In: M.C. Damborena, D.C. Rogers, & J.H. Thorp (eds). *Thorp & Covich's Freshwater Invertebrates, 4th edition, Volume V: Keys to the Neotropical Fauna*. Academic Press. London.

Chapter 22

Class Ostracoda

Koen Martens
Royal Belgian Institute of Natural Sciences (RBINS), Brussels, Belgium, and Department of Biology, University of Ghent, Ghent, Belgium

Janet Higuti
State University of Maringá, Centre of Research on Limnology, Ichthyology and Aquaculture, Graduate Programme in Ecology of Inland Water Ecosystems, Maringá, Paraná, Brazil

Chapter Outline

INTRODUCTION

Ostracoda are small, bivalved Crustacea that form an important part of the biodiversity of inland waters, but which are often neglected in ecological surveys. This aversion to include ostracods in general ecological and biodiversity research mostly reflects the fact that identification often requires complete dissection, experience with these organisms, and a good microscope. Another reason, however, is the lack of good identification keys for the different zoogeographical regions. We hope that the present key to the non-marine ostracods of the Neotropical region will remedy this problem for South America, Antarctica and adjacent islands.

There are 331 species in 77 genera of recent non-marine ostracods known from the Neotropical region (Meisch et al., in press), but many new taxa remain to be described, while the status of several old doubtful species needs to be re-assessed. For example, various nominal species in large genera, such as *Chlamydotheca* and *Strandesia s.l.* might eventually be considered synonymous with others. On the other hand, there is increasing evidence for the existence of large numbers of cryptic species, which may only be detected with molecular methods. The most spectacular example is that of Bode et al. (2010) where close to 40 cryptic species where identified in the Holarctic species *Eucypris virens* in Europe alone. Some examples have also been found in the Neotropics, such as in darwinulids (Schön et al., 2012) and in *Strandesia* (Higuti et al., 2013; Schön et al., 2018). The present key allows the identification of 63 freshwater and terrestrial genera. A further 14 genera which were included in the index by Kempf (1980, 1997) are not considered here as they are either genera that only have marine or brackish water species in the Neotropical or belong to the family Entocytheridae which are epibiontic on other Crustacea (not free living).

The monograph by Sars (1901), the series of papers on Brazil by Klie (e.g. 1940), the comprehensive papers on Colombian ostracods by Roessler between 1982 and 1990 and the ground breaking work on the West Indies by Broodbakker with 10 papers between 1982 and 1984 (e.g., Broodbakker, 1984) under the guidance of D.L. Danielopol (Broodbakker & Danielopol, 1982) are all milestones in the history of taxonomy and ecology of Neotropical non-marine ostracods.

I.D. Pinto published extensively illustrated monographs between 1961 and 1993 (e.g., Pinto & Kotzian, 1961; Würdig & Pinto, 1990). Two more recent series of papers have contributed greatly to the taxonomy and ecology of previously unknown biomes of South American ostracods. R.L. Pinto and colleagues described a variety of previously unknown terrestrial ostracods from São Paulo State between 2003 and 2013 (e.g., Pinto et al., 2008). Higuti and colleagues showed that the floating aquatic macrophytes, typical of South American floodplains, contain highly diverse pleuston communities in their submerged root systems, in which ostracods abound (e.g. Higuti et al., 2007; Higuti & Martens, 2014; Campos et al., 2017; Conceição et al., 2018). It is also of note that Higuti et al. (2013) and Schön et al. (2018) introduced molecular phylogenetic work on South American non-marine ostracods.

There are also several recent papers on the Argentinian fauna by different authors (Cusminsky et al., 2005; Fontana & Ballent, 2005; Laprida, 2006; Díaz & Lopretto, 2011; D'Ambrosio et al., 2015).

The checklist of Ramirez (1967) was useful for a long time but was updated by Martens & Behen (1994). Martens & Savatenalinton (2011) and Meisch et al. (2019) tabulated the non-marine ostracods of the world and their occurrence in the different zoogeographical regions, so that the ostracod fauna of the Neotropical Region can be extracted from these lists.

LIMITATIONS

The best-known parts of the Neotropics are the West Indian Islands, several floodplains of North and Central Brazil and lakes from southern Brazil. Recently, several (semi-) terrestrial taxa were discovered, while also bromeliad phytothelmata received new attention. However, large parts of southern and western South America remain scantly explored. Dozens of new species have been collected from the ancient Lake Titicaca and adjacent high-altitude lakes but await formal description. Genuine Antarctic lakes appear to be devoid of non-marine ostracods (De Deckker, Pers. Comm.), but extensive surveys are needed to confirm this. Very little is known about the ostracods from Antarctic islands.

Only West Indian Islands have been explored for subterranean fauna, and this remains a challenging field for future studies on the main continent and other islands. Temporary pools from arid areas also deserve more attention, as they can have highly endemic faunas of sometimes gigantic forms (> 5 mm) because of the absence of fish predation. Estuaries can sometimes support brackish water species of otherwise fully marine genera (e.g. *Xestoleberis*, *Semicytherura* – see below) as well as some Paracypridinae. These species are not included here, as they are outside the scope of this work. On the other hand, the few (semi-) terrestrial species that can be found far inland are mostly closely related to genuine inland water ostracods and as some of them can on occasion be found in fully aquatic environments (e.g. some darwinulids), they are included in the present chapter.

There are several genera that require taxonomic revision. For example, it is highly unlikely that all species presently assigned to *Candona* and *Pseudocandona* actually belong there, as these (often old) generic assignments ignore recent revisions and divisions of these genera in small, monophyletic clades. In addition, genera such as *Chlamydotheca* and *Strandesia* comprise several older uncertain species of which identity and/ or position is uncertain. The present key is not the place to conduct such a revision, and only few taxonomic remarks are entered before the keys (see below).

TERMINOLOGY AND MORPHOLOGY

Valve and appendage morphology, anatomy and terminology have been extensively described by Smith et al. (2015) as an introduction to all ostracod chapters in the present series of identification guides, and we refer to this text for details on the terminology used in the keys below. Here, we present a summary of the most used terms. The most important structures are shown in Fig. 22.1 A-F.

Ostracods have a bivalved **carapace** (Cp), reduced body segmentation, and reduced number of appendages. The valves are impregnated with calcium and dorsally attached along the **hinge**, which can either consist solely out of ligaments (e.g., Cypridoidea) or can include teeth and matching sockets (e.g., in Cytheroidea). In or close to the center of both valves are the **central adductor muscles**, which close the valves. The attachments leave **adductor muscle scars (AMS)** (Fig. 22.1 A, D) that are visible on the inside, and often also in transparent light on the outside of the valves. These muscle scar patterns are important to distinguish higher taxonomic levels of ostracods.

Valves consist out of outer and **inner lamellae** (**il**) (Fig. 22.1 A, B). Around the **valve margins** (**vm**), these lamellae are fused over a distance and thus create the **fused zone (fz)**, through which **radial pore canals** (rpc, visible in transparent light) can run. The inner lamella is in part calcified and the edge of this calcified inner lamella is called the **inner margin** (**im**). Valve margins can be simple and un-ornamented, showing **marginal setae** and in some groups **marginal tubercles** or **spines**. Other taxa can have a complex of lists and ridges that allow the animal to close the valves more tightly. A distinction has to be made between selvages and inner lists. **Selvages** are old valve margins that have been displaced inwardly during evolution. Mostly, they still have traces of old radial pore canals and setae. **Inner lists** do not have remnants of such structures.

There are seven pairs of true appendages, four cephalic and three thoracic (Fig. 22.1 C-F).

- The **First Antennae (A1)** are at the front of the body and are mostly curved in dorsal direction. They are uniramous (all post antenullar appendages are originally biramous, although in some appendages this biramous aspect is largely lost) and mostly consist of seven segments. If the animal is a swimmer, the last four segments will have long natatory setae (e.g., cyprids). Non-swimmers will have spines or spiniform setae there (darwinulids, cytherids).
- The **Second Antennae (A2)** are in second position and are turned towards the ventral side. There are two (fused) basipodal segments, large three-segmented endopods and small, reduced exopods. Swimming species also have long natatory setae on the first endopodal segment; in non-swimming species these setae are either strongly reduced or fully absent. The last two endopodal segments have distal claws and setae in a pattern that can be sexually dimorphic. Antennae are mainly used for locomotion (swimming, crawling), for clinging to surfaces and by males during copulation.
- The **Mandibulae (Md)** consist of a sclerotized coxa with strong teeth and a palp. The coxa is used for chewing and crushing food segments. The palp is the endopod with a small branchial plate (exopod) used for respiration. In darwinulids, the palps have long and strong setae that form a basket which is presumably for filter feeding. Otherwise the Md-palps are used for the manipulation of food segments.
- A pair of **rake-like organs**, used to crush food, is situated between the third and the fourth pair of cephalic appendages. Their homology remains unknown.

- The **Maxillulae (Mx or Mx1)** consist of a plate to which three endites and a two-segmented palp as well as a large respiratory plate are attached. The endites are used for chewing food segments and the palp for food manipulation.

  In between the cephalic and thoracic appendages, there is a pair of brush-like organs in male cytherids. No other ostracods have these organs there and their homology remains unknown.
- The **first thoracopod** (**T1**); in other literature sometime referred to as Maxilla – Mx2) differs considerably between the three superfamilies. In darwinulids and cypridoids they are reduced and sexually dimorphic. In these groups, the female appendage consists of a plate with distal setae, a one or two-segmented palp and small respiratory plate. Here, the appendage is used mostly for food manipulation. In male cypridoids, the palps are transformed in strong, two-segmented and mostly asymmetrical prehensile palps that open the female valves during copulation. In darwinulid males, which were only found once (Smith et al., 2006) these palps are less developed but still more so than in the female. In cytherids, this appendage is a walking leg.
- The **second thoracopod (T2)** is a walking leg in all groups, although its main function could rather be clinging to substrate than actual walking.
- The **third thoracopod (T3)** is a walking leg in darwinulids and cytherids and an upturned cleaning leg in cypridoids. In Cyprididae, the last two segments are fused to form a pincer-shaped organ, used to clean the long (natatory) setae of the A1 and the A2. In the other three groups of the Cypridoidea, these segments remain unfused.

Nearly all ostracods have a pair of **caudal rami (CR)** which can consist of a strong ramus and two distal setae and claws or can be reduced to a pair of flagellate setae. In some literature, the caudal rami are called furcae, uropods or uropodal rami. When fully developed, as in most Cyprididae (not in Cypridopsinae), they are used for locomotion or for clinging to surfaces. The CR are not considered true appendages that are associated to a particular segment but are thought to be secondary structures. CR are supported by an attachment, which distally of the CR, can have a sclerotized loop, called **Triebel's loop** (**TL).**

Female copulatory organs are generally externally unornamented shallow protrusions with a genital operculum (except for two African giant genera, *Afrocypris* and *Liocypris*). The internal structure of female copulatory organs is not well-studied, and they are generally not used for identification of species and genera, although in some candonids protruding lobes can occur.

Male copulatory appendages, called **hemipenes (Hp)** are mostly large to very large. In cytherids, the hemipenes can be up to 1/3 of the body mass, because all muscles needed to pump the giant sperm cells into the female are incorporated in the actual hemipenis (ostracod sperms can be 10 times longer than the body length). In cytherids, copulatory processes and associated structures are also externally positioned. In cypridoids, the muscles are outside of the actual hemipenes in a special sperm pump called the Zenker organ. Copulatory processes and associated structures are internal, enveloped by hemipenal sheets, and are only external during erection.

Males and female can be recognised by the presence of the prehensile palps and the hemipenes in males, but also by the sometimes large and conspicuous **testical tubes** (four pairs) which can be visible in the posterior part of the body in males.

MATERIAL PREPARATION AND PRESERVATION

Each type of habitat where ostracods occur requires its own methods for qualitative and quantitative sampling, such as hand nets, (box-) corers and grabs, dredges, pipettes, etc. For an overview of various collecting techniques for living non-marine ostracods, see Smith et al. (2015) and Martens & Horne (2016).

A 4% formaldehyde solution was the most common preservative for aquatic animals, and is still used for some, including crustacean zooplankton. However, formaldehyde can be toxic, allergenic and carcinogenic and its use is therefore strongly discouraged. Preserving ostracods in formaldehyde also makes them unsuitable for classic molecular research. When using formaldehyde solutions to preserve ostracods, it is also vital that the formalin is neutralised by adding sodium bicarbonate crystals, so that the pH of the sample is between 9 and 10. If ostracods are kept in acid formalin for a number of days, the valves will rapidly decalcify, and identification then becomes extremely hazardous and illustration of valves impossible. The failure to neutralize the formalin when preserving non-marine ostracods is one of the reasons that this group remained ill known (more than half of existing ostracod collections in museums are virtually useless because if it) and studied by so few biologists.

Ostracods are best killed and fixed in ethanol, but to attain a proper fixation, a concentration of at least 70-80% much reach the animal. If 95% ethanol is added to a wet sample, often concentrations of less than 50% are attained, and this is insufficient to properly fix the tissues. If samples are fixed immediately after collecting, then most ostracods will have their valves tightly closed, which hampers dissection considerably (see below). If samples are left closed and unfixed for some time (depending on climate and temperature this could be anything from a few hours to a day), then ostracods will die because of lack of oxygen with valves spread open. Ethanol can then be added to the sample. This will facilitate subsequent dissection (see below).

However, if you wish to perform molecular studies on your ostracods, specimens should be stored in pure ethanol (i.e., not denatured by camphor or other additives that make the alcohol undrinkable) at 4°C. DNA will often be well-preserved only for individuals preserved in ~100% ETOH. Therefore, fixing whole samples in pure ethanol might not yield good material for DNA based research. Whether for molecular or morphological work, it is always wise to change the alcohol in the sample after a few days or weeks.

Proper identification and description of ostracods nearly invariably demands a complete dissection of the soft parts. This is not easy and will require practice. The dissection is performed with two needles, either steel insect pins (the smallest type: 000) fitted in convenient handles (for example large rechargeable pencil holders, of which the opening is stuffed with a flexible rubber), or pieces of tungsten wire. The latter gives finer points to the needles, but these are so vulnerable that to touch the valves slightly may be enough to destroy the needle. Tungsten needles are better for dissection of cladocerans and copepods, steel needles are better for ostracods, except for very small taxa less than 500 µm long.

The actual dissection requires two major steps: (1) opening the valves and separating valves and soft body; and (2) dissecting the soft parts.

The first step is performed in 96% ethanol in an embryo dish:

* insert the needles between the valves and cut the central muscle scars;
* separate valves and soft parts;
* dry valves in the air and store in micro-paleontological (cavity) slides;
* place the soft body in a drop of glycerine or another dissection medium (see below).

When the carapace is globular and tightly closed, step 1 (opening the valves) might be a challenge. One can choose to crush one valve; but as valves mostly have asymmetrical anatomies, one loses information. A more elegant method is to fix the specimen with the ventral side up on a small piece of double-sided sticky tape. The outside of the animal will dry, and one can then better attempt to open the valves. Because the valves are tightly closed, the soft parts will not dry immediately. This method easily has a success rate of 75% or more. If few specimens are available, it is advisable to note down some external features, prior to dissection (e.g., width-length ratio, overlap of valves, shape of ovarium, colours, etc.).

Valves can be stored in ethanol in separate tubes, but it is more convenient to store them dry in so-called micro-cavity or micro-palaeontological slides. Often, a water-based glue (called tragacanthin) is used to fix valves in these cavities; but unless these slides need to be transported or sent by mail, it is advisable not to use this glue for two reasons: (1) if the glue is pure, it is prone to become infected by fungi; or (2) if traces of formalin are used to prevent this, then the valves will be decalcified in the long run, even when dry (air moisture will be sufficient). If formalin in tragacanthin is neutralized with sodium (bi)carbonate, then the valves risk being covered with a white powder.

For the second part of the dissection, frustration will be the price paid for experience, but it is good to take the following suggestions into account:

* Divide the body in an anterior and a posterior part. The anterior part will contain A1, A2, Md, Mx1 and in Cypridoidea sometimes also the Mx2; the posterior part will contain the thoracic legs, the caudal rami, the hemipenes and the Zenkers organs.

* Leave the large A1 and A2 attached to the anterior body part until the very last, as they will facilitate orientation of the pieces.

* Mx2 in most taxa, and cypridopsine caudal rami, are hard to find and several specimens will have to be dissected before you will be able to locate and examine them.

* When dealing with large specimens (3 mm or more), divide the appendages over at least two slides, making sure that large and smaller parts are segregated over the two slides.

Other accounts on ostracod dissection are in Danielopol (1982) and Namiotko et al. (2011).

Glycerine-method

The dissected appendages need then be arranged to take a maximum of space in the glycerine drop, so that no limb will come to lie on top of another one and are then covered with a cover-slip. The preparation is sealed with glycol. Recently, however, glycol was taking out of commercial trade in several countries. Normal nail-varnish will also seal the dissection, although these seals are known eventually to crack. Other sealing mediums are Canada balsem, Eukit and Murrayite. For long-term storage, it is necessary that the preparation is sealed, as any contact with air will cause the preparation to dry out completely.

Glycerine-jelly (Gj)

Add several drops of methylene blue to the glycerine-jelly. Before starting to mount the limbs, the Gj has to be heated in a water bath in order to make it fluid. In this case, the limbs will not be mounted between a slide and a cover slip, but between two cover slips, which are subsequently mounted in a metal holder. The following description is based on notes of Danielopol (unpublished).

* Fix a cover slip (24x24 mm) with plasticine on a normal microscope slide. Prepare a second cover slip (18x18 mm), putting small points of plasticine at the four corners.

* Put one drop of hot Gj in the centre of the large, fixed cover slip. Spread it in order to get a thin, rectangular film of Gj.

* Insert the different limbs in the Gj film, arranged in two horizontal rows, containing the sequence of left and right limbs. Let the preparation dry.

