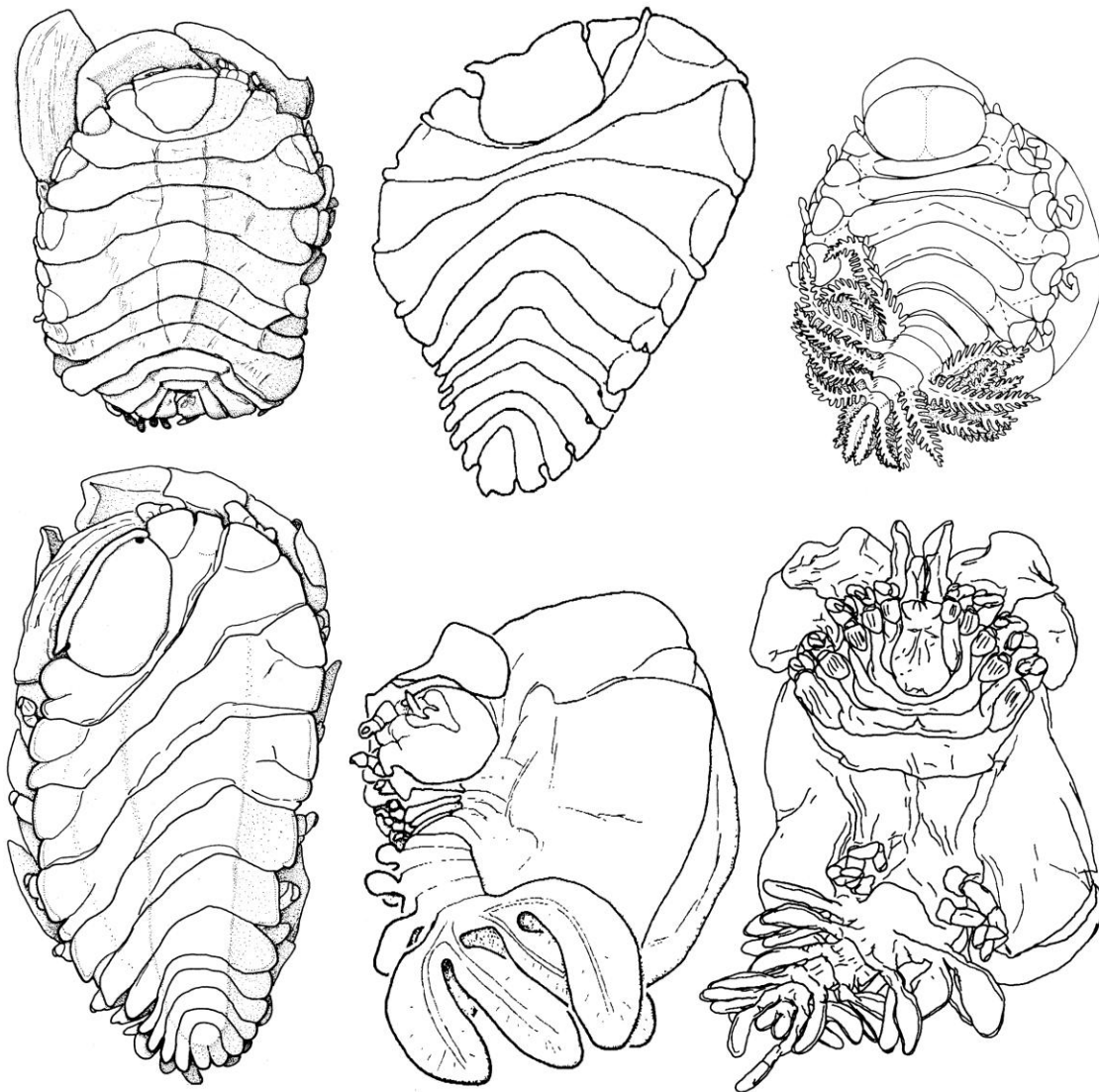


A Key to the Epicaridean Isopods of the South Atlantic Bight

Jana N. Thoma and Richard W. Heard

Thirty species of the isopod suborder Epicaridea Latreille, 1831, a diverse group of parasites occurring on various crustacean hosts, are known from the South Atlantic Bight (SAB) between Cape Lookout, North Carolina, and Cape Canaveral, Florida, USA. Illustrated keys to those species are provided here.



Images modified from Markham, 1988 & 1985; Wells & Wells, 1966; Markham, 1978 & 1985; Boyko & Williams, 2003 (left to right, top to bottom)

Preprint of the key from Thoma & Heard (in prep.) for the NOAA Professional Papers Series

(layout prepared by the Southeastern Regional Taxonomic Center for online use)

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Epicaridean isopods of the South Atlantic Bight (SAB)

Suborder **Epicaridea** Latreille, 1831 (after Martin & Davis, 2001)

Family **Bopyridae** Rafinesque-Schmaltz, 1815

Subfamily **Athelginae** Codreanu & Codreanu, 1956

Anathelges hyptius (Thompson, 1902)

Subfamily **Bopyrinae** Rafinesque-Schmaltz, 1815

Bopyrina abbreviata Richardson, 1904

Ogyridione caroliniana Markham, 1988

Probopyria alpei (Richardson, 1900)

Probopyrinella heardi Adkison, 1984

Probopyrinella latreuticola (Gissler, 1882)

Probopyrus pandalicola (Packard, 1879)

Schizobopyrina urocaridis (Richardson, 1904)

Synsynella choprae (Pearse, 1932)

Synsynella deformans Hay, 1917

Synsynella integra Bourdon, 1981

Subfamily **Hemiarthrinae** Markham, 1972

Azygopleon schmitti (Pearse, 1932)

Diplophryxus siankaanensis Markham, 1988

Eophrixus sp. A, new species*

Eophrixus subcaudalis (Hay, 1917)

Hemiarthrus synalpei (Pearse, 1950)

Subfamily **Ioninae** H. Milne Edwards, 1840

Cancricepon choprae (Nierstrasz & Brender à Brandis, 1925)

Dactylokepon hunterae Wells & Wells, 1966

Leidyia distorta (Leidy, 1855)

Subfamily **Pseudioninae** Codreanu, 1967

Anuropodione carolinensis Markham, 1973

Aporobopyrus curtatus (Richardson, 1904)

Asymmetrione desultor Markham, 1975

Bopyrissa wolffi Markham, 1978

Munidion longipedis Markham, 1975

Orthione furcata (Richardson, 1904)

Progebiophilus upogebiae (Hay, 1917)

Pseudionella markhami (Adkison & Heard, 1978)

Family **Cabiropidae** Giard & Bonnier, 1887

Clypeoniscus sp. A, new species*

Family **Dajidae** Giard & Bonnier, 1887

Zonophryxus dodecapus Holthuis, 1949

Family **Entoniscidae** Kossmann, 1881

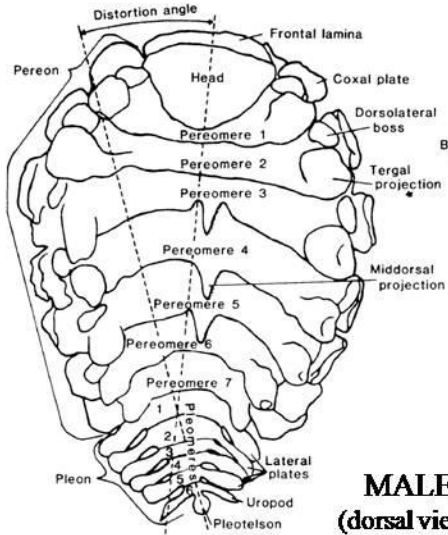
Cancrion carolinus Pearse & Walker, 1939

*new species that are in the process of being described by Thoma & Heard

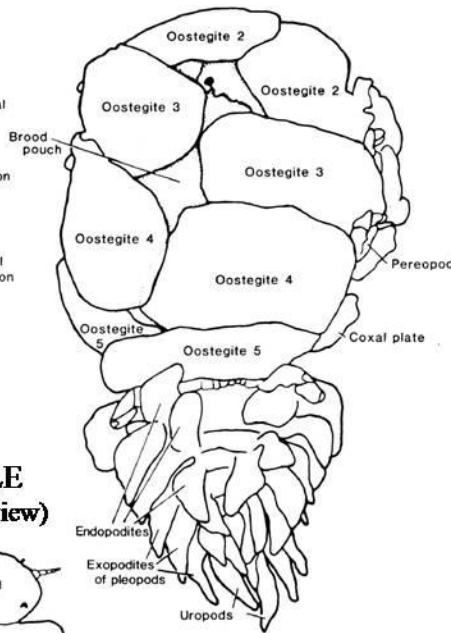
Overview of general bopyrid morphology

(after Markham, 1985)

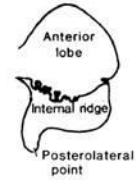
FEMALE (dorsal view)



FEMALE (ventral view)

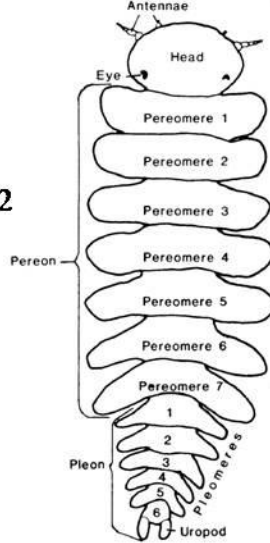


oostegite 1 (internal view)

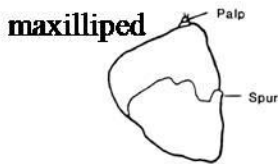
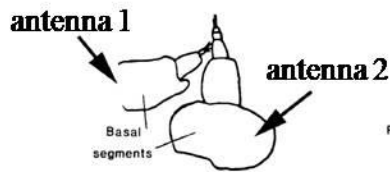
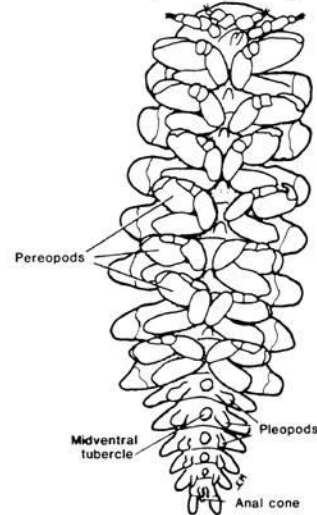


barbula (posteroventral border of the head)

