

NOTOPONTONIA PLATYCHELES, NEW GENUS, NEW SPECIES
(DECAPODA: PONTONIINAE) FROM SOUTH AUSTRALIA,
WITH REMARKS ON *PONTONIA PINNOPHYLAX* (OTTO),
THE TYPE SPECIES OF *PONTONIA* LATREILLE

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ABSTRACT

Notopontonia platycheles new genus, new species (Decapoda: Pontoniinae), is described and illustrated. Caught off Robe, South Australia, at a depth of 64 m, and of unknown commensal associations, this species increases to five the number of pontoniine shrimps known from South Australia. Assessment of the systematic relationships of *Notopontonia* involved study of *Pontonia pinnophylax* (Otto, 1821), the type species of the genus *Pontonia*, which is redescribed and illustrated, leading to the discovery of an interesting morphological feature of the feeding mechanism not previously reported in any palaemonid shrimps.

The casual examination of the alpheid shrimp collection of the South Australian Museum, Adelaide, led to the discovery of an unusual shrimp belonging to the Pontoniinae, a subfamily very poorly represented in southern Australian waters. Further search unfortunately failed to provide additional specimens. Although closely related to the genus *Pontonia* Latreille, 1829, the new species presents several small but distinctive features, sufficient to justify its exclusion from that genus. A new genus is, therefore, described for its reception.

Comparison with specimens of the type species of the genus, *Pontonia pinnophylax* (Otto) (Opinion 378, 1956) confirmed the presence of several distinctive characters of generic value, including a remarkable paragnathal feature that has not been described in any previously reported pontoniine or, indeed, palaemonid shrimp. This unusual feature is clearly lacking in the new genus. The type species of the genus *Pontonia* Latreille was first described by Otto (1821) as *Palaemon pinnophylax*, in an academic thesis. Subsequently, an account as *Alpheus pinnophylax*, with colored illustrations, was provided (Otto, 1828). The shrimps presently included in the genus *Pontonia* show a wide range of variation in many specific characters, which probably indicate a polyphyletic origin for that genus.

A new description of *P. pinnophylax* is, therefore, provided, which may be useful as a yardstick against which the systematic relationships of the other species of *Pontonia* may be assessed.

Carapace length refers to the postorbital carapace length.

SYSTEMATIC ACCOUNT

Notopontonia, new genus

Definition.—Commensal shrimps of unknown association. Carapace strongly depressed, smooth, with short broad triangular rostrum, dorsally concave, lacking dorsal and ventral carinae, unarmed, distally setose; supraorbital, epigastric, hepatic, and antennal spines absent, orbit obsolete, inferior orbital angle large, blunt, anterolateral angle of branchiostegite produced, angular; abdomen smooth, pleura rounded; telson broad, with 2 pairs of large dorsal spines, 2 pairs of small posterior spines; antennule with short stylocerite, upper flagellum feebly biramous; antenna with basicerite unarmed, scaphocerite well developed, distolateral tooth enlarged, epistome normal, paragnath without proximal median fissure; mandible normal, without palp; maxillula with bilobed palp, upper lacinia broad, lower lacinia slender; maxilla with short simple palp, basal endite bilobed, upper lobe greatly enlarged, dorsally concave, coxal endite obsolete, scaphognathite normal; first maxilliped with slender palp, basal and coxal endites fused, elongate, dorsally concave, medial fringe of short setae, exopod well developed, caridean lobe large, narrow, epipod bilobed; second maxilliped with dactylar segment reduced, propodal segment enlarged, dorsally concave, exopod well developed, epipod large, triangular,

without podobranch; third maxilliped with ischiomerus and basis completely fused, broad, exopod well developed, lateral plate normal, arthrobranch rudimentary; first pereopods slender, chela with fingers elongate, subspatulate; fourth thoracic sternite without fingerlike median process; second pereopods with large similar subequal chelae, strongly compressed, carried horizontally with dactyl laterally, ventral margin strongly carinate, dorsal margin feebly carinate, fingers without molar process and fossa, feebly dentate, proximal segments unarmed; ambulatory pereopods with dactyl simply biunguiculate, propod with distoventral spines; endopod of first pleopod curved distomedially, endopod of second pleopod with appendix masculina exceeding appendix interna; uropod with protopod distolaterally unarmed; exopod with small distolateral tooth, with larger mobile spine medially.

Type Species.—*Notopontonia platycheles*, new species.

Systematic Position.—The genus *Notopontonia* is undoubtedly closely related to *Pontonia* Latreille. *Notopontonia* may be most readily distinguished from *Pontonia* by the following features:

(1) The chelae of the second pereopods are very strongly compressed and carried in a horizontal plane, with the dactyl laterally, with very strongly carinate ventral margins and a feebly carinate lateral margin to the dorsal palm, with feebly armed fingers, crossing only at the tips. In *Pontonia*, the chelae generally have the palm oval in section, although some may have a small ventral carina, particularly in species with dissimilar chelae, the chelae generally being held in an oblique or near vertical plane, with the dactyl ventral, in an extended or semiextended rather than a retracted position.

(2) The rostrum is broad, dorsally concave, completely lacking dorsal and ventral carinae. In *Pontonia*, the rostrum is variable, frequently compressed and often minutely dentate distally, never dorsally concave.

(3) The orbit is obsolete, with the antennal spine lacking. Many species of *Pontonia* have a small distinct orbit, with a definite inferior orbital angle and well-developed

antennal spine. These species usually have simply biunguiculate ambulatory dactyls, as in *Notopontonia*. Other species, with obsolete orbits, lacking antennal spines, generally have complex biunguiculate dactyls, and are usually associated with ascidians.

(4) The maxilla has a characteristic basal endite, bilobed, with the upper lobe greatly enlarged and dorsally concave. In *Pontonia* these lobes are generally subequal, small, frequently much reduced. The fused endites of the first maxilliped in *Notopontonia* are centrally expanded, with a medial fringe of short setae, and the epipod is bilobed. The second maxilliped has the dactylar segment reduced and the propodal segment enlarged in comparison with species of *Pontonia*.

(5) The paragnath in *Notopontonia* is simply bilobed, without distinct accessory lobes and proximal median fissure, as in *P. pinnophylax*.

(6) The first pereopods have elongate spatulate fingers in *Notopontonia*, whereas in *P. pinnophylax* they are compressed, nonspatulate.

(7) The posterior margin of the telson is provided with two pairs of spines only in *Notopontonia*, whereas species of *Pontonia* are usually provided with the typical pontoniine complement of three pairs. The exopod of the uropod in *Notopontonia* bears a small distolateral tooth, as in most of the Pontoniinae, but which is usually absent from species of *Pontonia*.

(8) Where information is available, the appendix interna of the male second pleopod distinctly exceeds the appendix masculina in species of *Pontonia*. In *Notopontonia*, the appendix masculina exceeds the appendix interna.

Etymology.—From *notos*, Greek, south, and *Pontonia*, a generic name first used for a pontoniine shrimp by Latreille (1829).

***Notopontonia platycheles*,**

new species

Figs. 1–6, 14E

Material Examined.—1 ♂, northwest of Robe, South Australia, approximately 36°53'S, 139°53'E, in 64 m, September 1985, collected by Sangster.

Description.—Medium-sized, robust pontoniine shrimp, of strongly depressed body form. Carapace smooth, glabrous, strongly depressed, rostrum well developed, broadly triangular, about 1.5 times broader than

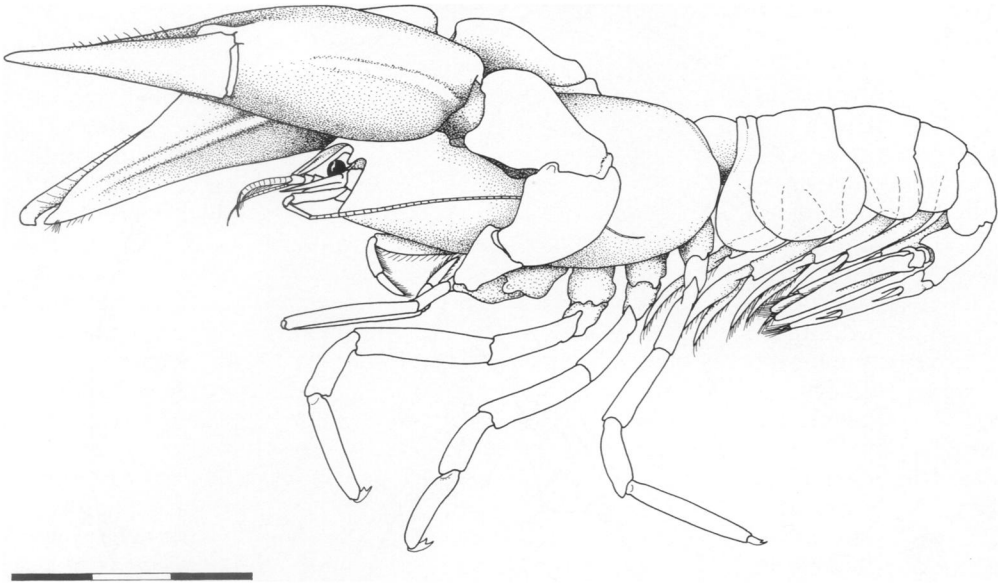


Fig. 1. *Notopontonia platycheles*, new genus, new species, holotype male, off Robe, South Australia, lateral. Scale divisions = 3 mm.

long, slightly exceeding intermediate segment of antennular peduncle, unarmed, without distinct dorsal or ventral carinae, strongly compressed dorsoventrally, slightly thickened centrally, dorsally concave, lateral margins convex, with pair of conspicuous setae distoventrally; supraorbital, epigastric, hepatic, and antennal spines absent; orbital notch well developed, without defined orbit, inferior orbital angle large, slightly upturned, blunt; anterolateral angle of carapace strongly produced, acute; ventral branchiostegite feebly angulate ventromedially.

Abdomen smooth, glabrous, subcylindrical; pleura of first 3 segments broadly rounded, fourth and fifth rounded, small; sixth segment about 1.2 times length of fifth, depressed, 1.8 times broader than long, 2.0 times longer than anterior depth, posteroventral angle large, subacute, posterolateral angle small, acute. Telson about 2.0 times longer than maximum width at about 0.1 of length, lateral margins convex, feebly converging posteriorly, anterior margin about 0.83 of width, dorsal surface deeply concave, with 2 pairs of large subequal lateral dorsal spines, about 0.15 of telson length, at 0.16 and 0.6 of telson length; posterior margin broad, feebly biconvex, about

0.5 of anterior margin width, with 2 pairs of lateral spines only, small outer spine, with larger blunt spine medially, 1.75 times length of lateral spine, 2.8 times longer than basal width, central posterior margin with about 30 long simple setae, 2 long plumose setae.

Antennule with proximal peduncular segment broad, about 1.25 times longer than proximal width, distolateral angle strongly produced, broadly acute, stylocerite short, broad, moderately acute, reaching to about 0.5 of segment length, statocyst normal with granular statolith; ventromedial margin with small acute tooth at 0.5 of length; intermediate segment short, broad, about 1.2 times broader than long; distal segment 1.3 times longer than broad, distal segments combined about 0.6 of proximal segment length; antennular flagella carried extended; upper flagellum short, biramous, rami fused proximally for 11 segments, robust, shorter free ramus with single segment, longer ramus about 0.6 of fused portion, slender, with 5 segments; with about 16 groups of aesthetascs; lower flagellum short, slender, subequal to long ramus of upper flagellum, about 0.2 of carapace length, with 13 segments.

