

sandstone lying between tide-marks, but outside the shade of the wharf, is not attacked by *S. quoyana*." A tiny Isopod (*Iais pubescens* var. *longistylis*) is often found in the burrow in company with the pill-louse.

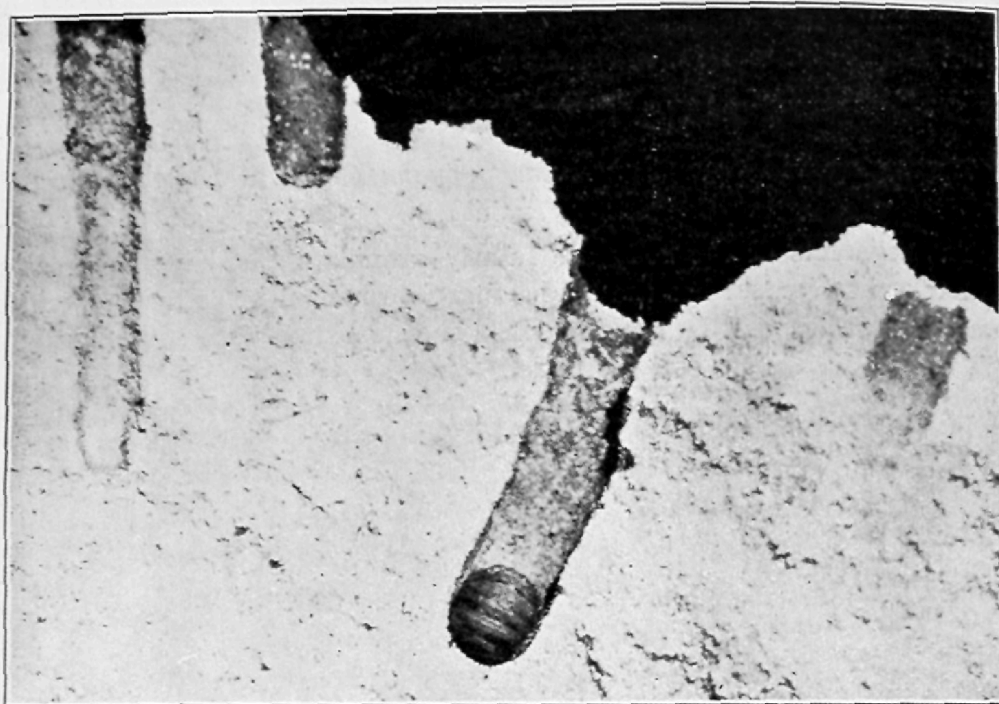


FIG. 271.—Sandstone, with burrows of *Sphaeroma quoyana* (after Paradise).

### NEOSPHAEROMA (Baker).

Very like the next genus, but differs in having some branchial folds on the inner branch of each of the third pleopods, and in having plumose hairs on both branches of the fourth pleopods. In the male the inner branch of the first, as well as the second, pair of pleopods bears sexual appendages.

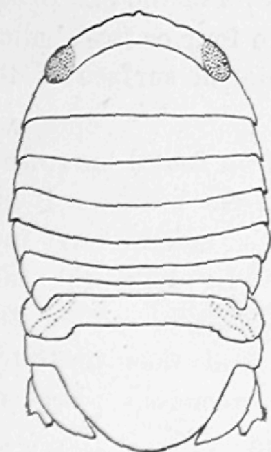


FIG. 272.—*Neosphaeroma laticauda* (after Whitelegge, x 4½).

#### Wide-tailed Pill-bug. *Neosphaeroma laticauda* (Whitelegge). (broad tailed).

Somewhat resembles the Burrowing Pill-bug in general appearance, but the body is relatively wider. The broad telsonic segment is strongly convex and smooth, with the hinder margin evenly rounded and unbroken. The outer branch of the uropods is only about half the length of the fixed endopod, which is somewhat scythe-shaped and reaches to the level of the end of the abdomen; the exopod is incised postero-laterally, and the apex and outer margin are furnished with tiny teeth. The colour is cream. Length: 21 mm., or  $\frac{1}{2}$  in. (S.A.M.)

## EXOSPHAEMORA (Stebbing).

Five species have been taken in our waters.

