Comparative Morphology and Review of Mytilocyprinid Ostracods (Family Cyprididae)

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Institut Géologique, Université de Louvain, 1348 Louvain-la-Neuve, Belgium; present address: Department of Zoology, University of Adelaide, Adelaide, S.A. 5000.

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Abstract

The morphology of 14 species of the Australian tribe Mytilocypridini (Family Cyprididae Baird, 1845), grouped within the three genera *Australocypris, Mytilocypris* and *Trigonocypris*, is compared in order to find which morphological features are important in their taxonomy at the generic and specific levels of that tribe. The following characteristics are found to be important at the generic level: longitudinal and transverse section of carapace; position of selvage and structure of inner lamella; shell outline; outline of prehensile palps of male first leg; length ratio, ventrodistal hair of first segment to third segment on second leg; fusion between second and third segments of second leg; ratio of claws of furca; ratio of branches of furcal attachment. The following are important at the specific level: shell outline (+ various measurements made on shell); hinge area; prehensile palps of male first leg; hemipenis. A description of five of the species studied (four new to science), and a revision of the others, follow.

Introduction

To date, the establishment of certain characteristics or features of ostracods as being important in distinguishing them from one another, has been limited. Often scientists have incompletely described some appendages and the carapaces of ostracods without really knowing which details were taxonomically important. However, such features do exist and have already been partly recognized by Triebel (1968), who investigated the importance of rosettes of the ejaculatory tube as well as the chitinous framework of the mouth region, Rome (1969) (the furcal attachment), Danielopol

(1969) (the hemipenis), McKenzie (1971) (the female first leg) and Schultz (1975) (the chitinous framework of the entire animal). Triebel, throughout most of his work on ostracods, also studied various features of the shell for their taxonomical importance; the features he considered significant were summarized in Morkhoven (1962) as: pattern of muscle scars; extent and structure of inner lamella; selvage (shown by sections through the anterior of the shell); marginal pore canals. With the aid of scanning electron microphotography, new fields of research became possible and, for example, Puri (1974) then investigated the taxonomical importance of the normal pore canals of the shell.

It is necessary to study all these features, and others, in order to facilitate the discovery of relationships, not only between families, but also among subfamilies, genera and species of ostracods.

To suit the purpose of this study, the 'giant' (3 mm or more) ostracods belonging to the tribe Mytilocypridini were chosen. So far, all the known species belonging to this tribe are endemic to Australia. They are either nectic or benthic in their mode of movement, and are found in waters of a wide range of salinities (some live in waters of up to 112.5°‰). All the species belonging to this tribe will be compared in order to find out distinguishing features at the specific and generic levels. It will be done in two stages; first examination of the hard parts and then that of the soft anatomy. However, a generalization about the usefulness of such features in taxonomy for all ostracods will only be possible after similar studies have been done for other groups.

History of the Discovery of Species of Mytilocypridini

In 1886, Brady described a large ostracod from Kangaroo I., which he called *Cypris mytiloides*, and of which he illustrated the carapace and furca. In 1919, F. Chapman described a Pleistocene fauna consisting of ostracods from Boneo Swamp, west of Cape Schanck in Victoria. It included *Cypris mytiloides*; Chapman also stated that this species was common in Victorian swamps and lakes and at Yering Flats near Lilydale, Vic. (Chapman also said that it was particularly abundant in Boneo Swamp.)

In 1936, F. Chapman described the fossil ostracod *Cypris praenuncius* from Bennett's Tank, Neds Corner (32 km south of the Murray and 16 km east of the South Australian boundary) and noted the close relationship of this species to *C. mytiloides*.

It was not until 1966 that McKenzie recognized a new genus from Calvert's Lagoon in Tasmania and named it *Mytilocypris tasmanica*. He also discussed the affinity of *C. mytiloides* to *Mytilocypris tasmanica* and transposed the former species to *Mytilocypris*. The same year, M. A. Chapman described three new species of large ostracods, *Eucypris henricae, E. splendidae* and *E. insularis*, and added to the list *E. mytiloides* (Brady, 1886) after having examined the type material of *Cypris mytiloides*. These species obviously belonged to *Mytilocypris*, with the exception of *E. insularis*, which is rather different in many ways (*sic* Chapman). The presence of *Mytilocypris henricae* in different localities in Victoria was later mentioned by McKenzie and Pollard (1966) and Pollard (1970). McKenzie (1968) mentioned the presence of a *Mytilocypris* sp. from the Tertiary near Geelong. (I have examined this material but could not identify it as it was badly preserved.)

In 1974, I described a new genus *Australocypris*, and two new species, *A. robusta* and *A. hypersalina*, as well as one *Australocypris* sp., and also mentioned the

similarity of *E. insularis* to *Australocypris*. It is also at this point that the tribe Mytilocypridini was created to group together *Australocypris* and *Mytilocypris*.

In 1976, I also studied a new genus, *Trigonocypris*, with one new species, *T. timmsi*, and a fossil one, *Trigonocypris* sp., from Queensland. These are closely related to *Mytilocypris* and *Australocypris*.

Since then I have accumulated a large collection of these giant ostracods. I received a large number of specimens from Dr I. A. E. Bayly, Dr M. Geddes, Dr P. S. Lake and Dr B. V. Timms, and also went on collecting trips in order to obtain as many specimens for the present study as possible, and to have enough data to allow me to plot the geographical distribution of this group of ostracods.

The list of localities for the various mytilocypridinid ostracods studied here is to be found below and in Fig. 1.

I also examined F. Chapman's specimens from Boneo Swamp and identified them as *M. tasmanica*.

F. Chapman's original material from which *C. praenuncius* from Bennett's Tank was described was lost, except for two thin sections from a slab of rock, as well as a second slab which I examined. The slab yielded poorly preserved ostracod specimens in a calcareous marl. However, among the fragments of ostracods found on the slab, kept in the National Museum of Victoria, I recognized the typical posterior end of the shell which is characteristic of fossil specimens collected from the side of Lake Keilambete and of living ones, for example, from Lakes Bookar, Coradgill, Corangamite and Kariah in Victoria. The specimens from the slab were then considered to belong to *M. praenuncia* and are illustrated here. They do not correspond to Chapman's original illustrations, but the accuracy of these is queried because, for example, the specimens which he illustrated from Boneo Swamp are quite different from the illustrations published.

List of Occurrences of Studied Mytilocypridinid Ostracods Recorded in the Literature and from my Unpublished Data

Australocypris De Deckker, 1974

    Australocypris hypersalina De Deckker, 1974

    (1) Cut-off arm of Lake Eliza, S.A. (De Deckker 1974)
    (2) Greenfield's Lagoon, Kangaroo I., S.A.
    (3) Mitre Lake, Vic.
    (4) Lake near Nora Creina Bay, S.A. (De Deckker 1974)
    (5) Lake Robe, S.A. (De Deckker 1974)
    (6) Lake St Clair, S.A. (De Deckker 1974)
    (7) Pond near Salt Works, 12 km E. of Langhorne Creek, S.A.
    (8) Salt Lake, Beachport, S.A.
    (9) Shallow saline swamp near southern end of Lake Eliza, S.A. (De Deckker 1974)
    (10) Small lake near Errington's Hole on way to the boundary, S.A. (De Deckker 1974)
    (11) Small lake on opposite side of road to southern end of Lake Eliza, S.A. (De Deckker 1974)
    (12) South of The Coorong, S.A.
    (13) St Mary's Lake, Vic.
    (14) White Lagoon, Kangaroo I., S.A.

    Australocypris insularis (Chapman, 1966)

    (15) Birida, 8.5 km south of Salt Works, Shark Bay, W.A. (26°33'S., 113°24'E.) (Loc. 21)
    (16) Birida, 40 km west of Hamilton Homestead, Shark Bay, W.A. (26°33'S., 113°55'E.) (Loc. 23)
    (17) Birida, 12 km south of Salt Works, Shark Bay, W.A. (26°12'S., 113°24'E.) (Loc. 24)
    (18) Houtmans Abrolhos, West Wallabi Island, W.A. (Chapman 1966)

Australocypris robusta De Deckker, 1974

(19) Lake Beeac, Vic. (De Deckker 1974)
(20) Lake Gnarpurt, Vic. (De Deckker 1974)
(21) Lake Gnotuk, Vic. (De Deckker 1974)
(22) Lake Keilambete, Vic. (De Deckker 1974)
(23) Salt Works, Tunbridge, Tas.
(24) Samphire Flats, Barrilla Bay, Tas. (= *Australocypris* sp., De Deckker 1974)
(25) South of The Coorong, S.A.

Australocypris ? rectangularis, sp. nov.

(26) Centre Lake, Vic.

Trigonocypris De Deckker, 1976

Trigonocypris globulosa, sp. nov.

(27) Lake Buchanan, Qld.
(28) The Salt Lake, 80 km south of Tibooburra, N.S.W.

Trigonocypris timmsi De Deckker, 1976

(29) Pine Tree Creek Lagoon, via Hughenden, Qld (De Deckker 1975)

Trigonocypris sp. De Deckker, 1976

(30) Fossil, Tertiary, central Queensland

Mytilocypris McKenzie, 1966

Mytilocypris henricae (Chapman, 1966)

(31) Bulldozer Swamp, Rottnest I., W.A.
(32) Currawong via Salt Creek, S.A.
(33) Lake Coradgill, Vic.
(34) Lake Linlithgow, near Hamilton, Vic. (Chapman 1966)
(35) Lake Lomond, Vic. (F. Chapman's collection)
(36) Lake Purdigulac, Vic.
(37) Murray Lagoon, NE. of Teatree Lagoon, Kangaroo I., S.A.
(38) Oldfield River, Rottnest I., W.A.
(39) Pond near Lake White, Vic.

Mytilocypris mytiloides (Brady, 1886)

(40) Birchmore Lagoon, Kangaroo I., S.A.
(41) Blackmans Lagoon, Tas. (40°55'S., 147°36'E.)
(42) Creek off Logans Lagoon, Flinders I.
(43) Kangaroo I. (Brady 1886)
(44) Lake Ada, Kangaroo I., S.A.
(45) Lake Edward, S.A. (37°38'S., 140°36'E.)
(46) Lake Hopetoun, Vic. (Chapman 1966)
(47) Lake Wallace, Vic. (Chapman 1966)
(48) Porters Lagoon, N. of Eleanor River, S.A.
(49) Sheepwash Lagoon, Vic. (38°08'S., 141°11'E.)
(50) Six Mile Lagoon, Kangaroo I., S.A.
(51) White Lagoon, Tas. (42°04'S., 147°28'E.)

Mytilocypris splendida (Chapman, 1966)

(52) Collins' Lake, near Lake Yallakar, Vic.
(53) Lake Bolac, Vic. (Chapman 1966)
(54) Lake Bookar, Vic. (Chapman 1966)
(55) Lake Buchanan, Qld.
(56) Lake Colac, Vic.
(57) Lake Cooper, Vic. (Chapman 1966)
(58) Lake Gnarpurt, Vic.
(59) Lake Kariah, Vic.
(60 Lake Learmonth, Vic. (Chapman 1966)

(61) Muddah Lake, N.S.W.

(62) The Salt Lake, 80 km S. of Tibooburra, N.S.W. (30°08'S., 142°07'E.)

(63) Salt Works, Tunbridge, Tas.

Mytilocypris tasmanica McKenzie, 1966

(64) Birchmore Lagoon, Kangaroo I., S.A.

(65) Calverts Lagoon, South Arm, near Hobart, Tas. (McKenzie 1966)

(66) Boneo Swamp, Vic. Pleistocene

Mytilocypris ambiguosa, sp. nov.

(67) Barkers Swamp, Rottnest I., W.A.

(68) Lighthouse Swamp, Rottnest I., W.A.

(69) Pool near Lake Goldsmith, Vic.

(70) 5 km east of Ongerup, W.A. (M. A. Chapman's collection)

Mytilocypris minuta, sp. nov.

(71) Barkers Swamp, Rottnest I., W.A.

(72) Currawong, via Salt Creek, S.A.

(73) Lake Preston, 50 km south of Perth, W.A.

(74) A pond 8 km N. of Kingscote, Kangaroo I., S.A.

(75) Rush Lagoon, Kangaroo I., S.A.

Mytilocypris praenuncia (Chapman, 1936)

(76) Lake Bookar, Vic.

(77) Lake Coradgill, Vic.

(78) Lake Corangamite, Vic.

(79) Lake Kariah, Vic.

(80) Lake Keilambete, fossil

(81) Small lake near Centre Lake, Vic.

(82) The Mallee, Vic. Pleistocene (Chapman 1936)

(83) Unnamed lagoon, N. of Eleanor River, S.A.

Mytilocypris sp. fossil

(84) Late Tertiary, Morwell Coal Seam, Geelong, Vic. (Waldman and Handby 1968)

Genus *Mytilocypris*

(85) Lake Modewarre, Vic. (Pollard 1970)

(86) Murchison River, W.A. (McKenzie 1971)

(87) Swampy Lagoon, near Kilcunda, Vic. (McKenzie 1971)

Comparative Morphology

Carapace Morphology

The following details will be studied in order to determine the interspecific variations.

(1) External features. Various measurements of the shell and general shape and outline of male and female;

Longitudinal and transverse sections of the specimens;

Surface features;

Muscle scars, including dorsal muscle scars;

Normal pore canals.

(2) Internal features. Marginal pore canals;

Longitudinal and transverse sections showing selvage, outer list, marginal zone and duplicature;

Hinge.

(3) Relation between carapace outline and mode of locomotion.

(i) *External features*

General shape and outline of the valves. All the species belonging to *Australocypris, Mytilocypris* and *Trigonocypris* have a smooth, pseudopunctate shell, without ornamentation or inflations (Figs 16-26). Therefore, to distinguish these three genera from one another and from other genera within the family Cyprididae, other features have to be used. For this purpose, thin sections were made in order to find the characteristic shape of each genus, and of each species in particular (discussed later).

A difficulty of describing a new species is placing it within its appropriate genus. However, if shapes typical of every genus could be tabulated, it would considerably simplify the process. It would also be a great advantage if features of the external carapace could be used to distinguish one genus from another, rather than, or in conjunction with, the soft parts. The size, first of all, is obviously not the best feature to use, as many species placed at present within one genus can show large differences. However, some genera are only characterized by their large size like *Megalocypris* Sars, 1898, *Apatelecypris* Rome, 1965 and *Hypselecypris* Rome, 1965, as well as the three genera grouped within the Mytilocypridini.

I do not think that it is possible at this stage to establish a complete formula to answer this problem, because of the lack of material available. However, my aim is to establish some basis for the identification and comparison of carapaces for the species within the Mytilocypridini, according to the most prominent features. For that purpose, measurements were made on male and female representatives of each mytilocypridinid species by plotting tangents over the lateral outline of the shell (Figs 2, 3). The anterior and ventral tangents were made to intersect and form a right angle (A in Fig. 3). The ratios derived from these measurements should be of more value than direct measurements of the specimens, as within a population there are always some individuals which are larger than others.

It should be pointed out that there is some sexual dimorphism and that females are always much larger and lack the posterodorsal hump of males. The tangent to the dorsal area therefore forms a smaller angle with the tangent to the ventral area in females than in males. The hump in males is thought to allow the hemipenes to rotate easily within the shell before copulation.

The data for all known mytilocypridinids were plotted against one another to see if some features (known here as measurements) could help to differentiate the species. First of all, it was found that, on most of the diagrams plotted, there were always some values which would not differentiate some *Australocypris* from some *Mytilocypris*. For that reason, values for these two genera are plotted separately. (However, it is possible to differentiate these two genera, and their appropriate species, on the basis of other shell characteristics, e.g. transverse sections.) The following data are compared in Figs 4-7 and tabulated in Appendix 1:* length AC to length CD (Fig. 6), length AB to length AD (Fig. 4), length AD to length AC (Fig. 5), angle γ to angle δ (Fig. 7), and the following conclusions have been made.

When AC is plotted against CD, many species have similar values, so that this ratio is unsatisfactory for taxonomic terms (Fig. 6). Similarly, plotting AD against AC does not enable differentiation of all species (Fig. 5), e.g. *A. robusta* and *A. rectangularis* are not distinguished from each other or from the *A. insularis-A. hypersalina* complex. However, plotting AB against AD (Fig. 4) is of some value,

* Appendix 1 has been lodged as accessory material with the Editor-in-Chief, Editorial and Publications Service, CSIRO, P.O. Box 89, East Melbourne, Vic. 3002.

and species are easily distinguished one from another. The measurement of angle γ against angle δ is also valuable (Fig. 7). Such measurements will need to be taken and plotted for other cypridinid species, to see if they are always of some taxonomical value. For the present, it is only possible to say that the ratios of AB to AD, and γ to δ, are good ways of differentiating all mytilocypridinid species studied here.

These plots also show how different the two *Trigonocypris* species are from the other two genera.

Sections. As mentioned before, longitudinal and transverse cross-sections of each species were made in order to examine the features of the shell and some of its internal structures.

In longitudinal sections it is possible at first glance to see that the three genera are consistent (Figs 8, 27). *Mytilocypris* has a very narrow elongated carapace, with length–width ratio *c.* 3.10 and greatest width at about $\frac{3}{5}$ of its length from the anterior end. *Australocypris* is more elliptical in shape and much broader than *Mytilocypris.* The length–width ratio is *c.* 2.71, and the greatest width is at $\frac{2.2}{5}$ of the length from the anterior end. *Trigonocypris* is broad at its centre but rapidly narrows anteriorly and posteriorly. The length–width ratio is 2.2 and the greatest width is at the middle.

Within the genus *Mytilocypris* it is also possible to distinguish each species-group as follows:

	Anterior end	Posterior end
M. tasmanica, M. praenuncia	Narrow, pointed	Narrow, rounded
M. henricae, M. mytiloides	Pinched, forming small neck	Narrow, rounded
M. splendida	Pinched, forming small neck	Pinched, forming small neck
M. ambiguosa, M. minuta	Pinched, forming small neck	Pointed

In transverse sections, for each of the three genera, typical shapes can be recognized: *Mytilocypris* is oval; *Australocypris* is nearly circular; *Trigonocypris* is oval but very broad ventrally compared to *Mytilocypris.*

Within *Mytilocypris*, some features are typical of certain species (Fig. 27).

M. tasmanica, M. praenuncia	Oval
M. henricae, M. mytiloides	Dorsal area crested
M. splendida	Almost ellipsoid
M. ambiguosa, M. minuta	Oval, with low height–width ratio

It should be noted that, for both the longitudinal and transverse sections, the species of *Mytilocypris* grouped together according to shared characteristics are identical. This could indicate that these closely associated species had identical ancestry.

Although transverse and longitudinal sections are valuable in differentiating genera from one another, it is necessary not to overestimate their value. Unrelated ostracods of similar outlines do exist (e.g. *Mytilocypris splendida* and *Chlamydotheca spectabilis* Sars, 1901). The only way, then, to separate such ostracods would be by a comparison of a combination of characters (especially of external and internal carapace features).

Surface features. No obvious features seem to characterize each species studied except for the following two: *M. ambiguosa* is very pilose all over its carapace (Figs 18G, 18I), but this is not a good diagnostic feature, as hairs would be missing on fossil specimens; *T. timmsi* possesses a small spine on the posterocentral area of the right valve in both sexes (Figs 26A, 26B).

Many specimens of *M. henricae*, from a coastal lagoon on Flinders I. (Figs 22*I*, 22*J*), showed abundant, rather broad, conspicuous normal pore canals all over their carapace. However, specimens from other localities did not.

