

**New mysids from the South Australian coastal waters:
Paranchialina secunda sp. nov.; *Leptomysis longisquama* sp.
nov. and *Doxomysis johnsoni* sp. nov.**

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Abstract. Three new species are described, *Paranchialina secunda*, *Leptomysis longisquama* and *Doxomysis johnsoni* from the coastal waters of South West Australia.

Introduction

The three new species of Mysidacea described here are from the zooplankton samples collected from the coastal waters of South West Australia. Collections were taken from various parts of the water column between the surface and 40 m and the area between 33° and 35°S and 114° and 119°E is covered. The type specimens are deposited in the Reference Collections of the Indian Ocean Biological Centre, Cochin.

Results

Sub family Gastrosaccinae

Paranchialina secunda sp. nov.

Material

Many mature and immature males and females.

Holotype male IOBC - 0388 - 10-50-1985.

Allotype female IOBC - 0388A - 10-50-1985.

Paratypes three males and three females - IOBC - 0388B - 10-50-1985.

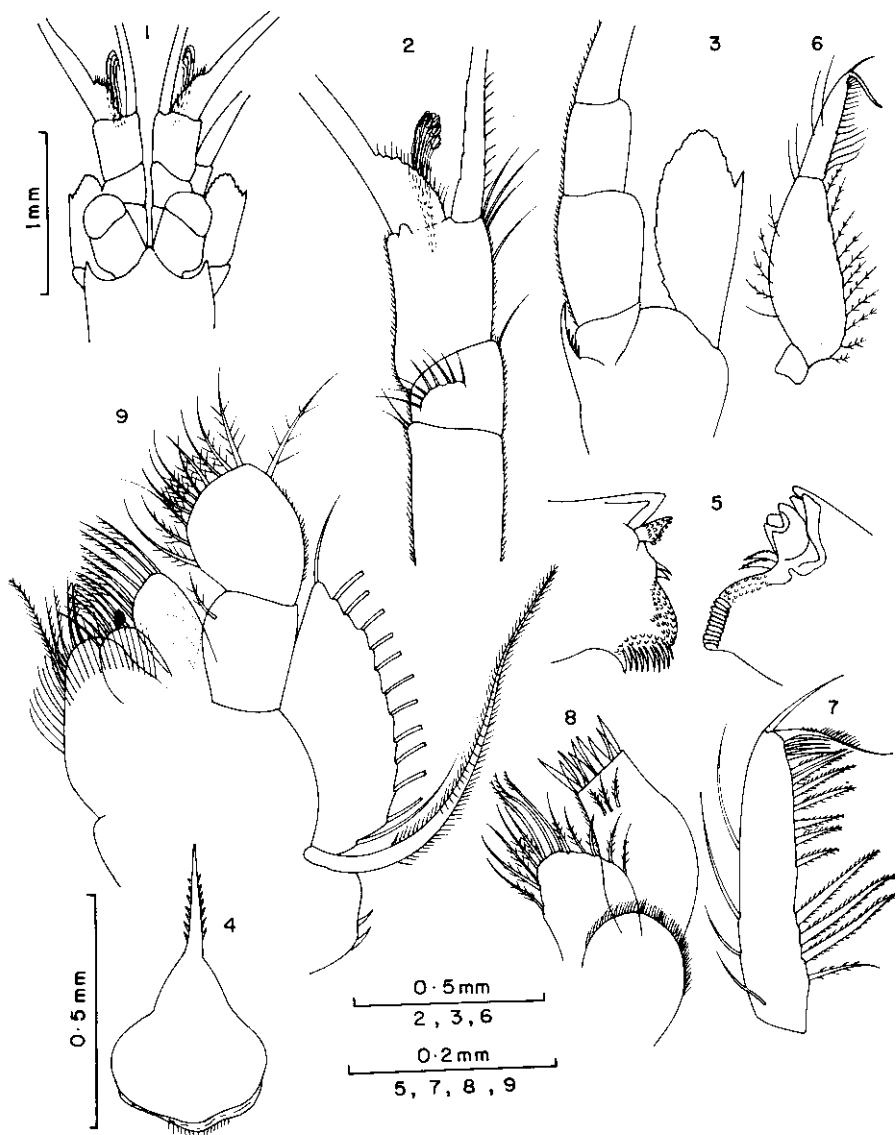
Description

General form slender. Entire surface of body, peduncle of eyes and appendages prominently hispid. Carapace (Figure 1) anteriorly produced into short triangular rostrum with bluntly pointed apex, extending slightly beyond base of antennular peduncle, anteriolateral angles produced, posteriorly emarginate, leaving ultimate and part of penultimate thoracic somites dorsally exposed.

Eyes longer than broad, cornea occupying 2/5 of whole eye.

