip circling flat lips. Abdomen short, carried al-

most horizontally, extending only slightly beyond tips of fourth lateral processes, originating from a low bulge between bases of third lateral processes, armed with distal fringe of six short setae.

Chelifores single-segmented, tubercle-like, blunt, curved inward, carried at very elevated angle, each armed with 4–5 short distal setae.

Palp four-segmented, little longer than proboscis, originating with broad basal segment only as long as its proximal diameter. Second segment consisting of coalesced second and third segments, the juncture evident beneath integument, armed with 4–5 ectal setae and 2–3 ventrodial setae, none as long as segment diameter. Third segment only little longer than its diameter, armed with 2–3 short ventrodial setae. Fourth segment a curved cylinder about 3.5 times longer than its diameter, armed with many ventral and distal setae mostly longer than its diameter.

Oviger fourth and fifth segments subequal in length, armed with few short recurved spines laterally. Second segment very slightly shorter, armed with 1–2 short lateral spines. Sixth and seventh segments short, their combined length not as long as fifth segment, armed with several stout recurved spines, in greater numbers on sixth segment, and 1–2 short distal setae on seventh segment. Seventh lacks spinose distal apophysis. Terminal three segments each shorter than last, eighth rounded, armed with 3 distal setae longer than segment diameter, without spines. Ninth a short curved cylinder without spines, with single distal seta longer than segment diameter. Tenth segment a tiny bud, broader than long, armed with 2 stout straight spines lacking any form of denticulation.

Legs very stout, the major segments armed with dorsal bulges bearing several setae each. First coxae not as long as their diameters, armed with low laterodistal tubercle on anterior surface bearing 2 short setae. Posterior surface armed with 1–4 short latero-

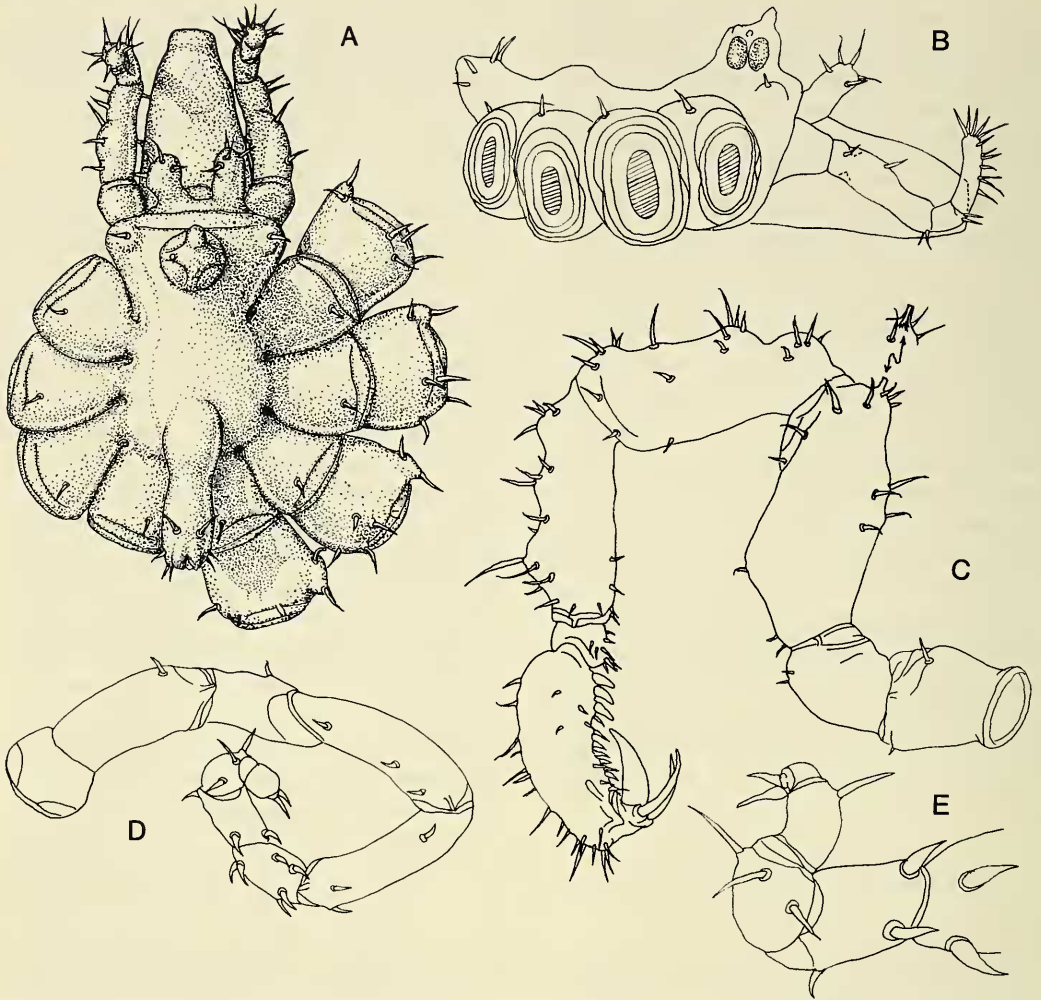


Fig. 2. *Tanystylum haswelli*, new species, holotype male: A, Trunk, dorsal view; B, Trunk, lateral view; C, Third leg, with enlargement of cement gland tube; D, Oviger; E, Strigilis segments, enlarged.

distal setae. Second coxae with 2 laterodistal setae, third with few ventrodistal setae. Femur with large ventromedian bulge bearing 1–2 short setae, a large dorsomedian bulge with 4–5 longer setae, and a fringe of 7–8 distal setae. Cement gland orifice a short tiny tube tapering to constricted tip. Femur slightly longer than tibiae which are equal in length. Tibiae armed with many short setae mostly on dorsal bulges. Tarsus very short, heavily setose ventrally. Propodus stout, only slightly curved, armed with 3

stout heel spines, about 5 shorter sole spines, many short flanking setae, and few short dorsal and distal setae. Claw broad, short, less than half propodal length, auxiliary claws more slender, almost as long as main claw.

Female of the species unknown.

Measurements (in mm).—Trunk length (chelifore insertion to tip 4th lateral processes), 0.6; trunk width (across 2nd lateral processes), 0.66; proboscis length, 0.35; abdomen length (from bulge anterior), 0.28;

third leg, coxa 1, 0.19; coxa 2, 0.26; coxa 3, 0.22; femur, 0.5; tibia 1, 0.44; tibia 2, 0.44; tarsus, 0.06; propodus, 0.39; claw, 0.16.

Distribution.—The species is known only from its type locality, Lizard Island on the northern Great Barrier Reef, in 2 m.

Etymology.—The new species is named for Dr. William A. Haswell who, following Hoek's offshore records of Australian species taken by the *Challenger*, provided the first substantial knowledge of Australian pycnogonids.

Remarks.—This specimen appeared to be *T. orbiculare* Wilson at first examination. Specimens identified as Wilson's species have been found along the littoral of eastern Australia, although there is some question as to whether or not they are indeed this far flung species (Clark 1977:332). The unique type of Wilson's *T. orbiculare* (unfortunately a female without ovigers—the male ovigers bear the diagnostic characters) was examined for purposes of comparison. A set of figures of the type is presented herein (Fig. 3), along with a male oviger from a specimen taken near the type locality by Wilson himself. The type specimen of this species has not been figured adequately for many years.

The new species differs from *T. orbiculare* mainly in the palps and abdomen. The abdomen of Wilson's species is notably longer and extends almost the length of the first coxae of the fourth leg pair, it has no basal bulge and is swollen in dorsal view rather than having a median constriction as in the new species. The lateral processes are larger in girth in relation to the trunk size in the new species, and the terminal palp segment is notably longer than that of Wilson's species. The palp of *T. orbiculare* has a variable number of segments, ranging sometimes from four to as many as seven in some specimens. The large ventral bulge on each femur of the new species is not present on the femorae of *T. orbiculare*, but most of the remaining characters of these two species are very similar. Both species have male

ovigers without the characteristic seventh segment apophysis.

This new species has some similarities to *T. hooperi* Clark (1977:325–327, figs. 20–30), another species found on the New South Wales coast of Australia. The major difference between these two species is that *T. hooperi* has the male oviger bearing a seventh segment apophysis. The two species have very similar abdomina, proboscides, and legs, but the palps are quite different.