- a. Outer branch of uropods suboval, with apex rounded. Joints of peduncle of first antennae not subequal in length.
- b. Uropods reaching almost or quite to end of abdomen. Telsonic segment smooth above.
  - c. Large species attaining to 1 inch in length. Body very broad. Epistome apically rounded . . . . . *gigas*.
  - cc. Small species under  $\frac{3}{8}$  of an inch in length. Body not very broad. Epistome apically subacute.
  - d. Apex of telsonic segment acute in the adult . . . . . *laevis*.
  - dd. Apex of telsonic segment roundly subtruncate . . . . . *alii*.
- bb. Uropods only three-fourths as long as telsonic segment, which has a pair of very short, low ridges near the base *varicolor*.
- aa. Outer branch of uropods lanceolate, apically narrowed, and very acute. Joints of peduncle of first antennae subequal in length . . . . . *bicolor*.

*Exosphaeroma gigas* (Leach). (very large).

A rather variable species. In the adult the body is broad and almost smooth, with the sides of the thorax nearly parallel in dorsal view. The infero-lateral edges of the thoracic segments are grooved. The convex telsonic segment is smooth and subtriangular in shape, with the apex narrowly rounded and the sides a little sinuous. The first antennae have the first joint of the peduncle nearly twice as long as the second and the third narrower but longer than the second. The epistome is widened and rounded apically. The fourth, fifth, and sixth joints of the legs are furred on the inner margins, and the merus and carpus each bear a group of apical spines. The male appendage of the second pleopods is much longer than the rami and ends almost acutely. The branches of the uropods are subequal in length, suboval in shape, with rounded apices; the endopod reaches to about the level of the apex of the abdomen. The animal is dark or light brown, with whitish markings on the thorax, and the margins of the segments bordered with yellow or orange. Length: 25 mm., or 1 in. (S.A.M.)

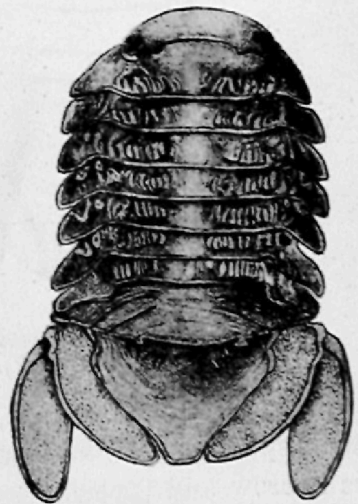


FIG. 273.—*Exosphaeroma gigas* (after Stebbing, x 3).

It has already been noted that a variety of *Iais pubescens*, one of the Isopoda-Asellota, is commonly associated with *Sphaeroma quoyana*. The typical form of *I. pubescens* is found with *E. gigas*.

*Exosphaeroma laevis* (Baker). (smooth).

The surface of the suboval body is smooth. The telsonic segment is domed, triangular in shape, with the apex acute in the adult and bent slightly downwards. The first peduncular joint of the first antennae is twice as long as the second and slightly longer than the third narrow segment. The narrow epistome is subacute apically. The male appendage of the second pleopods is long with several small setae at the apex. The branches of the uropods are broad, suboval, and rounded apically; the inner branch reaches nearly to the end of the abdomen, and in the male the exopod is a little longer than the endopod. Length: 8 mm., or  $\frac{3}{10}$  in. (S.A.M.)

*Exosphaeroma alii* (Baker). (personal name).

The body is somewhat narrowly oval in shape, with the surface smooth. The telsonic segment is not strongly domed, subtriangular with the apex rounded and subtruncate. The third peduncular joint of the first antennae is narrower and a little longer than the second, which is only half as long as the first. The rather long epistome is acute at the apex. The

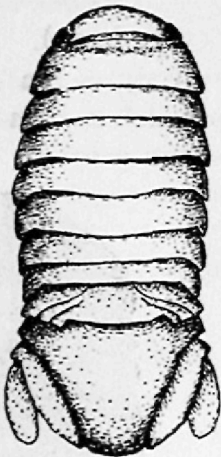


FIG. 274.—*Exosphaeroma alii* (after Baker, x 7).