Antennular peduncle in male stout (Figure 2), third segment about same length as first, base of outer flagellum swollen in both sexes, male lobe short and with thick brush of setae.

Antennal scale short (Figure 3) less than two and a half times as long as broad, apex broadly rounded and extending to distal margin of second segment of antennular peduncle, denticle on outer corner prominent, suture marking of distal joint absent. Pedun-

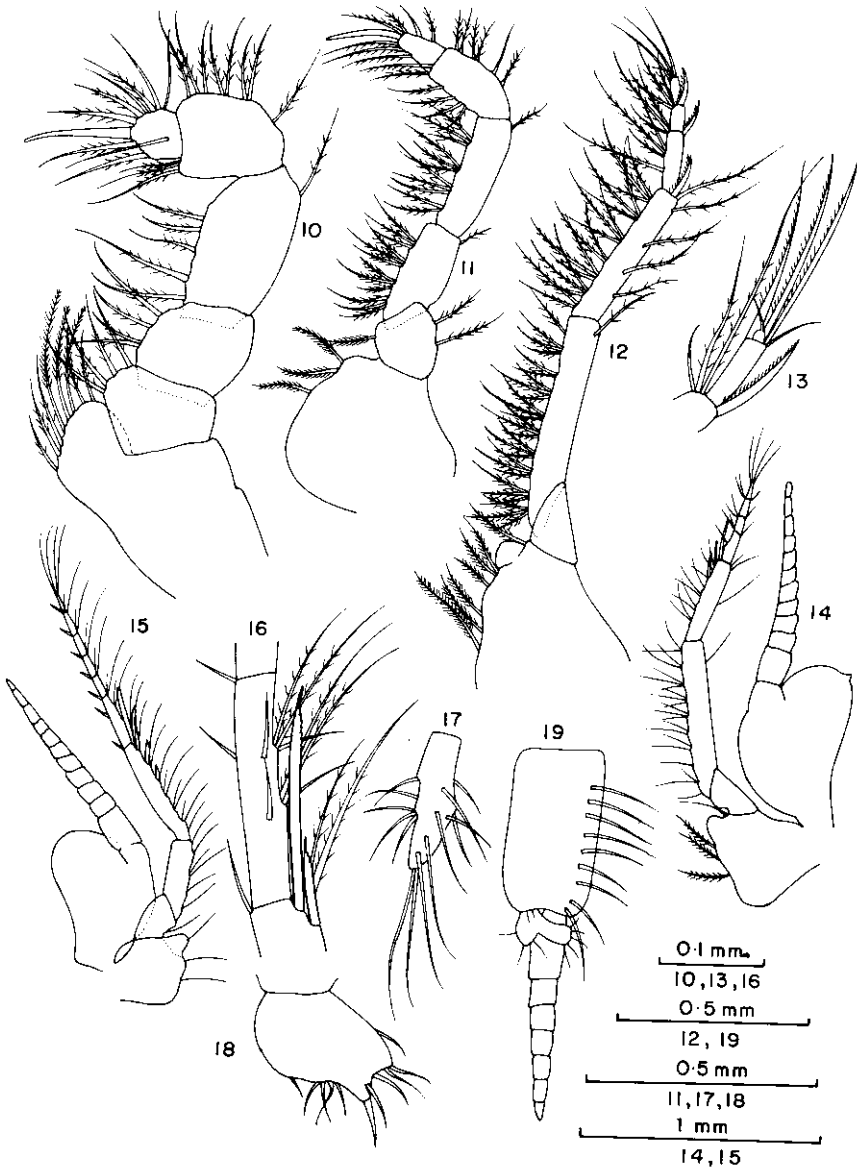


Paranchialina secunda sp. nov. (male). **Fig. 1.** anterior end of body; **2.** antennule; **3.** antenna; **4.** labrum; **5.** cutting edge of mandibles; **6, 7.** mandibular palp; **8.** maxillule; **9.** maxilla.

cle stout, slightly longer than scale, second joint about $1 \frac{1}{3}$ times as long as third, spine from sympod prominent and with secondary spinules along inner margin.

Labrum (Figure 4) produced in front into long spiniform process with spinules on proximal two-thirds.

Mandibles (Figure 5) asymmetrical, right with lacinia mobilis, incisor and molar processes well developed, spine row consisting of two strong barbed spines; left with nar-



Paranchialina secunda sp. nov. (male). Fig. 10, first thoracic endopod; 11, second thoracic endopod; 12, third thoracic endopod; 13, same, tip enlarged; 14, fourth thoracic limb; 15, seventh thoracic endopod; 16, same, middle part enlarged; 17, first pleopod of female; 18, fourth pleopod of female; 19, first pleopod.

row incisor processes; lacinia mobilis and spine row feebly developed. Second segment of mandibular palp (Figure 6 and 7) stout, third joint long and narrow, slightly more than half length of second and strongly armed.