Antenna with short, stout, unarmed basicerite, ischiocerite and merocerite normal, carpocerite about 4.5 times longer than dis-

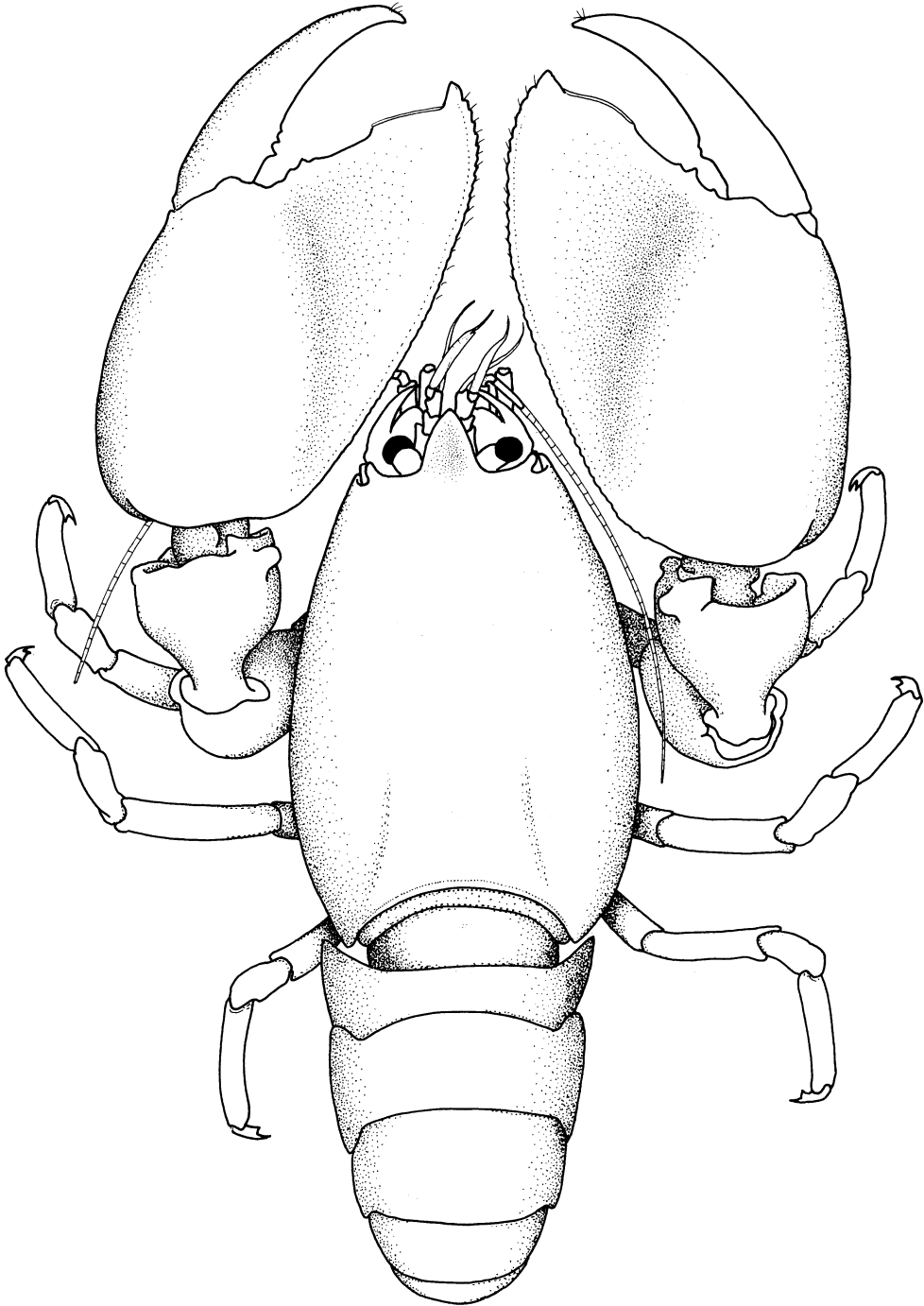


Fig. 2. *Notopontonia platycheles*, new genus, new species, holotype male, off Robe, South Australia, dorsal. Scale divisions = 3 mm.

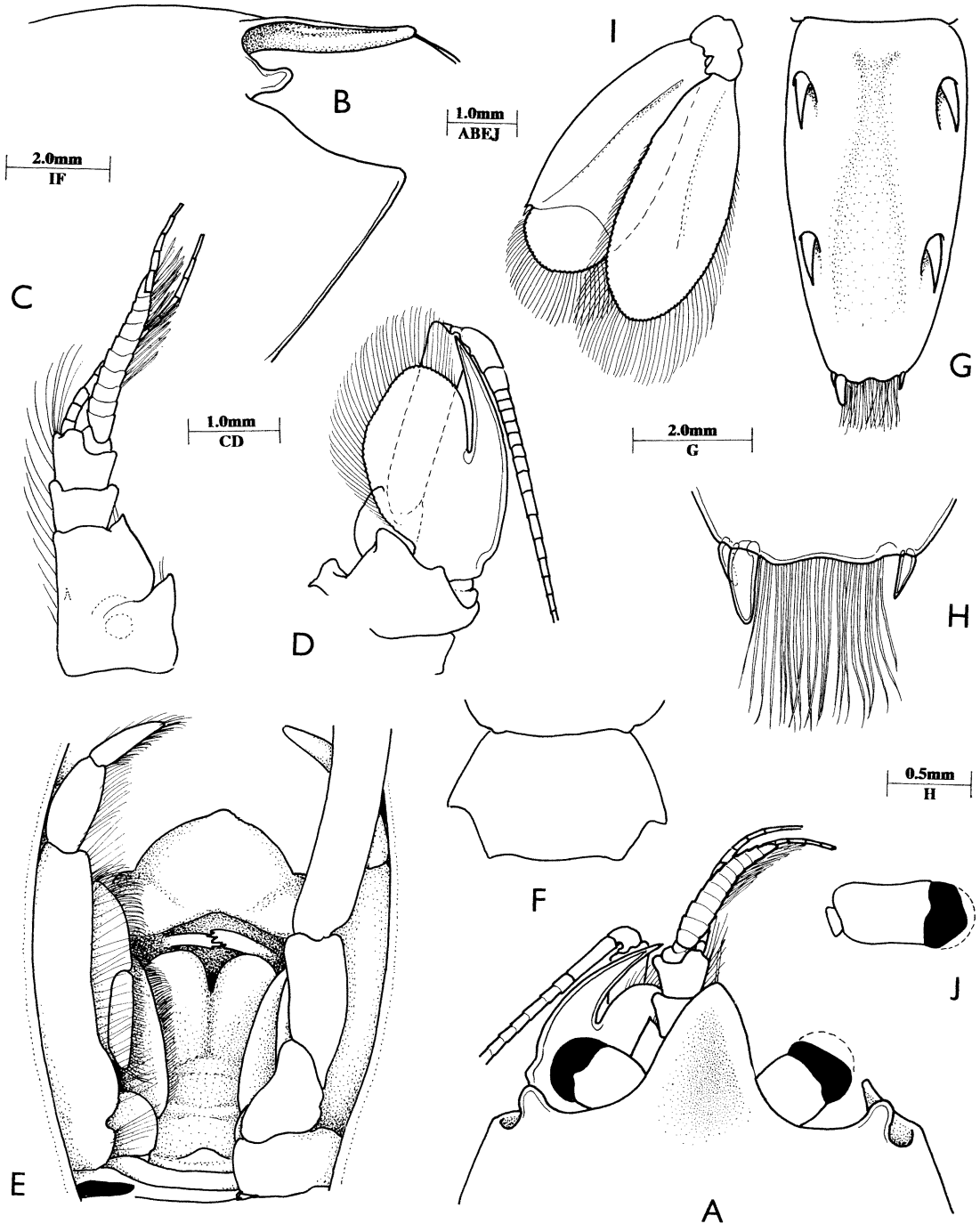


Fig. 3. *Notopontonia platycheles*, new genus, new species, holotype male. A, anterior carapace, eyes, left antennae, dorsal; B, anterior carapace, lateral; C, antennule; D, antenna; E, buccal region, ventral; F, sixth abdominal segment, dorsal; G, telson; H, same, posterior spines; I, uropod; J, right eye, dorsal.

tal width, uniform, compressed, distinctly exceeding rostrum, flagellum short, slender, subequal to carapace length; scaphocerite well developed, lamina extending to level

of tip of rostrum, broad, about 1.5 times longer than wide, distal lamina broadly rounded, lateral margin convex, with enormous curved distolateral tooth, arising at

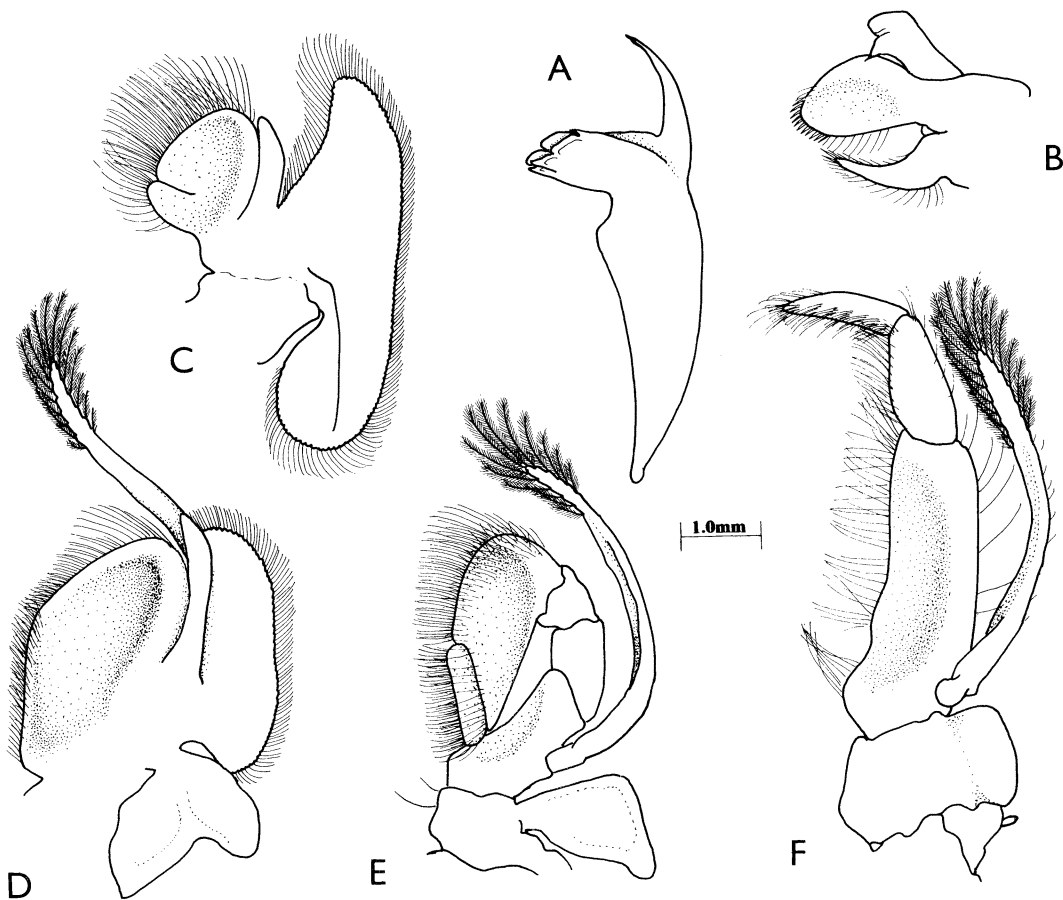


Fig. 4. *Notopontonia platycheles*, new genus, new species, holotype male. A, mandible; B, maxillula; C, maxilla; D, first maxilliped; E, second maxilliped; F, third maxilliped.

about 0.5 of lamina length, far exceeding distal margin of lamina, separated by deep fissure.