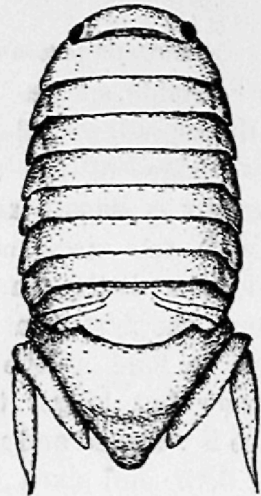


FIG. 275.—*Exosphaeroma bicolor* (after Baker, x 5).

legs are somewhat slender, the first pair furnished with fine hairs, the others with sparse spines and hairs. The male appendage of the second pleopods is narrow and tapering towards the end, and is longer than the rami. The endopod of the uropods barely reaches to the end of the abdomen, and has the inner margin nearly straight and the outer edge convex, and is subacute at the apex. The exopod is a little shorter, suboval, with narrowly rounded apex. The colour is white with dark markings. Length: 7 mm., or  $\frac{9}{32}$  in. (S.A.M.)

*Exosphaeroma varicolor* (Barnard). (with varicous colours).

The body is smooth and strongly convex transversely. The side-plates of the thorax are bent down nearly vertically, and are not so much separated as in *E. gigas*. The abdomen has a pair of obscure tubercles on the hind

margin of the fourth segment in both sexes. The telsonic segment is long, as long as broad, triangular, with the sides almost straight and the apex narrowly rounded; near the base there is a pair of short, submedian, blunt carinae, one on each side of a groove. The second joint of the peduncle of the first antennae is about two-thirds as long as the first, and the third is a little longer than the second. The epistome is rather narrow, with the sides concave and the apex truncate. The legs are armed with a few spines and pads of fur on the fourth to sixth joints. The male appendage of the second pleopods is half as long again as the inner branch, and tapers to a fine point. The uropods are only about three-fourths of the length of the telsonic segment in both sexes; both branches are ovate and the inner ramus is slightly longer than the outer, with the apex somewhat acutely rounded. The colour is variable. Length: 10.5 mm., or  $\frac{2}{3}$  in. (S.A.M.)

This species was originally described from South Africa, and the South Australian record is based upon some specimens dredged at Beachport.

*Exosphaeroma bicolor* (Baker). (with two colours).

The body is moderately wide, suboval in shape, almost smooth, and slightly shining. The convex telsonic segment is subtriangular in shape, with the apex narrowly rounded. The peduncular joints of the first antennae are subequal in length, and the epistome is elongate and rounded apically. The legs are robust and well armed with spines on the ischium, merus and carpus, and have furry pads on the merus, carpus and propodus.

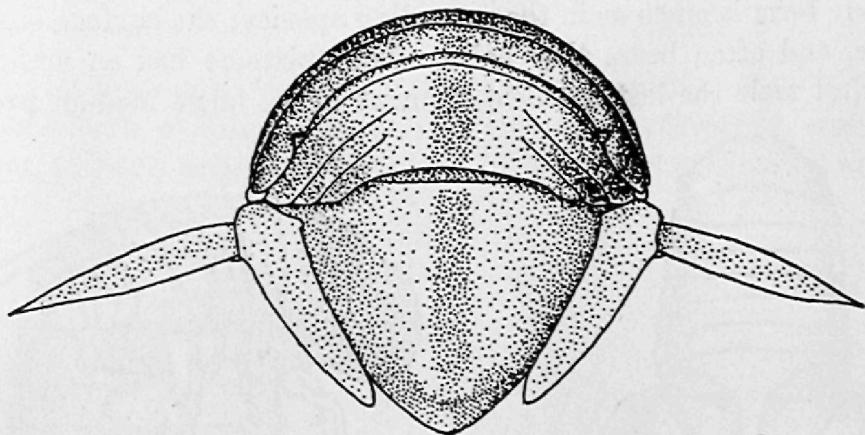


FIG. 276.—*Exosphaeroma bicolor*, attitude when alarmed.

The male appendage of the second pleopods is thick, apically obtuse, and is longer than the rami. The rather broad inner ramus of the uropods does not reach to the end of the abdomen and is subacute apically; the exopod is narrower, lanceolate with a very acute tapering apex, and in the male is longer than the endopod and reaches beyond the end of the abdomen. The colour is very variable, sometimes greyish-black, pale grey or white without markings, sometimes variously mottled or striped. Length: 10 mm., or  $\frac{2}{3}$  in. (S.A.M.)

This species was discovered in the Bay of Shoals, Kangaroo Island, most of the specimens being taken in places where the bottom consists of broken

shell. When crawling over or resting on debris of this sort the animals were difficult to detect owing to their protective colouration. They roll into a perfect sphere when disturbed, with the outer branches of the uropods directed outwards. A female in this posture is shown in fig. 276 and the male is illustrated in fig. 275.