The surface features mentioned above are of minor significance and could only be restricted to the specific level as there are no conspicuous differences between the genera.

Muscle scars (Fig. 9).   It is important to determine the muscle scar pattern in order to associate an ostracod with its appropriate family or subfamily, but at the generic and specific levels it appears to be of no importance as a distinctive character. Several authors (Omatsola 1971; Szczechura 1971 for *Cyprinotus*) have shown the great variety of the central muscle field pattern possible among specimens of one species.

Investigation of the muscle scar pattern on many specimens of *A. robusta* and some *Mytilocypris* species showed great variety in the placement of the scars. Often this was caused by the difficulty of determining the outline of some scars. Therefore, the central muscle scar patterns are considered, at present, of no value for distinguishing the genera and species. However, above the generic level, the pattern appears to be a very important diagnostic feature, as shown by Morkhoven (1962).

Similar conclusions can be drawn for the dorsal muscle scars. These show even greater variety, as they are more abundant and not as easy to study because of their position on the shell, which is very difficult to keep in an upright position under the microscope.

Normal pore canals. Within the tribe Mytilocypridini, the normal pore canals are more common in the dorsal area for all species. They are all simple-rimmed, with a hair protruding from the centre of the pore. This type of pore, not being useful in taxonomy at specific or generic level, corresponds to type 'A' of Puri (1974). This type is the most common for the Cypridacea.

(ii) *Internal features*

Marginal pore canals. The marginal pore canals show slight differences between species within each of the three genera studied. However, generally, these canals are always numerous and narrow, and almost all straight. They are most abundant antero-ventrally. No particular details were found to be typical of each species. However, they are thought to be of some importance in taxonomy above the generic level.

Longitudinal sections at the anterior end of the carapace. There are some conspicuous differences among the three genera, but the species within each genus bear identical characteristics (Fig. 27).

In *Australocypris*, the inner lamellae are much narrower and the selvages are much smaller or appear to be absent.

In *Mytilocypris* the inner lamellae are the broadest (Figs 9, 10, 18–24, 27) and are almost all unequal in size. On both valves the selvage is also the most prominent and sometimes hook-shaped in profile.

In *Trigonocypris*, the inner lamellae are the narrowest but the selvages are quite well pronounced.

Longitudinal section at the posterior end of the carapace. In contrast to the sections of the anterior end of the carapaces, those of the posterior end differ considerably between species.

In *Mytilocypris* the inner lamellae can be very broad compared to those in *Australocypris* and *Trigonocypris*, in which (especially *T. timmsi*) they are much narrower. In *Australocypris*, the posterior inner lamellae are about the same width as the anterior ones and the width appears to be uniform, except that they narrow to nothing in the posterodorsal area. In *Mytilocypris*, the width of the posterior inner lamellae is not as constant as in *Australocypris*. They seem to be very different for each species (Fig. 27) and, for example, are helpful in distinguishing *M. tasmanica* from the closely related *M. praenuncia*, being broader in the former species. In *Trigonocypris timmsi*, as mentioned earlier, the inner lamellae are very narrow; in *T. globulosa* they are rather broad and appear to be similar to those of *Australocypris* species.

Transverse sections of the ventral area of the carapace. The ventral area near the mouth region was studied in each species. However, the difficulties involved in sectioning an ostracod shell exactly in the mouth region mean that diagnostic characters cannot be made out.

In all species, a non-calcified inner lamella is fixed to the calcified inner lamella, and, on this, many almost regular fine striae are visible. However, this is not thought to be of taxonomic importance, as it is not always well preserved after dissection, and is absent in fossil material.

Hinge. There is no great variation in the mytilocypridinid species, as in all of them the hinge consists of a groove on the left valve and a corresponding ridge on the right one. There is a difference between species, however, in the position of the hinge, which can often vary. Both *M. mytiloides* and *M. henricae*, for example, possess a dorsal crest, in this instance in the hinge area (Figs 27*F*, 27*P*). The valves are unequal in size, one forming the entire crest and the other fitting just below it. It is worth noting that such a crest is supported by an internal ligament (Fig. 27*F*) which joins both sides of the crest.

The long, narrow, elongated dorsal scars which run parallel to the hinge are thought to indicate the presence of many muscles which support the weak hinge, but, like the central muscle scars, these are of no taxonomic importance because they show great variation and are not easily detectable.

(iii) *Relations between carapace outline and mode of locomotion*

Because most of the species belonging to *Mytilocypris* have a carapace with a tapering posterior end in which little of the soft parts can fit (except perhaps the testes), it was expected that this feature of the shell, forming an extra weight, would be inconvenient in locomotion. To test this idea, specimens of *M. henricae*, *M. splendida*, *A. robusta*, *A. hypersalina* and *T. globulosa* were kept alive in an aquarium.

Both *Mytilocypris* species were benthic most of the time but when swimming, always for short distances, they moved at an angle with the horizontal. The posterior end of the carapace was far below the anterior, and it appeared that the animal had to drag this 'heavy weight', which made it swim rather slowly.

For the *Australocypris* species and *T. globulosa* swimming appeared to be much easier, as the shell is almost completely filled by the soft parts of the animals. No 'unnecessary' part of the carapace is present and animals swam in a horizontal position. These species swam more frequently and for longer distances than the

Mytilocypris species. Often *Australocypris* is found at all levels in a lake, whereas *Mytilocypris* is more common at the bottom.

Soft Anatomy

Various soft parts will be investigated. They will be listed and studied as they are encountered when an ostracod is examined, starting at the anterior end near the eye, and finishing at the posterior end at the furcal attachment. The features studied include: eye, first antenna, second antenna, mandible, rake-like process, maxilla, first leg, second leg, third leg, hemipenis and ejaculatory process (and genital lobes), furca and furcal attachment.

Eye. No emphasis was placed on this organ as details are not easily discernible under the binocular microscope. For the three genera studied, the eye is single, dark brown in colour and bearing two large lateral silver lenses.

First antenna. No sexual dimorphism for this appendage was detected in any of the species studied. Length–height ratios of the third to seventh segments were measured to detect any specific variations (Appendix 2*). Ratios are more reliable than direct measurements as standards of comparison, as they are not influenced by the differences in size among individuals. Also, as some species were only collected once, it was thought that measuring ratios was a way to avoid possible differences due to collecting either in summer or in winter. No emphasis will be placed on the natatory setae, as for this tribe they appear to be all similar, and extremely long (as long as the length of all the seven segments together).

There seem to be no features which would distinguish all the species. For some species one ratio appears to be diagnostic (e.g. in *A. robusta* the ratio of the third segment ranges between 2.00 and 2.25, which is much lower than in all the other species, and the ratio of the fourth segment ranges between 1.14 and 1.37, also lower than for the others). However, these are features typical of individual species and not valid for distinguishing all species.

Second antenna. For mytilocypridinids, as for all ostracods belonging to the Cypridacea, the second antenna is sexually dimorphic. Here, in the male the second segment always possesses three large plus one small end claw, all with a double row of small teeth, and the third segment bears a long end claw with long teeth. In the female there are only two large claws plus a small end claw on the second segment, with a double row of small teeth; on the third segment the end claw has no teeth.

The length–width ratio of the first and second segments of the endopodite are tabulated in Appendix 2, as well as the ratios of the lengths of the second to the third segment. These ratios do not appear to be of great taxonomic importance, as there is much variation among different populations within a single species, but also because many ratios appear to be similar for different species. However, some ratios can be used to distinguish some species.

The position of the natatory setae on the first segment of the endopodite appears to be very important, separating *Australocypris* from the other two genera. In *Australocypris* the setae is about one-third from the distal end of the first endopodite, where in *Mytilocypris* and *Trigonocypris* it is nearly at the distal end.

* Appendix 2 has been lodged as accessory material with the Editor-in-Chief, Editorial and Publications Service, CSIRO, P.O. Box 89, East Melbourne, Vic. 3002.

The length of these setae does not seem to vary significantly enough to be taxonomically important. Their number (five long ones plus a small one) is constant for the tribe Mytilocypridini and appears to be so for most of the genera within the superfamily Cypridacea. The length of the small seta could be of some importance in taxonomy but, because it is often hidden between the large ones in the dissected specimens, it is not considered here.

All the species also possess the 'sense club' [so-called by Kesling (1951)] at the anterior end of the first segment of the endopodite. The length of that organ was found to be of no taxonomic importance, at the specific and generic level at least.

The ratio of the length of the anterior part of the first segment of the endopodite to the length from the proximal end of the podomere to the attachment of the 'sense club' was also computed. Such a ratio is, however, considered to be inaccurate because the length of the first segment is considerably affected by the bending of the antenna. However, the ratio seemed to be larger in *Australocypris* than in the other genera.

Mandible. Sexual dimorphism for this appendage was not highly pronounced. The mandibles of each species were studied but all details investigated appeared to be the same for all species.

The lengths of the basal segments of the exopodite (Appendix 2) were measured and these were constant for all species, except for *M. henricae* which had greater length. The number of teeth (seven molars decreasing in size from front to rear except for the last one which is as long as the third) and of the small spines in between them is constant for every species. This, however, could be of importance at a higher level of taxonomy.

The ratios of the first three segments of the endopodite were computed (Appendix 2) but similarly, the results showed no signs of taxonomic importance. It is, in fact, hard to measure these, as the ends of each podomere occasionally overlap when fixed in the dissection slides. The exopodite plate was not studied because it was very difficult to see, being often folded under the basal podomere, or partly destroyed during dissection.

Rake-like process. This process is characterized by seven or eight teeth, all stout and short. From the inside, the first tooth is always bifid. The number of teeth appears to vary occasionally within a population of a single species. This process is, however, very important for the taxonomy of the subfamilies of Cypridacea.

Chitinous framework of the forehead. The chitinous frameworks of the forehead, upper lip and hypostome were not studied because they are very often deformed when a preparation slide is covered with a glass cover slip.

Maxilla. Sexual dimorphism is absent for this appendage. The length–width ratios of the elongate and cylindrical palp and distal palp were measured, and the ratios of both lengths of these palps were computed (Appendix 2). No distinctive results appear from such computation at the specific or generic level. The length–width ratio of the distal palp ranges between 1.5 and 2.0, and that of the palp was between 3.0 and 4.0. For all species the ratio of both lengths is also rather constant, with the exception of *A. ? rectangularis* and *M. ambiguosa*, which have much lower values (2.0 and 2.4 respectively) than the average value (3.3) for the other species.

Two Zahnborsten (tooth bristles) are present on the outer third lobe in each species studied. Some of these bear small teeth on their sides; their number is quite variable within a species. For that reason, and because it is rather difficult to see these extremely small teeth, they have not been investigated further.

The number of Strahlen (pilose bristles) on the branchial plate averages 24 for all species. The branchial plate is not considered further as it is often folded or torn apart during dissection, like the exopodite plate of the mandible.

First leg. This appendage is strongly dimorphic. The male possesses prehensile palps which are distinctive for every species (Figs 11, 12), e.g. *M. splendida* has a very long sickle-shaped palp. The left and right palps are almost identical except for their curvatures; this could prove to be typical of mytilocypridinids.

Emphasis was placed on the male palps because in the females the bristles on the lobes are not easily distinguishable. They can be minute and thin, or often folded under the lobes. Because both sexes are equally present in all collections of mytilocypridinids, the lobes of females were not studied in detail. The number of Strahlen on the exopodite plate was not studied for every species, as they are often damaged or folded behind the plate after dissection, but also because the prehensile palp was obviously sufficient to distinguish the species.

In general, the 'hook-shaped' extremity of the palp (forming the last segment) is much longer and broader in *Australocypris* species than in the other two genera with the exception of *M. splendida.* It is, however, very difficult, if not impossible, to tabulate details for every species, and the palps are illustrated instead (Figs 11, 12). Mostly, it is the curvature of the extremity of the palp which appears to be important, as well as the variations in width along its entire length. Occasionally, the penultimate segments of the palp possess one or two spines of varying shapes and lengths. As these seem to vary between individuals within one species and sometimes between left and right sides of a single individual, they are not investigated further.

Second leg. No sexual dimorphism is noticeable for this appendage, except for a slight difference in length of the terminal claw. As it is an appendage with rather conservative morphology and easily measurable, quite a few measurements were taken. These are: length–width ratios of the four segments of the endopodites; ratio of the length of the ventrodistal hair of the first segment to the length of the third segment; ratio of the length of the ventrodistal hair of the third segment to the length of the dorsodistal hair of the last segment. The presence and absence of obvious fusion between the second and third segment was investigated (Appendix 2).

It is possible to see that the ratio of the length of the ventrodistal hair of the first segment to the length of the third segment is larger in *Mytilocypris* than in the other genera. Similarly, there is no obvious fusion between the second and third segments in most species of *Australocypris* and in *Trigonocypris.* Therefore these two characters show themselves to be good diagnostic features at the generic level, whereas the other ratios are more important at the specific level. They differentiate some species from others but are not unique for each species. The most valuable character is the length–width ratio of the fourth segment.

Third leg. No sexual dimorphism can be detected for this appendage. Several ratios were measured, because the cylindrical shape made measurement easy, as did the long hairs and two claws. The following were calculated (Appendix 2): ratio of the lengths of the first to the second plus third segments of the endopodite; ratio of

the length of the ventrodistal hair of the protopodite to that of the distal hair of the third (small) segment of endopodite; ratio of the length of the posterodorsal hair of the first segment of the endopodite to that of the distal hair of the third (small) segment of the endopodite; ratio of the length of the distal hair of the third segment of the endopodite to the length of the claw.

The ratio of the lengths of the first and second segments of the endopodite appears to be constant for all the mytilocypridinid species. This might be an important characteristic above the generic level, as are the four rows of hairs present on one side, and two on the other side, of the third segment of the endopodite. The other three ratios show obvious differences within most of the species.

Hemipenis and genital lobe. The genital lobes were not studied here, because of their poor chitinization and their tendency to become deformed in the fixed preparations. In contrast, the hemipenes are strongly chitinized and showed obvious differences among species. There was no need to dissect the hemipenis, as the copulatory sheath with its well defined lateral lobe was distinctive enough on its own. The outline of these features are shown in Figs 28–30 and summarized in Fig. 13. It is thought that features taxonomically important above the specific level will only be detected after the dissection of the hemipenis.

From the outline of the lateral lobe, it is possible to see interspecific affinities. For example, *A. hypersalina* and *A. insularis* have a similar lateral lobe, except that the outer base is much broader in *A. insularis*. Most of the *Mytilocypris* species show a similar type of digitate and stiff lateral lobe, except for *M. splendida*. The differences can then be found in the shape and size of the copulatory sheath and its position next to the lateral lobe. It is interesting to note that *M. splendida* possesses a rather large hemipenis with a very broad and prominent lateral lobe just as the prehensile palps of the male first thoracic legs are also large and very long.

Ejaculatory process (Zenker organ). This is cylindrical in shape in mytilocypridinids. The covering sheath is usually nearly transparent and allows many inside rosettes to be seen. In all mytilocypridinid species there are about 70 of these rosettes; this character is thought to be of suprageneric taxonimical importance. Both ends of the tube are flat, and terminated by rosettes of the same size as the central ones.

The length–width ratios of the ejaculatory processes have been measured in all species, but do not appear to be diagnostic characters, contrary to what I originally thought when describing *A. robusta* and *A. hypersalina* (De Deckker 1974, pp. 95, 101).

Furca. The presence of two claws and two hairs at the distal end of the furca is character of the tribe, as is the presence of four double rows of spinules on the shaft from the proximal posterior edge of the shaft to the edge of the proximal claw. The ratio of the lengths of the anterior to posterior hairs was measured for each species, as well as the length ratios of the two claws (Appendix 2). The claws are almost identical in size in *Australocypris*, and are obviously unequal in *Mytilocypris* and *Trigonocypris*. This character is therefore considered as important at the generic level.

Furcal attachment. This was studied in every species (Figs 14, 15). Its shape is typical of the subfamily Cypridinae, possessing two branches at the proximal extremity with an obtuse angle between them. The dorsal branch can vary in length but is always curved. The median part is long and nearly straight. The articulary extremity is short and pointed. A supplementary growth was noticed on some specimens, but these are thought to be pathological.

The ratio of the length of the median branch over the length of the ventral part was calculated for every species (Appendix 2).

As the furcal attachment is necessary for the movement of the furca, by providing appropriate muscle attachment, it is expected that it should reflect the morphology of the furca and its claws. This appears to be so for the median part of the attachment, as it is much longer in all *Mytilocypris* species which have unequal claws at the end of the furca.

The ratio of the lengths of the dorsal and ventral branches is also distinctive in most mytilocypridinid species.

Often, after dissection, the proximal part of the furcal attachment appears to be bifurcate. These two little branches, when attached to the other two of the furcal attachment, form a circle to which the furca is welded. These two branches are not here considered as forming part of the furcal attachment, to be consistent with the illustrations given by Rome (1969) and to avoid confusion of morphological differences.

Summary

The results of the present investigation are shown in Table 1. From these results it is possible to see which features are valuable in the taxonomy of mytilocypridinid ostracods at the genus and species level.

Taxonomy

MYTILOCYPRIDINI De Deckker

Mytilocypridini De Deckker, 1974, p. 92.

Diagnosis

Large carapace (*c.* 3 mm or more), subrectangular to subtriangular in shape; surface of valves smooth or micropunctate with peripheral hairs; simple-rimmed normal pore canals scattered; radial pore canals numerous, short, straight or rarely branched; ridge and groove hinge; inner lamellae almost symmetrical anteriorly with selvages weakly to strongly pronounced.

Slender 1st antenna; very close similarity of both prehensile palps on male 1st legs; single or double row of spinules on posterior margin of each slender, long furcal shaft; large number of rosettes (60 or more) on ejaculatory process; simple furcal attachment bifurcate.

Remarks

The position of the tribe Mytilocypridini within the subfamily Eucypridinae has been discussed in De Deckker (1976, p. 146).

So far, all known mytilocypridinid species are endemic to the Australian continent and are grouped within three known genera: *Australocypris* De Deckker, 1974; *Mytilocypris* McKenzie, 1966; *Trigonocypris* De Deckker, 1976.

Note on Location of Type-specimens

Holotypes are deposited in the Australian Museum, Sydney. Paratypes are deposited in the United States National Museum, Washington, D.C., and the British Museum (Natural History), London.

Table 1. Summary of morphological characters important in taxonomy of Mytilocypridini, at species, species-group or generic level

X Character important at level indicated. X? Probably important. (X) Important for some taxa. ? Doubtful. − Not important.

Character	Taxonomic importance		
	Species level	Species-group level	Genus level
Carapace morphology			
Lateral outline of shell	X	−	−
Ornamentation of shell	(X)?	−	X?
Measurements of shell (ratios)	X	X	−
Longitudinal section of shell	−	−	X
Transverse section of shell	−	(X)	X
Central and dorsal muscle scars	−	−	−
Marginal pore canals	−	−	−
Selvage	−	−	X
Inner lamella	(X)	X	X
Ventral area	−	−	X?
Hinge area	X	(X)	−
Anatomy			
Eye	?	?	?
First antenna, length : width of segments	(X)	−	−
Second antenna			
Length : width of first and second segments	(X)	−	−
Length ratio of second : third segments	(X)	−	−
Position of natatory setae	−	−	(X)
Length of natatory setae	−	−	−
Length of small natatory setae	?	?	?
Position of sense club	−	−	(X)
Mandible			
Length : width of third segment of endopodite	−	−	−
Molars	−	−	−
Rake-like process	−	−	−
Maxilla			
Length : width of palp and distal palp	−	−	−
Zahnborsten	−	−	−
First leg of male, shape of palp	X	X	X
Second leg			
Length : width of four segments of endopodite	(X)	−	−
Length ratio, ventrodistal hair of first segment to third segment	−	−	X
Length ratio, ventrodistal hairs of third to last segments	(X)	−	−
Fusion between second and third segments	−	−	X
Third leg, ratios	−	−	−
Hemipenis	X	−	−
Ejaculatory process	−	−	−
Furca			
Ratio of claws	−	−	X
Ratio of two hairs	−	−	−
Four rows of spinules on shaft	−	−	−
Furcal attachment, length of branches	(X)	(X)	X

Genus **Australocypris** De Deckker

Australocypris De Deckker, 1974, p. 92. Type-species *Australocypris robusta* De Deckker.