Maxillule (Figure 8) with large pseudexopod, bordered with fringe of very fine hair.

Inner lobe with ten setae and three barbed spines; outer lobe with eleven stout spines. Maxilla (Figure 9) with prominent basal lobe, distal lobe deeply cleft, distal segment of endopod ovate and hairy along its entire border; exopod large.

First thoracic limb (Figure 10) with well developed gnathobasic lobe on second joint, dactylus with long straight nail. Second thoracic endopod (Figure 11) fairly stout, inner margin armed with pectinate setae, dactylus with long slightly curved nail. Thoracic endopods three to eight (Figures 12–16) long and well built. Carpopropodus of third composed of three segments, 4th of four, 5th of five and remaining endopods of six segments. All endopods armed with long plumose setae and pointed barbed spines along inner edge; dactylus rudimentary. Small knob-like process present on inner margin of basal joint of endopod of third to eighth thoracic limb; this process more prominent in male than in female. Basal plate of exopod of thoracic limb with spine on outer distal corner in anterior (1–4) pairs and wanting in posterior pairs; exopod twelve segmented. In male eighth thoracic limb with well-developed male appendix.

In male first and fifth pairs of pleopods (Figure 19) with normal exopod composed of seven segments and small unsegmented endopods. Second and fourth pair (Figure 20) with both rami composed of seven segments, exopod longer than endopod. Third pleopod (Figures 21 and 22) with seven-segmented endopod. Exopod elongate and composed of ten segments, penultimate segment more than three times as long as ultimate joint and armed on outer corner with long distally barbed seta and on inner corner with short spine. Ultimate segment short and terminating into two equally long feebly barbed setae. Sympod large and rectangular, side lobes on endopods normally developed.

In female first three pairs of pleopods (Figure 17) rod-like and of usual form. Fourth and fifth pairs (Figure 18) reduced to delicate lamellae, attached side by side to posterior ventral margin of somite and projecting backwards; distal margin with few setae and 2–3 spines.

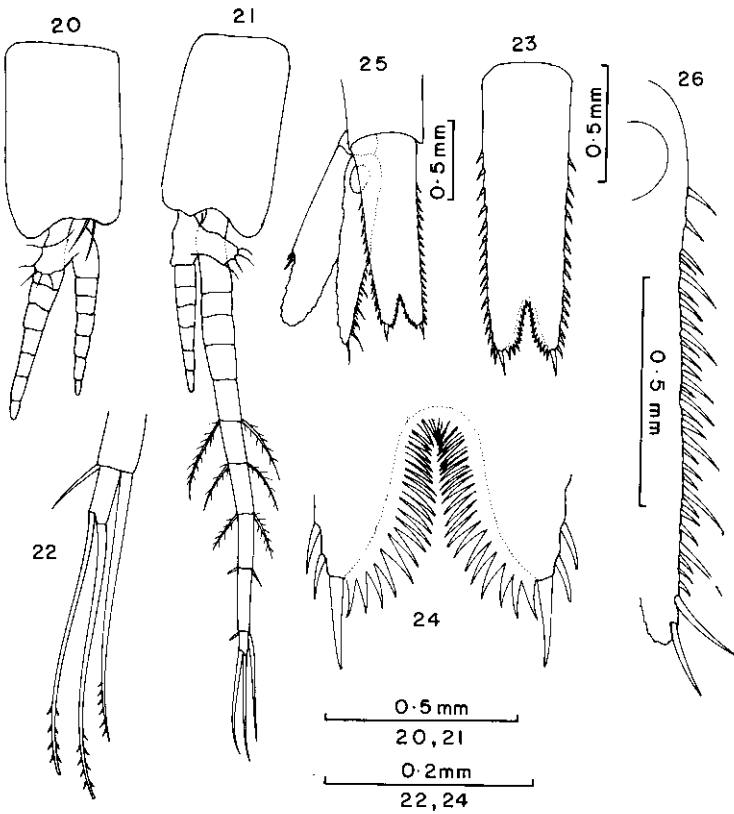
First abdominal segment in female with small epimeral plate on either side covering small part of brood-pouch. Sixth abdominal segment twice as long as fifth.

Telson (Figures 23 and 24) longer than last abdominal segment nearly three times as long as broad, tapering gradually and slowly in breadth from base to apex with almost straight lateral margins; distal two-thirds of lateral margin armed with 15–17 slender spines arranged regularly, terminal pair of spines stouter and longer. Apex cleft for one-sixth of total length and armed with 25 sharp teeth on each margin.

