

LEONTOCARIS AMPLECTIPES SP. NOV. (HIPPOLYTIDAE),
A NEW DEEP-WATER SHRIMP FROM SOUTHERN AUSTRALIA

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Abstract

Bruce, A.J., 1990. *Leontocaris amplexipes* sp. nov. (Hippolytidae), a new deep-water shrimp from southern Australia. *Memoirs of the Museum of Victoria* 51(1): 121-130.

Leontocaris amplexipes is described and illustrated, compared with the two other species of the genus, and a key for their identification is provided. The present record is the first occurrence of this little-known genus outside the Atlantic Ocean. A previous suggestion that the genus is associated with coelenterates is supported and a raptorial function for the unusual major chela is suggested.

Introduction

The small hippolytid genus *Leontocaris* was first reported from South African waters by Stebbing (1905), who described a single male specimen of *L. paulsoni* from 240-249 m off Lion Head. Subsequently Kemp (1906) described *L. lar* in the north-west Atlantic Ocean, off Ireland, from about 1000-1300 m, and further material of *L. paulsoni* from South Africa, at 240-265 m, was added by Barnard (1950). The last 40 years have provided no further records despite increased scientific activities in deeper water, particularly in the tropics.

***Leontocaris amplexipes* sp. nov.**

Figures 1-5

Material examined. Holotype, ?male, Victoria, S of Point Hicks (38°21.9'S, 149°20.0'E), 1000 m, WHOI epibenthic sledge, G.C.B. Poore et al. on ORV Franklin, 23 July 1986 (stn SLOPE-32), Museum of Victoria register number J19881.

Description. Small, slenderly built shrimp, of subcylindrical body form, in a fragile state, rather macerated, with abdomen almost separated from cephalothorax, ophthalmic somite damaged, and lacking right antenna, and right third and fifth pereopods and first and second pleopods.

Carapace smooth, glabrous; rostrum well developed, slender, acute, slightly compressed, straight, horizontal, about 0.65 of carapace length, not exceeding antennular peduncle, reaching to about distal margin of intermediate

peduncular segment, extreme tip missing; with 9 acute dorsal teeth, all anterior to posterior orbital margin, decreasing slightly in size distally, dorsal carina without setae; lateral carinae feebly developed; ventral carina with 3 small acute teeth on central third, non-setose; epigastric region with 3 acute teeth, similar to posterior rostral teeth but separated by larger interval, supraorbital and hepatic spines absent, orbit with feeble posterior marginal ridge, inferior orbital angle produced, blunt, antennal spine well developed, exceeding inferior orbital angle, marginal, with distinct carina; anterolateral angle of branchiostegite rounded.

Abdomen smooth, glabrous; third segment feebly produced posterodorsally, without posterodorsal tooth, fifth segment about 0.6 of sixth segment length, sixth segment about 1.8 times longer than deep, compressed, posteroventral angle bluntly produced, posterolateral angle acute. Telson about 1.5 times sixth segment length, 3.0 times longer than anterior width, lateral margins straight, feebly convergent, with 4 pairs of small marginal spines at about 0.3, 0.5, 0.75 and 0.9 of telson length, posterior margin about 0.8 of anterior margin width, broadly rounded, without median process, with 4 pairs of short simple spines, lateral posterior spines slightly larger than lateral marginal spines, submedian spines about 0.085 of telson length, 2.0 times lateral posterior spine length.

Antennule distinctly exceeding rostrum, with proximal segment of peduncle subcylindrical slender, about 4.0 times as long as distal width, unarmed, stylocerite short, broad, with small lateral tooth, statocyst obsolete; intermediate