Perhaps a species with greater similarities to the new species than *T. hooperi* is *T. bredini* Child (1970:296–299, fig. 3) in which males of both species have ovigers without a seventh segment apophysis. There are a number of other similarities between these species including the proboscis, four-segmented palps, ovigers, legs, and ocular tubercle and abdomen. The differences lie in *T. bredini* having anterior and posterior lateral process tubercles, larger first coxae tubercles, a slightly more tapering proboscis, shorter auxiliary claws, and a much shorter terminal palp segment. It is possible that these differences might be reduced or eliminated by examination of a large suite of specimens, but with only one male available of the new species, I will keep the Australian specimen separate from the Society Islands species until more Lizard Island specimens can be collected for examination.

Family Callipallenidae Hilton

Genus *Callipallene* Flynn

Callipallene species indeterminate

?*Callipallene emaciata* subsp. Stock, 1954: 46–48, figs. 19h, i, 20c–e.

Material examined.—Heron Island: SW reef crest, rubble in 0–1 m, coll. N. Bruce, 2 Jun 1978 (1 ♂).

Lizard Island: S of Lizard Head Peninsula, rubble in 2 m, sta. JDT/LIZ-14, 29 Jan 1989 (1 ♀); Lizard Head, rubble bank in 2 m, sta. JDT/LIZ-15, 31 Jan 1989 (1 ♀); SW of Lizard Head, rubble zone in 1.5 m, sta. JDT/LIZ-17, 1 Feb 1989 (1 ♀); Lizard

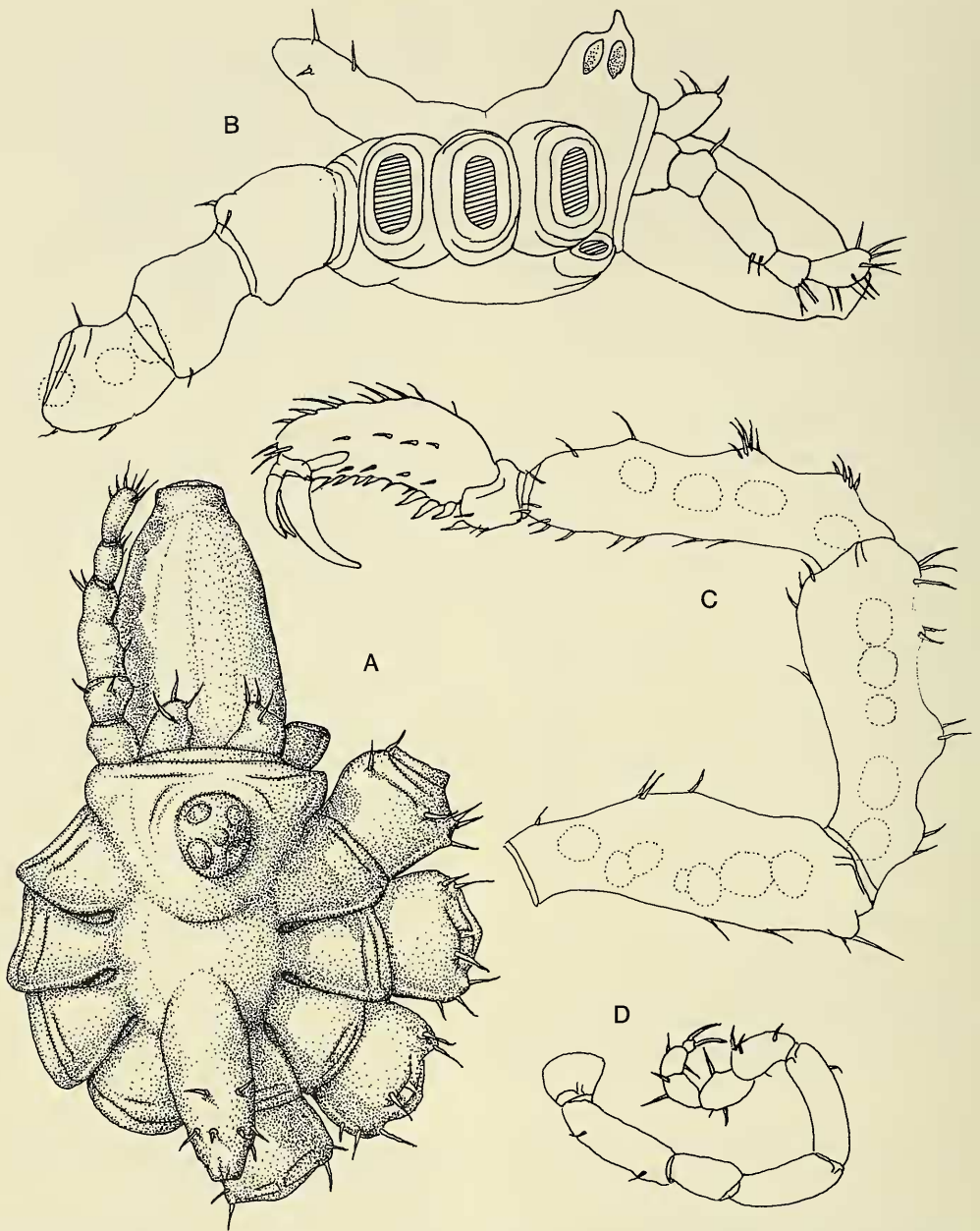


Fig. 3. *Tanystylum orbiculare* Wilson, holotype female: A, Trunk, dorsal view; B, Trunk, lateral view; C, Third leg, with ova indicated within. Nontype male: D, Oviger.

Head, small rubble in sand, 2 m, sta. JDT/LIZ-19, 2 Feb 1989 (2 ♀).

Distribution.—In spite of the very shallow water in which these specimens were taken, they agree in almost all respects with Stock's

figures for his unnamed subspecies. His material came from 65 fathoms (119 m) off Three Kings Island, New Zealand.

Remarks.—The figures given by Stock emphasize the statement he made (1954:46)

that "the specimens have almost no striking features." The above specimens also agree with this comment and I must therefore refrain from naming them. Having only one male among five females does not constitute an adequate number of specimens to justify adding another new species in this highly variable genus.

These specimens agree in the neck and trunk habitus figured by Stock (1954:47, fig. 20d), but have a few more long setae on the chelae and laterally on the legs. The propodus is almost exactly as that figured (fig. 19i), and the ocular tubercle has the same small conical apex. The legs of the above specimens bear the low swellings of the femorae and first tibiae as in Stock's fig. 20c. There is nothing unique about any of these characters among the many species in this genus to warrant erecting another species from this scant material.

Genus *Cheilopallene* Stock

Cheilopallene nodulosa Hong & Kim

Cheilopallene nodulosa Hong & Kim, 1987: 153–155, fig. 12.—Nakamura & Child (1990).

Material examined.—Lizard Island: North Point, rubble at bottom of cliff, 12 m, sta. JDT/LIZ-13, 28 Jan 1989 (2 ♀).

Distribution.—Hong & Kim recently described this species from a female and a juvenile found on the west coast of Korea in floating *Sargassum* weed. Nakamura & Child (1990) list it among the fauna of the Japanese Islands, and it appears herein on the Great Barrier Reef as a third recorded locality. The above record at 12 m is the deepest recorded capture. This new record extends the distribution for this species greatly to the south and into the southern hemisphere, suggesting that it is another of the growing list of species inhabiting a north-south corridor of related localities from Australia through the western Pacific Islands and to Japan and Korea.

Remarks.—The female figured by Hong

& Kim (1987:fig. 12) is apparently a subadult with incompletely developed ovigers. The above females appear to be fully adult and agree in almost all respects with the characters of the type except for the ovigers and the placement of several small tubercles. The ovigers of the females above have segment lengths in agreement with those of the type, but each segment from the fourth onward has a stout lateral spine on the dorsodistal surface. The strigilis has fully denticulate spines in the formula 3:3:3:4, with several tiny teeth on both the ectal and endal surfaces of the terminal claw imparting a frayed or worn appearance. The denticulate spines each bear 3–4 lateral serrations per side and are broad and short.

The peculiar lateral bulges or "baloons" at the proximal margins of each scape are present on both these specimens, suggesting that they are a normal character of the anatomy rather than an artifact. Hong & Kim did not figure the tiny setose tubercles over the insertion of each scape nor the similar tubercles of the first lateral processes (single) and the first coxae (double). These tubercles are relatively inconspicuous and could easily be overlooked.

Genus *Seguapallene* Pushkin

Seguapallene crassa, new species

Fig. 4

Material examined.—Lizard Island: Lizard Head, rubble bank in 2 m, sta. JDT/LIZ-15, 31 Jan 1989 (1 ♂, holotype, 1 ♂, 2 ♀, paratypes).

