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PLATYBRANCH SPHAEROMATIDS (CRUSTACEA: ISOPODA) FROM THE AUSTRALIAN REGION WITH DESCRIPTION OF A NEW GENUS

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SUMMARY

Recent sampling off the eastern and south-eastern coasts of Australia has produced a number of specimens of platybranchiate sphaeromatid isopods, but the unfortunate lack of detailed keys has led to a number of misidentifications and the curation of unidentified material in museum collections. In an effort to prevent this, all known Australian platybranch species are redescribed and refigured here. The geographical ranges of *Paracassidina pectinata* Baker and *Syncassidina aestuaria* Baker are extended from Western Australia to south-eastern Australia and Queensland. The general biology of *P. pectinata* is discussed and adults of *S. aestuaria* are described for the first time. In addition, a new species, forming a new genus, *Platysphaera membranata* gen. nov., sp. nov., is described from the Coral Sea. A key for the identification of all known Australian platybranchs is provided.

INTRODUCTION

Survey work involving the sampling of benthic macrofauna off the Queensland coast of Australia is uncovering numerous marine invertebrate species, many of which are new to science and others which have only infrequently been recorded. Unfortunately, due to the lack of detailed keys to many of the common groups, a large number of specimens are not identified and after coding are stored in museum collections (Queensland Museum, 1974a & b; Stephenson and Cook, 1977). This is often the case with crustacean orders such as the Isopoda and Tanaidacea. This paper is one of a series intended to help survey workers and ecologists identify isopods and tanaids from various environments in Australia.

Sphaeromatid isopods are a common element of the marine fauna of the southern hemisphere (Hurley and Jansen, 1977) but little work has been carried out on species not considered to be of economic importance. Hansen (1905) devised a system for sub-dividing the Sphaeromatidae and although it is sometimes difficult to assign newly discovered species to these groups, his system is adhered to in the present paper. Most sphaeromatids belong to two sub-families: the Hemibranchiatinae, in which only the endopods of pleopods 4 and 5 have respiratory folds e.g. *Sphaeroma* Latreille; and the Eubranchiatinae, in which both rami of these appendages have respiratory folds e.g. *Dynamenella* Hansen. A third sub-family, the Platybranchiatinae, in which both rami of pleopods 4 and 5 lack respiratory folds, contains far fewer species and in Australian waters has previously only been represented by the genera; *Chitonopsis* Whitelegge, *Paracassidina* Baker, *Waiteolana* Baker and *Syncassidina* Baker. Very few records exist for these genera and none has previously been recorded off the Queensland coast.

Paracassidina was erected in 1911 by Baker to contain the species *P. pectinata*, collected in Geographe Bay in Western Australia. *Syncassidina* was erected in 1929 by Baker to contain the species *S. aestuaria* from Rocky Bay, Swan River, Western Australia, and only non-ovigerous females were described. These two species have only previously been recorded in their original descriptions, but in the present paper they are recorded from Queensland waters. In addition *S. aestuaria* is recorded from Victoria and *P. pectinata* from Tasmania and New South Wales. Adult specimens of *S. aestuaria* are described for the first time here, and the availability of a relatively large number of specimens of *P. pectinata* has facilitated observations on its general biology.

The only other platybranch species previously known from Australian waters are; *Chitonopsis spatulifrons* Whitelegge, from New South Wales and South Australia, *Chitonopsis hanseni* Nierstrasz, from Indonesian waters, and *Waiteolana rugosa* Baker, from New South Wales, but the present paper contains the description of a new platybranch genus, *Platysphaera*, erected here to house a new species *Platysphaera membranata*, found associated with coral reefs in the Central Coral Sea.

All material not designated a museum location has been placed in a reference collection at Nottingham University.

Fig. 1 shows the known distribution of platybranchiate sphaeromatids in Australian and New Zealand waters.

SYSTEMATICS

Order Isopoda

Family **Sphaeromatidae**

Subfamily **Platybranchiatinae**

KEY TO SPECIES FROM THE AUSTRALIAN REGION

1. Body deeply vaulted with entire dorsal surface ornately sculptured (fig. 7)
..... *Waiteolana rugosa* Baker
- Body flattened, or if vaulted, dorsal surface smooth..... 2
2. Epistome visible between expanded antennules in dorsal view 3
- Epistome not visible in dorsal view (fig. 8)
..... *Platysphaera membranata*. gen. nov., sp. nov.
3. Epistome extending anteriorly at least as far as anterior margin of antennular peduncle. All pereopods ambulatory, unmodified 4
- Epistome extending, at most, half way to anterior margin of antennular peduncle. First pereopods highly modified, scythe-shaped (Figs 2,3)
..... *Paracassidina pectinata* Baker
4. Exopod of uropod minute, not obvious. Pleonal tergite not marked by sutures (Fig. 4) *Syncassidina aestuaria* Baker
- Exopod of uropod obvious. Pleonal tergite marked by sutures (Figs 5,6)
..... *Chitonopsis spatulifrons* Whitelegge
5. Merus of pereopod 1 with superior setae very short (Fig. 5)
..... *Chitonopsis spatulifrons* Whitelegge
- Merus of pereopod 1 with superior setae reaching dactylus (Fig. 6)
..... *Chitonopsis hanseni* Nierstrasz

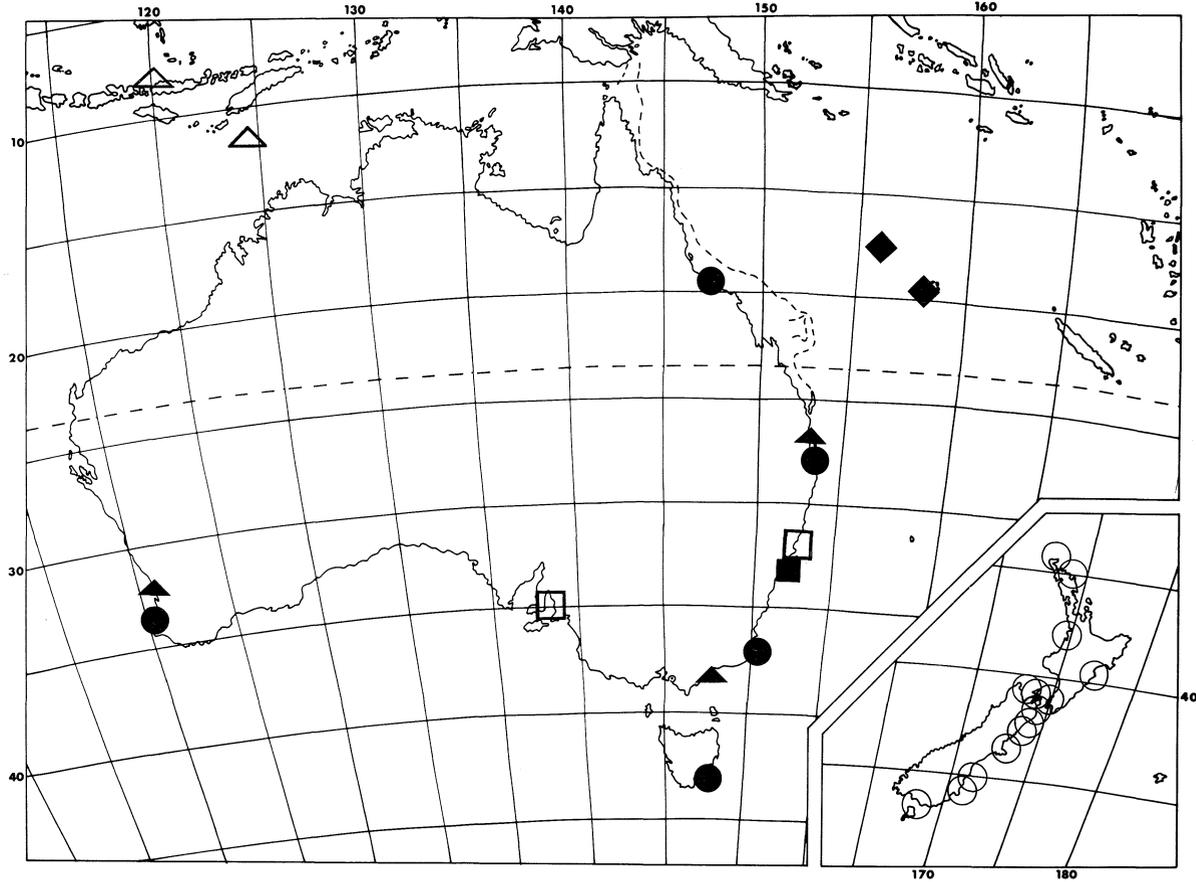


Figure 1. Known distribution of platybranchiate sphaeromatids in the Australia region.

● — <i>P. pectinata</i> .	▲ — <i>S. aestuaria</i> .	■ — <i>W. rugosa</i> .
○ — <i>C. tya</i> .	△ — <i>C. hanseni</i> .	□ — <i>C. spatulifrons</i> .
◆ — <i>Platysphaera membranata</i> gen. nov., sp. nov.		

Genus **Paracassidina** Baker, 1911

Paracassidina Baker, 1911: 90-93, pl. 23. Nierstrasz, 1931: 219.

Type species — *P. pectinata* Baker, 1911.

GENERIC DIAGNOSIS: Body moderately flattened, dorsally naked, punctate, lacking tubercles and projections. Coxal plates of pereonites 2 to 7 separated from tergites by sutures. Pleonal tergite of three segments, fused in midline; anterior not reaching lateral margins of body. Pleotelson with apex entire, lacking notch or groove. Antennular peduncle articles 1 and 2 expanded as flattened lobes projecting anteriorly and laterally. Antennules separated in mid-line by anteriorly produced epistome. Pereopod 1 highly modified, scythe-shaped with long meral lobe; distal articles bearing long setae. Exopod of pleopod 3 with marked line of articulation; both rami with margin of plumose setae. Uropod with minute exopod in outer margin. Sexual dimorphism apparent in antennule form. *Adult male*. Penes separate to base. Appendix masculina present, linear with smoothly rounded apex; arising from proximal, internal angle of endopod of pleopod 2 and extending beyond both rami. Antennular peduncle article 1 markedly bilobed anteriorly with a deep cleft. *Ovigerous female*. Mouthparts not metamorphosed. Brood pouch of three pairs of overlapping brood plates, arising from pereonites 2 to 4, and a posterior pocket. Antennular peduncle article 1 not markedly bilobed anteriorly, lacking a deep cleft.

Paracassidina pectinata Baker, 1911

Paracassidina pectinata Baker, 1911:90-93, pl. 23. Nierstrasz, 1931:219.

PREVIOUS RECORDS: Geographe Bay, W.A. (Baker, 1911), 1 male and 1 ovigerous female.

HOLOTYPE: South Australian Museum Reg. No. C 381.

TYPE LOCALITY: Geographe Bay, Western Australia.

MATERIAL EXAMINED: Geographe Bay, W.A.; dredged, 16-20 fms (29-37 m); 1 male, 1 female (with brood plates but no obvious brood) (types); coll. Verco and Torr; South Australian Museum Reg. No. C 381.

Off Twofold Bay, N.S.W. (37°05'S. 150°05'E); sand and mud at 30-50 fms (55-91 m); 1 ovigerous female, 1 non-ovigerous female; coll. Th. Mortensen ("Endeavour"), 30 September 1914; Copenhagen University Zoology Museum (no Reg. No.).

