

II. Ischyrocerids

Family Ischyroceridae

The ischyrocerids, like the amphipods you will meet later, all have distinctive 3rd uropods. Both the inner and outer rami bear embedded terminal spines whose fine dentition is of value in specific determination. They are clearly corophioids based on their eyes, which are usually relatively large and range from obtusely triangular to rectangular to oval to round. They also show the same ontogenic changes in relative strength of gnathopods discussed above in isaeid; the male strongly, and the female weakly. They are tubicolous, and bear spinning glands and modified dactyls for the extrusion of amphipod silk.

We have nine genera from this family represented in the SCB; *Cerapus*, *Erichthonius*, *Ischyrocerus*, *Jassa*, *Microjassa*, *Neoischyrocerus*, *Parajassa*, *Ventojassa*, and the deep water *Bonnierella*. There is not currently a key available to separate them all. I will attempt to provide one below.

Key to the genera of Ischyroceridae in the NEP (modified from J. L. Barnard 1973) dcadien – 28 August 2004

1. U3 with 1 ramus, or with 2 rami of which 1 is vestigial.....2
U3 with 2 fully developed rami.....3
2. U2 with 1 ramus.....*Cerapus*
U2 with 2 rami.....*Erichthonius*
3. Article 2 of Per 5-7 linear; article 4 of mxpd palp clawlike and larger than article 3.....*Bonnierella*
Article 2 of Per 5-7 subovate or broadly rectangular; article 4 of mxpd palp shorter than article 3 and blunt or subconical.....4
4. Article 5 of G1 much longer than article 6.....*Ventojassa*
Article 5 of G1 as long as or shorter than article 6.....5
5. Accessory flagellum a small scale.....*Parajassa*
Accessory flagellum multisegmented and elongate.....6
6. Coxae 5 and 6 subequal in length; coxa 1 half as long as coxa 2....*Microjassa*
Coxa 5 much longer than 6; coxa 1 $\frac{3}{4}$ as long as coxa 2.....7
7. Outer ramus of U3 with basally immersed hooked terminal spine; distolateral margin of ramus with 2-4 large reverted cusps.....8
Outer ramus of U3 immersed spine, if present, never hooked; distolateral margin of ramus with 0-7+ perpendicular, small blunt denticles....*Ischyrocerus*
8. Urosomite 1 with dorsal pair of erect setae; distodorsal margin of U3 peduncle with a series of stout spines.....*Jassa*
Urosomite 1 lacking dorsal setae; distodorsal margin of U3 peduncle with a single or a pair of stout spines.....*Neoischyrocerus*

Cerapus – Animals in this genus are tubicolous, and the two species which occur in SCB waters differ in the tube they construct. Both forms have been relegated to *C. tubularis* in the past (e.g. J. L. Barnard 1962). More recent investigations (Morino 1976, Lowry & Thomas 1991) have shown that a number of undetected species lurk under the broad interpretation of Say's *C. tubularis*. With the reexamination and more detailed description of material from the first reviser (the types are lost) by Lowry & Berents 1989, who designated a neotype, the sibling species and misidentified taxa from around the world could begin to be separated. Extensive groups of species in the genus have been found in the tropics, and we have two distinctly different forms which occupy different habitats. By far the most common is *Cerapus sp A*, which is from shallow sublittoral sandy bottoms in the SCB. I have many specimens of this for you to view, and we also have vouchers in our collections. The second form, *Cerapus sp B*, is known so far from a single collection from surfgrass root sievings intertidally on Point Loma. All material of this has been forwarded to Jim Thomas in Florida, who is working on a revision of the *Cerapus* from the Americas along with Jim Lowry. I also sent quite a bit of sp A material to him. We will eventually get described species out of the pair, but the time line is uncertain and potentially long.

Cerapus sp A has (as far as I have been able to tell) unique configuration of the head, and may prove sufficiently different that it requires a new genus. The animals are antennapedic, using the robust first antennae to drag themselves and their tubes (which are not attached) around on the sandy sediments where they live. The animals concentrate, either actively or passively, around flow interruptors on the bottom (typically tubes of onuphid polychaetes such as *Diopatra*). I assume they are surface detritivores and benefit from being in the polychaete tube proximity both by being able to hold on to the tube (and avoid being washed away in the surge and/or current) as well as by the abundance of organic particles which are captured by the “sticky” water in the flow boundary just around the tube.

