PROC. BIOL. SOC. WASH.
94(1), 1981, pp. 181–227

ADDITIONAL ACANTHONOTOZOMATID, PARAMPHITHOID, AND STEGOCEPHALID AMPHIPODA FROM THE SOUTHERN OCEAN

Les Watling and Heather Holman

Abstract.—*Odius antarcticus* n. sp. is described and 2 new subspecies of *Gnathiphimedia sexdentata* are named. In addition 14 acanthonotozomatid, 5 paramphithoid, and 4 stegocephalid species are recorded, with most redescribed. *Iphimediella discoveryi* Watling and Holman is herein considered synonymous with *Gnathiphimedia macrops*. A combined key to *Gnathiphimedia* and *Iphimediella* is given. In the genus *Epimeria, E. excisipes* is placed into synonymy with *E. georgiana* and *Subepimeria geodesiae* with *E. puncticulata*. The boreal North Pacific *Uschakoviella echinophora* is recorded from Antarctic waters for the first time.

This paper is the second in a series directed toward the redescription of poorly known or incorrectly described species as well as the description of new species. In the first paper (Watling and Holman, 1980) we described 6 new species and one new genus of Acanthonotozomatidae, 2 new species of Paramphithoidae and one new species of Stegocephalidae, chiefly from the Scotia Sea region. New revisions were also offered for the acanthonotozomatid genera *Acanthonotozomella, Iphimedia, Iphimediella* and *Pseudiphimediella,* and the paramphithoid genera *Epimeria* and *Parepimeria*. The present paper contains one new species (*Odius antarcticus*), two new subspecies of *Gnathiphimedia sexdentata,* and redescriptions of 10 acanthonotozomatids, 5 paramphithoids, and 2 stegocephalids. Several other species are also recorded.

Acanthonotozomatidae

Acanthonotozomoides Schellenberg

Acanthonotozomoides Schellenberg, 1931:124.

Type-species.—*A. sublitoralis* Schellenberg, 1931 (original designation).

Diagnosis.—Mandible with narrow, slightly toothed apex; maxilla 1 palp biarticulate, inner plate minute; maxilliped palp exceeding outer plate, 4-articulate, article 2 slightly produced medially; gnathopods simple; coxa 1 distally acute.

Acanthonotozomoides oatesi (K. H. Barnard 1930)

Acanthonotozomella oatesi K. H. Barnard, 1930:346, figs. 20, 21.—K. H. Barnard, 1932:117, fig. 65.

Acanthonotozomoides oatesi.—J. L. Barnard, 1969:119.—Bellan-Santini, 1972:167, pl. 1.

Material.—*Eltanin* Cruise 12, Sta. 1003, 15 Mar. 1964, 62°41′S, 54°43′W, 210–220 m, 1 juvenile.

Diagnosis.—Pereonite 1 with single pair of sub-dorsal processes; coxa 1 not bidentate distally.

Distribution.—From Adelie Coast, along western Antarctica to Palmer Archipelago and South Georgia, 82–236 m.

Anchiphimedia K. H. Barnard

Anchiphimedia K. H. Barnard, 1930:357.

Type-species.—*A. dorsalis* K. H. Barnard, 1930 (original designation).

Diagnosis.—Upper lip incised; mandibles meet along frontal plane with cutting edge angled downwards and toward posterior of body; maxilla 1 palp biarticulate, very short, outer plate bears numerous curved setae instead of strongly chitinized, toothed spines; maxilliped palp article 4 very small, partly covered by hood-like extension of article 3, article 2 medially expanded but not produced along article 3; gnathopods 1 and 2 chelate.

Anchiphimedia dorsalis K. H. Barnard 1930
Figs. 1, 2

Anchiphimedia dorsalis K. H. Barnard, 1930:357, figs. 29, 30.—K. H. Barnard, 1932:123.

Material.—*Eltanin* Cruise 27, Sta. 1924, 27 Jan. 1967, 75°11′S, 176°13′W, 728–732 m, 1 ♂.

Diagnosis.—As for genus.

Description.—The following supplements the description of K. H. Barnard (1930). Upper lip incised. Right mandible with prominent, toothed accessory plate; left mandible with minute accessory plate. Maxilla 1 outer plate slender, with numerous non-plumose setae distally; inner plate subacute apically, with approximately 15 plumose setae on distal half of medial margin. Maxilla 2 inner plate wider than outer, both densely setose distally, setae on outer plate slightly longer than those on inner plate; inner plate with plumose setae along medial margin. Maxilliped outer plate broad; palp article 4 minute, articles 1 and 3 subequal, article 2 expanded medially and only slightly shorter than either articles 1 or 3. Gnathopod 1 chelate; lateral margins of articles 5 and 6 setose; article 3 one-third length of article 6.