Federick Henry Bay, S.E. Tasmania; 1 male, 2 non-ovigerous females; coll. J. R. Penprase, 16 August 1971; Tasmanian Museum Reg. No. G. 1797.

Middle Banks, Moreton Bay, Qld.; sand and shell, 6-24 m; 26 males, 26 females; coll. Cook and Newlands, 1972-1976; Queensland Museum Reg. Nos. W. 6273-6287.

Bowling Green Bay, Townsville, Qld; sand, muddy sand, 1.9-6.0 m; 2 males, 5 females; coll. P. Arnold, 1974-1975.

Cleveland Bay, Townsville, Qld.; soft mud on shell/mud, 8.9 m; 6 males, 6 females; coll. P. Arnold, 1975.

DESCRIPTION OF SPECIMENS FROM QUEENSLAND

Adult male. Body length 3.28 mm. (Figs 2a-m, 3j-l, p, q; Fig. 10).

Body elliptical, twice as long as wide; moderately flattened, coxal plates directed

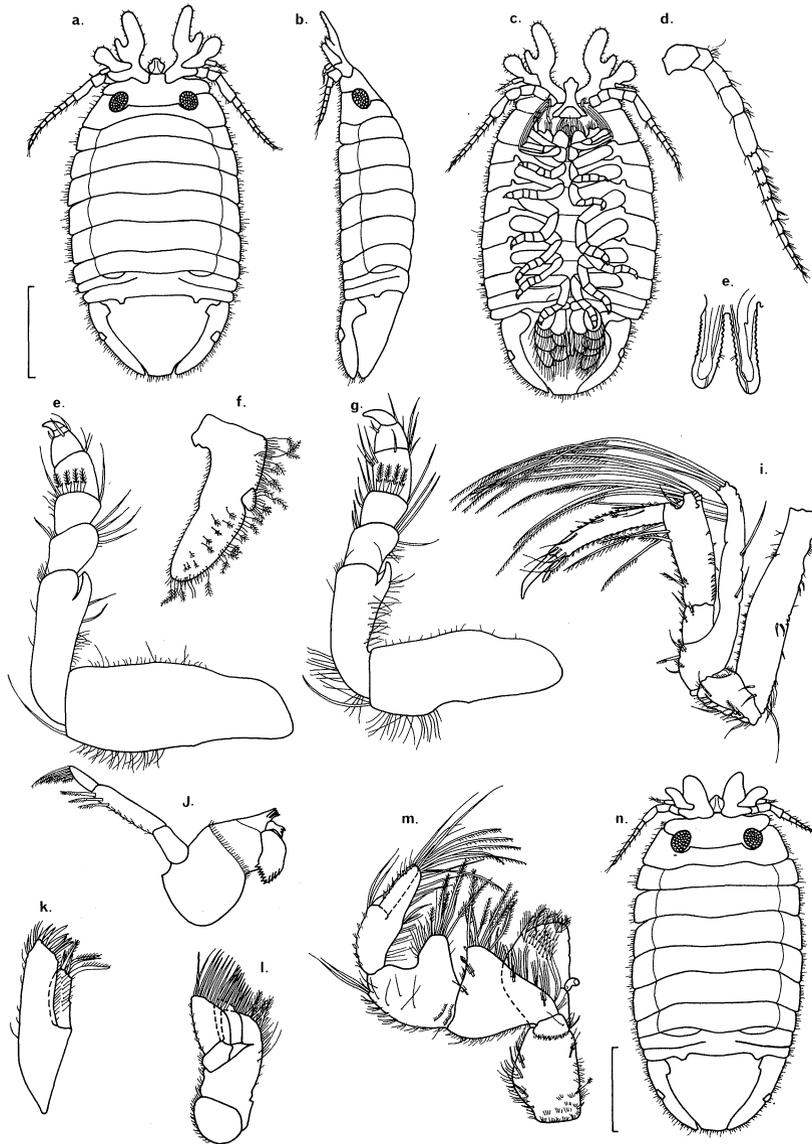


Figure 2. *Paracassidina pectinata* Baker from Queensland. Adult male (a) dorsal; (b) lateral; (c) ventral; (d) antenna; (e) penes; (f) pereopod 6; (g) uropod; (h) pereopod 2; (i) pereopod 1; (j) left mandible; (k) maxillule; (l) maxilla; (m) maxillipede. Ovigerous female (n) dorsal. Scale line represents 1 mm in each case.

laterally; dorsal surface naked, punctate, lateral margins bearing compound fringing setae. Cephalosome five times as broad as long, having an anterior quadratic projection in mid-line contiguous distally with the tip of the anteriorly produced epistome. Laterally, division between cephalosome and pereonite 1 lying anterior to eyes, which are well developed, darkly pigmented and set posteriorly into the anterolateral margin of pereonite 1. Lateral margins of pereonites and pleonal tergite closely applied forming a regular, sub-continuous outline. Pleotelson sub-triangular with apex broadly truncated.

Antennae. Antennular peduncle article 1 strongly flattened and produced into lobes; a larger, bifid, inner lobe projecting anteriorly, and an outer lobe projecting laterally (Fig. 10). Article 2 also flattened, anteriorly extended, arising from an excavation between the lobes of article 1; 3 cylindrical, arising mid-way along external margin of article 2. Flagellum of three articles, distal two each bearing one aesthetasc. Antennal articles not expanded; nine-articled flagellum reaching level of pereonite 4. *Mouthparts.* Epistome produced anteriorly beyond cephalosome, widening distally as a short process, visible between antennules in dorsal view; ventral, proximal region embracing labrum. Mandible with quadridentate incisor process; molar process well developed, strongly dentate; palp well developed, article 2 with three, and article 3 with five, pectinate setae; lacinia mobilis of left mandible as a quadridentate peg. Maxillule with ten simple spines on exopod, two simple spines and four pectinate spines on endopod. Maxilla with long, simple spines on both outer lobes and shorter, more robust, plumose spines on the inner lobe. Maxillipede with palp articles 2 to 4 strongly lobed, 5 extending only as far as tip of lobe of article 4. *Pereopods.* Pereopod 1 highly modified, held horizontally across the mouthparts. Basis long, slender, directed medially; ischium very short; merus extended superiorly as an elongated lobe running alongside the propus; carpus short; propus well developed and widening distally; dactylus long, arising from inferior border of propus and held at right angles to it; unguis well developed, one third length of dactylus, with an inferior, basal spine. Apex of meral lobe with four very long, curved setae, each pectinate in distal half; distal, inferior margin of lobe with three similar setae and one shorter simple seta near apex. Distal tip of propus with a number of long setae, pectinate in distal half; inferior margin with two pectinate and two plumose setae. All long setae mentioned above projecting inferiorly at right angles to meral lobe and in same plane as elongated dactylus. Pereopods 2 to 7 ambulatory, similar in form, moderately setose; basis expanded for distal one third of length; ischium with superior hooked protuberance; merus with superior distal lobe; carpus with four distal, trifold, plumose spines; dactylus with strongly curved unguis. *Penes* short, reaching just beyond articulation of basis of pleopod 1 and pleonal tergite. *Pleopods.* Pleopod 1 with exopod and endopod sub-similar, each with terminal plumose setae sub-equal in length to ramus bearing them. Exopod also bearing external plumose setae. Pleopod 2 with endopod more rectangular than slightly larger exopod, inner margin of endopod with well developed appendix masculina — one and a half times length of ramus. Setation as in pleopod 1. Pleopod 3 with endopod rectangular and slightly larger than ovate, two-articled exopod. Each ramus with terminal plumose setae half length of ramus, and exopod with similar external setae. Pleopods 4 and 5 with both rami lacking respiratory folds; blood lacunae obvious; proximal inner regions thickened; exopods larger than endopods. Exopod of 5 with three equidistant finely-toothed bosses in distal half of inner margin and several short, simple setae on external border. *Uropods.* Endopod juxtaposed to pleotelsonic margin, terminating just before apex. Exopod minute, housed in notch in proximal one third of lateral margin.

Ovigerous female. Body length 3.78 mm. (Fig. 2n).

Similar to male excepting primary sexual characteristics and form of antennular peduncle. Peduncle articles 1 and 2 as dorsoventrally flattened lobes, but anteriorly

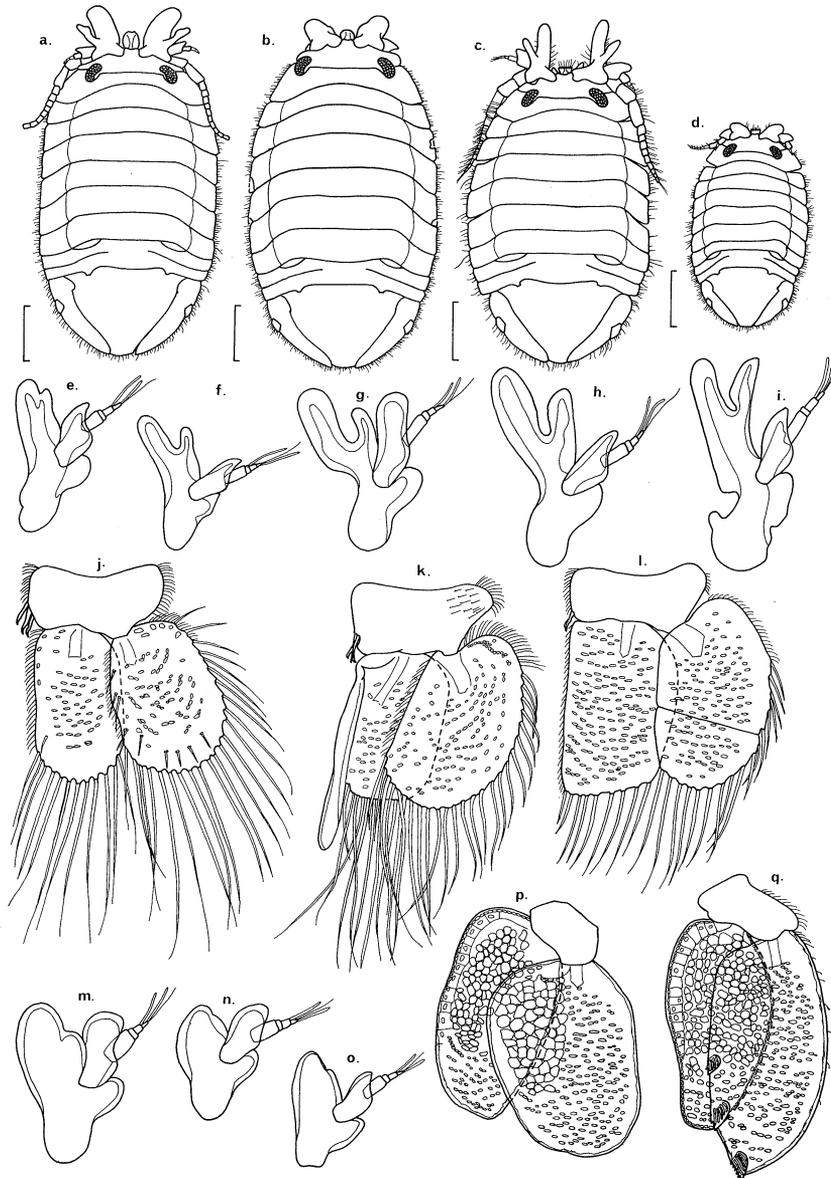


Figure 3. *P. pectinata* Baker. (a) adult male (type) — dorsal; (b) ovigerous female (type) — dorsal; (c) adult male from Tasmania — dorsal; (d) non-ovigerous female from Tasmania — dorsal. Queensland specimens. Adult males (e) to (i) antennules; (j) to (l), (p), (q) pleopods 1 to 5 respectively (setules omitted from plumose setae). Ovigerous females (m) to (o) antennules. Scale line represents 1 mm in each case.

projecting lobe of 1 is single and relatively shorter than in male. Brood pouch formed from three pairs of brood plates, increasing in size posteriorly and arising from pereonites 2-4, those on pereonite 4 being three times the size of those on pereonite 3 and nine times the size of those on pereonite 2. In addition to the brood plates there is an anteriorly directed pocket covering the posterior sternite and opening between the seventh pereopods. Mouthparts unmodified.