* After 3-6 hours, add a new film of medium hot Gj, which has to cover the entire area covered by the first drop. Put the small cover slip on top and press gently at the corners. The plasticine will help prevent any deformation of the limbs. Let the preparation dry.

* Seal the slide (see above for the sealing mediums).

* Remove the preparation, consisting of the two coverslips sealed to each other from the microscope slide and slip it in the metal holder. Fix carton labels on both sides of the preparation.

This method is rather more time consuming, but has a number of advantages: (1) the use of the glycerine-jelly allows the limbs to be arranged in proper sequence and in the desired orientation (with normal glycerine-preparations, this is not possible); and (2) the use of two coverslips (which can also be used with normal glycerine) allows the limbs to be observed with the microscope from both sides of the preparation.

Other mediums. Glycerine based mediums are known to slowly dissolve the limbs after a long time (50-100 years) in a number of cases. For ostracods which were fixed in ethanol, the limbs can be mounted in other mediums like Euparal and Polyvinyl-lactophenol. These mediums are not (yet?) known to dissolve limbs, but for a while, at least the latter medium was reported to be carcinogenic. As these mediums polymerize when exposed to the air, the preparations do not require additional sealing but dissecting needs to be done relatively fast.

KEYS TO OSTRACODA

All freshwater Ostracoda belong to the Podocopida. Myodocopida and Platycopida are both exclusively marine. Table 1 presents a full list of genera that have been cited in the literature on Neotropical non-marine ostracods. However, the keys only treat real (inland) freshwater or terrestrial ostracods. So, the commensal or ectoparasitic Entocytheridae, brackish water taxa and some genera with doubtful identification (e.g. *Bradleystrandesia, Chrissia*) are not treated in the keys, but are listed in Table 1 for completeness.

Ostracoda: Podocopida: Superfamilies

1 Valves not elongated or subquadrate in lateral view, valve surface smooth or ornamented; AMS not arranged in a rosette pattern (Fig. 22.1 A, D) 2

1’ Valves elongated or subquadrate in lateral view, surface smooth; AMS arranged in a rosette-pattern (Fig. 22.2 B, C, E, F); appendages T2 and T3 walking legs (Fig. 22.1 E) ……. .... Darwinuloidea, one family: **Darwinulidae [p. xxx]**

2(1) Last three appendage pairs (T1-T3, not CR) subequal walking legs (Fig. 22.1 F) exception of T3 in male *Cytheridella* – see below); four AMS arranged in a vertical row (Fig. 22.1 A) .... **Cytheroidea [p. xxx]**

2’ Last three appendage pairs (T1-T3 – not CR) with different shapes and function (Fig. 22.1 C); AMS with different pattern, mostly resembling a “pawprint” (Fig. 22.1 D) ……..... .... **Cypridoidea [p. xxx]**

Ostracoda: Podocopida: Darwinuloidea: Darwinulidae: Genera

Darwinulids are small- to medium-sized ostracods (0.4-0.8 mm), with carapaces elongate, sub-squarish or rounded in lateral view. The hinge is adont or with a medial groove, anterior and posterior cardinal teeth on the RV, cardinal ridge and sockets on the LV. Valve margins are devoid of selvages or (continuous) inner or outer lists. The fused zones are very narrow with few straight and very short marginal pore canals. *Vestalenula* has a ventro-caudal keel on the RV (a remnant of an outer list). Other genera like *Penthesilenula*, *Microdarwinula* and *Alicenula* have internal ventral or caudal teeth on the LV (remnants of inner lists). *Darwinula* *s.s.* is devoid of any such features. All species (except those in *Microdarwinula*) have an externally visible brooding cavity.

A frontal eye is present. The A2 is devoid of natatory setae. Md and Mx have large respiratory plates. T1 is a maxilliped, with three-segmented palp, in the female. ST2 and T3 are walking leg. The CR, if present, is reduced to single seta. A post abdomen is present or absent.

Although in general not very common, the species can be found in a wide range of habitats, including lakes, rivers, springs, groundwater, etc., but also in more marginal biotopes such as (semi-) terrestrial habitats. Drought-resistant stages (present in Cytheroidea and Cypridoidea) have not yet been described for Darwinulidae. There are only about 30 living species thus far described.

1 Cp elongate or subquadrate in LV, brood pouch in dorsal view externally visible; AMS positioned anterior to the centre (Fig. 22.2 B, C, E, F) 2

1’ Cp rounded in LV, brood pouch in dorsal view not externally visible; AMS centrally placed (Fig. 22.2 A) .... *Microdarwinula*
[Cosmopolitan. Neotropical: Brazil]

2(1) RV without posterioventral keel (Fig. 22.2 F), LV with or without internal teeth (Fig. 22.2 B, E); A2 exopodite with two setae and a spine (Fig. 22.2 G) 3

2’ RV with posterioventral keel (Fig. 22.2 C), LV without anterioventral internal tooth (Fig. 22.2 B); A2 exopodite with one seta and a spine (Figs. 22.2 D, 17 A) .... *Vestalenula*
[Cosmopolitan. Neotropical: Brazil]

3(2) Cp elongated (Fig. 22.1 E), LV with or without inner teeth; Md-palp last segment with < five claws (three or four, Fig. 22.2 I, J), penultimate segment with seta *y* shorter than seta *z* (Fig. 22.2 I) or absent (Fig. 22.2 J) 4

3’ Cp in lateral view subquadrate; LV with internal posterioventral tooth (Fig. 22.2 E); Md-palp last segment with five claws, penultimate segment with seta *y* as long as seta *z* (Figs. 22.2 H, 17 B) .... *Penthesilenula*
[Cosmopolitan. Neotropical: Brazil, Chile, Peru]

4(3) RV in dorsal view overlapping LV, Le > 0.65 mm; Md-palp: penultimate segment with seta *z* long, seta *y* shorter, setae *a* and *b* present (Fig. 22.2 I) ..... *Darwinula stevensoni*
[Cosmopolitan. Neotropical: West Indies, Nicaragua, Brazil]

4’ LV overlapping RV, Le ≤ 0.65 mm; Md-palp: penultimate segment with seta *z* short, seta *y* absent, seta *a* absent (Fig. 22.2 J) .... *Alicenula*
[Cosmopolitan. Neotropical: Brazil]

Ostracoda: Podocopida: Cytheroidea: Families

Cytheroids are mostly small, the length of the carapace is 1 mm or less. Valves can be either smooth or ornamented, with reticulation, nodes, tubercles and spines all being possible. Marginal valve structures mostly consist of fused zone and well-developed calcified inner lamellae; inner lists and selvages can be either present or absent. Hinge is mostly well-developed, rarely adont. Valve overlap is variable. AMS invariably consists of four isolated scars in a vertical row.

A2 lacks natatory setae, the exopodite of A2 is a long, hollow seta connected to a gland at the base of the A2. Respiratory plate on Md is small. T1 -T3 are generally all walking limbs (except for the parasitic Entocytheridae). Male reproductive organs (hemipenes) have the sperm pump incorporated in the main body (i.e., there is no separate Zenker organ as in

Cypridoidea – see below); the copulatory complex is fully external, i.e. not enveloped by a peniferal sheat. UR absent or strongly reduced.

Most species occur in larger epigean waterbodies, but there are also some interstitial taxa while at least some limnocytherids can produce drought resistant stages and can occur in temporary pools. One genus (*Elpidium)* only occurs phytothelmata (mostly bromeliads), while another genus (*Intrepidocythere*) is the only known fully terrestrial limnocytherid.

1 Cp well-calcified, with or without external ornamentation; T1-3 mostly with long terminal claws (Fig. 22.3 B) (always free living) 2

1’ Cp weakly calcified, externally without ornamentation; T1-3 with terminal claws short, hamulate (Fig. 22.3 A); (only commensal or ectoparasitic on Amphipoda, Malacostraca) .... Entocytheridae
[Cuba. Mostly Nearctic and western Palaearctic]

2(1) T1 and T2 basal segment posterior seta stout and annulated (Fig. 22.3 C) (mostly in slightly saline/ brackish water) .... Cytherideidae, one genus: *Cyprideis*
[Cosmopolitan]

2’ T1 and T2 basal segment posterior seta slender or absent, never annulated (Fig. 22.3 B) …… .... **Limnocytheridae [p. xxx]**

Ostracoda: Podocopida: Cytheroidea: Limnocytheridae: Genera

Cohuo-Duran et al. (2014) report the genus *Limnocytherina* from Central America. However, it is uncertain that these species indeed belong to this genus. Thus, *Limnocytherina* is for the time being not included in the present key.

1 Female carapace with externally visible (especially in dorsal and ventral views) posterior brood pouch (Fig. 22.3 D, E); males without such swollen posterior and often smaller than females; Timiriaseviinae 2

1’ Female carapace without posterior brood pouch; males mostly distinctly longer and larger than females (to accommodate very large hemipenes – see female in Fig. 22.3 F, male in Fig. 22.3 G); Limnocytherinae 4

2(1) External valve surface smooth, T3 a normal walking limb (Fig. 22.4 B) 3

2’ External valve surface set with pits and coloured patches, T3 transformed in a prehensile limb, especially in females (Figs. 22.4 A, 17 C, D); very common in lakes and ponds . ... *Cytheridella*
[Neotropical]

3(2) Carapace mostly rounded in dorsal view, with width more than half the length (Figs. 22.3 E, 4 E); male A2 terminal segment with one serrated claw (Fig. 22.4 D); RV inner view in Fig. 22.4 C; in phytotelmata .... *Elpidium*
[Neotropical. Sometimes found in exported bromeliads in other parts of the world]

3’ Carapace narrower in dorsal view, width less than half the length (Fig. 22.4 E); male A2 terminal segment with three serrated claws (Fig. 22.4 F); fully terrestrial, in leaf litter . ... *Intrepidocythere*
[Brazil]

4(1) Hemipenes with very large UR (Fig.22. 4 G, H) 5

4’ UR on hemipenes smaller, mostly reduced to a few setae (Fig. 22.4 I) .... *Limnocythere*

[Cosmopolitan. Neotropical: Andean lakes, southern Brazil]

5(4) Valves with large lateral spines or with numerous small spines (Fig. 22.4 J, K); UR on hemipenes large and membranous (Fig. 22.4 G) .... *Neolimnocythere*
[Peru]

5’ Valves without spines (Fig. 22.4 L); UR on hemipenes large and chitinized (Fig. 22.4 H) … .... *Paracythereis*
[Peru]

Ostracoda: Podocopida: Cypridoidea: Families

Cypridoidea contains both very small (c 0.4 mm – *Danielocandona*) and very large (7-8 mm – *Megalocypris* Sars, 1898) species. Valves can externally be smooth or be set with a variety of ornamentations; valve shape extremely variable (narrow and elongated, round and broad) and can be symmetrical or widely asymmetrical (e.g., with dorsal humps, or with position of valves skewed in frontal view, etc.). Valves can marginally be very simple, or have complex structures involving a set of selvages, inner lists, etc. (e.g. *Chlamydotheca*). Basic AMS shows a “pawprint” pattern, with a variable number of scars (but mostly six) in a variable pattern.

The A2 exopodite is mostly reduced to a small plate, bearing 2-3 small setae; many species with robust natatory setae (5+1 in adults) on A2. T1-3 with different morphologies and functions. T1 with strong sexual dimorphism, forming a small plate with a weak 1-2 segmentd palp, the latter developed into string (mostly asymmetrical) clasper organs (also 1-2 segmentd) in males. T2 a walking limb. T3 a cleaning limb. UR well-developed in some groups (strong ramus, two claws, two setae) and reduced in some groups. Males with a well-developed sperm pump (Zenker’s organ) outside of the actual hemipenes; the latter with copulatory organs internally and enveloped by peniferum in non-erect state. Females never with an externally visible and inflated brood pouch.

Three quarters of non-marine ostracods belong to this superfamily. Cypridoideans occur in a large variety of aquatic and (semi-) terrestrial habitats. The majority of Cyprididae can occur in temporary habitats, many candonids are interstitial while notodromatids are generally hyponeustic (living upside down, attached to the water surface).

1 Cp of variable shape, smooth or ornamented; eye cups fused or absent; Mx1 3rd masticatory process with 2-3 stout claws and various setae (Fig. 22. 5 C) 2

1’ Cp mostly subglobular, set with pustules and ventral ridges, eye-cups dorsally not fused (Fig. 22.5 A – slightly exaggerated); Mx1 3rd masticator process with 4-6 stout claws and various setae (Fig. 22.5 B) .... Notodromadidae
[Cosmopolitan]. Note: *Argentodromas* (Argentina) and *Newnhamia* (Argentina, Uruguay) occur.

2(1) Cp of variable shape, smooth or ornamented, without mediodorsal sulcus; T1 palp in females (mostly) unarticulate (Fig. 22.5 G) 3

2’ Cp subquadrate, with mediodorsal sulcus (Figs. 22.5 D, E); dorsal margin straight over *c* half its length, valve surface mostly heavily ornamented (reticulated, set with pits, spines); female T1 palp (mostly) consisting of two segments (Fig. 22.5 F) …………….. .... Ilyocyprididae, one genus: *Ilyocypris*
[Cosmopolitan]

3(2) T3 without a terminal pincer, i.e. terminal and penultimate segments clearly separate (Fig. 22.5 H) .... **Candonidae [p. xxx]**

[Cosmopolitan]

3’ T3 with a terminal pincer, i.e. terminal and penultimate segments partly fused (Figs. 22.5 I, J) (exceptions: *Neocypridopsis*, *Callistocypris* – see below) .... **Cyprididae [p. xxx]** [Cosmopolitan]

Ostracoda: Podocopida: Cypridoidea: Candonidae: Genera

We follow the classical division of cyclocypridinid genera based on the valve features, where species with marginal tubercles are united in *Physocypria*, those without the marginal tubercles in *Cypria*.

Callistocypridinae are at present still classified in the Cyprididae. However, the T3 has no terminal pincer (Fig. 22.8 L), so following the above keys the genus will also be sorted in the Candonidae. The exact position of this subfamily and genus needs to be investigated.

1 Cp short, dorsal margin in lateral view rounded (Fig. 22.6 A); A2 with (long) natatory setae (Fig. 22.6 B); male prehensile palps with two segments (Fig. 22.6 C); Cyclocypridinae 2

1’ Cp with variable shapes, but mostly subquadrate or elongate, rarely (never?) with dorsal margin rounded (Fig. 22.6 D); A2 without swimming setae (Fig. 22.6 E); male prehensile palps with one segment (Fig. 22.6 F); Candoninae 3

2(1) RV with marginal tubercles (Fig. 22.6 G) .... *Physocypria* [Cosmopolitan. Neotropical: Brazil]

2’ RV without marginal tubercles (Fig. 22.6 H) .... *Cypria* [Cosmopolitan. Neotropical: Colombia]

3(1) CR with large ramus, two claws and one or two setae (Figs. 22.7 A, B) 4

3’ CR with less claws or setae and with ramus possibly reduced (Fig. 22.7 C, D) 8

4(3) Length 0.3-0.4 mm; CR short; ramus and claws robust; terrestrial (Fig 22.7 A) 5

4’ Length > 0.5 mm; CR ramus and claws elongate; aquatic (Fig. 22.7 B) 6

5(4) T3 terminal segment with one claw and two setae (Figs. 22.7 E, 8 L); T2 without seta d1 (Fig. 22.7 F); CR proximal seta distally positioned (Fig. 22.7 G) ..... *Caaporacandona* [Brazil]

5’ T3 terminal segment with one claw only (Fig. 22.7 H); T2 seta d1 present (Fig. 22.7 I); CR proximal seta centrally positioned (Fig. 22.7 A) .... *Terrestricypris* [Brazil]

6(4) Cp not covered in stiff setae (Fig. 22.7 L); T3 basal segment with two setae (Fig. 22.7 M) 7

6’ Cp usually covered in long and stiff setae (Fig. 22.7 J); T3 basal segment with three setae (Fig. 22.7 K) .... *Pseudocandona s.l.* [West Indies. Venezuela. Brazil]

7(6) Cp in subovate in dorsal view, W/L ratio > 0.4 .... *Candona s.s.* [West Indies. Brazil]

7’ Cp laterally compressed in dorsal view, W/L < 0.4 .... *Fabaeformiscandona*

8(3) CR with large ramus, two claws and one distal seta, proximal (ventral) seta missing (Fig. 22.8 A) 9

8' CR with small ramus and only one claw (Fig. 22.7 C, D) 11

9(8) Md-palp with terminal segment length less than twice the basal width (Fig. 22.8 C, setae and claws not drawn) 10

9' Md-palp with terminal segment length at least three times the basal width) (Fig. 22.8 B, setae and claws not drawn) .... *Candonopsis* [Cosmopolitan]

10(9) Both valves with broad anterior calcified inner lamellae, inner margin sinuous (Fig.22.8 D); hemipenes with protruding lobes 'a' only (Figs. 22.8 E, 17 E) ... *Candobrasilopsis* [Brazil]

10' Both valves with narrow calcified inner lamella, inner margin evenly rounded (Fig. 22.8 F); hemipenes with protruding lobes 'a' and 'b' (Fig. 22.8 G) (surface water) ……….. .... *Latinopsis* [Brazil]

11(8) CR with elongated ramus and a single end claw, both distinct and separated from each other (Fig. 22.7 C) 12

11' CR flagellate (but sclerified), with ramus and end claw fused and without additional setae (Fig. 22.7 D); L = c 0.4 mm (Fig. 22.8 H); subterranean .... *Danielocandona* [Venezuela]

12(11) All appendages quite elongate and slender; CR with elongated ramus, a single end claw and 1-2 small setae (Fig. 22.7 C); RV dorsally sometimes projecting beyond LV (Fig. 22.8 I, 8 J); L = 0.6-0.8 mm; subterranean .... *Caribecandona* and *Cubacandona* [West Indies]

12' All appendages stout, with short and compact claws and segments; CR with elongated, narrow ramus and one distinct end claw, without additional setae (Fig. 22.8 K); LV overlapping RV on all sides; L= 0.4-0.5 mm; terrestrial; Callistocypridinae …………. .... *Callistocypris* [Brazil]

Ostracoda: Podocopida: Cypridoidea: Cyprididae: Subfamilies

There are more than 20 subfamilies in the Cyprididae, but only 10 have thus far been reported from the Neotropical Region.