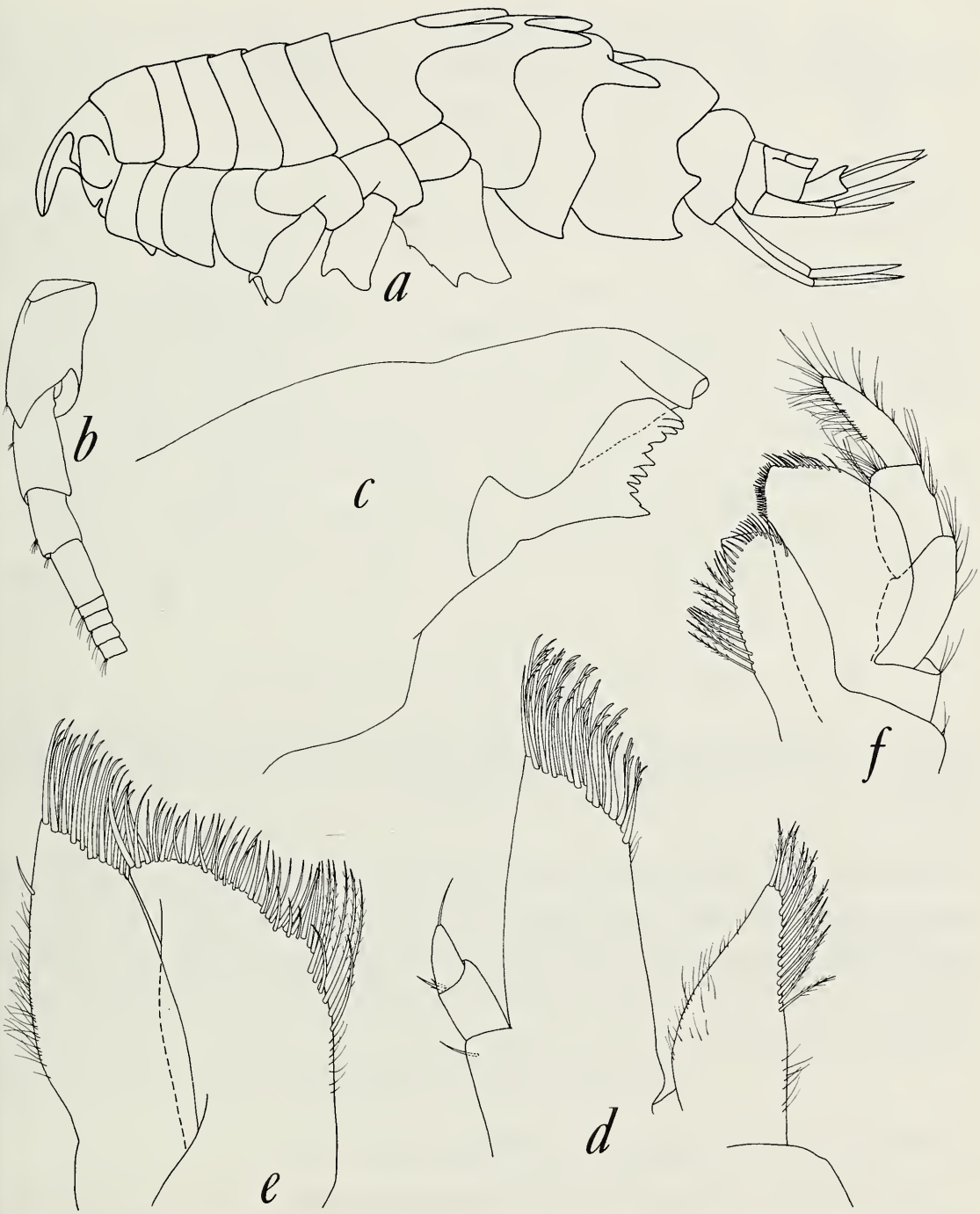

Fig. 1. *Anchiphimedia dorsalis, Eltanin* Sta. 1924: a, Body side view; b, Antenna 1 peduncle; c, Right mandible; d, Maxilla 1; e, Maxilla 2; f, Maxilliped.

Gnathopod 2 chelate; lateral margins of articles 5 and 6 more setose than on gnathopod 1; articles 5 and 6 subequal, longer than article 3.

Distribution.—Palmer Archipelago along western Antarctic to McMurdo Sound, 259–732 m.

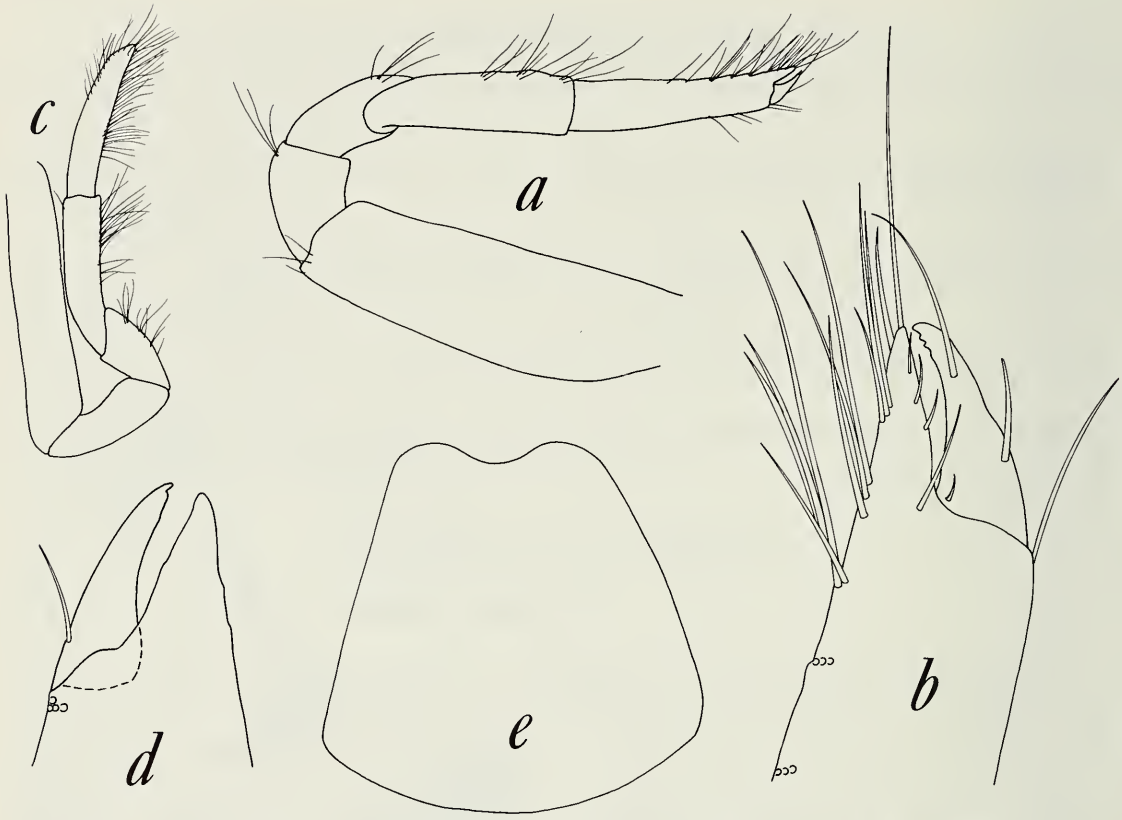

Fig. 2. *Anchiphimedia dorsalis, Eltanin* Sta. 1924: a, Gnathopod 1, b, Gnathopod 1 propodus and dactylus; c, Gnathopod 2; d, Gnathopod 2 propodus and dactylus without setae; e, Telson.