Diagnosis

Carapace subrectangular to subtriangular in lateral view and elliptical in dorsal view, length-width ratio *c.* 2.71, greatest width at $\frac{2.2}{5}$ from anterior end; in frontal view, nearly circular in shape; at anterior end, inner lamellae narrow with small or nearly absent selvages; at posterior end, inner lamellae of about similar width as anterior ones.

Natatory setae *c.* $\frac{1}{3}$ from distal end of 1st endopodite on 2nd antenna; hook-shaped extremity of prehensile palp of male 1st leg broad and long; length ratio of ventrodistal hair of 1st segment to 3rd segment 0.82-1.43; outside lobe of copulatory sheath of hemipenis very broad; claws of furca almost identical in size.

Remarks

Within the genus *Australocypris*, the two species *A. hypersalina* and *A. insularis* appear to be closely related to one another, and on the other hand are quite different in many morphological characters (e.g. hemipenis) from *A. robusta*.

Australocypris sp. De Deckker, 1974, described from Barilla Bay near Cambridge in Tasmania, is considered to belong to *A. robusta*; since more material yielding soft parts was collected from that area and compared with the type-species.

Australocypris hypersalina De Deckker

(Figs 16*E*-16*L*, 18*A*, 18*B*, 27*N*, 28*A*-28*C*)

Australocypris hypersalina De Deckker, 1974, p. 101.

Types

Holotype ♀, paratype ♂, Lake Eliza, South Australia; in Australian Museum.

Diagnosis

Carapace subtriangular in shape; hook-shaped extremity of prehensile palps of male 1st leg long; lateral lobe of hemipenis broad, short and convex at its outside base.

Remarks

Some specimens collected from a pond near the Salt Works, 12 km east of Langhorne Creek in South Australia, show some morphological differences (e.g. larger size, etc.) from the other specimens of *A. hypersalina*, but because of the lack of material they are temporarily grouped within this species.

Australocypris robusta De Deckker

(Figs 16*A*-16*D*, 17*M*, 17*N*, 27*L*, 27*M*, 28*G*, 30*A*)

Australocypris robusta De Deckker, 1974, p. 95.

Types

Holotype ♀, paratype ♂, Lake Keilambete, Victoria, in Australian Museum.

Diagnosis

Carapace subrectangular in shape; chitinous pocket on inside of posterodorsal area in females; hemipenis with digitate and stiff lateral lobe.

Remarks

Unusually large specimens have been collected from Barilla Bay (previously described as *Australocypris* sp. in 1974) and the Salt Works in Tunbridge, Tas.

Australocypris insularis (Chapman)
(Figs 17*A*-17*L*, 27*O*, 28*D*-28*F*)

Eucypris insularis Chapman, 1966, p. 375.

Types

Damaged, desiccated and shrunk, from Houtmans Abrolhos, West Wallabi I., Western Australia, in Australian Museum.

Diagnosis

Carapace subtriangular in shape; hook-shaped extremity of prehensile palps of male 1st legs rather short; lateral lobe of hemipenis broad, short, pinched inwards at its outside base and with pointed extremity.

Remarks

The original material from which Chapman (1966) described *Eucypris insularis* was found in the Australian Museum only after the description of *Australocypris* had been published. It was therefore impossible, at the time *A. hypersalina* was studied, to compare it with its close associate *A. insularis*. Chapman's material of this species is actually unrecognizable as the phials containing the ostracods had been broken and the specimens became dry and have shrunk. However, the specimens collected in Western Australia show differences from the Victorian and South Australian ones (e.g. the morphology of the hemipenes). In fact, the morphology of the hemipenes of one of the damaged paratypes of *A. insularis* deposited by M. A. Chapman in the Australian Museum is identical to the morphology of my Western Australian specimens, showing especially the smooth, convex outside base of the lateral lobe. It is therefore accepted that the specimens collected in Western Australia belong to *A. insularis* and the others are *A. hypersalina*.

Australocypris ? rectangularis, sp. nov.
(Figs 18*C*-18*F*, 28*H*, 33*A*-33*K*)

Derivation of name from Latin *rectangularis* (rectangular), on account of the typical shell outline.

Types

Holotype adult ♀, Centre Lake, Victoria, collected by P. De Deckker. Paratype: adult ♂, same data, in Australian Museum.

Diagnosis

Carapace very large and rectangular in shape; lateral lobe of hemipenis hook-shaped, copulatory sheath almost semicircular in shape; prehensile palps of male 1st legs long and narrow and strongly curved.

Dimensions

	Holotype ♀	Paratype ♂
Length (mm)	4.42	3.50
Height (mm)	2.24	1.60
Width (mm)	1.87	1.20

Carapace

Externally rectangular; ventral margin almost straight but concave near mouth region and dorsum in female forming a smaller angle with ventral side than in male. Anterior and posterior ends broadly rounded. Left valve slightly longer than right anteriorly and posteriorly. Greatest height at about $\frac{1}{3}$ from anterior end. In dorsal view, carapace almost rectangular in shape.

Internally, flange marginal and very narrow; marginal zone narrow anteriorly and posteriorly but of same width all along. Non-calcified part of the inner lamella very broad anteriorly and posteriorly. Selvage very prominent. Radial pore canals numerous, short and almost all straight. Hinge consisting of a fine groove and a ridge. Muscle scars pattern as for other *Australocypris* species.

Anatomy

First antenna (Fig. 33*A*). No sexual dimorphism; length–width ratio of 4th–7th segments: IV, 2.71; V, 2.50; VI, 2.28; VII, 2.33.

Second antenna. Badly preserved.

Mandible. Badly preserved.

Rake-like process (Figs 33*F*, 33*G*). 8 teeth in both sexes, short and stout but irregular; both inner teeth bifid.

Maxilla. No sexual dimorphism; branchial plate destroyed; lobes cylindrical and elongate; 3rd lobe bearing 2 long Zahnborsten; length–width ratios of palp 3.78; of distal palp 1.47.

First leg (Figs 33*B*, 33*C*). Strong sexual dimorphism; female lobe bearing 3 small pilose bristles, male with 2 prehensile palps almost identical; each possessing 2 small, stout bristles which are close to the base of the palp, except that, in the left palp, one of the bristles is attached a bit further away from the palp on the endopodite. Palps narrow but long and strongly curved.

Second leg (Fig. 33*I*). No strong sexual dimorphism; length–width ratios of last 4 segments: I, 2.20; II, 2.10; III, 1.80; IV, 0.87. No fusion of 2nd and 3rd segments apparent. Position of hairs on these segments similar to that in *Australocypris robusta* except that the ventrodistal hair of the last is missing (it could have been destroyed: see below). Claw strong, as long as last 3 segments.

Third leg (Fig. 33*J*). Ratio of length of 2nd to 3rd segment 1.10; length ratio of both claws 2.00. Position of hairs on segments similar to that in *Australocypris robusta* except that mediodorsal hair of 3rd segment missing (probably destroyed, see below).

Hemipenis (Figs 28*H*, 33*D*). Lateral lobe hook-shaped at its extremity and copulatory sheath semicircular near the lateral lobe. For further details see Fig. 28*H*.

Ejaculatory tube (Fig. 33*K*). Rosettes not visible; length–width ratio of tube 6.85.

Furca. Badly damaged, claws missing on all specimens studied (see below).

Furcal attachment (Fig. 33*H*). Typical of the genus *Australocypris* with both branches (ventral and dorsal) of almost equal size.

Eye. Unknown.

Eggs. Unknown.

Remarks

All the specimens collected from Centre Lake were found in a very small pool which had dried out. The salinity of the lake at that time was about $300^o/_{oo}$. All the ostracods were surrounded by salt crystals and it is for that reason that most of the soft parts have been preserved. Some parts were missing and are mentioned in the text as unknown; they are, however, thought to have been destroyed only during the drying-out of the pool.

I am not completely sure as to which genus this species belongs, the closest being *Australocypris*. However, the shell outline and the lateral lobe of the hemipenis indicate that this species is very different from any other *Australocypris* species known so far. Until better specimens can be studied it will be allied to the above-mentioned genus, but it seems that it could belong to a new genus (the claws of the furca, for example, when studied could indicate if it belongs to *Australocypris* or not).

Genus **Mytilocypris** McKenzie

Mytilocypris McKenzie, 1966, p. 27.   Type-species *Mytilocypris tasmanica* McKenzie.

Diagnosis

Carapace subtriangular in lateral view and narrow and elongated in dorsal view, length–width ratio 3.10, greatest width of *c.* $\frac{3}{5}$ from anterior end; in frontal view oval in shape; at anterior end inner lamellae broad with selvages prominent and occasionally hook-shaped in cross-section; at posterior end inner lamellae of different width in different species.

Natatory setae at distal end of 1st endopodite on 2nd antenna; hook-shaped extremity of prehensile palp of male 1st leg generally short and narrow; length ratio of ventrodistal hair of 1st segment to 3rd segment 0.82–2.89; 2nd and 3rd segment on 2nd leg almost always fused; outside lobe of copulatory sheath unequal in size.

Remarks

Within the genus *Mytilocypris*, it is possible to distinguish species which are closely associated to one another on morphological grounds. These are: *M. tasmanica* and *M. praenuncia*; *M. henricae* and *M. mytiloides*; *M. ambiguosa* and *M. minuta*. *M. splendida* is quite different from the other species (e.g. in the very broad and long lateral lobe of the hemipenis and in the very long prehensile palp of the male first leg).

Mytilocypris ambiguosa, sp. nov.

(Figs 18*G*–18*J*, 27*I*, 29*K*, 29*L*, 32*A*–32*K*)

Derivation of name from Latin *ambiguus* (ambiguous), because the carapace shares characteristics of *Mytilocypris* and *Australocypris*.

Types

Holotype: adult ovigerous ♀, Barkers Swamp, Rottnest I., Western Australia, collected by Dr I. A. E. Bayly. Paratype: adult ♂, same data, in Australian Museum.

Diagnosis

Carapace trapezoidal in lateral view and very pilose; posteroventral part rounded; angle γ measured on shell 135°-142°; angle δ 118°-135°; prehensile palps broad at the middle and narrow at distal end; lateral lobe of hemipenis tapering, narrow, pinched in middle.

Dimensions

	Holotype ♀	Paratype ♂
Length (mm)	4.00	3.50
Height (mm)	2.00	1.78
Width (mm)	1.74	1.48

Carapace

Externally large and trapezoidal in lateral view with posteroventral fairly rounded; carapace pseudopunctate and very pilose all over. Colour of valves white when preserved in formalin. In dorsal view, anterior narrow and pinched and posterior pointed. In ventral view oval in shape and greatest width at about middle. Right valve slightly overlapping left one in both dorsal and ventral areas.

Internally with a long free margin, transparent outer list and flange both narrow and marginal on both valves; marginal zone broad anteriorly and posteroventrally; anteriorly almost of same width all along whereas broader and unequal in posteroventral area. Selvage broad. Radial pore canals numerous, short and almost all straight; most abundant anteroventrally. Hinge consisting of a fine ridge on left valve and a groove in slightly overlapping right valve. Muscle scars pattern as for other *Mytilocypris* species.

Anatomy

First antenna (Fig. 32A). Length–width ratio of 3rd–7th segments: III, 3.88; IV, 2.39; V, 2.48; VI, 3.50; VII, 3.50.

Second antenna (Fig. 32B). Sexual dimorphism of the end claws: male 3 large plus 1 small end claw, all with a double row of small teeth on 2nd segment; 1 long end claw with long teeth on 3rd segment. Female with only 2 large claws plus 1 small end claw on 2nd segment. Length–width ratio of 1st segment 3.17; of 2nd segment 2.80. Natatory setae (1 small plus 5 long) very close to distal end of 2nd segment.

Mandible (Fig. 32D). No strong sexual dimorphism; exopodite plate, mandibular coxale, molar teeth and endopodite typical of the genus as described by McKenzie (1966) for *M. tasmanica*.

Rake-like process. 9 teeth in both sexes, all irregular, stout and broad at their base; from inside 1st tooth bifid.

Maxilla (Fig. 32C). No sexual dimorphism. Length–width ratio of palp 4.17; of distal palp 1.74. Inner masticatory process with 2 smooth Zahnborsten.

First leg (Figs 32E, 32F). Palp strongly sexually dimorphic. In female, lobe with 3 unequal bristles. In male, prehensile palps of slightly dissimilar shapes, and both

broadest in their middle; distal ends of palps pointed. Distal end of inside of endo-podite bearing 3 small stout spines. Left prehensile palp more strongly curved than right one.

Second leg (Fig. 32*G*). No sexual dimorphism; length–width ratio of 3rd–6th segments: III, 1.90; IV, 1.90; V, 2.10; VI, 1.22. 4th and 5th segments not fused; 2nd segment geniculate, barren except for a few scattered small transparent hairs; 1 ventrodistal hair on inside of 3rd segment; 1 ventrodistal on inside of 4th segment, almost as long as 3rd and 4th segments together; 2 distal hairs (1 ventral, 1 dorsal) at proximal end of 6th segment; claw strong and curved and smaller than last 4 segments together.

Third leg (Fig. 32*H*). No sexual dimorphism; rather thin; ratio of length of 2nd to 3rd segment 1.35; 2nd segment with 2 hairs on proximal end (1 anterior and 1 posterior) plus 1 posterodistal hair; 3rd segment with rows of spinules on anterior middle, absence of 2 rows on posterior median part. Distal end of 3rd segment with 2 unequal claws (length ratio 2.43), smaller being hook-shaped, 2 small pincers and small pilose plate at base of 2 distal claws.

Hemipenis (Figs 29*K*, 29*L*, 32*I*). Lateral lobe narrow, long, pinched in middle; copulatory sheath subrectangular, not as pronounced as in *M. minuta*.

Ejaculatory tube. Bearing about 75 rosettes. Length–width ratio 3.00.

Furca (Fig. 32*J*). No sexual dimorphism. Length ratio of bristles 0.70; of claws 1.50. Posterior bristle almost of same length as claws. 4 double rows of spinules on posterior of shaft.

Furcal attachment (Fig. 32*K*). No sexual dimorphism. Length ratio of median to ventral branch 2.19. Proximal end of ventral branch bifurcate.

Distribution

From Barkers Swamp and Lighthouse Swamp, both on Rottnest I., and 5 km east of Ongerup, W.A., and a pool near Lake Goldsmith, Vic.

Remarks

Originally it was thought that the carapace of this species shared characteristics of *Australocypris* and *Mytilocypris*, but the soft parts seem to place it definitely in *Mytilocypris* because of the position of the natatory setae on the second antenna, the equal length of the furcal claws, and the shape of the furcal attachment.

<div align="center">

Mytilocypris henricae (Chapman)

(Figs 22*G*–22*J*, 23*A*–23*L*)

</div>

Eucypris henricae Chapman, 1966, p. 373.

Types

From Lake Linlithgow, near Hamilton, Victoria, kept in Australian Museum.

Diagnosis

Carapace subtriangular in lateral view, posteroventral part pointed; angle β measured on shell 117°–131°; angle γ 144°–158°; dorsal area of shell with crest in frontal view, anterior end pinched and forming a small neck in dorsal view,

posterior end narrow but rounded. Prehensile palps of male 1st leg strongly curved, narrow but long; hemipenis with small, almost straight, and pointed lateral lobe, but broad at its base.

Remarks

A population of *M. henricae* collected from a coastal lagoon on Flinders I. was atypical in possessing very many broad normal pore canals on the carapace (see Figs 22*I*, 22*J*).

Mytilocypris minuta, sp. nov.

(Figs 20*G*-20*J*, 27*H*, 28*J*, 31*A*-31*K*)

Derivation of name from Latin *minutus* (small).

Types

Holotype: adult ovigerous ♀, Barkers Swamp, Rottnest I., Western Australia, collected by Dr I. A. E. Bayly. Paratype: adult ♂, same data, kept in Australian Museum.

Diagnosis

Carapace small (for a *Mytilocypris* species), subrectangular in lateral view and with posterior area pointed; angle δ measured on shell 63°-65°; male 1st legs with small, strongly curved, prehensile palps of almost same size (left one with small hairs on inside of endopodite and with 1 small spine at base of palp); hemipenis with long, narrow lateral lobe and prominent rectangular couplatory sheath on inside, near lateral lobe.

Dimensions

	Holotype adult ♀	Paratype adult ♂
Length (mm)	3.64	3.20
Height (mm)	1.68	1.64
Width (mm)	0.76	0.72

Carapace

Externally small, subrectangular in shape with posterior end pointed; surface pseudopunctate with peripheral hairs most prominent anteriorly. Colour of valves green. Greatest height $\frac{1}{3}$ from anterior end and just under $\frac{1}{2}$ the length of carapace. Greatest breadth at $\frac{3}{5}$ from dorsum. In dorsal view, anterior end slightly pinched, narrower than posterior end, which is pointed. Angle β 148°-142°; angle γ 132°-130°. Right valve overlaps left one in ventral area.

Internally, along the free margin, transparent outer list narrow and marginal on both valves; selvage broad anteriorly and posteriorly (Figs 20*H*, 20*J*) and almost absent in ventral area; calcified inner lamella broad, of same width in all anterior areas, broadest posteroventrally; non-calcified inner lamella very large, covered with thin striae. Marginal pore canals narrow, straight, most abundant anteriorly and posteroventrally. Hinge consisting of a fine ridge on right valve and a groove in left valve. Muscle scar as in all other *Mytilocypris* species.

Anatomy

First antenna (Fig. 31*A*). No sexual dimorphism; length-width ratios of 3rd-7th segments: III, 3.46; IV, 1.84; V, 2.00; VI, 2.25; VII, 2.33.

Second antenna (Fig. 31*B*). Sexual dimorphism of the end claws as described for *Mytilocypris ambiguosa*. Length–width ratio of 1st and 2nd segments: I, 3.64; II, 2.55; natatory setae very close to distal end of 2nd segment.

Mandible (Fig. 31*D*). No strong sexual dimorphism. Same characters as *M. ambiguosa*.

Rake-like process. 9 teeth on each plate for both sexes; teeth short, stout, broad at their base; from the inside, 1st tooth bifid.

Maxilla (Fig. 31*C*). No sexual dimorphism; branchial plate bearing 24 pilose bristles (Strahlen); lobes cylindrical and elongate; 3rd lobe (inner masticatory process) bearing 2 Zahnborsten. Length–width ratio of palp 4.77; of distal palp 2.20.

First leg (Figs 31*E*, 31*F*). Palp strongly sexually dimorphic. In female, a lobe bearing 3 pilose bristles of different lengths. In male, palpe prehensile, almost equal in length and rather small; left one with small hairs on internal side of endopodite but with one small spine at the distal end. In both sexes, exopodite plate with 6 Strahlen.