Other material.—Lizard Island: S of Lizard Head Peninsula, rubble in 2 m, sta. JDT/LIZ-14, 29 Jan 1989 (1 ♂ with eggs, 1 ♂, 2 ♀); Lizard Head, small rubble in sand, 2 m, sta. JDT/LIZ-19, 2 Feb 1989 (1 ♂ with eggs, 1 ♀); Palfrey Island, near SW point, rubble in 1 m, sta. JDT/LIZ-21, 6 Feb 1989 (1 juv); Lizard Island, off Casuarina Beach, coral with *Halimeda* clumps and red algae in 2 m, sta. K-L1, 27 May 1980 (1 ♂ with eggs, 1 ♀).

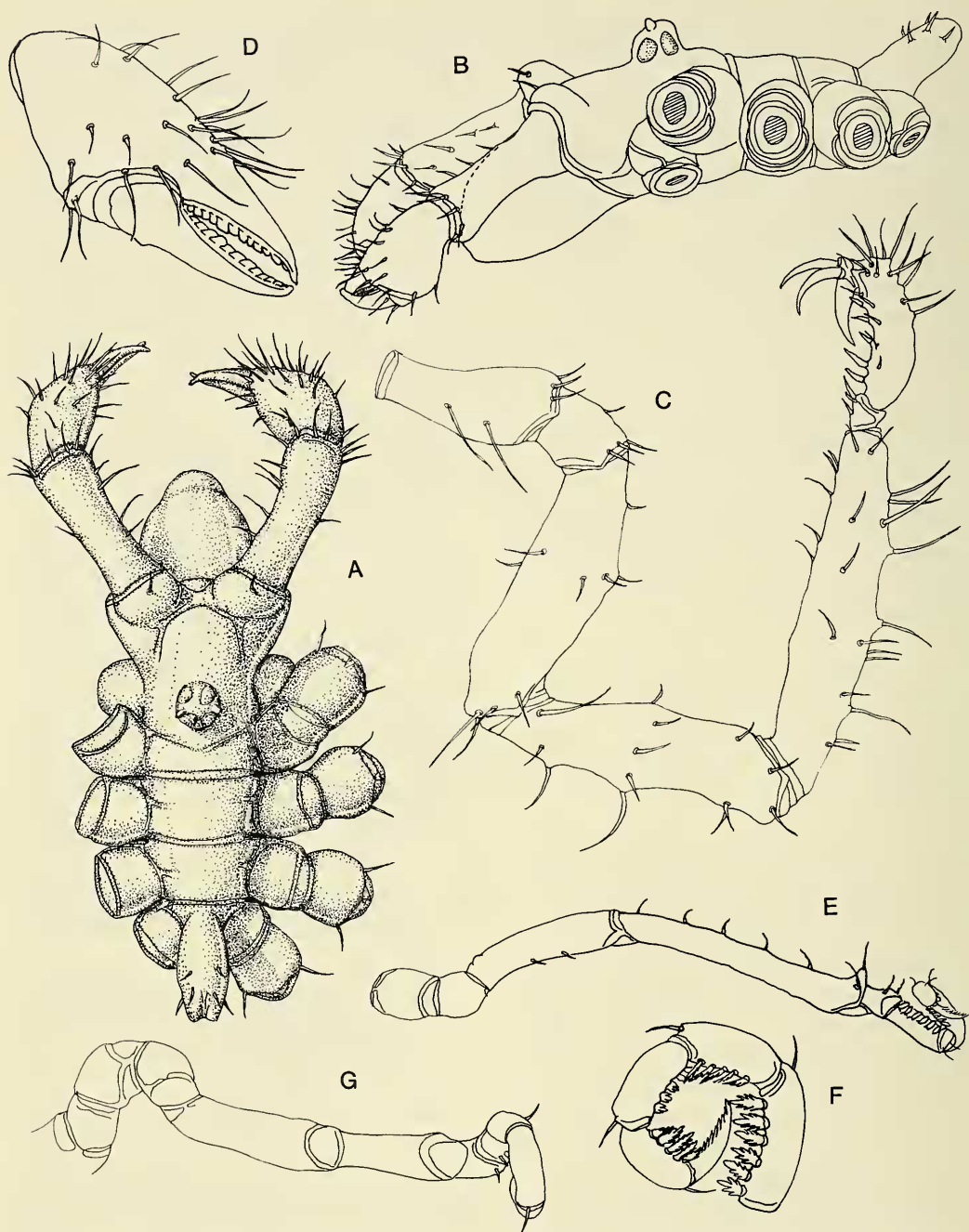


Fig. 4. *Seguapallene crassa*, new species, holotype male: A, Trunk, dorsal view; B, Trunk, lateral view; C, Third leg; D, Chela; E, Oviger; F, Strigilis segments, enlarged. Paratype female: G, Oviger.

Description.—Size very small, leg span about 6 mm. Trunk fully segmented, stout, lateral processes crowded, touching to slightly separated, each only as long as its diameter or slightly shorter, glabrous, suture line at base of each lateral process and neck prominent. Neck moderately short, flanked by extremely large oviger bases and extending to broad expansion at chelore insertions. Ocular tubercle at neck midpoint over oviger bases, about as tall as wide, eyes prominent, well pigmented, with large sensory papillae on horn-like tubercles at apex. Abdomen moderately short, carried at low oblique angle, inflated in dorsal view, armed with 6 short distal setae.

Proboscis short, rotund, a broad cylinder proximally, tapering abruptly distally to very small oral surface. Lips flat, without setae or other adornment.

Chelifores 2-segmented, inserting into raised crests or cowls on neck anterior. Scape robust, moderately setose with several endal and dorsodistal setae shorter than segment diameter. Chela palm triangular, armed with distal fringe of setae with greater numbers at junction of palm and immovable finger. Fingers moderately slender, curved only at tips, glabrous, with 12 block-shaped teeth on each finger.

Oviger fourth segment slightly curved, armed with 2–3 short endal setae, segment about 0.6 as long as fifth. Fifth segment with 6–7 ectal setae and small distal apophysis with apical seta. Sixth segment very short, shorter than any strigilis segment, armed with 2 lateral setae. Strigilis segments each shorter than last, armed with dorsodistal seta each and endal denticulate spines in the formula 6:5:5:5, with a terminal claw having 7–8 endal serrations. Denticulate spines with 2–5 serrations per side.

Legs stout, moderately setose, second tibiae the longest segment, femorae longer than first tibiae, terminal leg segments small in relation to proximal leg segments. First coxae with 2 short laterodistal setae, second

coxae with 2 long lateral setae per side and fringe of shorter ventrodiscal setae, third coxae with few ventral and ventrodiscal setae. Femorae with fringe of short setae around the median length, several distal setae with single longer dorsodistal seta, cement gland pores not evident. First tibiae with 2 long proximolateral setae, a fringe of short median and distal setae, with long proximal, median, and distal setae on dorsal surface. Second tibiae with several dorsal and dorsolateral setae, those along median line longest, several short lateral setae, and few ventrodiscal setae. Tarsus very short, semitriangular, with 3–4 ventral setae and 1 spine. Propodus very small, slightly curved, with 2 heel spines, 4–5 slender sole spines, and many distal and dorsodistal setae longer than segment diameter. Claw robust, short, less than half propodal length, slightly curved, auxiliaries more slender, almost as long as main claw.

Female slightly larger in most measurements, oviger segments four and five much shorter than those of male, fifth shorter than fourth and without distal apophysis. Oviger strigilis spine formula: 6:5:4:5, with 9 terminal claw serrations. Major oviger segments without setae or recurved spines. Neck equal in length to that of male.

Measurements of holotype (in mm).—Trunk length (chelifore insertion to tip 4th lateral processes), 0.7; trunk width (across 1st lateral processes), 0.46; proboscis length, 0.26; abdomen length, 0.16; third leg, coxa 1, 0.18; coxa 2, 0.32; coxa 3, 0.15; femur, 0.54; tibia 1, 0.5; tibia 2, 0.64; tarsus, 0.07; propodus, 0.27; claw, 0.12.

Distribution.—This species is known from its type locality, Lizard Island, from a rubble bank at Lizard Head, in 2 m, and from other Lizard Island localities.

Etymology.—The specific name (Latin: thick, stout) refers to the stout trunk with its closely crowded lateral processes.