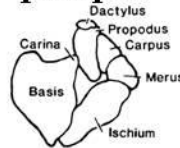
MALE (dorsal view)



MALE (ventral view)



pereopod



Key to families for adult female members of the Epicaridea of the South Atlantic Bight

1. Body lacking any pereonal or pleonal segmentation (Fig. 1A) **Cabiropidae**
(Clypeoniscus sp. A is the only representative of this family in the SAB)
 —Body with at least some pereonal or pleonal segmentation (Fig. 1B-F) 2
2. Pereopods absent; antennae 1-2 absent (Fig. 1B)..... **Entoniscidae**
(Cancrion carolinus is the only representative of this family in the SAB)
 —At least five pereopods present; antennae 1-2 present (Fig. 1D-E)..... 3
3. Body symmetrical, shield-like; marsupium consisting of two cavities, bounded laterally by body rather than oostegites (Fig. 1C-D)..... **Dajidae**
(Zonophryxus dodecapus is the only representative of this family in the SAB)
 —Body asymmetrical, not shield-like; marsupium formed by oostegites rather than body cavity (Fig. 1E-F)
 **Bopyridae**

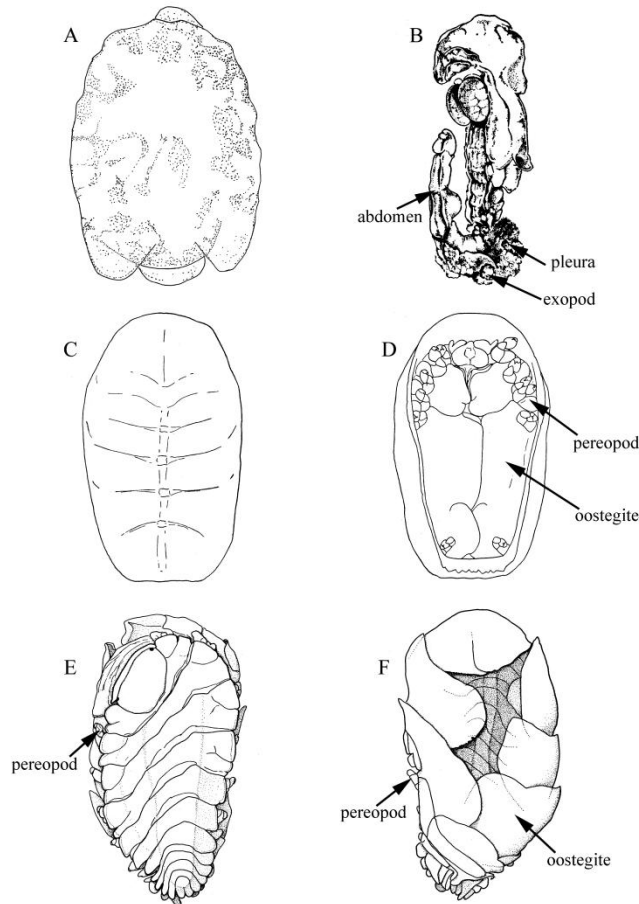


Figure 1. Epicaridea, female, family representatives. A, *Clypeoniscus* sp. A; B, *Cancrion carolinus*, lateral view of female; C, *Zonophryxus dodecapus*, dorsal view; D, *Z. dodecapus*, ventral view; E, *Bopyrissa wolffi*, dorsal view; F, *B. wolffi*, ventral view. (B modified from Pearse & Walker, 1939; C-D modified from Holthuis, 1949; E-F modified from Markham, 1978.)

Key to subfamilies for adult female members of the Bopyridae of the South Atlantic Bight

1. Oostegites surround but do not enclose marsupium (Fig. 2A) **Bopyrinae**
 —Oostegites nearly to completely enclose marsupium (Fig. 2D, G).....2
2. Pleonites with extended, digitate to tuberculate lateral plates (Fig. 2B) **Ioninae**
 —Pleonites with extended, simple lateral plates (Fig. 2C)3
3. Brood pouch formed by oostegites from one side of body only (Fig. 2D)..... **Hemiarthrinae**
 —Brood pouch formed by oostegites from both sides (Fig. 2G)4
4. Pleonites with greatly extended lateral plates; pereopods present on dorsal surface (Fig. 2E) **Athelginae**
 (*Anathelges hyptius* is the only representative of this family in the SAB)
 —Pleonites with slightly extended lateral plates; pereopods present on ventral surface (Fig. 2F) **Pseudioninae**

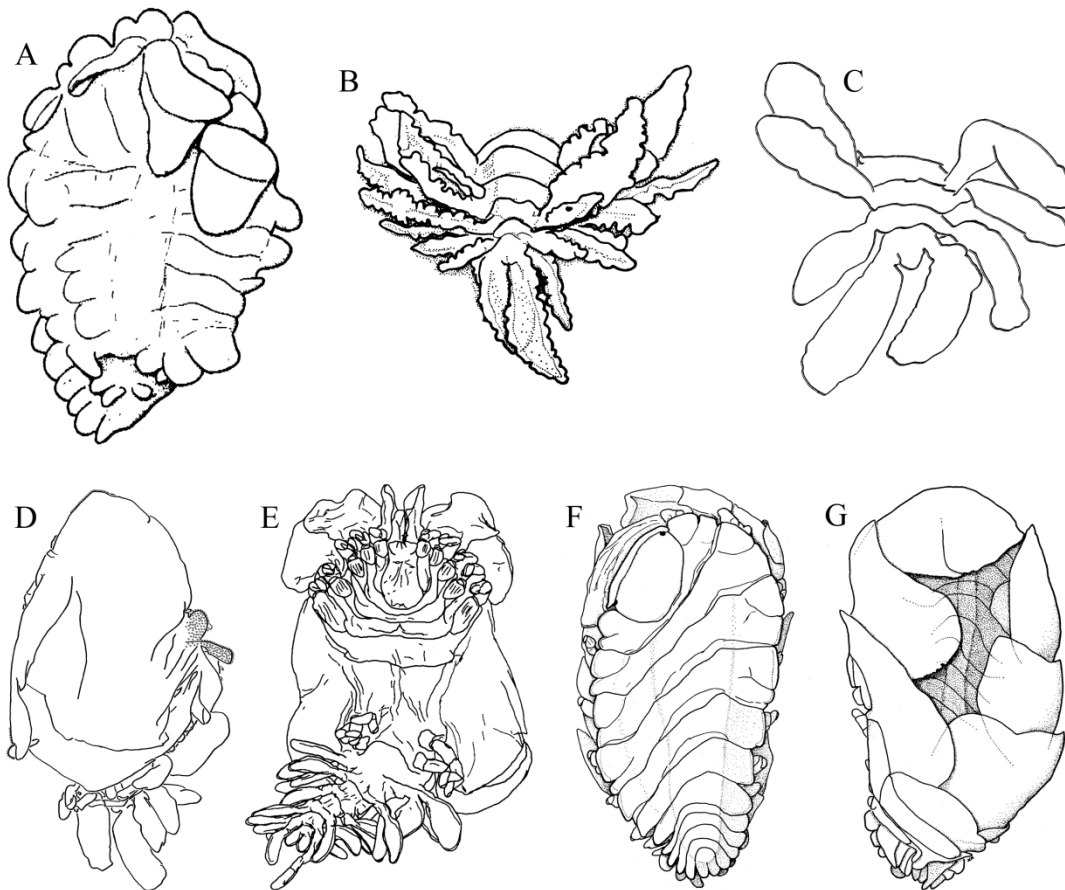


Figure 2. Bopyridae, female, subfamily representatives. A, *Bopyrina abbreviata*, ventral view; B, *Cancricepon choprae*, pleon, dorsal; C, *Eophrixus* sp. A, pleon, dorsal; D, *Eophrixus* sp. A, ventral view; E, *Anathelges hyptius*, dorsal view; F, *Bopyrissa wolffi*, dorsal view; G, *Bopyrissa wolffi*, ventral view. (A modified from Markham, 1985; B modified from Markham, 1975b; E modified from Boyko & Williams, 2003; F-G modified from Markham, 1978.)

Key to genera for adult female members of the Bopyrinae

1. Maxilliped with palp absent (Fig. 3A) 2
- Maxilliped with palp present, articulated or not (Fig. 3B) 3
2. Pleopods uniramous; posterior lamina (barbula) with one pair of lateral projections (Fig. 3C) *Bopyrina*
(Bopyrina abbreviata is the only representative of this genus in the SAB)
- Pleopods biramous; posterior lamina (barbula) with two pairs of lateral projections (Fig. 3D) *Probopyria*
(Probopyria alpei is the only representative of this genus in the SAB)
3. Coxal plates and dorsolateral bosses absent; posteroventral border of head (barbula) with one pair of lateral projections *Probopyrinella*
- Coxal plates or dorsolateral bosses present; barbula with two pairs of lateral projections (Fig. 3E) 4
4. Pleon posteriorly truncated (Fig. 3E) *Ogyridione*
(Ogyridione caroliniana is the only representative of this genus in the SAB)
- Pleon posteriorly rounded (Fig. 3F) 5
5. Five pairs of pleopods present *Probopyrus*
(Probopyrus pandalicola is the only representative of this genus in the SAB)
- Three or four pairs of pleopods present 6
6. Head unfused with pereonite 1; body elongate, spatulate (Fig. 3G) *Schizobopyrina*
(Schizobopyrina urocaridis is the only representative of this genus in the SAB)
- Head fused, at least medially, with pereonite 1; body subcordate (Fig. 3H) *Synsynella*