Second leg (Fig. 31*G*). No sexual dimorphism. Length–height ratio of 3rd–6th segments: III, 2.50; IV, 2.31; V, 2.50; VI, 0.89. 4th and 5th segments fused. Position of hairs as for *M. ambiguosa*, except that ventrodistal hair of 4th segment slightly longer and ventrodistal hair of 6th segment twice as long. Claw almost as long as 3rd–6th segments together.

Third leg (Fig. 31*H*). No sexual dimorphism. Ratio of length of 2nd to 3rd segment 1.25; length ratio of claws 2.00; position of hairs similar to *M. ambiguosa* except for 2 rows of spinules on posterior part of 3rd segment and 1 small hair on anterior midline.

Hemipenis (Figs 28*J*, 31*I*). Lateral lobe very narrow compared to rest of hemipenis; copulatory sheath prominent, square-shaped on inside near base of lateral lobe. For further details see Fig. 28*J*.

Ejaculatory tube. Bears *c.* 75 rosettes; length–width ratio of tube 4.78.

Furca (Fig. 31*J*). No pronounced sexual dimorphism; shaft slender and long; 2 bristles of similar lengths and 2 claws of unequal lengths at terminal end of shaft; posterior edge with 4 double rows of spinules from proximal third of shaft to edge of claw; the 2 claws slightly pectinate, their length ratio 2.00; length ratio of bristles 0.77.

Furcal attachment (Fig. 31*K*). Proximal part bifurcate; dorsal branch of almost same size as ventral one; ratio of median to ventral branch 2.56.

Eye. Single, dark brown in both sexes, with 2 large lateral silver lenses.

Eggs. Bright orange in colour.

Distribution

Barkers Swamp on Rottnest I., W.A., Lake Preston (50 km south of Perth), W.A., and Currawong, via Salt Creek, S.A. The specimens from Lake Preston were, in general, much smaller than the others.

Mytilocypris mytiloides (Brady)

(Figs 20*A*-20*F*, 27*P*, 29*E*, 29*F*, 30*B*)

Cypris mytiloides Brady, 1886, p. 89.

Types

From Kangaroo I., South Australia, in Hancock Museum, Newcastle upon Tyne, England.

Diagnosis

Carapace subtriangular in lateral view with posteroventral area strongly tapering; angle β measured on shell 116°-126°; angle γ 155°-159°; dorsal area characterized by crest in frontal view, anterior end pinched and forming a small neck in dorsal view, posterior end narrow but rounded; selvages hook-shaped in cross-section; prehensile palps of male 1st leg strongly curved, narrow and short; hemipenis with long, slightly curved, and pointed lateral lobe, but narrow at its base.

Remarks

Chapman (1966) examined the original material of *C. mytiloides* and identified it with her specimens from Victoria. Since then *M. mytiloides* has been re-collected from Kangaroo I., which is the type locality for Brady's species, and is accepted as fitting Brady's and Chapman's description for the species. Specimens from Kangaroo I. always have two furcal claws, which confirms Chapman's statement that Brady's original material had broken claws on the furcae, contrary to the original illustration which shows only one claw.

Occasionally some mature specimens collected on Kangaroo I. were much smaller (about 3 mm in length) than usual, but they possessed all the characters typical of the species.

Mytilocypris praenuncia (Chapman)

(Figs 19*E*-19*N*, 24*E*-24*H*, 27*C*, 27*D*, 28*K*, 35*A*-35*K*)

Cypris praenuncia Chapman, 1936, p. 298.

Types

Holotype missing: paratype from a limestone slab; both from Bennett's Tank, Ned's Corner, Victoria, in National Museum of Victoria.

Homeotypes: adult ovigerous ♀, Lake Bookar, Victoria, collected by P. De Deckker; adult ♂, same data; in Australian Museum.

Diagnosis

Carapace subtriangular in lateral view with posteroventral area subrounded; in dorsal view anterior end narrow and pointed, posterior end narrow but rounded; in frontal view oval; inner lamella broad but of similar width anteriorly and posteriorly; prehensile palps of male 1st leg curved and short; lateral lobe of hemipenis tapering, inner copulatory sheath broad and pointed medianly.

Dimensions

	Homeotype ♀	Homeotype ♂
Length (mm)	3.21	3.14
Height (mm)	1.70	1.56
Width (mm)	0.80	0.76

Carapace

Externally subtriangular in shape in lateral view with posteroventral area sub-
rounded; pseudopunctate. Colour of valves dark green. In dorsal view anterior end
narrow and pointed, posterior end narrow but rounded; in frontal view oval.

Internally, along free margin, transparent outer list and flange narrow and
marginal on both valves; inner lamella broad but of similar width anteriorly and
posteriorly. Selvage prominent on both valves. Radial pore canals numerous, short
and straight. Ridge and groove hinge. Muscle scar pattern as for all *Mytilocypris*
species.

Anatomy

First antenna (Fig. 35*A*). Length–width ratio of 3rd–7th segments: III, 3.43;
IV, 1.70; V, 2.09; VI, 2.22; VII, 1.85.

Second antenna (Fig. 35*B*). Sexual dimorphism of the end claws as *Mytilocypris
minuta*. Length–width ratio of 1st and 2nd segments: I, 2.69; II, 3.56; natatory
setae very close to distal end of 2nd segment.

Mandible (Fig. 35*D*). No strong sexual dimorphism. Same as in other *Mytilo-
cypris* species.

Rake-like process. 9 teeth in both sexes, all irregular, stout and broad at their
base; from inside 1st tooth bifid.

Maxilla (Fig. 35*C*). No sexual dimorphism. Length–width ratio of palp 5.50;
of distal palp 1.83. Inner masticatory process with 2 smooth Zahnborsten.

First leg (Figs 35*E*, 35*F*). Palp strongly sexually dimorphic. In female, lobe
with 3 unequal bristles. In male, prehensile palps of slightly dissimilar shape, both
broadest at their base; left prehensile palp strongly curved but broader than right
one.

Second leg (Fig. 35*H*). No sexual dimorphism. Length–width ratio of 3rd–6th
segments: III, 2.36; IV, 2.40; V, 2.50; VI, 0.80. 4th and 5th segments not
fused. Position of hairs as in *M. minuta*, except that ventrodistal hair of 3rd seg-
ment not as long as 4th segment, and ventrodistal hair of 5th segment as long as 6th
segment and hair together. Claw of same length as 3rd–6th segments together.

Third leg (Fig. 35*I*). No sexual dimorphism; ratio of length of 2nd to 3rd
segments 1.40–1.25; length ratio of claws 2.1; position of hair similar to *M. minuta*
except that ventrodistal hair of 4th segment as long as 4th segment.

Hemipenis (Figs 28*K*, 35*G*). Lateral lobe very long and very narrow; copulatory
sheath subrectangular on the inner side and pointed inwards, in contrast to
M. tasmanica which has a more rounded and straight one.

Ejaculatory tube. With *c.* 77 rosettes. Length–width ratio 7.00.

Furca (Fig. 35*K*). No sexual dimorphism. Length ratio of bristles 1.53; of
claws 1.83. Both bristles very thin. 4 double rows of spinules also present on
posterior shaft.

Furcal attachment (Fig. 35*J*). No sexual dimorphism. Length ratio of median to
ventral branch 4.00; posterior end of ventral branch slightly bifurcate.

Distribution

So far *M. praenuncia* has been found live in five places in Victoria (Lakes Bookar, Coradgill, Corangamite and Kariah, which are all close together, and a small lake near Centre Lake) and in one place in South Australia (unnamed lagoon north of Eleanor River). It has also been recorded as a fossil from the Mallee (type locality) and from Lake Keilambete, both in Victoria.

Remarks

Mytilocypris sp. nov. aff. *M. tasmanica* in De Deckker (1975), recorded from Lake Coradgill and a small lake near Centre Lake, Vic., belongs to *M. praenuncia.* Morphologically *M. praenuncia* and *M. tasmanica* are very closely related.

<center>*Mytilocypris splendida* (Chapman)</center>

<center>(Figs 21*A*–21*J*, 22*A*–22*D*, 24*A*–24*D*, 27*E*, 29*A*–29*D*, 30*C*)</center>

Eucypris splendida Chapman, 1966, p. 369.

Types

From Lake Learmonth, near Ballarat, Victoria, in Australian Museum.

Diagnosis

Carapace trapezoidal in lateral view with posteroventral area tapering and ending in a thin point; angle δ measured on shell 51°–60°; prehensile palps extremely long and narrow; lateral lobe of hemipenis straight, rounded at end and very broad.

Remarks

M. splendida can be distinguished from *M. minuta* by the following shell characters: larger size; shell pinched anteriorly and posteriorly when seen in dorsal view; posteroventral area narrower and more pointed.

<center>*Mytilocypris tasmanica* McKenzie</center>

<center>(Figs 19*A*–19*D*, 27*A*, 28*I*)</center>

Mytilocypris tasmanica McKenzie, 1966, p. 27.

Types

Holotype: adult ovigerous ♀, paratype adult ♂; from Calverts Lagoon, South Arm, near Hobart, Tasmania; in Australian Museum.

Diagnosis

Carapace subtriangular in lateral view with posteroventral area pointed; in dorsal view anterior end narrow and pointed; posterior end narrow but rounded; in frontal view oval in shape; inner lamella broad anteriorly and posteroventrally where it is broadest; prehensile palps of male 1st leg strongly curved and short; lateral lobe of hemipenis small and tapering and inside copulatory sheath broad and rounded.

Remarks

Living material of *M. tasmanica* has been recorded only from the type locality, and from Birchmore Lagoon on Kangaroo I., S.A.

Fossil material (Pleistocene in age) identified by Chapman (1919) as *Cypris mytiloides* was studied from the collections of the National Museum of Victoria; it is considered to belong to *M. tasmanica* because it possesses the characteristic broad inner lamella in the tapering and pointed posteroventral area of the shell.

Genus **Trigonocypris** De Deckker

Trigonocypris De Deckker, 1976, p. 146. Type-species *Trigonocypris timmsi* De Deckker.

Diagnosis

Carapace subrounded to subtriangular in lateral view; broad at its centre but rapidly narrowing anteriorly and posteriorly in dorsal view, length–width ratio 2.2, greatest width at middle; at anterior end, inner lamellae very narrow but with prominent selvages; at posterior end inner lamellae narrow or almost absent.

Natatory setae at distal end of 1st endopodite on 2nd antennae; hook-shaped extremity of prehensile palp of male 1st leg narrow and short; length ratio of ventrodistal hair of 1st segment to 3rd segment 0.82-1.50; outside lobe of copulator sheath of hemipenis very narrow; claws of furcal unequal in size.

Remarks

T. timmsi and *T. globulosa*, sp. nov., appear to be quite different in lateral view, the former species being almost triangular and the latter one subrounded, but they share many anatomical similarities as well as some internal features of the shell.

Trigonocypris globulosa, sp. nov.

(Figs 25*A*-25*H*, 27*K*, 30*E*, 30*F*, 34*A*-34*K*)

Derivation of name from Latin *globulus* (globular), on account of the general shape of the carapace.

Types

Holotype: adult ovigerous ♀, Lake Buchanan, Queensland, collected by Dr B. V. Timms. Paratype: adult ♂, same data. In Australian Museum.

Diagnosis

Carapace hemispherical with ventral side almost flat; angle β measured on shell 109°-112°; angle γ 135°-138°; inner margin broad anteriorly and posteriorly; prehensile palps of male 1st leg arched, small but rather broad except for their distal ends; hemipenis with narrow lateral lobes curved medianly, copulatory sheath rounded.

Dimensions

	Holotype ♀	Paratype ♂
Length (mm)	3.12	2.89
Width (mm)	2.06	1.87
Height (mm)	1.54	1.34

Carapace

Externally semicircular in shape, ventral side almost straight except in the mouth where it is slightly concave. Angle β 109°-112°; angle γ 135°-139°. AC/CD 8.4C 5.00. Surface of valves pseudopunctate and slightly pilose all over the carapace.

Colour of valves light brown. Greatest height at $\frac{2}{5}$ from anterior end. In dorsal view, elliptical in shape with both ends pointed. In ventral view, oval in shape with left valve slightly overlapping right one ventrally and dorsally.

Internally, transparent outer list and flange narrow and marginal on both valves; marginal zone very broad anteriorly and rather narrow in posteroventral area. Non-calcified inner lamella very broad anteriorly, selvage very faint all round. Radial pore canals numerous and straight. Hinge consisting of a groove and a ridge. Muscle scars as for *Trigonocypris timmsi.*

Anatomy

First antenna (Fig. 34A). No sexual dimorphism; length–width ratios of 3rd–7th segments: III, 3.88; IV, 2.39; V, 2.48; VI, 3.50; VII, 3.50.

Second antenna (Fig. 34B). Sexual dimorphism of the end claws as in *M. minuta.* Length–width ratios of 1st and 2nd segment: I, 3.17; II, 2.80. Natatory setae attached near distal end of 2nd segment; 'sense club' near proximal end of 2nd segment.

Mandible (Fig. 34D). No strong sexual dimorphism; similar to mandible of *T. timmsi.*

Rake-like process. Bearing 8 teeth in both sexes, all irregular, small and stout; the inner ones bifid.

Maxilla (Fig. 34C). No sexual dimorphism, branchial plate bearing 24 Strahlen; lobes cylindrical and elongate; 3rd lobe (outer masticatory process) bearing 2 Zahnborsten; length–width ratio of palp 4.17; of distal palp 1.74.

First leg (Figs 34E, 34F). Strong sexual dimorphism: in female, a lobe bearing 3 unequal pilose bristles; in male, prehensile palps very similar and of same width all along except at distal end which is pointed. Right endopodite bearing a broad bristle distally on the inside; 2 small but broad protrusions at distal end of left endopodite near base of palp.

Second leg (Fig. 34H). No sexual dimorphism: similar to *T. timmsi* except for ventrodistal hair of 2nd segment which is longer. Length–width ratios of 1st–4th segments: I, 1.90; II, 1.90; III, 2.10; IV, 1.22. 2nd and 3rd segments not fused.

Third leg (Fig. 34I). No sexual dimorphism; ratio of length of 2nd to 3rd segment 1.35; length ratio of claws 2.43, smaller claw hook-shaped. Position of hairs similar to *T. timmsi.*

Hemipenis (Figs 30E, 30F). Lateral lobe digitate and slightly curved medianly; copulatory sheath rounded, prominent at base of the lateral lobe. For further details see Figs 30E, 30F.

Ejaculatory tube (Fig. 34G). With *c.* 75 rosettes; length–width ratio of process 3.00–5.34.

Furca (Fig. 34J). No strong sexual dimorphism; length ratios of claws 0.80; of bristles 1.50; length of posterior bristle *c.* $\frac{2}{3}$ length of claws. 4 double rows of spinules on posterior edge of shaft.

Furcal attachment (Fig. 34K). Proximal end bifurcate; length ratio of median to ventral branch 2.19; ventral and dorsal branches of almost same sizes.

Eye.   Single, dark brown, with 2 large lateral silver lenses.

Eggs.   Orange in colour.

Distribution

From Lake Buchanan, Qld, and the Salt Lake, 80 km south of Tibooburra, N.S.W.   It is interesting to note that *Mytilocypris splendida* is also recorded from both localities.

Trigonocypris timmsi De Deckker

(Figs 26*A*-26*E*, 27*J*, 30*D*)

Trigonocypris timmsi De Deckker, 1976, p. 150.

Types

Holotype ♀, paratypes ♀, ♂, Pine Tree Lagoon, Queensland, in Commonwealth Palaeontological Collection, Canberra.

Diagnosis

Carapace subtriangular in shape with 1 small spine on posteroventral edge of right valve;   angle β measured on shell 105°-106°;   angle γ 151°.   Inner margin almost absent posteriorly;   prehensile palps of male 1st leg long and narrow and unequally curved;   hemipenis with stiff, broad, lateral lobe strongly curved medianly;   prominent copulatory sheath pointing upwards, with many thin transverse striae.

Remarks

So far, *T. timmsi* has been collected only from the type locality.   It is also the only known mytilocypridinid species possessing a posteroventral spine on the right valve.

Trigonocypris sp. De Deckker

(Figs 26*F*, 26*G*)

Trigonocypris sp. De Deckker, 1976, p. 155.

Description

See De Deckker (1976, pp. 155-6).

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Corrigenda

Australian Journal of Zoology, Volume 22, Number 1, pp. 91-104 (1974)

p. 97, line 16:

 For 'width 60 μm', *read* 'width 10 μm'.

  line 19:

 For 'Fig. 11', *read* 'Fig. 10'.

p. 98, line 15:

 For '1st leg', *read* '2nd leg'.

Australian Journal of Zoology, Volume 24, Number 1, pp. 145-57 (1976)

p. 145, Introduction, line 3:

 For 'House Creek formation', *read* 'Horse Creek formation'.

      line 5:

 For 'central Queensland', *read* 'western Queensland'.

      line 18:

 For 'Escat Collection', *read* 'Escap Collection'.

      line 22:

 For 'JOEL', *read* 'JEOL'.

p. 155, legend to Figs 36–39:

 Transpose attribution of *37* and *38*.

pp. 155–6:

Holotype and paratypes of *Trigonocypris* sp. should be designated 'figured specimens', because this fossil is described in open nomenclature.

SOUTH AUSTRALIA

○ 28
■ 62

NEW SOUTH WALES

■ 48

■⊞
66 82

△ 7

△ □ ■ ■ ■
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14 43 75
44
50

△ 12
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3
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■ 37 ⊞ 81
47 52

■ 46

VICTORIA

■ 61

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34 33
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76.77.78.79.80.

