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Chapter 3. Suborder Asellota

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Abstract Poore, G.C.B. 2026. Chapter 3. Suborder Asellota. *In*: Poore, G.C.B. (ed.) Marine Crustacea Isopoda: guide to families and genera of the world. *Memoirs of Museum Victoria* 86: 29–129.

Diagnoses and illustrated keys are provided for 30 families and 234 genera of marine families of asellote isopods. The ecology and distribution of each taxon are discussed with citation of literature critical for further investigation and identification to species.

Keywords Acanthaspidiidae, Basoniscidae, Dendrotionidae, Desmosomatidae, Echinothambematidae, Gnathostenetroididae, Gnathostenetroidoidea, Haplomunnidae, Haploniscidae, Ischnomesidae, Janirellidae, Janiridae, Janiroidea, Joeropsididae, Katianiridae, Lepidocharontidae, Macrostylidae, Mesosignidae, Microparasellidae, Mictosomatidae, Munnidae, Munnopsidae, Nannoniscidae, Paramunnidae, Pleurocopidae, Pseudojaniridae, Santiidae, Stenetriidae, Stenetrioidea, Thambematidae, Urstylidae, Vermectiadidae, Xenosellidae, dichotomous keys

Introduction

The Asellota Latreille, 1802 are a diverse group of mostly small isopods, usually 3–5 mm long, but *Bathyopsurus sonnei* Brandt and Kelch, 2025 can reach a body length of 65 mm. Asellotes inhabit most marine environments but extremely abundant and diverse in the deep-sea (Hessler et al., 1979; Wolff, 1962) or in cold waters (Kaiser et al., 2007). In deep waters most are benthic, associated with soft sediments, but some are wholly or partially mesopelagic (Osborn, 2009). Asellotes also associate with subtidal rocky or coral reefs. Some inhabit fresh water (superfamily Aselloidea) but are not discussed further here.

Asellota have specialised reproductive structures that distinguish them from all other isopods. Pleonites 4 and 5 (and often pleonite 3) are fused to the pleotelson, making an enlarged posterior segment. Pleonites 1 and 2 are vestigial. Pleopods 1, 2 and/or 3 are fused to form an operculum covering the remaining pleopods; this way this happens defines the superfamilies. In the male, pleopods 2 form a specialised copulatory apparatus involving enlarged peduncles, a folded endopod and sturdy exopod (Harrison, 1987). One family, Vermectiadidae, thought to be the most primitive asellote, displays only some of these features (Just and Poore, 1992), which led to uncertainty about the relationships between the four accepted superfamilies.

Diagnosis. Head-pereonite 1 usually free. Dorsal pereopodal coxal plates absent. At least pleonites 4–6, sometimes pleonites 1–3, fused into pleotelson. Pleotelson underside flat, without ventrolateral ridges (pleopods not enclosed laterally). Penial processes at bases of pereopod 7. Mandibular lacinia mobilis present on both sides; molar usually a cylindrical process with triturative flat end; palp usually present. Maxilla trilobed. Maxillipedal endite reaching at least distal margin of palp article 2, usually distally truncate and setose. Pereopods 1–7 similar, directed more or less laterally. Pleopodal exopods biarticulate. Pleopod 1 uniramous in male, sometimes interacting with groove on pleopod 2, absent in female. Pleopod 2 biramous in male, endopod modified as complex gonopod; uniramous or pair fused as operculum in female. Pleopod 3 biramous (uniramous in Vermectiadidae); endopod more or less oval or rectangular, rounded distally. Telsonic region of pleotelson short, anus situated posteriorly on pleotelson. Uropod terminal; peduncle not operculate; rami terminal.

Key to Vermectiadidae and four superfamilies of Asellota

1. Pleotelson with 3 free pleonites. Male pleopods 1, 2 not operculate (fig. 3.1) ..... Vermectiadidae ... p. 31
– Pleotelson with 0–3 free pleonites. Male pleopods 1, 2 operculate 2
2. Male pleopods 1 and 2 and female pleopods 2 much smaller than pleopods 3, which form an operculum over pleopods 4 and 5 3

– Male pleopods 1 and 2 and fused female pleopods 2 large, forming an operculum totally covering pleopods 3–5 4

3. Left and right male pleopods 1 and female pleopods 2 distinctly separate ..... Aselloidea

– Peduncles of male pleopods 1 fused. Female pleopods 2 forming small, pear-shaped operculum (fig. 3.47) ..... Stenetrioidea ... p. 122

4. Peduncles of male pleopods 1 short, totally fused; rami separate, large, entirely covering succeeding pleopods (fig. 3.2f). Female operculum (fused pleopods 2) with broad median terminal incision (fig. 3.2e). Mandible with large tusk-like antero-exterior prolongation in terminal male (fig. 3.2d), small acute process in female (not seen in most specimens) ..... Gnathostenetroidoidea ... p. 32

– Peduncles of male pleopods 1 elongate, coupled (sometimes fused) with each other along midline, covering interior margins of pleopods 2. Pleopods 1 and 2 of male together cover succeeding pleopods (fig. 3.15). Female operculum (fused pleopods 2) rarely with median terminal incision. Mandibles without antero-exterior prolongation or process ..... Janiroidea ... p. 34

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Credits

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Fig. 3.1a–c, Just and Poore (1992). Fig. 3.2a, Stock and Vonk (1980); b, Malyutina and Bruce (2019); c, Carpenter and Magniez (1982). Fig. 3.3a–d, Brandt (1991); e, f, Just (2001). Fig. 3.4a, Wilson (2024). Fig. 3.5a, b, d, e, Cohen (1998); c, Golovan et al. (2018). Fig. 3.6a, b, Brix (2006a); h, Kaiser and Brix (2007). Fig. 3.9a, Just (2003); b, c, Wilson (1976); d, Brenke and Buschmann (2009). Fig. 3.11a, b, e–h, Merrin and Poore (2003); c, Cunha and Wilson (2006). Fig. 3.13a, l, Winkler and Brandt (1993); b, Kim et al. (2019); c, d, Malyutina (1994); e, f, k, Doti and Wilson (2010); g, Kensley (1976); h, Miller (1967); i, Lemos de Castro and Brasil Lima (1977). Fig. 3.14a, Veuille (1979); b, Doti and Wilson (2010); c, Menzies (1951); d, Wolff (1962); e, Matsumoto (1956); f, Shimomura (2005); g, Schiecke and Fresi (1970); h, Kussakin and Vasina (1984); i, Menzies (1962); j, Menzies and Barnard (1951); j, Chappuis et al. (1956); k, Müller (1993). Fig. 3.16a–c, Just (2001). Fig. 3.17a, Svavarsson (1987); b, Kensley (1984). Fig. 3.18a, Albuquerque et al. (2014); b, Galassi et al. (2016); c, Kim et al. (2017). Fig. 3.19, Riehl and Brandt (2013). Fig. 3.20a, d, George (2003); b, c, Menzies and Frankenberg (1967); e, Menzies (1962). Fig. 3.22a, Beddard (1886); b, c, Vanhöffen (1914); d, Teodorczyk and Wägele (1994); e, Müller (1990); g, Menzies and George (1972). Fig. 3.24a, b, Malytina et al. (2018); c, Wilson (1982b); d, e, h, i, Malyutina and Brandt (2006); f, g, Wilson (1982a); j, k, Wilson and Hessler (1981). Fig. 3.25a, b, e, Sars (1897); c, d, f, g, Merrin (2009); h, i, Merrin (2016); j, k, Merrin (2004). Fig. 3.26a, b, Merrin (2011); c, d, Merrin (2006); e–l, Wilson (1989). Fig. 3.27a, b, Wilson (1982a); c, Sars (1897); d, Beddard (1885); e, Svavarsson (1988). Fig. 3.28a, b, Wilson et al. (1989); c, d, Just (2001); e–h, Malyutina (2011); i, j, Malyutina and Brandt (2004b); k–m, Malyutina (2003); n–q, Haugsness and Hessler (1979). Fig. 3.29a, b, Malyutina and Brandt (2007); c, d, Malyutina (2008); e, f, Mursch et al. (2008); g, Sars (1885). Fig. 3.31d–h, Wilson (1989); i, m, Tattersall (1906); k, l, Just (2001); n–s, Malyutina (2011); t, Haugsness and Hessler (1979). Fig. 3.33a, Kaiser and Brandt (2007); b, c, Kaiser et al. (2021); d, e, Kaiser (2009). Fig. 3.35a, b, Just (1990); c, Chardy (1975); d, Doti and Roccatagliata (2005); e–g, Just and Wilson (2004); h, Shimomura (2009); i, Just and Wilson (2006); j, Just and Wilson (2007). Fig. 3.36a, Kussakin and Vasina (1984); b, Schiecke and Fresi (1972); c, Just (2009); d, Hodgson (1910); e, Choudhury et al. (2011); f–h, Just and Wilson (2004); i, Shimomura and Mawatari (2002). Fig. 3.37a, Doti et al. (2009); b, Amar (1974); c, Kussakin (1982); d, Winkler (1994); e, f, Just and Wilson (2007); g, Just and Wilson (2021); h, Beddard (1885); i, Shimomura (2009); j, Hodgson (1910); k, l, Just and Wilson (2004). Fig. 3.38a, b, g, i, Just and Wilson (2004); c, Just (1990); d, Just (2009); e, k, l, Winkler (1994); f, Golovan and Malyutina (2019); h, Shimomura (2009); j, Just and Wilson (2006). Fig. 3.40b, Shimomura (2009); c, Sars (1896–1899); d, Vanhöffen (1914). Fig. 3.41, Shimomura and Naruse (2015). Fig. 3.42a, Wolff (1989); d, e, Wolff and Brandt (2000). Fig. 3.44, Riehl et al. (2014). Fig. 3.45, Just (2005). Fig. 3.46b, Menzies (1962); c, Beddard (1886). Fig. 3.47a, Serov and Wilson (1999); b, Poore and Just (1990); c, Serov and Wilson (1999). Fig. 3.48a, Bruce and Buxton (2013); b, Serov and Wilson (1995).

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Asellota incerta sedis

Vermectias Sivetsen and Holthuis, 1980 is the only asellote genus with three free pleonites in front of the pleotelson. Other characters considered primitive within the Asellota are lateral penes arising from the base of pereopods 7; a pointed male pleopod 2 stylet with a broad, open lateral sperm groove; and characters of the female reproductive system not needed for identification of this genus. These features exclude the genus and the family erected for it by Just and Poore (1992) from the Janiroidea until the superfamilies are better understood.

Vermectiadidae Just and Poore, 1992

Figure 3.1

Vermectiadids are tiny (<2.5 mm long) elongate asellotes from subtidal environments on subantarctic islands (possibly also occurring in southern Chile).

Diagnosis. Pleonites 1–3 free from pleotelson. Male pleopods 1 and 2 not operculate; peduncles of male pleopods 1 short, fused; rami separate, fused to peduncle. Female pleopods 2 absent. Pleopods 3, 4 enlarged, uniramous, inflated, without setae; peduncle absent.

Vermectias Sivetsen and Holthuis, 1980

Subtidal. Southern Ocean. Tristan da Cunha, Macquarie I., Australia. 2 species (Just and Poore, 1992)

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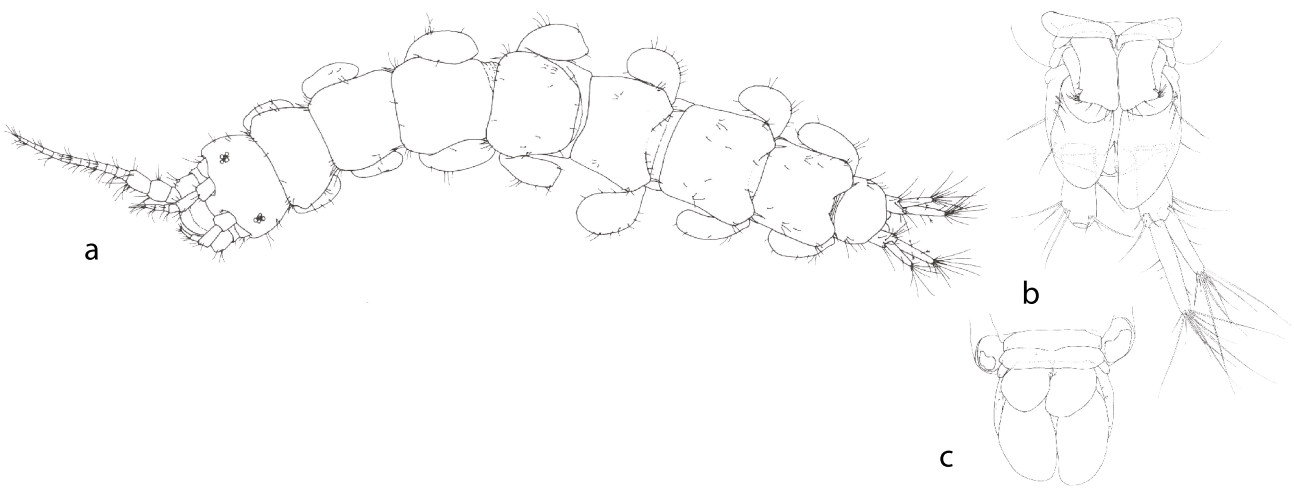

Figure 3.1. Vermectiadidae, *Vermectias nelladanae* Just and Poore, 1992. a, male; b, male pereonite 7, pleon ventral showing penes, pleopods 1–3, uropod; c, female pereonite 7, pleon ventral showing pleopods 1–3.

Superfamily Gnathostenetroidoidea Kussakin, 1967

Gnathostenetroidoidea are characterised by the large male pleopods 1 with unfused operculate rami covering the other pleopods. In other asellote superfamilies the operculum is formed by enlarged pleopods 3 (Stenetrioidea) or pleopods 1 and 2 together (Janiroidea). Gnathostenetroidids are vermiform isopods and like many asellotes are tiny (1–3 mm in length) as adults (Malyutina and Bruce, 2019). Gnathostenetroidoidea comprise two families: Gnathostenetroididae Kussakin, 1967 and Protojaniridae Fresi, Idato and Scipione, 1980. The latter is confined to freshwater interstitial environments and will not be discussed further. For recent information on the seven genera of Protojaniridae consult Fresi et al. (1980), Kensley (1995) and Pérez-Schultheiss and Wilson (2021).

Diagnosis. Mandibles with large tusk-like anteroexterior prolongation in terminal male and a small acute process in female (rarely seen). Male pleopods 1 forming an operculum totally covering pleopods 2–5; peduncles of male pleopods 1 short, totally fused; rami separate, large, entirely covering succeeding pleopods. Female operculum with broad median terminal incision; female pleopods 2 large, forming an operculum totally covering pleopods 3–5.

Gnathostenetroididae Kussakin, 1967

Figure 3.2

Gnathostenetroididae can be distinguished from Protojaniridae by the presence of two free (unfused) pleonites, while Protojaniridae is characterised by absence of free pleonites. All are tiny interstitial isopods of sediments in tropical and subtropical shores or anchialine caves. Malyutina and Bruce (2019) reviewed the family and provided a key to genera.

Diagnosis. Pleonites 1 and 2 free from pleotelson.

Key to genera of Gnathostenetroididae

1. Eyes present. Pleotelson posterolateral margins with indentations and posteriorly directed spines (fig. 3.2b). Pleopod 4 exopod of 1 article, about half as long as endopod (fig. 3.2j) ..... *Gnathostenetroides*

– Eyes absent. Pleotelson posterolateral margins rounded, without indentations and spines. Pleopod 4 exopod of 2 articles, not shorter than endopod 2

2. Body broad, flattened, about 2.5–3.0 times as long as wide (fig. 3.2c). Pleopods 3, 4 endopods of 2 articles. Pleopod 3 exopod narrower than endopod. Pleopod 4 exopod as long as and wider than endopod (fig. 3.2k, l) ..... *Neostenetroides*

– Body vermiform, about 9 times as long as wide (fig. 3.2a). Pleopods 3, 4 endopods of 1 article. Pleopod 3 exopod as wide as endopod. Pleopod 4 exopod about as long and wide as endopod (fig. 3.2g, h) ..... *Caecostenetroides*

Caecostenetroides Fresi and Schiecke, 1968

Diagnosis. Body vermiform, about 9 times as long as wide; pleotelson posterolateral margins rounded. Eyes absent. Pleopods 3, 4 endopods of 1 article. Pleopod 3 exopod as wide as endopod. Pleopod 4 exopod of 2 articles, about as long as wide as endopod.

Intertidal. Temperate Northern and Tropical Atlantic, Temperate Northern Pacific, Eastern Indo-Pacific. 6 species (Stock and Vonk, 1990: 2 species, one as *Dignatroides* Stock and Vonk, 1990, junior synonym; Müller, 1991).

Gnathostenetroides Amar, 1957

Diagnosis. Body elongate, 4.0–5.5 times as long as wide; pleotelson posterolateral margins with indentations and posteriorly directed spines. Eyes present. Pleopods 3, 4 endopods of 1 article. Pleopod 3 exopod narrower than endopod. Pleopod 4 exopod of 1 article, about half as long as endopod.

Intertidal shelf. Tropical Atlantic (including Eastern Mediterranean), Western and Central Indo-Pacific, Tropical Eastern Pacific. 12 species (Müller, 1992: description of 3 species as *Maresiella* Fresi and Scipione, 1980, junior synonym; Malyutina and Bruce, 2019: list and key to species).

Neostenetroides Carpenter and Magniez, 1982

Diagnosis. Body broad, flattened, about 2.5–3.0 times as long as wide; pleotelson posterolateral margins rounded. Eyes absent. Pleopods 3, 4 endopods of 2 articles. Pleopod 3 exopod narrower than endopod. Pleopod 4 exopod of 2 articles, as long and about as wide as endopod.

Anchialine caves. Tropical Atlantic (Caribbean). 3 species (Botosaneanu and Iliffe, 2007; Carpenter and Magniez, 1982).

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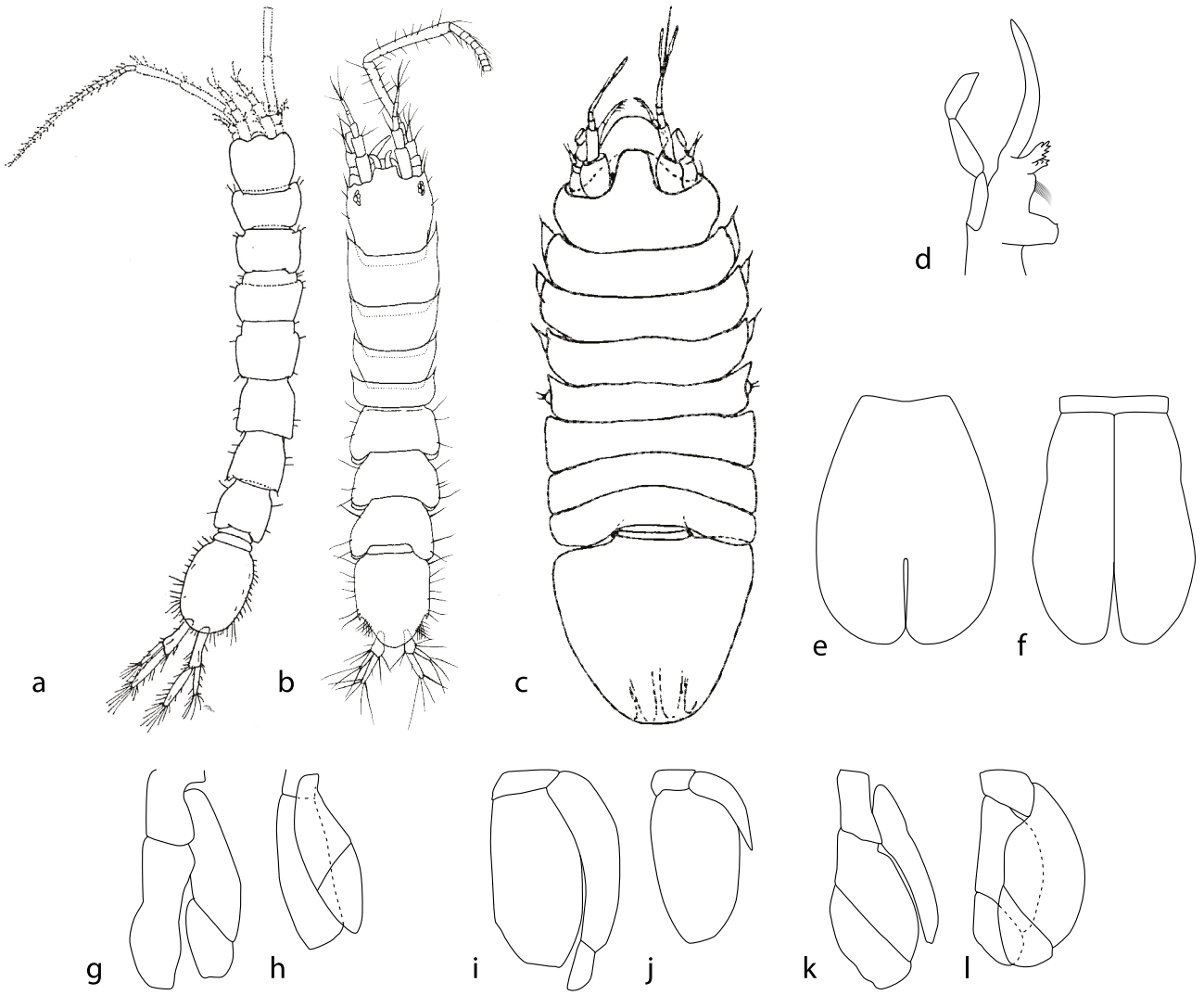

Figure 3.2. Gnathostenetroididae. a, *Caecostenetroides ruderalis* Stock and Vonk, 1990; b, *Gnathostenetroides blazewiczae* Malyutina and Bruce, 2019; c, *Neostenetroides stocki* Carpenter and Magniez, 1982; d, male mandible, *Gnathostenetroides*; e, female pleopods 2, *Gnathostenetroides*; f, male pleopods 2, *Gnathostenetroides*; g, h, pleopods 3, 4, *Caecostenetroides*; i, j, pleopods 3, 4, *Gnathostenetroides*; k, l, pleopods 3, 4, *Neostenetroides*.

Superfamily Janiroidea G.O. Sars, 1897

With 26 families, Janiroidea is the largest superfamily of Asellota. They are recognised by the unique arrangement of the first two pairs of pleopods. In males these pleopods together form an operculum entirely (or sometimes with lateral parts of pleopods 3) covering the more posterior pleopods. In females pleopods 1 are absent and pleopods 2 are fused, forming a discoid operculum.

While some families occur mostly in shallow rocky or coral reefs, sometimes associated with algae, many families occur exclusively in the deep sea. Their invasion and subsequent dominance of bathyal and abyssal benthic faunas has generated considerable discussion (Brandt et al., 2004; Raupach et al., 2004; Wolff, 1962). Janiroidea appear to be the most derived group of all Asellota (Wilson, 1987, 2024).

The key to families used that of Wilson (2013) as a starting point, but is much modified. It contains triplets.

Diagnosis. Pleon with or without free pleonites. Mandibles without antero-exterior prolongation. Male pleopods 1 and 2 forming an operculum totally or mostly covering pleopods 3–5; peduncles of male pleopods 1 elongate, coupled (sometimes fused) with each other along midline, covering interior margins of pleopods 2; rami indistinct. Female pleopods 2 fused, forming a large operculum totally covering pleopods 3–5, rarely with median terminal incision.

Key to families and genera incertae sedis of Janiroidea

1. Antenna geniculate, peduncular article 6 and flagellum folding laterally and backwards under lateral expansion of peduncular article 5. Anterior pereonites with sternal keels (fig. 3.15) ..... Joeropsididae ... p. 65
– Antennal peduncle axis with moderate bend at articles 3–5; distal articles not or scarcely folding against proximal articles. Anterior pereonites without sternal keels 2
2. Uropod peduncle vestigial or absent 3
– Uropod peduncle present 5
3. Pereonites 2–6 with 1 or 2 pairs of prominent lateral projections, often spinose; head and pereonite 1 without lateral processes. Pleonite 1 fused with pleotelson. Pereopod 1 ambulatory (fig. 3.20) ..... Mesosignidae ... p. 70
– Head and pereonites with or without lateral projections. Pleonite 1 free from pleotelson. Pereopod 1 prehensile 4
4. Body subpyriform, without lateral processes. Eyes on prominent lateral processes (if present). Anus not covered by pleopodal operculum (figs 3.22, 3.23) ..... Munnidae ... p. 73
– Body broad, ovate, often with lateral plates. Anus covered by pleopodal operculum (figs 3.35–3.40) ..... Paramunnidae ... p. 101
5. Uropod inserting on anterolateral surface of pleotelson (fig. 3.41) ..... Pleurocopidae ... p. 115
– Uropod inserting on posterolateral margin or on posteroventral surface of pleotelson 6
– Uropod inserting above posterior margin on dorsal surface on pleotelson 26
6. Pereonites 5–7 and pleon integrated into natasome, dorsal surface vaulted (figs 3.24–3.32) ..... Munnopsidae ... p. 76
– Pereonites 5–7 serially homologous, not especially integrated with pleon 7
7. Pereopod 4 coxa inserting on midlateral margin 8
– Pereopod 4 coxa inserting on anterolateral margin 19
8. Pereonites 1–3 more or less fused into rectangular section (fig. 3.19) ..... Macrostylidae ... p. 69
– Pereonites 1–3 not integrated into rectangular section 9
9. Antennula basal article directed anterodorsally 10
– Antennula basal article directed anteriorly 11
10. Body smooth, not spinose; pereonites 2–4 with lateral projections; pleon not swollen, in line with pereon. Uropod comprising single long article. Antennula much shorter than head width. Body dorsal surface without major spines (fig. 3.17) ..... Katianiridae ... p. 67

– Body spinose or setose; pereonites 2–4 without lateral projections; pleon swollen, angled dorsally. Uropod reduced, with 1 or 2 articles. Antennula longer or as long as head width (fig. 3.9) ..... Haplomunnidae ... p. 47

11. Body oval, smooth, without lateral processes. Pleon without free pleonites 12

– Body various, sometimes with lateral processes. Pleon with or without free pleonites 13

12. Uropod peduncle short, rod-like, not covering anus; exopod absent. Pleotelson usually with posteriorly pointing posterolateral angles or processes (fig. 3.10) ..... Haploniscidae ... p. 48

– Uropod peduncle broad, covering anus; exopod minute. Pleotelson without posterolateral angles or processes (fig. 3.4) ..... Basoniscidae ... p. 38

13. Pereonites with lateral projections, bifurcate on pereonites 2–4 or 2–7. Head with prominent narrow rostrum (fig. 3.3) ..... Acanthaspidiidae ... p. 36

– Pereonites without bifurcate lateral projections. Head without rostrum or rostrum minute or broad (never prominent) 14

14. Antennula with 7 articles. Antenna without scale. Maxilliped palp 4-articled, last article sickle-shaped. Pereopods with 3 claws; pereopod 5 sexually dimorphic, in male subchelate, stout (fig. 3.46a) ..... *Angeliera* ... p. 120

– These characters not combined 15

15. Anus covered by pleopodal operculum 16

– Anus not covered by pleopodal operculum 17

16. Pereonite 5 narrowed anteriorly as short stalk (fig. 3.21) ..... Mictosomatidae ... p. 72

– Pereonite 5 not narrowed anteriorly as short stalk (fig. 3.12) ..... Janirellidae ... p. 55

17. Body oval, flat or vaulted (about twice as long as wide), pereonites much wider than long (fig. 3.42) ..... Santiidae ... p. 116

– Body flat, slender (4–10 times as long as wide), pereonites similar, rectangular 18

18. Uropod uniramous, short. Antenna peduncle longer than flagellum. Head with prominent rostrum (mostly freshwater) ..... Microparasellidae ... p. 72

– Uropod biramous, large. Antenna peduncle shorter than flagellum. Rostrum small or absent (fig. 3.18) ..... Lepidocharontidae ... p. 68

– These characters not combined in these ways (figs 3.13–3.15) ..... Janiridae ... p. 57

19. Pereonite 7 or pereonites 6 and 7 fused with pleon. Head frontal margin not projecting anteriorly. Antennula as long as antenna, projecting laterally (fig. 3.8) ..... Echinothambematidae ... p. 46

– Pereonites 6 and 7 not fused with pleon. Head frontal margin projecting anteriorly. Antennula much shorter than antenna length, projecting anteriorly 20

20. Pereonites 2–4 without lateral projections. Pereopods 5–7 coxae oriented ventrolaterally 22

– Pereonites 2–4 tergites with lateral projections. Pereopods 5–7 coxae oriented ventrally 24

21. Anterior pereopods coxae with anterolateral robust setae. Pereon divided in anterior unit of 4 short pereonites and posterior unit of 3 longer depressed pereonites. Head deeper than anterior pereon, ventrally projecting (fig. 3.7) ..... Desmosomatidae ... p. 40

– Anterior pereopods coxae without anterolateral robust setae. Pereonites similar, tagmosis hardly developed. Head about as deep as anterior pereon 21

22. Pereonites 2–7 wider than long. Pleopods 3–5 completely covered by anterior pleopods. Pereopod 1 simple, carpus trapezoidal (fig. 3.44) ..... Urstylidae ... p. 118

– Pereonites 2–7 usually longer than wide. Pleopods 3–5 not completely covered by anterior pleopods. Pereopod 1 subchelate (fig. 3.43) ..... Thambematidae ... p. 118

– Pereonites 2–7 wider than long. Pleopods 3–5 completely covered by anterior pleopods. Pereopod 1 ambulatory 23

23. Pereon parallel-sided, not laterally splayed. Pleonite 1 free. Antennula and antenna about as long as head (fig. 3.46d) ..... *Xostylus* ... p. 120

– Pereon oval-elongate, laterally splayed. Pleon of 1 segment. Antennula and antenna much longer than head (fig. 3.46c) ..... *Trichopleon* ... p. 120

24. Mouthparts projecting strongly anteriorly (head including rostrum twice as long as wide). Pereonites with spinulose lateral extensions. Mandibles lanceolate, exposed in dorsal view (fig. 3.46b) ..... *Sugoniscus* ... p. 120

– Mouthparts not projecting strongly anteriorly (head including rostrum about as long as wide). Mandibles not exposed in dorsal view. Pereonites without lateral extensions 25

25. Pereonite 1 shorter than pereonite 2; pereonite 5 as long as pereonites 6 and 7, sometimes fused (figs 3.33, 3.34) ..... Nannoniscidae ... p. 96

– Pereonites 1, 2 similar; pereonite 5 much longer than pereonites 6, 7 (fig. 3.11) ..... Ischnomesidae ... p. 51

26. Pereonites 5–7 (and 1–4 in male) lateral parts tubular, with large intersegmental gaps; pereonite 5 as long as pereonite 3. Antennula longer than antenna (fig. 3.45) ..... Xenosellidae ... p. 118

– Head and pereonites bearing dorsal spines of long setae; pereonite 5 shorter than pereonite 3. Antennula much shorter than antenna (fig. 3.5) ..... Dendrotionidae ... p. 39

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Acanthaspidiidae Menzies, 1962

Figure 3.3

Acanthaspiids are largely deep-sea isopods with some emerging in shallow shores. Most can be easily recognised by the presence of lateral processes (often bifurcate) on the pereonites, but these are not well developed in some species. Brandt (1991) revised the family and listed the two genera and species then known. Her key to these two genera, *Acanthaspidia* Stebbing, 1893 (now *Iolanthe* Beddard, 1886) and *Ianthopsis* Beddard, 1886 is not reliable, and they appear to overlap for most of the characters in her key. Just (2001) rediagnosed the family, discussing specialisation of the male pleopod 2, and added a third genus. Adults range from 2.5 to 5.4 mm long.

Diagnosis. Body strongly depressed, broadly oval; head usually with prominent narrow rostrum; pereonites with lateral projections, bifurcate on 2–4 or 2–7. Pleon of 1 segment, with serrate margins. Anus covered by pleopodal operculum. Eyes present or absent. Antennal scale long. Maxillipedal palp articles 1–5 narrow, less than half as wide as endite. Pereopods 1–7 ambulatory; pereopod 4 coxa inserting on midlateral margin; pereopodal 2–7 dactyli with 2 claws. Uropod inserting on posterior margin, biramous, usually with long peduncle.

Key to genera of Acanthaspidiidae

1. Eyes present on lateral stalks. Mouthparts produced forwards beyond front of head (fig. 3.3e, f) ..... *Mexicope*

– Eyes absent or not on lateral stalks if present. Mouthparts not or scarcely produced forwards beyond front of head 2

2. Pleotelson about one third as long as and narrow than pereon; lateral margin coarsely or finely serrate (fig. 3.3c, d) ..... *Iolanthe*

– Pleotelson half as long as pereon, narrow anteriorly; lateral margin finely serrate with short curved robust setae (fig. 3.3a, b) ..... *Ianthopsis*

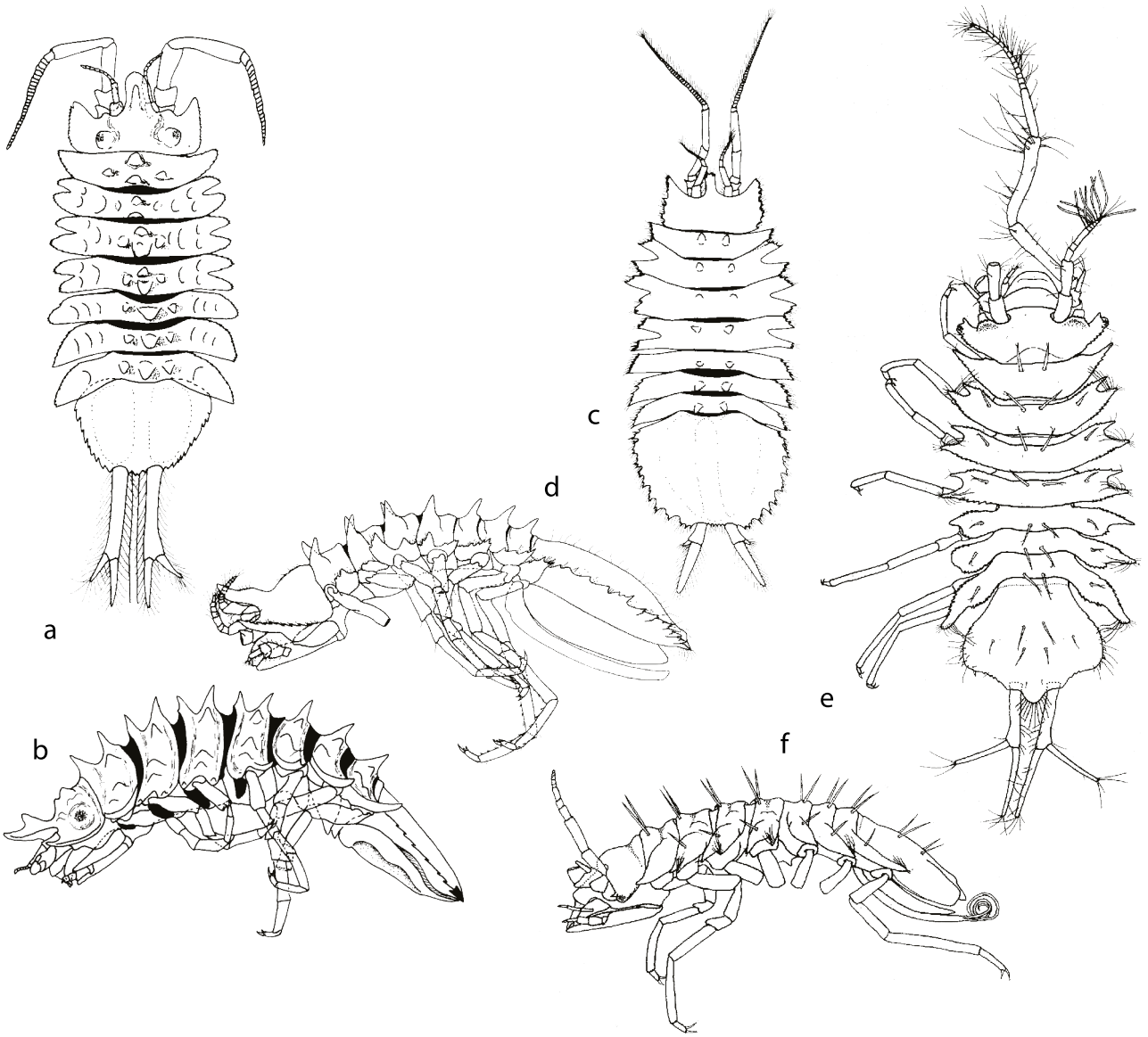

Figure 3.3. Acanthaspidiidae. a, b, *Ianthopsis nasicornis* Vanhöffen, 1914, male, female; c, d, *Iolanthe drygalskii* (Vanhöffen, 1914), female, male; e, f, *Mexicope westralia* Just, 2001, male.

Ianthopsis Beddard, 1886

Diagnosis. Rostrum present. Pleotelson about one third as long as and narrow than pereon; lateral margin coarsely or finely serrate. Eyes present on low bulges, or absent. Mouthparts not or slightly produced forwards.

Subtidal–bathyal. Temperate South America, Temperate Australasia, Southern Ocean. 13 species (Brandt, 1991: rediagnosis, key to 10 species; Just, 2001: rediagnosis, depth distribution; Riehl et al., 2024: rediagnosis, list of species).

Iolanthe Beddard, 1886

Diagnosis. Rostrum present. Pleotelson discoid, about half as long and as wide as pereon; lateral margin with long spines or serrate. Eyes absent. Mouthparts not produced forwards.

Slope–hadal. Arctic, Temperate Northern Atlantic, Temperate Northern W Pacific, Temperate Southern Africa, Southern Ocean. GOODS bathyal provinces: Northern N Atlantic, Northern N Pacific, Antarctic, Subantarctic, Indian, W Pacific, S Atlantic, N Pacific. 20 species (Brandt, 1991: rediagnosis, key to 18 species as *Acanthaspidia*; Just, 2001: depth distribution). Most species in this genus were described or recognised as members of *Acanthaspidia* Stebbing, 1893 but *Iolanthe* is a senior synonym (Merrin and Poore, 2015).

Mexicope Hooker, 1985

Diagnosis. Rostrum absent or short, spine-like. Pleotelson half as long as pereon, narrow anteriorly; lateral margin finely serrate with short curved robust setae. Eyes present on lateral stalks. Mouthparts produced forwards beyond front of head.

Subtidal, shelf. Temperate Northern and Tropical Atlantic, Temperate Australasia. 4 species (Just, 2001: rediagnosis; Bruce, 2004: comment on diagnosis; Riehl et al., 2024: rediagnosis, key to species).

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Basoniscidae Wilson, 2024

Figure 3.4

Basoniscidae was erected for a single genus and species said to be intermediate between Joeropsididae and Haploniscidae (Wilson, 2024).

Diagnosis. Body oval, flat; pereonites 1–7 free, wider than long, with laminar lateral expansions. Coxal plates absent. Pleon without free pleonites, semicircular, flanged. Anus not covered by pleopodal operculum. Eyes absent. Antennal scale lobe-like. Maxillipedal palp articles 1–5 narrow, less than half as wide as endite. Pereopods 1–7 ambulatory. Uropod inserting posteroventrally, peduncle broad, covering anus, biramous, with short exopod.

Basoniscus Wilson, 2024

Bathyal (2974–3183 m depth). GOODS bathyal provinces: New Zealand/Kermadec. 1 species.

Reference

Wilson, G.D.F. 2024. A new family of Asellota (Crustacea, Isopoda) from the deep sea of Zealandia. *European Journal of Taxonomy* 917: 122–151. https://doi.org/10.5852/ejt.2024.917.2393

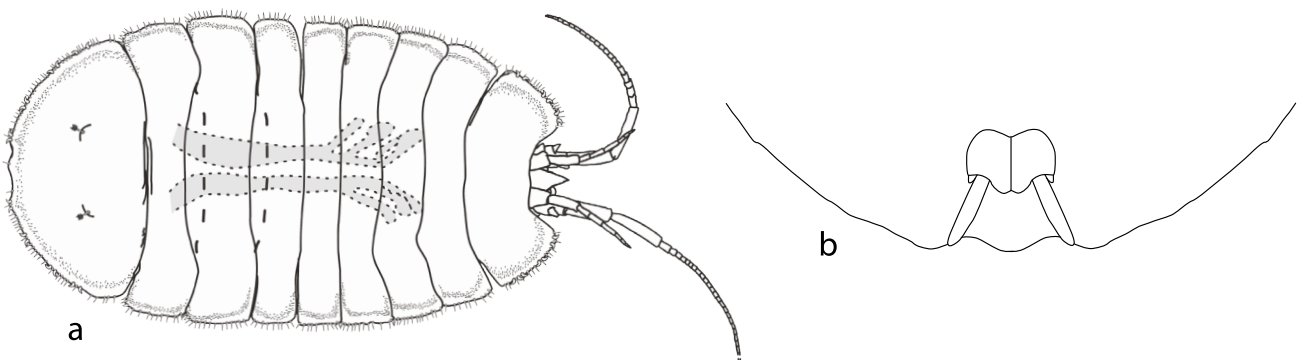

Figure 3.4. Basoniscidae, *Basoniscus hikurangi* Wilson, 2024. a, habitus; posterior pleotelson, uropods (ventral).

Dendrotionidae Vanhöffen, 1914

Figure 3.5

Dendrotionid isopods are confined to the slope and deep sea. They are best recognised by their oval shape, more or less spinose or setose dorsally, and their long spindly legs. The family and its genera were diagnosed and reviewed by Cohen (1998), who noted than half the known species occur in the southern Australasian region. Dendrotiidae is a misspelling of the family name.

Diagnosis. Body bearing dorsal spines or long setae. Pleon of 1 free pleonite plus pleotelson. Antennula much shorter than antenna. Maxillipedal palp articles 1–5 narrow, less than half as wide as endite. Pereopod 1 subchelate; pereopods 2–7 ambulatory, dactlyi with 1 unguis. Uropod inserting dorsally or dorsolaterally, elongate, biramous, often enlarged.

Key to genera of Dendrotionidae

1. Head with prominent lateral process supporting antennae. Antennula basal article elongate (more than 5 times as long as wide) (fig. 3.5d, e) ..... *Dendrotion*

– Head without prominent lateral process supporting antennae. Antennula basal article less than twice as long as wide 2

2. Eyes present. Pereon smooth or bearing many small spines, without dorsolaterally directed spine-like processes (fig. 3.5a, b) ..... *Acanthomunna*

– Eyes absent. Pereon bearing few large dorsolaterally directed spine-like processes, each with apical cluster of spines (fig. 3.5c) ..... *Dendromunna*

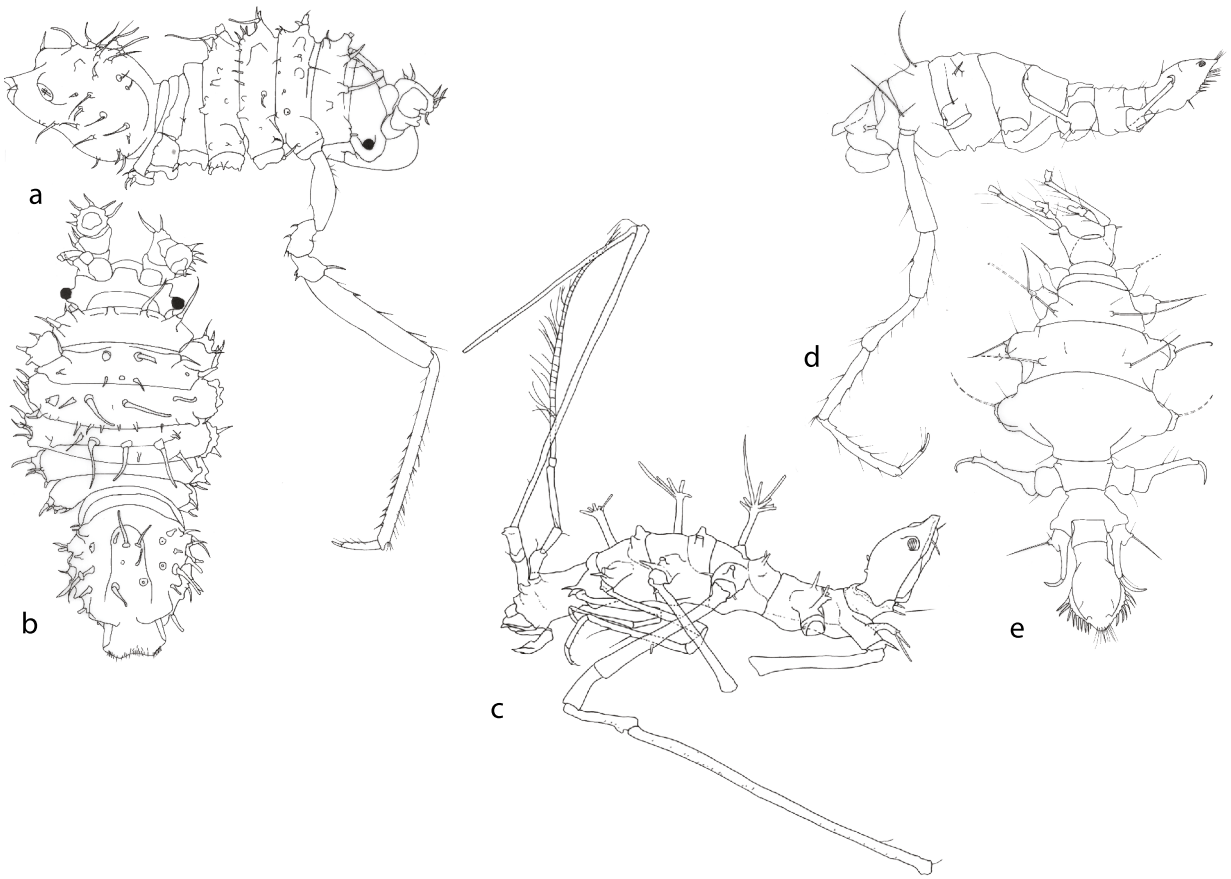

Figure 3.5. Dendrotionidae. a, b, *Acanthomunna potorous* Cohen, 1998; c, *Dendromunna kurilensis* Golovan, Malyutina and Brandt, 2018; d, e, *Dendrotion perodorous* Cohen, 1998.

Acanthomunna Beddard, 1886

Diagnosis. Head without prominent lateral process supporting antennae. Pereon smooth or bearing many small spines, without dorsolaterally directed spine-like processes. Eyes present. Antennula basal article less than twice as long as wide. Pereopod 7 present in adult.

Slope (385–2011 m). Arctic, Temperate Northern Atlantic, Temperate Northern Pacific, Temperate Australasia, Southern Ocean. 10 species (Cohen, 1998: rediagnosis, key to 9 species).

Dendromunna Menzies, 1962

Diagnosis. Head without prominent lateral process supporting antennae. Pereon bearing few large dorsolaterally directed spine-like processes, each with apical cluster of spines. Eyes absent. Antennula basal article less than twice as long as wide. Pereopod 7 absent in adult.

Slope–abyssal (1271–5408 m). GOODS bathyal provinces: Northern N Atlantic, Northern N Pacific, New Zealand/Kermadec, S Atlantic. 6 species (Cohen, 1998: rediagnosis, key to 3 species; Golovan et al., 2018: key to 6 species).

Dendrotion G.O. Sars, 1872

Diagnosis. Head with prominent lateral process supporting antennae. Pereon without dorsal spines, often conspicuously setose. Eyes absent. Antennula basal article elongate (more than 5 times as long as wide). Pereopod 7 present in adult.

Slope (281–2900 m). Arctic, Temperate Northern and Tropical Atlantic, Temperate Australasia. 11 species (Cohen, 1998: rediagnosis, key to 9 species).

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Desmosomatidae G.O. Sars, 1897

Figures 3.6, 3.7

Desmosomatidae are asellote isopods known from all oceanic basins, with many species waiting to be described. Although they are predominantly deep-sea taxa, several species occur on polar and temperate shelves, whereas others have been reported only from hadal depths (Brix et al., 2021). Members of the family are most easily recognised by the separation of a unit comprising the short pereonites 1–4 from the longer and more depressed pereonites 5–7. Adults range from 1.4 to 9.5 mm long.

Hessler (1970) established the fundamentals of the taxonomy of the family, dividing it into two subfamilies and erecting ten new genera. One of his genera has since been moved to another family and another has jumped subfamily; few genera have been established since. While the Desmosomatidae appear monophyletic, the subfamilies and some of the larger genera are para- or polyphyletic, according to Brix et al. (2021), who based this conclusion on morphological and molecular evidence.

Both Hessler (1970) and Brix et al. (2021) offered keys to genera that are augmented and modified here. Substantial additions to described species were made by Malyutina and Kussakin (1996) and Brix and coauthors (Brenke et al., 2005; Brix, 2006a, 2007; Brix and Bruce, 2008; Brix et al., 2021; Brix et al., 2015). *Chelibranchus* Mezhov, 1986 is poorly diagnosed according to Brix et al. (2021) and not included in this key.

Diagnosis. Body elongate, subcylindrical; head frontal margin projecting forward, deeper than pereon; pereon divided into anterior unit of 4 short pereonites and posterior unit of 3 longer depressed pereonites. Pleon of 1 free pleonite plus pleotelson. Anus not covered by pleopodal operculum. Eyes absent. Antennula short, dorsal. Mandibular molar small, triangular, spinulose. Maxillipedal palp articles 1–3 wider than distal articles, as wide or wider than endite. Pereopods 2–7 ambulatory; pereopod 4 coxa inserting on anterolateral margin. Uropod inserting posteroventrally.

Key to genera of Desmosomatidae

The key contains a triplet.