Eyes small; cornea hemispherical, well pigmented, with discernible accessory pigment spot, diameter about 0.9 of carapace length; stalk subcylindrical, subequal to corneal diameter, about 1.2 times longer than broad.

Epistome normal, unarmed; ophthalmic somite simple, without bec ocellaire. Labrum without special features. Paragnath about 1.25 times broader than long, alae well developed, feebly lobulate, with deep hollow at proximal end of median fissure; basal portion short, broad, with central eminence, without distinct lateral ridge or deep median groove. First three thoracic sternites broad, unarmed, fourth narrow, unarmed, fifth narrow, with strong transverse carina posterior to coxae of second pereopods,

sixth to eighth unarmed, progressively broadening posteriorly.

Mouthparts (right): mandible without palp, corpus normal; molar process robust, obliquely truncate distally, with 2 blunt teeth dorsally, 2 rounded laminar plates ventrally, single acute tooth posteriorly, with small tufts of setae anteriorly and posteriorly; incisor process feeble, obliquely truncate distally, with 5 small acute teeth, sublateral tooth smaller than others. Maxillula with small weakly bilobed palp, lower lobe tapering distally, with small distal tubercle with short simple seta; upper lacinia broad, dorsally concave, with double rows of about 11 short small finely denticulate spines distally, short plumose setae ventrally; lower lacinia slender, tapering distally, with 3 distal spines, numerous simple setae. Maxilla with short simple palp, basal endite well developed, dorsally concave, bilobed, distal

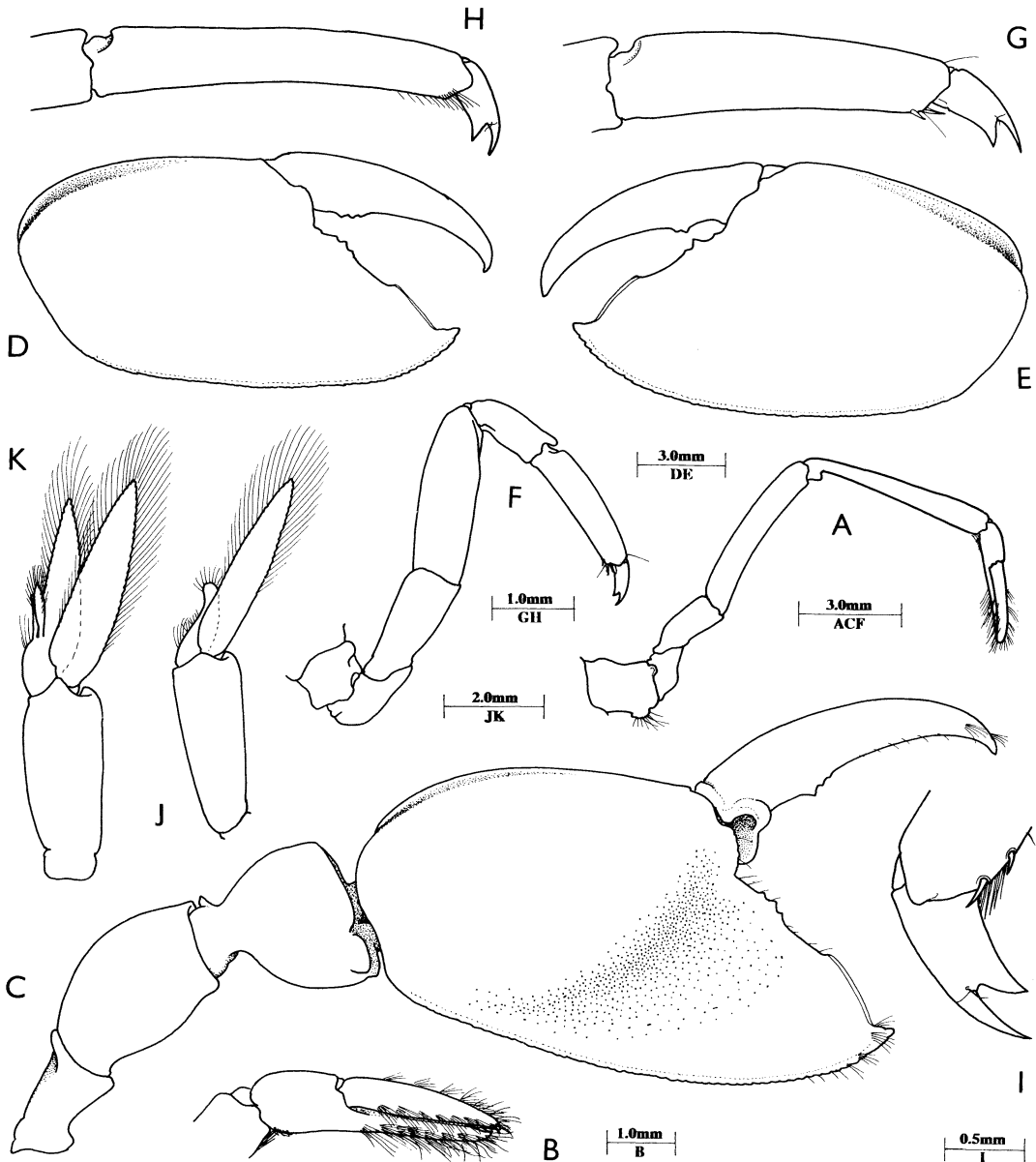


Fig. 5. *Notopontonia platycheles*, new genus, new species, holotype male. A, first pereiopod; B, same, chela; C, second pereiopod, left; D, same, chela, dorsal; E, same, right chela, dorsal; F, third pereiopod; G, same, propod and dactyl; H, fifth pereiopod, propod and dactyl; I, same, dactyl and distal propod, medial; J, first pleopod; K, second pleopod.

lobe greatly enlarged, broadened, both lobes with dense fringe of long marginal setae, minutely serrulate, coxal endite obsolete; scaphognathite normal, about 3.0 times longer than broad, posterior lobe large, about 1.25 times longer than broad, 0.3 of scaphognathite length, anterior lobe strongly tapering distally, medial margin concave. First maxilliped with slender, simple non-

setose palp, basal and coxal endites fused forming large rounded lobe, with dense fringe of minutely serrulate marginal setae, concave dorsally and laterally thickened; exopod well developed, flagellum with numerous plumose setae distally, caridean lobe large, broad; epipod unequally bilobed, proximal lobe larger. Second maxilliped with dactylar segment small, about 4.0 times lon-

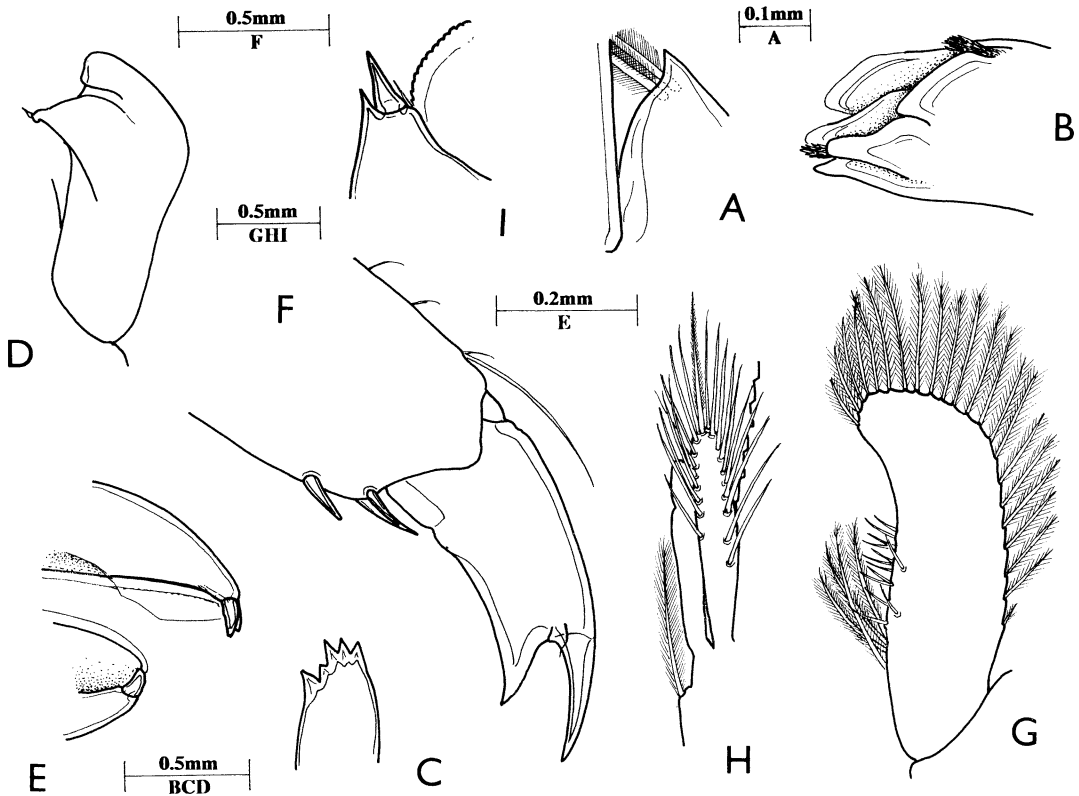


Fig. 6. *Notopontonia platycheles*, new genus, new species, holotype male. A, antennal peduncle, proximal segment, distolateral angle; B, mandible, molar process; C, same, incisor process; D, maxillula, palp; E, first pereiopod, finger tips, dactyl uppermost; F, third pereiopod, dactyl; G, first pleopod, endopod; H, second pleopod, appendix masculina and appendix interna; I, uropod, exopod, distolateral angle.

ger than broad, medially densely fringed with coarsely serrulate setae; propodal segment large, 2.0 times length of dactylar segment, deeply concave dorsally, distomedial margin broadly rounded, densely fringed with long minutely serrulate setae; carpus, ischiomerus normal; basis normal, feebly excavate dorsally, with well-developed exopod, with numerous plumose setae distally; coxa feebly produced medially, sparsely setose, with large simple triangular epipod laterally, without podobranch. Third maxilliped with endopod extending to about middle of carpocerite; ischiomerus and basis completely fused, combined segment broad, about 3.3 times longer than central width, dorsally concave medially, medial margin with feeble convexities in ischial and basal regions, with numerous slender feebly setulose setae, lateral margins sparsely setose, longer setae; penultimate segment about 0.45 of proximal segment length, about 2.3 times longer than proximal width,

tapering distally, densely setose medially; terminal segment about 0.9 of penultimate segment length, about 3.5 times longer than proximal width, tapering distally, with numerous transverse rows of short finely setulose spiniform setae ventromedially; coxa robust, feebly produced medially, with large subrectangular lateral plate; with rudimentary arthrobranch.

First pereiopods slender, distal end of merus exceeding antennular peduncle; chela slender with short, subcylindrical, feebly compressed palm, about 1.6 times longer than deep, fingers elongate, broad, subspatulate, about 2.0 times palm length, dactyl slightly longer than fixed finger, with 2 small teeth distally, entire laminar cutting edge laterally, fixed finger similar single tooth distally, fingers with numerous groups of long serrulate setae; carpus slender, about 1.6 times chela length, 7.2 times longer than distal width, tapering proximally, proximal width about 0.5 of distal width; merus fee-

bly bowed about 0.95 of carpus length, uniform, about 6.0 times longer than width; ischium about 0.45 of merus length; basis about 0.33 of merus length, coxa robust, with small setose ventral lobe.

