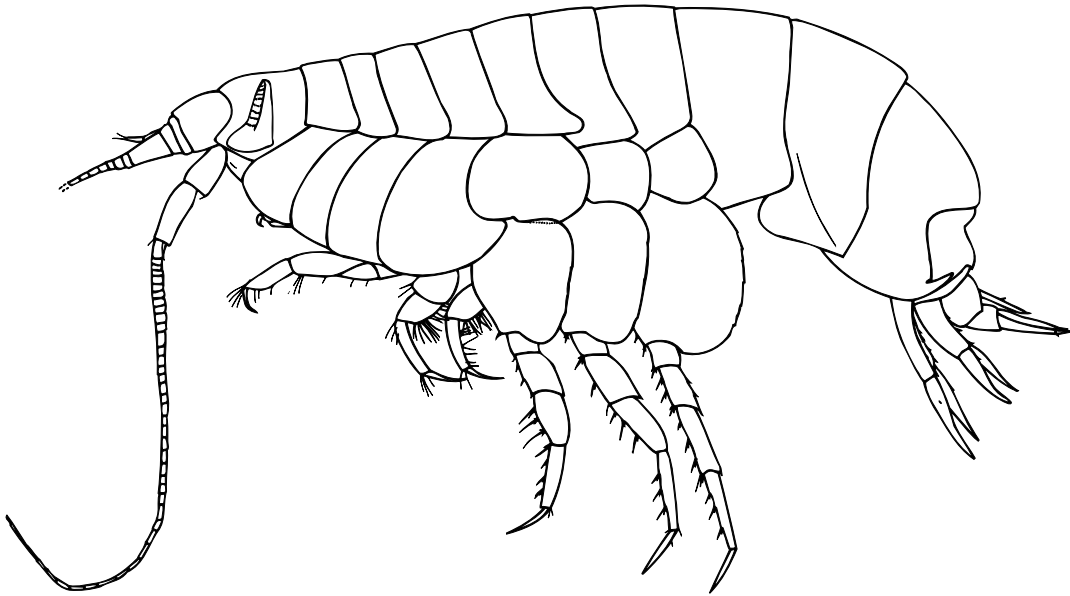


AN ILLUSTRATED IDENTIFICATION GUIDE TO THE NEARSHORE MARINE AND ESTUARINE GAMMARIDEAN AMPHIPODA OF FLORIDA

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VOLUME 4
FAMILIES ANAMIXIDAE, EUSIRIDAE, HYALELLIDAE, HYALIDAE,
IPHIMEDIIDAE, ISCHYROCERIDAE, LYSIANASSIDAE,
MEGALUROPIDAE AND MELPHIDIPPIDAE

Cover illustration: *Hippomedon pensicola* Lowry and Stoddart, 1997
(reproduced from Lowry and Stoddart, 1997)

**State of Florida
Department of Environmental Protection
Tallahassee**

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**An Illustrated Identification Guide to the Nearshore Marine and Estuarine
Gammaridean Amphipoda of Florida**

Volume 4

**Families Anamixidae, Eusiridae, Hyaletellidae, Hyalidae, Iphimediidae, Ischyroceridae,
Lysianassidae, Megaluropidae and Melphidippidae**

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Family Anamixidae Stebbing, 1897

Regional diagnosis: Antennae 1-2 of terminal (anamorph) male extending ventrally from head; antenna 1, peduncle elongate, slender, flagellum longer than peduncle article 3, accessory flagellum minute or absent; head not elongate, not forming cylindrical “snout”, ventral keel present; eyes small, round; mandible without molar, palp 1-articulate; maxilliped, inner and outer plates absent or greatly reduced; body laterally compressed, segments not carinate or laterally expanded, without dorsal processes; coxae not splayed; coxa 1 reduced, subquadrate or subtriangular, much shorter than and mostly hidden by coxa 2; gnathopod 1 carpocheate, with 6-7 articles, ischium not elongate, less than twice as long as wide, carpus and propodus of terminal male with long terminal seta; gnathopod 2 of terminal male greatly enlarged, carpocheate, ischium elongate, at least twice as wide as long; gnathopod 2 of subterminal (leucomorph) male and female not very slender, subchelate, ischium not elongate, less than twice as long as wide, propodus subtriangular, palm straight; peraeopod 5, basis expanded, not linear; urosome segments 1-3 separate, segment 1 not elongate, less than twice length of segments 2 and 3 combined, without dorsal crest; uropod 3 biramous, peduncle elongate, extending almost as far as tips of rami of uropod 2, both rami 1-articulate, outer ramus slightly shorter than inner, inner ramus not scale-like; telson entire.

Florida genera: *Anamixis*

Remarks: Although the family Anamixidae is currently considered to be synonymous with the Leucothoidae (Lowry et al., 2000; Lowry and Stoddart, 2003), this was not the case when Volume 1 of this guide (LeCroy, 2000), which contains the key to families, was produced. As a consequence, they were treated separately in that family key and for reasons of internal consistency, are treated separately herein. However, it should be remembered that *Anamixis* and the other “anamixid” genera (none of which occur in Florida) are now placed in the Leucothoidae.

Genus *Anamixis* Stebbing, 1897

Regional diagnosis: That of the family.

Florida species: *A. cavatura*, *A. vanga*

Remarks: Males of *Anamixis* species occur in two morphs, the terminal anamorph (“anamixis morph”) males and the subterminal leucomorph (“leucothoides morph”) males, which are similar to the females. Prior to the work of Thomas and Barnard (1983), anamorphs and leucomorphs were thought to belong to separate genera in different families, the anamorphs to *Anamixis* (Anamixidae) and the leucomorphs to *Leucothoides* (Leucothoidae). However, Thomas and Barnard (1983) observed what they thought were adult males of *Leucothoides pottsi* Shoemaker, 1933, transform into males of “*Anamixis hanseni* Stebbing, 1897” (later determined to be *A. cavatura* Thomas, 1997) in one molt. This discovery led to the realization that males and females of species belonging to the genus *Leucothoides* were actually subterminal males and females of various *Anamixis* species, for which the females were then unknown. It further led to the determination that the Leucothoidae and the Anamixidae should be synonymized.

KEY TO FLORIDA SPECIES OF *ANAMIXIS*

1. < Anamorph male: lateral margins of head convex, anterior margin defined by notch or small tooth (especially in large males) ventral keel deep, subtriangular, tip acute; gnathopod 2, basis with acute subdistal process on anteromedial margin, propodus, palm with 5 teeth (proximal pair small); peraeopods 5-7, basis, posterior margin without setae. Leucomorph male and female: head, ocular lobe subacute, ventral keel subrectangular; gnathopod 1, carpus, inner margin finely serrate, without larger serrations, largest terminal spine with minutely bifid tip; gnathopod 2 of male, palm nearly transverse *Anamixis cavatura*

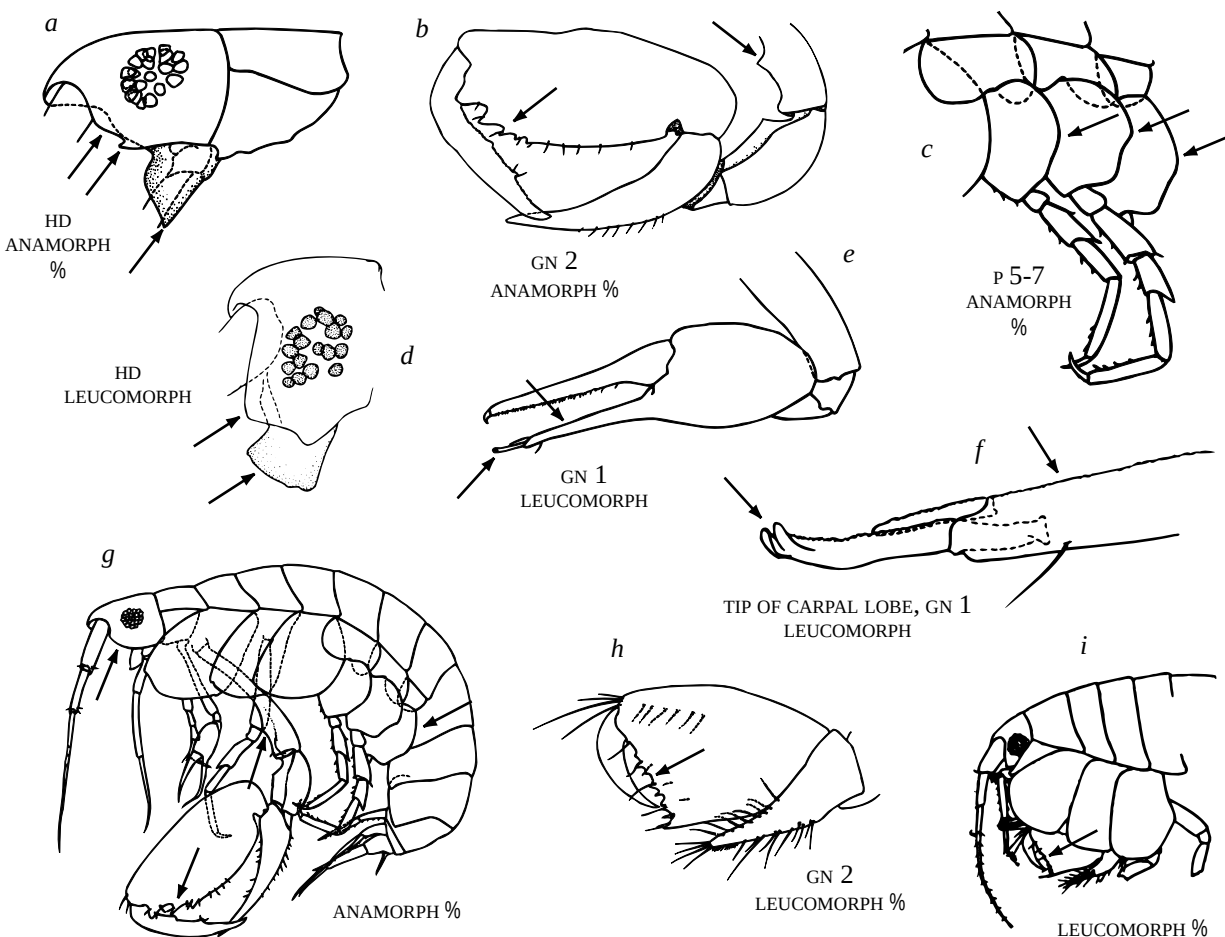


Figure 447.

< Anamorph male: lateral margins of head concave, anterior margin without small tooth or notch, ventral keel shallow, subrectangular, tip truncate; gnathopod 2, basis without acute subdistal process on anteromedial margin, propodus, palm with 3 teeth; pereaeopods 5-7, basis, posterior margin lined with small setae. Leucomorph male and female: head, ocular lobe rounded, ventral keel subtriangular; gnathopod 1, carpus, inner margin finely serrate, with 9-12 larger serrations, largest terminal spine with rounded, flattened tip; gnathopod 2 of male, palm oblique*Anamixis vanga*

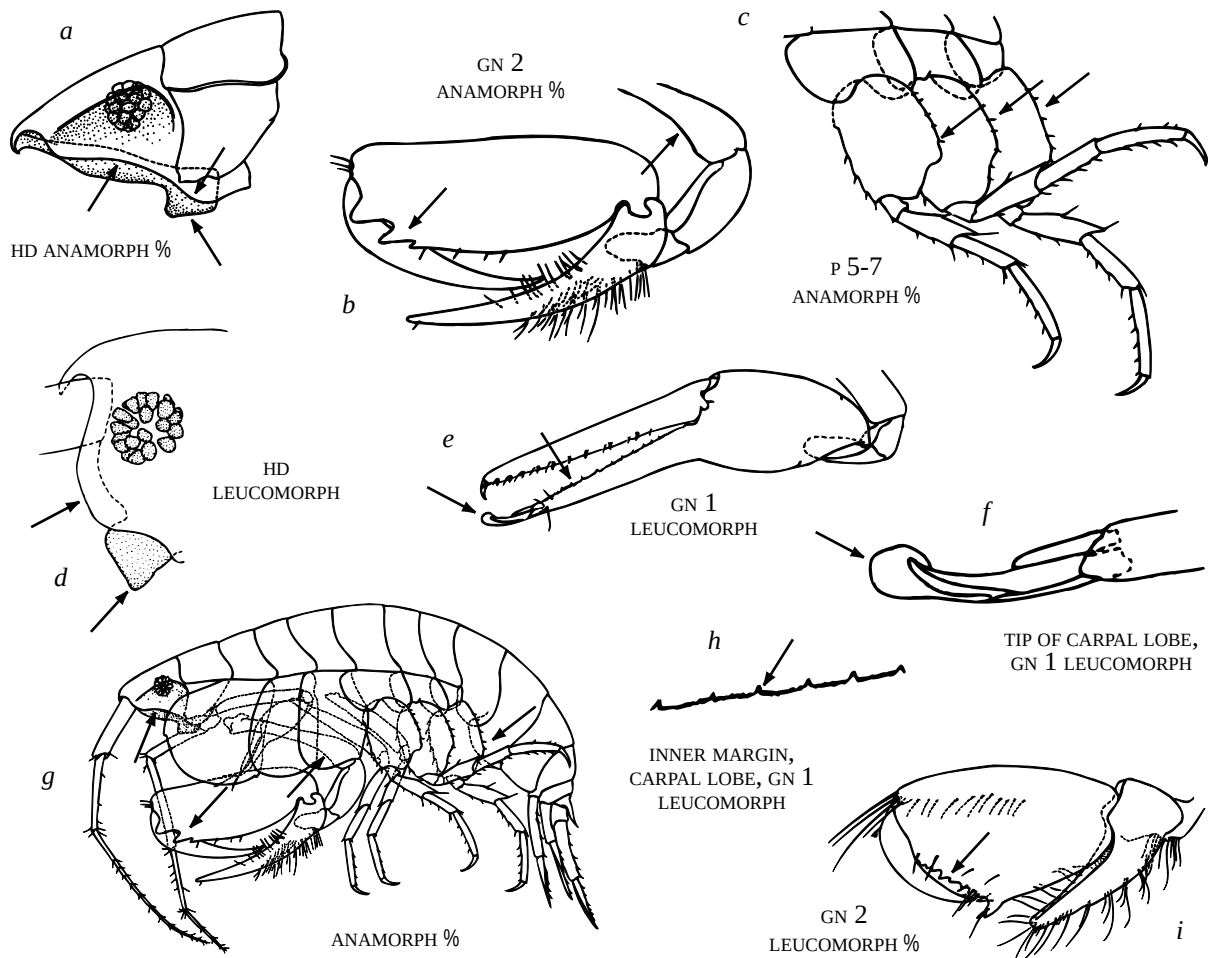


Figure 448.

***Anamixis cavatura* Thomas, 1997**
(Figure 447)

?*Leucothoides pottsi* Shoemaker, 1933a, pp. 249-250, fig. 3.

Anamixis hansenii: Thomas, 1979, pp. 107-109; Thomas and Taylor, 1981, pp. 462-467, figs. 1-5; Thomas and Barnard, 1983, pp. 154-157 (not *A. hansenii* Stebbing, 1897).

Anamixis cavatura Thomas, 1997, pp. 47-50, figs. 3-4.

Regional diagnosis: Anamorph male: lateral margins of head convex, anterior margin defined by notch or small tooth, ventral keel deep, subtriangular, tip acute; gnathopod 2, basis with acute subdistal process on anteromedial margin, propodus, palm with 5 teeth (proximal pair small); peraeopods 5-7, basis, posterior margin without setae. Leucomorph male and female: head, ocular lobe subacute, ventral keel subrectangular; gnathopod 1, carpus, inner margin finely serrate, without larger serrations, largest terminal spine with minutely bifid tip; gnathopod 2 of male, palm transverse.

Distribution: Fort Pierce to Tampa, Florida, including the Florida Keys and Dry Tortugas; Bahamas; Yucatan, Mexico; Belize; Honduras; Jamaica; Greater and Lesser Antilles (Shoemaker, 1933a; Thomas, 1997).

Ecology: This species resides inside small asconoid sponges and colonial tunicates, especially *Ecteinascidia turbinata* Herdman, 1880, occurring at depths of 1-5 m (Thomas, 1979, 1997). They are filter feeders, taking advantage of the feeding currents generated by the host to move water over setal tufts on the second gnathopods, trapping particulate matter. This trapped material is then removed from the setae by the antennae and maxillipedal palps and pushed into the mouth (Thomas and Taylor, 1981, as *A. hansenii*).

Remarks: Anamorphs of *A. cavatura* are strikingly colored in life, with distinct dorsal and lateral bands of bright reddish-pink and a wash of the same color on coxae 2-4. The eyes are bright red and the second gnathopods are white. Leucomorphs and females are transparent, with a brownish internal mass of gonadal tissue and deep green eggs in the female (Thomas, 1997). Adults of this species range from 2-5 mm in length.

There is a great deal of developmental variability in the morphology of gnathopod 2 in males, even after the molt to the anamorph stage has occurred. In very small anamorphs, the 2 proximal teeth on the palm may be absent or very tiny and there may be only 1 tooth (or 1 small and 1 large tooth) on the posterior margin of the dactyl instead of the 2 large teeth normally present in larger specimens. In addition, the propodus itself may be more slender in small individuals.

Anamixis cavatura is very similar to its sympatric congener, *A. vanga*. The two species can be most readily separated using head characters; in *A. cavatura* the head of the anamorph male has a rounded lateral margin with the anterior margin defined by a small tooth or notch (more evident in large males) and the ventral keel is deep, subtriangular and acute distally. *Anamixis vanga* anamorphs have the lateral margin of the head excavate, without either tooth or notch, and the ventral keel is shallow, subrectangular and truncate distally. The leucomorph male and the female of *A. cavatura* have a subacute ocular lobe and subrectangular ventral keel, whereas the *A. vanga* leucomorph male and female have a rounded ocular lobe and a subtriangular ventral keel.

Although Thomas (1997, p. 30, Taxonomy section) indicates that *Leucothoides pottsi* Shoemaker, 1933 is synonymous with *Anamixis cavatura*, the illustration of gnathopod 1 in Shoemaker (1933a) more closely resembles that of *A. vanga* in the presence of larger serrations on the inner margin of the carpus. However, other characters, such as the transverse palm of gnathopod 2 and the shape of the ocular lobe, are more similar to those of *A. cavatura* and it is tentatively included in the synonymy for this species, pending a reexamination of Shoemaker's material.

See Shoemaker, 1933a (as *Leucothoides pottsi*); Thomas, 1979 (as *Leucothoides pottsi*); Thomas and Taylor, 1981 (as *Anamixis hansenii*); Thomas, 1997.

***Anamixis vanga* Thomas, 1997**
(Figure 448)

Anamixis vanga Thomas, 1997, pp. 70-73, figs. 17-18.

Regional diagnosis: Anamorph male: lateral margins of head concave, anterior margin without small tooth or notch, ventral keel shallow, subrectangular, tip truncate; gnathopod 2, basis without acute subdistal process on anteromedial margin, propodus, palm with 3 teeth; peraeopods 5-7, basis, posterior margin lined with small setae. Leucomorph male and female: head, ocular lobe rounded, ventral keel subtriangular; gnathopod 1, carpus, inner margin finely serrate, with 9-12 larger serrations, largest terminal spine with rounded, flattened tip; gnathopod 2 of male, palm oblique.

Distribution: Georgia to the Florida Keys; Belize (Thomas, 1997).

Ecology: *Anamixis vanga* is associated with large, solitary tunicates, especially *Ascidia interrupta* Heller, 1878, and is also found in small asconoid sponges occurring on coral reefs or in other hard bottom areas (Thomas, 1997). It has been found at depths of 2-20 m (Thomas, 1997).

Remarks: The color of live *A. vanga* apomorphs is translucent pink, without any additional color or banding pattern. Leucomorphs are transparent, with easily visible internal organs (Thomas, 1997). Adult size ranges from 2.5 to 5 mm; females and leucomorph males are generally smaller than anamorph males, but there is some overlap. See Remarks section for *A. cavatura* for a comparison of these two species.

See Thomas, 1997.

Family Eusiridae Stebbing, 1888

Regional diagnosis: Antenna 1 subequal to or slightly shorter than antenna 2, accessory flagellum reduced or absent, 0-2 articles in length; antenna 2, peduncle calceolate in male; rostrum short, not reaching distal margin of antenna 1, peduncle article 1; eye present, well-developed; maxilliped, palp 4-articulate, article 4 well-developed; coxae 1-2 not reduced, subequal to following coxae in length, coxa 4 slightly excavate posteriorly; gnathopod 1 well-developed, subchelate, with 7 articles; gnathopod 2 not strongly sexually dimorphic, similar to or slightly larger than gnathopod 1 in both sexes, article 3 not elongate, less than twice as long as wide; peraeopods 5-7, basis broadly expanded; peraeopod 7 subequal to or slightly longer than peraeopod 6; urosome segments 1-3 separate, segment 1 not elongate, at least as deep as long; uropod 1, outer ramus distinctly shorter than inner; uropod 3 biramous; telson cleft, tips of lobes entire, not notched.

Florida genera: *Eusiroides*, *Nasageneia*, *Tethygeneia*

Remarks: Regional species assigned to the genera *Pontogeneia*, *Tethygeneia* and *Nasageneia* are very similar and their taxonomy needs to be clarified. As pointed out by Ledoyer (1986), virtually the only difference between *Nasageneia yucatanensis* Ledoyer, 1986 from Mexico and *Tethygeneia longleyi* from Florida is the posteriorly serrate epimeron 3 of the former species. However, in Florida material of *T. longleyi*, even this character is somewhat variable, with minute serrations occurring on some specimens. The degree of serration can, in fact, vary between the left and right third epimera on the same specimen. Additionally, one of the main diagnostic characters separating species of *Pontogeneia* from those of *Tethygeneia* is the presence of a posteriorly lobate carpus on gnathopod 2 of *Tethygeneia* species. However, *P. bartschi* Shoemaker, 1948 from Cuba has this carpal lobe and it is possible that it should be transferred to the genus *Tethygeneia*, although the short, blunt rostrum is more typical of *Pontogeneia* species. To date, the occurrence of *P. bartschi* in Florida waters has not been confirmed.

Although Barnard (1969) submerged the family Pontogeneiidae Stebbing, 1906 within the Eusiridae, a classification followed by Barnard and Karaman (1991) and Martin and Davis (2001), Bousfield and Hendrycks (1995) and Bousfield (2001) continue to recognize it as a valid family within the superfamily Eusiroidea. They place the genera *Nasageneia*, *Pontogeneia* and *Tethygeneia* (as a subgenus of *Pontogeneia*) in the family Pontogeneiidae (Bousfield, 2001). The classification of Barnard and Karaman (1991) is followed herein.

KEY TO FLORIDA GENERA OF EUSIRIDAE

1. < Antenna 1 with 1-articulate accessory flagellum; maxilla 1, inner plate with single simple apical seta, palp articles 1-2 slender; coxa 1 widest distally, anteroventral angle produced; gnathopods 1-2, propodus enlarged, palmar angle indistinct, palmar margin lined with stout, peg-like spines; peraeopods 3-4, propodus with distal locking spine on flexor margin; uropod 2, rami extending subequally with those of uropods 1 and 3; telson subtriangular, distinctly longer than wide, apices of lobes subacute *Eusiroides*

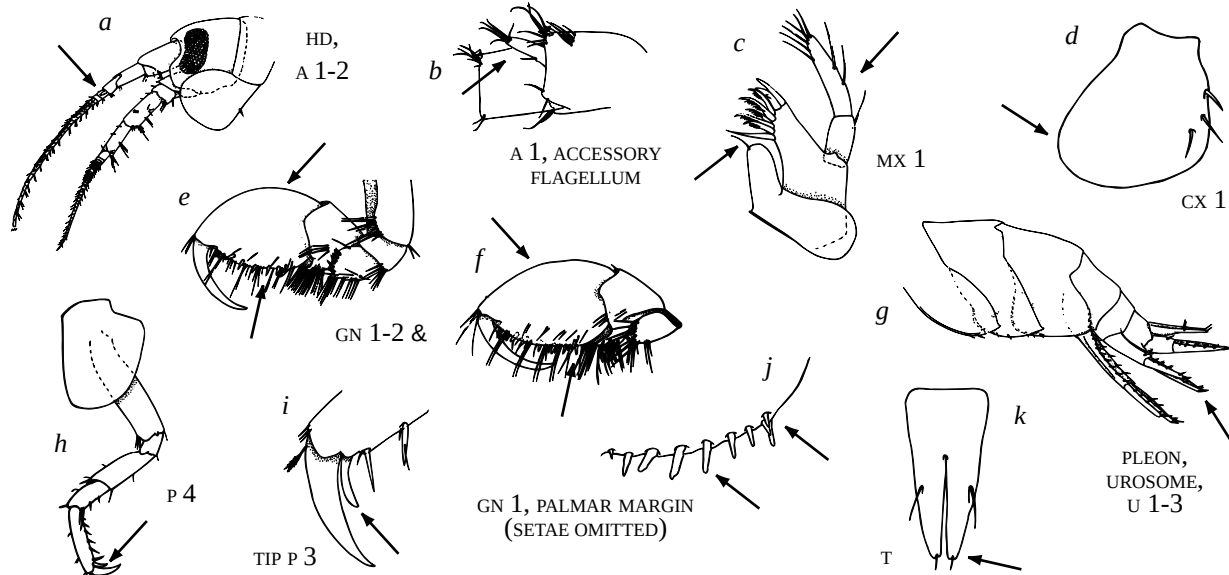


Figure 449.

- < Antenna 1 without accessory flagellum; maxilla 1, inner plate with 3 plumose apical setae, palp articles 1-2 stout; coxa 1 subrectangular, anteroventral angle not produced; gnathopods 1-2, propodus relatively small (slightly larger in male), palmar angle distinct, palmar margin lined with slender spines; peraeopods 3-4, propodus without distal locking spine on flexor margin; uropod 2, rami not extending as far posteriorly as those of uropods 1 and 3; telson subrectangular, slightly longer than wide, apices of lobes rounded or subtruncate 2

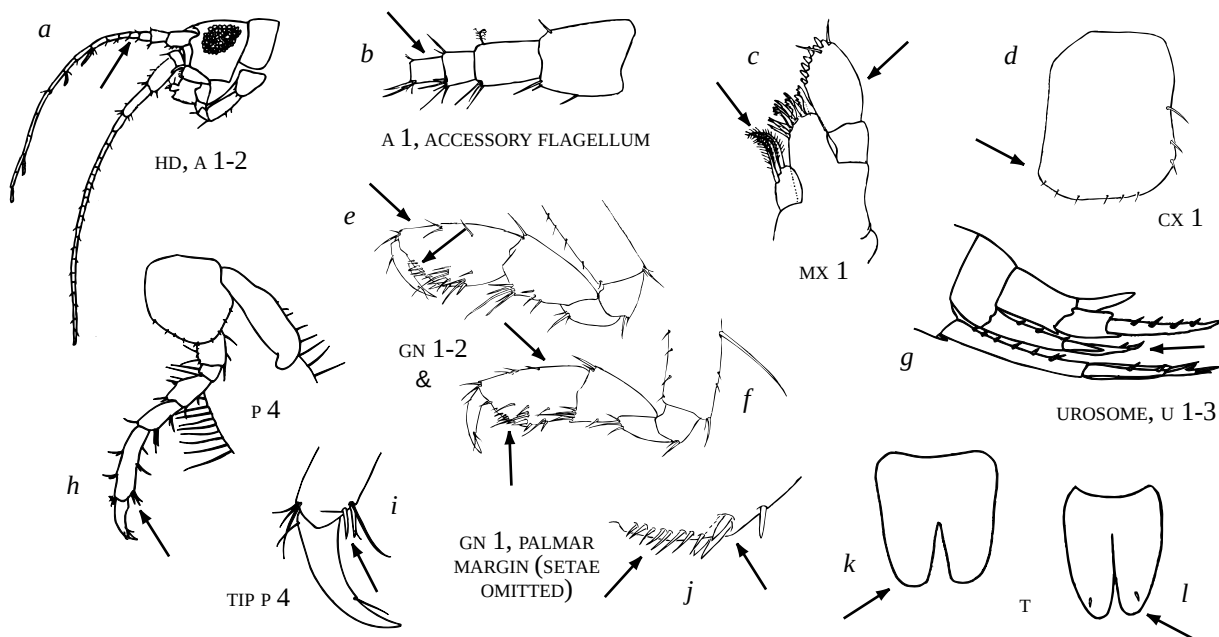


Figure 450.

2. < Epimeron 3, posteroventral margin serrate *Nasageneia*

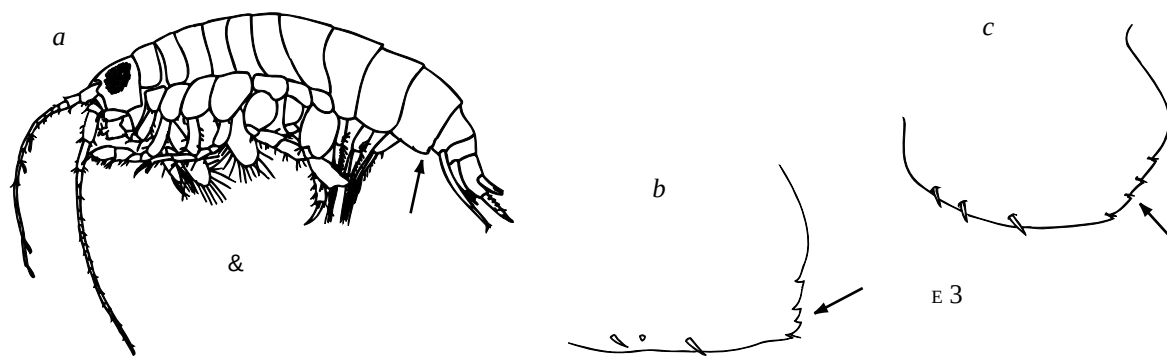


Figure 451.

- < Epimeron 3, posteroventral margin entire or weakly serrate *Tethygeneia*

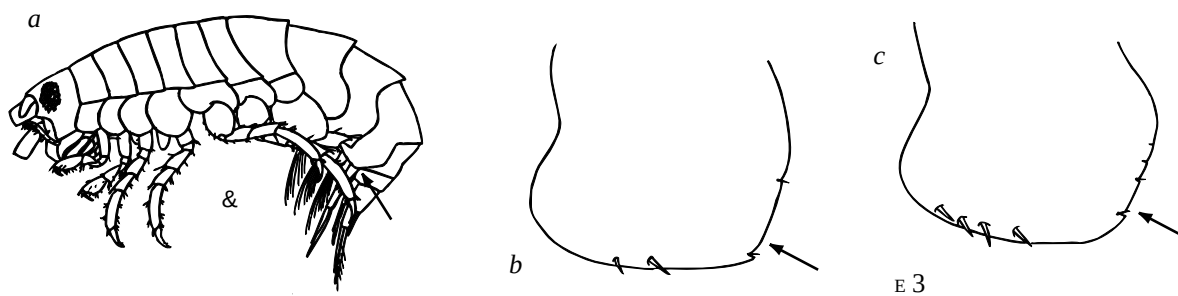


Figure 452.

Genus *Eusiroides* Stebbing, 1888

Regional diagnosis: Antenna 1 with 1-articulate accessory flagellum; rostrum short, approximately one fourth length of antenna 1, peduncle article 1; mandible, palp article 2 with medial margin convex; maxilla 1, inner plate with single simple apical seta, palp articles 1-2 slender; coxa 1 widest distally, anteroventral angle produced; gnathopods 1-2, propodus enlarged, palmar angle indistinct, palmar margin lined with stout, peg-like spines; peraeopods 3-4, propodus with distal locking spine on flexor margin; epimeron 3, posteroventral margin serrate; uropod 2, rami extending subequally with those of uropods 1 and 3; telson subtriangular, distinctly longer than wide, apices of lobes subacute

Florida species: *Eusiroides* sp. A

Remarks: Because of the serrate posteroventral margin of epimeron 3, large eye and general appearance, members of the genus *Eusiroides* might be confused at first glance with members of the genus *Batea* (Bateidae). However, gnathopod 1 in *Batea* species is always vestigial, simple and 2-articulate, whereas in *Eusiroides* it is fully developed, subchelate and 7-articulate. In addition, coxa 1 in *Eusiroides* species is well-developed and subequal to coxa 2 in size; however, in *Batea* species it is reduced and hidden by coxa 2.

Eusiroides sp. A (Figure 449)

Eusiroides sp. 1: Thomas, 1993, p. 39, fig. 47

Regional diagnosis: That of the genus.

Distribution: Florida Keys.

Ecology: This species occurs in algal turf from coral rubble and reef habitats at 1 to 10 m depths (Thomas, 1993).

Remarks: *Eusiroides* sp. A is readily distinguished from other Florida eusirid species by the relatively long, subacute telson lobes and by having the rami of uropod 2 extending subequally with those of uropods 1 and 3. It is very similar to *E. yucatanensis* McKinney, 1980 from Mexico and the Caribbean, differing chiefly in the number of posteroventral serrations on epimeron 3, as well as in uropod spination and mouthpart morphology (Thomas, 1993). Color in live material is distinctive, with the anterior part of the animal washed with reddish maroon (Thomas, 1993); adult size ranges from 5 to 7 mm.

Note that the illustrations in Figure 447 of the generic key are of *E. yucatanensis* because of a lack of available material of *Eusiroides* sp. A. Therefore, there may be some slight differences between these illustrations and the morphology of *Eusiroides* sp. A, especially in the mouthparts and uropods. *Eusiroides yucatanensis* has not been reported in Florida waters to date.

See Thomas, 1993.

Genus *Nasageneia* Barnard and Karaman, 1982

Regional diagnosis: Antenna 1 without accessory flagellum; rostrum moderately long, approximately one half length of antenna 1, peduncle article 1; mandible, palp article 2 with medial margin straight to slightly concave; maxilla 1, inner plate with 3 plumose apical setae, palp articles 1-2 stout; coxa 1 subrectangular, anteroventral angle not produced; gnathopods 1-2, propodus relatively small (slightly larger in males), palmar angle distinct, palmar margin lined with slender spines; peraeopods 3-4, propodus without distal locking spine on flexor margin; epimeron 3, posteroventral margin serrate; uropod 2, rami not extending as far posteriorly as those of uropods 1 and 3; telson subrectangular, slightly longer than wide, apices of lobes rounded or subtruncate

Florida species: *Nasageneia bacescui*

Remarks: *Nasageneia* species, like those of *Eusiroides*, may appear similar to bateids at first glance, but are distinguished by the presence of a fully developed, subchelate and 7-articulate gnathopod 1 and an unreduced coxa 1. In *Batea* species, gnathopod 1 is vestigial, simple and 2-articulate and coxa 1 is reduced and hidden by coxa 2.

Nasageneia bacescui Ortiz and Lalana, 1994 (Figure 451)

Nasageneia bacescui Ortiz and Lalana, 1994, pp. 285-291, figs. 1-5

Regional diagnosis: That of the genus.

Distribution: Tampa Bay, Florida; Pigeon Key, Florida Keys; Cayo Mendoza, northern Cuba (Ortiz and Lalana, 1996); Gulf of Batabano and Peninsula de Guanahacabibes, southwestern Cuba (Ortiz and Lalana, 1994; Varela et al., 2003); Colombia, south of Cartagena (Ortiz and Lemaitre, 1994).

Ecology: *Nasageneia bacescui* is known to occur on sand bottoms with *Thalassia* and various macroalgal species (Ortiz and Lemaitre, 1994), including *Caulerpa*, *Penicillus*, and *Halimeda* (Ortiz and Lalana, 1994). It has also been captured in night plankton tows over these habitats (pers. obs.). *Nasageneia bacescui* is a shallow-water species, occurring at depths of 0.5 to 4 m (Varela et al., 2003).

Remarks: Although the Florida distribution of *N. bacescui* consists of one record from the Tampa Bay area and one from the Florida Keys, the close similarity between this species and species of *Pontogeneia* and *Tethygeneia* may have led to misidentifications in the past and the actual distribution may be much broader; certainly, the appropriate habitat is widespread in South Florida. *Nasageneia bacescui* can generally be distinguished from members of the latter two genera by the presence of a serrate posteroventral margin on epimeron 3 (margin entire in *Pontogeneia* and *Tethygeneia*); these serrations appear to be somewhat more pronounced in larger specimens. However, as mentioned in the Remarks sections for the family and for *T. longleyi*, that species occasionally has a few small serrations on epimeron 3 and distinguishing between these two species can be difficult. An examination of the type material and a larger series of specimens of both species is necessary to clarify their status and it is not impossible that the two species may prove to belong to a single, somewhat variable species. Adult size in *N. bacescui* ranges from 3-5 mm and females are larger than males.

An examination of the figures of maxilla 1 in Ortiz and Lalana (1994) for *N. bacescui* and Shoemaker (1933a) for *T. longleyi* might lead one to the conclusion that the two species can be distinguished based upon differences in the shape and spination of the distal article of the palp. However, these differences are attributable to consistent differences in structure between the left and right maxilla 1 in both taxa, rather than to differences between species.

See Ortiz and Lalana, 1994.

Genus *Tethygeneia* Barnard, 1972

Regional diagnosis: Antenna 1 without accessory flagellum; rostrum long, approximately three fourths length of antenna 1, peduncle article 1; mandible, palp article 2 with medial margin straight to slightly concave; maxilla 1, inner plate with 3 plumose apical setae, palp articles 1-2 stout; coxa 1 subrectangular, anteroventral angle not produced; gnathopods 1-2, propodus relatively small (slightly larger in males), palmar angle distinct, palmar margin lined with slender spines; peraeopods 3-4, propodus without distal locking spine on flexor margin; epimeron 3, posteroventral margin entire or weakly serrate; uropod 2, rami not extending as far posteriorly as those of uropods 1 and 3; telson subrectangular, slightly longer than wide, apices of lobes rounded or subtruncate.

Florida species: *Tethygeneia longleyi*

Remarks: *Pontogeneia bartschi* from Cuba may also belong in the genus *Tethygeneia* based on the presence of a carpal lobe on gnathopod 2, although it was not placed there by Barnard (1972) or Barnard and Karaman (1991). This species bears some resemblance to *T. longleyi*, but can be distinguished by the shape of mandibular palp article 2 (medial margin evenly convex in *P. bartschi*, straight and slightly expanded distally in *T. longleyi*), the absence of 2 stout, elongate plumose setae on the medial margin of the inner plate of maxilla 2 (present in *T. longleyi*), the presence of fine setae on the medial margin of maxilla 1, palp article 2 (absent in *T. longleyi*) and by the telson cleft to the base (one half to two thirds cleft in *T. longleyi*).

Tethygeneia longleyi (Shoemaker, 1933) (Figure 452)

Pontogeneia longleyi Shoemaker, 1933a, pp. 253-254, figs. 6-7.

Tethygeneia longleyi: Barnard, 1972, p. 198.

Regional diagnosis: That of the genus.

Distribution: Hutchinson Island, Florida (Camp et al., 1977); Biscayne Bay, Florida; Charlotte Harbor, Florida, to the Florida Keys; Dry Tortugas, Florida (Shoemaker, 1933a); Apalachee Bay, Florida (Lewis, 1984; 1987); Cuba (Ortiz, 1978; Ortiz and Lalana, 1996); Venezuela (Ruffo, 1950); Brazil (Wakabara and Serejo, 1998).

Ecology: *Tethygeneia longleyi* occurs in *Thalassia* and *Halodule* grassbeds, as well as among various species of macroalgae, including members of the genera *Laurencia*, *Digenia*, *Halimeda*, *Anadyomene* and *Penicillus* (Lewis, 1984; 1987). It also is occasionally found on open sand bottoms adjacent to grassbeds (Lewis, 1984), as well as on unvegetated sand bottoms (Camp et al., 1977) and on sand bottoms mixed with shell. It is a mid to high salinity species, occurring at salinities of 16 to 36 ppt and at depths of 1 to 11 m (Camp et al., 1977; Lewis, 1984).

Remarks: Many specimens of *T. longleyi* from Florida waters appear to have somewhat more subtruncate apices on the telson lobes than illustrated by Shoemaker (1933a), but they are otherwise identical. They can generally be separated from *N. bacescui* by the lack of serrations on the posterior margin of epimeron 3; however, some specimens, especially larger specimens, may have 1-2 small serrations there. These are usually more widely separated and less well-developed than those of *Nasageneia* or *Eusiroides* species. See the Remarks section for *N. bacescui* for a discussion of maxilla 1 morphology in these two species. Adult size in *T. longleyi* is 3-5 mm and females are larger than males.

See Shoemaker, 1933a (as *Pontogeneia longleyi*); Barnard, 1972.

Family Hyalellidae Bulychева, 1957

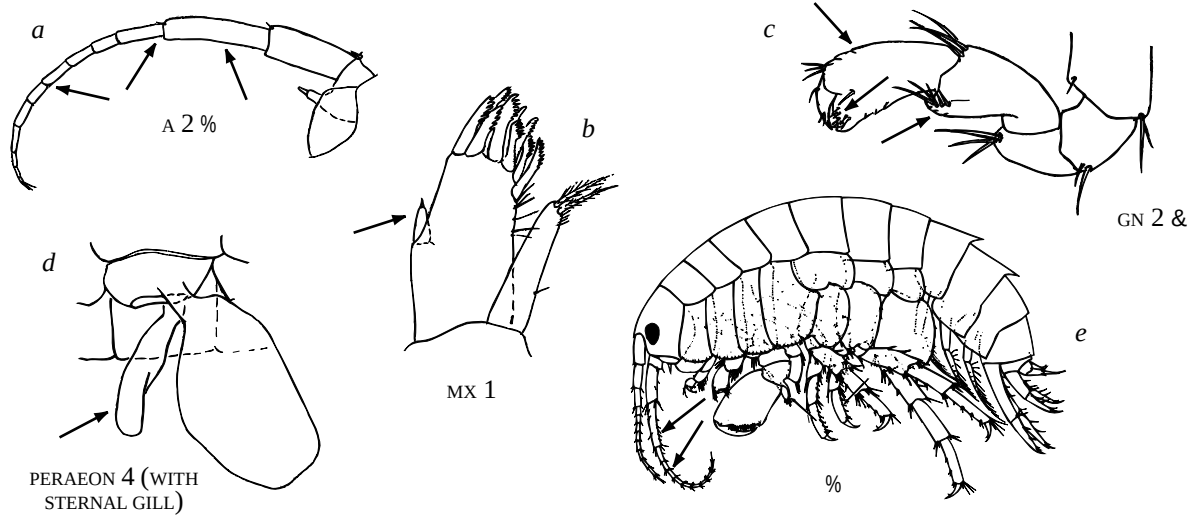
Regional diagnosis: Antenna 1 shorter than antenna 2, reaching well beyond peduncle article 4 of antenna 2; head, rostrum absent; eyes present, lateral, not closely approximated or fused dorsally; mandible lacking palp, molar present, triturative; maxilliped, palp article 4 normally developed, not vestigial; peraeon 2 of female with lateral preamplexing notch above insertion of coxa; coxae 1-4 subequal in depth, deeper than wide, extending well beyond proximal end of basis of coxa 4, posterior margin excavate proximally; coxa 5, anterior lobe much shorter than coxa 4, similar to coxae 6-7 in depth; gnathopod 1 well-developed, subchelate; gnathopod 2 sexually dimorphic, larger in male, merus not elongate, less than twice as long as wide; peraeopod 7 subequal to or slightly longer than peraeopod 6; urosome segments 1-3 separate, segment 1 not elongate, deeper than long; uropod 3 uniramous, ramus subequal to or shorter than peduncle; telson entire.

Florida genera: *Hyalella*, *Parhyalella*

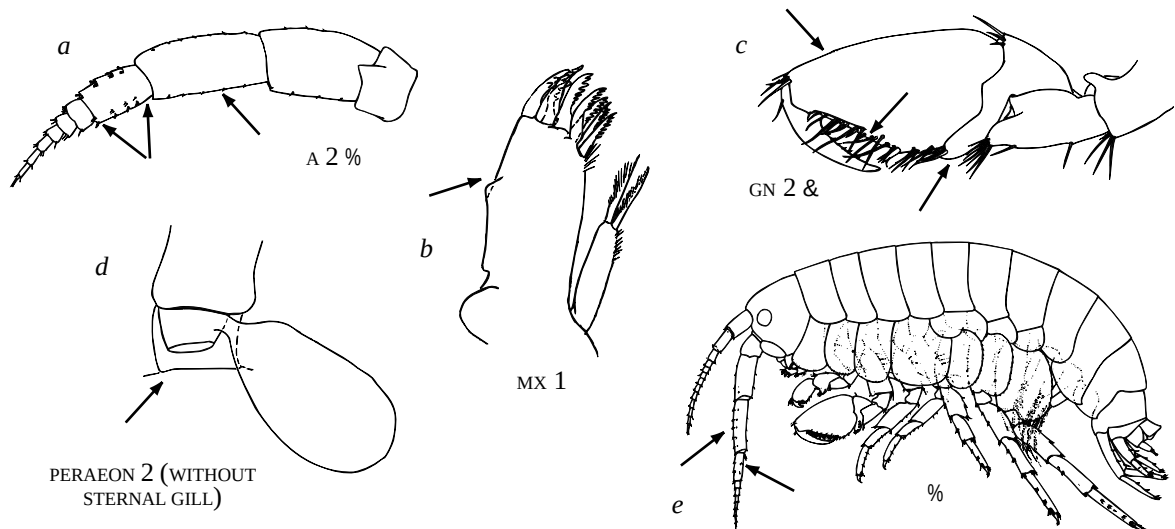
Remarks: The familial alliance of the genus *Parhyalella* has been the subject of some debate over the years. Although the genus has been placed in the family Hyalidae by many authors (Bulychева, 1957; Barnard, 1969; Barnard and Karaman, 1991; Ruffo and Vader, 1998; Wakabara and Serejo, 1998; Lazo-Wasem and Gable, 2001), it has also frequently been assigned to the family Hyalellidae (Bousfield, 1973, 1982, 1996; Zeidler, 1991; Gonzalez and Watling, 1998) (see discussion in Lazo-Wasem and Gable, 2001). A recent phylogenetic analysis of the superfamily Talitroidea (Serejo, 2004), which includes both of these families as well as a number of others, suggests that *Parhyalella* is indeed more closely related to the hyalellids than the hyalids. However, the results also indicate that the genus *Parhyalella*, along with *Hyalella* and a number of other related genera, should actually be placed in the family Dogielinotidae Gurjanova, 1953. The Hyalidae remains a valid family, but *Parhyalella* is excluded from it. For the purposes of this guide, both *Hyalella* and *Parhyalella* are retained together in the Hyalellidae. The family key in Volume 1 (LeCroy, 2000) does not include the Dogielinotidae (formerly restricted to the Pacific), but *Parhyalella* will key out in the family Hyalellidae, along with *Hyalella*.