1 CR with ramus, two terminal claws and with 2-3 setae (Fig. 22.9 B); length < 0.5 to 5 mm ... 2

1' CR in females reduced to a flagellum, usually with an additional basal seta (Fig. 22.9 A), absent in males (incorporated in hemipenis); length mostly < 1 mm ......**Cypridopsinae [p. xxx]**

2(1) CR attachment without apical TL (Fig. 22.9 D) 3

2' CR attachment with apical TL (Fig. 22.9 C) .... **Cypricercinae [p. xxx]**

3(2) T2 endopod 1st segment with two lateral setae (Fig. 22.9 E); Cp in lateral view 3 - 5 mm, either rounded (Fig. 22.9 G) or elongate (Fig. 22.9 H) 4

3' T2 endopod 1st segment with one lateral seta (Fig. 22.9 F); Cp generally smaller and of different shape 5

4(3) Both valves with anterior selvage inwardly displaced; either relatively high and rounded, with anterioventral beak (Fig. 22.9 G) or elongated without beak and possibly with posterioventral spine (Figs. 22.9 H, 17 F) .... Cypridinae; one genus: *Chlamydotheca* [Guatemala. Venezuela. Columbia. Ecuador. Brazil. Peru. Bolivia. Chile. Paraguay. Argentina. Uruguay]

4' Both valves without inwardly displaced selvages or inner lists; Cp elongated and laterally flattened (Figs. 22.9 I, J) .... **Eucypridinae (partim) [p. xxx]**

5(3) CR attachment without basal sclerotized reinforcements (Fig. 22.9 M) 6

5' CR attachment at the basis with sclerotized reinforcement, either robust triangular structure (indicated in Fig. 22.9 L), or reduced to a trabecula (Fig. 22.9 K, arrow) …………………. .... **Herpetocypridinae [p. xxx]**

6(5) LV without long anterior and posterior spines 7

6' Carapace elongate, left valve with very large anterior and posterior spines (Fig. 22.9 N, O) …. .... Rudjakoviellinae, one species: *Rudjakoviella prolongata* (Triebel, 1962) [Venezuela]

7(6) T1 without 'c'-seta, only 'd' seta present 8

7' T1 with 'c' and 'd' setae (Fig. 22.10 A) .... **Eucypridinae partim [p. xxx]**

8(7) At least one valve without marginal tubercles 9

8' Valves subrectangular, laterally compressed, anterior and posterior margins set with large, spinal tubercles (Fig. 22.10 B-D) .... Pelocypridinae, one genus: *Pelocypris* [Brazil]

9(8) Valves globular, laterally flattened or elongate, without marginal septae 10

9' Carapace globular (Fig. 22.10 E), valves at least anteriorly set with a row of marginal septae (Figs. 22.10 F, 17 G, H) .... Cyprettinae; one genus: *Cypretta* [Circumtropical to cosmopolitan.]

10(9) Cp elongate, selvage largely inwardly displaced in one valve only or neither valve; T2 with penultimate segment divided (Fig. 22.10 J) 11

10' Cp globular, frontal selvage largely inwardly displaced in both valves (Fig. 22.10 G, H), T2 with penultimate segment undivided (Fig. 22.9 F) ....Cypridinae s.s.; one genus: *Cypris* [Cosmopolitan. Neotropical: West Indies]

11(10) Cp length c 3x height, selvage in RV submarginal, in LV largely inwardly displaced, both along anterior and posterior margins (Fig. 22.10 K-M); in need of revision ……………. .... Dolerocypridinae; one genus: *Dolerocypris* [Holarctic. Neotropical: Guatemala, Chile, Paraguay, Argentina]

11' Cp length < 2x height; posterior selvage in LV absent or not so strikingly inwardly displaced (Fig. 22.16 B, E, H) .... **Cyprinotinae [p. xxx]**

Ostracoda: Podocopida: Cypridoidea: Cyprididae: Cypridopsinae: Genera

Cuminsky et al. (2005) reported *Kapcypridopsis megapodus* from Argentina. However, the occurrence of this South African genus in South America is highly unlikely.

1 A2 of female with claw G2 large, stout and serrated (Fig. 22.11 A); Zonocypridini 2

1’ Claw G2 of female A2 of normal shape and size (Fig. 22.11 B) 3

2(1) Cp rounded and with pronounced external valve ornamentation (spines, ridged) but never overly hirsute (Fig. 22.11 C, D) .... *Zonocypris*
[Not yet recorded in Neotropics with certainty]

2’ Cp smooth, but highly hirsute (Figs. 22.11 E, 17 R) .... *Cabelodopsis hispida* (Sars, 1901)
[Brazil]

3(1) Terminal segment of Mx1-palp elongated (Fig. 22.11 F); Cypridopsini 4

3’ Terminal segment of Mx1-palp spatulate (Fig. 22.11 G, H, I); Potamocypridini *Potamocypris*
[Cosmopolitan]

4(3) T3 with an apical pincer, i.e. segments 3 and 4 largely fused (Fig. 22.12 D, E) 5

4’ T3 with fourth segment separate from third and bearing three setae (Fig. 22.12 A-C) ………. *Neocypridopsis*
[Neotropical]

5(4) Cp elongate, in dorsal view width =≤0.5x length; RV overlapping LV (Fig. 22.12 I, J) 6

5’ Cp rounded, in dorsal view width >0.5x length; LV overlapping RV (Fig. 22.12 F, G) ……..…
.... *Cypridopsis*
[Cosmopolitan]

6(5) CR with stem short and triangular (Fig. 22.12 H-J) *Sarscypridopsis aculeata* (Costa, 1847)
[Cosmopolitan. Neotropical: Chile, Uruguay]

6’ CR with stem elongated and with parallel sides (Fig. 22.12 K) .... *Plesiocypridopsis*
[Not yet recorded in Neotropics with certainty]

Ostracoda: Podocopida: Cypridoidea: Cyprididae: Cypricercinae: Genera

1 TL triangular, in middle or distal part of CR attachment or in dorsal branch (Figs. 22.13 B-D); Cp rounded or elongate; external valves smooth or set with ornamentations 2

1’ TL an oval loop in dorsal branch of CR attachment (Fig. 22.13 A, 17 N, O), Cp rounded in dorsal view .... ***Bradleytriebella* [p. xxx]**

2(1) TL ventral branch short and stubby (Fig. 22.13 B, C); Cp in dorsal view flattened, width <0.3x length; Cp without caudal or dorsal protuberances 3

2’ TL ventral branch robust (Fig. 22.13 D); Cp width ≥0.3x length, both caudal and dorsal protuberances possible 4

3(2) TL divided into 2-3 compartments (Fig. 22.13 B); valves elongate and laterally flattened (Figs. 22.13 E, 17 I) .... *Diaphanocypris*
[West Indies. Ecuador. Brazil]

3’ TL a single cell (Fig. 22.13 C) .... *Nealecypris clavigera* (G.W. Müller, 1898)
[Caribbean]

4(2) Cp in lateral view elliptical, subovate or elongate (Fig. 22.13 F, G); one species (*S. bicuspis*, Fig. 17 J) with dorsal large, pointed helmet (Fig. 22.13 H, I); never with anterior or posterior spines (Fig. 17 K-M) .... *Strandesia* [Cosmopolitan]

4' Cp in lateral view elongate, often with posterior spines (Figs. 22.13 J, K, 17 P) .. *Cypricercus* [Neotropical]

Ostracoda: Podocopida: Cypridoidea: Cyprididae: Cypricercinae: *Bradleytriebella* Species

1 CP externally with fine, longitudinal ridges; no marginal spines or dorsal helmet ……………… . ... *Bradleytriebella lineata* (Victor & Fernando, 1981) [Brazil]

1' Cp externally smooth, with marginal three spines (two short anterior on LV, one long posterior on RV) and a dorsal helmet on RV .... *B. trispinosa* (Pinto & Purper, 1965) [Brazil]

Ostracoda: Podocopida: Cypridoidea: Cyprididae: Herpetocypridinae: Genera

1 Anterior margins of both valves set with marginal septae (Fig. 22.14 A, B) 2

1' Anterior margins of both valves without marginal septae 3

2(1) Cp in lateral view rounded, anterior marginal septae small, anterior inner calcified lamella wide, posterior calcified inner lamella absent in both valves (Fig. 22.14 A); CR symmetrical .... *Isocypris beauchampi* (Paris, 1920) [Cosmopolitan. Neotropical: Brazil, Chile]

2' Cp in lateral view elongate, anterior marginal septae large, posterior calcified inner lamella narrow but present in both valves (Fig. 22.14 B); CR asymmetrical, at least one with large spines on ramus and claws (Fig. 22.14 C) .... *Stenocypris* [Circumtropical. Neotropical: West Indies, Brazil]

3(1) Anterior overlap small, inverse or absent 4

3' Anterior overlap of RV by LV very large (Fig. 17 Q) .... *Paranacypris* [Brazil]

4(3) CR with two claws and two setae, proximal seta is a seta (Fig. 22.14 D) .... *Herpetocypris* [Cosmopolitan]

4' CR with three claws and one seta, proximal seta is a claw (Fig. 22.14 E) .... *Ilyodromus* [Australasia. Afrotropical. Palaearctic. Neotropical: Paraguay. Chile.]

Ostracoda: Podocopida: Cypridoidea: Cyprididae: Eucypridinae: Genera

1 Species max 2 mm, valves less compressed; T2 first endopodal segment with one apical seta (Fig. 22.9 F) 2

1' Cp large (2.5-4 mm), elongated and laterally compressed (Fig. 22.9 I, J); T2 first endopodal segment with two apical setae (Fig. 22.9 E) .... *Amphicypris / Cypriconcha* [Holarctic. Neotropical: Paraguay. Argentina. South Georgia.]

2(1) Both valves without selvages (Fig. 22.15 A, B) 3
2' RV with inwardly displaced anterior selvage (Fig. 22.15 C) 4

3(2) Valves short and high, anteriorly often set with *Porenwarzen*, LV without internal tooth ……. . ... *Eucypris*
[Cosmopolitan. Not yet recorded in Neotropics]
3' Valves elongated, without *Porenwarzen*, LV ventrally with an internal tooth .. *Tonnacypris*
[Holarctic, with invasions in the southern hemisphere]
4(2) LV with pronounced inner list (Fig. 22.15 D) .... *Trajancypris*
[Holarctic, with invasions in the southern hemisphere]
4' LV without pronounced inner list (Fig. 22.15 E) .... *Argentocypris*
[Argentina]

Ostracoda: Podocopida: Cypridoidea: Cyprididae: Cyprinotinae: Genera

The ubiquitous genus *Heterocypris* is in need of revision and probably composed of several genera.

1 At least one valve with marginal tubercles, one valve always overlapping another anteriorly and posteriorly, anteriorly in dorsal view without pointed rostrum (Fig. 22.16 D) 2
1' Both valves without marginal tubercles, no valve overlapping the other anteriorly or posteriorly; in dorsal view anteriorly with a pointed rostrum (Fig. 22.16 A-C) .... *Riocypris*
[Uruguay]

2(1) LV overlapping RV, RV with marginal tubercles 3
2' RV overlapping LV, LV with marginal tubercles (Fig. 22.16 D-F) .... *Hemicypris*
[Tropical and sub-tropical. Neotropical: West Indies. Brazil. Paraguay.]

3(2) RV without large dorsal expansion (Fig. 22.16 G-I) .... *Heterocypris*
[Cosmopolitan]
3' Cp in left lateral view RV with large dorsal expansion, overarching LV (arrowed in Fig. 22.11 J) .... *Cyprinotus*
[Tropical and sub-tropical]

ACKNOWLEDGMENTS

We thank Eduardo Grou (Maringá, Brazil) for inking all the drawings electronically and Julien Cillis (Brussels, Belgium) for technical help with the scanning electron micrographs. We owe many thanks to Cristina Damborenea (La Plata, Argentina) for guiding us through the editorial process with this chapter, and for showing us much more patience than we deserved! Large parts of the taxonomic revisions that are reported on herein were made possible by grants allocated to either of the present authors by GTI, Belspo and UEM. The State University of Maringá (UEM, Maringá) and the Royal Belgian Institute of natural Sciences (RBINS, Brussels) have a bilateral Memorandum of Understanding regarding collaborative Scientific Research.

REFERENCES

Bode, S.N.S., S. Adolfsson, D.K. Lamatsch, M.J.M. Martins, O. Schmit, J. Vandekerkhove, F. Mezquita, T. Namiotko, G. Rossetti, I. Schön, R.K. Butlin & K. Martens. 2010. Exceptional cryptic diversity and multiple origins of parthenogenesis in a freshwater ostracod. Molecular Phylogenetics and Evolution 54: 542-552.

Broodbakker, N.W. 1984. The distribution and zoogeography of freshwater Ostracoda (Crustacea) in the West Indies, with emphasis on species inhabiting wells. Bijdragen tot de Dierkunde 54: 25-50.

Broodbakker, N.W. & D.L. Danielopol .1982. The chaetotaxy of Cypridacea (Crustacea, Ostracoda) limbs: proposals for a descriptive model. Bijdragen tot de Dierkunde 52: 103-120.

Campos, R., E.O. Conceição, M.B.O. Pinto, A.P.S. Bertoncin, J. Higuti & K. Martens. 2017. Evaluation of quantitative sampling methods in pleuston: an example from ostracod communities. Limnologica 63:36-41.

Cohuo-Durán, S., L. Pérez, I. Karanovic. 2014. On *Limnocytherina axalapasco,* a new freshwater ostracod (Podocopida: Limnocytheridae) from Mexican crater lakes. Revista de Biologia Tropical 62: 15-32.

Conceição, E.O., J. Higuti, R. Campos & K. Martens. 2018. Effects of flood pulses on persistence and variability of pleuston communities in a tropical floodplain lake. Hydrobiologia 807: 175-188.

Cusminsky, G.C., P.A. Pérez, A. Schwalb & R. Whatley. 2005. Recent lacustrine ostracods from Patagonia, Argentina. Revista Española de Micropaleontología 37: 431-450.

D´Ambrosio, D.S., A.R. Díaz, A. García & M.C. Claps. 2015. First description of the soft part anatomy of *Ilyocypris ramirezi* Cusminsky & Whatley (Crustacea, Ostracoda) from Argentina, South America. Zootaxa 3957: 59-68.

Danielopol, D.L. 1982. The preparation of ostracods limbs for optical microscopy (dissection, staining and mounting procedures). Pages 41-42 *in* R. Maddocks (ed.): Abstracts of the 8th Interna-tional Symposium on Ostracoda. University of Houston, Houston.

Díaz, A.R. & E.C. Lopretto. 2011. A new species of *Keysercypria* Karanovic (Crustacea: Ostracoda) from Argentina. Zootaxa 3063: 64-68.

Fontana, S.L. & S. Ballent. 2005. A new giant cypridid ostracod (Crustacea) from southern Buenos Aires province, Argentina. Hydrobiologia 533: 187-197.

Higuti, J. & K. Martens. 2014. Five new species of Candoninae (Crustacea, Ostracoda) from the alluvial valley of the Upper Paraná River (Brazil, South America). European Journal of Taxonomy 106: 1-36.

Higuti, J., L.F.M. Velho, F.A. Lansac-Tôha & K. Martens. 2007. Pleuston communities are buffered from regional flood pulses: the example of ostracods in the Paraná River floodplain, Brazil. Freshwater Biology 52: 1930-1943.

Higuti, J., I. Schön, L. Audenaert & K. Martens 2013. On the *Strandesia obtusata/elliptica* – lineage (Ostracoda, Cyprididae) in the alluvial valley of the Upper Paraná River (Brazil), with the description of three new species. Crustaceana 86: 182-211.

Kempf E.K. 1980. Index and Bibliography of Nonmarine Ostracoda. 1. Index A. *Sonderveröffentlichungen des Geologischen Instituts der Universität zu Köln* 35: 1–188.

Kempf E.K. 1997. Index and Bibliography of Nonmarine Ostracoda. 6. Index A, Supplement 1. *Sonderveröffentlichungen des Geologischen Instituts der Universität zu Köln* 109: 1–142.

Klie, W. 1940. Süsswasserostracoden aus Nordostbrasilien IV. *Eucypris* oder *Heterocypris*? Zoologischer Anzeiger 129: 113-121.

Laprida, C. 2006. Ostrácodos recientes de la llanura pampeana, Buenos Aires, Argentina: ecología e implicancias Paleolimnológicas. Ameghiniana 43: 181-204.

Martens, K. & F. Behen. 1994. A Checklist of the recent non-marine ostracods (Crustacea, Ostracoda) from the inland waters of South America and adjacent islands. Travaux scientifiques du Musée d'Histoire Naturelle de Luxembourg 22:1-81.

Martens, K. & D.J. Horne 2016. Collecting and processing living non-marine ostracods. Journal Crustacean Biology 36: 849-854.

Martens, K. & S. Savatenalinton. 2011. A subjective checklist of the Recent, free-living, non-marine Ostracoda (Crustacea). Zootaxa 2855: 1-79.

Meisch, C. R. Smith & K. Martens 2019 A subjective global checklistof the Recent non-marine Ostracoda (Crustacea). European Journal of Taxonomy 492: 1-135.

Namiotko T., D.L. Danielopol & A. Baltanás. 2011. Soft body morphology, dissection and slide-preparation of Ostracoda: a primer. Joannea Geologie und Paläontologie 11:327-343.

Pinto, I.D. & C.B. Kotzian. 1961. Novos Ostracodes de Familia Darwinulidae e a variação das impressões musculares. Boletim do Instituto de Ciências Naturais de Porto Alegre 11: 5-64.