1. Pereonite 1 shorter or as long as pereonite 2 (fig. 3.6d, f, h). Pereopod 1 smaller or similar to pereopod 2, more slender than pereopod 2 (rarely subchelate) (fig. 3.7a, b) ..... Desmosomatinae ... 2

– Pereonite 1 as long or longer than pereonite 2 (fig. 3.6a–c, e, g). Pereopod 1 usually more robust than pereopod 2, chelate or raptorial (fig. 3.7c–f) ..... Eugerdellatinae ... 9

2. Body margins serrate (fig. 3.7c) ..... *Echinopleura*

– Body margins smooth 3

3. Pleotelson enlarged (wider than and at least twice as long as pereonite 7) (fig. 3.6h). Uropods inserting close together, endopod short, almost bulbous (fig. 3.6l). Pereopod 7 ischium upper margin with proximal tooth (fig. 3.7w) ..... *Pseudomesus*

– Pleotelson not enlarged. Uropods extending beyond posterior margin of pleotelson. Pereopod 7 ischium upper margin without tooth 4

4. Pereopod 1 subchelate (dactylus closing on propodus) (fig. 3.7r) ..... *Torwolia*

– Pereopod 1 not subchelate 5

5. Pereopod 1 elongate (carpus and propodus more than 5 times as long as wide) (fig. 3.7a) ..... *Eugerda*

– Pereopod 1 not elongate 6

6. Pereopods 5–7 carpi and propodi wide, flat, with rows of long natatory setae (fig. 3.7u) ..... *Desmosoma*

– Pereopods 5–7 carpi and propodi not wide or flat (fig. 3.7t) 7

7. Pereopods 1–4 coxae sexually dimorphic, in male anteriorly produced, well overlapping more anterior somite (fig. 3.6f). Pereonites 5–7 and pleotelson with lateral flanges ..... *Mirabilicoxa*

– Pereopods 1–4 coxae not sexually dimorphic, with short spine in both sexes. Pereonites 5–7 and pleotelson without lateral flanges 8

8. Pereopod 1 carpus as long as propodus, setae largely confined to row on lower margin (fig. 3.7l) ..... *Momedossa*

– Pereopod 1 carpus shorter than propodus, with rows of setae on lower margin and lateral face (fig. 3.7g) ..... *Balbidocolon*

9. Pereopod 1 raptorial (carpus with more than 1 robust seta on lower margin) (fig. 3.7j, n) 10

– Pereopod 1 chelate (carpus with 1 distal dominating robust seta on lower margin) (fig. 3.7h, i, k, m) 12

10. Pereopod 4 natatory (enlarged, carpus and propodus paddle-like, with numerous setae) (fig. 3.7s) ..... *Paradesmosoma*

– Pereopod 4 ambulatory (fig. 3.7t) 11

11. Pereopod 1 carpus lower margin with distal seta longer than others (fig. 3.73) ..... *Whoia*

– Pereopod 1 carpus lower margin with distal seta shorter than penultimate seta (fig. 3.7c) ..... *Eugerdella*

– Pereopod 1 carpus lower margin with row of setae increasing in length towards claw (fig. 3.7j) ..... *Cryodesma*

12. Pereonites 6, 7 and pleotelson fused (fig. 3.7a, b) ..... *Chelantermedia*

– Pereonites free (fig. 3.7c–h) 13

13. Pleotelson vaulted (fig. 3.6j). Operculum small, rounded (fig. 3.6k) ..... *Oecidiobranchus*

– Pleotelson not vaulted. Operculum almost as wide as pleotelson 14

14. Head with spines lateral to antennae (fig. 3.6i) ..... *Disparella*

– Head without spines 15

15. Maxillipedal palp with 4 articles (fig. 3.6n) ..... *Reductosoma*

– Maxillipedal palp with 5 articles (fig. 3.6m) 16

16. Pereopod 1 carpus distally produced (except *C. stellae*); propodus strongly tapered distally (fig. 3.7i) ..... *Chelator*

– Pereopod 1 carpus not anteriorly produced; propodus not strongly tapered distally 17

17. Pereopod 1 carpus 3.7 times as long as wide, longer than propodus, with 1 slender seta lateral to carpo-propodal articulation between propodus and distal seta (fig. 3.7o) ..... *Parvochelus*

– Pereopod 1 carpus about twice as long as wide, shorter than propodus, with accessory seta next to distal seta and marginal robust seta (fig. 3.7p) ..... *Prochelator*

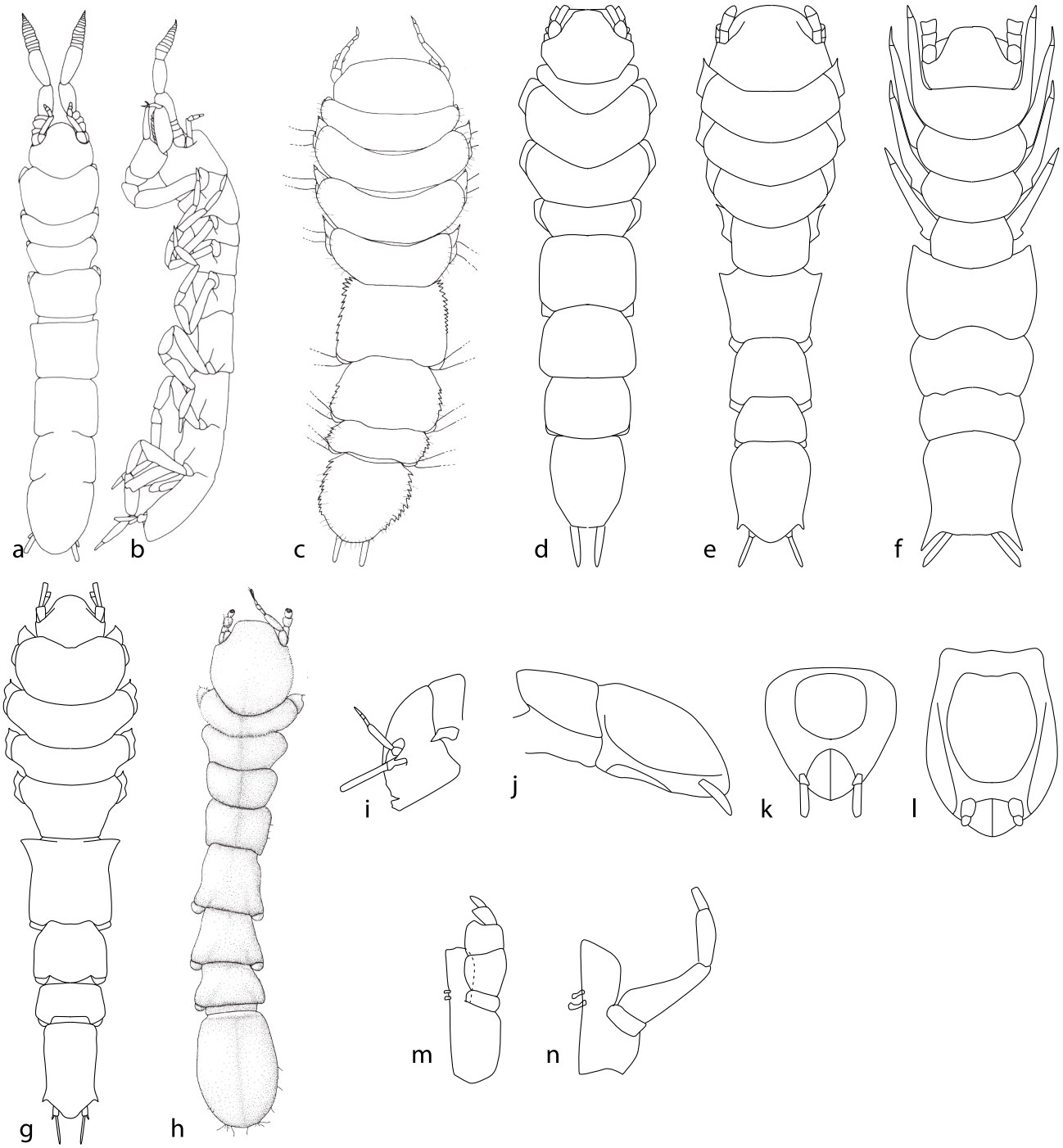

Figure 3.6. Desmosomatidae. a, b, *Chelantermedia composita* Brix, 2006; c, *Echinopleura cephalomagna* Brix, 2006; d, *Eugerda*; e, *Eugerdella*; f, *Mirabilicoxa* (male); g, *Prochelator*; h, *Pseudomesus pitombo* Kaiser and Brix, 2007; i, *Disparella*, lateral head; j, *Oecidiobranchus*, pereonite 7, pleotelson, lateral; k, *Oecidiobranchus*, pleotelson, ventral; l, *Pseudomesus*, pleon, ventral. Maxilliped: m, *Prochelator*; n, *Reductosoma*.

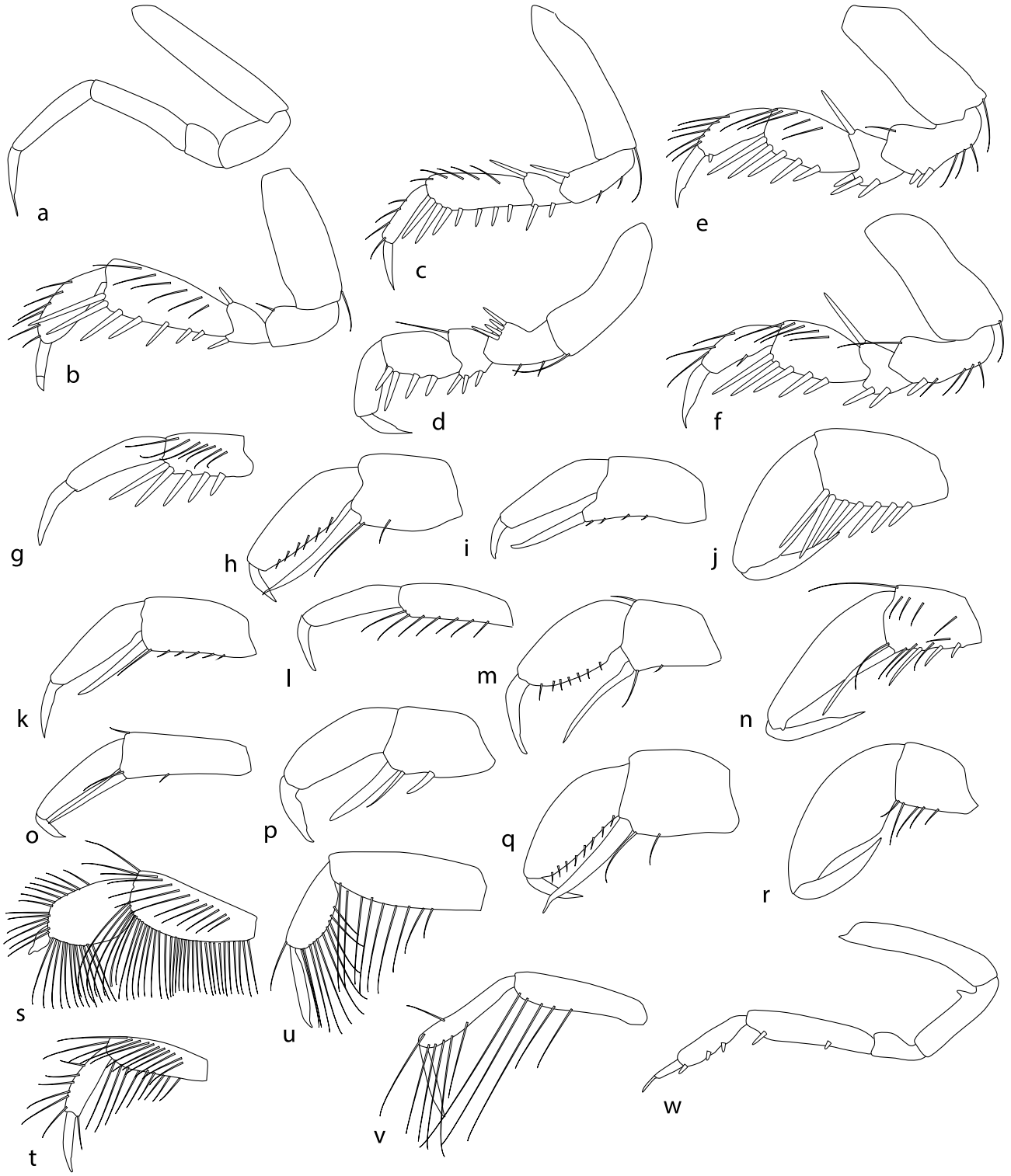

Figure 3.7. Desmosomatidae. Pereopods 1, 2: a, b, Desmosomatinae, *Eugerda*; c, d, Eugerdellatinae, *Eugerdella*; e, f, Eugerdellatinae, *Whoia*. Pereopod 1, carpus–dactylus: g, *Balbidocolon*; h, *Chelantermedia*; i, *Chelator*; j, *Cryodesma*; k, *Disparella*; l, *Momedossa*; m, *Oecidiobranchus*; n, *Paradesmosoma*; o, *Parvochelus*; p, *Prochelator*; q, *Reductosoma*; r, *Torwolia*. Pereopod 4, carpus–propodus: s, *Paradesmosoma*; t, *Whoia*. Pereopod 5, carpus–propodus: u, *Desmosoma*; v, *Mirabilicoxa*. Pereopod 7: w, *Pseudomesus*.

Subfamily Desmosomatinae G.O. Sars, 1897

Diagnosis. Pereonite 1 shorter or as long as pereonite 2. Pereopods 1, 2 of similar size and form, or pereopod 1 more slender than pereopod 2, with few setae (Hessler, 1970: diagnosis of subfamily).

Balbidocolon Hessler, 1970

Diagnosis. Pleotelson widest at posterolateral spines, highly vaulted, with flat lateral fields. Pereopod 1 carpus shorter than propodus, with rows of setae on lower margin and lateral face. Uropod uniramous, or uropod with rudimentary exopod.

Slope, bathyal. Temperate Northern and Tropical Atlantic, Temperate Australasia. 2 species (Hessler, 1970).

Desmosoma G. O. Sars, 1864

Diagnosis. Pleotelson without posterolateral angles, vaulted, without lateral fields. Pereopod 1 carpus lower margin lower margin with slender setae; propodus without setae. Pereopods 5–7 carpi and propodi wide, flattened, with rows of long natatory setae. Uropod uniramous.

Shelf–hadal. Arctic, Temperate Northern and Tropical Atlantic, Temperate Northern Pacific, Southern Ocean. GOODS bathyal provinces: N Atlantic, N Pacific. 29 species (Hessler, 1970: rediagnosis; Brix, 2007: rediagnosis).

Echinopleura G. O. Sars, 1897

Diagnosis. Body margins serrate. Pleotelson constricted at base, without posterolateral spines. Pereopod 1 carpus lower margin with few robust setae. Uropod uniramous.

Shelf, slope (15–990 m). Temperate Northern Atlantic, Temperate Australasia. 2 species (Hessler, 1970: rediagnosis).

Eugerda Meinert, 1890

Diagnosis. Pleotelson without posterolateral angles, vaulted, without lateral fields. Pereopod 1 elongate (carpus and propodus more than 5 times as long as wide); carpus lower margin with few small setae. Uropod biramous, exopod well developed.

Shelf–abyssal. Arctic, Temperate Northern and Tropical Atlantic, Temperate Northern W Pacific, Western Indo-Pacific, Temperate South America, Temperate Southern Africa, Temperate Australasia. 17 species (Hessler, 1970: rediagnosis).

Mirabilicoxa Hessler, 1970

Diagnosis. Pereonites 5–7 and pleotelson with lateral flanges. Pleotelson widest anteriorly, tapering, with posterolateral spines. Pereopod 1 carpus lower margin with few robust setae. Pereopods 1–4 coxae sexually dimorphic, in male anteriorly produced, well overlapping more anterior somite. Uropod uniramous, or uropod with rudimentary exopod.

Slope–abyssal. Arctic, Temperate Northern and Tropical Atlantic, Western Indo-Pacific, Temperate South America, Temperate Australasia, Southern Ocean. GOODS bathyal provinces: N Atlantic, W Pacific. 20 species (Hessler, 1970).

Momedossa Hessler, 1970

Diagnosis. Pleotelson with posterolateral angles. Pereopod 1 simple; carpus as long as propodus, setae confined to row on lower margin. Uropod biramous, exopod well developed.

Bathyal, abyssal. GOODS bathyal provinces: Northern N Pacific, N Atlantic, S Atlantic. 29 species (Hessler, 1970: rediagnosis; Brix, 2007: rediagnosis).

Pseudomesus Hansen, 1916

Diagnosis. Pleotelson enlarged, vaulted (wider than and at least twice as long as pereonite 7). Pereopod 1 simple; carpus lower margin with few robust setae. Pereopod 7 ischium upper margin with proximal tooth. Uropods inserting close together, endopod short, almost bulbous.

Shelf–abyssal (80–5441 m). Arctic, Temperate Northern and Tropical Atlantic, Temperate Northern W Pacific, Temperate Australasia. 5 species (Hessler, 1970: rediagnosis; Kaiser and Brix, 2007: rediagnosis, species distributions).

Torwolia Hessler, 1970

Diagnosis. Pleotelson without posterolateral spines. Pereopod 1 subchelate (dactylus closing on propodus); carpus short, broad, lower margin with short robust setae.

Bathyal, abyssal (2000–5395 m). GOODS bathyal provinces: Northern N Atlantic, S Atlantic. 3 species (Hessler, 1970: diagnosis; Brix, 2007: rediagnosis).

Subfamily Eugerdellatinae Hessler, 1970

Diagnosis. Pereonite 1 as long or longer than pereonite 2. Pereopod 1 usually more robust than pereopod 2, chelate or raptorial (Hessler, 1970).

Chelantermedia Brix, 2006

Diagnosis. Pereonites 6, 7 and pleotelson fused. Pleotelson without posterolateral spines. Pereopod 1 large, chelate; carpus lower margin with 1 strong distal seta opposing dactylus plus finer accessory seta. Uropod biramous.

Slope (204 m). Temperate Australasia (SE Australia). 1 species (Brix, 2006a).

Chelator Hessler, 1970

Diagnosis. Pleotelson without posterolateral spines in female, small ones sometimes in male. Pereopod 1 large, chelate; carpus distally produced (except *C. stellae*), as long or shorter than propodus, with small or slender setae; propodus strongly tapered distally. Uropod uniramous.

Shelf–abyssal. Cosmopolitan. 9 species (Hessler, 1970; Brix et al., 2015: rediagnosis, key to 8 species).

Cryodesma Svavarsson, 1988

Diagnosis. Pleotelson with posterolateral angles. Pereopod 1 raptorial; carpus lower margin with row of setae increasing in length towards claw. Uropod uniramous.

Bathyal (970–3627 m). GOODS bathyal provinces: Arctic, Northern N Atlantic. 2 species (Svavarsson, 1988).

Disparella Hessler, 1970

Diagnosis. Head with spines lateral to antennae. Pleotelson with posterolateral angles. Pereopod 1 large, chelate; carpus lower margin with row of small setae proximal to distal robust seta. Uropod uniramous.

Bathyal, abyssal. Temperate Northern Atlantic, Western Indo-Pacific, Temperate Australasia, Southern Ocean. 5 species (Hessler, 1970).

Eugerdella Kussakin, 1965

Diagnosis. Pleotelson with or without posterolateral spines. Pereopod 1 raptorial; carpus lower margin with distal robust seta shorter than penultimate seta. Uropod exopod small or absent.

Shelf. Arctic, Temperate Northern and Tropical Atlantic, Temperate Northern W Pacific, Western Indo-Pacific, Temperate South America, Temperate Australasia, Southern Ocean. 18 species (Hessler, 1970: rediagnosis; Brix, 2006b: rediagnosis).

Oecidiobranchus Hessler, 1970

Diagnosis. Pleotelson vaulted, without posterolateral spines. Pereopod 1 large, chelate; carpus lower margin with strong distal robust seta and finer accessory seta. Uropod uniramous. Branchial chamber and operculum small, rounded.

Shelf–bathyal. Arctic, Temperate Northern and Tropical Atlantic, Temperate Australasia. 5 species (Hessler, 1970).

Paradesmosoma Kussakin, 1965

Diagnosis. Pleotelson without posterolateral spines. Pereopod 1 raptorial; carpus lower margin with row of irregularly-sized robust setae proximal to distal robust seta, 1 slender seta distal to 'claw'. Pereopod 4 natatory (enlarged, carpus and propodus paddle-like, with numerous setae). Uropod uniramous.

Shelf, slope (95–400 m). Temperate Northern Pacific, Temperate Australasia. 3 species (Hessler, 1970: rediagnosis).

Parvochelus Brix and Kihara, 2015

Diagnosis. Pleotelson without posterolateral spines. Pereopod 1 chelate; carpus 3.7 times as long as wide, longer than propodus, with 1 slender seta lateral to carpo-propodal articulation between propodus and distal seta; propodus subparallel.

Abyssal (4863–5180 m). GOODS bathyal provinces: Northern N Pacific, N Atlantic. 2 species (Brix et al., 2015).

Prochelator Hessler, 1970

Diagnosis. Pleotelson with posterolateral spines (sometimes rudimentary). Pereopod 1 large, chelate; carpus about twice as long as wide, shorter than propodus, with accessory seta next to distal seta and marginal robust seta. Uropod biramous.

Shelf–abyssal. Temperate Northern and Tropical Atlantic, Temperate Southern Africa, Temperate Australasia. GOODS bathyal provinces: N Atlantic, Cocos Plate, Antarctic. 12 species (Hessler, 1970; Brix and Bruce, 2008: rediagnosis).

Reductosoma Brandt, 1992

Diagnosis. Pleotelson without posterolateral spines. Maxillipedal palp with 4 articles. Pereopod 1 large, chelate; carpus about 1.5 times as long as wide, shorter than propodus, with accessory seta next to distal seta and marginal slender seta. Uropod biramous.

Abyssal (3981 m). Southern Ocean. 1 species (Brandt, 1992).

Whoia Hessler, 1970

Diagnosis. Pleotelson without posterolateral angles, vaulted, without lateral fields. Pereopod 1 raptorial; carpus lower margin with robust setae, upper margin with fine setae. Uropod exopod small or absent.

Shelf–slope, bathyal (50–1840 m). Temperate Northern and Tropical Atlantic, Temperate Australasia. 5 species (Hessler, 1970).

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Echinothambematidae Menzies, 1956

Figure 3.8

Echinothambematids are rare, known only from very deep water in the Atlantic and Pacific Oceans. They are cylindrical isopods, up to 5.4 mm long, with one or two of the posterior pereonites fused with the pleotelson. The family was rediagnosed by Malyutina et al. (2001), who differentiated the two genera and by Just (2025) who provided a key to species.

Diagnosis. Body elongate, subcylindrical; pereonite 7 or pereonites 6 and 7 fused with pleon (sutures visible dorsally in adults). Coxal plates absent. Pleon widest posteriorly, vaulted. Anus covered by pleopodal operculum. Eyes absent. Antennula as long as antenna, projecting laterally. Maxillipedal palp articles 1–3 wider than distal articles. Pereopods 2–7 ambulatory; pereopod 4 coxa inserting on anterolateral margin; pereopodal 2–7 dactyli with 1 or 2 claws. Uropod inserting posterolaterally, comprising single long article.

Echinothambema Menzies, 1956

Diagnosis. Pereonal and pleonal lateral spines present. Antennula article 1 laterally expanded, longer than article 2. Head and pereonite 1 not fused (fig. 3.8a).

Abyssal (5100 m). GOODS bathyal provinces: N Atlantic, SE Pacific Ridges. 2 species (Menzies, 1962).

Vemathambema Menzies, 1962

Diagnosis. Pereonal and pleonal lateral spines absent. Antennula article 1 stout, similar to article 2. Head and pereonite 1 fused (fig. 3.8b).

Abyssal (4630–5397 m). GOODS bathyal provinces: S Atlantic. 3 species (Just, 20025; Malyutina et al., 2001).

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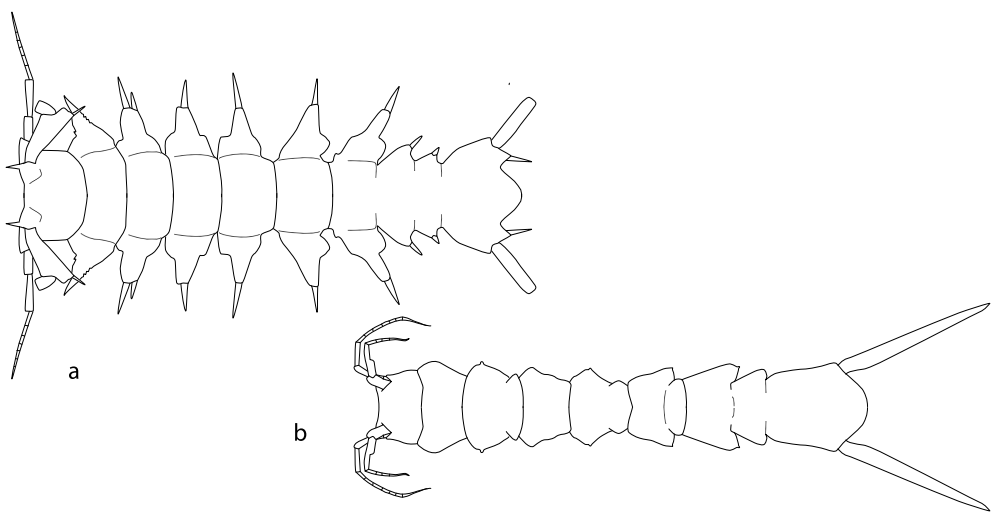

Figure 3.8. Echinothambematidae. Habitus dorsal views: a, *Echinothambema*; b, *Vemathambema*.

Haplomunnidae Wilson, 1976

Figure 3.9

Haplomunnidae were diagnosed by Wilson (1976) and again by Cunha and Wilson (2003). The family includes only deep-water forms, all oval (*Munna*-like), up to 3 mm long, spinose, with strong subchelate pereopods 1 and long ambulatory legs. A key to four genera Wilson (1976) was written before the fifth genus was described (Just, 2003). Just (2003) tabulated differences between all genera. Cunha and Wilson (2003) listed all material known with their distributions including several undescribed species.

Diagnosis. Body dorsal surface spinose or setose; pereonites 5–7 shorter than anterior pereonites. Pleon of 1 segment. Anus covered by pleopodal operculum. Eyes absent. Antennula basal article directed anterodorsally, with many articles. Pereopod 1 subchelate; pereopods 2–7 ambulatory; pereopod 4 coxa inserting on midlateral margin. Uropod reduced, of 1 or 2 articles, inserting near ventral margin.

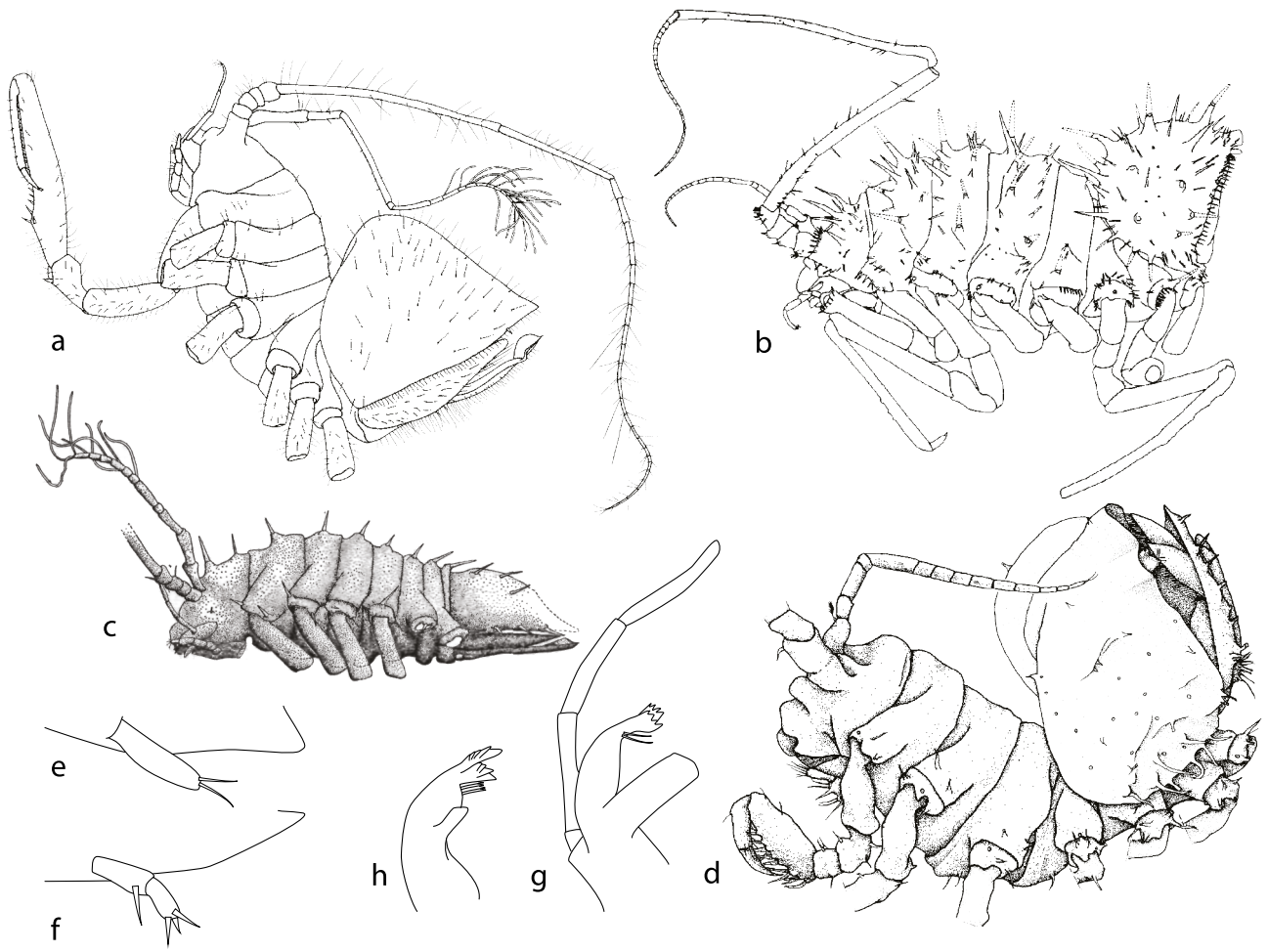

Figure 3.9. Haplomunnidae. Habitus, lateral views, not all pereopods shown: a, *Haplodendron buzwilsoni* Just, 2003 1; b, *Haplomunna hubbsi* Wilson, 1976; c, *Munella gayda* Wilson,1974; d, *Thylakogaster namibiensis* Brenke and Buschmann, 2009. Uropod: e, *Abyssaranea*; f, *Munella*. Mandible: g, *Haplodendron*; h, *Thylakogaster.*

Key to genera of Haplomunnidae

1. Pereonite 7 and pereopods 7 present (fig. 3.9a, b, d) 2

– Pereonite 7 and pereopods 7 absent (fig. 3.9c) 4

2. Pleotelson slightly expanded, half size of pereon (fig. 3.9b) ..... *Haplomunna*
– Pleotelson balloon-like, almost as large as pereon (fig. 3.9a, d) 3
3. Pereonites, pleotelson lateral margins with spines. Antennula and antenna attached directly or on small projection to head (fig. 3.9d). Mandible without palp (fig. 3.9h) ..... *Thylakogaster*
– Pereonites, pleotelson lateral margins setose. Antennula and antenna attached to dorsolateral stalk on head (fig. 3.9a). Mandible with 3-articled palp (fig. 3.9g) ..... *Haplodendron*
4. Uropod with 2 articles (fig. 3.9f). Antenna as long as body (fig. 3.9c) ..... *Munella*
– Uropod with 1 article (fig. 3.9e). Antenna shorter than body ..... *Abyssaranea*

Abyssaranea Wilson and Hessler, 1974

Diagnosis. Pereonite 7 and pereopods 7 absent. Pleotelson balloon-like, almost as large as pereon, in line with axis of pereon. Pleotelson spinose. Antennula and antenna attached directly to head. Antenna shorter than body. Mandible with 3-articled palp. Uropod with 1 article.

Abyssal (3459–4438 m). GOODS bathyal provinces: N Atlantic. 1 species (Wilson and Hessler, 1974).

Haplodendron Just, 2003

Diagnosis. Pereonite 7 and pereopods 7 present. Pleotelson balloon-like, almost as large as pereon, acutely angled with axis of pereon. Pereonites, pleotelson lateral margins setose. Antennula and antenna attached to dorsolateral stalk on head. Antenna longer than body. Mandible with 3-articled palp. Uropod with 2 articles.

Slope (1220–2500 m). Temperate Australasia. SE Australia. 1 species (Just, 2003).

Haplomunna Richardson, 1908

Diagnosis. Pereonite 7 and pereopods 7 present. Pleotelson slightly expanded, half size of pereon. Head, pereonites and pleotelson spinose. Antennula and antenna attached directly to head. Antenna longer than body. Mandible with 3-articled palp. Uropod with 1 article.

Abyssal (3880–6450 m). GOODS bathyal provinces: Northern N Pacific, N Atlantic. Three species (Cunha and Wilson, 2003; Wilson, 1976).

Munella Bonnier, 1896

Diagnosis. Pereonite 7 and pereopods 7 absent. Pleotelson swollen, in line with axis of pereon. Head, pereonites and pleotelson with few spines. Antennula and antenna attached directly to head. Antenna as long as body. Mandible with 3-articled palp. Uropod with 2 articles.

Shelf–abyssal (100–4797 m). Temperate Northern Atlantic. GOODS bathyal provinces: N Atlantic, N Pacific. 2 species (Wilson and Hessler, 1974).

Thylakogaster Wilson and Hessler, 1974

Diagnosis. Pereonite 7 and pereopods 7 present. Pleotelson balloon-like, almost as large as pereon, acutely angled with axis of pereon. Pereonites, pleotelson lateral margins with spines. Antennula and antenna attached directly or on small projection to head. Antenna shorter than body. Mandible without palp. Uropod with 1 article.

Slope–abyssal (1141–5216 m). GOODS bathyal provinces: Northern N Atlantic, SE Pacific Ridges, Cocos Plate, S Atlantic. 4 species (Brenke and Buschmann, 2009; Wilson and Hessler, 1974).

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Haploniscidae Hansen, 1916

Figure 3.10

Haploniscids are common inhabitants of deep-water sediments, recognisable by their half-barrel-shaped body and spindly legs. Some species are able to conglobate (roll up like a pill bug; fig. 3.10). Lincoln (1985) reviewed the diversity of the family around New Zealand, adding two genera and providing a key to the seven then known. George (2004) added another genus,

Chandraniscus George, 2004, based on supposed differences in the degree of pereonite fusion. Brökeland (2005) considered these differences unreliable, later describing many species in existing genera (Brökeland, 2006; Brokeland and Brandt, 2006; Brökeland and Raupach, 2008; Brökeland and Wägele, 2004). *Chandraniscus* is treated as a synonym of *Haploniscus* here. Most species are in the size range 3–5 mm but specimens up to 11.3 mm have been recorded. The key to genera is based on that of George (2004).

Diagnosis. Body compact, oval, more or less flat; pereonites similar, wider than long. Coxal plates absent. Pleon without free pleonites, usually with posteriorly pointing posterolateral processes. Anus not covered by pleopodal operculum. Eyes absent. Antennal scale spine-like, fused to article 3. Maxillipedal palp articles 1–5 narrow, less than half as wide as endite. Pereopods 1–7 ambulatory. Uropod inserting posteroventrally, peduncle rod-like, uniramous.

Implicit generic attributes. Pereonites 2–4 without anterolateral processes; pereonite 7 in adult similar to pereonite 6. Female operculum fringed with simple short setae.

Key to genera of Haploniscidae

1.	Pleotelson tapering to point (fig. 3.10a, d)	2
–	Pleotelson truncate or broadly rounded (fig. 3.10b, e, g–h)	3
2.	Uropod not concealed, set close together, ventral to anal valves (fig. 3.10n). Female operculum fringed with long plumose distomarginal setae (fig. 3.10d)	*Aspidoniscus*
–	Uropod concealed (fig. 3.10m). Female operculum fringed with simple short setae (fig. 3.10a, p)	*Abyssoniscus*
3.	Antenna peduncle flat; article 3 longer than wide, grooved; article 4 short; articles 5 and 6 fused, apically prolonged; flagellum small, slender, subterminal (fig. 3.10b, j)	*Antennuloniscus*
–	Antenna peduncle not so modified (fig. 3.10k, i)	4
4.	Pereonites 5–7 fused with pleotelson. Head with large lobe-like rostrum (fig. 3.10h). Antenna article 3 without dorsal tooth	*Hydroniscus*
–	Pereonites 5–7 free or middorsally fused with pleotelson. Head without or with small rostrum. Antenna article 3 with dorsal tooth (fig. 3.10k)	5
5.	Pereonite 7 in adult shorter and narrower than pereonite 6 (fig. 3.10i)	*Mastigoniscus*
–	Pereonite 7 in adult similar to pereonite 6	6
6.	Some of pereonites 2–4 with anterolateral processes, more pronounced in male (fig. 3.10e, f)	*Chauliodoniscus*
–	Pereonites 2–4 without anterolateral processes (fig. 3.10g)	*Haploniscus*

Abyssoniscus Birstein, 1971

Diagnosis. Head with short rounded rostrum. Pereonites 6–7 free; pleotelson tapering to obtuse point. Antenna peduncle article 3 without dorsal tooth.

Abyssal (5005–5045 m). GOODS bathyal provinces: N Pacific. 1 species (Birstein, 1971; George, 2004).

Antennuloniscus Menzies, 1962

Diagnosis. Head with anteriorly prolonged clypeus. Pereonites 5–7 fused with pleotelson, sutures usually visible; pleotelson posterior margin truncate, with prominent posterolateral spines in male. Antenna peduncle article 1 small, concealed by article 2; article 3 longer than wide, with longitudinal groove, with small tooth; articles 5 and 6 fused; article 6 with terminal projection; flagellum small, slender, inserting subapically on peduncular article 6.

Slope–abyssal (1300–5800 m). GOODS bathyal provinces: Northern N Atlantic, N Atlantic, Antarctic, Subantarctic, S Atlantic. 12 species (Menzies and Schultz, 1967: key to 5 species; Brökeland, 2006: rediagnosis).

Aspidoniscus Menzies and Schultz, 1968

Diagnosis. Head with short rounded rostrum. Pereonite 7 fused to pleotelson; pleotelson tapering to obtuse point. Antenna peduncle article 3 without dorsal tooth. Female operculum fringed with long plumose distomarginal setae. Uropod not concealed, set close together, ventral to anal valves.

Bathyal (3071 m). GOODS bathyal provinces: N Atlantic. Caribbean. 1 species (Menzies and Schultz, 1967).

Chauliodoniscus Lincoln, 1985

Diagnosis. Head without rostrum. One or more of pereonites 2–4 with anterolateral processes, longer in male; pereonite 5 not fused to pereonite 6, enrolment possible; pleotelson posterior margin truncate, with small posterolateral angles. Antenna peduncle article 3 dorsal tooth as long as or longer

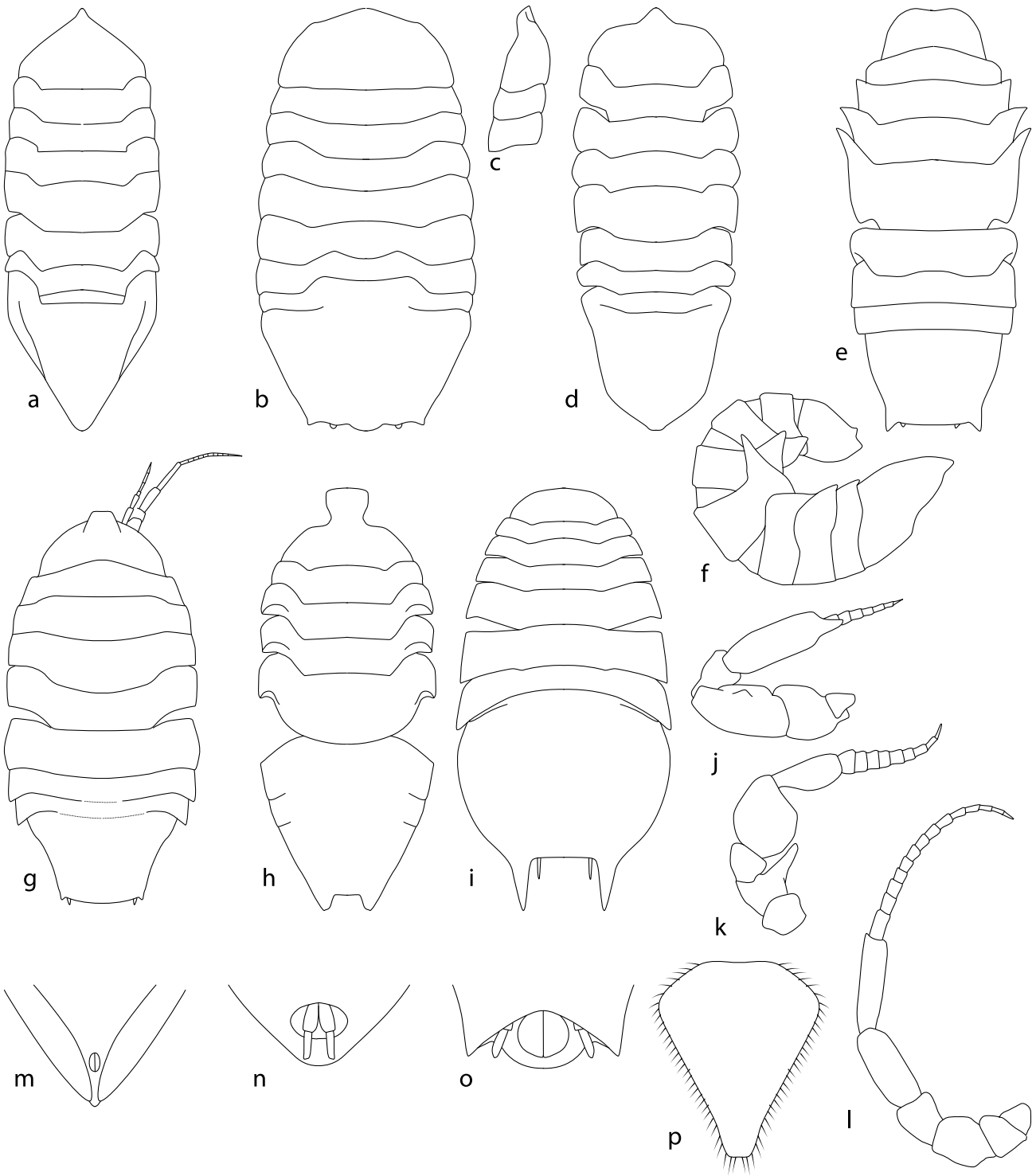

Figure 3.10. Haploniscidae. Dorsal views: a, *Abyssoniscus*; b, c, *Antennuloniscus* (with head, pereonites 1, 2, left, lateral); d, *Aspidoniscus*; e, f, *Chauliodoniscus* (with right lateral view); g, *Haploniscus*; h, *Hydroniscus*; i, *Mastigoniscus*. Antenna: j, *Antennuloniscus*; k, *Chauliodoniscus*; l, *Haploniscus*. Anus, uropods, ventral: m, *Abyssoniscus*; n, *Aspidoniscus*; o, *Haploniscus*. Female operculum: p, *Abyssoniscus*.

than width of article; article 5 inflated, with convex lateral margins.

Slope–abyssal (1300–5024 m). GOODS bathyal provinces: Northern N Atlantic, N Atlantic, New Zealand/Kermadec, Antarctic, Subantarctic, S Atlantic. 11 species (Lincoln, 1985: diagnosis, key to 9 species; Leese and Brenke, 2005).

Haploniscus Richardson, 1908

Diagnosis. Head with rostrum. Pereonites 5–7 at least laterally free, fused to pleotelson; pleotelson posterior margin truncate, with small posterolateral angles. Antenna peduncle article 3 little longer than wide, often with dorsal tooth; articles 5 and 6 not fused; flagellum distinct.

Slope (680–9043 m). Cosmopolitan. 77 species (Brökeland and Wägele, 2004: rediagnosis; Brökeland and Raupach, 2008: 7 new species; Brökeland, 2010: 4 new species; Knauber et al., 2025: *H. belyaevi* species complex).

Hydroniscus Hansen, 1916

Diagnosis. Head with large lobe-like rostrum. Pereonites 5–7 fused with pleotelson, lateral sutures faint, enrolment possible; pleotelson posterior margin convex, with broad triangular posterolateral angles. Antenna peduncle article 3 without dorsal tooth.

Bathyal–hadal (3200–7300 m). GOODS bathyal provinces: Northern N Atlantic, Northern N Pacific, N Atlantic, New Zealand/Kermadec, S Atlantic. 10 species (Lincoln, 1985: rediagnosis, key to 7 species; George, 2004: 3 new species).

Mastigoniscus Lincoln, 1985

Diagnosis. Head without rostrum. Pereonites 5–7 and pleotelson fused middorsally, sutures more or less distinct; pereonite 7 in adult shorter and narrower than pereonite 6; pleotelson posterior margin truncate, with prominent posterolateral spines in male. Antenna peduncle article 3 with dorsal tooth.

Abyssal, hadal (2476–8345 m). GOODS bathyal provinces: Northern N Pacific, SE Pacific Ridges, Cocos Plate, Nazca Plate, W Pacific. 13 species (Lincoln, 1985: diagnosis, key to 6 species; Park, 2000: rediagnosis, key to 10 species; Brokeland and Brandt, 2006).

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Ischnomesidae Hansen, 1916

Figure 3.11

Ischnomesids are cylindrical, blind, deep-water isopods with an elongate pereonite 5 (Kavanagh and Wilson, 2007). The family was rediagnosed by Merrin and Poore (2003) and again by Kavanagh and Sorbe (2006). The key to genera of Brandt et al. (2015), based on that of Wolff (1962), partly took into account the additional genera of Kavanagh and Wilson (2007) but not their comments on the enigmatic *Mixomesus*. Kussakin (1988) synonymised two of the genera erected by Wolff (1962) with *Stylomesus*. Maximum size recorded is 14.5 mm, but many species are much smaller.

Diagnosis. Body elongate, subcylindrical; head fused to pereonite 1; pereonite 5 elongate, cylindrical, much longer than pereonites 6, 7. Pleon without or with 1 or 2 free pleonites. Eyes absent. Pereopod 1 prehensile; pereopods 2–7 ambulatory; pereopod 4 coxa inserting on anterolateral margin; pereopodal 2–7 dactyli with 1 unguis. Uropod uniramous.

Key to genera of Ischnomesidae

1. Uropod of 2 articles (peduncle and ramus) (fig. 3.11a, e) 2
– Uropod of 1 article (*I. justi* excepted) (fig. 3.11g) 5
2. Head with projections supporting antennae (fig. 3.11g) ..... *Stylomesus*
– Head without projections supporting antennae 3
3. Pereonites and pleonites 1, 2 free, movable (fig. 3.11c, d) ..... *Ischnomesus*
– Pereonites and pleonites 1, 2 not movable 4
4. Pleotelson posterolateral margin produced at uropod insertion. Pereonite 4 about as long as wide (fig. 3.11a) ..... *Contrarimesus*
– Pleotelson evenly curved posterolaterally. Pereonite 4 1.5 times as long as wide (fig. 3.11m) ..... *Mixomesus*
5. Pereonite 5 free, pereonites 6, 7 and pleon fused (fig. 3.11c). Antennula article 2 inserting dorsally, strongly curved anteriorly at proximal insertion; following 1–3 articles less than 0.3 article 2 length (fig. 3.11d) ..... *Heteromesus*
– Pereonites 5–7 and pleon fused. Antennula with 5 or 6 articles, distal flagellar articles much longer than wide 6
6. Pleotelson axial ridge strongly vaulted, separated from lateral fields by distinct indented lines (fig. 3.11l) ..... *Haplomesus*
– Pleotelson axial ridge weakly vaulted, separated from lateral fields by shallow elongate concavities 7
7. Pleotelson posterolateral margin anterior to uropods without posterolateral spines or tubercles (fig. 3.11j) ..... *Fortimesus*
– Pleotelson posterolateral margin anterior to uropods with posterolateral spines or tubercles (fig. 3.11i, k) 8
8. Pereonite 4 at least 1.5 times as long as wide. Head with long, thin anterolateral projections supporting antennae (fig. 3.11i) ..... *Cornuamesus*
– Pereonite 4 as long as wide. Head without anterolateral projections supporting antennae (fig. 3.11k) ..... *Gracilimesus*

Contrarimesus Kavanagh and Wilson, 2007

Diagnosis. Pereonite 4 as long as wide; pereonites 5–7 articulation rudimentary, non-functional; pleotelson dorsal surface axial ridge weakly vaulted, separated from lateral fields by shallow elongate concavities; posterolateral margin anterior to uropods without spines; pleotelson posterolateral margin produced at uropod insertion. Antennula with 6 articles, distal flagellar articles much longer than wide. Maxillipedal palp narrower than endite, articles 2 and 3 scarcely expanded. Uropod of 2 articles, peduncle distinct.

Slope–abyssal (900–4149 m). Temperate Australasia, Southern Ocean. 19 species (Kavanagh and Wilson, 2007: diagnosis).

Cornuamesus Kavanagh and Wilson, 2007

Diagnosis. Head with long, thin anterolateral projections supporting antennae. Pereonite 4 at least 1.5 times as long as wide; pereonites 5–7, pleonite 1 and pleotelson not articulating; pleotelson dorsal surface axial ridge weakly vaulted, separated from lateral fields by shallow elongate concavities; pleotelson with distinct posterolateral spines. Antennula article 2 inserting on article 1 dorsally, straight, not curved at insertion. Maxillipedal palp narrower than endite, articles 2, 3 not expanded. Uropod of 1 long article.

Slope. Temperate Northern Atlantic. 2 species (Kavanagh and Sorbe, 2006: as *Haplomesus longiramus*, plus undescribed species; Kavanagh and Wilson, 2007: diagnosis, key to species).

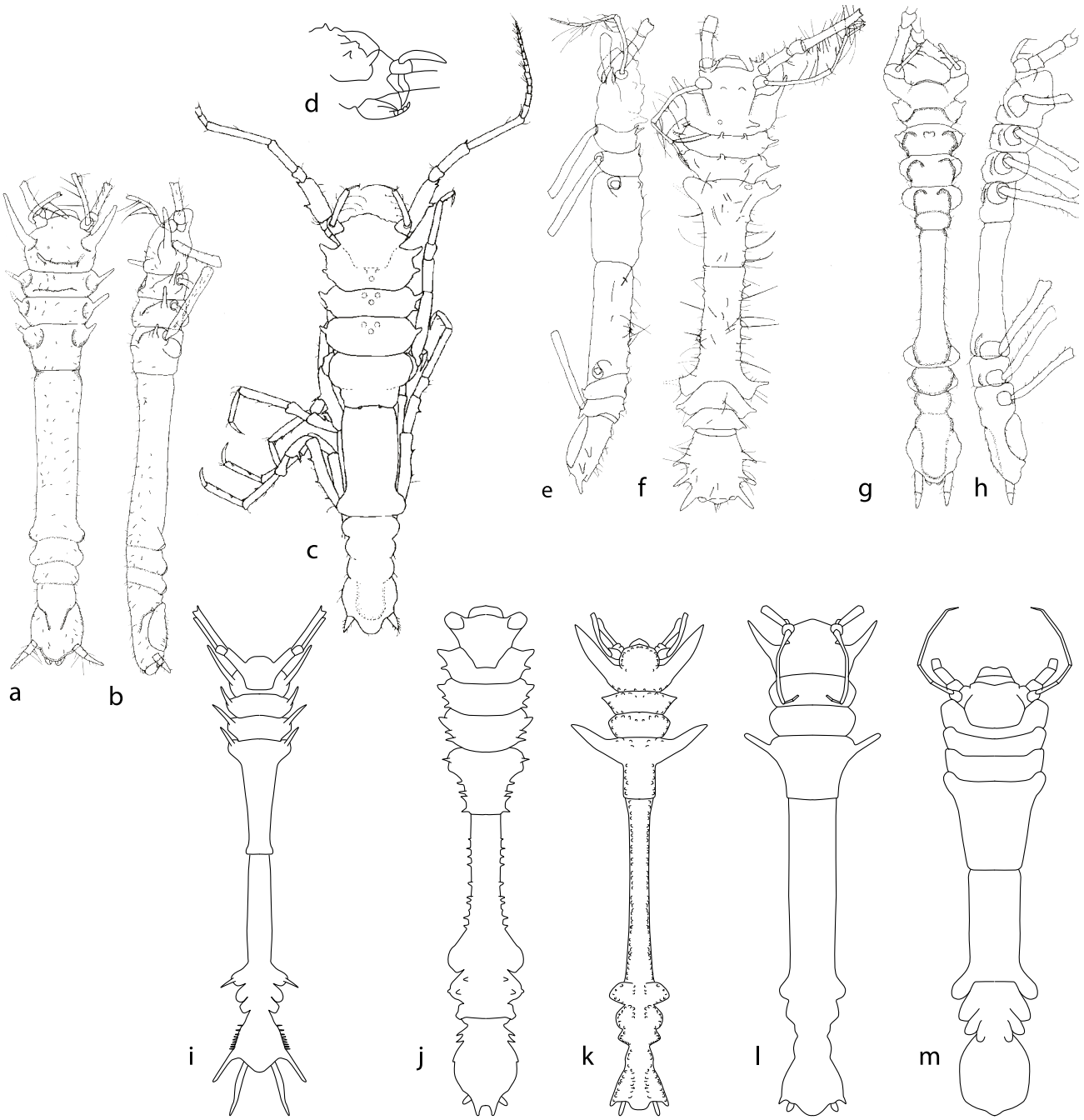

Figure 3.11. Ischnomesidae. Dorsal views: a, b, *Contrarimesus franklinae* (Merrin and Poore, 2003); c, d, *Heteromesus calcar* Cunha, 2006 (with lateral head, antennula, antenna); e, f, *Ischnomesus tasmanensis* Merrin and Poore, 2003; g, h, *Stylomesus sarsi* Merrin and Poore, 2003; i, *Cornuamesus*; j, *Fortimesus*; k, *Gracilimesus*; l, *Haplomesus*; m, *Mixomesus*.

***Fortimesus* Kavanagh and Wilson, 2007**

Diagnosis. Pereonite 4 as long as wide; pereonites 5–7, pleonite 1 and pleotelson not articulating; pleotelson dorsal surface axial ridge weakly vaulted, smoothly arched; separated from lateral fields by shallow elongate concavities; pleotelson without posterolateral spines. Antennula with 5 or 6 articles, distal flagellar articles much longer than wide. Maxillipedal palp as wide as or wider than endite, articles 2 and 3 expanded. Uropod of 1 article.

Slope–hadal. Temperate Northern Pacific, Temperate Southern Africa. 12 species (Kavanagh and Wilson, 2007: diagnosis, key to 11 species).

Gracilimesus Kavanagh and Wilson, 2007

Diagnosis. Pereonite 4 as long as wide; pereonites 5–7, pleonite 1 and pleotelson not articulating; pleotelson dorsal surface axial ridge smoothly arched, not separated from lateral fields, or weakly vaulted, separated from lateral fields by shallow elongate concavities; pleotelson with distinct posterolateral spines. Antennula with 5 or 6 articles, distal flagellar articles much longer than wide. Maxillipedal palp narrower than endite, articles 2, 3 not expanded. Uropod of 1 long article.