KEY TO FLORIDA GENERA OF HYALELLIDAE

1. < Antenna 2 of adult male slender, peduncle articles not inflated, proximal articles of flagellum unfused (not conjoint); maxilla 1, palp present, vestigial; gnathopod 2 of female, carpal lobe weakly produced, less than half length of posterior margin of propodus, propodus slender, uninflated, palm transverse; sternal gills present *Hyalella*



- < Antenna 2 of adult male stout, peduncle articles inflated, proximal articles of flagellum fused (conjoint); maxilla 1, palp absent; gnathopod 2 of female, carpal lobe strongly produced, reaching at least half length of posterior margin of propodus; propodus stout, inflated, palm oblique; sternal gills absent *Parhyalella*



Genus *Hyaella* Smith, 1874

Regional diagnosis: Antenna 2 of adult male slender, peduncle articles not inflated, proximal articles of flagellum separate, not conjoint; maxilla 1, palp present, vestigial; gnathopod 2 of female, carpal lobe weakly produced, less than half length of posterior margin of propodus, propodus slender, uninflated, palm transverse; sternal gills present.

Florida species: *Hyaella* sp. C, *Hyaella* sp. D.

Remarks: Until relatively recently, *Hyaella azteca* (Saussure, 1858) was considered to have a very broad distribution, occurring throughout North, Central and South America, the Caribbean islands and Bermuda (Bousfield, 1973; Gonzalez and Watling, 2002). However, recent studies on the ecology, life history, toxicology and genetics of the species (see discussion in Gonzalez and Watling, 2002) indicate that *H. azteca* actually comprises a species complex and there are probably many undescribed species in this genus that have been reported in the literature as *H. azteca*. Gonzalez and Watling (2002) have redescribed the species based upon the type material from Veracruz, Mexico, and this redescription, along with the descriptions of a number of new North American and Caribbean species of *Hyaella* (Stevenson and Peden, 1973; Cole and Watkins, 1977; Bousfield, 1996; Baldinger et al., 2000; Baldinger, 2004), must be used to determine the status of any Florida *Hyaella* material examined. The material reported in Bousfield (1973) as *H. azteca* appears to be a new species and there is at least one new species inhabiting the fresh waters of Florida.

Although *Hyaella* is predominantly a freshwater genus, with species occurring in lakes, streams, springs and other permanent freshwater systems, there are a few species that occur in the low salinity reaches of estuaries, bays and lagoons. They are often assumed to be found there as a result of being washed out of adjacent freshwater areas by rain events; however, the material examined here was collected at higher salinities than is usual for *Hyaella* and the possibility exists that they are capable of surviving in such areas long-term. The key below includes only those species that have been found in Florida estuarine waters and does not include the local freshwater species. Recent, more comprehensive keys to species in the genus *Hyaella* can be found in Bousfield (1996) and Baldinger (2004).

KEY TO FLORIDA ESTUARINE SPECIES OF *HYALELLA*

1. < Maxilliped, palp article 4 with 3 subterminal setae on medial margin; gnathopod 2 of male, propodus, palm short, subequal to hind margin in length, dactyl stout; pleon segments 1-2 with dorsal processes; uropods 1-2, rami with 2-3 marginal spines; uropod 3, peduncle of male with 3 distal spines, ramus of both sexes with 2 terminal setae; telson subovate, lateral and terminal setae short *Hyaella* sp. C

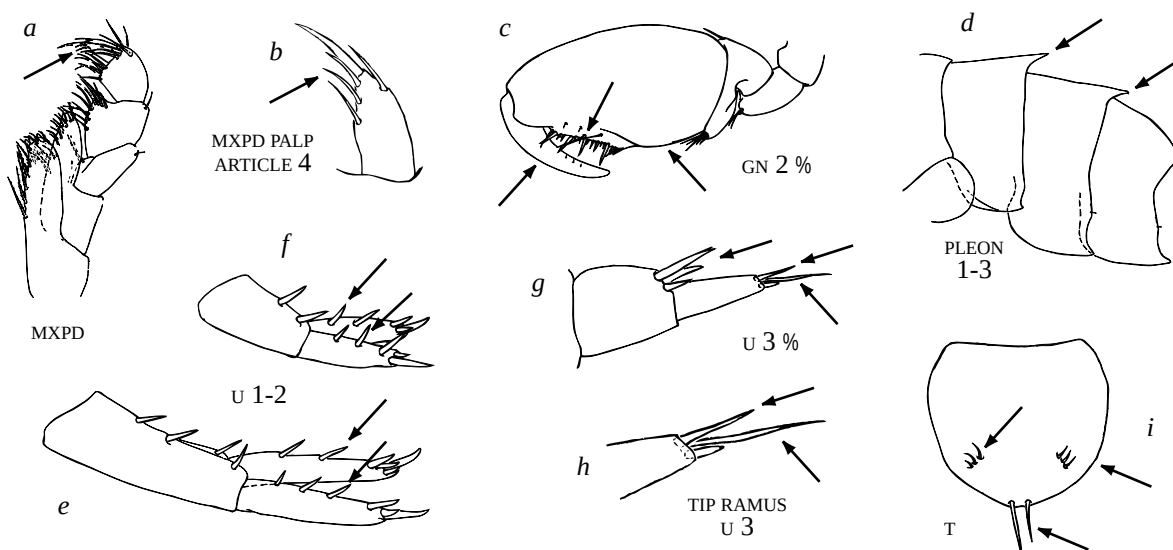


Figure 455.

- < Maxilliped, palp article 4 with 1 subterminal seta on medial margin; gnathopod 2 of male, propodus, palm long, distinctly longer than hind margin, dactyl slender; pleon segments 1-2 without dorsal processes; uropods 1-2, rami with 1 marginal spine; uropod 3, peduncle of male with 2 distal spines, ramus of both sexes with 1 terminal seta; telson subtriangular, lateral and terminal setae elongate *Hyaella* sp. D

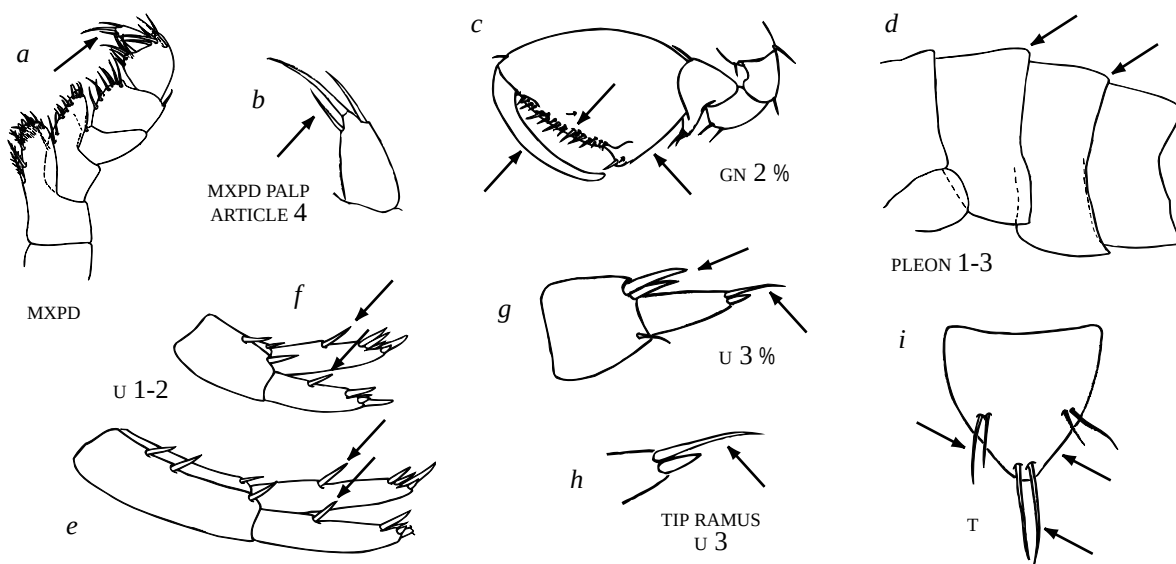


Figure 456.

***Hyaella* sp. C**
(Figure 455)

Regional diagnosis: Maxilliped, palp article 4 with 3 subterminal setae on medial margin; gnathopod 2 of male, propodus, palm short, subequal to hind margin in length, dactyl stout; pleon segments 1-2 with dorsal processes; uropods 1-2, rami with 2-3 marginal spines; uropod 3, peduncle of male with 3 distal spines, ramus of both sexes with 2 terminal setae; telson subovate, lateral and terminal setae short.

Distribution: Lemon Bay and Estero Bay, Florida.

Ecology: Associated with *Thalassia* grassbeds and sand/mud bottoms in relatively shallow (0.5-2 m), medium to high salinity (20-35 ppt) habitats (Ford Walton, pers. comm.).

Remarks: This is a relatively small species, with adults ranging in size from 2-3.5 mm. Subadult and juvenile specimens may have only 1 marginal spine on the rami of uropod 2, but usually have 2 spines on the rami of uropod 1, as do adults.

Hyaella sp. C is very close to *H. azteca*, but seems to have stronger serrations on the posterior margin and stronger spines on the posteroventral margin of the basis of pereopod 7, especially in the male. In addition, there are only 2 terminal plumose setae on the inner plate of maxilla 1 (*H. azteca* has 3) and the palp lacks marginal setules, but has a terminal spinule (setules present, terminal spinule absent in *H. azteca*), the propodus of gnathopod 2 in the female is slightly stouter and the palm is transverse (reverse oblique, almost chelate, in *H. azteca*), there are only 2 terminal setae surrounding the terminal spine on the ramus of uropod 3 (4 in *H. azteca*), and the terminal setae on the telson are separated by a small gap (no gap in *H. azteca*). See the Remarks section for *Hyaella* sp. D for a discussion of the differences between that species and *Hyaella* sp. C.

***Hyaella* sp. D**
(Figure 456)

Regional diagnosis: Maxilliped, palp article 4 with 1 subterminal seta on medial margin; gnathopod 2 of male, propodus, palm long, distinctly longer than hind margin, dactyl slender; pleon segments 1-2 without dorsal processes; uropods 1-2, rami with 1 marginal spine; uropod 3, peduncle of male with 2 distal spines, ramus of both sexes with 1 terminal seta; telson subovate, lateral and terminal setae short.

Distribution: Lemon Bay, Florida

Ecology: This species is associated with *Thalassia* grassbeds in shallow (0.5-1 m), medium to high salinity (20-35 ppt) habitats (Ford Walton, pers. comm.). It can occur in the same samples as *Hyaella* sp. C.

Remarks: *Hyaella* sp. D is easily distinguished from both *Hyaella* sp. C and *Hyaella azteca* by the lack of dorsal processes on the pleon segments; the longer palm and shorter hind margin of gnathopod 2 in the male; the presence of only 1 terminal seta on the ramus of uropod 3 (*Hyaella* sp. C has 2 setae; *H. azteca* has 4 setae) and the long dorsolateral setae on the telson (short setae in *Hyaella* sp. C and *H. azteca*). Additionally, *Hyaella* sp. D differs from *H. azteca* in the following: inner plate of maxilla 1 with 2 terminal plumose setae (3 in *H. azteca*), palp without marginal setules, but with a terminal spinule (marginal setules present, terminal spinule absent in *H. azteca*); and the palm of gnathopod 2 in the female is transverse (reverse oblique, almost chelate, in *H. azteca*). Also, *Hyaella* sp. D, at 2-2.5 mm in length, is a slightly smaller species than *Hyaella* sp. C (2-3.5 mm) and much smaller than *H. azteca*, which is 6-8 mm in length.

Genus *Parhyalella* Kunkel, 1910

Regional diagnosis: Antenna 2 of adult male stout, peduncle articles inflated, proximal articles of flagellum conjoint; maxilla 1, palp absent; gnathopod 2 of female, carpal lobe strongly produced, reaching at least half length of posterior margin of propodus; propodus stout, inflated, palm oblique; sternal gills absent.

Florida species: *Parhyalella whelpleyi*, *Parhyalella* sp. A

Remarks: The genus *Parhyalella* has been recently revised by Lazo-Wasem and Gable (2001).

KEY TO FLORIDA SPECIES OF *PARHYALELLA*

1. < Antenna 2 of male, article 1 of flagellum 3-conjointed; gnathopod 1 of male, anterior margin of carpus with small medial seta; gnathopod 2 of female, anterodistal margin of ischium without process *Parhyalella whelpleyi*

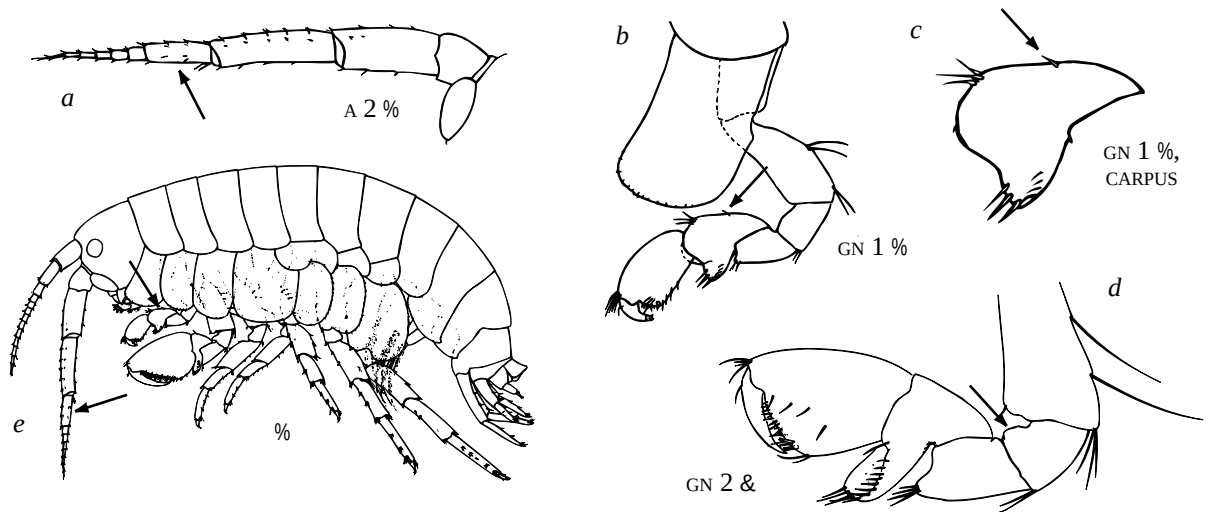


Figure 457.

- < Antenna 2 of male, article 1 of flagellum 4-conjointed; gnathopod 1 of male, anterior margin of carpus without small medial seta; gnathopod 2 of female, anterodistal margin of ischium with slender, distally rounded process *Parhyalella* sp. A

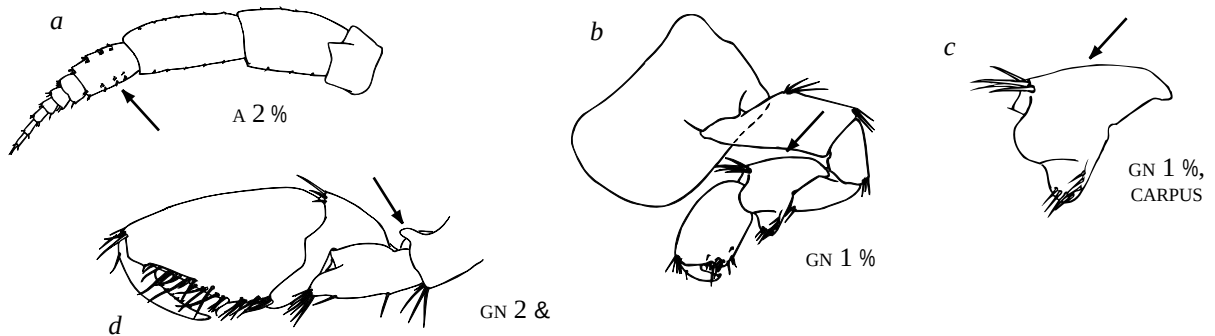


Figure 458.

***Parhyalella whelpleyi* (Shoemaker, 1933)
(Figure 457)**

Hyaella whelpleyi Shoemaker, 1933b, pp. 22-24, figs. 12-13.
not *Parhyalella whelpleyi*: Shoemaker, 1948, p. 11.

Regional diagnosis: Antenna 2 of male, article 1 of flagellum 3-conjointed; gnathopod 1 of male, anterior margin of carpus with small medial seta; gnathopod 2 of female, anterodistal margin of ischium without process.

Distribution: Florida (Camp, 1998); Península Guanahacabibes, Cuba (Varela et al., 2003); Port of Spain, Trinidad (Shoemaker, 1933b); Brazil (Wakabara and Serejo, 1998; Lazo-Wasem and Gable, 2001).

Ecology: *Parhyalella whelpleyi* occurs in salt marshes, among algae and under algal wrack on beaches in moderately high salinities (27-32 ppt) and at depths of 0-4 m (Lazo-Wasem and Gable, 2001; Varela et al., 2003).

Remarks: The status of *Parhyalella whelpleyi* in Florida is not certain, but it is included here because it has been reported from the state (Camp, 1998) and it is possible that it does occur there. However, no material referable to this species was available for study and regional material reported as *P. whelpleyi* from Bahía Corrientes, Cuba by Shoemaker (1948) is actually a new species, described by Lazo-Wasem and Gable (2001) as *P. nisbetæ*. Although his specific determination for the Cuban material was incorrect, Shoemaker (1948) did transfer *Parhyalella whelpleyi* from the genus *Hyaella* to the genus *Parhyalella*.

Parhyalella whelpleyi is easily distinguished from *Parhyalalla* sp. A by the 3-conjointed article 1 of the flagellum of antenna 1 in the male (4-conjointed in *Parhyalella* sp. A) and by the lack of an anterodistal process on the ischium of gnathopod 2 of the female (process present in *Parhyalella* sp. A). The seta on the anterior margin of the carpus of the male gnathopod 1 in *P. whelpleyi* can be very hard to see, often requiring examination under a compound microscope; that seta is lacking in *Parhyalella* sp. A. The habitat requirements of the two species apparently differ as well; *P. whelpleyi* generally occurs in salt marshes or under beach wrack, whereas *Parhyalella* sp. A is found in algae on hard substrates. Adult size in *P. whelpleyi* ranges from 4 to 6.5 mm.

See Shoemaker (1933b) (as *Hyaella whelpleyi*); Lazo-Wasem and Gable (2001).

***Parhyalella* sp. A
(Figure 458)**

Regional diagnosis: Antenna 2 of male, article 1 of flagellum 4-conjointed; gnathopod 1 of male, anterior margin of carpus without small medial seta; gnathopod 2 of female, anterodistal margin of ischium with slender, distally rounded process.

Distribution: Hutchinson Island, Florida

Ecology: This species occurs among algae on structures and other hard substrates, but may also be found in the water column over sand or mud bottoms near such habitats. It is usually found in relatively high salinity water (34-35 ppt) and at depths of 0.2-8 m.

Remarks: *Parhyalella* sp. A is only known from Hutchinson Island thus far, although it seems likely that it occurs on algae-covered hard substrates along other parts of the Florida east coast as well. It is also possible that this is the species occasionally seen in the Florida Keys and referred to by Lazo-Wasem and Gable (2001) as *Parhyalella* sp. The eye in *Parhyalella* sp. A is large and is usually reddish in alcohol-preserved specimens. It is a fairly large species, with adults ranging from 5.5 to 7.5 mm in length. See the Remarks section for *P. whelpleyi* for a comparison of these two species.

Family Hyalidae Bulychева, 1957

Regional diagnosis: Antennae 1-2, posterior margin of articles not lined with very long setae; antenna 1 not greatly reduced, reaching beyond peduncle article 4 of antenna 2, accessory flagellum absent; rostrum obsolescent; eyes present, well-developed; mandible without palp; maxilla 1, palp present, reduced; peraeon 2 of female with lateral preamplifying notch above insertion of coxa; coxae 1-4 subequal in depth, deeper than wide or depth subequal to width, margins overlapping, some or all coxae with posterior marginal cusp, coxa 5 smaller than anterior coxae; gnathopod 1 well-developed, subchelate; gnathopod 2 strongly sexually dimorphic, greatly enlarged in male, article 3 not elongate, less than twice as long as wide; peraeopod 7 subequal to or slightly longer than peraeopod 6; urosome segments 1-3 separate, segment 1 not elongate, deeper than long; uropod 1, rami subequal in length; uropod 2 biramous, rami extending well beyond peduncle of uropod 1; uropod 3 uniramous or unequally biramous, inner ramus minute; telson cleft to base, lobes thick, fleshy.

Florida genera: *Apohyale*, *Parhyale*, *Protohyale*

Remarks: The systematics of the family Hyalidae is in a somewhat confused state, although several recent revisions and species redescrptions (Serejo, 1999, 2001, 2004; Hendrycks and Bousfield, 2001; Bousfield and Hendrycks, 2002; Krapp-Schickel and Bousfield, 2002) have begun to address the problems associated with the group. The reason for the confusion is twofold: first, hyalids are often fouling organisms and can be easily transported from one place to another on drifting vegetation, ships, logs, etc. and thus many species may be widely distributed. Second, the species in this group are very similar, resulting in many misidentifications in the literature, which compounds the error when those misidentifications are used as the basis for further identifications. The examination and/or redescription of type material or material from the type localities of the species involved will be necessary to resolve many of the issues associated with members of this family.

KEY TO FLORIDA GENERA OF HYALIDAE

1. < Eye pyriform or ovate; maxilliped, palp article 3, outer surface with brush of dense setae distally; peraeon 2 of female, preamplexing notch in anteroventral margin poorly developed; peraeopod 7, dactyl small, slender, approximately one third length of propodus; uropod 3 biramous, inner ramus minute *Parhyale*

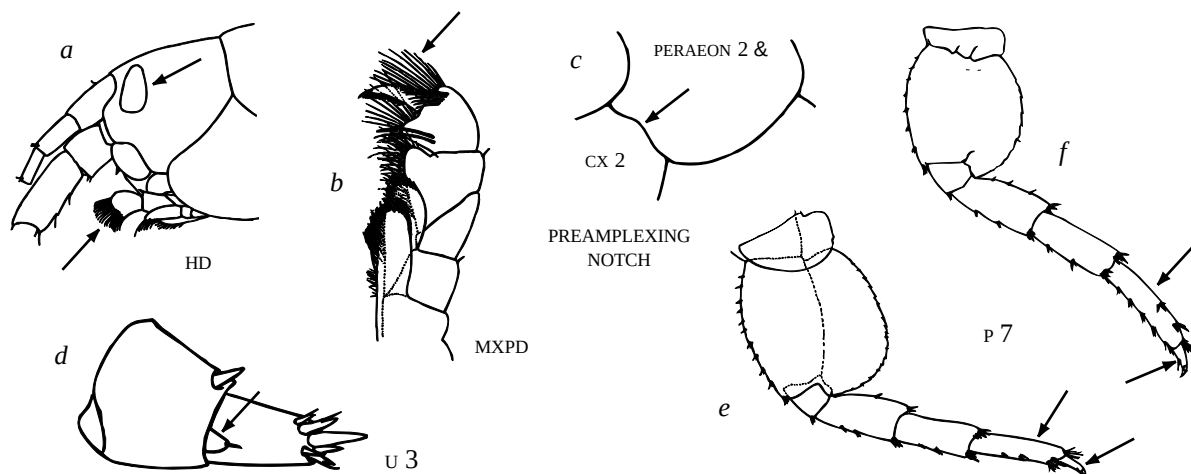


Figure 459.

- < Eye round; maxilliped, palp article 3, outer surface without brush of dense setae distally; peraeon 2 of female, preamplexing notch in anteroventral margin well-developed; peraeopod 7, dactyl large, stout, approximately one half length of propodus; uropod 3 uniramous 2

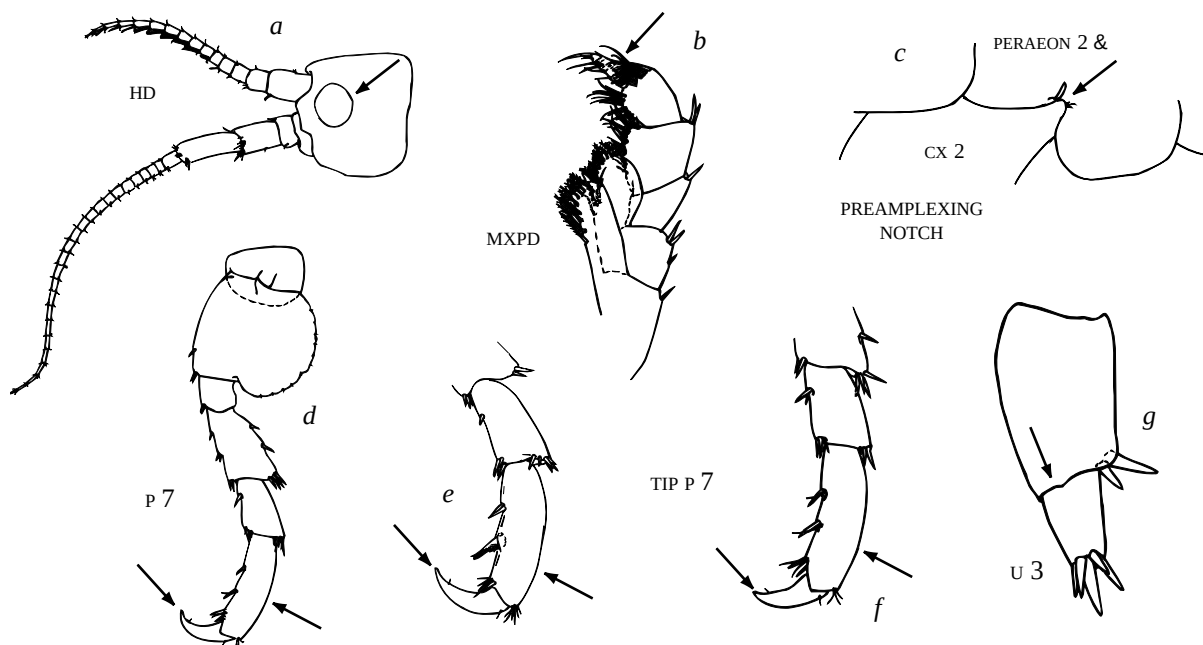


Figure 460.

2. < Maxilliped, distolateral margins of basal portion of inner and outer plates and palp articles 1-2, spines slender or lacking; coxa 1, posterior margin with well-developed cusp; peraeopods 5-7, propodus with very large, striate spine just distal to midpoint of flexor margin; oostegites of female with short marginal setae; uropods 1-2, outer ramus without marginal spines *Apohyale*

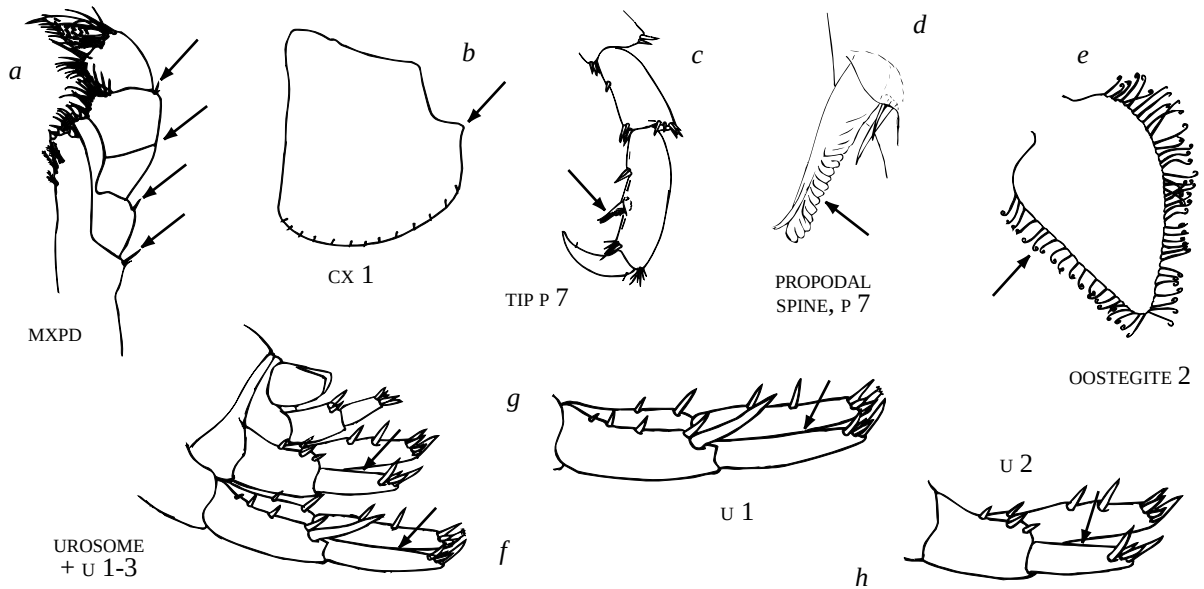


Figure 461.

- < Maxilliped, distolateral margins of basal portion of inner and outer plates and palp articles 1-2, spines robust; coxa 1, posterior margin with very weak or no cusp (shelf may be present); peraeopods 5-7, propodus without very large, strongly striate spine just distal to midpoint of flexor margin (may be weakly striate); oostegites of female with long marginal setae; uropods 1-2, outer ramus with marginal spines *Protohyale*

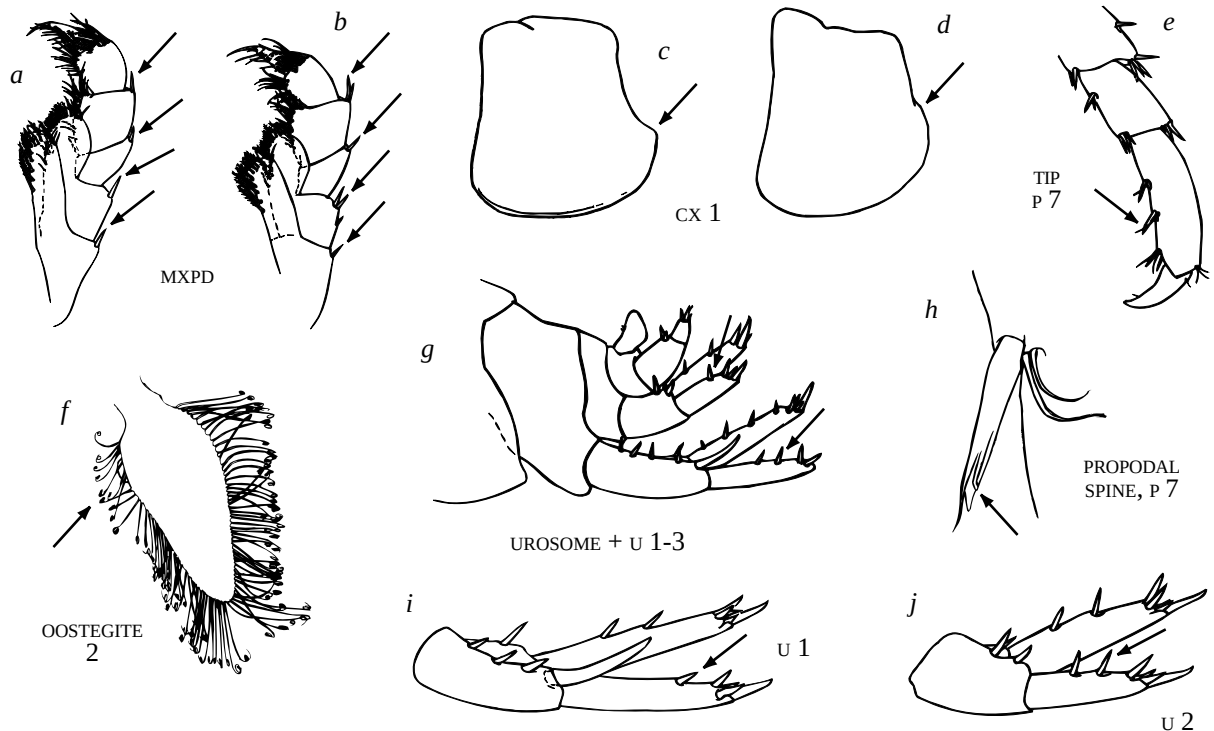


Figure 462.

Genus *Apohyale* Bousfield and Hendrycks, 2002

Regional diagnosis: Eye round; maxilliped, distolateral margins of basal portion of inner and outer plates and palp articles 1-2, spines slender or lacking, palp article 3, outer surface without brush of dense setae distally; peraeon 2 of female, preamplexing notch well-developed; coxa 1, posterior margin with well-developed cusp; peraeopods 5-7, propodus with very large, striate spine just distal to midpoint of flexor margin; peraeopod 7, dactyl large, stout, approximately one half length of propodus; oostegites of female with short marginal setae; uropods 1-2, outer ramus without marginal spines; uropod 3 uniramous.

Florida species: *A. media*

Remarks: Although *Apohyale perieri* (Lucas, 1846) has been reported to be a dominant species on the sabellariid worm rocks at Sebastian Inlet, Florida (Nelson and Demetriades, 1992, as *Hyale perieri*), an examination of material from similar rocks at Hutchinson Island, Florida, did not yield any material referable to this species. Instead, the common hyalid species occurring there were *Protohyale* sp. A and *Protohyale* sp. B, with the occasional appearance of *Protohyale* sp. D. The Hutchinson Island specimens are not *A. perieri* based on the descriptions and figures in Chevreux and Fage (1925), Krapp-Schickel (1974), Lincoln (1979), Krapp-Schickel (1993) and the key to genera in Bousfield and Hendrycks (2002), differing as follows for all three species occurring there: coxae 1-4 with no more than a rounded shelf on posterior margin (weak rounded cusp on coxa 4), especially on coxa 1 (well-developed cusps in *A. perieri*); gnathopod 1 of male, propodus with sinuous or straight posterior margin (convex in *A. perieri*); gnathopod 2 of the female, carpal lobe short, not produced, propodus slender, subrectangular (carpal lobe elongate, produced, propodus stout, subovate in *A. perieri*); oostegites with long marginal setae (short in *A. perieri*); uropod 1, peduncle with strong interramal spine (weak spine in *A. perieri*? Material figured by Krapp-Schickel, 1974 has a strong spine, but the other authors do not show it). It seems unlikely that a species dominant in the worm rocks at Sebastian Inlet would be completely absent in the same somewhat unusual habitat in a second area in such close proximity to the first, and Nelson and Demetriades' (1992) material is probably *Protohyale* sp. A or B. Based on the broadly rounded palmar angle of gnathopod 1 and the slightly sinuous palm lined with elongate setae of gnathopod 2 in the male, the lack of serrations on the basis of peraeopod 7 and the subacute posteroventral tooth on epimeron 3, all characteristics of *Protohyale* sp. A that resemble those of *A. perieri* and differ from those of *Protohyale* sp. B, it seems most likely that Nelson and Demetriades (1992) material is referable to *Protohyale* sp. A. However, their specimens or additional material from Sebastian Inlet will have to be examined to confirm the identification.

Apohyale wakabarae (Serejo, 1999), a Brazilian species, has not been reported from Florida waters to date; however, it has been found in Mississippi, mainly occurring near shipping channels, and it could easily be present in Florida as well. It can be recognized by its large size (11-13 mm), the absence of a very large striate spine on the flexor margin of the propodus of peraeopods 5-7, the presence of a large subterminal seta on the peraeopod dactyls, the lack of a large interramal spine on the peduncle of uropod 1 and the presence of marginal spines on the ramus of uropod 3.

***Apohyale media* (Dana, 1853)
(Figure 461)**

Allorchestes media Dana, 1853, p. 898, pl. 61, fig. 4.

Hyale antares Oliviera, 1953, p. 340, figs. 15-16.

Hyale media: Ruffo, 1950, p. 60, figs. 4-5.

Apohyale media: Bousfield and Hendrycks, 2002, p. 104.

Regional diagnosis: That of the genus.

Distribution: Cosmopolitan in tropical and subtropical waters (Wakabara and Serejo, 1998; Serejo, 1999; Martín and Díaz, 2003). Florida records include: Sebastian Inlet (Nelson, 1995); Anna Maria Island; Crystal River; St. Andrew Bay.

Ecology: *Apohyale media* is associated with algae and algae covered rocks from intertidal depths to depths of 7 m (Shoemaker, 1935; Lagarde, 1987; Oliva-Rivera and Jiminez-Cueto, 1992; Nelson, 1995; Martín and Díaz, 2003; Varela et al., 2003).

Remarks: Serejo (1999) recently redescribed *A. media* (as *Hyale media*) based on material collected near the type locality in Brazil and Dana's (1853) syntype series from Rio de Janeiro harbor. Florida material of *A. media* compares very well with her description and figures and also with those of Ruffo (1950) based on material from Venezuela. The Brazilian and Florida specimens differ from the Tristan da Cunha material of Stephensen (1949) and the New Zealand material of Hurley (1957) in several respects, including the lack of the strongly serrate subdistal spine on the propodus of peraeopods 3-4, the lack of marginal spines on the outer ramus of uropods 1-2 and the presence of a large interramal spine on the peduncle of uropod 1. According to Serejo (1999), the material of these latter two authors is therefore probably not *A. media*. However, Bousfield and Hendrycks' (2002) key to members of the genus *Apohyale* was apparently based on New Zealand material of *A. media* and, as a consequence, local material of *A. media* will not key out to that species using their key. Many records of this species in the literature, especially Pacific records, may actually refer to other species.

Apohyale media can be distinguished from all other Florida hyalid species except *Parhyale fascigera* by the lack of marginal spines on the outer ramus of uropods 1-2 in both sexes. It is readily separated from the latter species by the densely setose posterodistal margins of peduncle articles 4-5 and the proximal flagellar articles of antenna 2 in the male (sparse setae only in *P. fascigera*); the round eye (pyriform or subovate in *P. fascigera*) the absence of a stout, mid-palmar spine on gnathopod 1 of the male (mid-palmar spine present in *P. fascigera*); having short marginal setae on the oostegites (long marginal setae in *P. fascigera*); the presence of a large, striated, submedian spine on the flexor margin of the propodus of peraeopods 6-7 (no submedian striated spine in *P. fascigera*); and the uniramous third uropod (biramous in *P. fascigera*). Sizes of the two species are similar, however (5-10 mm).

See Ruffo, 1950 (as *Hyale media*); Serejo, 1999 (as *Hyale media*).

Genus *Parhyale* Stebbing, 1897

Regional diagnosis: Eye pyriform or ovate; maxilliped, distolateral margins of basal portion of inner and outer plates and palp articles 1-2, spines slender or lacking; palp article 3, outer surface with brush of dense setae distally; peraeon 2 of female, preamplexing notch poorly developed; coxa 1, posterior margin with small cusp; peraeopods 5-7, propodus without very large, striate spine just distal to midpoint of flexor margin; peraeopod 7, dactyl small, slender, approximately one third length of propodus; oostegites of female with long marginal setae; uropod 3 biramous, inner ramus minute.

Florida species: *P. fascigera*, *P. hawaiiensis*

Remarks: Subadult males in the genus *Parhyale* have a produced carpal lobe on gnathopod 2, which may cause them to be mistaken for members of the genus *Allorchestes*, a cool water, Pacific genus (Hendrycks and Bousfield, 2001). However, the palp of maxilla 1, although reduced, reaches the distal end of the outer plate, the peduncle of uropod 1 has a large interramal spine, uropod 3 has a minute inner ramus and the telson is cleft to the base in *Parhyale*, whereas *Allorchestes* has the palp of maxilla 1 minute or lacking, no large interramal spine on the peduncle of uropod 1, no inner ramus on uropod 3 and a less deeply cleft telson (cleft in the distal one fourth). The carpal lobe on gnathopod 2 disappears and is not present in adult males of *Parhyale* (Shoemaker, 1956).

KEY TO FLORIDA SPECIES OF *PARHYALE*

1. < Gnathopod 1 of male, propodus with stout, mid-palmar spine; gnathopod 2, basis, anteroventral margin unproduced; peraeopods 6-7, propodus, extensor margin without spines; uropods 1-2, outer ramus without marginal spines *Parhyale fascigera*

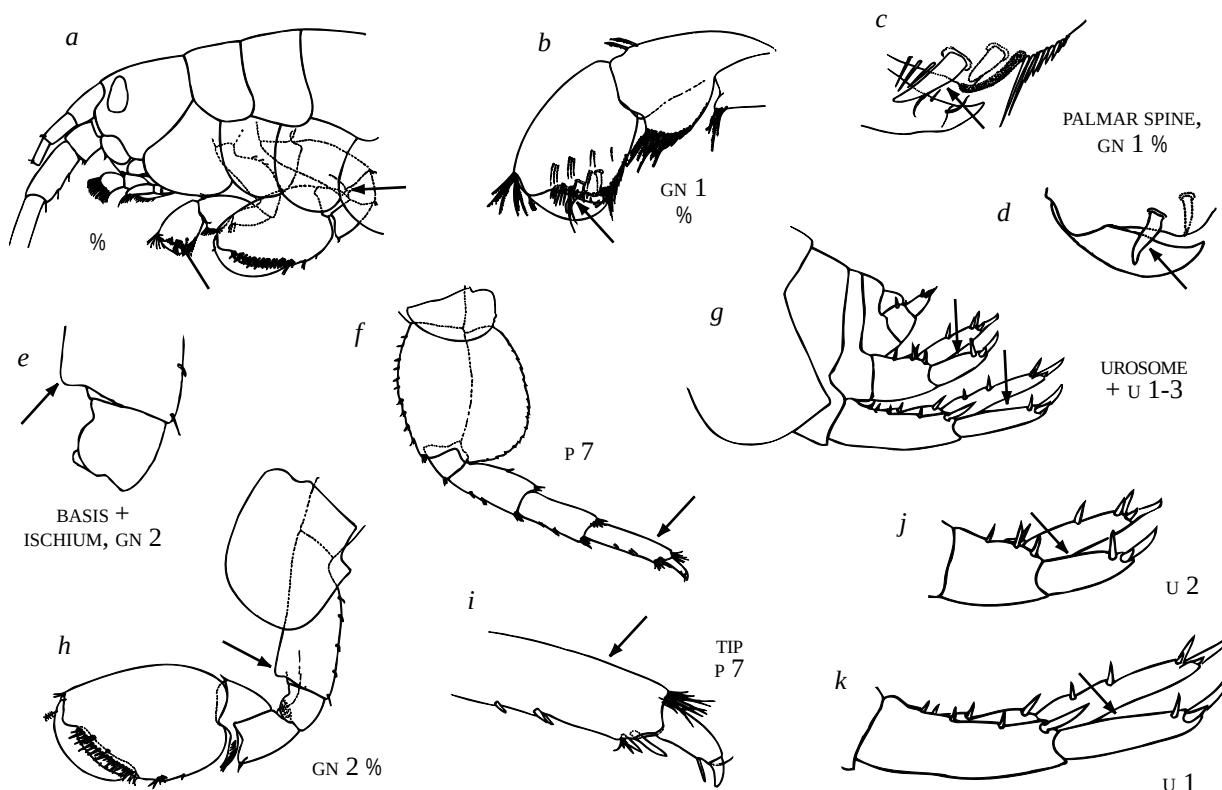


Figure 463.