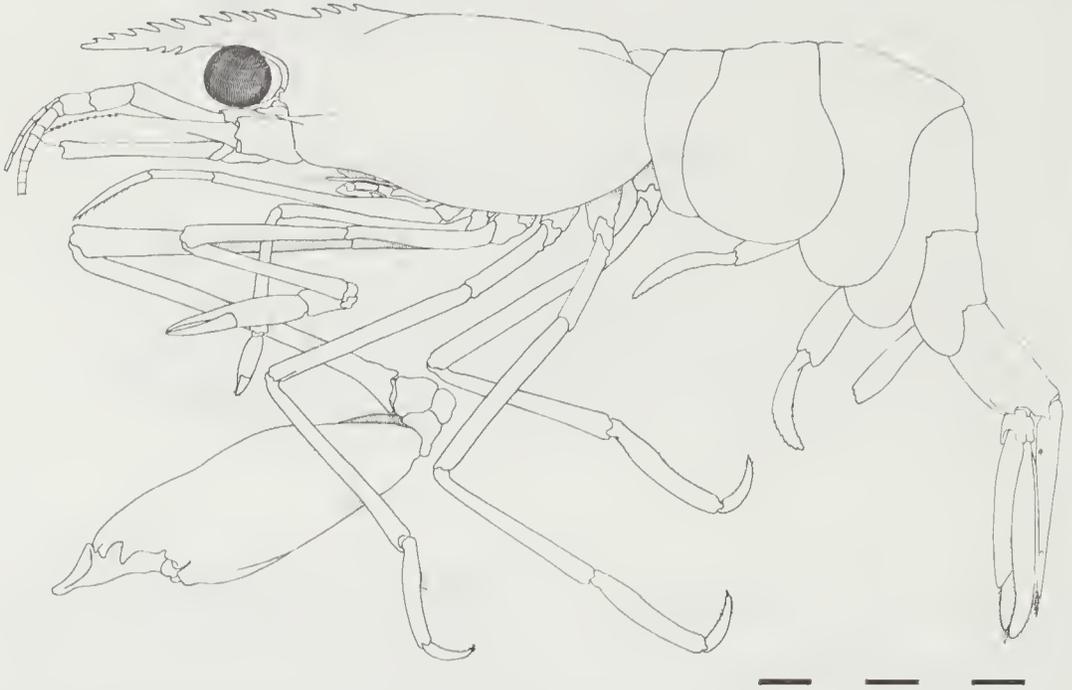


Figure 1. *Leontocaris amplectipes* sp. nov., ?male, holotype, Victoria, 1000 m. Scale bar in millimetres.

segment about 0.38 of proximal segment length, subcylindrical, unarmed; distal segment about 0.26 of proximal segment length, subcylindrical, unarmed; flagella damaged, upper flagellum robust, lower flagellum slender.

Antenna with stout, unarmed basicerite, ischioerite normal, merocerite small, carpoerite elongate, slender, subcylindrical, about 9.0 times as long as distal width, reaching to distal end of antennular peduncle, flagellum lacking; scaphocerite well developed, exceeding antennular peduncle, broad, about 2.6 times as long as central width, proximal half of lateral margin straight, entire, distal half feebly convex with 11 small acute teeth, distal lamella broadly rounded, distinctly exceeding distal lateral tooth.

Eye with large globular cornea, diameter about 0.2 of carapace length, well pigmented, without accessory pigment spot; stalk short, broad, length about 0.75 of width, 0.6 of corneal diameter.

Epistome unarmed; labrum normal; anterior thoracic sternites narrow, posterior sternites broad, fifth with small elongate median boss, sixth with larger hemispherical eminence,

seventh with small anterolateral rounded lobes, eighth unarmed.

Mandible (right) with single segmented palp, slender, about 3.0 times longer than wide, with single simple distal seta; molar process normal, distally excavate, with 2 blunt posterior teeth, with dense mass of marginal setae, short, simple, slender proximally, larger, stouter distally, with numerous blunt denticles distally; incisor process normal, obliquely truncate distally, with 6 acute teeth, medial and lateral teeth larger than central teeth; maxillula with slender, feebly bilobed palp, upper lobe rounded, with long slender feebly plumose seta, lower lobe angular, with short simple seta; upper lacinia broadened centrally, distal border with double row of about 14 short stout simple spines and numerous simple setae; lower lacinia slender, tapering distally, with numerous long simple setae. Maxilla with short, slender palp, medially emarginate, with single long plumose distal seta, basal endite deeply bilobed, distal lobe broader than proximal, both with numerous simple setae distally, coxal endite simple, short, broad, rounded, sparsely setose; scaphognathite about 3.2 times longer than broad, posterior lobe slender, about