Pinto, R.L., C.E.F. Rocha & K. Martens. 2008. On the first terrestrial ostracod of the Superfamily Cytheroidea (Crustacea, Ostracoda): description of *Intrepidocythere ibipora* n. gen. n. sp. from forest leaf litter in São Paulo State, Brazil. Zootaxa 1828: 29-42.

Ramirez, F.C. 1967. Ostracodos de lagunas de la Provincia de Buenos Aires. Revista Museo de La Plata (Nueva Serie), Zoologia (73)10: 5-54.

Roessler, E.W. 1982. Estudios taxonómicos, ontogenéticos, ecológicos y etológicos sobre los ostrácodos de agua dulce en Colombia. I. Estudio morfológico de una nueva especie Colombiana del género *Heterocypris* Claus, 1892 (Ostracoda, Podocopa, Cyprididae). Caldasia 13: 429-452.

Sars, G.O. 1901. Contributions to the knowledge of the freshwater Entomostraca of South America. Part II. Copepoda-Ostracoda. Archiv for Mathematik og Naturvidenskab B 14: 1-52, 8 plts.

Schön I., R.L. Pinto, S. Halse, A.J. Smith, K. Martens & C.W.Birky. 2012. Cryptic species in putative ancient asexual darwinulids (Crustacea, Ostracoda). Plos One Biology 7: e39844.

Schön, I., J. Higuti, T. Patel & K. Martens 2018. High connectivity through long distance aquatic dispersal of (cryptic) non-marine ostracod species (Ostracoda, Crustacea) in four major Brazilian floodplains. Molecular Phylogenetics and Evolution 121: 86–97.

Smith, R.J., T. Kamiya & D.J Horne. 2006. Living males of the 'ancient asexual' Darwinulidae (Ostracoda: Crustacea). Proceedings of the Royal Society B 273: 1569-1578.

Smith, A.J., D.J. Horne, K. Martens & I. Schön 2015. Class Ostracoda. Pages 757-780 *in* J. Thorp & D.C. Rogers (eds.), Ecology and general biology: Thorp & Covich's Freshwater Invertebrates, Elsevier.

Würdig, N.L. & I.D. Pinto. 1990. *Diaphanocypris* a new Ostracoda genus occurring in South and Central America. Pesquisas 17: 31-38.

Captions of figures

Figure 22.1 Podocopid superfamilies, general features: (A) Cytheroidea, hypothetical ostracod, RV internal view, showing various anatomical details, including AMS consisting of four scars in a vertical row; (B) Cytheroidea, same valve as above, but D-V cut and slightly rotated, showing anatomical details; (C) Cypridoidea, male Cp left lateral view, LV removed and only one of each pair of appendages shown, T1 a palp, T2 a walking limb, T3 a cleaning limb; (D) Cypridoidea, RV internal view, showing pawprint-like AMS; (E) Darwinuloidea, female, Cp left lateral view, LV removed and only one of each pair of appendages shown, T1 a palp, T2-T3 walking limbs; (F) Cytheroidea, male, Cp right lateral view, RV removed and only one of each pair of appendages shown, T1 – T3 walking limbs. Abbreviations: A1, antennule; A2, antenna; AMS, adductor muscle scars; CR, caudal ramus; fz, fused zone; Hp, hemipenis; il, inner lamella; im, inner margin; Md, mandibulae; Mx1, maxillula; ns, natatory setae; ol, outer lamella; rpc, radial pore canal; T1, first thoracopod; T2, second thoracopod; T3, third thoracopod; vm, valve margin.

Figure 22.2. Darwinuloidea, Darwinulidae: (A) *Microdarwinula* sp. female, Cp left lateral view, with LV removed and only one of each pairs of appendages shown; (B) *Vestalenula* sp., LV internal view, showing rosette-like AMS and absence of tooth; (C) *Vestalenula* sp., RV internal view, showing presence of postero-ventral, external keel and rosette-like AMS; (D) *Vestalenula* sp., A2 showing exopodite (exo) with one seta and one spine; (E) *Penthesilenula* sp., LV internal view, showing presence of internal postero-ventral tooth and rosette-like AMS; (F) *Penthesilenula* sp., RV internal view, showing rosette-like AMS and absence of external postero-ventral keel; (G) *Penthesilenula* sp., A2 showing exopodite (exo) with two setae and one spine; (H) *Penthesilenula,* Md-palp, with five apical claws, and setae *y* and *z* both long; (I) *Darwinula*, Md-palp with four apical claws, and seta *y* much shorter than seta *z*; setae *a* and *b* both present; (J) *Alicenula*, Md-palp, with three apical claws, seta *z* small and seta *y* absent; seta *a* absent. Abbreviations: A1, antennule; A2, antenna; AMS, adductor muscle scars; exo, exopodite; T1, first thoracopod; T2, second thoracopod; T3, third thoracopod.

Figure 22.3. Cytheroidea: (A) Entocytheridae, female, Cp right lateral view, with RV removed and only one of each pairs of appendages shown, T1-T3 with terminal hook-like claws; (B) Limnocytheridae, three thoracic appendages all walking legs, terminal claws not hook-like; (C) Cytherideidae, *Cyprideis*, male, T2 with large and annulated ventral seta on first segment; (D) *Cytheridella* female, Cp dorsal view, showing dorso-lateral sulcus, and expanded posterior brooding pouch; (E) *Metacypris* female, Cp dorsal view, showing absence of dorso-lateral sulcus and different shape of posterior brooding pouch; (F) *Limnocythere* female, right lateral view; (G) *Limnocythere* male, right lateral view. Abbreviations: A1, antennule; A2, antenna; Md, mandibulae; Mx1, maxillula; T1, first thoracopod; T2, second thoracopod; T3, third thoracopod.

Figure 22.4. Cytheroidea: (A) *Cytheridella*, T3 transformed in a cleaning leg; (B) *Elpidium*, T3 a normal walking leg; (C) *Elpidium,* RV internal view; (D) *Elpidium,* male A2, with one serrated end claw; (E) *Intrepidocythere,* Cp dorsal view; (F) *Intrepidocythere* male, A2, with three serrated end claws; (G) *Neolimnocythere*, hemipenis showing very large and membranous UR; (H) *Paracythereis*, hemipenis, showing very large and chitinised UR; (I) *Limnocythere*, hemipenis showing 'normal', hook-like UR; (J) *Neolimnocythere*, Cp left lateral view, with LV removed and only one of each pairs of appendages shown, note large posterior spine; (K) *Neolimnocythere*, Cp dorsal view, showing large lateral spines; (L) *Paracythereis*, Cp right

lateral view, note absence of large posterior spine. Abbreviation: UR, upper ramus of the cytheroid hemipenis.

Figure 22.5. Cypridoidea: (A) Notodromadidae, showing non-fused dorsal eye cups; (B) Notodromadidae, Mx1, third endite with c 4 serrated claws; (C) Cyprididae, Mx1, third endite with two serrated claws; (D) Ilyocyprididae, Cp right lateral view, showing latero-dorsal sulci; (E) Ilyocyprididae, Cp dorsal view, showing latero-dorsal sulci; (F) Ilyocyprididae, T1 female, two-segmented palp; (G) Cyprididae, T1 female, one-segmented palp; (H) Candonidae T3, with segment 3 clearly separated from segment 2; (I) Cyprididae T3, with segments 2 and 3 fused into a pincer; (J) Cyprididae T3, detail of distal pincer.

Figure 22.6. Candonidae: (A) Cyclocypridinae, Cp in lateral view rounded and highly arched; (B) Cyclocypridinae A2 with natatory setae; (C) Cyclocypridinae male T1, consisting of two segments; (D) Candonidae, Cp in lateral view elongated; (E) Candonidae A2 without natatory setae; (F) Candonidae male T1 consisting of one segment only; (G) *Physocypria*, RV with marginal tubercles; (H) *Cypria* RV without marginal tubercles. Abbreviation: ns, natatory setae.

Figure 22.7. Candonidae: (A) *Terrestricypris* caudal ramus; (B) Candonidae, caudal ramus unreduced (two claws, two setae); (C) Candonidae caudal ramus reduced (one ramus, one claw); (D) Candonidae, caudal ramus reduced (one ramus); (E) *Caaporacandona* T3, showing one claw and two setae on last segment; (F) *Caaporacandona* T2, no seta d1; (G) *Caaporacandona*, caudal ramus; (H) *Terrestricypris* T3, showing a single claw on last segment; (I) *Terrestricypris* T2, with seta d1; (J) *Pseudocandona*, Cp dorsal view; (K) *Pseudocandona* T3, showing three setae on first segment; (L) *Candona*, Cp dorsal view; (M) *Candona* T3, showing two setae on first segment.

Figure 22.8. Candonidae: (A) *Candonopsis*, caudal ramus with proximal seta missing; (B) *Candonopsis* Md-palp, without setae and claws, showing elongated terminal segment; (C) *Candobrasilopsis* Md-palp, without setae and claws, showing short terminal segment; (D) *Candobrasilopsis* RV internal view, showing broad inner lamella and sinuous inner margin; (E) *Candobrasilopsis*, hemipenis outline; (F) *Latinopsis* RV outer view, showing narrow inner lamella and evenly rounded anterior inner margin; (G) *Latinopsis*, hemipenis outline; (H) *Danielocandona*, Cp right lateral view; (I) *Caribecandona*, Cp right lateral view; (J) *Caribecandona*, Cp left lateral view; (K) *Caaporacandona*, caudal ramus; (L) *Caaporacandona* T3. Abbreviation: il, inner lamella.

Figure 22.9. Cyprididae: (A) Cypridopsinae, flagellum-like caudal ramus; (B) Herpetocypridinae (*Paranacypris*), fully developed caudal ramus; (C) Cypricercinae, attachment of caudal ramus with distal Triebels' loop (TL); (D) Cyprididae, attachment of caudal ramus without distal Triebels' loop; (E). *Chlamydotheca*, T2 with two distal setae on first endopodal segment; (F) Cyprididae, T2 with one distal seta on first edopodal segment; (G) *Chlamydotheca incisa* (Claus, 1892), RV internal view, showing presence of antero-ventral beak-like structure and absence of posteroventral spine; (H) *Chlamydotheca unispinosa* (Baird, 1862), RV internal view, showing absence of antero-ventral beak and presence of posteroventral spine; (I) *Amphicypris*, Cp left lateral view; (J) *Amphicypris*, Cp dorsal view; (K) Herpetocypridinae, attachment of caudal ramus with proximal trabecule as reinforcement; (L) Herpetocypridinae, attachment of caudal ramus with proximal triangular reinforcement; (M) Cyprididae, attachment of caudal ramus without proximal reinforcements; (N)

Rudjakoviella, LV external view, showing large anterior and posterior spines; (O) *Rudjakoviella*, Cp dorsal view, showing large anterior and posterior spines on LV. Abbreviation: TL, Triebels' loop.

Figure 22.10. Cyprididae: (A) Eucypridinae, T1 showing presence of "d" and "c" setae; (B) *Pelocypris* female, Cp left lateral view; (C) *Pelocypris* male, Cp left lateral view; (D) *Pelocypris* female, Cp dorsal view; (E) *Cypretta*, Cp dorsal view; (F) *Cypretta*, Cp left lateral view showing anterior marginal septae, present in both valves; (G) *Cypris*, LV inner view showing submarginal selvage; (H) *Cypris*, RV inner view showing largely inwardly displaced selvage; (I) *Cypris*, LV dorsal view; (J) *Eucypris*, T2; showing divided penultimate segment; (K) *Dolerocypris*, LV external view, with submarginal selvages; (L) *Dolerocypris*, RV external view, with largely displaced selvages; (M) *Dolerocypris*, Cp dorsal view (slightly opened).

Figure 22.11. Cyprididae, Cypridopsinae: (A) Zonocypridini, overdeveloped claw G2 on A2 in females; (B) Cypridopsini, normal claw G2 on A2 in females; (C) *Zonocypris cordata* (Sars, 1924), Cp right lateral view, showing striking external valve ornamentation; (D) *Zonocypris cordata* (Sars, 1924), Cp dorsal view, showing wide Cp and striking external valve ornamentation; (E) *Cabelodopsis hispida* (Sars, 1901), Cp left lateral view, showing hirsute Cp; (F) Cypridopsini, Mx1-palp, showing elongated distal segment; (G) Potamocypridini, Mx1-palp, showing spatulate distal segment; (H) *Potamocypris*, RV external view; (I) *Potamocypris*, LV external view.

Figure 22.12. Cyprididae, Cypridopsinae: (A) *Neocypridopsis*, T3 with separate distal (fourth) segment; (B) *Neocypridopsis*, Cp right lateral view; (C) *Neocypridopsis*, Cp dorsal view; (D) Cypridopsinae, T3 with segments 3 and 4 fused; (E) Cypridopsinae, T3 with segments 3 and 4 partly fused; (F) *Cypridopsis s.s.*, Cp right lateral view; (G) *Cypridopsis s.s.*, Cp dorsal view; (H) *Sarscypridopsis*, caudal ramus, showing short and triangular base; (I) *Sarscypridopsis*, Cp left lateral view; (J) *Sarscypridopsis*, Cp dorsal view; (K) *Plesiocypridopsis*, caudal ramus, showing elongated base with largely parallel sides.

Figure 22.13. Cyprididae, Cypricercinae: (A) Cypricercinae, attachment of caudal ramus, showing Triebels' loop inside the dorsal branch; (B) *Diaphanocypris*, attachment of caudal ramus, showing centrally positioned Triebels' loop, with multiple cells; (C) *Nealecypris*, attachment of caudal ramus, showing centrally positioned Triebels' loop with single cell and ventral branch absent; (D) *Strandesia*, attachment of caudal ramus, showing centrally positioned Triebels' loop with single cell, and long ventral branch; (E) *Diaphanocypris*, RV internal view; (F) *Strandesia obtusata* (Sars, 1901), Cp left lateral view; (G) *Strandesia obtusata*, (Sars, 1901) Cp dorsal view; (H) *Strandesia bicuspis*, (Clause, 1892) Cp left lateral view, showing dorsal 'helmet'; (I) *Strandesia bicuspis* (Claus, 1892), Cp dorsal view, showing dorsal 'helmet'; (J) *Cypricercus*, Cp left lateral view, showing large posterior spine on RV; (K) *Cypricercus*, Cp dorsal view, showing large posterior spine on RV. Abbreviations: db, dorsal branch; TL, Triebels' loop; vb, ventral branch.

Figure 22.14. Cyprididae, Herpetocypridina: (A) *Isocypris*, RV inner view, showing anterior marginal septae and absence of posterior calcified inner lamella; (B) *Stenocypris*, LV internal view, showing presence of posterior calcified inner lamella and presence of marginal septae; (C) *Stenocypris*, distal part of right caudal ramus, showing large ventral spines (absent on left caudal ramus); (D) *Herpetocypris*, caudal ramus showing proximal seta; (E) *Ilyodromus*, caudal ramus showing proximal seta transferred into a third claw. Abbreviation: il, inner lamella.

Figure 22.15. Cyprididae, Eucypridinae: (A) *Eucypris*, RV internal view, showing absence of anterior selvage; (B) *Eucypris*, LV internal view, showing absence of anterior selvage, and presence of short anterior inner lists; (C) *Trajancypris*, RV internal view, showing presence of anterior selvage; (D) *Trajancypris*, LV internal view, showing presence of anterior inner list; (E) *Argentocypris*, LV inner view, showing absence of anterior inner list. Abbreviations: il, inner lamella; im, inner margin.

Figure 22.16. Cyprididae, Cyprinotinae: (A) *Riocypris*, RV internal view, showing absence of marginal tubercles; (B) *Riocypris*, LV internal view, showing absence of marginal tubercles; (C) *Riocypris*, Cp dorsal view, showing absence of anterior overlap and presence of anterior rostrum; (D) *Hemicypris*, Cp dorsal view, showing clear anterior RV>LV overlap and absence of rostrum; (E) *Hemicypris*, LV external view, showing presence of marginal tubercles; (F) *Hemicypris*, RV external view, showing absence of marginal tubercles; (G) *Heterocypris*, Cp dorsal view, showing anterior LV>RV overlap and absence of rostrum; (H) *Heterocypris*, LV external view, showing absence of marginal tubercles; (I) *Heterocypris*, RV external view, showing presence of marginal tubercles; (J) *Cyprinotus*, Cp left lateral view, showing dorsal expansion (possibly larger) and marginal tubercles on RV.

Figure 22.17. Scanning electron microscopy images of valves and carapaces of selected Neotropical ostracod species: (A) *Vestalenula pagliolii* (Pinto & Kotzian, 1961); (B) *Penthesilenula brasiliensis* (Pinto & Kotzian, 1961); (C and D) *Cytheridella ilosvayi* Daday, 1905, male (C) and female (D); (E) *Candobrasilopsis elongata* Higuti & Martens, 2014; (F) *Chlamydotheca iheringi* (Sars, 1901); (G and H) *Cypretta vivacis* Würdig & Pinto, 1993; (I) *Diaphanocypris meridana* (Furtos, 1936); (J) *Strandesia bicuspis* (Claus, 1892); (K) *Strandesia lansactohai* Higuti & Martens, 2013; (L) *Strandesia mutica* (Sars, 1901); (M) *Strandesia psittacea* (Sars, 1901); (N and O) *Bradleytriebella trispinosa* (Pinto & Purper, 1965); (P) *Cypricercus centrura* (Klie, 1940); (Q) *Paranacypris samambaiensis* Higuti, Meisch & Martens, 2009); (R) *Cabelodopsis hispida* (Sars, 1901). Scale bars: A, B = 100 µm, G, H, K, Q, R = 200 µm, C-E, I, J, L, N-P = 500 µm, M = 1000 µm, F = 2000 µm. A, B, E-L, Q, R: Upper Paraná River floodplain, Brazil and C, D, M-P: Amazon River floodplain, Brazil.