Slope–abyssal. GOODS bathyal provinces: Northern N Atlantic, Northern N Pacific, Nazca Plate, Antarctic, W Pacific, S Atlantic. 12 species (Kavanagh et al., 2006: key to species without pereopod 7; Kavanagh and Wilson, 2007: diagnosis, key to 10 species).

Haplomesus Richardson, 1908

Diagnosis. Pereonites 5–7, pleonite 1 and pleotelson not articulating; pleotelson dorsal surface axial ridge strongly vaulted, separated from lateral fields by distinct indented line; pleotelson without posterolateral spines. Antennula with 5 or 6 articles, distal flagellar articles much longer than wide. Maxillipedal palp wider than endite, articles 2 and 3 expanded. Uropod of 1 article.

Slope–hadal. Temperate Australasia. GOODS bathyal provinces: Arctic, Northern N Atlantic, N Atlantic, Nazca Plate, S Atlantic, N Pacific. 4 species (Kavanagh and Wilson, 2007: rediagnosis, key to species).

Heteromesus Richardson, 1908

Diagnosis. Pereonite 4 wider than long; pereonite 5 articulating with pereonite 6; pereonites 6, 7, pleon not articulating; pleotelson dorsal surface axial ridge strongly vaulted, separated from lateral fields by distinct indented line; pleotelson posterolateral margin produced at uropod insertion. Antennula article 2 inserting dorsally, strongly curved anteriorly at proximal insertion; following 1–3 articles less than 0.3 article 2 length. Maxillipedal palp narrower than endite, articles 2, 3 not expanded. Uropod of 1 long article.

Slope–abyssal (364–4077 m). GOODS bathyal provinces: Northern N Atlantic, Northern N Pacific, N Atlantic, S Atlantic. 16 species (Cunha and Wilson, 2006: rediagnosis, key to 16 species, notes on undescribed species).

Ischnomesus Richardson, 1908

Diagnosis. Pereonite 4 at least 1.5 times as long as wide, or as long as wide; pereonites 5–7, pleonite 1 and pleotelson free, articulating; pleotelson dorsal surface axial ridge scarcely vaulted; pleotelson with distinct posterolateral spines. Antennula of 6 articles. Maxillipedal palp as wide as or wider than endite, articles 2 and 3 expanded. Uropod of 2 articles, peduncle distinct, or of 1 article (rare).

Rhabdomesus Richardson, 1908 is a junior subjective synonym without a type species. The type species is herein designated as: *Ischnosoma bacillus* Beddard, 1886.

Shelf–hadal. Cosmopolitan. 41 species (Merrin and Poore, 2003: rediagnosis; Kavanagh et al., 2015: key to European species).

Mixomesus Wolff, 1962

Diagnosis. Pereonite 4 at least 1.5 times as long as wide; pereonites 5–7 articulation rudimentary, non-functional; pleotelson dorsal surface axial ridge scarcely vaulted; pleotelson without posterolateral spines. Antennula article 2 short, articles 3–5 elongate. Maxillipedal palp wider than endite, articles 2 and 3 expanded. Uropod of 2 articles, peduncle distinct.

Slope (610 m). Central Indo-Pacific, Temperate Australasia (New Zealand, N Australia). 1 described species (Wolff, 1962: diagnosis, description of species; Kavanagh and Wilson, 2007: reassessment, undescribed species).

Stylomesus Wolff, 1956

Diagnosis. Head with projections supporting antennae. Pereonite 4 as long as wide; at least pereonite 7 fused with pleon; pleotelson dorsal surface axial ridge weakly vaulted, separated from lateral fields by shallow elongate concavities; pleotelson without posterolateral spines. Antennula of 6 articles. Maxillipedal palp narrower than endite, articles 2, 3 not expanded. Uropod of 2 articles, peduncle distinct.

Slope–abyssal (690–6079 m). Temperate Australasia. GOODS bathyal provinces: Northern N Pacific, Antarctic, Subantarctic, Indian, S Atlantic. 19 species (Wolff, 1962: key to 8 species; Merrin and Poore, 2003: rediagnosis; Brandt and Andres, 2008: list of 17 species with distributions).

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Janirellidae Menzies, 1956

Figure 3.12

The definition and composition of Janirellidae (originally erected as Ianirellidae) were disputed until settled by Just (2008). Janirellids are best recognised usually by the presence of lateral spines or plates, or by the combination of a covered anus, uniramous uropods and no free pleonites. Most species are found deeper than 500 m; half the species are abyssal or hadal. Maximum length is about 7.5 mm.

Diagnosis. Body subcylindrical or flattened; head frontal margin projecting forward; pereonites with or rarely without lateral spines. Pleon without free pleonites, lateral margins with spines or irregular denticles. Anus covered by pleopodal operculum. Eyes absent. Antennula much shorter than antenna. Maxillipedal palp articles 2 and 3 expanded medially. Pereopod 1 carposubchelate; pereopods 2–7 ambulatory; pereopod 4 coxa inserting on midlateral margin; pereopodal 2–7 dactyli with 1 unguis, sometimes with small secondary claw. Uropod inserting posterolaterally, uniramous, rodlike.

Key to genera and subgenera of Janirellidae

1. Head without rostrum or pseudorostrum. Front between antennulae as wide as antennula base. Posterior margin of pleotelson evenly convex curve between uropods. Uropod more than 0.7 pleotelson length (fig. 3.12a) ..... *Dactylostylis*

– Head with rostrum or pseudorostrum derived from frons/clypeus. Front between antennulae more than twice width of antennula base. Posterior margin of pleotelson projecting between uropods. Uropod about 0.2 pleotelson length 2

2. Head with pseudorostrum. Body flattened, margins parallel, pereonites laterally truncate without spines (fig. 3.12d) ..... *Triaina*

– Head with true simple or complex rostrum. Body fusiform, usually with lateral spines ..... *Janirella*

Dactylostylis Richardson, 1911

Diagnosis. Body fusiform, with lateral spines. Head without rostrum or pseudorostum; frontal margin between antennulae as wide as antennula base. Posterior margin of pleotelson evenly convex between uropods. Uropod greater than 0.7 pleotelson length.

Slope, bathyal (350–2970 m). Temperate Northern Atlantic, Tropical Atlantic, Temperate South America (Atlantic coast). 3 species (Hessler, 1968: rediagnosis, species description; Kensley and Heard, 1985: species description as *Spinianirella*).

Janirella Bonnier, 1896

Diagnosis. Body fusiform, usually with lateral spines. Head with rostrum; frontal margin between antennulae more than twice width of antennula base. Posterior margin of pleotelson projecting between uropods; uropod about 0.2 pleotelson length.

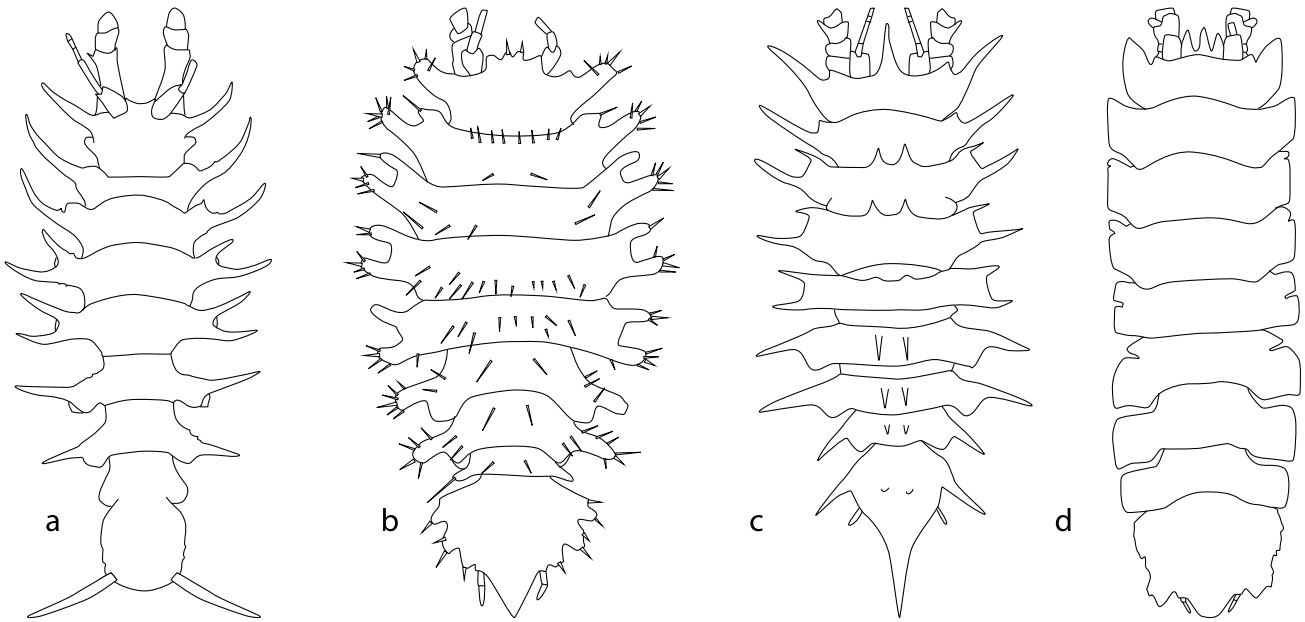

Figure 3.12. Janirellidae. Dorsal views: a, *Dactylostylis*; b, *Janirella bifida* Menzies, 1962; c, *J. diplospinosa* Birstein, 1971; d, *Triaina isodonte* Just, 2008.

Slope–hadal (946–9043 m). Temperate Northern and Tropical Atlantic, Temperate Northern W Pacific. GOODS bathyal provinces: New Zealand/Kermadec. 39 species. (Menzies, 1962: redignosis, key to 11 species; Kussakin, 1988: key to 33 species of N Pacific; George, 2004: diagnosis). Two subgenera, *Janirella* Bonnier, 1896, *Parjanirella* Birstein, 1971, are no longer recognised (Ohta et al., 2025).

Triaina Just, 2009

Diagnosis. Body flattened, margins parallel, truncate, without spines. Head with pseudorostrum derived from frons/clypeus; frontal margin between antennulae more than twice width of antennula base. Posterior margin of pleotelson projecting between uropods. Uropod about 0.2 pleotelson length.

Shelf, slope (80–2500 m). Temperate SE Australia. 2 species (Just, 2008).

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Janiridae G.O. Sars, 1897

Figures 3.13–3.15

Janiridae are archetypal janiroideans, the family that remains when other taxa are placed in more recognisable or better characterised families. Most are very small, usually less than 5 mm long, always longer than wide, with similar pereopods, although the first can be more or less prehensile. Most are marine, usually in shallow water, but a few are found exclusively in fresh water.

Of more than 50 genera placed at one time or another in Janiridae, many have been assigned to other smaller families, or synonymised (Wilson and Wägele, 1994). These authors reviewed and diagnosed the remaining genera, with many provisos, and their arrangement has been scarcely revisited. Their generic diagnoses have been simplified here and their key updated.

Diagnosis. Body oblong, depressed; head with or without rostrum; pereonites 1–7 free, wider than long, often with laminar lateral expansions. Pleon with 0, 1 or 2 free pleonites. Anus not covered by pleopodal operculum. Eyes usually present, dorsal. Maxillipedal palp articles 1–3 wider than distal articles. Pereopod 1 usually prehensile; pereopods 2–7 ambulatory; pereopod 4 coxa inserting on midlateral margin; pereopodal 2–7 dactyli with 2 or 3 claws. Uropod inserting laterally or terminally.

Key to genera of Janiridae

1. Uropod long, about as long as or longer than pleotelson; endopod longer than peduncle (figs 3.13b, f, k, l, 3.14b–d, k) 2
– Uropod shorter than pleotelson (even if narrow); endopod as long as or shorter than peduncle (figs 3.13a, c, g, h–j, 3.14a, e–j) 10
2. Eyes absent 3
– Eyes present 4
3. Body vermiform, more than 5 times as long as wide (fig. 3.13b) ..... *Caecianiropsis*
– Body broad, flat; pereonites 1–3 laterally bilobed (fig. 3.14d) ..... *Janthura*
4. Male pereopod 1 propodus and carpus enlarged, often swollen; carpus with strong marginal teeth (fig. 3.15a, g) 5
– Male pereopod 1 propodus and carpus similar to those of pereopods 2–7; if sexually dimorphic, carpus without strong marginal teeth (fig. 3.15b, c, e, f) 6
5. Front with rounded rostrum. Body flat, oval, twice as long as wide; coxa 1 and pereonites 2–4 projecting anteriorly (fig. 3.14k) ..... *Rostrobagatus*
– Front without rostrum. Body broad, pereonite 4 broadest, tergites of pereonites 2–4 laterally concave (fig. 3.13e, f) ..... *Carpias*
6. Pereonites often with large lateral lappets or spines (fig. 3.14c). Pereopod 1 propodus with proximal serration on lower margin (fig. 3.15c, d) ..... *Janiralata*
– Pereonites without lateral lappets or spines. Pereopod 1 propodus without proximal serration on lower margin, sometimes with distal palmar teeth 7
7. Head with small dorsally curved rostrum. Eyes large, often bulging laterally. Uropodal rami flattened (fig. 3.13l) ..... *Iathrippa*
– Head without rostrum. Eyes compact, not bulging laterally. Uropodal rami round in cross-section 8
8. Coxae 1–3 not visible dorsally (fig. 3.14b). Male pleopod 1 medial lobe convex, lateral lobe short, acute (fig. 3.15t) ..... *Janaira*
– Coxae 1–3 visible dorsally. Male pleopod 1 medial lobe lobed or convex, lateral lobe prominent (fig. 3.15r, s, u, v) 9
9. Male pleopod 1 distal tip with medial and lateral lobes posteriorly directed, separated by notch (fig. 3.15u). Maxillipedal palp as wide as endite (fig. 3.15o). Pereopod 2 elongate, longer than pereopods 1 and 3 (fig. 3.15f, i) ..... *Janira*

– Male pleopod 1 medial lobe convex, merging into acute prominent lateral lobe (fig. 3.15s). Maxillipedal palp wider than endite (fig. 3.15n). Pereopod 2 as long as pereopods 1 and 3 ..... *Ianiropsis*

10. Uropod with squat peduncle, wider than long, barely emerging from pleotelson margin; rami usually shorter than peduncle (figs 3.13c, h, 3.14a, h, i) 11

– Uropod with peduncle clearly emerging from pleotelson margin, especially in ventral view; rami longer than peduncle 14

11. Pereopods 2–7 with 3 claws, lower claw similar to upper claw, accessory seta enlarged as third claw (fig. 3.15k) (freshwater to marine) ..... *Jaera*

– Pereopods 2–7 with 2 dactylar claws (fig. 3.15h, j, m) (marine) 12

12. Pereopods 2–7 with lower dactylar claw subequal to upper claw (fig. 3.15j) ..... *Hawaianira*

– Pereopods 2–7 with lower dactylar claw distinctly smaller than upper claw 13

13. Pereopods 2–7 with lower dactylar claw minute (fig. 3.15h). Body flat, twice as long as wide, with setose margins (fig. 3.13c, d) ..... *Caecijaera*

– Pereopods 2–7 with lower dactylar claw slightly smaller than upper claw (fig. 3.15m). Body flat, at least 3.5 times as long as wide, without setose margins (fig. 3.14h, i) ..... *Neojaera*

14. Uropodal endopod longer than peduncle, longer than exopod (fig. 3.13a, g, j, 3.14f) 15

– Uropod with thin subequal rami and peduncle 18

15. Front of head with rostrum extending beyond anterior curved margin of head 16

– Front of head without rostrum extending beyond anterior curved margin of head 17

16. Eyes present. Pleotelson as wide as or wider than long (fig. 3.13a) ..... *Austrofilius*

– Eyes absent. Pleotelson longer than wide (fig. 3.14f) ..... *Microjaera*

17. Pereopod 1 gnathopod-like; carpus enlarged, with robust sensillate setae (fig. 3.15b) ..... *Ectias*

– Pereopod 1 leg-like; carpus slender, with few setae (fig. 3.15e) ..... *Iais*

18. Maxillipedal palp much narrower than endite (fig. 3.15q). Antennal articles 5–6 as long as articles 2–3 ..... *Protocharon*

– Maxillipedal palp wider than (fig. 3.15p) or subequal to endite. Antenna articles 5–6 longer than articles 1–4 19

19. Front broad, truncate, projecting between antennulae (fig. 3.14g) ..... *Microjanira*

– Front straight or convex, not projecting 20

20. Body more than 4 times as long as wide, pleotelson narrower than pereon (fig. 3.14e). Male pleopod 2 stylet shorter than peduncle, thin, with distinct angle in distal part (fig. 3.15x) (freshwater) ..... *Mackinia*

– Body about twice as long as wide, setose, broad, posterior pereonites and pleotelson wider than anterior pereonites (fig. 3.13i). Male pleopod 2 stylet much longer than peduncle, distally coiled (fig. 3.15w) (freshwater, estuarine) ..... *Heterias*

Austrofilius Hodgson, 1910

Diagnosis. Body broad, flattened. Front with broad, quadrate rostrum. Pleotelson wider than long. Antennula flagellum of 5 or 6 articles. Antennal flagellum proximal articles fused; with conspicuous scale. Maxillipedal palp wider than endite. Pereopod 1 ambulatory, carpus slender, with few setae. Pereopods 2–7 dactyli with lower claw smaller than upper claw. Male pleopod 1 medial lobes broad, rounded; lateral lobes curving, projecting posteriorly. Uropod shorter than pleotelson; endopod longer than peduncle, longer than exopod.

Shelf, slope. Temperate Northern Atlantic, Southern Ocean. 4 species (Winkler and Brandt, 1993: description of 2 species; Castelló, 2002).

Caecianiropsis Menzies and Pettit, 1956

Diagnosis. Body vermiform, more than 5 times as long as wide. Front with rounded rostrum, with acute anterolateral projections. Blind. Antennula flagellum of 2 or 3 articles. Antennal article 3 longer than articles 1, 2 and 4. Maxillipedal palp wider than endite. Pereopod 1 ambulatory, carpus slender, with few setae.

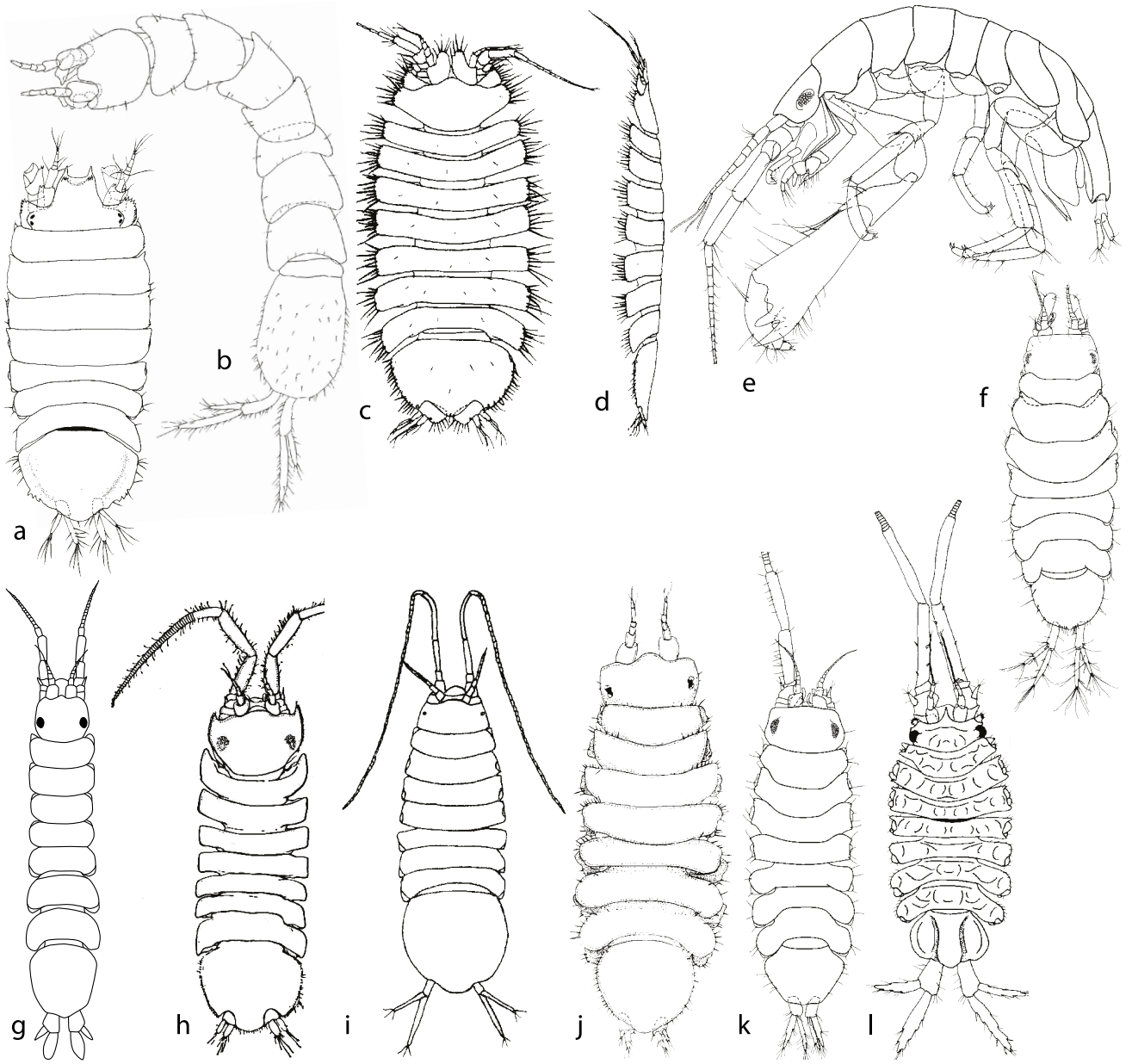

Figure 3.13. Janiridae. Dorsal views: a, *Austrofilius furcatus* Hodgson, 1910; b, *Caecianiropsis goseongensis* Kim, Lee and Karanovic, 2019; c, d, *Caecijaera kussakini* Malyutina, 1994 (dorsal, lateral); e, f, *Carpias montaguensis* Doti and Wilson, 2010 (lateral, dorsal); g, *Ectias turqueti* Richardson, 1906; h, *Hawaianira peleae* Miller, 1967; i, *Heterias exul* (F. Müller, 1892); j, *Iais pubescens* (Dana, 1853); k, *Ianiropsis alanmillari* Doti and Wilson, 2010; l, *Iathrippa sarsi* (Pfeffer, 1887).

Pereopods 2–7 dactyli with 2 similar claws. Male pleopod 1 medial lobes distally rounded; lateral lobes angular, projecting laterally. Male pleopod 2 stylet coiled. Uropod about as long as pleotelson; peduncle, elongate; endopod longer than endopod.

Intertidal (interstitial). Temperate Northern Pacific, Southern Ocean. 4 species (Menzies and Pettit, 1956; Kim et al., 2019: rediagnosis, key to species).

Caecijaera Menzies, 1951

Diagnosis. Body broad, about twice as long as wide, setose, lateral margins widening posteriorly. Front without rostrum. Blind. Antennula article 1 with medial lobe; flagellum of 2 or 3 articles. Antennal articles 5–6 as long as articles 1–4, with setose scale. Maxillipedal palp as wide as endite. Pereopod 1

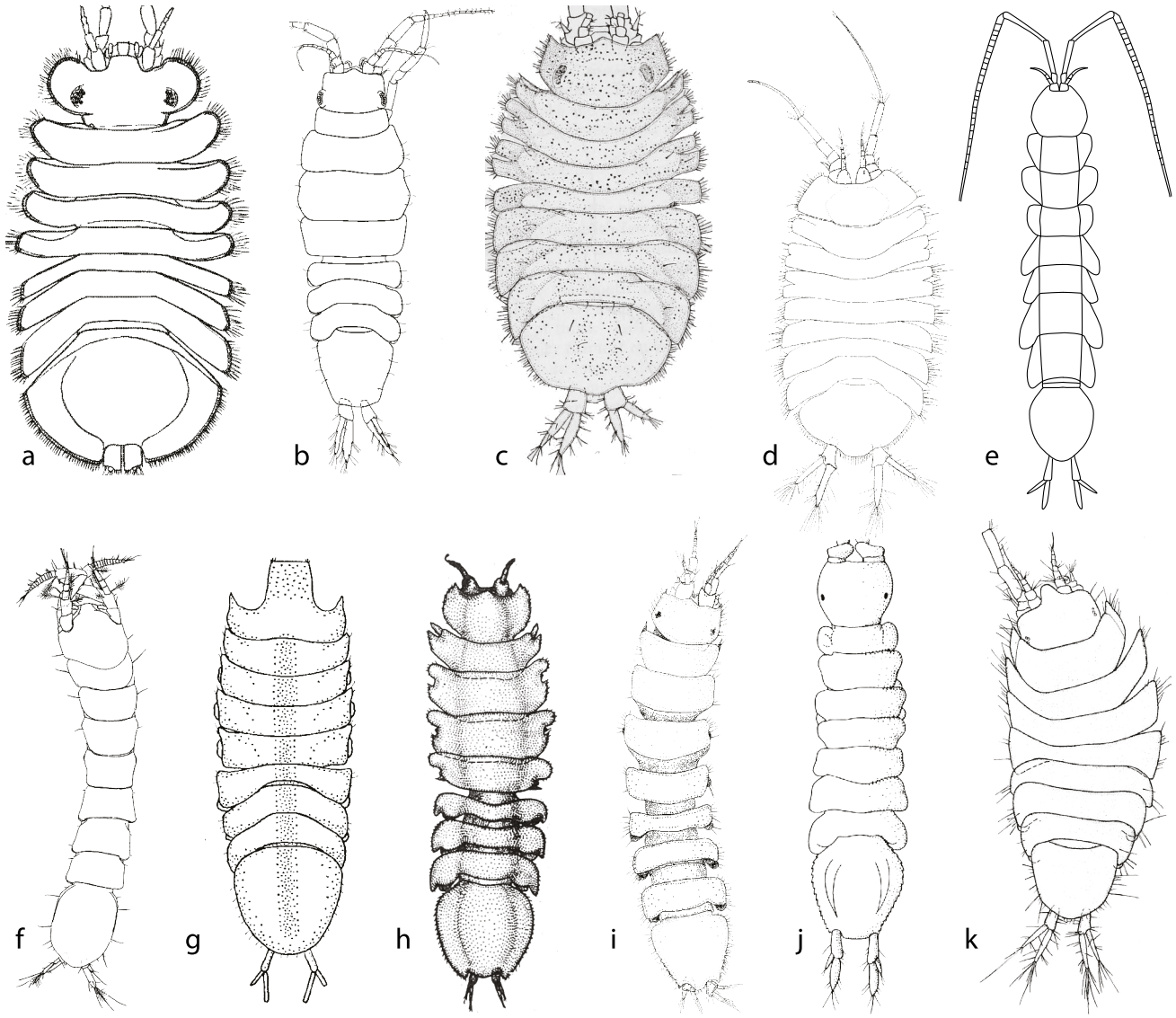

Figure 3.14. Janiridae. Dorsal views: a, *Jaera istri* Veuille, 1979; b, *Janaira platyoura* Doti and Wilson, 2010; c, *Janiralata davisi* Menzies, 1951; d, *Janthura abyssicola* Wolff, 1962; e, *Mackinia japonica* Matsumoto, 1956; f, *Microjaera morii* Shimomura, 2005; g, *Microjanira dentifrons* Schiecke and Fresi, 1970; h, *Neojaera caeca* Kussakin and Vasina, 1984; i, *Neojaera elongata* Menzies, 1962; j, *Protocharon arenicola* Chappuis, Delamare-Debouteville and Paulian, 1956; k, *Rostrobagatus microps* Müller, 1993.

ambulatory, carpus slender, with few setae. Pereopods 2–7 dactyli with 2 claws, lower claw minute. Male pleopod 1 medial lobe transverse, lateral lobes minute or prominent. Uropod with squat peduncle immersed in pleotelson margin, with setose mesial margin; rami short and narrow.

Intertidal (commensal with limnoriid isopods). Arctic, Temperate Northern Pacific, Central Indo-Pacific. 5 species (Kussakin, 1962: 3 species; 1988: key to 5 species; Malyutina, 1994).

Carpias Richardson, 1902

Diagnosis. Body broad, pereonite 4 broadest, tergites of pereonites 2–4 laterally concave. Front without rostrum. Antennula flagellum of 7–11 articles. Antennal articles 5–6 longer than articles 1–4; with scale. Maxillipedal palp wider than endite. Pereopod 1 carposubchelate, carpus oval in female, swollen with strong marginal spines in male; propodus elongate, curved. Pereopods 2–7 dactyli with 2 large subequal distal claws plus third large subdistal accessory seta. Male pleopod 1 distally V-shaped, with merging medial and posteriorly projecting lateral lobes. Uropod about as long as or longer than pleotelson; rami elongate, longer than peduncle.

Intertidal–shelf (coral and rocky reefs). Temperate Northern and Tropical W Atlantic, Indo West-Pacific, Temperate Australasia. 27 species (Doti and Wilson, 2010: rediagnosis, key to 19 species).

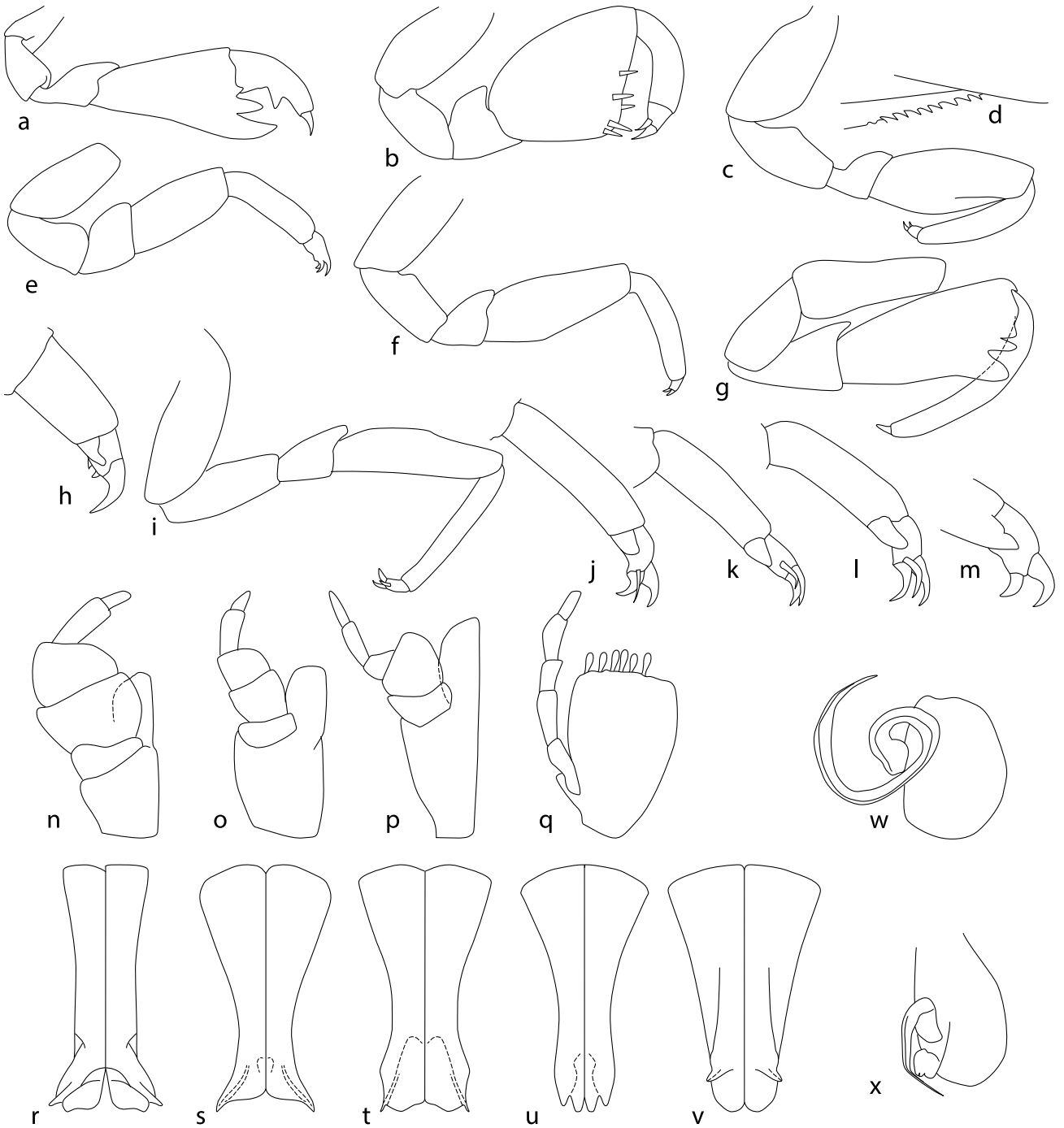

Figure 3.15. Janiridae. Pereopod 1; a, *Carpias*; b, *Ectias*; c, d, *Janiralata* (with detail of inner margin of dactylus); e, *Iais*; f, *Janira*; g, *Rostrobagatus*. Pereopod 2: h, *Caecijaera* (propodus, dactylus); i, *Janira*. Pereopod 4, propodus, dactylus: j, *Hawaianira*; k, *Jaera*. Pereopod 7: l, *Iais*; m, *Neojaera*. Maxilliped: n, *Ianiropsis*; o, *Jaera*; p, *Microjaera*; q, *Protocharon*. Male pleopods 1: r, *Heterias*; s, *Ianiropsis*; t, *Janaira*; u, *Janira*; v, *Mackinia*. Male pleopod 2: w, *Heterias*; x, *Mackinia*.

Ectias Richardson, 1906

Diagnosis. Body vermiform, about 6 times as wide as long. Front without rostrum. Antennula flagellum of 5 or 6 articles. Antennal articles 5–6 longer than articles 1–4; with scale. Maxillipedal palp as wide as endite. Pereopod 1 carposubchelate; carpus enlarged, subtriangular, with 2 rows of spiniform setae on transverse margin opposing propodus. Pereopods 2–7

dactyli with 2 large subequal distal claws plus third large subdistal accessory seta. Male pleopod 1 distally V-shaped, with medial and lateral lobes merged into elongate posterolateral projections. Male pleopod 2 stylet elongate, curved. Uropod shorter than pleotelson; endopod longer than peduncle, flat, ovoid, longer than exopod.

Subtidal, shelf. Temperate Southern Africa, Southern Ocean. 2 species (Barnard, 1920; Richardson, 1906).

Hawaianira Miller, 1967

Diagnosis. Body compact, flat, pereonites subequal. Front without rostrum, with acute anterolateral angles. Antennula flagellum of 3 articles. Antennal articles 5–6 longer than articles 1–4. Maxillipedal palp narrower than endite. Pereopod 1 ambulatory, carpus slender, with few setae. Pereopods 2–7 dactyli with 2 similar claws. Male pleopod 1 medial lobe short, setose, rounded; lateral lobe short, triangular. Uropod with squat peduncle immersed in pleotelson margin; rami short, adjacent.

Intertidal. Indo West-Pacific (Hawaii, Philippines, Réunion). 2 species (Miller, 1967).

Heterias Richardson, 1904

Diagnosis. Body broad, about twice as long as wide, setose, lateral margins widening posteriorly. Front without rostrum. Pleotelson wider than pereonite 7. Antennula flagellum of 3 or 4 articles. Antennal articles 5–6 longer than articles 1–4. Maxillipedal palp wider than endite. Pereopod 1 ambulatory, carpus slender, with few setae. Pereopods 2–7 dactyli with lower claw shorter than upper claw. Male pleopod 1 medial lobe broad, flattened; lateral lobe pointing laterally. Male pleopod 2 stylet much longer than peduncle, distally coiled. Uropod shorter than pleotelson, thin; endopod as long as peduncle, longer than exopod.

Estuarine, freshwater. Southern Australia, South America. 4 species (Bowman et al., 1987; Roberts, 1975). Two genera, *Heterias* for three species in fresh water and estuaries in southern Australia and *Fritzianira* Lemos de Castro and Brasil Lima, 1977 for *H. exul* (Müller, 1892) from fresh water in South America, are synonymous but sometimes treated as subgenera.

Iais Bovallius, 1886

Diagnosis. Body narrow, about 3 times as long as wide, broadest at pereonites 4–5. Front without rostrum. Eyes reduced to few ocelli. Antennula flagellum of 3 articles. Antennal articles 5–6 longer than articles 1–4. Pereopod 1 ambulatory, carpus slender, with few setae. Pereopods 2–7 dactyli with 2 similar claws and enlarged accessory seta. Male pleopod 1 medial and lateral lobes short, scarcely separated, projecting distally. Uropod shorter than pleotelson; endopod longer than peduncle, longer than exopod.

Estuarine, subtidal (commensal with sphaeromatid isopods). Tropical Atlantic, Indo West-Pacific, Temperate South America, Temperate Southern Africa, Temperate Australasia, Southern Ocean. 8 species (Kensley and Schotte, 1999; Menzies and Barnard, 1951).

Ianiropsis G. O. Sars, 1897

Diagnosis. Body narrow, 3 times as long as wide, anterior pereonites with visible coxae. Front without rostrum. Antennula flagellum of 5–25 articles. Antennal articles 5–6 longer than articles 1–4; with scale. Maxillipedal palp wider than endite. Pereopod 1 ambulatory, basis-merus of adult male elongate, distinctly longer than those on posterior pereopods; carpus elongate. Pereopods 2–7 dactyli with 2 large subequal distal claws plus third large subdistal accessory seta. Male pleopod 1 medial lobe convex, merging into acute prominent lateral lobe. Uropod about as long as pleotelson; rami longer than broad peduncle (rarely short).

Intertidal–slope. Cosmopolitan. 23 species (Kussakin, 1988: key to 27 species; Jang and Kwon, 1990; Doti and Wilson, 2010: rediagnosis, key to 22 species).

Iathrippa Bovallius, 1886

Diagnosis. Body broad, setose, pereonites 2–4 with small lappets. Front with small dorsally curved rostrum. Eyes bulging laterally. Antennula flagellum of more than 15 articles. Antennal articles 5–6 longer than articles 1–4; with scale. Maxillipedal palp wider than endite. Pereopod 1 ambulatory, basis-merus of adult male elongate, distinctly longer than those on posterior pereopods; carpus elongate. Pereopods 2–7 dactyli with 2 large subequal distal claws plus third large subdistal accessory seta. Male pleopod 1 medial lobe longer than acute lateral lobe. Male pleopod 2 stylet elongate, curved. Uropod longer than pleotelson; rami broad, flat, longer than peduncle, endopod longer than exopod.

Intertidal, subtidal. Temperate South America, Temperate Southern Africa, Temperate Australasia, Southern Ocean. 11 species (Winkler and Brandt, 1993: figures, some as *Notasellus* (junior synonym)).

Jaera Leach, 1814

Diagnosis. Body broad, setose, lateral margins often widening posteriorly. Front without or with small rostrum. Eyes present, or blind (rare). Antennula flagellum of 2 or 3 articles. Antennal articles 5–6 longer than articles 1–4. Pereopod 1 ambulatory, carpus slender, with few setae. Pereopods 2–7 dactyli with 3 claws, lower claw similar to upper claw, accessory seta enlarged as third claw. Male pleopod 1 broad, lateral lobe distinct from medial lobe, with projecting copulatory horns. Male pleopod 2 stylet elongate, curved. Uropod with squat peduncle immersed in pleotelson margin; rami short, adjacent.

Estuarine, intertidal, slope, freshwater (some commensal with sphaeromatid isopods). Arctic, Temperate Northern Atlantic, Southern Ocean. 18 species (Veuille, 1979: review of species; Kussakin, 1988: key to 21 species and subspecies; Linse et al., 2014: rediagnosis, distribution, discussion, phylogeny of Janiroidea).

Janaira Moreira and Pires, 1977

Diagnosis. Body narrow, 3 times as long as wide, anterior pereonites laterally rounded without visible coxae. Front without rostrum. Antennula flagellum of 9–12 articles. Antennal articles 5–6 longer than articles 1–4. Maxillipedal

palp wider than endite. Pereopod 1 of female ambulatory; carpus of male wider proximally than distally, with 2 rows of spiniform setae; dactylus with 2 claws. Pereopods 2–7 dactyli with 2 large subequal distal claws plus third large subdistal accessory seta. Male pleopod 1 medial lobe convex, lateral lobe short, acute. Uropod longer than pleotelson; peduncle broad; rami longer than peduncle.

Intertidal. Tropical W Atlantic, Temperate SE Australia. 2 species (Moreira and Pires, 1977a; b: biology of type species; Doti and Wilson, 2010).

Janira Leach, 1814

Diagnosis. Body narrow, 3 times as long as wide, anterior pereonites with visible coxae. Front without or with small rostrum. Antennula flagellum of more than 25 articles. Antennal articles 5–6 longer than articles 1–4; with scale. Maxillipedal palp as wide as endite. Pereopod 1 of female ambulatory; carpus of male wider proximally than distally, with 2 rows of spiniform setae; dactylus with 2 claws. Pereopod 2 of male elongate, longer than pereopods 1 and 3. Pereopods 2–7 dactyli with 2 large subequal distal claws plus third large subdistal accessory seta. Male pleopod 1 distal tip with medial and lateral lobes posteriorly directed, separated by notch. Uropod longer than pleotelson; peduncle and rami narrow.

Subtidal–bathyal. Temperate Northern and Tropical Atlantic, Temperate Northern W Pacific. 5 species (Menzies, 1951; Wolff, 1962: rediagnosis, key to 8 species, some now in other genera; Kussakin, 1988: 2 species).

Janiralata Menzies, 1951

Diagnosis. Body broad, flat; at least pereonites 2 and 3 (often other pereonites) with 2 lateral lappets. Front without rostrum, with acute anterolateral angles. Antennula flagellum of more than 15 articles. Antennal articles 5–6 longer than articles 1–4; with scale. Maxillipedal palp as wide as endite. Pereopod 1 carposubchelate, sexually dimorphic; carpus with marginal spiniform setae, propodus proximally serrate, dactylus short, with or without claws. Pereopods 2–7 dactyli with 2 similar claws and enlarged accessory seta. Male pleopod 1 with broad setose medial lobes merging into subtriangular lateral lobe. Male pleopod 2 stylet elongate, curved. Uropod longer than pleotelson; peduncle broad; rami longer than peduncle.

Subtidal–slope. Temperate Northern Pacific. 34 species (Kussakin and Mezhov, 1979: diagnoses of 15 species; Kussakin, 1988: key to 53 species, some now in other genera; Wilson and Wägele, 1994: divided genus in several groups and subgroups; Kim and Yoon, 2021). Ohta et al. (2023) reviewed species attached to other invertebrates such as asteroids and sponges.

Janthura Wolff, 1962

Diagnosis. Body broad, flat; pereonites 1–3 laterally bilobed. Front without rostrum. Blind. Antennula flagellum of 3 articles. Antennal articles 5–6 longer than articles 1–4; with scale. Maxillipedal palp wider than endite. Pereopod 1 ambulatory, carpus slender, with few setae. Pereopods 2–7 dactyli with lower claw smaller than upper claw (on anterior pereopods). Male pleopod 1 medial lobe expanded; lateral lobe pointing laterally. Male pleopod 2 stylet elongate, curved. Uropod longer than pleotelson; rami elongate, longer than thick peduncle.

Bathyal–hadal (2250–9034 m). Tropical Atlantic, Central Indo-Pacific. 2 species (Birstein, 1963; Wolff, 1962).

Mackinia Matsumoto, 1956

Diagnosis. Body elongate, more than 4 times as long as wide. Front without rostrum. Blind. Antennula flagellum of 4 articles. Antennal articles 5–6 longer than articles 1–4; with scale. Maxillipedal palp wider than endite. Pereopod 1 ambulatory, carpus slender, with few setae. Pereopods 2–7 dactyli with lower claw smaller than upper claw. Male pleopod 1 medial lobe semicircular; lateral lobe reduced. Male pleopod 2 stylet shorter than peduncle, thin, with distal angle. Uropod shorter than pleotelson, thin; endopod as long as peduncle, much longer than exopod.

Freshwater. Japan, Korea, far east of Russia. 7 species (Birstein and Ljovuschkin, 1965; Matsumoto, 1956, 1967).

Microjaera Bocquet and Levi, 1955

Diagnosis. Body vermiform, about 6 times as wide as long. Front with broad, truncate rostrum projecting between antennulae. Pleotelson longer than wide. Blind. Antennula flagellum of 2 articles. Antennal articles 5–6 longer than articles 1–4. Maxillipedal palp wider than endite. Pereopod 1 ambulatory but stouter than pereopods 2–7; carpus with few spiniform setae; dactylus short, with 2 unequal claws, distal claw as long as dactylus. Pereopods 2–7 dactyli with 2 similar claws. Male pleopod 1 medial lobe distally flat, merging into lateral lobe elongated into copulatory horns. Male pleopod 2 stylet elongate, curved. Uropod shorter than pleotelson; exopod longer than peduncle; endopod 3 times as long as exopod.

Intertidal (interstitial). Temperate Northern Atlantic, Temperate Northern W Pacific (Mediterranean, Japan). 2 species (Bocquet and Lévi, 1955; Shimomura, 2005).

Microjanira Schiecke and Fresi, 1970

Diagnosis. Body flat, less than 3 times as long as wide. Front with broad, truncate rostrum projecting between antennulae. Blind, or eyes reduced to few ocelli. Antennula flagellum of 3 or 4 articles. Antennal articles 5–6 longer than articles 1–4; with scale. Maxillipedal palp wider than endite. Pereopod 1 ambulatory, carpus slender, with few setae. Pereopods 2–7 dactyli with lower claw smaller than upper claw. Male pleopod 1 not distolaterally expanded, tip bilobed. Uropod shorter than pleotelson, thin; endopod as long as peduncle, longer than exopod.

Intertidal, shelf (interstitial). Temperate Northern and Tropical Atlantic. 3 species (Hooker, 1985; Jaume, 1995; Schiecke and Fresi, 1970). *Trogloianiropsis* Jaume, 1995 is treated as a synonym of *Microjanira* here. Its only species has similar male pleopods and a similar rostrum.

Neojaera Nordenstam, 1933

Diagnosis. Body flat, at least 3.5 times as long as wide. Front without rostrum. Blind, or eyes reduced to few ocelli. Antennula flagellum of 2 or 3 articles. Antennal articles 5–6 longer than

articles 1–4. Maxillipedal palp narrower than endite, or as wide as endite. Pereopod 1 ambulatory, carpus slender, with few setae. Pereopods 2–7 dactyli with lower claw smaller than upper claw. Male pleopod 1 medial lobe rounded; lateral lobe sometimes prolonged; proximal region broad, rounded. Male pleopod 2 stylet much longer than peduncle, distally coiled. Uropod with squat peduncle immersed in pleotelson margin; rami narrow, longer than peduncle.

Intertidal–slope. Temperate South America, Temperate Southern Africa, Southern Ocean. 10 species (Kussakin and Vasina, 1984; Menzies, 1962; Wilson and Wägele, 1994).

Protocharon Chappuis, Delamare-Deboutteville and Paulian, 1956

Diagnosis. Body flat, 4 times as long as wide. Front without rostrum. Eyes reduced to few ocelli. Antennula flagellum of 3 or 4 articles. Antennal articles 5–6 as long as articles 2–3. Maxillipedal palp narrower than endite. Pereopod 1 ambulatory, carpus slender, with few setae. Pereopods 2–7 dactyli with 2 similar claws. Male pleopod 1 medial lobe rounded; lateral lobe slightly rounded. Uropod shorter than pleotelson, thin; endopod as long as peduncle, longer than exopod.

Intertidal marine, freshwater (interstitial). Tropical Atlantic, Western Indo-Pacific (Domincan Republic, Réunion). 2 species (Chappuis et al., 1956; Wagner, 1990: second species as Jehaia, junior synonym).

Rostrobagatus Müller, 1993

Diagnosis. Body flat, oval, twice as long as wide; coxa 1 and pereonites 2–4 projecting anteriorly. Front with rounded rostrum. Eyes reduced to few ocelli. Antennula flagellum of 4 articles. Antennal articles 5–6 longer than articles 1–4; with scale. Maxillipedal palp wider than endite. Pereopod 1 carposubchelate, carpus oval in female, swollen with strong marginal spines in male; propodus elongate, curved. Pereopods 2–7 dactyli with 2 similar claws. Male pleopod 1 medial lobe rounded; lateral lobe digitiform. Uropod about as long as or longer than pleotelson; rami elongate, longer than peduncle.

Subtidal (coral rubble). Tropical Atlantic (French Antilles). 1 species (Müller, 1993).

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Joeropsididae Nordenstam, 1933

Figure 3.16

The family Joeropsididae, particularly the genus *Joeropsis*, is distributed globally except in polar waters (Bruce, 2015; Just, 2001). *Joeropsis* is well represented in tropical coral reefs worldwide but has been reported from slope depths. The family is readily recognised, even in the field, by the compact body shape, with a characteristically robust and reflexed antenna (fig. 3.16d), and small, ventrolaterally inserted uropods with a large peduncle and tiny rami (fig. 3.16g). Many species are coloured with brown patches. Most individuals are less than 2 mm long and few species reach more than 5 mm long.

A single genus was known until Just (2001) erected two more for just three species from the continental slope of southeastern Australia.

Diagnosis. Body flat, longer than wide, robust; head with rostrum; anterior pereonites with sternal keels. Coxal plates absent. Pleon of 1 evenly-rounded segment. Anus not covered by pleopodal operculum. Antenna geniculate, peduncular article 6 and flagellum folding laterally and backwards under lateral expansion of peduncular article 5. Mandibular molar spiniform. Maxillipedal palp articles 1–5 narrow, less than half as wide as endite. Uropod inserted in terminal incision of pleotelson; rami minute.

Key to genera of Joeropsididae

1. Body lateral margins converging posteriorly (fig. 3.16c). Maxillipedal palp articles 2 and 3 widest distally, each with distomesial lobe (fig. 3.16f) ..... *Scaphojoeropsis*

– Body lateral margins straight (fig. 3.16a, b). Maxillipedal palp article 2 with distomesial lobe, not widest distally (fig. 3.16e) 2

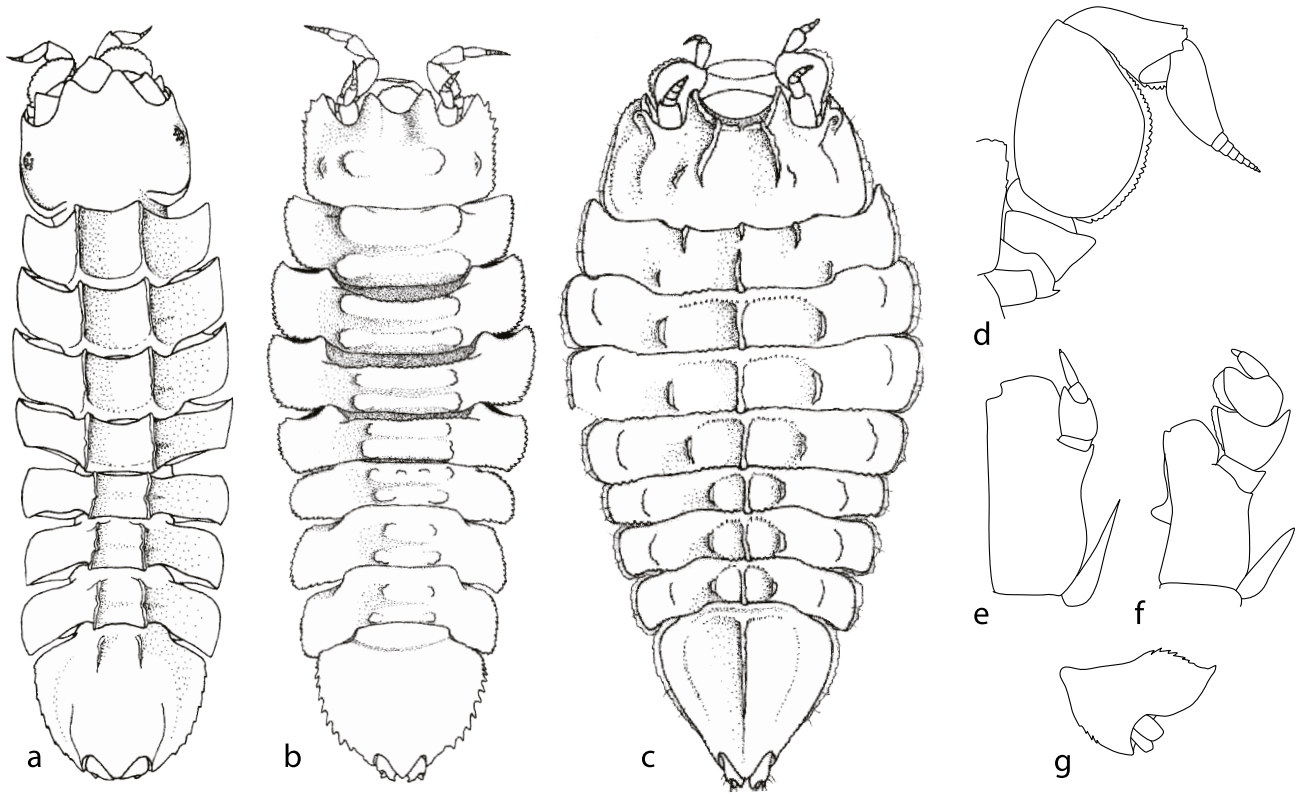

Figure 3.16. Joeropsididae. Dorsal views: a, *Joeropsis bicarinata* Just, 2001; b, *Rugojoeropsis rugosa* Just, 2001; c, *Scaphojoeropsis multicarinata* Just, 2001. Antenna: d, *Joeropsis*. Maxilliped: e, *Joeropsis*; f, *Scaphojoeropsis*. Uropod: g, *Joeropsis*.