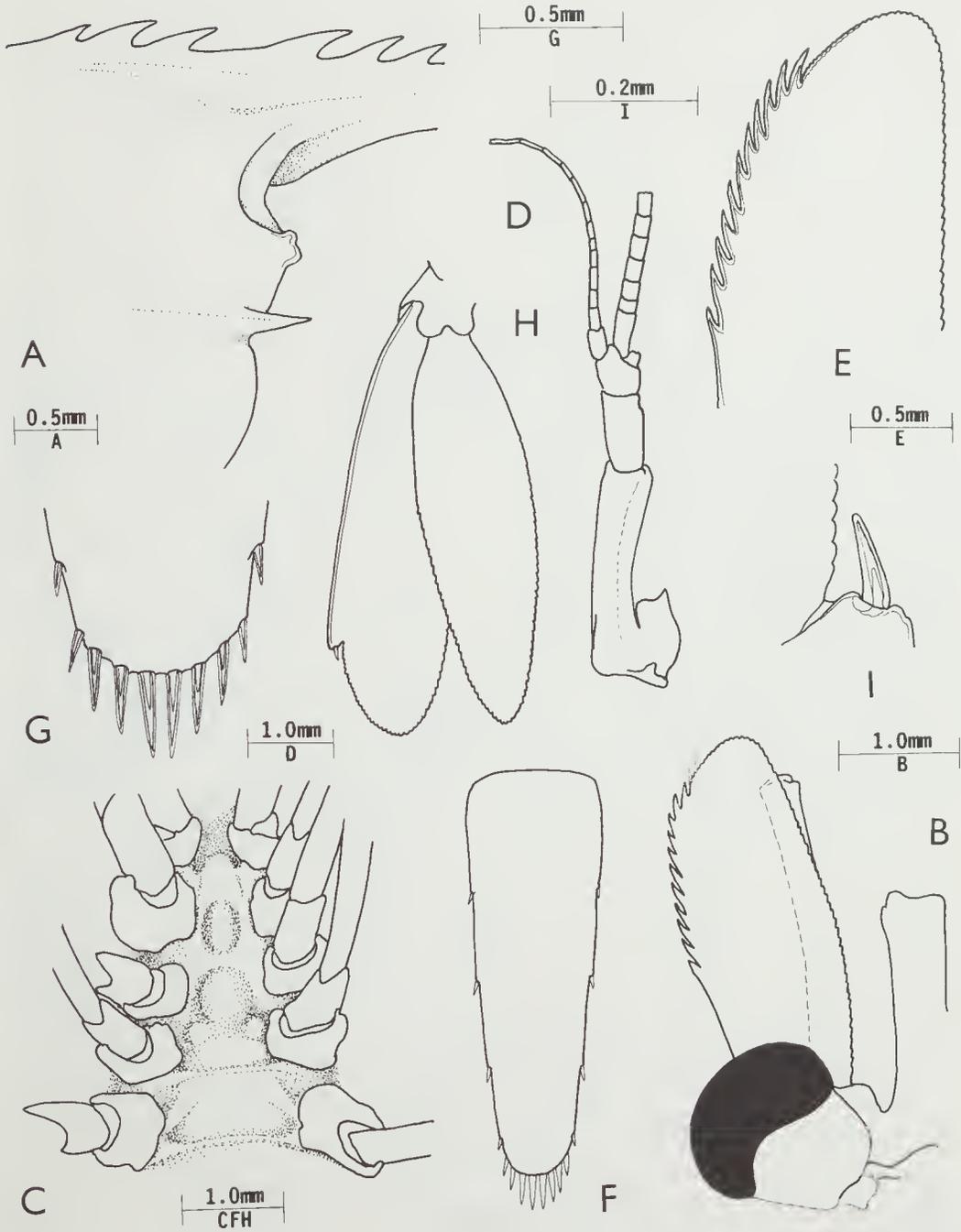


Figure 2. *Leontocaris amplexipes* sp. nov., holotype. A, anterolateral carapace, orbital region. B, eye and antennular region, dorsal. C, thoracic sternites. D, antennule. E, scaphoerite, distal half. F, telson. G, same, posterior spines. H, uropod. I, same, distolateral spine of exopod.