The special structures of the head all seem related to the antennapedism of the animal, as they are structural reinforcements to restrict cuticle flexibility and provide more rigid points for strong basal muscle attachments for antenna 1. They involve a network of anastomosing ridges surrounding the insertions of the first antennae, which are connected to a subrostral spine at their nexus. A ridge runs up to the underside of the rostrum from this spine. The spine also serves as a “lock” for the antennal bases when the animal draws the antennae within the tube and rotates them so that their expanded first articles form an operculum to close the tube. Quite an elaborate system. The genus *Bathypoma* (Lowry & Berents 1996) from bathyal depths in Tasmania also can form an operculum from the antenna 1 basal article, but differs in other respects. Operculum formation is not mentioned for other *Cerapus* related genera.

The tube of *C. sp A* is typically dark brown, and is banded with lighter brown bands (often with reddish tinges – Barnard called this the rusty tube). It is relatively short, not much longer than the animal itself. Notes on *sp. B* are mislaid, and I took them long ago (and have relinquished the specimens to others), but I remember their tubes as lighter in

color and both narrower and a bit longer than those of *C. sp A*. Unless we sample intertidally I doubt we will find any of *sp B* anyway. There are differences in the ornamentation of the urosome in *sp B*, but I can't recall the details unfortunately.

A quick look at Barnard's illustration of *Cerapus "tubularis"* in his 1962 paper will allow you to immediately recognize any *Cerapus* you might get in a sample as belonging to that genus. The short robust body combined with the strong rostrum and enlarged and almost hemispherical bases of the first antennae (which are flat on their median faces) leaves no doubt that you have a *Cerapus* (although as I mentioned, the genus may change later). If you are provided with the tubes along with the animal that is another character which helps confirm their identity.

In light of my inability to remember the details of *C. sp B* so that a sheet could be done, and the uncertainty that there are not still more undescribed forms lurking in our area, SCAMIT currently carries these animals as *Cerapus tubularis* CMPLX. This is a bit of a misnomer, since we know they are not *C. tubularis*, an Atlantic form. We should probably correct things by preparation of a detailed voucher sheet for *Cerapus sp A* and a change in Edition 5 of the SCAMIT list from CMPLX to *C. sp A*. Perhaps we can produce one together. You seem uncomfortable with the CMPLX designation, which is only a stopgap. and I suppose I am a bit too.

Erichthonius – like the last genus *Erichthonius* has a modified telson which bears a field of denticles on its posterior dorsal surface. These are fairly obscure in *Cerapus*, but are quite prominent in *Erichthonius*, looking almost like a thin velcro pad glued to the top of the telson. Although I usually identify our two *Erichthonius* species based on the antennae, eyes and gnathopods, the telson specialization is a very useful confirmatory character for the genus.

We have two described species which occur in the SCB, both broadly ranging: *E. brasiliensis* and *E. rubricornis*. Conlan (1995) treats the latter species, providing good illustrations and description and recapping the nomenclatural history in her synonymy. It is as *E. hunteri* in Barnard 1962. Lincoln (1979) also provides a good representation of this species. Our second local species is *E. brasiliensis*. While *E. rubricornis* is the offshore form we normally take in all but our shallowest samples, *E. brasiliensis* is found among fouling organisms in bays and harbors. It also shows up in shallow sublittoral samples now and then, but is not terribly frequent outside embayments. Since it can, like some other corophioids (notably *Laticorophium baconi*) form fouling encrustations on ship hulls there is always a chance that *E. brasiliensis* will show up offshore as a ship supplied contaminant. Barnard distinguished between these two with the following couplet (from his Light's Manual key):

Article 5 of male gnathopod 2 with apical tooth bifid.....*E. brasiliensis*
Article 5 of male gnathopod 2 simple.....*E. hunteri* [now = *rubricornis*]

Females can be distinguished by eye-color (*brasiliensis* bright red in life fading to pale in preservation while *rubricornis* have black eyes). Stebbing in his 1906 key also uses the

male character to separate the two species, and no one else seems to provide female characters other than eye color to separate the two. I have provided plates from Sars 1895 showing *E. hunteri* [= *E. rubricornis*] and *E. abditus* [= *E. brasiliensis* fide Stebbing 1906 p. 670], and the corresponding text descriptions for the two species.