Table 1. A taxonomic checklist of Neotropical freshwater and terrestrial ostracod genera

Class Ostracoda Latreille, 1806

Order Podocopida Sars, 1866

Superfamily Darwinuloidea Brady & Norman, 1889

Family Darwinulidae Brady & Norman, 1889

Genus ***Alicenula*** Rossetti & Martens, 1998

Genus ***Darwinula*** Brady & Robertson, 1885

Genus ***Microdarwinula*** Danielopol, 1968

Genus ***Penthesilenula*** Rossetti & Martens, 1998

Genus ***Vestalenula*** Rossetti & Martens, 1998

Superfamily Cytheroidea Baird, 1850

Family Limnocytheridae Klie, 1938

Subfamily Limnocytherinae Klie, 1938

Genus ***Limnocythere*** Brady, 1968 (including ***Limnocytherina*** Negadaev-Nikonov, 1967)

Genus ***Neolimnocythere*** Delachaux, 1928

Genus ***Paracythereis*** Delachaux, 1928

Subfamily Timiriaseviinae Mandelstam, 1960

Genus ***Cytheridella*** Daday, 1905

Genus ***Elpidium*** O.F. Müller, 1880

Genus ***Intrepidocythere*** Pinto, Rocha & Martens, 2008

Family Cytherideidae Sars, 1925

Subfamily Cytherideinae Sars, 1925

Genus ***Cyprideis*** Jones, 1857

Family Xestoleberididae Sars, 1928 (Not treated in this key)

Genus ***Xestoleberis*** Sars, 1866

Family Entocytheridae Hoff, 1942 (Not treated in this key)

Subfamily Entocytherinae Hoff, 1942

Genus ***Ankylocythere*** Hart, 1962

Genus ***Entocythere*** Marshall, 1903

Genus ***Uncinocythere*** Hart, 1962

Family Cytheruridae G.W. Müller, 1894 (Not treated in this key)

Subfamily Cytherurinae G.W. Müller, 1894

Genus ***Cytherura*** Sars, 1866

Genus ***Semicytherura*** Wagner, 1957

Family Cytheridae Baird, 1850 (Not treated in this key)

Subfamily Cytherinae Baird, 1850

Genus ***Pericythere*** Hartmann, 1957

Genus ***Perissocytheridea*** Stephenson, 1938 [Syn.: *Ilyocythere* Klie, 1939]

Superfamily Cypridoidea Baird, 1845

Family Ilyocyprididae Kaufmann, 1900

Genus ***Ilyocypris*** Brady & Norman, 1889

Family Notodromadidae Kaufmann, 1900

Genus ***Argentodromas*** Diaz & Martens, 2018

Genus ***Newnhamia*** King, 1855

Family Candonidae Kaufmann, 1900

Subfamily Candoninae Kaufmann, 1900

Tribe Candonini Kaufmann, 1900

Genus ***Candona*** Baird, 1845

Genus ***Fabaeformiscandona*** Kristc, 1972

Genus ***Pseudocandona*** Kaufmann, 1900

Genus ***Caribecandona*** Broodbakker, 1983

Genus ***Cubacandona*** Broodbakker, 1983

Tribe Candonopsini Karanovic, 2004

Genus ***Candobrasilopsis*** Higuti & Martens, 2012

Genus ***Candonopsis*** Vavra, 1891

Genus ***Latinopsis*** Karanovic & Datry, 2009

Tribe Namibcypridini Martens, 1992

Genus ***Danielocandona*** Broodbakker, 1983

Tribe Terrestricypridini Schornikov, 1969

Genus ***Caaporacandona*** Pinto, Rocha & Martens, 2005

Genus ***Terrestricypris*** Schornikov, 1980

Subfamily Paracypridinae Sars, 1923 (Not treated in this key)

Genus ***Dolerocypria*** Tressler, 1937

Genus ***Paracypria*** Sars, 1910

Genus ***Pontoparta*** Vavra, 1901

Genus ***Thalassocypria*** Hartmann, 1957

Subfamily Cyclocypridinae Kaufmann, 1900

Genus ***Cypria*** Zenker, 1854 [Syn.: *Keysercypria* (partim)]

Genus ***Physocypria*** Vavra, 1898 [Syn.: *Keysercypria* (partim)]

Family Cyprididae Baird, 1845

Subfamily Callistocypridinae Schornikov, 1980

Genus ***Callistocypris*** Schornikov, 1980

Subfamily Cyprinotinae Bronstein, 1947

Genus ***Cyprinotus*** Brady, 1886

Genus ***Hemicypris*** Sars, 1903

Genus ***Heterocypris*** Claus, 1893

Genus ***Riocypris*** Klie, 1935

Subfamily Eucypridinae Bronstein, 1947

Tribe Eucypridini Bronstein, 1947

Genus ***Amphicypris*** Sars, 1901

Genus ***Argentocypris*** Diaz & Martens, 2014

Genus ***Cypriconcha*** Sars, 1926

Genus ***Eucypris*** Vavra, 1891
Genus ***Tonnacypris*** Diebel & Pietrzeniuk, 1975
Genus ***Trajancypris*** Martens, 1989

Subfamily Cypricercinae Mckenzie, 1971

Tribe Cypricercini Mckenzie, 1971
Genus ***Bradleystrandesia*** Broodbakker, 1983 (Not treated in this key)
Genus ***Bradleytriebella*** Savatenalinton & Martens, 2009
Genus ***Cypricercus*** Sars, 1895
Genus ***Strandesia*** Stuhlmann, 1888 [Syn.: *Acanthocypris* Claus, 1892; Syn.: *Neocypris* Sars, 1901]

Tribe Nealecypridini Savatenalinton & Martens, 2009
Genus ***Diaphanocypris*** Würdig & Pinto, 1990
Genus ***Nealecypris*** Savatenalinton & Martens, 2009

Subfamily Rudjakoviellinae Triebel, 1973 In Malz
Genus ***Rudjakoviella*** Triebel, 1973 In Malz [Syn.: *Xenocypris* Triebel, 1962]

Subfamily Pelocypridinae Triebel, 1962
Genus ***Pelocypris*** Klie, 1939

Subfamily Herpetocypridinae Kaufmann, 1900

Tribe Herpetocypridini Kaufmann, 1900
Genus ***Herpetocypris*** Brady & Norman, 1889
Genus ***Ilyodromus*** G.W. Müller, 1908

Tribe Psychrodromini Martens, 2001
Genus ***Paranacypris*** Higuti, Meisch & Martens, 2009

Tribe Stenocypridini Ferguson, 1964
Genus ***Chrissia*** Hartmann, 1957 (Not treated in this key)
Genus ***Stenocypris*** Sars, 1889

Tribe Isocypridini Hartmann & Puri, 1974
Genus ***Isocypris*** G.W. Müller, 1908

Subfamily Dolerocypridinae Triebel, 1961
Genus ***Dolerocypris*** Kaufmann, 1900

Subfamily Cypridinae Baird, 1845
Genus ***Chlamydotheca*** Saussure, 1858 [Syn.: *Pachycypris* Claus, 1892]
Genus ***Cypris*** O.F. Müller, 1776

Subfamily Cyprettinae Hartmann, 1963
Genus ***Cypretta*** Vavra, 1895

Subfamily Cypridopsinae Kaufmann, 1900

Tribe Cypridopsini Kaufmann, 1900
Genus ***Cypridopsis*** Brady, 18687
Genus ***Neocypridopsis*** Klie, 1940 [Syn.: *Notiocypridopsis* De Deckker, 1981]
Genus ***Plesiocypridopsis*** Rome, 1965
Genus ***Sarscypridopsis*** Mckenzie, 1977

Tribe Potamocypridini Ghetti & Mckenzie, 1981
Genus ***Potamocypris*** Brady, 1870

Tribe Zonocypridini Higuti & Martens, 2012
Genus ***Cabelodopsis*** Higuti & Martens, 2012
Genus ***Zonocypris*** G.W. Müller, 1898

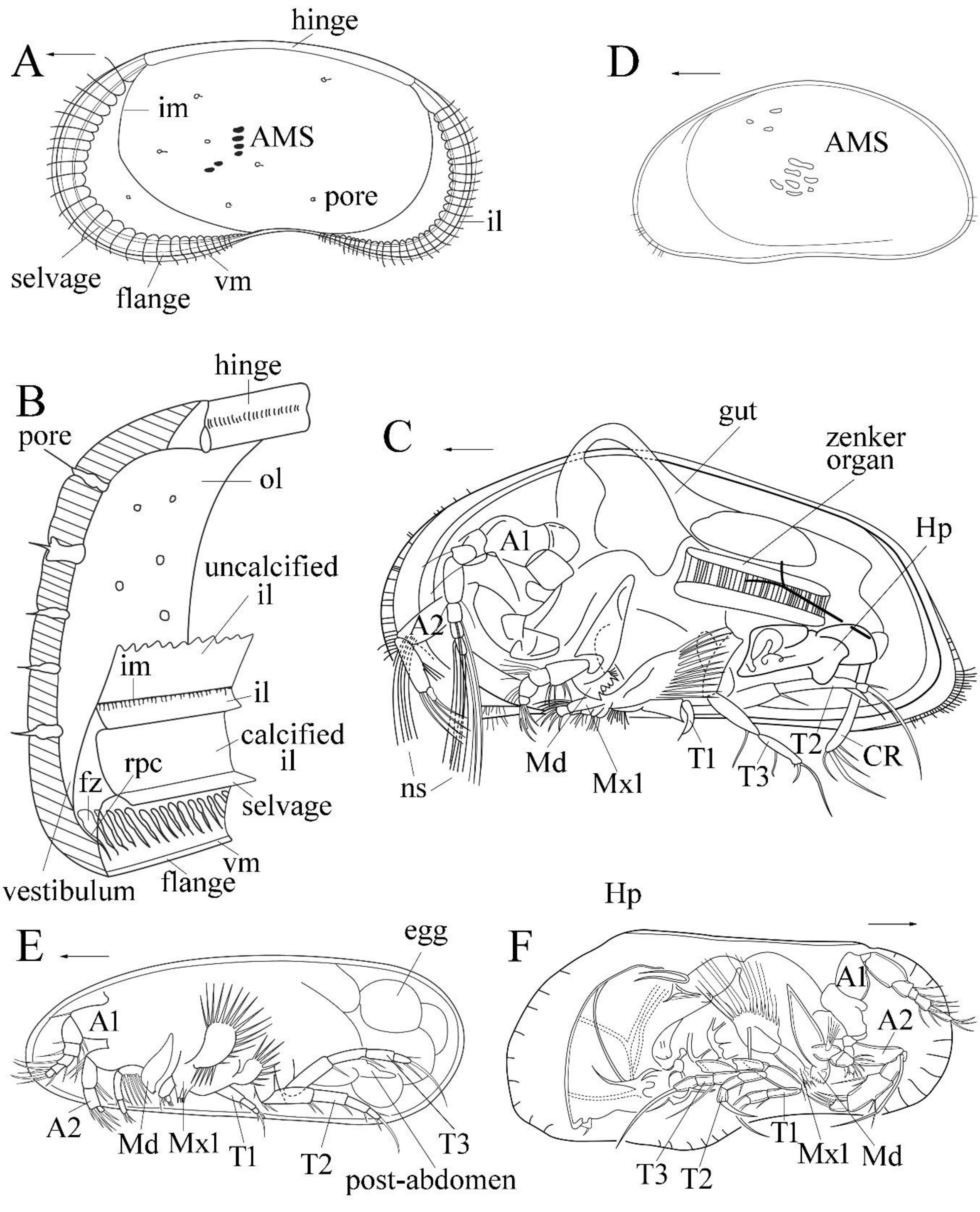

A
hinge
im
AMS
pore
il
selvage
flange
vm
D
AMS
B
hinge
pore
ol
uncalcified
il
im
il
calcified
il
rpc
fz
selvage
vm
vestibulum
flange
C
gut
zenker
organ
Hp
A1
A2
Md
Mx1
T1
T3
T2
CR
ns
Hp
E
egg
A1
A2
Md
Mx1
T1
T2
T3
post-abdomen
F
A1
A2
T1
Mx1
Md
T3
T2

Figure 22.1

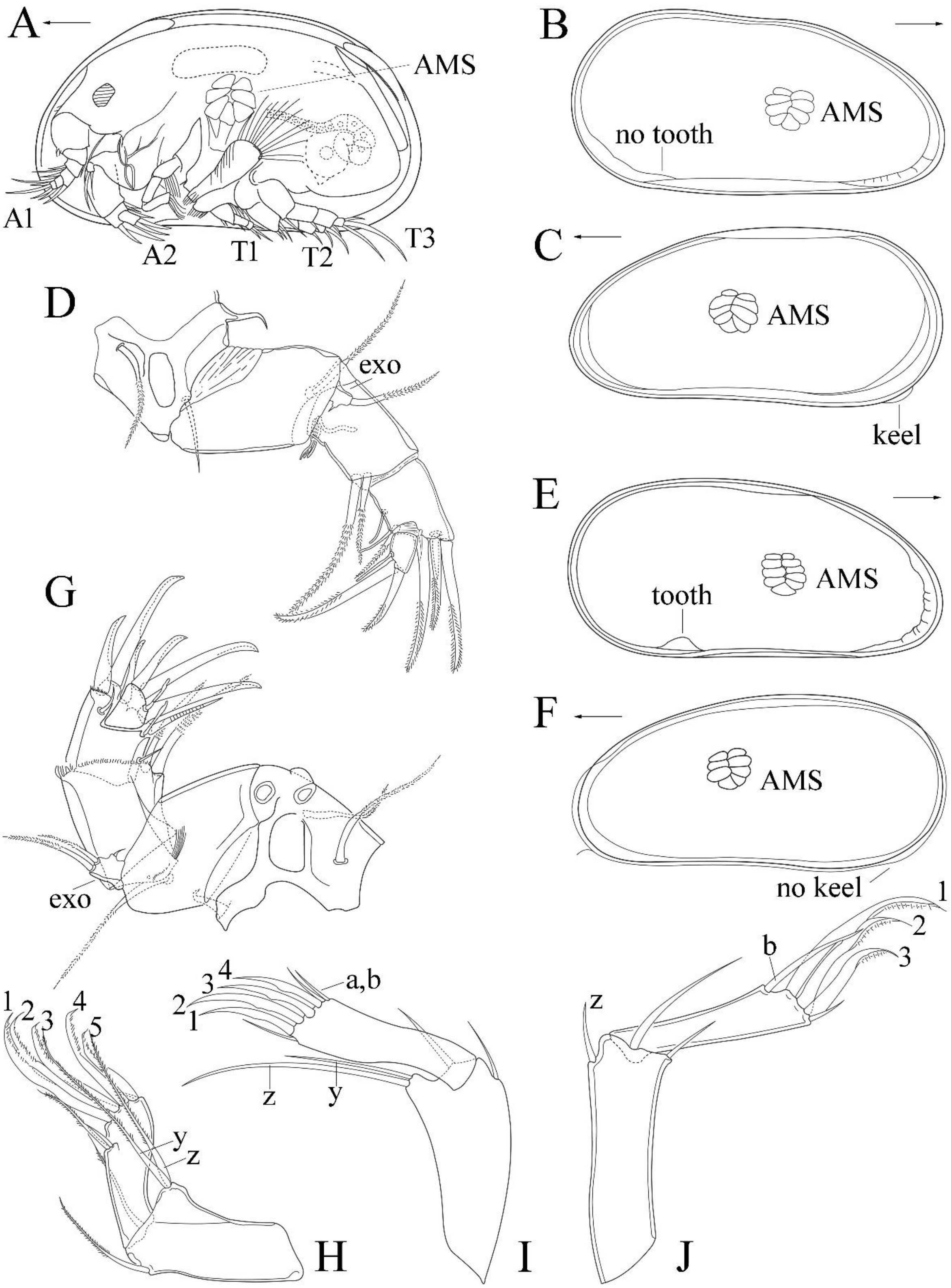

A
AMS
A1
A2
T1
T2
T3
B
AMS
no tooth
C
AMS
keel
D
exo
E
tooth
AMS
F
AMS
no keel
G
exo
1
2
3
4
5
y
z
H
2
1
3
4
a,b
z
y
I
z
b
1
2
3
J