< Gnathopod 1 of male, propodus without mid-palmar spine; gnathopod 2, basis, anteroventral margin produced ventrally; pereopods 6-7, propodus, extensor margin with spines; uropods 1-2, outer ramus with marginal spines..... *Parhyale hawaiiensis*

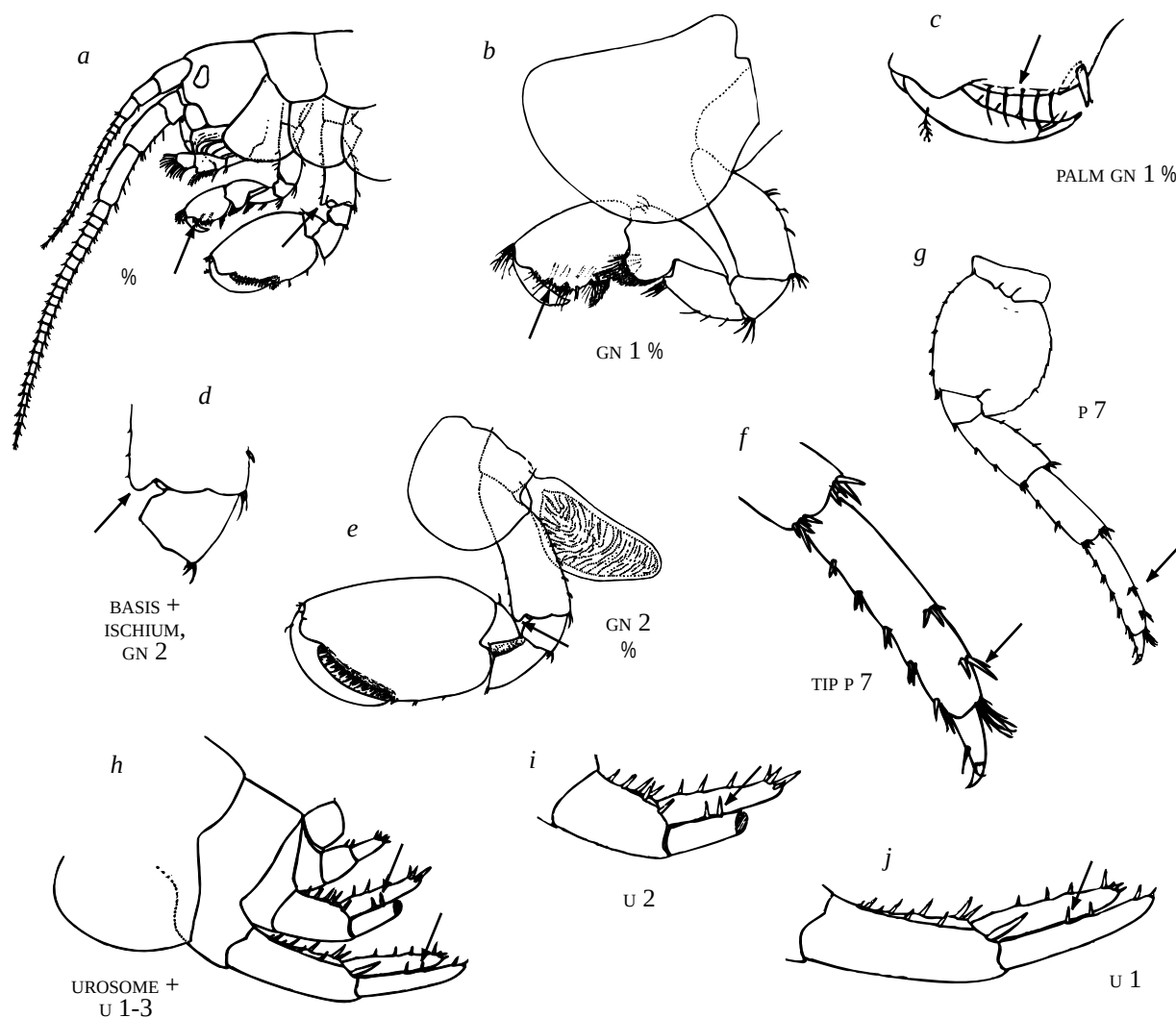


Figure 464.

***Parhyale fascigera* Stebbing, 1897
(Figure 463)**

Parhyale fasciger Stebbing, 1897, p. 26, pl. 6.

Parhyale fascigera: Stebbing, 1906, p. 556.

Hyale brevipes: Shoemaker, 1933b, p. 18, figs 10-11.

Hyale hawaiiensis: Shoemaker, 1942, p. 18.

Regional diagnosis: Gnathopod 1 of male, propodus with stout, mid-palmar spine; gnathopod 2, basis, anteroventral margin unproduced; peraeopods 6-7, propodus, extensor margin without spines; uropods 1-2, outer ramus without marginal spines.

Distribution: Lower Maticumbe Key and Gasparilla Sound, Florida; Florida, Texas and the Caribbean (Shoemaker, 1956); Brazil (Wakabara and Serejo, 1998); eastern Pacific from Mexico to Peru and the Galapagos Islands (Shoemaker, 1956).

Ecology: This species is found on beaches, intertidally in small tidepools under stones (pers. obs.) or supratidally under small stones and debris on the upper beach (Shoemaker, 1933, as *Hyale brevipes*).

Remarks: *Parhyale fascigera* appears to be much less common in Florida waters than its congener, *P. hawaiiensis*. The two species can be easily separated by the spination of the propodus of peraeopods 6-7 (spines absent on the extensor margin in *P. fascigera*; spines present on the extensor margin in *P. hawaiiensis*) and the spination of uropods 1-2 (outer ramus without marginal spines in *P. fascigera*; with marginal spines in *P. hawaiiensis*). In addition, males of *P. fascigera* have a stout mid-palmar spine on gnathopod 1 of the male; this spine is lacking in *P. hawaiiensis*. Adult size in *P. fascigera* ranges from 5 to 10 mm.

Parhyale fascigera can be distinguished from all other Florida hyalid species except *Apohyale media* by the absence of marginal spines on the outer ramus of uropods 1-2 (see Remarks section for *A. media* for a discussion of the differences between these two species).

See Shoemaker, 1933b (as *Hyale brevipes*); Shoemaker, 1956.

***Parhyale hawaiiensis* (Dana, 1853)**
(Figure 464)

Allorchestes hawaiiensis Dana, 1853, p. 900, pl. 61, fig. 5.
Hyale brevipes Chevreux, 1901, p. 400, figs. 15-18.
Hyale hawaiiensis: Stebbing, 1906, p. 573.
Hyale trifoliadens Kunkel, 1910, p. 72, fig. 27.
Hyaloides dartevellei Schellenberg, 1939, p. 126, figs. 6-10.
Allorchestes chelonitis Oliveira, 1953, p. 353, pls. 20-21.
Parhyale inyacka: Barnard, 1955a, p. 23, fig. 12 [not *Parhyale inyacka* (K.H. Barnard, 1916)]
Parhyale hawaiiensis: Shoemaker, 1956, p. 349, figs. 3-4.

Regional diagnosis: Gnathopod 1 of male, propodus without mid-palmar spine; gnathopod 2, basis, anteroventral margin produced ventrally; pereopods 6-7, propodus, extensor margin with spines; uropods 1-2, outer ramus with marginal spines.

Distribution: Cosmopolitan in tropical and warm temperate regions. In the western Atlantic, this species is found from North Carolina to Brazil, including the Gulf of Mexico (Shoemaker, 1956; Thomas, 1976; Wakabara and Serejo, 1998; Serejo, 1999).

Ecology: *Parhyale hawaiiensis* occurs in a variety of habitats across a fairly wide range of salinities. It is most commonly found in bays and estuaries (Shoemaker, 1956) at low to mid salinities, although it can occur at salinities as high as 30 ppt. It is usually found in the intertidal or shallow subtidal zone among algae and other fouling growth on hard substrates, including piers and jetties (McKinney, 1977), oyster beds (Nelson, 1995), mangroves (Serejo, 1999) and coral rock (pers. obs.). However, this species has also been reported to tunnel in the root system of *Spartina* marshes (Thomas, 1976) and live intertidally on wet sand under shells (Richard W. Heard, pers. comm.).

Remarks: *Parhyale hawaiiensis* is the most common hyalid in Florida waters and, fortunately, is one of the easiest to recognize. It is the only Florida hyalid species with spines on the extensor margin of the propodus of pereopods 6-7, making this a good character to use to quickly spot this species. Additional useful features are the pyriform or ovate eyes and the distal brush of dense setae on the outer surface of the maxilliped palp article 3; all other Florida hyalids except for *Parhyale fascigera* have round eyes and have a much less dense setal brush on the maxilliped (although there are usually some setae evident in this position). See the Remarks section for *P. fascigera* for characters separating these two species.

Parhyale hawaiiensis is generally a relatively large species, but adult size can be quite variable, ranging from 5 to 12 mm. Males are usually larger than females and the brush of long setae on palp article 3 of the maxilliped is usually denser in males than in females.

See Shoemaker, 1956; Serejo, 1999.

Genus *Protohyale* Bousfield and Hendrycks, 2002

Regional diagnosis: Eye round; maxilliped, distolateral margins of basal portion of inner and outer plates and palp articles 1-2, spines robust; palp article 3, outer surface without brush of dense setae distally; peraeon 2 of female, preamplexing notch well-developed; coxa 1, posterior margin with very weak or no cusp (shelf may be present); peraeopods 5-7, propodus without very large, striate spine just distal to midpoint of flexor margin; peraeopod 7, dactyl large, stout, approximately one half length of propodus; oostegites of female with long marginal setae; uropods 2-3, outer ramus with marginal spines; uropod 3 uniramous.

Florida species: *Protohyale* sp. A, *Protohyale* sp. B, *Protohyale* sp. D

Remarks: Another species of hyalid which may occur in Florida waters, although it has yet to be reported from there, is *Hyale galateae* Stebbing, 1899. It was apparently not included in Bousfield and Hendrycks' (2002) revision of the Hyalidae and is currently retained in the genus *Hyale*, although it should probably be placed in *Protohyale* based upon their keys and diagnoses. This species lives in floating *Sargassum* and occurs in the Sargasso Sea (Stebbing, 1899), Bermuda (Shoemaker, 1945) and off the Texas coast (pers. obs.), as well as in the Pacific (Stebbing, 1899). Texas material keys out to this species readily in the *Hyale* key in Barnard (1965) and can be distinguished from other Florida hyalids by the very large eye, the short unguis (terminal seta) on the palp of the maxilliped, the large median process or "hump" on the anterior margin of the propodus of gnathopod 1 in the male and the two relatively short distolateral (interramal) spines on the peduncle of uropod 1.

There is also a small (3-4 mm) species of hyalid that occurs in the Dry Tortugas, but has not been found elsewhere in Florida. No material was available for study and notes based on the previous examination of a few specimens in the uncatalogued collections of the National Museum of Natural History were not sufficient to adequately determine its status. It is probably a *Protohyale* (*Protohyale* sp. C) and appears similar to *Hyale pygmaea* Ruffo, 1950, a species from Venezuela that was also not included in Bousfield and Hendrycks' (2002) revision of the family. In this species, antenna 2 of the male has moderately long, non-plumose setae on the distoventral margins of the peduncular and proximal flagellar articles. Gnathopod 2 of the male is very similar to that illustrated by Ruffo (1950) for *H. pygmaea*, with a broadly expanded anterodistal lobe on the basis and a short, oblique palm lined with stout non-plumose spines and simple setae. The distal clasping spines on the peraeopod propodi are weakly striate and slightly unequal in size; gnathopod 2 of the female is subrectangular, with a single median spine on the posterior margin; and uropod 1 has a strong interramal spine on the peduncle. It is similar to *Protohyale* sp. D from the Florida Keys; however, the setation of antenna 2 of the male and the more oblique palm of gnathopod 2, as well as the lack of a distinct posterior marginal shelf on coxa 2 of both sexes in the Dry Tortugas material, would seem to indicate that they are different species. However, further examination of material from the Dry Tortugas will be necessary to clarify its status.

KEY TO FLORIDA SPECIES OF *PROTOHYALE*

1. < Coxa 1 of male with distinct shelf on posterior margin; gnathopod 1 of male, palmar angle rounded, indistinct, posterior margin of propodus straight; gnathopod 2 of male, palm sinuous, longer than hind margin of propodus, lined with long, distally plumose setae, without stout spines; pereopod 7, posterior margin of basis without blunt serrations (may be weakly scalloped), with strong median or submedian notch; uropod 2, inner ramus with 1 marginal spine *Protohyale* sp. A

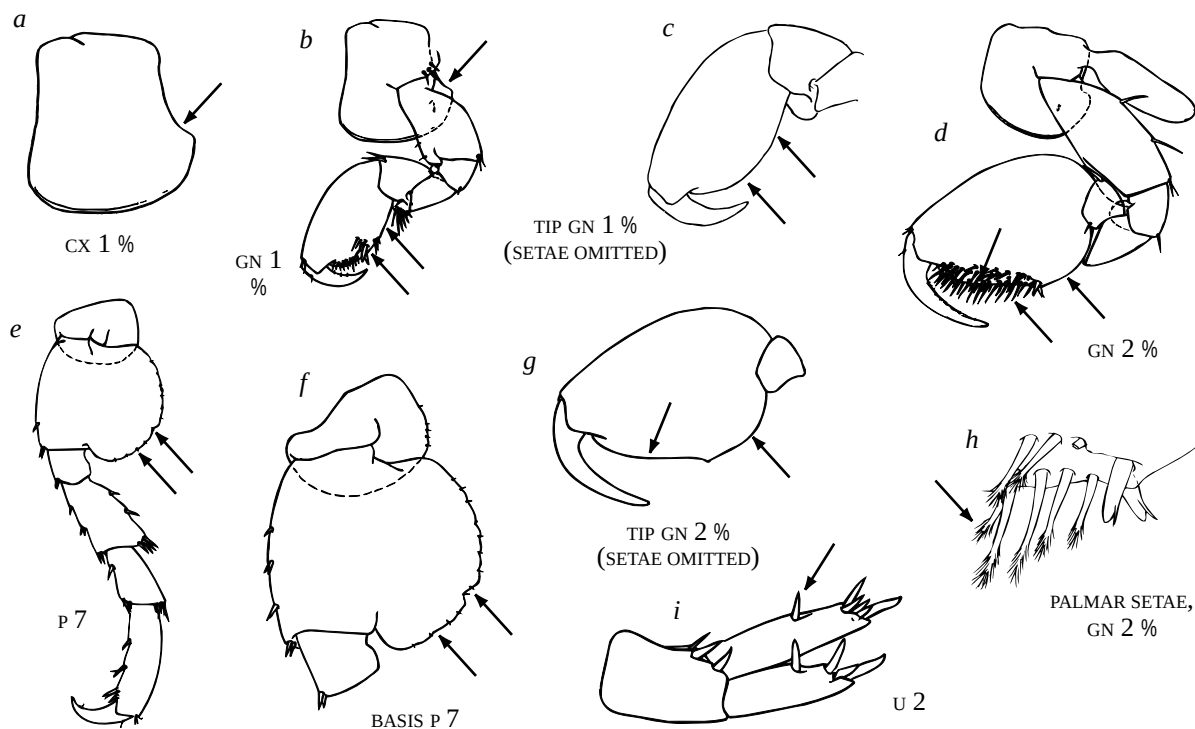


Figure 465.

< Coxa 1 of male lacking distinct shelf on posterior margin; gnathopod 1 of male, palmar angle distinct, subacute, posterior margin of propodus sinuous; gnathopod 2 of male, palm straight, subequal to or slightly shorter than hind margin of propodus, without long, distally plumose setae, with stout spines; peraeopod 7, posterior margin of basis with blunt serrations, especially distally, without median or submedian notch; uropod 2, inner ramus with 2 marginal spines

2

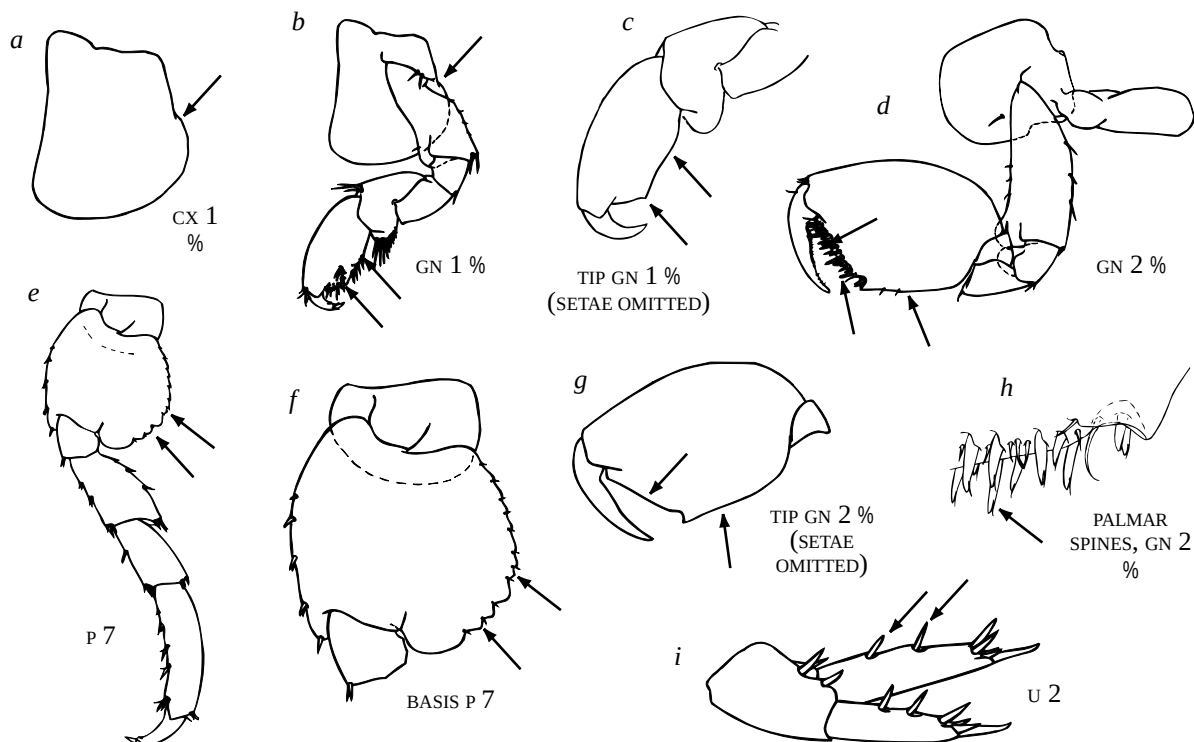


Figure 466.

2. < Antenna 2 of male, flagellum with 24 articles; eye large; coxa 1 of female with distinct shelf on posterior margin; gnathopods 1-2 of female relatively large, propodus subequal to corresponding coxa in length; gnathopod 2 of female larger than gnathopod 1, ischium with strong, rounded anterior lobe; peraeopod 5 of female, propodus slender, length approximately 3 times width; peraeopods 5-7, distal claspingspines of propodus unequal in size *Protohyale* sp. B

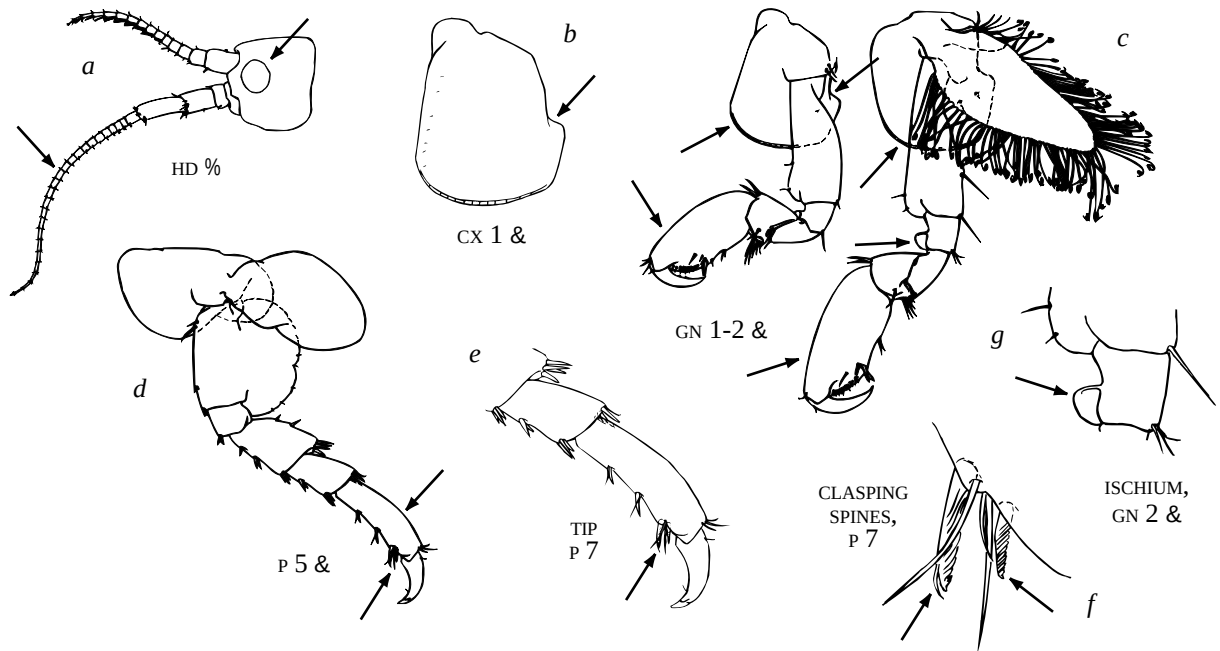


Figure 467.

- < Antenna 2 of male, flagellum with 16 articles; eye small; coxa 1 of female lacking distinct shelf on posterior margin; gnathopods 1-2 of female relatively small, propodus approximately half corresponding coxa in length; gnathopod 2 of female subequal to gnathopod 1, ischium without strong, rounded anterior lobe; peraeopod 5 of female, propodus stout, length approximately twice width; peraeopods 5-7, distal claspingspines of propodus subequal in size *Protohyale* sp. D

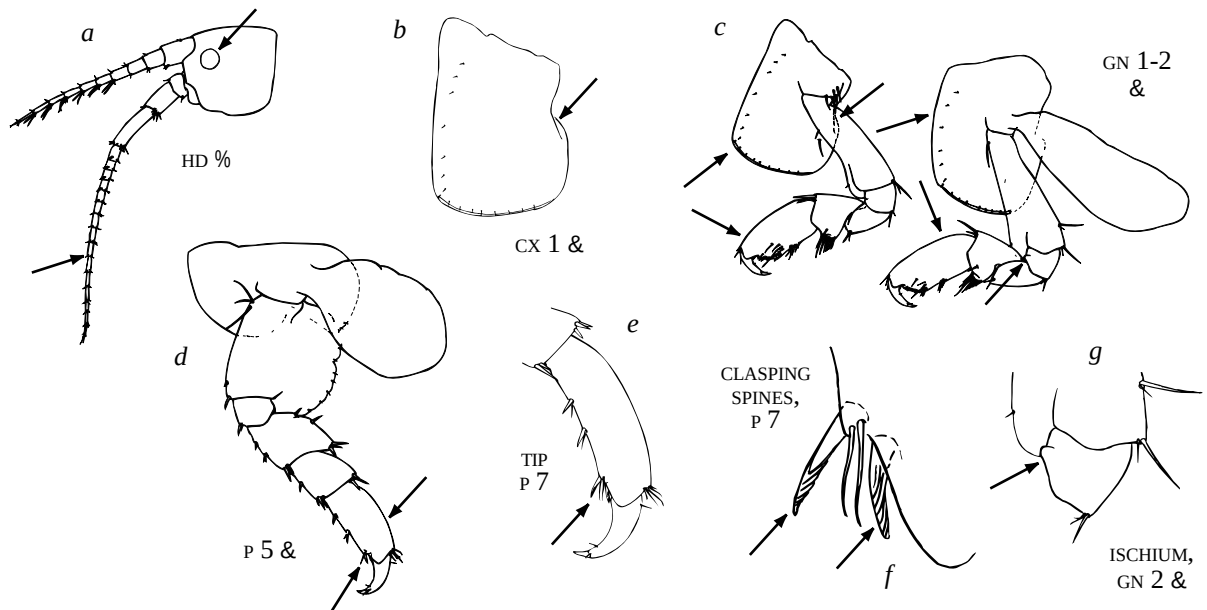


Figure 468.

***Protohyale* sp. A**
(Figure 465)

Regional diagnosis: Antenna 2 of male, flagellum with 20 articles; eye large; coxa 1 of both sexes with distinct shelf on posterior margin; gnathopod 1 of male, palmar angle rounded, indistinct, posterior margin of propodus straight; gnathopod 2 of male, palm sinuous, longer than hind margin of propodus, lined with long, distally plumose setae, without stout spines; gnathopods 1-2 of female relatively large, propodus subequal to corresponding coxa in length; gnathopod 2 of female slightly larger than gnathopod 1, ischium with strong, rounded anterior lobe; peraeopods 5-7, distal clasping spines of propodus unequal in size; peraeopod 5 of female, propodus slender, length approximately 3 times width; peraeopod 7, posterior margin of basis without blunt serrations (may be weakly scalloped), with strong median or submedian notch; uropod 2, inner ramus with 1 marginal spine.

Distribution: Hutchinson Island, Florida.

Ecology: *Protohyale* sp. A occurs intertidally and subtidally among algae on hard substrates, including sabellariid worm rocks, on relatively high salinity, high energy beaches.

Remarks: *Protohyale* sp. A is near *P. macrodactyla* Stebbing, 1899, a Caribbean, southern Atlantic and western Indian Ocean species, and can be characterized as a member of the *macrodactyla* subgroup of species based on the setose, distally narrowing propodus of gnathopod 2 in the male, combined with the stout propodus of the male gnathopod 1 (Bousfield and Hendrycks, 2002). It differs from *P. macrodactyla* in the shorter flagellum of antenna 2 in the male (28 articles in *P. macrodactyla*; 20 articles in *Protohyale* sp. A); the length of the palm of gnathopod 2 in the male (extends along entire length of the propodus in *P. macrodactyla*; approximately two thirds the length of the propodus in *Protohyale* sp. A); the length of the dactyl of gnathopod 2 in the male (extending along entire palm in *P. macrodactyla*; extending approximately three fourths the length of the palm in *Protohyale* sp. A); the relative sizes of the clasping spines on peraeopods 3-7 (greatly dissimilar in size in *P. macrodactyla*; moderately dissimilar in size in *Protohyale* sp. A); and the spination of uropod 2 (2 marginal spines on the inner ramus in *P. macrodactyla*; 1 marginal spine in *Protohyale* sp. A). The Hutchinson Island material of *Protohyale* sp. A, although adult, is smaller (3-5 mm) than Brazilian material of *P. macrodactyla* examined by Serejo (1999) (5-7 mm) and it is possible that some, if not all, of these differences are size-related.

Male *Protohyale* sp. A are easily separated from other Florida species of *Protohyale* by the elongate, sinuous palm of gnathopod 2 lined with long plumose setae (short palm lined with stout spines in *Protohyale* spp. B and D). Females are more difficult to distinguish, but may be recognized by a combination of a large eye, relatively large gnathopods 1-2, the presence of an anterior lobe on the ischium of peraeopods 3-4 and having only 1 spine on the inner ramus of uropod 2.

It is very likely that the relatively restricted distribution of this species is a result of inadequate sampling and does not accurately reflect the actual distribution.

***Protohyale* sp. B**
(Figure 467)

Regional diagnosis: Antenna 2 of male, flagellum with 24 articles; eye large; coxa 1 of male lacking distinct shelf on posterior margin, that of female with distinct shelf; gnathopod 1 of male, palmar angle distinct, subacute, posterior margin of propodus sinuous; gnathopod 2 of male, palm straight, subequal to or slightly shorter than hind margin of propodus, without long, distally plumose setae, with stout spines; gnathopods 1-2 of female relatively large, propodus subequal to corresponding coxa in length; gnathopod 2 of female larger than gnathopod 1, ischium with strong, rounded anterior lobe; peraeopods 5-7, distal clasping spines of propodus unequal in size; peraeopod 5 of female, propodus slender, length approximately 3 times width; peraeopod 7, posterior margin of basis with blunt serrations, especially distally, without median or submedian notch; uropod 2, inner ramus with 2 marginal spines.

Distribution: Hutchinson Island, Florida.

Ecology: *Protohyale* sp. B occurs in the same habitats as *Protohyale* sp. A and may be present in the same samples. It is found intertidally and subtidally among algae on hard substrates, including sabellariid worm rocks, on relatively high salinity, high energy beaches.

Remarks: Material of this species from Florida is similar to that described by Serejo (1999) from Brazil as *Hyale nigra* (Haswell, 1879), which, although it was apparently not included in the revision of Bousfield and Hendrycks (2002), should probably be placed in the genus *Protohyale* based upon their keys and diagnoses. *Protohyale* sp. B differs from Brazilian *H. nigra* material in the greater number of articles in the flagellum of antenna 2 in the male (24 vs 16); the presence of an anteroventral lobe of the ischium of gnathopods 1-2 in the female (absent in *H. nigra*); the large, unequally sized gnathopods in the female (female gnathopods small and subequal in *H. nigra*); and in the slightly dissimilar sizes of the distal clasping spines on peraeopods 5-7 (spines similar in size in *H. nigra*). These clasping spines appear to be more dissimilar in size in smaller individuals than in larger. There is also some variation in the degree of serration on the posterior margin of the basis of peraeopod 7, with females and smaller individuals often having somewhat weaker serrations than larger individuals. The most pronounced serrations are those of large males. In addition, *Protohyale* sp. B is smaller than *Hyale nigra*, with adult sizes ranging from 4 to 6 mm (6-8 mm in *H. nigra*).

Among Florida species of *Protohyale*, *Protohyale* sp. B is most similar to *Protohyale* sp. D, a species which even more closely resembles *H. nigra*. See the Remarks section for *Protohyale* sp. D for characters distinguishing these two species.

As is true for *Protohyale* sp. A, the actual distribution of *Protohyale* sp. B will probably be found to be broader than indicated herein once more extensive sampling occurs.

***Protohyale* sp. D**
(Figure 468)

Regional diagnosis: Antenna 2 of male, flagellum with 16 articles; eye small; coxa 1 of both sexes lacking distinct shelf on posterior margin; gnathopod 1 of male, palmar angle distinct, subacute, posterior margin of propodus sinuous; gnathopod 2 of male, palm straight, subequal to or slightly shorter than hind margin of propodus, without long, distally plumose setae, with stout spines; gnathopods 1-2 of female relatively small, propodus approximately half corresponding coxa in length; gnathopod 2 of female subequal to gnathopod 1, ischium without strong, rounded anterior lobe; pereopod 5 of female, propodus stout, length approximately twice width; pereopods 5-7, distal clasping spines of propodus subequal in size; pereopod 7, posterior margin of basis with blunt serrations, especially distally, without median or submedian notch; uropod 2, inner ramus with 2 marginal spines.

Distribution: Hutchinson Island, Florida; Florida Keys.

Ecology: *Protohyale* sp. D occurs in high salinity waters among algae and other fouling growth on hard substrates such as sabellariid worm rocks, coral rock and rubble. It is found intertidally to depths of 2 m in both low and high energy environments and may cooccur with *Protohyale* sp. B at Hutchinson Island, Florida.

Remarks: This species is very close to *Hyale nigra* of Serejo (1999) from Brazil, differing chiefly in its relatively small size (3-4 mm vs 6-8 mm for *H. nigra*), the small eye (large in *H. nigra*), pereopods 3-7 with 2 spines in addition to the pair of distal clasping spines on the flexor margin of the propodus (3 spines in *H. nigra*), and the somewhat weaker blunt serrations on the posterior margin of the basis of pereopod 7. These differences may all be attributable to the smaller body size of the Florida specimens and *Protohyale* sp. D may ultimately prove to be a small form of *Hyale nigra*.

Protohyale sp. D is also similar to *Protohyale* sp. B from Hutchinson Island, with which it may sometimes cooccur. Although females of the two species may be readily distinguished by eye size (small in *Protohyale* sp. D; large in *Protohyale* sp. B), the relative size of the gnathopods (propodus of gnathopod 1-2 subequal in size and approximately half length of corresponding coxa in *Protohyale* sp. D; gnathopod 2 larger than gnathopod 1, both subequal to corresponding coxa in *Protohyale* sp. B) and the presence or absence of an anterior ischial lobe (absent in *Protohyale* sp. D; present in *Protohyale* sp. B), males are more difficult to separate. As in females, the eye size differs between the two species and *Protohyale* sp. D is smaller than *Protohyale* sp. B. The clasping spines on the propodus of pereopods 5-7 are generally subequal in size in *Protohyale* sp. D and unequal in size in *Protohyale* sp. B, although this may vary somewhat. Also, the flagellum of antenna 2 is shorter in *Protohyale* sp. D (16 articles) than in *Protohyale* sp. B (24 articles).

Family Iphimediidae Boeck, 1871

Regional diagnosis: Mouthpart bundle conical, projecting ventrally; body laterally compressed; peraeon segments not strongly carinate, peraeon 7 and pleon 1-3 with pair of strong dorsal teeth or processes; coxae not splayed; gnathopod 1 minutely chelate; gnathopods 1-2, article 3 elongate, at least twice as long as wide; urosome segments 1-3 separate; telson entire.

Florida genera: *Iphimedia*

Remarks: Although iphimediids were previously considered to be members of the family Acanthonotozomatidae, current workers in the group retain their status as a separate family (Coleman and Barnard, 1991; Thomas and Barnard, 1991; Martin and Davis, 2001; Coleman and Lowry, 2006), distinguished from the acanthonotozomatids by the presence of at least one pair of chelate gnathopods (Coleman and Barnard, 1991). Most members of the family are residents of polar waters and *Iphimedia* is the only genus known to occur in the tropics (Thomas and Barnard, 1991).

Genus *Iphimedia* Rathke, 1843

Regional diagnosis: That of the family.

Florida species: *I. zora*

Iphimedia zora Thomas and Barnard, 1991 (Volume 1, Figures 18b, 19)

Iphimedia zora Thomas and Barnard, 1991, pp. 475-478, figs. 4-6.

Regional diagnosis: That of the family.

Distribution: Florida Keys (Thomas, 1993).

Ecology: *Iphimedia zora* occurs on the forereef in the algal “lawns” maintained in stands of staghorn coral (*Acropora cervicornis*) by the three-spot damselfish (*Eupomacentrus planifrons*) (Thomas and Barnard, 1991; Thomas, 1993). It is found at depths of 3-10 m.

Remarks: This species, although uncommon, is very distinctive in appearance. The color in life is brownish-black with flecks of grey or white (Thomas, 1993) and it is approximately 5.5 mm in length (Thomas and Barnard, 1991). In addition to the strong, paired dorsal processes on peraeon segment 7 and the pleon segments, *I. zora* has very slender, elongate gnathopods 1-2, a very reduced palp on maxilla 1 that only reaches halfway to the tip of the outer plate, and a third epimeral plate with two large, posteroventral processes.

See Thomas and Barnard, 1991; Thomas, 1993

Family Ischyroceridae Stebbing, 1899

Regional diagnosis: Antenna 1 not strongly geniculate between peduncle articles 1 and 2, peduncle article 1 not greatly enlarged, not overhanging articles 2-3, accessory flagellum minute or vestigial; antenna 2 subequal to or longer than antenna 1, peduncle article 4 without distal processes or teeth; head not globular, buccal mass not exceptionally large relative to size of head, ocular lobe moderately to narrowly produced anteriorly, bearing eye; eyes small, lateral; mandible with molar and palp; maxilliped palp article 4 normally developed, not vestigial (may be somewhat reduced); coxae 1-4 (occasionally only 1-2) shallow, extending only slightly beyond proximal end of basis; coxae 1-2 not reduced relative to coxae 3-4, subequal to or slightly longer than following coxae; gnathopod 1 well-developed, subequal to or smaller than gnathopod 2; gnathopod 2, ischium not elongate, less than twice as long as wide; pereopods 3-4, basis, anterior margin expanded medially or distally; pereopod 5 not doubly geniculate at merus; pereopod 7 not slender and attenuate distally; urosome segments 1-3 separate, segment 1 not elongate, usually less than twice as long as segment 2 (if more than twice as long, then deeper than long); telson short, fleshy.

Florida genera: *Caribboecetes*, *Cerapus*, *Ericthonius*, *Jassa*

Remarks: Two species of a fifth genus of ischyrocerid, *Microjassa* Stebbing, 1899, occur in the deeper waters (29-54 m) off Panama City, Florida (Conlan, 1995). These two species, *M. floridensis* Conlan, 1995, and *M. tetradonta* Conlan, 1995, are residents of the fouling community attached to submerged floats in that area. Members of this genus resemble species belonging to the genus *Jassa* in the general morphology of gnathopod 2 in the male, the morphology of the antennae, the biramous third uropods and the subtriangular telson. However, they can be distinguished from those species by having coxae 2-4 deeper than coxae 1 and 5, having an excavate posterior margin on coxa 4 and having the female gnathopod 2 similar to gnathopod 1 in size and morphology. They are also quite small, with adults ranging in size from 2 to 3 mm. Conlan (1995) has recently revised the genus *Microjassa* and provides the descriptions of six new species (including the two Florida species), as well as a key to world species in the genus.

An additional genus of ischyrocerid, *Neoischyrocerus* Conlan, 1995, formerly known only from Pacific waters, has recently been reported from Cuba by Ortiz and Lalana (2002), although it has not been found in Florida to date. *Neoischyrocerus vidali* Ortiz and Lalana, 2002 differs from Florida ischyrocerid species in the backward-directed thumb on the propodus of gnathopod 2 in the adult male, the large distal clasping spines on the propodus of pereopods 3-7, and the extremely elongate peduncle of uropod 3.

Although the subfamily Siphonoecetinae, which includes *Caribboecetes*, was originally placed in the family Corophiidae by Just (1983, 1984), it was removed to the family Ischyroceridae by Barnard and Karaman (1991) and this placement was followed by Just (1998). The inclusion of the siphonoecetines within the family Ischyroceridae was supported by the recent phylogenetic analysis of the Corophiidea by Myers and Lowry (2003); however, the status of the group was changed to that of a tribe, the Siphonoecetini, within the subfamily Ischyrocerinae. *Cerapus* and *Ericthonius* were also placed within this tribe, whereas *Jassa* and *Microjassa* were placed in the tribe Ischyrocerini. *Neoischyrocerus* was apparently not included in the analysis, but would probably fall within the Ischyrocerini as well.

KEY TO FLORIDA GENERA OF ISCHYROCERIDAE

1. < Rostrum strong, down curved; mandibular palp short, not extending beyond tip of incisor process, 2-articulate, terminal article greatly reduced; gnathopod 1 simple; gnathopod 2 not strongly sexually dimorphic, carpus or propodus not greatly enlarged, palm lined with stout spines; pereopod 5 geniculate at carpus; uropod 1, inner ramus one third or less length of outer ramus; uropod 2 absent; uropod 3 lacking rami. *Caribboecetes*

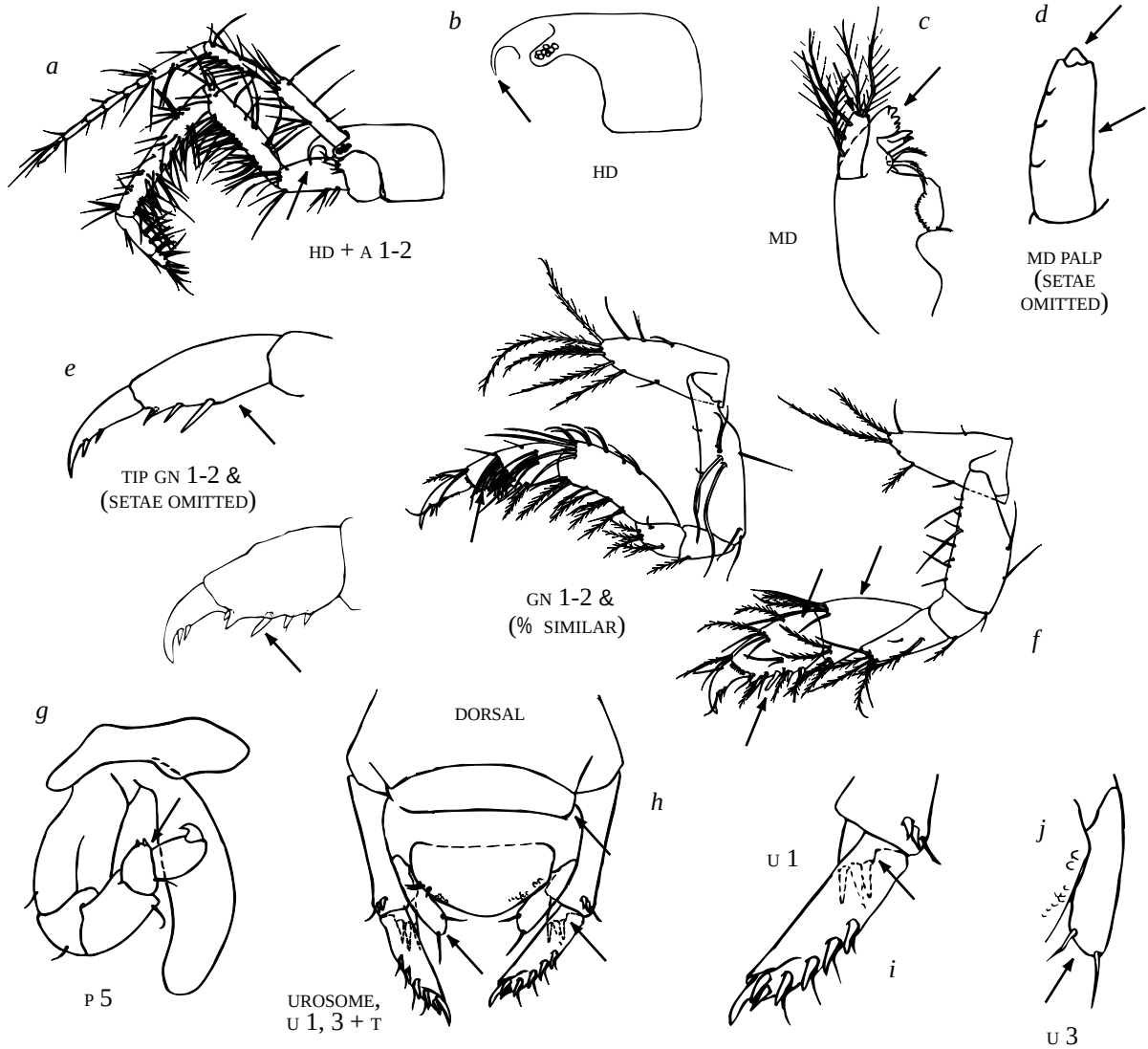


Figure 469.

< Rostrum short and straight or absent; mandibular palp long, extending well beyond tip of incisor process, 3-articulate, terminal article not reduced; gnathopod 1 subchelate; gnathopod 2 strongly sexually dimorphic, carpus or propodus of male greatly enlarged, palm of both sexes not lined with stout spines; peraeopod 5 not geniculate at carpus; uropod 1, inner ramus more than half length of outer ramus; uropod 2 present; uropod 3 uniramous or biramous 2

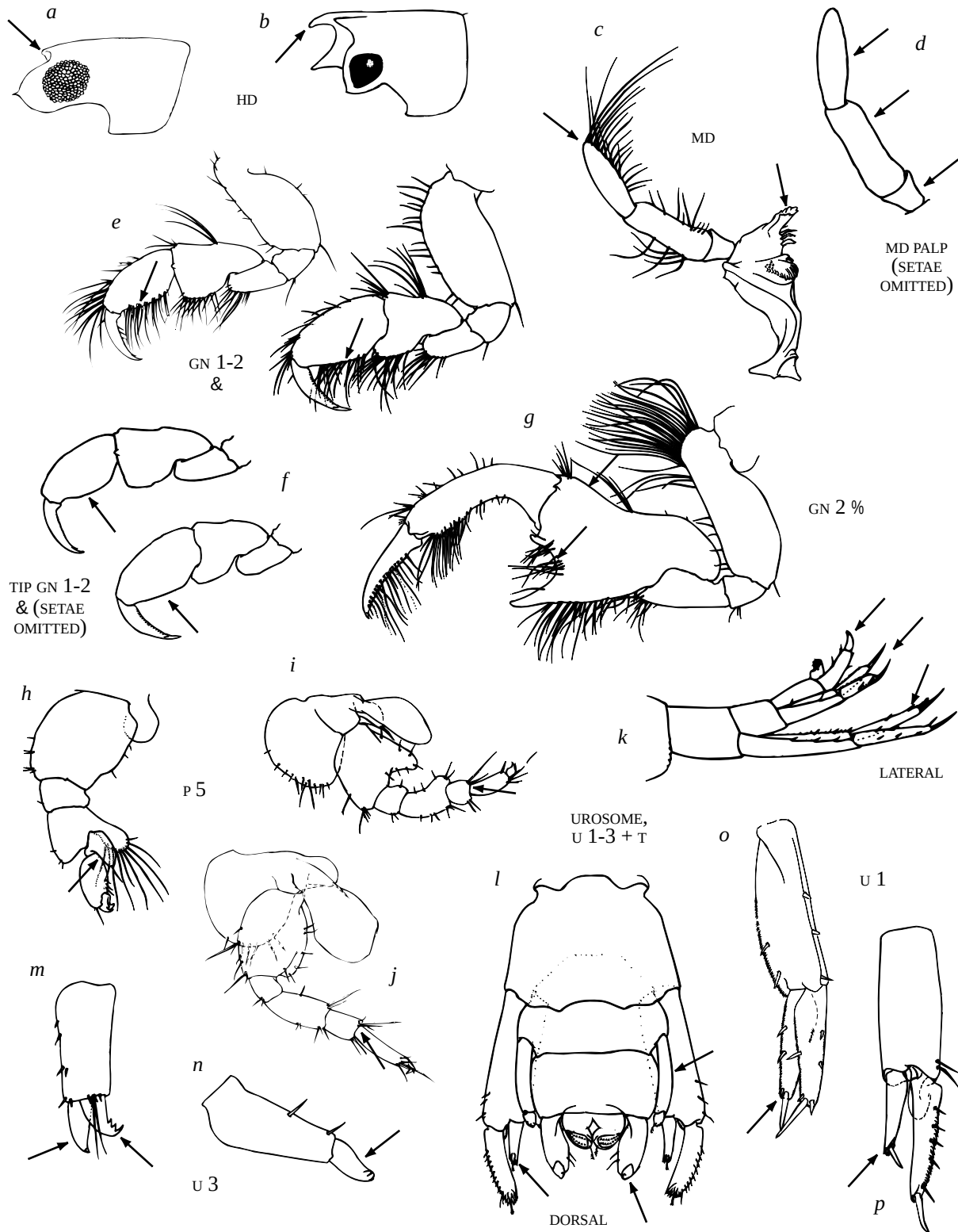


Figure 470.