San Diego has added a provisional species *Erichthonius sp SD1*, which I have not seen. I cannot find a voucher sheet for it, so you should contact Dean and ask him for one (we don't have one in our SCAMIT voucher file). It is apparently valid as we put it on the Ed. 4 SCAMIT list.

Ischyrocerus – The boundaries of this genus have widened and then shrunk over the years as new species were described, and later new genera were added to which those species were transferred from *Ischyrocerus*.

We have four species listed under *Ischyrocerus* from Ed. 4, *I. anguipes*, *I. pelagops*, I. sp B, and I. sp C. *Microjassa litotes*, which was listed by Barnard & Karaman (1991) as among the species assigned to the genus, was rerevised to *Microjassa* by Conlan (1995). Sars (1895) provides a plate and text description of *I. anguipes* (appended). *Ischyrocerus pelagops* was described by J. L. Barnard (1962), and sp B was characterized by J. L. Barnard 1969. *Ischyrocerus* sp C should probably be removed from the list because, although it was examined and discussed at a SCAMIT meeting, no sheet was ever produced. Many specimens provided from Northern California by Tony Chess were examined during the meeting. Carol Paquette's records are from Goleta, which extends the range into our area. The species can be distinguished from other local *Ischyrocerus* by the structure of the male G2. There are two *Ischyrocerus* species from deeper water, *I. malacus* and *I. hortator* both of J. L. Barnard 1964, which we should probably compare with the other species. Barnard has opined that *I. parvus* of Stout 1913 from Laguna is probably a form of *I. anguipes*. As there are no records of *I. parvus* anywhere after Stout, it seems that Barnard's interpretation is probably the appropriate one.

A key to the NEP species of *Ischyrocerus* might then go like this: [need to prepare after literature recovery and examination of I. sp C]

Jassa - The genus *Jassa* was monographed by Conlan (1990). The four species recorded from the Bight; *J. carltoni*, *J. myersi*, *J. slatteryi*, and *J. staudei*, can be compared with all other members of the genus using her key. *Jassa* has an elaborate ontogenetic change pattern, particularly in males. Their gnathopods undergo some extreme modification with increasing maturity. Conlan presents all this, and it is of value to internalize the process so it can be used to view development in other corophioids.

Microjassa – Even more recently monographed than *Jassa*, by Conlan 1995. She reviews the nomenclatural history as well as fully keying both males and females/juveniles for the known species worldwide. It's all there, I don't have to add anything other than that we get three species...*M. litotes*, *M. barnardi*, and *M. bousfieldi* in the SCB. *M. macrocoxa* of Shoemaker has not been reported from our area, but occurs just to the south and could show up (especially in the San Diego area) during strong

ENSO events. Conlan treats it fully, but if you wish to see the OD go to Shoemaker (1942)

Neoschyrocerus – This genus was described in the same paper in which Conlan (1995) monographed *Microjassa*. It was carved out of the *Ischyrocerus/Microjassa* block and contains only one species which occurs in the SCB, *Neoschyrocerus claustris*. Barnard described this in 1969 as *Microjassa*, where it remained until transferred to *Neoschyrocerus* by Conlan.

Parajassa – There is a single species in this genus in the SCB, *P. angularis*. It is a shallow water algal associate that may turn up at some point. It is not uncommon in the SCB, but we don't sample the habitat. It is well described and figured in Barnard 1962.

Ventojassa – Another monotypic genus in our area. The type was originally described as *Eurystheus ventosa* by Barnard 1962. He later created the genus *Ventojassa* for it (Barnard 1970). This is an intertidal species associated with sponges and algae, and we will probably not ever see it.

Bonnierella – If we continue with slope sampling we will probably see *Bonnierella*. I have abundant material from Oregon so that at least one of the species which occur in the NEP can be evaluated. *Bonnierella linearis californica* [retained at subspecies level in Barnard and Karaman 1991] was described by Barnard (1966a) from the Tanner Basin off the SCB. An apparently different species (based on male gnathopod configuration) is found off Oregon. Barnard gave a key to the genus in his 1967 paper.