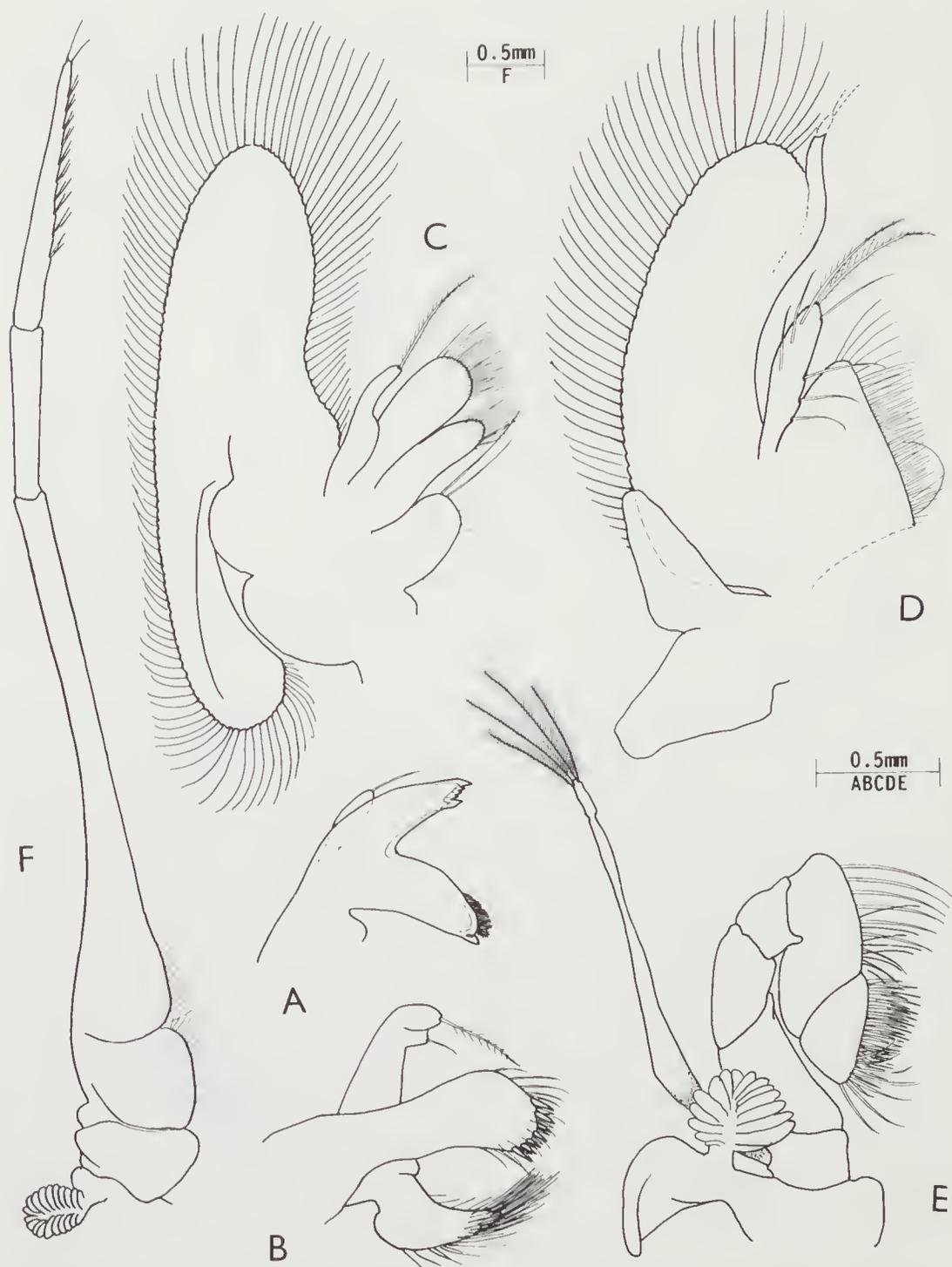


Figure 3. *Leontocaris amplexipes* sp. nov., holotype. A, mandible. B, maxillula. C, maxilla. D, first maxilliped. E, second maxilliped. F, third maxilliped.

4.2 times longer than anterior width, slightly expanded distally, anterior lobe broad, 1.6 times longer than wide, medial margin feebly emarginate. First maxilliped with short subcylindrical palp, with 2 plumose distal setae, several preterminal simple setae, basal endite angular, densely setose medially, coxal endite lost in dissection, exopod with large, broad caridean lobe, flagellum feebly developed, with vestigial setation; epipod large, deeply bilobed. Second maxilliped with normal endopod, dactylar segment short, broad, 1.8 times longer than wide, densely setose medially, setae denticulate, obliquely articulated with propodal segment, 2.5 times longer than wide, medial margin with long spiniform setae, simple proximally, feebly denticulate distally, proximal segments of endopod normal, coxa produced medially, exopod with slender flagellum with 4 plumose setae distally, epipod simple, with podobranch. Third maxilliped slender, extending to distal margin of scaphocerite, exceeding antennular peduncle, ischiomerus distinct from basis medially, about 5.6 times longer than proximal width, broadly expanded proximally, slender, subcylindrical distally, with few simple setae proximomedially, penultimate segment subcylindrical, about 5.3 times longer than wide, 0.3 of ischial length, distal segment subcylindrical, about 10.5 times longer than proximal width, tapering distally, 0.5 of ischial length, with numerous groups of short simple spines distoventrally, few feeble setae distally; basis broad, about 1.9 of ischial length, sparsely setose medially, without exopod; coxa feebly produced medially, without epipod or lateral plate, with well developed small arthrobranch.

First pereopods similar, small, slender, reaching to about middle of intermediate segment of antennular peduncle; chela small, with palm subcylindrical, slightly compressed, about 2.0 times longer than deep; dactylus about 0.5 of palm length, stout, broad, ventrally concave, with small acute hooked tip, dense arc of short setae distodorsally; fixed finger, slender, subcylindrical, with small acute hooked tip; carpus about 2.3 times chela length, subcylindrical, unarmed, about 8.0 times longer than distal width, tapered proximally, with small setose depression distoventrally; merus about 0.75 of carpal length, 6.0 times longer than central width, generally uniform, slightly expanded distoventrally, unarmed; ischium 0.5 of carpal length, 5.0 times longer than distal width, unarmed; basis short, without exopod; coxa robust, without epipod or arthrobranch.