Non-ovigerous female:

As above but without the brood pouch.

INTRASPECIFIC VARIATION: In addition to the gross sexual differences in the form of the antennular peduncle, the Queensland specimens also show variation in this character within each sex (Fig. 3e-i, m-o). This variation between sexes and between individuals of the same sex is important to bear in mind when considering the formation of new species based on minor characters. The Queensland specimens do differ slightly in the form of epistome tip from the type specimens (Fig. 3a, b) and specimens from Tasmanian waters (Fig. 3c, d) but due to the geographical separation of the three localities, the variation shown by the antennules of the Queensland specimens, and the similarity of all specimens in all other respects, their separation as distinct species would be unjustified. Morphological variation with geographical location has also been noted in the *Serolis minuta*-group, isopods which are found in similar habitats to *P. pectinata* (Holdich and Harrison, in press (a)).

Amongst the specimens from Queensland one male was found with the male antennular form, appendices masculinae and penes, but also with fully formed brood plates, although the posterior pocket was not developed.

REMARKS: Although *Paracassidina* bears a superficial resemblance to *Chitonopsis* there are marked differences, notably the highly modified first pereopod, and the antennular peduncle extending anteriorly well beyond the epistome tip.

Regarding the variation in form of the epistome tip of *P. pectinata*: if a gradual change from the form found in the type specimens (Fig. 3a, b) to the form found in the Tasmanian specimens (Fig. 3c, d) is anticipated, the Queensland and New South Wales specimens form intermediates, suggesting that the range of this species may extend around the north coast of Australia and down the east coast to Tasmania rather than following the south coast. Unfortunately there is no evidence to suggest this gradual change with geographical location, and more sampling must be carried out before the true range of this species can be appreciated. It is interesting to note, however, that *P. pectinata* has not been recorded during intensive sampling of the Port Phillip Bay area (Naylor, 1966; Poore *et al.*, 1975) where depth and substratum are similar to those in its known sites.

PARASITES: The intersex male mentioned above was also found to have the cryptoniscan stage of an epicaridian isopod parasite in its "brood pouch". A number of ovigerous females were also found with cryptoniscid and other stages of development of (presumably) this parasite. As many parasites evolve with their host and a number of epicaridian isopods are believed to be species specific, although the evidence is not conclusive (Schultz, 1969: 338; Nielsen and Stromberg, 1973: 76), it is possible that the epicarid mentioned here is a new species.

ECOLOGY AND BREEDING BIOLOGY IN QUEENSLAND WATERS

Specimens of *P. pectinata* were collected during routine sampling of the fauna associated with particulate substrata in various bays in Queensland. The Townsville samples were collected during the James Cook University Three Bays Survey using a

modified Barnett-Hardy suction sampler with a 1mm or 1.5mm mesh bag. The Brisbane samples were collected for Queensland University using a Smith-McIntyre grab. It seems likely that the sampling methods precluded collection of the younger stages of the life-cycle. The adults collected appear to have been associated with either the surface of the sediment or the top few millimetres, and observations of the gut contents revealed only detritus. This observation, coupled with the presence of very highly modified first pereopods, suggests that this isopod may obtain its food from particles sifted from the sediment with this modified limb. Such a method of feeding would be unusual for a sphaeromatid, although Rotramel (1975) has suggested it for *Sphaeroma quoyanum* Milne-Edwards, in which the limbs concerned are not as highly modified as in *P. pectinata*.

P. pectinata in Queensland appears to be associated with a variety of particulate substrata, ranging from fine mud to sand with shell gravel at depths from approximately 2m to 24m. Ovigerous females were taken in most samples and breeding appears to occur all the year round, a situation typical of shallow water populations in sub-tropical and tropical marine habitats. Large numbers of other invertebrate species were to be found in the same samples as *P. pectinata*, notably polychaete annelids (P. Arnold, personal communication) and a number of other isopod groups e.g. anthurids, cirolanids, small serolids and gnathiids. The systematics and some aspects of the ecology of the last two groups have been dealt with by Holdich and Harrison (in press (a) and (b)). The serolids at least would appear to occupy a similar niche to *P. pectinata*, although the food taken is probably of larger dimensions. Specimens from New South Wales were also taken in association with serolids but from a greater depth i.e. 91m.

Genus **Syncassidina** Baker, 1929

Syncassidina Baker, 1929: 60, 61, pl. 5. Nierstrasz, 1931: 222.

Type species — *S. aestuaria* Baker, 1929.

GENERIC DIAGNOSIS: Body moderately flattened, smooth, with a compound setal margin. Coxal plates of pereonites 1 to 7 separated from tergites by sutures. Single pleonal tergite lacking sutures. Pleotelson with apex entire, lacking notch or groove. All tergites reaching lateral margins of body except anterolateral angles of pleotelson. Antennular peduncle articles 1 and 2 expanded as flattened lobes anterior to cephalosome; sub-equal in length to and separated by cuneiform epistome. Pereopods ambulatory, unmodified. Exopod of pleopod 3 lacking articulations; both rami lacking plumose setae. Uropods large with minute exopods set in lateral margins. (Exopods not lacking as stated by Baker, 1929: 60, 61). Secondary sexual dimorphism not apparent. *Adult male*. Penes slender, simple, separate to base. Appendix masculina present, arising from proximal internal angle of endopod of pleopod 2 and extending beyond both rami. *Ovigerous female*. Mouthparts not metamorphosed. Brood pouch formed from an anterior pocket opening at the level of pereopod 3 and a posterior pocket opening at the level of pereopod 4. Pereopods 3 and 4 bearing small brood plates not overlapping in the ventral mid-line.

Syncassidina aestuaria Baker, 1929

Syncassidina aestuaria Baker, 1929: 60, 61, pl. 5. Nierstrasz, 1931: 222.

Chitonopsis sp. — Queensland Museum, 1974a: 9. Queensland Museum, 1974b: App. 1, p. 2; App. 2, pp. 2, 5, 8, 14, 17, 20, 23.

PREVIOUS RECORDS: Rocky Bay, Swan River, W.A. (Baker, 1929), non-ovigerous female.

HOLOTYPE: Western Australian Museum Reg. No. 11180 (4 microslides).

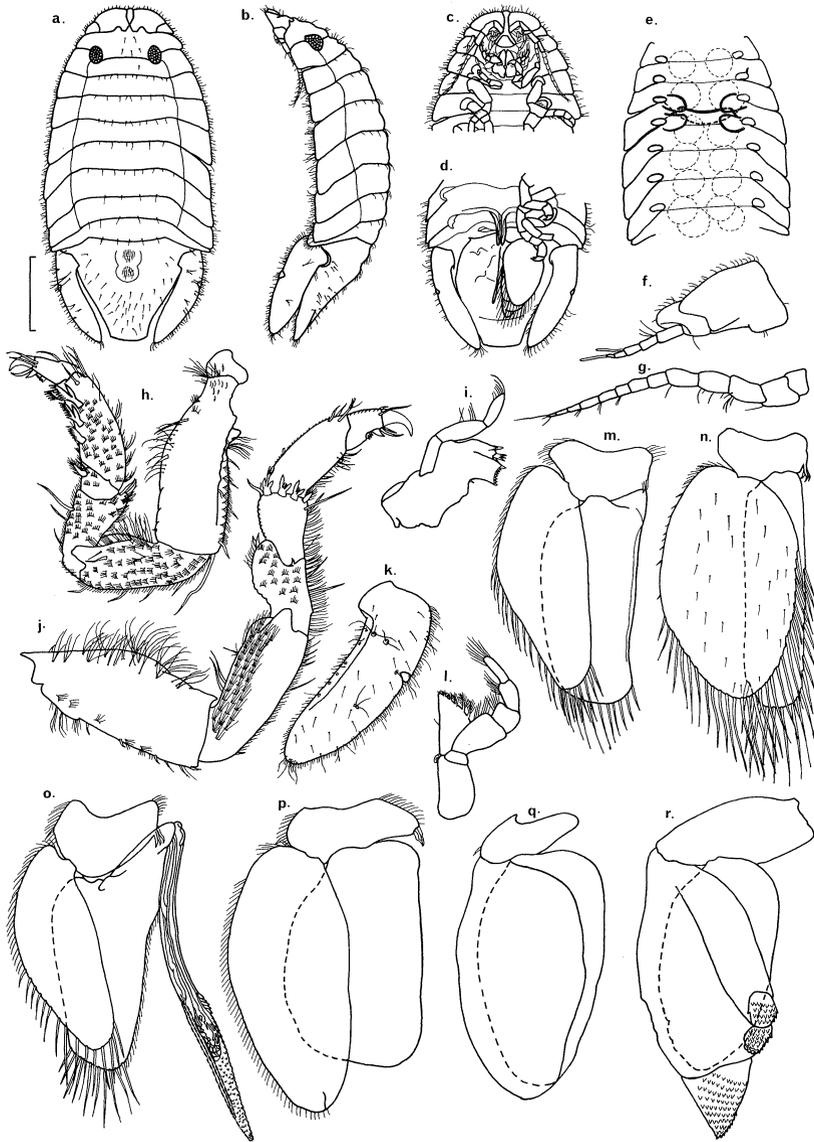


Figure 4. *Syncassidina aestuaria* Baker. Adult male (a) dorsal; (b) lateral; (c) ventral anterior; (d) ventral posterior, right pleopods removed; (f) antennule; (g) antenna; (h) pereopod 1; (i) left mandible; (j) pereopod 2; (k) uropod; (l) maxillipede; (n) to (r) pleopods 1 to 5 respectively (blood lacunae and setules of plumose setae omitted). Ovigerous female (e) ventral pereon showing brood pouch opening and position of ova; (m) pleopod 2 (lacunae and setules omitted). Scale represents 1 mm.

TYPE LOCALITY: Rocky Bay, Swan River, Western Australia.

MATERIAL EXAMINED: Rocky Bay, Swan River, W.A.; 1 non-ovigerous female (type); coll. L. G. Glauert; Western Australian Museum Reg. No. 11180.

Caboorture River, S.E. Queensland; 1 km up Tributary Creek, 4.5 km from mouth; 2 non-ovigerous females; coll. Coastal Management Survey, 23 May 1974; Queensland Museum Reg. No. W. 5611.

Serpentine Creek, S. E. Queensland; right bank 4.5 km in from mouth, Site 4/R, sample 153; 1 non-ovigerous female; coll. B. Campbell *et al.*, 20 February 1973; Queensland Museum Reg. No. W. 4323.

East of Swan Bay, S. Moreton Bay, S. E. Queensland; Mangrove Patch; 1 male; coll. P. Shanco, 18 May 1976; Queensland Museum Reg. No. W. 6305.

Banksia Peninsula, Gippsland Lakes, Victoria; from *Zostera* community, depth 1m; 3 ovigerous females, 5 non-ovigerous females, 2 juveniles; coll. G. C. B. Poore, 30 November 1978.