Endopod of uropod (Figures 25 and 26) slightly longer than exopod and over-reaching telson; inner margin armed with dense row of spines extending from region of statocyst to distal end and arranged in series. Exopod with truncate apex and with two unequal spines a little beyond middle of outer margin and setiferous along distal margin. Adult male and female 8 mm.

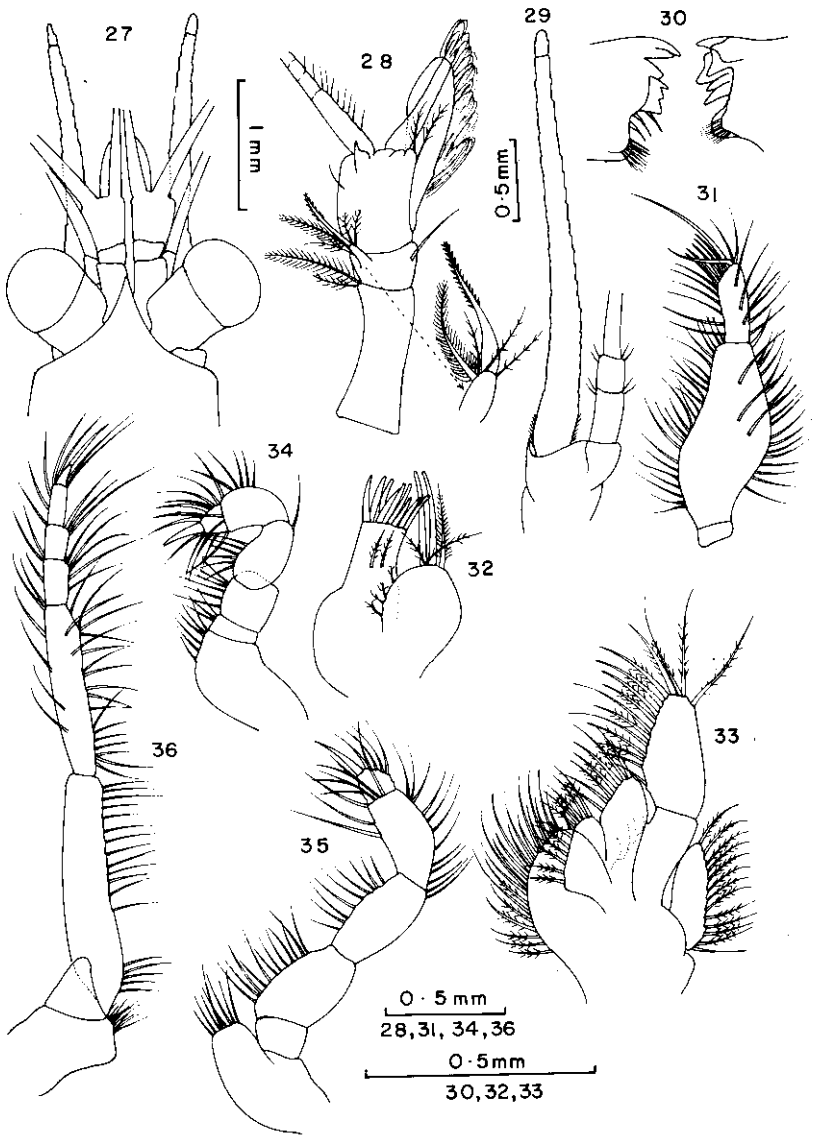
Remarks

The genus *Paranchialina* was established by Hansen (1910) for the reception of *Anchialus augustuss*, Sars (1885) found by the Challenger Expedition. The present species is closely allied to *P. augusta*, the type and only species of the genus, in the strongly hispid body, in the front region, and in the shape and armature of the telson and uropod. It is, however, distinguishable from the latter in the following characters:



Paranchialina secunda sp. nov. (male). **Fig. 20**, second pleopod; **21**, third pleopod; **22**, same, tip of exopod; **23**, telson; **24**, tip of telson; **25**, posterior end of body; **26**, endopod of uropod.

1. Antennal scale has no distal joint while in *P. augusta* it is provided with a distinct distal joint.
2. The spine on the antennal sympod has secondary spinules along its inner margin whereas in *P. augusta* the spine is smooth.
3. The spiniform process of the labrum is longer and has spinules along the proximal two-thirds only. In *P. augusta* the process is shorter and has spinules throughout its length.
4. The most readily distinguishable difference is seen in the third pleopod of the male. The exopod is ten segmented and the penultimate segment is armed with a long spinous seta and the ultimate segment is terminated by two long feebly barbed setae. In *P. augusta* the exopod is eleven segmented; the antepenultimate segment is armed with a long naked spine, the penultimate segment does not possess any setae and the ultimate segment is terminated by two small apical spines. (According to Sars' account the exopod of the fourth pleopod of the male is described to be elongated and modified. Judging from the definition of the Subfamily Gastrosaccinae, it should be rather regarded as the exopod of the third male pleopod.)