Second pereopods well developed, chelae carried retracted, with carpomeral joint flexed, merus and ischium lying alongside carapace, chelae carried horizontally with dactyls laterally; chelae subequal, similar, about 1.3 times carapace length, palmar portion about 1.6 times longer than proximal width, strongly compressed, smooth, tapering slightly distally, with weak carina proximolaterally, ventral margin enlarged into broad fixed tooth, very strongly compressed with feebly irregularly carinate ventral margin; dactylus slender, oval in section, carinate, outer margin feebly irregular, feebly curved, about 0.8 of palm length, tip acute, not hooked, distal cutting edge concave, entire, blunt with 3 small acute teeth proximally on left, 2 on right; fixed finger very broad, about 0.5 of palm length, as long as deep, with small acute tip, distal half of cutting edge situated dorsally, convex, sharp, separated by blunt concave diastema from 3 small proximal teeth on left, 2 on right; carpus stout, distally enlarged, tapering strongly proximally, about 0.45 of palm length, length subequal to distal width, feebly excavate distally, unarmed, left carpus with small acute tooth proximolaterally; merus robust, about 0.55 of palm length, 1.6 times longer than central width, centrally swollen, unarmed; ischium unarmed, about 0.28 of palm length; basis normal, coxa stout.

Ambulatory pereopods moderately robust, third exceeding rostrum by half carpus length, dactyl about 2.8 times longer than proximal depth, unguis about 0.36 of corpus length, 3.0 times longer than basal width, feebly curved, corpus compressed, 1.8 times longer than proximal depth, without basal process, scarcely tapering distally, with large acute distoventral accessory tooth, with single short medial and lateral sensory setae distally; propod about 0.33 of carapace length, robust, 4.2 times longer than proximal depth, feebly tapering distally, ventral margin with 2 small slender spines distally, with single larger stouter spine proximally; corpus about 0.6 of palm length, 2.4 times longer than width, with small distodorsal

lobe, unarmed; merus 1.2 times propod length, 3.0 times longer than central depth, unarmed; ischium about 0.9 of propod length, 2.3 times longer than distal width, tapered proximally, unarmed; basis about 0.6 of propod length; coxa robust, without special features. Fourth and fifth pereopods similar to third; fifth propod 1.1 times third propod length, about 6.0 times longer than proximal depth, with transverse row of short serrulate setae distolaterally, distal and pre-terminal ventral spines medially.

First pleopod with basipodite about 2.6 times longer than distal width; endopod about 0.55 of exopod length, 3.4 times longer than central width, with distal portion curved medially, distal and lateral margins with about 20 short plumose setae; central third of medial margin with 4 longer plumose setae proximally, about 12 short simple slender spines distally. Second pleopod with basipodite about 2.2 times longer than distal width; endopod about 1.1 times basipodite length, 4.0 times longer than broad, appendices at about 0.3 of medial margin length, proximal margin convex, with plumose setae; appendix masculina subcylindrical, slightly swollen centrally, 5.5 times longer than central width, with 8 ventromedial and 10 ventrolateral simple setae, 1 longer, finely serrulate distal seta; appendix interna slender, with few distal cincinnuli, slightly shorter than appendix masculina.

Uropod with protopodite short, stout, unarmed; exopod not exceeding telson, about 2.5 times longer than wide, lateral margin convex, with small acute tooth distally, with larger mobile spine medially; endopod subequal to exopod length, 2.6 times longer than broad.

Types.—The single male specimen is designated as the holotype and is held in the collection of the South Australian Museum, catalogue number C.4240.

Measurements (mm).—Total body length (approximate), 36; carapace and rostrum, 15.5; postorbital carapace, 13; second pereopod chelae, left, 17; right, 18.

Coloration.—No data.

Host.—Unknown.

Etymology.—From *platys*, Greek, flat, and *chele*, Greek, a claw, a reference to the shape of the second pereopods.

Pontonia pinnophylax (Otto, 1821)
Figs. 7–13, 14F

Palaemon pinnophylax Otto, 1821: 12.

Alpheus pinnophylax Otto, 1828: 341, pl. 21, figs. 1, 2.

Pontonia pinnophylax Holthuis, 1947: 319 (full synonymy).

Material Examined.—1 ♂, 1 ♀. Straits of Messina, 38°15'N, 15°36'E, depth ?, 8 December 1988, in *Pinna nobilis*, collected by N. Calafiore and G. Constanzo, Northern Territory Museum (NTM) Cr.006750.

Description of Male.—Medium-sized pontoniine shrimp of normal subcylindrical body form. Carapace smooth, glabrous, with well-developed rostrum extending anteriorly to slightly exceed intermediate segment of antennal peduncle, triangular in dorsal view, about 2.3 times longer than broad, dorsally convex, unarmed, without dorsal carina, distal portion slender, compressed, with distinct ventral carina, unarmed, tip acute, with pair of simple preterminal dorsal setae; supraorbital, epigastric, hepatic spines absent; orbit distinct, feebly developed, with small blunt inferior orbital angle, antennal spine well developed, slender, acute, marginal; anterolateral angle of branchiostegite not produced, broadly rounded.

Abdomen smooth, glabrous; sixth segment depressed, about 1.4 times longer than fifth, as long as wide, posteroventral and posterolateral angles acutely produced; pleura of first 3 segments broadly rounded, fourth, fifth, slightly produced posteriorly,

rounded. Telson about 2.0 times length of sixth segment, about 2.3 times longer than broad, lateral margins convex, convergent, anterior margin about 0.8 of greatest width; with 2 pairs of subequal dorsal spines, about 0.09 of telson length, at 0.4, 0.66 of telson length, submarginal; posterior margin feebly concave, 0.4 of anterior margin width, with 3 pairs of small spines, lateral spines short, about 0.4 of dorsal spine length, intermediate spines more robust, broken, submedian spines more slender, broken.

Antennule small, peduncle distinctly exceeding rostrum, proximal segment about 1.8 times longer than broad, tapering distally, medial margin sparsely setose, with minute ventromedial tooth at 0.5 of length, lateral margin sinuous, distolaterally produced, subtruncate, with weak rounded distolateral tooth, stylocerite short, broad, acute, reaching to 0.5 of segment length, statocyst normal, with granular statolith; intermediate segment about 1.8 times longer than broad, 0.55 of proximal segment length, with small lateral lamella, obliquely articulated with distal segment; distal segment about 0.9 of intermediate segment length, 1.3 times longer than broad; upper flagellum feebly biramous, proximal 9 segments fused, robust, shorter free ramus with single segment, longer free ramus with 6 slender segments; about 6 groups of aesthetascs present; lower flagellum short, subequal to longer upper ramus flagellum, with 16 slender segments.

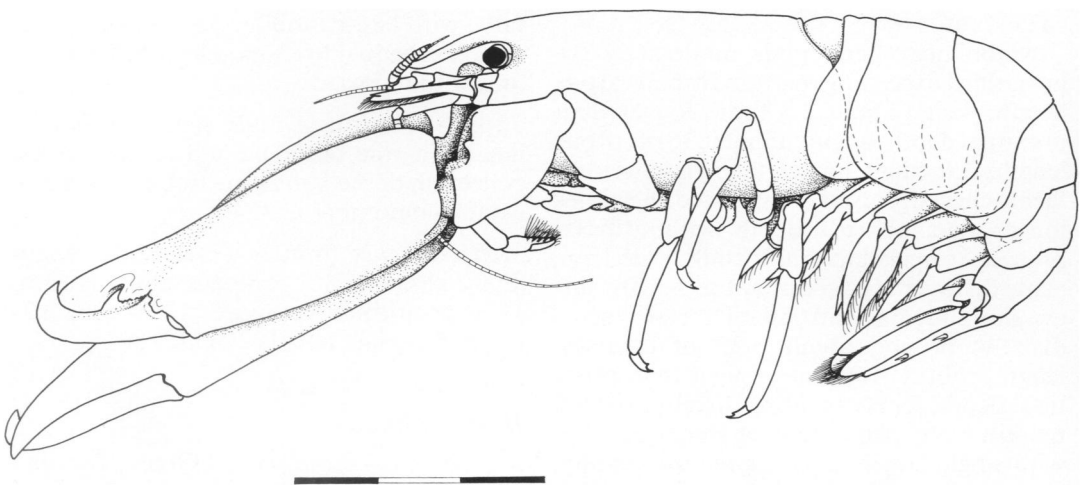


Fig. 7. *Pontonia pinnophylax* (Otto), male, lateral, Straits of Messina. Scale divisions = 3 mm.

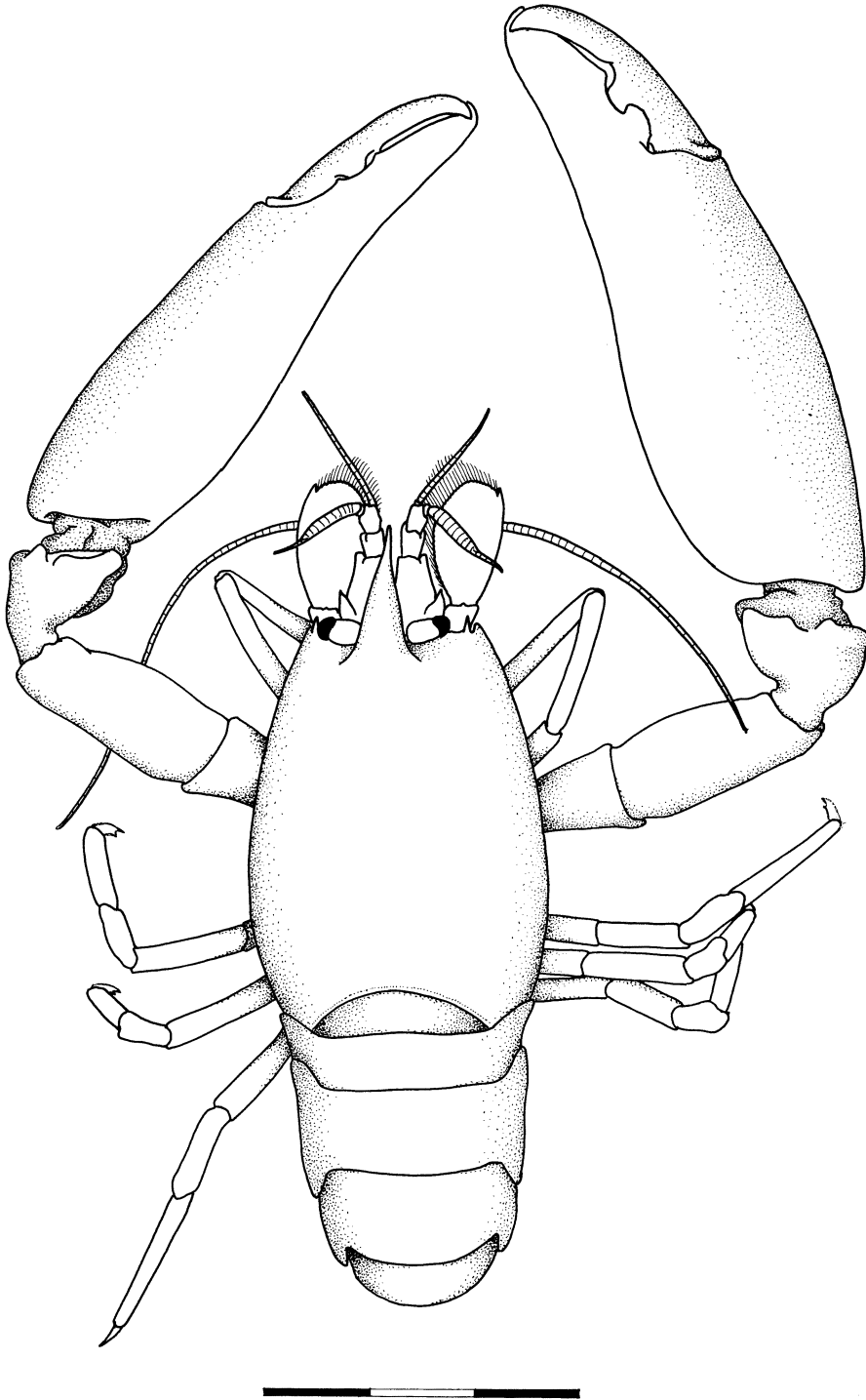


Fig. 8. *Pontonia pinnophylax* (Otto), male, dorsal, Straits of Messina. Scale divisions = 3 mm.