2. < Coxae 1-4, at least some coxae overlapping; gnathopod 2 of male subchelate, dactyl closing on propodal process; gnathopod 2 of female, propodus, palm concave; peraeopods 3-4, merus produced anteroventrally, anteroventral lobe reaching distal margin of carpus; peraeopod 7 subequal to peraeopod 6 in length; uropod 3 biramous; telson subtriangular *Jassa*

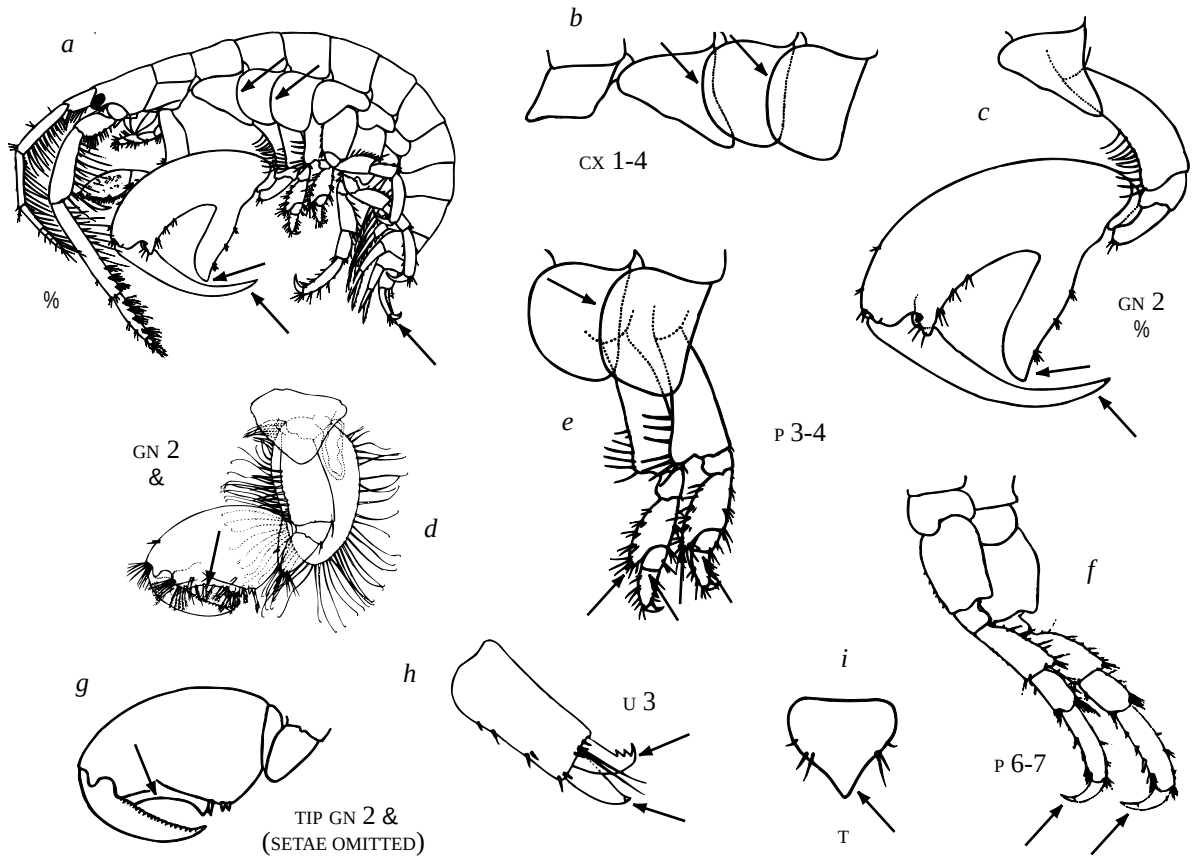


Figure 471.

< Coxae 1-4 separated, not overlapping; gnathopod 2 of male carpochele, dactyl closing on carpal process; gnathopod 2 of female, propodus, palm straight to slightly convex; peraeopods 3-4, merus not produced anteroventrally; peraeopod 7 longer than peraeopod 6; uropod 3 uniramous; telson subrectangular (may be cleft)..... 3

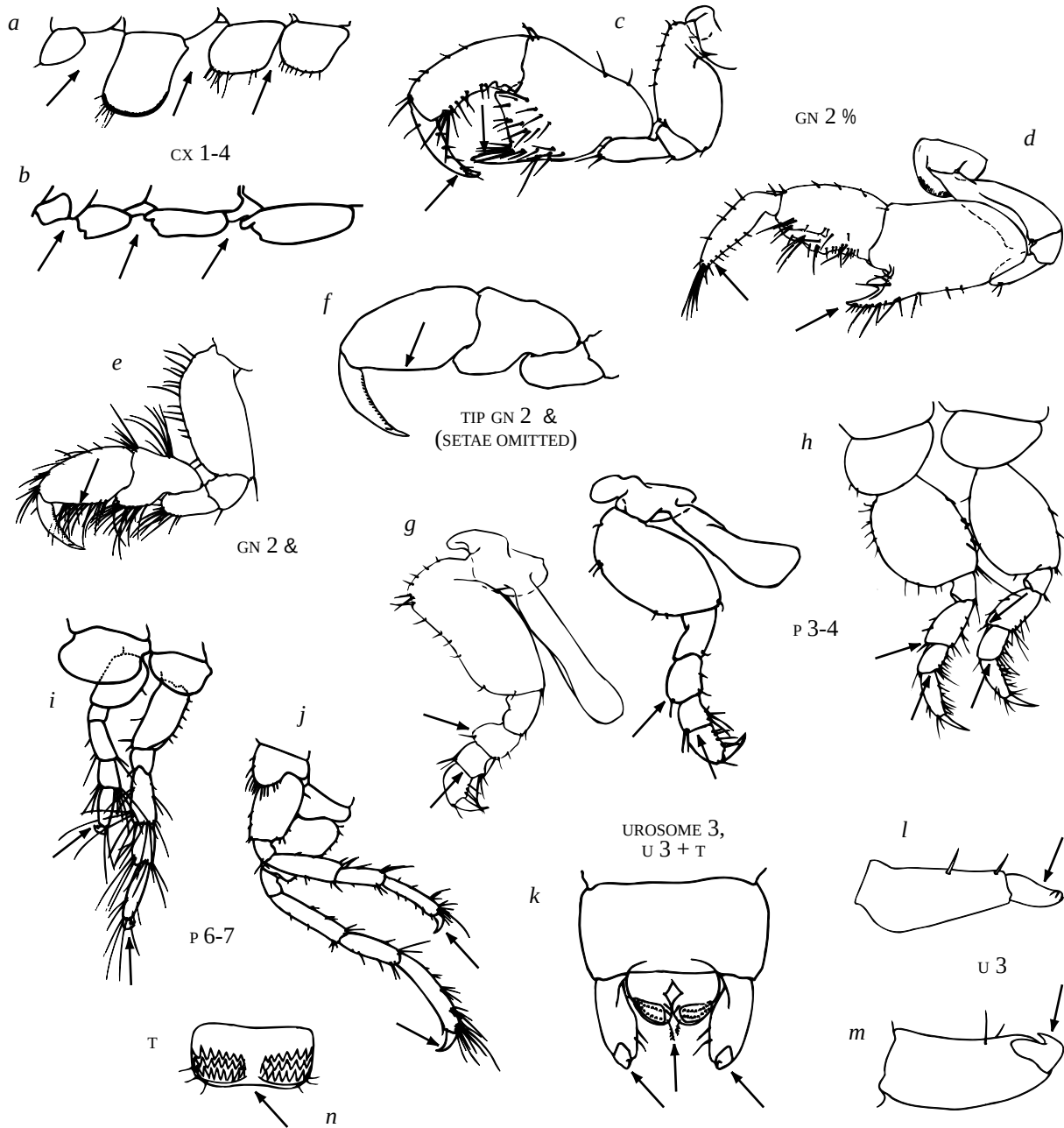


Figure 472.

3. < Antennae 1-2, peduncle articles slender; antenna 1, peduncle article 1 not expanded, similar in width to articles 2-3; pereopod 5 not geniculate at merus, merus subrectangular, not strongly produced posteroventrally (may be slightly produced in male); pleopods 1-3, outer ramus slender, not expanded proximally, pleopods 2-3, rami not reduced, subequal, articulations distinct; uropod 2 biramous; telson entire *Erichthonius*

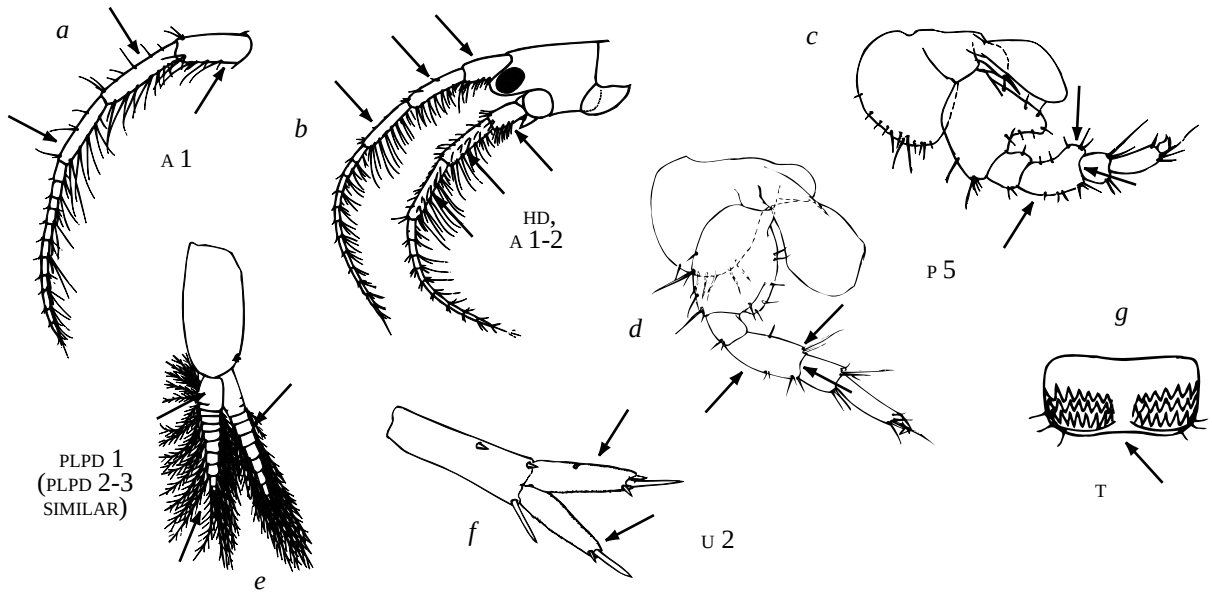


Figure 473.

- < Antennae 1-2, peduncle articles stout; antenna 1, peduncle article 1 expanded, wider than articles 2-3; pereopod 5 geniculate at merus, merus subtriangular, strongly produced posteroventrally to form lobe; pleopods 1-3, outer ramus broad, expanded proximally, pleopods 2-3, rami reduced, inner ramus shorter than outer, articulations indistinct or lacking; uropod 2 uniramous; telson cleft *Cerapus*

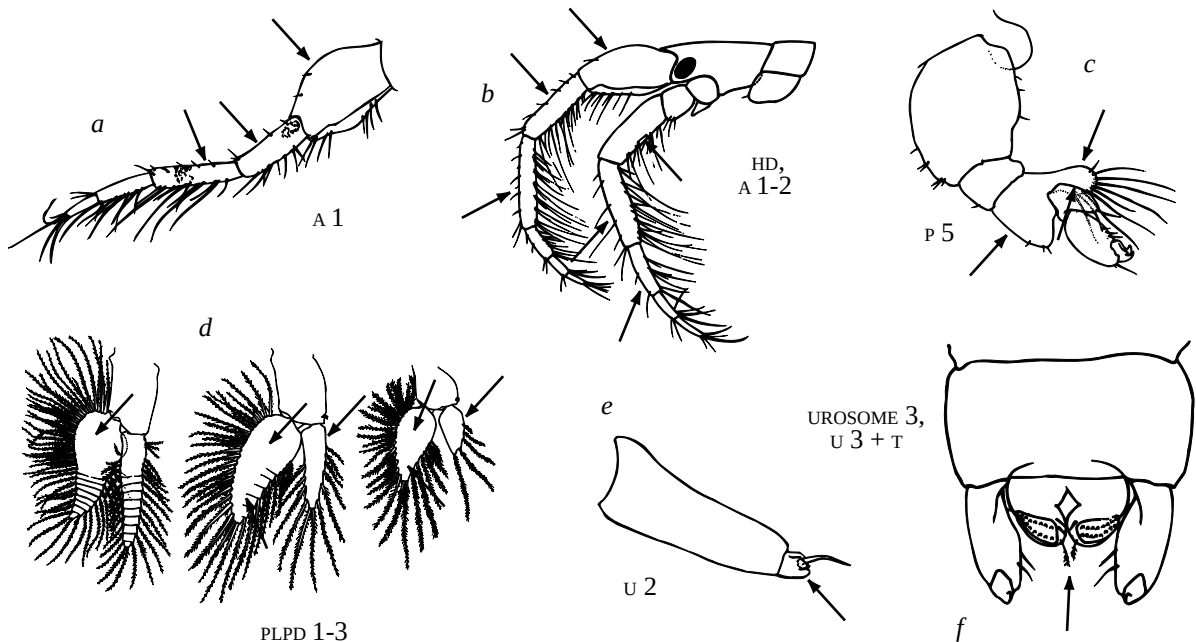


Figure 474.

Genus *Caribboecetes* Just, 1983

Regional diagnosis: Antennae 1-2, peduncle articles moderately slender; antenna 1, peduncle article 1 not expanded, similar in width to articles 2-3; rostrum strong, downcurved; mandibular palp short, not extending beyond tip of incisor process, 2-articulate, terminal article greatly reduced; coxae 1-4 separated, not overlapping; gnathopod 1 simple; gnathopod 2 not strongly sexually dimorphic, propodus not greatly enlarged in either sex, weakly subchelate, palm straight to slightly convex, lined with stout spines, propodal process lacking in male; peraeopod 5 geniculate at carpus, merus subrectangular, not strongly produced posteroventrally; peraeopods 3-4, merus produced anteroventrally, anteroventral lobe reaching distal margin of carpus; peraeopod 7 longer than peraeopod 6; pleopods 1-3, peduncle broadly expanded medially, rami moderately slender, weakly expanded proximally, pleopods 2-3, rami not reduced, inner ramus slightly longer than outer, articulations distinct; uropod 1, inner ramus one third or less length of outer ramus; uropod 2 absent; uropod 3 lacking rami; telson subovate, entire.

Florida species: *Caribboecetes* sp. A

Remarks: Members of this genus are known to inhabit a variety of portable dwellings, including small gastropod shells, polychaete tubes, claw tips from decapod molts and scaphopod shells. To these, they add a characteristic short tube covered with sand, shell or foraminiferans, emerging from the opening of the domicile. Gastropod shells are the most common selection, but the choice of a home is apparently not species specific (Just, 1984). The presence of the short tube at the opening of a small shell is a sure sign that the shell is occupied by a *Caribboecetes* individual rather than the original owner or one of the amphipod's competitors for housing space, such as a small hermit crab or the tanaid *Pagurotanais largoensis* (McSweeney, 1982).

Caribboecetes is readily distinguished from all other known ischyrocerid genera in the region by the well-developed, strongly downcurved rostrum, the very short inner ramus on uropod 1, the lack of uropod 2 and the lack of rami on uropod 3. However, it should be remembered that the rostral description in the regional generic diagnosis presented herein (rostrum strong, downcurved) is only valid in Florida waters; other species of *Caribboecetes* in different areas have a short, straight rostrum or are lacking a rostrum.

***Caribboecetes* sp. A**
(Figure 469)

Regional diagnosis: That of the genus.

Distribution: Biscayne Bay, Florida.

Ecology: This species has been found at depths of 3-4 m on a sand/shell hash bottom near grassbeds and also on a silty, muddy sand bottom with soft corals.

Remarks: *Caribboecetes* sp. A appears to be near *C. pterycornis* Just, 1984 from Barbados. It has the strong, downcurved rostrum that is diagnostic for that species, as well as a lack of transverse rows of setae on the head and peraeon, a smooth posterior margin on coxa 1, and the lateral surface of the basis of peraeopod 7 without an additional row of setae, all of which are characteristic of *C. pterycornis*. However, it does not have a broad, marginally setose lateral “wing” on peduncle 1 of antenna 1; the antennae, especially those of the male, are longer; the eye appears to be somewhat better developed; the first article of the mandibular palp has 3 long plumose setae on the lateral margin (1 long plumose seta and 1 short simple seta in *C. pterycornis*); and the inner ramus on uropod 1 has larger spines, all 3 of which are terminal (smaller spines, with 1 subterminal and 2 terminal in *C. pterycornis*). Also, it is found at much shallower depths than *C. pterycornis*, which occurs at depths of 15-54 m. An additional character, the degree of fusion between the telson and urosome segment 3, appears to be somewhat variable in *Caribboecetes* sp. A. Fusion is illustrated as being complete in *C. pterycornis* by Just (1984) and no mention is made of variation in fusion for that species; however, he does discuss variability in the completeness of this fusion for other species of *Caribboecetes*.

Just (1998) presented a revised diagnosis of the genus *Caribboecetes* and transferred several species described in his 1984 paper on the genus to the newly erected genus *Ambicholestes*. However, *C. pterycornis* remains in *Caribboecetes* (with some reservations by Just) and *Caribboecetes* sp. A belongs there for the moment as well, based on the simple inner lobe of the lower lip, the lack of an extra lateral row of setae on the basis of peraeopod 7, the uninflated eyelobe, antenna 1 with peduncle 1 longer than peduncle 2, the distally rounded mandibular palp with a small second article, and having the male antenna 2 shorter than the head and peraeon combined (but only slightly).

Corocubanus guitarti Ortiz & Nazabal, 1984, a cavernicolous siphonoececin species from the north-west coast of Cuba, is very similar to both *Caribboecetes* sp. A and *C. pterycornis* and, as suggested by Barnard and Karaman (1991), the two genera may be synonymous. Barnard and Karaman's (1991) retention of the genus *Corocubanus* is based on the apparently vestigial dactyl of peraeopod 7 illustrated by Ortiz and Nazabal (1984). However, these authors make no mention of the vestigial dactyl in the text and it is possible that appearance of the illustration is due to a mounting artifact or damaged material. In any event, *Corocubanus guitarti* and *Caribboecetes* sp. A appear to be different species. Although both species have a downturned rostrum, the mandibular palp of *Caribboecetes* sp. A is 2-articulate, with setae along the lateral margin, and that of *Corocubanus guitarti* is uniarticulate, with only distal setae; coxae 1-2 of *Caribboecetes* sp. A are less acute and less curved distally than are those of *Corocubanus guitarti*, coxa 3 is strongly dentate distally in *Caribboecetes* sp. A and entire in *Corocubanus guitarti*; and there are other differences in the peraeopods and uropods as well.

There is some slight sexual dimorphism apparent in *Caribboecetes* sp. A. Males have much longer setae on the posterior margins of the antennal articles than do females and the antennae themselves are longer. Also, the rostrum is somewhat longer in males than in females and the gnathopods are slightly stouter. *Caribboecetes* sp. A is a tiny species, with adults ranging in length from 1.5 to 2 mm.

Genus *Cerapus* Say, 1817

Regional diagnosis: Antennae 1-2, peduncle articles stout; antenna 1, peduncle article 1 expanded, wider than articles 2-3; rostrum short and straight or absent; mandibular palp long, extending well beyond tip of incisor process, 3-articulate, terminal article not reduced; coxae 1-4 separated, not overlapping; gnathopod 1 subchelate; gnathopod 2 strongly sexually dimorphic, that of male carpochelate, dactyl closing on carpal process, that of female subchelate, propodus with palm straight to slightly convex, without stout spines; peraeopods 3-4, merus not produced anteroventrally; peraeopod 5 geniculate at merus, merus subtriangular, produced strongly posteroventrally to form lobe; peraeopod 7 longer than peraeopod 6; pleopods 1-3, peduncle not broadly expanded, outer ramus broad, expanded proximally; pleopods 2-3, rami reduced, inner ramus shorter than outer, articulations indistinct or lacking; uropod 1, inner ramus one half to three fourths length of outer ramus; uropod 2 present, uniramous, ramus vestigial; uropod 3 uniramous, ramus vestigial, with terminal hook; telson subrectangular, cleft.

Florida species: *C. benthophilus*, *C. cudjoe*, *C. tubularis*, *Cerapus* sp. B, *Cerapus* sp. C

Remarks: Members of the genus *Cerapus* are tube-dwellers, attaching tubes constructed of bits of algae or detritus to algae, hydroids or various hard substrates, often in areas of high current flow (Lowry and Thomas, 1991; Thomas, 1993). They may also form large mats of intertwined tubes on muddy or silty bottoms (Thomas, 1976; Thomas and Heard, 1979). The tubes can differ in construction and composition between species, possibly as a result of differences in available materials (Morino, 1976); however, those of most Florida species are very similar. Some *Cerapus* species are filter feeders, others are detritivores; in both feeding modes the setose antennae emerging from the opening of the tube are used to gather the food. *Cerapus* individuals, usually males, can swim up into the water column by emerging halfway from the tube and strongly beating the antennae; they are not able to swim without the tube, however (Morino, 1976; Lowry and Thomas, 1991). Species with elongate tubes, such as *Cerapus benthophilus*, cut off the top 10-15 mm of tube and swim with it (Thomas, 1976); others with shorter tubes merely release the attached end.

The taxonomy of the genus *Cerapus* is in a somewhat confused state, partly because members of the genus tend to be very similar in morphology and also because there appears to be quite a bit of variability in most characters that are used to separate the species. This variability is difficult to assess and appears to involve both ontogenetic, or developmental, variation and seasonal variation. In the latter case, adult individuals collected during cooler months tend to be larger and, as a consequence, often have more articles in the antennal flagella, more elongate articles in the antennae, more spines, more setae, etc. than the smaller individuals found in warmer months. In addition, gnathopod 2 of the male, while a very important diagnostic appendage for many amphipod species, is virtually useless for identifying Florida *Cerapus* species. Not only does the morphology change considerably and in a similar fashion as a part of the developmental process for all of the species found in Florida, but it appears to follow more than one path within each species. Small juveniles have large distal tooth on the carpal lobe with a smaller, acute "palmar" tooth midway between the large tooth and the propodal articulation. In most, if not all, species, this smaller tooth moves progressively closer to the propodal articulation over a series of molts, becoming somewhat more blunt terminally and ending up adjacent to the articulation. The propodus is very stout in juvenile males and sometimes (but not always) appears to pass through a stage where the posterior margin has 2-3 blunt, triangular processes. These usually disappear as the propodus elongates, although adults of several species sometimes have a small proximal "bump" and are expanded posterodistally. However, some individuals in all species apparently retain these marginal teeth as adults and, in large individuals, the margins of the teeth may be serrate. There also appears to be some variation in the shape of the "palmar" margin in adult males, with some specimens having a sinuous margin, others a straight margin and still others a concave margin. All of this raises the interesting possibility of the occurrence of more than one morph in males of *Cerapus* species, similar to the situation found in members of the genus *Jassa*. Further work with large series of specimens will be necessary to determine if this is actually the case. In the meantime, there are often individual specimens in any given collection that just do not seem to "fit" the description of any known species. This may either be because of the above mentioned variability or because there are still as yet unrecognized new species living in mixed communities with known species.

KEY TO FLORIDA SPECIES OF *CERAPUS*

1. < Antennae 1-2, flagellum with 6-12 articles; maxilla 1, inner plate, terminal seta short, reaching no more than halfway to tip of outer plate; mandible, palp article 2 with setae on posterior margin; coxa 3 of male, anterior lobe large, broad; gnathopod 2 of male, basis with tuft of long setae on anteroproximal margin, propodus and dactyl, setae on posterior margin dense, elongate; gnathopod 2 of female, basis, anterior margin with long setae, propodus slender; pleopod 2, inner ramus slender, subtriangular, with setae on lateral margin in male; uropod 1, outer ramus broad, with broadly rounded tip *C. benthophilus*

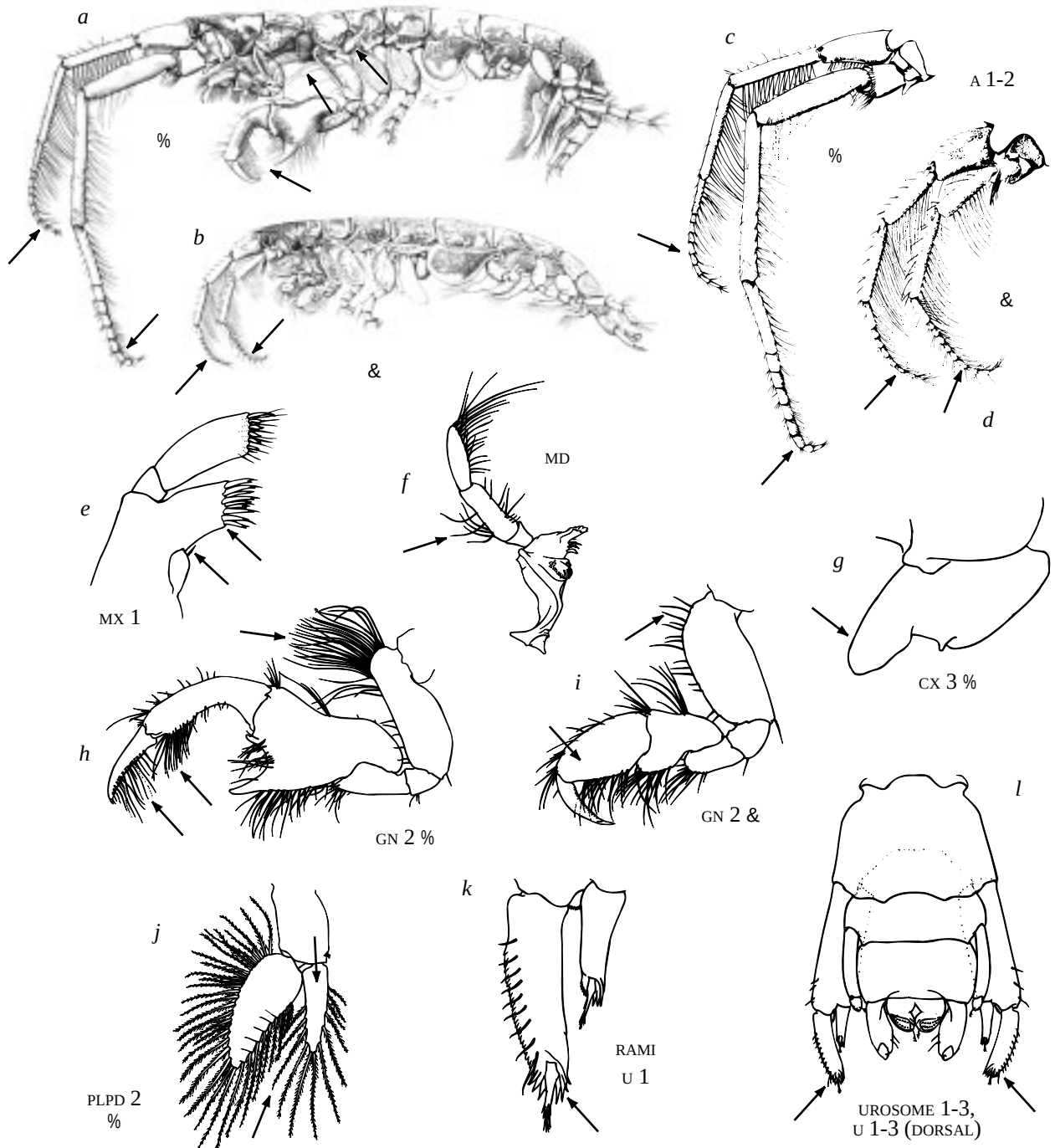


Figure 475.

< Antennae 1-2, flagellum with 2-5 articles; maxilla 1, inner plate, terminal seta long, reaching tip of outer plate; mandible, palp article 2 without setae on posterior margin; coxa 3 of male, anterior lobe small, slender; gnathopod 2 of male, basis without tuft of long setae on anteroproximal margin, propodus and dactyl, setae on posterior margin sparse, mostly short (may be a few long distal setae on propodus); gnathopod 2 of female, basis, anterior margin with short setae, propodus stout; pleopod 2, inner ramus stout, subovate, without setae on lateral margin; uropod 1, outer ramus slender, with subacute tip 2

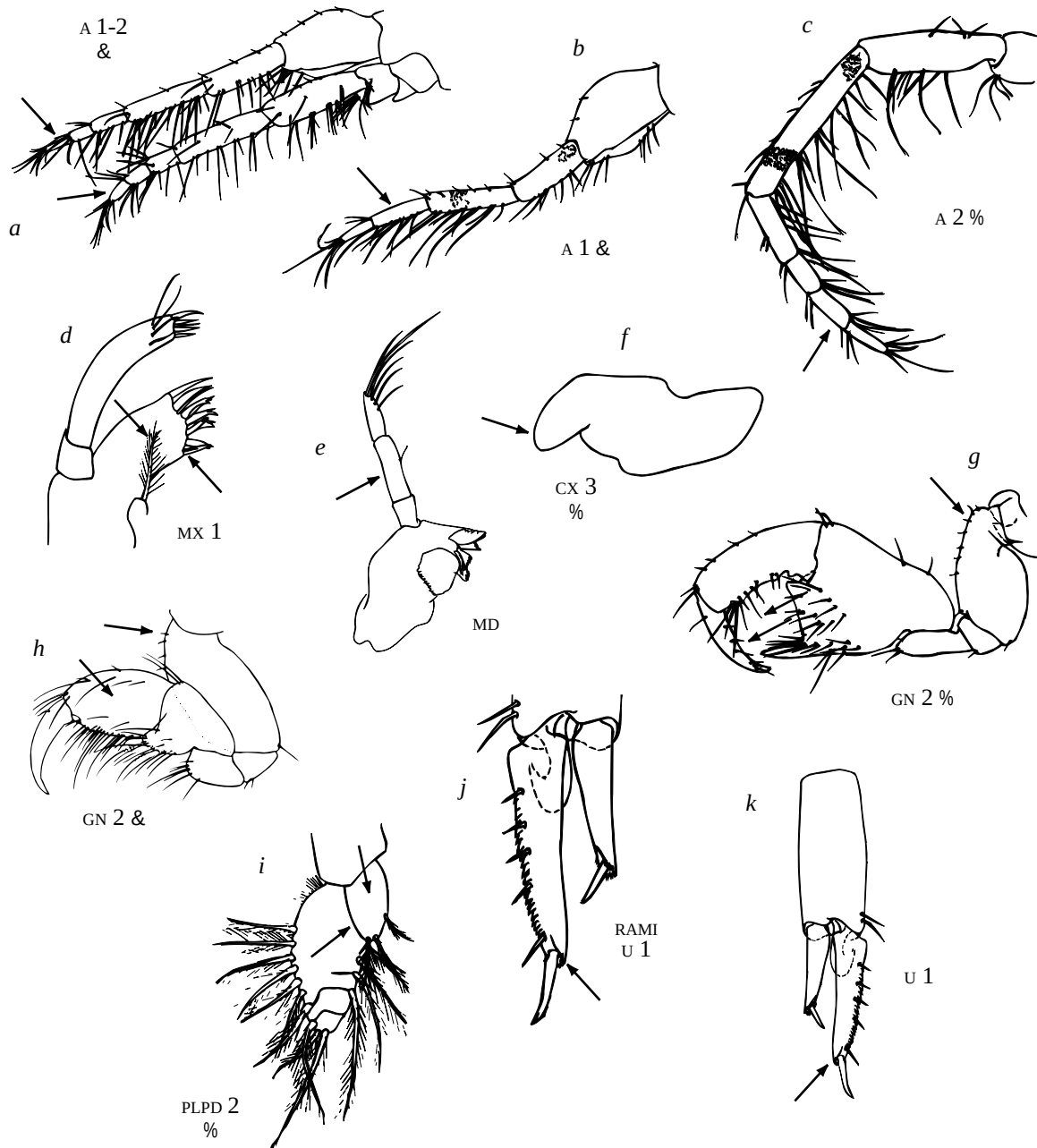


Figure 476.

2. < Antenna 1 of male, flagellum with 4-5 articles (usually 4); antenna 1 of female, flagellum with 3-4 articles (usually 4); peraeon segment 1 of male with lateral keel; gnathopod 2 of female, basis, anterior margin straight to slightly convex, anterior margin and ridge on medial surface lined with small spinules; peraeopod 7, basis, anterior margin with long setae
 *C. cudjoe*

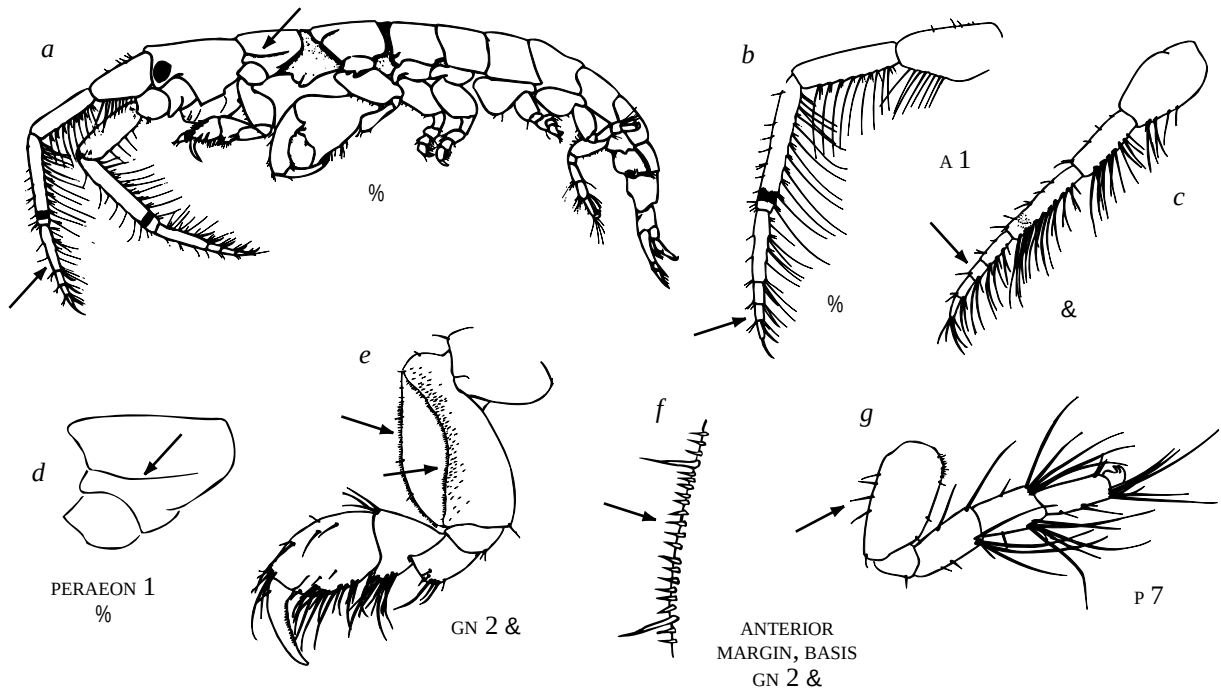


Figure 477.

- < Antenna 1, flagellum of both sexes with 2-3 articles; peraeon segment 1 of male without lateral keel; gnathopod 2 of female, basis, anterior margin strongly convex, anterior margin and ridge on medial surface (if present) without small spinules; peraeopod 7, basis, anterior margin with short setae 3

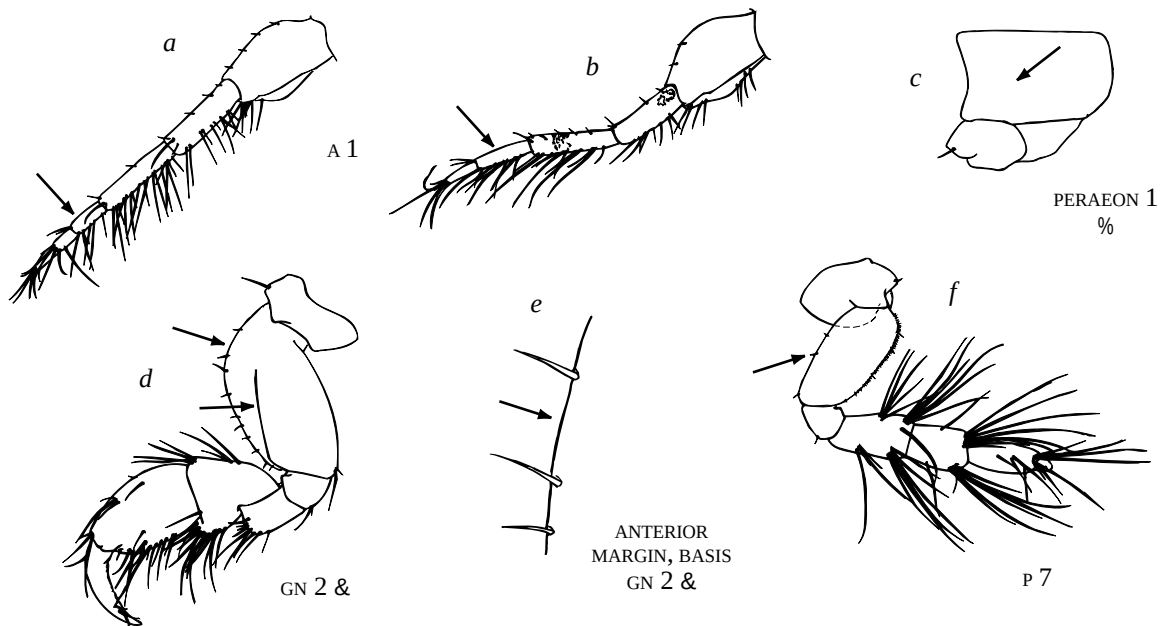


Figure 478.

3. < Antenna 1 of male, peduncle article 3 distinctly longer than article 1, peduncle articles 2-3 slender, elongate, flagellum with 2 articles, penultimate article elongate; rostrum very short, indistinct; gnathopod 2 of male, carpus, "palmar" margin with median process; uropod 1 of male, peduncle without large distoventral hook *C. tubularis*

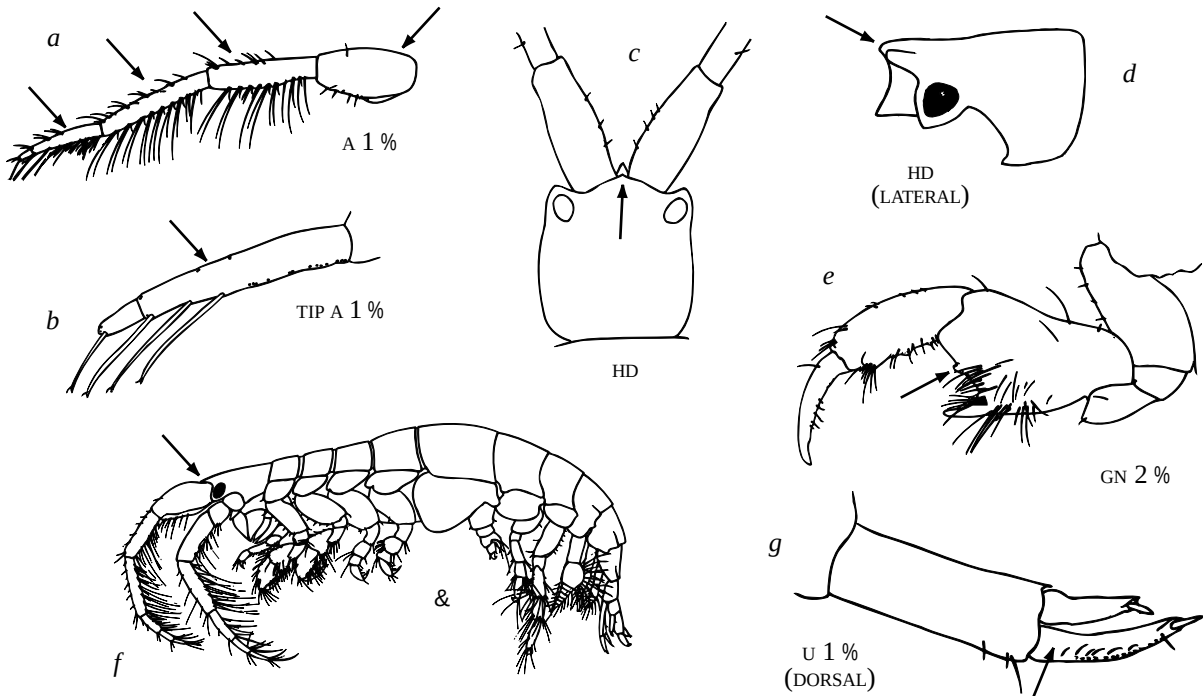


Figure 479.

- < Antenna 1 of male, peduncle article 3 subequal to or shorter than article 1 in length, peduncle articles 2-3 stout, short, flagellum with 3 articles, penultimate article short; rostrum relatively long, distinct; gnathopod 2 of male, carpus, "palmar" margin with process near propodal articulation; uropod 1 of male, peduncle with large distoventral hook 4

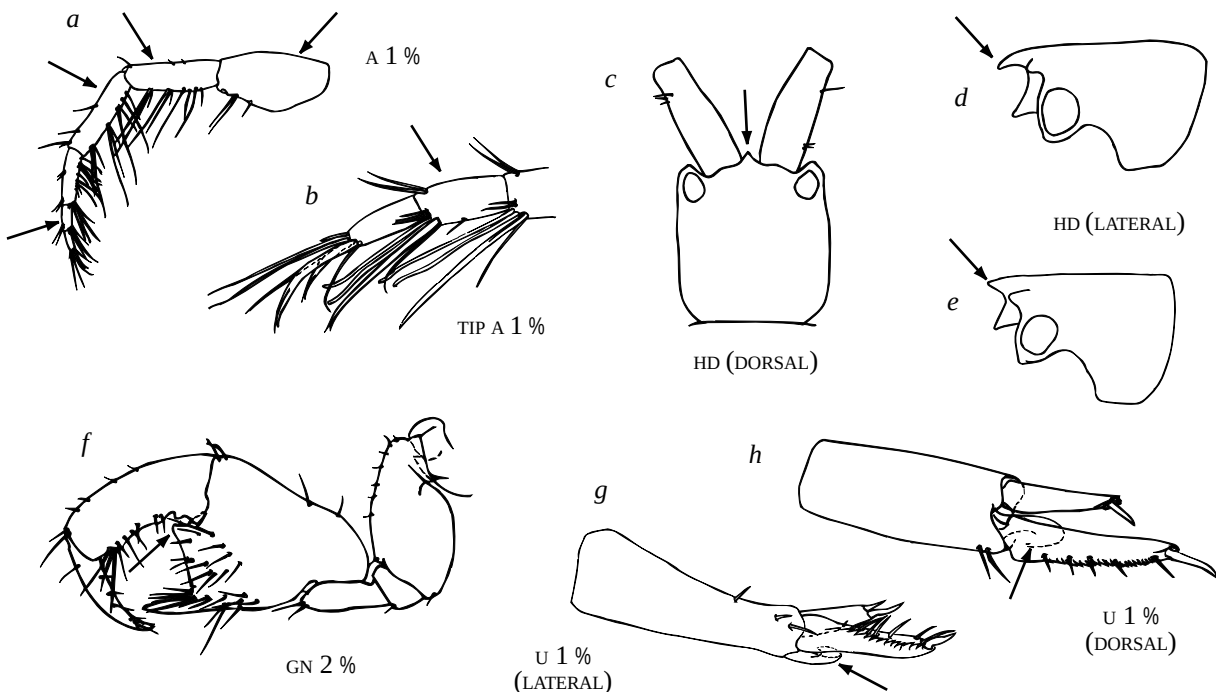


Figure 480.

4. < Antennae 1-2, peduncle articles 3 and 5, respectively, without pigment band, flagellum of female with 3 articles, first flagellar article stout, length 2-3 times width; antenna 1, peduncle articles 1-2, combined dorsal margin nearly straight, peduncle article 1 of female relatively slender, dorsal margin moderately convex; antenna 2 of male, flagellum with 3 articles; peraeopod 7, basis, posterior margin lined with small spinules *Cerapus* sp. B

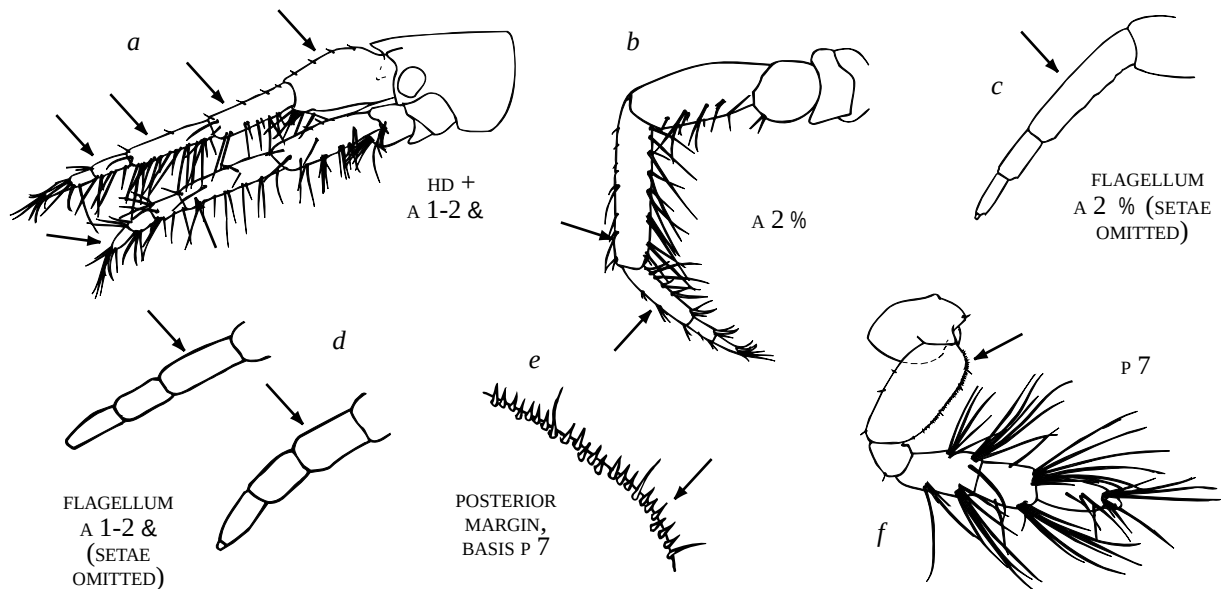


Figure 481.