2. Body dorsal surface coarsely granular and nodulose (fig. 3.16b) ..... *Rugojoeropsis*
– Body dorsal surfaces smooth or finely granular, with or without longitudinal carinae (fig. 3.16b) ..... *Joeropsis*

Joeropsis Koehler, 1885

Diagnosis. Body with subparallel margins, one or more of pereonites 2–4 occasionally slightly wider than pereonite 1, particularly in ovigerous females; cuticle smooth. Head without dorsal ornaments. Anterior margin between antennae not depressed; pseudorostrum in lateral view with apical projection. Eyes dorsolateral on bulges. Maxillipedal palp article 2 only with distomesial lobe, not widest distally.

Intertidal–slope (0–1408 m). Cosmopolitan. 81 species (Just, 2001: rediagnosis, list of species; Kensley and Schotte, 2002: key to 22 species from Indian Ocean; Bruce, 2015: rediagnosis, key to 10 species from Great Barrier Reef).

Rugojoeropsis Just, 2001

Diagnosis. Body with subparallel margins, one or more of pereonites 2–4 occasionally slightly wider than pereonite 1, particularly in ovigerous females; cuticle roughly calcified. Head with middorsal humps. Anterior margin between antennae not depressed; pseudorostrum in lateral view without lateral projection. Eyes dorsolateral on bulges. Maxillipedal palp article 2 only with distomesial lobe, not widest distally.

Slope (400–600 m). Temperate SE Australia. 1 species (Just, 2001).

Scaphojoeropsis Just, 2001

Diagnosis. Body fusiform, tapering from pereonites 2 or 3 to posterior of pleotelson; cuticle roughly calcified. Head with anterior and dorsal ridges. Anterior margin between antennae strongly depressed relative to dorsal face of head; pseudorostrum attached to depressed anterior margin of head, nearly vertical. Eyes absent. Maxillipedal palp articles 2 and 3 widest distally, each with distomesial lobe.

Shelf, slope (124–363 m). Temperate SE Australia. 2 species (Just, 2001).

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Katianiridae Svavarsson, 1987

Figure 3.17

Katianirids can be recognised by lateral pereonal lappets, the structure of the maxillipedal palp, by the chelate structure of pereopod 1, and by the antennula being larger than the antenna (Svavarsson, 1987). There are two genera whose few species occur in cold waters in polar regions or the moderately deep sea. The maximum length is around 2.5–3.0 mm.

Diagnosis. Body broad, flat; head frontal margin projecting forward; pereonites 2–4 with lateral projections. Pleon of 1 swollen segment angled dorsally to pereon. Anus covered by pleopodal operculum. Eyes absent. Antennula basal article directed anterodorsally; much shorter than head width. Antennal scale absent. Maxillipedal palp of 4 articles, 3 and 4 little narrower than article 2. Pereopod 1 chelate between dactylus and spine; pereopods 2–7 ambulatory; pereopod 4 coxa inserting on midlateral margin; pereopodal 2–7 dactyli with 1 unguis. Uropod inserting posterolaterally, comprising single long article.

Katianira Hansen, 1916

Diagnosis. Body without dorsal bumps. Pleotelson evenly rounded laterally (fig. 3.17a). Antennula article 1 linear, without lateral robust setae (fig. 3.17c).

Shelf, slope (74–1050 m). Arctic, Temperate Northern Atlantic, Temperate Northern W Pacific, Southern Ocean. 4 species, perhaps associated with sponges (Svavarsson, 1987: key to 4 species; Shimomura and Akiyama, 2006).

Natalianira Kensley, 1984

Diagnosis. Body dorsal surface with rows of bumps. Pleotelson with rounded lateral lobes (fig. 3.17b). Antennula article 1 enlarged, with lateral robust setae (fig. 3.17d).

Slope (550–850 m). Temperate Southern Africa. 1 species (Kensley, 1984).

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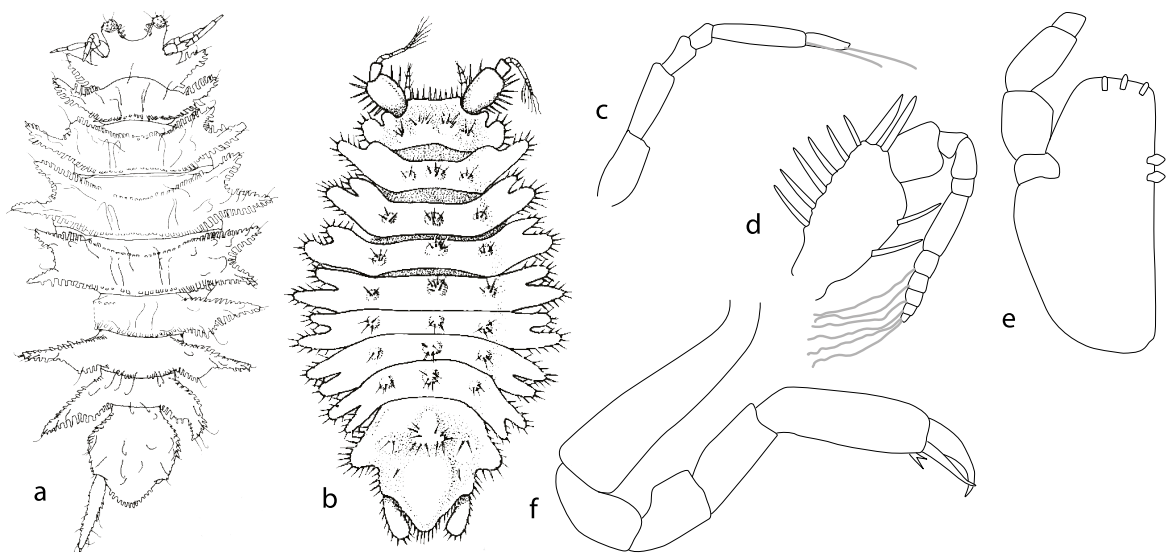

Figure 3.17. Katianiridae. Dorsal views: a, *Katianira bilobata* Gurjanova, 1930; b, *Natalianira spinosa* Kensley, 1984. Antennula: c, *Katianira*; d, *Natalianira*. Maxilliped: e, *Katianira*. Pereopod 1: f, *Katianira*.

Lepidocharontidae Galassi and Bruce *in* Galassi, Bruce, Fiasca and Dole-Olivier, 2016

Figure 3.18

Lepidocharontids include three genera of slender blind isopods from interstitial environments. While two genera are fully marine, the largest genus *Microcharon* comprises mostly species from fresh or brackish water in wells or caves, often far from the sea. Unlike other interstitial asellotes, they have large biramous uropods (Galassi et al., 2016).

Diagnosis. Body flat, slender, up to 10 times as long as wide; head without or with small rostrum; pereonites similar, rectangular, with subparallel margins. Pleon of 1 free pleonite plus pleotelson. Anus not covered by pleopodal operculum. Eyes absent. Antenna flagellum longer than peduncle; antennal scale present. Maxillipedal palp about as wide as endite. Pereopods 2–7 ambulatory, articulating dorsolaterally or laterally; pereopodal 2–7 dactyli with 2 claws. Uropod inserting ventrally, with long peduncle, with exopod articulating anteriorly and separately from endopod.

Key to genera of Lepidocharontidae

1. Pereonites 1–7 cylindrical. Pleonite 1 as wide as pereonite 7 (fig. 3.18c) ..... *Microcharon*
– Pereonites 1–7 dorsally flat, trapezoidal, except pereonite 4. Pleonite 1 narrower than pereonite 7 (fig. 3.18a, b) 2
2. Male pleopod 1 with transverse stylet-guiding grooves, unfolded; proximal posterolateral margins without scale-like elements (fig. 3.18d) ..... *Janinella*
– Male pleopod 1 with distal stylet-guiding grooves parallel to lateral margins, folded by hyaline lamella posteriorly; proximal lateral margins with scale-like elements (fig. 3.18e) ..... *Lepidocharon*

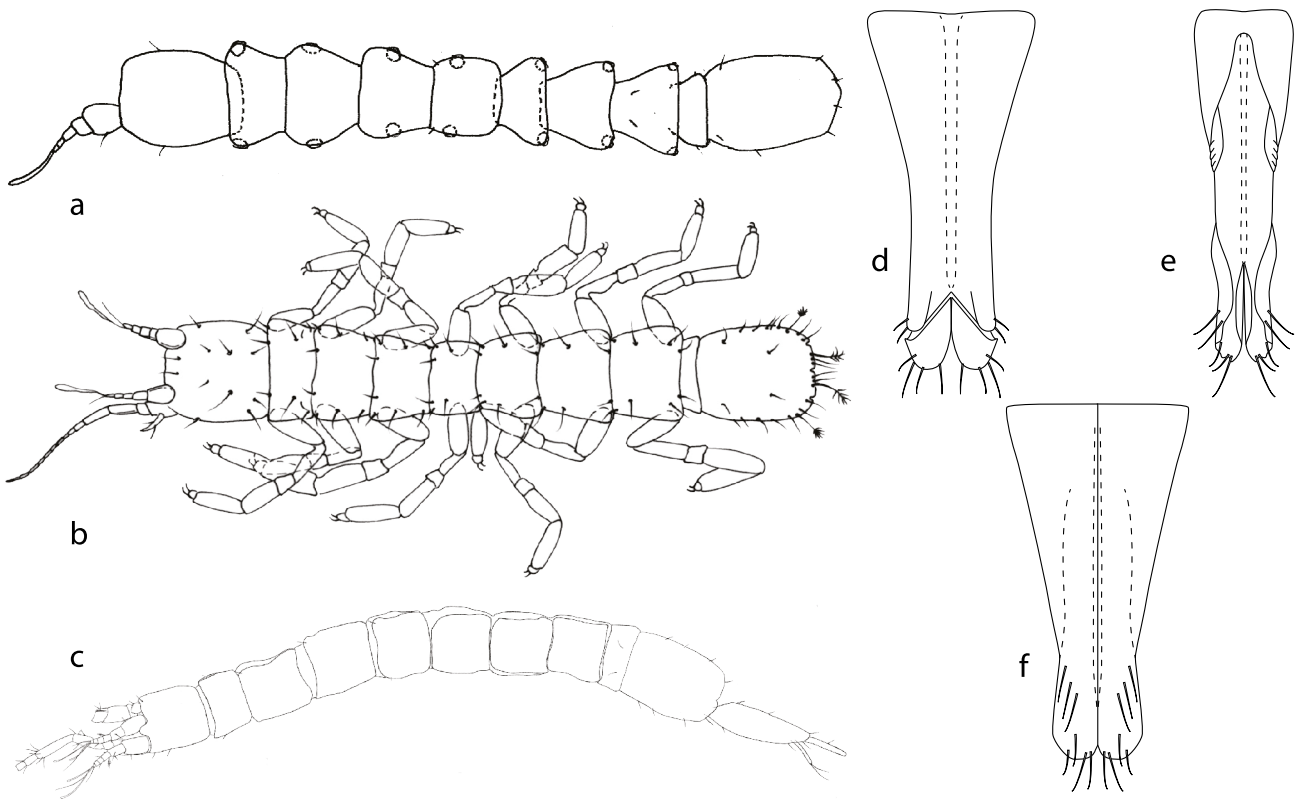

Figure 3.18. Lepidocharontidae. a, *Janinella brasiliensis* Albuquerque, Boulanouar and Coineau, 2014; b, *Lepidocharon lizardensis* Galassi and Bruce *in* Galassi, Bruce, Fiasca and Dole-Olivier, 2016; c, *Microcharon tanakai* Kim, Lee, and Karanovic, 2017. Male pleopod 1: d, *Janinella*; e, *Lepidocharon*; f, *Microcharon*.

Janinella Albuquerque, Boulanouar and Coineau, 2014

Diagnosis. Pereonites 1–7 dorsally flat, trapezoidal, except pereonite 4. Pleonite 1 narrower than pereonite 7. Male pleopod 1 with transverse stylet-guiding grooves, unfolded; proximal posterolateral margins without scale-like elements.

Intertidal, subtidal (interstitial). Tropical Atlantic (Brazil), Central Indo-Pacific (New Caledonia). 2 species (Albuquerque et al., 2014; Coineau, 1968). The genus name replaces *Paracharon* Coineau, 1970.

Lepidocharon Galassi and Bruce *in* Galassi, Bruce, Fiasca and Dole-Olivier, 2016

Diagnosis. Pereonites 1–7 dorsally flat, trapezoidal, except pereonite 4. Pleonite 1 narrower than pereonite 7. Male pleopod 1 with distal stylet-guiding grooves parallel to lateral margins, folded by hyaline lamella posteriorly; proximal lateral margins armed with scale-like elements.

Subtidal (4 m). Central Indo-Pacific (Great Barrier Reef, Australia). 2 species (Galassi et al., 2016).

Microcharon Boyko, 2024

Diagnosis. Pereonites 1–7 cylindrical. Pleonite 1 as wide as pereonite 7. Male pleopod 1 with distal stylet-guiding grooves parallel to lateral margins.

Freshwater and brackish wells, interstitial on beaches, in Europe, North Africa, Iran, New Caledonia and Caribbean. 66 species (Coineau, 1986: list of species with localities; Kim et al., 2017: rediagnosis, 1 marine species from Japan). Kensley (1984) characterised marine species of *Microcharon*. *Microcharon* Karaman, 1934 is an unavailable name (Boyko, 2024).

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Macrostylidae Hansen, 1916

Figure 3.19

Macrostylids are one of the commonest deep-water asellotes that emerge into shallower water in the Arctic and Antarctica. The only genus has many species, recognisable by the pereonites 1–3 forming a rectangular block, sometimes called a "fossosome", and the long uniramous uropods. Maximum length range 2.0–5.4 mm (Riehl and Brandt, 2013).

Diagnosis. Body slender, cylindrical; pereonites 1–3 more or less fused forming subrectangular section. Pleon of 1 segment. Anus not covered by pleopodal operculum. Eyes absent. Antennal scale absent. Mandible without palp. Maxillipedal palp articles 1–3 wider than distal articles, as wide or wider than endite. Pereopods 1–4 fossorial, with marginal robust setae; pereopod 4 coxa inserting on midlateral margin. Uropod uniramous, long.

Macrostylis G.O. Sars, 1864

Shelf–hadal (27–10730 m). Cosmopolitan in all ocean basins. 87 species (Menzies, 1962: key to 18 species; Riehl and Brandt, 2010: rediagnosis, synonymy of *Desmostylis* Brandt, 1992; Riehl and Brandt, 2013: key to 9 species from Southern Ocean; Bober et al., 2018: distributions of 86 species, key to 9 species of NW Pacific).

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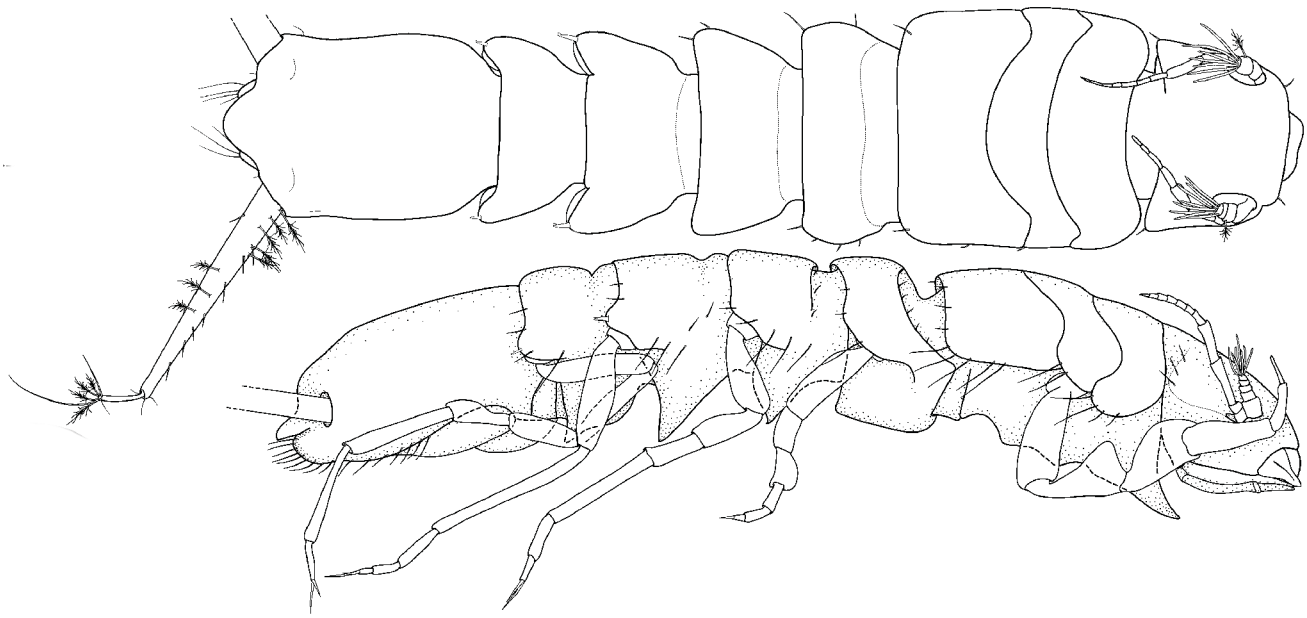

Figure 3.19. Macrostylidae, *Macrostylis scotti* Riehl and Brandt, 2013 (dorsal, lateral views).

Mesosignidae Schultz, 1969

Figure 3.20

Mesosignids are a family of highly decorated asellotes from deep oceanic basins and trenches but occur in shallower water in polar seas. The family comprised a single genus, *Mesosignum* (Menzies, 1962; Menzies and Frankenberg, 1967; Schultz, 1969) until George (2003) divided it into five genera based on the segmental pattern of lateral spines or lappets. Since then only two species have been described but neither was allocated to George's new genera (Choudhury and Brandt, 2004, 2006). Choudhury and Brandt (2004) listed all species as *Mesosignum* with distributions and depth ranges. Specimens range from 1.6 to 3.5 mm long.

Diagnosis. Body oval; pereonites 2–6 with 1 or 2 pairs of prominent lateral projections, often spinose. Pleon of 1 segment. Eyes absent. Antennula as long or longer than head width. Pereopods 1–7 ambulatory. Uropod uniramous, short.

Key to genera of Mesosignidae

1	Pleotelson without lateral spines and with spine or extension at posterolateral angles	2
–	Pleotelson with pronounced lateral spines or extensions plus spine or extension at posterolateral angles	4
2.	Pereonite 7 with prominent lateral spines or extensions (fig. 3.20b)	*Costasignum*
–	Pereonite 7 without lateral spine or extensions (fig. 3.20a, c–e)	3
3.	Head not more than twice as wide as long (fig. 3.20e)	*Mesosignum*
–	Head about 5 times as wide as long (fig. 3.20d)	*Kurilosignum*
4.	Pereonite 7 without prominent lateral extensions (fig. 3.20a)	*Bermudasignum*
–	Pereonite 7 with prominent lateral extensions (fig. 3.20c)	*Japanosignum*

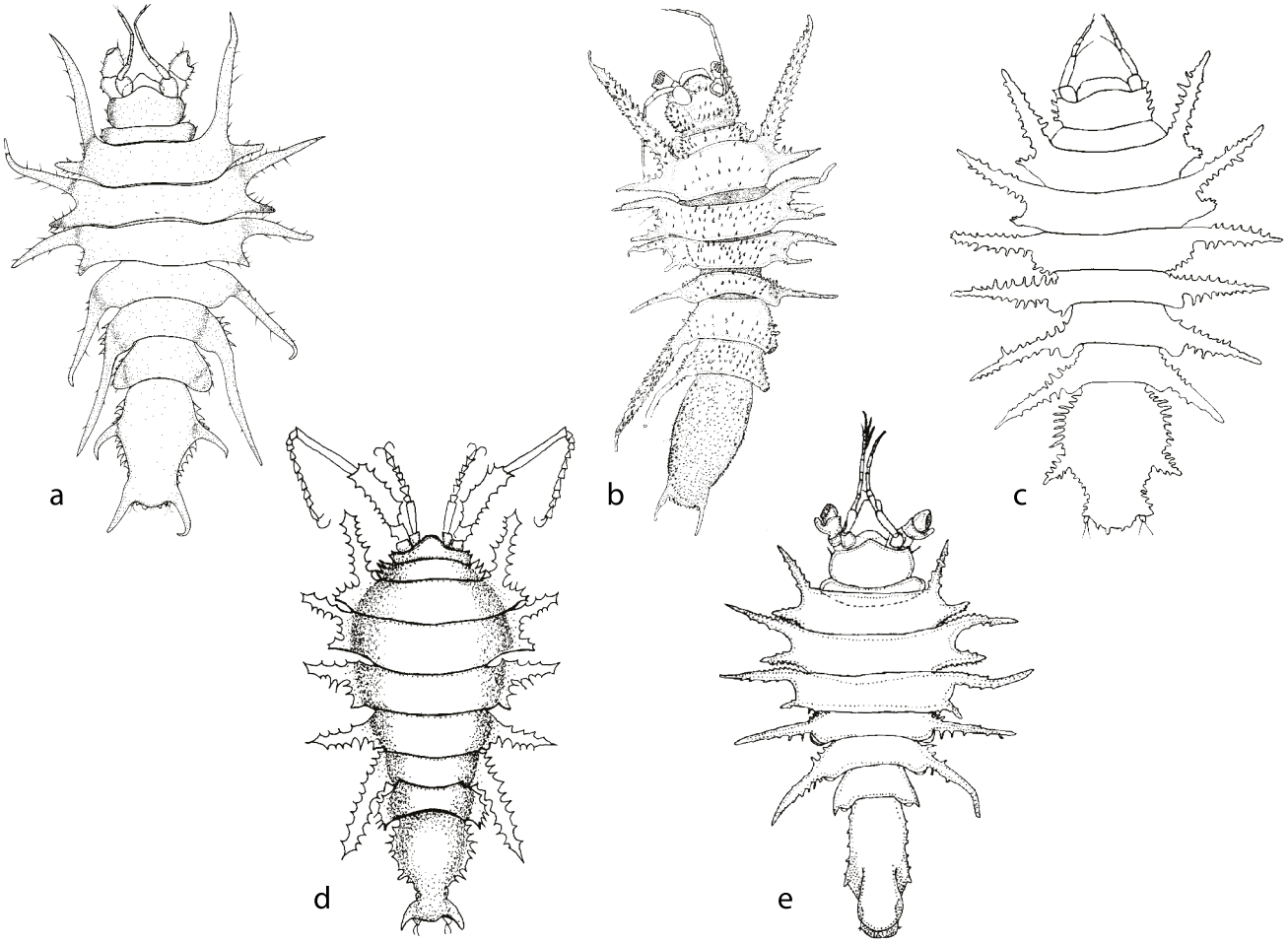

Figure 3.20. Mesosignidae. Dorsal views of type species: a, *Bermudasignum frankenbergi* George, 2003; b, *Costasignum macrum* (Menzies and Frankenberg, 1967); c, *Japanosignum elegantulum* (Birstein, 1963); d, *Kurilosignum latum* (Birstein, 1970); e, *Mesosignum kohleri* Menzies, 1962.

Bermudasignum George, 2003

Diagnosis. Head as wide as or twice as wide as long. Pereonite 7 without lateral spines or extensions. Pleotelson with pronounced lateral spine or extension plus spine or extension at posterolateral angle.

Slope–abyssal (1174–6354 m). GOODS bathyal provinces: N Atlantic, Cocos Plate, Nazca Plate. 4 species (George, 2003: diagnosis and description of type species).

Costasignum George, 2003

Diagnosis. Head as wide as or twice as wide as long. Pereonite 7 with prominent lateral spines or extensions. Pleotelson without lateral spine and with spine or extension at posterolateral angle.

Bathyal–hadal (3260–7954 m). GOODS bathyal provinces: Cocos Plate, W Pacific. 2 species (Menzies and Frankenberg, 1967: description and figure of type species; George, 2003: diagnosis).

Japanosignum George, 2003

Diagnosis. Head as wide as or twice as wide as long, with serrated lateral margin. Pereonite 7 with prominent lateral spines or extensions. Pleotelson with pronounced lateral spine or extension plus spine or extension at posterolateral angle.

Abyssal (4000–5670 m). GOODS bathyal provinces: Northern N Pacific, Antarctic, W Pacific. 3 species (Menzies and Frankenberg, 1967: description of type species; George, 2003: diagnosis)

Kurilosignum George, 2003

Diagnosis. Head about 5 times as wide as long, with convex front. Pereonite 7 without lateral spines or extensions. Pleotelson without lateral spine and with spine or extension at posterolateral angle.

Abyssal (5005–6135 m). GOODS bathyal provinces: Northern N Pacific. 1 species (Birstein, 1970: description of type species; George, 2003: diagnosis).

Mesosignum Menzies, 1962

Diagnosis. Head as wide as long. Pereonite 7 without lateral spines or extensions. Pleotelson without lateral spine and with spine or extension at posterolateral angle.

Slope–abyssal (1530–4925 m). GOODS bathyal provinces: Nazca Plate, Antarctic, Subantarctic. 7 species (Menzies and Frankenberg, 1967: diagnosis of genus s.l.; key to 11 species).

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Microparasellidae Karaman, 1934

Galassi et al. (2016) restricted Microparasellidae to a single genus of four tiny (< 2 mm long) interstitial species distinguished from similar families by the prominent acute or narrowly rounded rostrum and the unique uniramous and short uropods. All species are from freshwater caves and wells (Argano and Pesce, 1979).

Diagnosis. Body flat, slender, almost parallel-sided; head with rostrum; pereonites similar, margins with scales. Pleon of 1 free pleonite plus pleotelson. Anus not covered by pleopodal operculum. Eyes absent. Antenna flagellum shorter than peduncle; antennal scale absent. Maxillipedal palp about as wide as endite. Pereopods 2–7 ambulatory, articulating ventrally; pereopodal 2–7 dactlyi with 2 claws. Uropod uniramous, short.

Microparasellus Karaman, 1934

Freshwater wells and caves. Europe, Mediterranean coasts. 4 species (Coineau, 1986: list of species with distributions).

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Mictosomatidae Wolff, 1965

Figure 3.21

The tiny specimen of the only species of Mictosomatidae has been taken only once, on the slope south of Iceland. The narrow anterior "stalk" on pereonite 5 is diagnostic. Hansen's (1916) genus name *Schistosoma* was replaced by *Mictosoma* by Wolff (1965).

Diagnosis. Body slender, cylindrical; head frontal margin projecting forward; pereonites 1–4 with anterolateral projections; pereonite 5 narrowed anteriorly as short stalk. Pleon of 1 free pleonite plus pleotelson. Anus covered by pleopodal operculum. Eyes absent. Maxillipedal palp article 3 half as wide as article 2. Pereopods 2–7 ambulatory; pereopod 4 coxa inserting on midlateral margin; pereopodal 2–7 dactyli with 1 unguis. Uropod inserting posterolaterally, uniramous, rodlike. Maximum length 1.4 mm.

Figure 3.21. Mictosomatidae, *Mictosoma ramosum* (Hansen, 1916).

Mictosoma Wolff, 1965

Slope (1900 m). Temperate Northern Atlantic. 1 species (Hansen, 1916: description and figure of only species as *Schistosoma ramosum* Hansen, 1916; Wolff, 1965: family and genus names).

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Munnidae G.O. Sars, 1897

Figures 3.22, 3.23

Munnids are tiny asellotes, around 2 mm long, recognised by the pear-shaped pleotelson and the long spindly legs. Some genera are common inhabitants of shallow reefs and algal beds in temperate and polar waters, but others occur at much greater depths.

Diagnosis. Body subpyriform; head with prominent lateral processes. Pleon of 1 free pleonite plus pear-shaped pleotelson. Anus not covered by pleopodal operculum. Eyes on lateral process (if present). Maxillipedal palp articles 1–3 wider than distal articles. Pereopod 1 prehensile, subchelate or carpochelate in male; pereopods 2–7 ambulatory. Uropod absent or minute, without peduncle.

Key to genera of Munnidae

1. Front with pair of horns. Coxal plates not visible dorsally on pereonites 2–7, obscured by lateral pereonal spikes (fig. 3.22a–c) 2
– Front rounded or truncate. Coxal plates visible dorsally on pereonites 2–7 (fig. 3.22d–f) 3
2. Eyes present (fig. 3.22a, c). Pereopod 1 of male carpochelate, carpus produced distally (fig. 3.23a). Antennular flagellum last article elongate, with 1 aesthetasc ..... *Astrurus*
– Eyes absent (fig. 3.22c). Pereopod 1 of male subchelate, carpus not produced distally. Antennular flagellum last article minute, penultimate article, both with 1 aesthetasc (fig. 3.23e) ..... *Echinomunna*
3. Body with numerous dorsal setae and often with articulating robust setae on head, pleon, pleopods 1 and 2 (fig. 3.22d). Antennular flagellum last article minute, last and penultimate article both with 1 aesthetasc (fig. 3.23e) ..... *Munna*
– Body smooth, with few setae, without articulating robust setae (fig. 3.22e–g). Antennular flagellum last article elongate, with 1 aesthetasc, or of 6 articles (fig. 3.23f, g) 4
4. Eyes absent (fig. 3.22g). Antennular flagellum of 6 articles (fig. 3.23g). Mandibular palp reaching beyond incisor (fig. 3.23j) ..... *Zoromunna*
– Eyes present (fig. 3.22e, f). Antennular flagellum last article last article elongate, with 1 aesthetasc (fig. 3.23f). Mandibular palp not reaching incisor (fig. 3.23h) 5
5. Pereopod 1 of male short, robust; carpus triangular; propodus oval, bearing strong distal horn-like process; palm with row of many sharp teeth; dactylus long, slender, pointed (fig. 3.23c). Mandibular molar elongate, with several small teeth in distal half (fig. 3.23i) ..... *Salvatiella*
– Pereopod 1 not sexually dimorphic, symmetrical, small (fig. 3.23d). Mandibular molar strong, subcylindrical, truncate ..... *Uromunna*

Astrurus Beddard, 1886

Diagnosis. Body with dorsal scattered or clustered robust setae; coxal plates not visible dorsally, obscured by lateral spikes on pereonites 1–7; front with pair of horns; eyes present. Antennular flagellum last article elongate, with 1 aesthetasc. Mandibular molar subcylindrical; palp reaching beyond incisor. Pereopod 1 of male carpochelate; carpus produced distally.

Shelf, slope (141–385 m). Southern Ocean (Kergulen I., Davis Strait). 2 species (Beddard, 1886; Vanhöffen, 1914). The two species differ remarkably.

Echinomunna Vanhöffen, 1914

Diagnosis. Pereonites 1–6 with transverse rows of long spines; all pereonites, pleotelson with lateral spines; coxal plates not

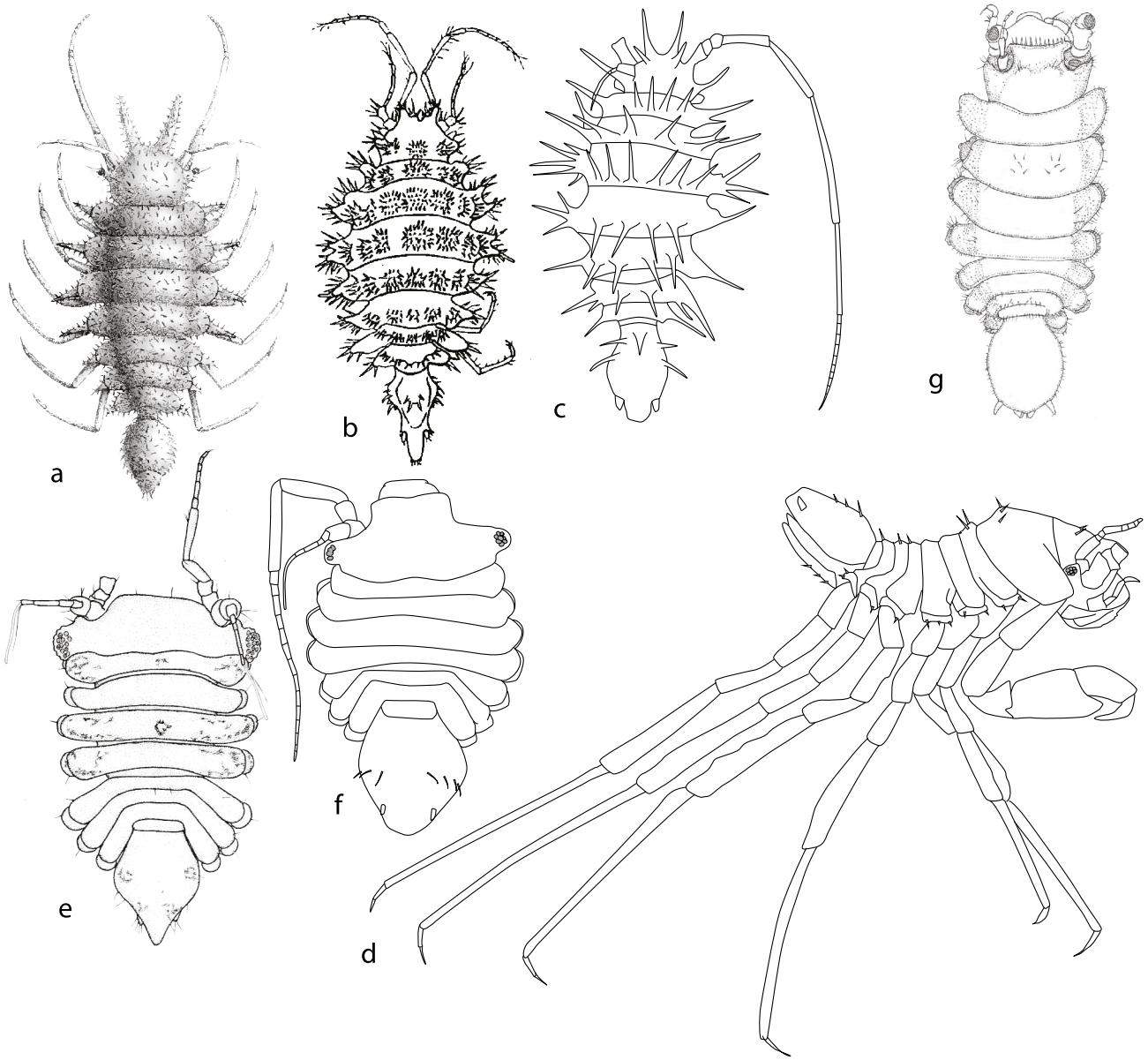

Figure 3.22. Munnidae. a, *Astrurus crucicauda* Beddard, 1886; b, *Astrurus ornatus* Vanhöffen, 1914; c, *Echinomunna horrida* Vanhöffen, 1914; d, *Munna spicata* Teodorczyk and Wägele, 1994; e, *Salvatiella polynesica* Müller, 1990; f, *Uromunna humei* Poore, 1984; g, *Zoromunna setifrons* Menzies and George, 1972.

visible dorsally, obscured by lateral spikes on pereonites 1–7; front with pair of horns; eyes absent. Antennular flagellum last article minute, penultimate article, both with 1 aesthetasc. Mandibular molar subcylindrical; palp reaching beyond incisor. Pereopod 1 subchelate, carpus not produced.

Slope (385 m). Southern Ocean. 2 species (Kensley, 1976; Vanhöffen, 1914).

Munna Krøyer, 1839

Diagnosis. Body with numerous dorsal setae and often with articulating robust setae on head, pleon, pleopods 1 and 2; coxal plates visible dorsally on pereonites 2–7; front rounded; eyes present. Antennular flagellum last article minute, penultimate article, both with 1 aesthetasc. Mandibular molar strong, subcylindrical, truncate, with accessory seta; palp reaching beyond incisor. Pereopod 1 sexually dimorphic; of male usually enlarged, sometimes massive, sometimes carpochelate, or subchelate, carpus not produced. Pereopod 2 not or barely sexually dimorphic.

Intertidal, subtidal. Arctic, Temperate Northern Atlantic, Temperate Northern Pacific, Temperate Northern W Pacific, Western Indo-Pacific, Temperate South America, Temperate Southern Africa, Temperate Australasia, Southern Ocean. 80

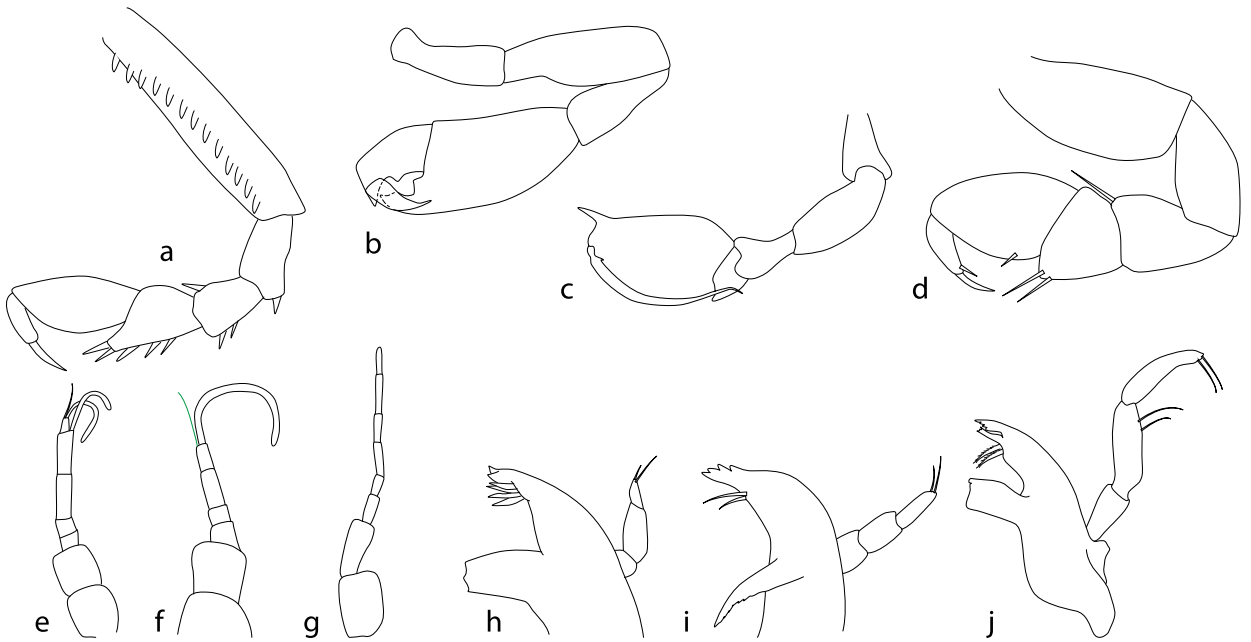

Figure 3.23. Munnidae. Male pereopod 1: a, *Astrurus*; b, *Munna*; c, *Salvatiella*; d, *Uromunna*. Antennula: e, *Munna*; f, *Uromunna*; g, *Zoromunna*. Mandible: h, *Uromunna*; i, *Salvatiella*; j, *Zoromunna*.

species (Kussakin, 1962: key to 63 species [in Russian]; Kussakin, 1972: notes on 9 species; Poore, 1984: rediagnosis, list of species, key to 2 Australian species; Teodorczyk and Wägele, 1994: key to 33 Antarctic and subantarctic species, descriptions of several species, discussion of genus).

Salvatiella Müller, 1990

Diagnosis. Body smooth, with few setae, without articulating robust setae; coxal plates visible dorsally on pereonites 2–7; front rounded; eyes present. Antennular flagellum last article elongate, with 1 aesthetasc. Mandibular molar elongate, with several small teeth in distal half; palp not exceeding incisor. Pereopod 1 of male short, robust; carpus triangular; propodus oval, bearing strong distal horn-like process; palm with row of many sharp teeth; dactylus long, slender, pointed.

Subtidal (dead coral, sponges). Western Indo-Pacific (French Polynesia, Easter I.) 2 species (Kensley, 2003; Müller, 1990).

Uromunna Menzies, 1962

Diagnosis. Body smooth, with few setae, without articulating robust setae; coxal plates visible dorsally on pereonites 2–7; front rounded; eyes present. Antennular flagellum last article elongate, with 1 aesthetasc. Mandibular molar strong, subcylindrical, truncate, without accessory seta; palp not exceeding incisor. Pereopod 1 not sexually dimorphic, symmetrical, small. Pereopod 2 sexually dimorphic; carpus and propodus of male broadened.

Intertidal, subtidal. Tropical Atlantic, Temperate Northern Pacific, Western Indo-Pacific, Temperate South America, Temperate Southern Africa, Temperate Australasia. 29 species (Poore, 1984: rediagnosis, list of species, key to 3 Australian species).

Zoromunna Menzies and George, 1972

Diagnosis. Body smooth, with few setae, without articulating robust setae; coxal plates visible dorsally on pereonites 2–7; front truncate, with row of short setae; eyes absent. Antennular flagellum of 6 articles. Mandibular molar subcylindrical; palp reaching beyond incisor.

Abyssal (5986–6134 m). GOODS bathyal provinces: Nazca Plate (Peru-Chile Trench). 1 species (Menzies and George, 1972).

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Munnopsidae Lilljeborg, 1864

Figures 3.24–3.32

Munnopsidae (or less frequently Munnopsididae) are a diverse group of asellote isopods important in the deep sea (Wilson and Hessler, 1987). Munnopsidae is the largest family of Asellota but many species remain undescribed (e.g. Malyutina and Brandt, 2015, 2018). Munnopsids live digging below the seafloor surface (e.g. *Ilyarachna*), epibenthic on the seafloor (e.g., *Munnopsurus*, *Vanhoeffenura*), holopelagic in the water column (e.g. *Acanthamunnopsis*, *Paramunnopsis* and some species of *Munneurycope*), or benthopelagic both on the seafloor and in the water column (e.g. *Munnopsoides*, *Paropsurus*, *Rectisura*) (Hessler and Strömberg, 1989; Jamieson et al., 2012; Osborn, 2009). Munnopsids may be benthic scavengers or predators on foraminiferans (Gudmundsson et al., 2000; Svavarsson et al., 1993). This ecological diversity is reflected in high levels of morphological variation. They have in common, unlike other asellotes, paddle-like posterior pereopods specialised for swimming, but a small number of genera are not modified in this way. Few are associated with hydrothermal vents (Malyutina and Golovan, 2022). The maximum size of munnopsids varies; many species are typically a few millimetres (3–10 mm) long but *Eurycope magna* Birstein, 1963 reaches 40 mm long.

The taxonomy of Munnopsidae was established by Kussakin (2003) in a large work in Russian. His substantial revision and key to subfamilies, genera and species concentrated on the Northern Hemisphere fauna. Relationships between the many genera and subfamilies was attempted using morphological characters (Merrin, 2007) but her suggestion that the family could be divided into smaller families has not been followed. A hypothetical tree of the Munnopsidae compiled from previous phylogenetic analyses and suggested relationships based on morphological similarity was summarised by Osborn (2009). Munnopsidae are certainly monophyletic on morphological and molecular grounds (Osborn, 2009). Her finding that not all subfamilies are monophyletic and not all genera can be placed confidently corroborated earlier opinions (Kussakin, 2003; Malyutina and Brandt, 2007).

This family diagnosis is abbreviated from earlier diagnoses (Kussakin, 2003; Wilson et al., 1989; Wolff, 1962). Nine subfamilies are recognised, but four genera appear not to fall into any of them. Keys are provided for subfamilies with more than two genera.

Diagnosis. Body oval; pereonites 1–4 (ambulosome) differentiated from pereonites 5–7 and pleon (collectively natasome). Pleon more or less semicircular, without free pleonites. Eyes absent. Maxillipedal palp articles 1–3 wider than distal articles. Pereopods 5, 6, sometimes 7, usually oar-shaped, carpus and propodus expanded, with margins bearing long plumose setae.

Key to subfamilies and unaligned genera of Munnopsidae

1.	Rostrum present (fig. 3.24d–k)	Eurycopinae
–	Rostrum absent	2
2.	Pereopods 5–7 without dactyli (fig. 3.31i, m). Uropod terminal or slightly ventral, uniramous (fig. 3.27)	Munnopsinae
–	Pereopods 5–7 with dactyli (rarely rudimentary on pereopod 5) (fig. 3.31b, d, e, k, l). Uropod ventral, uniramous or biramous	3
3.	Body smooth or setose dorsally and laterally, without spines	4
–	Body with strong dorsal and lateral spines	12
4.	Head hidden dorsally by anterior flange of pereonite 1 (fig. 3.29c, d)	*Microcope*
–	Head visible dorsally	5
5.	Mandible short, thick, with blunt incisor, with reduced molar process (fig. 3.30l, n). Head usually wider than anterior pereonites. Pereopods 3, 4 bases much shorter than pereopod 2 basis (figs 3.24a–d, 3.25)	Ilyarachninae

– Mandible typical, rarely reduced. Head usually about as wide as already anterior pereonites. Pereopods 3, 4 bases elongate, rarely slightly shorter than pereopod 2 basis 6

6. Antennula inserted on anterior margin; article 1 cylindrical, shorter than article 2. Pleotelson elongate, 1.3 or more times as long as wide (fig. 3.28n–q). Pereopods 5–7 natatory, but with narrow carpi- and propodi; dactyli strong, long, more than half as long as propodi, with apical setae and 1 or 2 claws (fig. 3.31t) ..... Syneurycopinae

– Antennula dorsal; article 1 wide, much larger than article 2. Pleotelson swollen or typical, less than 1.5 times as long as wide. Pereopods 5, 6 and usually 7 natatory, with broad carpi and propodi; dactyli small, less than half as long as propodi, without apical setae and claws 7

7. Pereonites 5–7 and pleotelson large, swollen, as high as wide. Antennulae inserted between antennae. Pereopod 1 slender, basis 3 times as long as those of pereopods 2–4 ..... Bathyopsurinae

– Pereonites 5–7 and pleotelson more or less flattened, not as high as wide. Antennulae inserted above/behind antennae. Pereopods 1–4 bases of similar lengths; first not especially elongate 8

8. Pereonite 7 strongly reduced, much shorter than more anterior natasome pereonites, or absent. Pereopod 7 simple walking leg or absent (fig. 3.26e–l) ..... Lipomerinae

– Pereonite 7 shorter or longer than more anterior natasome pereonites. Pereopod 7 natatory 9

9. Mandibular molar strong, rounded, with 1 or 2 bundles of small setae (fig. 3.30m) ..... *Munnopsurus*

– Mandibular molar cylindrical, truncate 10

10. Pleotelson more or less triangular, strongly tapering posteriorly (fig. 3.24c). Uropod peduncle strong, not cylindrical, tapering; biramous, rami attached laterally (fig. 3.32a) ..... Betamorphinae

– Pleotelson posterior margin rounded or truncate. Uropod peduncle cylindrical, biramous, rami attached distally 11

11. Pleotelson posterior margin rounded. Pereopod 1 basis little longer than bases of pereopods 2–4 (fig. 3.29e, f) ..... *Munneurycope*

– Pleotelson posterior margin truncate with medial notch including anus and uropods. Pereopod 1 basis twice as long as bases of pereopods 2–4 (fig. 3.29a, b) ..... *Gurjanopsis*

12. Pereopods 5–7 bases shorter than pereopod 4 basis (fig. 3.24a, b). Uropod usually uniramous, rarely with rudimentary exopod ..... Acanthocopinae ... *Acanthocope*

– Pereopods 5–7 bases of similar lengths. Uropod biramous (fig. 3.28a–m) ..... Storthyngurinae

Subfamily Acanthocopinae Wolff, 1962

The subfamily was introduced by Wolff (1962) and its only genus reviewed by Malyutina et al. (2018).

Diagnosis. Body with natasome differentiated, with strong dorsal and lateral spines; rostrum absent. Pereonites 5–7 dorsally fused; pleotelson suboval, fused to all natasome segments, with 2 pairs of lateral and 1 long terminal spine. Antennulae dorsal; article 1 wide, much larger than article 2. Pereopods 3, 4 bases elongate, about as long as pereopod 2 basis; pereopods 5–7 natatory, with broad carpi and propodi; bases shorter than pereopod 4 basis; dactyli small, less than half as long as propodi, without apical setae and claws. Uropod ventral, usually uniramous, rarely with rudimentary exopod (fig. 3.24a, b).

Acanthocope Beddard, 1885

Bathyal, abyssal (2149–5778 m). GOODS bathyal provinces: Northern N Atlantic, Northern N Pacific, N Atlantic, SE Pacific Ridges, Cocos Plate, Nazca Plate, Antarctic, Indian, W Pacific, S Atlantic (almost cosmopolitan). 18 species (Malyutina et al., 2018: rediagnosis, key to species, distributions).

Subfamily Bathyopsurinae Wolff, 1962

The subfamily was introduced by Wolff (1962).

Diagnosis. Body with enlarged natasome, 3 times as long as anterior segments; rostrum absent. Pereonites 5–7 with complete dorsal articulation; pleotelson huge. Antennulae dorsal, inserted between antennae; article 1 broad. Mandibular molar absent or vestigial. Pereopods 2–4 bases similar; pereopod 1 slender, basis 3 times as long as more posterior pereopods; pereopods 5, 6 natatory, with broad carpi and propodi; pereopod 7 smaller than 5 and 6. Uropod ventrolateral, minute, biramous, or absent.

Bathyopsurus Nordenstam, 1955

Diagnosis. Maxilliped palp article 3 with mesial margin as long as lateral margin; article 4 elongate, much narrower than article 3; epipod short, rounded (fig. 3.32p). Pereopod 7 basis less than half as long and wide as pereopods 5, 6 bases.

Abyssal, hadal (4400–7900 m). GOODS bathyal provinces: N Atlantic, New Zealand Kermadec. 3 species (Nordenstam, 1955; Wolff, 1962: rediagnosis, key to 2 species; Brandt et al., 2025).

Paropsurus Wolff, 1962

Diagnosis. Maxilliped palp article 3 with mesial margin longer than lateral margin; article 4 oval or triangular, at least half as wide as article 3; epipod diamond-shaped (fig. 3.32q). Pereopod 7 basis almost as long and wide as pereopods 5, 6 bases.

Bathyal, abyssal (1957–3570 m). GOODS bathyal provinces: Cocos Plate, W Pacific. 2 species (Wolff, 1962: rediagnosis, key to 2 species).

Subfamily Betamorphinae Kussakin, 2003

Wilson and Thistle (1985) reviewed the subfamily.

Diagnosis. Body smooth or setose dorsally and laterally, without spines; natasome segments free; head narrower than anterior pereonites; rostrum absent. Pereonites 5–7 with complete dorsal articulation; pleotelson less than 1.5 times as long as wide. Antennulae dorsal; article 1 wide, much larger than article 2. Pereopods 3, 4 bases elongate, about as long as pereopod 2 basis; pereopods 5–7 natatory, with broad carpi and propodi; dactyli small, less than half as long as propodi, without apical setae and claws. Uropod ventral, strong, not cylindrical, tapering; biramous, rami attached proximolaterally (fig. 3.24c).

Amuletta Wilson and Thistle, 1985

Diagnosis. Mandibular palp absent (fig. 3.30f). Uropod peduncle with distomesial lobe, with 2 subdistal similar rami (fig. 3.32a).

Bathyal, abyssal (2397–4829 m). GOODS bathyal provinces: Northern N Atlantic. 1 species (Wilson and Thistle, 1985).

Betamorpha Hessler and Thistle, 1975

Diagnosis. Mandibular palp present (fig. 3.30i). Uropod peduncle narrow, with 2 proximal rami, endopod longer than exopod (fig. 3.32e).

Slope–hadal (587–8400 m). GOODS bathyal provinces: Northern N Pacific, N Atlantic, S Atlantic. 10 species (Hessler and Thistle, 1975; Thistle and Hessler, 1977: rediagnosis, key to 7 species).