DESCRIPTION OF SPECIMENS FROM QUEENSLAND

Adult male. Body length 4.23 mm (Fig. 4a-d, f-l, n-r)

Body with subcontinuous, elliptical outline; twice as long as wide; moderately flattened with coxal plates directed laterally; surface smooth. Cephalosome four times as wide as long with an acute anterior projection in mid-line lying between two blunt projections on anterior margin.

Antennular peduncle articles 1 and 2 forming smooth, arcuate anterior margin; separated in dorsal view by cuneiform epistome extending anteriorly to limit of article 1. Pleotelson convex, bearing two low, setose tubercles in the anterior mid-line.

Antennae. Antennular peduncle articles 1 and 2 flattened, 1 approximately four times the size of 2; 3 cylindrical. Flagellum of four articles, last two each bearing a single aesthesc. Antennal peduncle article 1 reduced, 2 to 5 sub-equal. Flagellum of eight articles. *Mouthparts.* Labrum broad, deeply set into base of anteriorly produced epistome. Mandibles with incisor processes, molar processes and palps well developed. Lacinia mobilis of left mandible as a tridentate peg; right mandible with row of spines. Maxillule and maxilla of usual sphaeromatid form. Maxillipede with palp articles narrow, 2 as long as 3 and 4 together; 2 to 4 with weakly produced setigerous lobes, 5 with apical setae. *Pereopods.* Ambulatory, increasing in size posteriorly to 5, then 6 and 7 decreasing. Pereopod 1 with carpus reduced and inferior margin of propus bearing three strong pectinate spines, the distal two being bifid. Distal margin of carpus of pereopods 2 to 7 bearing a row of trifid spines. Dactylus of all pereopods with a strong simple setae opposing the unguis, giving a chelate appearance, and a small secondary unguis. *Penes.* Simple, six times as long as broad, separate to base. *Pleopods.* Rami of pleopod 1 sub-equal in length, endopod rectangular, four times as long as wide; exopod ovate, two and a half times as wide as endopod. Both rami bearing short internal and terminal plumose setae and a number of short, simple, non-marginal setae. Endopod of pleopod 2 trapezoidal with apical row of short plumose setae and an inner appendix masculina one and a half times the length of the ramus and arising from the proximal, internal angle. Appendix masculina widest at its mid-point and covered with small teeth distally. Exopod sub-equal in length to endopod, sub-elliptical, with short, terminal and external plumose setae. Exopod of pleopod 3 sub-elliptical, twice as long as broad with an external fringe of simple setae. Endopod slightly wider than exopod, broadly truncate, lacking setae. Both

rami lacking articulations and plumose setae. Rami of pleopod 4 ovate, sub-equal, lacking setae and articulations. Endopod of pleopod 5 elliptical, twice as long as broad. Exopod one and a half times length of endopod, apex acute and separated from proximal three-quarters by an articulation. Apical article finely toothed over entire surface. Proximal article bearing two contiguous, toothed bosses on internal, distal margin. Bosses lying either side of a long oblique fold in the pleopod surface. *Uropods*. Endopods broad, juxtaposed to pleotelsonic margin. Exopods minute, set in external margin two-thirds of the length from the apex.

Ovigerous female. Body length 4.42 mm (Fig. 4e, m).

Similar to male excepting primary sexual characteristics. Brood pouch formed by an anterior pocket extending from the cephalosome to the level of pereopod 3, and a posterior pocket extending from the level of the pleopods to the level of pereopod 4. These opposing pockets open between the third and fourth pereopods, the smoothly rounded lip of the anterior pocket being well overlapped by the bi-lobed lip of the posterior (Fig. 4e). The remaining lateral openings are each covered by a pair of small brood plates, arising from pereopods 3 and 4. Within this brood pouch the ova are embedded in the ventral surface of the body, either side of the nerve cord, some ova lying against the terga and being visible through the cuticle in dorsal view. The brood pouch of one female examined contained 23 ova. Mouthparts unmodified.

REMARKS: Morton and Miller (1968: 214, 403-4) mentioned an unidentified isopod from New Zealand which they called *Chitonopsis* sp. Their diagram of this isopod, however, bears a much greater resemblance to *Syncassidina* than to *Chitonopsis*, and its habitat, under stones in stream mouths, a brackish site, would tend to reinforce the view that this is a species of *Syncassidina*. Unfortunately, no full description has been published and the original specimens are no longer available (Hurley and Jansen, 1977: 26). At present the only known platybranch from New Zealand is *Cassidina typa* M-Edw., which is not known from Australian waters (see Fig. 1) and the discovery of a *Syncassidina* species from New Zealand, giving these two regions a common platybranch genus, would be most interesting.

Genus *Chitonopsis* Whitelegge, 1902

Chitonopsis Whitelegge, 1902: 278-283. Hale, 1929: 305. Nierstrasz, 1931: 219-221.

Chitonopsis — Hansen, 1905: 83, 112, 131, (*lapsus calami*).

Type species — *C. spatulifrons* Whitelegge, 1902.

GENERIC DIAGNOSIS: Body elliptical, smooth. Coxal plates of pereonites 2 to 7 separated from tergites by sutures. Pleonal tergite of three apparent segments, fused in mid line, anterior not reaching lateral margins of body. Pleotelson smoothly convex, lacking projections, with apex entire, lacking notch or groove. Antennular peduncle articles 1 and 2 expanded as dorsoventrally flattened lobes, separated in mid-line by anteriorly produced epistome. Epistome extending at least to anterior tip of first peduncle article of antennule. All pereopods ambulatory, unmodified. Exopod of uropod reduced, housed in notch in external margin. *Adult male*. Penes separate to base. Appendix masculina present, having a blunt, dilated tip and arising from proximal, internal angle of endopod of pleopod 2 and extending beyond both rami. *Ovigerous female*. Brood pouch formed from four pairs of brood plates arising from pereopods 1 to 4. Mouthparts not metamorphosed.

Chitonopsis spatulifrons Whitelegge, 1902

Chitonopsis spatulifrons Whitelegge, 1902: 278-283. Hansen, 1905: 83, 112, 131. Hale, 1929: 305-6. Nierstrasz, 1931: 221.

PREVIOUS RECORDS: Off Port Jackson, Coogee and Crookhaven River, N.S.W. (Whitelegge, 1902).

SYNTYPES: Australian Museum Reg. Nos. G. 2151-2 (+1?).

TYPE LOCALITIES: Off Port Jackson, Coogee and Crookhaven River, N.S.W.

MATERIAL EXAMINED: Off Port Jackson, N.S.W.; trawled 2.5 to 3.5 miles (4-5.6 km) from shore, sand and mud, depth 36-39 fathoms (66-71 m); 1 male (syntype); coll. E. R. Waite, 10 March 1898 ("Thetis" Expedition Station 34); Australian Museum Reg. No. G. 2151.

Off Coogee, N.S.W.; trawled 5-6 miles (8-9.7 km) from shore, fine sand, depth 49-50 fathoms (89-91 m); 1 ovigerous female (syntype); coll. E. R. Waite, 15 March 1898 ("Thetis" Expedition Station 44); Australian Museum Reg. No. G. 2152.

St. Vincent Gulf, South Australia; 4 fathoms (7.3 m); 1 male; coll. H. M. Hale; South Australian Museum Reg. No. C. 1057.

St. Vincent Gulf, South Australia; dredged, 18 fathoms (33 m); 1 male; coll. H. M. Hale, 2 February 1924; South Australian Museum Reg. No. C. 1557.

St. Vincent Gulf, South Australia; 1 male, 1 damaged specimen; coll. W. H. Baker; South Australian Museum Reg. No. C. 577.

St. Vincent Gulf, South Australia; 5 males, 5 ovigerous females; South Australian Museum.

Locality unknown; dredged; 1 non-ovigerous female; coll. Verco; South Australian Museum.

SPECIFIC DESCRIPTION: Adult male. Body length 9.8 mm (Fig. 5)

Body elliptical, slightly more than one and a half times as long as wide, very depressed, smooth, lacking projections and dorsal setae, bearing marginal fringe of short setae. Cephalosome four times as wide as long with anterior quadratic projection in mid-line, contiguous with epistome. Eyes small, reniform and — with median region of cephalosome — set into tergum of pereonite 1. Dorsally visible region of epistome and antennular peduncle article 1 equal in length to cephalosome. Pereonal tergites 1 to 7 sub-equal in length with well formed laterally directed coxal plates, those of pereonites 2 to 7 separated from the tergites by sutures. Pleotelson sub-triangular, antero-lateral angles not reaching lateral margins of body; apex smoothly rounded.

Antennae. Antennular peduncle with article 1 directed anteriorly, sub-rectangular, one and a half times as long as broad, with an external notch housing article 3. Article 3 half length of 2, cylindrical and bearing six-articled flagellum. Antenna with peduncle article 1 reduced, 2 to 5 sub-equal, 1 to 5 setose on superior margin, 3 to 5 setose on inferior margin. Setose flagellum of 14 articles. *Mouthparts.* Epistome sub-rectangular with distal lateral margins parallel, expanding proximally to enclose labrum. Mandibles with quadridentate incisor processes and well developed, dorsally acute, molar processes. Inferior borders of palp articles 2 and 3 bearing many plumose setae. Lacinia mobilis of left mandible as a stout, tridentate peg next to four pectinate spines. Right mandible with a cluster of simple spines only. Maxillule and maxilla of usual sphaeromatid form. Maxillipede with palp very well developed. Palp article 1 reduced, 2, 3 and 4 sub-equal, bearing pronounced lobes with apical, plumose setae. *Pereopods.* All ambulatory, unmodified. Pereopod 1 more slender than succeeding; carpus reduced; propus elongate, three and a half times as long as broad; inferior margins of merus,

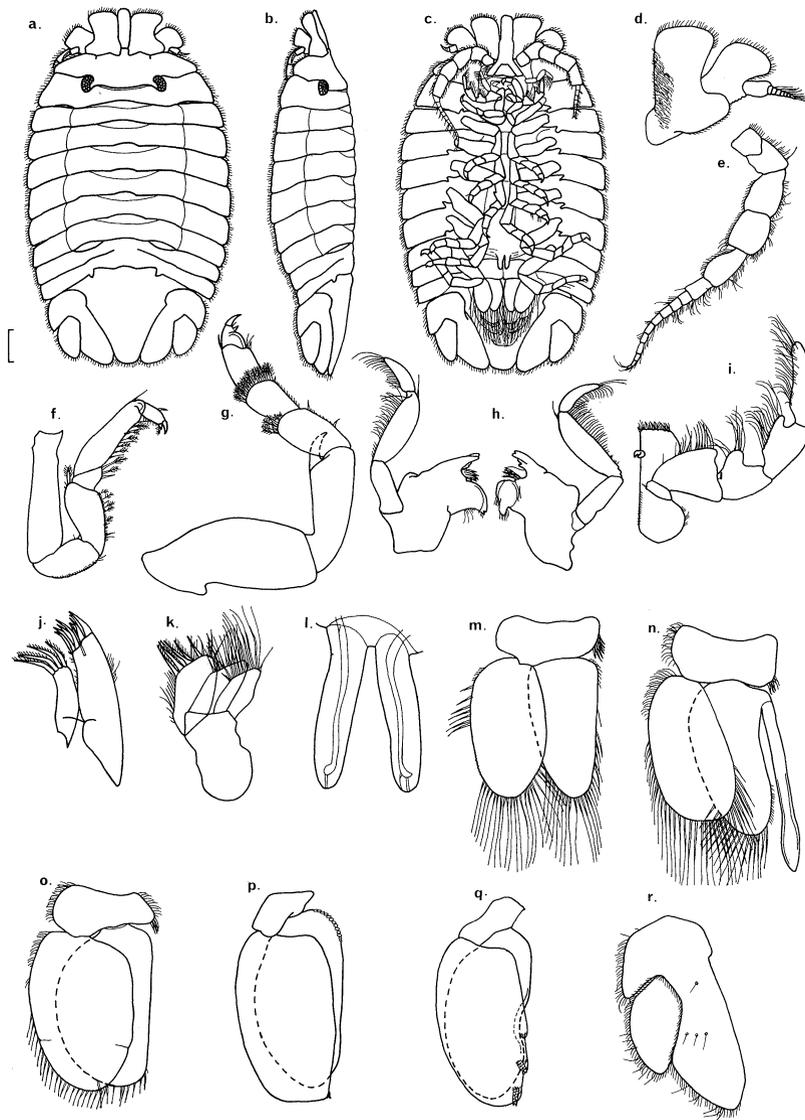


Figure 5. *Chitonopsis spatulifrons* Whitelegge. Adult male (a) dorsal (type); (b) lateral (type); (c) ventral (type); (d) antennule; (e) antenna; (f) pereopod 1; (g) pereopod 4; (h) mandibles; (i) maxillipede; (j) maxillule; (k) maxilla; (l) penes; (m) to (q) pleopods 1 to 5 respectively (blood lacunae and setules of plumose setae omitted); (r) uropod. Scale line represents 1 mm.