- < Antennae 1-2, peduncle articles 3 and 5, respectively, with pigment band, flagellum of female with 2 articles, first flagellar article slender, length 4-5 times width; antenna 1, peduncle articles 1-2, combined dorsal margin distinctly concave, especially in female, peduncle article 1 of female very stout, dorsal margin strongly convex; antenna 2 of male, flagellum with 2 articles (occasionally 3 in large individuals); peraeopod 7 basis, posterior margin without spinules *Cerapus* sp. C

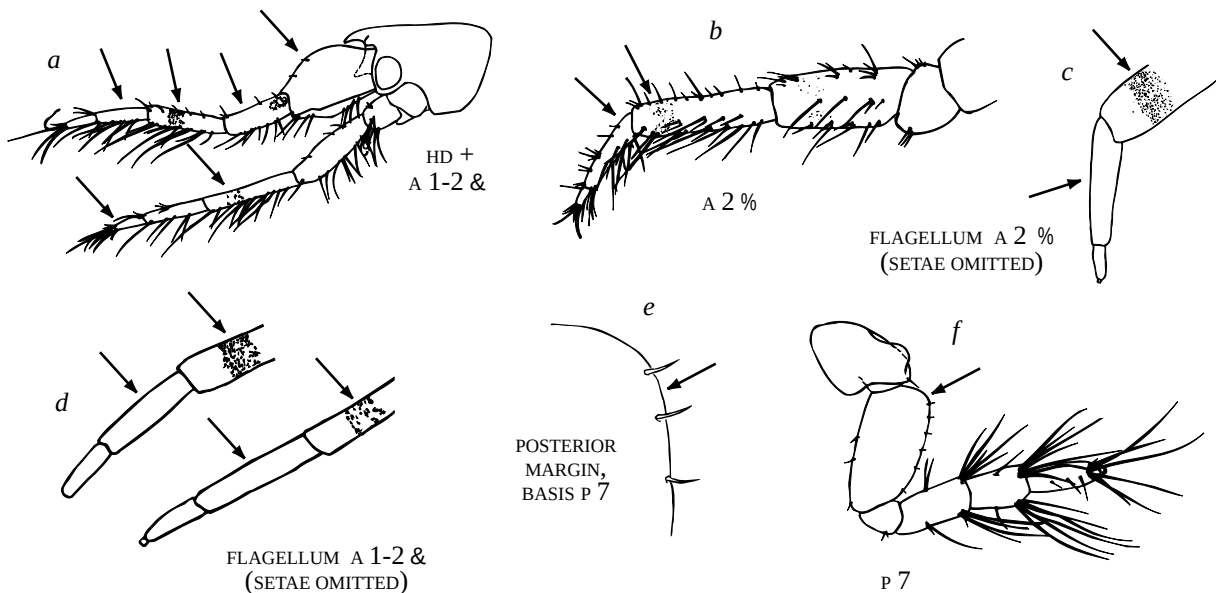


Figure 482.

***Cerapus benthophilus* Thomas and Heard, 1979
(Figure 475)**

Cerapus sp.: Thomas, 1976, pp. 92-93.

Cerapus benthophilus Thomas and Heard, 1979, pp. 98-104, figs. 1-4.

Regional diagnosis: Antennae 1-2, peduncle articles 3 and 5, respectively, without pigment band, flagellum with 6-12 articles, first flagellar article of female slender, length 4-5 times width; antenna 1, peduncle articles 1-2, combined dorsal margin nearly straight, peduncle article 1 of female relatively slender, dorsal margin moderately convex, peduncle articles 2-3 of male slender, elongate, article 3 distinctly longer than article 1; rostrum relatively long, distinct; maxilla 1, inner plate, terminal seta short, reaching no more than halfway to tip of outer plate; mandible, palp article 2 with setae on posterior margin; peraeon segment 1 of male with strong lateral keel; coxa 3 of male, anterior lobe large, broad; gnathopod 2 of male, basis with tuft of long setae on anteroproximal margin, carpus, "palmar" margin with process near propodal articulation, propodus and dactyl with dense, elongate setae on posterior margin; gnathopod 2 of female, basis, anterior margin straight to slightly convex, with long setae, anterior margin and weak ridge on medial surface without small spinules, propodus slender; peraeopod 7, basis, anterior margin with short setae, posterior margin densely lined with small spinules; pleopod 2, inner ramus slender, subtriangular, with setae on lateral margin in male; uropod 1, peduncle of male without large distoventral hook, outer ramus broad, with broadly rounded tip.

Distribution: Indian River Lagoon (Nelson, 1995); St. Lucie River; Biscayne Bay; southeastern Gulf of Mexico between Cape Sable and Cape Romano; Estero Bay and Cocohatchee River, Florida (Florida Department of Environmental Protection (FDEP), Punta Gorda Laboratory, unpublished records); Withlacoochee Bay; Florida panhandle to Louisiana (Thomas, 1976; Thomas and Heard, 1979); Laguna de Alvarado, Veracruz (Winfield et al., 1997; 2001) and Laguna de Términos, Campeche (Ledoyer, 1986), Mexico.

Ecology: *Cerapus benthophilus* is typically found in dense mats in the low to moderate salinity waters of coastal marshes and bayous (Thomas and Heard, 1979) or associated with the seagrasses *Halodule wrightii* and *Thalassia testudinum* (Winfield et al., 2001). It usually occurs on muddy silt bottoms in areas where there is some water movement (Thomas and Heard, 1979), but has also occasionally been found on silty sand bottoms with oyster shell. This species has been reported from waters with salinities of 0 to 15 ppt and depths of 0.3 to 4 m (Thomas, 1976; Thomas and Heard, 1979; Winfield et al., 2001).

Remarks: *Cerapus benthophilus* is a relatively large species (4-13 mm), inhabiting detrital tubes reaching 90 mm in length (Thomas, 1976; Thomas and Heard, 1979), and it is usually heavily pigmented. Specimens from South Florida waters tend to be somewhat smaller and paler than their more northern counterparts. It is the most easily recognized of the Florida *Cerapus* species and, as an adult, is readily distinguished from the other species by its large size (4-13 mm vs. 2-5 mm for the other species) and the relatively long antennal flagella (6-12 articles vs. 2-5 articles). Juveniles, however, are small, have fewer articles in the antennal flagella (4-6) and can be confused with adults of *C. cudjoe*, which have 4-5 flagellar articles. If the specimen has a 4-articulate flagellum and is a juvenile (no penes or oostegites) in the 3-4 mm size range, then it is probably *C. benthophilus*; *C. cudjoe* would be an adult at this size. Adult males of *C. benthophilus* are very distinctive, possessing a strong lateral keel on peraeon segment 1, a tuft of long setae on the anteroproximal margin of the basis of gnathopod 2, and no distoventral hook on the peduncle of uropod 1. *Cerapus tubularis* also lacks this hook, but differs from *C. benthophilus* in all of the other characters mentioned above.

See Thomas, 1976 (as *Cerapus* sp.); Thomas and Heard, 1979.

***Cerapus cudjoe* Lowry and Thomas, 1991
(Figure 477)**

Cerapus cudjoe Lowry and Thomas, 1991, pp. 1461-1467, figs. 1-4.

Regional diagnosis: Antennae 1-2, peduncle articles 3 and 5, respectively, with pigment band, flagellum of male with 4-5 articles (usually 4), that of female with 3-4 (usually 4) articles, first flagellar article of female slender to moderately stout, length 3-5 times width; antenna 1, peduncle articles 1-2, combined dorsal margin nearly straight, peduncle article 1 of female relatively slender, dorsal margin moderately convex, peduncle articles 2-3 of male slender, elongate, article 3 distinctly longer than article 1; rostrum very short, indistinct; maxilla 1, inner plate, terminal seta long, reaching tip of outer plate; mandible, palp article 2 without setae on posterior margin; peraeon segment 1 of male with lateral keel; coxa 3 of male, anterior lobe small, slender; gnathopod 2 of male, basis without tuft of long setae on anteroproximal margin, carpus, "palmar" margin with process near propodal articulation, propodus and dactyl, setae on posterior margin sparse, mostly short (may be a few long distal setae on propodus); gnathopod 2 of female, basis, anterior margin straight to slightly convex, with short setae, anterior margin and ridge on medial surface lined with small spinules, propodus stout; peraeopod 7, basis, anterior margin with long setae, posterior margin lined with small spinules proximally; pleopod 2, inner ramus stout, subovate, without setae on lateral margin in male; uropod 1, peduncle of male with large distoventral hook, outer ramus slender, with subacute tip.

Distribution: Biscayne Bay; Florida Keys (Lowry and Thomas, 1991); Florida Bay; Florida coast between Cape Romano and Cape Sable; Pine Island Sound, Florida (FDEP, Punta Gorda Laboratory, unpublished records); Tampa Bay, Florida; ?Horn Island and ?Petit Bois Island, Mississippi; north-eastern Venezuela (Martín and Díaz, 2003).

Ecology: This species is a member of the fouling community, living in tubes attached to algae (*Gracilaria*, *Amphiroa*, *Halimeda*), hydroids (*Cnidoscypus marginatus*) and octocorals in areas of high current flow, often in very large numbers (Lowry and Thomas, 1991; Thomas, 1993). It occurs at depths of 1-10 m.

Remarks: Material collected from the Gulf of Mexico off Key West (Northwest Channel) by the USFC steamer *Fish Hawk* and reported by Pearse (1912) as *Cerapus tubularis* may prove to be *C. cudjoe* upon reexamination. *Cerapus tubularis* appears to be a more cool water species than *C. cudjoe* and there are as yet no confirmed reports of that species from Florida waters. Material from the barrier islands along the Mississippi Gulf coast is very close to *C. cudjoe*; however the adult males are very variable in the morphology of gnathopod 2, exhibiting as many as 3 different morphs in specimens collected at the same time and place (see Remarks section for the genus *Cerapus*).

Males of *C. cudjoe* are readily distinguished from those of *C. tubularis* and *C. benthophilus* by the presence of the large distoventral hook on the peduncle of uropod 1. *Cerapus* sp. B males also have this hook, but do not have pigment bands on the antennae (bands present in *C. cudjoe*), have 3 articles in the antennal flagella (4-5 articles in *C. cudjoe*), have peduncle article 3 of antenna 1 subequal to article 1 in length (peduncle article 3 distinctly longer than article 1 in *C. cudjoe*), have a relatively long rostrum (rostrum very short in *C. cudjoe*) and have short setae on the anterior margin of the basis of peraeopod 7 (*C. cudjoe* has long anterior marginal setae). *Cerapus* sp. C males have both the peduncular hook on uropod 1 and the pigment bands on the antennae; however, they are similar to *Cerapus* sp. B and differ from *C. cudjoe* in the remaining characters mentioned above. In addition, they lack spinules on the posterior margin of the basis of peraeopod 7 (spinules present in *C. cudjoe*).

Females are more difficult to separate, but can be recognized by the combination of small size (*C. benthophilus* is much larger), 4 articles (usually) in the antennal flagella (6-9 articles in *C. benthophilus*, 3 articles in *C. tubularis* and *Cerapus* sp. B, 2 articles in *Cerapus* sp. C), pigment bands on the antennae (lacking in the other species except for *Cerapus* sp. C), the straight to slightly

convex anterior margin of the basis of gnathopod 2 (strongly convex in other species, except for *C. benthophilus*), which is lined with small spinules (spinules lacking in all other species), the presence of spinules on the posterior margin of the basis of pereopod 7 (spinules absent in *Cerapus* sp. C) and the slender, distally subacute outer ramus on uropod 1 (outer ramus broad and distally rounded in *C. benthophilus*). *Cerapus cudjoe* is usually lightly pigmented, except for the dark pigment bands on the antennae, which may fade over time in alcohol. It is a relatively small species, with adult size ranging from 3 to 4 mm.

See Lowry and Thomas, 1991; Thomas, 1993.

***Cerapus tubularis* Say, 1817
(Figure 479)**

Cerapus tubularis Say, 1817, pp. 50-52, pl. 4, figs. 7-11.

Cerapus tabularis: Holmes, 1905, p. 517, 1 text fig.

Regional diagnosis: Antennae 1-2, peduncle articles 3 and 5, respectively, without pigment band, flagellum of female with 3 articles, first flagellar article moderately stout, length 3-4 times width; antenna 1, peduncle articles 1-2, combined dorsal margin nearly straight, peduncle article 1 of female relatively slender, dorsal margin moderately convex, peduncle articles 2-3 of male slender, elongate, article 3 distinctly longer than article 1, flagellum of male with 2 articles; antenna 2 of male, flagellum with 3 articles; rostrum very short, indistinct; maxilla 1, inner plate, terminal seta long, reaching tip of outer plate; mandible, palp article 2 without setae on posterior margin; pereopod segment 1 of male without lateral keel; coxa 3 of male, anterior lobe small, slender; gnathopod 2 of male, basis without tuft of long setae on anteroproximal margin, carpus, “palmar” margin with median process, propodus and dactyl, setae on posterior margin sparse, mostly short (may be a few long distal setae on propodus); gnathopod 2 of female, basis, anterior margin strongly convex, with short setae, anterior margin and ridge on medial surface without small spinules, propodus stout; pereopod 7, basis, anterior margin with short setae, posterior margin lined with small spinules proximally; pleopod 2, inner ramus stout, subovate, without setae on lateral margin in male; uropod 1, peduncle of male without large distiventral hook, outer ramus slender, with subacute tip.

Distribution: Cape Cod to eastern Florida (Smith, 1880; Holmes, 1905; Watling and Maurer, 1972; Bousfield, 1973; Fox and Bynum, 1975; Dickinson et al., 1980; Lowry and Berents, 1989; Nelson, 1995); Texas (McKinney, 1977); Laguna de Tamiahua and Punta del Gada, Mexico (McKinney, 1977); Laguna Madre, Tamaulipas, Mexico (Barba and Sánchez, 1995); Laguna Alvarado, Veracruz, Mexico (Ortiz and Winfield, 1995); Cuba (Ortiz and Lalana, 1989); Brazil (Wakabara and Serejo, 1998); and Ría Deseado, Argentina (Alonso, 1980).

Ecology: *Cerapus tubularis* is a tube-dwelling species found in fouling communities and in seagrass (*Zostera*) beds, as well as on muddy sand bottoms and channels along the east coast of the U.S. (Bousfield, 1973; Fox and Bynum, 1975; Dickinson, 1980; Nelson, 1995). Material from Texas, which may not represent *C. tubularis* (see Remarks section), occurred on soft bottoms or attached to subtidal rocks, algae and oyster reefs in low energy habitats (McKinney, 1977). Cuban material identified as *C. tubularis* was found in algae at 20 m depths (Ortiz and Lalana, 1989). It has been reported from depths of 1 to 30 m (Bousfield, 1973).

Remarks: Prior to the relatively recent redescription of *C. tubularis* and the designation of a neotype from material collected near the original type locality (Lowry and Berents, 1989), it was impossible to determine if *Cerapus* material from the western Atlantic region actually belonged to that species. Say’s (1817) type material of *C. tubularis* from Egg Harbor, New Jersey, has been lost and the original description is lacking in detail, so for many years any *Cerapus* specimen from the region was assumed to be *C. tubularis*. Many distribution records of this species from earlier than 1989 may prove to be erroneous and the identity of the material on which they are based needs to be confirmed.

Although the presence of *C. tubularis* in Florida waters has not been reconfirmed, it has been reported in the literature and may possibly occur on the east coast, therefore it is included in this guide. However, SERTC material examined from the Mid-Atlantic Bight area, material from Savannah Beach, Georgia, and material from Hutchinson Island, Florida, is all *Cerapus* sp. B, not *C. tubularis* (males have large peduncular hook on uropod 1, which *C. tubularis* lacks), and it is possible that *C. tubularis* is restricted to the cooler waters of the northeastern U.S.

Male *C. tubularis* can be distinguished from males of all other regional species of *Cerapus* except *C. benthophilus* by the lack of a large distoventral hook on the peduncle of uropod 1. It can be separated from males of that species by its generally smaller size (3-5 mm vs 4-13 mm in *C. benthophilus*), having 2 articles in the flagellum of antenna 1 (6-13 articles in *C. benthophilus*), lacking a lateral keel on pereopod segment 1 (strong keel present in *C. benthophilus*) and lacking the tuft of long setae on the anteroproximal margin of the basis of gnathopod 2 (setae present in *C. benthophilus*). Females are more difficult to identify, but can be recognized by the very short, indistinct rostrum (well-developed in *C. benthophilus*, *Cerapus* sp. B and *Cerapus* sp. C), having 3 articles in the antennal flagella (6-9 in *C. benthophilus*, 4 in *C. cudjoe*; 2 in *Cerapus* sp. C), lacking pigment bands on the peduncle of antennae 1-2 (bands present in *C. cudjoe* and *Cerapus* sp. C) and the presence of short setae on the anterior margin of the basis of pereopod 7 (long setae present in *C. cudjoe*).

See Bousfield, 1973; Lowry and Berents, 1989.

***Cerapus* sp. B**
(Figure 481)

Regional diagnosis: Antennae 1-2, peduncle articles 3 and 5, respectively, without pigment band, flagellum with 3 articles, first flagellar article of female stout, length 2-3 times width; antenna 1, peduncle articles 1-2, combined dorsal margin nearly straight, peduncle article 1 of female relatively slender, dorsal margin moderately convex, peduncle articles 2-3 of male stout, short, article 3 subequal to or shorter than article 1; rostrum relatively long, distinct; maxilla 1, inner plate, terminal seta long, reaching tip of outer plate; mandible, palp article 2 without setae on posterior margin; peraeon segment 1 of male without lateral keel; coxa 3 of male, anterior lobe small, slender; gnathopod 2 of male, basis without tuft of long setae on anteroproximal margin, carpus, “palmar” margin with process near propodal articulation, propodus and dactyl, setae on posterior margin sparse, mostly short (may be a few long distal setae on propodus); gnathopod 2 of female, basis, anterior margin strongly convex, with short setae, anterior margin and ridge on medial surface without small spinules, propodus stout; peraeopod 7, basis, anterior margin with short setae, posterior margin lined with small spinules; pleopod 2, inner ramus stout, subovate, without setae on lateral margin in male; uropod 1, peduncle of male with large distoventral hook, outer ramus slender, with subacute tip.

Distribution: Murrells Inlet, South Carolina (SERTC, SCDNR, unpublished records) to Hutchinson Island, Florida.

Ecology: *Cerapus* sp. B usually occurs along open beaches or off jetties on fine sand bottoms with some silt; however, it is occasionally found on hard substrates (jetties or offshore reefs) (SERTC, SCDNR, unpublished records). It has been found at depths of 1 to 19 m.

Remarks: *Cerapus* sp. B belongs to the group of species in which the males have a large distoventral hook on the peduncle of uropod 1, distinguishing them from males of *C. benthophilus* and *C. tubularis*, which lack this hook. Both males and females can be recognized by the relatively long rostrum (very short in *C. tubularis* and *C. cudjoe*), the lack of pigment bands on the peduncle of antennae 1-2 (pigment present in *C. cudjoe* and *Cerapus* sp. C), having 3 articles in the antennal flagella (2 articles in *Cerapus* sp. C, 6-12 articles in *C. benthophilus*, 4 articles [usually] in *C. cudjoe*), having short setae on the anterior margin and spinules on the posterior margin of the basis of peraeopod 7 (long setae in *C. cudjoe*; no spinules in *Cerapus* sp. C). Although the range of *Cerapus* sp. B may overlap with that of *C. tubularis*, the habitat seems to be somewhat different, with *Cerapus* sp. B occurring on open sandy beaches and *C. tubularis* generally found in more protected areas as a fouling species on seagrasses, hydroids and algae or on muddy sand bottoms. *Cerapus* sp. B is a relatively small species, ranging from 3 to 5 mm in length.

***Cerapus* sp. C**
(Figure 482)

Cerapus cf *tubularis*: Rakocinski et al., 1993, p. 102.

Cerapus sp. B: Rakocinski et al., 1996, p. 350.

Regional diagnosis: Antennae 1-2, peduncle articles 3 and 5, respectively, with pigment band, flagellum of female with 2 articles, first flagellar article slender, length 4-5 times width; antenna 1, peduncle articles 1-2, combined dorsal margin distinctly concave, especially in female, peduncle article 1 of female very stout, dorsal margin strongly convex, peduncle articles 2-3 of male stout, short, article 3 subequal to or shorter than article 1, flagellum with 3 articles; antenna 2 of male, flagellum with 2 articles (occasionally 3 in large individuals); rostrum relatively long, distinct; maxilla 1, inner plate, terminal seta long, reaching tip of outer plate; mandible, palp article 2 without setae on posterior margin; peraeon 1 of male without lateral keel; coxa 3 of male, anterior lobe small, slender; gnathopod 2 of male, basis without tuft of long setae on anteroproximal margin, carpus, “palmar” margin with process near propodal articulation, propodus and dactyl, setae on posterior margin sparse, mostly short (may be a few long distal setae on propodus); gnathopod 2 of female, basis, anterior margin strongly convex, with short setae, anterior margin and ridge on medial surface without spinules, propodus stout; peraeopod 7, basis, anterior margin with short setae, posterior margin without spinules; pleopod 2, inner ramus stout, subovate, without setae on lateral margin in male; uropod 1, peduncle of male with large distoventral hook, outer ramus slender, with subacute tip.

Distribution: Hutchinson Island; Biscayne Bay; southeastern Gulf of Mexico between Cape Sable and Cape Romano; Big Carlos Pass (Florida Department of Environmental Protection (FDEP), Punta Gorda Laboratory, unpublished records); Tampa Bay; St. Andrew Sound; Santa Rosa Island and Perdido Key, Florida; Corpus Christi, Texas.

Ecology: *Cerapus* sp. C is found on medium to fine sand bottoms both along beaches and in slightly deeper waters further offshore. The sand is often mixed with fine shell hash or silt. The depth range for this species is 1 to 12 m.

Remarks: *Cerapus* sp. C is very widespread and is the smallest species of *Cerapus* found in Florida waters, ranging from 2-4 mm in length. It can often be recognized by the characteristic way in which the antennae are positioned in preserved material, especially in females. The large, stout peduncle article 1 of antenna 1 is directed downwards and slightly outwards, with the remaining articles gradually curving back up. Antenna 2 usually parallels antenna 1. Also, in addition to the pigment bands on peduncle articles 3 and 5 of antennae 1 and 2, respectively, there is often a dark pigment spot on the dorsolateral surface at the base of antenna 1, peduncle article 2. This spot is not always present, but appears to be characteristic of this species when it is. Also, *Cerapus* sp. C is the only Florida species to lack spinules on the posterior margin of the basis of peraeopod 7; the remaining species have at least some spinules proximally. Females are further characterized by having only 2 articles in the antennal flagella; females of the other species have at least 3 articles. In general, this species is fairly lightly pigmented, although females seem to have somewhat more pigmentation than males.

Genus *Erichthonius* Milne-Edwards, 1830

Regional diagnosis: Antennae 1-2, peduncle articles slender; antenna 1, peduncle article 1 not expanded, similar in width to articles 2-3; rostrum short, straight; mandibular palp long, extending well beyond tip of incisor process, 3-articulate, terminal article not reduced; coxae 1-4 separated, not overlapping; gnathopod 1 subchelate; gnathopod 2 strongly sexually dimorphic, that of male carpochele, dactyl closing on carpal process, that of female subchelate, propodus with palm straight to slightly convex, without stout spines; pereopods 3-4, merus not produced anteroventrally; pereopod 5 not geniculate, merus subrectangular, not strongly produced posteroventrally (may be slightly produced in male); pereopod 7 longer than pereopod 6; pleopods 1-3, peduncle not broadly expanded, outer ramus slender, not expanded proximally, pleopods 2-3, rami not reduced, subequal, articulations distinct; uropod 1, inner ramus subequal to outer ramus in length; uropod 2 present, biramous, rami not vestigial; uropod 3 uniramous, ramus reduced, with hooked apical teeth; telson subrectangular, entire.

Florida species: *E. brasiliensis*, *Erichthonius* sp. A

Remarks: *Erichthonius* is yet another genus of ischyrocerid with a tangled taxonomy, although the revision of North Atlantic species by Myers and McGrath (1984) has begun to clarify the situation. Many species have been misidentified in the literature, making it difficult, if not impossible, to determine accurate geographic distributions for some of them. Also, there are a number of undescribed species present in many areas, including Florida and the east coast of the United States. In addition to an apparently undescribed species from Florida waters, *Erichthonius* sp. A, included herein, there are two other species found along the mid-Atlantic coast that may also be new.

Erichthonius sp. B is very similar to *E. punctatus* from the northeastern Atlantic and may prove to be that species, although it has not previously been reported from the region (see Myers and McGrath, 1984). It differs from *E. brasiliensis* in the lack of a strong “hump” on the posterior margin of the basis in gnathopod 1 of the male (“hump” present in *E. brasiliensis*), the shallower coxa 2 in the male, the lack of setae on the basis of gnathopod 2 in the male (*E. brasiliensis* has setae), the sparse setae on the carpus, propodus and dactyl of the male gnathopod 2 (much denser setae in *E. brasiliensis*), coxa 6 of the female having more and longer marginal plumose setae than in *E. brasiliensis* and having a larger eye than *E. brasiliensis*.

Erichthonius sp. C is similar to *Erichthonius* sp. A from Florida in having the unusual wing-like expansion of the posterior lobe on the basis on pereopod 5 in the male (*E. brasiliensis* and *Erichthonius* sp. B lack this expansion); however, it is otherwise quite different. Coxae 1-4 are much wider than deep and coxa 2 lacks distal stridulating ridges in the male (coxae as deep as wide, male coxa 2 with stridulating ridges in *Erichthonius* sp. A), gnathopod 2 of the male has a single tooth on the posterodistal margin of the carpus (two teeth present in *Erichthonius* sp. A) and the peduncle of uropod 3 is more elongate and slender in the male.

Males of *Erichthonius* species are usually larger than females and the eyes are usually red in preserved material of Florida members of this genus.

KEY TO FLORIDA SPECIES OF *ERICTHONIUS*

1. < Gnathopod 1 of male, basis stout, posterior margin angled proximally; gnathopod 2 of male, basis slender, setose, propodus slender, posterior margin concave, dactyl, anterior margin evenly convex, margins with long setae; coxa 5 of female, ventral margin of anterior lobe lined with short setae, setae not reaching distal margin of basis; peraeopod 5 of male, basis, posterior margin not produced, lacking wing-like process; peraeopod 5 of female, basis, posterior margin lined with short setae, propodus slender; uropod 3, ramus slender
 *Ericthonius brasiliensis*

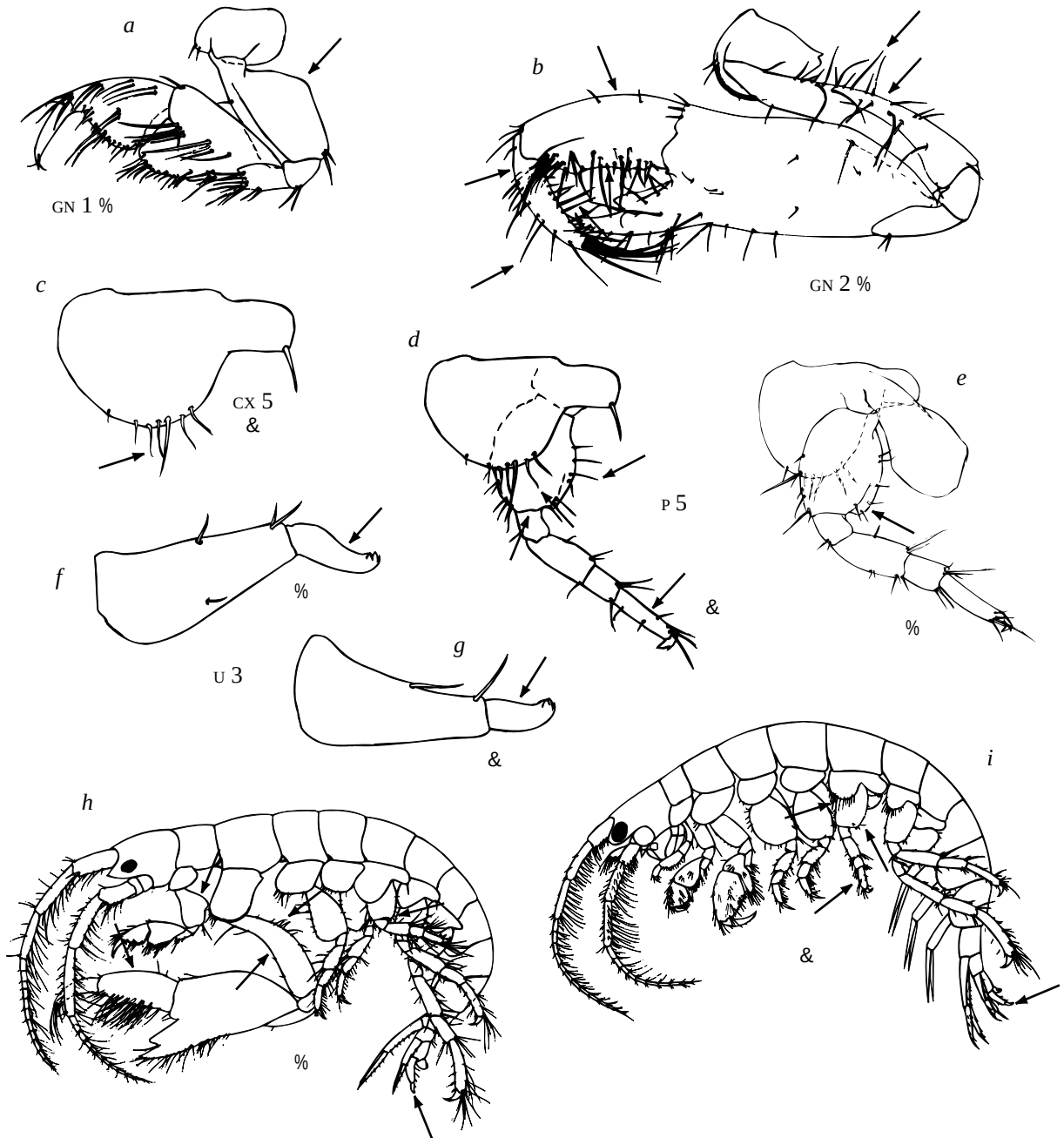


Figure 483.

< Gnathopod 1 of male, basis slender, posterior margin evenly convex proximally; gnathopod 2 of male, basis stout, without setae, propodus stout, posterior margin convex, dactyl, anterior margin angled proximally, margins with short setae; coxa 5 of female, ventral margin of anterior lobe lined with long setae, setae extending beyond distal margin of basis; peraeopod 5 of male, basis, posterior margin narrowly produced to form wing-like process; peraeopod 5 of female, basis, posterior margin without setae, propodus stout; uropod 3, ramus stout.....
 *Erichthonius* sp. A

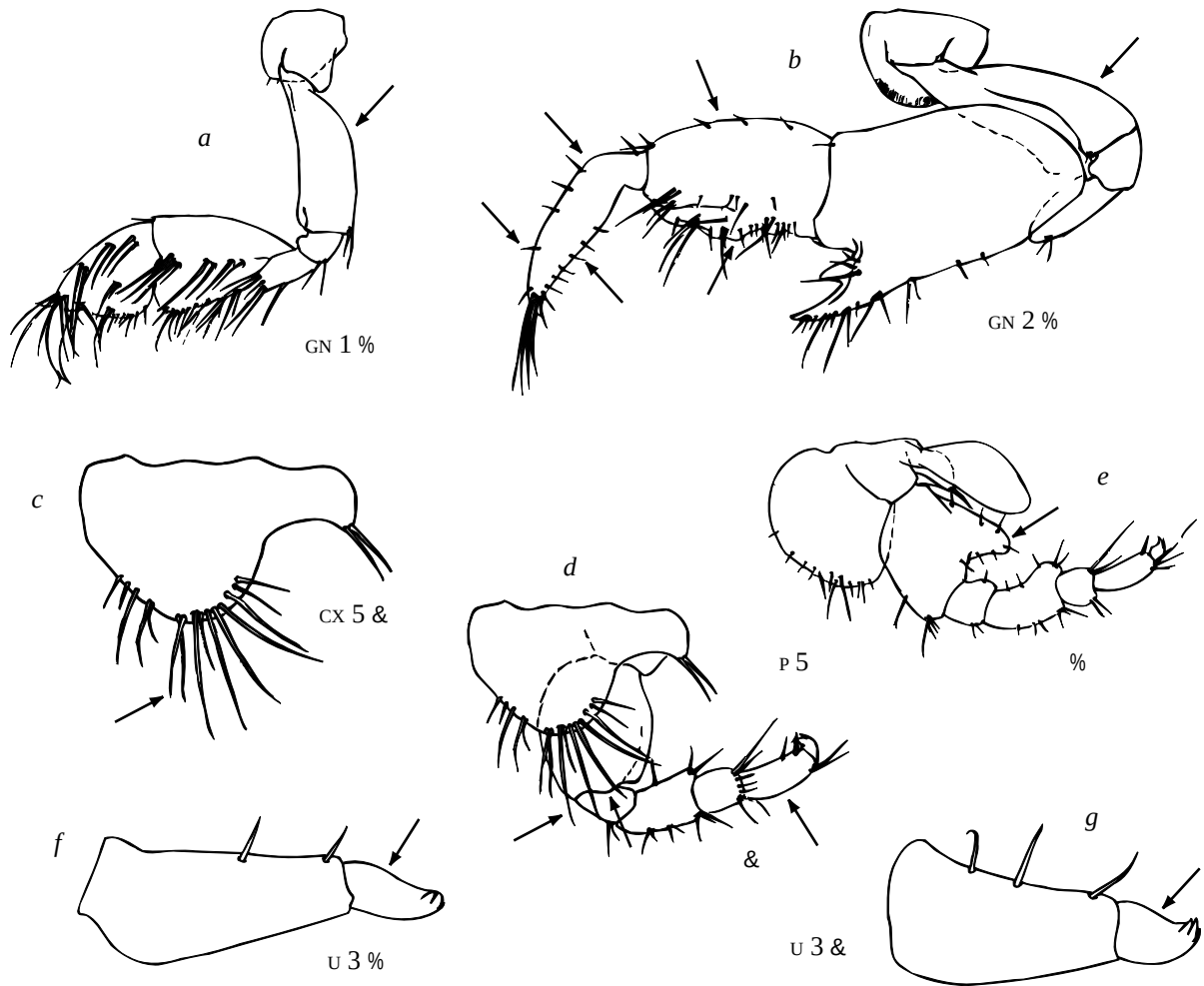


Figure 484.

***Erichthonius brasiliensis* (Dana, 1853)**
(Figure 483)

Pyctilus brasiliensis Dana, 1853, p. 976, pl. LXVII, fig. 5a-h.

Cerapus brasiliensis: Bate, 1862, p. 267, pl. XLV, fig. 8.

Erichthonius brasiliensis: Bousfield, 1973, p. 175, pl. LIX, fig. 2.

Erichthonius brasiliensis: Myers, 1982, p. 200, figs. 136-137.

Regional diagnosis: Gnathopod 1 of male, basis stout, posterior margin angled proximally; gnathopod 2 of male, basis slender, setose, propodus slender, posterior margin concave, dactyl, anterior margin evenly convex, margins with long setae; coxa 5 of female, ventral margin of anterior lobe lined with short setae, setae not reaching distal margin of basis; peraeopod 5 of male, basis, posterior margin not produced, lacking wing-like process; peraeopod 5 of female, basis, posterior margin lined with short setae, propodus slender; uropod 3, ramus slender.

Distribution: Cosmopolitan in temperate and tropical waters (Thomas, 1993).

Ecology: *Erichthonius brasiliensis* is a tube-dwelling fouling species, often occurring on hard substrates such as rocks, pilings, oil rigs, mangroves and oyster shell, but also on algae, sponges, hydroids, sand bottoms and seagrasses (Bousfield, 1973; Lewbel et al., 1987; Lewis, 1984, 1987; Rakocinski et al., 1993, 1996; Nelson, 1995; Thomas, 1993; Oliva-Rivera and Jiménez-Cueto, 1992; Serejo, 1998b; Oliva-Rivera, 2003). Although it has been found subtidally to depths of over 200 m, it is generally a shallow water species (1-10 m) (Bousfield, 1973; Thomas, 1993).

Remarks: The extremely broad range reported for this species may be due in part to taxonomic confusion in the literature and the actual distribution may be more limited (the distribution reported by Myers and McGrath [1984] in their revision of the northeastern Atlantic members of the genus is Brazil, Venezuela, West Indies, New England and the Mediterranean Sea.) However, *E. brasiliensis* is a fouling species and could have easily been transported from one locality to another by naturally occurring floating objects or ships. Many records of this species, especially early records and those from the Pacific and Indian Oceans, will need to be verified before it can be determined whether or not *E. brasiliensis* is actually a cosmopolitan species.

Male *E. brasiliensis* specimens are readily distinguished from those of the other Florida *Erichthonius* species, *Erichthonius* sp. A, by the lack of a broadly expanded basis with a posterior wing-like process and an expanded posterodistal margin on the merus of peraeopod 5. If peraeopod 5 is missing, as it often is in preserved material, male *E. brasiliensis* can be recognized by the broad basis of gnathopod 1 with a strongly angled “hump” on the posterior margin (basis slender, without “hump” in *Erichthonius* sp. A) and the slender, setose basis of gnathopod 2 (stout and without setae in *Erichthonius* sp. A). The ramus of uropod 3 also tends to be somewhat more slender in *E. brasiliensis* than in *Erichthonius* sp. A, but this can be difficult to determine without material of both species at hand.

Females are more difficult to separate and those of *E. brasiliensis* are most easily distinguished by the presence of short marginal setae on the anterior lobe of coxa 5 (long setae in *Erichthonius* sp. A) and the presence of setae on the posterior margin of the basis of peraeopod 5 (setae lacking in *Erichthonius* sp. A).

Adult size in *E. brasiliensis* ranges from 3 to 7 mm.

See Bousfield, 1973; Myers and McGrath, 1984; Thomas, 1993.

***Erichthonius* sp. A**
(Figure 484)

Regional diagnosis: Gnathopod 1 of male, basis slender, posterior margin evenly convex proximally; gnathopod 2 of male, basis stout, without setae, propodus stout, posterior margin convex, dactyl, anterior margin angled proximally, margins with short setae; coxa 5 of female, ventral margin of anterior lobe lined with long setae, setae extending beyond distal margin of basis; peraeopod 5 of male, basis, posterior margin narrowly produced to form wing-like process; peraeopod 5 of female basis, posterior margin without setae, propodus stout; uropod 3, ramus stout.

Distribution: Biscayne Bay; Florida Bay; southeastern Gulf of Mexico between Cape Romano and the lower Florida Keys; Peace River at U.S. 41 (FDEP, Punta Gorda Laboratory, unpublished records).

Ecology: *Erichthonius* sp. A occurs on bottom types ranging from sandy shell to silty mud mixed with shell hash. Both seagrasses and shell are usually present. It has been found at salinities of 28 to 36 ppt and at depths of 1 to 15 m.

Remarks: *Erichthonius* sp. A is a very distinctive species, differing from all other known western Atlantic species of *Erichthonius* except for *Erichthonius* sp. C, another undescribed species occurring on the east coast of the United States, in the morphology of peraeopod 5 of the adult male. In both *Erichthonius* sp. A and *Erichthonius* sp. C, the basis is expanded posterodistally to form a wing-like process. This process or lobe is broader in *Erichthonius* sp. A than it is in *Erichthonius* sp. C, but is otherwise similar. In addition, the merus is expanded distally in both species, but more strongly expanded in *Erichthonius* sp. A. Other differences between males of the two species include the morphology of coxa 2 (depth subequal to width, subovate, ventral margin rounded, with stridulating ridges in *Erichthonius* sp. A; width much greater than depth, subrectangular, ventral margin emarginate, without stridulating ridges in *Erichthonius* sp. C), gnathopod 2 (carpus with 2 distal teeth on posterior margin in *Erichthonius* sp. A; one tooth in *Erichthonius* sp. C) and uropod 3 (ramus short, stout in *Erichthonius* sp. A; elongate, slender in *Erichthonius* sp. C). *Erichthonius* sp. A closely resembles the Indo-Pacific species *Erichthonius pugnax* Dana, 1852 (see Myers, 1995) in the morphology of the coxae, gnathopod 2 and peraeopod 5 of the male. In *Erichthonius* sp. A, as in some other species of *Erichthonius* including *E. pugnax*, the hyperadult male may not have the second tooth on carpal lobe of gnathopod 2 and the propodus is more slender than in less fully developed males of those species. *Erichthonius* sp. A is a relatively small species, ranging from 2 to 3 mm in length.

Genus *Jassa* Leach, 1814

Regional diagnosis: Antennae 1-2, peduncle articles slender to moderately stout; antenna 1, peduncle article 1 slightly expanded, slightly wider than articles 2-3; rostrum short, straight; mandibular palp long, extending well beyond tip of incisor process, 3-articulate, terminal article not reduced; coxae 1-4, at least some coxae overlapping; gnathopod 1 subchelate; gnathopod 2 strongly sexually dimorphic, that of male subchelate, dactyl closing on propodal process, that of female subchelate, propodus with palm concave, without stout spines; peraeopods 3-4, merus produced anteroventrally, anteroventral lobe reaching distal margin of carpus; peraeopod 5 not geniculate, merus weakly subtriangular, not strongly produced posteroventrally; peraeopod 7 subequal to peraeopod 6 in length; pleopods 1-3, peduncle not broadly expanded, outer ramus slender, not expanded proximally, pleopods 2-3, rami not reduced, subequal, articulations distinct; uropod 1, outer ramus slightly shorter than inner ramus; uropod 2 present, biramous, rami not vestigial; uropod 3 biramous, rami reduced, outer ramus with hooked apical teeth; telson subtriangular, entire.

Florida species: *J. marmorata*, *Jassa* sp. A

Remarks: Conlan (1990) revised the genus *Jassa*, redescribing *Jassa falcata* (Montagu, 1808), the type species of the genus, as well as four other previously described species and describing 14 additional new species. Prior to this revision, material of many species worldwide had been misidentified as *Jassa falcata* and although many of these records were clarified by Conlan (1990), a number of others remain to be verified.

Members of the genus *Jassa* are fouling species, living among algae and hydroids on both natural and man-made hard substrates worldwide. The species are generally difficult to distinguish and this difficulty is compounded by the fact that they have rather complex life histories, resulting considerable morphological variation within each species. In addition to the usual ontogenetic variation, many species exhibit two forms of males, called major males and minor males. Both forms are terminal males and have the thumb on the propodus of gnathopod 2 that is characteristic of adult males in this genus (subadult males do not have thumbs). This thumbed state is arrived at on the terminal or final molt; the individual does not molt again and minor males do not become major males (Conlan, 1990). Borowsky (1983, 1985) determined that males with large thumbs are reproductively dominant over males with small thumbs and Conlan (1989, 1990) has suggested that the two forms may exhibit different mating strategies, with minor males filling the role of sneaker males (sneaking in and mating with females when no major males are around) and major males openly competing for females. See Conlan (1989, 1990) for a more complete discussion of variation and behavior in *Jassa* species.