Remarks.—The orientation of the mandible in this species is intermediate between the condition seen in species of *Iphimediella* and that seen in *Pseudiphimediella* (documented by Watling and Holman, 1980). The cutting edges of the incisors meet in a plane oriented more to the frontal than to the transverse plane.

Echiniphimedia K. H. Barnard

Echiniphimedia K. H. Barnard, 1930:358.

Type-species.—*Iphimedia hodgsoni* Walker, 1906.

Diagnosis (from description in J. L. Barnard, 1967).—2 or more coxal plates with submarginal fixed teeth; some or all body segments covered with rows or groups of erect cusps on lateral surfaces; epistome broad; maxilla 1 palp biarticulate; maxilliped palp 4-articulate, article 4 extremely minute; gnathopods 1 and 2 chelate.

Echiniphimedia echinata (Walker 1906)

Iphimedia echinata Walker, 1906:150; 1907:28, pl. 10, fig. 16.—Chevreux, 1912:119.

Echiniphimedia nodosa.—K. H. Barnard, 1930:361, fig. 33.
Echiniphimedia echinata.—K. H. Barnard, 1932:126.—Nicholls, 1938:80, fig. 42.—J. L. Barnard, 1967:9, figs. 4, 5.
Pariphimediella echinata.—J. L. Barnard, 1964:51.

Material.—*Eltanin* Cruise 32, Sta. 1995, 10 Jan. 1968, 72°04′S, 172°38′E, 360–342 m, 1 juvenile; Cruise 32, Sta. 2065, 26 Jan. 1968, 78°23′S, 173°06′W, 473–475 m, 1 juvenile.

Diagnosis (from description in J. L. Barnard, 1967).—Pereonites 5–7 (occasionally 2–7), pleonites 1–4, coxae 5–7 (occasionally 3–7), and bases of pereopods 5–7 sparsely covered with small, fixed, marginal and submarginal teeth; pereonite 1 smooth; antenna 1 peduncle article 1 lacking strong distal teeth; maxilla 2 outer plate lateral margin with only 1 or 2 setae.

Distribution.—Davis Sea, Adelie Coast, Ross Sea and western Antarctica to Palmer Archipelago, South Orkneys and South Georgia, 10–585 m.

Remarks.—The specimen from Sta. 2065 (8 mm) possessed teeth beginning on pereonite 2 hind margin, similar to specimens reported by Nicholls (1938).

Echiniphimedia hodgsoni (Walker 1906)

Iphimedia hodgsoni Walker, 1906:152; 1907:30, pl. 11, fig. 18.
Echiniphimedia hodgsoni.—K. H. Barnard, 1930:359, fig. 31.—Nicholls, 1938:82, figs. 43–44.—J. L. Barnard, 1967:3, figs. 1–3.

Material.—*Eltanin* Cruise 12, Sta. 1003, 15 Mar. 1964, 62°41′S, 54°43′W, 210–220 m, 1 juvenile.

Diagnosis (from description in J. L. Barnard, 1967).—Pereonites 1–4 densely covered with elongate teeth; pereonites 2–6 with 2 vertical rows of very slender teeth; coxa 3 with more than 5 teeth.

Distribution.—From Davis Sea, around the western Antarctic coasts to South Orkney Islands and South Georgia, 20–1120 m.

Gnathiphimedia K. H. Barnard

Gnathiphimedia K. H. Barnard, 1930.

Type-species.—*G. mandibularis* K. H. Barnard, 1930.

Diagnosis (modified from J. L. Barnard, 1969).—Antenna 1 with uniarticulate accessory flagellum; upper lip entire or sinuous; epistome broadened, greater than 3 times as broad as high; mandible short, incisor thickened, oriented to cut in transverse plane; lower lip without inner lobes, distal apices broadly rounded; maxilla 1 palp biarticulate, reaching end of outer plate; maxilliped palp 4-articulate, article 2 slightly expanded, not produced along article 3, article 4 minute, covered by hood-like extension of article 3; gnathopods 1 and 2 chelate; telson slightly cleft.

Remarks.—This genus and *Iphimediella* are externally very similar but differ in the width of the epistome and shape of the mandible, suggesting two quite different modes of feeding. The incisor of *Iphimediella* is much thinner indicating a cutting or tearing function whereas the incisor of *Gnathiphimedia* is thickened, indicating a crushing function.

Key to species of *Gnathiphimedia* and *Iphimediella*

1. Pleonites with enlarged mid-dorsal carinae, paired dorsal processes not prominent ..... *I. imparidentata* (Bellan-Santini)
– Pleonites with distinct paired dorsal processes 2
2. Pleonites without paired dorsal processes on pleonite 3 3
– Pleonites with paired dorsal processes on pleonite 3 7
3. Pereonites 6 and 7 with paired dorsal processes ..... *I. octodentata* (Nicholls)
– Pereonite 6 without paired dorsal processes 4
4. Coxa 1 rectangular, smoothly rounded anterodistally; upper lip incised 5
– Coxa 1 tapering distally; upper lip entire 6
5. Pleonite 3 with slightly projecting keel, dorsal processes meet to form a "U" ..... *I. georgei* Watling and Holman
– Pleonite 3 smooth, without keel, dorsal processes short, meet to form a "V" ..... *I. bransfieldi* K. H. Barnard
6. Antenna 1, article 1, distal tooth extending past article 3; lateral head sinus broadly rounded ..... *G. sexdentata* (Schellenberg)
– Antenna 1, article 1, distal tooth not extending past end of article 2; lateral head sinus narrow ..... *G. macrops* K. H. Barnard
7. Paired dorsal processes on pereonites 6 and 7 and pleonites 1–3 ..... *I. serrata* (Schellenberg)
– Paired dorsal processes on pereonite 7 and pleonites 1–3 8
8. Coxa 7 posterior margin produced as an elongate process; pereopod 7 basis with 2 posterior teeth ..... *I. acuticoxa* Watling and Holman
– Coxa 7 smoothly rounded behind, at most with small tooth; pereopod 7 basis smoothly rounded with single small tooth at posterodistal corner 9
9. Prominent distal tooth on antenna 1 peduncle article 1 extending well past third peduncle article 10
– Teeth on antenna 1 peduncle article 1 not extending past third article 12
10. Coxa 1 rectangular, smoothly rounded anterodistally ..... *G. mandibularis* K. H. Barnard
– Coxa 1 not smoothly rounded, tapering distally, often bidentate 11