carpus and propus bearing many stout plumose setae. Superior distal lobe of merus with one such seta. Pereopods 2 to 7 similar; ischium bearing curved, distal, antero-superior projection; superior distal lobe of merus and posterior distal margin of carpus with row of plumose setae; dactylus robust with strong unguis and small secondary unguis. *Penes*. Simple, each five times as long as wide, cylindrical, with a hemispherical tip. *Pleopods*. Basis of pleopod 1 with seven simple spines on interno-distal margin. Rami sub-equal in length, exopod elliptical, endopod sub-ovate, elongate. Both rami with terminal fringe of long plumose setae. Exopod with external and endopod with internal fringe of long plumose setae. Basis of pleopod 2 with five spines on internal distal margin. Both rami sub-elliptical with terminal, and exopod with external, plumose setae. Endopod slightly narrower and longer than exopod with the internal proximal angle bearing an appendix masculina approximately one and a quarter times the length of the ramus. Appendix masculina twelve times as long as wide with sub-parallel margins and a dilated tip. Basis of pleopod 3 with three spines on the internal distal margin. Rami sub-equal. Exopod bearing very faint sign of an articulation at either side in distal half. Endopod with several, and exopod with many, short, terminal, plumose setae. Rami of pleopod 4 sub-equal, lacking folds, articulations and setae. Proximal, internal margin of endopod with a row of small "scales". Rami of pleopod 5 sub-equal, lacking folds, articulations and setae. Internal, distal margin of exopod bearing three separate, finely-toothed bosses. Inner margin of endopod thickened in region juxtaposed to proximal boss on exopod. *Uropods*. Twice as long as wide. Rounded tip of endopod reaching level of pleotelsonic apex. Exopod half length of endopod, borne in notch on external margin. Outer margins of both rami setose.

Ovigerous female. Body length 13.1 mm.

Similar to male excepting primary sexual characteristics. Brood pouch composed of four pairs of brood plates only, arising from pereonites 1 to 4. Brood plates increasing in size posteriorly and overlapping well in mid-line. Anterior and posterior pockets absent but with the ventral body wall, anterior to the pleopods, dilating ventrally as a shelf juxtaposed to the internal face of the posterior brood plates, the anterior rim of this shelf preventing posterior passage of the eggs. Mouthparts not metamorphosed.

REMARKS: Whitelegge (1902: 283) in describing this species gave the total length of the male as 13 mm and the breadth as 8 mm. Even including the epistome of the present male syntype it does not reach these proportions. It must be concluded therefore that the male specimen to which he refers was larger than the syntype figured here and it was presumably that specimen which was collected off the Crookhaven River, the habitat details being: Off Crookhaven River, N.S.W.; trawled 4 miles (6.4 km) from shore, rock, depth 23 fathoms (42 m); 1 ? male (syntype); coll. E. R. Waite, 19 March 1898 ("Thetis" Expedition Station 53).

Excepting primary sexual characteristics, sexual dimorphism is not apparent in this species. The following morphological comparisons between males (n=9) and ovigerous females (n=6) were made. Mean body length: males 12.57 mm (SD = \pm 2.956), females 14.46 mm (SD = \pm 1.62). Mean body length/body width ratio: Males 1.403 (SD = \pm 0.104), females 1.405 (SD = \pm 0.07). Mean number of antennular flagellum articles: males 7 (SD = \pm 1.6), females 7 (SD = \pm 1.5). Mean number of antennal flagellum articles: males 12 (SD = \pm 1.85), females 13 (SD = \pm 1.73).

It was noted, however, that some of the larger individuals bore very slight median and medio-lateral pereonal tubercles.

Chitonopsis hanseni* Nierstrasz, 1931

Chitonopsis hanseni Nierstrasz, 1931: 219-221.

RECORDS: Labuan Badjo and Timor Sea, Indonesia.

SYNTYPES: Zoological Museum, Amsterdam Reg. Nos. IS. 100. 617-618.

TYPE LOCALITIES: Labuan Badjo, Flores Sea and Timor Sea (10°12.2'S., 124°27.3'E) Indonesia.

MATERIAL EXAMINED: Labuan Badjo, Flores Sea, Indonesia; depth 27-36 m; 1 male, 1 ovigerous female (syntypes); coll. M. Weber, 16-18 April 1899 (Siboga Expedition Station 50); Zoological Museum, Amsterdam Reg. No. IS. 100. 617.

Timor Sea (10°12.2'S., 124°27.3'E); depth 73 m; 1 sub-adult male (syntype); coll. M. Weber, 23 January 1900 (Siboga Expedition Station 294); Zoological Museum, Amsterdam Reg. No. IS. 100. 618.

SPECIFIC DESCRIPTION: Adult male. Body length 8.4 mm (Fig. 6a, b, d, h-o, u, v).

Body elliptical, two and a half times as long as wide, deeply vaulted, lacking projections and dorsal setae. Cephalosome approximately three times as wide as long with anterior quadratic projection in mid-line, dorsal to epistome, not smoothly contiguous with it. Eyes large, reniform, set into tergum of pereonite 1. First antennular peduncle article one and a half times length of cephalosome, not extending anteriorly as far as tip of epistome. Pereonal tergites 1 to 7 sub-equal in length, with well developed, ventro-laterally directed coxal plates, those of pereonites 2 to 7 separated from the tergites by sutures. Pleotelson sub-triangular, apex truncate.

Antennae. Antennular peduncle article 1 directed anteriorly, dorso-ventrally flattened, sub-triangular, apex rounded; 2 sub-pentagonal, extending laterally from article 1; 3 sub-rectangular. Flagellum of eight articles. Antennal peduncle articles not expanded; flagellum of fourteen articles. Antenna reaching posteriorly to pereonite 4. *Mouthparts.* Epistome elongate distally, sub-cylindrical, punctate ventrally, widely bifid proximally enclosing trapeziform labrum and extending anteriorly beyond antennular peduncle article 1. Mandible with well formed palp, tridentate incisor process, setal row and acute molar process. Palp articles 2 and 3 with many plumose setae along inferior margins. Maxillule and maxilla of usual sphaeromatid form. Maxillipedal palp with broad lobe on article 2 and narrow lobes on articles 3 and 4. Articles 2 to 5 with inferior margin of plumose setae. *Pereopods.* Pereopod 1 slender with ischium, merus and propus sub-equal in length; carpus reduced; dactylus slender, twice as long as wide; merus with distal superior lobe bearing several long setae which extend to distal margin of propus. Inferior margins of merus, carpus and propus setose. Pereopods 2 to 6 similar, more robust than 1; ischium to propus with each article slightly shorter than that preceding; dactylus robust. Merus with slight superior distal lobe bearing short setae. Superior distal margin of carpus bearing several long setae. Inferior margins of carpus and propus with several setae. Pereopod 7 as for 2 to 6 but inferior margin of carpus bearing a pronounced row of 7 setae. *Penes.* Separate to base, three times as long as wide. *Pleopods.* Missing from specimen; following description based on Nierstrasz (1931: Fig. 128) and reproduced here as Fig. 6V. Pleopod 2 with endopod just longer than elliptical exopod. Proximal internal margin of endopod bearing an appendix masculina longer than the endopod

*Since going to press a specimen of *C. hanseni* has been sent to the authors from Queensland. The collection details are: Moreton Bay, Qld.; on ascidian, trawled 6 m, 27° 31.4'S 153° 22.2' E; 1 ovigerous female; coll. N. Bruce and N. Svernivig, 10 July 1979; Q. M. Reg. No. W.8047. This is the first record of this species from the Australian coast and greatly extends its known range.

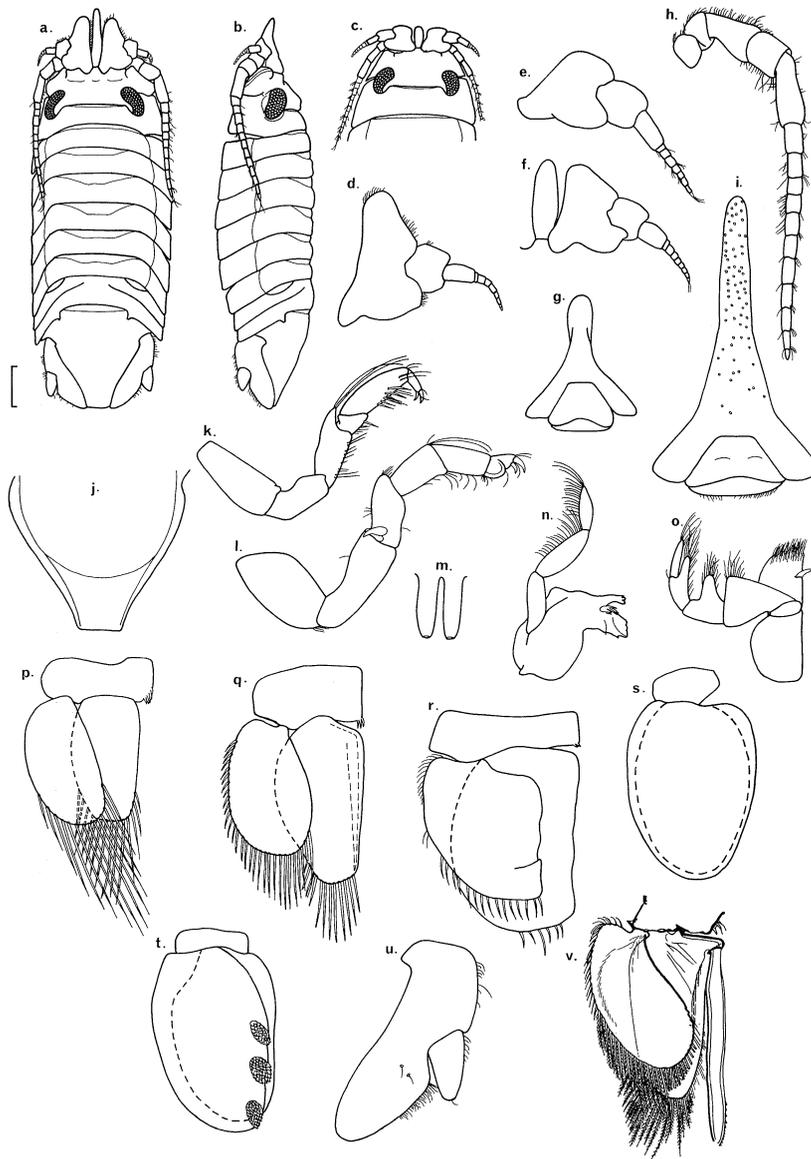


Figure 6. *Chitonopsis hanseni* Nierstrasz. Adult male (type); (a) dorsal; (b) lateral; (d) antenna; (h) antenna; (i) epistome and labrum — ventral; (j) pleotelson — ventral; (k) pereopod 1; (l) pereopod 2; (m) penes; (n) right mandible; (o) maxillipede; (u) uropod; (v) pleopod 2 (from Nierstrasz, 1931: Fig. 128). Ovigerous female (type) (c) dorsal anterior; (e) antennule; (g) epistome and labrum — ventral. Sub-adult male (type) (f) antennule and epistome dorsal; (p) to (t) pleopods 1 to 5 respectively (blood lacunae and setules on plumose setae omitted). Scale line represents 1 mm.

itself. Margins of appendix masculina sub-parallel, tip slightly dilated. Both rami with terminal margins of plumose setae half length of ramus bearing them. *Uropods*. Three times as long as wide; exopod sub-triangular, quarter length of endopod and housed in notch on outer margin mid-way between proximal margin and apex.