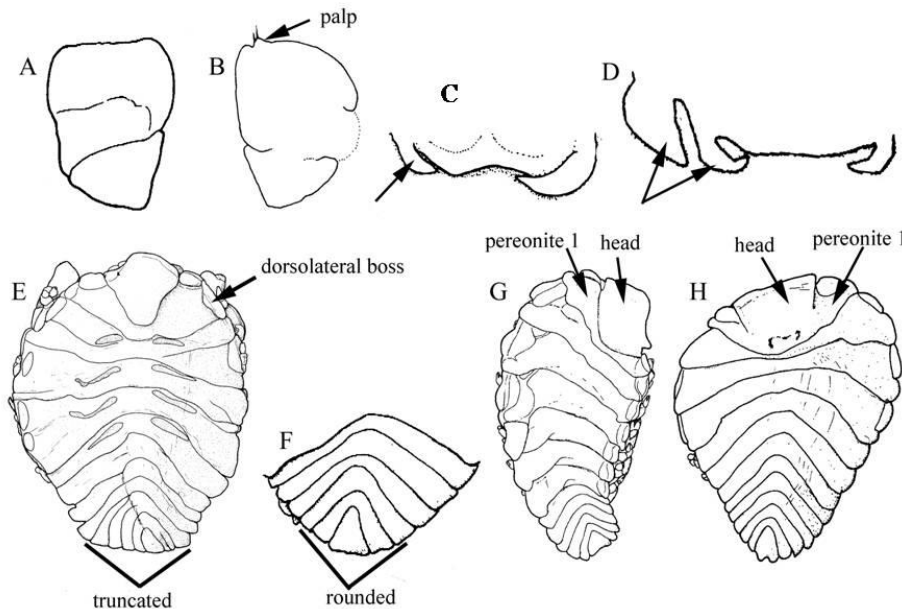


Figure 3. Bopyrinae, female, generic representatives. A, *Bopyrina abbreviata*, maxilliped lacking palp; B, *Probopyrinella heardi*, maxilliped with palp; C, *Probopyrinella heardi*, barbula with one pair of lateral projections; D, *Probopyria alpei*, barbula with two pairs of lateral projections; E, *Ogyridione caroliniana*, dorsal view; F, *Probopyrus pandalicola*, pleon, dorsal; G, *Schizobopyrina urocaridis*, dorsal view; H, *Synsynella deformans*, dorsal view. (A, D, F-H modified from Markham, 1985; B-C modified from Adkison, 1984; E modified from Markham, 1988.)

Key to genera for adult male members of the Bopyrinae

1. Pleopods absent (Fig. 4A-B) *Bopyrina*
 (*Bopyrina abbreviata* is the only representative of this genus in the SAB)
 —Pleopods present (Fig. 4D, J) 2
2. Head partially or completely fused with pereonite 1 (Fig. 4E) 3
 —Head not fused with pereonite 1 (Fig. 4C) 4
3. Pleonites fused dorsally, indicated laterally by indentations (Fig. 4E) *Schizobopyrina*
 (*Schizobopyrina urocaridis* is the only representative of this genus in the SAB)
 —Pleonites completely unfused or partially fused (Fig. 4F)..... *Synsynella*
4. Pleonites fused dorsally, indicated laterally by indentations (Fig. 4C-D)..... *Probopyria*
 (*Probopyria alpei* is the only representative of this genus in the SAB)
 —Pleonites completely unfused or partially fused dorsally (Fig. 4G) 5
5. Head elongate, partially bisecting pereonite 1 (Fig. 4G)..... *Ogyridione*
 (*Ogyridione caroliniana* is the only representative of this genus in the SAB)
 —Head broadened, not bisecting pereonite 1 (Fig. 4H)..... 6
6. Pleonite 6 deeply set into pleonite 5, the two being medially distinct (Fig. 4H)..... *Probopyrus*
 (*Probopyrus pandalicola* is the only representative of this genus in the SAB)
 —Pleonite 6 not deeply set into pleonite 5, the two being medially fused (Fig. 4I) *Probopyrinella*

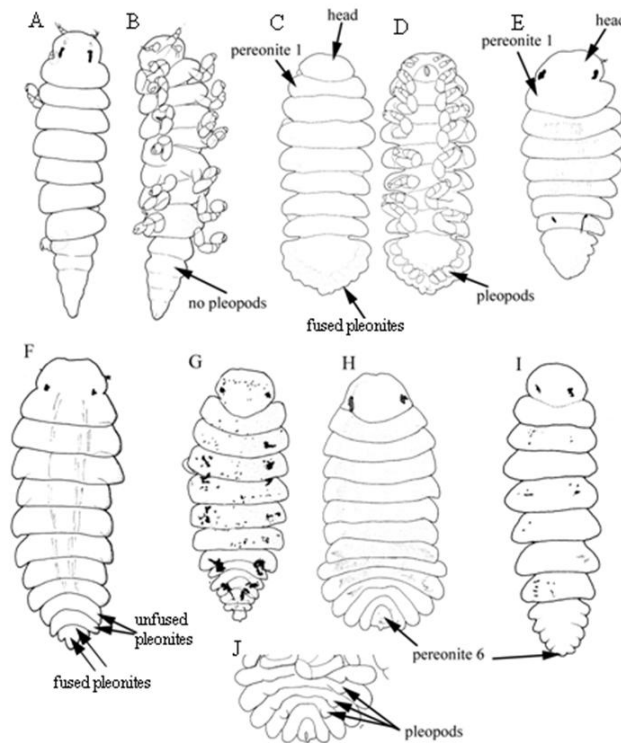


Figure 4. Bopyrinae, male, generic representatives. A, *Bopyrina abbreviata*, dorsal view; B, *Bopyrina abbreviata*, ventral view; C, *Probopyria alpei*, dorsal view; D, *Probopyria alpei*, ventral view; E, *Schizobopyrina urocaridis*, dorsal view; F, *Synsynella choprae*, dorsal view; G, *Ogyridione caroliniana*, dorsal view; H, *Probopyrus pandalicola*, dorsal view; I, *Probopyrinella heardi*, dorsal view; J, *Probopyrus pandalicola*, pleon, ventral view. (A-F, H, J modified from Markham, 1985; G modified from Markham, 1988; I modified from Adkison, 1984.)

Key to adult female members of *Probopyrinella*

1. Maxilliped with palp unarticulated; barbula asymmetrically produced, one projection larger and more elongate than other; head subrectangular (Fig. 5A-C).....*Probopyrinella heardi*
 — Maxilliped with palp articulated; barbula symmetrically produced, with one projection not larger or more elongate than other; head trapezoidal to spade-like (Fig. 5D-F)..... *Probopyrinella latreuticola*

Key to adult male members of *Probopyrinella*

1. Antenna 2 with two articles; head round; eyes with irregular outline (Fig. 5G-H).....*Probopyrinella heardi*
 —Antenna 2 with three articles; head trapezoidal; eyes with smooth outline (Fig. 5I-J)
 *Probopyrinella latreuticola*

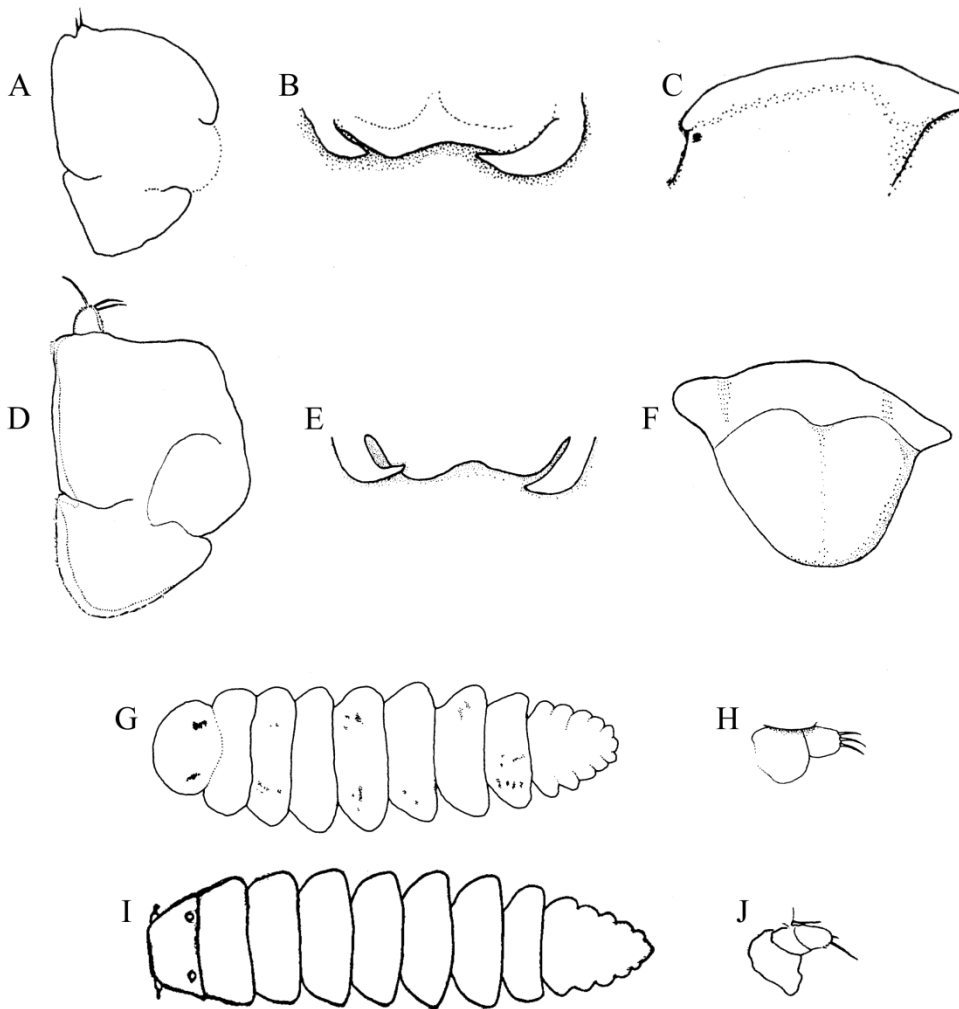


Figure 5. *Probopyrinella*, specific representatives. A, *P. heardi*, female, maxilliped; B, *P. heardi*, female, barbula; C, *P. heardi*, female, head; D, *P. latreuticola*, female, maxilliped; E, *P. latreuticola*, female, barbula; F, *P. latreuticola*, female, head; G, *P. heardi*, male, dorsal view; H, *P. heardi*, male, antenna 2; I, *P. latreuticola*, male, dorsal view; J, *P. latreuticola*, male, antenna 2. (A-C, G-H modified from Adkison, 1984; D-F, J modified from Markham, 1977; I modified from Richardson, 1905.)