11. Lateral head sinus a well rounded notch; mandible smooth; thick ..... *G. barnardi* Thurston
– Lateral head sinus narrow; subacute mandible incisor multidentate, thin ..... *I. margueritei* Chevreux
12. Paired dorsal teeth form a distinct "V," mid-dorsal keel present on pleonites 1–3, additional upright keel on urosomite 1 ..... *I. rigida* K. H. Barnard
– Paired dorsal teeth meet to form a "U," no mid-dorsal keel present 13
13. Coxa 1 distally tapering to an acute or subacute tip ..... *G. fuchsi* Thurston
– Coxa 1 rounded anterodistally 14
14. Dorsal processes short, stubby; upper lip entire ..... *I. microdentata* (Schellenberg)
– Dorsal processes elongate, slender; upper lip incised ..... *I. cyclogena* K. H. Barnard

Gnathiphimedia barnardi Thurston 1974
Fig. 3

Gnathiphimedia barnardi Thurston, 1974:15, figs. 3, 4.

Material—Eltanin Cruise 6, Sta. 410, 31 Dec. 1962, 61°18–20′S, 56°09–10′W, 220–240 m, 1 ♂.

Diagnosis.—Body with paired dorsal processes on pereonite 7 and pleonites 1–3; head, lateral sinus broadly rounded; antenna 1 peduncle article 2 dorsal tooth not extending beyond article 3; coxa 1 distally truncate; coxa 7 posterodistal corner slightly produced.

Description.—The following supplements the description of Thurston (1974). Antennule with minute uniarticulate accessory flagellum; mandible palp article 3 heavily setose, setae increasing in length distally; maxilliped with minute article 4 concealed by hood-like extension of article 3; coxa 7 posterodistal corner slightly produced.

Distribution.—South Georgia, South Shetland Islands, 26–250 m.

Remarks.—Aside from the additions to Thurston's description noted above, the specimen from the South Shetland Islands differs from his material as follows: the mandible palp and maxilla 1 inner plate and palp are more setose; dorsal processes on pleon somite 3 are not as strong; upper tooth on epimeral plate 3 is more dorsally positioned. Superficially, *G. barnardi* resembles *Iphimediella margueritei,* especially with respect to processes on the body and antennules. The two species can be distinguished on the basis of mouthparts, head sinus (broad in *G. barnardi*) and coxa 6 (posteriorly acute in *I. margueritei*).