Remarks.—There were only two species known in this genus, one of the many genera

in this cumbersome family. These are *S. insignatus* Pushkin, the type of the genus, and *S. micronesica* Child. The distribution of these species is extremely disjunct with Pushkin's species found in the subantarctic Crozet Islands, and *S. micronesica* found in the tropical Palau Islands. This third species is another from the tropics and is closest to *S. micronesica*.

Pushkin's species has lateral process tubercles and an oviger with shorter fourth and fifth segments, the latter lacking a distal apophysis, both characters which are different in the two tropical species.

The new species differs from *S. micronesica* in having much more compacted lateral processes which are more robust, shorter leg segments which are also rather robust, a smaller propodus with a more typical claw rather than the short one of *S. micronesica*, and a chela with block-like closely set teeth rather than well separated triangular teeth. The new species is about 0.3 smaller than the Palauan species, but both have very similar ocular tubercles, abdomina, proboscides, chelifores, and sometimes prominent suture lines on the trunk.

Family Nymphonidae Wilson

Genus *Nymphon* Fabricius

Nymphon draconis, new species

Fig. 5

Material examined.—Lizard Island: S of Lizard Head Peninsula, rubble in 2 m, sta. JDT/LIZ-14, 29 Jan 1989 (1 ♂, holotype, 3 ♂ with eggs, 1 juv, 1 larva, paratypes).

Other material.—Lizard Island: Lizard Head, rubble bank in 2 m, sta. JDT/LIZ-15, 31 Jan 1989 (1 ♀); SW of Lizard Head, rubble zone in 1.5 m, sta. JDT/LIZ-17, 1 Feb 1989 (1 ♀); Lizard Head, small rubble

in sand, 2 m, sta. JDT/LIZ-19, 2 Feb 1989 (1 ♂, 2 ♀, 3 juv); off Casuarina Beach, rubble with encrusting and red algal turf in 2 m, sta. K-L2, 27 May 1980 (1 juv).

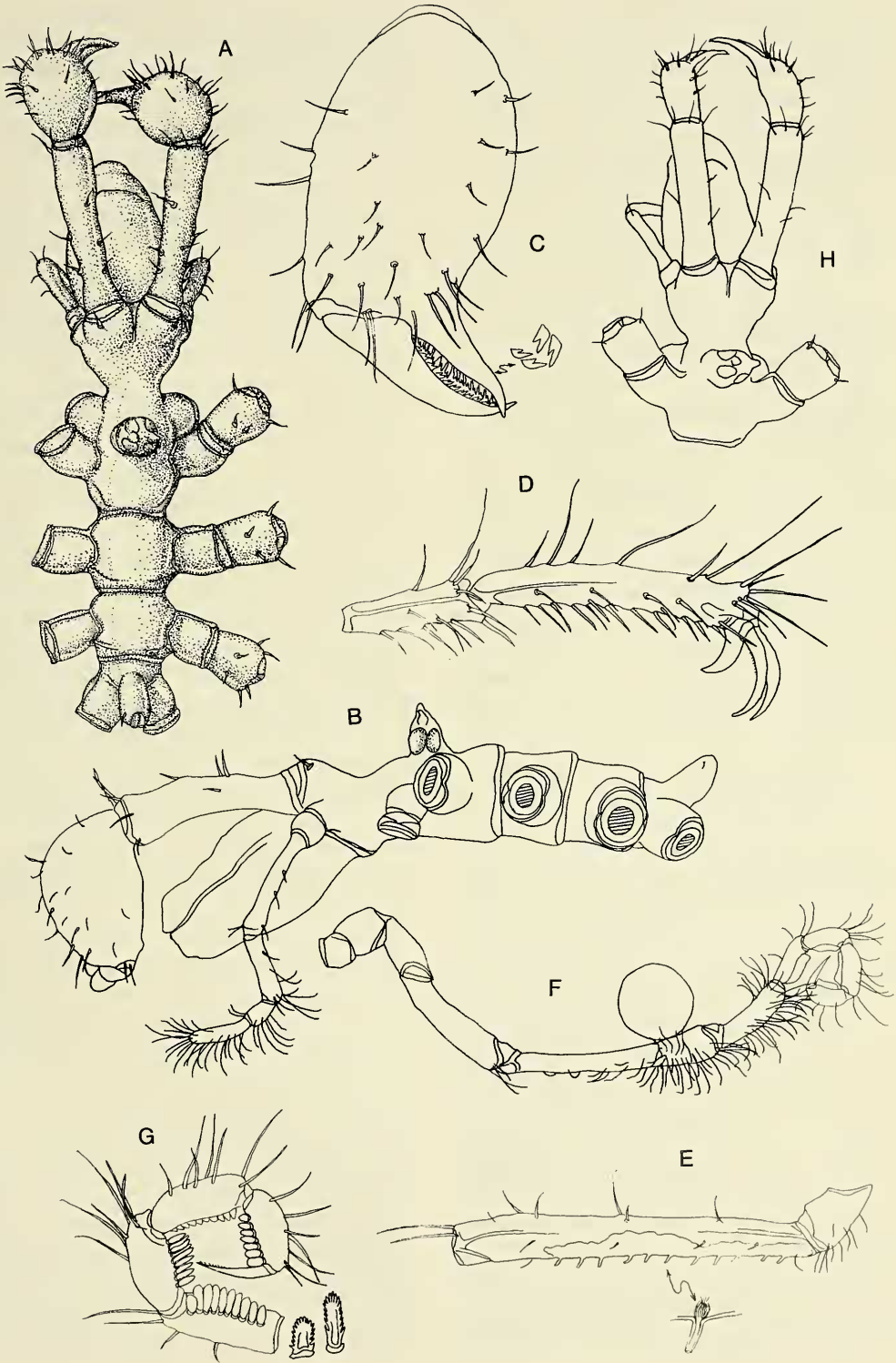
Description.—Size moderately small, leg span 11.4 mm. Trunk fully segmented, segments fairly short, bulbous, not longer than wide, lateral processes short, slightly longer than wide, separated by more than their diameters in anterior pairs, less than their diameters in posterior pairs, glabrous. Neck short, without parallel sides, oviger implantation bulges just anterior to first lateral processes, occupying half neck length, neck armed with short seta over insertion of each chelifore. Ocular tubercle low, only slightly taller than basal width, eyes large, anterior pair larger than posterior pair, ocular tubercle capped with pair of short lateral sensory tubercles. Abdomen very short, semi-erect, a tapering truncate cone armed with pair of short lateral setae.

Proboscis barrel-shaped, widest swelling at midpoint, tapering distally to cylinder, lips almost flat.

Chelifores very large, chelae massive, globular, moderately setose. Scape as long as proboscis, slightly swollen distally, armed with few short dorsal and lateral setae. Chela very swollen, palm ovoid, much larger than short fingers. Fingers armed with closely crowded unevenly bifurcate teeth, 11 on each finger, fingers carried at sharp lateral angle to palm.

Palp segments relatively short, second segment longest, third and fifth subequal in length, first and fourth little longer than their diameters. Second segment with few short lateral and distal setae, third with many ventral setae longer than segment diameter, fourth and fifth with many long ventral and lateral setae, some about 3 segment diam-

Fig. 5. *Nymphon draconis*, new species, holotype male: A, Trunk, dorsal view; B, Trunk, lateral view; C, Chela, with enlargement of four teeth; D, Terminal leg segments, enlarged; E, Femur, showing cement gland and tubes; F, Oviger with egg attached; G, Strigilis segments, enlarged, with proximal and distal denticulate spines further enlarged. Paratype female: H, Trunk anterior, dorsal view.



eters in length. Terminal segment slightly curved.

Oviger fifth segment longest, swollen distally, without apophysis, fourth segment about 0.6 length of fifth. Fourth armed with few distal setae, 2 longer than segment diameter. Fifth armed with many setae increasing in numbers and length distally. Sixth segment with many long setae mostly endal, with greater numbers distally. Strigilis segments increasingly shorter with terminal segment shortest, armed with 2 to many long ectal setae, some twice as long as segment diameter, and endal denticulate spines in the formula 10:10:10:7, with terminal claw only slightly shorter than tenth segment. Claw with few tiny distal setules, without teeth. Denticulate spines with pair of wider lateral serrations proximally and many smaller distal serrations, distal spines of each segment longer than proximal spines.