KEY TO FLORIDA SPECIES OF *JASSA*

1. < Antenna 2, peduncle articles 4-5 and flagellum article 1 of major male elongate, flagellum article 1 with stout submarginal spines distally on posterior margin, peduncle article 5 and flagellum article 1 of major and minor male with dense plumose setae on posterior margin, those of female similar, but plumose setae less dense; coxa 1 of major male not strongly produced anteroventrally, subquadrate, with strong diagonal ridge on posteroventral surface, that of female subquadrate, with flat ventral margin; gnathopod 1, carpus with distal dorsolateral seta; gnathopod 2 of major male, thumb not tapering distally, tip blunt, thumb of minor male stout, tapering distally; telson without terminal setae *Jassa marmorata*

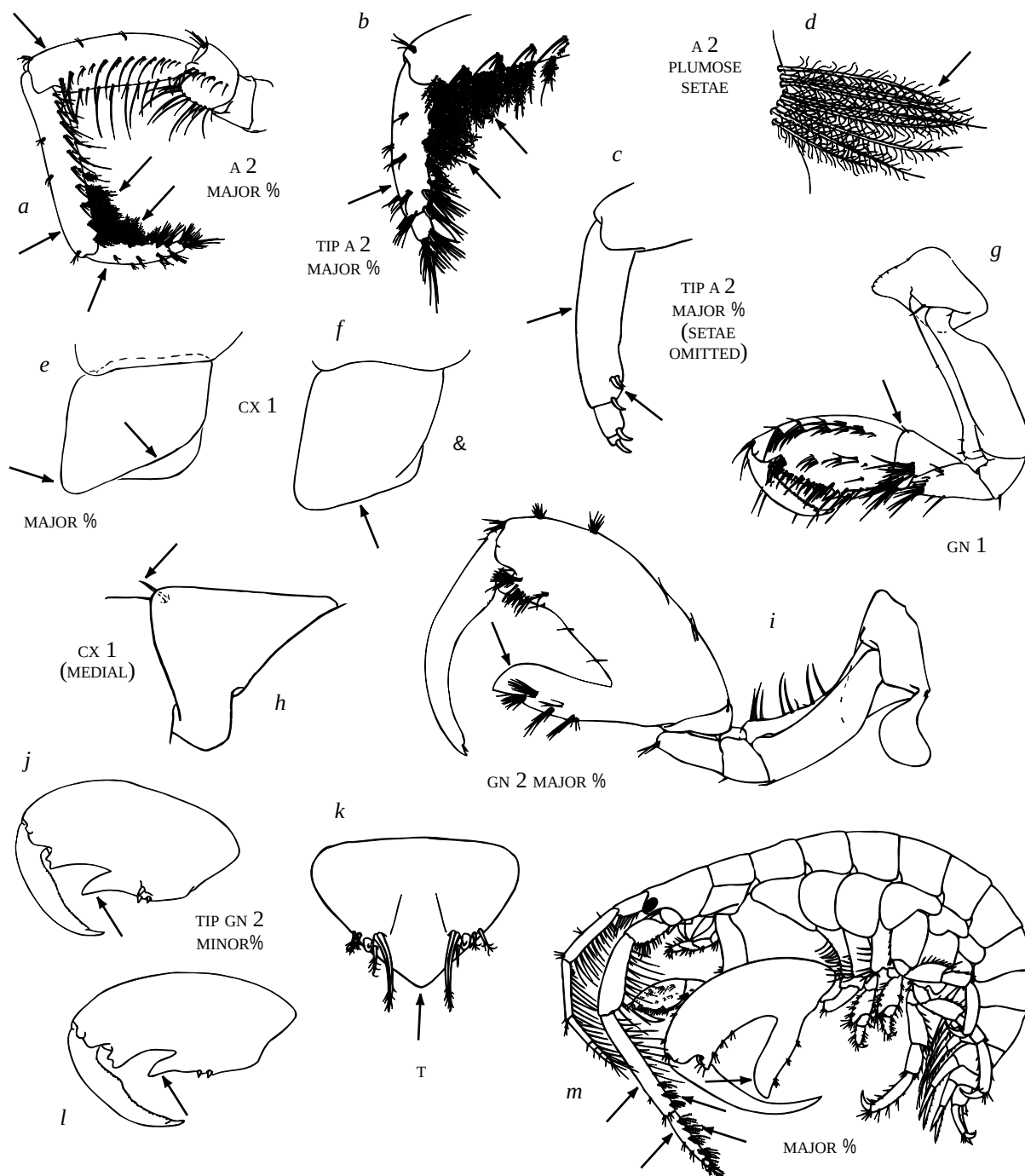


Figure 485.

< Antenna 2, peduncle articles 4-5 and flagellum article 1 of major male relatively stout, flagellum article 1 with stout submarginal spines along entire length of posterior margin, peduncle article 5 and flagellum article 1 of major male, minor male and female with minutely pectinate setae on posterior margin, without plumose setae; coxa 1 of major male strongly produced anteroventrally, shoe-shaped, without diagonal ridge on posteroventral surface, that of female widest distally, with convex ventral margin; gnathopod 1, carpus with distal dorsomedial seta; gnathopod 2 of major male, thumb tapering distally, tip subacute, thumb of minor male slender, not tapering distally; telson with terminal setae *Jassa* sp. A

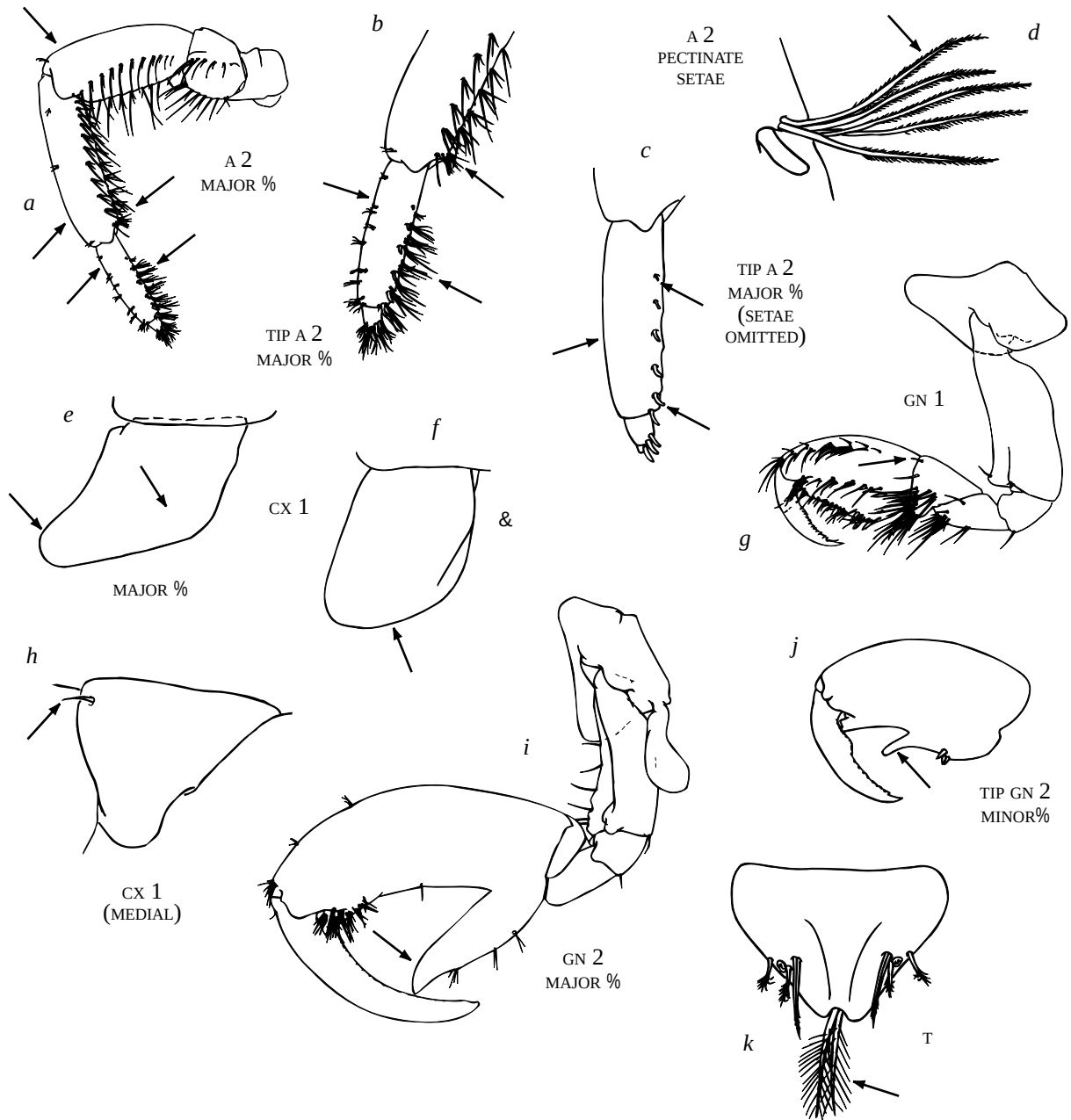


Figure 486.

***Jassa marmorata* Holmes, 1903
(Figure 485)**

Jassa marmorata Holmes, 1903, p. 289.

Jassa falcata: Bousfield, 1973, p. 190-191, pl. LVIII, fig. 2 (not *Jassa falcata* [Montagu, 1808]).

Regional diagnosis: Antenna 2, peduncle articles 4-5 and flagellum article 1 of major male elongate, flagellum article 1 with stout submarginal spines distally on posterior margin, peduncle article 5 and flagellum article 1 of major and minor male with dense plumose setae on posterior margin, those of female similar, but plumose setae less dense; coxa 1 of major male not strongly produced anteroventrally, subquadrate, with strong diagonal ridge on posteroventral surface, that of female subquadrate, with flat ventral margin; gnathopod 1, carpus with distal dorsolateral seta; gnathopod 2 of major male, thumb not tapering distally, tip blunt, thumb of minor male stout, tapering distally; telson without terminal setae.

Distribution: Cosmopolitan in temperate and tropical waters (Conlan, 1990).

Ecology: *Jassa marmorata* is a fouling species, living among hydroids and algae on both man-made and naturally occurring hard substrates. It is found from the intertidal zone out to depths of 30 m (Conlan, 1990).

Remarks: Prior to the revision of the genus *Jassa* by Conlan (1990), many records of *J. marmorata* in the western Atlantic were reported as *Jassa falcata*, as were those of a number of other species worldwide. For many of these records, the specimens have been rechecked by Conlan (1990) and found to represent *J. marmorata*; others were assumed by her to represent *J. marmorata* records based on the known distributions of that species and others. However, these latter records, as well as any newer records of *J. marmorata* from Florida and the Gulf of Mexico will need to be checked again to determine whether they actually represent records of *J. marmorata* or *Jassa* sp. A.

Jassa marmorata is a moderately large species, with adult size ranging from 3 to 7 mm. Males are slightly larger than females, although there is considerable overlap (Conlan, 1990). It is readily distinguished from its congener in the area, *Jassa* sp. A, by the lack of long terminal setae on the telson in both sexes and at all stages. Also, the color patterns differ, although there is some overlap here as well. In general, *J. marmorata* is more heavily pigmented and browner, with the broad pigment bands on the peraeon and pleon extending solidly across the dorsal midline of each segment. In *Jassa* sp. A, however, the pigmentation is not as extensive and the bands across each segment of the peraeon and pleon tend to be broken in the middle, resulting in a line of open, unpigmented patches running down the dorsal midline. This often causes the pigmented areas to appear as two lines of pigment blocks, one on each side of the dorsal mid-line.

See Bousfield, 1973 (as *J. falcata*); Conlan, 1990.

***Jassa* sp. A**
(Figure 486)

Regional diagnosis: Antenna 2, peduncle articles 4-5 and flagellum article 1 of major male relatively stout, flagellum article 1 with stout submarginal spines along entire length of posterior margin, peduncle article 5 and flagellum article 1 of major male, minor male and female with minutely pectinate setae on posterior margin, without plumose setae; coxa 1 of major male strongly produced anteroventrally, shoe-shaped, without diagonal ridge on posteroventral surface, that of female widest distally, with convex ventral margin; gnathopod 1, carpus with distal dorsomedial seta; gnathopod 2 of major male, thumb tapering distally, tip subacute, thumb of minor male slender, not tapering distally; telson with terminal setae.

Distribution: Hutchinson Island, Florida; St Andrew Bay, Florida; Dog Keys Pass, Mississippi; Galveston Bay, Texas; Mustang Island, Texas; South Padre Island, Texas.

Ecology: *Jassa* sp. A occurs in fouling growth and algae growing on hard substrates such as buoys, pilings, rocks and jetties. It has also been found living in floating clumps of *Sargassum* near shore and on floating fish cages offshore (pers. obs.) The known depth range for this species is from just below the surface to 1 m at salinities of 16 to 34 ppt.

Remarks: *Jassa* sp. A is close to *J. morinoi* from Japan and the west coast of North America in that it lacks setae on the anterolateral margin of basis of gnathopod 1 (except for one at the anterodistal angle); has a dorsomedial seta at the anterodistal junction of the carpus of gnathopod 1; has sparse, simple setae on the anterolateral margin of basis of gnathopod 2; gnathopod 2 of the female has a concave palm; on uropod 1, the peduncle has a distoventral spur approximately one half the length of the shortest ramus (outer); and the telson has apical setae in addition to those at each lateral cusp. However, the flagellum of antenna 2 is 3-articulate rather than 5-articulate, the dorsomedial seta on the carpus of gnathopod 1 is usually short rather than long, gnathopod 2 of the major male lacks the ledge and defining spines at base of the thumb and the thumb is longer than in *J. morinoi*. Also, the thumb on gnathopod 2 of the minor male is somewhat longer than in *J. morinoi*.

Jassa sp. A occurs together with *J. marmorata* at St. Andrew Bay and probably in other areas as well. It is most easily distinguished from that species at all stages and for both sexes by the presence of several long terminal setae on the telson. These setae are lacking in *Jassa marmorata* and, in fact, *J. morinoi* is the only other species for which they have been reported (Conlan, 1990). *Jassa* sp. A is a slightly smaller species than *J. marmorata*, with adults ranging in size from 2 to 5 mm.

Family Lysianassidae Dana, 1849

Regional diagnosis: Antenna 1, peduncle short, stout, accessory flagellum well-developed; head not elongate, not produced to form “snout”, eyes large, subrectangular, pyriform or vertically ovate; body laterally compressed, peraeon segments not dorsally carinate; pleon dorsally smooth, without strong teeth or processes; coxae not splayed; coxa 1 not reduced, as large as or larger than coxa 2; coxa 4, posterior margin strongly excavate; gnathopod 1, ischium not elongate, subquadrate or slightly longer than wide; gnathopod 2 minutely chelate or subchelate, ischium elongate, at least twice as long as wide, longer than merus, propodus unenlarged, dactyl minute; uropod 3, peduncle short, extending no more than halfway along rami of uropod 2, inner ramus at least one half outer ramus in length, outer ramus not elongate; urosome segments 1-3 separate.

Florida genera: *Aruga*, *Concarnes*, *Hippomedon*, *Lepidepecreum*, *Lysianopsis*, *Orchomenella*, *Shoemakerella*

Remarks: The family Lysianassidae *sensu lato* (approximately equivalent to the current superfamily Lysianassoidea) is enormous and extremely unwieldy and has recently been the subject of considerable revision by various workers, in particular by J.K. Lowry and H.E. Stoddart of the Australian Museum (Lowry, 1984; Lowry and Stoddart, 1983, 1987, 1989, 1990, 1992, 1993, 1995a, b, 1996, 1997, 2002a, b, c; Stoddart and Lowry, 2004). Their efforts have resulted in the establishment of many new lysianassoid families, as well as several recognized groups of genera that have not yet been awarded family status. A number of these new families, including the Uristidae Lowry and Stoddart, 1992, Aristiidae Lowry and Stoddart, 1997, Cyphocarididae Lowry and Stoddart, 1997, Endeavouridae Lowry and Stoddart, 1997, Scopelocheiridae Lowry and Stoddart, 1997, and Eurytheneidae Stoddart and Lowry, 2004, are known from Florida and nearby waters. However, the only family found to occur to date in Florida waters less than 10 m in depth is the Lysianassidae *sensu stricto*.

Lysianassoid amphipods, especially members of the family Lysianassidae, are common, often very abundant, infaunal inhabitants of Florida nearshore waters. They are a diverse group and a number of the genera and species are superficially similar, which, combined with the lack of any comprehensive regional literature prior to 1997, has made them a difficult group to work with. Lowry and Stoddart's (1997) monograph on the lysianassoids from the Hourglass Cruises in the eastern Gulf of Mexico has made a significant and very welcome start towards resolving some of the taxonomic problems within the group in Florida. In this publication, they provide a list of species reported from the Gulf of Mexico and adjacent waters, as well as a key to warm temperate and tropical western Atlantic and Caribbean species. In addition, they establish four new families, two new genera and 14 new species, many of which are not included herein because they have only been found in waters deeper than 10 m to date. However, in spite of Lowry and Stoddart's work, there remain a number of undescribed or unreported species in the region, especially in deeper waters.

Thomas (1993) reported a species of *Lysianassa*, *Lysianassa* sp. 1, from shallow coral rubble, sand and *Thalassia* habitats in the backreef areas of Looe Key, Florida. It is apparently relatively uncommon and no specimens assignable to this species were encountered in the material available for study during the preparation of this guide. For this reason, it is not included herein. However, it can be separated from members of the other lysianassid species in the area by the nearly circular or horizontally ovate basis on peraeopod 7. Other regional species have a vertically ovate basis on peraeopod 7.

KEY TO FLORIDA GENERA OF LYSIANASSIDAE

1. < Maxilla 1, palp article 2 with apical spines; gnathopod 1 subchelate; uropod 2, inner ramus without distinct dorsal notch 2

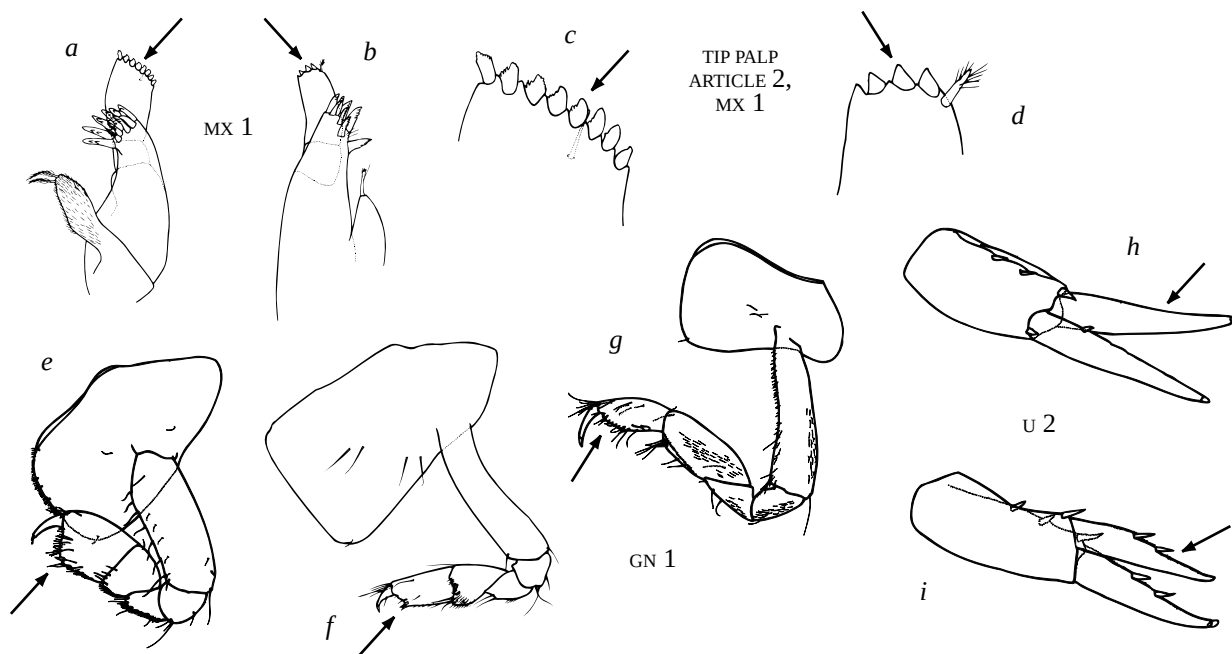


Figure 487.

- < Maxilla 1, palp article 2 without apical spines (may have processes or crenulations); gnathopod 1 simple; uropod 2, inner ramus with distinct dorsal notch 4

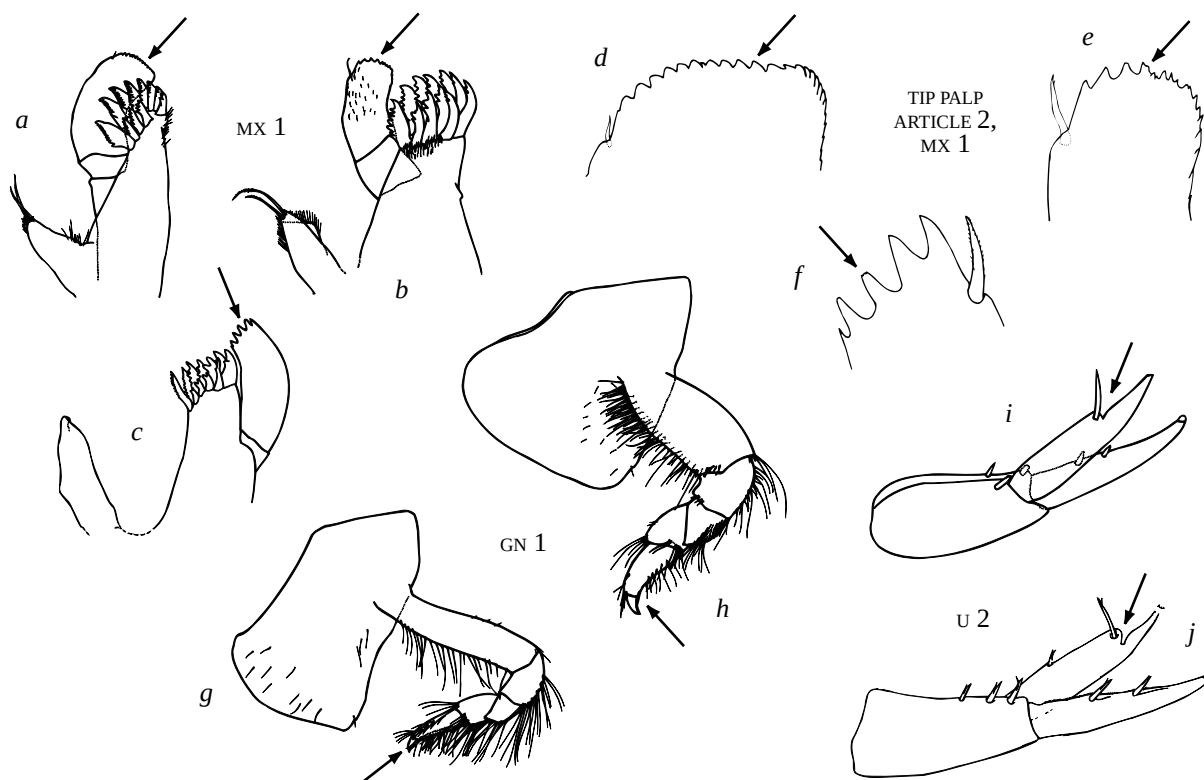


Figure 488.

2. < Antenna 2 of female, flagellum elongate; mandible, palp article 3 long, subequal to article 2 in length; gnathopod 1, propodus subovate, palm oblique; epimeron 3, posteroventral angle produced to form strong tooth *Hippomedon*

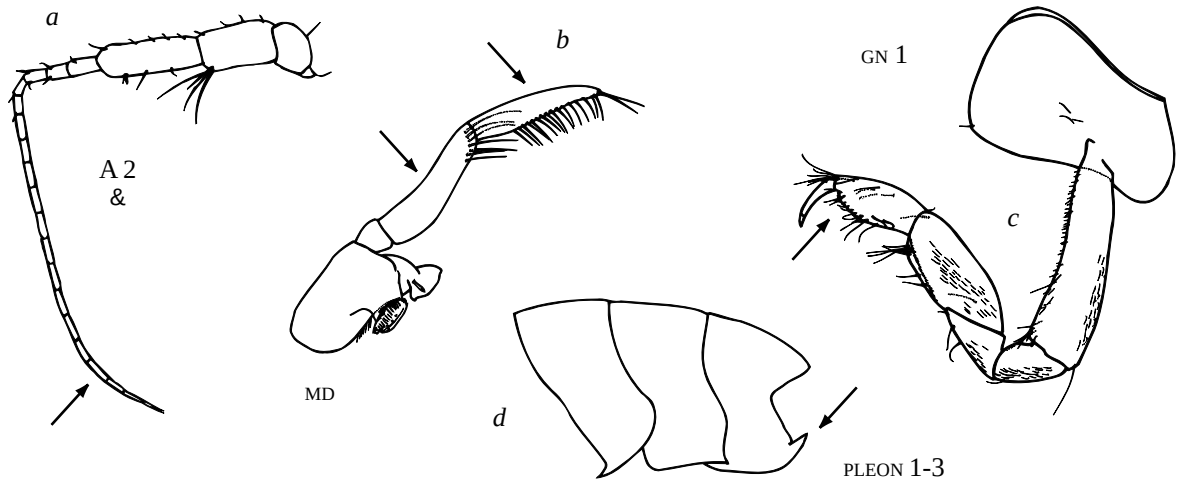


Figure 489.

- < Antenna 2 of female, flagellum short; mandible, palp article 3 short, approximately half length of article 2; gnathopod 1, propodus subrectangular or subquadrate, palm transverse; epimeron 3, posteroventral angle acute or subquadrate, not produced to form strong tooth.... 3

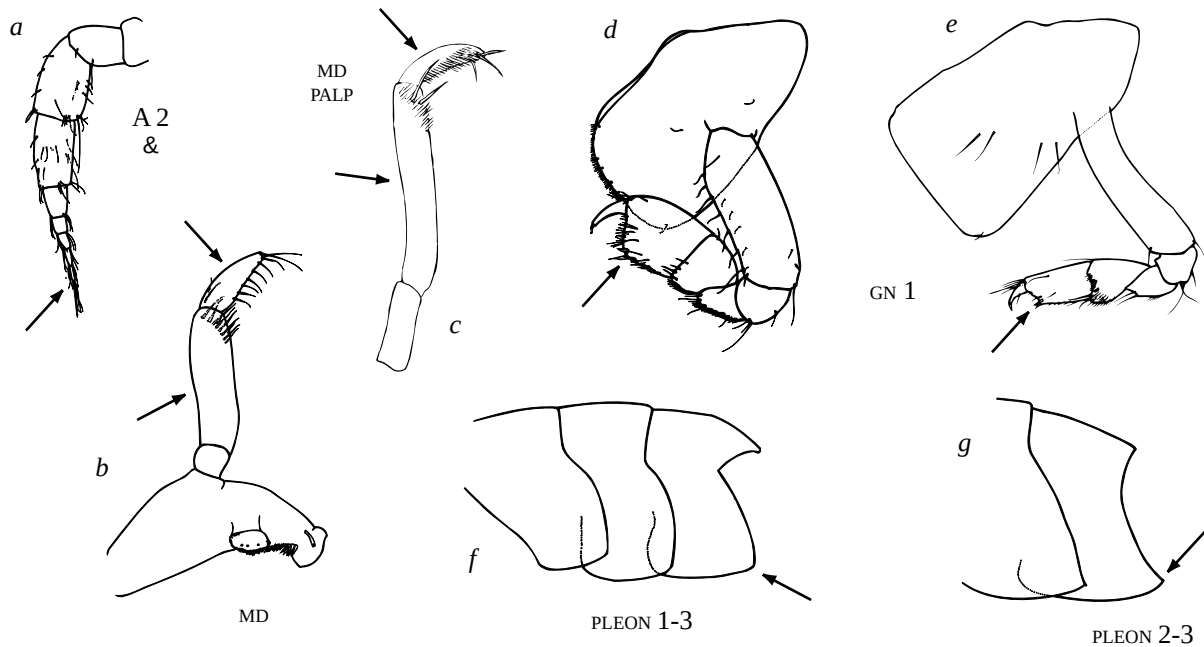


Figure 490.

3. < Antenna 2 of female, peduncle article 3 short, length 1.5-2 times width; eye medium, not nearly reaching dorsal margin of head in female; maxilla 1, palp article 2 with 3 or 6 apical spines; maxilliped, outer plate short, not reaching beyond distal margin of palp article 2, palp articles stout; gnathopod 1, carpus short, less than twice as long as deep *Orchomenella*

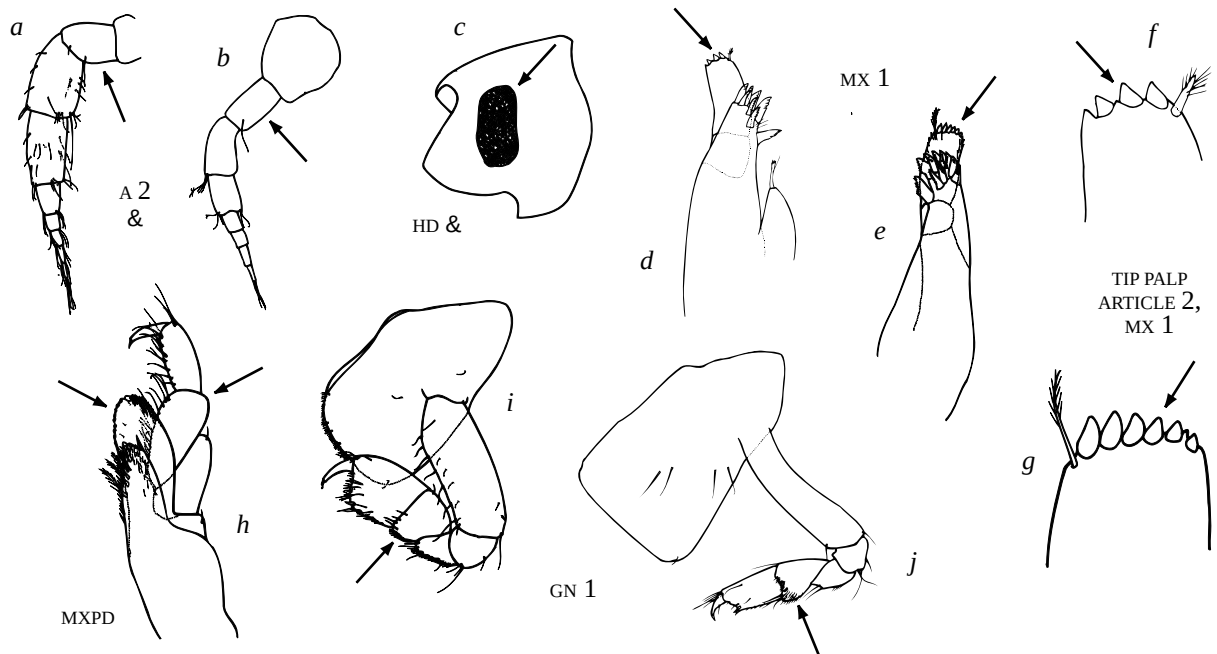


Figure 491.

- < Antenna 2 of female, peduncle article 3 elongate, length 3-3.5 times width; eye large, nearly reaching dorsal margin of head in female; maxilla 1, palp article 2 with 5 apical spines; maxilliped, outer plate long, reaching at least to midpoint of palp article 3, palp articles slender; gnathopod 1, carpus elongate, more than twice as long as deep *Lepidepcreum*

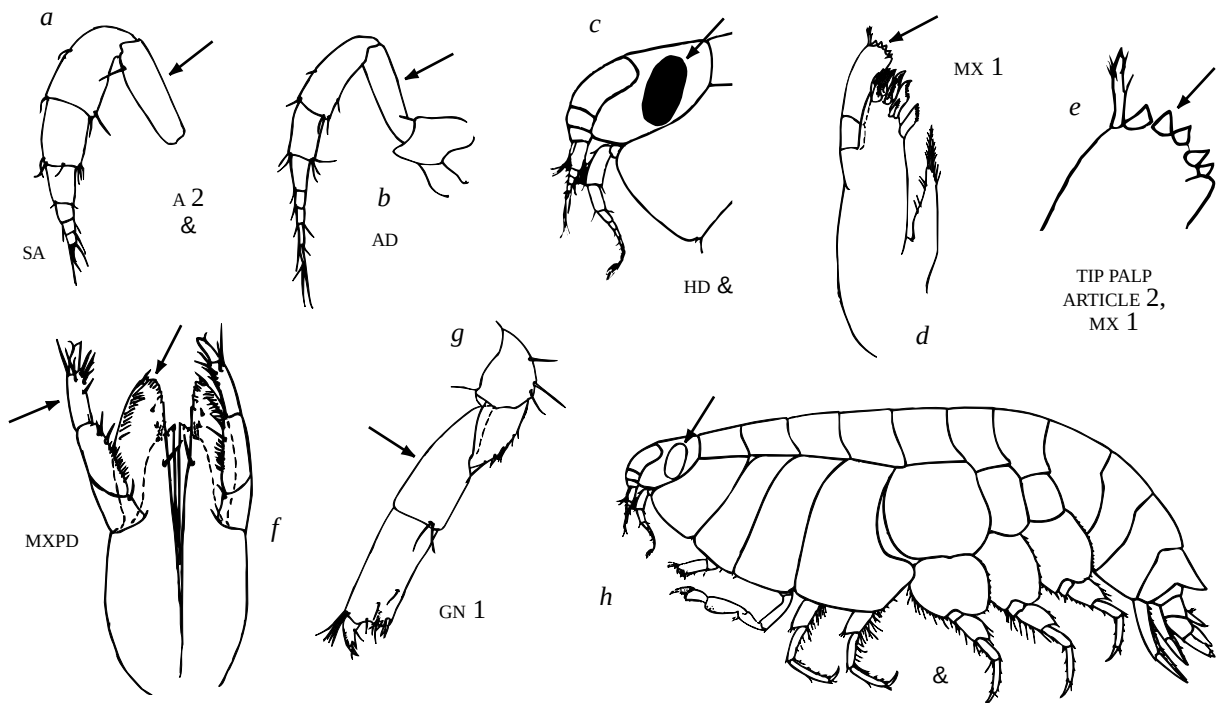


Figure 492.

4. < Gnathopod 1, basis slender, length approximately 4 times width; gnathopod 2 minutely subchelate, propodus slender, not expanded distally, anterior margin nearly straight; uropod 3, peduncle without dorsolateral flange; telson partially cleft *Concarnes*

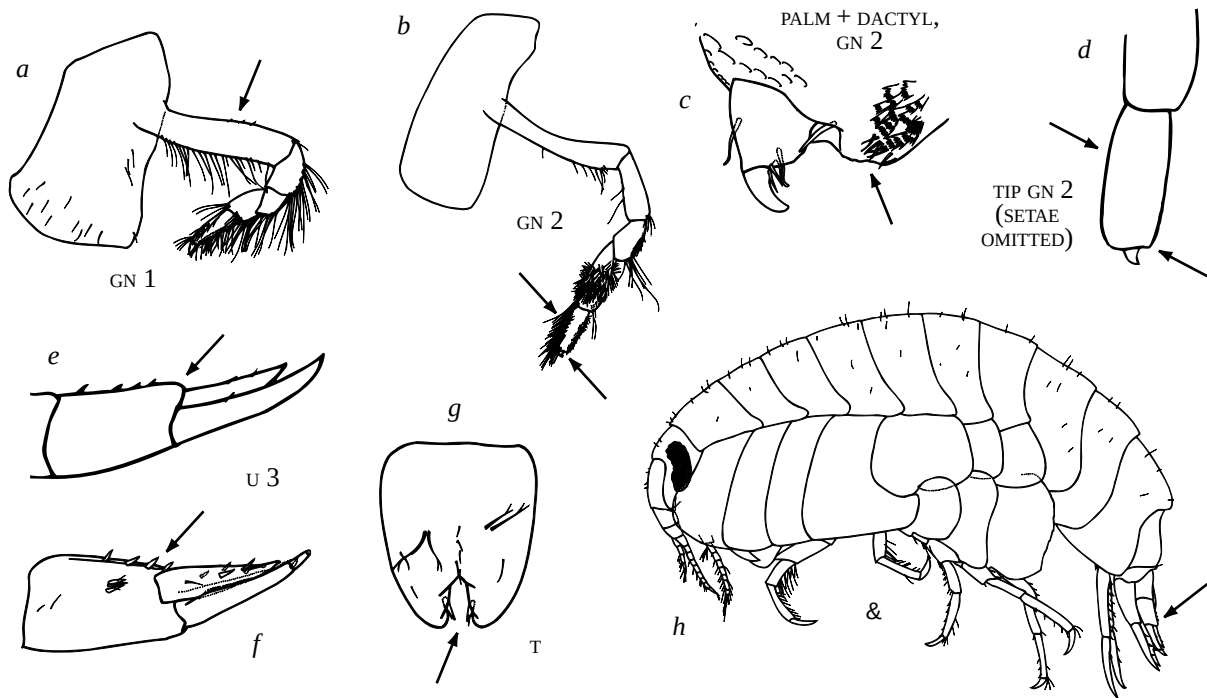


Figure 493.

- < Gnathopod 1, basis stout, length approximately 2.5 times width; gnathopod 2 minutely chelate, propodus stout, expanded distally, anterior margin convex; uropod 3, peduncle with dorsolateral flange; telson entire 5

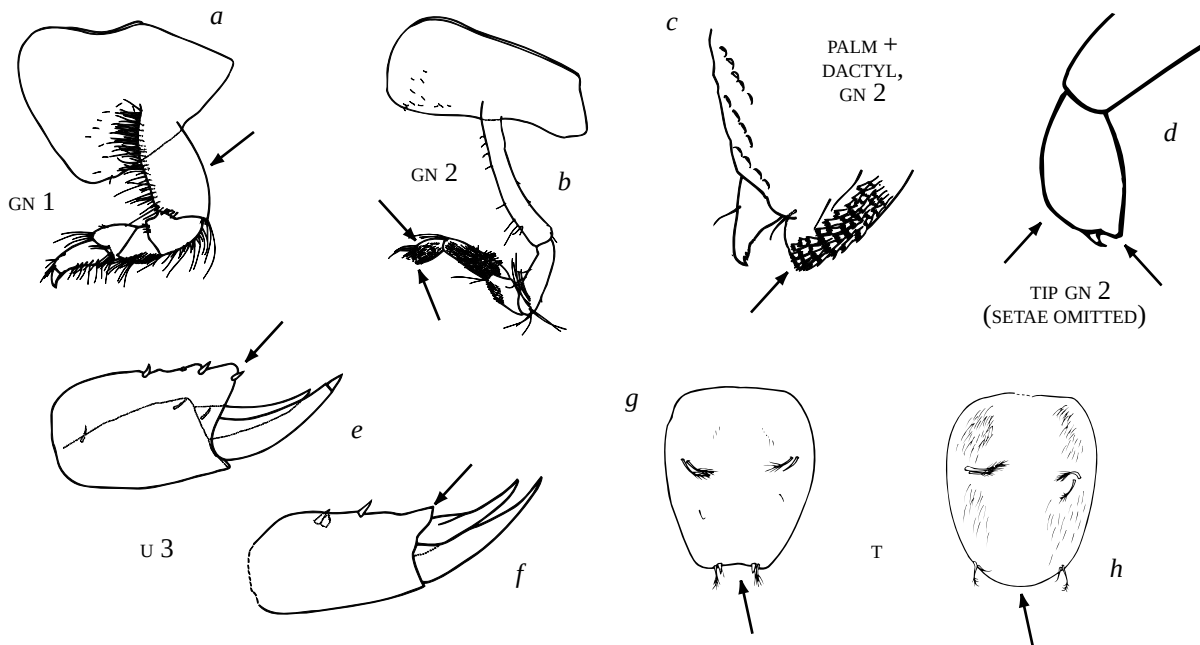


Figure 494.

5. < Maxilla 1, inner plate without terminal setae; maxilla 2, inner plate broad, distinctly wider than outer plate; pereopods 3-4, merus not enlarged, only slightly larger than carpus; uropod 2, inner ramus abruptly narrowing at dorsal notch, distal portion much more slender than proximal portion; uropod 3 of female, peduncle, inner margin with 1-2 proximal spines, outer margin without distal spines *Shoemakerella*

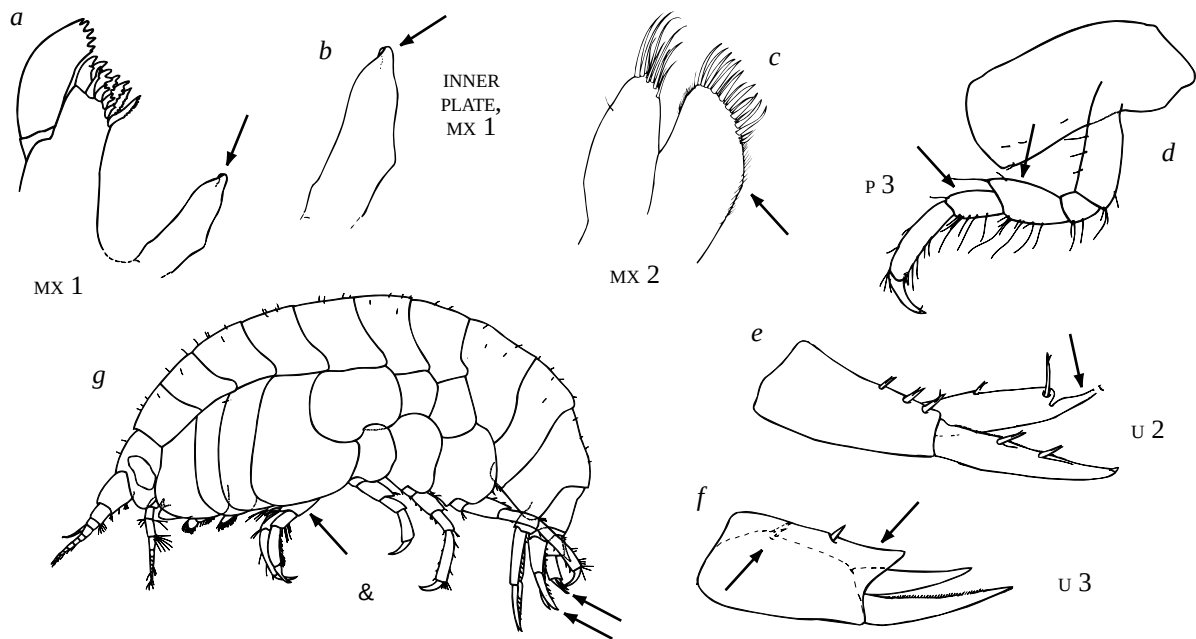


Figure 495.

- < Maxilla 1, inner plate with 2 terminal setae; maxilla 2, inner plate narrow, similar to outer plate in width; pereopods 3-4, merus enlarged, much larger than carpus; uropod 2, inner ramus not abruptly narrowing at dorsal notch, distal portion not much more slender than proximal portion; uropod 3 of female, peduncle, inner margin with single proximal seta, outer margin with distal spines 6

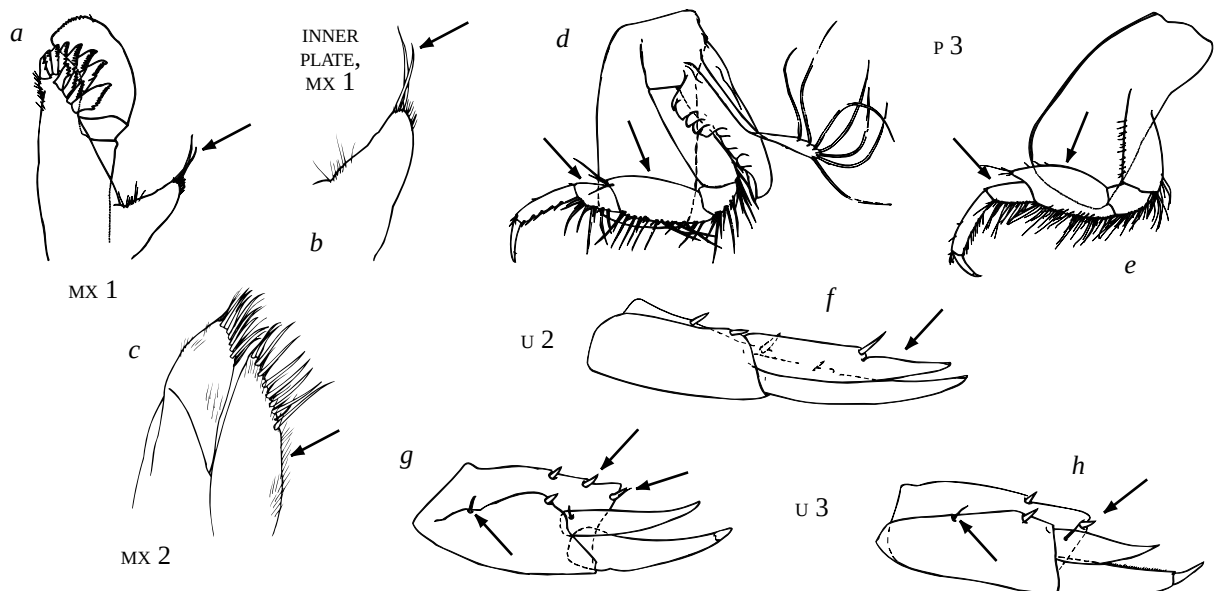


Figure 496.

6. < Antenna 1 of female, callynophore present, strong; antenna 2 of male, flagellum elongate; maxilla 1, palp article 2 crenulate distally; peraeopods 3-4 of male, anterior margin of merus, carpus and propodus lined with short, fine setae; uropod 3 of male, peduncle and rami with plumose setae; telson emarginate distally *Aruga*

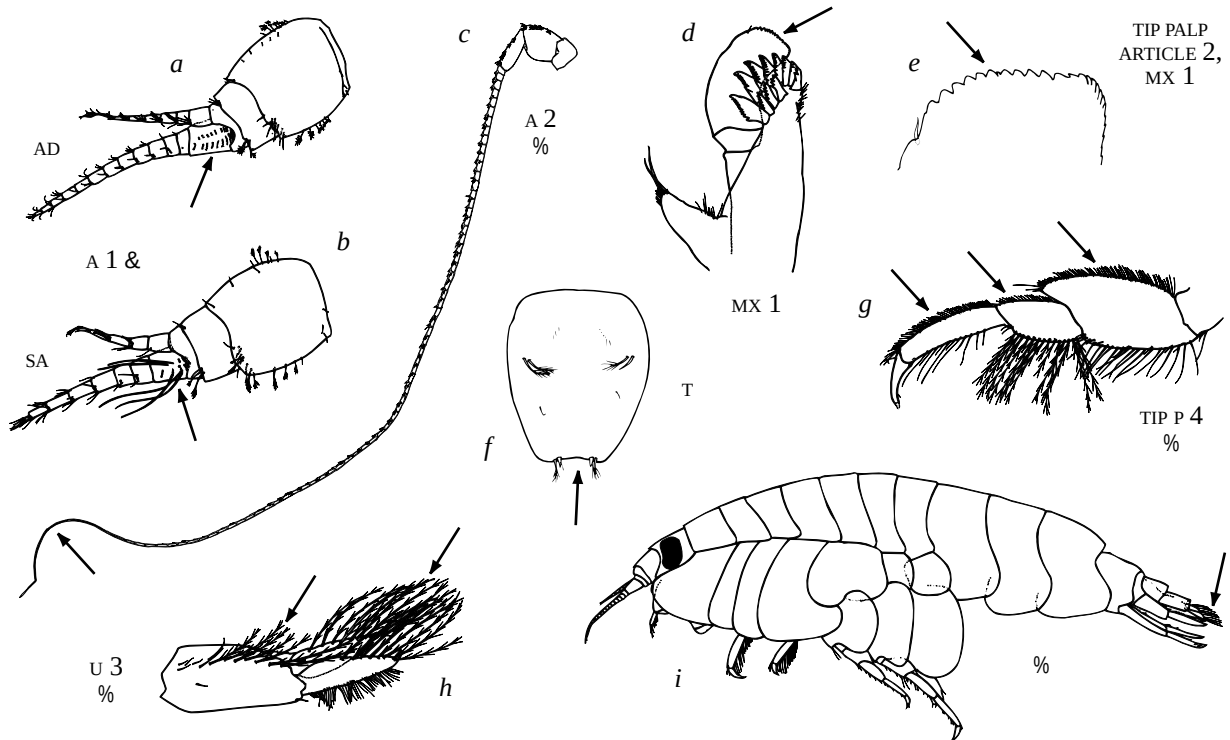


Figure 497.