### ISOCLADUS (Miers).

*Isocladus excavatus* (Baker). (excavate).

The body is ovate in shape, and practically smooth. The seventh thoracic segment of the adult male has a large process, which reaches back to the end of the abdomen. The anterior part of the abdomen is short, but the telsonic segment is large, triangular, and apically subacute. The anterior part of the epistome is not crested, and its lateral limbs recede more than in the following form. As shown in the figure, the uropods are very large, broad, and lamellate. Length: 8 mm., or  $\frac{3}{10}$  in. (S.A.M.)

This species is apparently rare, being known only from a male taken near shore in St. Vincent Gulf, and a male found in a rock-pool in Western Australia; the generic characters, as outlined in the key to the genera of Hemibranchiate Sphaeromids, and other features given above, separate it from the next species, which it greatly resembles.

### ZUZARA (Leach).

*Zuzara venosa* (Stebbing). (veiny).

The body form is much as in the preceding species; the surface is minutely granulate, and often bears tiny hairs. The epistome has an arched crest. In the adult male the last thoracic segment has a large median process, so

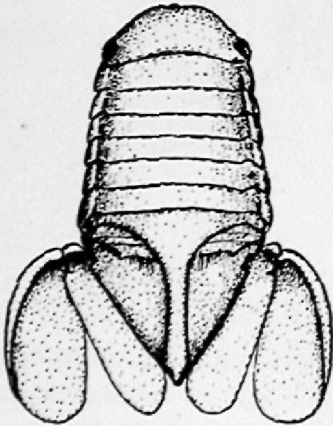


FIG. 277.—*Isocladus excavatus*  
(after Baker, x 6).

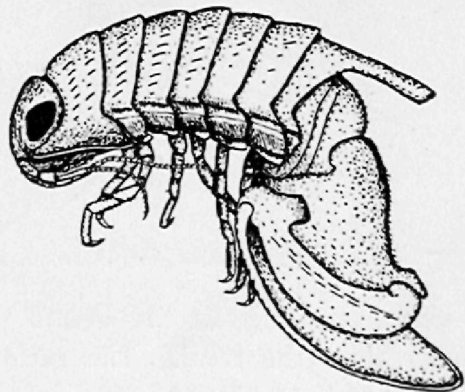


FIG. 278.—*Zuzara venosa*  
(after Baker, x  $4\frac{1}{2}$ ).

that this segment, with its posterior projection, is as long as the fourth to sixth segments together; the process is rather narrow, may be obtusely rounded, or nearly truncate apically, and sometimes there is a pair of tubercles alongside the base, one on each side; it is absent or short in young males, but increases in length with age, until it attains the size given. The

end of the telson has a humped terminal projection (as shown in the illustration of an adult male), on each side of which is a small tooth. The uropods are large; the outer branch is much longer than the inner, with the upper surface excavate and the external border raised and thickened.

The female differs considerably from the male. There is no large process from the seventh thoracic segment. The telson has no terminal notch, and the uropoda are smaller, with the branches subequal in length. The adult female has two faint submedian tubercles at the base of the telsonic segment, and the crest of the epistome may be nearly obsolete. The colour, which is somewhat variable, is usually brownish or grey. Length: 13 mm., or  $\frac{1}{2}$  in. (S.A.M.)

An exceedingly common species, and almost certain to be taken anywhere along the shores of our Gulfs where rocks and stones occur at the edge of the sea. Numerous colonies of individuals of both sexes, in all stages of development, are commonly secured by turning over such shelters, either in or near the water.

#### CYMODOPSIS (Baker).

Although this genus belongs to a section of the Hemibranchiate genera, having a semicircular or bilobed notch at the end of the abdomen, in both sexes, the notch in this case is completely obliterated by a pointed median, terminal process. The end of the abdomen has a vertical exit channel to the branchial cavity, and the apex of the telson often projects slightly beyond this passage.