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23.21 ◇
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36 56
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⊠ 84

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⊟ 87

□ 43

■ 41

TASMANIA

■ 31

◇ 23
63 ■
65 ■

24

△ A. hypersalina   ■ M. splendida
◇ A. robusta   ■ M. tasmanica
◆ A. ? rectangularis   ■ M. ambiguosa
○ T. globulosa   ■ M. minuta
□ M. henricae   ⊞ M. praenuncia
■ M. mytiloides   ⊠ Mytilocypris sp. (fossil)
                          ⊟ Mytilocypris sp.
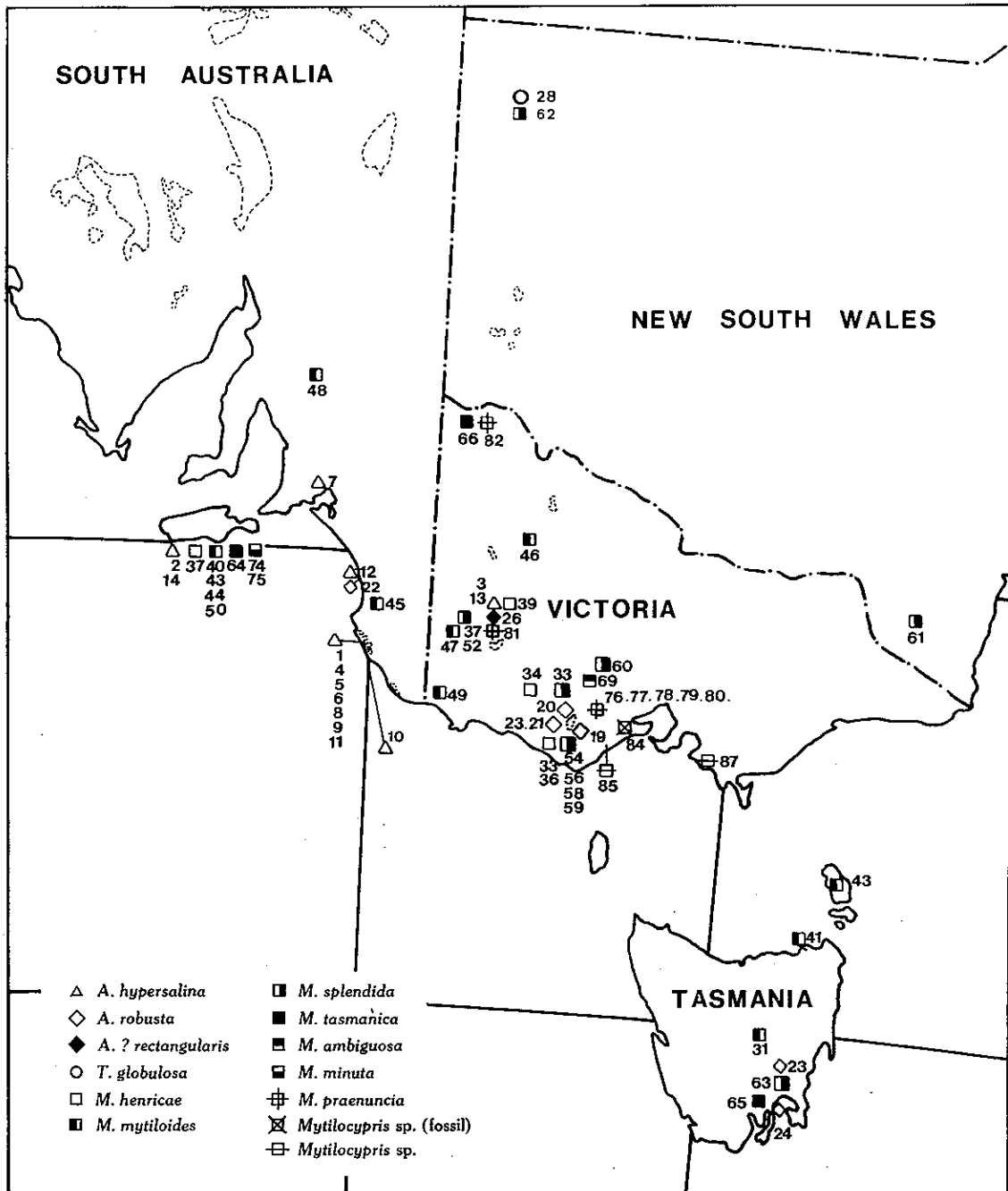
Fig. 1a. Localities in South Australia, New South Wales, Victoria and Tasmania from which mytilocypridinid ostracods are recorded. For explanation of numbers, see pp. 3–5.
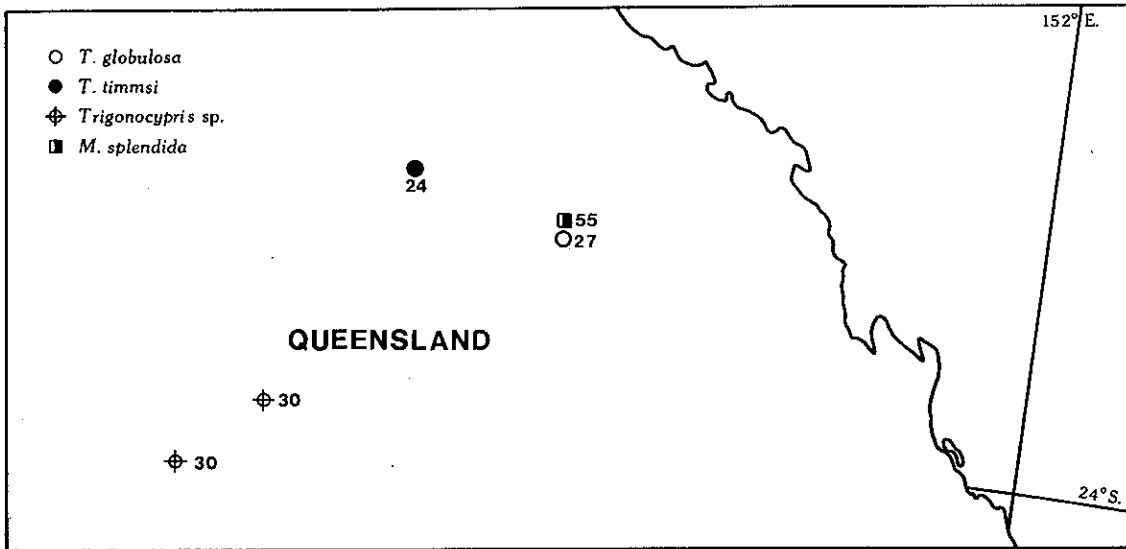
Fig. 1b. Localities in Queensland from which *Trigonocypris* and *Mytilocypris* are recorded. For explanation of numbers, see pp. 3–5.
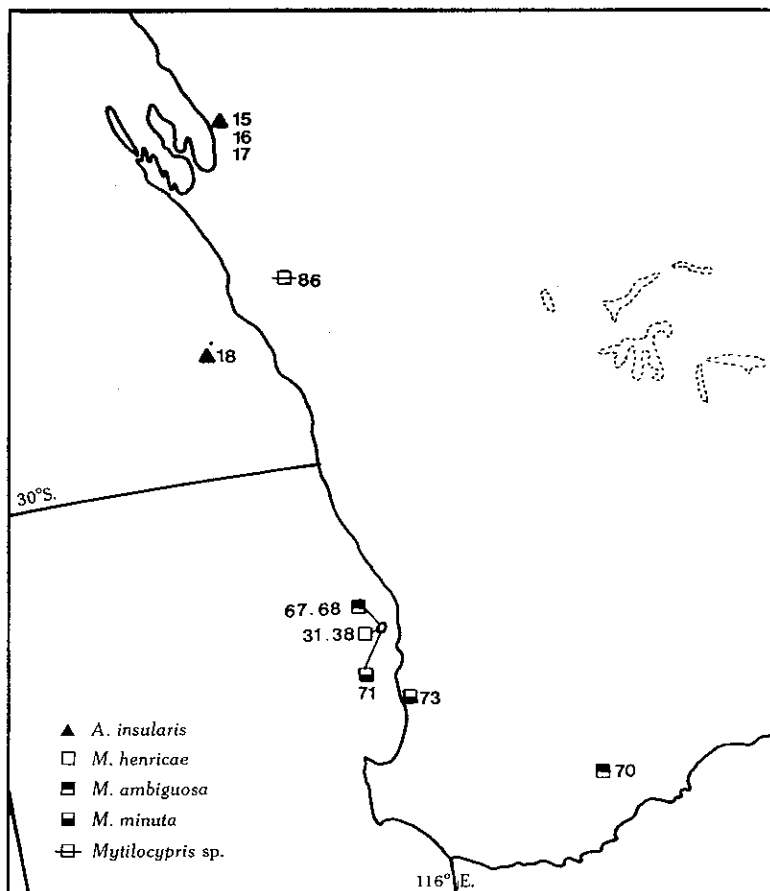
Fig. 1c. Localities in Western Australia from which *Australocypris* and *Mytilocypris* are recorded. For explanation of numbers, see pp. 3–5.
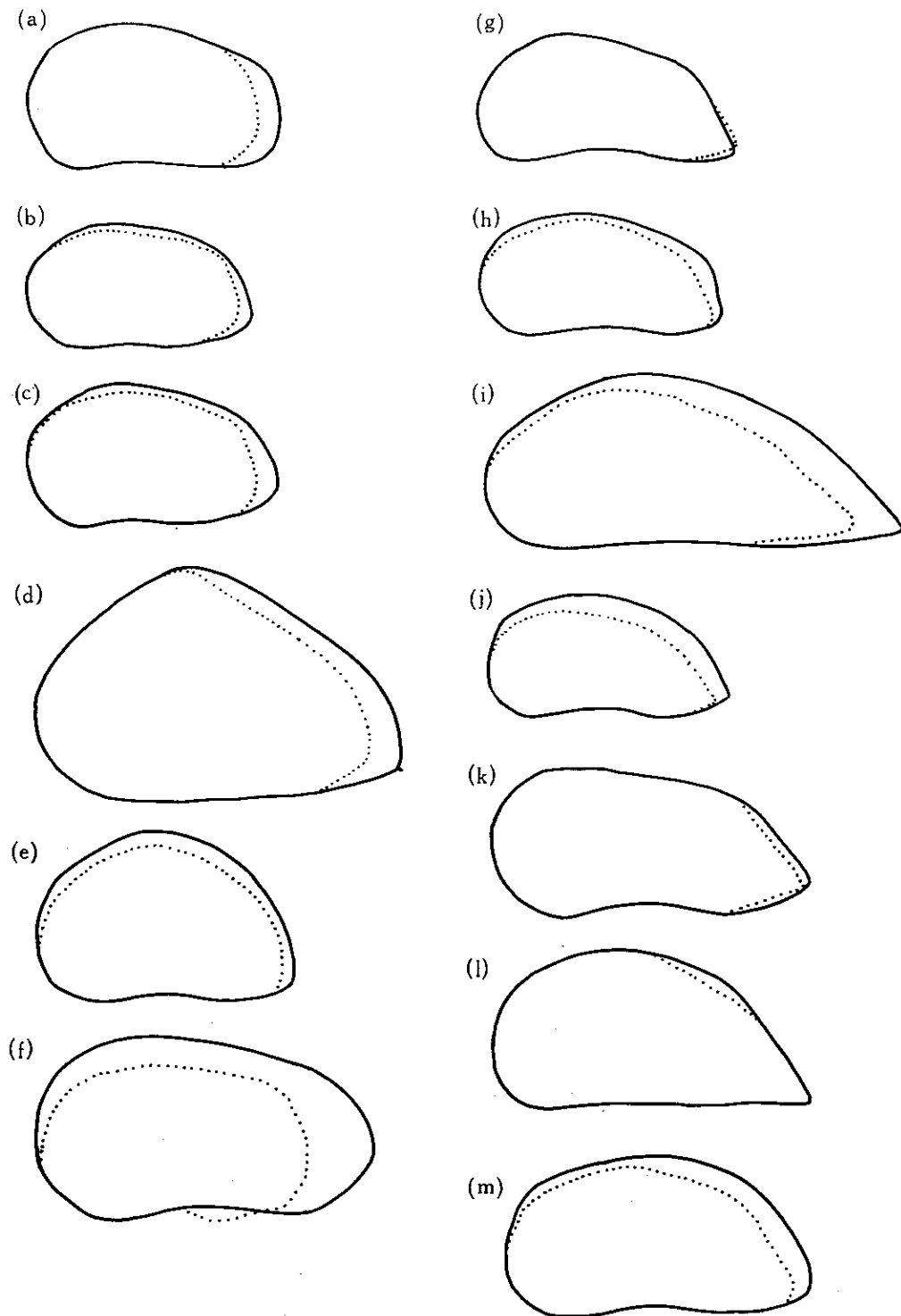
Fig. 2. Outline of carapace, in lateral view: (a) *Australocypris robusta*; (b) *A. hypersalina*; (c) *A. insularis*; (d) *Trigonocypris timmsi*; (e) *T. globulosa*; (f) *A. ? rectangularis*; (g) *Mytilocypris tasmanica*; (h) *M. praenuncia*; (i) *M. mytiloides*; (j) *M. minuta*; (k) *M. splendida*; (l) *M. henricae*; (m) *M. ambiguosa*. .... Male. — Female.
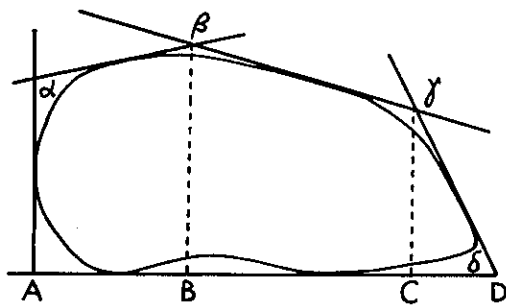
Fig. 3. Diagram showing the tangents, angles and lengths measured on the lateral outline of a mytilocypridinid carapace.
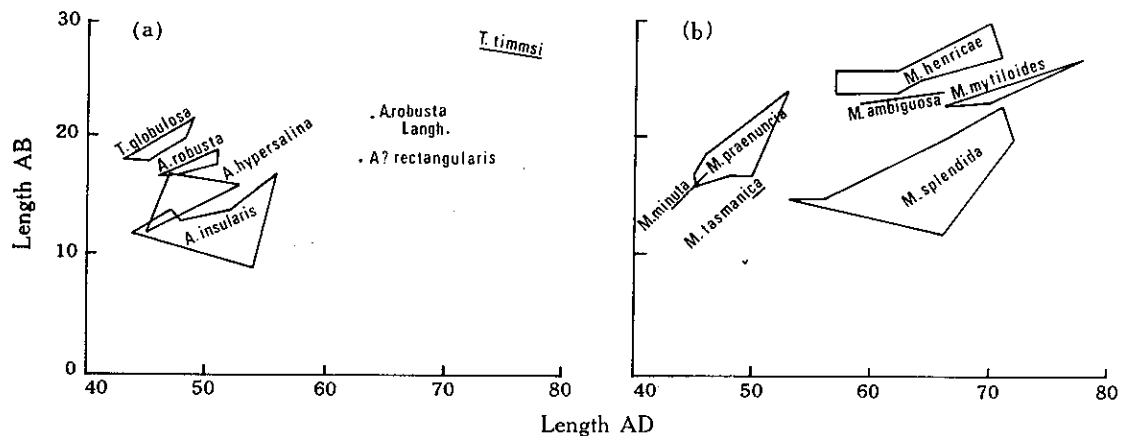
Fig. 4. Plots of lengths AB against AD (see Fig. 3). (a) *Australocypris* and *Trigonocypris*. (b) *Mytilocypris*.
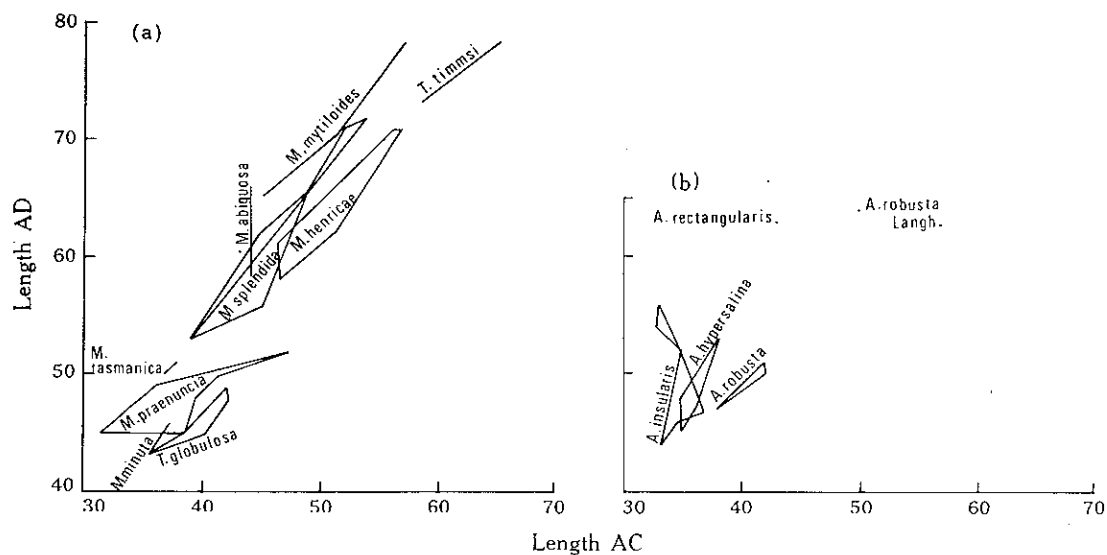
Fig. 5. Plots of lengths AC against AD (see Fig. 3). (a) *Mytilocypris* and *Trigonocypris*. (b) *Australocypris*.
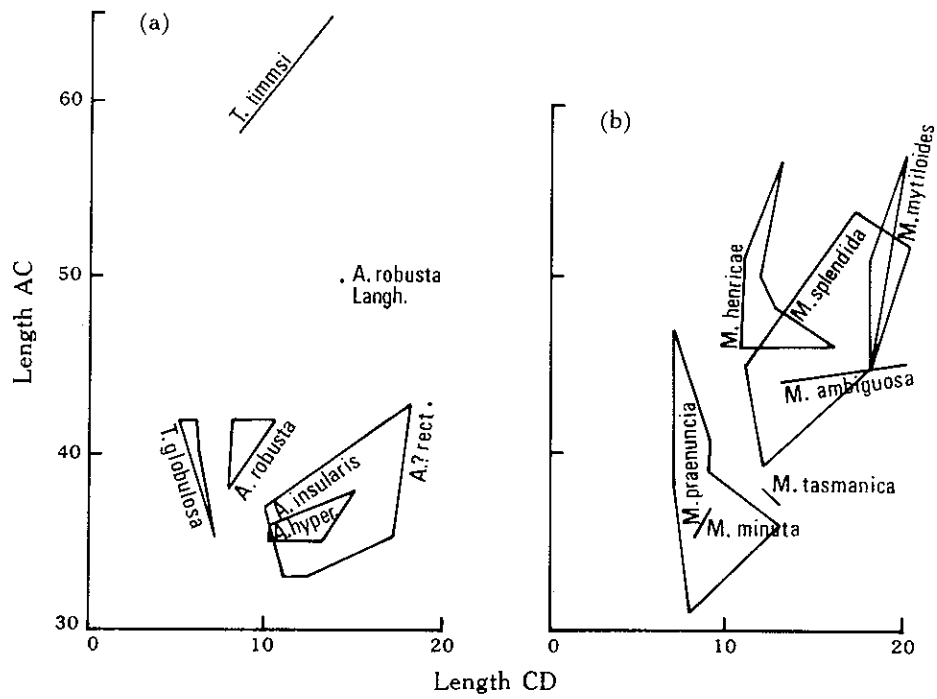
Fig. 6. Plots of lengths AC against CD (see Fig. 3). (*a*) *Australocypris* and *Trigonocypris.* (*b*) *Mytilocypris.*
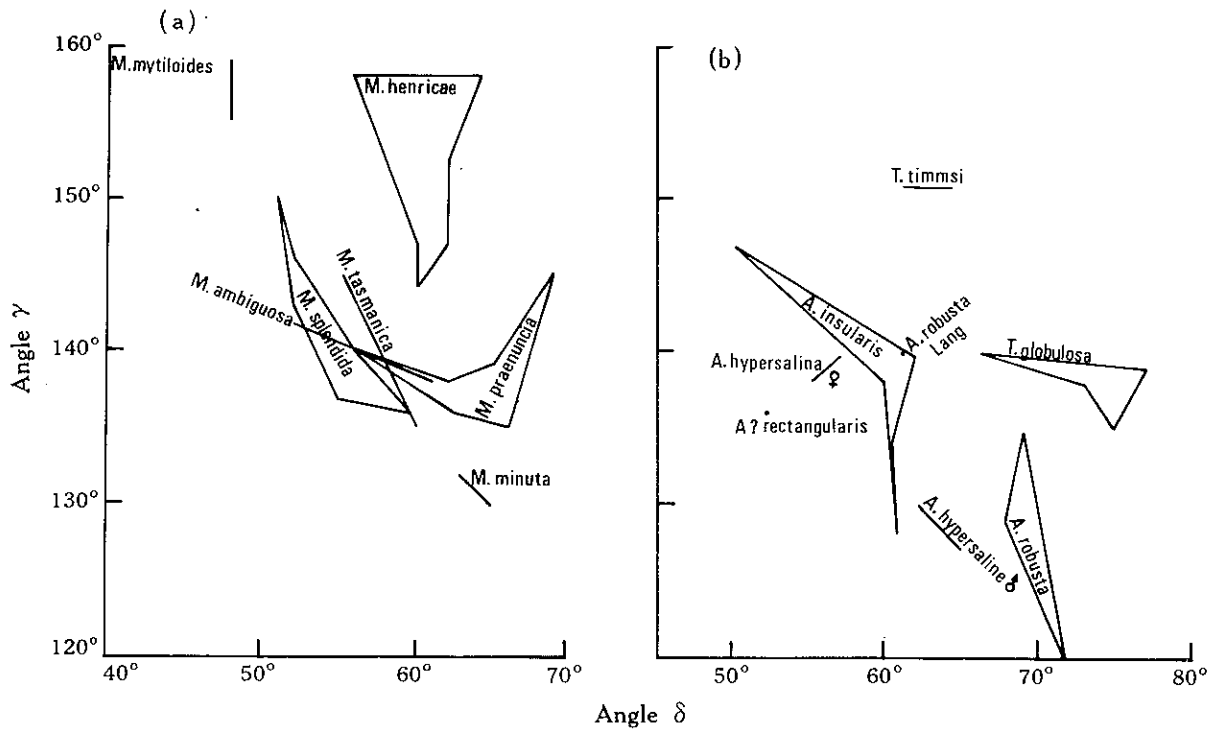
Fig. 7. Plots of angles γ against δ (see Fig. 3). (*a*) *Mytilocypris.* (*b*) *Australocypris* and *Trigonocypris.*
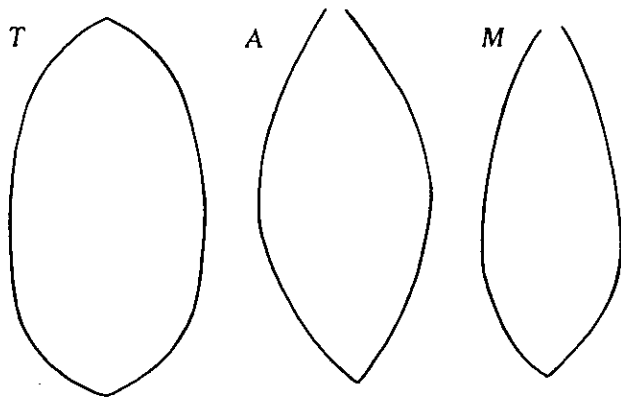
Fig. 8. Diagrams of typical outlines in longitudinal section of *Mytilo-cypris* (*M*), *Trigonocypris* (*T*) and *Australocypris* (*A*).