Sub-adult male. Body length 6.35 mm (Fig. 6f, p-t).

Differs from adult male in having epistome contiguous dorsally with anterior quadratic projection of cephalosome, and extending anteriorly to same level as the antennular peduncle. *Antennae*. Antennular peduncle article 1 produced anteriorly relatively less than that of adult male. *Penes*. Separate, twice as long as wide. *Pleopods*. Pleopod 1 with rami elliptical, sub-equal, with terminal margin of plumose setae sub-equal in length to the ramus bearing them. Pleopod 2 with appendix masculina not free from internal margin of endopod, but visible as a marginal thickening. Pleopod 3 with exopod slightly smaller than endopod, both rami with sparse terminal margin of short plumose setae. Pleopod 4 with both rami sub-ovate, lacking respiratory folds and setae. Exopod slightly larger than endopod. Pleopod 5 with rami sub-equal, elliptical, lacking respiratory folds and setae. Inner distal margin of exopod bearing three equidistant, finely-toothed bosses. None of the rami of any of the pleopods showing signs of articulation.

Pereopods, mouthparts, uropods and general body configuration as in adult male.

Ovigerous female. Body length 6.44 mm (Fig. 6c, e, s)

Secondary sexual dimorphism apparent, female differing from adult male in its smaller size and the form of the epistome and antennae. Antennular peduncle article 1 lacking pronounced anterior projection, extending little beyond article 2. Antennular flagellum of 7 articles. Antennal flagellum of 12 articles. Epistome contiguous with anterior quadratic projection of cephalosome and extending anteriorly to same level as antennular peduncle article 1. Further secondary sexual dimorphism lacking. Brood pouch composed of paired brood plates (specimen too damaged to allow detailed examination). Mouthparts not metamorphosed.

REMARKS: In his original description, Nierstrasz (1931: 221) stated that his Fig. 127 illustrated pereopod 5. In fact, this illustration is of pereopod 1, clearly showing the reduced carpus of that limb.

The pleopods of the adult male and ovigerous female specimens are now missing and their present whereabouts is unknown (S. Pinkster pers. comm.). It is unlikely, however, that the pleopods of the sub-adult male — excepting pleopod 2 — differ significantly from those of the adult.

Genus **Waiteolana** Baker, 1926

Waiteolana Baker, 1926: 276, 277, 279, pl. 1. Nierstrasz, 1931: 222.

Type species — *W. rugosa* Baker, 1926.

GENERIC DIAGNOSIS: Body strongly sculptured, narrow, vaulted not depressed, lacking projections. Coxal plates directed ventrally, those of pereonites 2 to 7 separated from tergites by sutures. Pleonal tergite bearing three suture lines; anterior entire, posterior two absent in mid-line. Endopod of uropod not reaching as far as indented apex of sub-triangular pleotelson. Exopod half length of endopod. Antennules juxtaposed to ventral margin of cephalosome. Pereopods ambulatory, unmodified. *Adult male*. Form of penes unknown (specimen damaged). Tapering appendix masculina present, arising from proximal internal angle of endopod of pleopod 2 and extending beyond both rami.

Exopods of pleopods 3 to 5 each with sub-terminal, complete articulation. Rami of pleopod 3 with many, and of 4 with several, plumose setae. Inner margin of exopod of pleopod 5 with five finely-toothed bosses, three on distal article and two on proximal article. *Female* unknown.

Waiteolana rugosa Baker, 1926

Waiteolana rugosa Baker, 1926; 276, 277, 279, pl. 1. Nierstrasz, 1931: 222.

PREVIOUS RECORDS: Off Wata Mooli, New South Wales, 1 male.

HOLOTYPE: Australian Museum Reg. No. G. 2275, 1 adult male and 3 microslides.

TYPE LOCALITY: Off Wata Mooli, N.S.W.

MATERIAL EXAMINED: Off Wata Mooli, N.S.W.; trawled 3.5-4 miles (5.6-6.4 km) off shore, mud, depth 54-59 fathoms (99-104 mm); 1 male (holotype); coll. E. R. Waite, 22 March 1898 ("Thetis" Expedition Station 57); Australian Museum Reg. No. G. 2275.

SPECIFIC DESCRIPTION: Adult male. Body length 7.82 mm (Fig. 7a-n).

Body deeply vaulted, two and a half times as long as broad; lateral margins sub-parallel; fine dorsal ornamentation over entire surface. Cephalosome twice as wide as long. Eyes large, strongly convex. Pereonites 1 to 7 sub-equal. Coxal plates of 1 extended anteriorly ventral to eyes. Coxal plates of 2 to 7 ventrally directed, with smoothly rounded margins; not contiguous; and separated from their tergites by obvious suture lines. Pleonal tergite showing evidence of four segments. Anterior segment as wide as tergum of pereonite 7 with entire posterior margin marked by suture line. Second segment reaching lateral margins of body and fused in mid-line to succeeding two. Pleotelson sub-triangular, apex weakly indented with a shallow groove ventrally.

Antennae. Antennular peduncle articles rugose, 1 and 2 expanded anteriorly, just visible in dorsal view. Flagellum of 7 articles. Antenna robust; peduncle article 5 and seven flagellar articles densely setose on external margins. *Mouthparts.* Epistome sub-triangular, flat, extended anteriorly, apex just visible in dorsal view; proximally semi-encloses sub-circular labrum. Mandible with well formed, smoothly rounded, entire incisor process; molar process narrow, acute. Maxillule missing from specimen. Maxilla with lobes slender, bearing stout terminal setae. Maxillipede with palp well produced with articles 2 to 4 bearing pronounced lobes with short terminal setae; article 5 extending beyond lobe of article 4. *Pereopods.* All ambulatory. Pereopod 1 more robust than succeeding, carpus reduced. Inferior margins of merus, carpus and propus of all pereopods bearing spines, those on 1 very stout. Dactylus of all with robust unguis and small secondary unguis. *Penes.* Unknown (holotype damaged). *Pleopods.* Endopod of pleopod 1 almost three times as long as wide, tapering to acute apex. Posterior surface bearing fine ridge next to, and parallel with, inner margin for most of length. Exopod sub-ovate, shorter than endopod. Both rami with terminal border of plumose setae. Exopod of pleopod 2 elliptical, shorter than endopod. Endopod tapering to rounded apex, proximal internal margin bearing a narrow appendix masculina longer than ramus and tapering to an acute tip. Both rami with terminal, and exopod with external, margin of plumose setae. Endopod of pleopod 3 semi-circular with inner margin straight. Exopod sub-ovate with strongly marked, complete, sub-terminal articulation. Both rami with terminal border of plumose setae. Rami of pleopod 4 sub-equal, twice as long as wide, lacking respiratory folds and having several terminal, plumose setae. Exopod with marked, complete sub-terminal articulation; external border bearing simple setae. Both rami of pleopod 5 lacking respiratory folds. Exopod twice as long as wide with

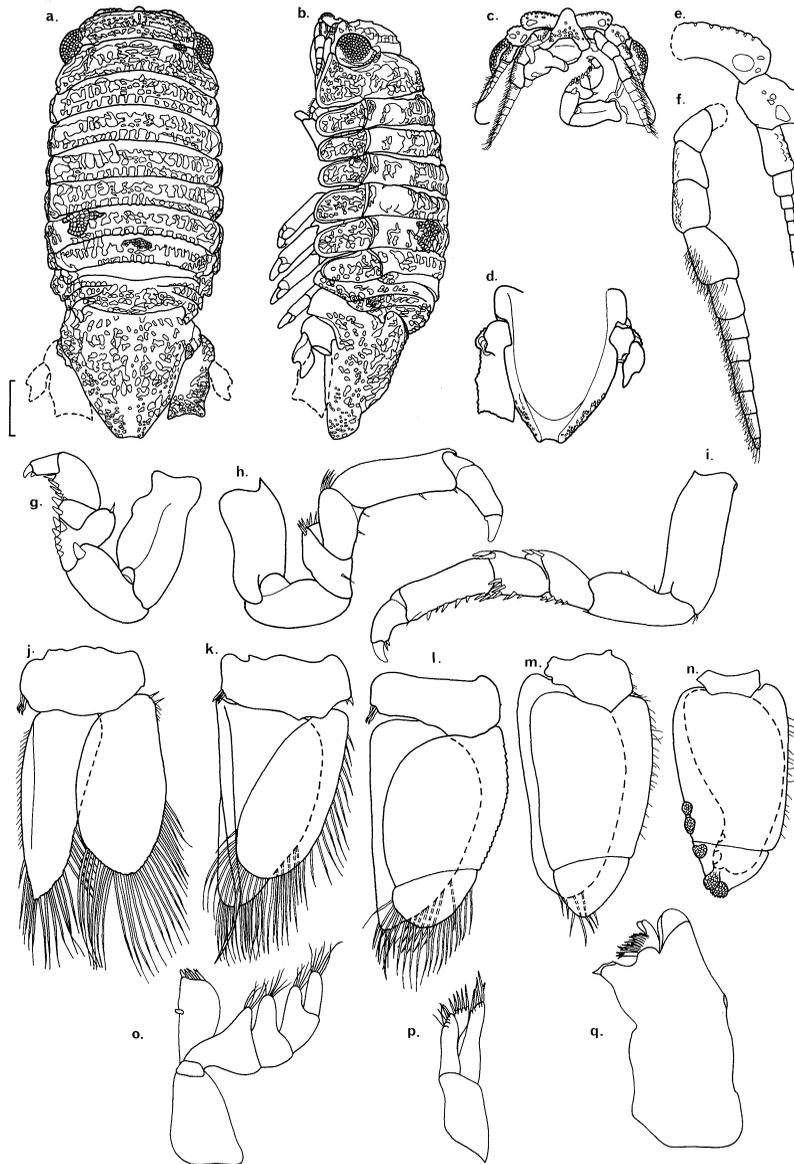


Figure 7. *Waiteolana rugosa* Baker. Adult male (holotype) (a) dorsal; (b) lateral; (c) ventral anterior; (d) pleotelson and uropods — ventral; (e) antennule; (f) antenna; (g) pereopod 1; (h) pereopod 4; (i) pereopod 7; (j) to (n) pleopods 1 to 5 respectively (blood lacunae and setules on plumose setae omitted); (o) maxillipede; (p) maxilla; (q) left mandible (palp omitted). Scale line represents 1 mm.

sub-terminal, complete articulation and simple setae on external border. Inner margin of proximal article of exopod having two finely-toothed bosses near articulation. Distal article with one such boss near articulation and two larger contiguous bosses apically. Endopod damaged on holotype. *Uropods*. Endopod not extending as far as apex of pleotelson; external border sinuous; truncate apex assymmetrically emarginate. Exopod half length of endopod, free, elliptical with deep notch in distal, external margin.