Figure 22.2

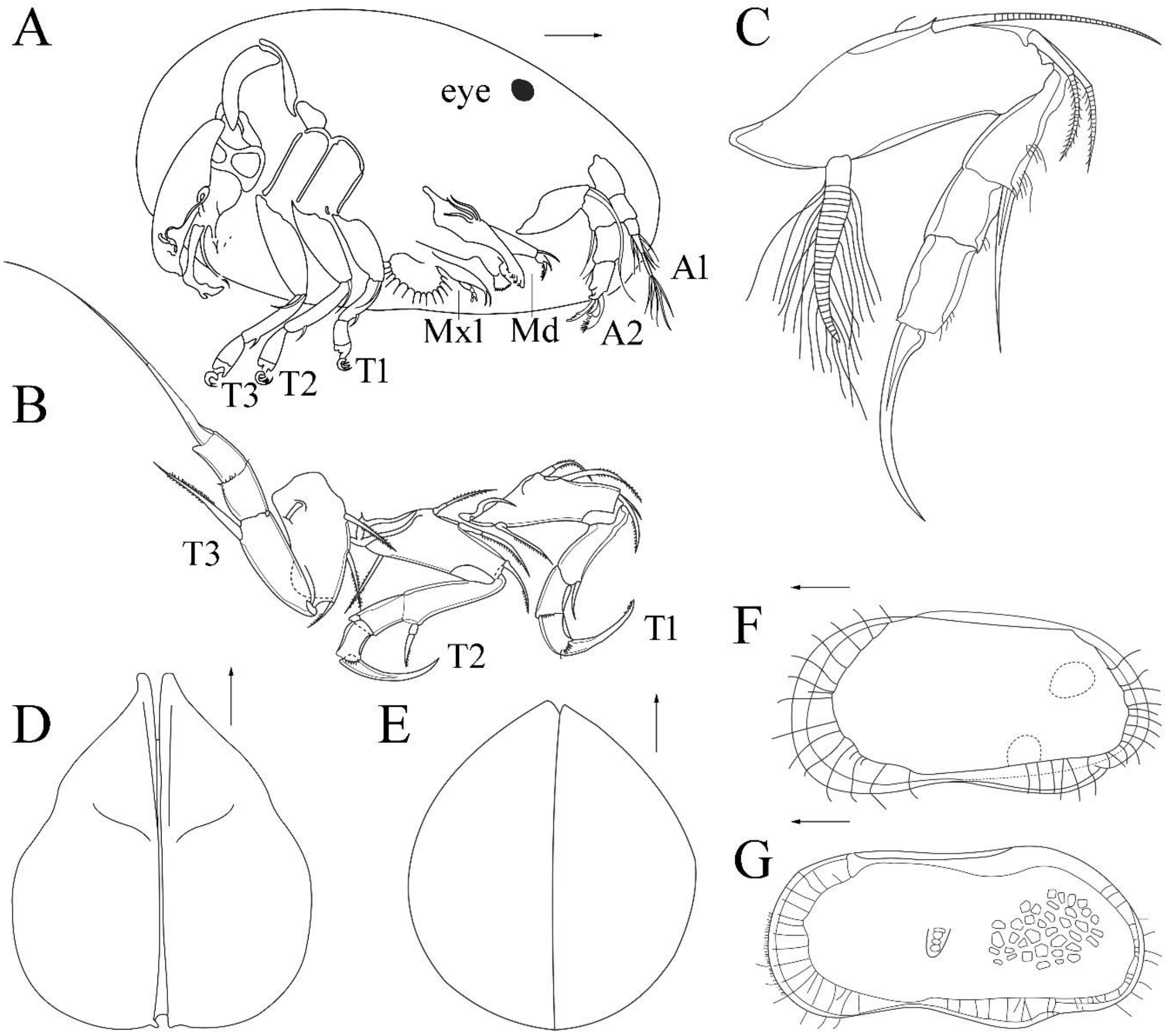


Figure 22.3

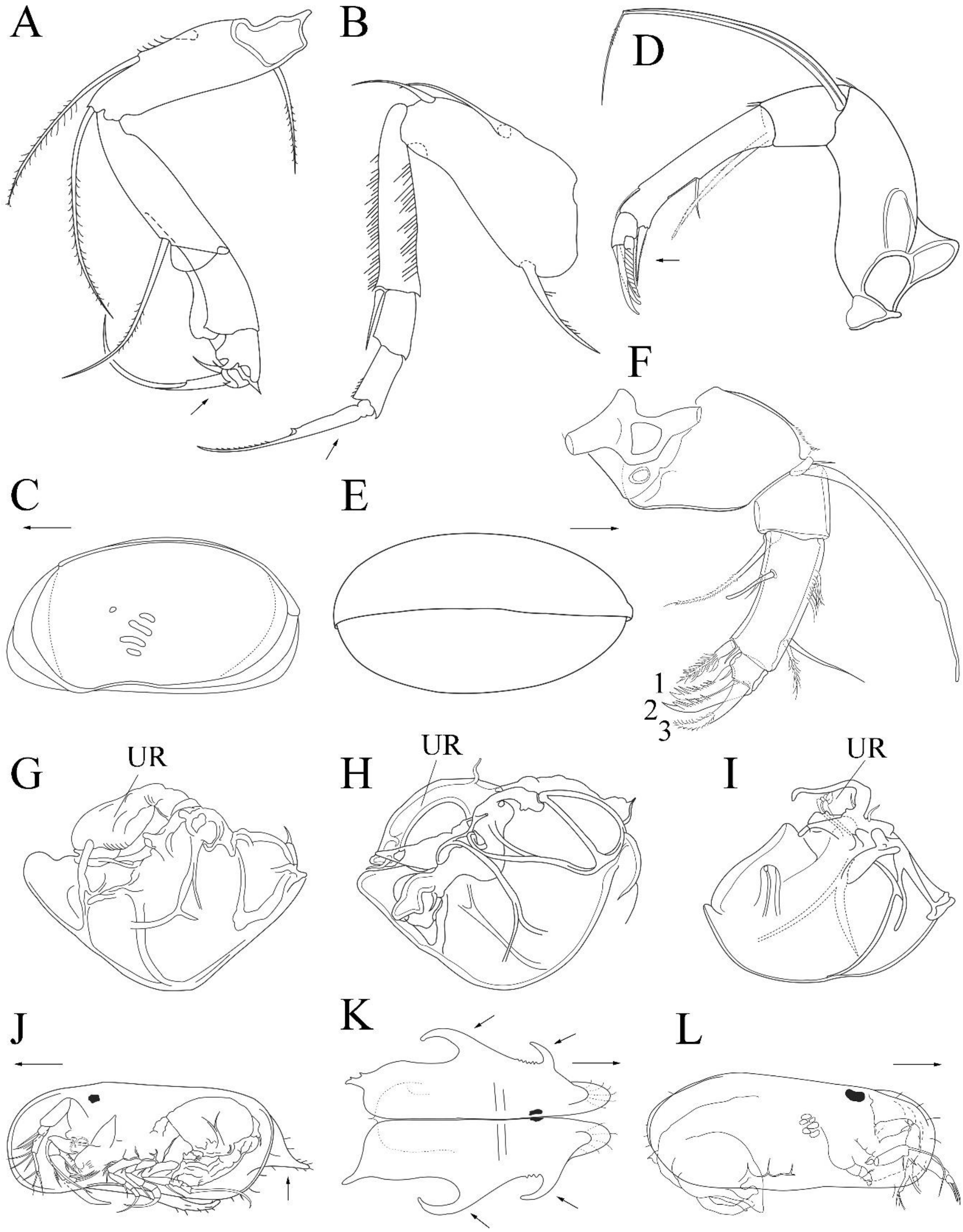


Figure 22.4

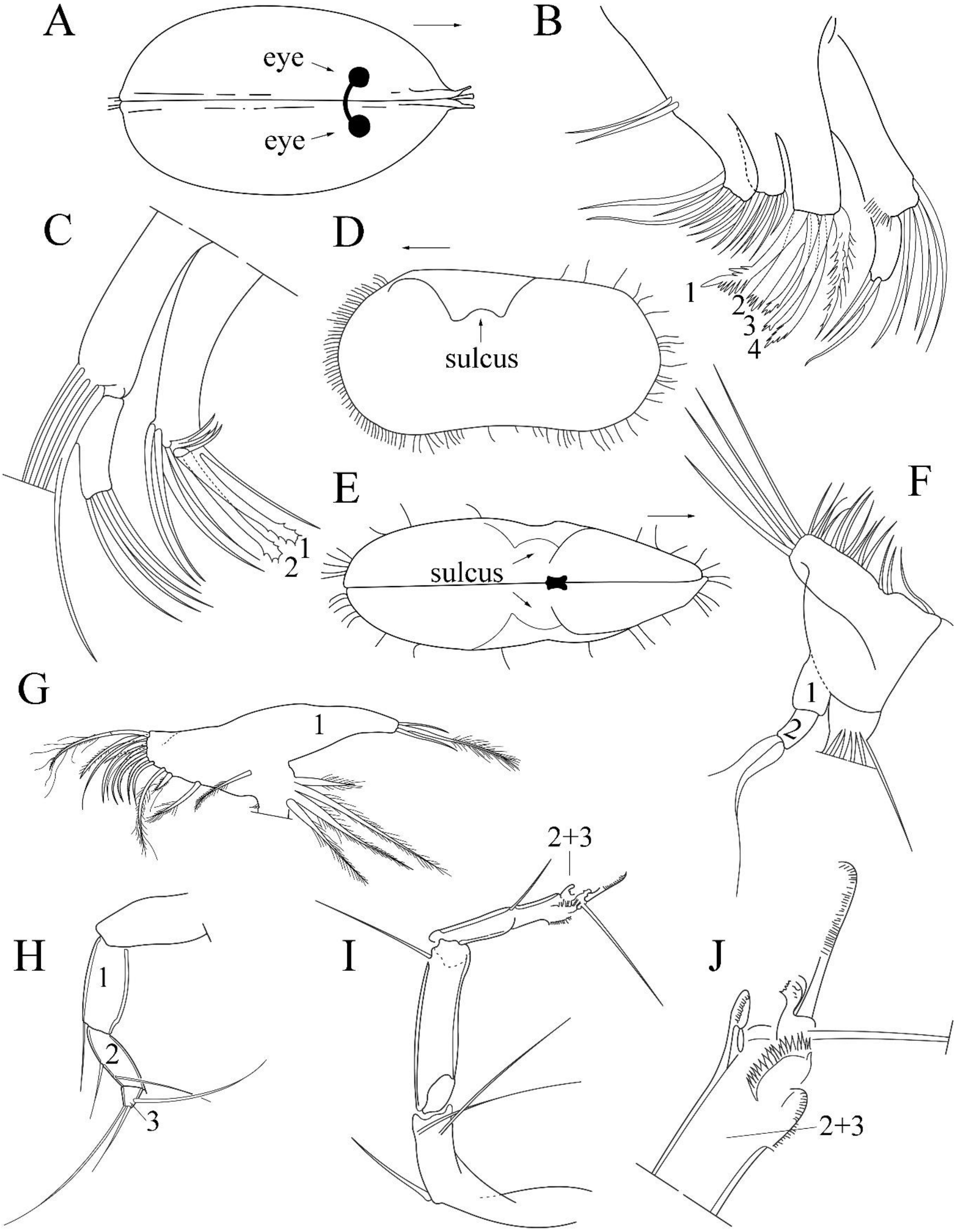


Figure 22.5

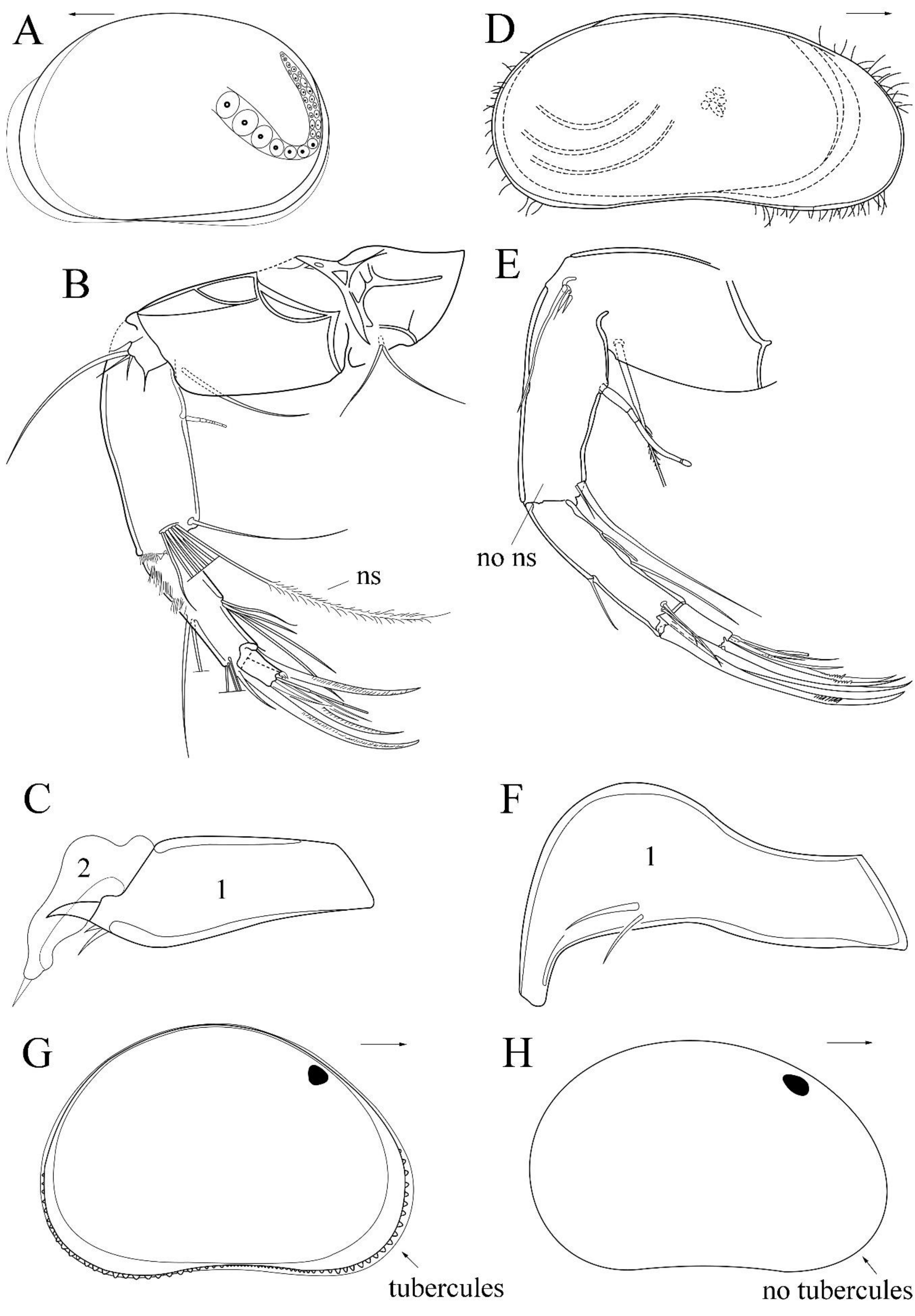


Figure 22.6

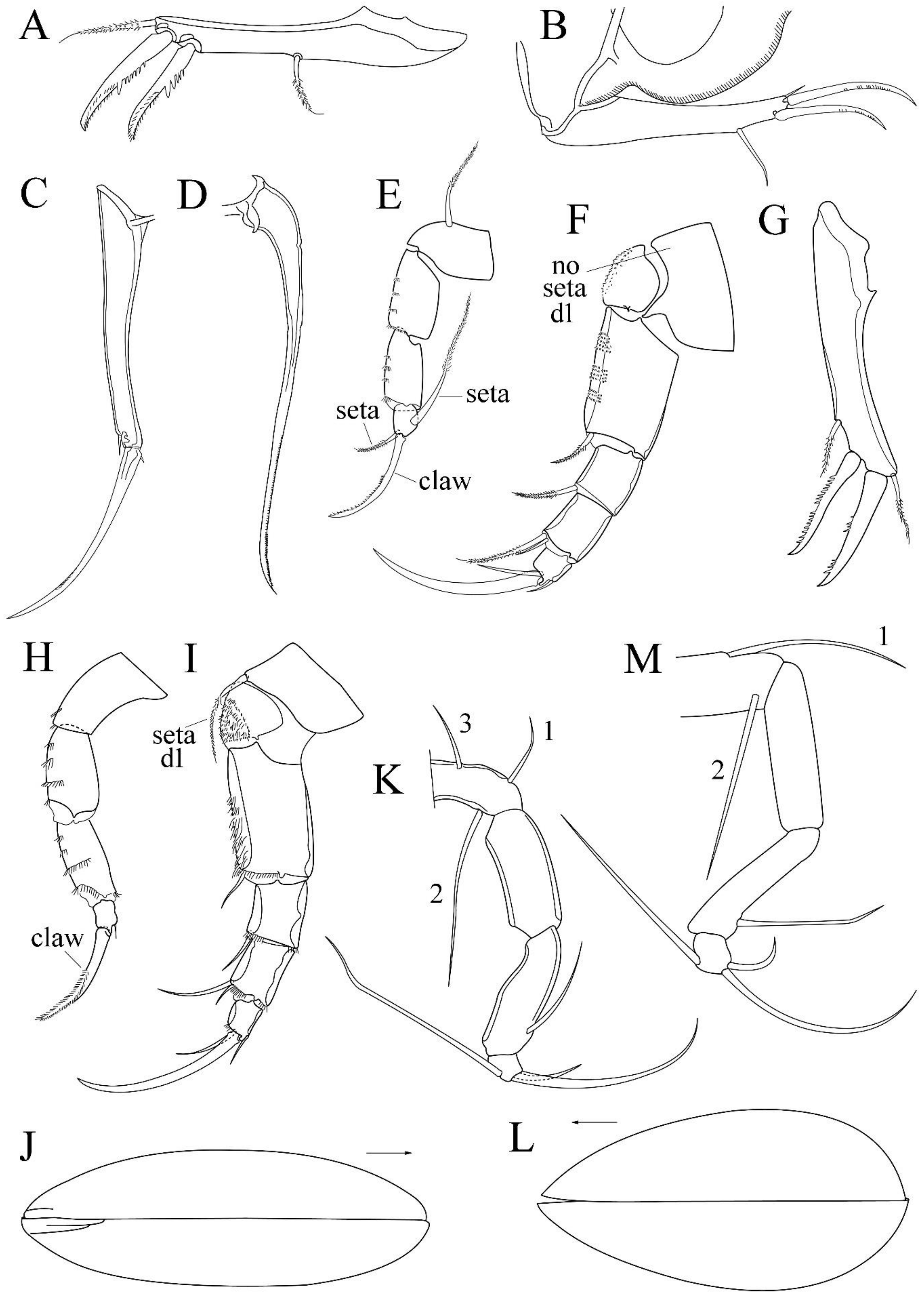


Figure 22.7

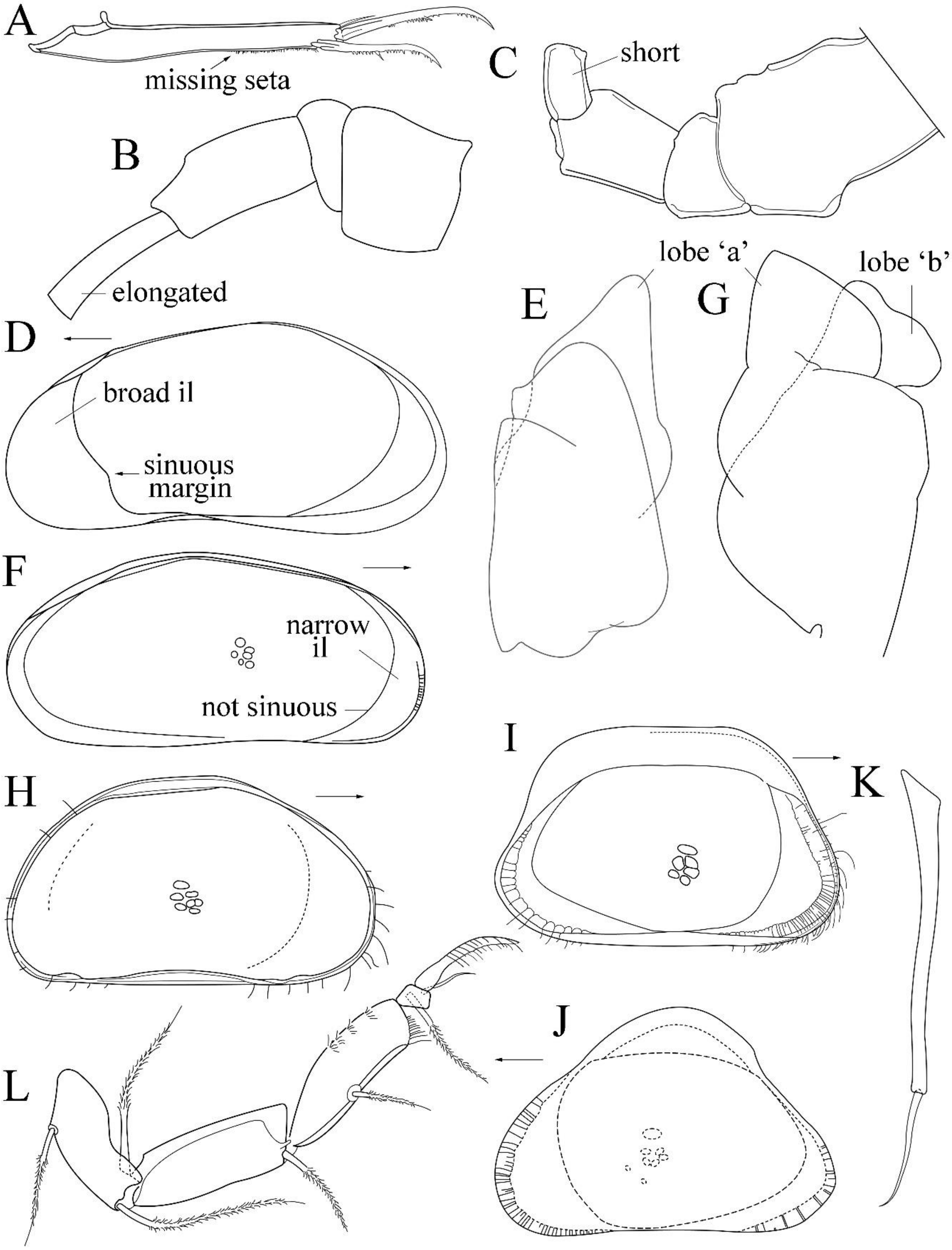

A
missing seta
B
elongated
C
short
D
broad il
sinuous
margin
E
lobe ‘a’
G