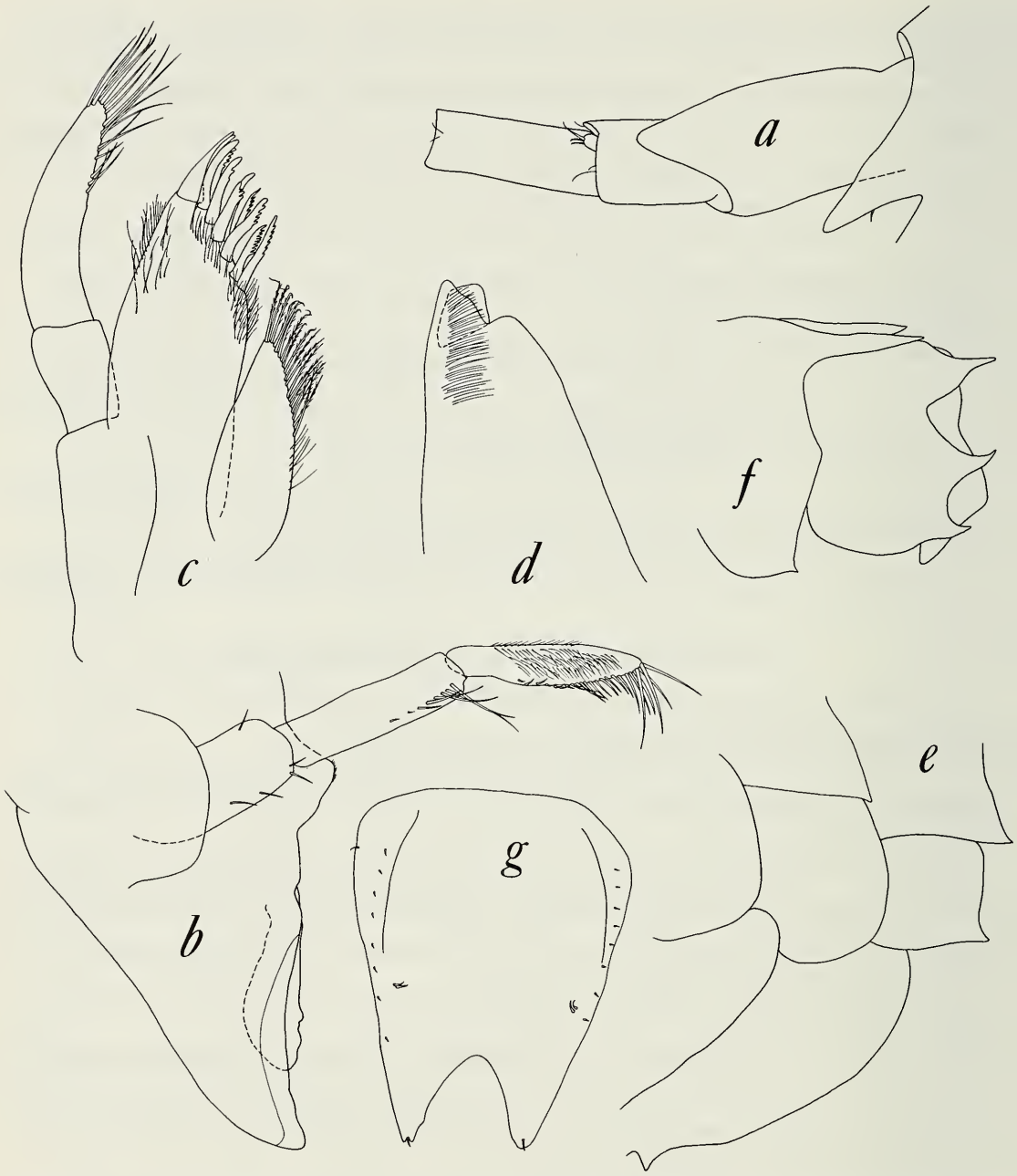

Fig. 3. *Gnathiphimedia barnardi, Eltanin* Sta. 410: a, Antenna 1 peduncle articles 2, 3 and accessory flagellum; b, Mandible; c, Maxilla 1; d, Distal end of maxilliped palp article 3 and minute article 4; e, Coxae 6 and 7; f, Epimeral plates 2 and 3; g, Telson.

Gnathiphimedia macrops K. H. Barnard, 1932

Gnathiphimedia macrops K. H. Barnard, 1932:122, fig. 68.—Nicholls, 1938:78, fig. 41.—Thurston, 1974:13, fig. 2b.
Gnathiphimedia sexdentata.—K. H. Barnard, 1932:122 (in part).
Iphimediella bransfieldi K. H. Barnard, 1932:119 (in part).
Iphimediella discoveryi Watling and Holman, 1980:635.

Material.—*Discovery* Sta. 123, 15 Dec. 1926, off mouth of Cumberland Bay, South Georgia, 230–250 m, 1 ♀ with eggs; Sta. 148, 9 Jan. 1927, off Cape Saunders, South Georgia, 132–148 m, 1 ♀ non-setose brood plates; Sta. 175, 2 Mar. 1927, 63°17′S, 59°48′W, 200 m, 1 ♀ with eggs.

Diagnosis.—Body with short, paired dorsal processes on pereonite 7, pleonites 1 and 2; antenna 1 peduncle article 1 ventrodistal tooth extending only to middle article 3; head lateral sinus bounded below by acute tooth, bluntly rounded above; coxa 1 distally tapering and multidentate ventrally.

Description.—The following supplements the description given by K. H. Barnard (1932) and Nicholls (1938). Body with 3 pairs of short processes meeting dorsally in a narrow "U" shape. Upper lip entire. Mandible short and stout but incisor smoothly dentate, not extremely thickened; molar setose; palp article 3 only slightly shorter than article 2; accessory plate present on both mandibles, better developed on left. Gnathopods 1 and 2 chelate; carpus and propodus short in gnathopod 1, carpus slightly longer than propodus; gnathopod 2 carpus and propodus subequal. Pereopod 5 basis only slightly expanded, anterior and posterior margins parallel, posterodistal corner produced into small acute point.

Distribution.—Adelie Coast and South Georgia, 120–540 m.

Remarks.—The mandible of this species is not as heavily chitinized and smooth as that found in other species of *Gnathiphimedia*. This, along with some variation in length of the dorsal spines with body size, have probably been the primary reasons for the confusion of this species with *G. sexdentata* and *I. bransfieldi* and the designation of one specimen as a new species, *I. discoveryi* (Watling and Holman, 1980). Smaller specimens (from Sta. 123 and 148) carried proportionately longer dorsal teeth than did the larger female from Sta. 175. *G. macrops* can be distinguished from the only other species of *Gnathiphimedia* with 3 pairs of dorsal processes, *G. sexdentata*, by the short tooth on antenna 1 article 1 and by the shape of the lateral head sinus. For a summary of the distinctions between *I. bransfieldi* and *G. macrops* see the discussion concerning the differences between the former and *I. discoveryi* in Watling and Holman (1980).

Gnathiphimedia sexdentata (Schellenberg 1926)

Diagnosis.—Body with paired dorsal processes on pereonite 7, pleonites 1 and 2; head lateral sinus broadly rounded; antenna 1 peduncle article 1 ventrodistal tooth extending beyond peduncle article 3; coxa 1 distally tapering, generally bidentate.

Gnathiphimedia sexdentata sexdentata, new subspecies
Figs. 4–6

Iphimediella sexdentata Schellenberg, 1926:331.
Iphimedia pacifica.—Walker, 1907 (part):27.—Chevreux, 1913:118.