Genus **Platysphaera**, gen. nov.

Synonyms — none.

Type species — *P. membranata* sp. nov.

GENERIC DIAGNOSIS: Body flattened with a membranous extension to circumference; dorsally lacking marked ornamentation and projections. Cephalosome not reaching lateral margins of body. Antennular peduncle articles 1 and 2 expanded as flattened lobes anterior to cephalosome, not separated in mid-line by epistome. Coxal plates of pereonites 2-7 separated from tergites by sutures. Single pleonal tergite lacking sutures. Pleotelson with apex entire, lacking notch or groove. All pereonites and pleonite reaching lateral margins of body. Pereopods ambulatory, unmodified. Both rami of pleopod 3 lacking articulations; bearing long plumose setae. Exopod of pleopod 4 two-articled. Exopod of pleopod 5 with two faint, weakly-toothed bosses. Uropods not meeting in posterior mid-line; exopods reduced, situated anterior to endopods, not housed in notch. Sexual dimorphism not pronounced. *Adult male*. Penes simple, short, separate to base. Appendix masculina present, arising near interno-proximal angle of endopod of pleopod 2 and extending beyond both rami. *Ovigerous female*. Mouthparts not metamorphosed. Ventral pereonal surface as smooth, continuous cuticle, lacking obvious openings and completely enclosing brood. Pereopods 2 to 4 with short brood plates not overlapping in mid-line.

Etymology — Gr. *platus* + *sphaera* i.e. flat sphere (flattened sphaeromatid) (feminine).

Platysphaera membranata, gen. nov., sp. nov.

Synonyms — none.

MATERIAL EXAMINED: Holotype male, 1.84 mm. Queensland Museum Reg. No. W.6327 (+ 1 microslide).

TYPE LOCALITY: Mellish Reef, Central Coral Sea, 17°28'S, 155°55'E. In dead coral in lagoon, depth 6 m. Coll. N. L. Bruce, 01 May 1979.

ALLOTYPE: Ovigerous female, 2.7 mm. Queensland Museum Reg. No. W. 6328. Long Island, Chesterfield Reefs, Central Coral Sea, 19°53'S, 158°28'E. Seaward edge, depth 12 m. Coll. N. L. Bruce, 05 May 1979.

ADDITIONAL PARATYPES: Coral cay, North of Long Island, Chesterfield Reefs Central Coral Sea. In pool at reef rim, depth 2 m. Coll. N. L. Bruce, 05 May 1979. 1 ovigerous female. Queensland Museum Reg. No. W.6329 (+ 2 microslides of antennae, pereopods, uropod, mouthparts).

— Long Island, Chesterfield Reef. Seaward edge of reef, depth 15 m. Coll. N. L. Bruce, 06 May, 1979. 1 immature specimen.

— Mellish Reef, Central Coral Sea. Depth 20 m. Coll. N. L. Bruce, 01 May 1979. 1 immature specimen.

Etymology — *Platysphaera* + *L. membranata* i.e. membraned.

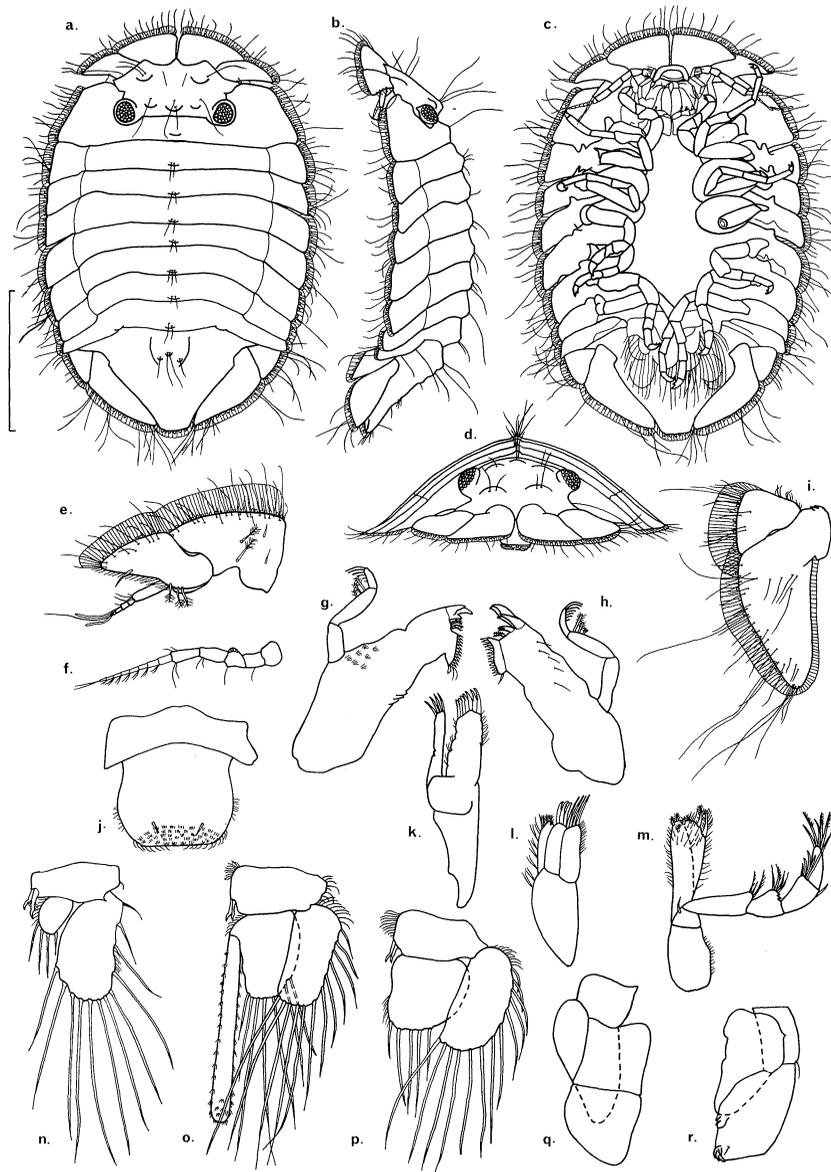


Figure 8. *Platsphaera membranata* gen. nov., sp. nov. Ovigerous female paratype (non-allotype) (a) dorsal; (b) lateral; (c) ventral; (d) anterior; (e) antennule; (f) antenna; (g) right mandible; (h) left mandible; (i) uropod; (j) epistome and labrum; (k) maxillule; (l) maxilla; (m) maxillipede. Adult male (holotype) (n-r) pleopods 1-5 respectively (setules omitted from plumose setae). Scale line represents 1 mm.

SPECIFIC DESCRIPTION: Adult male. Body length 1.84 mm. (Figs 8n-r, 9h).

Body elliptical, one and a half times as long as wide; flattened, coxal plates directed laterally. Margins of antennules, pereon, pleon, uropods and pleotelson closely applied, producing a regular, sub-continuous outline. Entire margin bearing a narrow "membrane" (apparently formed from fused setae). At junction of "membrane" with true margin, margin bearing short, separate "pegs" embedded in membrane base. Circumference of body also bearing a fringe of irregular, long setae. Cephalosome twice as wide as long with a short, acute projection in the anterior mid-line and an obtuse projection either side of this. Dorsal surface of cephalosome with 5 tubercles; two anterior — at bases of obtuse anterior projections — and three in a transverse row between the eyes. Eyes sub-circular, darkly pigmented, very convex, occupying the postero-lateral angles of the cephalosome. Pereonite 1 extending anteriorly lateral to the eyes, juxtaposed to article 2 of antennule. Pereonites 2 to 7 and pleonite sub-equal, each having a slight setose tubercle in dorsal mid-line, additional ornamentation absent. Pleotelson domed, sub-triangular, apex broadly truncated; anterior mid-line bearing a raised boss, additional ornamentation absent.

Antennae. Antennular peduncle articles 1 and 2 strongly flattened, article 1 twice length of article 2. Article 3 unmodified, five times as long as broad, sub-equal in length to article 2. Flagellum of four articles, distal two each bearing one aesthetasc. Antennules juxtaposed in animal's mid-line, not separated by epistome. Antennal articles not expanded. Peduncle articles sub-equal in length; article 1 sub-circular, article 3 with superior lobe bearing several "scales". Flagellum of nine articles. Antenna sub-equal in length to antennule. *Mouthparts.* Epistome transverse anteriorly, not extended between antennules or beyond cephalosome; not embracing labrum proximally. Mandibles slender, incisor processes and palps well developed, molar processes short, oblique, serrate. Left mandible with incisor process of four stout teeth. Lacinia mobilis as a notched peg, and a short setal row. Right mandible with incisor process of three stout teeth, and a setal row. Second article of each palp with three plumose setae on infero-distal margin. Maxillule with seven simple spines on exopod and four pectinate spines on endopod. Maxilla with four long, simple spines on each of outer two lobes and shorter plumose spines on inner lobe. Maxillipede with endite narrow, four times as long as broad, lacking coupling hooks; distal margin bearing two long, external, and a group of short, internal plumose setae. Palp slender, articles 2 to 4 bearing long, inferior lobes; articles 2 to 5 bearing short, weakly-plumose setae. *Pereopods.* Pereopod 1 more robust than succeeding pereopods; carpus reduced; propus with three antero-distal, plumose setae. Pereopods 2 and 3 sub-equal, slender; ischium, merus, carpus and propus sub-equal in length. Pereopod 4 slightly more robust than 3, carpus reduced. Pereopods 5 and 6 sub-equal, slightly more robust than pereopod 4 with carpi slightly longer. Pereopod 7 longer than, and more slender than, pereopod 6; carpus not reduced, with postero-distal margin bearing five stout plumose setae not found on other pereopods. *Penes* simple, separate to base; each twice as long as wide with smoothly rounded tip. *Pleopods.* Interno-distal angle of basis of pleopod 1 with two coupling hooks. Rami sub-elliptical, markedly unequal; exopod five times the size of the endopod, with one simple externo-proximal seta, three external plumose setae and a terminal margin of plumose setae one and a half times the length of the ramus. Endopod with four short, terminal setae. Basis of pleopod 2 bearing two coupling hooks. Exopod sub-rectangular, equal in length to sub-ovate endopod. Endopod bearing an appendix masculina originating near interno-proximal angle and being separated from the ramus by an articulation. Appendix masculina flat, twice as long as ramus with sub-parallel sides bearing microtrichia and a rounded, truncated apex bearing several non-marginal microtrichia. Both rami with terminal, plumose setae twice length of rami, and exopod

with external margin of setae. Basis of pleopod 4 lacking coupling hooks. Exopod sub-rectangular, one and a half times the length of narrowly sub-ovate endopod. Both rami lacking setae and respiratory folds. Exopod bearing transverse articulation mid-way along length, separating sub-quadratic, proximal article from sub-quadrantic distal article. Endopod lacking articulations. Basis of pleopod 5 lacking coupling hooks. Rami sub-equal in length but exopod extending beyond endopod. Endopod narrowly sub-ovate, exopod sub-elliptical; both rami lacking setae, folds and articulations. Exopod with two very weakly toothed bosses on internal margin, one apical and one sub-apical. *Uropods*. Each with endopod broad, four times the size of exopod, sub-triangular, juxtaposed to lateral margin of pleotelson and not extending beyond level of its apex. Exopod sub-triangular, arising from anterior-proximal margin of endopod and occupying region between endopod and pleonite.