Legs moderately slender, with few dorsal setae, more ventral setae, second tibiae 0.3 longer than first tibiae, femorae slightly shorter than first tibiae. Femorae with 10–11 conspicuous ventral cement gland tubes, each slender, less than half femoral diameter in length, placed in row along 0.7 of femoral length. Each major segment with 3 long distal setae. Tarsus cylindrical, distally inflated, about half propodal length, armed with 4–5 long ectal setae and many endal setae along with 2 slender spines. Propodus slender, very slightly curved, armed with 7–8 slender sole spines alternating with 2–3 sole setae between spines, without heel or heel spines, but with row of short lateral setae and several long dorsal and distal setae, the longest about 3 times segment diameter. Claw very reduced, broad, very curved, without endal setules. Auxiliaries about 0.3 longer than main claw, well curved distally, armed with few tiny endal setules proximally.

Female slightly larger in most measurements than male, neck equal in length to male's. Chelae not inflated, palm a curved

cylinder, fingers slightly longer than those of male and armed with 12–13 unevenly bifurcate teeth. Oviger fourth and fifth segments shorter, fifth not clubbed distally, none of the segments with the long setae of the male oviger, but rather few short setae.

Measurements of holotype (in mm).—Trunk length (chelifore insertion to tip 4th lateral processes), 1.23; trunk width (across 2nd lateral processes), 0.55; proboscis length, 0.56; abdomen length, 0.15; third leg, coxa 1, 0.17; coxa 2, 0.49; coxa 3, 0.22; femur, 1.04; tibia 1, 1.4; tibia 2, 1.66; tarsus, 0.21; propodus, 0.4; claw, 0.07; auxiliaries, 0.11.

Distribution.—This species is known from its type locality, south of Lizard Head Peninsula on Lizard Island in 2 m, and from other Lizard Island localities in 1.5–2 m.

Etymology.—The species name (Latin: *draconis*, a dragon-like lizard) is a play on the name Lizard Island, its type locality.

Remarks.—This new species is the eleventh reported of the *N. aequidigitatus* group discussed recently by Child (1988b:67–68). It fits well in the key of the ten known species at couplet 8 with *N. megacheles* Child, and couplet 9 with *N. biformidens* Stock and *N. aequidigitatus* Haswell, the three species with which it is most closely allied. Members of the *aequidigitatus* group have, besides the diagnostic characters of the genus, another set of characters more or less in common which involve chelae teeth usually being bifurcate, a longer than usual terminal palp segment, often very inflated chelae in the males, an oviger claw lacking the usual endal teeth, and auxiliary claws often longer than the short main claw with any or all of these claws bearing endal setules or rugosities. Some members of the group may be without one or more of these characters.

This new species differs from *N. megacheles* in having a slightly longer trunk with the lateral processes wider apart as a consequence, somewhat shorter legs with more setae, and a much longer tarsus in relation to propodal length and a much shorter main

claw. The tarsus of *N. megacheles* is extremely short and both it and the propodus have robust heel spines. The type of *N. megacheles* is listed as a female, but the large inflated chelae and long setose fifth oviger segment suggest that it is actually a male. As far as is known, only males have the very inflated chelae in this group while those of the female are the more typical semicylindrical shape. The strigilis terminal claw differs between these two species in that the new species claw has few endal setules while that of *N. megacheles* has an endal lamina. None of the species of this group have the conspicuous cement gland tubes of the new species.

There are many similarities between this new species and *N. biforimidens*, including those of neck and trunk habitus, leg segment length ratios, tarsus and propodus relative lengths, main and auxiliary claw lengths, and palp and chelifore similarities. The differences are in a shorter ocular tubercle lacking the lateral "horns" of *N. draconis*, the slender strigilis claw and shorter strigilis segments (those of a female specimen were compared with Stock's species figures which are also of a female), the very different chelae teeth which are all bifurcate in the new species while not all are bifurcate in *N. biforimidens*, and the very different oviger denticulate spines which, in the new species, are more like those of the genus *Callipallene* in having many tiny distal serrations. The denticulate spines of Stock's species have 7–8 larger lateral serrations per side.

The new species has fewer characters in common with Haswell's *N. aequidigitatus*. It has longer chelae fingers in relation to palm length and the fingers bear many more teeth. It also has slightly longer leg segments with far fewer setae, particularly the longer setae, a third palp segment longer than the terminal segment, again also lacking the long setae of the new species, and a very different oviger which lacks most of the long setae present on the oviger of the new species.

Males of several of the *aequidigitatus* group are unknown, but where they are known, none display the conspicuous femoral cement gland tubes of this new species.

Family Phoxichilidiidae Sars

Genus *Anoplodactylus* Wilson

Anoplodactylus batangensis (Helfer)

Pycnosoma batangense Helfer, 1938:174–176, fig. 6a–c.

Anoplodactylus batangensis.—Stock, 1968: 54 [early literature].—Child, 1988a:14 [later literature].

Material examined.—Lizard Island: between Palfrey and South Islands, dead coral rubble with algal turf in 3 m, sta. K-L11, 30 May 1980 (1 ♂ with eggs, 1 ♀); S of Lizard Head Peninsula, rubble in 2 m, sta. JDT/LIZ-14, 29 Jan 1989 (3 ♂, 1 ♀); SW of Lizard Head, rubble zone in 1.5 m, sta. JDT/LIZ-17, 1 Feb 1989 (1 ♀).

Distribution.—This species has a pan-tropical distribution in littoral and shallow depths. The above records mark the first time it has been taken in Australian waters.

Anoplodactylus brucei, new species

Fig. 6

Material examined.—Heron Island: rubble from 6.2 m, sta. HI/26/5 coll. A. J. Bruce, 28 Apr 1978 (1 ♂, holotype).

Description.—Size moderately small, leg span 14.6 mm. Trunk lightly segmented, first segmentation line fully encircling trunk, second lighter, difficult to discern laterally, third only a hint, not encircling trunk. Anterior pair of lateral processes longest, each succeeding posterior pair shorter to last pair which are wider than long. Lateral processes separated by their maximum diameters or slightly less, armed with short dorso- and laterodistal setae numbering 4 on anterior pair, 3 on middle pairs, and 1 on posterior pair. Neck fairly short, flanked by lateral expansions or "wings" bearing rudimentary