Leptomysis longisquama sp. nov. (male). Fig. 27, anterior end of body; 28, antennule; 29, antenna; 30, cutting edge of mandibles; 31, mandibular palp; 32, maxillule; 33, maxilla; 34, first thoracic endopod; 35, second thoracic endopod; 36, third thoracic endopod.

5. The lateral spines on the telson are slightly less in number. Lateral margin is armed with 15–17 spines in *P. secunda* as against 20–30 in *P. augusta*.
 6. The present species appears to be a small species. The type specimen measures about 10 mm while the present specimens measure only about 8 mm.

Apart from these, minor differences are found in the relative length between the antennal peduncle and scale, number of segments in the carpopropodus and in the number of spines on the inner uropod.

Sub family *Mysinae*

Leptomysis longisquama sp. nov.

Material

Many mature and immature males and females.

Holotype male IOBC - 0389 - 10-50-1985.

Allotype female IOBC - 0389A - 10-50-1985.

Description

Body strongly built, stouter in female than in male. Body covered with oblong minute scales presenting hispid appearance. Carapace (Figure 27) anteriorly produced into triangular rostrum with pointed apex extending beyond middle of first antennular segment; posteriorly emarginate leaving last two thoracic somites dorsally exposed.

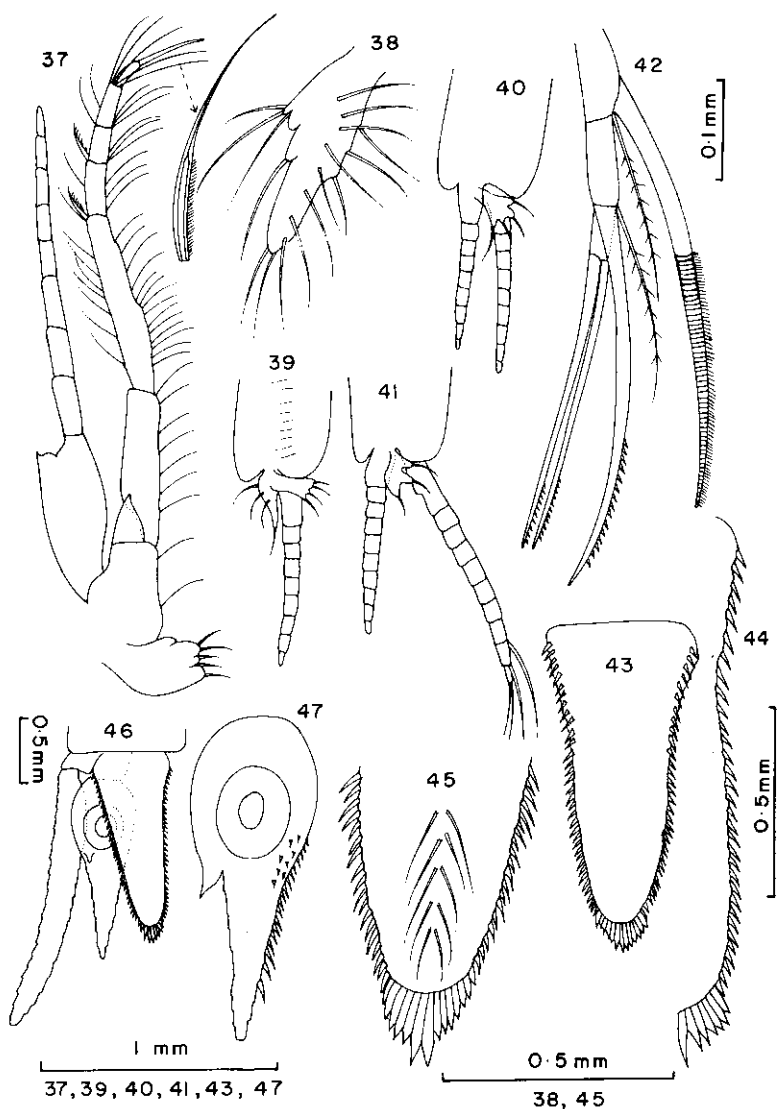
Eyes large, elongate and prominent extending to distal margin of second antennular segment and projecting beyond lateral margin of carapace.

First segment of antennular peduncle (Figure 28) as long as second and third together, hollowed dorsally, outer distal corner produced; second segment with prominent dorsal lobe carrying exceptionally long stout distally pectinate seta, one thickly plumose seta and three slender setae; third segment rather stout with median dorsal lobe tipped with spine and few setae. Male lobe large and hirsute. Antennal scale (Figure 29) exceptionally long and narrow, 13 times as long as broad, over reaching antennular peduncle by more than half of its length, very short distal joint marked off by distinct suture; peduncle short, one-fifth length of scale; sympod with prominent spine.