Key to adult female members of *Synsynella*

1. Antenna 1 with two articles; pleonite 6 with smooth to slightly bifurcate posterior margin (Fig. 6A).....
 *Synsynella integra*
 —Antenna 1 with three articles; pleonite 6 with distinctly bifurcate posterior margin (Fig. 6B).....2
2. Maxilliped with palp articulated (Fig. 6C); oostegites 4-5 nearly as long as wide*Synsynella deformans*
 —Maxilliped with palp unarticulated (Fig. 6D); oostegites 4-5 nearly three times longer than wide
*Synsynella choprae*

Key to adult male members of *Synsynella*

1. Three pleopods present; eyes absent *Synsynella integra*
 —Four pleopods present; eyes present.....2
2. Antenna 1 with all three articles setose; antenna 2 of two articles; dorsal pigmentation lacking (Fig. 6E)
*Synsynella choprae*
 —Antenna 1 with only article 3 setose; antenna 2 of three articles; dorsal pigmentation irregular (Fig. 6F-G)
*Synsynella deformans*

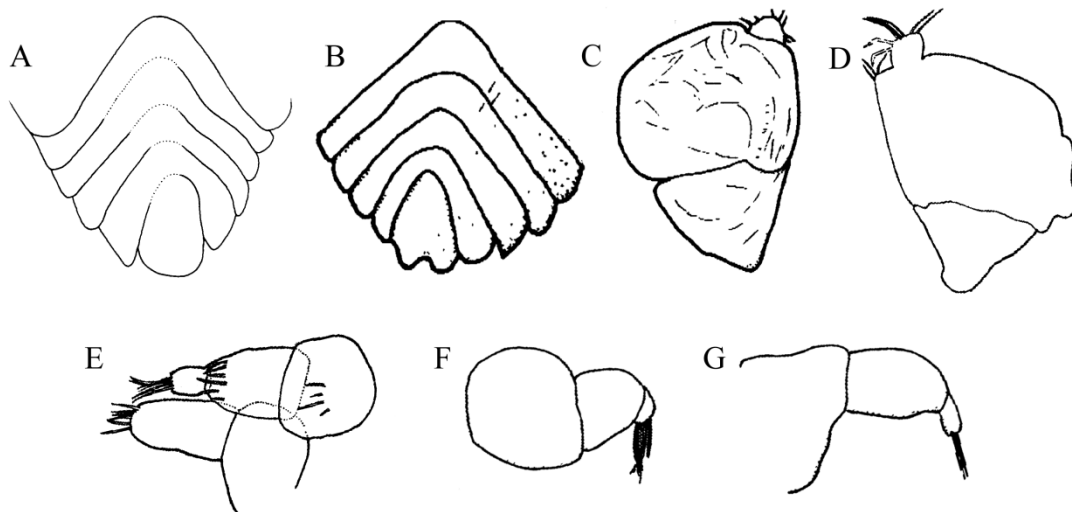


Figure 6. *Synsynella*, specific representatives. A, *S. integra*, pleon, dorsal; B, *S. deformans*, pleon, dorsal; C, *S. deformans*, maxilliped; D, *S. choprae*, maxilliped; E, *S. choprae*, male, antenna 1-2, antenna 1 above, antenna 2 below; F, *S. deformans*, antenna 1; G, *S. deformans*, antenna 2. (A modified from Bourdon, 1981; B-G modified from Markham, 1985.)

Key to genera for adult female members of the Hemiarthrinae

1. Lateral plates biramous (Fig. 7A)..... *Diplophryxus*
(Diplophryxus siankaanensis is the only representative of this genus in the SAB)
- Lateral plates uniramous (Fig. 7B).....2
2. Head not overlapping any pereonites (Fig. 7B); seven pereopods present on expanded side of body....*Eophrixus*
—Head overlapping one or more pereonites (Fig. 7C-D); one pereopod present on expanded side of body3
3. Pleon with four pleonites present, pleonite 5 absent; lateral plates asymmetrical in shape (Fig. 7C)...*Azygopleon*
(Azygopleon schmitti is the only representative of this genus in the SAB)
- Pleon with five pleonites present, pleonite 5 greatly elongated posteriorly; lateral plates somewhat symmetrical in shape (Fig. 7D).....*Hemiarthrus*
(Hemiarthrus synalpei is the only representative of this genus in the SAB)

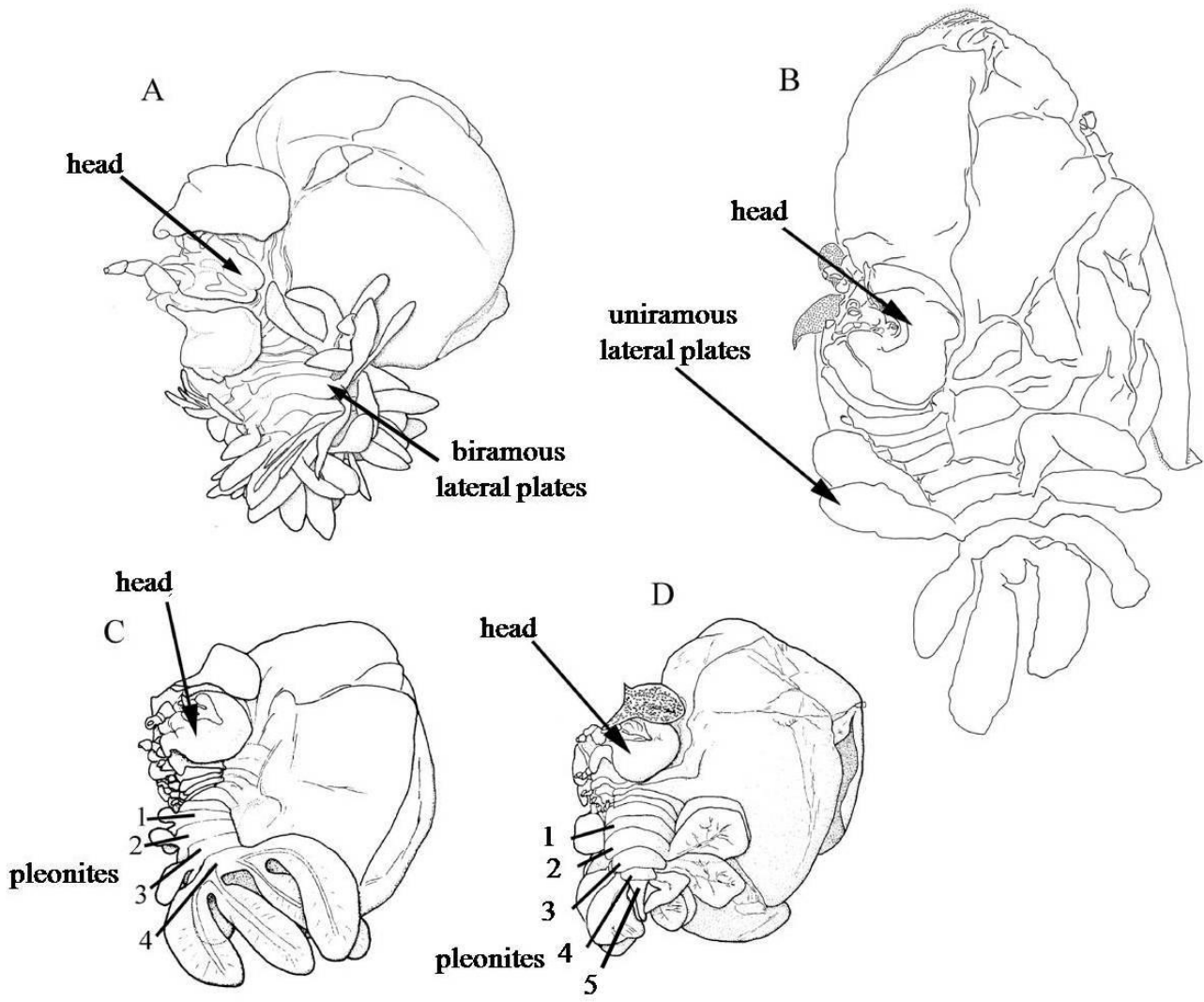


Figure 7. Hemiarthrinae, female, generic representatives. A, *Diplophryxus siankaanensis*, dorsal view; B, *Eophrixus* sp. A, dorsal view; C, *Azygopleon schmitti*, dorsal view; D, *Hemiarthrus synalpei*, dorsal view. (A modified from Markham, 1988; C-D modified from Markham, 1985.)