lobe ‘b’
F
narrow
il
not sinuous
H
I
K
J
L

Figure 22.8

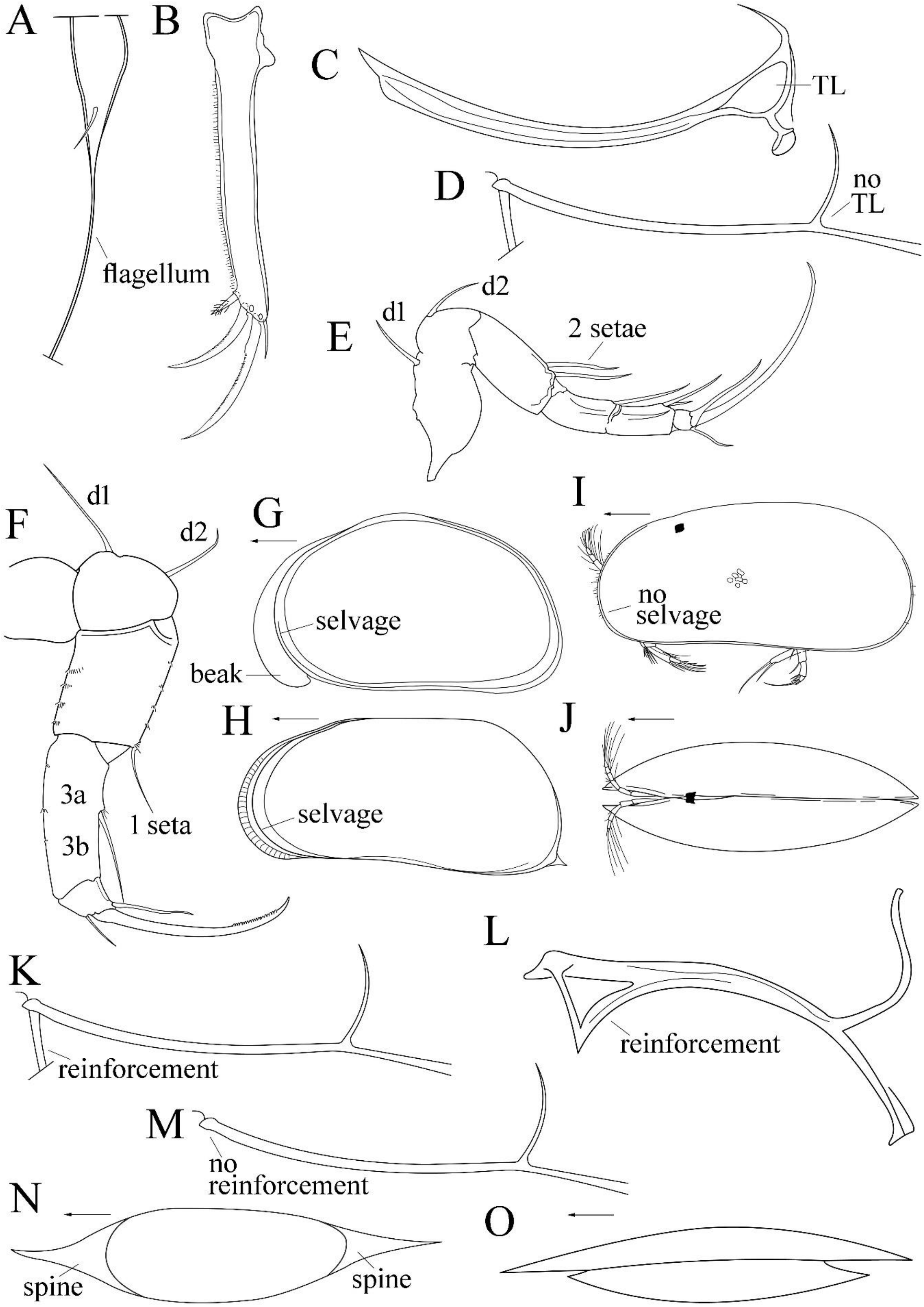

A
B
flagellum
C
TL
D
no
TL
E
d1
d2
2 setae
F
d1
d2
3a
3b
1 seta
G
selvage
beak
H
selvage
I
no
selvage
J
K
reinforcement
L
reinforcement
M
no
reinforcement
N
spine
spine
O

Figure 22.9

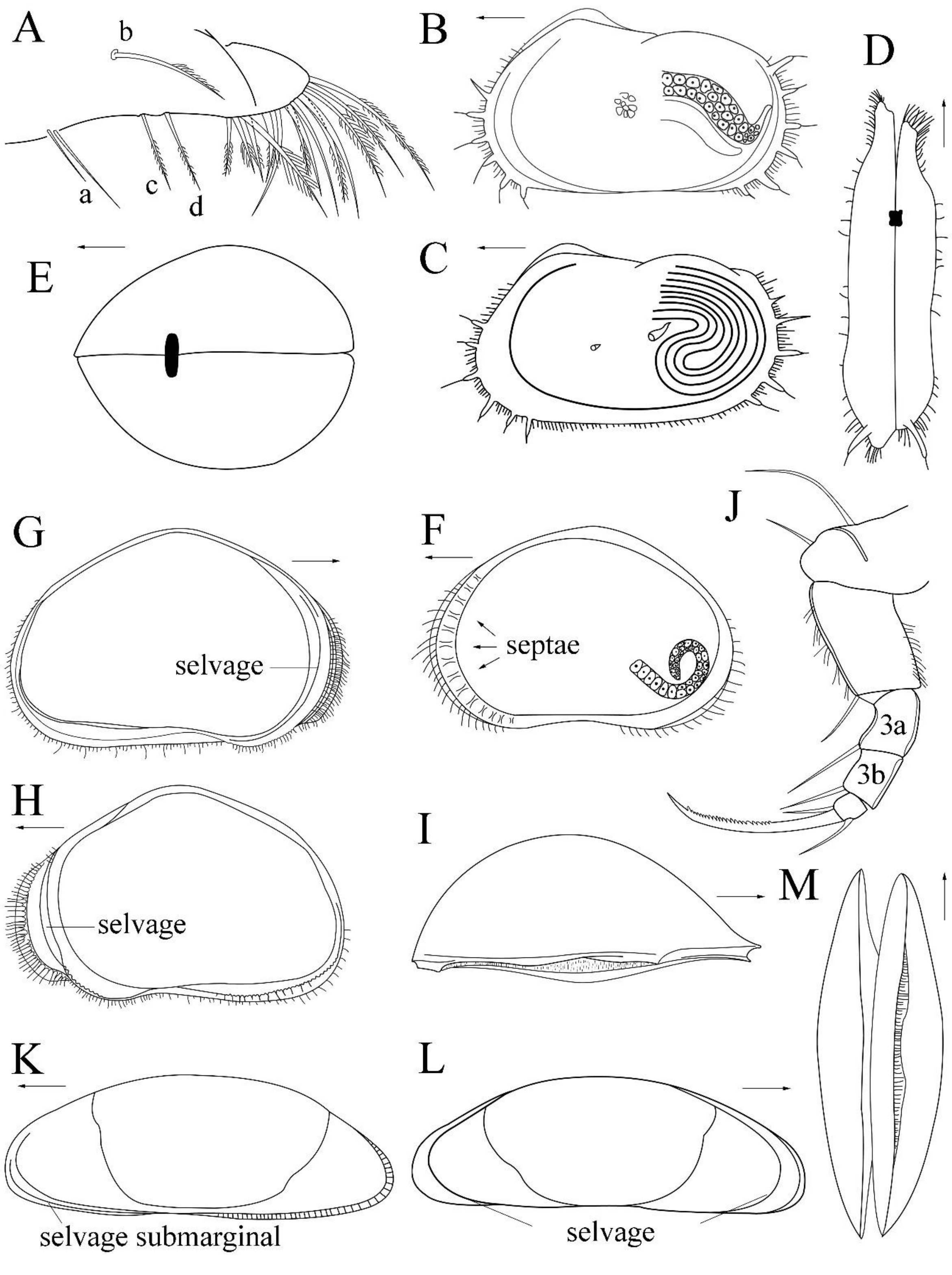

A
b
a
c
d
B
D
E
C
G
selvage
F
septae
J
3a
3b
H
selvage
I
M
K
L
selvage submarginal
selvage