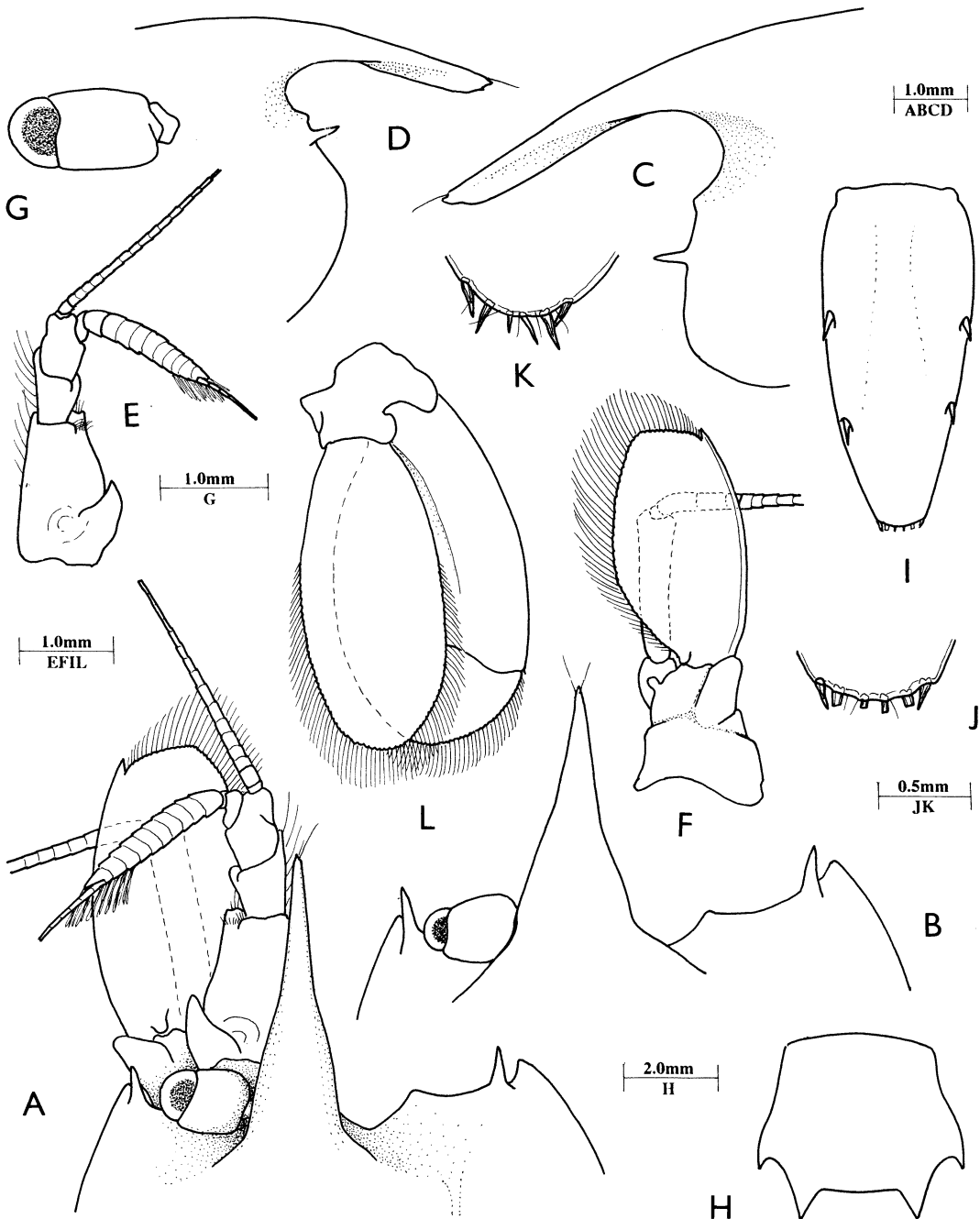


Fig. 9. *Pontonia pinnophylax* (Otto). A, anterior carapace and rostrum, eye, antennae, right orbit, dorsal; B, anterior carapace, rostrum, eye, right orbit, dorsal; C, D, anterior carapace and rostrum, lateral; E, antennule; F, antenna; G, eye, dorsal; H, sixth abdominal segment, dorsal; I, telson; J, K, same, posterior spines; L, uropod. A, C, E-J, male; B, D, K, female.

Antenna with stout unarmed basicerite, with small antennal gland tubercle medially; ischiocerite, merocerite normal; carapocerite subcylindrical, slightly com-

pressed, 4.0 times longer than distal width, flagellum short, slender, about 1.6 times carapace length; scaphocerite well developed, broad, 1.8 times longer than wide,

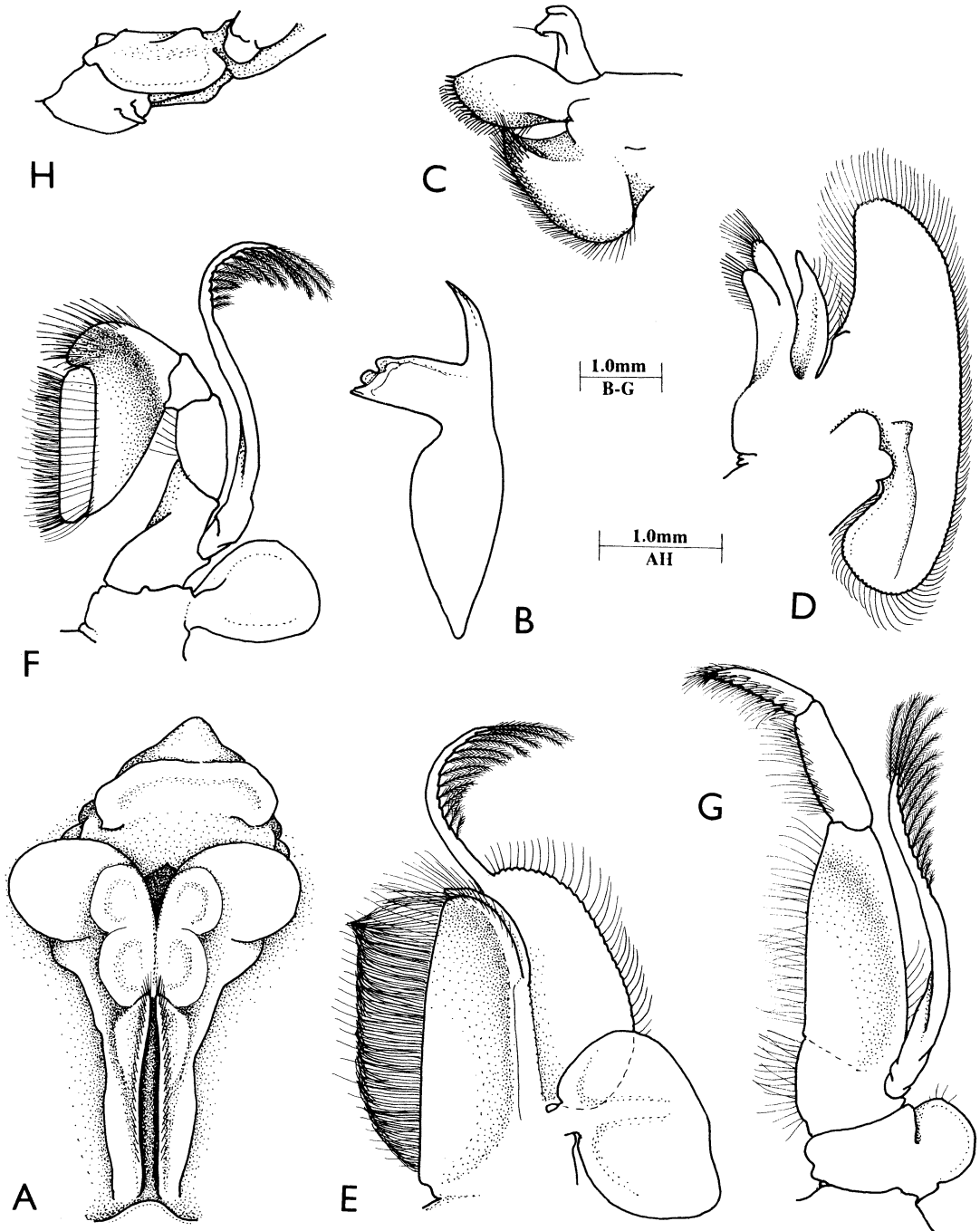


Fig. 10. *Pontonia pinnophylax* (Otto), male. A, paragnaths, ventral; B, mandible; C, maxillula; D, maxilla; E, first maxilliped; F, second maxilliped; G, third maxilliped; H, same, coxal region, lateral.

extending well beyond antennal peduncle, lateral margin distinctly convex, with small acute distal tooth, slightly exceeded by weakly angulate distal margin of lamella.

Eye with small hemispherical cornea,

about 0.075 of carapace length, without accessory pigment spot, stalk subcylindrical, feebly compressed, about 1.2 times longer than broad, 1.1 times corneal diameter.