Key to genera for adult male members of the Hemiarthrinae

1. Head trapezoidal, fused with pereonite 1 (Fig. 8A) *Eophrixus*
 —Head ovate, free from pereonite 1 (Fig. 8B)..... 2
2. Head not overlapping anterior portion of pereonite 1 (Fig. 8B)..... *Azygopleon*
 (*Azygopleon schmitti* is the only representative of this genus in the SAB)
 —Head overlapping anterior portion of pereonite 1 (Fig. 8C-D)..... 3
3. Head greatly overlapping anterior portion of pereonite 1 (Fig. 8C); tip of pleon acute..... *Hemiarthrus*
 (*Hemiarthrus synalphei* is the only representative of this genus in the SAB)
 —Head slightly overlapping anterior portion of pereonite 1 (Fig. 8D); tip of pleon broadly rounded. *Diplophryxus*
 (*Diplophryxus siankaanensis* is the only representative of this genus in the SAB)

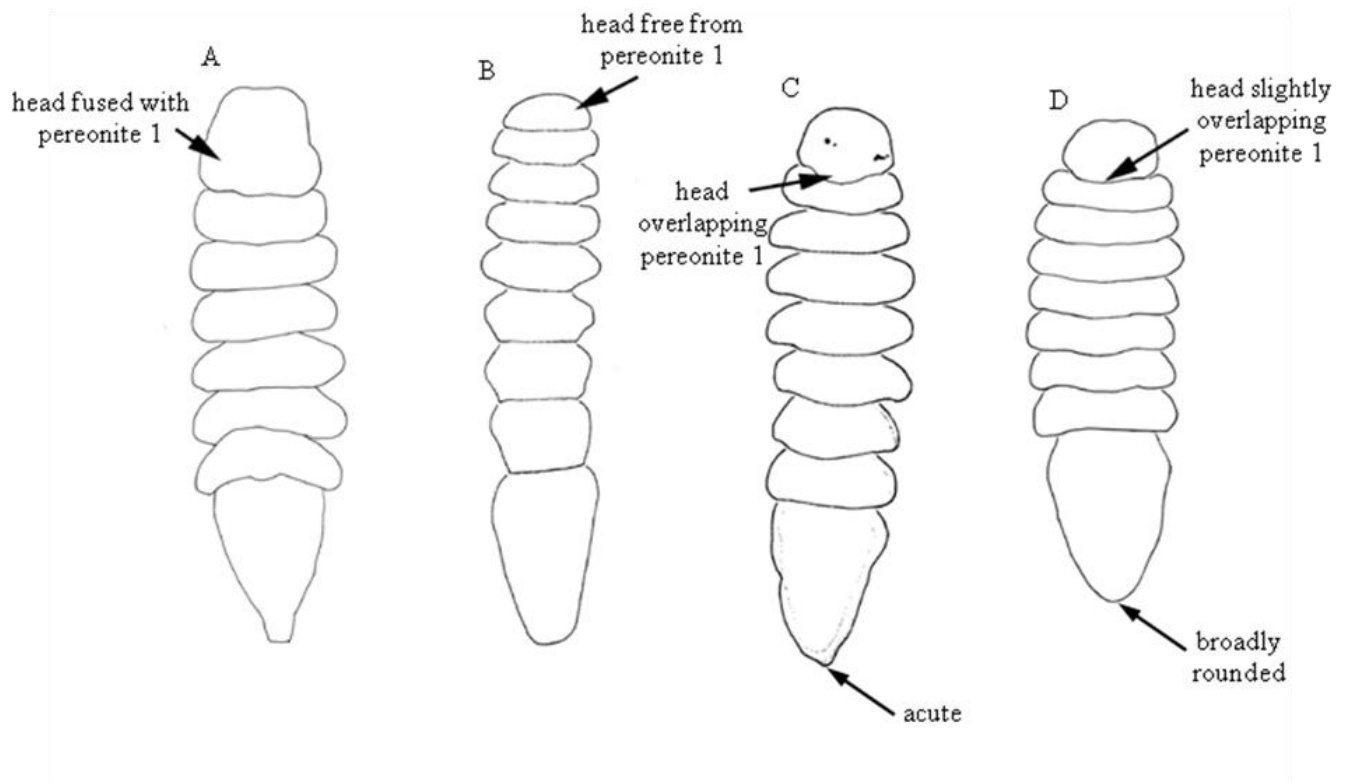


Figure 8. Hemiarthrinae, male, generic representatives. A, *Eophrixus* sp. A, dorsal view; B, *Azygopleon schmitti*, dorsal view; C, *Hemiarthrus synalphei*, dorsal view; D, *Diplophryxus siankaanensis*, dorsal view. (B-C modified from Markham, 1985; D modified from Markham, 1988.)

Key to adult female members of *Eophrixus*

1. Pereopod 3 on expanded side with elongate dactylus (Fig. 9A); uropods present, but small
*Eophrixus subcaudalis*
 —Pereopod 3 on expanded side with squat dactylus (Fig. 9B); uropods absent.....*Eophrixus* sp. A

Key to adult male of members of *Eophrixus*

1. Pleon, tip bifid, lobes rounded terminally (Fig. 9C).....*Eophrixus subcaudalis*
 —Pleon, tip not bifid, truncate terminally (Fig. 9D).....*Eophrixus* sp. A

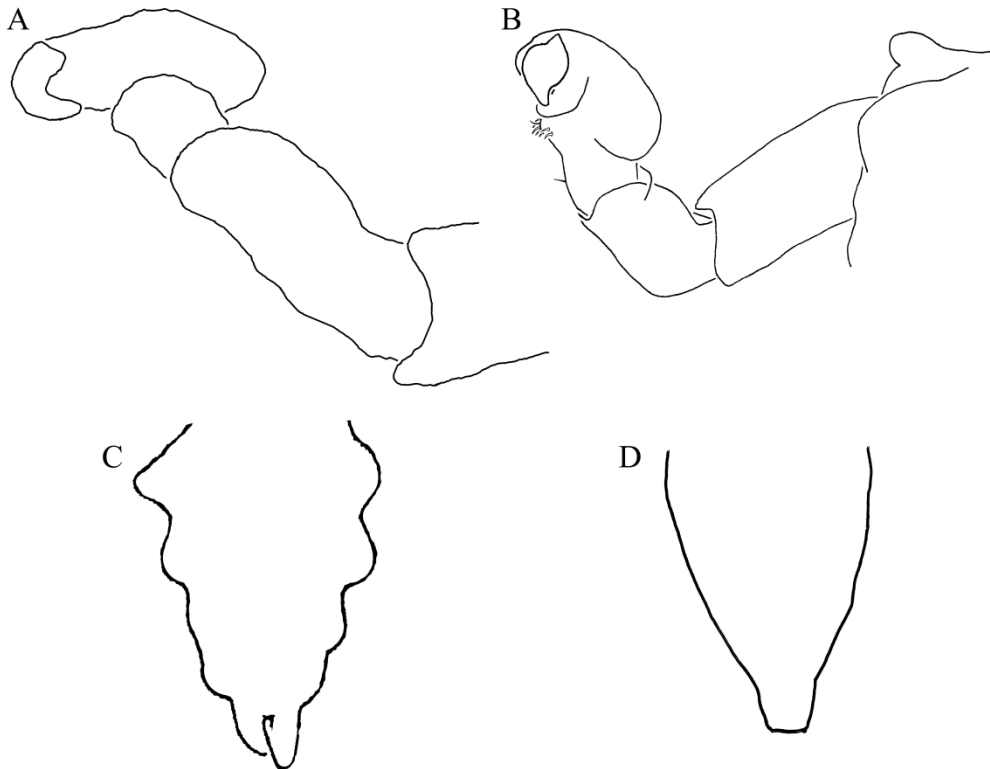


Figure 9. *Eophrixus*, specific representatives. A, *E. subcaudalis*, female pereopod 3 of expanded side; B, *E. sp. A*, female, pereopod 3 of expanded side; C, *E. subcaudalis*, male, pleon, dorsal; D, *E. sp. A*, male, pleon, dorsal. (A, C redrawn from Markham, 1985.)

Key to genera for adult female members of the Ioninae

1. Pleopods 1-5 uniramous (Fig. 10A) *Cancricepon*
 (*Cancricepon choprae* is the only representative of this genus in the SAB)
- Pleopods 1-5 biramous (Fig. 10B)..... 2
2. Frontal lamina anteriorly produced; pereonites lacking mid-dorsal projections (Fig. 10C) *Dactylokepon*
 (*Dactylokepon hunterae* is the only representative of this genus in the SAB)
- Frontal lamina anteriorly truncate; pereonites with prominent mid-dorsal projections (Fig. 10D) *Leidya*
 (*Leidya distorta* is the only representative of this genus in the SAB)

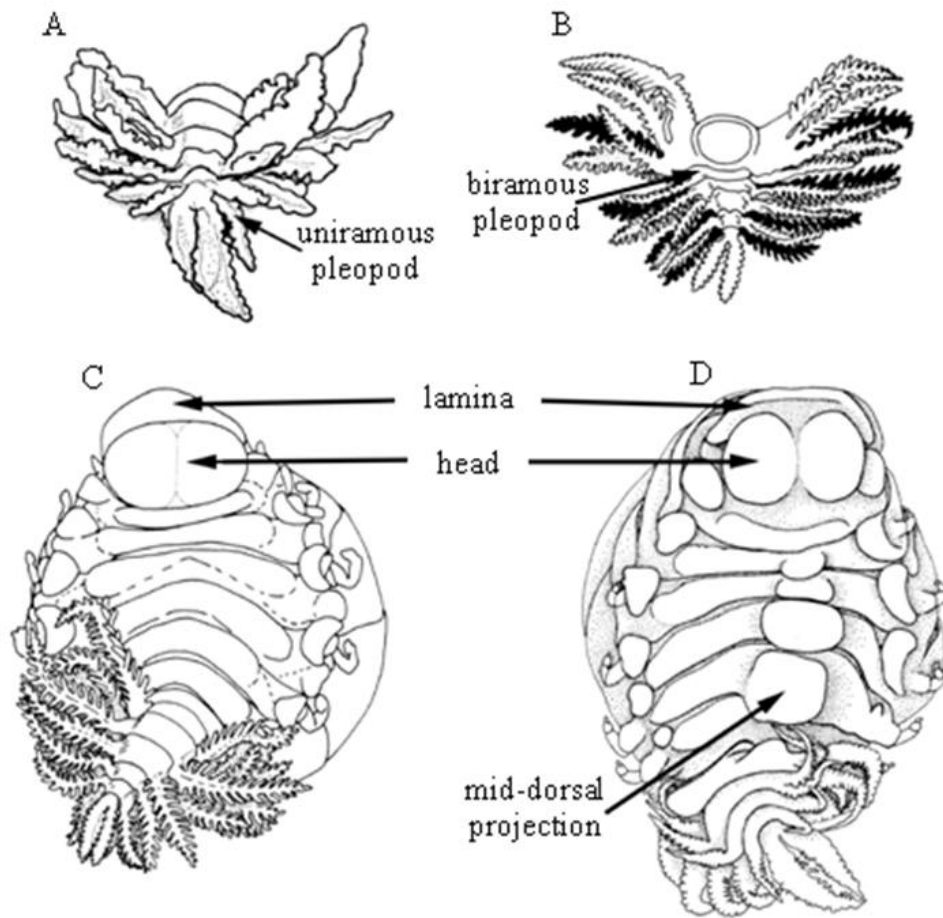


Figure 10. Ioninae, female, generic representatives. A, *Cancricepon choprae*, pleon dorsal; B, *Dactylokepon hunterae*, pleon ventral; C, *Dactylokepon hunterae*, dorsal view; D, *Leidya distorta*, dorsal view. (A modified from Markham, 1975b; B-C modified from Wells & Wells, 1966; D modified from Bourdon & Bowman, 1970.)