Ovigerous female. Body length 2.7 mm (figs 8a-m, 9a-g).

Differs from the above description of the male only in primary sexual characters and — in the specimens examined — by its larger size. Brood enclosed by ventral cuticle, which is smooth and apparently devoid of openings. Pereopods 2 to 4 with short brood plates not overlapping in mid-line. Brood number 6 to 8 (approximately 6 late stage embryos in allotype, 8 ova in second ovigerous female paratype). Mouthparts unmodified.

REMARKS: The type series contained only one adult male specimen, which has been designated the holotype. Due to the undesirability of dissecting the holotype, only the pleopods from one side have been removed for figuring (fig. 8n-r). The remaining figures are of an ovigerous female paratype (non-allotype) and while the written description of the male is based — for fine detail — on the appendages of this female (the use of immature specimens being considered unsatisfactory for this purpose), the holotype has, as far as possible, been compared closely to the female and any differences have been incorporated in the holotype's description.

In the ovigerous female it proved impossible to tell whether the ventral cuticle is composed of the sternites (with the brood housed within the body e.g. in the oviducts), or fused folds of cuticle (with the brood in a pouch ventral to the sternites). More specimens are needed to decide this, but it is more probable that the latter is the case as ventral 'pockets' of cuticle are found in platybranch genera closely related to *Platysphaera* (e.g. *Leptosphaeroma* sp.: Hansen, 1905: 79, 80; *Syncassidina* — see above).

Of the known sphaeromatid genera, *Platysphaera* appears to be most closely related to *Leptosphaeroma* Hilgendorf, especially with regard to the cephalosome and pereon. The mandibles show a similar form and pereopod 1 is more robust than the other pereopods in both genera. *Platysphaera* differs from *Leptosphaeroma* in the form of the pleon and pleotelson. In *Leptosphaeroma* the pleonal tergite is divided by two sutures reaching the lateral margins, and the endopods of the uropods meet in the mid-line beyond the pleotelsonic apex. The uropodal exopods of *Leptosphaeroma* are housed in lateral notches, the anterior margins of these notches being reduced to narrow spines (Nishimura, 1976). In *Platysphaera* this region of uropod appears to have been lost completely, leading to the condition of the exopod lying anterior to the endopod.

The pereopods of *Platysphaera* are unusual in that pereopod 4 has a reduced carpus similar to that of pereopod 1. Pereopods 5 and 6 show a similar, though less pronounced, reduction.

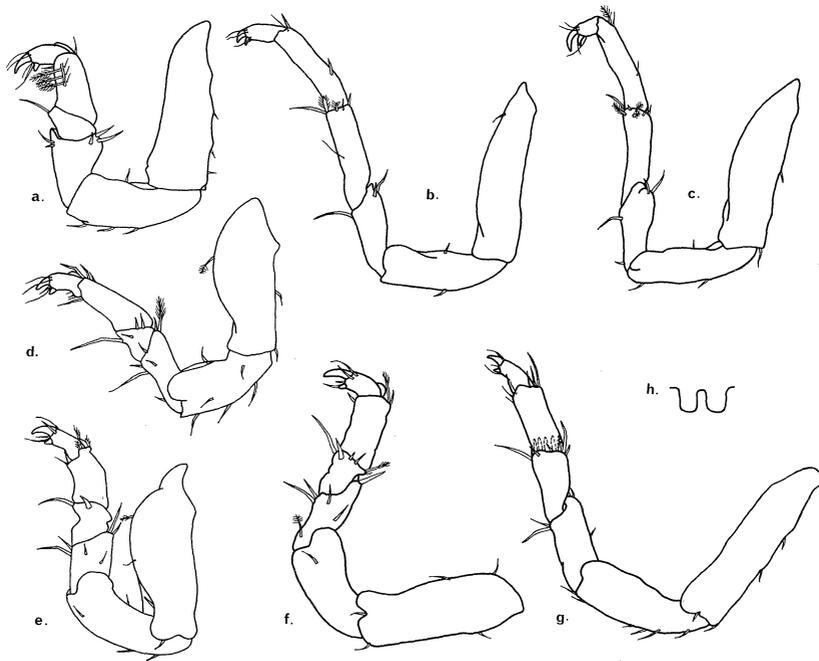


Figure 9. *Platysphaera membranata* gen. nov., sp. nov. Ovigerous female (non-allotype) (a-g) pereopods 1-7 respectively. Adult male (holotype) (h) penes.

It is noteworthy that many new platybranch species are proving to be members of new genera, showing the Platybranchiatae to be a very diverse group. It is to be expected that many new species and genera remain to be discovered, and these will hopefully provide much information that will aid our understanding of the Sphaeromatidae as a family.

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REFERENCES

- Baker, W. H. 1911. Notes on some species of the isopod family Sphaeromidae from Southern Australian seas. Part 3. *Trans. R. Soc. S. Aust.* 35: 89-93.
- 1926. Species of the isopod family Sphaeromidae, from Eastern, Southern and Western coasts of Australia. *Trans. R. Soc. S. Aust.* 50: 247-279.
- 1929. Australian species of the isopod family Sphaeromidae (continued). *Trans. R. Soc. S. Aust.* 52: 49-61.
- Hale, H. M. 1929. The crustaceans of South Australia. In: Handbooks of the flora and fauna of South Australia Pt. 2: 201-380. British Science Guild, Adelaide.
- Hansen, H. J. 1905. On the propagation, structure and classification of the family Sphaeromidae. *Q. Jl microsc. Sci.* 49: 69-135.
- Holdich, D. M. and Harrison K. in press (a). Morphological variation in the *Serolis minuta*-group (Isopoda, Serolidae) from Australian waters. *Zool. J. Linn. Soc.*, 68: 373-386.
- In press (b). the isopod genus *Gnathia* Leach from Queensland waters with descriptions of nine new species. *Aust. J. mar. Freshwat. Res.*
- Hurley, D. E. and Jansen, K. P. 1977. The marine fauna of New Zealand: family Sphaeromatidae (Crustacea, Isopoda, Flabellifera). *Mem. N.Z. oceanogr. Inst.* 63: 1-95.
- Morton, J., and Miller, M. 1968. *The New Zealand Sea Shore*. Collins, London. 638 pp.
- Naylor, E. 1966. Port Phillip Survey 1957-1963. Isopoda. *Mem. Nat. Mus. Vict.* 27: 183-198, 377-384.
- Nierstrasz, H. F. 1931. Die Isopoden der Siboga-Expedition. 3 Isopoda Genuina. 2. Flabellifera. In: Weber, M. Siboga-Expeditie No. 114. (Monogr. 32c): 123-233.
- Nishimura, S. 1976. Redescription of *Leptosphaeroma gottschei* Hilgendorf (Isopoda, Sphaeromatidae), with some biological notes. *Publ. Seto Mar. Biol. Lab.* 23 (1/2): 169-177.
- Poore, G. C. B., Rainer, S. F., Spies, R. B. and Ward E. 1975. The Zoobenthos Program in Port Phillip Bay, 1969-73. *Fish. Wildl. Pap., Vict.* No. 7. 77pp.

Queensland Museum 1974a. The sublittoral macrobenthos of the proposed Brisbane airport extension area. Brisbane. 43pp. (Report).

Queensland Museum 1974b. The estuarine sublittoral macrobenthos of southeastern Queensland: a preliminary survey. Brisbane. 41pp, Appendix 1 (4pp), Appendix 2 (25pp). (Report).

Rotramel, G. 1975. Filter-feeding by the marine boring isopod, *Sphaeroma quoyanum* H. Milne Edwards, 1840 (Isopoda, Sphaeromatidae). *Crustaceana* 28 (1): 7-10.

Stephenson, W. and Cook, S. D. 1977. Aggregation of sublittoral macrobenthos in Moreton Bay, Queensland. *Aust. J. Ecol.* 2: 419-428.

Whitelegge, T. 1902. Scientific results of the trawling expedition of H.M.C.S. "Thetis". *Crustacea*. Pt. 3. Isopoda Pt. 2. *Mem. Austr. Mus.* 4: 249-283.

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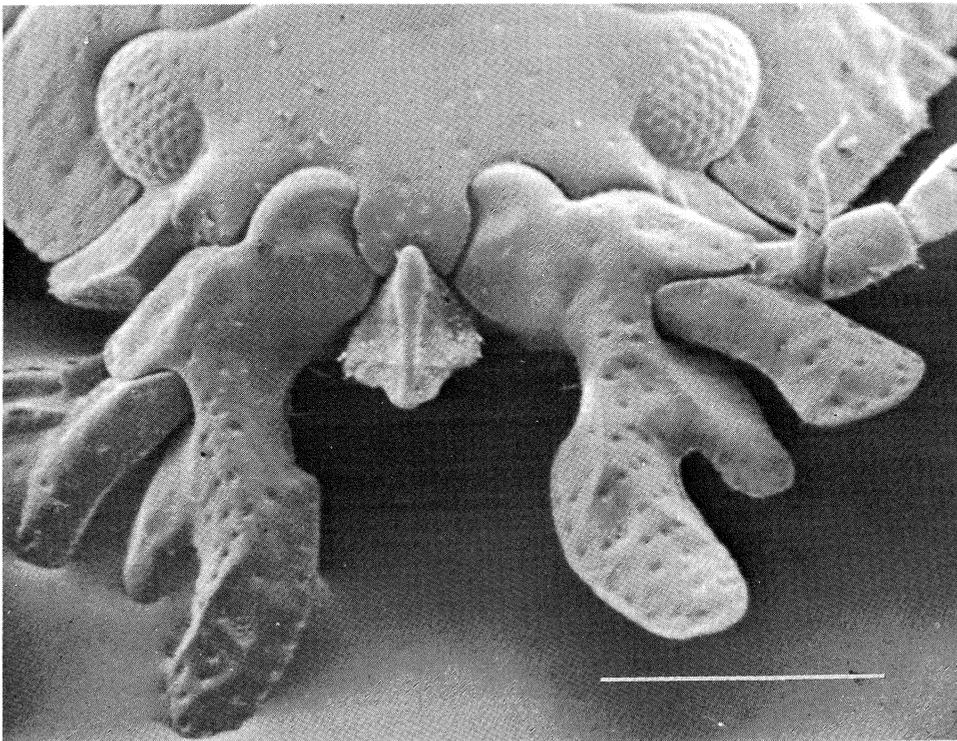


Figure 10. Scanning electron micrograph of the cephalosome of a male *Paracassidina pectinata* Baker from Queensland. (Coated in gold with a polaron Sputter Coater and viewed with a Cambridge 600 SEM). Scale bar equals 0.5 mm.