Epistome and labrum without special fea-

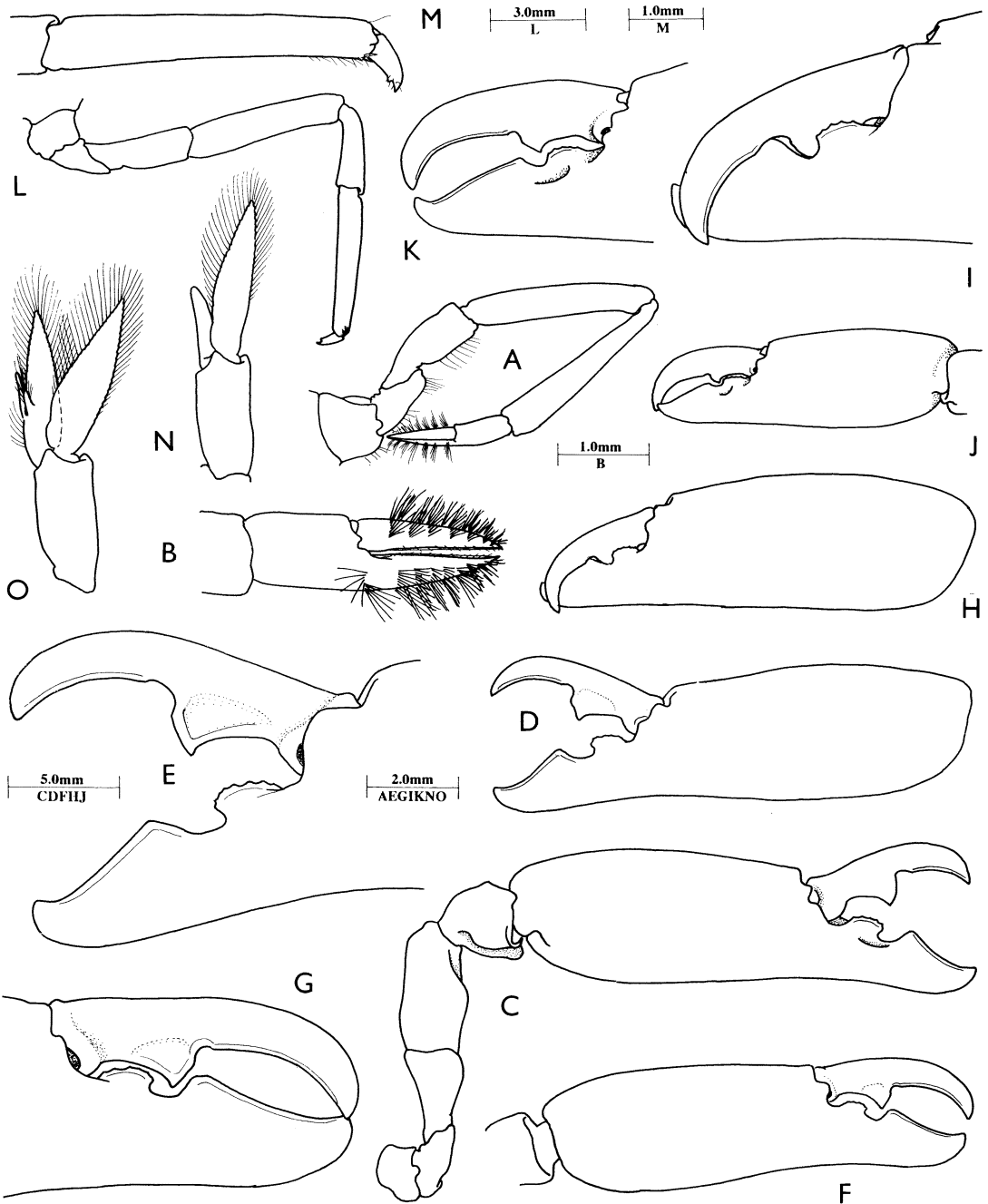


Fig. 11. *Pontonia pinnophylax* (Otto). A, first pereiopod; B, same, chela; C, major second pereiopod; D, same, major chela; E, same, fingers; F, minor second pereiopod, chela; G, same, fingers; H, major second pereiopod, chela; I, same, fingers; J, minor chela same; K, same, fingers; L, third pereiopod; M, same, propod and dactyl; N, first pleopod; O, second pleopod. A-G, L-O, male; H-K, female.

tures. Paragnath well developed, about 1.25 times longer than broad, deeply bilobed distally, with large subcircular smooth nonsetose lobes, with 2 pairs of smaller submedian ventral lobes, with depressed centers;

proximal half narrower with deep median groove, bordered laterally by raised setose carinae, most marked anteriorly. Anterior thoracic sternites broader, second with rounded transverse median carina, third

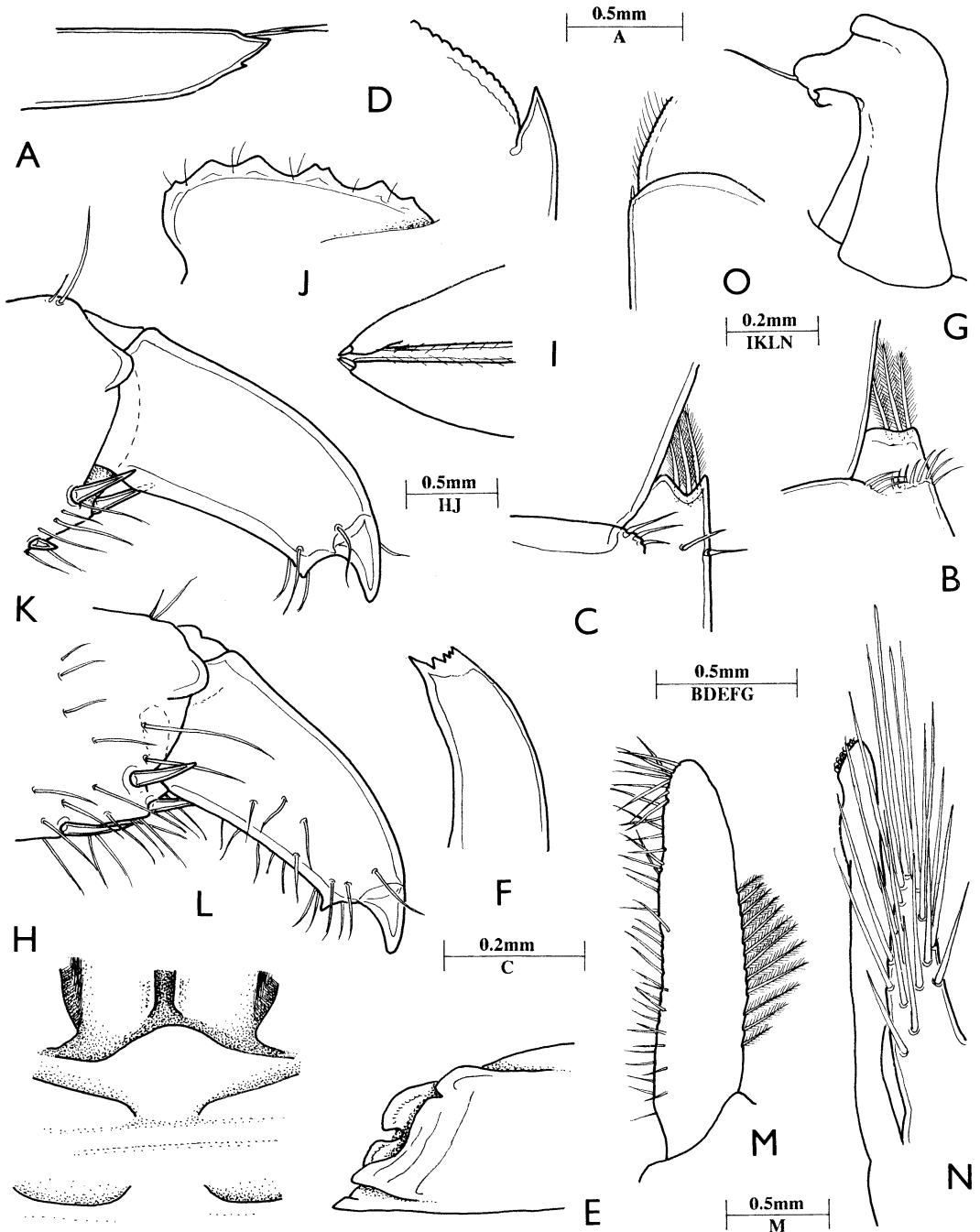


Fig. 12. *Pontonia pinnophylax* (Otto). A, rostrum; B, C, antennule, distolateral angle of proximal peduncular segment; D, scaphocerite, distolateral tooth; E, mandible, molar process; F, same, incisor process; G, maxillula, palp; H, second to fourth thoracic sternites; I, first pereiopod, tips of fingers (setae omitted); J, second pereiopod, proximal tooth of fixed finger; K, L, third pereiopod, dactyl; M, first pleopod, endopod; N, second pleopod, appendix masculina, and appendix interna; O, uropod, distolateral exopod. A, C, L, female; B, D, E-K, M-O, male.

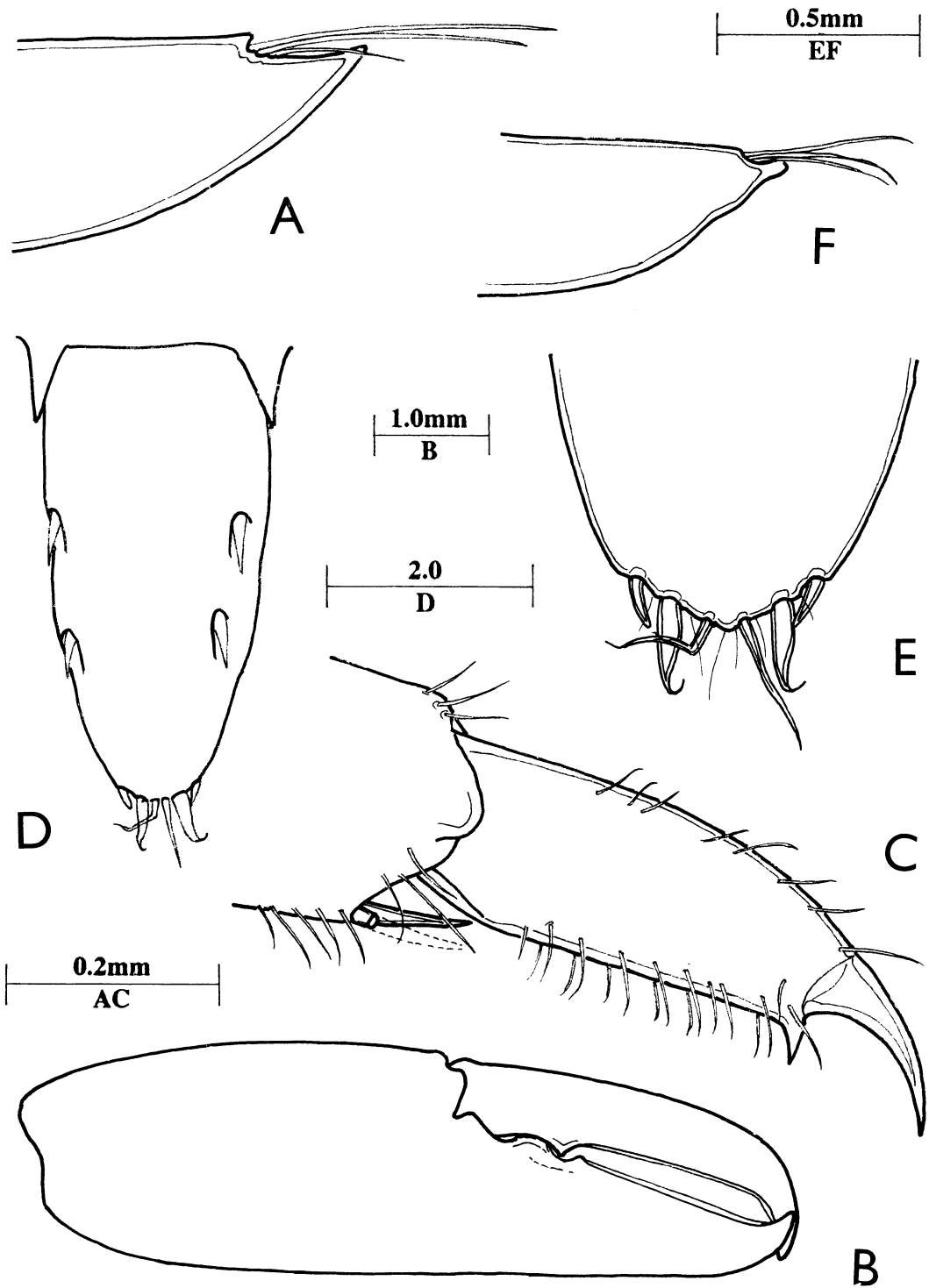


Fig. 13. *Pontonia pinnophylax* (Otto), female, Ulnis an der Schlei. A, tip of rostrum; B, minor second pereiopod, chela; C, third pereiopod, dactyl and distal propod; D, telson; E, same, posterior spines; F, male, Straits of Messina, tip of rostrum.