Subfamily Eurycopinae Hansen, 1916

Eurycope, type genus of Eurycopinae (formerly Eurycopidae) was reviewed by several authors including Wilson and Hessler (1980, 1981), who erected three new genera, and Malyutina and Brandt (2006), who erected another. Malyutina and Brandt (2006) compared in a table and by illustration features of six genera and groups of *Eurycope*. This subfamily diagnosis and key are based on their table and key to six genera.

Diagnosis. Body smooth or setose dorsally and laterally, without spines; rostrum present. Pereonites 5–7 free or fused dorsally; pleotelson less than 1.5 times as long as wide. Antennulae dorsal; article 1 wide, much larger than article 2. Mandibular palp 3-articulate, article 3 twisted. Pereopods 3, 4 bases elongate, about as long as pereopod 2 basis; pereopods 5–7 natatory, with broad carpi and propodi; dactyli small, less than half as long as propodi, without apical setae and claws. Uropod ventral, biramous, with short peduncle, exopod usually shorter than endopod (fig. 3.24d–k).

Key to the genera of Eurycopinae

1. Pereopod 2 ischium longer than basis (fig. 3.31j) ..... *Pirinectes*
– Pereopod 2 ischium shorter than basis 2
2. Pleotelson posterior margin with outer rim projecting dorsally and ventrally. Uropod peduncle bent at midlength, both margins angled (fig. 3.32u). Cuticle strongly calcified, mat. Body highest at head ..... *Dubinectes*
– Pleotelson posterior margin simple, projecting ventrally only. Uropod peduncle with straight lateral margin (fig. 3.32d, g, h). Cuticle thin, glossy. Body highest at natasome 3
3. Pereonites 5 and 6 with complete dorsal articulation (fig. 3.24d, e). Antennula article 1 with produced distomesial lobe (fig. 3.30a) 4
– Pereonites 5 and 6 without complete dorsal articulation (fig. 3.24f–k). Antennula article 1 with reduced distomesial lobe (fig. 3.30b, c) 5

4. Male pleopod 2 stylet reflexed, overreaching distal margin of endopod (fig. 3.32s) ..... *Eurycope*

– Male pleopod 2 stylet barely emerging from endopod margin (fig. 3.32t) ..... *Munnicope*

5. Pereonite 6 dorsally fused with pereonite 7. Rostrum without distinct margins (fig. 3.24f, g). Mandibular molar thick, condyle longer than molar (fig. 3.30h). Maxilliped epipod truncate (fig. 3.32o) ..... *Baeonectes*

– Pereonite 7 separated from pereonite 6 by dorsal suture. Rostrum with lateral margins (fig. 3.24h–k). Mandibular molar narrow, condyle shorter than molar. Maxilliped epipod elongate, with acute tip (fig. 3.30p) 6

6. Pereonite 7 much shorter than pereonite 6. Pereonites 5–7 compressed dorsally. Pereonite 6 bulging ventrally (fig. 3.24j, k) ..... *Tytthocope*

– Pereonite 7 subequal to pereonite 6 in lateral length. Pereonites 5–7 convex dorsally. Pereonite 5 bulging ventrally 7

7. Body broad (fig. 3.24i). Pereonite 5 bulging anteroventrally. Uropodal exopod as long as or longer than endopod (fig. 3.32g) ..... *Disconectes*

– Body elongate (fig. 3.24h). Pereonite 5 bulging posteroventrally. Uropod exopod much smaller than endopod (fig. 3.32d) ..... *Belonectes*

Baeonectes Wilson, 1982

Diagnosis. Body broad, highest at natasome; cuticle thin, glossy; rostrum without distinct margins. Pereonites 5–7 convex dorsally, not bulging ventrally; 5–7 dorsally fused. Antennular article 1 without mesial spine, distolateral lobe subrectangular, distally truncate. Mandibular molar thick, condyle longer than molar. Maxilliped epipod truncate, broad. Pereopod 2 ischium shorter than basis. Uropod peduncle with straight lateral margin.

Shelf, slope (9–787 m). Temperate Northern Atlantic, Temperate Northern Pacific. 7 species (Wilson, 1982b; Malyutina and Golovan, 2010: rediagnosis, species list; Malyutina et al., 2013).

Belonectes Wilson and Hessler, 1981

Diagnosis. Body elongate, highest at natasome; cuticle thin, glossy; rostrum with lateral margins. Pereonites 5–7 convex dorsally; pereonite 5 bulging posteroventrally; pereonite 7 lateral length as long as pereonite 6; 5, 6 without complete dorsal articulation; pereonite 7 separated by dorsal suture from pereonite 6. Antennular article 1 without mesial spine, distolateral lobe subrectangular, distally truncate. Mandibular molar narrow, condyle shorter than molar. Maxilliped epipod narrow, with acute tip. Pereopod 2 ischium shorter than basis. Uropod peduncle with straight lateral margin; exopod much smaller than endopod.

Slope–abyssal (1227–4382 m). GOODS bathyal provinces: Northern N Atlantic, Antarctic, W Pacific. 5 species (Wilson and Hessler, 1981; Malyutina and Brandt, 2009: rediagnosis, key to species).

Disconectes Wilson and Hessler, 1981

Diagnosis. Body broad, highest at natasome; cuticle thin, glossy; rostrum with lateral margins. Pereonites 5–7 convex dorsally; pereonite 5 bulging anteroventrally; pereonite 7 lateral length as long as pereonite 6; 5, 6 without complete dorsal articulation; pereonite 7 separated by dorsal suture from pereonite 6. Antennular article 1 without mesial spine, distolateral lobe subrectangular, distally truncate. Mandibular molar narrow, condyle shorter than molar. Maxilliped epipod narrow, with acute tip. Pereopod 2 ischium shorter than basis. Uropod peduncle with straight lateral margin; exopod as long or longer than endopod.

Shelf–hadal (15–7934 m). Temperate Northern Atlantic. GOODS bathyal provinces: Northern N Atlantic, Northern N Pacific, New Zealand/Kermadec, Nazca Plate, Antarctic, S Atlantic. 13 species (Wilson and Hessler, 1981: species list).

Dubinectes Malyutina and Brandt, 2006

Diagnosis. Body highest at head; cuticle strongly calcified, mat; rostrum long, robust. Pereonites 5–7 with complete dorsal articulation; pleotelson posterior margin with outer rim projecting dorsally and ventrally. Antennular article 1 triangular. Mandibular molar thick, condyle longer than molar. Maxilliped epipod truncate, broad. Pereopod 2 ischium shorter than basis. Uropod peduncle bent at midlength, both margins angled.

Slope–abyssal (1121–4960 m). GOODS bathyal provinces: Antarctic, S Atlantic. 5 species (Malyutina and Brandt, 2006: tabulation of generic characters).

Eurycope G.O. Sars, 1864

Diagnosis. Body broad, highest at natasome; cuticle thin, glossy; rostrum with lateral margins. Pereonites 5–7 convex dorsally, not bulging ventrally; 5–7 with complete dorsal articulation. Antennular article 1 with produced distomesial lobe. Mandibular molar thick, condyle longer than molar. Maxilliped epipod produced distally, laterally convex. Pereopod 2 ischium shorter than basis. Male pleopod 2 stylet reflexed, overreaching distal margin of endopod. Uropod peduncle with straight lateral margin.

Shelf–hadal (46–7230 m). Cosmopolitan. 53 species (Wilson and Hessler, 1981: list of species; Wilson, 1982a: rediagnosis, revison of *E. complanata* species complex)

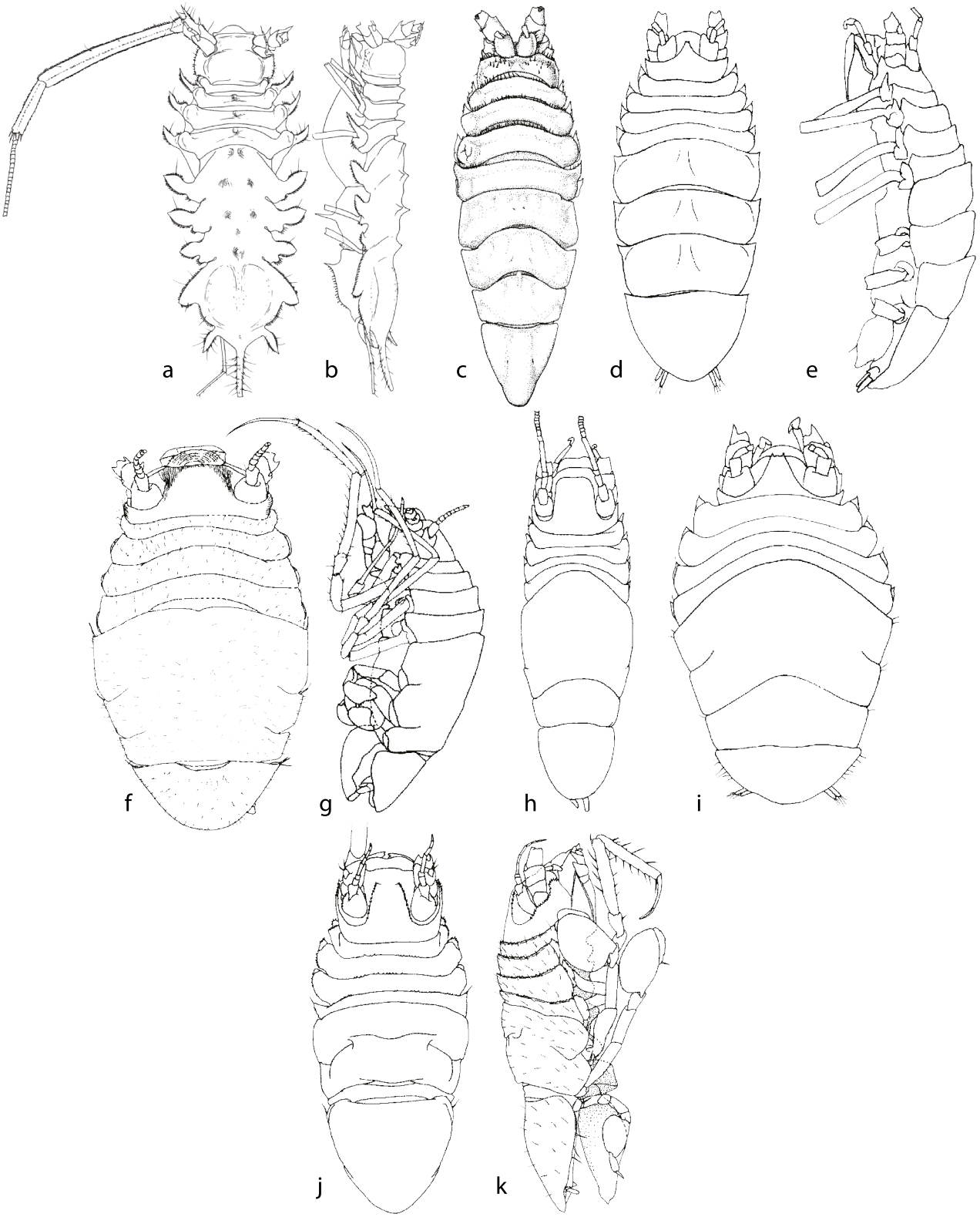

Figure 3.24. Munnopsidae. Dorsal and lateral views. Acanthocopinae: a, b, *Acanthocope puertoricana* Malyutina, Frutos and Brandt, 2018. Betamorphinae: c, *Amuletta abyssorum* (Richardson, 1911). Eurycopinae: d, e, *Eurycope cornuta* G.O Sars, 1864; f, g, *Baeonectes improvisus* Wilson, 1982; h, *Belonectes* sp.; i, *Disconectes* sp.; j, k, *Tytthocope megalura* (G.O. Sars, 1872).

Munnicope Menzies and George, 1972

Diagnosis. Body broad, highest at natasome; cuticle thin, glossy; rostrum with lateral margins. Pereonites 5–7 convex dorsally, not bulging ventrally; 5–7 with complete dorsal articulation. Antennular article 1 with produced distomesial lobe. Mandibular molar thick, condyle longer than molar. Maxilliped epipod produced distally, laterally convex. Pereopod 2 ischium shorter than basis. Male pleopod 2 stylet barely emerging from endopod margin.

Bathyal–hadal (2486–8100 m). GOODS bathyal provinces: Northern N Pacific, Cocos Plate, Nazca Plate. 6 species (Menzies and George, 1972; Malyutina, 2025).

Pirinectes Malyutina and Brix *in* Malyutina, Kihara and Brix, 2020

Diagnosis. Body broad, highest at natasome; cuticle thin, glossy; rostrum with rounded margin. Pereonites 5–7 convex dorsally, not bulging ventrally; 5, 6 without complete dorsal articulation; pereonite 7 separated by dorsal suture from pereonite 6. Antennular article 1 without distomesial lobe, article 3 not shorter than article 2. Mandibular molar thick, condyle longer than molar. Maxilliped oval. Pereopod 2 ischium longer than basis. Uropod peduncle with straight lateral margin; exopod much smaller than endopod.

Abyssal (4122–5019m). GOODS bathyal provinces: N Pacific. 2 species (Malyutina et al., 2020: key to species).

Tytthocope Wilson and Hessler, 1981

Diagnosis. Body broad, highest at natasome; cuticle thin, glossy; rostrum with lateral margins. Pereonites 5–7 compressed dorsally; pereonite 6 bulging ventrally; pereonite 7 much shorter than pereonite 6; pereonites 5, 6 without complete dorsal articulation; pereonite 7 separated by dorsal suture from pereonite 6. Antennular article 1 without mesial spine, distolateral lobe subrectangular, distally truncate. Mandibular molar narrow, condyle shorter than molar. Maxilliped epipod narrow, with acute tip. Pereopod 2 ischium shorter than basis. Uropod peduncle with straight lateral margin.

Slope–abyssal (267–4605 m). Arctic, Temperate Northern Atlantic, Tropical Atlantic, Temperate South America, Temperate Southern Africa, Southern Ocean. 8 species (Wilson and Hessler, 1981; Malyutina and Brandt, 2014: rediagnosis, key to 3 S Atlantic species).

Subfamily Ilyarachninae Hansen, 1916

Ilyarachines are recognised by the bases of pereopods 3, 4 being much shorter than that of pereopod 2, short, thick mandibles with a blunt incisor and reduced molar process, and a head usually wider than anterior pereonites. Merrin's (2007) thesis addressed the taxonomy of Ilyarachninae and was the basis of revision of existing genera and addition of two new genera (Merrin, 2004, 2006, 2009, 2011, 2016; Merrin et al., 2009).

Diagnosis. Body elongate, articulating, anterior margins smooth or with robust setae, without lateral spines; head usually wider than anterior pereonites; rostrum absent. Pereonites 5–7 with complete dorsal articulation; pleotelson oval-elongate. Antennulae inserted close together on frons; article 1 laminar. Antenna much longer than body. Mandible short, thick, with blunt incisor, with reduced molar process. Pereopods 3, 4 bases much shorter than bases of prehensile pereopods 1, 2; pereopods 5–7 natatory, propodi narrower than carpi; dactyli strong, long, more than half as long as propodi, with apical setae and 1 or 2 claws. Uropod ventral; uniramous or if biramous exopod minute (figs 3.25, 3.26a–d).

Key to genera of Ilyarachninae

1. Mandibular palp present (fig. 3.30g, l) 2
– Mandibular palp absent (fig. 3.30n) 5
2. Natasome outline streamlined, pereonites not laterally separate (fig. 3.25a, b, h, i) 3
– Natasome outline with pereonites laterally separate (figs 3.25c, d, 3.26a, b) 4
3. Uropod exopod reduced to small bump (fig. 3.32j) or absent. Pereonites 1–4 anterior margins with or without spines (fig. 3.25h, i) ..... *Ilyarachna*
– Uropod exopod small (fig. 3.32b). Pereonites 1–4 anterior margins without spines (fig. 3.25a, b) ..... *Aspidarachna*
4. Pereonites 1–4 anterior margins with spines, each without apical seta; pereonites 5–7 without lateral extensions (fig. 3.26a, b) ..... *Nyctobadistes*
– Pereonites 1–4 anterior margins with spines, each topped with apical seta; pereonites 5–7 lateral margins narrow and distinct from each other, either with elongate spine-like extensions or jagged (fig. 3.25c, d) ..... *Bathybadistes*
5. Pereonite 2 and pereopod 2 much larger than preceding pereonites and pereopods. Antennulae minute, placed far apart; article 1 laterally expanded (fig. 3.26c, d) ..... *Pseudarachna*

– Pereonite 2 and pereopod 2 not much larger than preceding pereonites and pereopods. Antennulae well developed, adjacent; article 1 rectangular or with lateral flange 6

6. Antenna article 1 distolateral angle with prominent horn-like spine and terminal robust seta (fig. 3.30e). Frons of head narrow, allowing maxillipeds to lie horizontally (fig. 3.25j, k) ..... *Notopais*

– Antenna article 1 rectangular, without prominent distolateral angle (fig. 3.30d). Frons of head wide, maxillipeds lying obliquely in lateral view 7

7. Pereonites 1–4 with simple setae, without spines (fig. 3.25f, g) ..... *Epikopais*

– Pereonites 1–4 anterior margins with spines, each without apical robust seta (fig. 3.25e) ..... *Echinozone*

Aspidarachna G.O. Sars, 1897

Diagnosis. Frons of head wide, rectangular. Pereonites 1–4 anterior margins without spines. Natasome outline streamlined, pereonites not laterally separate; pereonites 5–7 without lateral extensions. Antennulae well developed, adjacent; article 1 rectangular. Mandibular palp present. Pereopods 5, 6 carpi flat, subcircular; propodi expanded, oar-like; pereopod 7 carpus and propodus slender, with margin of plumose setae. Uropod foliaceous; exopod smaller than endopod.

Slope–abyssal (220–5495 m). GOODS bathyal provinces: Arctic, Northern N Pacific, N Atlantic. 4 species (Sars, 1896–1899: type species; Kussakin, 2003: rediagnosis, key to 3 species).

Bathybadistes Hessler and Thistle, 1975

Diagnosis. Frons of head wide, rectangular; cephalic anterior flanges absent. Pereonites 1–4 anterior margins with spines, each topped with apical robust seta. Natasome outline with pereonites laterally separate; pereonites 5–7 lateral margins narrow and distinct from each other, with either elongate spine-like extensions or jagged. Antennulae well developed, adjacent; article 1 rectangular. Mandibular palp present. Pereopods 5, 6 carpi flat, subcircular; propodi expanded, oar-like; pereopod 7 carpus and propodus slender, with margin of plumose setae. Uropod foliaceous; exopod reduced to bump or absent.

Bathyal, abyssal (2700–5024 m). GOODS bathyal provinces: Northern N Pacific, N Atlantic, Antarctic, Subantarctic, S Atlantic. 11 species (Merrin et al., 2009: key to 6 species).

Echinozone G.O. Sars, 1897

Diagnosis. Frons of head wide, rectangular. Pereonites 1–4 anterior margins with spines, each without apical robust seta. Natasome outline streamlined, pereonites not laterally separate; pereonites 5–7 without lateral extensions. Antennulae well developed, adjacent; article 1 rectangular. Mandibular palp absent. Pereopods 5, 6 carpi flat, subcircular; propodi expanded, oar-like; pereopod 7 carpus and propodus slender, with margin of plumose setae. Uropod foliaceous; exopod smaller than endopod.

Shelf, slope (100–1100 m). Arctic, Temperate Northern Atlantic, Temperate Northern W Pacific, Southern Ocean. 4 species (Brandt, 1990; Sars, 1896–1899; Kussakin and Vasina, 1982: all species dealt with belong to *Notopais*; Kussakin and Vasina, 1993).

Epikopais Merrin, 2009

Diagnosis. Frons of head laterally rounded; anterior flanges present. Pereonites 1–4 anterior margins with simple setae, dorsal spines absent. Natasome outline streamlined, pereonites not laterally separate; pereonites 5–7 without lateral extensions. Antennulae well developed, adjacent; article 1 rectangular. Mandibular palp absent. Pereopods 5, 6 carpi flat, subcircular; propodi expanded, oar-like; pereopod 7 carpus and propodus slender, with margin of plumose setae. Uropod foliaceous; exopod smaller than endopod.

Slope (385–1586 m). Temperate Australasia, Southern Ocean. 4 species (Merrin, 2009: key to 4 species).

Ilyarachna G.O. Sars, 1869

Diagnosis. Frons of head wide, rectangular; cephalic anterior flanges present, small. Pereonites 1–4 anterior margins with or without spines. Natasome outline streamlined, pereonites not laterally separate; pereonites 5–7 without lateral extensions. Antennulae well developed, adjacent; article 1 rectangular. Mandibular palp present. Pereopods 5, 6 carpi flat, subcircular; propodi expanded, oar-like; pereopod 7 carpus and propodus slender, with margin of plumose setae. Uropod foliaceous; exopod reduced to bump or absent.

Shelf–hadal (8–7230 m). Cosmopolitan. 45 species (Thistle, 1980: key to 10 Atlantic species; Kussakin, 2003: rediagnosis, key to 19 N Pacific species; Merrin, 2016: rediagnosis, key to 5 Australian species; Merrin, 2024: descriptions, and key to 12 species from SW Pacific).

Notopais Hodgson, 1910

Diagnosis. Frons of head narrow, allowing maxillipeds to lie horizontally. Pereonites 1–4 anterior margins usually with spines, if not, margins with robust setae; all spines tipped with robust setae. Natasome outline streamlined, pereonites not laterally separate; pereonites 5–7 without lateral extensions. Antennulae well developed, adjacent; article 1 rectangular. Antenna article 1 distolateral angle with prominent horn-like spine and terminal robust seta. Mandibular palp absent. Pereopods 5, 6 carpi flat, subcircular; propodi expanded, oar-like; pereopod 7 carpus and propodus slender, with margin of plumose setae. Uropod foliaceous; exopod smaller than endopod.

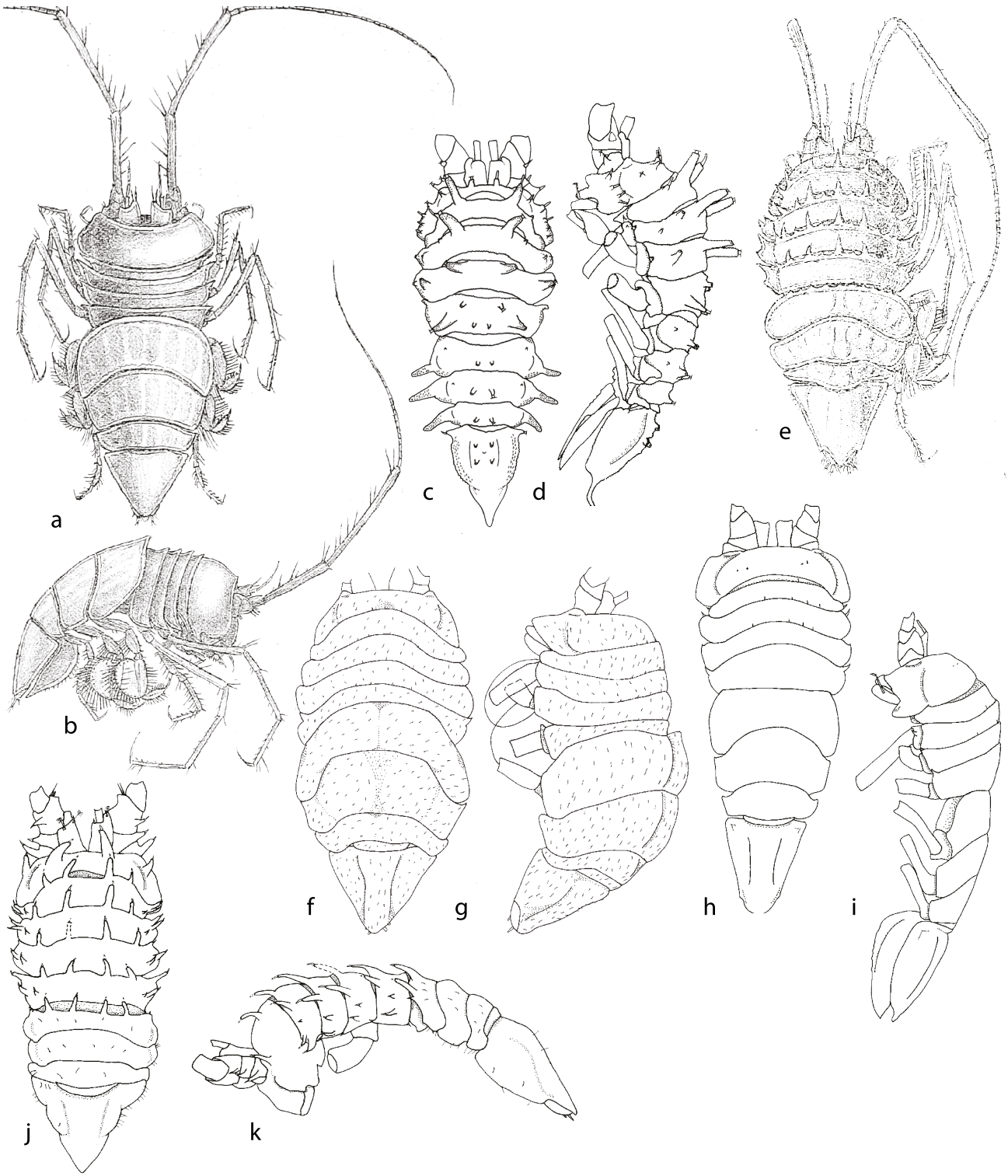

Figure 3.25. Munnopsidae, Ilyarachninae. Dorsal and lateral views: a, b, *Aspidarachna clypeata* (G.O. Sars, 1870); c, d, *Bathybadistes andrewsi* Merrin, 2009; e, *Echinozone coronata* (Sars, 1870); f, g, *Epikopais poorei* Merrin, 2009; h, i, *Ilyarachna ellae* Merrin, 2016; j, k, *Notopais spicatus* Hodgson, 1910.

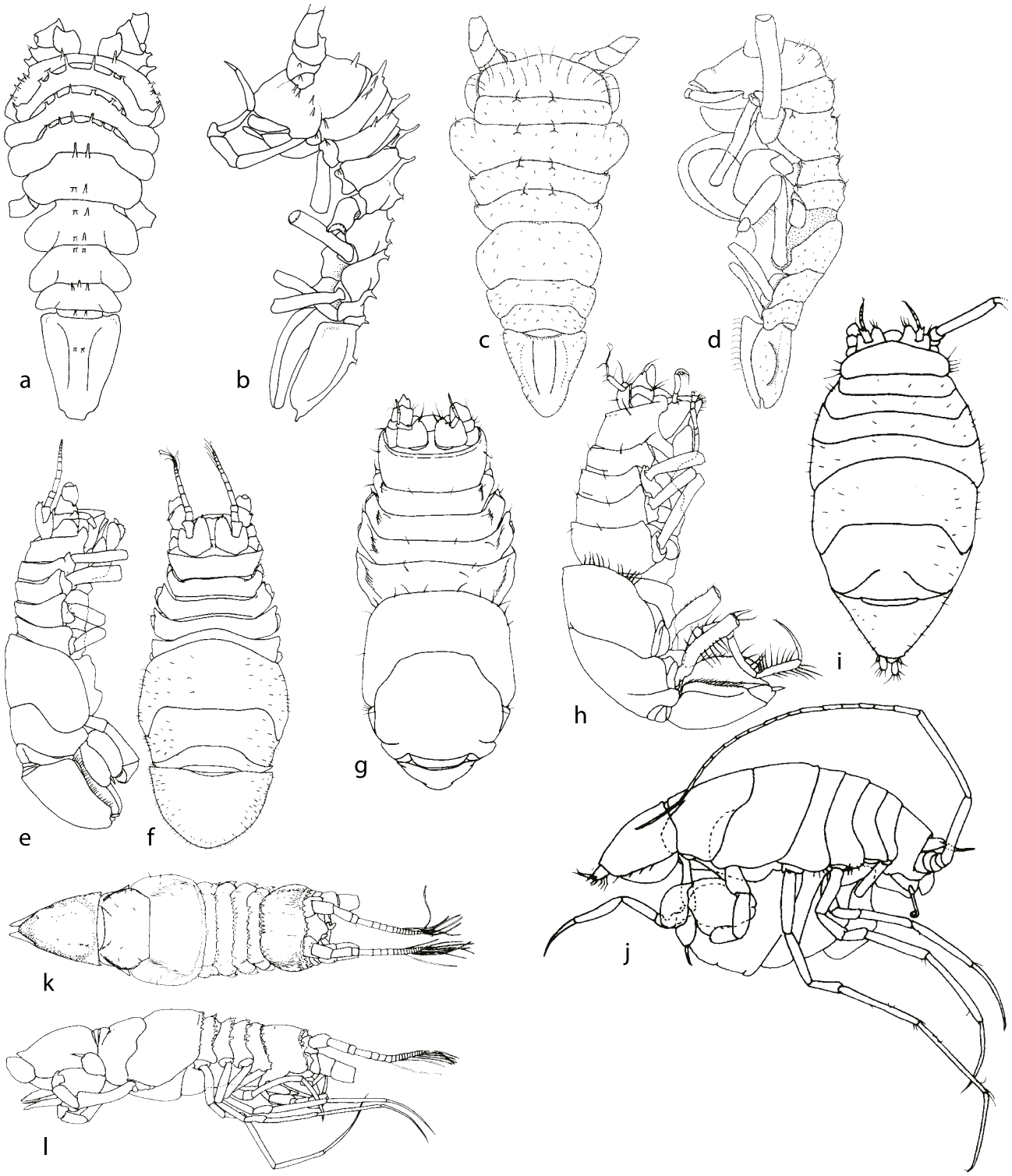

Figure 3.26. Munnopsidae, Ilyarachninae (cont.). Dorsal and lateral views: a, b, *Nyctobadistes hamatus* Merrin, 2011; c, d, *Pseudarachna nohinohi* Merrin, 2006. Lipomerinae: e, f, *Coperonus comptus* Wilson, 1989; g, h, *Hapsidohedra ochlera* Wilson, 1989; i, j, *Lionectes humicephalotus* Wilson, 1989; k, l, *Lipomera knorrae* Wilson,1989.

Shelf, slope (36–1640 m). Temperate Australasia, Southern Ocean. 11 species (Brandt, 1990: list of species as *Echinozone*; Merrin, 2004: rediagnosis, key to 7 species; Merrin and Bruce, 2006: 2 species; Merrin, 2024: descriptions, and key to 5 species of SW Pacific).

Nyctobadistes Merrin, 2011

Diagnosis. Frons of head wide, rectangular; cephalic anterior flanges absent. Pereonites 1–4 anterior margins with spines, each without apical robust seta. Natasome outline with pereonites laterally separate; pereonites 5–7 without lateral extensions. Antennulae well developed, adjacent; article 1 with lateral flange. Mandibular palp present. Pereopods 5–7 carpi and propodi narrow, elongate, not expanded and oar-like.

Slope (720–800 m). Temperate Australasia (SE Australia). 1 species (Merrin, 2011).

Pseudarachna G.O. Sars, 1897

Diagnosis. Frons of head wide, enlarged, semicircular; anterior flanges absent. Pereonites 1–4 anterior margins with spines, each topped with apical robust seta; pereonite 2 and pereopod 2 much larger than preceding pereonites and pereopods. Natasome outline streamlined, pereonites not laterally separate; pereonites 5–7 without lateral extensions. Antennulae minute, placed far apart; article 1 laterally expanded. Mandibular palp absent. Pereopods 5, 6 carpi flat, subcircular; propodi expanded, oar-like; pereopod 7 carpus and propodus slender, with margin of plumose setae. Uropod flat; exopod absent.

Shelf, slope (50–1463 m). Temperate Northern Atlantic, Temperate Australasia. 2 species (Merrin, 2006: rediagnosis).

Subfamily Lipomerinae Tattersall, 1905

Wilson (1989) revised the subfamily, adding three genera to the one existing. Members of Lipomerinae are recognised by the reduced or absent pereonite 7, a neotenous feature.

Diagnosis. Body smooth or setose dorsally and laterally, without spines; natasome wider than ambulosome; rostrum absent. Pereonites 5, 6 free or fused; pereonite 7 strongly reduced, much shorter than more anterior natasomites, or absent; pleotelson less than 1.5 times as long as wide. Antennulae dorsal; article 1 wide, much larger than article 2. Pereopods 3, 4 bases elongate, about as long as pereopod 2 basis; only pereopod 1 prehensile; pereopods 5, 6 natatory, with broad carpi and propodi; dactyli small, less than half as long as propodi, without apical setae and claws; pereopod 7 simple walking leg or absent. Uropod ventral, linear or expanded (fig. 3.26e–l).

Key to genera of Lipomerinae

1. Pereopod 7 large, similar to walking legs but with plumose setae on carpus and propodus (fig. 3.31d, e). Antennula article 1 with pronounced mesial lobe (fig. 3.26i) 2
– Pereopod 7 rudimentary or absent. Antennula article 1 without or with obsolete mesial lobe 4
2. Pereonite 7 of adult recessed into pleotelson (fig. 3.26i, j) ..... *Lionectes*
– Pereonite 7 of adult reaching lateral margin of pereon 3
3. Uropod small, with thick peduncle having pronounced mesial projection (fig. 3.32f). Natasome rounded posteriorly, not strongly reflexed ventrally (fig. 3.26e, f). Mandibular molar cylindrical, truncate (fig. 3.30j) ..... *Coperonus*
– Uropod large, with leaf-like peduncle (fig. 3.32i). Natasome angular posteriorly, strongly reflexed ventrally (fig. 3.26g, h). Mandible with massive molar process and blunt incisor process (fig. 3.30k) ..... *Hapsidohedra*
4. Uropod large, flat, rami absent, reaching end of pleotelson (fig. 3.32k). Pereopod 5 merus short; dactylus distinct (fig. 3.31f) ..... *Lipomera*
– Uropod small, sometimes with rudimentary exopod, not reaching end of pleotelson (fig. 3.32l). Pereopod 5 merus elongate; dactylus rudimentary (fig. 3.31h) ..... *Mimocopelates*

Coperonus Wilson, 1989

Diagnosis. Natasome rounded posteriorly, not strongly reflexed ventrally; pereonites 5--7 articulated; pereonite 7 strip-like, reaching lateral margin of pereon. Antennular article 1 with produced distomesial lobe. Pereopod 5 dactylus small, lenticular; pereopod 7 large, similar to walking legs but with plumose setae on carpus and propodus. Uropod small, with thick peduncle having pronounced mesial projection.

Shelf, slope (139–2012 m). Temperate South America, Southern Ocean. 8 species (Wilson, 1989; Brandt, 1992a: rediagnosis, key to 7 species; 1992b).

Hapsidohedra Wilson, 1989

Diagnosis. Natasome angular posteriorly, strongly reflexed ventrally; pereonite 7 strip-like, reaching lateral margin of pereon. Antennular article 1 with produced distomesial lobe. Mandible with massive molar process and blunt incisor process. Pereopod 7 large, similar to walking legs but with plumose setae on carpus and propodus. Uropod large, with leaf-like peduncle.

Slope (213–1022 m). Tropical Atlantic, Temperate Australasia. 2 species (Wilson, 1989).

Lionectes Wilson, 1989

Diagnosis. Natasome compact, conical in dorsal view; pereonites 5–7 articulated laterally, indistinctly articulated medially between pereonites 5 and 6, fused medially between pereonites 6 and 7; pereonite 7 recessed into pleotelson, not reaching lateral margin of natasome. Antennular article 1 with mesial and lateral lobes. Pereopod 5 dactylus rudimentary; pereopod 7 large, similar to walking legs but with plumose setae on carpus and propodus. Uropod peduncle flat, oval; endopod larger than small exopod.

Slope (282 m). Southern Ocean. 1 species (Wilson, 1989).

Lipomera Tattersall, 1905

Diagnosis. Natasome triangular in dorsal view; pereonites 5 and 6 large, dorsally articulated; pereonite 7 reduced, fused to pereonite 6. Antennular article 1 without mesial lobe, with lateral lobe. Pereopod 5 merus short; dactylus distinct; pereopod 7 rudimentary. Uropod peduncle leaf-like, flat, rami absent, reaching end of pleotelson.

Slope, bathyal (364–3264 m). Temperate Northern and Tropical SW Atlantic, Temperate South America. 3 species (Kussakin, 2003; Wilson, 1989: key and descriptions of 3 species, each in own subgenus).

Mimocopelates Wilson, 1989

Diagnosis. Natasome triangular in dorsal view; pereonites 5 and 6 large, dorsally articulated; pereonite 7 strip-like, reaching lateral margin of pereon. Antennular article 1 with obsolete mesial lobe, with lateral lobe. Mandible with molar process distally convex, heavily sclerotized. Pereopod 5 merus elongate; dactylus rudimentary; pereopod 7 absent in adult. Uropod small, exopod absent or rudimentary, not reaching end of pleotelson.

Slope, bathyal (587–2890 m). Temperate Northern Atlantic, Temperate South America. Atlantic. 2 species (Wilson, 1989).

Subfamily Munnopsinae Lilljeborg, 1864

Munnopsines are noted for the absence of dactyli on pereopods 5–7 and the terminal or slightly ventral uniramous uropod. Systematics of the subfamily has not been addressed since Kussakin's (2003) diagnosis and key to genera. In some genera the natasome is much narrower than the ambulosome.

Diagnosis. Body with natasome (pereonites 1–4) clearly differentiated from ambulosome (pereonites 5–7), with or without spines; rostrum absent. Pereonites 5–7 free, partly or completely fused dorsally; pleotelson oval-elongate. Antennulae dorsal; article 1 wide, much larger than article 2. Antenna much longer than body. Mandibular molar absent or narrowly conical, reduced; palp present, or absent. Pereopods 3, 4 bases much shorter than bases of prehensile pereopods 1, 2; pereopods 5–7 natatory, with broad carpi and propodi; without dactyli. Uropod terminal or slightly ventral; cylindrical, uniramous (rarely exopod indicated by setae) (fig. 3.27).

Key to genera of Munnopsinae

1. Natasome and pereonite 5 with few dorsal spines in midline (fig. 3.27a, b) ..... *Acanthamunnopsis*
– Natasome dorsal surface smooth 2
2. Natasome and ambulosome widths slightly different. Pereopods 5–7 carpi much wider than propodi (fig. 3.27e). Mandibles with molar process thin, conical (fig. 3.30o) ..... *Paramunnopsis*
– Natasome and ambulosome widths usually considerably different. Pereopods 5–7 carpi not wider than propodi (fig. 3.27c, d). Mandibles with molar process reduced or absent 4
4. Pereopods 5–7 carpi with sparse, spaced setae (fig. 3.31m) ..... *Pseudomunnopsis*
– Pereopods 5–7 carpi with many adjacent long setae (fig. 3.27c, d) 5

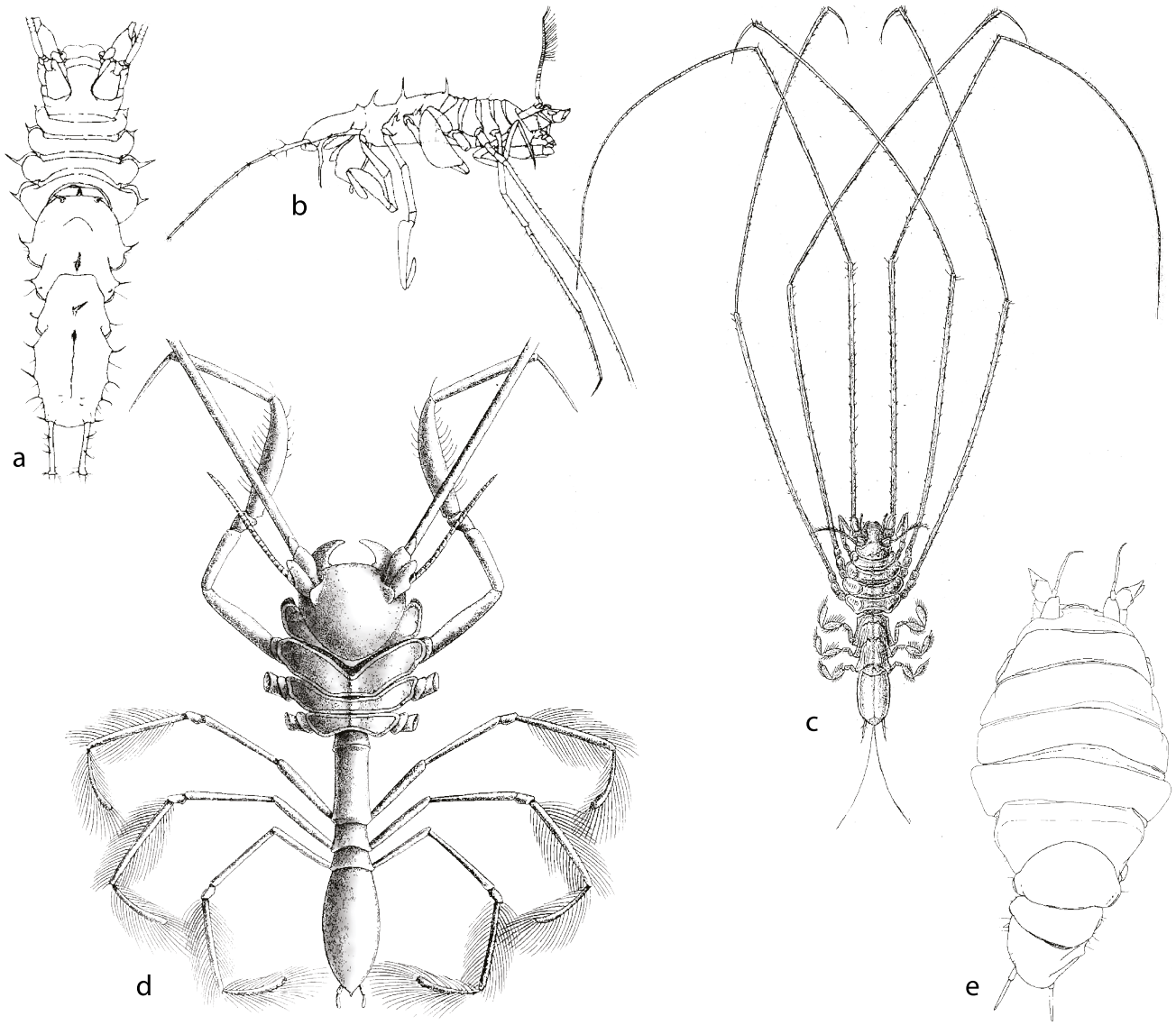

Figure 3.27. Munnopsidae, Munnopsinae. Dorsal and lateral views: a, b, *Acanthamunnopsis milleri* Wilson, 1982; c, *Munnopsis typica* M. Sars, 1861; d, *Munnopsoides australis* (Beddard, 1885); e, *Paramunnopsis justi* Svavarsson, 1988.

5. Natasome width less than 0.4 width of ambulosome. Pereonite 5 not longer along midline than each of pereonites 6 and 7 (fig. 3.27c). Mandibular palp well developed ..... *Munnopsis*

– Natasome width more than 0.4 width of ambulosome. Pereonite 5 longer along midline than each of pereonites 6 and 7 (fig. 3.27d). Mandibular palp absent ..... *Munnopsoides*

Acanthamunnopsis Schultz, 1978

Diagnosis. Natasome and pereonite 5 with middorsal spines; natasome slightly narrower than ambulosome, segments fused. Mandible with molar process thin, conical; mandibular palp present. Pereopods 5–7 carpi much wider than propodi, both with setose margins.

Bathypelagic (0–2893 m). Tropical Atlantic, Temperate Northern Pacific, Southern Ocean. 4 species (Schultz, 1978; Wilson, 1982b: rediagnosis, species composition, 2 species described).

Munnopsis M. Sars, 1861

Diagnosis. Natasome width less than 0.4 width of ambulosome, smooth; pereonite 5 not longer along midline than each of pereonites 6 and 7. Mandible with molar process reduced or absent; mandibular palp present. Pereopods 5–7 carpi not wider than propodi; carpi with setose margins.

Shelf–abyssal, mesopelagic, bathypelagic (4–4506 m). Temperate Northern Atlantic, Temperate Northern W Pacific, Temperate Southern Africa, Temperate Australasia. GOODS bathyal provinces: Northern N Pacific, Cocos Plate, Nazca Plate, Indian, W Pacific. 10 species (Sars, 1896–1899: figures of type species; Kussakin, 2003: rediagnosis, 2 species described).

Munnopsoides Tattersall, 1905

Diagnosis. Natasome width more than 0.4 width of ambulosome, smooth; pereonite 5 longer along midline than each of pereonites 6 and 7. Mandible with molar process reduced or absent; mandibular palp absent. Pereopods 5–7 carpi not wider than propodi; carpi with setose margins.

Slope–abyssal (400–4925m). GOODS bathyal provinces: Arctic, Northern N Pacific, Nazca Plate, Indian. 5 species (Beddard, 1886: figures of type species; Menzies and George, 1972: rediagnosis, 2 species).

Paramunnopsis Hansen, 1916

Diagnosis. Natasome and ambulosome widths slightly different, smooth. Mandible with molar process thin, conical; mandibular palp present. Pereopods 5–7 carpi much wider than propodi, both with setose margins.

Slope, bathyal, abyssal (1273–3909 m). GOODS bathyal provinces: Arctic, Northern N Atlantic. 2 species (Hansen, 1916; Svavarsson, 1988: second species).

Pseudomunnopsis Hansen, 1916

Diagnosis. Natasome width about half width of ambulosome, setose; pereonite 5 longer along midline than length of pereonites 6 and 7 together. Mandible with molar process reduced or absent; mandibular palp absent. Pereopods 5–7 carpi not wider than propodi; carpi with sparse setae.

Bathyal (2626 m). GOODS bathyal provinces: Northern N Atlantic. 1 species (Hansen, 1916; Tattersall, 1905).

Subfamily Storthyngurinae Kussakin, 2003

Storthyngurines have a body with strong dorsal and lateral spines, also with spines on the coxae of pereopods 2–4. They differ from acanthocopines in that the bases of pereopods 4–7 are of similar lengths and the uropod is biramous (Kussakin, 2003; Malyutina, 2003; Malyutina and Brandt, 2004a).

Diagnosis. Body with natasome differentiated, with strong dorsal and lateral spines; rostrum absent. Pereonites 5–7 dorsally fused; pleotelson suboval, fused to all natasome segments, with lateral spines. Antennulae dorsal; article 1 wide, much larger than article 2. Pereopods 3, 4 bases elongate, about as long as pereopod 2 basis; pereopods 5–7 natatory, with broad carpi and propodi; dactyli small, less than half as long as propodi, or ambulatory, with cylindrical carpi and propodi. Uropod ventral, biramous, with elongate peduncle and rami (fig. 3.28a–m).

Key to genera of Storthyngurinae

1.	Head with pair of dorsal spines (fig. 3.28i–k)	2
–	Head without pair of dorsal spines (tubercles at most) (fig. 3.28a–h, l, m)	3
2.	Pleotelson terminal process acute, bent dorsally (fig. 3.28k)	*Sursumura*
–	Pleotelson apex prolonged (fig. 3.28i, j)	*Storthyngurella*
3.	Pereopods 5–7 ambulatory, carpi and propodi elongate, cylindrical, without marginal plumose setae (fig. 3.31g, k, l)	4
–	Pereopods 5–7 natatory, carpi and propodi flat, with setose margins (fig. 3.31q–s)	5
4.	Body flat, with lateral spines on pereonites 3, 4. Pleotelson flat, wider than flat natasome, terminally truncate (fig. 3.28c, d)	*Platyprotus*
–	Body subcylindrical, with sublateral spines on pereonites 2–4 and lateral spines on pereonites 5–7 pleotelson. Pleotelson tapering to bifid apex (fig. 3.28a, b)	*Microprotus*
5.	Pereopods 2–4 of similar lengths (fig. 3.31a–c)	*Storthyngura*
–	Pereopods 3 and 4 significantly longer than pereopod 2	6
6.	Body stout, vaulted, with lateral spines on pereonites 4–7 and pleotelson. Head with pair of dorsal anterior tubercles. Pleotelson terminal process bent ventrally (fig. 3.28l, m)	*Vanhoeffenura*
–	Body subcylindrical, with lateral spines on pereonites 3–7 and pleotelson. Head without pair of tubercles. Pleotelson terminal process rounded, not bent ventrally (fig. 3.28e, f)	*Rectisura*

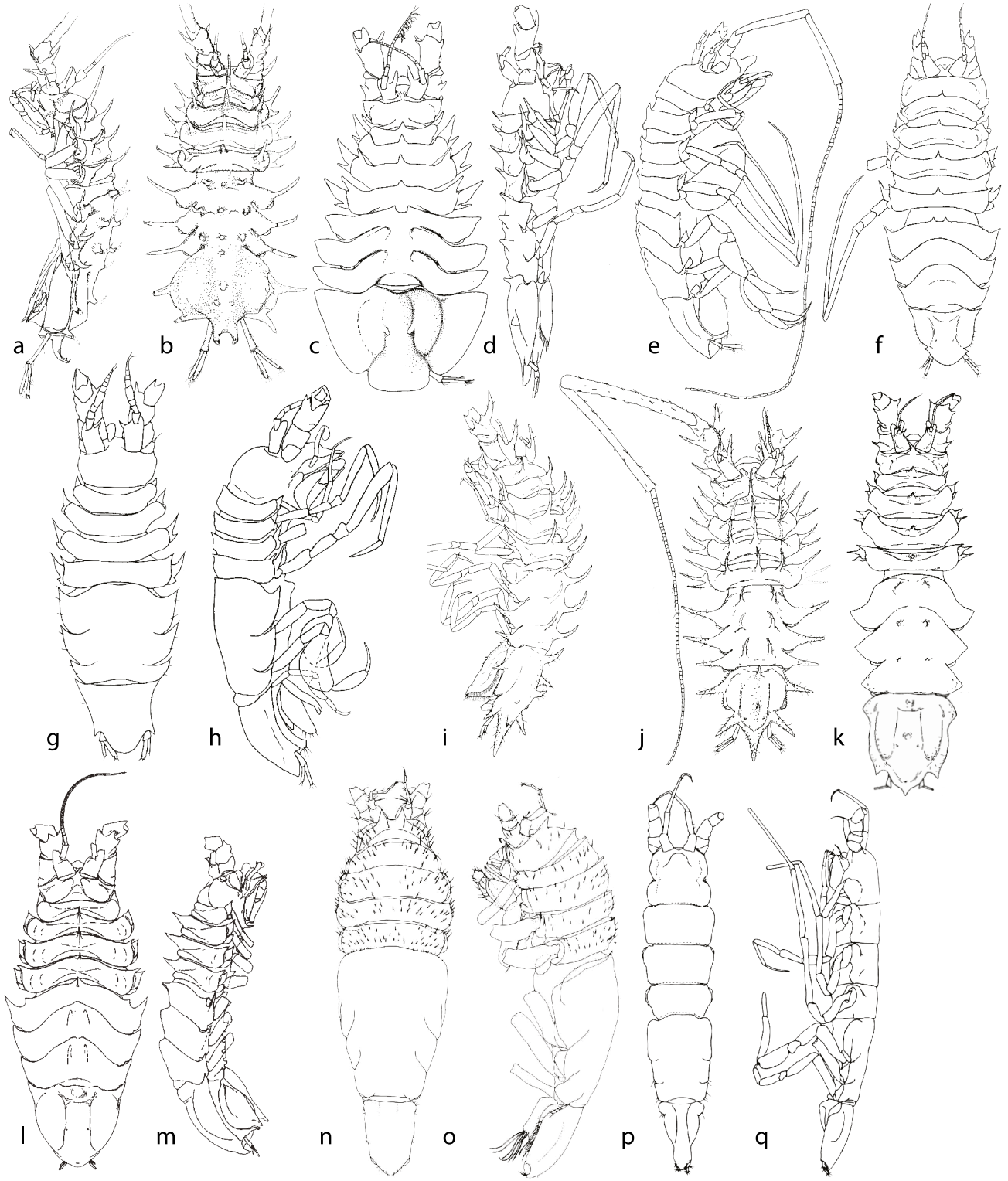

Figure 3.28. Munnopsidae, Storthyngurinae. Dorsal and lateral views: a, b, *Microprotus caecus* Richardson, 1910; c, d, *Platyprotus phyllosoma* Just, 2001; e, f, *Rectisura slavai* Malyutina, 2011; g, h, *Storthyngura yuzhmorgeo* Malyutina, 2011; i, j, *Storthyngurella andeepae* Malyutina and Brandt, 2004; k, *Sursumura aberrata* Malyutina, 2003; l, m, *Vanhoeffenura georgei* Malyutina, 2003. Syneurycopinae: n, o, *Bellibos buzwilsoni* Haugsness and Hessler, 1979; p, q, *Syneurycope parallela* Hansen, 1916.