Second pereopods grossly unequal, dissimi-

lar. Major pereopod (right) exceeding antennular peduncle by carpus and chela: chela with palm smooth, glabrous, about 3.3 times longer than central width, subcylindrical with well developed ventral flange, with a deep narrow submarginal fissure along central medial third, irregular distodorsally; dactylus strongly compressed, laminar, far exceeding fixed finger, about 2.3 times longer than central depth, lateral margin broadly rounded, far over reaching small blunt distal tooth, curved laterally, cutting edge curved medially, with large acute central tooth separated by deep notches from small proximal tooth and blunt distal tooth; fixed finger stout, about as long as deep, moderately compressed, distally with blunt rounded tip, large irregular preterminal tooth separated by deep notch from proximal acute tooth; fixed finger stout, about as long as deep, moderately compressed, distally with blunt rounded tip, large irregular preterminal tooth separated by deep notch from proximal acute tooth, with 5 smaller denticles proximally, notches with scattered simple setae medially; carpus long and slender, unarmed, 4-segmented with proximal segment about 1.3 times palm length, subcylindrical, moderately expanded distally, about 18.5 times longer than central width, 3 distal segments subequal, quadrate, irregular, about 0.1 of proximal segment length; merus about 0.6 of proximal carpal segment length, slender, slightly expanded distally, about 12.0 times longer than central width, unarmed, with distinct flange proximomedially; ischium 0.5 of merus length, about 5.0 times longer than central width, unarmed, with feeble ventromedial flange; basis and coxa normal, without special features; exopod, epipod and arthrobranch lacking.

Minor second pereopod with proximal carpal segment extending to about end of antennular peduncle; chela small, about 0.45 of carapace length, palm smooth, subcylindrical, feebly compressed, forcipulate, about 2.6 times longer than deep; fingers slender, about 0.9 of palm length, dactylus tapering, about 5.0 times longer than proximal width, distally feebly spatulate, with serrate cutting edges medially and laterally, small acute hooked tooth distally; fixed finger similar, spatulate, with 2 small distal teeth; carpus 4-segmented, distal segment robust, unarmed, about 0.5 of palm length, 2 central segments short, stout, 0.3 of palm length, unarmed, proximal segment elongate, subequal to length of chela and distal carpal segment, about 7.0 times longer than distal width, 2.0 times wider distally than proximally, unarmed; merus about