Key to genera for adult male members of the Ioninae

1. With distinctly elongate, attenuate, posterolateral processes extending far beyond terminal margin of pleonite 6 (Fig. 11A).....*Leidya*
 (*Leidya distorta* is the only representative of this genus in the SAB)
 —With short, blunt, posterolateral processes extending slightly beyond terminal margin of pleonite 6 (Fig. 11B-C)2
2. Pereonites with mid-ventral projections present (Fig. 11B).....*Cancricepon*
 (*Cancricepon choprae* is the only representative of this genus in the SAB)
 —Pereonites with mid-ventral projections absent (Fig. 11C).....*Dactylokepon*
 (*Dactylokepon hunterae* is the only representative of this genus in the SAB)

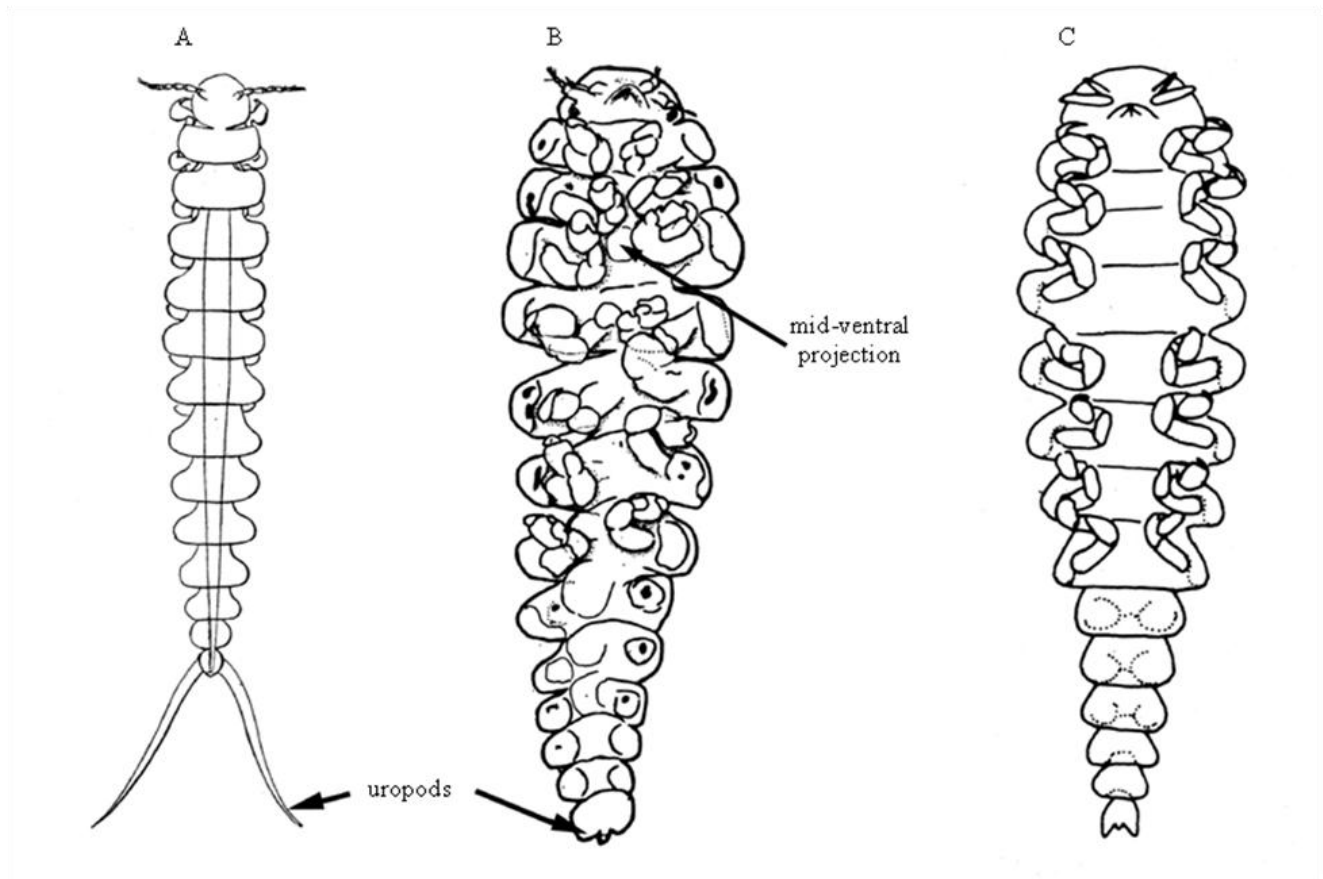


Figure 11. Ioninae, male, generic representatives. A, *Leidya distorta*, dorsal view; B, *Cancricepon choprae*, ventral view; C, *Dactylokepon hunterae*, ventral view. (A modified from Bourdon & Bowman, 1970; B modified from Markham, 1975b; C modified from Wells & Wells, 1966.)

Key to genera for adult female members of the Pseudioninae

1. Uropods absent (Figs. 12A-B).....*Anuropodione*
 (*Anuropodione carolinensis* is the only representative of this genus in the SAB)
- Uropods present, either uniramous or biramous (Figs. 12C-D)2
2. Uropods biramous (Fig. 12H)..... *Munidion*
 (*Munidion longipedis* is the only representative of this genus in the SAB)
- Uropods uniramous (Fig. 12G).....3
3. Body doubly distorted, producing S-shape (Figs. 12E-F)*Bopyrissa*
 (*Bopyrissa wolffi* is the only representative of this genus in the SAB)
- Body asymmetrically distorted, not producing S-shape (Fig. I-J).....4
4. Oostegite 1 lacking posterolateral point (Fig. 12K) *Orthione*
 (*Orthione furcata* is the only representative of this genus in the SAB)
- Oostegite 1 with posterolateral point (Fig. 12L)(continued over page)...5

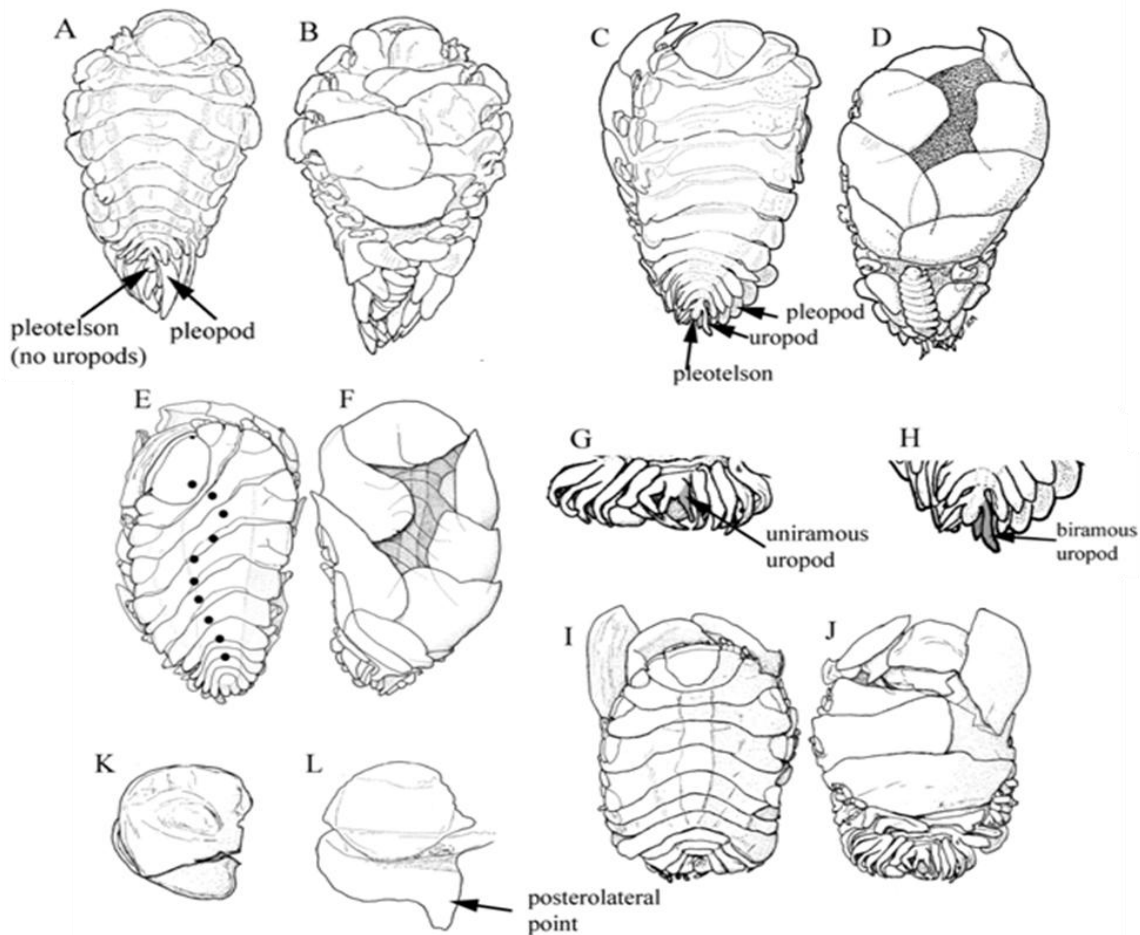


Figure 12. Pseudioninae, female, generic representatives. A, *Anuropodione carolinensis*, dorsal view; B, *Anuropodione carolinensis*, ventral view; C, *Munidion longipedis*, dorsal view; D, *Munidion longipedis*, ventral view; E, *Bopyrissa wolffi*, dorsal view; F, *Bopyrissa wolffi*, ventral view; G, *Orthione furcata*, uniramous uropod; H, *Munidion longipedis*, biramous uropod; I, *Orthione furcata*, dorsal view; J, *Orthione furcata*, ventral view; K, *Orthione furcata*, oostegite 1 internal view; L, *Asymmetrione desultory*, oostegite 1, internal view. (A-B modified from Markham, 1973; C-D, H modified from Markham, 1975d; E-F modified from Markham, 1978; G, I-K modified from Markham, 1988; L modified from Markham, 1975c.)