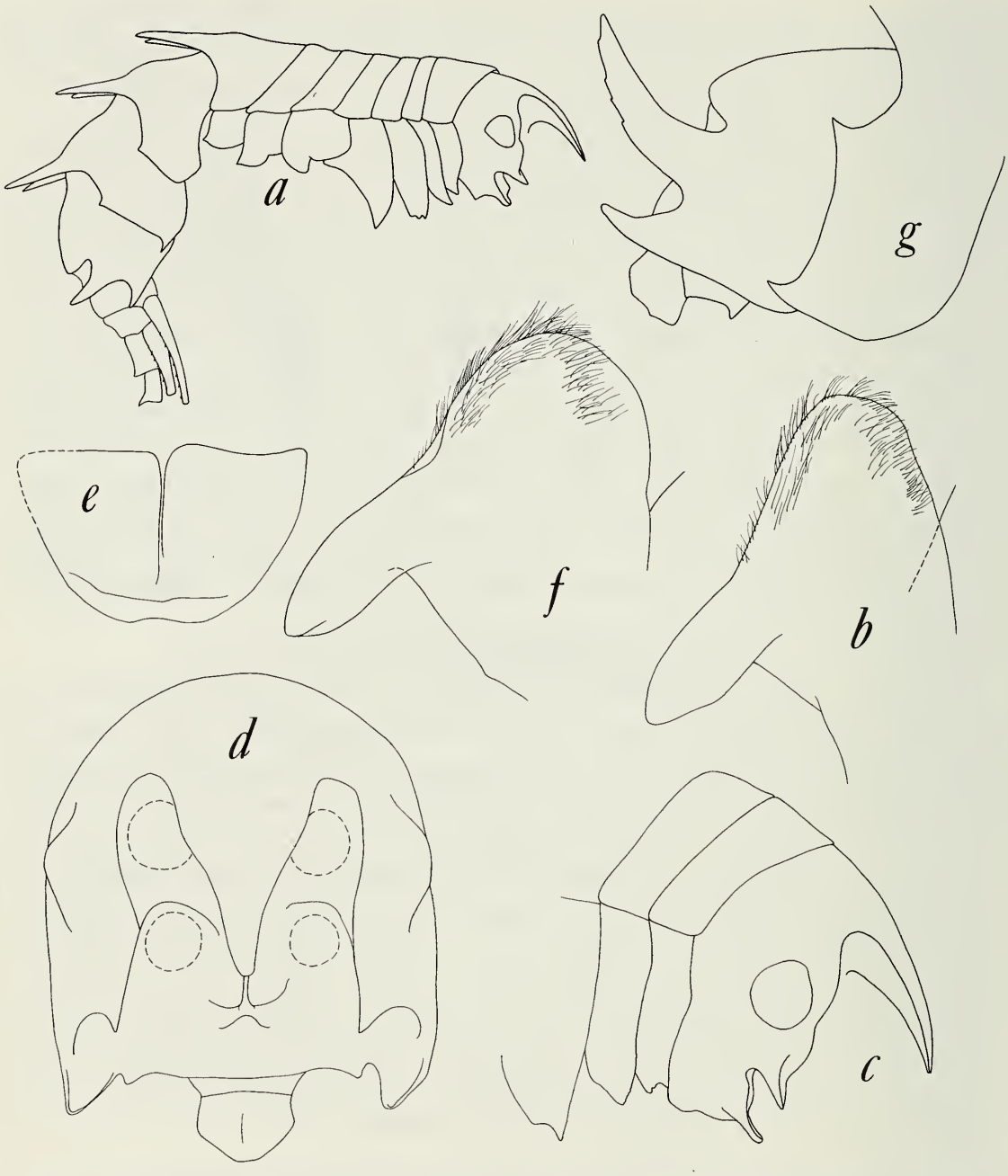

Fig. 4. *Gnathiphimedia sexdentata sexdentata, Terra Nova* Sta. 8 male: a, Body, side view; b, Lower lip. Female: c, Head side view; d, Head front view antennules and antennae removed; e, Upper lip; f, Lower lip; g, Epimeral plates 2 and 3.

Gnathiphimedia pacifica.—K. H. Barnard, 1930:353, 449, fig. 27.
Gnathiphimedia sexdentata.—K. H. Barnard, 1932:122 (part).—Nicholls, 1938:77, fig. 40.—Thurston, 1974:13, fig. 2A.

Material.—*Terra Nova* Sta. 8 (?339) McMurdo Sound, 256 m, 2 ♂♂, 3

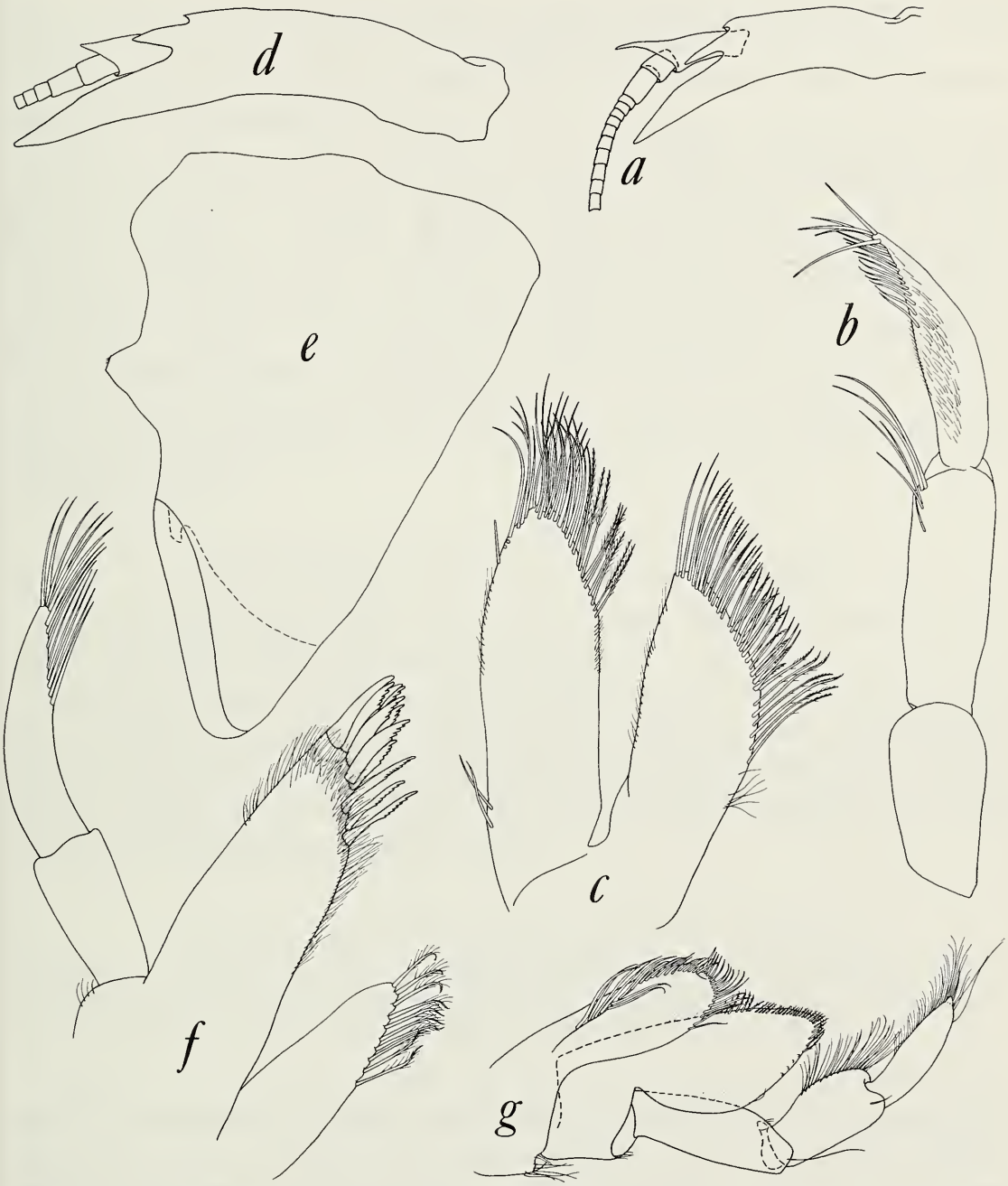

Fig. 5. *Gnathiphimedia sexdentata sexdentata, Terra Nova* Sta. 8, male: a, Antenna 1; b, Mandible palp; c, Maxilla 2. Female: d, Antenna 1; e, Mandible; f, Maxilla 1; g, Maxilliped.