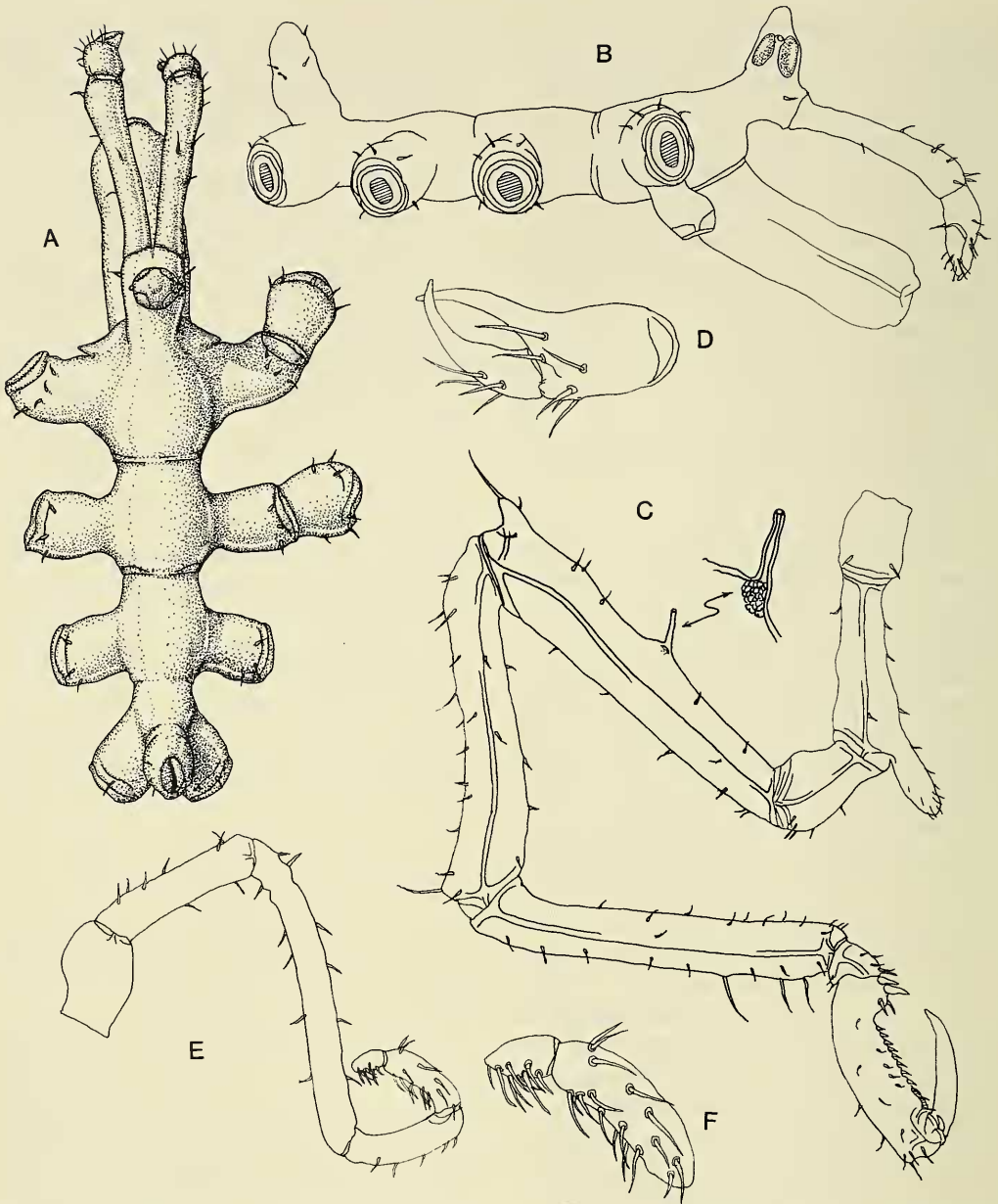


Fig. 6. *Anoplodactylus brucei*, new species, holotype male: A, Trunk, dorsal view; B, Trunk, lateral view; C, Third leg, with cement gland and tube, enlarged; D, Chela; E, Oviger; F, Terminal two strigilis segments, enlarged.

palp buds which point laterally rather than anteriorly. Neck armed with single seta per side. Ocular tubercle moderately large with broad base occupying most of neck dorsally,

little taller than wide, with broad rounded apical cone. Eyes large, anterior pair slightly larger than posterior pair, darkly pigmented, occupying most of ocular tubercle at its

midpoint. Abdomen rather short, erect, swollen from constricted base, tip tapering, armed with 6–7 short lateral and dorsal setae.

Proboscis a cylinder curving anteriorly, slightly swollen distally, lips rounded.

Chelifores moderately short, scape not as long as proboscis, with slight distal inflation, armed with few dorsodistal and lateral setae. Chelae long, slender, palm a cylinder twice as long as its diameter, armed with few setae encircling finger bases. Movable finger longer than immovable finger, well curved, overlapping immovable finger at tip, armed with 4 ectal setae longer than finger diameter. Immovable finger not as curved, about equal in length to palm. Fingers without teeth.

Ovigers moderately slender, rather setose. Third segment longest, almost twice length of second segment, with proximal constriction, both armed with few short lateral setae. Fourth segment with several short ectal setae, fifth and sixth equal in combined length to fourth, fifth with many recurved setae, sixth with pad of 8–9 similar setae on one side only, segment about 0.3 as long as fifth segment.

Legs lightly setose, moderately long. Second coxae of third and fourth pair with long ventrodorsal sexual tubercle equal in length to segment diameter, armed with many short setae. Femur the longest segment, with short dorsodistal tubercle half as long as segment diameter, armed with seta as long as segment diameter. Cement gland a long tube slightly over half femoral diameter, arising from low bulge at midpoint of segment. Tibiae subequal in length, with short dorsal, lateral, and ventral setae and single longer dorsodistal seta. Tarsus very short, subtriangular, with several short ventral setae. Propodus robust, moderately long, with well marked heel bearing 2 broad spines, the distal one larger than proximal spine, 3 distal stout setae, and 9–10 short sole spines with very short lamina at claw base. Claw stout,

curved at tip, 0.6 as long as propodus, with tiny curved auxiliaries at base.

Female of the species unknown.

Measurements (in mm).—Trunk length (chelifore insertion to tip 4th lateral processes), 1.87; trunk width (across 1st lateral processes), 1.06; proboscis length, 0.89; abdomen length, 0.35; third leg, coxa 1, 0.29; coxa 2, 0.83; coxa 3, 0.4; femur, 1.39; tibia 1, 1.3; tibia 2, 1.31; tarsus, 0.16; propodus, 0.66; claw, 0.46.

Distribution.—The new species is known only from Heron Island, its type locality, in 6.2 m.

Etymology.—I take pleasure in naming this species for Alexander J. (Sandy) Bruce, sometime collecting partner, expedition cabin mate, collector of this specimen, prolific author and systematist of pontoniid shrimp of the world, and Director of the Natural Sciences section of the Northern Territories Museum of Arts and Sciences, Darwin, Australia.

Remarks.—This new species has little to differentiate it from many others in this genus and there are several species quite similar to this one among the *Anoplodactylus* legions. Similar species are *A. digitatus* (Böhm) and its cousin *A. paradigitatus* Child, *A. erectus* Cole, *A. californicus* Hall, and *A. allotrius* Child. All have some characters agreeing with those of the new species. Most of the similarities are found in the legs as all share a long sexual tubercle on the second coxae of the posterior legs, a single cement gland tube, sometimes a dorsodistal tubercle on the femorae, and other similarities of the propodus.

The legs of *A. erectus* are almost exactly like those of the new species except that Cole's species does not have the small dorsodistal tubercle on the femur. One of Cole's paratype specimens was examined for comparison and this specimen has small slender dorsodistal lateral process tubercles which are lacking in the new species. Many specimens of *A. erectus* from Panama do not

have these tubercles or else have low bumps in their place, so this character is inconsistent and not a good diagnostic feature. The lateral processes of *A. erectus* are notably longer than those of the new species, as is the third oviger segment and the ocular tubercle. The laterally projecting palp buds of the new species are apparently unique as other species with this character have the buds pointing toward the anterior of the specimen.

Both *A. digitatus* and *A. paradigitatus* have legs with very similar characters to those of *A. brucei*, except that the second coxae sexual tubercles are not as long as those of the new species, the lateral processes are longer in the two species, and the proboscis is of a very different shape with females of the two species. Females of these species have small alar processes on the proximoventral surfaces of their proboscides. Unfortunately, a female of the new species is not available for comparison. Neither of the other species have palp buds suggesting any similarity to those of *A. brucei*.

Hall's species (with the recently synonymized *A. portus* Calman) also has very similar legs, trunk habitus, chelae, and ocular tubercle, but the chelifore scapes are much shorter, the lateral processes are much closer together, the oviger terminal segment is much shorter and has quite different setation, and the femoral cement gland tube is a truncate cone rather than a slender tube as in *A. brucei*.

The new species has even less similarity to *A. allotrius*, but has legs which agree in most characters. The sexual tubercle is much shorter than in the new species and the lateral processes are closer together, the chelae have longer fingers with several teeth on the movable finger, the scapes are shorter, there are low lateral process tubercles, and the oviger terminal segments (fifth and sixth) are shorter and with fewer setae than the same segments of the new species.

Although *A. brucei* has no outstanding character to set it off from all others, I be-

lieve that the shades of difference in the several characters discussed are sufficient to separate this species from all others known in the genus.

Anoplodactylus chamorrus Child

Anoplodactylus chamorrus Child, 1983: 705–707, fig. 3; 1988a:16.

Material examined.—Lizard Island: between Palfrey and South Islands, dead coral rubble with algal turf in 3 m, sta. K-L11, 30 May 1980 (1 ♂ with eggs, 1 ♂, 2 ♀); same locality, coral rubble with algal turf on reef crest in 0.3 m, sta. K-L12, 31 May 1980 (1 ♂ with eggs, 3 ♀); S of Lizard Head Peninsula, rubble in 2 m, sta. JDT/LIZ-14, 29 Jan 1989 (1 ♂).

Distribution.—This species was recently described from specimens taken in Guam, and it has more recently been taken in several localities in the southern Philippines. These records greatly extend its range to the south but add nothing to the known depth range.

Remarks.—The lateral processes are closely crowded in this small compact species and there are few other such compact species known in the Pacific. Such compact species of this genus were previously grouped under the genus *Halosoma*, now synonymized under *Anoplodactylus*. The only Australian species known with this compact character is *A. haswelli* (Flynn). The Guamanian species differs from Flynn's by having broad lateral "wings" between the neck and first lateral processes, small lateral process dorsodistal tubercles, a conspicuous cement gland tube on the femorae, and several other smaller differences.