Key to genera for adult female members of the Pseudioninae (continued)

5. Frontal lamina notched; pereopods with enlarged, flattened, disk-like propodi (Fig. 13A-B, E) *Asymmetrione*
 (*Asymmetrione desultor* is the only representative of this genus in the SAB)
- Frontal lamina not notched (Fig. 13C); pereopods with normally developed propodi 6
6. Pleopods 1-2 with bilobed rami (Fig. 13D).....*Pseudionella*
 (*Pseudionella markhami* is the only representative of this genus in the SAB)
- Pleopods 1-2 with entire, unlobed rami (Fig. 13F)..... 7
7. Pleonites with ventral digitate longitudinal ridges (Fig. 13G)*Progebiophilus*
 (*Progebiophilus upogebiae* is the only representative of this genus in the SAB)
- Pleonites lacking ventral digitate longitudinal ridges (Fig. 13F)*Aporobopyrus*
 (*Aporobopyrus curtatus* is the only representative of this genus in the SAB)

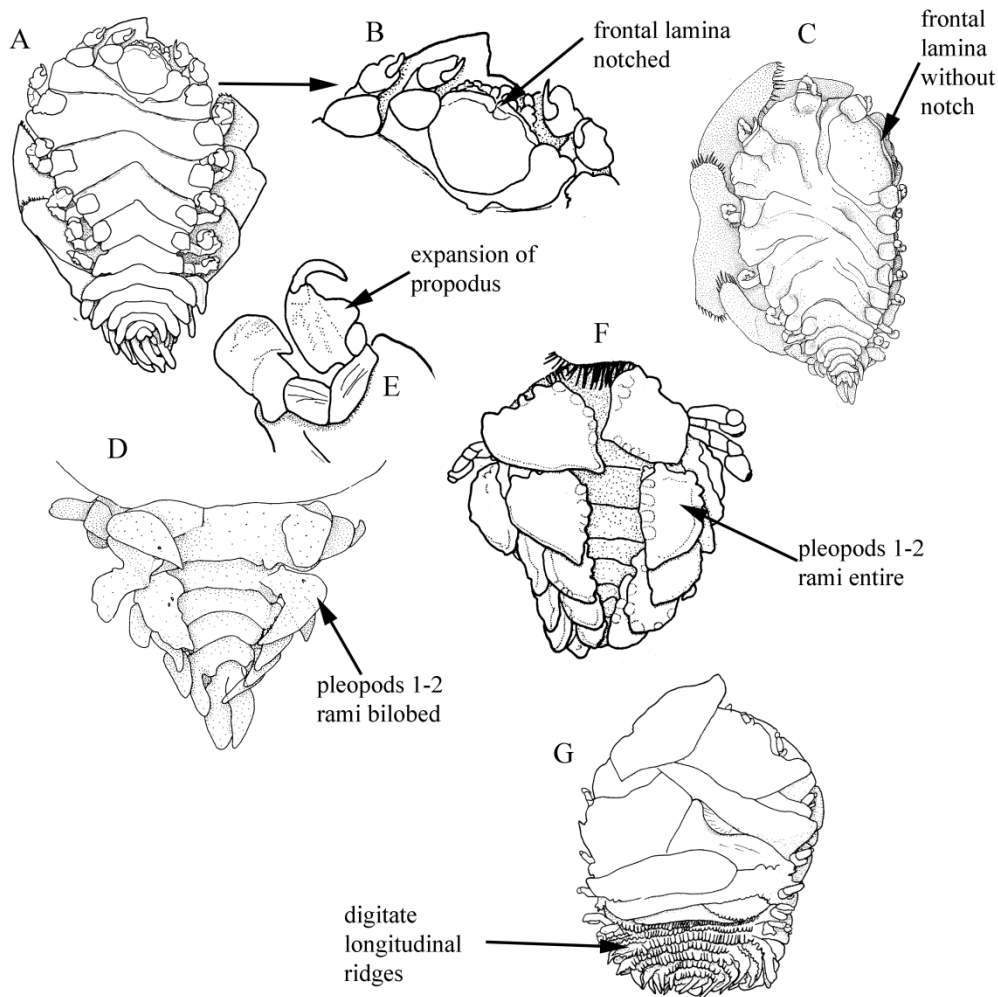


Figure 13. Pseudioninae, female, generic representatives. A, *Asymmetrione desultor*, dorsal view; B, *Asymmetrione desultor*, enlargement of head showing notched frontal lamina; C, *Pseudionella markhami*, dorsal view; D, *Pseudionella markhami*, pleon, ventral; E, *Asymmetrione desultor*, pereopod 1; F, *Aporobopyrus curtatus*, pleon, ventral; G, *Progebiophilus upogebiae*, ventral view. (A-B, E modified from Markham, 1975c; C-D modified from Adkison & Heard, 1978; F modified from Markham, 1975a; G modified from Markham, 1988.)

Key to genera for adult male members of the Pseudioninae

1. Pleopods absent (Fig. 14B) 2
- Pleopods present (Fig. 14G) 4
2. Pleonites unfused (Figs. 14A-B) *Aporobopyrus*
 (*Aporobopyrus curtatus* is the only representative of this genus in the SAB)
- Pleonites fused (Fig. 14C-E) 3
3. Pleonites with mid-ventral tubercle (located near anterior margin) *Munidion*
 (*Munidion longipedis* is the only representative of this genus in the SAB)
- Pleonites lacking mid-ventral tubercles *Anuropodione*
 (*Anuropodione carolinensis* is the only representative of this genus in the SAB)
4. Pereon and pleon with sharply pointed lateral plates (SAB species only) (Fig. 14F) *Progebiophilus*
 (*Progebiophilus upogebiae* is the only representative of this genus in the SAB)
- Pereon and pleon with rounded to squared lateral plates (Fig. 14H) (continued over page) ... 5

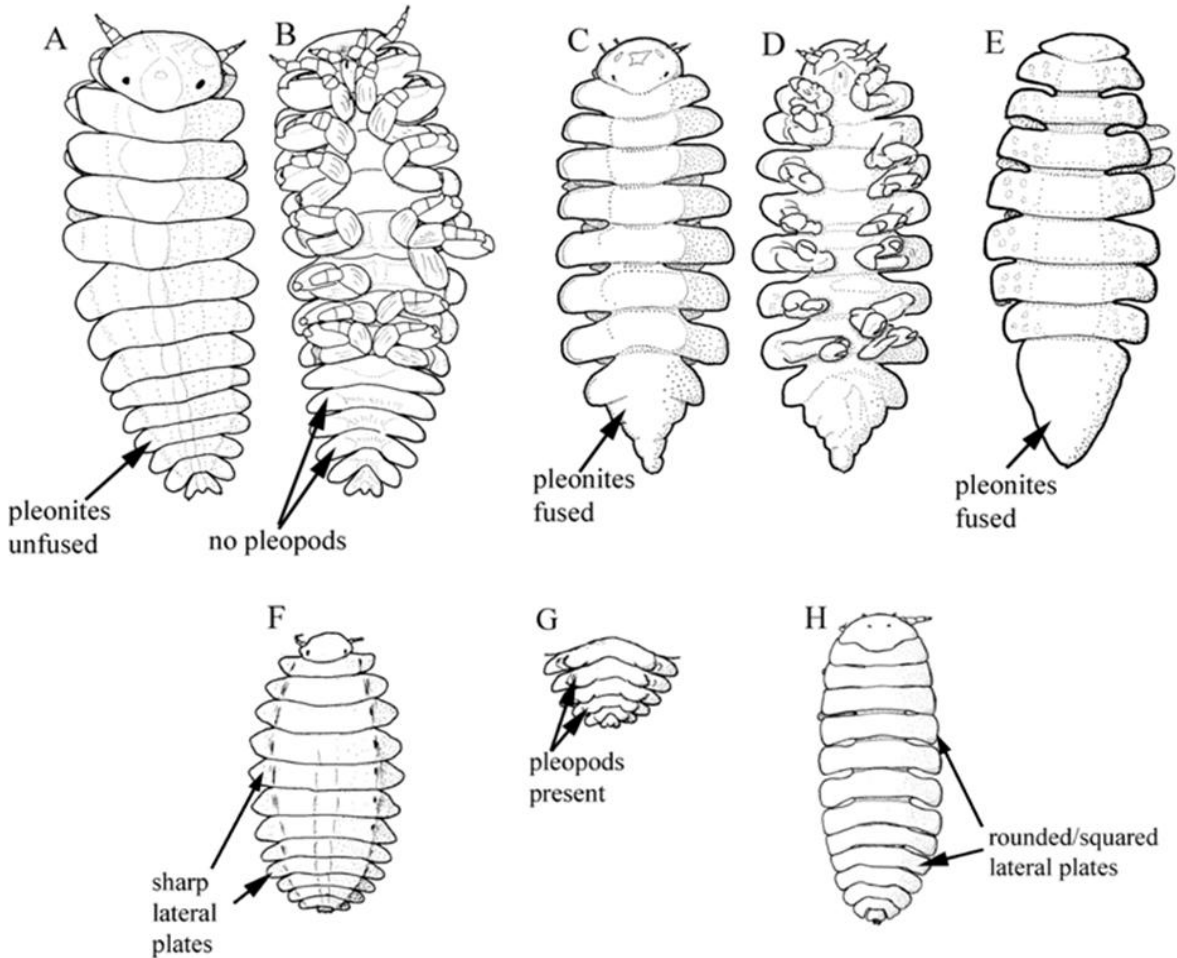


Figure 14. Pseudioninae, male, generic representatives. A, *Aporobopyrus curtatus*, dorsal view; B, *Aporobopyrus curtatus*, ventral view; C, *Munidion longipedis*, dorsal view; D, *Munidion longipedis*, ventral view; E, *Anuropodione carolinensis*, dorsal view; F, *Progebiophilus upogebiae*, dorsal view; G, *Progebiophilus upogebiae*, ventral view of pleonites with pleopods; H, *Orthione furcata*, dorsal view. (A-B modified from Markham, 1975a; C-D modified from Markham, 1975d; E modified from Markham, 1973; F-H modified from Markham, 1988.)