Figure 22.10

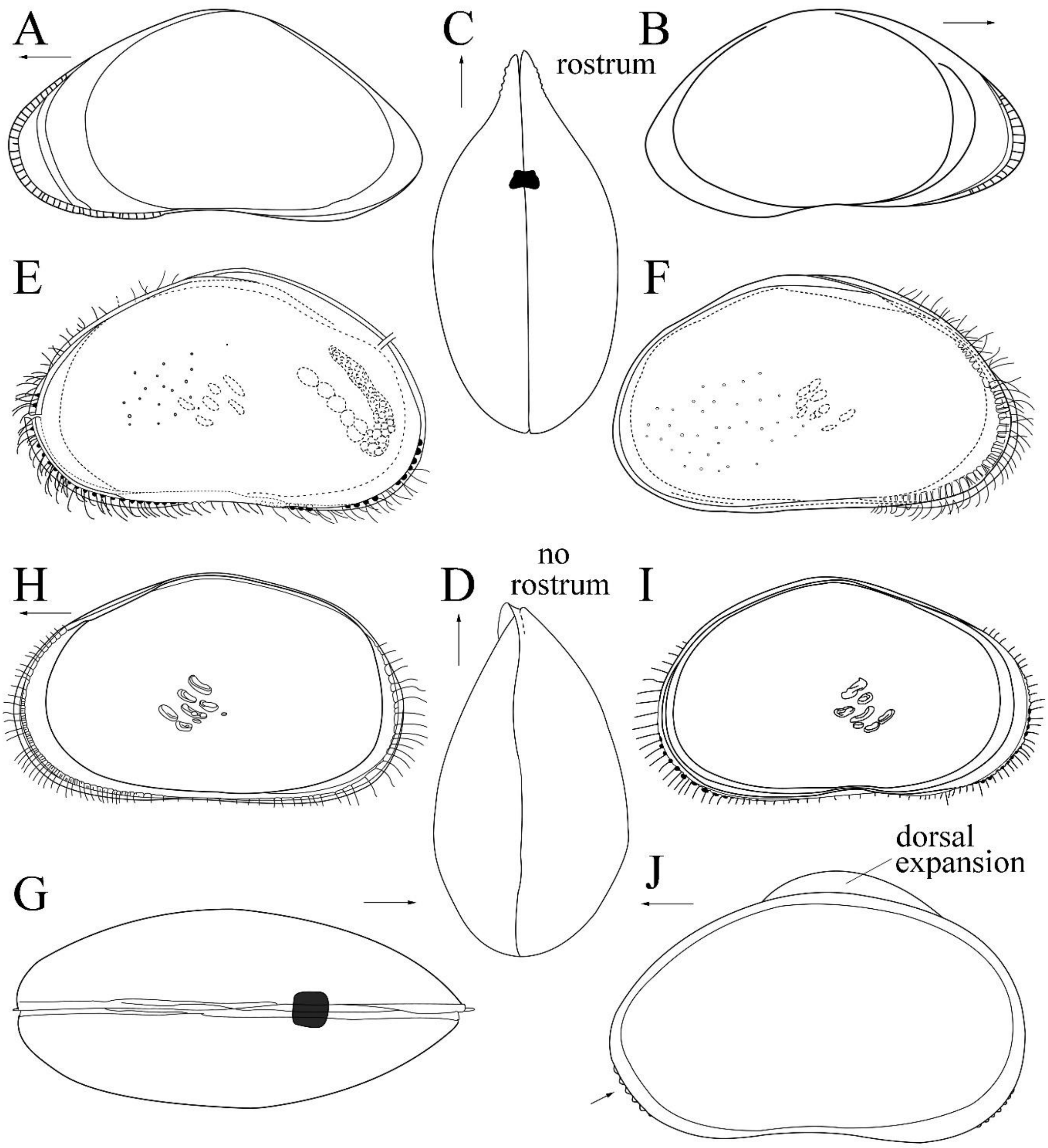


Figure 22.11

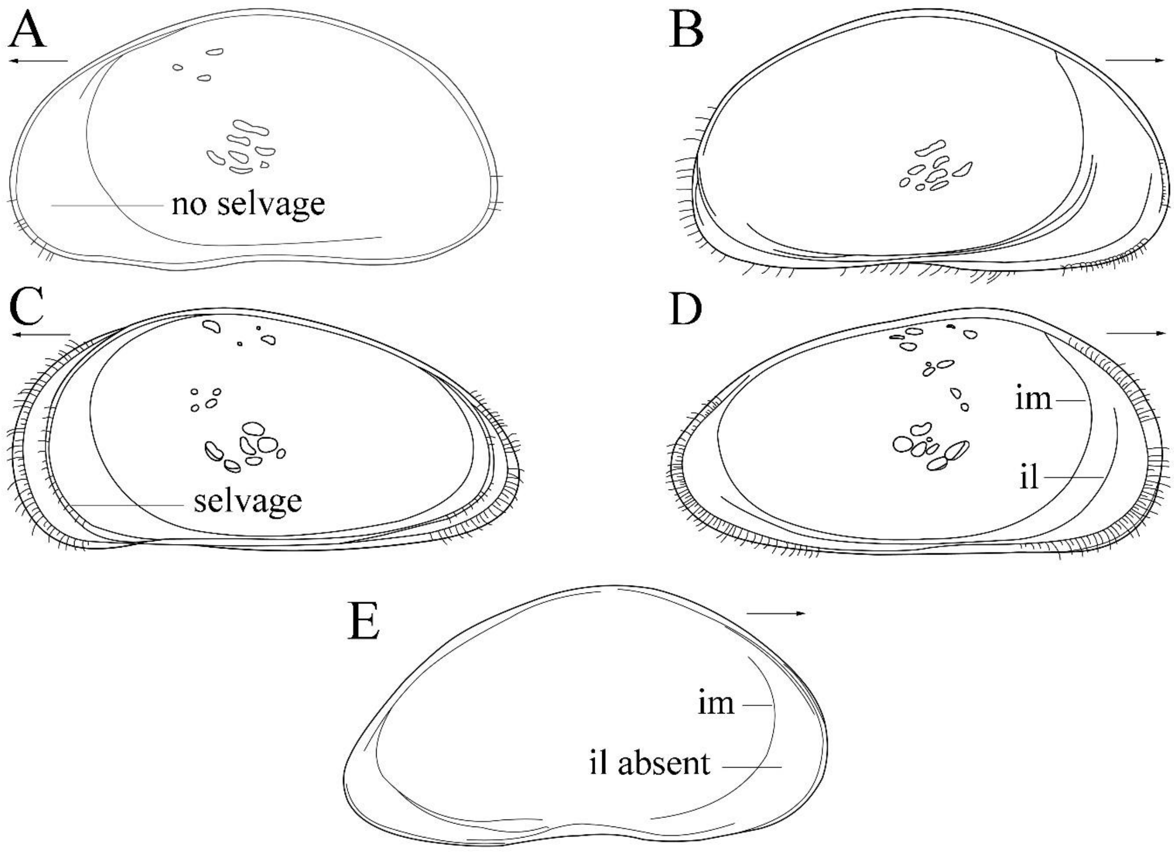


Figure 22.12

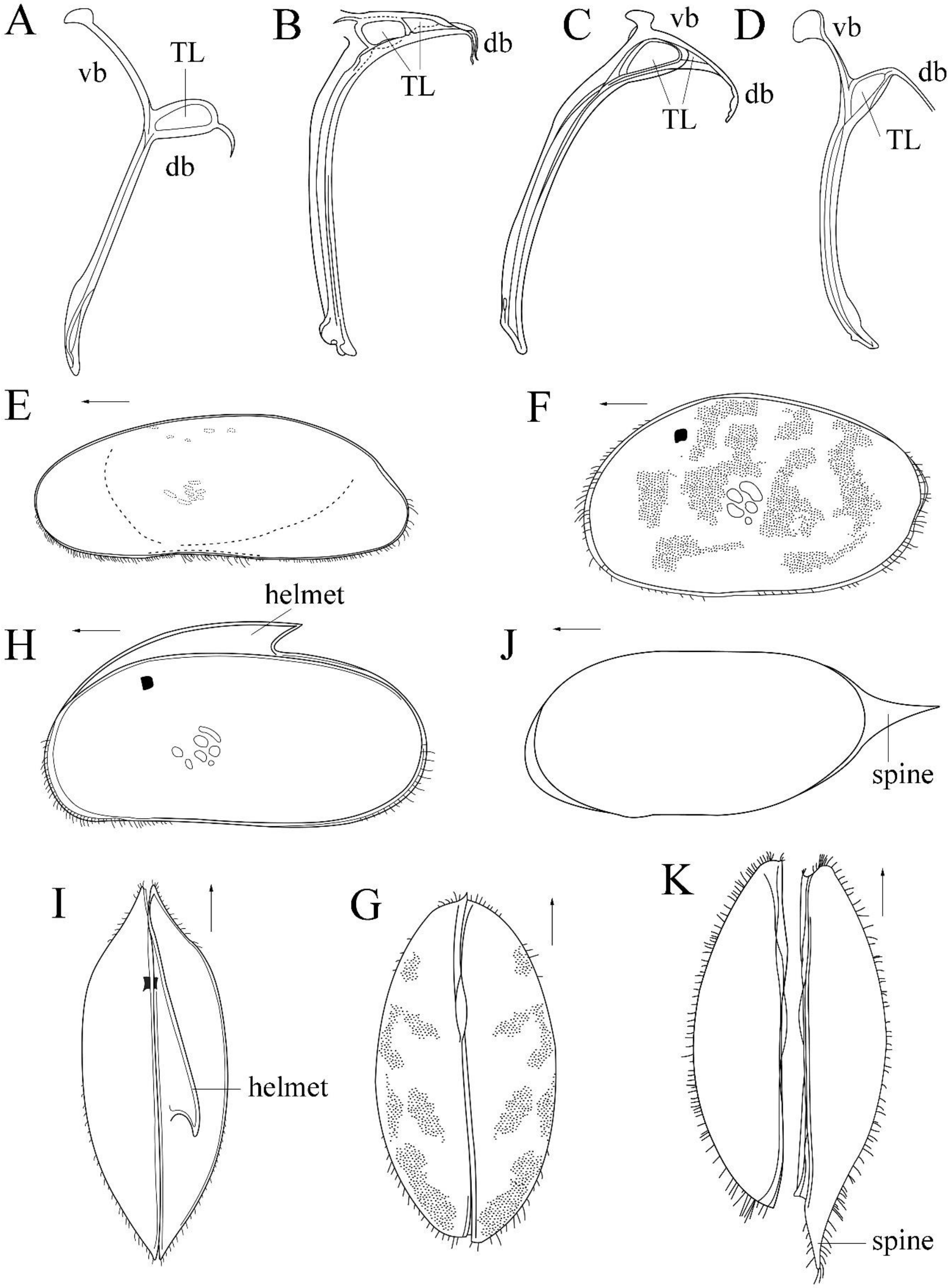

A
vb
TL
db
B
TL
db
C
vb
TL
db
D
vb
db
TL
E
F
helmet
H
J
spine
I
helmet
G
K
spine

Figure 22.13

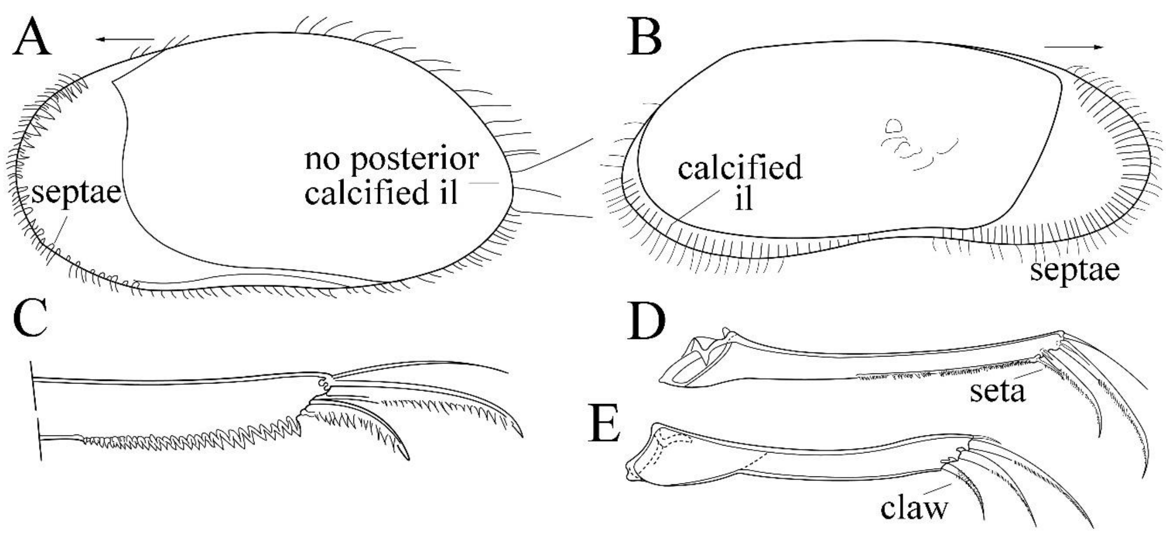

A
no posterior
calcified il
septae
B
calcified
il
septae
C
D
seta
E
claw

Figure 22.14

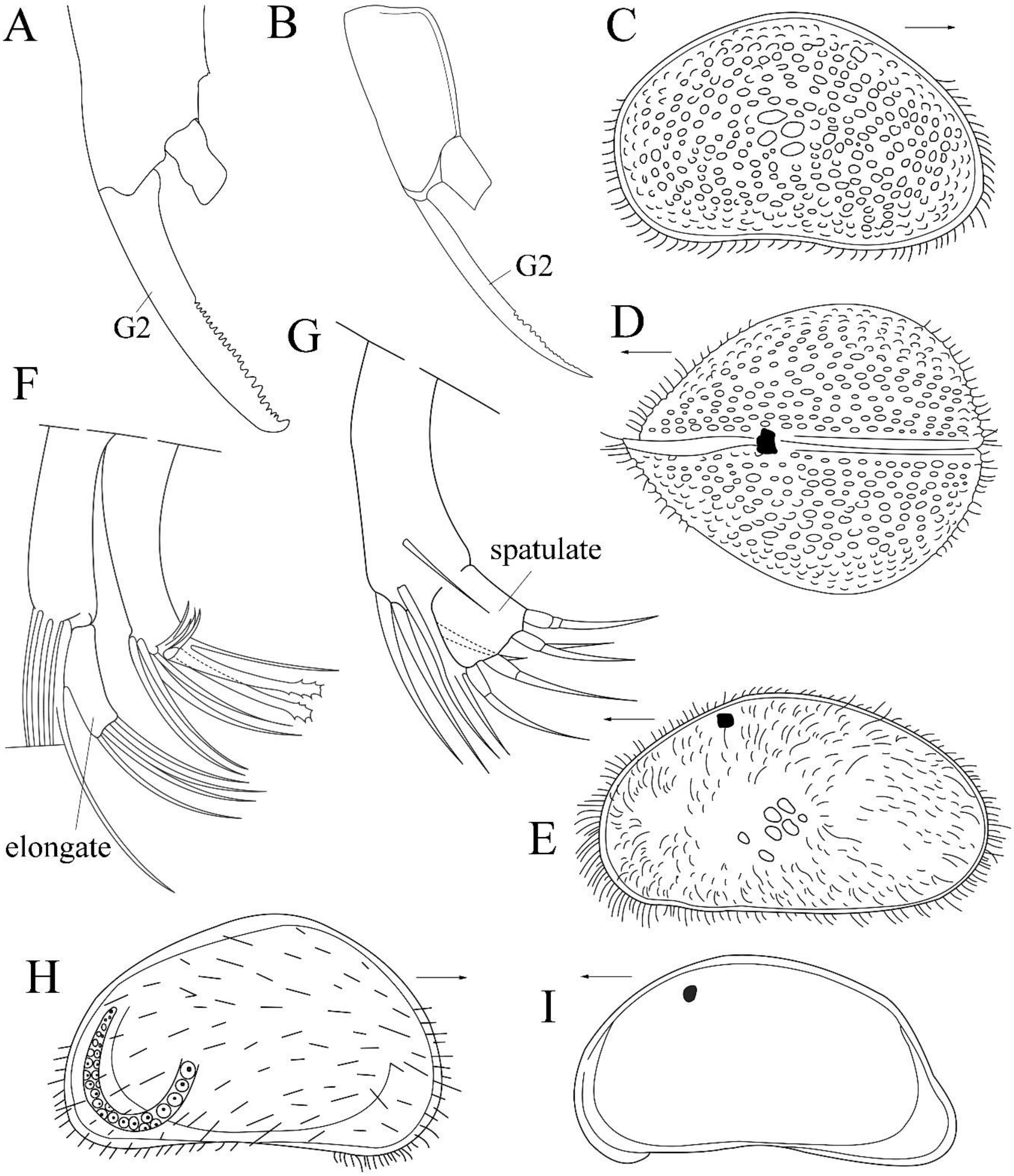
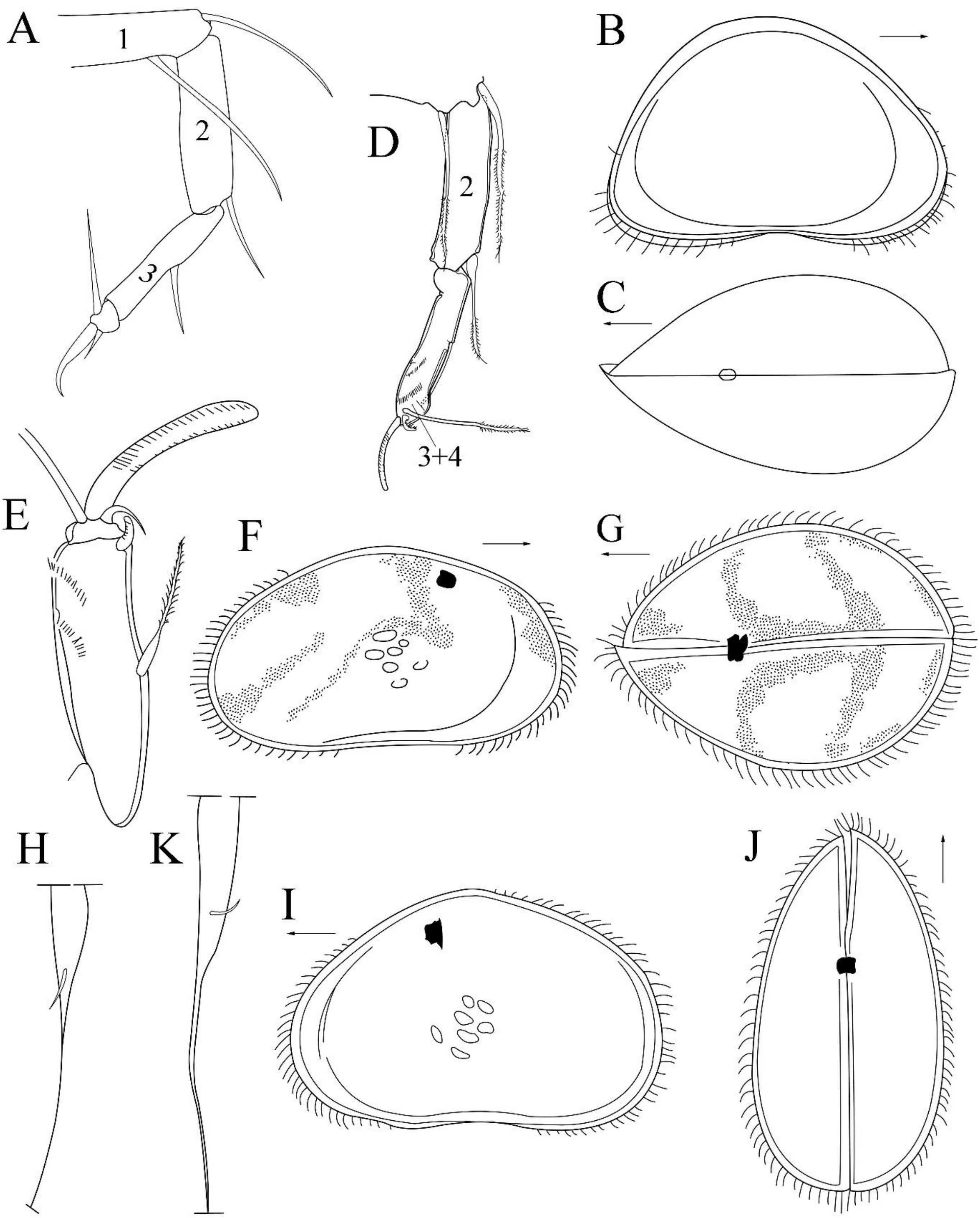


Figure 22.15



1305
1306
1307 **Figure 22.16**
1308

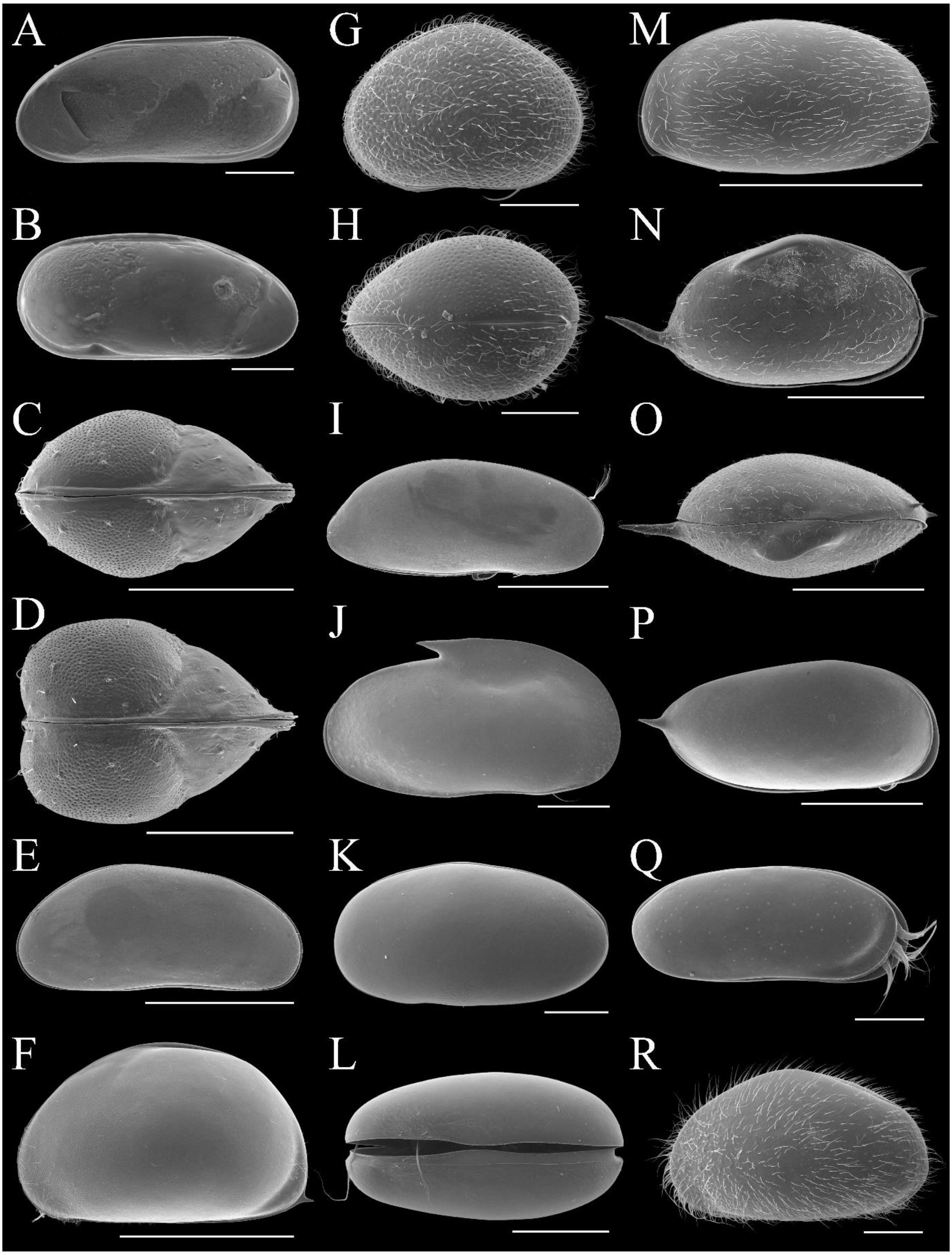


Figure 22.17