#### *Cymodopsis crassa* (Baker). (thickened).

The body is smooth, oval in shape, and very convex transversely, especially near the front, where it is deep and plump. The rounded epistome is swollen

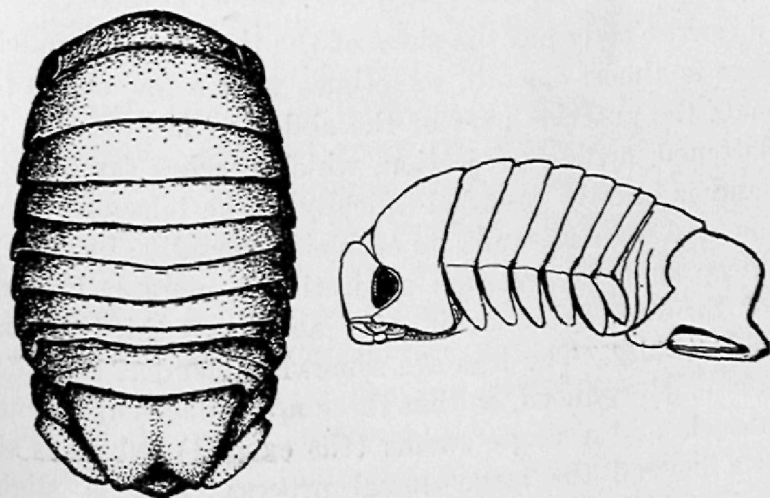


FIG. 279.—*Cymodopsis crassa* (after Baker, x 4).

anteriorly, and the legs are sparsely spined. The short anterior portion of the abdomen has no projections, but the telsonic segment has a pair of large conical dorsal elevations, between which is a shallow depression.

Behind these bosses the telson is abruptly declivous; the end of the abdomen is very obtuse, with a wide, shallow, vertical excavation. The male appendage of the second pleopods is whip-like, and twice as long as the rami. In both sexes the inner fixed branch of the uropods is somewhat scythe-shaped, and does not reach to the end of the telson, while the outer branch is very tiny. During life the known specimens, which were taken in St. Vincent Gulf, were pink, marked with minute dark dots. Length: 12 mm., or  $\frac{1}{2}$  in. (S.A.M.)

#### CILICAEA (Leach).

The thorax has no median dorsal processes, but in the adult male a large projection extends back from the anterior part of the abdomen. In the introductory remarks to the family it has already been mentioned that in genera such as this, in which marked sexual dimorphism occurs, the females cannot always be identified with certainty; in all such genera it is most desirable, and in some cases absolutely necessary, to base determinations upon adult male material. Three species have been recorded.

- a. Large dorsal abdominal process of male rounded apically.  
Endopod of uropods rudimentary.
- b. Exopod of uropods truncate, or bifid apically. Terminal process above apical notch of abdomen more or less trilobed . . . . . *curtispina*.
- bb. Exopod of uropods apically rounded. Terminal process above apical notch of abdomen simple . . . . . *latreillei*.
- aa. Large dorsal abdominal process of male tridentate. Endopod of uropods large . . . . . *tridens*.

#### *Ciliceaea curtispina* (Haswell). (short-spined).

The strongly convex body has the sides of the thorax subparallel in dorsal view; the surface is almost smooth, sometimes with a few obscure tubercles. In the adult male the anterior part of the abdomen is produced backwards into a large, flattened median projection, which reaches far beyond the end of the telson, and is bluntly rounded apically. The telsonic segment has a conical elevation, and some granules on each side dorsally; its posterior notch is moderately deep, and the terminal projection is more or less trifid. The second joint of the first antennae is only about one-third as long as the first, and is bifid distally. The legs are somewhat slender, and the endopod of the uropods is much reduced, so that these appendages apparently consist of a broad peduncle and a single ramus (the exopod), which is strong and curved, projects beyond the large dorsal process, and is slightly bifid apically.

As is usual in the genus, the female is very different from the male; the anterior portion of the abdomen has two short, longitudinal submedian ridges, but no large process, while the telsonic segment has two small tubercles above each of the conical dorsal projections; the notch at the end

of the abdomen is deeper than in the male. Both rami of the uropods are bifid distally, the rudimentary endopod being grooved to receive part of the edge of the exopod when the latter is folded. Length: 16 mm., or  $\frac{5}{8}$  in. (S.A.M.)

A very common species in shallow water around our coasts.



FIG. 280.—*Cilicaea curtispina*  
(after Baker, x 3).