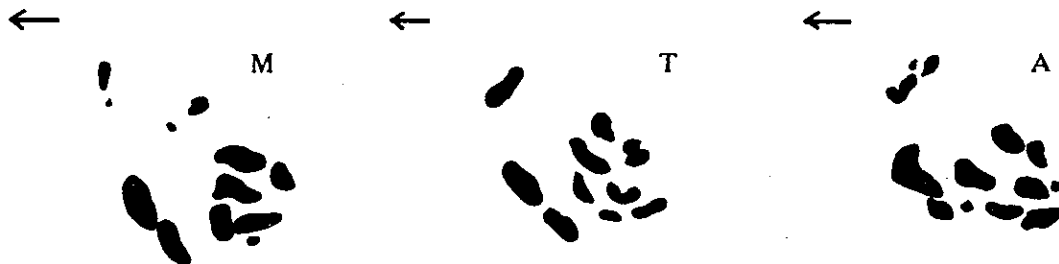
Fig. 9. Central muscle scars of *Mytilocypris tasmanica* (*M*), *Trigonocypris timmsi* (*T*) and *Australocypris robusta* (*A*). Arrows indicate anterior direction.
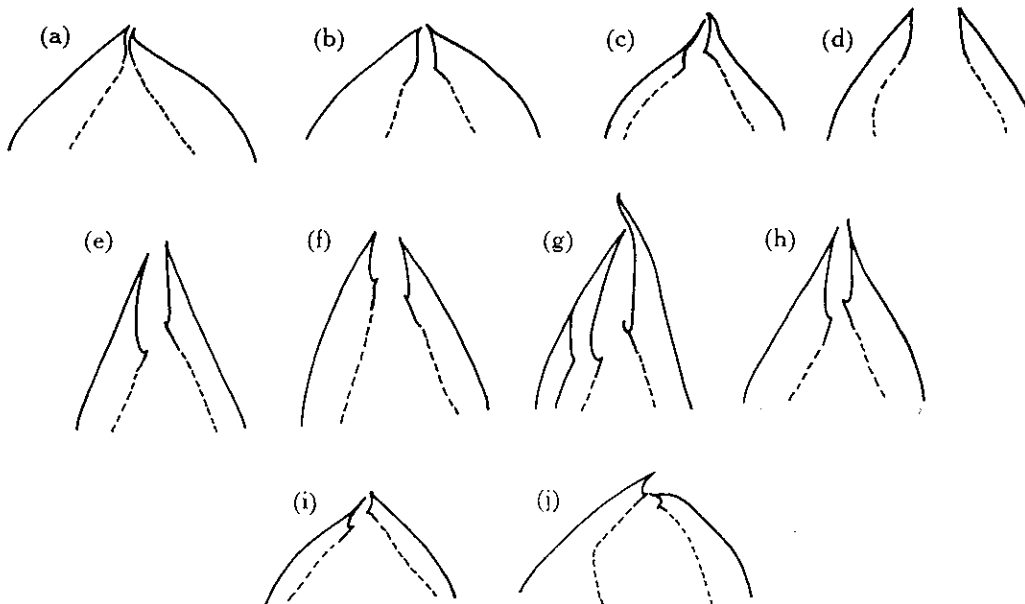
Fig. 10. Diagrams of anterior part of the carapace, in longitudinal section: (*a*) *Australocypris robusta*; (*b*) *A. insularis*; (*c*) *A. robusta* (Tasmania); (*d*) *A. insularis*; (*e*) *Mytilocypris tasmanica*; (*f*) *M. praenuncia*; (*g*) *M. mytiloides*; (*h*) *M. henricae*; (*i*) *Trigonocypris timmsi*; (*j*) *T. globulosa*.
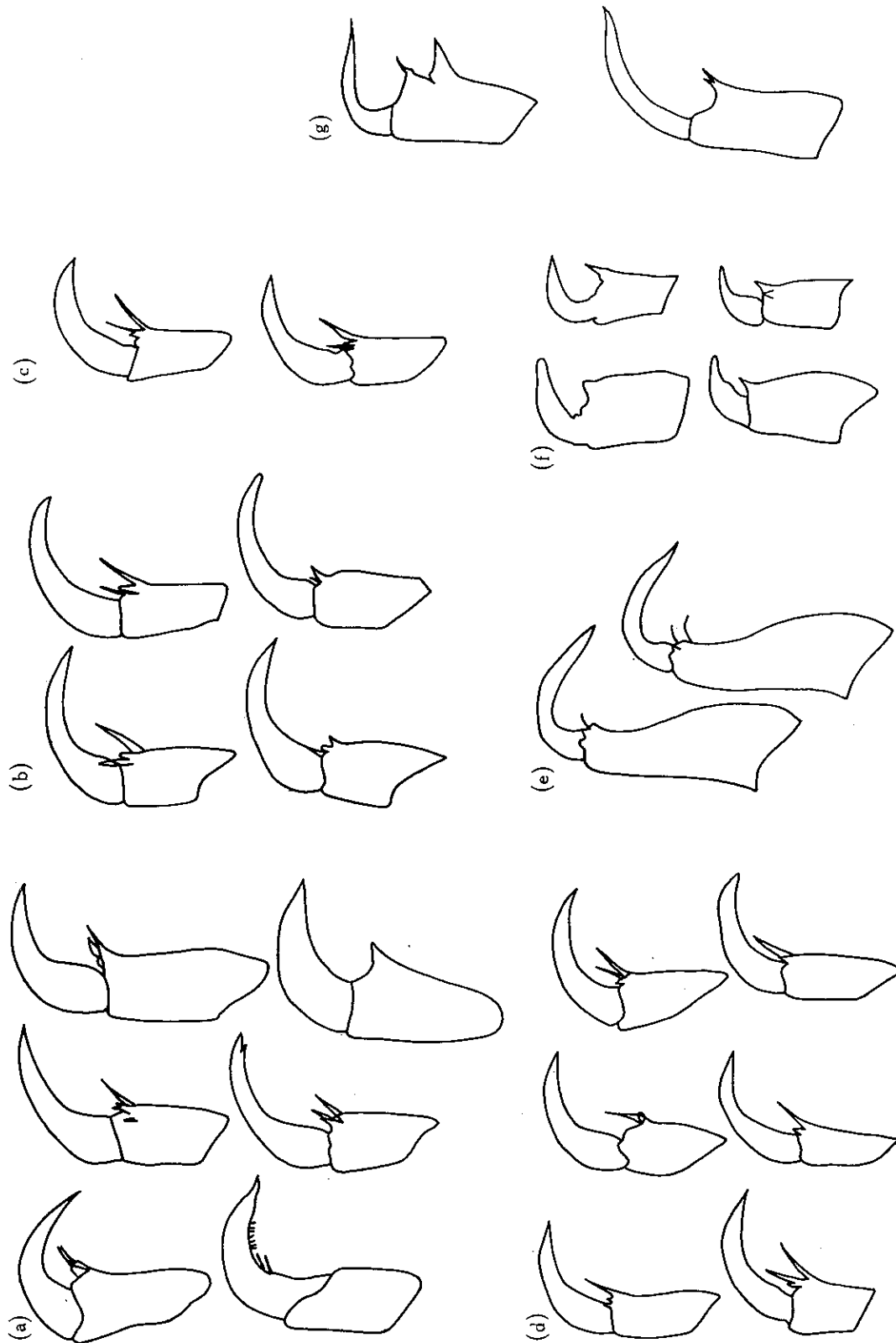
Fig. 11. Prehensile palps of male first legs of *Australocypris* and *Trigonocypris*. (*a*) *A. robusta*: left, L. Gnotuk; mid, pond near Langhorne; right, Tunbridge. (*b*) *A. hypersalina*: left, Mitre Lake; right, L. Robe. (*c*) *A. insularis*, loc. 23, Shark Bay. (*d*) *A. insularis*: left, loc. 24, Shark Bay; mid, Houtmans Abrolhos; right, loc. 21, Shark Bay. (*e*) *A. ? rectangularis*, Centre Lake. (*f*) *T. globulosa*: left, L. Buchanan; right, Tunbridge. (*g*) *T. tinnsi*, Pine Tree Creek Lagoon.
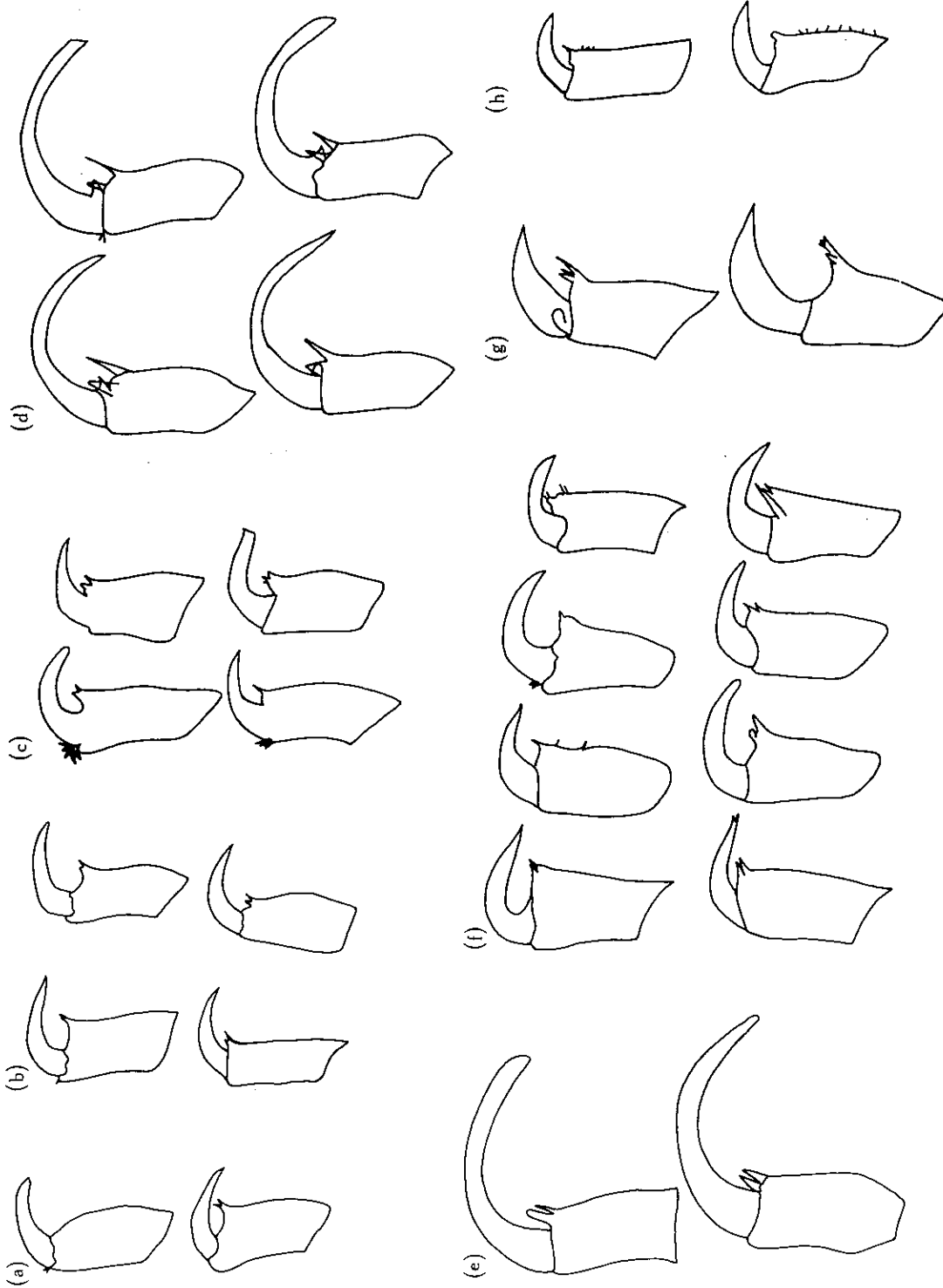
Fig. 12. Prehensile palps of male first legs of *Mytilocypris*. (a) *M. tasmanica*. (b) *M. praenuncia*. (c) *M. mytiloides*: left, Blackmans Lagoon; right, Logans Lagoon. (d) *M. splendida*: left, L. Bolac; right, L. Colac. (e) *M. splendida*, L. Gnarpurt. (f) *M. henricae*, left to right: L. Purdigulac; L. Linlithgow; pond near L. White; coastal lagoon, Flinders I. (g) *M. ambiguosa*, Barkers Swamp, Rottnest I. (h) *M. minuta*, Barkers Swamp.
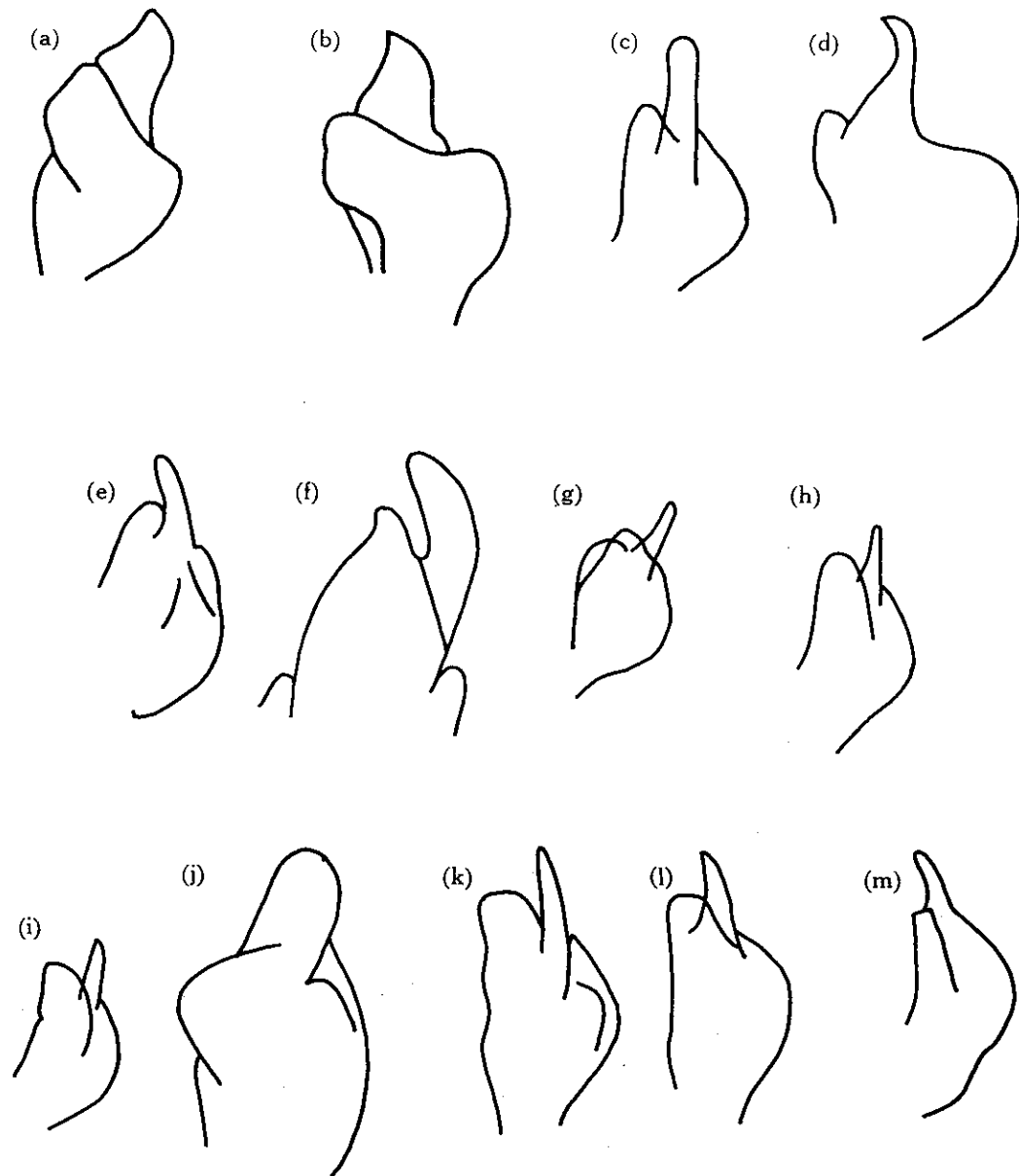
Fig. 13. Outline of hemipenis of mytilocypridinids: (*a*) *Australocypris hypersalina*; (*b*) *A. insularis*; (*c*) *A. robusta*; (*d*) *A. ? rectangularis*; (*e*) *Trigonocypris globulosa*; (*f*) *T. timmsi*; (*g*) *Mytilocypris minuta*; (*h*) *M. tasmanica*; (*i*) *M. praenuncia*; (*j*) *M. splendida*; (*k*) *M. mytiloides*; (*l*) *M. henricae*; (*m*) *M. ambiguosa.*
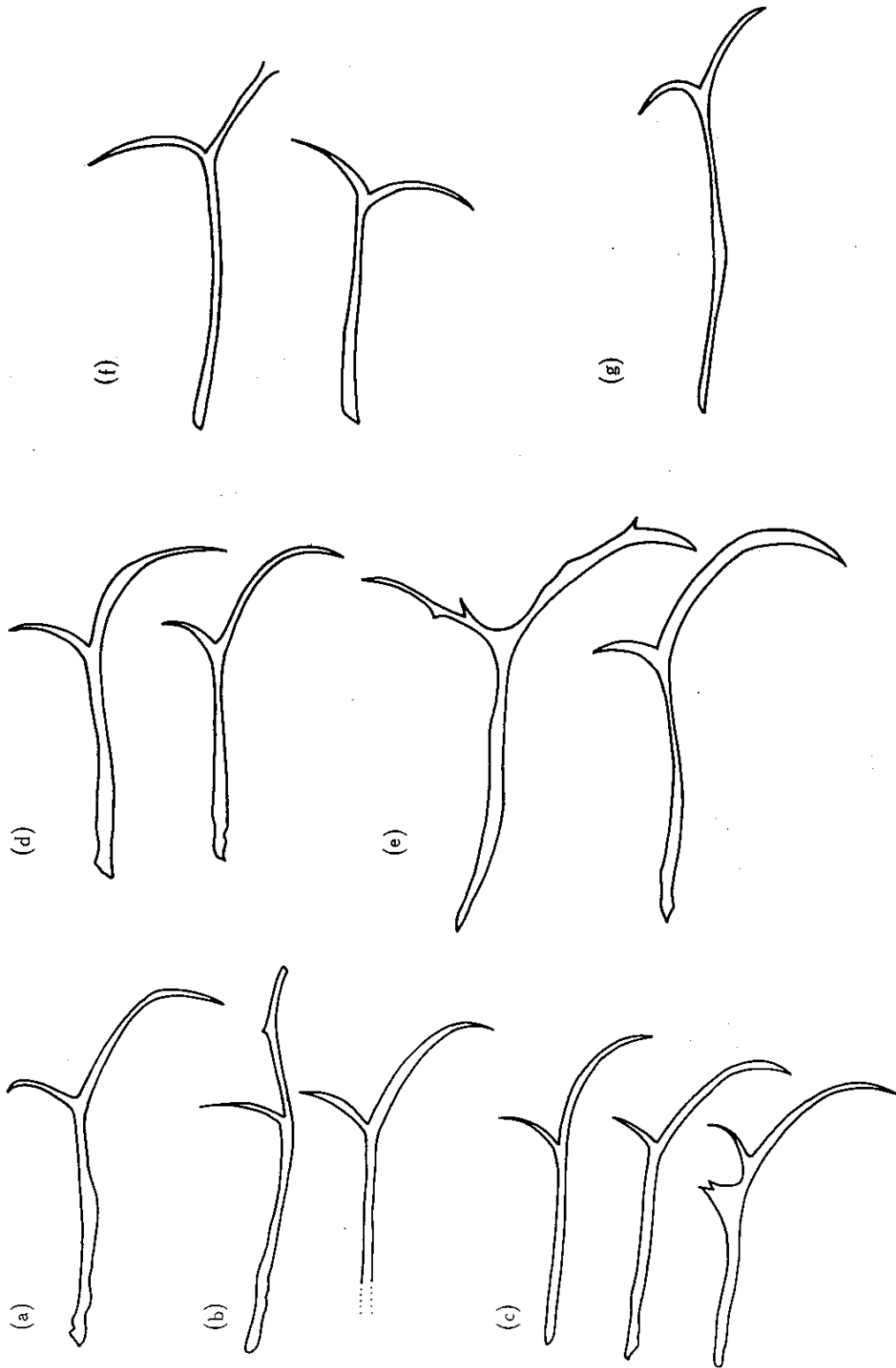
Fig. 14. Furcal attachments of *Australocypris* and *Trigonocypris*. (*a*) *A. robusta*, L. Gnotuk. (*b*) *A. hypersalina*: upper, L. Robe; lower, Mitre Lake. (*c*) *A. insularis*: upper, Houtmans Abrolhos; lower, both loc. 23, Shark Bay. (*d*) *A. insularis*: upper, loc. 21, Shark Bay; lower, loc. 24, Shark Bay. (*e*) *A. robusta*: upper, L. Buchanan; lower, Tunbridge. (*f*) *T. globulosa*: both Tunbridge. (*g*) *T. timmsi*, Pine Tree Creek Lagoon.