Key to genera for adult male members of the Pseudioninae (continued)

5. Pleopods incompletely formed (Fig. 15B) *Orthione*
 (*Orthione furcata* is the only representative of this genus in the SAB)
- Pleopods completely formed, flap-like or tuberculate (Figs. 15D, F, I)..... 6
6. Antenna 2 with three or four articles (SAB species only) *Bopyrissa*
 (*Bopyrissa wolffi* is the only representative of this genus in the SAB)
- Antenna 2 with five or more articles (SAB species only) (Figs. 15G, J) 7
7. Antenna 2 with five articles (SAB species only) (Fig. 15G)..... *Pseudionella*
 (*Pseudionella markhami* is the only representative of this genus in the SAB)
- Antenna 2 with seven articles (SAB species only) (Fig. 15J) *Asymmetrione*
 (*Asymmetrione desultor* is the only representative of this genus in the SAB)

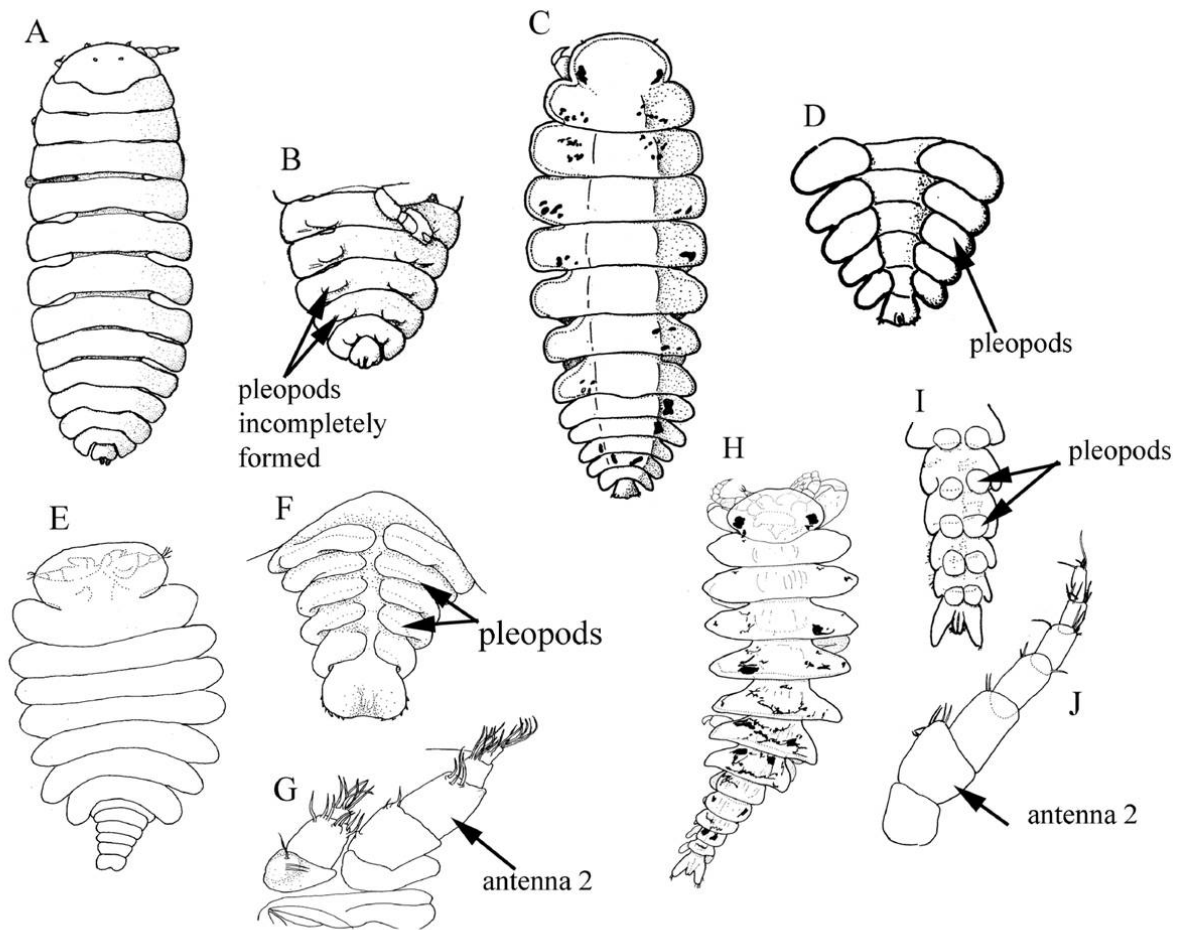


Figure 15. Pseudioninae, male, generic representatives. A, *Orthione furcata*, dorsal view; B, *Orthione furcata*, ventral view of pleon; C, *Bopyrissa wolffi*, dorsal view; D, *Bopyrissa wolffi*, ventral view of pleon; E, *Pseudionella markhami*, dorsal view; F, *Pseudionella markhami*, ventral view of pleon; G, *Pseudionella markhami*, antennae; H, *Asymmetrione desultor*, dorsal view; I, *Asymmetrione desultor*, ventral view of pleon; J, *Asymmetrione desultor*, antenna 2. (A-B modified from Markham, 1988; C-D modified from Markham, 1978; E-G modified from Adkison & Heard, 1978; H-J modified from Markham, 1975c.)

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References

- Adkison, D.L. 1984. *Probopyrinella heardi* n. sp. (Isopoda: Bopyridae) a branchial parasite of the hippolytid shrimp *Latreutes parvulus* (Decapoda: Caridea). Proceedings of the Biological Society of Washington 97:550-554.
- Adkison, D.L. & R.W. Heard. 1978. Description of a new genus and species of Pseudioninae (Isopoda: Bopyridae) parasite of the hermit crab *Pagurus annulipes* (Stimpson) from North Carolina. Proceedings of the Biological Society of Washington 91:408-417.
- Bourdon, R. 1981. Remarques sur le genre *Synsynella* Hay, avec description de *S. integra* n. sp. (Crustacea, Epicaridea, Bopyridae). Bulletin du Muséum National d'histoire Naturelle, Paris 3 (Sect. A):1143-1162.
- Bourdon, R. & T.E. Bowman. 1970. Western Atlantic species of the parasitic genus *Leidya* (Epicaridea: Bopyridae). Proceedings of the Biological Society of Washington 83:409-424.
- Boyko, C.B. & J.D. Williams. 2003. A revision of *Anathelges* and *Stegophryxus* (Isopoda: Bopyridae: Athelginae) with descriptions of two new genera and one new species. Journal of Crustacean Biology 23:795-813.
- Holthuis, L.B. 1949. *Zonophryxus dodecapus* nov. spec., a remarkable species of the family Dajidae (Crustacea Isopoda) from the Canary Islands. Proceedings Koninklijke Nederlandse Akademie van Wetenschappen 52:1-8.
- Markham, J.C. 1973. Biological Results of the University of Miami Deep-Sea Expeditions. 101. Six new species of bopyrid isopods parasitic on galatheid crabs of the genus *Munida* in the western Atlantic. Bulletin of Marine Sciences 23:613-648.
- Markham, J.C. 1975a. Bopyrid isopods infesting porcellanid crabs in the northwestern Atlantic. Crustaceana 28:257-270.
- Markham, J.C. 1975b. New records of two species of parasitic isopods of the bopyrid subfamily Ioninae in the western Atlantic. Crustaceana 29:55-67.
- Markham, J.C. 1975c. Two new species of *Asymmetrione* (Isopoda, Bopyridae) from the western Atlantic. Crustaceana 29:255-265.
- Markham, J.C. 1975d. Biological results of the University of Miami deep-sea expeditions. 113. A review of the bopyrid isopod genus *Munidion* Hanse, 1897, parasitic on galatheid crabs in the Atlantic and Pacific coasts. Bulletin of Marine Science 25:422-441.
- Markham, J.C. 1977. Distribution and systematic review of the bopyrid isopod. Crustaceana 33:189-197.
- Markham, J.C. 1978. Bopyrid isopods parasitizing hermit crabs in the northwestern Atlantic Ocean. Bulletin of Marine Science 28:102-117.

- Markham, J.C. 1985. A review of the bopyrid isopods infesting caridean shrimps in the northwestern Atlantic Ocean, with special reference to those collected during the Hourglass Cruises in the Gulf of Mexico. *Memoirs of the Hourglass Cruises* 7:1-156.
- Markham, J.C. 1988. Descriptions and revisions of some species of Isopoda Bopyridae of the north western Atlantic Ocean. *Zoologische Verhandelingen* 246:1-63.
- Martin, J.W. & G.E. Davis. 2001. An updated classification of the recent Crustacea. *Natural History Museum of Los Angeles County, Science Series* 39: 1-124.
- Pearse, A.S. & H.A. Walker. 1939. Two parasitic isopods from the eastern coast of North America. *Proceedings of the United States National Museum* 87:19-23.
- Richardson, H. 1905. Monograph on the isopods of North America. *Bulletin of the United States National Museum* 54:1-727.
- Wells, M.J. & H.W. Wells. 1966. *Dactylokepon hunterae* and *Bopyrina pontoniae*, two new species of bopyrid isopods from North Carolina. *Crustaceana* 11:53-64.