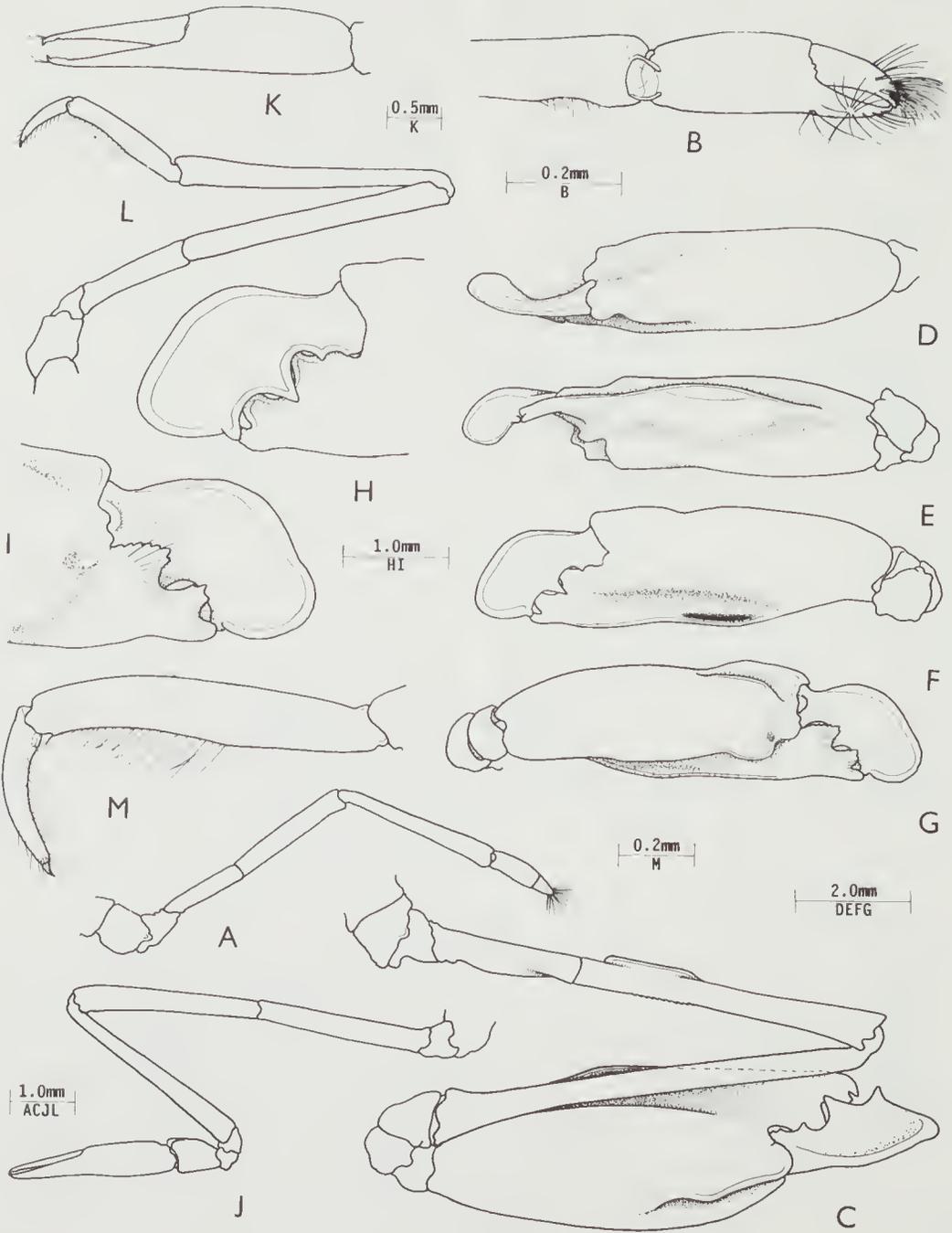


Figure 4. *Leontocaris amplexipes* sp. nov., holotype. A, first perciopod. B, same, chela. C, major second perciopod. D-G, same, chela. H, same, fingers, medial. I, same, lateral. J, minor second perciopod. K, same, chela. L, fourth perciopod. M, same, dactylus and propod.

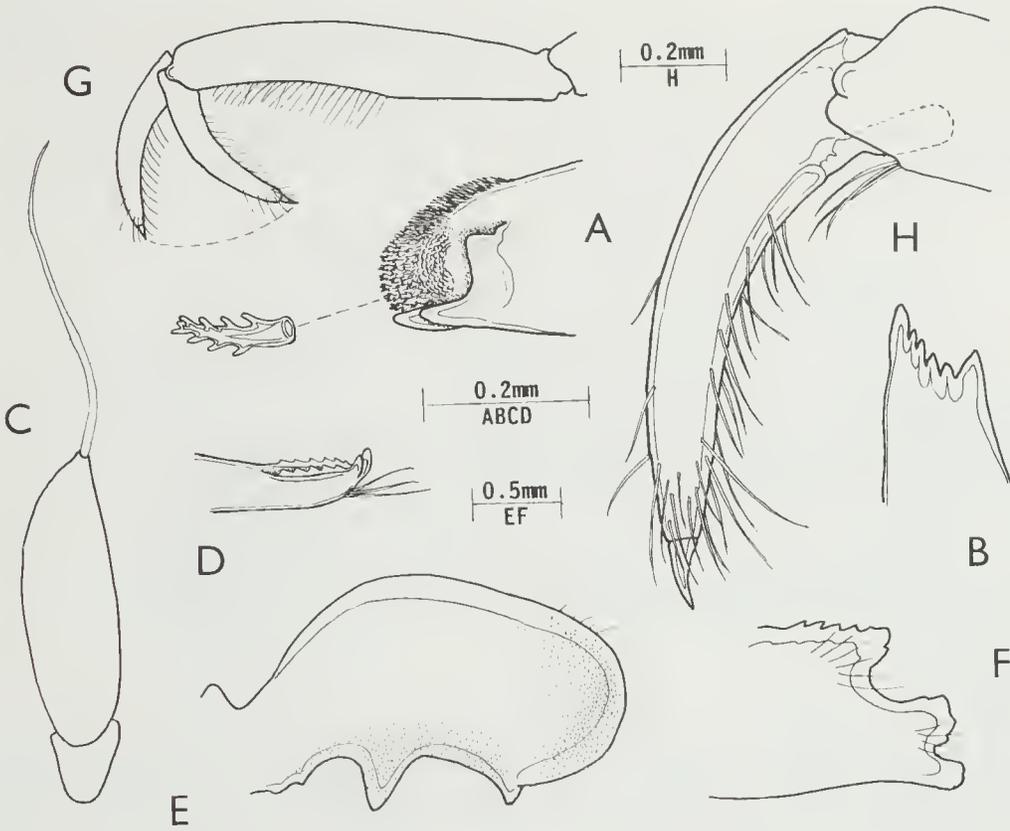


Figure 5. *Leontocaris amplexipes* sp. nov., holotype. A, mandible, molar process; inset, marginal spine (not to scale). B, same, incisor process. C, same, palp. D, minor second pereiopod, tip of dactylus. E, major second pereiopod, dactylus. F, same, fixed fingers. G, fourth pereiopod, not to scale, indicating range of dactylar movement. H, fourth pereiopod, dactylus.

0.9 of proximal carpal segment length, 6.5 times longer than distal width, feebly tapering proximally, unarmed; ischium about 0.95 of meral length, 7.5 times longer than central width, unarmed; basis and coxa short, stout, without special features.

Ambulatory pereiopods moderately slender. Third pereiopod with carpus reaching to about distal antennular peduncle; dactylus robust, subcylindrical, feebly curved ventrally, about 0.5 of propod length; unguis distinctly demarcated, short, conical about 2.5 times longer than basal width, simple, curved, about 0.12 of carpus length, corpus about 5.0 times longer than proximal width, tapering feebly distally, simple, ventral border concave, without accessory spines or teeth, with numerous scattered simple setae; propod about 6.0 times longer than central

width, 0.33 of carapace length, slightly bowed, distal 0.45 ventrally concave, with numerous long simple setae, ventral margin without spines; carpus slender, about 2.0 times propod length, about 10.5 times longer than distal width, unarmed; merus subequal to propod length, unarmed; ischium about 0.43 of merus length, unarmed; basis and coxa normal, without special features; without exopod, cpi-pod or arthrobranch. Fourth and fifth pereiopods generally similar, propods subequal, about 1.25 third propod length; carpus subequal, about 0.9 of third carpus lengths; merus subequal, about 0.8 of third merus length.