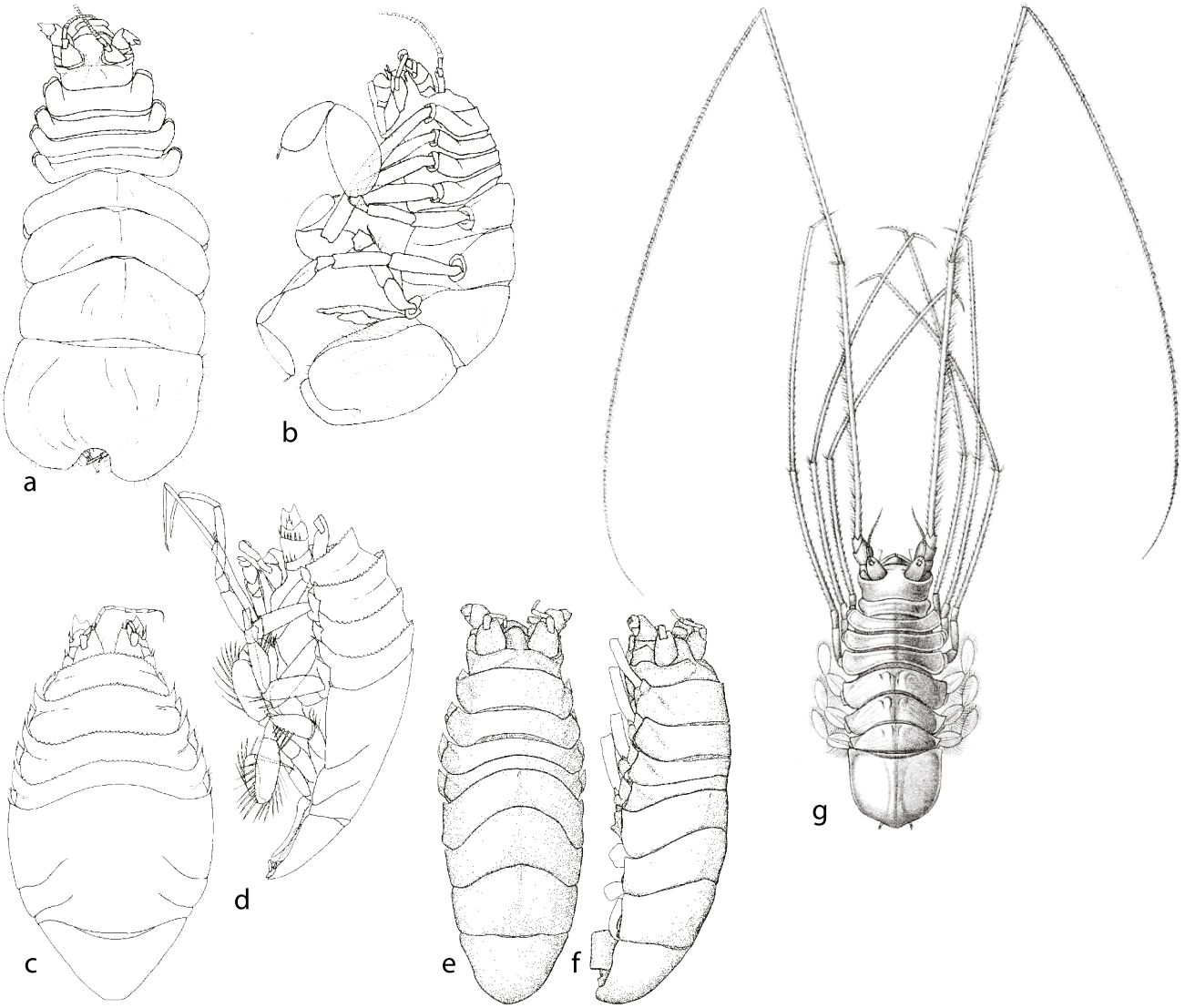

Figure 3.29. Munnopsidae. Dorsal and lateral views. Unaligned genera: a, b, *Gurjanopsis australis* Malyutina, 2007; c, d, *Microcope denticulata* Malyutina, 2008; e, f, *Munneurycope persephone* Mursch, Brenke and Wägele, 2008; g, *Munnopsurus giganteus* (G.O. Sars, 1877).

Microprotus Richardson, 1909

Diagnosis. Body subcylindrical, with sublateral spines on pereonites 2–4 and lateral spines on pereonites 5–7 pleotelson; head without dorsal spines. Pleotelson bifid. Antennular article 1 without mesial spine. Pereopods 5–7 ambulatory, carpi and propodi elongate, cylindrical, without plumose setae.

Slope, bathyal (550–3400 m). Temperate Northern Pacific, Southern Ocean. 5 species (Wilson et al., 1989: rediagnosis, key to species).

Platyprotus Just, 2001

Diagnosis. Body flat, with lateral spines on pereonites 3, 4; head without dorsal spines. Pleotelson flat, wider than flat natasome, terminally truncate. Antennular article 1 with long mesial spine. Pereopods 5–7 ambulatory, carpi and propodi elongate, cylindrical, without plumose setae.

Slope (540 m). Southern Ocean. 1 species (Just, 2001). Malyutina and Brandt (2004c) treated *Platyprotus* as a junior synonym of *Storthyngura*, but it is resurrected here for the time being on basis of its ambulatory pereopods 5–7.

***Rectisura* Malyutina, 2003**

Diagnosis. Body stout, vaulted, with lateral spines on pereonites 4–7 and pleotelson; head vaulted, without dorsal spines. Pleotelson tip broad, truncate or rounded. Antennular article 1 without mesial spine. Pereopods 3 and 4 significantly longer than pereopod 2; 5–7 natatory, carpi and propodi broad, oval, propodi longer than carpi.

Bathyal–hadal (2084–9345 m). GOODS bathyal provinces: Northern N Pacific, SE Pacific Ridges, New Zealand/ Kermadec, Cocos Plate, Antarctic. 12 species (Malyutina and Brandt, 2004b: species list with distributions; Malyutina, 2011).

***Storthyngura* Vanhöffen, 1914**

Diagnosis. Body subcylindrical, with lateral spines on some pereonites and pleotelson; head without dorsal spines, tubercles at most. Pleotelson not acute. Antennular article 1 without or with small mesial spine. Pereopods 2–4 of similar lengths; 5–7 natatory, carpi and propodi broad, oval, propodi longer than carpi.

Slope–abyssal (181–5166 m). GOODS bathyal provinces: Northern N Pacific, N Atlantic, Nazca Plate, Antarctic. 13 species (Malyutina, 2003: rediagnosis; Malyutina, 2011; Malyutina and Brandt, 2004c).

***Storthyngurella* Malyutina, 1999**

Diagnosis. Body subcylindrical, with lateral spines on pereonites 4–7 and pleotelson; head with pair of dorsal spines. Pleotelson apex prolonged. Antennular article 1 with long mesial spine. Pereopods 5–7 narrow, carpi and propodi tubular, without marginal setae, or barely natatory, with marginal setae.

Bathyal–hadal (2856–7200 m). GOODS bathyal provinces: New Zealand/Kermadec, Cocos Plate, Antarctic, Subantarctic, Indian, S Atlantic. 9 species (Malyutina, 1999; Malyutina and Brandt, 2004a: table of differences from *Sursumara*).

***Sursumura* Malyutina, 2003**

Diagnosis. Body subcylindrical, with lateral spines on pereonites 5–7 and pleotelson; head with pair of dorsal spines. Pleotelson terminal process acute, bent dorsally. Antennular article 1 with long mesial spine. Pereopods 5–7 carpi and especially propodi narrow, more than 3 times as long as wide.

Slope– (400–7216 m). GOODS bathyal provinces: N Atlantic, New Zealand/Kermadec, Antarctic, Subantarctic, Indian, W Pacific, S Atlantic. 12 species (Malyutina, 2003; Malyutina and Brandt, 2004a: differences from *Storthyngurella*, species list).

***Vanhoeffenura* Malyutina, 2004**

Diagnosis. Body subcylindrical, with lateral spines on pereonites 3–7 and pleotelson; head with pair of tubercles near anterior margin. Pleotelson terminal process rounded, bent ventrally. Antennular article 1 without mesial spine. Pereopods 3 and 4 significantly longer than pereopod 2; 5–7 natatory, carpi and propodi broad, oval, propodi longer than carpi.

Slope–hadal (1257–8045 m). GOODS bathyal provinces: Northern N Pacific, N Atlantic, New Zealand/Kermadec, Cocos Plate, Subantarctic, S Atlantic. 18 species (Malyutina, 2003: as Vanhoeffenella; 2004: correction of name; Malyutina and Brandt, 2004a).

Subfamily Syneurycopinae Wolff, 1962

Syneurycopinae are more elongate than most other munnopsids and unique in the terminal position of the antennulae and the subcylindrical shape of the first article, in denticles on the maxillipedal palp and in short pleopods. Although Haugsness and Hessler (1979) noted considerable morphological variation in this subfamily, they did rediagnosise it and provided a key to two genera and all seven species.

Diagnosis. Body elongate, more than 3 times as long as wide, smooth or setose dorsally and laterally, without spines; pereonites 5–7 usually fused; rostrum absent. Pereonites 5–7 dorsally fused; pleotelson elongate, 1.3 or more times as long as wide. Antennulae inserted on anterior margin; article 1 cylindrical, shorter than article 2. Pereopods 3, 4 bases elongate, about as long as pereopod 2 basis; pereopods 5–7 natatory, but with narrow carpi and propodi; dactyli strong, long, more than half as long as propodi, with apical setae and 1 or 2 claws. Uropod ventral, small, flat, biramous (fig. 28n–q).

***Bellibos* Haugsness and Hessler, 1979**

Diagnosis. Body usually less than 4 times as long as wide; pereonites 1–4 usually shorter than pereonites 5–7; head free from pereonite 1, with pair of dorsal spines. Pleotelson tapers simply. Antennular flagellum of female multiarticulate. Uropod exopod at least two thirds length of endopod (fig. 3.32c).

Bathyal, abyssal (2379–4980 m). GOODS bathyal provinces: N Atlantic, S Atlantic. 4 species (Haugsness and Hessler, 1979: two subgenera, key to species).

***Syneurycope* Hansen, 1916**

Diagnosis. Body greater than 4 times as long as wide; pereonites 1–4 longer than pereonites 5–7; head fused to pereonite 1, without dorsal spines. Pleotelson complexly contoured. Antennular flagellum of female of 1 article. Uropod exopod less than one third length of endopod (fig. 3.32n).

Slope–abyssal (1280–5122 m). GOODS bathyal provinces: Northern N Pacific, N Atlantic, S Atlantic. 3 species (Haugsness and Hessler, 1979: key to species).

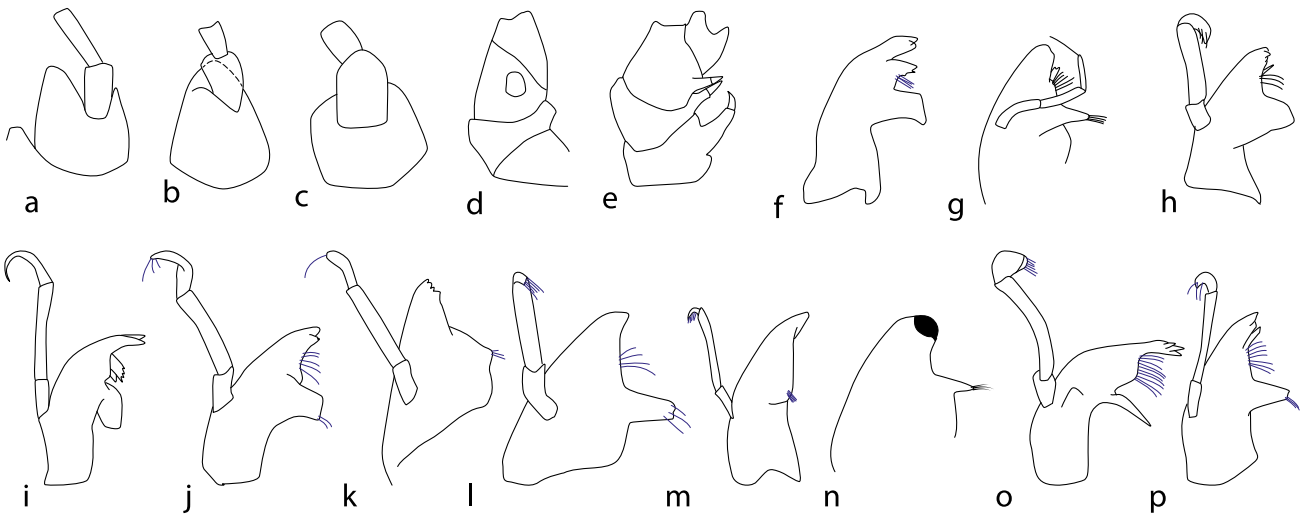

Figure 3.30. Munnopsidae. Right antennula, articles 1–3: a, *Eurycope*; b, *Baeonectes*; c, *Disconectes*. Right antenna, proximal articles: d, *Epikopais*; e, *Notopais*. Mandible: f, *Amuletta*; g, *Aspidarachna*: h, *Baeonectes*; i, *Betamorpha*; j, *Coperonus*; k, *Hapsidohedra*; l, *Ilyarachna*; m, *Munnopsurus*; n, *Notopais*; o, *Paramunnopsis*; p, *Tytthocope*.

Subfamily incertae sedis

Gurjanopsis Malyutina and Brandt, 2007

Diagnosis. Body smooth or setose dorsally and laterally, without spines; rostrum absent. Pereonites 5–7 with complete dorsal articulation; pleotelson broader than long, subrectangular, swollen dorsally, flattened ventrally, posteromedial area pleotelson compressed, with deep notch including anus and uropods. Antennulae dorsal; article 1 wide, much larger than article 2. Pereopods 2–4 bases similar; pereopod 1 slender, basis twice as long as that of more posterior pereopods; pereopods 5–7 natatory, with broad carpi and propodi; dactyli small, less than half as long as propodi, without apical setae and claws. Uropod ventral, peduncle cylindrical, biramous, rami attached distally (fig. 3.29a, b).

Bathyal, abyssal (2380–3709 m). GOODS bathyal provinces: Arctic, Northern N Pacific, Antarctic. 3 species. Malyutina and Brandt (2007) argued the genus was close to *Munneurycope* but later did not include it in a subfamily (Malyutina and Brandt, 2018).

Microcope Malyutina, 2008

Diagnosis. Body broad, highest at natasome; cuticle thin, glossy; frons of head high; head hidden under anterior flange of pereonite 1; rostrum absent. Pereonites 5–7 dorsally fused; pleotelson wider than long, subtriangular. Antennulae inserted close together on frons; article 1 with anteromesial lobe; antennular article 1 with produced distomesial lobe. Mandibular molar thick, condyle longer than molar. Maxilliped epipod produced distally, laterally convex. Pereopods 1–4 bases subequal in length; pereopods 2–4 with conspicuous difference between bulky basis–ischium part and slender carpus–dactylus part; pereopods 5–7 natatory, propodi narrower than carpi; dactyli almost as long as propodi. Uropod peduncle with mesial extension; rami inserted at midlength of lateral margin (fig. 3.29c, d).

Slope, bathyal, abyssal (349–5780 m). GOODS bathyal provinces: Northern N Pacific, Antarctic, W Pacific, S Atlantic. 5 species (Malyutina, 2008; 2015: rediagnosis, key to species). Malyutina (2008) compared *Microcope* with six other munnopsid genera and argued that the genus combined characters common to some genera of Eurycopinae, Betamorphinae and Syneurycopinae.

Munneurycope Stephensen, 1912

Diagnosis. Body smooth or setose dorsally and laterally, without spines; rostrum absent. Pereonites 5–7 with complete dorsal articulation; pleotelson posterior margin more or less rounded. Antennulae dorsal; article 1 wide, much larger than article 2. Pereopods 2–4 bases similar; pereopod 1 slender, basis little longer than that of more posterior pereopods; pereopods 5–7 natatory, with broad carpi and propodi; dactyli small, less than half as long as propodi, without apical setae and claws. Uropod ventral, peduncle cylindrical, biramous, rami attached distally (fig. 3.29e, f).

Slope–hadal (530–7800 m). Arctic, Temperate Northern Atlantic, Tropical Atlantic, Temperate South America, Temperate Australasia, Southern Ocean. 10 species. (Kussakin, 2003: diagnosis, key to 6 species; Malyutina and Brandt, 2007: discussion of species; Mursch et al., 2008: rediagnosis, discussion of subfamily placement, comparison of 5 species).

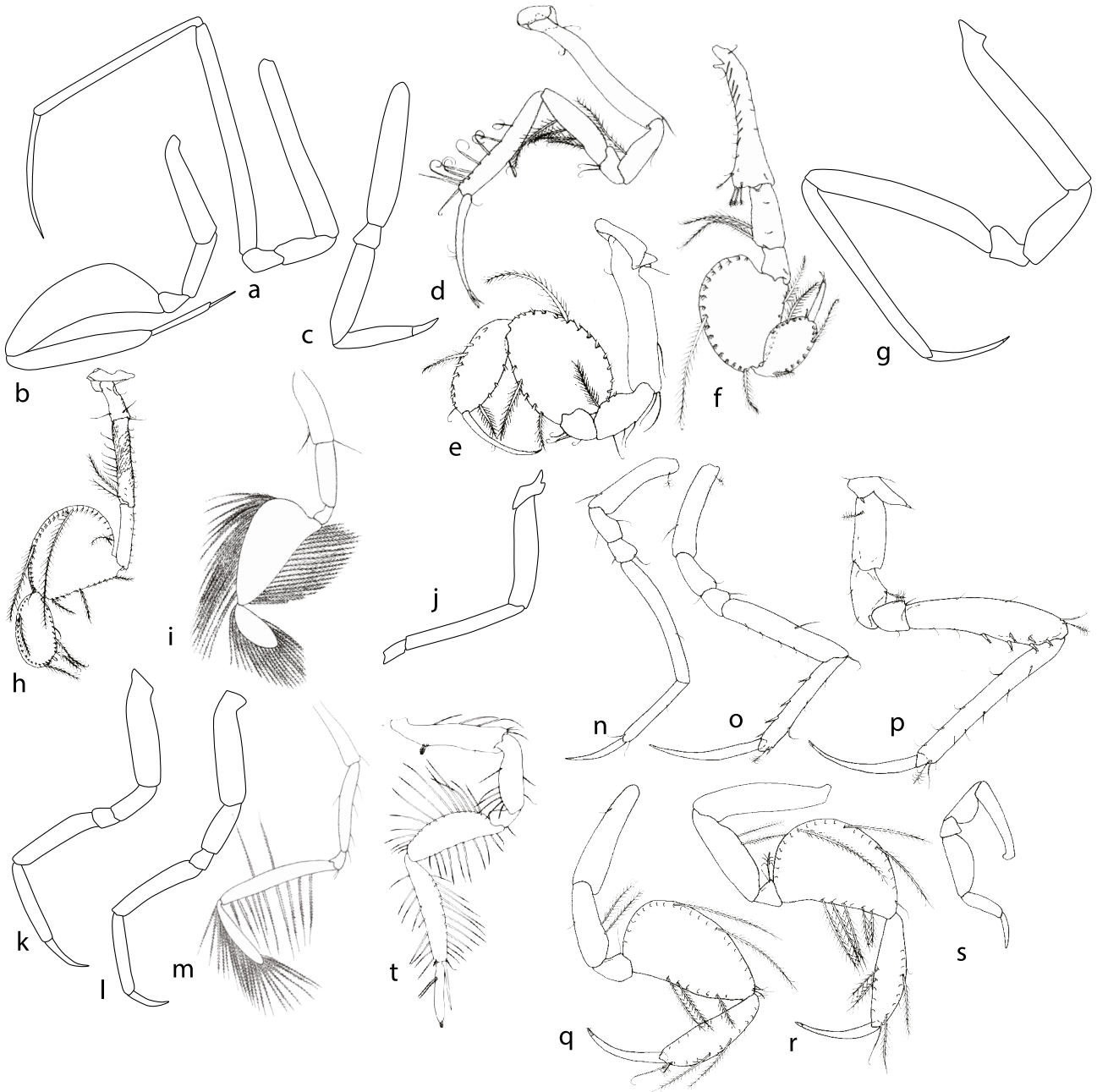

Figure 3.31. Munnopsidae. Pereopods. a, b, *Acanthocope* (p4, p5); c, *Bathyopsurus* (p1); d, e, *Lionectes* (p6, p7); f, *Liomera* (p5); g, *Microprotus* (p6); h, *Mimocopelates* (p5); i, *Paramunnopsis* (p5); j, *Pirinectes* (p2 coxa–merus); k, l, *Platyprotus* (p5, p6); m, *Pseudomunnopsis* (p5); n–s, *Storthyngura* (p1, p2, p4– p7); t, *Syneurycope* (p5).

Munnopsurus Richardson, 1912

Diagnosis. Body smooth or setose dorsally and laterally, without spines; rostrum absent. Pereonites 5–7 with complete dorsal articulation; pleotelson less than 1.5 times as long as wide. Antennulae dorsal; article 1 wide, much larger than article 2. Mandibular molar strong, rounded, with 1 or 2 bundles of small setae. Pereopods 2–4 bases similar; pereopod 1 slender, basis little longer than that of more posterior pereopods; pereopods 5–7 natatory, with broad carpi and propodi; dactyli small, less than half as long as propodi, without apical setae and claws. Uropod ventral, peduncle cylindrical, biramous, rami attached distally (fig. 3.29g).

Shelf–bathyal (40–3423 m). Arctic, Temperate Northern Atlantic, Temperate Northern W Pacific, Temperate Southern

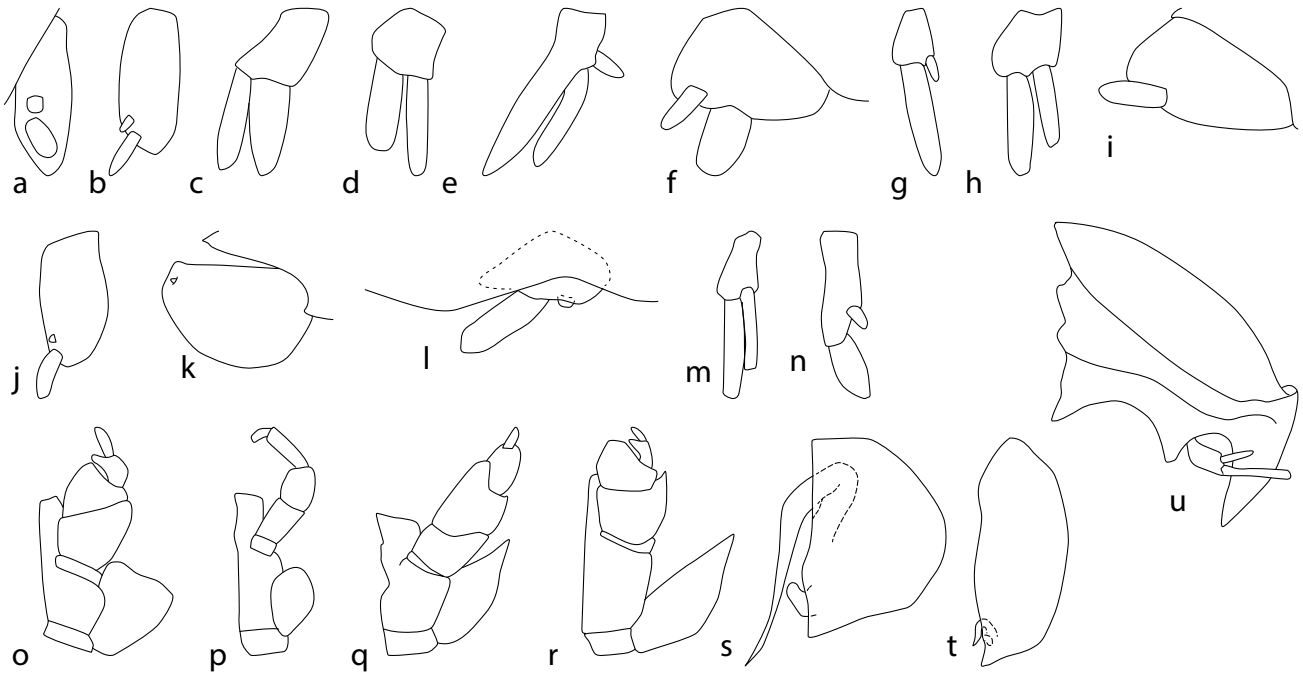

Figure 3.32. Munnopsidae. Uropod: a, *Amuletta*; b, *Aspidarachna*; c, *Bellibos*; d, *Belonectes*; e, *Betamorpha*; f, *Coperonus*; g, *Disconectes*; h, *Eurycope*; i, *Hapsidohedra*; j, *Ilyarachna*; k, *Lipomera*; l, *Mimocopelates*; m, *Munneurycope*; n, *Syneurycope*. Maxilliped: o, *Baeonectes*; p, *Bathyopsurus*; q, *Paropsurus*; r, *Tytthocope*. Male pleopod 2: s, *Eurycope*; t, *Munnicope*. Pleotelson (with left uropod, lateral view): u, *Dubinectes*.

Africa, Southern Ocean. 7 species (Sars, 1885: figure of type species; Richardson, 1912; Kussakin, 2003: key to 4 species).

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Nannoniscidae Hansen, 1916

Figures 3.33, 3.34

Nannoniscids are usually slender, blind asellotes but may be somewhat flattened. The pereonites are more or less similar. The pereopods are all ambulatory. Adults range in size from 1.3 mm to almost 6 mm in length; most are around 2–3 mm. The family occurs only in cold water, on the shelf in the Arctic but more commonly at greater depths throughout the world's oceans.

The family was diagnosed in a modern context by Siebenaller and Hessler (1977), but more recent literature has concentrated on differentiating its genera (Kaiser, 2009; Kaiser et al., 2018; Siebenaller and Hessler, 1981; Wilson, 2008). The following key to genera is based on that of Wilson (2008) with additions.

Diagnosis. Body elongate, flattened, with subparallel margins or narrow in middle; head frontal margin projecting forward

(usually); pereonites parallel-sided, pereonite 1 shorter than pereonite 2, pereonite 5 as long as pereonites 6 and 7, sometimes fused. Pleon of 1 segment. Anus not covered by pleopodal operculum. Eyes absent. Antennula shorter than head. Mandibular molar small, triangular, spinulose. Maxillipedal palp articles 1–3 wider than distal articles. Pereopods 1–7 or pereopods 2–7 ambulatory, articulating dorsolaterally or laterally; pereopod 4 coxa inserting on anterolateral margin; pereopodal 2–7 dactyli with 1 major claw. Uropod inserting posteroventrally.

Implicit generic attributes. Pereonites 4–5 wider than long; and pleon not broadly expanded laterally (distance from midline to posterior coxae greater than distance from coxae to lateral margin); pereonites 6, 7 and pleotelson free; without midventral peronal or opercular spines. Head anterolateral margin rounded, not projecting. Mandibles projecting anteroventrally, not prognathous, not visible in dorsal view; palp present. Pleopodal operculum more than half as wide as pleotelson. Female operculum without midventral spine. Uropod biramous.

Key to genera of Nannoniscidae

1. Antennula with 6 or more articles, terminal article tubular (fig. 3.34l, n, s) 2
– Antennula with 5 articles, terminal article usually bulbous (fig. 3.34m, o–r) 5
2. Pereonites and pleon broadly expanded laterally (distance from midline to posterior coxae subequal or less than distance from coxae to lateral margin) (fig. 3.33a). Pleopodal operculum less than half as wide as pleotelson (fig. 3.34a) ..... *Austroniscus*
– Pereonites and pleon not broadly expanded laterally (distance from midline to posterior coxae greater than distance from coxae to lateral margin). Pleopodal operculum more than half as wide as pleotelson (fig. 3.34b, c) 3
3. Head anterolateral margin projecting, angular. Mandibles projecting anteroventrally, not prognathous, not visible in dorsal view (fig. 3.33h) ..... *Nannoniscoides*
– Head anterolateral margin rounded, not projecting. Mandibles prognathous, projecting anteriorly in dorsal view (fig. 3.33l, m) 4
4. Pereonite 7 and female operculum each with midventral spine (fig. 3.34i). Female pleotelson with weak posterolateral angles (fig. 3.34d) ..... *Thaumastosoma*
– Pereonite 7 and female operculum each without midventral spine (fig. 3.34f). Female pleotelson with posterolateral spines (fig. 3.34e) ..... *Ketosoma*
5. Antennula article 4 margin with distomesial process (fig. 3.34p–r) 6
– Antennula article 4 distomesial margin unmodified, lacking projections (fig. 3.34m) or absent in male (fig. 3.34o) 12
6. Body narrow, pereonal margins rounded in cross-section, tergites curving ventrally. Pereonites 4, 5 about as long as wide (fig. 3.33b–e). Ventral surface without spines 7
– Body moderately broad, tergites projecting laterally, especially of pereonites 5–7. Pereonites 4–5 much wider than long (fig. 3.33i, j). Ventral surface often with spines or keels (fig. 3.34g–i) 9
7. Head with massive broad rostral crest. Antennula tiny, not projecting anteriorly. Antenna short, article 5 and flagellum together about as long as proximal articles, flagellum strongly tapering distally (fig. 3.33f, k). Mandibular palp absent ..... *Exiliniscus*
– Head with narrow rostrum or concave anteriorly (fig. 3.33d). Antennula projecting beyond margin of head. Antenna of normal length, article 5 and flagellum together distinctly longer than proximal articles, flagellum weakly tapering. Mandibular palp present 8
8. Pereonites 6, 7 pleotelson free ..... *Panetela*
– Pereonites 6, 7 pleotelson fused (fig. 3.33d, e) ..... *Nymphodora*
9. Pleon broad, elongate, wider than head or pereonites 5–7, distinctly longer than pereonites 5–7. Pereonites 6, 7 pleotelson free. Pleopods about as long as pleotelson (fig. 3.33i) ..... *Nannonisconus*
– Pleon small, less than or about as wide as head or pereonites 5–7, subequal or shorter than pereonites 5–7. Pereonites 6, 7 pleotelson fused dorsally. Pleopods distinctly shorter than pleotelson (fig. 3.33j) 10
10. Pereopod 1 robust, all articles wider than those of pereopod 2, carpus and propodus flexor margin with robust elongate setae (fig. 3.34x) ..... *Rapaniscus*

– Pereopod 1 not robust, articles about as wide as those of pereopod 2, carpus and propodus flexor margin with simple setae (fig. 3.34t, v) 11

11. Pereon or pleopodal surfaces with at most 1 ventromedial spine. Pereopod 1 carpus and propodus as wide as in pereopod 2, with similar setation (fig. 3.34t, u) ..... *Nannoniscus*

– Pereon or pleopodal surfaces with 2 or more ventromedial spines (fig. 3.34h). Pereopod 1 carpus and propodus narrower than in pereopod 2, with fewer robust setae (fig. 3.34v, w) ..... *Regabellator*

12. Uropod biramous (fig. 3.34j). Pleotelson as wide as long, shield-shaped, with distolateral spines (fig. 3.34b). Antennula article 5 slightly inflated, elongate (fig. 3.34m) ..... *Hebefustis*

– Uropod uniramous (fig. 3.34k). Pleotelson much longer than wide, ovoid, without distolateral spines (fig. 3.33g). Antennula of 2 articles in male; article 2 with mesiodistal projection, terminal article bulbous (fig. 3.34o) ..... *Micromesus*

Austroniscus Vanhöffen, 1914

Diagnosis. Body flattened; 2.5 times as long as width of pereonite 2; pereonites and pleon broadly expanded laterally (distance from midline to posterior coxae subequal or less than distance from coxae to lateral margin); pleotelson without posterolateral spines. Head with narrow rostrum; anterolateral margin projecting, angular. Antennula of 6 articles, distal article tubular; article 4 distal margin lacking projections. Pereopod 1 not robust, articles about as wide as those of pereopod 2, carpus and propodus with simple ventral setae. Pleopodal operculum less than half as wide as pleotelson. Maximum length 2.4 mm.

Shelf–abyssal (10–6135 m). Arctic, Atlantic, Temperate Northern Pacific, Tropical Eastern Pacific, Southern Ocean. 10 species (Siebenaller and Hessler, 1981: rediagnosis; Kaiser and Brandt, 2007: rediagnosis, list and distributions of species).

Exiliniscus Siebenaller and Hessler, 1981

Diagnosis. Body narrow, pereonal margins rounded in cross-section, tergites curving ventrally; at least 5 times as long as width of pereonite 2; pereonites 4–5 about as long as wide; pleotelson without posterolateral spines. Head with massive broad rostral crest. Antennula of 5 articles; terminal article bulbous, not projecting anteriorly; article 4 distal margin with distomesial process. Antenna short, article 5 and flagellum together about as long as proximal articles, flagellum strongly tapering distally. Palp absent. Pereopod 1 carpus and propodus narrower than in pereopod 1, with fewer robust setae. Maximum length 2.7 mm.

Shelf, abyssal (80–5023 m). Arctic, Temperate Northern Atlantic, Tropical Atlantic. 3 species (Siebenaller and Hessler, 1981: diagnosis, distributions of species).

Hebefustis Siebenaller and Hessler, 1977

Diagnosis. Body flattened; 3.8 times as long as width of pereonite 2; pereonites 6, 7 fused dorsally; pleotelson small, as wide as and shorter than pereonites 5–7, shield-shaped, with distolateral spines. Head with broad truncate rostrum. Antennula of 5 articles; article 5 slightly inflated, elongate; article 4 distal margin lacking projections. Pereopod 1 not robust, articles about as wide as those of pereopod 2, carpus and propodus with simple ventral setae. Maximum length 3.4 mm.

Slope–abyssal (587–5690 m). Temperate Northern Atlantic, Tropical Atlantic, Temperate Northern W Pacific, Temperate Atlantic South America. GOODS bathyal provinces: SE Pacific Ridges. 14 species (Siebenaller and Hessler, 1977: diagnosis, 7 species; 1981: rediagnosis; Kaiser, 2014: 1 new species, distribution of species, key to species).

Ketosoma Kaiser and Brix *in* Kaiser, Brix, Kihara, Janssen and Jennings, 2018

Diagnosis. Body moderately broad, tergites projecting laterally, especially of pereonites 5–7; 4.3 times as long as width of pereonite 2; pleotelson with posterolateral spines. Head with narrow rostrum. Antennula of 6–13 articles, distal article tubular; article 4 distal margin lacking projections. Mandibles prognathous, often projecting anteriorly in dorsal view. Pereopod 1 shorter, but more robust than pereopods 2–7. Maximum length 5.8 mm.

Abyssal (4133–5690 m). GOODS bathyal provinces: Northern N Pacific, N Atlantic, Cocos Plate, S Atlantic. 5 species (Kaiser et al., 2018: diagnosis, species descriptions).

Micromesus Birstein, 1963

Diagnosis. Body vermiform; pereonite 1 fused to head; 5.5 times as long as width of pereonite 2; pleotelson narrower and shorter than pereonites 5–7, tapering, without distolateral spines. Head with well-produced rostrum. Antennula of 2 articles in male; article 3 with mesiodistal projection; terminal article bulbous; article 4 distal margin lacking projections. Palp absent. Pereopod 1 not robust, articles about as wide as those of pereopod 2, carpus and propodus with simple ventral setae. Uropod uniramous. Maximum length 1.3 mm.

Abyssal (4000–4150 m). GOODS bathyal provinces: N Pacific. 1 species (Birstein, 1963; Svavarsson, 1984: species family placement).

Nannoniscoides Hansen, 1916

Diagnosis. Body flattened; about 3 times as long as width of pereonite 2; pereonites 6, 7 fused or free; pleotelson with posterolateral spines. Head with narrow rostrum; anterolateral margin lappet-like. Antennula of 6 (rarely 7) articles, distal article tubular; article 4 distal margin lacking projections.

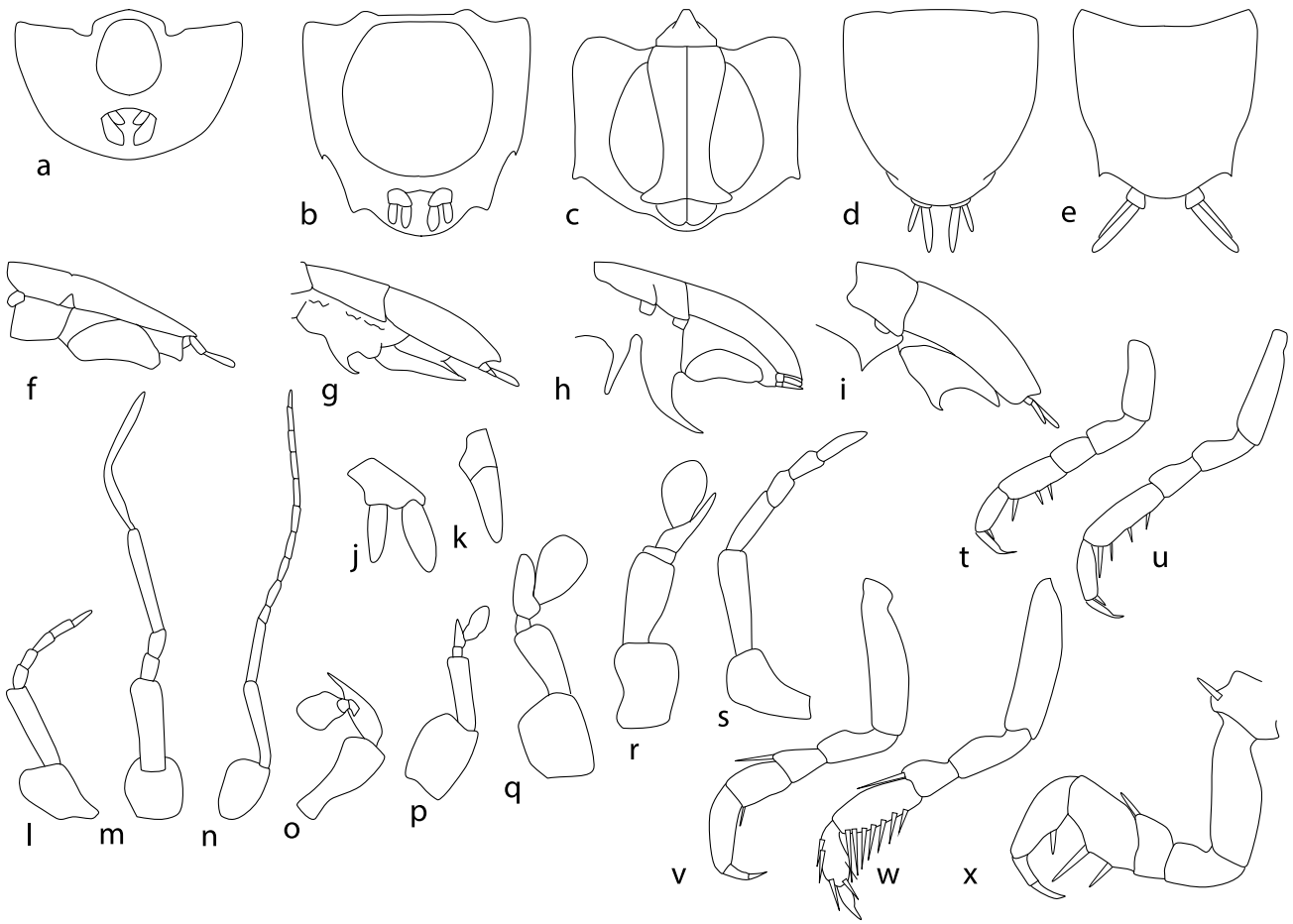

Figure 3.34. Nannoniscidae. Pleotelson, ventral view: a, *Austroniscus*; b, *Hebefustis*; c, *Nannoniscoides*. Pleotelson, dorsal view: d, *Thaumastosoma*; e, *Ketosoma*. Pereonite 6–pleotelson, lateral view: f, *Ketosoma*; g, *Rapaniscus*; h, *Regabellator* (with pereonite 6); i, *Thaumastosoma*. Uropod: j, *Hebefustis*; k, *Micromesus*. Left antennula: l, *Austroniscus*; m, *Hebefustis*; n, *Ketosoma*; o, *Micromesus*; p, *Nannonisconus*; q, *Nannoniscus*; r, *Regabellator*; s, *Thaumastosoma*. t, u, pereopods 1, 2, *Nannoniscus*. v, w, pereopods 1, 2, *Regabellator*. x, pereopod 1, *Rapaniscus*.

Maximum length 1.7 mm.

Shelf–abyssal (160–4833 m). Arctic, Temperate Northern Atlantic, Tropical Atlantic, Temperate Northern Pacific, Temperate Atlantic South America. 7 species (Siebenaller and Hessler, 1977: rediagnosis; 1981: rediagnosis, 4 species).

Nannonisconus Schultz, 1966

Diagnosis. Body moderately broad, tergites projecting laterally, especially of pereonites 5–7; 3.5 times as long as width of pereonite 2; pleotelson wider than head or pereonites 5–7, with posterolateral spines. Head with broad truncate rostrum; anterolateral margin projecting, angular. Antennula of 5 articles; terminal article bulbous; article 4 distal margin with distomesial process. Maximum length 2.8 mm.

Slope (456–1028 m). Tropical Atlantic, Temperate Northern Pacific, Eastern Indo-Pacific. 3 species (Siebenaller and Hessler, 1981: rediagnosis; Mezhov, 1986: third species; Brix and Svavarsson, 2010: undescribed species).

Nannoniscus G. O. Sars, 1870

Diagnosis. Body moderately broad, tergites projecting laterally, especially of pereonites 5–7; less than 4 times as long as width of pereonite 2; pereonites 6, 7 fused dorsally; pereonites 6 or 7 or female operculum with midventral spine; pleotelson broad, elongate, wider than head or pereonites 5–7, distinctly longer than pereonites 5–7. Antennula of 5 articles; terminal article bulbous; article 4 distal margin with distomesial process. Pereopod 1 carpus and propodus as wide as in pereopod 2, with similar setation. Uropod usually biramous. Maximum length 4.2 mm.

Shelf–abyssal (75–6328 m). Arctic, Temperate Northern

Atlantic, Tropical Atlantic, Temperate Northern W Pacific, Southern Ocean. GOODS bathyal provinces: Nazca Plate, Antarctic (possibly cosmopolitan). 35 species (Siebenaller and Hessler, 1981: rediagnosis; Kaiser et al., 2021: rediagnosis, list of species with distributions, key to 12 Pacific species).

Nymphodora Kaiser, 2009

Diagnosis. Body moderately broad, tergites projecting laterally, especially of pereonites 5–7; 4.3 times as long as width of pereonite 2; pereonites 6, 7 and pleotelson fused dorsally; pleotelson without posterolateral spines. Head with concave rostral margin. Antennula of 5 articles; article 4 with distolateral projection; terminal article bulbous; article 4 distal margin with distomesial process. Pereopod 1 shorter, but more robust than pereopods 2–7. Uropod biramous; endopod long, projecting beyond posterior margin of pleotelson; exopod minute. Maximum length 2.8 mm.

Slope (1740 m). Arctic (Canada Basin). 1 species (Kaiser, 2009).

Panetela Siebenaller and Hessler, 1981

Diagnosis. Body narrow, pereonal margins rounded in cross-section, tergites curving ventrally; at least 5 times as long as width of pereonite 2; pereonites 4–5 about as long as wide; pleotelson without posterolateral spines. Head with narrow rostrum. Antennula of 5 articles; terminal article bulbous; article 4 distal margin with distomesial process. Uropod biramous; endopod long, projecting beyond posterior margin of pleotelson; exopod minute. Maximum length 2 mm.

Slope–abyssal (1427–5495 m). Arctic, Temperate Northern and Temperate Northern W Pacific. 3 species (Siebenaller and Hessler, 1981; Malyutina and Kussakin, 1996: third species).

Rapaniscus Siebenaller and Hessler, 1981

Diagnosis. Body moderately broad, tergites projecting laterally, especially of pereonites 5–7; 3.5 times as long as width of pereonite 2; pereonites 6, 7 fused dorsally; pleotelson without posterolateral spines. Head with broad truncate rostrum. Antennula of 5 articles; terminal article bulbous; article 4 distal margin with distomesial process. Pereopod 1 robust, all articles wider than those of pereopod 2, carpus and propodus with robust elongate ventral setae. Maximum length 1.4 mm.

Slope–abyssal (220–5389 m). Temperate Northern and Tropical Atlantic. 3 species (Siebenaller and Hessler, 1981; Brandt, 2002: third species).

Regabellator Siebenaller and Hessler, 1981

Diagnosis. Body moderately broad, tergites projecting laterally, especially of pereonites 5–7; 3.4 times as long as width of pereonite 2; pereonites 6, 7 fused dorsally; pereonites 6 and 7 each with midventral spine; pleotelson small, as wide as and shorter than pereonites 5–7. Head with broad truncate rostrum. Antennula of 5 articles; terminal article bulbous; article 4 distal margin with distomesial and distolateral processes. Pereopod 1 carpus and propodus narrower than in pereopod 1, with fewer robust setae. Uropod biramous; endopod long, projecting beyond posterior margin of pleotelson; exopod minute. Maximum length 3.1 mm.

Slope–abyssal (472–5415 m). Temperate Northern Atlantic, Tropical Atlantic, Temperate Atlantic South America, Southern Ocean. 4 species (Siebenaller and Hessler, 1981; Kaiser, 2015: rediagnosis, species distributions, key to species).

Thaumastosoma Hessler, 1970

Diagnosis. Body moderately broad, tergites projecting laterally, especially of pereonites 5–7; 5 times as long as width of pereonite 2; pereonites 7 or 6 and 7 each with midventral spine; pleotelson with posterolateral spines. Head with narrow rostrum. Antennula of 6 articles, distal article tubular; article 4 distal margin lacking projections. Mandibles prognathous, often projecting anteriorly in dorsal view. Pereopod 1 shorter, but more robust than pereopods 2–7. Female operculum with midventral spine. Maximum length 4 mm.

Bathyal, abyssal (2886–4308 m). GOODS bathyal provinces: Northern N Atlantic, N Atlantic, S Atlantic. 3 species (Kaiser et al., 2018: rediagnosis, species redescriptions).

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Paramunnidae Vanhöffen, 1914

Figures 3.35–3.40

Paramunnidae[1] are one of the largest family in the suborder Asellota, comprising 185 species in 44 genera, all of which are tiny (maximum length 0.6–3 mm) benthic dwellers known worldwide from shallow tidal to abyssal depths (Just and Wilson, 2004, 2006, 2007). Most genera are endemic to the Southern Hemisphere. For example, in the Ross Sea, paramunnids were reported to be the most abundant and most frequently collected isopod family (Choudhury and Brandt, 2007).

Wolff (1962) included paramunnids in Munnidae, providing a key to 11 genera. Wilson (1980) treated paramunnids as a separated family that he called Pleurogoniidae Nordenstam, 1933, including 11 genera. Just (1990) synonymised Abyssianiridae Menzies, 1956 with Paramunnidae. Wilson (1980) recognised suprageneric relationships within three clusters: *Pleurogonium*, *Pleurosignum* and *Antennulosignum*, based on their mandibular molar with a pointed or rounded apex; *Notoxenus, Coulmannia* and *Notoxenoides* with dorsal spines; and the more loosely knit *Paramunna*, *Austrosignum* and other genera. The *Paramunna* complex within the last cluster was reinterpreted by Just and Wilson (2004), who provided a key to 12 genera of which nine were new, and documented their geographical and depth distribution. This complex has no dorsally visible pereopodal coxae, lacks pereonal spines, has bulging eyestalks and truncate mandibular molars. Similarly, two new genera were introduced to the smaller *Austronanus* complex (Just and Wilson, 2006). Just and Wilson (2007, 2021) dealt with the confused *Austrosignum-Munnogonium* complex, providing a key to ten genera, of which eight were new.

Males often differ from females, notably in having swollen shoulders on pereonite 1 (cf. fig. 3.37e, f).

Several papers have dealt with regional faunas, sometimes with keys to species: Magellan Strait, Chile (Winkler, 1994); Southern Ocean (Doti et al., 2009); North Pacific (Golovan and Malyutina, 2019, 2022); and Japan (Shimomura, 2009).

Just and Wilson (2004, 2007) treated *Metamunna* Tattersall, 1905 and its only species, *M. typica* Tattersall, 1905, as nomina dubia, arguing that the type species was poorly known. The genus name has been used (e.g. by Wolff and Brandt (2000)) for species of *Austrosignum* and *Munnogonium*. Bamber and Robbins' (2010) redescription of the type species fits easily within the diagnosis of *Boreosignum* Just and Wilson, 2007, one of the few genera with species in the Northern Hemisphere. *Boreosignum* is treated here as a junior synonym of *Metamunna*.

Diagnosis. Body broad, ovate, often with lateral plates. Pleon of 1 free pleonite plus pleotelson. Anus covered by pleopodal operculum. Eyes on lateral process (if present). Pereopod 1 prehensile; pereopods 2–7 ambulatory. Uropod inserting posterodorsally, minute, without peduncle.

Implicit generic attributes. Pereonites 1–7 and pleonite 1 without middorsal spines. Mandibular molar process strong, subcylindrical-dilating, truncate; palp present.

Key to genera of Paramunnidae

The first couplet relies on a difficult interpretation of the shape of the mandibular molar process, whether truncate or with an oblique, rounded or pointed apex. Habitus figures and the mandibles of the four genera with a narrow molar process are included in figure 3.40. All other genera are in alphabetical order in figures 3.35–3.39.