♀♀. *Eltanin* Cruise 6, Sta. 418, 2 Jan. 1963, 62°39–40′S, 56°08–10′W, 311–426 m, 2 juveniles; Cruise 51, Sta. 5769, 77°09.1′S, 158°59.6–159°00.2′W, 344–357 m, 2 ♀♀, 1 juvenile.

Diagnosis.—Dorsal processes long, extending to posterior margin of following somite, projecting outward and slightly upward from body.

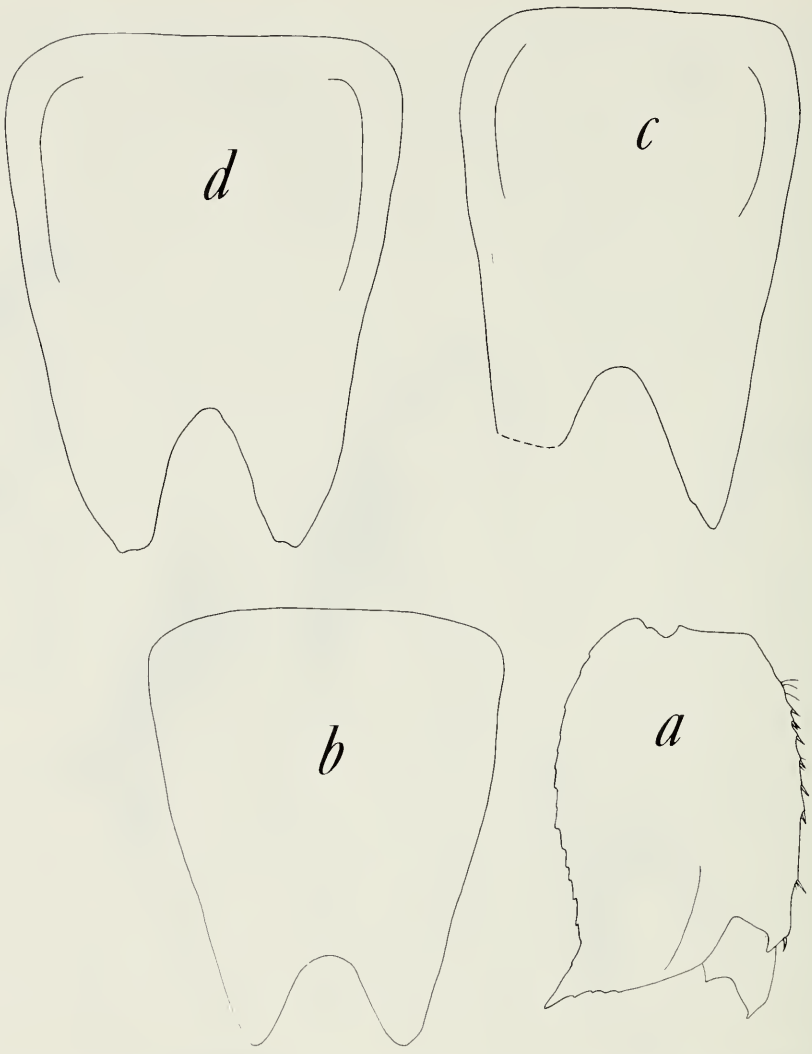

Fig. 6. *Gnathiphimedia sexdentata sexdentata, Terra Nova* Sta. 8, female: a, Pereopod 7 basis; b, Telson 21 mm specimen; c, Telson 22 mm specimen; d, Telson 28 mm specimen.

Description.—The following supplements the description given by K. H. Barnard (1930). Antenna 1 peduncle article 2 ventrodistal tooth of variable length, occasionally extending beyond peduncle article 3; accessory flagellum uniarticulate. Upper lip lower margin entire to sinuous. Mandible incisor thick, smooth; molar a short, broad-based cone, not as figured for *G. mandibularis* (K. H. Barnard, 1930); accessory plates on right and left mandibles, that on right mandible minute, often broken; palp articles 2 and 3 subequal. Lower lip, distal apices vary from narrowly to broadly rounded. Maxilla 1 palp article 2 armed along distal half of medial margin; outer plate distally tapering; inner plate sub-acute, armed with approximately 10 plumose setae. Maxilla 2 inner plate broadened distally. Maxilliped palp article 4 minute, not covered by hood-like extension of article 3, article 1 longer

than article 3, article 2 not produced along article 3; outer plate pointed distally, ovate; inner plate narrow, distally truncate.

Distribution.—Davis Sea, Adelie Coast, Ross Sea, Palmer Peninsula, South Shetland Islands, 9–720 m.

Remarks.—Our examination of 5 British Museum specimens has demonstrated this species to be extremely variable with regard to the following features: antenna 1 peduncle article 2 distal tooth extends to or beyond article 3; head sinus broad or narrow; mandible incisor of variable thickness and degree of denticulation; coxa 1 narrowly or widely bidentate; maxilliped palp article 2 equal to or shorter than article 1; pleurae on pereonites 3–7 lie flat against the body or project postero-laterally as acute processes. The only constant character that separates *G. s. sexdentata* from *G. s. incerta* appears to be the length of the dorsal body processes on pereonite 7 and pleonites 1 and 2.

Gnathiphimedia sexdentata sexdentata, juvenile

Material.—*Eltanin* Cruise 6, Sta. 418, 2 Jan. 1963, 62°39–40′S, 56°08–10′W, 311–426 m, 2 juveniles (6 mm length).