Pleopods damaged, first and second pairs completely lacking, posterior pairs incomplete.

Uropods with protopodite normal, unarmed; exopod subequal to endopod, distinctly exceed-

ing posterior margin of telson, about 3.6 times longer than wide, lateral margin convex proximally, straight, entire, with small mobile spines distally, diaeresis feebly indicated.

Measurements. Total body length (approx.), 25.7 mm; carapace and rostrum, 10.0 mm; cara-

pace, 6.2 mm; major second pereopod, chela, 7.8 mm; minor second pereopod, chela, 2.8 mm.

Colour. No data.

Etymology. From *amplector*, to embrace, and

Table 1. Comparison of the three species of *Leontocaris*.

<i>L. paulsoni</i> Stebbing	<i>L. lar</i> Kemp	<i>L. amplectipes</i> sp. nov.
Rostrum distinctly exceeding carapace length and antennular peduncle	Rostrum distinctly exceeding carapace length and antennular peduncle	Rostrum much shorter than carapace length, not exceeding antennular peduncle
Rostrum with 6 dorsal and 6–8 ventral teeth.	Rostrum with 9 or 10 dorsal and 9–13 ventral teeth.	Rostrum with 9 dorsal and 3 ventral teeth.
2 epigastric teeth	3 epigastric teeth	3 epigastric teeth
Inferior orbital angle acute	Inferior orbital angle acute	Inferior orbital angle blunt
Scaphocerite with strong distolateral tooth, with 19 distolateral teeth	Scaphocerite without strong distolateral tooth, with 17 distolateral teeth	Scaphocerite without strong distolateral tooth, with 11 distolateral teeth
Cornea reduced, narrower than stalk	Cornea well developed, broader than stalk	Cornea well developed, broader than stalk
Second pereopod with fixed finger teeth very slender, acute, simple	Second pereopod with fixed teeth acute, simple	Second pereopod with fixed finger teeth short, stout, blunt, denticulate
Third pereopod with dactylus about 0.25 of propod length, propod subequal to carpal length	Third pereopod with dactylus about 0.2 of propod length, propod subequal to carpal length	Third pereopod with dactylus about 0.5 of propod length, propod about 0.5 of carpal length
Third abdominal segment with posterodorsal tooth	Third abdominal segment posterodorsally unarmed	Third abdominal segment posterodorsally unarmed
Pleuron of fifth abdominal segment with posterior tooth	Pleuron of fifth abdominal segment with posterior tooth	Pleuron of fifth abdominal segment rounded, unarmed
Telson with 5 pairs of marginal dorsal spines; posterior margin acute, bifid, with 2 pairs of spines	Telson with 5 pairs of marginal dorsal spines; posterior margin broadly rounded, with 3 pairs of spines	Telson with 4 pairs of marginal dorsal spines; posterior margin broadly rounded, with 4 pairs of spines

pes, foot (Latin) referring to the prehensile appearance of the ambulatory pereopods.

Associated fauna. Three small hippolytid shrimps, badly damaged and unidentifiable to genus level.

Systematic position. The two other species of the genus, *L. paulsoni* Stebbing and *L. lar* Kemp, appear more closely related to each other than to *L. amplexipes*. The major features of the three species are outlined in Table 1.

Key to the species of *Leontocaris* Stebbing, 1905

1. Rostrum exceeding carapace length, with 8 or more ventral teeth; ambulatory pereopod with dactylus much less than 0.5 of propod length; fifth pleuron with small posterior tooth; exopod of uropod distolaterally serrate 2
- Rostrum much shorter than carapace length, with 3 ventral teeth only; ambulatory pereopod with dactylus about 0.5 of propod length; fifth pleuron posteriorly unarmed; exopod of uropod distolaterally entire, with small mobile spine only *L. amplexipes* sp. nov.
2. Rostrum with 9–10 dorsal teeth; distolateral tooth of scaphocerite small; cornea large; third abdominal segment without posterodorsal tooth; posterior margin of telson rounded *L. lar* Kemp
- Rostrum with 6 dorsal teeth; distolateral tooth of scaphocerite large; cornea small; third abdominal segment with posterodorsal tooth; posterior margin of telson bifid *L. paulsoni* Stebbing