- < Antenna 1 of female, callynophore weak or absent; antenna 2 of male, flagellum short; maxilla 1, palp article 2 serrate distally; peraeopods 3-4 of male, anterior margin of merus, carpus and propodus not lined with short, fine setae; uropod 3 of male, peduncle and rami without plumose setae; telson rounded distally *Lysianopsis*

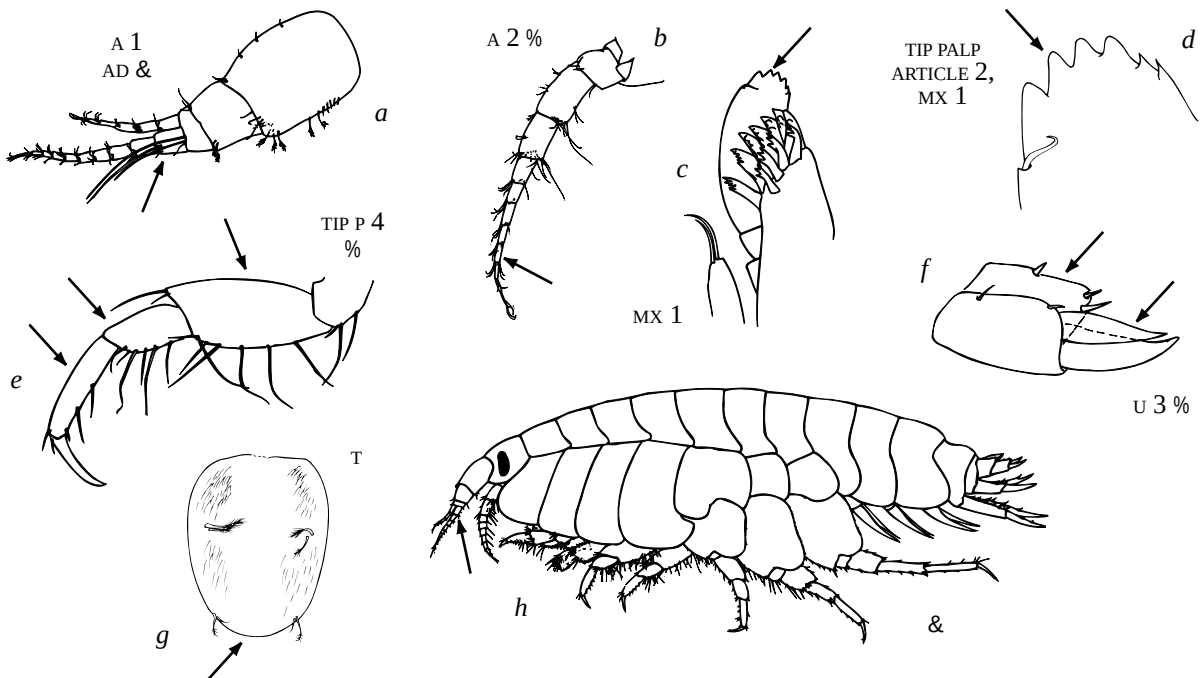


Figure 498.

Genus *Aruga* Holmes, 1908

Regional diagnosis: Antenna 1 of female, callynophore present, strong; antenna 2 of male, flagellum elongate; antenna 2 of female, peduncle article 3 short, length subequal to width, flagellum short; eye large, nearly reaching dorsal margin of head in female; mandible, palp article 3 moderately long, slightly shorter than article 2; maxilla 1, inner plate with 2 terminal setae, palp article 2 crenulate distally, without apical spines; maxilla 2, inner plate narrow, similar to outer plate in width; maxilliped, outer plate short, not reaching beyond distal margin of palp article 2, palp articles slender; gnathopod 1 simple, basis stout, length approximately 2.5 times width, propodus narrowing distally, carpus short, less than twice as long as deep; gnathopod 2 minutely chelate, propodus stout, expanded distally, anterior margin convex; peraeopods 3-4 of both sexes, merus enlarged, much larger than carpus; peraeopods 3-4 of male, anterior margin of merus, carpus and propodus lined with short, fine setae; epimeron 3, posteroventral angle subquadrate, not produced to form strong tooth; uropod 2, inner ramus with distinct dorsal notch, not abruptly narrowing at notch, distal portion not much more slender than proximal portion; uropod 3 of both sexes, peduncle with dorsolateral flange; uropod 3 of male, peduncle and rami with plumose setae; uropod 3 of female, peduncle, inner margin with single proximal seta, outer margin with distal spines; telson entire, tip emarginate.

Florida species: *A. holmesi*

Aruga holmesi Barnard, 1955 (Figure 497)

Aruga holmesi Barnard, 1955b, p. 100, pls. 27-28.

Lysianopsis holmesi: Hurley, 1963, pp. 74-75, fig. 21b.

Lysianassa holmesi: Barnard, 1966, p. 25.

Lysianopsis sp. A: Rakocinski et al., 1996, p. 350.

Regional diagnosis: That of the genus.

Distribution: Off Folly Island, South Carolina (Southeastern Regional Taxonomic Center [SERTC], South Carolina Department of Natural Resources [SCDNR], unpublished records); eastern Gulf of Mexico from the lower Florida Keys to Perdido Key, Florida (pers. obs.; Lowry and Stoddart, 1997); eastern Pacific from California to Ecuador (Lowry and Stoddart, 1997).

Ecology: *Aruga holmesi* is an infaunal species, occurring on silty, sandy mud bottoms near grassbeds, as well as on fine, medium or coarse sand bottoms in relatively high salinity areas. It has been found at depths ranging from 2 to 73 m (pers. obs.; Lowry and Stoddart, 1997).

Remarks: *Aruga holmesi* is one of three common Florida lysianassid species (*Shoemakerella cubensis* and *Lysianopsis alba* are the other two) belonging to genera characterized by having a simple gnathopod 1 and an entire telson. It differs from both of the other species by having a well-developed callynophore on antenna 1 of the female, an elongate flagellum on antenna 2 in the male, the peduncle and rami of uropod 3 in the male with long plumose setae, a very distinct second article on the outer ramus of uropod 3 and an emarginate telson tip. It is further distinguished from *S. cubensis* by the enlarged merus on peraeopods 3-4, the peduncle of uropod 3 in the female having distal spines on the expanded lateral margin, and the relatively stout distal portion of the inner ramus of uropod 2. In addition, the peduncle of uropod 3 is somewhat more elongate than in either *S. cubensis* or *L. alba*.

Aruga holmesi is a relatively large species, with adult sizes ranging from 6 to 11.5 mm. Gulf of Mexico material is generally smaller than California material and is usually not larger than 9 mm. Males are similar to females in size but, in addition to the elongate flagellum on antenna 2, setose uropod 3 and setose distal articles on peraeopod 4, they have much larger eyes than the females. See Barnard, 1955b; Lowry and Stoddart, 1997.

Genus *Concarnes* Barnard and Karaman, 1991

Regional diagnosis: Antenna 1 of female, callynophore absent; antenna 2 of female, peduncle article 3 short, length subequal to width; antenna 2 of both sexes, flagellum short; eye medium, not nearly reaching dorsal margin of head in female; mandible, palp article 3 short, slightly more than half length of article 2; maxilla 1, inner plate with 2 terminal setae, palp article 2 serrate distally, without apical spines; maxilla 2, inner plate narrow, similar to outer plate in width; maxilliped, outer plate short, not reaching distal margin of palp article 2, palp articles slender; gnathopod 1 simple, basis slender, length approximately 4 times width, carpus short, less than twice as long as deep, propodus narrowing distally; gnathopod 2 minutely subchelate, propodus slender, not expanded distally, anterior margin nearly straight; pereopods 3-4 of both sexes, merus slightly enlarged, not much larger than carpus; pereopods 3-4 of male, anterior margin of merus, carpus and propodus not lined with short, fine setae; epimeron 3, posteroventral angle subquadrate, not produced to form strong tooth; uropod 2, inner ramus with distinct dorsal notch, not abruptly narrowing at notch, distal portion not much more slender than proximal portion; uropod 3 of both sexes, peduncle without dorsolateral flange; uropod 3 of male, peduncle and rami without plumose setae; uropod 3 of female, peduncle, inner margin without proximal spines or setae, outer margin with distal spines; telson cleft in distal one fourth.

Florida species: *C. concavus*

Concarnes concavus (Shoemaker, 1933) (Figure 493)

Socarnes concavus Shoemaker, 1933a, pp. 247-248, fig. 1.

Concarnes concavus: Barnard and Karaman, 1991, p. 477.

Regional diagnosis: That of the genus.

Distribution: Off Santee River, South Carolina (SERTC, SCDNR, unpublished records); off Sapelo Island and Little Tybee Island, Georgia (SERTC, SCDNR, unpublished records); Dry Tortugas (Shoemaker, 1933a); eastern Gulf of Mexico from the Florida Keys to Panama City (Thomas, 1993; Lowry and Stoddart, 1997); Belize (Thomas, 1993).

Ecology: *Concarnes concavus* occurs on coral reef habitats in shallow rubble areas and also on the forereef (Thomas, 1993). In addition, it has been found on coarse sand bottoms in somewhat deeper water (Lowry and Stoddart, 1997). The depth range for this species extends from the immediate subtidal zone out to 80 m (Thomas, 1993; Lowry and Stoddart, 1997).

Remarks: *Concarnes concavus* is similar to *Aruga holmesi*, *Shoemakerella cubensis* and *Lysianopsis alba* in having a simple gnathopod 1 and a dorsally incised or notched inner ramus on uropod 3. In addition, both *C. concavus* and *S. cubensis* have numerous short setae on the head, pereaeon and pleon (a good character to use for rough sorting, but not definitive). However, all three of the latter species are distinguished from *C. concavus* by the presence of an entire telson; the telson is cleft in the distal one third in *C. concavus*.

According to Thomas (1993), live material of this species has a distinctive reddish-orange coloration on pereaeon segments 2-4 that is diagnostic. Lowry and Stoddart (1997), citing Thomas (pers. com.), mention that this orange coloration is found on the head and pereaeon segments 1-5, with the posterior portion of the animal being white in color. Adult size ranges from 4 to 10 mm and males are smaller than females.

See Shoemaker, 1933a (as *Socarnes concavus*); Thomas, 1993; Lowry and Stoddart, 1997.

Genus *Hippomedon* Boeck, 1871

Regional diagnosis: Antenna 1 of female, callynophore present, strong; antenna 2 of female, peduncle article 3 short, slightly longer than wide; antenna 2 of both sexes, flagellum elongate; eye poorly developed, not readily visible in preserved material; mandible, palp article 3 long, subequal to article 2 in length; maxilla 1, inner plate with 2 terminal setae, palp article 2 with short, stout, microserrate apical spines; maxilla 2, inner plate narrow, similar to outer plate in width; maxilliped, outer plate long, nearly reaching mid-point of palp article 3, palp articles stout; gnathopod 1 subchelate, basis slender, length approximately 3.5 times width, carpus elongate, more than twice as long as deep, propodus subovate, palm oblique; gnathopod 2 minutely subchelate, propodus slender, not expanded distally, anterior margin nearly straight; peraeopods 3-4 of both sexes, merus not enlarged, only slightly larger than carpus; peraeopods 3-4 of male, anterior margin of merus, carpus and propodus not lined with short, fine setae; epimeron 3, posteroventral angle produced to form strong tooth; uropod 2, inner ramus without distinct dorsal notch, tapering distally; uropod 3 of both sexes, peduncle without dorsolateral flange; uropod 3 of male, peduncle and rami without plumose setae; uropod 3 of female, inner margin with single proximal seta, outer margin with distal spine; telson cleft in distal three fourths.

Florida species: *H. pensacola*, *Hippomedon* sp. B

Remarks: *Hippomedon* is the only shallow-water (less than 10 m) genus of lyssianassid amphipod currently known from Florida waters that has a large posteroventral hook or tooth on epimeron 3, making this a useful character to use in the initial, generic level identification of specimens belonging to this family. *Orchomenella thomasi* does have an acute, somewhat produced posteroventral angle on epimeron 3, but there is no hook present.

KEY TO FLORIDA SPECIES OF *HIPPOMEDON*

1. < Epimeron 3 with slit or notch above posteroventral tooth; uropod 2, lateral margin of peduncle unexpanded distally, without distolateral flange, marginal spines present *Hippomedon pensacola*

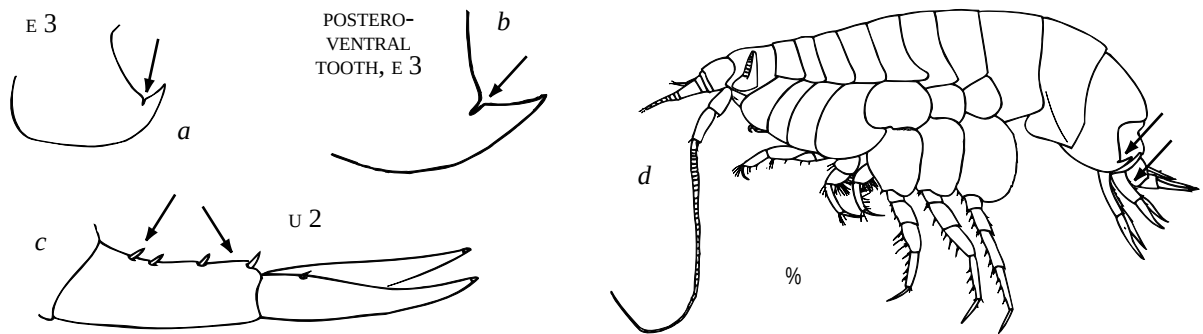


Figure 499.

- < Epimeron 3 without slit or notch above posteroventral tooth; uropod 2, lateral margin of peduncle expanded distally to form upturned distolateral flange, marginal spines absent *Hippomedon* sp. B

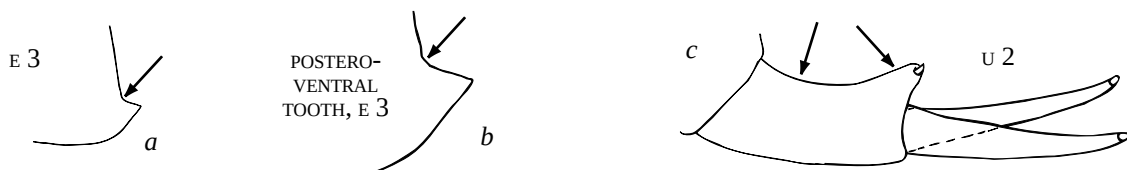


Figure 500.

***Hippomedon pensacola* Lowry and Stoddart, 1997
(Figure 499)**

Hippomedon pensacola Lowry and Stoddart, 1997, pp. 99-104, figs. 46-48.

Regional diagnosis: Epimeron 3 with slit or notch above posteroventral tooth; uropod 2, lateral margin of peduncle unexpanded distally, without distolateral flange, marginal spines present.

Distribution: Off Folly Island and Santee River, South Carolina (SERTC, SCDNR, unpublished records); off Little Tybee Island, Georgia (SERTC, SCDNR, unpublished records); Apalachee Bay, Florida; Santa Rosa Island, Florida (Lowry and Stoddart, 1997).

Ecology: Although the Florida material from Santa Rosa Island, described by Lowry and Stoddart (1997), was from very shallow water (5 m from shore, subtidal sand bottom), the material from South Carolina and Georgia occurred in somewhat deeper water (18-34 m; SERTC, SCDNR, unpublished records).

Remarks: Although *Hippomedon pensacola* has not been reported to occur anywhere except the Florida panhandle area and the South Atlantic Bight, it seems likely that this is the result of a lack of sampling in the appropriate habitats rather than an accurate reflection of its distribution pattern. South Carolina and Georgia material is virtually indistinguishable from that of the northeastern Gulf of Mexico. *Hippomedon pensacola* is easily separated from *Hippomedon* sp. B, the only other member of the genus known from Florida to date, by the lack of a strong distolateral flange on the peduncle of uropod 2 (flange present in *Hippomedon* sp. B). Adult size ranges from 4 to 5 mm. See Lowry and Stoddart, 1997.

***Hippomedon* sp. B
(Figure 500)**

Regional diagnosis: Epimeron 3 without slit or notch above posteroventral tooth; uropod 2, lateral margin of peduncle expanded distally to form upturned distolateral flange, marginal spines absent.

Distribution: Charleston Ocean Disposal Area, South Carolina (SERTC, SCDNR, unpublished records); Biscayne Bay, Florida; southeastern Gulf of Mexico between Cape Romano and Cape Sable; Tampa Bay, Florida.

Ecology: The specific habitat of *Hippomedon* sp. B is unknown, but presumably it is a sand-dwelling species, as are other members of the genus. It has been found at depths of 8-17 m (12-14 m in Florida waters.)

Remarks: This species keys out to *Hippomedon propinquus* Sars, 1890, a U.S. east coast species occurring as far south as Cape Hatteras (Dickinson, 1980), in Lowry and Stoddart (1997) and also in Bousfield (1973). It resembles this species in the lack of an anterodistal process on peduncle article 1 of antenna 1; the weakly subchelate gnathopod 1 with a poorly defined palm; the large posteroventral hook without a basal slit or notch on epimeron 3; the small posteroventral process on epimeron 2; and the long, deeply and narrowly cleft telson. However, *Hippomedon* sp. B differs from *H. propinquus* in the presence of an expanded distal flange on the dorsolateral margin of the peduncle of uropod 2. This flange is present even in small juveniles and is apparently unique to this species. The adult size range for this species is 4-6 mm.

Genus *Lepidepecreum* Bate and Westwood, 1868

Regional diagnosis: Antenna 1 of female, callynophore present, strong; antenna 2 of male, flagellum elongate; antenna 2 of female, peduncle article 3 elongate, length 3-3.5 times width, flagellum short; eye large, nearly reaching dorsal margin of head in female; mandible, palp article 3 short, approximately half length of article 2; maxilla 1, inner plate with 2 terminal setae, palp article 2 with 5 apical spines; maxilla 2, inner plate narrow, similar to outer plate in width; maxilliped, outer plate long, reaching at least to midpoint of palp article 3, palp articles slender; gnathopod 1 subchelate, basis slender, length approximately 4 times width, carpus elongate, more than twice as long as deep, propodus subrectangular, palm transverse; gnathopod 2 minutely chelate, propodus stout, expanded distally, anterior margin convex; peraeopods 3-4 of both sexes, merus not enlarged, only slightly larger than carpus; peraeopods 3-4 of male, anterior margin of merus, carpus and propodus not lined with short, fine setae; epimeron 3, posteroventral angle acute, not produced to form strong tooth; uropod 2, inner ramus without distinct dorsal notch, tapering distally; uropod 3 of both sexes, peduncle without dorsolateral flange; uropod 3 of male, peduncle and rami without plumose setae; uropod 3 of female, peduncle, inner margin without proximal spines or setae, outer margin with distal seta; telson cleft in distal two thirds.

Florida species: *L. cf magdalenensis*

Remarks: Lowry and Stoddart (2002a) have recently revised the genus *Lepidepecreum* and placed *Orchomenella magdalenensis* Shoemaker, 1942 from Baja California in that genus. This placement was based, in part, on the elongate peduncle article 3 of antenna 2 and the elongate carpus of gnathopod 1, two characters which distinguish it from the closely related members of the genus *Orchomenella sensu stricto*. They also mention the presence of a midlateral bulge in the body of *Lepidepecreum* species which causes the body to be diamond-shaped in cross section. This bulge appears to be present, but weak in *L. cf magdalenensis* from Florida and seems to be the result of the long anterior coxae, the bases of peraeopods 5-7 and epimera 1-3 being pressed together ventrally, nearly enclosing gnathopods 1-2, peraeopods 3-4 and the pleopods.

***Lepidepecreum cf magdalenensis* (Shoemaker, 1942)**
(Figure 492)

Orchomenella magdalenensis Shoemaker, 1942, pp. 4-7, fig.1.

Lepidepecreum magdalenensis: Lowry and Stoddart, 2002a, pp. 173, 174.

Regional diagnosis: That of the genus.

Distribution: Southeastern Gulf of Mexico between Cape Romano and the Lower Florida Keys; ?Cuba (Ortiz, 1978, as *Orchomenella magdalenensis*).

Ecology: The specific habitat of this species is unknown; however, it probably occurs on sand bottoms as do other members of the genus.

Remarks: This species and *Orchomenella thomasi* are the only two shallow water Florida lysianassid species with a raised, distally acute posterodorsal process on urosome segment 1. However, *Lepidepecreum cf magdalenensis* differs from *O. thomasi* in the presence of a callynophore on antenna 1 in the female (callynophore absent in *O. thomasi*), having an elongate peduncle article 3 on antenna 2 in the female (short in *O. thomasi*), having larger eyes, having an elongate mandibular palp article 1 (short in *O. thomasi*), having 5 apical spines on palp article 2 of maxilla 1 (3 spines in *O. thomasi*), having the carpus of gnathopod 1 shorter than the propodus (carpus subequal to the propodus in *O. thomasi*) and having an elongate carpus on pereopods 3-7 (carpus short in *O. thomasi*). Overall, the appendages of *L. cf magdalenensis* are somewhat more elongate than those of *O. thomasi*. Adult size in the two species is similar and relatively small (2.5-3 mm).

There is some slight developmental variability and sexual dimorphism evident in this species. In juveniles of *L. cf magdalenensis*, the articles of appendages are generally stouter than in adults and there are often fewer spines or setae. Males are similar in size to females and the eyes are enlarged in both sexes, not larger in the male. However, the flagellum of antenna 2 of the male is elongate, whereas that of the female is short.

Lepidepecreum cf magdalenensis differs slightly from *L. magdalenensis* from Magdalena Bay, Baja California. In Gulf of Mexico specimens, peduncle articles 4-5 of antenna 2 are relatively stout compared to those of Pacific *L. magdalenensis*. In addition, *L. cf magdalenensis* has 1 seta on the ventrolateral margin of the inner ramus of uropod 3 (*L. magdalenensis* has a row of 3 spinules.) and the terminal article of outer ramus of uropod 3 is longer than in *L. magdalenensis*. Material from both localities needs to be compared to determine whether or not they are actually members of the same species; however, they are very close.

Ortiz's (1978) record of *Orchomenella* (= *Lepidepecreum*) *magdalenensis* from Cuban waters is probably *L. cf magdalenensis*, but the material needs to be reexamined to ensure that it does not represent *Orchomenella thomasi*.

See Shoemaker, 1942 (as *Orchomenella magdalenensis*); Lowry and Stoddart, 2002a.

Genus *Lysianopsis* Holmes, 1903

Regional diagnosis: Antenna 1 of female, callynophore weak or absent; antenna 2 of both sexes, flagellum short; antenna 2 of female, peduncle article 3 short, slightly wider than long; eye medium, not nearly reaching dorsal margin of head in female; mandible, palp article 3 short, slightly more than half length of article 2; maxilla 1, inner plate with 2 terminal setae, palp article 2 serrate distally, without apical spines; maxilla 2, inner plate narrow, similar to outer plate in width; maxilliped, outer plate short, not reaching distal margin of palp article 2, palp articles stout; gnathopod 1 simple, basis stout, length approximately 2.5 times width, carpus moderately long, slightly less than twice as long as deep, propodus narrowing distally; gnathopod 2 minutely chelate, propodus stout, expanded distally, anterior margin convex; peraeopods 3-4 of both sexes, merus enlarged, much larger than carpus; peraeopods 3-4 of male, anterior margin of merus, carpus and propodus not lined with short, fine setae; epimeron 3, posteroventral angle subquadrate, not produced to form strong tooth; uropod 2, inner ramus with distinct dorsal notch, not abruptly narrowing at notch, distal portion not much more slender than proximal portion; uropod 3 of both sexes, peduncle with dorsolateral flange; uropod 3 of male, peduncle and rami without plumose setae; uropod 3 of female, peduncle, inner margin with single proximal seta, outer margin with distal spines; telson entire, tip rounded.

Florida species: *L. alba*

Remarks: *Lysianopsis*, along with *Aruga*, *Lysianassa*, *Shoemakerella* and several other genera are all members of the *Lysianassa* group within the family Lysianassidae, subfamily Lysianassinae. Most of these genera have been periodically synonymized and split out again over the years, causing a certain amount of nomenclatural confusion in the taxonomic literature on the group. Currently, they are all recognized as distinct genera (Barnard and Karaman, 1991; Lowry and Stoddart, 1997) (see Lowry and Stoddart [1997] for a brief discussion of this group).

A second species of *Lysianopsis*, *L. ozona* Lowry and Stoddart, 1997, occurs in the eastern Gulf of Mexico in slightly deeper water (18-29 m). Although this species has not been reported from shallower waters to date, it is possible that it does occur there. It is distinguished from *L. alba* by the stronger callynophore on antenna 1 of both sexes (weak callynophore only in *L. alba*, especially in the female), the lack of a prehensile gnathopod 1 in the male (weakly prehensile in male *L. alba*), the presence of a coxal gill on peraeopod 7 (gill lacking in *L. alba*), the strongly 2-articulate outer ramus on uropod 3 (very weakly 2-articulate in *L. alba*) and the presence of terminal spines on the telson (terminal spines absent on *L. alba*).

***Lysianopsis alba* Holmes, 1903**
(Figure 498)

Lysianopsis alba Holmes, 1903, p. 276; Holmes, 1905, pp. 475-476, unnumbered text fig., pl. 5, fig. 1.
Lysianassa alba: Feely and Wass, 1971, pp. 26, 52.

Regional diagnosis: That of the genus.

Distribution: Cape Cod, Massachusetts to northern Florida (Bousfield (1973); Biscayne Bay; Key Largo (Shoemaker, 1933b); Florida Bay to Tampa Bay; Apalachee Bay (Stoner, 1980).

Ecology: *Lysianopsis alba* is usually found in relatively shallow water on muddy or silty sand or shell hash bottoms, often near grassbeds along protected or semiprotected shores (Holmes, 1905; Bousfield, 1973). It has also been found on gravel bottoms (Dickinson et al., 1980) in somewhat deeper water (37 m). This species has been reported at depths ranging from the low tide level out to 40 m (Bousfield, 1973; Lowry and Stoddart, 1997), although the deeper records should probably be verified.

Remarks: *Lysianopsis alba* is most similar to *L. hummelincki* from Curaçao, differing only in the less strongly prehensile gnathopod 1 in the male and the poorly defined article 2 on the outer ramus of uropod 3 (outer ramus uniarticulate in *L. hummelincki*). The second article on the outer ramus of uropod 3 in Florida material is usually very weakly indicated and the outer ramus often appears uniarticulate under low magnification. No Florida material was seen in which the second article was as distinct as that shown by Lowry and Stoddart (1997) for material of *L. alba* from Long Island, New York. Also, although a number of male specimens were observed, none had the propodus on gnathopod 1 as strongly prehensile or falcate as that of *L. hummelincki*. Instead, the morphology of gnathopod 1 agreed well with that of *L. alba* from New York, although the posterior margin of the propodus was slightly more concave distally in some specimens. Thus there is apparently some variation in both characters that are used to distinguish these two species and it will be necessary to examine additional material, especially from Caribbean localities, to determine whether or not they are truly distinct species and, if so, the geographic distribution of each. It should be noted, however, that the habitats of the two species appear to be quite different, with *L. alba* occurring in muddy sand or shell near grassbeds and *L. hummelincki* in reef pools.

Males are very similar to females in this species, differing in the slightly stronger callynophore on antenna 1, the weakly prehensile gnathopod 2 and the much stronger distolateral spine on the peduncle of uropod 1. In addition, they are usually considerably smaller than females, with adult males ranging from 3 to 5 mm in length and adult females from 4 to 10 mm. In general, specimens from the more northern parts of the range tend to be somewhat larger than those from South Florida and the Florida Keys. Bousfield (1973) indicates that the males of this species are pelagic and possibly rare; however, no evidence that the males are pelagic was seen in the material examined here and males were actually relatively common, if somewhat difficult to spot. In fact, the easiest way to find them was to look for small individuals with slightly larger eyes than other specimens of a similar size and a large distolateral spine on the peduncle of uropod 1. Upon closer examination, these invariably proved to be males.

Lysianopsis alba is most similar to two other species of lysianassids found in shallow Florida waters, *Aruga holmesi* and *Shoemakerella cubensis*. All three of these species have a simple gnathopod 1 and an entire telson. It differs from *A. holmesi* in lacking a well-developed callynophore in the female, lacking an elongate flagellum on antenna 2 in the male, having an indistinct article 2 on the outer ramus of uropod 3 (article 2 distinct in *A. holmesi*) and having a rounded telson tip (emarginate in *A. holmesi*). *Lysianopsis alba* can be distinguished from *S. cubensis* by the enlarged merus on pereopods 3-4 (small in *S. cubensis*), the relatively narrow inner plate on maxilla 2 (inner plate broad in *S. cubensis*), the less slender distal portion of the inner ramus of uropod 2 (more slender in *S. cubensis*) and the presence of distal spines on the expanded lateral margin of the peduncle of

uropod 3 (distal spines absent in *S. cubensis*). Also, *L. alba* has a less convex posterior margin on the basis of pereopod 7 than does *S. cubensis*.

See Shoemaker, 1933b; Bousfield, 1973; Lowry and Stoddart, 1997.

Genus *Orchomenella* Sars, 1890

Regional diagnosis: Antenna 2 of male, flagellum elongate; antenna 2 of female, peduncle article 3 short, length 1.5-2 times width, flagellum short; eye medium, not nearly reaching dorsal margin of head in female; mandible, palp article 3 short, approximately half length of article 2; maxilla 1, inner plate with 1-2 terminal setae, palp article 2 with 3 or 6 short, stout, marginally entire apical spines; maxilla 2, inner plate narrow, similar to outer plate in width; maxilliped, outer plate short, not reaching beyond distal margin of palp article 2, palp articles stout; gnathopod 1 subchelate, carpus short, less than twice as long as deep, propodus subrectangular or subquadrate, palm transverse; gnathopod 2 minutely subchelate, propodus stout, expanded distally, anterior margin convex; pereopods 3-4 of both sexes, merus slightly enlarged, not much larger than carpus; pereopods 3-4 of male, anterior margin of merus, carpus and propodus not lined with short, fine setae; epimeron 3, posteroventral angle acute or subquadrate, not produced to form strong tooth; uropod 2, inner ramus without distinct dorsal notch, tapering distally; uropod 3 of both sexes, peduncle without dorsolateral flange; uropod 3 of male, peduncle and rami without plumose setae; uropod 3 of female, peduncle, inner margin with 1-2 proximal setae, outer margin without distal spines; telson partially cleft.

Florida species: *O. perdido*, *O. thomasi*

Remarks: Members of this genus can be distinguished from members of all of the other shallow water lysianassid genera in Florida except *Hippomedon* and *Lepidepecreum* by having a subchelate gnathopod 1. However, in *Hippomedon* the palm of gnathopod 1 is oblique and poorly defined, whereas in *Orchomenella* it is more transverse and defined by an obvious palmar angle. In addition, *Hippomedon* species have a large posteroventral hook or tooth on epimeron 3 and epimeron 3 of *Orchomenella* species is subquadrate or subacute; there is no large hook present. *Orchomenella* is very close to *Lepidepecreum*, but can be distinguished from that genus by the relatively short peduncle article 3 of antenna 2 in the female (elongate in *Lepidepecreum*), by the smaller eye, and by the short carpus of gnathopod 1 (elongate in *Lepidepecreum*).

KEY TO FLORIDA SPECIES OF *ORCHOMENELLA*

- 1 < Antenna 1 of female with callynophore; mandible, palp article 1 subquadrate, approximately as long as wide; maxilla 1, palp article 2 with 6 apical spines; gnathopod 1, basis stout, length approximately 2.5 times width, propodus stout, subquadrate, palm weakly convex, subequal to hind margin in length; peraeopods 3-7, dactyl short, less than half length of propodus; epimeron 3, posteroventral angle not produced, subquadrate; urosome segment 1 with low, rounded posterodorsal boss; telson notched distally, dorsolateral spines in distal one third *Orchomenella perdido*

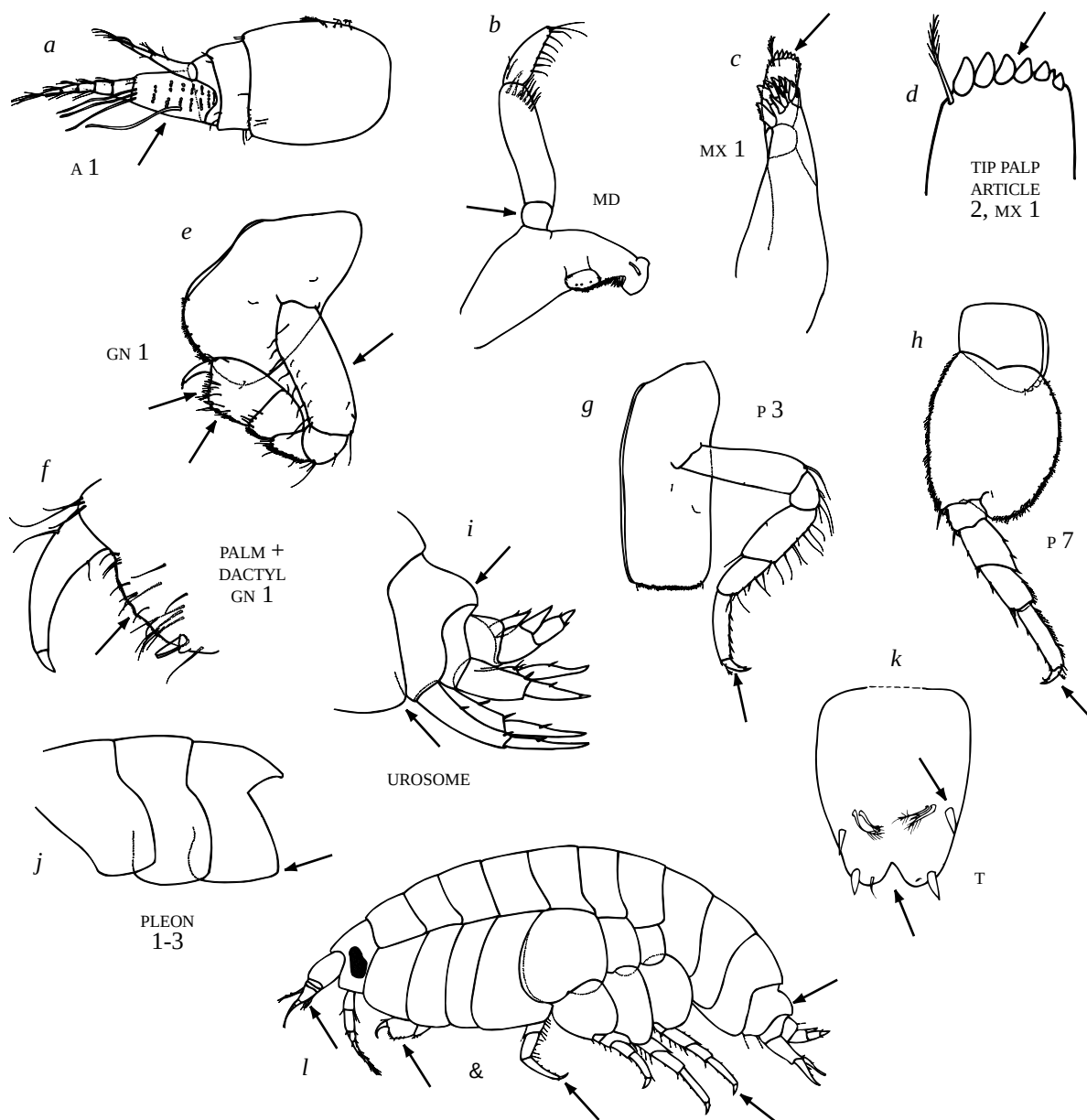


Figure 501.

< Antenna 1 of female without callynophore; mandible, palp article 1 subrectangular, approximately twice as long as wide; maxilla 1, palp article 2 with 3 apical spines; gnathopod 1, basis slender, length approximately 4 times width, propodus slender, subrectangular, palm concave, distinctly shorter than hind margin; pereopods 3-7, dactyl elongate, more than half length of propodus; epimeron 3, posteroventral angle produced, subacute; urosome segment 1 with raised, distally acute posterodorsal process; telson cleft in distal two thirds, dorsolateral spines in proximal one third *Orchomenella thomasi*

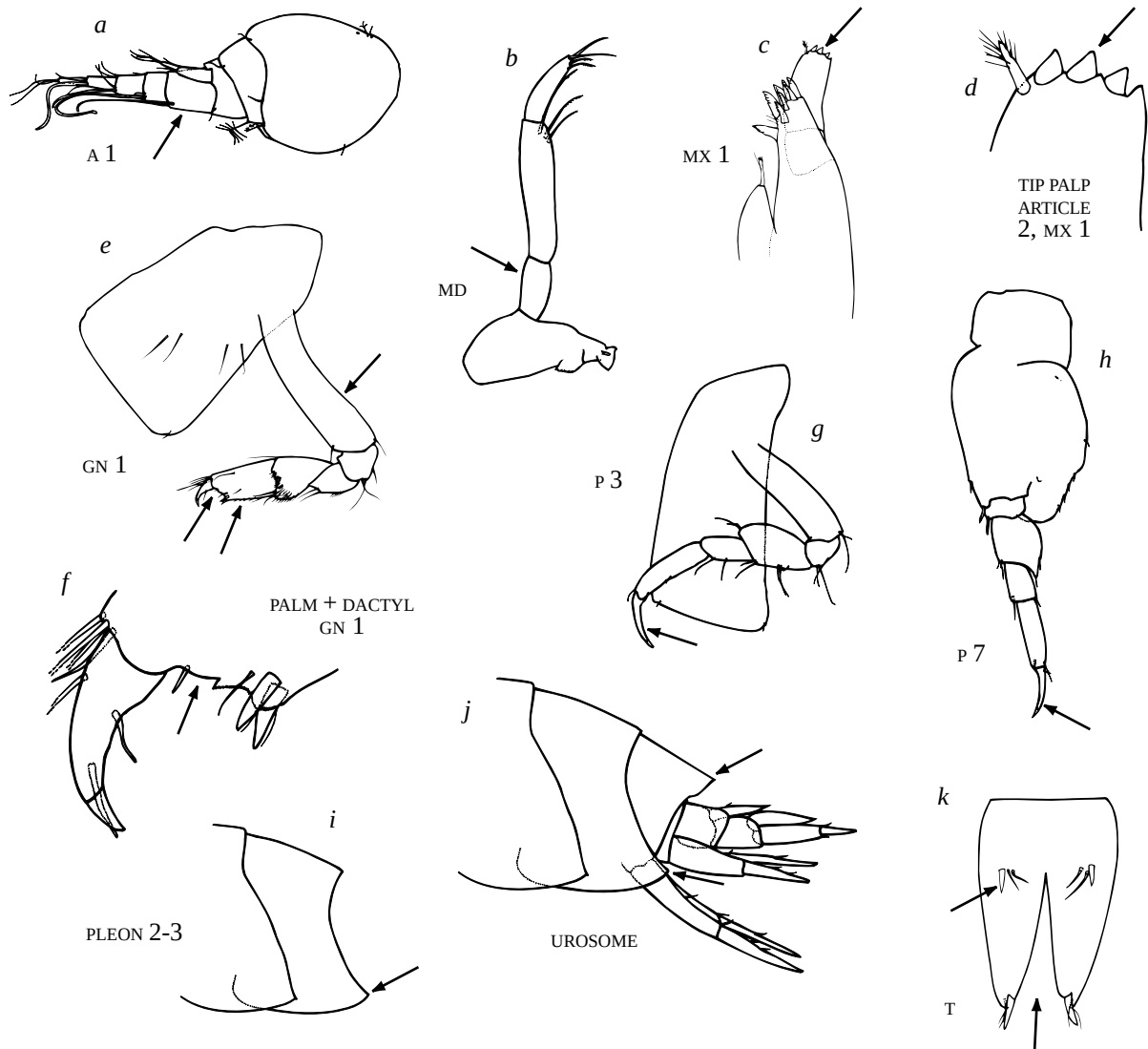


Figure 502.

***Orchomenella perdido* Lowry and Stoddart, 1997**
(Figure 501)

Orchomene sp. A: Rakocinski et al., 1993, p.102; Rakocinski et al., 1996, p. 350.

Orchomenella perdido Lowry and Stoddart, 1997, pp. 104-109, figs. 49-51.

Regional diagnosis: Antenna 1 of female with callynophore; mandible, palp article 1 subquadrate, approximately as long as wide; maxilla 1, palp article 2 with 6 apical spines; gnathopod 1, basis stout, length approximately 2.5 times width, propodus stout, subquadrate, palm weakly convex, subequal to hind margin in length; peraeopods 3-7, dactyl short, less than half length of propodus; epimeron 3, posteroventral angle not produced, subquadrate; urosome segment 1 with low, rounded posterodorsal boss; telson notched distally, dorsolateral spines in distal one third.

Distribution: Charleston Ocean Disposal Area, South Carolina (SERTC, SCDNR, unpublished records); northeastern Gulf of Mexico from Sannibel Island to Perdido Key, Florida (Lowry and Stoddart, 1997).

Ecology: *Orchomenella perdido* has been found on silty fine sand bottoms and also on bottoms composed of crushed shell and calcareous silt interspersed with limestone outcrops. Sponges, algae and *Lithothamnion* (calcareous algae) were also present in the latter habitat (Lowry and Stoddart, 1997). Depths range from just subtidal to 37 m (Lowry and Stoddart, 1997).

Remarks: *Orchomenella perdido* is immediately distinguishable from its congener in Florida waters by the absence of a raised, distally acute posterodorsal process on urosome 1. It is probably more widespread than the above distribution would indicate and further sampling in appropriate habitats is likely to reveal additional material. Specimens from off Charleston, South Carolina, agree well with those from the northeastern Gulf of Mexico. Adult size is approximately 4 mm.

See Lowry and Stoddart, 1997.

***Orchomenella thomasi* Lowry and Stoddart, 1997**
(Figure 502)

Orchomenella thomasi Lowry and Stoddart, 1997, pp. 109-113, figs.52-53.

Regional diagnosis: Antenna 1 of female without callynophore; mandible, palp article 1 subrectangular, approximately twice as long as wide; maxilla 1, palp article 2 with 3 apical spines; gnathopod 1, basis slender, length approximately 4 times width, propodus slender, subrectangular, palm concave, distinctly shorter than hind margin; peraeopods 3-7, dactyl elongate, more than half length of propodus; epimeron 3, posteroventral angle produced, subacute; urosome segment 1 with raised, distally acute posterodorsal process; telson cleft in distal two thirds, dorsolateral spines in proximal one third.

Distribution: Northeastern Gulf of Mexico, from Sanibel Island, Florida (Lowry and Stoddart, 1997) to Louisiana (pers. obs.).

Ecology: This species is found on fine to medium sand bottoms at depths of 10-73 m, often with crushed shell, dead bryozoans or calcareous algae present (Lowry and Stoddart, 1997).

Remarks: *Orchomenella thomasi* can be easily distinguished from all other shallow water lysianassids in Florida except for *Lepidepecreum* cf *magdalenensis* by the presence of a raised, distally acute posterodorsal process on urosome segment 1. It differs from the latter species in the absence of a callynophore on antenna 1 in the female (well-developed callynophore present in *L. cf magdalenensis*), the relatively short peduncle article 3 on antenna 2 (elongate in *L. cf magdalenensis*), the smaller eye, and the short carpus on gnathopod 1 (elongate in *L. cf magdalenensis*). Adult size in *O. thomasi* ranges from 2.5 to 3 mm.

See Lowry and Stoddart, 1997.

Genus *Shoemakerella* Pirlot, 1936

Regional diagnosis: Antenna 1 of female, callynophore absent; antenna 2 of both sexes, flagellum short; antenna 2 of female, peduncle article 3 short, slightly longer than wide; eye medium, not nearly reaching dorsal margin of head in female; mandible, palp article 3 short, slightly more than half length of article 2; maxilla 1, inner plate without terminal setae, palp article 2 serrate distally, without apical spines; maxilla 2, inner plate broad, distinctly wider than outer plate; maxilliped, outer plate short, not reaching beyond distal margin of palp article 2, palp articles stout; gnathopod 1 simple, basis stout, length approximately 2.5 times width, carpus short, less than twice as long as deep, propodus narrowing distally; gnathopod 2 minutely chelate, propodus stout, expanded distally, anterior margin convex; pereopods 3-4 of both sexes, merus not enlarged, only slightly larger than carpus; pereopods 3-4 of male, anterior margin of merus, carpus and propodus not lined with short, fine setae; epimeron 3, posteroventral angle subquadrate, not produced to form strong tooth; uropod 2, inner ramus with distinct dorsal notch, abruptly narrowing at notch, distal portion much more slender than proximal portion; uropod 3 of both sexes, peduncle with dorsolateral flange; uropod 3 of male, peduncle and rami without plumose setae; uropod 3 of female, peduncle, inner margin with 1-2 proximal spines, outer margin without distal spines; telson entire, tip rounded.