1. Mandibular molar process strong, subcylindrical-dilating, truncate (fig. 3.39c–e) 2

[1] Three genera have been added since this was compiled: Just, J. 2026. Review of *Pleurosignum* Vanhöffen, 1914, with re-descriptions, new genera and species in a new *Pleurosignum* group in Paramunnidae (Isopoda, Asellota), with remarks on *Pleurogonium* Sars, 1863. *Zootaxa* 5782:249–282. http://doi.org/10.11646/zootaxa.5782.2.2

– Mandibular molar process narrow, apex oblique, rounded or pointed (fig. 3.40f–h) 41

2. Some or all pereonites with prominent lateral and/or dorsal spines 3

– Pereonites without lateral or dorsal spines, lateral margins rounded or triangular; body oval (spines on coxae may be present; *Kussakinella* with short middorsal cones) 11

3. Mandibular palp absent (fig. 3.39c) 4

– Mandibular palp present (fig. 3.39d, e) 6

4. Head with medial crest bearing tuft of setae on posterior part. Pereonite 7 reduced; pereopod 7 absent (fig. 3.38f) ..... *Reductogonium*

– Head without medial crest bearing tuft of setae on posterior part. Pereonite 7 normal; pereopod 7 present 5

5. Pereonites 1–7 and pleonite 1 each with dorsal spine or crest, sometimes duplicated. Head frontal margin convex, without anterolateral angle (fig. 3.36d, e) ..... *Coulmannia*

– Pereonites 1–7 sometimes with sharp dorsal spine, never duplicated; pleonite 1 without dorsal spine. Head frontal margin with anterolateral angle at base of antenna (fig. 3.36i) ..... *Heterosignum*

6. Pereonites 1–7 with low median projection, without lateral spines (fig. 3.37j) ..... *Notoxenus*

– Pereonites 1–7 projecting laterally or with lateral spines 7

7. Head with prominent eyestalks 8

– Head without eyestalks 10

8. Head frontal margin simply convex between antennae (fig. 3.35c) ..... *Acutomunna*

– Head frontal margin with medial and/or anterolateral spines between antennae 9

9. Head with anterior medial spine or tooth, pair of anterolateral spines (fig. 3.38d) ..... *Pentaceration*

– Head without anterior medial spine, upright outgrowths at base of 2 lateral forward-pointing spines (fig. 3.36c) ..... *Compoceration*

10. Head with anterolateral projections (fig. 3.37i) ..... *Notoxenoides*

– Head without anterolateral projections (fig. 3.38h) ..... *Spinogonium*

11. Coxal plates 4, 5 or 6 to 7 visible in dorsal view (e.g. fig. 3.35h–j) 12

– No coxal plates visible in dorsal view (e.g. fig. 3.35d–g) 29

12. Coxal plates with lateral spines (figs 3.35h, 3.36a, 3.37a) 13

– Coxal plates without lateral spines 15

13. Pleotelson with narrow proximal half, bulb-like posteriorly. Eyestalks absent (fig. 3.35h) ..... *Austrogonium*

– Pleotelson flattened, with denticulate lateral margin. Eyestalks present (even if blind) 14

14. Pleotelson longer than wide. Coxal spines prominent. Eyestalks curving posterolaterally anterior to pereonite 1 (fig. 3.36a) ..... *Bathygonium*

– Pleotelson wider than long. Coxal spines barely protruding beyond pereonite lateral margins. Eyestalks extending laterally (fig. 3.37a) ..... *Holodentata*

15. Head with depressed frontal plate 16

– Head without depressed frontal plate 17

16. Head frontal margin dipping ventrally to thin horizontal convex plate with evenly serrate convex margin. Eyestalks present (fig. 3.35a, b) ..... *Abyssianira*

– Head frontal margin plate truncate with rounded anterolateral corners, barely serrate. Eyestalks absent (fig. 3.37d) ..... *Magellianira*

17. Head frontal margin produced as large subtriangular or rounded plate. Eyes not on eyestalks or eyestalks short 18

– Head frontal margin straight or rounded. Eyes on narrow eyestalks 20

18. Pleotelson tapering, lateral margins smooth (fig. 3.38k) ..... *Xigonus*

– Pleotelson rounded, lateral margins entirely or partially denticulate (fig. 3.35) 19

19. Head frontal margin evenly convex. Pleotelson anterolateral margin as long as posterolateral margin; denticles on lateral corner only (fig. 3.38j) ..... *Stephenseniellus*

– Head frontal margin with rounded or pointed angle. Pleotelson anterolateral margin shorter than lateral margin; lateral margin entirely denticulate (fig. 3.35i) ..... *Austronanus*

20. Pleotelson lateral margin smooth or with few denticles near uropod 21

– Pleotelson lateral margin denticulate along entire lateral curve 26

21. Pleotelson lateral margin with few denticles near uropod (fig. 3.38e) ..... *Quetzogonium*

– Pleotelson lateral margin smooth 22

22. Pereonites with short middorsal cones (fig. 3.37c) ..... *Kussakinella*

– Pereonites and pleotelson dorsally smooth or with low transverse ridges 23

23. Eyestalks vestigial, about as long as wide 24

– Eyestalks prominent, at least twice as long as wide 25

24. Eyestalks round, angled downward. Head frontal margin convex or straight (fig. 3.37g). Pereopod 1 carpus triangular, flexor margin with 3 straight robust setae (fig. 3.39n). Pereopod 2 carpus and propodus flexor margin with long, slender setae (fig. 3.39r) ..... *Munnogonium*

– Eyestalks conical, angled laterally. Head frontal margin concave in middle, laterally inflated (fig. 3.35d). Pereopod 1 carpus flexor margin with 2 straight robust setae (fig. 3.39h). Pereopod 2 carpus and propodus flexor margin with short robust setae (fig. 3.39q) ..... *Advenogonium*

25. Pereopod 1 carpus triangular, with 2 long and 1 short robust setae (fig. 3.39j). Mandibular palp absent. Uropod endopod acute, curved mediad (fig. 3.39g) ..... *Austrosignum*

– Pereopod 1 carpus oval, with 2 robust setae (fig. 3.39k). Mandibular palp present (fig. 3.39d). Uropod endopod rounded truncate (fig. 3.39f) ..... *Cryosignum*

26. Head frontal margin concave in middle, laterally prominently rounded (fig. 3.38l). Mandibular palp of 3 articles. Antennal article 3 lateral margin expanded (fig. 3.39b) ..... *Zizzygonium*

– Head frontal margin convex or nearly straight. Mandibular palp absent or of 2 articles. Antennal article 3 lateral margin straight 27

27. Antennular peduncle article 1 shorter than or as long as eyestalk. Pleotelson posterior projection with fringe of long setae around apex (fig. 3.37e, f). Pereopod 1 propodus with 1 or 2 robust setae on opposing margin ..... *Meridiosignum*

– Antennular peduncle article 1 at least twice as long as eyestalk. Pleotelson posterior projection without short setae near apex. Pereopod 1 propodus without robust setae on opposing margin 28

28. Pereopod 1 carpus oval, with 3–5 curved robust setae; dactylus with acute posterior spine proximal to accessory claw (fig. 3.39p) ..... *Tethygonium*

– Pereopod 1 carpus triangular, with 2–4 straight robust setae; dactylus without posterior spine proximal to accessory claw (fig. 3.39m) ..... *Metamunna*

29. Pereonite 4 margin not extending laterally as far as margins of 1–3, 5 and 6 (fig. 3.37h) ..... *Neasellus*

– Pereonite 4 lateral margin more or less aligned with other pereonites 30

30. Pleotelson with denticles along entire lateral margin (e.g. fig. 3.38c) 31

– Pleotelson smooth (or 1 or few denticles) along entire lateral margin (e.g. fig. 3.38i) 36

31. Head frontal margin with 2 dorsolateral forward-pointing, flat, rounded or acute projections (fig. 3.38c) ..... *Paramunna*

– Head frontal margin without dorsolateral projections 32

32. Head frontal margin with median projection (fig. 3.37l) ..... *Pagonana*

– Head frontal margin without median projection 33

33. Entire head frontal margin protruding 34

– Head frontal margin not projecting, straight or weakly convex 35

34. Head frontal margin forming broadly rounded curve without lateral corners, anterior and lateral edges upcurved (fig. 3.38a, b) ..... *Palanana*

– Head frontal margin weakly convex to straight; anterior edge only upcurved (fig. 3.38g) ..... *Spiculonana*

35. Head frontal margin projection inconspicuous, convex (fig. 3.36g). Pereonite lateral margins denticulate. Pleotelson posterior margin barely produced, denticulate (fig. 3.36f) ..... *Epipedonana*

– Head frontal margin not produced, straight to weakly convex. Pereonite lateral margins smooth. Pleotelson posterior margin produced, smooth (fig. 3.37k) ..... *Omonana*

36. Head frontal margin with median projection 37

– Head frontal margin straight or broadly rounded, without median projection 39

37. Body tapering posteriorly. Pleotelson lateral margin tapering (fig. 3.38i). Antenna article 3 as long as wide. Pereopod 1 carpus projecting (fig. 3.39o) ..... *Sporonana*

– Body oval in dorsal view. Pleotelson lateral margin rounded. Antenna article 3 longer than wide. Pereopod 1 carpus oval (fig. 3.39i) 38

38. Antennular article 1 cylindrical, inflated. Antenna article 3 subcylindrical, lateral margin convex. Uropods just dorsal to pleotelson margin (fig. 3.36h) ..... *Harrietonana*

– Antennular article 1 expanded, curved ventrally under base of antenna and eyestalk. Antenna article 3 rectangular, laterally expanded (fig. 3.39a). Uropods ventral to pleotelson margin (fig. 3.35e) ..... *Allorostrata*

39. Head frontal margin dorsoventrally flattened, convex, with prominent rounded lateral corners (most species with short median slit). Pleotelson tapering. Uropods fully dorsal on pleotelson, uniramous (fig. 3.35f) ..... *Ascionana*

– Head frontal margin straight or broadly rounded. Pleotelson broadly rounded. Uropods marginal on pleotelson, biramous 40

40. Head frontal margin nearly straight, with angular lateral corners. Pereonite 5 as wide as pereonites 4 and 6 (fig. 3.35g). Pereopod 1 carpus triangular (fig. 3.39i) ..... *Austrimunna*

– Head frontal margin broadly rounded, without angular lateral corners. Pereonite 5 narrower than pereonites 4 and 6 (fig. 3.37b). Pereopod 1 carpus projecting (fig. 3.39l) ..... *Kiklonana*

41. Head without eyes or eyestalks 42

– Head with long eyestalks 43

42. Pereonites 1–6 posterolateral margins and pleotelson margin denticulate (fig. 3.40b) ..... *Dentigonium*

Pereonites 1–6 posterolateral margins and pleotelson margin smooth (fig. 3.40c) ..... *Pleurogonium*

43. Antennular peduncle article 2 with distal spine-like projection exceeding flagellum (fig. 3.40e) ..... *Antennulosignum*

– Antennular peduncle article 2 not projecting (fig. 3.40d) ..... *Pleurosignum*

Abyssianira Menzies, 1956

Diagnosis. Head frontal margin dipping ventrally to thin horizontal plate with evenly serrate convex margin; with long eyestalks. Coxal plates 5–7 visible in dorsal view. Pleotelson lateral margin serrate.

Slope–abyssal (400–5293 m). Tropical Atlantic, Temperate Atlantic South America, Temperate Australasia. 6 species (Menzies, 1956: type species; Just, 1990: rediagnosis; Doti and Roccatagliata, 2006: Atlantic species).

Acutomunna Winkler, 1994

Diagnosis. Head frontal margin convex or subtruncate; with long eyestalks, without ommatidia. Pereonites 1–7 with evenly tapered lateral spines. Coxal plates not visible in dorsal view. Pleotelson more or less flattened; lateral margin denticulate.

Slope, bathyal (1677–2470 m). Tropical Atlantic, Temperate Northern W Pacific. 2 species (Chardy, 1975: type species; Shimomura, 2009; Winkler, 1994: second species).

Advenogonium Just and Wilson, 2007

Diagnosis. Head frontal margin concave in middle, laterally inflated; with eyestalks conical, angled laterally. Coxal plates 5–7 visible in dorsal view. Pleotelson lateral margin smooth. Antennular peduncle article 1 shorter than eyestalk. Pereopod 1 carpus triangular, flexor margin with 2 straight robust setae. Pereopod 1 propodus with 2 robust setae on opposing margin. Pereopod 2 carpus and propodus flexor margin with short robust setae. Uropod endopod apex truncate.

Shelf (15–35 m). Temperate South America (Beagle Channel). 1 species (Doti and Roccatagliata, 2005: description of type species, *Austrosignum fuegiae*; Just and Wilson, 2007).

Allorostrata Winkler, 1994

Diagnosis. Head frontal margin with rounded flat median projection. Coxal plates not visible in dorsal view. Pleotelson with produced posterior margin beyond uropods; lateral margin smooth. Antennular peduncle article 1 longer and wider than article 2, expanded, curved ventrally under base of antenna and eyestalk. Antenna article 3 rectangular, laterally expanded. Pereopod 1 carpus triangular. Uropod ventral to lateral margin.

Shelf (9–60 m). Temperate South America (Magellan Strait). 2 species (Just and Wilson, 2004: rediagnosis).

Antennulosignum Nordenstam, 1933

Diagnosis. Head frontal margin evenly convex; with long eyestalks. Pereonites 2–7 margins with lateral spine. Coxal plates not visible in dorsal view. Pleotelson lateral margin smooth. Antennular peduncle article 2 with distal spine-like projection exceeding flagellum. Mandibular molar process narrow, apex oblique, rounded or pointed.

Shelf (22 m). Temperate South America (Falkland Is). 1 species (Brandt, 1999; Nordenstam, 1933: only species refigured as *Pleurosignum chilense* Menzies, 1962).

Ascionana Just and Wilson, 2004

Diagnosis. Head frontal margin dorsoventrally flattened, convex, with prominent rounded lateral corners (most species with short median slit). Coxal plates not visible in dorsal view. Pleotelson tapering; lateral margin smooth, sometimes with few denticles near uropod. Mandibular palp present, or absent. Pereopod 1 carpus rectangular. Uropod dorsal and well removed from lateral margin.

Subtidal, shelf (1–204 m). Temperate Northern Pacific, Central Indo-Pacific, Temperate Southern Africa, Temperate Australia. 14 species (Just and Wilson, 2004: key to 13 species).

Austrimunna Richardson, 1906

Diagnosis. Head frontal margin almost straight. Coxal plates not visible in dorsal view. Pleotelson subcircular, with produced posterior margin; lateral margin smooth. Mandibular palp absent. Pereopod 1 carpus triangular. Uropod just dorsal to lateral margin.

Shelf (12–60 m). Temperate South America. 1 species (Just and Wilson, 2004: rediagnosis).

Austrogonium Hodgson, 1910

Diagnosis. Head frontal margin evenly convex; without eyes or eyestalks. Coxal plates 2–7 with prominent lateral spines visible in dorsal view. Pleotelson anteriorly narrow, posteriorly bulbous; lateral margin serrate.

Slope (1651–3318 m). Temperate Northern W Pacific, Temperate Pacific South America. 2 species (Shimomura, 2009).

Austronanus Hodgson, 1910

Diagnosis. Head frontal margin angular with pointed or blunt midpoint; with short eyestalks. Coxal plates 5–7 visible in dorsal view. Pleotelson rounded; anterolateral margin shorter than lateral margin; lateral margin entirely denticulate.

Shelf (12–55 m). Temperate South America, Southern Ocean. 6 species (Just and Wilson, 2006: key to 6 species).

Austrosignum Hodgson, 1910

Diagnosis. Head frontal margin evenly convex; with prominent eyestalks, at least twice as long as wide. Coxal plates 5–7 visible in dorsal view. Pleotelson lateral margin smooth. Mandibular palp absent. Pereopod 1 carpus triangular, with 2 long and 1 short robust setae. Pereopod 2 carpus and propodus flexor margin with short robust setae. Uropod endopod acute, curved mediad.

Shelf (13–45 m). Temperate Northern Pacific, Southern Ocean. 4 species (Just and Wilson, 2007; 2021: key to 4 species, distributions).

Bathygonium Kussakin and Vasina, 1984

Diagnosis. Head frontal margin convex, with anterolateral projections; with eyestalks curving posterolaterally anterior to pereonite 1, blind. Coxal plates 2–7 with prominent lateral spines visible in dorsal view. Pleotelson longer than wide; lateral margin serrate.

Slope (807–912 m). Southern Ocean (Scotia Sea). 1 species (Kussakin and Vasina, 1984).

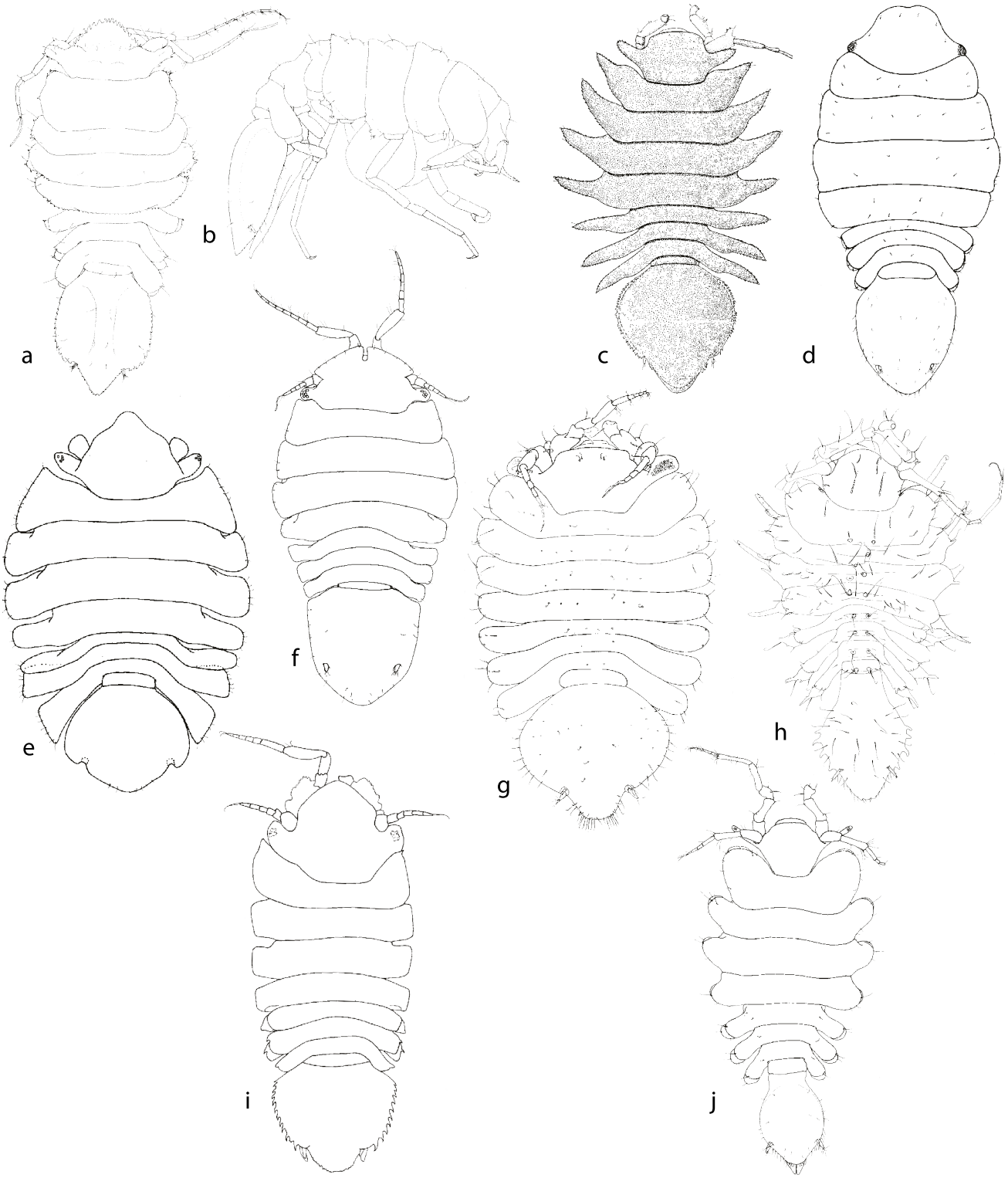

Figure 3.35. Paramunnidae. a, b, *Abyssianira bathyalis* Just, 1990 (dorsal, lateral); c, *Acutomunna foliacea* (Chardy, 1975); d, *Advenogonium fuegiae* (Doti and Roccatagliata, 2005); e, *Allorostrata ovalis* (Winkler, 1994); f, *Ascionana darwinia* Just and Wilson, 2004; g, *Austrimunna antarctica* (Richardson, 1906); h, *Austrogonium japonicum* Shimomura, 2009; i, *Austronanus glacialis* Hodgson, 1910; j, *Austrosignum glaciale* Hodgson, 1910.

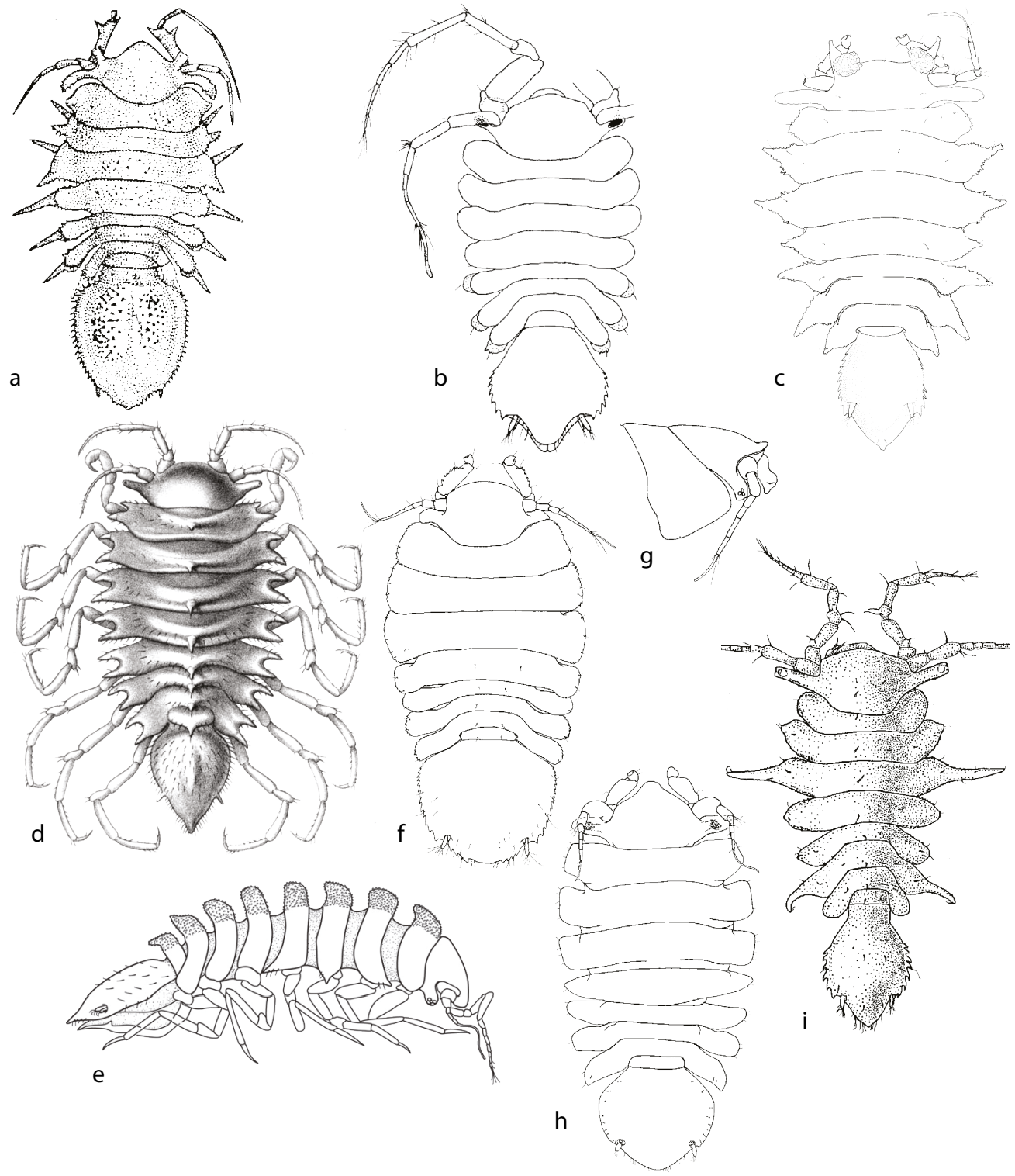

Figure 3.36. Paramunnidae. a, *Bathygonium moskalevi* Kussakin and Vasina, 1984; b, *Metamunna maltini* (Schiecke and Fresi, 1972); c, *Compoceration garyi* Just, 2009; d, *Coulmannia australis* Hodgson, 1910; e, *Coulmannia rossensis* Choudhury, Doti and Brandt, 2011; f, g, *Epipedonana profunda* Just and Wilson, 2004 (dorsal, pereonite 1 and head lateral); h, *Harrietonana subtriangulata* (Richardson, 1908); i, *Heterosignum mutsuensis* Shimomura and Mawatari, 2002.

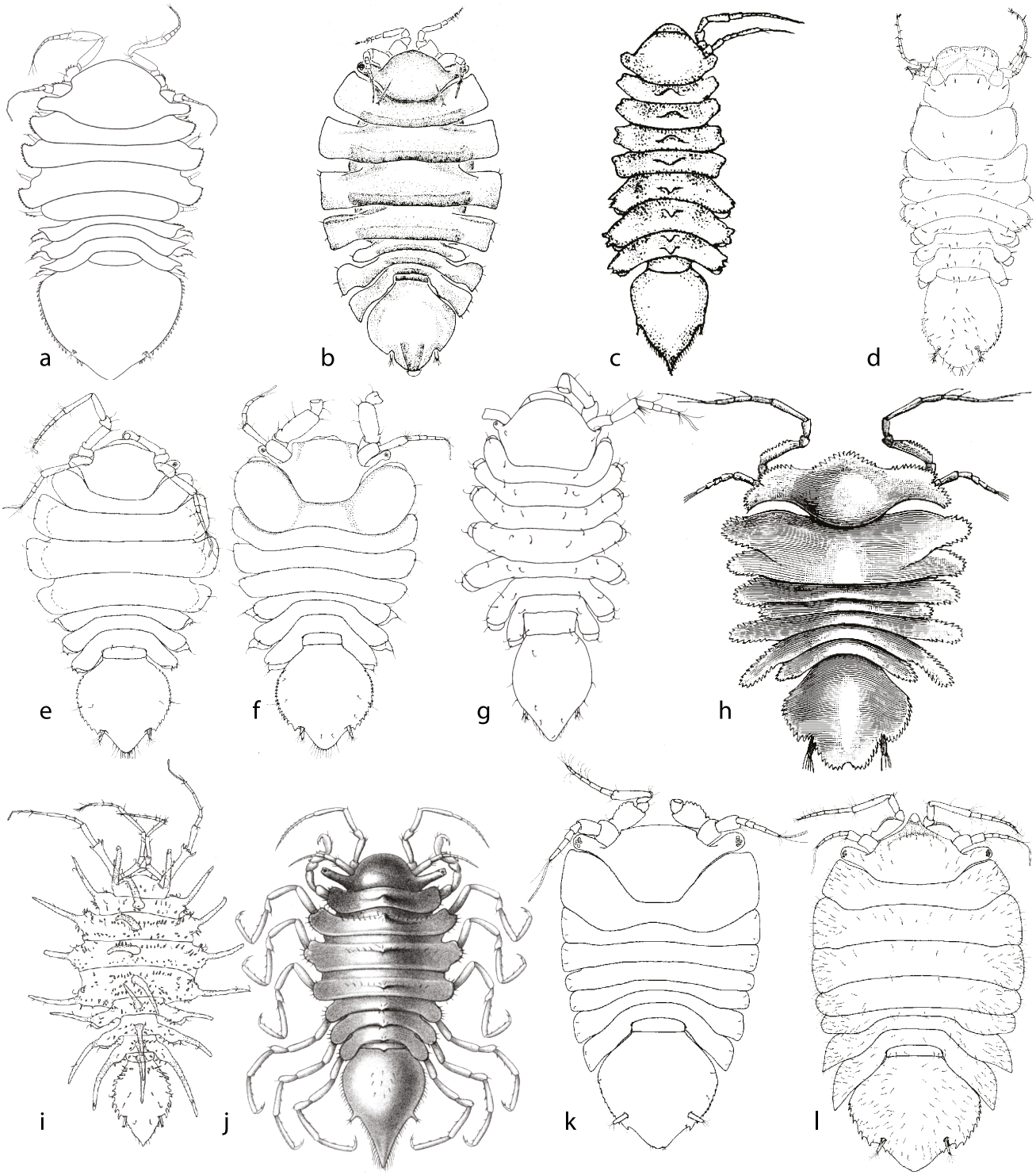

Figure 3.37. Paramunnidae. a, *Holodentata caeca* Doti, Choudhury and Brandt, 2009; b, *Kiklonana arnaudi* (Amar, 1974); c, *Kussakinella spinosum* (Kussakin, 1982); d, *Magellianira serrata* (Winkler, 1994); e, f, *Meridiosignum minidenticulatum* Just and Wilson 2007 (female, male); g, *Munnogonium globifrons* (Menzies, 1962); h, *Neasellus kerguelensis* Beddard, 1885; i, *Notoxenoides setosa* Shimomura, 2009; j, *Notoxenus spinifer* Hodgson, 1910; k, *Omonana brachycephala* Just and Wilson, 2004 (male); l, *Pagonana rostrata* (Hodgson, 1910).

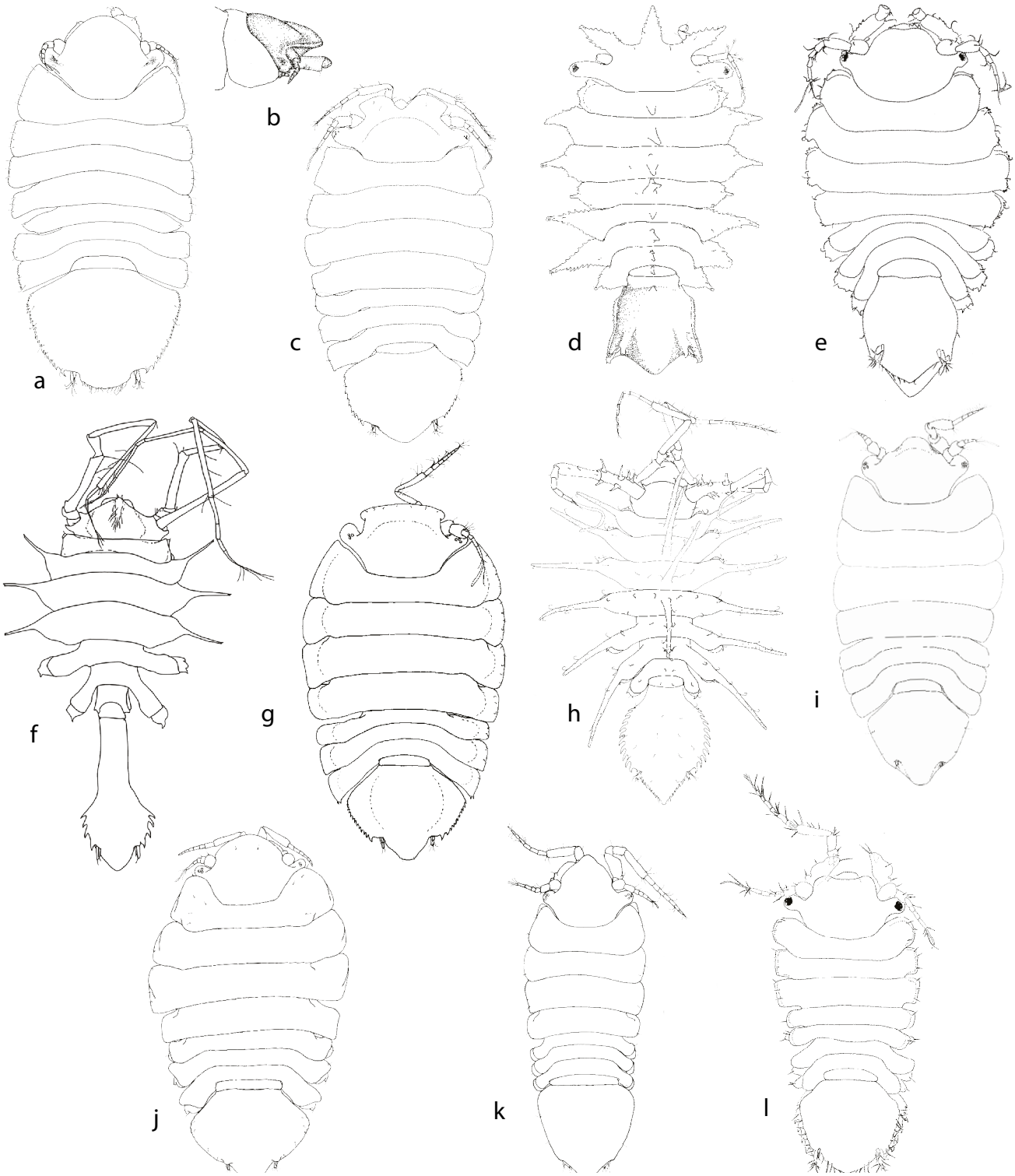

Figure 3.38. Paramunnidae. a, b, *Palanana serrata* (Richardson, 1913) (dorsal, pereonite 1 and head lateral); c, *Paramunna bilobata* G.O. Sars, 1866; d, *Pentaceration bassiana* Just, 2009; e, *Quetzogonium dentatum* (Winkler, 1994); f, *Reductogonium iroquois* Golovan and Malyutina, 2019; g, *Spiculonana platysoma* Just and Wilson, 2004; h, *Spinogonium spinosum* Shimomura, 2009; i, *Sporonana robusta* Just and Wilson, 2004; j, *Stephenseniellus palliolatipes* Just and Wilson, 2006; k, *Xigonus patagoniensis* (Winkler, 1994); l, *Zizzygonium magellanensis* (Winkler 1994).

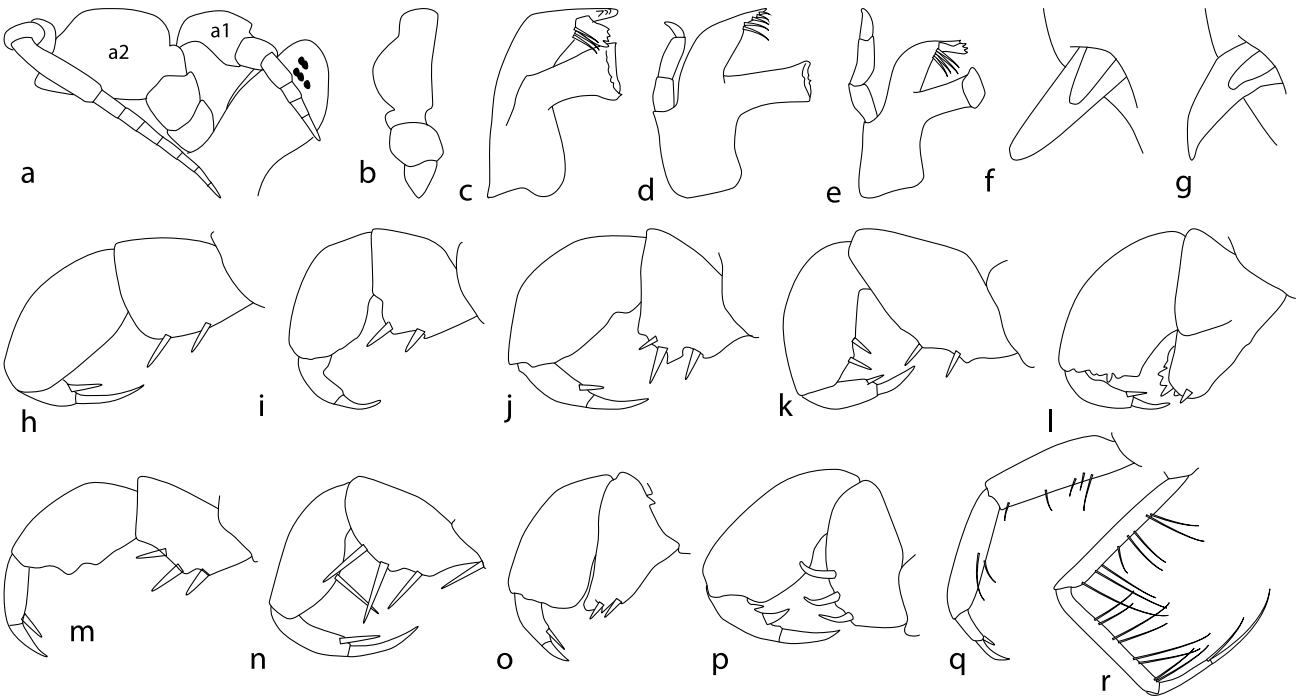

Figure 3.39. Paramunnidae. a, *Allorostrata*, a1 = antennula, a2 = antenna (ventral view, left); b, *Zizzygonium* antennula. Mandibles: c, *Coulmannia*; d, *Cryosignum*; e, *Pentaceration*. Left uropod (dorsal view): f, *Cryosignum*; g, *Austrosignum*. Pereopod 1, carpus–dactylus: h, *Advenogonium*; i, *Austrimunna*; j, *Austrosignum*; k, *Cryosignum*; l, *Kiklonana*; m, *Metamunna*; n, *Munnogonium*; o, *Sporonana*; p, *Tethygonium*. Pereopod 2, carpus–dactylus: q, *Advenogonium*; r, *Munnogonium*.

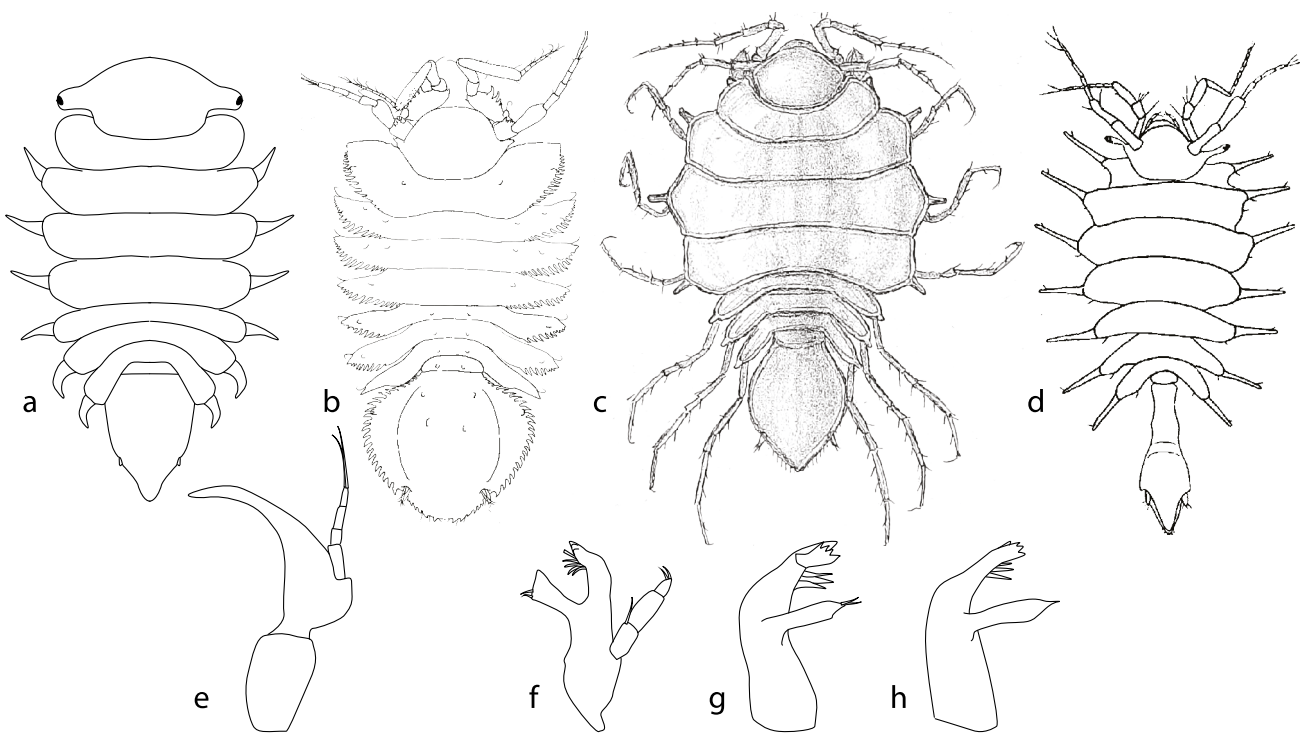

Figure 3.40. Paramunnidae. a, *Antennulosignum elegans* Nordenstam, 1933; b, *Dentigonium tantulum* Shimomura, 2009; c, *Pleurogonium rubicundum* G.O. Sars, 1897; d, *Pleurosignum elongatum* Vanhöffen, 1914; e, *Antennulosignum*, antennula. Mandible: f, *Dentigonium*; g, *Pleurogonium*; h, *Pleurosignum*.

***Compoceration* Just, 2009**

Diagnosis. Head frontal margin without anterior medial spine, upright outgrowths at base of 2 lateral forward-pointing spines; with long eyestalks. Pereonites 1–7 with lateral spines. Coxal plates not visible in dorsal view. Pleotelson more or less flattened; lateral margin serrate.

Slope (220 m). Temperate SE Australia. 1 species (Just, 2009b).

***Coulmannia* Hodgson, 1910**

Diagnosis. Head frontal margin convex, without anterolateral angle; with short eyestalks. Pereonites 1–7 and pleonite 1 each with dorsal spine or crest, sometimes duplicated. Coxal plates visible posteriorly or not. Pleotelson more or less flattened; lateral margin smooth. Mandibular palp absent.

Type species: *Coulmannia australis* Hodgson, 1910, herein designated.

Shelf, slope (89–474 m). Southern Ocean. 4 species (Hodgson, 1910; Choudhury et al., 2011: key to 4 species).

***Cryosignum* Just and Wilson, 2007**

Diagnosis. Head frontal margin evenly convex; with prominent eyestalks, at least twice as long as wide. Coxal plates 2–7 visible in dorsal view. Pleotelson lateral margin smooth. Pereopod 1 carpus oval, with 2 robust setae. Pereopod 1 propodus with 2 robust setae on opposing margin. Pereopod 2 carpus and propodus flexor margin with short robust setae. Uropod endopod apex truncate.

Subtidal, shelf (3–100 m). Temperate South America, Southern Ocean. 4 species (Just and Wilson, 2007; 2021: key to 4 species).

***Dentigonium* Shimomura, 2009**

Diagnosis. Head frontal margin evenly convex; without eyes or eyestalks. Pereonites 1–6 posterolateral margins and pleotelson margin denticulate. Coxal plates not visible in dorsal view. Antennular peduncle article 2 not projecting. Mandibular molar process narrow, apex oblique.

Slope (565–723 m). Temperate Northern W Pacific (Japan). 1 species (Shimomura, 2009).

***Epipedonana* Just and Wilson, 2004**

Diagnosis. Head frontal margin weakly produced, convex, with angular corners. Coxal plates not visible in dorsal view. Pleotelson rounded; lateral margin denticulate. Antenna article 3, 3 times as long as wide, with mesial spine. Pereopod 1 carpus oval. Uropod just dorsal to lateral margin.

Slope (930–1000 m). Temperate Australia. 1 species (Just and Wilson, 2004).

***Harrietonana* Just and Wilson, 2004**

Diagnosis. Head frontal margin with blunt median projection. Coxal plates not visible in dorsal view. Pleotelson subcircular, with weakly produced posterior margin; lateral margin denticulate near uropods. Antennular peduncle article 1 inflated, wider than article 2. Antenna article 3 subcylindrical, lateral margin convex. Pereopod 1 carpus oval. Uropod just dorsal to lateral margin.

Shelf (25 m). Southern Ocean. 1 species (Just and Wilson, 2004).

***Heterosignum* Gamô, 1976**

Diagnosis. Head frontal margin convex, with anterolateral angle at base of antenna; with long eyestalks. Pereonites 1–7 sometimes with sharp dorsal spine, never duplicated; pleonite 1 without dorsal spine. Coxal plates not visible in dorsal view. Pleotelson anteriorly narrow, posteriorly bulbous; lateral margin serrate. Mandibular palp absent.

Shelf (30–135 m). Temperate Northern W Pacific (Japan), Southern Ocean (Amsterdam I.). 7 species (Gamô, 1976; Shimomura and Mawatari, 2002: revised diagnosis, 3 new species; Khalaji-Pirbalouty & Al-Kandari, 2024; key to males).

***Holodentata* Doti, Choudhury and Brandt, 2009**

Diagnosis. Head frontal margin evenly convex; with short eyestalks, with or without ommatidia. Coxal plates 1–7 with short lateral spines visible in dorsal view. Pleotelson wider than long; lateral margin serrate. Mandibular palp absent.

Shelf, slope (84–1584 m). Southern Ocean. 3 species (Doti et al., 2009).

***Kiklonana* Just and Wilson, 2004**

Diagnosis. Head frontal margin broadly rounded, without lateral corners. Coxal plates not visible in dorsal view. Pleotelson subcircular, with produced posterior margin; lateral margin smooth. Antennular peduncle article 1 inflated, wider than article 2. Pereopod 1 carpus distally projecting. Uropod on lateral margin.

Shelf (13–20 m). Southern Ocean (Terre Adélie). 1 species (Amar and Roman, 1974: figures; Just and Wilson, 2004: redescription).

***Kussakinella* Just and Wilson, 2007**

Diagnosis. Head frontal margin evenly convex; with short eyestalks. Pereonites 1–7 with short middorsal conies. Coxal plates 5–7 visible in dorsal view. Pleotelson apex with acute apical spine-like projection; lateral margin smooth. Mandibular palp absent. Pereopod 1 carpus triangular, with 2 straight robust setae; dactylus without posterior spine proximal to accessory claw. Pereopod 2 carpus and propodus flexor margin with short robust setae. Uropod endopod apex truncate.

Shelf (17 m). Temperate South America. 1 species (Kussakin, 1982: type species; Just and Wilson, 2007).

***Magellianira* Winkler, 1994**

Diagnosis. Head frontal margin plate truncate with rounded anterolateral corners, barely serrate; without eyestalks. Coxal plates 1–7 visible in dorsal view. Pleotelson lateral margin denticulate.

Subtidal (10 m). Temperate South America (Magellan Strait). 1 species (Winkler, 1994).

Meridiosignum Just and Wilson, 2007

Diagnosis. Head frontal margin almost straight; with prominent eyestalks, at least twice as long as wide. Coxal plates 5–7 visible in dorsal view. Pleotelson posterior projection with fringe of long setae around apex; lateral margin serrate. Antennular peduncle article 1 shorter than or as long as eyestalk. Mandibular palp absent. Pereopod 1 carpus triangular, with 2 straight robust setae; dactylus without posterior spine proximal to accessory claw. Pereopod 1 propodus with 1 or 2 robust setae on opposing margin. Pereopod 2 carpus and propodus flexor margin with short robust setae. Uropod endopod apex truncate.

Subtidal, shelf (0–129 m). Temperate Atlantic South America, Temperate Australasia, Southern Ocean. 7 species (Just and Wilson, 2007; 2021: key to 7 species).

Metamunna Tattersall, 1905

Diagnosis. Head frontal margin almost straight; with prominent eyestalks, at least twice as long as wide. Coxal plates 2–7 or 5–7 visible in dorsal view. Pleotelson posterior projection with short lateral setae, without setae on apex; lateral margin serrate. Antennular peduncle article 1 longer and wider than article 2, longer than eyestalk. Mandibular palp absent. Pereopod 1 carpus subtriangular, with 2–4 straight robust setae. Pereopod 1 propodus with simple setae on opposing margin. Uropod endopod apex truncate.

Subtidal–slope (0–300 m). Temperate Northern Atlantic, Tropical Atlantic, Temperate Northern W Pacific, Eastern Indo-Pacific, Tropical Eastern Pacific, Temperate Australasia. 8 species. The type species *Metamunna typica* Tattersall, 1905 was redescribed by Bamber and Robbins (2010). *Boreosignum* Just and Wilson, 2007 is treated as a junior synonym and its included species transferred to *Metamunna*. Its type species, *Austrosignum maltinii*, was figured by Schiecke and Fresi (1972).

Munnogonium George and Stromberg, 1968

Diagnosis. Head frontal margin evenly convex, or straight; with eyestalks round, angled downward. Coxal plates 5–7 visible in dorsal view. Pleotelson lateral margin smooth. Antennular peduncle article 1 at least twice as long as eyestalk. Mandibular palp absent. Pereopod 1 carpus triangular, flexor margin with 3 straight robust setae. Pereopod 2 carpus and propodus flexor margin with long, slender setae. Uropod endopod apex truncate.

Subtidal–slope (0–660 m). Temperate Northern Pacific, Temperate South America, Temperate Australasia, Southern Ocean. 11 species (Just and Wilson, 2007: rediagnosis; 2021: key to 8 species; Golovan and Malyutina, 2022: list and distributions of 10 species).

Neasellus Beddard, 1885

Diagnosis. Head frontal margin sinuous; eyestalk club-shaped, curved backwards in distal half, with or without ommatidia. Pereonites 1–3, 5, 6 projecting as rounded spatulate processes; pereonite 4 lateral margin not extending as far as lateral margins of pereonites 3 and 5. Coxal plates not visible in dorsal view. Pleotelson wider than long; lateral margin serrate.

Shelf, slope (110–1373 m). Temperate Atlantic South America, Southern Ocean. 4 species (Beddard, 1885: figure of type species; Doti, 2017: rediagnosis, all species described).

Notoxenoides Menzies, 1962

Diagnosis. Head frontal margin convex, with anterolateral projections; without eyestalks. Pereonites 1–7 with middorsal and lateral spines. Coxal plates 5–7 visible in dorsal view. Pleotelson laterally convex; lateral margin serrate.

Slope, bathyal (565–4047 m). Temperate Northern W Pacific, Tropical Eastern Pacific, Temperate Southern Africa. 5 species (Kensley, 1984; Menzies, 1962; Shimomura, 2009).

Notoxenus Hodgson, 1910

Diagnosis. Head frontal margin evenly convex; with long eyestalks. Pereonites 1–7 with low median projection, without lateral spines. Coxal plates not visible in dorsal view. Pleotelson more or less flattened; lateral margin smooth.

Shelf. Southern Ocean. 1 species (Hodgson, 1910).

Omonana Just and Wilson, 2004

Diagnosis. Head frontal margin almost straight. Coxal plates not visible in dorsal view. Pleotelson laterally rounded, posterior margin produced; lateral margin denticulate. Antennular peduncle article 1 as long as article 2. Pereopod 1 carpus oval. Uropod dorsal and well removed from lateral margin.

Subtidal, shelf (9–100 m). Temperate South America (Magellan Strait), Temperate Australasia (New Zealand). 4 species (Just and Wilson, 2004).

Pagonana Just and Wilson, 2004

Diagnosis. Head frontal margin with median projection. Coxal plates not visible in dorsal view. Pleotelson laterally rounded, posterior margin produced; lateral margin denticulate. Antennular peduncle article 1 longer and wider than article 2. Antenna article 3 with crenulate lateral flange. Pereopod 1 carpus oval. Uropod on lateral margin, or just dorsal to lateral margin.

Shelf. Temperate South America (Magellan Strait), Southern Ocean (Kerguelen I.). 4 species (Just and Wilson, 2004: key to 4 species).

Palanana Just and Wilson, 2004

Diagnosis. Head frontal margin forming broadly rounded curve without lateral corners, anterior and lateral edges upcurved. Coxal plates not visible in dorsal view. Pleotelson laterally rounded, posterior margin produced; lateral margin denticulate. Antennular peduncle article 1 longer and wider than article 2. Pereopod 1 carpus triangular. Uropod on lateral margin.

Subtidal (0.5–23 m). Southern Ocean (Antarctica). 2 species (Just and Wilson, 2004).

Paramunna G. O. Sars, 1866

Diagnosis. Head frontal margin with 2 dorsolaterally projecting lobes. Coxal plates not visible in dorsal view. Pleotelson with produced posterior margin beyond uropods; lateral margin denticulate. Antennular peduncle article 1 as long as article 2, inflated. Pereopod 1 carpus triangular. Uropod on lateral margin.

Subtidal–slope (1–481 m). Temperate Northern Atlantic, Temperate Northern Pacific, Temperate South America, Temperate Southern Africa, Temperate Australasia. 11 species (Just, 1990: type species; Just and Wilson, 2004: rediagnosis,

key to 8 species).

Pentaceration Just, 2009

Diagnosis. Head frontal margin with anterior medial spine or tooth, pair of anterolateral spines; with long eyestalks. Pereonites 1–7 with lateral spines. Coxal plates not visible in dorsal view. Pleotelson more or less flattened; lateral margin serrate.

Subtidal–abyssal (7–5340 m). Central Indo-Pacific, Temperate South America, Temperate Australasia. Atlantic. 23 species (Just, 2009a, 2011: key to 16 Australian species; Doti, 2017: Atlantic species; Peart and Schnabel, 2024: diagnosis; key to 8 New Zealand species).

Pleurogonium G.O. Sars, 1864

Diagnosis. Head frontal margin evenly convex; without eyes or eyestalks. Coxal plates 5–7 or more visible in dorsal view. Pleotelson lateral margin smooth. Antennular peduncle article 2 not projecting. Mandibular molar process narrow, apex oblique, rounded or pointed.

Intertidal–slope (0–1769 m). Arctic, Temperate Northern Atlantic, Temperate Northern Pacific, Southern Ocean. 20 species (figures: Sars, 1896–1899; Shimomura and Mawatari, 2001; Shimomura, 2009).

Pleurosignum Vanhöffen, 1914

Diagnosis. Head frontal margin evenly convex; with long eyestalks. Pereonites 1–7 margins with lateral spine. Coxal plates not visible in dorsal view. Pleotelson lateral margin smooth. Antennular peduncle article 2 not projecting. Mandibular molar process narrow, apex oblique, rounded or pointed.

Intertidal–shelf (22–183 m). Temperate South America, Temperate Southern Africa. 4 species (figures: Kensley, 1977; Vanhöffen, 1914).

Quetzogonium Just and Wilson, 2007

Diagnosis. Head frontal margin concave in middle; with short eyestalks. Coxal plates 5–7 visible in dorsal view. Pleotelson with few denticles near uropod. Antennular peduncle article 1 shorter than eyestalk. Pereopod 1 carpus triangular, with 2 straight robust setae. Pereopod 1 propodus with 2 robust setae on opposing margin. Pereopod 2 carpus and propodus flexor margin with short robust setae. Uropod endopod apex truncate.

Shelf (12–40 m). Temperate South America. Magellan Strait. 1 species (Winkler, 1994: type species; Just and Wilson, 2007).

Reductogonium Golovan and Malyutina, 2019

Diagnosis. Head frontal margin with medial crest bearing tuft of setae on posterior part; without eyestalks. Pereonites 2–4 with long lateral spines. Coxal plates 5, 6 visible in dorsal view; pereonite 7 reduced, without pereopod. Pleotelson anteriorly narrow, posteriorly bulbous; lateral margin serrate. Mandibular palp absent.

Abyssal (5215–5266 m). Temperate Northern W Pacific. 1 species (Golovan and Malyutina, 2019).

Spiculonana Just and Wilson, 2004

Diagnosis. Head frontal margin weakly convex to straight; anterior edge only upcurved. Coxal plates not visible in dorsal view. Pleotelson wider than long; lateral margin denticulate. Antennular peduncle article 1 as long as article 2, tubular. Antenna article 3 tubular. Pereopod 1 carpus triangular. Uropod on lateral margin.

Subtidal–slope (3–400 m). Temperate Australasia. 3 species (Just and Wilson, 2004: key to 3 species).