Discussion

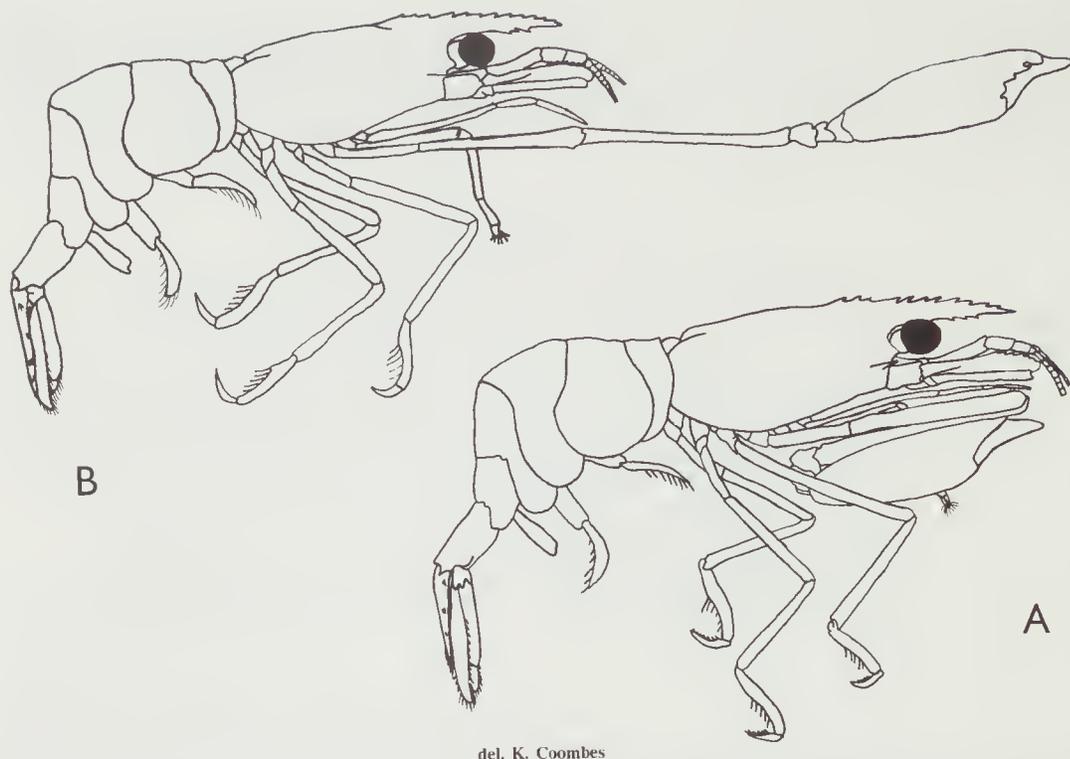
The discovery of a third species of the genus *Leontocaris* in Australian waters provides a significant extension to the known geographic range of the genus and the first record of its occurrence outside the Atlantic Ocean. The additional species confirms Barnard's (1950) diagnosis of the genus.

The functions of the unusual but diagnostic major chela remain obscure. As noted by Kemp (1910) when extended it can be almost equal to the entire length of the shrimp, but at the same time it is capable of being folded away in an inconspicuous position beneath the body. The long proximal segment of the carpus lies in the longitudinal groove lateral to the flange along the ante-dactylar border of the palm and is probably held in place by the merus, which bears a proximal medial flange which can fit exactly into the deep groove in the central portion of the palmar flange. Kemp (1910) reported a thin-walled sausage-shaped structure arising from an extra deep area of this groove. It is suggested that the floor of this fossa is feebly calcified and has been everted by post-mortem swelling in the case of Kemp's material – which as he states, is very variable. This locking mechanism suggests that the limb may be capable of rapid extension and may have a predatory function, similar to that of the raptorial claws in stomatopods (Fig. 6).

The proximal ventral margin of the merus of the major second pereopod shows a row of small serrations. In both *L. paulsoni* and *L. lar*, these have small spines attached (Barnard, 1950; Kemp, 1910), which have presumably been lost in the present specimen. From their positions, these spines would appear to be related to the locking mechanism between merus and palm but their exact function is not obvious.

The ecological niche occupied by species of *Leontocaris* remains unknown. Kemp (1910) suggested an association with coelenterates (*Antipatharia* and *Lophohelia*). A commensal life-style is also suggested by the prehensile appearance and limited range of movement in the dactylus and propod of the ambulatory pereopods in *L. amplexipes*, although this feature is less conspicuous in the other two species of the genus. The limited range of dactylar movement appears to be compensated for by an increased range of movement in the carpo-propodal joint, where an unusually large degree of extension is possible. The arrangement resembles that found in many chirostylids, many of which are found in association with coelenterate hosts.

The three species of *Leontocaris* now known all occur in deep water. *Leontocaris paulsoni* has been reported from 246–269 m (Stebbing, 1906) and 240–265 m (Barnard, 1950); *L. lar* is known from 914 m and 1146–1368 m (Kemp, 1910).



del. K. Coombes

Figure 6. *Leontocaris amplexipes* sp. nov. A, with major first pereiopod flexed. B, with major second pereiopod extended.

The new species, at 1000 m, lies at the deeper end of the range of the genus.

Acknowledgements

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