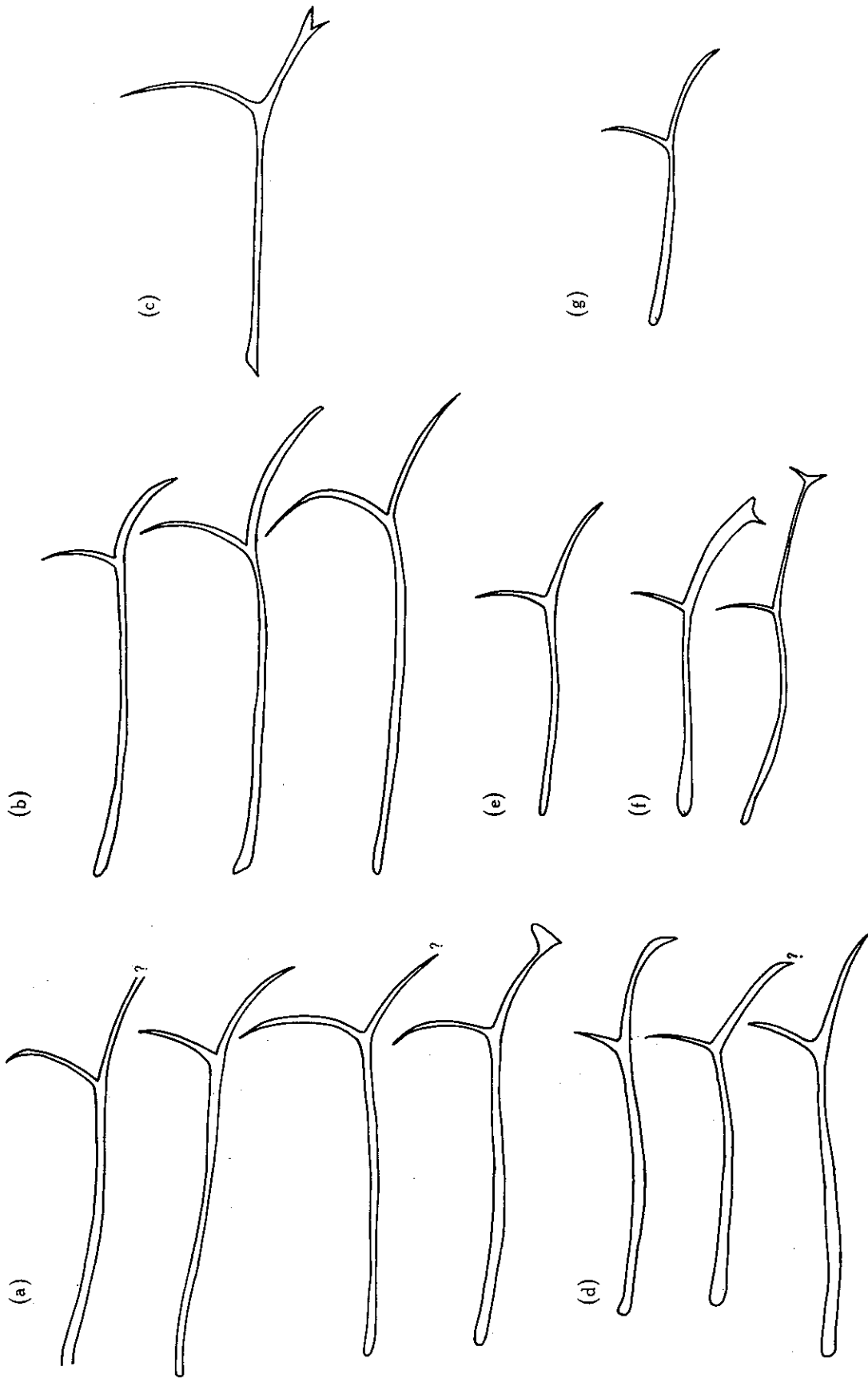
Fig. 15. Furcal attachments of *Myptilocypris*. (*a*) *M. henricae*, upper to lower: L. Linlithgow; coastal lagoon, Flinders I.; L. Purdigulac; pond near L. White. (*b*) *M. mytiloides*: upper, Logans Lagoon; mid, Blackmans Lagoon; lower, L. Edward. (*c*) *M. ambiguosa*, Barkers Swamp, Rottnest I. (*d*) *M. splendida*: upper, L. Colac; mid, L. Bolac; lower, L. Gnarpurt. (*e*) *M. tasmanica*, Calverts Lagoon. (*f*) *M. praenuncia*: upper, L. Corangamite; lower, L. Coradgill. (*g*) *M. minuta*, Barkers Swamp, Rottnest I.
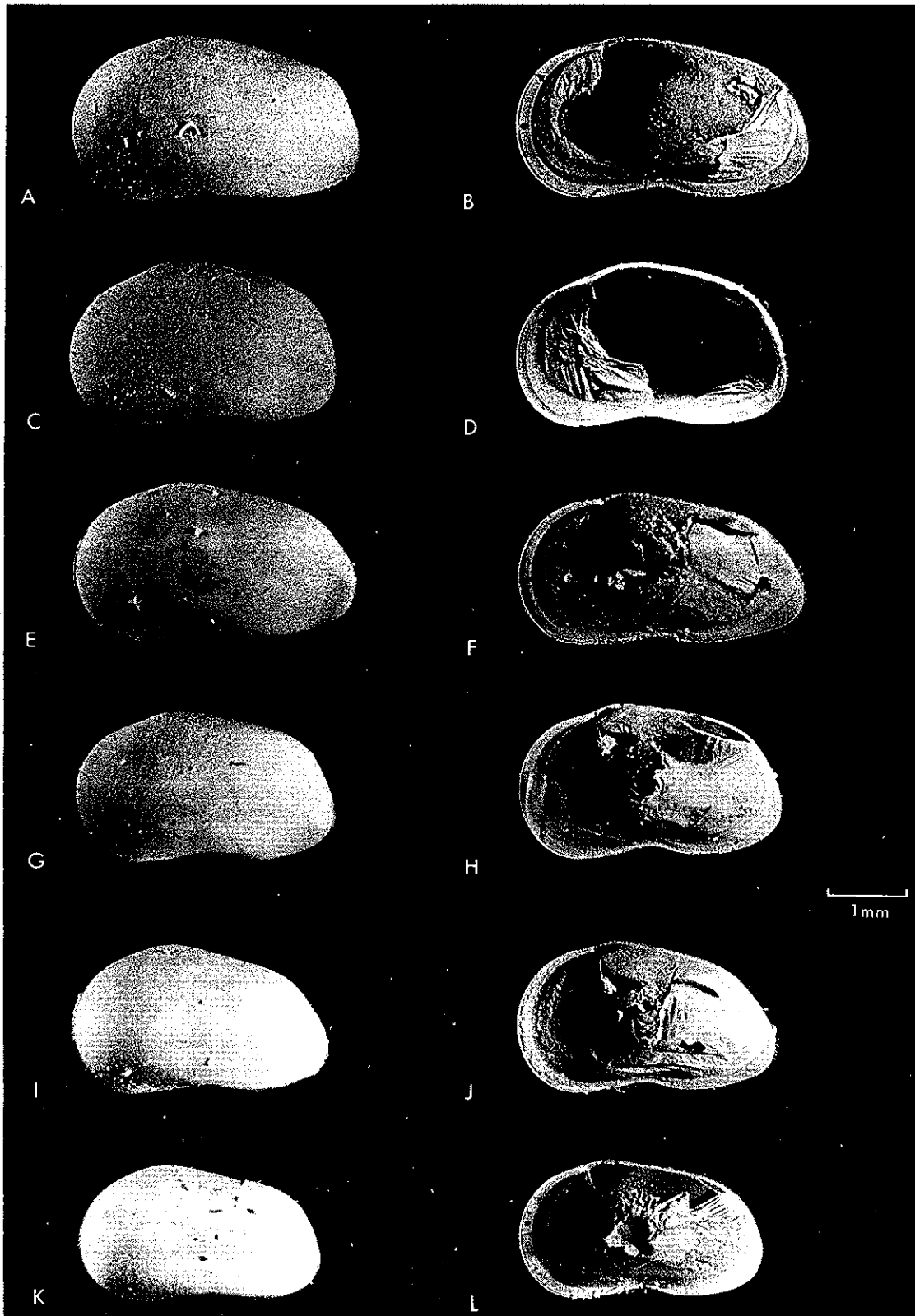
Fig. 16. *Australocypris* spp. For each pair of Figures the first is of the outside of the left valve and the second of the inside of the right valve. *A−D, A. robusta*, L. Gnotuk, Vic. *A, B*, female (note chitinous pocket in posterodorsal area of *B*); *C, D*, male. *E−L, A. hypersalina*: *E, F*, female, Mitre Lake, Vic.; *G, H*, male, Mitre Lake; *I, J*, female, L. Robe, S.A.; *K, L*, male, L. Robe. Both are Recent species.
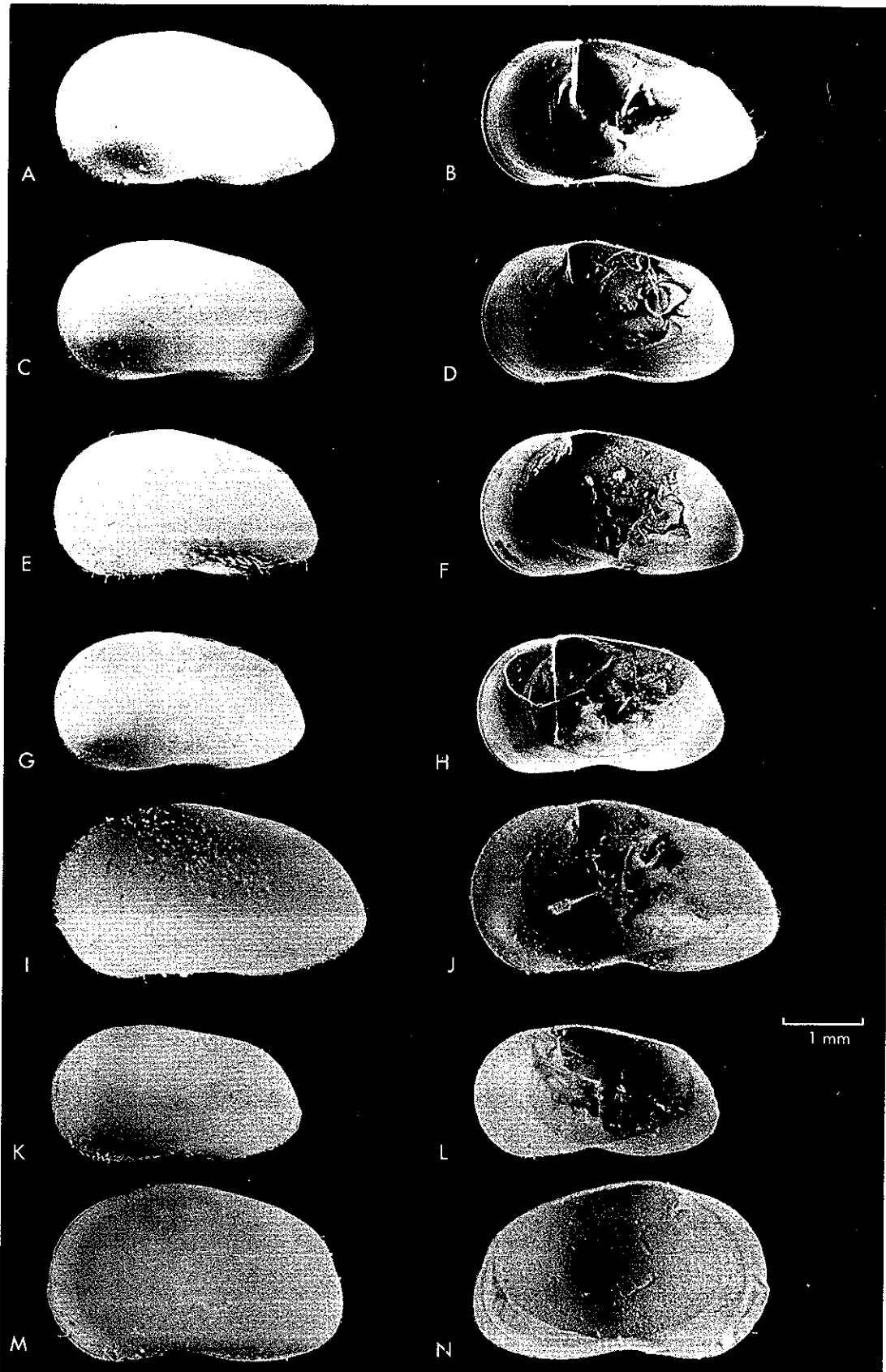
Fig. 17. *Australocypris* spp., outside of left valve and inside of right valve, as in Fig. 16. *A–L*, *A. insularis*, Birida, W.A.: *A, B*, female, locality 23; *C, D*, male, locality 23; *E, F*, female, locality 21; *G, H*, male, locality 21; *I, J*, female, locality 24; *K, L*, male, locality 24 (identity of *I–L* doubtful). *M, N, A. robusta*, female, Barilla Bay, Tas. Both are Recent species.
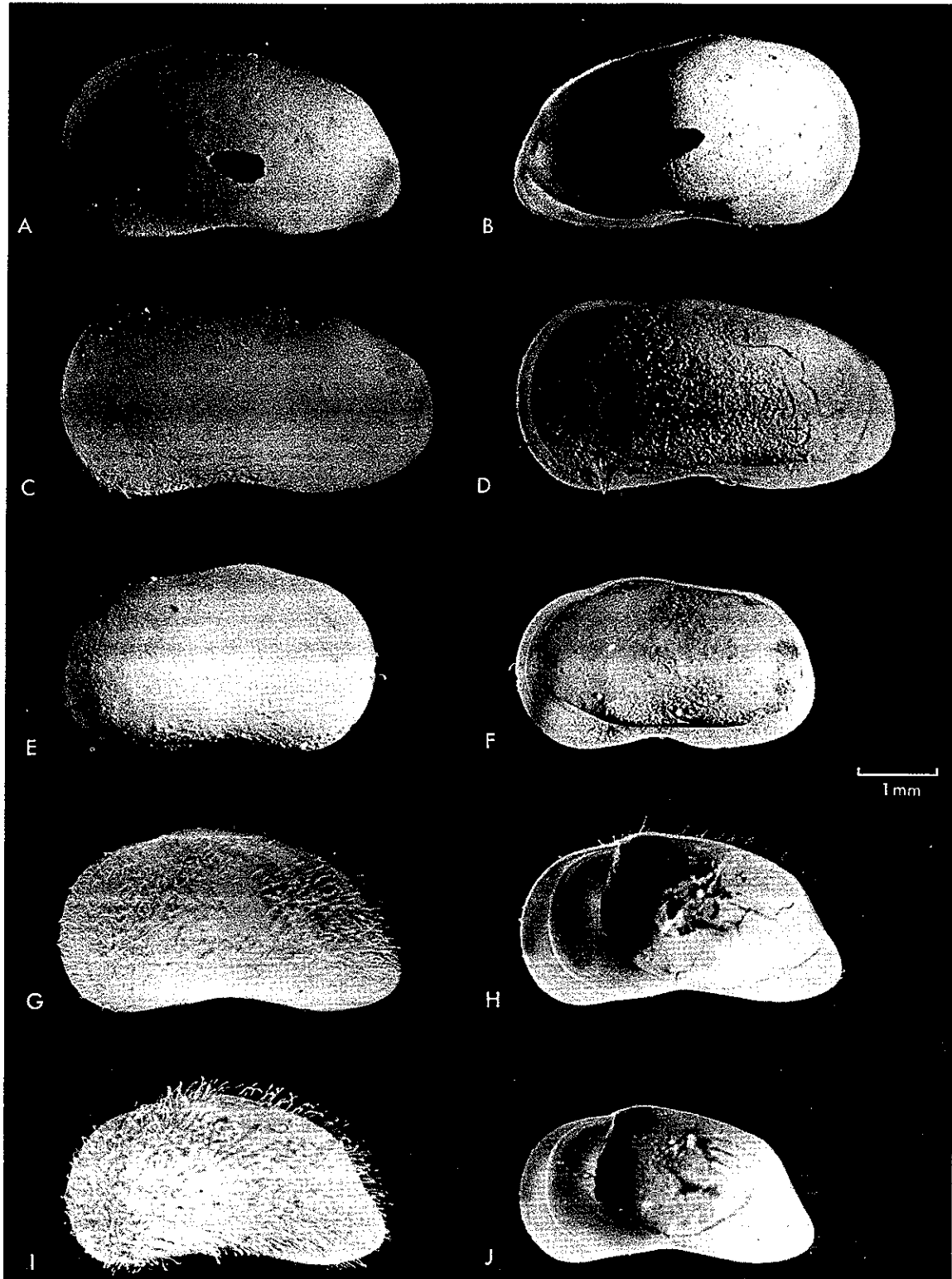
Fig. 18. *Australocypris* and *Mytilocypris* spp., outside of left valve and inside of right valve, as in Fig. 16. *A, B, A. hypersalina*, female?, pond 12 km E. of Langhorne Creek, near saltworks, S.A. (identity doubtful). *C–F, A. ? rectangularis*: *C, D*, holotype female, Centre Lake, Vic.; *E, F*, paratype male, Centre Lake. *G–J, M. ambiguosa*: *G, H*, holotype female, Barkers Swamp, Rottnest I., W.A.; *I, J*, paratype male, Barkers Swamp. All are Recent species.
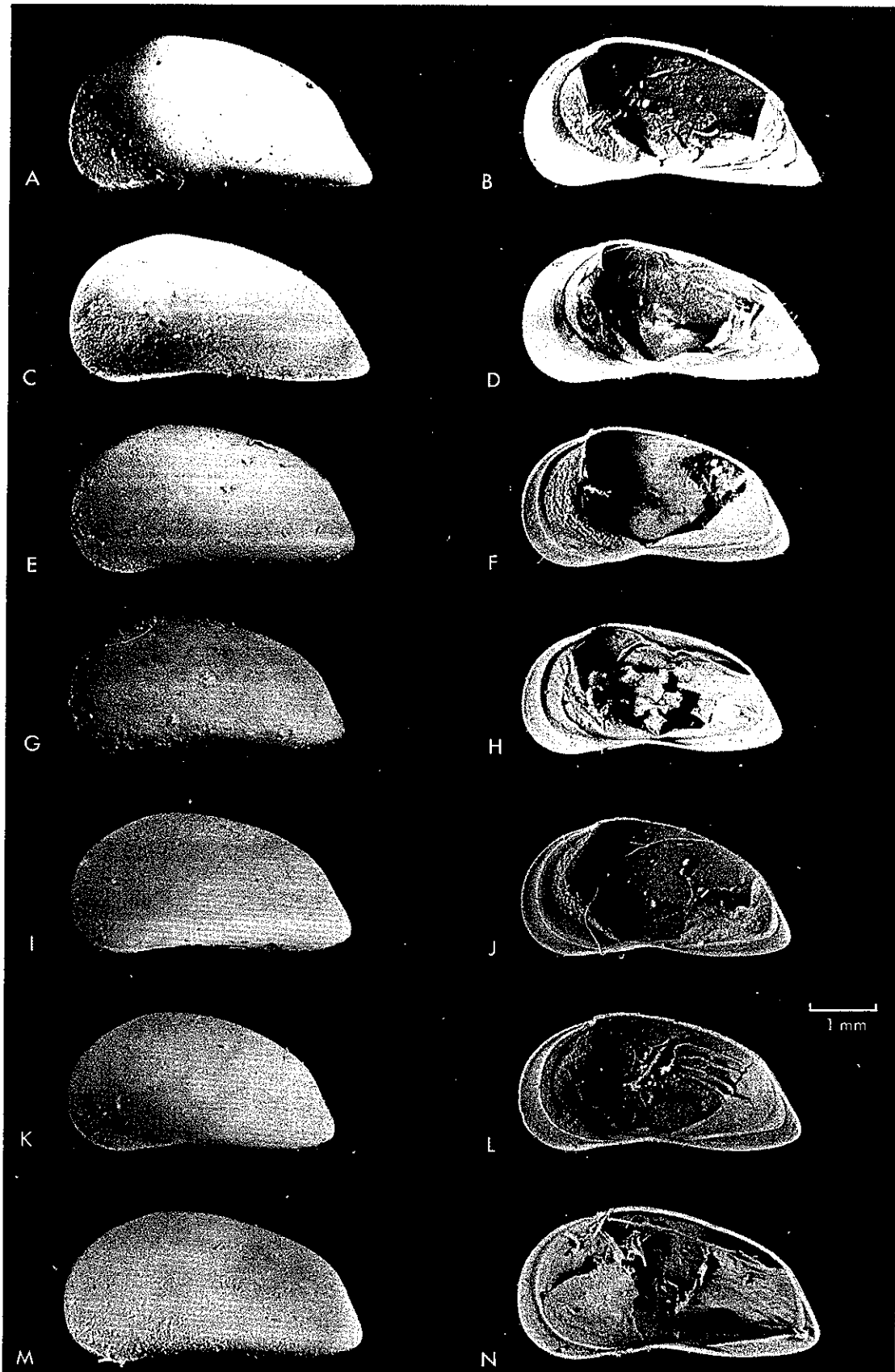
Fig. 19. *Mytilocypris* spp., outside of left valve and inside of right valve, as in Fig. 16. *A−D,*
M. tasmanica, Calverts Lagoon, Tas.: *A, B*, female; *C, D*, male. *E−N, M. praenuncia*: *E, F*,
female, L. Corangamite, Vic.; *G, H*, male, L. Corangamite; *I, J*, female, L. Coradgill, Vic.;
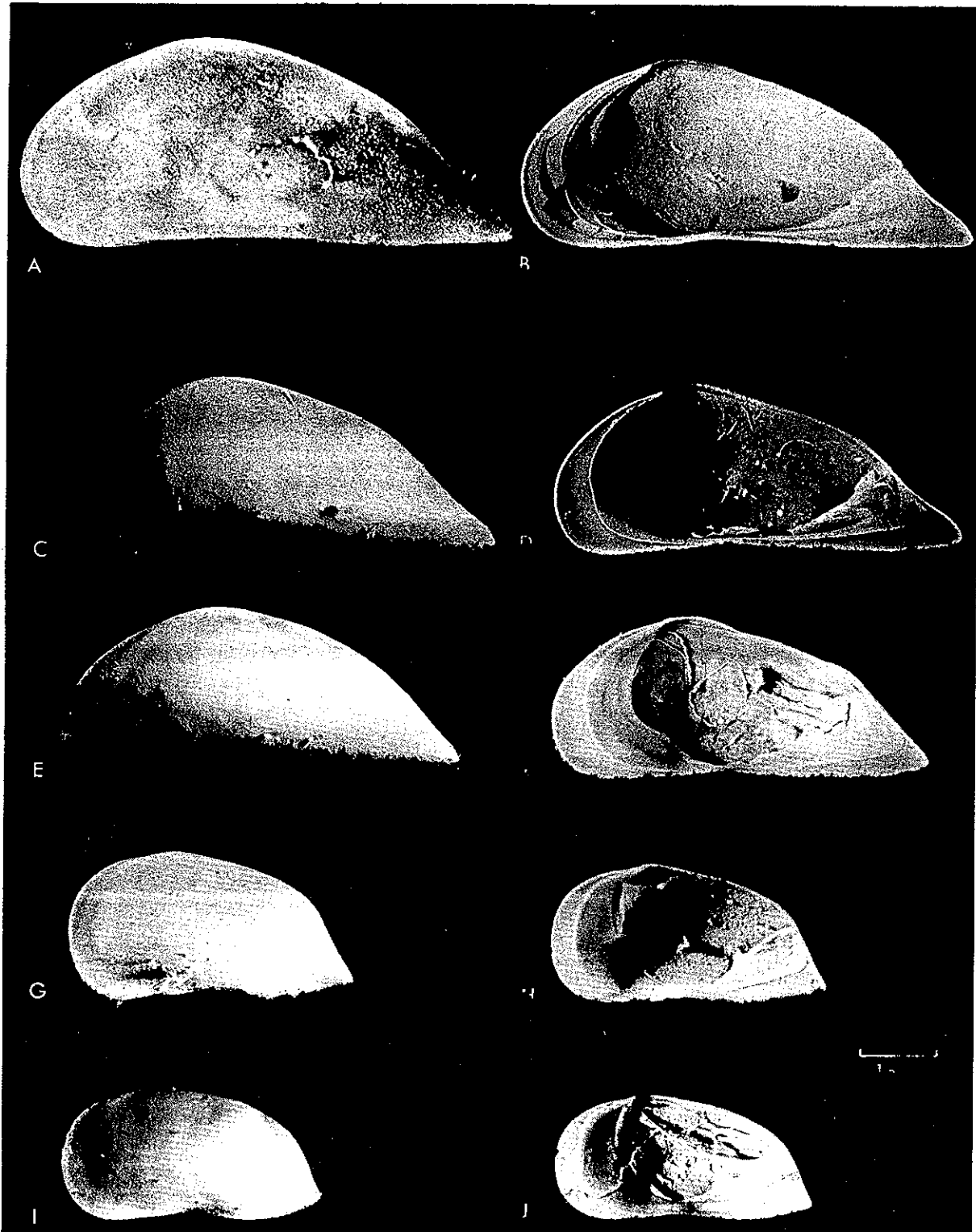*K, L*, male, L. Coradgill; *M, N*, male, L. Bookar, Vic. All are Recent species.