Labrum roughly circular, distal border bilobed and asymmetrically armed. Mandibles (Figure 30) with incisor processes, and lacinia mobilis; molar lobe smooth with tuft of setae. Second segment of mandibular palp (Figure 31) stout and densely setose, third segment with long setae. Maxillule (Figure 32) with large inner lobe armed with two stout spines and few plumose setae. Outer lobe with distinct hump and distally armed with nine strong spines. Basal lobe of maxilla large (Figure 33) distal lobe bifid; exopod small but well developed, outer border with 12 long plumose setae.

First thoracic endopod (Figure 34) short and stout, third joint distinct but very short, masticatory lobes not developed, dactylus armed with strongly barbed spines and setae, nail stout and straight. Second thoracic endopod (Figure 35) robust, inner margin of ischium and merus densely setose, carpopropodus sparsely setose, dactylus densely setose and with long slender nail. Thoracic endopods three to eight (Figures 36 and 37) subsimilar, long and strongly built, densely furnished with setae; carpopropodus divided into three subsimilar segments; dactylus with long slender nail; basis of thoracic endopods expanded on inner margin. Exopod nine segmented, basal segment with small outer distal spine. Genital appendage of eighth thoracic limb in male small and armed with small bristles.

Pleopods in female (Figure 38) uniramous and unsegmented setose plates.



Leptomysis longisquama sp. nov. (male). Fig. 37, eighth thoracic limb; 38, pleopod of female; 39, first pleopod; 40, second pleopod; 41, fourth pleopod; 42, same, tip of exopod; 43, telson; 44, lateral margin of telson; 45, ventral view of telson; 46, posterior end of body; 47, endopod of uropod.

Pleopods in male well developed, natatory and biramous. First pleopod (Figure 39) with one-segmented endopod and nine-segmented exopod; second, third and fifth (Figure 40) similar in form, endopod nine jointed and exopod ten jointed. Fourth pleopod (Figures 41 and 42) with endopod ten jointed and exopod eleven jointed; antepenultimate joint of exopod with very long stout modified seta, penultimate joint with strongly barbed seta and ultimate joint ending in two comparatively slender feebly barbed setae.

Sixth abdominal segment one and half times as long as fifth. Telson (Figures 43 and 44) longer than last abdominal segment, twice as long as broad at base, wedge shaped with slight waist-like constriction at basal quarter, lateral margin armed throughout with closely set spines; lateral row of spines continuous over rounded apex, spines increasing gradually in length from outermost pair to central pair. Four pairs of simple setae present on ventral side of telson (Figure 45) arranged in row along middle line.

Uropods (Figures 46 and 47) clearly over-reaching telson. Endopod with swollen base lodging large statocyst, blunt spiniform process present on dorsal surface of outer posterior margin of statocyst, the process prominent in lateral view; inner ventral margin armed with 21 regularly graduated spines extending from statocyst towards apex; a series of small spinules present around inner margin of statocyst. Exopod long and narrow, slightly curved outward and setose all round.

Adult male 6.4–7 mm. Female 8–10 mm.

Remarks

In the overall shape and armature of the telson the present species shows the strongest resemblance to *Leptomysis australiensis*. Tattersall (1927) known from the Gulf of Vincent, South Australia. Judging from his brief description and figures of *L. australiensis* the present species differs from it in the following characters:

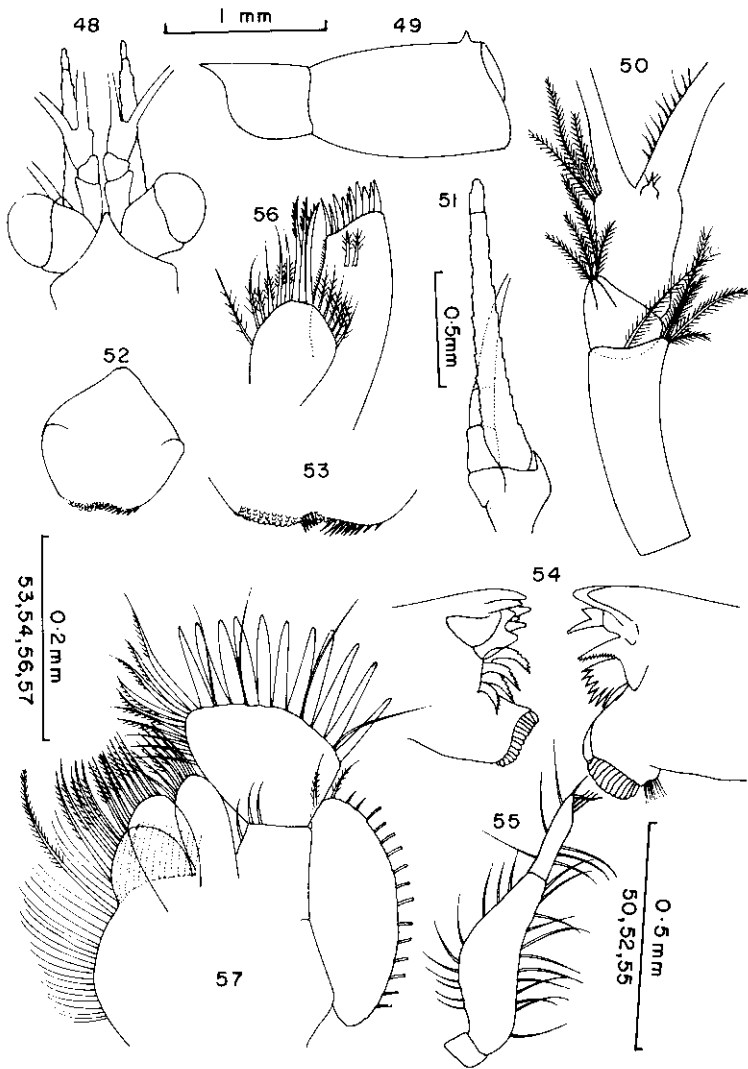
1. In *L. longisquama* the body surface is hispid. As Tattersall makes no mention of it, it is presumably absent in *L. australiensis*.
2. The rostrum is more produced and pointed and extends to three-quarters of first antennular segment. In *L. australiensis* the rostrum is short and extends to one-quarter of the first antennular segment.
3. A prominent dorsal lobe armed with stout setae is present on the second segment of the antennular peduncle. This is absent in *L. australiensis*.
4. Antennal scale is longer, being 13 times as long as broad and over-reaching the antennular peduncle by more than half of its length. In *L. australiensis* the antennal scale is only eight times as long as broad.
5. The most readily recognisable difference is seen in the fourth pleopod of the male. In *L. longisquama* the exopod has modified setae on the last three joints only where as in *L. australiensis* modified setae are present on the last four joints.
6. In *L. longisquama* the telson is longer than the last abdominal segment and has on the ventral side four pairs of setae arranged in a row along the middle line. In *L. australiensis* the telson is shorter than the last abdominal segment and setae are absent on the ventral side.
7. The inner uropod is armed with a row of 21 regularly graduated spines whereas in *L. australiensis* there are only seven spines on the inner uropod.

Doxomysis johnsoni sp. nov.

Material

Two adult females, five immature females, eight immature males and six juveniles. Holotype female IOBC-0390-10-50-1985.

Allotype young male IOBC-0390A-10-50-1985.