Florida species: *S. cubensis*

Remarks: A second species of *Shoemakerella*, *S. lowryi* Gable and Lazo-Wasem, 1990, is known from Bermuda, differing from Florida *S. cubensis* material only in the relative lengths of the propodus of pereopod 7 (length 9.5 times width in *S. lowryi*; length 5-6 times width in *S. cubensis*). To date, no material identifiable as this species has been reported from Florida waters. See Gable and Lazo-Wasem (1990) and Lowry and Stoddart (1997) for a more complete discussion of the similarities and differences between the two species.

***Shoemakerella cubensis* (Stebbing, 1897)
(Figure 495)**

Lysianax cubensis Stebbing, 1897, pp. 29-30, pl. 7B.

Lysianassa cubensis: Stebbing, 1906, p. 38; Shoemaker, 1935, pp. 232-234, fig. 1.

Lysianopsis alba: Pearse, 1912, p. 369, fig. 1 (in part).

Shoemakerella nasuta: Pirlot, 1936, pp. 265-266.

Lysianopsis cubensis: Hurley, 1963, fig. 21a.

Lysianassa nasuta: Ortiz, 1978, p. 8.

Shoemakerella cubensis: Barnard and Karaman, 1991, p. 530.

Regional diagnosis: That of the genus.

Distribution: Eastern Gulf of Mexico and Caribbean Sea (Lowry and Stoddart, 1997). Florida records: Panama City to the Dry Tortugas (Lowry and Stoddart, 1997). ?Gulf of California (Hurley, 1963; Lowry and Stoddart, 1997).

Ecology: *Shoemakerella cubensis* is very common in grassbeds, rubble and mixed algae in the Florida Keys. It also occurs on fine, medium or coarse sand bottoms, usually in somewhat deeper water (Lowry and Stoddart, 1997). In the Gulf of Mexico and Caribbean Sea, *S. cubensis* is found at depths of 1-69 m and in the Gulf of California at depths of 5-18 m.

Remarks: *Shoemakerella cubensis* has very noticeable setules scattered over the head, peraeon and pleon and, although there are other Florida species that have these (e.g. *Concarnes concavus*), the two species that are the most similar to *S. cubensis*, *Lysianopsis alba* and *Aruga holmesi*, do not. *Shoemakerella cubensis* also differs from the latter two species in the unenlarged merus on peraeopods 3-4 (enlarged in *A. holmesi* and *L. alba*), the lack of terminal setae on the inner plate of maxilla 1 (2 terminal setae present in *A. holmesi* and *L. alba*), the relatively broad inner plate on maxilla 2 (inner plate more slender in *A. holmesi* and *L. alba*), the very slender distal portion of the inner ramus of uropod 2 (less slender in *A. holmesi* and *L. alba*) and the lack of distal spines on the expanded lateral margin of the peduncle in uropod 3 (distal spines present in *A. holmesi* and *L. alba*). Additionally, *S. cubensis* differs from *L. alba* in the more convex posterior margin of the basis of peraeopod 7. Note that in Figure 45 of Lowry and Stoddart (1997), the labels for the illustrations of peraeopods 6 and 7 appear to be reversed for *S. cubensis* (compare with those in the whole drawing and the description in the text).

Although sexual dimorphism in *Shoemakerella cubensis* is slight, there are some differences between males and females. Males are generally smaller than females and have a somewhat larger eye. In addition, the propodus of gnathopod 1 of the male is more slender than that of the female. Adult size in this species ranges from 5-9 mm.

See Thomas, 1993; Lowry and Stoddart, 1997.

Family Megaluropidae Thomas and Barnard, 1986

Regional diagnosis: Antenna 1 subequal to or slightly longer than peduncle of antenna 2, not strongly geniculate between articles 1-2, peduncle article 1 not greatly enlarged, not overhanging articles 2-3, accessory flagellum present; eyes present, well-developed, ocular lobe broad, not narrowly produced anteriorly, with small sharp angle or cusp on anterior margin; buccal mass rounded or subquadrate, not strongly produced ventrally; maxilliped, palp well-developed, 3-4 articulate; coxae 2-4 without small median process on posterior margin; coxa 3 shorter than coxae 1-2, 4; gnathopod 1 simple or weakly subchelate; gnathopod 2, article 3 not elongate, less than twice as long as wide, articles 6-7 normal, not jointly mitten-shaped; peraeopod 5 not doubly geniculate at article 4; peraeopods 5-6 not geniculate at article 5; peraeopod 7 elongate, distal articles extremely slender, article 6 subdivided, multiarticulate; urosome segments 1-3 separate; uropod 1, inner ramus at least half length of outer ramus; uropod 2 present; uropod 3 well-developed, biramous, rami broadly paddle-shaped; telson cleft, not partially fused to urosome segment 3.

Florida genera: *Gibberosus*

Remarks: Florida genera in this family and those in the Melphidippidae were temporarily placed together in the latter family by Thomas (1993) pending the establishment of familial status for Barnard and Barnard's (1983) "Cheirocratid" grouping, which includes the "Megaluropuses" and "Hornellias". This placement was based in part on morphology and in part on the distinctive upside down feeding behavior that members of both groups exhibit. However, although Lowry and Springthorpe (2001) maintain this grouping, the "Cheirocratids" have never been properly awarded a family level ranking and other authors have continued to recognize the Megaluropidae and Melphidippidae as separate, valid families (Barnard and Barnard, 1990; Barnard and Karaman, 1991; Ruffo and Vader, 1998; Bellan-Santini, 1999; Martin and Davis, 2001; McLaughlin et al., 2005). This practice is followed herein as well.

Genus *Gibberosus* Thomas and Barnard, 1986

Regional diagnosis: That of the family.

Florida species: *G. myersi*

***Gibberosus myersi* (McKinney, 1980)**
(Volume 1, Figures 46c-d, 47)

Megaluropus longimerus: Barnard, 1962, p. 103, fig. 17o-q (not *Megaluropus longimerus* Schellenberg, 1925).
Megaluropus sp.: Camp et al., 1977, pp. 17-18.
Megaluropus myersi McKinney, 1980, pp. 93-98, figs. 5-7.
Gibberosus myersi: Thomas and Barnard, 1986a, pp. 464-469, figs. 6, 12
Gibberosus sp. A: Rakocinski et al., 1993, p. 102.
Gibberosus cf. *myersi*: Rakocinski et al., 1996, p.350.

Regional diagnosis: That of the family.

Distribution: South Carolina to Brazil, including the Gulf of Mexico (Thomas and Barnard (1986a); eastern Pacific from British Columbia to Peru (Thomas and Barnard (1986a). Florida records include: Fort Pierce and Hutchinson Island (Camp et al., 1977; Thomas and Barnard, 1986a); Florida Keys, Looe Key Reef (Thomas and Barnard, 1986a); Florida Bay; southwestern Gulf of Mexico between Cape Romano and the lower Florida Keys; Tampa Bay; Perdido Key (Rakocinski et al., 1993, 1996).

Ecology: This species occurs in fine to medium well-sorted sand, often mixed with shell. It is frequently found in sand patches in or near grassbeds (Barnard et al., 1988; Thomas and Barnard, 1986a; Thomas, 1993) and has also been collected in plankton tows (Thomas and Barnard, 1986a; Martín and Díaz, 2003). *Gibberosus myersi* has been reported at depths of 1-29 m (Thomas and Barnard, 1986a), temperatures of 21.8-32.0 °C and salinities of 35.0-38.0 ppt (Camp et al., 1977).

Remarks: *Gibberosus myersi* is one of a group of megaluropid and melphidippid species known as “upside down feeders”. It is a burrowing species and feeds by positioning itself upside down near the surface of the burrow, supported in a flexed position by peraeopods 3-7, with the flat, paddle-like rami of uropod 3 positioned near the underside of the head. In this position, it filters organic particles from the water passing over the burrow opening and may also lick organic material from the surfaces of sand grains (Thomas and Barnard, 1986a; Barnard et al., 1988; Thomas, 1993).

The shape of uropod 3 is diagnostic for *G. myersi*, but unfortunately this appendage is often lost and other characters must be used. A combination of the large eye; the minute, acutely tipped anterior process on the ocular lobe; the very minute, posterodorsal serrations on peraeon segments 2-3 and urosome segments 1-3; the multiarticulate propodus of peraeopod 7; and the dorsally directed peraeopods will distinguish this species from others in the area. It most closely resembles *Hornellia tequestae* Thomas and Barnard, 1986 (Melphidippidae) from which it may be separated by the shorter accessory flagellum on antenna 1 (long in *H. tequestae*), the acute process on the ocular lobe (absent in *H. tequestae*), the minute size of the posterodorsal serrations on the pleon and urosome segments and the lack of serrations on pleon segment 1 (serrations larger and present on segment 1 in *H. tequestae*), the multiarticulate propodus of peraeopod 7 (propodus uniarticulate in *H. tequestae*), the posteroventrally serrate epimeron 3 (large posteroventral tooth present in *H. tequestae*) and the broad, paddle-shaped rami on uropod 3 (rami foliaceous, but more slender in *H. tequestae*). Size in *G. myersi* ranges from 2.5 to 4.5 mm and its color in life varies from white (in sand) to clear (when swimming in the water column), with patches of pink and burgundy and frosted white eyes (Barnard et al., 1988).

See McKinney, 1980 (as *Megaluropus myersi*); Thomas and Barnard, 1986a; Barnard et al, 1988; Thomas, 1993.

Family Melphidippidae Stebbing, 1899

Regional diagnosis: Antenna 1 slightly shorter than antenna 2, accessory flagellum present, 3-5 articles in length; antenna 2, peduncle without calceoli in male; head not globular, rostrum small, eyes present, well-developed, buccal mass not exceptionally large relative to size of head; mandible with well-developed molar and palp; maxilliped, palp article 4 normally developed, not vestigial; coxae 1-2 subequal, slightly longer than coxa 3, not hidden; coxa 4, ventral margin straight or concave, posterior margin not excavate; gnathopod 1 well-developed, subchelate; gnathopod 2 not strongly sexually dimorphic, slightly larger than gnathopod 1 in both sexes, article 3 not elongate, less than twice as long as wide; pereopods 5-7, basis weakly expanded; pereopod 7 subequal to pereopod 6 in length; pleon segments 1-3 with posterodorsal serrations; epimeron 3, posteroventral angle with large hook; urosome segments 1-3 separate, segments 1-2 with posterodorsal serrations; segment 1 not elongate, deeper than long, less than twice as long as segment 2; uropod 1, outer ramus distinctly shorter than inner; uropod 3 biramous; telson cleft, tips of lobes notched.

Florida genera: *Hornellia*

Remarks: Some genera in this family, including *Hornellia*, were placed in the “Cheirocratid” group by Barnard and Barnard (1983), along with the members of the Megaluropidae. Thomas (1993) included both *Hornellia* and *Gibberosus* in the family Melphidippidae, but the two families are maintained separately herein (see Remarks for the family Megaluropidae for a more complete discussion).

Genus *Hornellia* Walker, 1904

Regional diagnosis: That of the family.

Florida species: *H. tequestae*

Hornellia tequestae Thomas and Barnard, 1986 (Volume 1, Figures 61a, e, 64)

Hornellia (Metaceradocus) tequestae Thomas and Barnard, 1986b, pp. 478-483, figs. 1-3.

Regional diagnosis: That of the family.

Distribution: Biscayne Bay; Florida Keys (Thomas and Barnard, 1986b); southeastern Gulf of Mexico between Cape Romano and lower Florida Keys.

Ecology: *Hornellia tequestae* occurs in algal turf on dead coral (Thomas and Barnard, 1986b), in coral rubble and on the undersides of coral overhangs on the forereef (Thomas, 1993); it also occurs on relatively shallow (2-4 m) sandy shell bottoms in Florida Bay. This species has been found at depths of 1-45 m, salinities of 32-36 ppt and at temperatures of 27-30 °C.

Remarks: Uropod 3 is often missing in this species, but the combination of a large eye, short coxae, distinctly serrate posterodorsal margins of the pleon and urosome segments, dorsally directed pereopods 3-7 and a large posteroventral tooth on epimeron 3 serve to distinguish *H. tequestae* from other generally similar species in the area. It shares some of these characters with *Gibberosus myersi* (Megaluropidae), with which it also shares the upside down mode of walking and feeding (Thomas and Barnard, 1986b; Thomas, 1993) (see Remarks section for *G. myersi* for a comparison between these two species). *Hornellia tequestae* is a small species, with adult sizes ranging from 2 to 3 mm. See Thomas and Barnard, 1986b; Thomas, 1993.

GLOSSARY

A1-2 - antennae 1-2.

Abdomen - the posterior six body segments, consisting of three anterior pleon segments and three posterior urosome segments.

Accessory claw - small curved subapical process on the extensor margin of the dactyl.

Accessory eye - small cluster of one to several ommatidia located adjacent to the primary eye.

Accessory flagellum - small secondary ramus of antenna 1, attached to the distomedial margin of peduncle article 3; may be vestigial or lacking, rarely as long as the primary flagellum.

Acuminate - produced into a sharp point; acute.

Acute - sharply pointed.

Aesthetascs - Specialized sensory setae located on the antennae of some species of amphipods and other crustaceans. They are usually elongate and flattened, with parallel sides and rounded ends, giving them a somewhat strap-like appearance.

Antenna - one of two paired, multi-articulate appendages attached to the anterodorsal margin of the head, anterior to the mouthparts. In amphipods, these appendages are referred to as antenna 1 (anterior pair) and antenna 2 (posterior pair). In most other crustacean groups, however, the term antenna refers only to the second, or posterior, pair of these appendages, with the first being referred to as the antennule.

Antennal sinus - one of two emarginations of the anterior margin of the head, separated by the cephalic or ocular lobe, that allow the sideways rotation of the antennae. The superior antennal sinus lies at the base of antenna 1; the inferior antennal sinus lies at the base of antenna 2.

Anterior - front end; towards the front.

Anthropogenic - caused or generated by man.

Apical - at the apex, tip or distal end; terminal.

Article - individual unit or subdivision of an appendage.

Attenuate - very slender, weak.

Basis - article 2 of a gnathopod or pereopod.

Basofacial spine - stout spine located on the proximolateral surface of the peduncle of uropod 1 in some amphipod groups.

Benthic - pertaining to the bed (bottom) of an ocean, lake, river or other body of water; inhabiting the bottom.

Beveled - diagonally truncated; oblique.

Biarticulate - composed of two articles.

Bifurcate - divided into two non-articulating branches; forked.

Biramous - having two articulating branches (rami).

Brood plate - see **oostegite**.

Brood pouch - see **marsupium**.

Buccal mass - conical, subquadrate or styliform bundle made up of closely appressed mouthparts, located on the ventral surface of the head.

Calceoli - small disk-like, rounded or oblong articulated sensory structures attached to the segments of the antennal peduncle and flagellum.

Callynophore - A sensory structure located on antenna 1 and formed by the fusion of the proximal articles of the flagellum. There is an accompanying increase in the number of aesthetascs, which are inserted in rows on this fused section (callynophore = “brush carrier”.) This structure is usually found only in adult males, but in certain species it occurs in both sexes.

Carapace - cuticular layer attached to the posterior margin of the head and extending anteriorly and posteriorly, often covering the entire head and thorax; present in many crustaceans, but not found in amphipods.

Carinate - having at least one laterally compressed, acute ridge, carina, or keel; usually dorsal.

Carpal lobe - expansion or elongation of the posterior margin of the carpus, often extending distally along the posterior margin of the propodus.

Carpochelate - condition of a prehensile appendage, usually a gnathopod, in which it is formed by the closure of the dactylus (article 7) on a fixed projection of the carpus (article 5).

Carpus - article 5 of a gnathopod or peraeopod.

Castellate - lined with short, closely-set, distally truncate processes.

Castelloserrate - lined with short, closely-set blunt serrations or teeth.

Cephalic lobe - forward expansion of the anterolateral margin of the head between the bases of the peduncles of antennae 1-2; often bearing the eyes and referred to as the ocular lobe.

Chelate - condition of a prehensile appendage, usually a gnathopod, in which it is formed by the closure of the dactylus (article 7) on a subequal, parallel, fixed, distally directed subterminal projection of the propodus (article 6); pincer-like. Propodus usually linear.

Circumtropical - distributed throughout the tropics.

Clavate - club-shaped; broadened distally.

Cleft - split or divided; often used to describe a telson that is separated into two lobes by a narrow incision or gap.

Complexly subchelate - see **subchelate**.

Conjoint - a condition in which several smaller articles are fused to form a single larger article.

Couplet - numbered section of a dichotomous key, consisting of a pair of contrasting descriptions.

Coupling hooks - small distomedial hooked spines on the peduncle of the pleopod; used to hook left and right pleopods of a pair together to enhance synchronous beating.

Comb row - a row of short, stiff, straight or slightly curved setae resembling the teeth of a comb.

Comb setae - the setae making up a comb row.

Compressed - flattened laterally; usually refers to body shape.

Congener - belonging to the same genus.

Conspecific - belonging to the same species.

Cosmopolitan - having a worldwide distribution; ubiquitous.

Cotype - syntype; each specimen of a type series for which no holotype has been designated.

Coxa - article 1 of a gnathopod or peraeopod.

Coxal gill - a respiratory structure attached to the posteromedial surface of the coxa of gnathopod 2 and peraeopods 3-6 or 7.

Coxal plate - a flattened lateral expansion of the coxa of a peraeon appendage, often forming a shield for the gills and oostegites and providing a chamber through which the respiratory current can be drawn by the beating of the pleopods.

Crenulate - lined with small bumps, tubercles or rounded teeth.

Cryptic - hidden, camouflaged.

Cusp - small tooth or process.

CX1-7 - coxae 1-7.

Dactyl - terminal article of a gnathopod or peraeopod (article 7), or of the maxillipedal palp (article 3 or 4).

Dactylar hinge tooth - process on palmar margin of propodus adjacent to articulation with dactyl.

Deflexed - downturned.

Dendritic - branching.

Dentate - toothed.

Denticulate - with small, sharp teeth or denticles.

Depressed - flattened dorsoventrally; usually refers to body shape.

Dichotomous - divided into two parts; used to describe a taxonomic key made up of pairs of contrasting descriptions, each of which serves to divide the larger group of organisms being identified into two, mutually exclusive smaller groups.

Distal - located away from the body or point of attachment.

Domicolous - living in a nest, tube or other refuge (a domicile).

Dorsal - pertaining to the back; in amphipods refers to the upper or top surface or margin.

Ectocommensal - a commensal organism that resides on the outer surface of its host.

Emarginate - having a shallow marginal depression; slightly concave, hollowed out or indented.

Endocommensal - a commensal organism that resides inside of its host.

Entire - complete; having a simple, smooth, unmodified margin; not cleft (telson), serrate, crenulate, or incised.

Epimeral plate - see **epimeron**.

Epimeron (epimera) - ventrolateral, laminar extension(s) of pleonal segments 1-3 enclosing the peduncles of the pleopods.

Epistome - front of head just dorsal to upper lip.

Estuarine - referring to shallow, often partially enclosed, coastal waters that have a variable salinity regime caused by the mixing of fresh and salt water; usually found adjacent to river mouths.

Euryhaline - referring to organisms that are tolerant of a wide range of salinities.

Excavate - having a deep marginal depression, strongly emarginate, deeply concave.

Extensor margin - the margin of an article on the side away from the direction of flexion ("on the outside of the bend"), the side on which the extensor muscles are located.

Facial - on a flat surface; not marginal.

Flagellum - the multiarticulate distal part of the antenna, exclusive of the peduncle; begins distal to peduncle article 3 for antenna 1 and distal to peduncle article 5 for antenna 2.

Falcate - strongly curved and tapering distally; sickle-shaped.

Filiform - elongate, very slender; thread-like.

Flexor margin - the margin of an article on the side towards the direction of flexion ("on the inside of the bend"), the side on which the flexor muscles are located.

Foliaceous - broad and flat, leaf-like, often with marginal setae.

Fossorial - adapted for digging.

Geniculate - bent and fixed at a right angle; knee-like.

Gland cone - conical distoventral process on peduncle article 2 of antenna 2; contains duct and opening of antennal gland.

Globular - round, bulbous, globe-like.

GN1-2 - gnathopods 1-2.

Gnathopod - a paired uniramous appendage attached to one of the first 2 pereon segments; usually subchelate or otherwise dissimilar to the remaining 5 paired pereonal appendages (pereopods).

HD - head.

Hyperadult - unusually large and well-developed adult individual.

Incised - with narrow slit or notch, usually marginal.

Incisor - the distal, often toothed, cutting edge of the mandible.

Inquilinous - living within the burrow, nest, tube or domicile of another species; living within a host organism of another species without causing any harm to that host

Interantennal plate - anterior margin of the head expanded as a vertical plate extending forward between the right and left antennae and below the rostrum.

Ischium - article 3 of a gnathopod or pereopod.

Labium - see **lower lip**.

Labrum - see **upper lip**.

Lacinia mobilis - small articulated plate located on the mandible at the base of the incisor, just distal to the spine row.

Laminar - thin, flat, plate-like.

Lanceolate - tapering distally to an acute or subacute tip; lance-shaped.

Lateral - outer; towards the outside.

Laterally compressed - flattened from side to side.

Linear - with parallel margins; slender, rod-shaped or subrectangular.

Linguiform - tongue-shaped.

LL - lower lip; labium.

Locking spine - large spine on the distal flexor margin of the pereopod propodus.

Lower lip - a fleshy, bilobed plate located on the posterior margin of the mouth.

Mandible - one of the first, or most anterior, pair of articulated mouthparts, located on either side of the mouth; typically composed of a base or body, molar, incisor, spine row, lacinia mobilis and 3-articulate palp.

Marsupium - chamber for holding eggs or recently hatched juveniles; formed by overlapping oostegites and located ventrally, between the bases of the gnathopods and pereopods; brood pouch.

Maxilla 1 - one of the second pair of articulated mouthparts; typically composed of a basal article, inner plate, outer plate, and 2-articulate palp.

Maxilla 2 - one of the third pair of articulated mouthparts, immediately posterior to maxilla 1; typically composed of a basal article, inner plate, and outer plate.

Maxilliped - most posterior pair of mouthparts, derived from the first thoracic segment which, in amphipods, is fused with the head; fused basally and typically composed of an inner plate, outer plate, and 4-articulate palp.

MD - mandible.

Medial - inner; towards the middle.

Median - central, on the mid-line or at the mid-point.

Merus - article 4 of a gnathopod or pereopod.

Molar - medial process on the mandible, normally subcylindrical with a distally flattened grinding surface, but often reduced or modified.

Monotypic - describes a taxon containing only one taxon at the next lowest level in the taxonomic hierarchy (e.g. a family containing one genus; a genus containing one species).

Morphology - shape, form.

Mouthpart bundle - see **buccal mass**.

Multiarticulate - composed of many articles.

MX1-2 - maxillae 1-2.

MXPD - maxilliped.

Natatory - used for swimming.

Oblique - angled; not perpendicular to the vertical axis of the article.

Ocular lobe - see **cephalic lobe**.

Oligohaline - (1) referring to organisms that are only tolerant of low salinities; (2) referring to low salinity or brackish waters (0.5-3.0 ppt).

Ommatidia - individual facets of the subintegumentary compound eye.

Oostegite - thin, flat plate lined with setae, attached to the posteromedial margin of the coxa of gnathopod 2 and pereopods 3-5 in females, just proximal to the coxal gill. In adult females, these plates interlock and overlap, forming the marsupium for holding eggs and newly hatched juveniles; in subadult females, they are more sac-like and lack setae.

Oostegite bud - sac-like developing oostegite found in subadult female amphipods.

Ovate - oval-shaped.

P1-7 - pereopods 1-7.

Palm - portion of the posterior margin of the gnathopod upon which the dactyl closes for grasping. Usually delimited distally by the dactylar articulation and proximally by a change in the curvature of the margin or by the presence of spines or setae.

Palmar angle - proximal end of the palm where the curvature of the margin changes.

Palp - small, uniramous, articulated appendage found on the lateral margin of the mandible, maxilla 1, and maxilliped.

Parachelate - condition of a prehensile appendage, usually a gnathopod, occasionally a pereopod, in which it is formed by the closure of the dactylus (article 7) on a very short, parallel or subparallel, fixed, distally directed, subterminal projection of the propodus (article 6); dactyl may overlap tip of projection. Propodus usually linear.

Peduncle - combined, typically robust, proximal or basal articles of the antennae, pleopods and uropods; 3-articulate in antenna 1, 5-articulate in antenna 2, 1-2 (usually 1)-articulate in the pleopods, 1-articulate in the uropods.

Pelagic - pertaining to the open water column of an ocean or lake; inhabiting the water column.

Penes - small, paired genital processes located on the ventral surface of the peraeon just medial to the coxa of pereopod 7 in males, through which the sperm is released.

Peraeon - combined 7 free thoracic segments of the body, located immediately behind the head and bearing the gnathopods and pereopods.

Pereopod - a paired, uniramous thoracic appendage attached to each peraeon segment; typically 7-articulate. The anterior 2 pairs, called gnathopods, are usually modified and morphologically distinct from the posterior 5 pairs.

Pleon - combined anterior 3 abdominal segments, located just posterior to the peraeon, bearing the paired, biramous pleopods (occasionally used to refer to the entire 6 segments of the abdomen).

Pleopod - a paired, biramous appendage attached to each pleon segment; typically composed of a uniarticulate basal peduncle and marginally setose, multiarticulate rami. Used in swimming and in the creation of water currents for respiration.

PLPD1-3 - pleopods 1-3.

Plumose - feather-like; lined with very fine microsetae.

Polytypic - describes a taxon containing more than one taxon at the next lowest level in the taxonomic hierarchy (e.g. a family containing more than one genus; a genus containing more than one species).

Posterior - back end; towards the rear.

Ppt - parts per thousand.

Preamplexing notch - indentation in the anterodistal or anterodorsal margin of a peraeon segment used by the male for grasping the female with the gnathopods during precopulatory mate carrying behavior.

Prehensile - modified for grasping.

Produced - narrowly expanded.

Propodus - article 6 of a gnathopod or peraeopod.

Proximal - located close to the body or point of attachment.

Pyriform - broadest at the base; pear-shaped.

Raker row - see **spine row**.

Ramus (rami) - branch(es) of an appendage.

Recurved - curved back on itself.

Reniform - kidney-shaped.

Rostrum - forward projection of the anterodorsal margin of the head between the peduncles of antenna 1.

Segment - individual unit or subdivision of the body.

Sensu lato - in the broad sense (Latin); usually used to refer to a taxon as it was defined before a revision restricted its definition (e.g. *Amphilochus sensu lato*).

Sensu stricto - in the strict or narrow sense (Latin); usually used to refer to a taxon as it is defined after a revision has restricted its definition (e.g. *Amphilochus sensu stricto*).

Serrate - with a series of saw-like teeth or sharp processes.

Seta - bristle or hair; a slender, flexible chitinous extension of the cuticle, articulated with the surface of the body or appendage.

Setose - having setae.

Sexually dimorphic - having a different form or appearance in males and females.

Sibling species - two or more closely related, often sympatric, species that are morphologically indistinguishable, but are reproductively isolated.

Simple - condition of a prehensile appendage, usually a gnathopod, in which none of the articles are expanded to meet the dactylus (article 7) when closed (articles usually linear).

Sinuuous - s-shaped, with both convex and concave portions.

Spine - a stout, inflexible seta.

Spine row (mandibular) - row of small spinules located on the mandible between the base of the incisor and the molar.

Spinose - having spines.

Splayed - flared or extended laterally.

Spur - a sharp process.

Sternal gill - a slender, unstalked structure, presumed to be respiratory or osmoregulatory in nature, located ventrally just medial to the coxa on peraeon segments 2- or 3-7.

Sternal processes - processes located mid-ventrally on peraeon segments 1-7.

Sternite - ventral surface of peraeon segment.

Stridulating ridges - small ridges usually found in rows on the ventral margins of the coxae and the lateral or anterior margins of the gnathopod or peraeopod bases. These ridges function in sound production when two opposing rows are rubbed together.

Styliform - very slender, elongate and sharply pointed at the tip.

Subacute - nearly acute.

Subapical - nearly at the apex or tip; subterminal.

Subchelate - condition of a prehensile appendage, usually a gnathopod, occasionally a peraeopod or palp, in which it is formed by the closure of the dactylus (article 7) on the oblique or transverse (non-parallel) expanded distal margin (palm) of the propodus (article 6). The term *complexly subchelate* is sometimes used to refer to a prehensile appendage formed by the closure of the dactylus on a non-parallel fixed process of any article other than the propodus (eg. carpochele, merochele).

Subconical - nearly conical.

Subcylindrical - nearly cylindrical.

Subequal - nearly equal.

Submarginal - nearly on the margin.

Subovate - nearly oval.

Subquadrate - nearly square.

Subrectangular - nearly rectangular.

Subround - nearly round.

Subterminal - nearly at the apex or tip; subapical.

Sympatric - occurring in the same geographic area.

Synanthropic - with man; pertains to organisms that are transported by man to other regions or those that live in or near human dwellings.

Systematics - the study of the evolutionary relationships among organisms.

T - telson.

Taxonomy - the identification and classification of organisms.

Telson - a small flap attached to the posterior margin of urosome segment 3, just above the anus; may be cleft, entire, laminar, fleshy, emarginate or otherwise modified, but always present in amphipods.

Terminal - at the tip or distal end.

Terminal adult - an individual with fully adult morphology.

Tooth - an acute, non-articulated process.

Transverse - perpendicular to the long axis of an article.

Triturative - having a ridged surface used for grinding or crushing.

Truncate - with distal margin transverse, quadrate, cut-off.

Tuberculate - with small rounded processes; bumpy.

U1-3 - uropods 1-3.

UL - upper lip; labrum.

Unguiform - claw-like.

Unguis - terminal claw-like seta or nail on the palp of the maxilliped or the dactyl of the gnathopods and peraeopods.

Uniarticulate - composed of one article.

Uniramous - having one branch (ramus).

Upper lip - a fleshy plate or lobe located on the anterior margin of the mouth; distal margin may be entire, incised or emarginate, usually minutely setose or pilose.

Uropod - a paired, typically biramous, appendage attached to each urosome segment; usually composed of a peduncle and 2 uniarticulate rami, but may be uniramous, without rami or completely absent.

Urosome - combined posterior 3 abdominal segments (sometimes referred to as pleon segments 4-6), located just posterior to the pleon and bearing the paired, typically biramous uropods and the telson.

Ventral - pertaining to the abdomen; in amphipods refers to the lower or bottom surface or margin.

Vermiform - elongate, slender and cylindrical; worm-like.

Vestigial - very reduced, degenerate, poorly developed.

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APPENDIX I: FIGURE SOURCES

The illustrations used in this document were obtained from a variety of sources and include both published figures and original drawings. In many cases, the illustrations have been modified from the original to better illustrate the character being described. Sources for all illustrations are listed below and published sources are cited in full in the Literature Cited section. Illustrations that have been noticeably changed from the original are listed as being “modified from” the original source, while those that have not been changed (other than by removing labels or adjusting positioning) are referred to as being “from” the original source. Permission has been obtained for the use of those illustrations obtained from copyrighted publications and this copyrighted material is credited as follows:

Illustrations from “Shallow-water Gammaridean Amphipoda of New England” by E. L. Bousfield (1973) are reproduced courtesy of the Canadian Museum of Nature, Ottawa, Ontario, Canada.

Figure 447a-h from Thomas, 1997 (*a, d, g* from Figure 3; *b, e-f, h* from Figure 4; *c* modified from Figure 3); *i* modified from Shoemaker, 1933a, Figure 3.

Figure 448a-i from Thomas, 1997 (*a, g* from Figure 17; *b-c* modified from Figure 17; *d-f, h-i* from Figure 18).

Figure 449a, c, e-i, k from McKinney, 1980 (*a, c* from Figure 3; *e* modified from Figure 3; *f-i, k* from Figure 4); *b, d, j* from LeCroy, unpublished drawings.

Figure 450a, g from Ortiz and Lalana, 1994 (*a, g* modified from Figures 1 and 5, respectively); *b-c, h, l* from Shoemaker, 1933a (*b, h* modified from Figure 7; *c, l* from Figure 6); *d-f, i-k* from LeCroy, unpublished drawings.

Figure 451a-b from Ortiz and Lalana, 1994 (*a, b* modified from Figures 1 and 5, respectively); *c* from LeCroy, unpublished drawing.

Figure 452a modified from Shoemaker, 1933a, Figure 6; *b-c* from LeCroy, unpublished drawings.

Figure 453a-d from LeCroy, unpublished drawings; *e* from Bousfield, 1973, Plate XLIII 2.

Figure 454a-d from LeCroy, unpublished drawings; *e* from Shoemaker, 1933b, Figure 12.

Figure 455a-i from LeCroy, unpublished drawings.

Figure 456a-i from LeCroy, unpublished drawings.

Figure 457a-c, e from Shoemaker, 1933b (*a-c* modified from Figure 12; *e* from Figure 12); *d* from Lazo-Wasem and Gable, 2001, Figure 4.

Figure 458a-d from LeCroy, unpublished drawings.

Figure 459a-b, e from Shoemaker, 1956 (*a* modified from Figure 1; *b, e* from Figures 3 and 1, respectively); *c* from Bousfield and Hendrycks, 2002, Figure 14; *d, f* from LeCroy, unpublished drawings.

Figure 460a-g from LeCroy, unpublished drawings.

Figure 461a-h from LeCroy, unpublished drawings.

Figure 462a-h from LeCroy, unpublished drawings.

Figure 463a-f, h from Shoemaker, 1956 (*a-b, f, h* from Figure 1; *c* from Figure 2; *d-e* modified from Figure 1); *g, j-k* from LeCroy, unpublished drawings; *i* from Shoemaker, 1933b, Figure 10.

Figure 464a-e, h-j from Shoemaker, 1956 (*a, c* from Figure 4; *b, e, h* from Figure 3; *d, i-j* modified from Figure 3;); *f-g* from LeCroy, unpublished drawings.

Figure 465a-i from LeCroy, unpublished drawings.

Figure 466a-i from LeCroy, unpublished drawings.

Figure 467a-g from LeCroy, unpublished drawings.

Figure 468a-g from LeCroy, unpublished drawings.

Figure 469a-j from LeCroy, unpublished drawings.

Figure 470a-b, i-j, n-p from LeCroy, unpublished drawings; *c-h, l* from Thomas and Heard, 1979 (*c* from Figure 2; *d, f* modified from Figures 2 and 3, respectively; *e, g-h* from Figure 3); *k, m* from Bousfield, 1973 (*k* modified from Plate LIX 2; *m* from Plate LVIII 2).

Figure 471a-e, g-i from Bousfield, 1973 (*a-c, e, g* modified from Plate LVIII 2; *d, h-i* from Plate LVIII 2); *f* modified from Conlan, 1990, Figure 17.

Figure 472a modified from Myers and McGrath, 1984, Figure 1; *b* modified from Lowry and Thomas, 1991, Figure 1; *c-d, g, l* from LeCroy, unpublished drawings; *e-f, k, m* from Thomas and Heard, 1979 (*e, m* from Figures 3 and 4, respectively; *f, k* modified from Figures 3 and 4, respectively); *h-j, n* from Bousfield, 1973 (*h, j* modified from Plate LIX 2; *i* modified from Plate LX 1; *n* from Plate LIX 2).

Figure 473a modified from Myers and McGrath, 1984, Figure 1; *b, g* from Bousfield, 1973 (*b* modified from Plate LIX 2; *g* from Plate LIX 2); *c-f* from LeCroy, unpublished drawings.

Figure 474a, e from LeCroy, unpublished drawings; *b* modified from Bousfield, 1973, Plate LX 1; *c-d, f* from Thomas and Heard, 1979 (*c, d* from Figures 3 and 4, respectively; *f* modified from Figure 4).

Figure 475a-f, h-l from Thomas and Heard, 1979 (*a-b* from Figure 1; *c-d* modified from Figure 1; *e* modified from Figure 2; *f* from Figure 2; *h-i* from Figure 3; *j-l* from Figure 4); *g* from LeCroy, unpublished drawing.

Figure 476a-c, e-g, i-k from LeCroy, unpublished drawings; *d* modified from Lowry and Thomas, 1991, Figure 2; *h* modified from Lowry and Berents, 1989, Figure 2).

Figure 477a-b, d from Lowry and Thomas, 1991 (*a, d* modified from Figure 1; *b* from Figure 2); *c, e-g* from LeCroy, unpublished drawings.

Figure 478a-f from LeCroy, unpublished drawings.

Figure 479a-b, e, g from Lowry and Berents, 1991 (*a-b, e* from Figure 3; *g* modified from Figure 4); *c-d* from LeCroy, unpublished drawings; *f* modified from Bousfield, 1973, Plate LX 1.

Figure 480a-h from LeCroy, unpublished drawings.

Figure 481a-f from LeCroy, unpublished drawings.

Figure 482a-f from LeCroy, unpublished drawings.

Figure 483a-g from LeCroy, unpublished drawings; *h* modified from Bousfield, 1973, Plate LIX 2; *i* modified from Myers and McGrath, 1984, Figure 1.

Figure 484a-g from LeCroy, unpublished drawings.

Figure 485a-l from LeCroy, unpublished drawings; *m* modified from Bousfield, 1973, Plate LVIII 2.

Figure 486a-k from LeCroy, unpublished drawings.

Figure 487a-i from Lowry and Stoddart, 1997 (*a, c, h* from Figure 47; *b, d* from Figure 52; *e, i* from Figure 50; *f-g* from Figures 53 and 48, respectively).

Figure 488a-i from Lowry and Stoddart, 1997 (*a, d* from Figure 18; *b, e* from Figure 25; *c, f* from Figure 44; *g-i* from Figures 26, 19 and 20, respectively); *j* from LeCroy, unpublished drawing.

Figure 489a from LeCroy, unpublished drawing; *b-d* from Lowry and Stoddart, 1997 (*b-d* from Figures 47-48 and 46, respectively).

Figure 490a-b, d-g from Lowry and Stoddart, 1997 (*a-b* from Figure 50; *d-f* from Figures 51, 53 and 49, respectively; *g* modified from Figure 52); *c* from LeCroy, unpublished drawing.

Figure 491a-j from Lowry and Stoddart, 1997 (*a, e, g-h* from Figure 50; *b, d, f* from Figure 52; *c, i, j* from Figures 49, 51 and 53, respectively).

Figure 492a-b, d-g from LeCroy, unpublished drawings; *c, h* modified from Shoemaker, 1942, Figure 1.

Figure 493a-h from Lowry and Stoddart, 1997 (*a-c, f-g* from Figure 26; *d-e* modified from Figures 26 and 24, respectively; *h* from Figure 24).

Figure 494a-h from Lowry and Stoddart, 1997 (*a-c* from Figure 19; *d* modified from Figure 19; *e, h* from Figure 36; *f-g* from Figures 44 and 17, respectively).

Figure 495a-d, g from Lowry and Stoddart, 1997 (*a, c* from Figure 44; *b* modified from Figure 44; *d, g* from Figures 45 and 43, respectively); *e-f* from LeCroy, unpublished drawings.

Figure 496a-c, e from Lowry and Stoddart, 1997 (*a, c* from Figure 18; *b* modified from Figure 18; *e* from Figure 19); *d, f-h* from LeCroy, unpublished drawings.

Figure 497a-b, d-i from Lowry and Stoddart, 1997 (*a, d-e* from Figure 18; *b* and *g* from Figures 20 and 19, respectively; *f, h-i* from Figure 17); *c* from LeCroy, unpublished drawing.

Figure 498a-d, g from Lowry and Stoddart, 1997 (*a, g* from Figure 36; *b-d* from Figure 37); *e-f* from LeCroy, unpublished drawings; *h* modified from Bousfield, 1973, Plate XLIII 1.

Figure 499a-c from LeCroy, unpublished drawings; *d* from Lowry and Stoddart, 1997, Figure 46.

Figure 500a-c from LeCroy, unpublished drawings.

Figure 501a-l from Lowry and Stoddart, 1997 (*a-d, k* from Figure 50; *e-h* from Figure 51; *i-j, l* from Figure 49).

Figure 502a-k from Lowry and Stoddart, 1997 (*a-d, j* from Figure 52; *e-h, k* from Figure 53; *i* modified from Figure 52).

APPENDIX II: REVISED CLASSIFICATION OF THE COROPHIIDEA

In a recent publication, Myers and Lowry (2003) present a revised higher level classification of the corophiidean amphipods based upon a phylogenetic analysis of the infraorders Corophiida and Caprellida, originally placed in the suborder Corophiidea Leach, 1814 by Barnard and Karaman (1983). Although the classification of Barnard and Karaman (1983) did not gain general acceptance at the time, the analysis of Myers and Lowry (2003) supports the retention of the suborder Corophiidea as a monophyletic group containing the infraorders Corophiida and Caprellida and also results in the realignment of a number of taxa formerly placed in the suborder Gammaridea. In addition, several new families are erected and the placement of many genera within other previously recognized families is changed. The classification of the suborders Hyperiidea and Ingolfiellidea is not considered in their revision and remains unchanged.

Although the new classification affects many of the taxa presented in this guide, it is not followed herein for two reasons. The first is that it is not practical to reorganize the format of the guide in midstream and keys designed for the system of classification currently in use (e.g. the family key in Volume 1) will no longer function properly under that of Myers and Lowry (2003). The second is that, although the proposed classification has had a favorable reception, it is too early to determine whether or not it will be generally accepted. However, the new higher level classification is presented below (Table 1) and a table indicating how the proposed changes affect the taxa covered in this guide is also included (Table 2).

Table 1. Suprafamilial corophiidean classification of Myers and Lowry (2003).

Suborder Hyperiidea
Suborder Ingolfiellidea
Suborder Gammaridea
Suborder Corophiidea
Infraorder Corophiida
Superfamily Aoroidea
Family Aoridae Stebbing, 1899
Family Unciolidae Myers and Lowry, 2003
Superfamily Cheluroidea
Family Cheluridae Allman, 1847
Superfamily Chevalioidea
Family Chevaliidae Myers and Lowry, 2003
Superfamily Corophioidea
Family Ampithoidae Boeck, 1871
Family Corophiidae Leach, 1814
Infraorder Caprellida
Superfamily Aetiopedesoidea
Family Aetiopedesidae Myers and Lowry, 2003
Family Paragammaropsidae Myers and Lowry, 2003
Superfamily Caprelloidea
Family Caprellidae Leach, 1814
Family Caprogammaridae Kudrjaschov and Vassilenko, 1966
Family Cyamidae Rafinesque, 1815
Family Dulichiidae Dana, 1849
Family Podoceridae Leach, 1814

Superfamily Isaeoidea
 Family Isaeidae Dana, 1852
Superfamily Microtopoidea
 Family Microtopidae Myers and Lowry, 2003
Superfamily Neomegamphoidea
 Family Neomegamphopidae Myers, 1981
 Family Pricomilitariidae Hirayama, 1988
Superfamily Photoidea
 Family Ischyroceridae Stebbing, 1899
 Family Kamakidae Myers and Lowry, 2003
 Family Photidae Boeck, 1871
Superfamily Rakirooidea
 Family Rakiroidae Myers and Lowry, 2003

Table 2. Family level classification of Florida coropliidean genera.

Coropliidean family level classification used in this guide		Revised coropliidean family level classification based on Myers and Lowry (2003)	
Family	Regional Genera	Family	Regional Genera
Ampithoidae	<i>Ampithoe</i> <i>Cymadusa</i> <i>Peramphithoe</i> <i>Sunamphitoe</i>	Ampithoidae	<i>Ampithoe</i> <i>Cymadusa</i> <i>Peramphithoe</i> <i>Sunamphitoe</i>
Aoridae	<i>Bemlos</i> <i>Globosolembos</i> <i>Grandidierella</i> <i>Lembos</i> <i>Leptocheirus</i> <i>Paramicrodeutopus</i> <i>Pediorophium</i> <i>Plesiolembos</i> <i>Rudilemboides</i> <i>Uncia</i>	Aoridae	<i>Bemlos</i> <i>Globosolembos</i> <i>Grandidierella</i> <i>Lembos</i> <i>Paramicrodeutopus</i> <i>Plesiolembos</i>
		Coropliidae	<i>Leptocheirus</i>
		Unciaidae	<i>Pediorophium</i> <i>Rudilemboides</i> <i>Uncia</i>
Cheluridae	<i>Chelura</i> <i>Tropichelura</i>	Cheluridae	<i>Chelura</i> <i>Tropichelura</i>
Coropliidae	<i>Americorophium</i> <i>Apocorophium</i> <i>Laticorophium</i> <i>Monocorophium</i>	Coropliidae	<i>Americorophium</i> <i>Apocorophium</i> <i>Laticorophium</i> <i>Monocorophium</i>
Isaeidae	<i>Audulla</i> <i>Chevalia</i> <i>Gammaropsis</i> <i>Microprotopus</i> <i>Photis</i>	Chevaliidae	<i>Chevalia</i>
		Microprotopidae	<i>Microprotopus</i>
		Photidae	<i>Audulla</i> <i>Gammaropsis</i> <i>Photis</i>
Ischyroceridae	<i>Carriboecetes</i> <i>Cerapus</i> <i>Erichthonius</i> <i>Jassa</i>	Ischyroceridae	<i>Carriboecetes</i> <i>Cerapus</i> <i>Erichthonius</i> <i>Jassa</i>
Neomegamphopidae	<i>Konatopus</i> <i>Neomegamphopus</i> <i>Varohios</i>	Neomegamphopidae	<i>Konatopus</i> <i>Neomegamphopus</i> <i>Varohios</i>
Podoceridae	<i>Podocerus</i>	Podoceridae	<i>Podocerus</i>