Fig. 20. *Mytilocypris* spp., outside of left valve and inside of right valve, as in Fig. 16. *A—F*, *M. mytiloides*: *A, B*, female, Blackmans Lagoon, Tas.; *C, D*, male, Blackmans Lagoon; *E, F*, male, creek off Logans Lagoon, Flinders I. *G—J, M. minuta*: *G, H*, holotype female, Barkers Swamp, Rottnest I., W.A.; *I, J*, paratype male, Barkers Swamp. Both are Recent species.
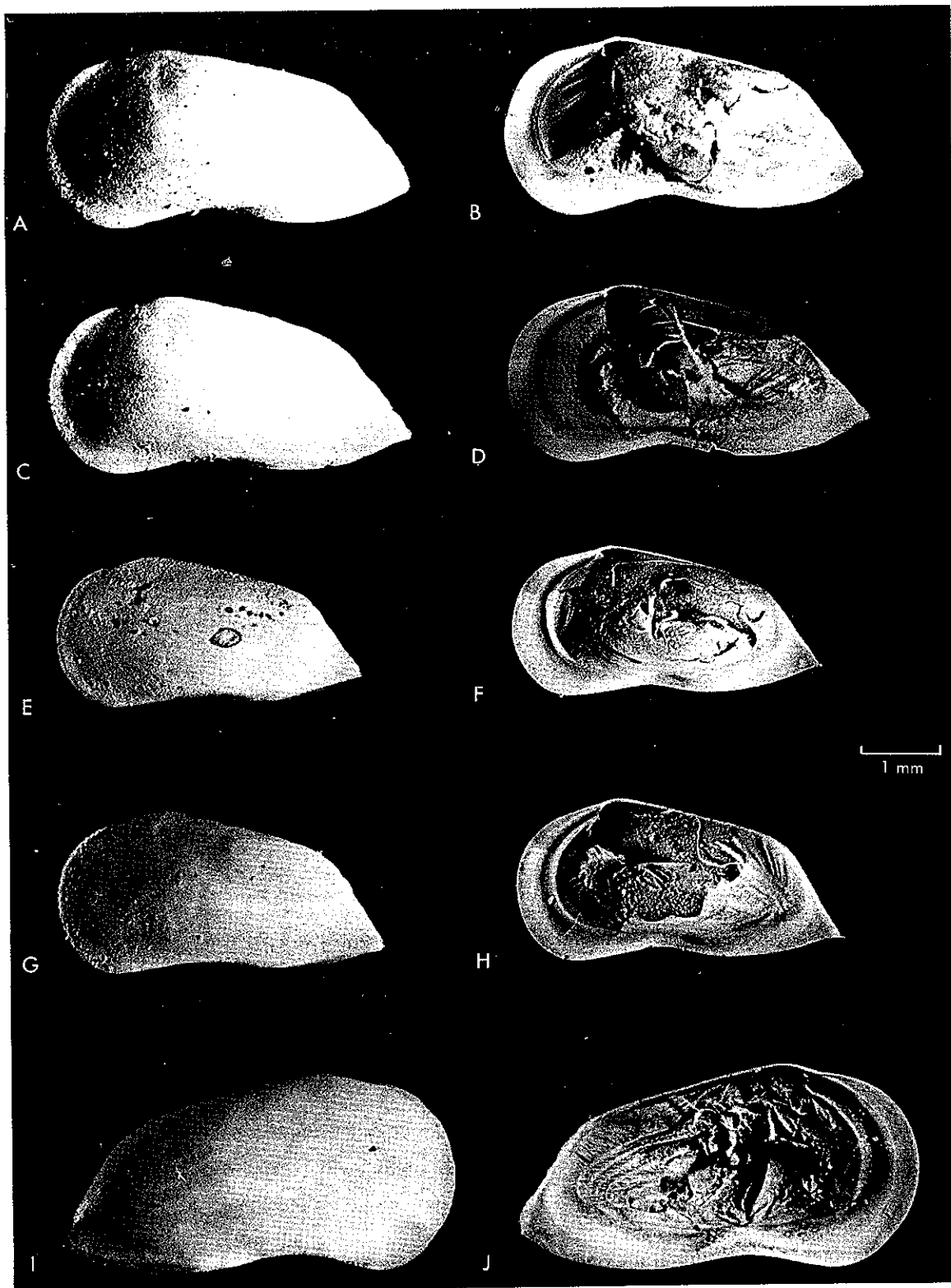
Fig. 21. *Mytilocypris splendida*, outside of left valve and inside of right valve, as in Fig. 16: *A, B,* female, L. Gnarpurt, Vic.; *C, D,* male, L. Gnarpurt; *E, F,* male, L. Bolac, Vic.; *G, H,* male, L. Colac, Vic.; *I, J,* male, L. Linlithgow, Vic. Recent species.
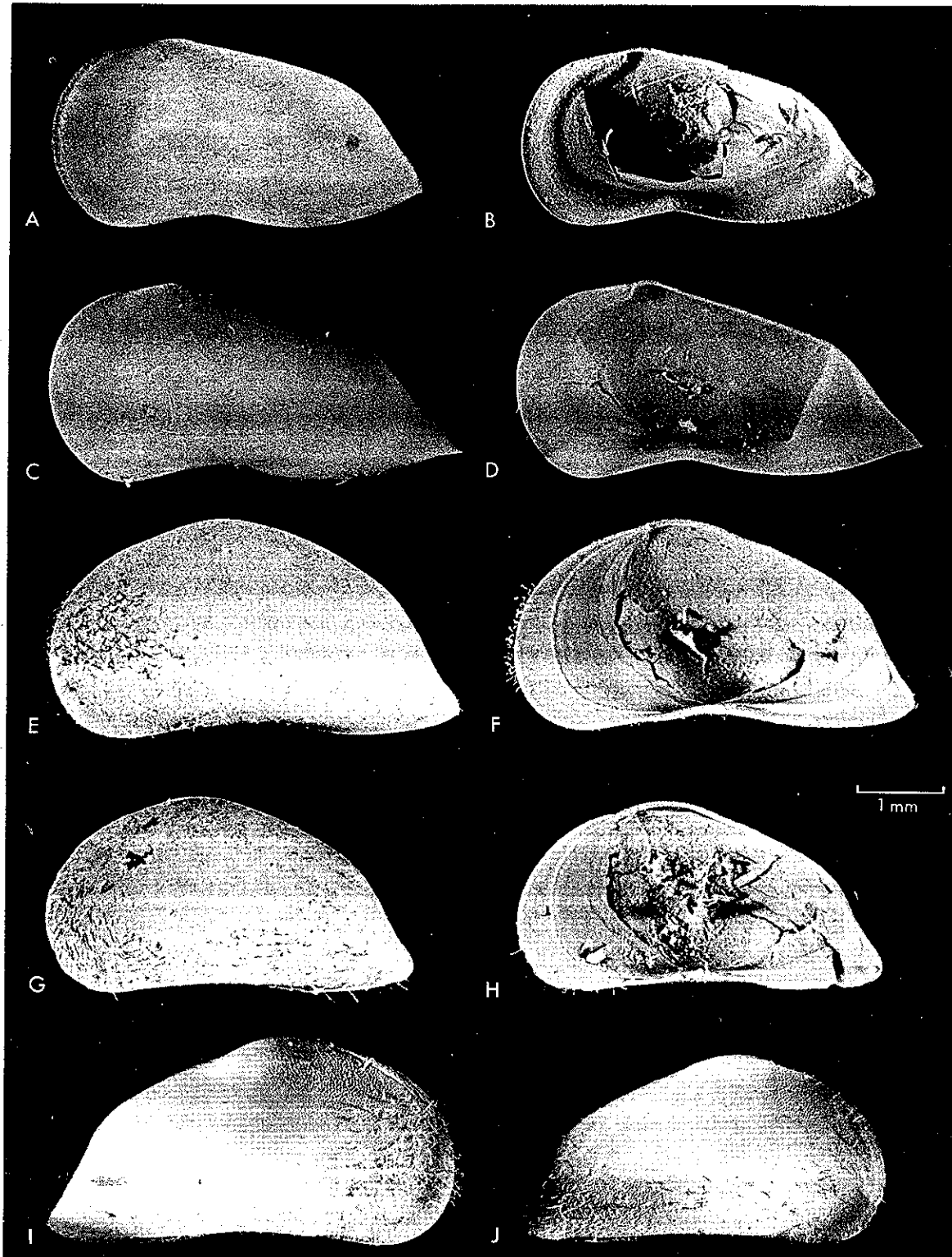
Fig. 22. *Mytilocypris* spp., outside of left valve and inside of right valve, as in Fig. 16. *A—D,*
M. splendida: *A, B*, female, L. Learmonth, Vic.; *C, D*, male, L. Learmonth. *E—J, M. henricae*:
E, F, female, coastal lagoon, Flinders I.; *G, H,* male, same locality; *I, J*, same locality, outside
of right valve only: *I*, female; *J*, male. Both are Recent species.