The species differs from other more northerly distributed compact species such as *A. crassus* Nakamura & Child, *A. viridintestinalis* (Cole), and perhaps *A. monotrema* Stock, in having the lateral neck wings mentioned above. Some compact species have conspicuous oviger bulges of the male in this location, but few have these broad

anterior wings with tiny palp vestiges along their first lateral process margins.

Anoplodactylus glandulifer Stock

Anoplodactylus glandulifer Stock, 1954:80–84, fig. 36.—Child, 1982:273–274 [literature]; 1988b:58–59; 1988c:813.

Material examined.—Lizard Island: North Point, rubble at bottom of cliff, 12 m, sta. JDT/LIZ-13, 28 Jan 1989 (1 ♀); Lizard Head, small rubble in sand, 2 m, sta. JDT/LIZ-19, 2 Feb 1989 (1 ♂, 1 questionable larva).

Distribution.—This species has been taken in many localities from the Red Sea and Indian Ocean to as far east as the Samoa Islands. These records mark its first capture on the Great Barrier Reef. It is known from 0–12 m.

Remarks.—The conspicuous cement gland cups number from 2 to 4 per femur, and serve as a good recognition character in males in a genus where the cement gland is much more often served by a single orifice per femur. Females, of course, are difficult to distinguish as a particular species from other similar species without accompanying males, but both sexes in this species have very long propodal lamina which sets them off from those many species with shorter lamina. The female from station 13 is only provisionally placed in this species due to lack of an accompanying male. This female propodus agrees well with *A. glandulifer* as does the ocular tubercle and lateral process placement, and is little different from other females examined of this species.

Anoplodactylus longiceps Stock

Anoplodactylus longicollis Williams, 1941: 36–38, figs. 2–5 (preoccupied).

Anoplodactylus longiceps Stock, 1951:16 [footnote]; 1954:83 [text]; 1956:97–98, fig. 14c, d.—Clark, 1963:56 [key].—Child, 1975:20, fig. 9f.

Material examined.—Lizard Island: North Point, rubble at bottom of cliff in 12

m, sta. JDT/LIZ-13, 28 Jan 1989 (1 damaged ♀); S of Lizard Head Peninsula, rubble in 2 m, sta. JDT/LIZ-14, 29 Jan 1989 (1 ♂).

Distribution.—This species is known from the east and west coasts of Australia in tropical to temperate waters, and from the Kei Islands in eastern Indonesia in depths of 28–134 m. These records establish the species at Lizard Island on the Barrier Reef and in much shallower water at 2 and 12 m.

Remarks.—This very long slender species is easily recognized with its very widely separated lateral processes, tall ocular tubercle with a long slender apical cone, slim legs with a long femoral dorsodistal tubercle and two low cement gland cups, and its moderately short proboscis.

This species is reminiscent of another very elongate species, *A. attenuatus* Child, from the Philippines. The Philippine species has lateral processes spaced even wider than in this species and also lacks the femoral dorsodistal tubercle, has a shorter oviger, has a crenulate major heel spine on the propodus, lacks the usual tiny auxiliary claws, and has a very different ocular tubercle which is shorter than its width. Both species, though, have a widely spaced pair of cement gland cups on each femur. They are probably quite closely related, having possibly originated from a single parent stock.

Anoplodactylus species indeterminate

Material examined.—Lizard Island: off Casuarina Beach, coral with *Halimeda* clumps and red algae in 2 m, sta. K-L1, 27 May 1980 (1 larva); between Palfrey and South Islands, dead coral rubble with algal turf in 3 m, sta. K-L11, 30 May 1980 (1 larva); point between Anchor Bay and Watson's Bay, coral rubble in 2 m, sta. JDT/LIZ-5, 24 Jan 1989 (1 ♀); Lizard Head, small rubble in sand, 2 m, sta. JDT/LIZ-19, 2 Feb 1989 (1 juv).

Remarks.—The juvenile and larvae are too immature for determination and the female is unlike other species in these collec-

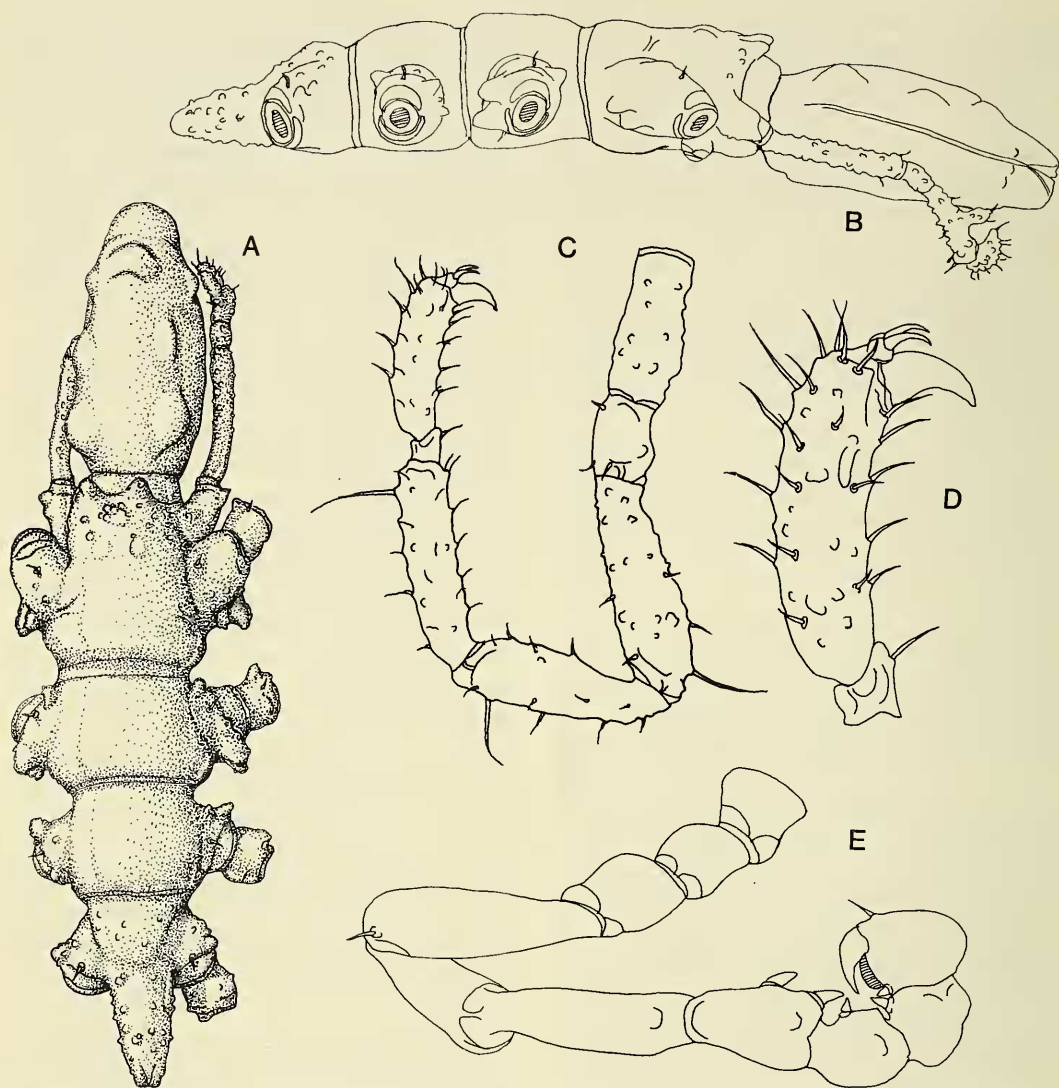


Fig. 7. *Rhynchothorax vallatus*, new species, holotype female: A, Trunk, dorsal view; B, Trunk, lateral view; C, First leg; D, First leg terminal segments, enlarged; E, Ovipositor, greatly enlarged.

tions and shows little similarity to published figures of other species from Australia.

Genus *Endeis* Philippi, 1843
Endeis biserata Stock

Endeis biserata Stock, 1968:57–60, fig. 21;
1970:1; 1974:17; 1979:28–30, fig. 9.—
Child, 1988a:20.

Phoxichilus meridionalis Loman (non
Böhm, 1879), 1908:78–79.

Material examined. — Lizard Island: Watson's Bay, SW border, reef and sand flat rubble in 1–7 m, sta. JDT/LIZ-7, 25 Jan 1989 (1 ♀, 1 juv); S of Lizard Head Peninsula, rubble in 2 m, sta. JDT/LIZ-14, 29 Jan 1989 (1 ♂).