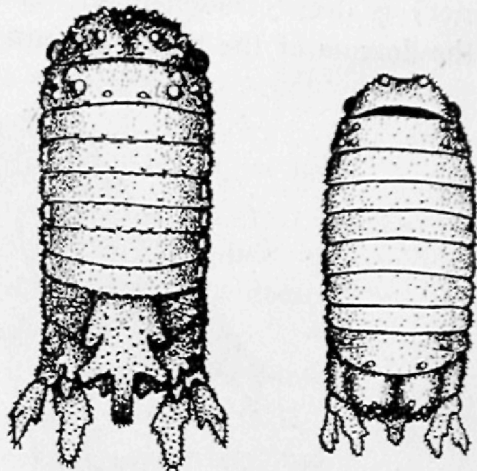


FIG. 281.—*Cilicaea tridens*, male and female  
(after Baker, x 7).

*Cilicaea tridens* (Baker). (three-pronged).

In the male the very convex body has the sides nearly parallel; the surface is slightly hairy and rough on the abdomen. The head and first thoracic segment are tuberculate, and the other thoracic segments each have stout spines on the hinder margin. The large median dorsal process of the anterior portion of the abdomen is trident-like and extends a little beyond the apex of the telson. The telsonic segment has three large tubercles on each side anteriorly, and behind these is cut into three small projections on each side. The terminal notch of the telson is deep, and the median projection does not reach its lateral angles. The second joint of the peduncle of the first antennae is half as long as the first, and the third is narrow but longer than the second. The moderately robust legs are spiny, but without furry pads. The exopod of the uropods is smaller than the large endopod, is apically acute, and has a sharp process on the inner edge and another on the upper surface near the acute outer angle. The endopod is obtuse distally and has two rounded elevations on the outer edge and one on the inner margin.

A female associated with the males, and therefore presumably belonging to this species (see illustrations) has the surface much smoother, and, as usual, lacks a dorsal process from the anterior part of the abdomen. There are no spines on the thoracic segments and the median process in the terminal telsonic notch is somewhat tridentate. Length: 6 mm., or  $\frac{1}{4}$  in. (S.A.M.)



*Cilicaca latreillei* (Leach). (personal name).

The surface of the body is very finely granulate and covered with hairs. In the male, which is illustrated, the median dorsal process of the anterior part of the abdomen is thick, obtuse at the end, and projects much beyond the end of the telson. The end of the telsonic segment (which, as in the males of other species, must be viewed from below in order to ascertain its character) is deeply notched and has a low, simple, mesial lobe on each side; the dorsum of the telson is roundly elevated. The second joint of the

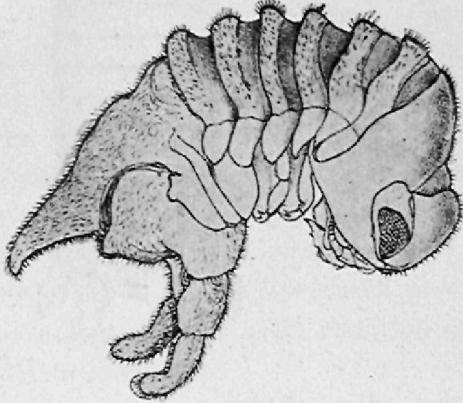


FIG. 282.—*Cilicaca latreillei* (after Stebbing, x 5).

first antennae is only one-third the length of the first and the third is longer than the second. The fixed endopod of the uropods is rudimentary, being represented only by a short, thick, inner process of the peduncle; the outer branch is subcylindrical, curved inwards, extends beyond the end of the large dorsal projection, and has a more or less distinct tooth on the outer margin. Length: 13 mm., or  $\frac{1}{2}$  in. (S.A.M.)

The female of this species may be confused with the female or immature male of *Paracilicaca pubescens*, which see.

## CYMODOCE (Leach).

As in the preceding species, there are often considerable differences between the sexes of the species, and between immature and mature males. It must be remembered that the characters given in the key to the South Australian species do not necessarily refer to females and immature males, but are based on adult males.

Classical appellations are commonly used in the nomenclature of animals and plants, and, amongst others, the names of the mythical sea-nymphs are freely applied to crustacean genera. In this handbook alone we may notice *Cymodoce*, *Dynamene*, *Cerceis*, *Cymothoa*, *Apseudes*, *Ampithoe*, *Leucothoe*, *Galathea*, *Actaea*, *Callianassa*, etc.

- a. Body very convex. Terminal process of abdomen not very narrow, and not projecting as far as, or much beyond, lateral angles of posterior notch. Branches of uropods not narrowly lanceolate.