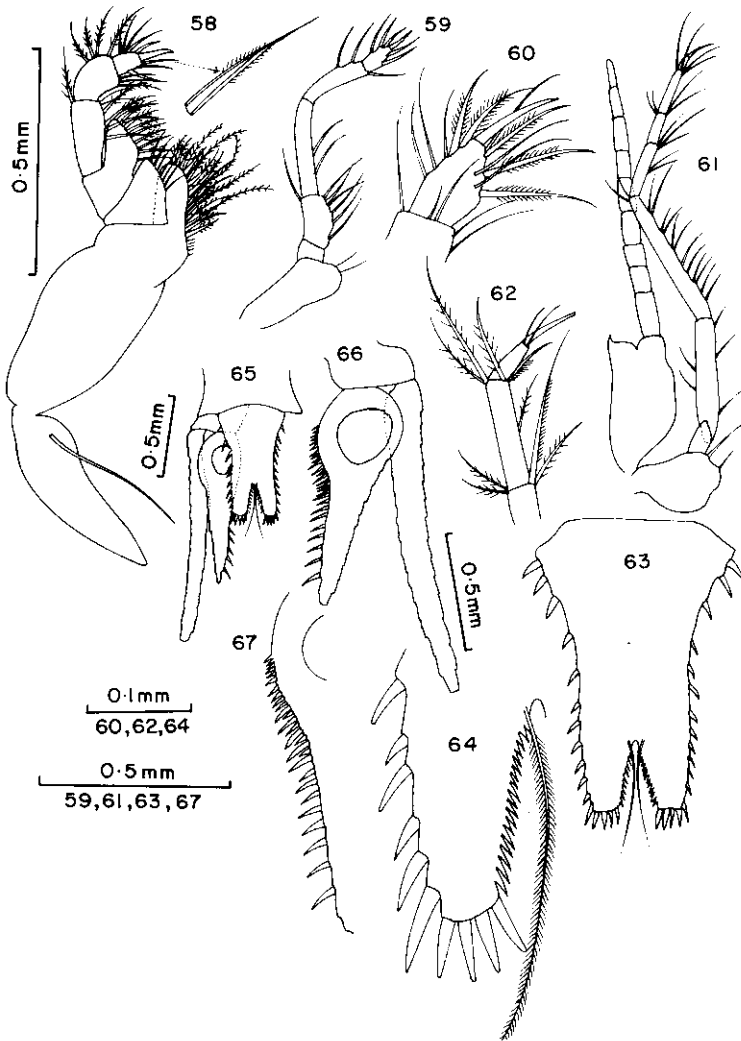


Doxomyxis johnsoni sp. nov. (female). **Fig. 48.** anterior end of body; **49.** carapace, lateral view; **50.** antennule; **51.** antenna; **52, 53,** labrum; **54,** cutting edge of mandibles; **55,** palp of mandible; **56,** maxillule; **57,** maxilla.

Description (female)

Carapace short (Figures 48 and 49) leaving last two thoracic somites exposed, frontal margin produced into triangular rostral plate, apex bluntly pointed, extending to middle of first antennular segment, small dorso-median tubercle present on carapace just in front of hind margin, posterior margin nearly straight.

Eyes of moderate size, little longer than broad, cornea occupying distal half of eye and slightly broader than stalk.



Doxomysis johnsoni sp. nov. (female). **Fig. 58**, first thoracic endopod; **59**, second thoracic endopod; **60**, same, tip enlarged; **61**, third thoracic limb; **62**, same, tip of endopod; **63**, telson; **64**, tip of telson; **65**, posterior end of body; **66**, uropod; **67**, endopod or uropod.

Antennular peduncle (Figure 50) with first segment longer than rest, outer distal corner produced, second segment with small dorsal lobe. Antennal scale (Figure 51) long and narrow, about nine times as long as broad, over-reaching antennular peduncle by one-third of its length, distal segment one-ninth of total length; peduncle short, one-third length of scale; sympod with prominent spine on outer distal margin.

Labrum (Figures 52 and 53) with obtuse anterior margin, distal border with strong teeth on one side and blunt cusps on other. Mandibles (Figures 54 and 55) with all parts normally developed; second segment of palp flattened, third cylindrical. Maxillule

(Figure 56) with club-shaped inner lobe with three strong barbed setae and 12 plumose setae, outer lobe with 10 spines on distal border. Maxilla (Figure 57) broad, exopod large and oblong; distal segment of endopod transversely expanded, broader than long, its distal border armed with four long plumose setae and 11 strong spines.

Basis of first thoracic endopod (Figure 58) with large gnathobasic lobe, next two segments conspicuously produced inwards. Basis of second thoracic endopod (Figures 59 and 60) produced inwards, ischium with long setae. Thoracic endopods three to eight long and slender (Figures 61 and 62), carpopropodus divided into three segments of which first longer than others; dactylus carrying long slightly curved nail. Basal segment of exopod narrow, distally ending in spine.

Pleopods in female uniramous. Pleopods of male in specimen in immature condition and all biramous.

Telson (Figures 63 and 64) as long as last abdominal segment, broader slightly beyond base, cleft deep one-third length of telson and diverging. Lateral border armed throughout with 12–14 sharp spines, spines hardly increasing in length except for last pair; sub-truncate distal border of telsonic lobes with four blunt large spines. Telsonic sinus armed with 14–18 pairs of spines and two long plumose setae.

Uropods (Figures 65 and 66) clearly over-reaching telson, exopod longer than endopod. Inner border of endopod (Figure 67) with a row of 27 spines extending from statocyst to little short of apex, spines on proximal half closely packed and arranged in series, distal 6–7 spines large and distantly placed without smaller spines among them.

Adult female 6.3–6.7 mm.

Remarks

The characteristic that the lateral margins of the telson are armed with spines throughout their length makes the present specimen closely related to *D. littoralis* Tattersall (1922), *D. australiensis* Tattersall (1940), *D. longiura* Pillai (1963), *D. rinkaiensis* Valbonesi and Murano (1980) and *D. proxima* Bacescu and Udrescu (1982). In having no mature male available it is rather difficult to compare this species with the others. It is, however, sufficiently well marked from the other species by the presence of the dorso-median tubercle on the carapace. This character is so well marked in both immature and adult specimens that one can easily recognise this species. Other distinguishing characters are the more produced bluntly pointed triangular rostrum, long antennal scale, the well-spaced spines on the lateral margin of the telson, the presence of four sub-equal blunt spines on the sub-truncate apex of the telson and the fewer spines of the endopod of the uropod.

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