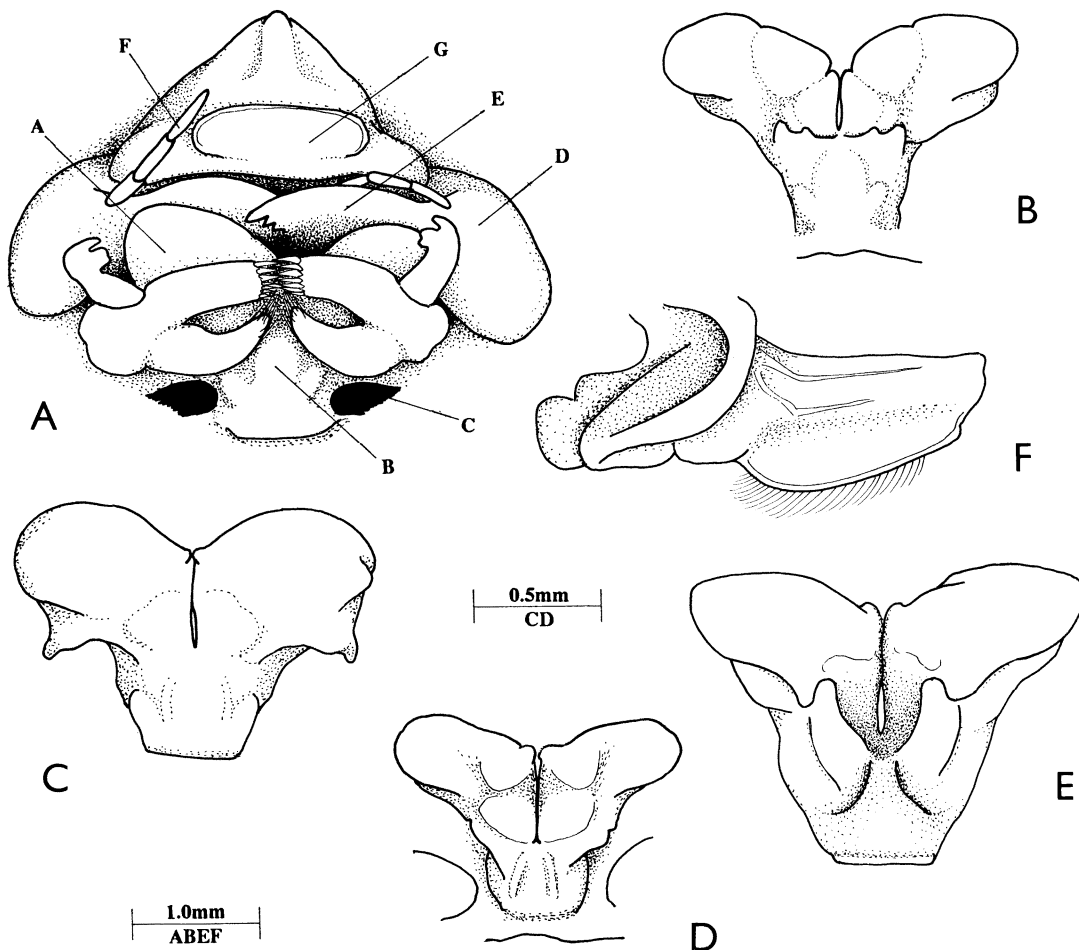


Fig. 14. *Macrobrachium rosenbergii* (de Man), immature male, Northern Territory, Australia. A, oral region, ventral (A = ala of paragnath, B = peduncle of paragnath, C = origin of first maxilliped, D = corpus of mandible, E = incisor process of mandible, F = mandibular palp, G = labrum); B, paragnaths, ventral aspect. *Palaemonella rotumana* (Borradaile), male, Coburg Peninsula, Northern Territory. C, paragnaths. *Pontonia katoi* Kubo, ovigerous female, Heron Island, Queensland. D, paragnaths. *Notopontonia platycheles*, new genus, new species, holotype male. E, paragnaths, ventral. *Pontonia pinnophylax* (Otto), male, Straits of Messina. F, same, left lateral.

with 2 lateral carinae, fourth with 2 lateral carinae, without median process, fifth with well-developed lateral plates posterior to second pereopod coxae, sixth to eighth unarmed, broadening posteriorly.

Mandible (right) normal, corpus robust, without palp; molar process stout, with 2 large blunt teeth dorsally, 2 rounded, sharp-edged teeth ventrally, one subacute tooth posteriorly; incisor process slender, distally truncate, with 5 small acute teeth distally, longest teeth ventrally; maxillula with feebly bilobed palp, larger lower lobe with small ventral tubercle with single short recurved simple seta, with longer slender simple setae

anteriorly, upper lacinia feebly expanded, 1.7 times longer than broad, distally curved dorsally, distal margin curved continuously with ventral margin, with about 15 minute simple spines distally, largely obscured by numerous short simple setae, extending along ventral border, lower lacinia large, markedly broadened, thickened, distally acute, curved dorsally, densely covered with short simple setae distally, ventrally; maxilla with simple palp, expanded proximally, tapered distally, with short plumose setae along lateral margin, basal endite well developed, bilobed, distal lobe longer than proximal, with about 22 long slender setae,

minutely serrulate distally, proximal lobe with about 15 similar, slightly shorter setae; coxal endite obsolete, medial margin convex, nonsetose; scaphognathite large, 2.7 times longer than wide, posterior lobe large, 1.5 times longer than wide, anterior lobe 1.3 times longer than wide, medial margin concave; first maxilliped with simple, nonsetose palp, closely adpressed around distolateral margin of basal endite, basal and coxal endites completely fused, combined endite elongate, narrow, dorsally concave, with dense fringe of long finely plumose setae along medial margin, with row of more sparse, longer, simple submarginal setae ventrally; exopod well developed, flagellum broad, with numerous plumose setae distally, caridean lobe large, elongate, narrow, epipod large, suboval; second maxilliped with normal endopod, dactylar segment about 4.0 times longer than broad, densely fringed with coarsely serrulate spiniform setae medially, dactylar segment with distomedial lobe small, with numerous longer finely serrulate spiniform setae, ischiomerus, with setae along medial margin, basis feebly excavate medially, exopod normal, with numerous plumose setae distally, coxa without medial protuberance, with large suboval epipod laterally, without podobranch; third maxilliped extending to about level of middle of carpocerite; ischiomerus almost completely fused to basis, junction indicated by small protuberance on medial margin at proximal end of ischium, combined segment about 3.0 times longer than proximal width, tapering distally, flattened, anterior width about 0.4 of proximal width, basal margin feebly convex, with long simple setae, ischiomerus medial margin similar, proximal lateral margin sparsely setose; penultimate segment about 0.45 of proximal segment length, subcylindrical, with numerous groups of long finely serrulate setae ventromedially, terminal segment about 0.8 of intermediate segment length, 4.5 times longer than proximal width, tapering distally, with numerous groups of longer, coarsely serrulate spines distally; exopod well developed, exceeding distal merus, with numerous plumose setae distally; coxa without medial process, with large oval lateral plate, with rudimentary arthrobranch.

First pereopod slender, exceeding carpocerite by chela and distal third of propod;

chela 1.5 times longer than deep, subcylindrical, slightly compressed, dactyl about 1.25 times palm length, 4.5 times longer than proximal depth, slender, tapering, compressed, with low entire lateral cutting edge, tip acute with single small spine, fixed finger similar, with 2 small distal spines, both fingers with numerous transverse rows of long densely serrate setae laterally; carpus about 1.6 times chela length, 5.5 times longer than distal width, tapering proximally, unarmed; merus subequal to carpus length, 6.0 times longer than central width, slightly compressed, uniform, unarmed; ischium 0.6 of merus length, ventrally carinate, setose; basis 0.4 of merus length, sparsely setose ventrally; coxa normal, without ventral process.

Second pereopods well developed, chelae large, robust, subequal, similar; major chela (right) about 1.9 times carapace length, smooth, subcylindrical, slightly swollen centrally, oval in section, without ventral carina, 2.3 times longer than deep, dactyl slender, curved, with slightly hooked blunt tip, about 0.5 of palm length, about 5.0 times longer than proximal depth, distal half of cutting edge concave, blunt, with small notch proximally, proximal half of cutting edge with large acute compressed tooth, fixed finger subequal to dactyl length, 2.5 times longer than proximal depth, tip slightly hooked, blunt, distal half of cutting edge with large low acute tooth, separated by deep diastema from large convex tooth with about 7 small denticles on dorsal margin, medial aspect of fixed finger with fossa for reception of dactylar tooth when fingers closed, tips extensively crossing with fixed finger diastema opposing small prepedal dactylar notch with dactylus crossing over fixed finger centrally: minor chela (left) about 1.75 times carapace length, 0.87 of major chela length, palm about 2.3 times longer than central depths, dactyl 0.5 of palm length, fingers as in major chela; carpus about 0.25 of palm length, as long as distal depth, strongly tapered proximally, excavate distally, unarmed; merus about 0.45 of palm length, 2.1 times longer than central depth, feebly excavate distoventrally, unarmed; ischium about 0.3 of palm length, 1.6 times longer than distal width, tapered, compressed, proximally unarmed; basis and coxa robust, without special features.

Ambulatory pereopods normal; third pereopod exceeding carapocerite by propod and dactyl; dactyl with unguis short, stout, blunt, 1.5 times longer than basal width, 0.28 of carpus length, carpus compressed, 2.0 times longer than proximal width, slightly tapering distally, ventral border blunt, with single small subacute distal accessory tooth, with few short simple setae distally, medially, and laterally; propod 5.5 times dactyl length; 0.38 of carapace length, 6.6 times longer than proximal depth, slightly tapering distally, with pair of distoventral spines, single very small preterminal ventral spine, distoventral margin sparsely setose; carpus about 0.55 of propod length, 3.0 times longer than distal width, slightly tapered proximally, with small distal lobe, unarmed; merus about 1.25 times propod length, 5.0 times longer than central width, slightly swollen proximally, unarmed; ischium about 0.7 of propod length, 3.5 times longer than distal width; basis and coxa without special features. Fourth and fifth pereopods similar to third.

First pleopod with basipodite about 2.3 times longer than wide; exopod 1.25 times basipodite length; endopod 0.66 of basipodite length, 4.5 times longer than proximal width, slightly tapering distally, apically rounded, without median lobule, lateral margin with 12 short plumose setae over proximal 0.6 of length, distal margin glabrous, medial margin with about 40 short simple spiniform setae over whole length, setae slightly longer distally. Second pleopod with basipodite about 2.5 times longer than wide; endopod about 1.1 times basipodite length; endopod 0.95 of exopod length, appendices at 0.33 of medial margin length, appendix masculina with short tapering corpus, about 3.0 times longer than basal width, with about 18 long simple spines ventrally, apical spine about 1.4 times corpus length, proximal spines shorter; appendix interna slender, 2.0 times length of appendix masculina corpus, far exceeding distal corpus, with few distal cincinnuli.

Uropod with protopodite stout, short, distolateral angle bluntly rounded; exopod distinctly exceeding telson, broad, 1.75 times longer than wide, lateral margin convex, nonsetose, without distolateral tooth, with minute mobile spinule, diaeresis distinct;

endopod 0.9 of exopod length, 2.1 times longer than broad.

Description of Female.—Generally very similar to male, with much stouter body, more expanded pleura, relatively smaller second pereopod chelae.

Rostrum with single minute distoventral tooth, lateral margins feebly constricted proximally; distolateral angle of proximal segment of antennular peduncle with more strongly developed acute tooth; mouthparts not removed, deep proximal paragnathal groove clearly visible; major second pereopod with chela 1.6 times of carapace length, minor chela 1.12 times of carapace length, 0.68 of major chela length, dentition as in male; ambulatory pereopod dactyls similar, accessory tooth more acute, recurved; dactyl and propod more setose; telson broader, posterior marginal spines small, irregular, only slightly different in size.