Distribution. — This is a wide-ranging species having been taken from Brazil, the Red Sea, Indian Ocean, Indonesia, Hawaii, and the Philippines in 0–37 m. These rec-

ords place it to the south of its nearest known capture in Indonesia, on the northern Great Barrier Reef and well within its known depth range.

Remarks.—The male from station 14 lacks the long dorsodistal tubercles of the femorae, but has a moderately long and very robust spine in its place. This femoral spine is flanked by two shorter broad spines. Most of the small spines of the trunk and legs are short but very broad, a character not found or at least not remarked on by Stock in his description. The male is otherwise very like the type and other specimens figured in Stock's fig. 21 (1968:57). The leg length ratios, the propodal configuration, trunk habitus, oviger, and the leg lateral spines are all very like those shown in the figures. The female has the dorsodistal femoral tubercles, but those of the above specimen are slightly longer than that shown in Stock's fig. 21e.

Family Rhynchothoracidae Thompson
Genus *Rhynchothorax* Costa
Rhynchothorax vallatus, new species
Fig. 7

Material examined.—Lizard Island: S of Lizard Head Peninsula, rubble in 2 m, sta. JDT/LIZ-14, 29 Jan 1989 (1 ♀, holotype).

Description.—Size very tiny, leg span only 3.2 mm across second lateral processes. Trunk fully segmented, covered with tiny granular papillae as are appendages, with greater numbers of papillae on extremities. Trunk moderately slender, without other adornment. Lateral processes very short, not as long as their diameters, widely separated, tubercular, armed with short dorsomedian seta each. First lateral processes with pair of posterior tubercles as broad as their length, second processes with similar pair of posterior tubercles and smaller anterior tubercle at lateral process bases. Third lateral processes with small anterior tubercle and smaller posterior tubercle, fourth with only small anterior tubercle. Ocular tubercle and

eyes lacking, with pair of broad, low, anterior-pointing tubercles in their place. Neck moderately narrow, flanked by short cylindrical tubercles as bases for palps, each bearing low ectal tubercle. Abdomen short, with broad base, tapering to small rounded anus, extending to less than half second coxal lengths on fourth legs.

Proboscis typical for genus, with 2 paired dorsolateral swellings, constricted at base and distally at lips, carried horizontally, without labial fringe or lamina on antimeres.

Palps 4-segmented, with prominent papillae. First segment cylindrical, as long as combined length of terminal 3 segments, armed with few distal setae. Second segment short, cylindrical, not as long as twice its diameter. Third segment slightly more than half length of first, armed with few short setae and dorsal tubercle slightly longer than segment diameter, placed slightly distal to dorsal midpoint of segment. Fourth segment short, little longer than second, recurved dorsally to height of third segment tubercle, armed with few short ectal setae.

Oviger also typical, tiny, fourth and sixth segments subequal. Seventh segment swollen distally, armed with 2 short broad endal spines, eighth and ninth segments shorter, subequal in length, armed with single small endal spine each. Tenth segment broader than long, armed with ectal seta, tiny endal basal spine, curved endal lamina, and broad curved claw which closes onto lamina.

Legs of approximately equal size except for second coxae on fourth leg pair which are 0.3 shorter than coxae 2 of other legs. Second coxae of anterior 3 pairs twice length of first coxae, femorae the longest segments with first tibiae longer than second. Three major segments armed with dorsodistal setae longer than segment diameters and several short setae increasing in numbers on distal leg segments. Tarsus very short, with single sole seta. Propodus short, inflated, slightly curved, armed with 4–5 sole setae, several short lateral setae, and several dorsal

setae almost as long as propodal diameter. Claw short, broad, well curved, auxiliaries present, short, slender, less than half main claw length.

Male of species unknown.

Measurements (in mm).—Trunk length (proboscis insertion to tip 4th lateral processes), 0.91; trunk width (across 1st lateral processes), 0.44; proboscis length, 0.57; abdomen length, 0.19; first leg, coxa 1, 0.1; coxa 2, 0.16; coxa 3, 0.09; femur, 0.26; tibia 1, 0.25; tibia 2, 0.23; tarsus, 0.04; propodus, 0.18; claw, 0.05.

Distribution.—This species is known from its type locality only, south of Lizard Head Peninsula, Lizard Island, in 2 m.

Etymology.—The name proposed for this species is a play on the Great Barrier Reef (Latin: surrounded by a wall or rampart) which surrounds Lizard Island with a rampart of coral.

Remarks.—This new species has a few characters close to the juvenile type of *R. malaccensis* Stock (1968:20–22, fig. 6), a species known from the Straits of Malacca, Indonesia. The similarities are mostly found in the proboscis and trunk. The lateral processes are similar, but in Stock's species they are placed much closer together. The proboscides have the dorsolateral bulges in both species and are of similar lengths.

The new species is closest to *R. philopsammum* Hedgpeth (1951:111–115, fig. 3) from the west coast of North America. Here again, the lateral processes of Hedgpeth's species are similar to the new species, including the tubercles size and placement, but the lateral processes themselves are placed very close together rather than well separated as in the new species. There are similarities in the appendages of both species, but the third palp segment is shorter in the new species than in Hedgpeth's species. Also in the palp, the first and third segments (second and fourth segments according to his text, mistaking the palp bases as segments instead of lateral extensions of the trunk anterior) are subequal in Hedg-

peth's species while this does not hold true for *R. vallatus*. The tubercle of the third palp segment is much more distally placed in *R. philopsammum* than in the new species.

The main and auxiliary claws differ in lengths between the two species, being much shorter in *R. vallatus*, and the femur is longer than the tibiae in the new species, but femur and first tibia are equal in length in Hedgpeth's species. Finally, the first coxae of *R. philopsammum* have several small dorsodistal tubercles, particularly on the second and third pairs, while the first coxae of this new species have a single low tubercle only on the anterior surface of the first three leg pairs.

The fact that these two species are separated in their distribution by the breadth of the Pacific Ocean is not in itself a valid reason to separate these species, but this fact combined with the various subtle differences discussed above should serve to maintain the two as separate species.

Acknowledgments

I wish to thank the collectors; J. D. Thomas, B. F. Kensley, and J. Clark for their specimens from Lizard and Orpheus Islands, and A. J. (Sandy) Bruce and Niel Bruce, his son, for the Heron Island collections. Holotype specimens are deposited in the Australian Museum, Sydney, while other specimens are deposited in the National Museum of Natural History, Smithsonian Institution, under catalog numbers of the old U.S. National Museum.

Literature Cited

- For the literature published prior to 1978, see the complete bibliography published by Fry & Stock 1978. A Pycnogonid Bibliography, in *Sea Spiders (Pycnogonida)*.—*Zoological Journal of the Linnean Society of London*, 63(1+2):197–238.
- Child, C. A. 1982. Pycnogonida of the Western Pacific Islands, I. The Marshall Islands.—*Proceedings of the Biological Society of Washington* 95:270–281, figs. 1–3.
- . 1983. Pycnogonida of the Western Pacific

- Islands, II. Guam and the Palau Islands.—Proceedings of the Biological Society of Washington 96:698–714, figs. 1–5.
- . 1988a. Pycnogonida of the Western Pacific Islands, III. Recent Smithsonian–Philippine expeditions.—Smithsonian Contributions to Zoology 468:1–32, figs. 1–12.
- . 1988b. Pycnogonida from Aldabra Atoll.—Bulletin of the Biological Society of Washington 8:45–78, figs. 1–9.
- . 1988c. Pycnogonida of the Western Pacific Islands, V. A Collection by the *Kakuyo Maru* from Samoa.—Proceedings of the Biological Society of Washington 101:809–816, figs. 1–2.
- Clark, W. C. 1977. The genus *Tanystylum* Miers, 1879 (Pycnogonida) in the southern oceans.—Journal of the Royal Society of New Zealand 7(3):313–338, figs. 1–67.
- Hong, J.-S., I.-H. Kim. 1987. Korean pycnogonids chiefly based on the collections of the Korea Ocean Research and Development Institute.—The Korean Journal of Systematic Zoology 3(2): 137–164, figs. 1–17.
- Nakamura, K., & C. A. Child. 1990. Pycnogonida of waters adjacent to Japan.—Smithsonian Contributions to Zoology (in press).
- Stock, J. H. 1979. Pycnogonida from the mediolittoral and infralittoral zones in the tropical western Atlantic.—Studies on the Fauna of Curaçao and other Caribbean Islands 59(184):1–32, figs. 1–9.

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