Spinogonium Shimomura, 2009

Diagnosis. Head frontal margin without anterolateral projections; without eyestalks. Pereonites 1–6 with lateral spines; pleonites 1–3 with middorsal spine. Coxal plates 1–7 visible in males; 1 and 5–7 visible in females in dorsal view. Pleotelson laterally convex; lateral margin serrate.

Slope (565–1769 m). Temperate Northern W Pacific. 2 species (Shimomura, 2009).

Sporonana Just and Wilson, 2004

Diagnosis. Head frontal margin with broad truncate median projection, dorsoventrally thick, rounded. Coxal plates not visible in dorsal view. Pleotelson tapering; lateral margin smooth. Antennular peduncle article 1 as long as article 2, inflated. Antenna article 3 as long as wide. Mandibular palp absent. Pereopod 1 carpus distally projecting. Uropod just dorsal to lateral margin.

Subtidal, shelf (0–20 m). Temperate South America, Temperate Australasia (subantarctic), Southern Ocean. 3 species (Just and Wilson, 2004: key to 3 species).

Stephenseniellus Just and Wilson, 2006

Diagnosis. Head frontal margin produced as large rounded plate; with short eyestalks. Coxal plates 5–7 visible in dorsal view. Pleotelson rounded; anterolateral margin as long as posterolateral margin; denticles on lateral corner only.

Intertidal. Southern Ocean (subantarctic New Zealand, Australia). 2 species (Just and Wilson, 2006: key to 2 species).

Tethygonium Just and Wilson, 2007

Diagnosis. Head frontal margin evenly convex; eyestalk vestigial to twice as long as wide. Coxal plates 1–7 or 5–7 visible in dorsal view. Pleotelson posterior projection with short lateral setae, without setae on apex; lateral margin serrate. Antennular peduncle article 1 at least twice as long as eyestalk. Mandibular palp absent. Pereopod 1 carpus oval, with 3–5 curved robust setae; dactylus with acute posterior spine proximal to accessory claw. Pereopod 2 carpus and propodus flexor margin with short robust setae. Uropod endopod apex truncate.

Shelf, slope (35–1000 m). Temperate Northern Atlantic, Temperate Northern W Pacific, Western Indo-Pacific, Temperate Australasia. 4 species (Just and Wilson, 2007; 2021: key to 4 species).

Xigonus Just and Wilson, 2006

Diagnosis. Head frontal margin angular with pointed or blunt midpoint; with short eyestalks. Coxal plates 5–7 visible in dorsal view. Pleotelson tapering; lateral margin smooth.

Subtidal (12 m). Temperate South America (Magellan Strait). 1 species (Just and Wilson, 2006).

Zizzygonium Just and Wilson, 2007

Diagnosis. Head frontal margin concave in middle, laterally prominently rounded; with prominent eyestalks, at least twice as long as wide. Coxal plates 5–7 visible in dorsal view. Pleotelson lateral margin denticulate. Antennular peduncle article 3 lateral margin expanded. Antenna article 3 lateral margin expanded. Pereopod 1 carpus oval, with 2 robust setae. Pereopod 1 propodus with 1 robust seta on opposing margin. Pereopod 2 carpus and propodus flexor margin with short robust setae. Uropod endopod apex truncate.

Subtidal (9–12 m). Temperate South America (Magellan Strait). 1 species (Winkler, 1994: type species; Just and Wilson, 2007).

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Pleurocopidae Fresi and Schiecke, 1972

Figure 3.41

Pleurocopids are small (<1 mm long) isopods of shallow coral rubble. They are instantly recognised by the large biramous uropods attached near the front of the pleotelson.

Diagnosis. Body flat; pereonites 2–4 and coxa 5–7 with tubular extensions. Pleon of 1 segment, tapering posteriorly. Eyes absent. Antennula flagellum of 6 or 7 articles. Mandible without palp. Maxillipedal palp articles 1–5 narrow, less than half as wide as endite. Pereopod 4 coxa inserting on midlateral margin; pereopodal 2–7 dactyli with 1 unguis. Uropod inserting on anterolateral surface of pleotelson, biramous.

Pleurocope Walker, 1901

Subtidal, shelf (4–17 m). Temperate Northern and Tropical Atlantic, Western and Central Indo-Pacific. 4 species (Shimomura and Naruse, 2015: rediagnosis, key to species).

Reference

Shimomura, M., and Naruse, T. 2015. Two new species of Asellota (Crustacea, Isopoda) from coral reefs on Iriomote Island, Okinawa, Japan. *ZooKeys* 520: 27–40. https://doi.org/10.3897/zookeys.520.5943

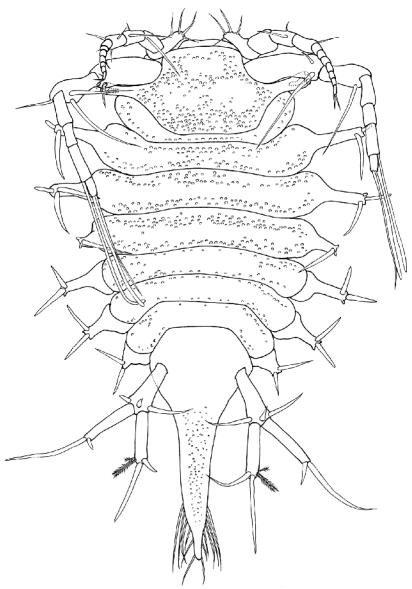

Figure 3.41. Pleurocopidae, *Pleurocope iriomotensis* Shimomura and Naruse, 2015.

Santiidae Kussakin, 1988

Figure 3.42

Santiids are small (usually <2 mm long) isopods of shallow coral or rubble sediments; some are associated with sponges. All are more or less oval, about twice as long as wide, have eyes on short stalks and an exposed anus. *Halacarsantia*, *Santia* and *Spinosantia* are recognisable by the numerous robust setae around the margins of the body and/or coxae. The family and four of its five genera were diagnosed by Wolff (1989). The fifth genus was included in Wolff's key but not named until later (Wolff and Brandt, 2000).

Diagnosis. Body oval, usually flat; head frontal margin usually convex; pereonites similar, wider than long. Pleon of 1 free pleonite plus pleotelson, or of 1 segment. Anus not covered by pleopodal operculum. Eyes on lateral process. Antennula much shorter than head width; flagellum with at most 3 articles. Antennal scale small, or absent. Maxillipedal palp articles 1–5 narrow, less than half as wide as endite. Pereopod 1 prehensile; pereopods 2–7 ambulatory; pereopod 4 coxa inserting on midlateral margin; pereopodal 2–7 dactyli with 2 claws. Uropod inserting posterolaterally, usually biramous.

Implicit generic characters. Epistome not or scarcely projecting. Antennula article 1 rounded distally. Male pleopod 2 not extending laterally beyond pleotelson margins.

Key to genera of Santiidae

1 .	Pleotelson much longer than wide, tapering over posterior third. Male pleopod 2 strongly inflated, extending laterally well beyond pleotelson margins, visible dorsally (fig. 3.42c, h)	*Prethura*
–	Pleotelson oval or pyriform or with truncate distal margin. Male pleopod 2 not extending laterally beyond pleotelson margins	2
2.	Epistome strongly projecting, longer than head (fig. 3.42b)	*Kuphomunna*
–	Epistome not projecting	3
3.	Head frontal margin with large, broadly rounded lobe with fringe of spines. Pleon comprising pleotelson only (fig. 3.42a). Uropod uniramous (fig. 3.42g)	*Halacarsantia*
–	Head frontal margin usually straight, occasionally with 2 rounded lobes. Pleon comprising free pleonite 1 plus pleotelson. Uropod biramous (fig. 3.42e, i)	4
4.	Pleotelson posterior apex rounded (fig. 3.42d). Antennula article 1 rounded distally	*Santia*
–	Pleotelson hexagonal, posterior apex almost straight (fig. 3.42e). Antennula article 1 with distolateral extension with strong spine (fig. 3.42f)	*Spinosantia*

Halacarsantia Wolff, 1989

Diagnosis. Body flat. Head frontal margin with large, broadly rounded lobe with fringe of robust setae. Pleon comprising pleotelson only; pleotelson pentagonal, posterior apex rounded. Uropod uniramous.

Subtidal (often with sponges). Tropical Atlantic, Temperate Northern Pacific, Central and Eastern Indo-Pacific, Temperate Australasia. 8 species (Wolff, 1989; Shimomura and Ariyama, 2004: association with sponges; Shimomura and Bruce, 2012: rediagnosis, key to 7 species; Ortiz and Winfield, 2015: key to 8 species).

Kuphomunna Barnard, 1914

Diagnosis. Body flat. Head frontal margin concave-straight; epistome strongly projecting in male, less so in female, longer than head. Pleon comprising free pleonite 1 plus pleotelson; pleotelson tapering. Uropod biramous.

Subtidal. Temperate Southern Africa. 1 species (Barnard, 1914; Wolff, 1989: rediagnosis).

Prethura Kensley, 1982

Diagnosis. Body vaulted. Head frontal margin concave–straight. Pleon comprising free pleonite 1 plus pleotelson; pleotelson much longer than wide, tapering over posterior third. Male pleopod 2 strongly inflated, extending laterally well beyond pleotelson margins, visible dorsally. Uropod uniramous, peduncle extended beyond endopod.

Shelf (coral reef). Central Indo-Pacific (Qld, Australia; Ryukus, Japan). 2 species (Kensley, 1982; Shimomura and Naruse, 2015: seceond species).

Santia Sivertsen and Holthuis, 1980

Diagnosis. Body flat. Head frontal margin convex. Pleon comprising free pleonite 1 plus pleotelson; pleotelson posterior apex rounded. Uropod biramous.

Intertidal, subtidal. Tropical Atlantic, Temperate Northern Pacific, Western Indo-Pacific, Temperate South America, Southern Ocean. Chile. 19 species (Wolff, 1989: rediagnosis, key to 13 species; Kensley and Schotte, 2002: key to 4 Indian Ocean species).

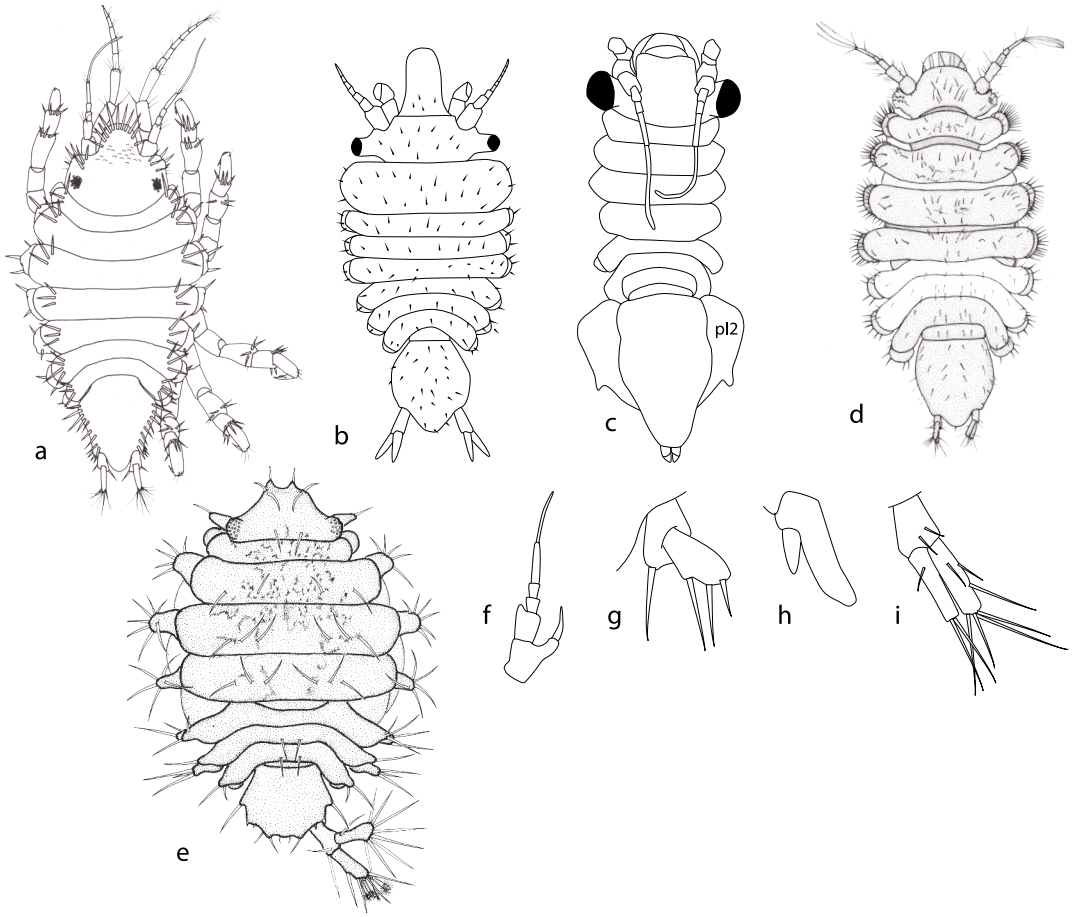

Figure 3.42. Santiidae. a, *Halacarsantia justi* Wolff, 1989; b, *Kuphomunna rostrata* Barnard 1914; c, *Prethura tuberculata* Shimomura and Naruse, 2015 (pl2 = male pleopod 2); d, *Santia lisbethae* Wolff and Brandt, 2000; e, *Spinosantia muelleri* Wolff and Brandt, 2000; f, antennula, *Spinosantia*. Left uropod: g, *Halacarsantia*; h, *Prethura*; i, *Santia*.

Spinosantia Wolff and Brandt, 2000

Diagnosis. Body vaulted. Head frontal margin concave. Pleon comprising free pleonite 1 plus pleotelson; pleotelson hexagonal, posterior apex transverse. Antennula article 1 with distolateral extension with strong spine. Uropod biramous.

Subtidal (0–30 m). Tropical Atlantic (Barbados, Columbia). 1 species (Wolff and Brandt, 2000).

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Thambematidae Stebbing, 1912

Figure 3.43

Thambematids are slender subcylindrical blind isopods, adults being 2.4–8.5 mm long (Harrison, 1987). They are notable in that pleopods 1 and 2 cover the remaining pleopods incompletely. Although Harrison (1987) rediagnosed the family, Zemko and Kaiser (2012) discussed problems distinguishing the family from 'Microjanirinae' (a nomen nudum) and Microparasellidae. While thambematids are relatively rare among families of deep-sea asellotes, Zemko and Kaiser (2012) noted reports of unidentified specimens in several deep-sea surveys. Harrison (1987) discussed potential differences between the antennae of the two genera, but these are difficult to interpret.

Diagnosis. Body elongate, subcylindrical; head frontal margin projecting forward; pereonites 2–7 longer than wide. Pleon of one free pleonite plus pleotelson. Anus not covered by pleopodal operculum. Eyes absent. Antennal scale absent. Maxillipedal palp articles 1–3 wider than distal articles. Pereopod 1 subchelate; pereopods 2–7 ambulatory, dactyli with one unguis plus small accessory unguis or long seta; pereopod 4 coxa inserting on anterolateral margin. Pleopods 1, 2 covering pleopods 3–5 incompletely. Uropod inserting posteriorly, biramous.

Microthambema Birstein, 1961

Diagnosis. Maxilla lobes of similar length (fig. 3.43e). Pleopod 3 uniramous (fig. 3.43h). Maximum length, 2.7 mm.

Abyssal (4820–5690 m). GOODS bathyal province: Northern N Pacific. 1 species (Birstein, 1961; Harrison, 1987: difference between genera).

Thambema Stebbing, 1912

Diagnosis. Maxilla middle lobe shorter than inner and outer lobes (fig. 3.43f). Pleopod 3 biramous (Fig. 3.43i). Maximum length 2.8–8.5 mm.

Shelf–hadal (45–8192 m). Temperate Northern Atlantic, Central Indo-Pacific, Temperate Australasia. GOODS bathyal provinces: Antarctic, S Atlantic. 5 species (Harrison, 1987: descriptions of 4 species; Zemko and Kaiser, 2012: rediagnosis, key to species).

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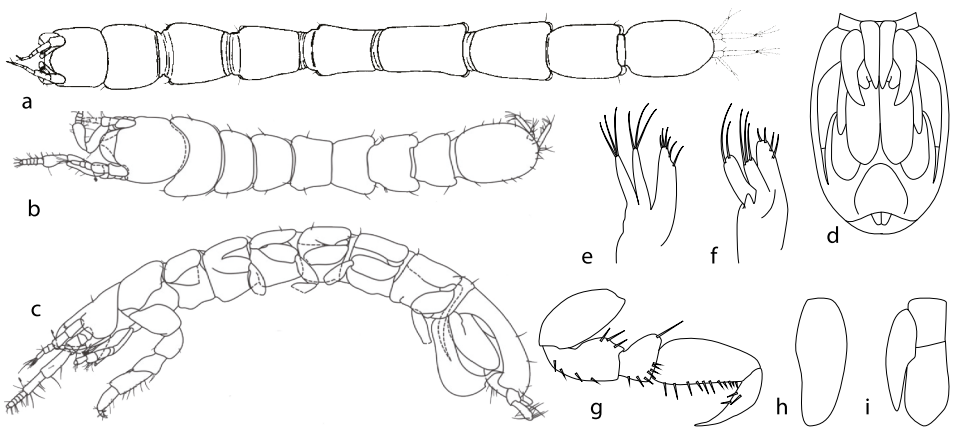

Figure 3.43. Thambematidae. a, *Thambema amicorum* Stebbing 1912; b, c, *Thambema thunderstruckae* Zemko and Kaiser, 2012; d, male pleon, ventral view (showing pleopods), *Thambema*. Maxilla: e, *Microthambema*; f, *Thambema*. g, Pereopod 1, *Thambema*. Pleopod 3: h, *Microthambema*; i, *Thambema*.

Urstylidae Riehl, Wilson and Malyutina, 2014

Figure 3.44

Urstylids occur in abyssal soft sediments near manganese nodules and hydrothermal vents. They are similar to macrostylids but have spade-like heads and lack the pereonal fusion seen in the larger family (Riehl et al., 2014). Adults reach 2 mm in length.

Diagnosis. Body elongate, subcylindrical; head frontal margin projecting forward; pereonites 2–4 similar, rectangular, 5–7 trapezoid, without lateral projections. Pleon of 1 free pleonite plus pleotelson. Anus not covered by pleopodal operculum. Eyes absent. Antennal scale small. Maxillipedal palp articles 1–3 wider than distal articles. Pereopod 1 simple, carpus trapezoidal; pereopods 2–7 ambulatory; 4 coxa inserting on anterolateral margin. Uropod inserting on posterolateral margin, peduncle long, exopod rudimentary.

Urstylis Riehl, Wilson and Malyutina, 2014

Bathyal, abyssal (2730–5223 m). GOODS bathyal provinces: S Atlantic, N Pacific. 3 species (Riehl et al., 2014).

Reference

Riehl, T., Wilson, G.D.F., and Malyutina, M. 2014. Urstylidae – a new family of abyssal isopods (Crustacea: Asellota) and its phylogenetic implications. *Zoological Journal of the Linnean Society* 170: 245–296. https://doi.org/10.1111/zoj.12104

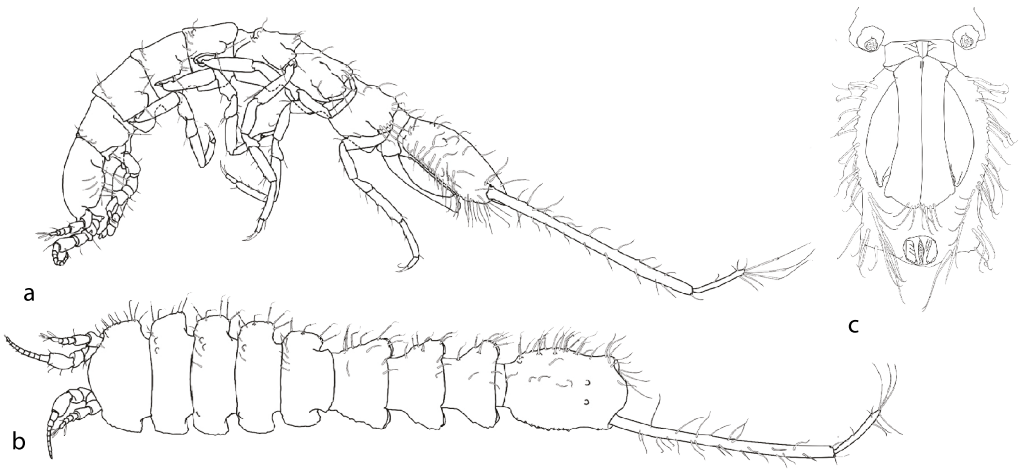

Figure 3.44. Urstylidae, *Urstylis zapiola* Riehl, Wilson and Malyutina, 2014. a, b, lateral, dorsal; c, pleotelson, male (ventral).

Xenosellidae Just, 2005

Figure 3.45

The only species *Xenosella coxospinosa* Just, 2005 is small, 1.4 mm long, and resembles some paramunnids, but has the uropods inserting more dorsally and has long external penes (Just, 2005). The largest individual is 1.4 mm long.

Diagnosis. Body flat; pereonites 5–7 (and 1–4 in male) lateral parts tubular, with large intersegmental gaps. Pleon with 1 free pleonite; pleotelson with elongate anterior neck. Eyes absent. Antennula longer than antenna. Maxillipedal palp articles 1–5 narrow, less than half as wide as endite. Pereopod 1 subchelate; pereopods 2–7 ambulatory; pereopodal 2–7 dactyli with 1 unguis. Uropod inserting posterodorsally, minute, without peduncle.

Xenosella Just, 2005

Slope (800–1600 m). Temperate SE Australia. 1 species (Just, 2005).

Reference

Just, J. 2005. Xenosellidae, a new family of Janiroidea (Asellota: Isopoda: Crustacea), for *Xenosella coxospinosa* gen. nov., sp. nov., from the marine bathyal of eastern Australia. *Zootaxa* 1085: 21–32. https://doi.org/10.11646/zootaxa.1085.1.2

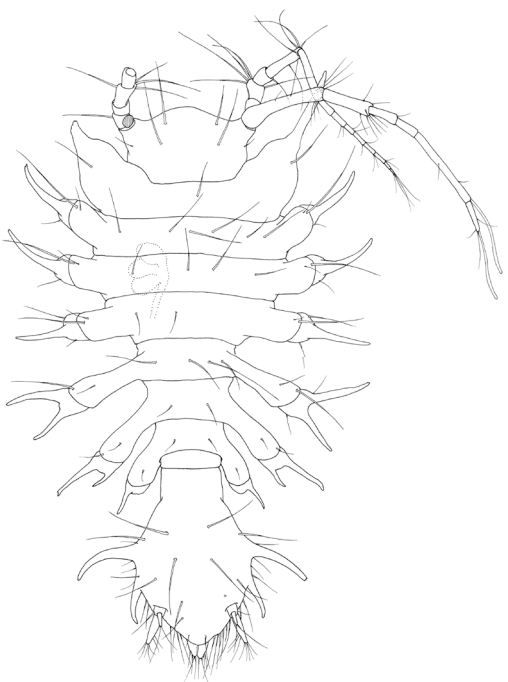

Figure 3.45. Xenosellidae, *Xenosella coxospinosa* Just, 2005 (female).

Janiroidea incertae sedis

Figure 3.46

Four genera can not be placed in any of the janiroid families as currently diagnosed.

Angeliera Chappuis and Delamare-Deboutteville, 1952

Diagnosis. Body elongate, subcylindrical. Anus not covered by pleopodal operculum. Eyes absent. Antennula with 7 articles. Antennal scale absent. Maxillipedal palp of 4 articles, last article sickle-shaped. Pereopods 1–7 ambulatory; pereopod 5 sexually dimorphic, in male subchelate, stout; pereopodal 2–7 dactyli with 3 claws. Uropod inserting posteriorly, biramous.

Intertidal marine beaches, sometimes with depressed salinity, freshwater. Temperate Northern and Tropical Atlantic, Western Indo-Pacific. NE Australia. 9 species (fig. 3.46a, e). The genus has been referred to the Microparasellidae (Wilson and Wägele, 1994) but with reassessment of this and other families its position became less certain (Galassi et al., 2016; Just and Poore, 1992). The antennula with 7 articles and the last article of the maxillipedal palp are unique within Janiroidea. Species of *Angeliera* are small, about 1 mm long, extremely elongate. Four species live in interstitial sands. Stock (1977) reviewed species groups but others have been described since (Kensley, 1984), including one from a stream in Australia (Stock, 1985).

Sugoniscus Menzies and George, 1972

Diagnosis. Body oblong, depressed; head with frontal margin projecting well forward, head including rostrum twice as long as wide; pereonites much wider than long, with acute spinulose lateral extensions. Pleon of 1 segment. Eyes absent. Antennula longer than head. Mouthparts projecting strongly anteriorly. Mandible lanceolate, exposed in dorsal view. Maxillipedal palp of 3 articles, much wider than endite. Pereopods 1–7 ambulatory; pereopod 4 coxa inserting on anterolateral margin; pereopodal 2–7 dactyli with 1 unguis. Uropod inserting posteriorly, biramous.

Abyssal (3909–4925 m). GOODS bathyal provinces: Nazca Plate. 1 species (fig. 3.46b). Menzies and George (1972) placed their new genus in Nannoniscidae but Siebenaller and Hessler (1981) excluded it in their review of this family. The only species has a prominent rostrum and mouthparts.

Trichopleon Beddard, 1886

Diagnosis. Body elongate–oval, splayed laterally; head frontal margin projecting forward; pereonites similar, rectangular, without lateral projections. Pleon of 1 segment. Eyes absent. Antennula half as long as body. Antenna peduncle more than half body length, flagellum multiarticulate; antennal scale present. Maxillipedal palp articles 1–3 wider than distal articles, as wide or wider than endite. Pereopods 1–7 ambulatory; pereopod 4 coxa inserting on anterolateral margin; pereopodal 2–7 dactyli with 2 claws. Uropod inserting posteriorly, biramous.

Slope (900 m). Central Indo-Pacific. 1 species (Beddard, 1886a, b) (fig. 3.46c). Wilson and Wägele (1994) rediagnosed *Trichopleon* but were unable to place the only species in any family. They believed it may be related to *Xostylus*.

Xostylus Menzies, 1962

Diagnosis. Body flat, slender, almost parallel-sided; head frontal margin projecting forward; pereonites similar, rectangular, without lateral projections. Pleon of 1 free pleonite plus pleotelson. Eyes absent. Antennula as long as head width. Maxillipedal palp articles 1–3 wider than distal articles, as wide or wider than endite. Pereopods 2–7 ambulatory; pereopod 4 coxa inserting on anterolateral margin.

Abyssal (5005–5056 m). GOODS bathyal provinces: Northern N Pacific, N Atlantic. 2 species (Birstein, 1970; Menzies, 1962) (fig. 3.46d). *Xostylus* was originally placed in Abyssianiridae, now Paramunnidae. Wilson and Wägele (1994) could not place the genus among other deep-sea families that shared some similarities. Species of *Xostylus* are rather undistinguished, with a parallel-side pereon.

Other genera

Five other genera remain even more poorly known.

Ianthe Bovallius, 1881. This name has a complicated taxonomic history, replacing *Tole* Ortmann, 1901 (Boyko, 2024). Richardson (1905) figured the type species as *Ianella spinosa* (Harger, 1879).

Jaerella Richardson, 1911. Vanhöffen (1914) figured the pleotelson of the only species.

Leptaspidia Bate and Westwood, 1868 was described and figured in the original description and may be a member of Paramunnidae.

Rhacura Richardson, 1908. Vanhöffen (1914) figured the pleotelson of the only species.

Urias Richardson, 1911. The only species has not been figured but may be similar to *Dendrotion* G.O. Sars, 1872.

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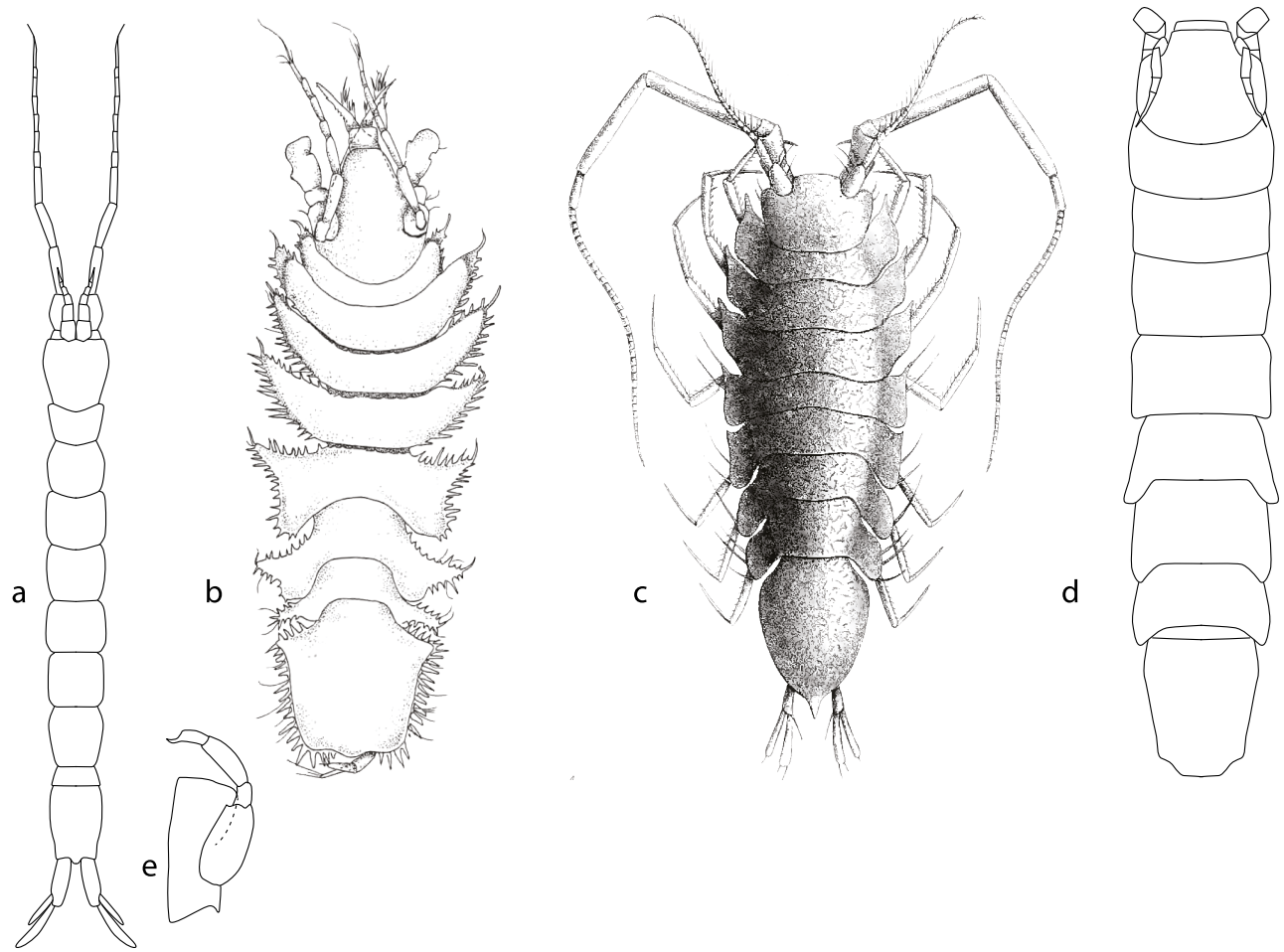

Figure 3.46. Janiroidea incertae sedis. a, *Angeliera*; b, *Sugoniscus parasitus* Menzies, 1972; c, *Trichopleon ramosum* Beddard, 1886; d, *Xostylus parallilus* Menzies, 1962; e, *Angeliera*, maxilliped.

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Superfamily Stenetrioidea Hansen, 1905

The superfamily was diagnosed in detail by Serov and Wilson (1999), who settled on its composition by including two families.

Diagnosis. Male pleopods 1 and 2 much smaller than pleopod 3; peduncles of male pleopods 1 fused. Female pleopods 2 forming small, pear-shaped operculum. Pleopods 3 forming an operculum over pleopods 4 and 5 (figs 3.47e, 3.48r, s).

Key to families of Stenetrioidea

1. Male pleopod 2 peduncle with large distal extension; appendix masculina elongate, narrow, with ventrolateral groove originating proximally; exopod inserting medially (fig. 3.47f–h). Penes adjacent to sternal spine, directed posteriorly, distally pointed (fig. 3.47e) ..... Pseudojaniridae

– Male pleopod 2 peduncle without distal extension; appendix masculina with short ventrolateral pocket or groove originating at midlength; exopod inserting distomedially (fig. 3.48o–q). Penes emerging midway between coxae and sternal spine, directed medially, distally rounded (fig. 3.48r) ..... Stenetriidae

Reference

Serov, P.A., and Wilson, G.D.F. 1999. A revision of the Pseudojaniridae Wilson, with a description of a new genus of Stenetriidae Hansen (Crustacea: Isopoda: Asellota). *Invertebrate Taxonomy* 13: 67–116. https://doi.org/10.1071/IT96038

Pseudojaniridae Wilson, 1996

Figure 3.47

Pseudojanirids are small flat asellote isopods with subchelate first pereopods. Pseudojanirids differ from stenetriids in the absence of posterior extensions on the male pleopod 2 peduncle and a more elongate appendix masculina. Body lengths are up to 5.3 mm. They inhabit marine subtidal and shelf waters in the Southern Hemisphere (Serov and Wilson, 1999).

Diagnosis. Male pleopod 2 peduncle with large distal extension; appendix masculina elongate, narrow, with ventrolateral groove originating proximally; exopod inserting medially (fig. 3.47f–h). Penes adjacent to sternal spine, directed posteriorly, distally pointed (fig. 3.47e).

Key to genera of Pseudojaniridae

1. Pereonal tergites broad, laterally extended, without dorsally visible coxal lobes. Antennal spine on frontal margin of head blunt, markedly reduced or absent (fig. 3.47b). Appendix masculina curved laterally (fig. 3.47g) ..... *Pseudojanira*

– Pereonal tergites with coxal lobes visible on pereonite 4 at least. Antennal spine on frontal margin of head prominent, acutely angular. Appendix masculina straight (fig. 3.47f, h) 3

2. Pereonal tergites sharply angled with single, visible coxal lobe on pereonite 4. Antennal spine on frontal margin of head shorter than lateral spine (fig. 3.47c). Male pleopod 2 peduncle distal extension distally widened, with stylet guide on distal margin (fig. 3.47h) ..... *Schottea*

– Pereonal tergites rounded, with double coxal lobes on pereonite 4, and single lobe on pereonite 5. Antennal spine on frontal margin of head subequal to lateral spine (fig. 3.47a). Male pleopod 2 peduncle distal extension rounded, without stylet guide on distal margin (fig. 3.47f) ..... *Adajinoperus*

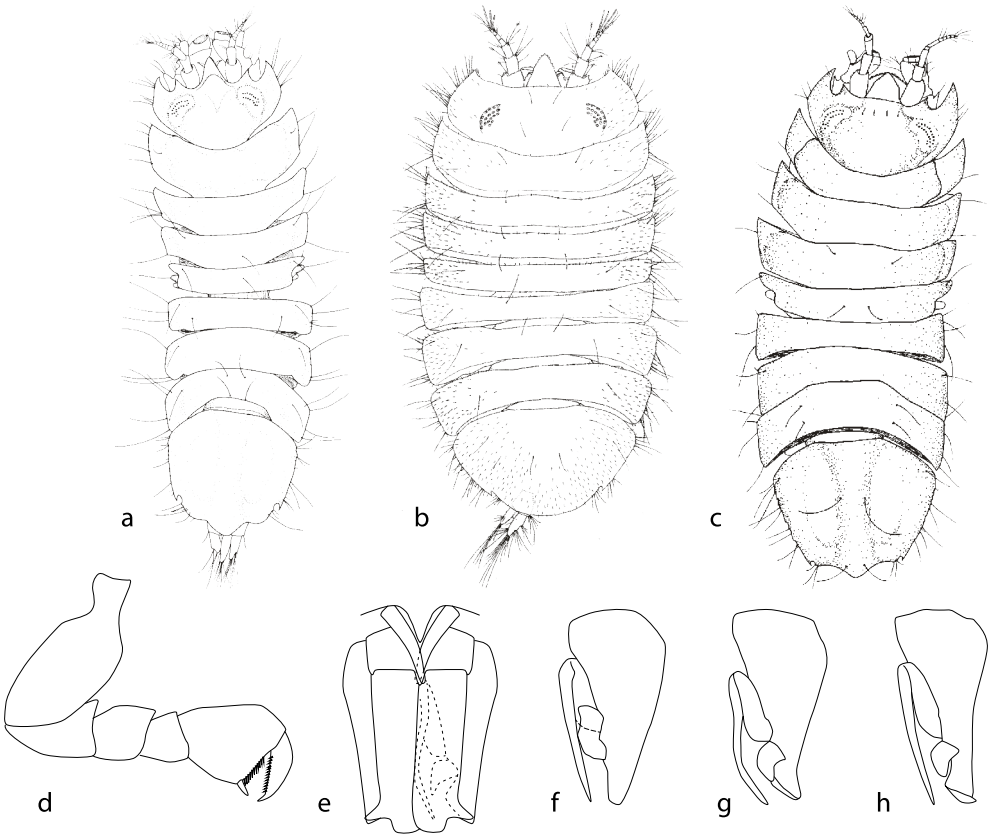

Figure 3.47. Pseudojaniridae. a, *Adajinoperus tetanomorphus* Serov and Wilson, 1990; b, *Pseudojanira fremantlensis* Serov and Wilson, 1990; c, *Schottea taupoensis* Serov and Wilson 1999. d, pereopod 1, *Pseudojanira*. e, penes, male pleopods 1, 2, *Pseudojanira*. Male pleopod 2: f, *Adajinoperus*; g, *Pseudojanira*; h, *Schottea*.

Pseudojanira Barnard, 1925

Diagnosis. Pereonal tergites broad, laterally extended, without dorsally visible coxal lobes. Antennal spine on frontal margin of head blunt, markedly reduced or absent. Male pleopod 2 peduncle distal extension produced into rounded tip, with stylet guide on distal margin; appendix masculina curved laterally.

Subtidal, shelf. Western Indo-Pacific, Temperate Southern Africa, Temperate Australasia. 5 species (Poore and Just, 1990; Serov and Wilson, 1999: rediagnosis, key to 4 species; Kensley and Schotte, 2002: key to 3 Indian Ocean species).

Schottea Serov and Wilson, 1999

Diagnosis. Pereonal tergites sharply angled with single, visible coxal lobe on pereonite 4. Antennal spine on frontal margin of head prominent, acutely angular, shorter than lateral spine. Male pleopod 2 peduncle distal extension distally widened, with stylet guide on distal margin; appendix masculina straight.

Shelf (134–154 m). Temperate Australasia (Taupo Seamount, New Zealand). 1 species (Serov and Wilson, 1999).

Adajinoperus Serov and Wilson, 1999

Diagnosis. Pereonal tergites rounded, with double coxal lobes on pereonite 4, and single lobe on pereonite 5. Antennal spine on frontal margin of head prominent, acutely angular, subequal to lateral spine. Male pleopod 2 peduncle distal extension rounded, without stylet guide on distal margin; appendix masculina straight.

Shelf (51–133 m). Temperate SE Australia. 1 species (Serov and Wilson, 1999).

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Stenetriidae Hansen, 1905

Figure 3.48

Stenetriids are flat elongate isopods up to 6.5 mm long, occurring worldwide in shallow temperate to tropical environments and occasionally in the deep sea. The first pereopod is subchelate, and variously ornamented and enlarged relative to other pereopods. The family was diagnosed in detail by Serov and Wilson (1995) and later revised by Serov and Wilson (1999), Bruce and Buxton (2013) and Bruce and Cumming (2015). An earlier work (Wolff, 1962) provided a key to species of *Stenetrium*, some now in other genera.

Diagnosis. Male pleopod 2 peduncle without distal extensions; appendix masculina with short ventrolateral pocket or groove originating at midlength; exopod inserting distomedially. Penes emerging midway between coxae and sternal spine, directed medially, distally rounded.

Implicit generic attributes. Pereonite 4 without coxae visible in dorsal view. Antenna article 1 lateral spine absent. Male pereopod 1 merus without blade; dactylus subequal to palm. Male pleopod 1 without angular lateral extensions, distolateral margin straight or medially curved. Appendix masculina without large ungrooved distal spine.

Key to genera of Stenetriidae

1. Male pleopod 1 with angular lateral extensions on distal margin (fig. 3.48m). Male pleopod 2 appendix masculina with pocket-like groove from midlength to base of elongate tubular spine (fig. 3.48o) ..... *Lexcenium*
– Male pleopod 1 without angular lateral extensions, distolateral margin straight or medially curved (fig. 3.48n). Male pleopod 2 appendix masculina without large ungrooved distal spines or, if spines present, with 2 or more thin elongate distal spines 2
2. Male pereopod 1 carpus lower margin with large distal process (fig. 3.48g, h, k) 3
– Male pereopod 1 carpus lower margin without distal process 6
3. Male pereopod 1 dactylus subequal to palm (fig. 3.48h). Head without lateral spines (fig. 3.48c) ..... *Liocoryphe*
– Male pereopod 1 dactylus longer than palm. Head with lateral spines 4
4. Pereopod 1 merus with anteriorly projecting blade; palm lower proximal margin with long, acute distal process (fig. 3.48k) ..... *Onychatrium*
– Pereopod 1 merus without blade; palm lower proximal margin without distal process 5
5. Pereopod 1 propodus robust; palm oblique, with 2 teeth (fig. 3.48a, g) ..... *Hansenium*
– Pereopod 1 propodus lower margin bladelike; palm transversely truncate or distally inflected (fig. 3.48i) ..... *Machatrium*
6. Male pleopod 2 appendix masculina distally pointed, with several elongate accessory spines or setae (fig. 3.48q) ..... *Tristenium*
– Male pleopod 2 appendix masculina without both elongate pointed form and several elongate accessory spines or setae 7
7. Male pleopod 2 appendix masculina distally complex with cuticular fan and medially curved narrow process (fig. 3.48p). Male pereopod 1 propodus elongate, much longer than wide, palm narrow (fig. 3.48l) ..... *Stenobermuda*
– Male pleopod 2 appendix masculina without distal cuticular fan and medially curved narrow process. Male pereopod 1 various, with well-developed propodal palm and robust propodus 8
8. Head without lateral extension or spines, antennal spines and rostrum reduced. Pereopod 1 not sexually dimorphic, propodus robust, much wider than head (fig. 3.48d, j) ..... *Mizothenar*
– Head with well-developed lateral spines and lateral fields. Pereopod 1 sexually dimorphic; female propodus less robust than male propodus, narrower than head 9
9. Rostrum robust, more than half as long as head (fig. 3.48e). Pereonite 4 without coxae visible in dorsal view ..... *Protallocoxa*

– Rostrum variable, always less than half as long as head. Pereonite 4 with coxae visible in dorsal view 10

10. Head lateral spines longer than antennal spines. Antenna article 1 spine absent (fig. 3.48f) ..... *Tenupedunculus*

– Head lateral spines as long as antennal spines. Antenna article 1 spine prominent (fig. 3.48b) ..... *Stenetrium*

Hansenium Serov and Wilson, 1995

Diagnosis. Head with lateral spines; rostrum trapezoid, wider than long. Male pereopod 1 carpus lower margin with bladelike serrate process; propodus palm oblique, with 2 teeth; dactylus as long or longer than palm.

Subtidal (coral reefs). Western and Eastern Indo-Pacific. 2 species (Serov and Wilson, 1995; Bruce and Buxton, 2013: rediagnosis, comparison of genera).

Lexcenium Serov and Wilson, 1999

Diagnosis. Head with lateral and antennal spines subequal to rostrum; rostrum denticulate, acute. Propodus with 1 simple robust seta. Male pleopod 1 with angular lateral extensions on distal margin. Appendix masculina with pocket-like groove from midlength to base of elongate tubular spine.

Subtidal, shelf. Temperate Australia. 2 species (Serov and Wilson, 1999).

Liocoryphe Serov and Wilson, 1995

Diagnosis. Head without lateral spines; rostrum short, wide, rounded. Male pereopod 1 carpus lower margin with large distal process; propodus palm serrate.

Subtidal. Tropical W Atlantic, Indo West-Pacific. 4 species (Serov and Wilson, 1995).

Machatrium Bruce and Buxton, 2013

Diagnosis. Head with lateral spines; rostrum trapezoid, wider than long. Male pereopod 1 carpus lower margin with large distal process; propodus lower margin bladelike; palm transversely truncate or distally inflected, lower proximal margin without distal process; dactylus longer than palm.

Subtidal (coral reefs). Tropical Atlantic, Western and Central Indo-Pacific. 8 species (Bruce and Buxton, 2013).

Mizothenar Serov and Wilson, 1995

Diagnosis. Head without lateral extension or spines, antennal spines reduced; rostrum weak, bilobed. Male pereopod 1 carpus lower margin without large distal process; not sexually dimorphic, propodus robust, much wider than head.

Subtidal. Tropical W Atlantic, Eastern Indo-Pacific. 3 species (Serov and Wilson, 1995).

Onychatrium Bruce and Cumming, 2015

Diagnosis. Head with lateral spines; rostrum trapezoid, wider than long. Male pereopod 1 merus with anteriorly projecting blade; carpus lower margin with large distal process; propodus lower margin thick, palm lower proximal margin with long, acute distal process; dactylus longer than palm.

Subtidal (coral reefs). Central and Eastern Indo-Pacific. 4 species (Bruce and Cumming, 2015).

Protallocoxa Schultz, 1978

Diagnosis. Head with lateral spines; rostrum robust, more than half as long as head. Pereonite 4 without coxae visible in dorsal view without coxae visible in dorsal view. Male pereopod 1 carpus lower margin without large distal process; sexually dimorphic; female propodus less robust than male propodus, narrower than head.

Bathyal, abyssal (2818–4540 m). GOODS bathyal provinces: New Zealand/Kermadec, Antarctic. 2 species (Serov and Wilson, 1995: rediagnosis).

Stenetrium Haswell, 1881

Diagnosis. Head with lateral spines as long as antennal spines; rostrum triangular, less than half as long as head. Antenna article 1 lateral spine prominent. Male pereopod 1 carpus lower margin without large distal process; sexually dimorphic; female propodus less robust than male propodus, narrower than head. Appendix masculina without large ungrooved distal spine, distally complex with cuticular fan and medially curved narrow process.

Subtidal–slope (0–460 m). Temperate Northern and Tropical Atlantic, Western Indo-Pacific, Temperate Southern Africa, Temperate Australasia. 26 species (Serov and Wilson, 1995: rediagnosis).

Stenobermuda Schultz, 1979

Diagnosis. Head with sharp triangular lateral spines, reduced antennal spines; rostrum long, robust, acute. Male pereopod 1 carpus lower margin without large distal process; propodus elongate, much longer than wide, palm narrow. Appendix masculina without large ungrooved distal spine, distally complex with cuticular fan and medially curved narrow process.

Subtidal, anchialine cave. Tropical W Atlantic, Temperate Southern Africa. 6 species (Serov and Wilson, 1995: rediagnosis).

Tenupedunculus Schultz, 1979

Diagnosis. Head with lateral fields, lateral spines longer than antennal spines; rostrum triangular, less than half as long as head. Male pereopod 1 carpus lower margin without large distal process; sexually dimorphic; female propodus less robust than male propodus, narrower than head. Appendix masculina with subdistal lateral setal ridge.

Slope–abyssal (500–4696 m). GOODS bathyal provinces: Antarctic, Subantarctic, S Atlantic. 4 species (Serov and Wilson, 1995: rediagnosis).

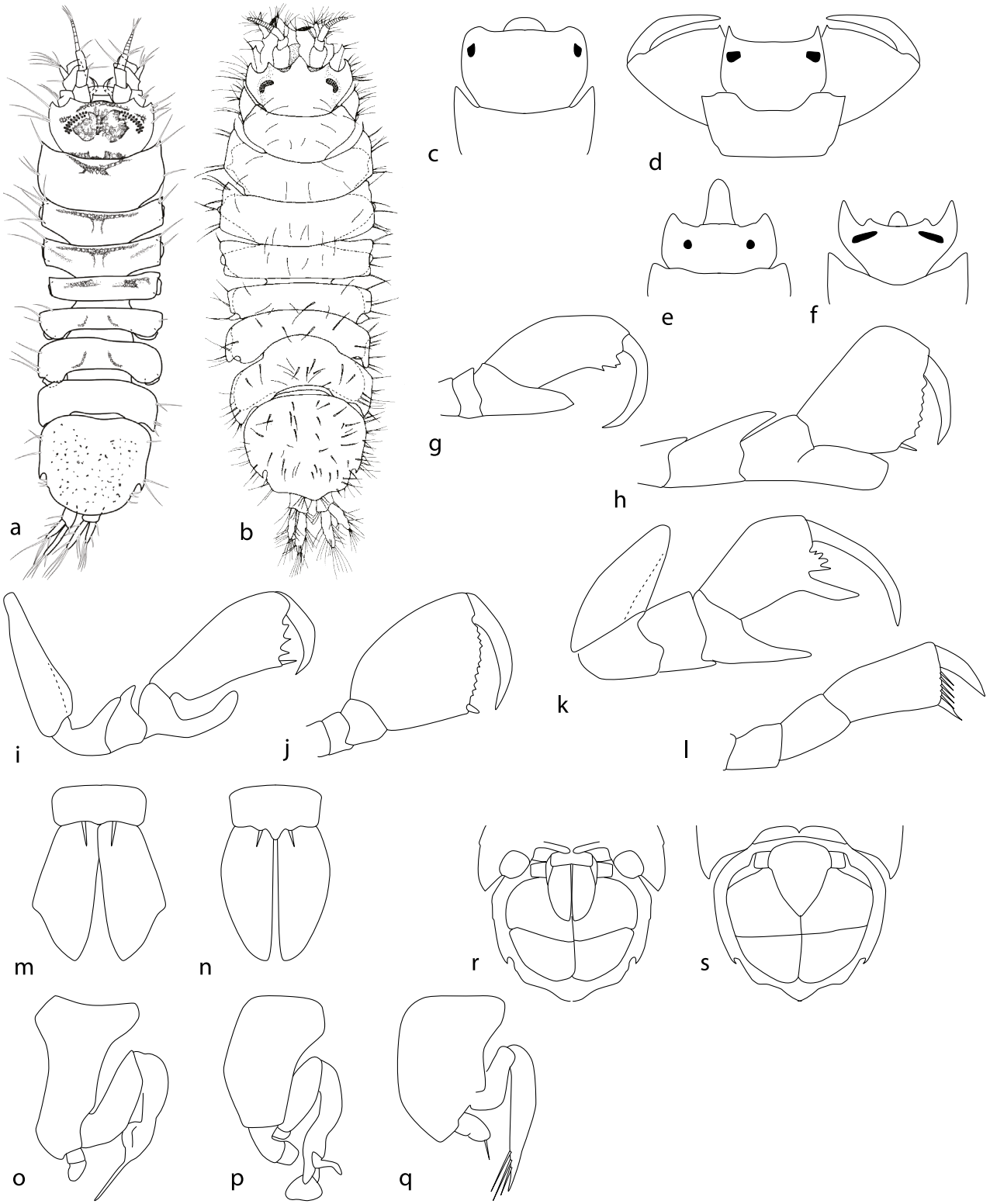

Figure 3.48. Stenetriidae. a, *Hansenium hanseni* (Nobili, 1906); b, *Stenetrium adrianae* Serov and Wilson, 1995. Head, pereonite 1: c, *Liocoryphe*; d, *Mizothenar* (with pereopod 1); e, *Protallocoxa*; f, *Tenupedunculus*. Male pereopod 1: g, *Hansenium*; h, *Liocoryphe*; i, *Machatrium*; j, *Mizothenar*; k, *Onychatrium*; l, *Stenobermuda*. Male pleopods 1: m, *Lexcenium*; n, *Stenetrium*. Male pleopod 2: o, *Lexcenium*; p, *Stenobermuda*; q, *Tristenium*. Pereonite 7, pleotelson (ventral view), *Stenetrium*: r, male (penes, pleopods 1, 3); s, female (fused pleopods 2, pleopods 3).

Tristenium Serov and Wilson, 1995

Diagnosis. Head with weak lateral and antennal spines. Male pereopod 1 carpus lower margin without large distal process; propodus broad, robust, with setae and broad blunt teeth on palm. Appendix masculina without large ungrooved distal spine, distally pointed, with several elongate accessory spines or setae.

Subtidal, slope (0–235 m). Indo-West Pacific. 3 species (Serov and Wilson, 1995).

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