Measurements (mm).—Male, total body length (approximate) 31.5; carapace and rostrum, 14.5; postorbital carapace 11.0; second pereopod, major chela, 23.0; minor chela, 18.5. Female, total body length (approximate) 39.0; carapace and rostrum, 16.5; postorbital carapace, 12.5; second pereopod, major chela, 20.0; minor chela, 14.0.

Types—The type material of *Palaemon pinophylax* Otto, 1821, is apparently no longer extant (H.E. Gruner, personal communication).

Remarks.—The most remarkable feature of the present redescription of *Pontonia pinophylax* is the presence of the deep longitudinal medial groove along the proximal half of the ventral aspect of the elongated paragnath, a feature that can be quite easily seen without the removal of the mouthparts. Its functional significance is not immediately obvious. The setose ventral margins of the lips of the groove are contiguous with the short setae fringing the endite of the first maxilliped, particularly when these are adducted. It is also noteworthy that the broad ischiomerus-basal segments of the third maxillipeds are widely separated and nonoperculate. However, the first pereopods appear to be carried, when not in use for feeding, with the carpomeral joint fully flexed, so that the chelae lie against the is-

chia. The pair of first pereopods dovetail together to form an effective closure of the space between the proximal parts of the third maxillipeds, so that a quadripartite opercular appearance is presented ventrally.

The present specimens of *P. pinnophylax* possess ambulatory dactyls that are markedly different from the illustration provided by Lagardère (1971) in which it appears distinctly triunguiculate, a feature that may be possibly due to individual abnormality or injury and repair.

A further specimen of *P. pinnophylax* has also been examined. A nonovigerous female was collected from Ulnis an der Schlei, Germany, in July–August, 1976. The specimen has a carapace length of 6.5 mm, and corresponds closely to the above redescription. A few small points of difference may be noted. The dorsal rostrum bears a minute distal tooth. This tooth was obsolete in the Mediterranean specimens. The chelae of the second pair of pereopods are unequal and dissimilar, with the minor chela about 0.6 of the major chela length, subequal to the carapace length, with the dactyl about 0.85 of the palm length, with the unarmed cutting edge occupying two-thirds of the cutting edge distally and a small acute tooth at about 0.3 of the length, with similar changes on the fixed finger. The ambulatory dactyls have a relatively longer, more slender, and acute unguis, and the ventral corpus is more strongly setose, with the setae largely in bilateral pairs. The ambulatory propods are provided with a well-developed pair of distoventral spines only. The telson is generally similar, but the posterior marginal spines are better developed. The exopods of the uropods appear to lack discernible distolateral spinules.

The most remarkable feature, however, is the presence of this species in the Baltic Sea. Holthuis (1952) gave the distribution of this species as the Mediterranean Sea, from the east coast of Spain to Greece, the Azores, Gabon, and north Angola. Chace (1966) recorded this species from Saint Helena, South Atlantic. The present specimen was collected alive, by U. Pettke, from pilings (M. Turkäy, personal communication). Since the normal host for *P. pinnophylax* does not occur in the Baltic Sea, it is difficult to imagine how this commensal shrimp

could survive. It may be noted that *P. pinnophylax* has also been reported from Turkey, among stones at 0–1-m depth, where no *Pinna* were collected (Holthuis, 1961). Bruce (1978) has reported an apparently free-living specimen of *Pontonia sibogae* from Madagascar, as has Holthuis (1986) for specimens for *P. sibogae* and *P. stylirostris* from Oman, found under boulders. However, it may be that removal of boulders causes sufficient disturbance to an ascidian host to cause it to suddenly contract and expel its associated shrimps. This could readily occur if the shrimps happened to be in the vicinity of one of the siphons when the host was caused to contract.

As noted by Holthuis (1952) the upper antennular flagellum in *P. pinnophylax* is curved backwards, lying alongside the ventral rostral carina, in contrast to *Notopontonia platycheles*, in which it is directed anteriorly.

DISCUSSION

The discovery of *Notopontonia platycheles* raises the small number of pontoniine shrimps known from South Australia to five. The only other species so far reported from South Australia are: *Periclimenes aesopius* (Bate), associated with anemones; *Pontonia minuta* Baker, host unknown; *Anchistus custos* (Forskål), associated with bivalve molluscs; and *Periclimenes carinidactylus* Bruce, associated with crinoids.

It is unfortunate that the host of *Notopontonia platycheles* is unknown. The strongly depressed body form and the horizontal disposition of the second pereopod chelae suggest a bivalve mollusc, such as one of the Pectinidae. How such a shrimp came to be caught in a trap set for crayfish, *Panulirus* spp., is particularly obscure. As far as is known, bivalve shrimp commensals such as *Anchistus*, *Paranchistus*, and *Conchodytes* spp. (Hipeau-Jacquotte, 1973) never leave their hosts to forage independently and it seems unlikely that *N. platycheles* would do so.

The single specimen of *Notopontonia platycheles* falls outside the normally accepted definition of the Pontoniinae, in which the posterior margin of the telson is armed with three pairs of spines. It must be

considered possible that this unique specimen is abnormal, a situation that will only be resolved when further specimens can be examined. The presence of two pairs of posterior spines on the telson is also known in the case of *Chernocaris placunae*, a rather similar associate of bivalve molluscs, *Placuna placenta*, also of extremely depressed body form (Johnson, 1967). This strengthens the suggestion that *N. platycheles* may also be a bivalve associate. Indeed, *Chernocaris* appears to bear a parallel relationship to *Conchodytes* as does *Notopontonia* to *Pontonia*. In *C. placunae*, the examination of numerous specimens confirms that the presence of only two pairs of posterior telson spines is the normal complement for this species.

The morphology of the paragnaths in palaemonid shrimps has attracted little attention. Borradaile (1917) illustrated the paragnath of *Palaemon serratus* in relation to the labrum, mandible, and maxillula, which largely obscure it, but did not discuss it further. Patwardhan (1937), in dealing with the mouthparts of the Indian river prawn, *Macrobrachium malcolmsonii*, omitted the paragnath from consideration. More recently, Alexander (1988) described the paragnath in *Palaemon serratus* (Pennant) and *Crangon crangon* (L.). In species descriptions, mention of the paragnaths is usually omitted, even when the mouthparts are described, possibly because they are easily damaged during the removal of the paired appendages.

The examination of the paragnath in *Macrobrachium* confirms the accuracy of Borradaile's figure, and it may be noted that the distal spines of the upper lacinia of the maxillula are in the closest apposition to the distomedian fissure between the alae of the paragnath. The lower laciniae lie adjacent to the median eminence of the basal portions of the paragnath and are directed anteriorly towards the median fissure. The paragnath in *Macrobrachium* shows a basically similar structure to that reported for *Palaemon serratus* by Alexander (1988), but the division of the alae into posterior, median, and anterior lobes is much less distinct. The basal portion also is larger, with a distinct rounded median eminence, with smaller lateral swellings proximally. The

basal portion is also distinctly relatively larger and more clearly separated from the alar region. *Palaemonella rotumana* (Borradaile) has an essentially similar paragnath, which may be considered to represent the primitive pontoniine condition for this feature. The alae have the lobes less well marked than in *Macrobrachium* and there is no distinct division between alar and basal parts. The basal part also has the central eminence, with smaller lateral swellings and a pair of well-separated feeble ridges are discernible laterally on the median eminence. The paragnath in *Pontonia katoi* Kubo is also basically similar to that in *Palaemonella*, but the alar lobes are more distinct, the basal portion lacks the smaller lateral swellings and the median eminence has a pair of feeble lateral carinae. In *Pontonia pinnophylax*, the alar lobes are distinct, the basal portions markedly elongate, with a distinct median channel bordered by long raised setose carinae, quite distinct from that of *Notopontonia*. The extent to which the morphology of the paragnath, as found in *P. pinnophylax*, occurs in the genus *Pontonia* is presently unknown, but it is clearly not a characteristic of the genus as presently defined. However, the morphological features of *Pontonia* show such a range of present-or-absent variations as to suggest a polyphyletic origin of the species now included under this name. In particular, three distinct types of ambulatory dactyl suggest at least three separate species groupings. These are: (1) simply biunguiculate, as in all the American species, most of which are associated with molluscs, particularly bivalves; (2) biunguiculate, with additional acute proximal and intermediate teeth, as in *P. katoi* and *P. sibogae*, associates of ascidians; and (3) biunguiculate, with series of blunt hooklike teeth distally, as in *P. ascidicola* Borradaile, *P. anachoreta* Kemp, *P. okai* Kemp, and *P. monnioti* Bruce, all associates of ascidians.

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LITERATURE CITED

- Alexander, C. G. 1988. The paragnaths of some intertidal crustaceans.—*Journal of the Marine Biological Association of the United Kingdom* 68: 581–590.
- Borradaile, L. A. 1917. On the structure and functions of the mouth parts of palaemonid prawns.—*Proceedings of the Zoological Society of London* 1917: 31–71.
- Bruce, A. J. 1978. A report on a collection of pontoniine shrimps from Madagascar and adjacent seas.—*Zoological Journal of the Linnean Society* 62: 205–209.
- Chace, F. A. 1966. Decapod crustaceans from Saint Helena Island, South Atlantic.—*Proceedings of the United States National Museum* 118: 623–662.
- Hipeau-Jacquotte, R. 1973. Étude des crevettes Pontoniinae (Palaemonidae) associées aux molluscs Pinidae à Tuléar (Madagascar). 3. Morphologie des pièces buccales.—*Tethys*, suppl. 5: 95–116.
- Holthuis, L. B. 1947. Nomenclatorial notes on European macrurous Crustacea Decapoda.—*Zoologische Mededelingen* 27: 312–322.
- . 1952. The Decapoda of the Siboga Expedition. Part XI. The Palaemonidae collected by the Siboga and Snellius Expeditions with remarks on the other species II. Subfamily Pontoniinae.—*Siboga Expedition Monograph* 39³: 1–252.
- . 1961. Report on a collection of Crustacea Decapoda and Stomatopoda from Turkey and the Balkans.—*Zoologische Verhandlungen* 47: 1–67.
- . 1986. Some Pontoniinae (Crustacea: Decapoda: Palaemonidae) from southern Oman.—*Zoologische Mededelingen* 60: 263–272.
- Johnson, D. S. 1967. On some commensal decapod crustaceans from Singapore (Palaemonidae and Porcellanidae).—*Journal of Zoology* 153: 499–526.
- Lagardère, J.-P. 1971. Les crevettes des côtes du Maroc.—*Travaux de l'Institut Scientifique Cherifien et de la Faculté de Science, série Zoologie* 36: 11–139.
- Latreille, P. A. 1829. Crustacés, Arachnides et partie des Insectes.—*In*: G. Cuvier, *Le regne animal distribué d'après son organisation, pour servir de base à l'histoire naturelle des animaux et d'introduction à l'anatomie comparée*, édition 2,4: 1–584.
- Opinion 378. 1956. Designations, under the Plenary Powers, of a type species in harmony with current usage for the genus *Pontonia* Latreille, 1829 (Class Crustacea, Order Decapoda) a genus based upon a misidentified type species.—*Opinion of the International Commission for Zoological Nomenclature*, 11: 411–420.
- Otto, A. W. 1821. *Conspectus animalium quorundam maritimarum nondum editorum* (academic thesis, Bratislava).
- . 1828. Beschreibung einige neuen, in den Jahren 1818- und 1819 im Mittelländischen Meere gefundene Crustacea.—*Nova Acta Academiae Caesareae Leopoldino Carolinae germanicae naturae curiosorum*, 14: 331–354.
- Patwardhan, S. S. 1937. *Palaemon*.—*In*: K. N. Bahl, *The Indian Zoological Memoirs* 6: i–xi, 1–100.

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