Remarks.—These specimens look very much like the adults described above with the exception of the mandible which is much more slender. Thus, these individuals are listed separately here in the event future workers find the narrow mandible incisor not to be a juvenile character but rather a feature indicative of a distinct species.

Gnathiphimedia sexdentata incerta, new subspecies
Figs. 7, 8

Gnathiphimedia incerta Bellan-Santini, 1972:170, figs. 2, 3.

Material.—*Eltanin* Cruise 6, Sta. 418, 2 Jan. 1963, 62°39–40′S, 56°08–10′W, 311–426 m, 1 ♂; Cruise 12, Sta. 1003, 15 Mar. 1964, 62°41′S, 54°43′W, 210–220 m, 1 ♂, 1 ♀, 1 juvenile; Cruise 32, Sta. 1995, 10 Jan. 1968, 72°04′S, 172°38′E, 342–360 m, 2 juveniles.

Diagnosis.—Dorsal processes short, each pair projecting along contour of body but not reaching to posterior margin of following somite.

Distribution.—Adelie Coast, South Shetland Islands, 60–426 m.

Remarks.—The morphological variation exhibited by these specimens was similar to that listed for *G. sexdentata sexdentata.* Because of the overlap in morphology for nearly all characters, *G. incerta* could not reliably be distinguished from *G. sexdentata* other than by the length of the dorsal body processes. Further study of many specimens will be required to fully document the variability of the *G. sexdentata* complex.

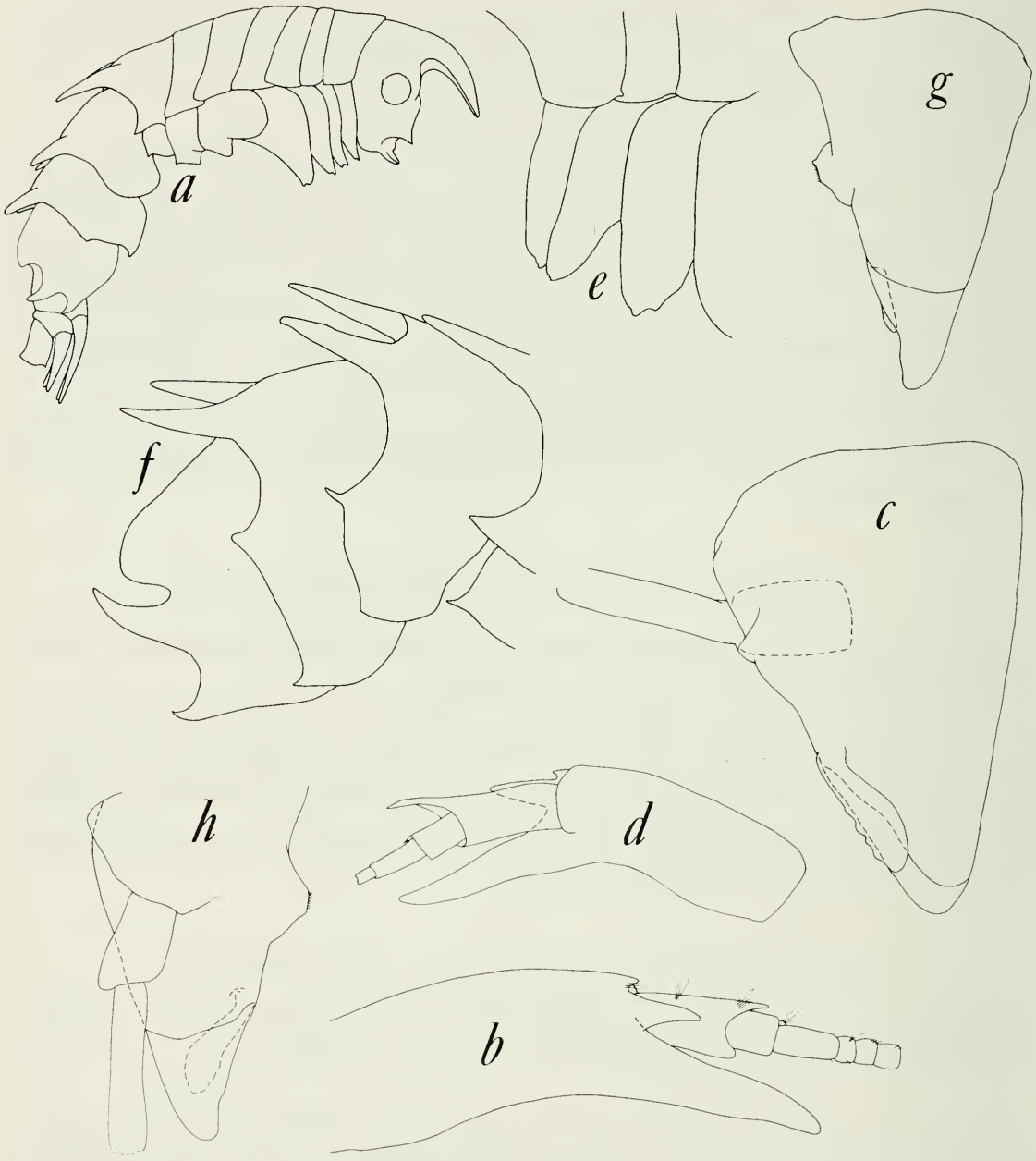

Fig. 7. *Gnathiphimedia sexdentata incerta* male. *Eltanin* Sta. 1003: a, Body side view; b, Antenna 1. Male *Eltanin* Sta. 418: c, Right mandible. Female *Eltanin* Sta. 1003: d, Antenna 1; e, Coxae 1–3; f, Pleosome. Juvenile *Eltanin* Sta. 1003: g, Left mandible; h, Right mandible.

Iphimedia Rathke

Iphimedia Rathke, 1843:85.
Panoploea Thomson, 1880:2.—Karaman and J. L. Barnard, 1979:110.
Cypsiphimedia K. H. Barnard, 1955:87.—Watling and Holman, 1980:615.

Type-species.—*I. obesa* Rathke, 1843.

Diagnosis.—Upper lip entire or slightly emarginate; maxilla 1 palp biar-

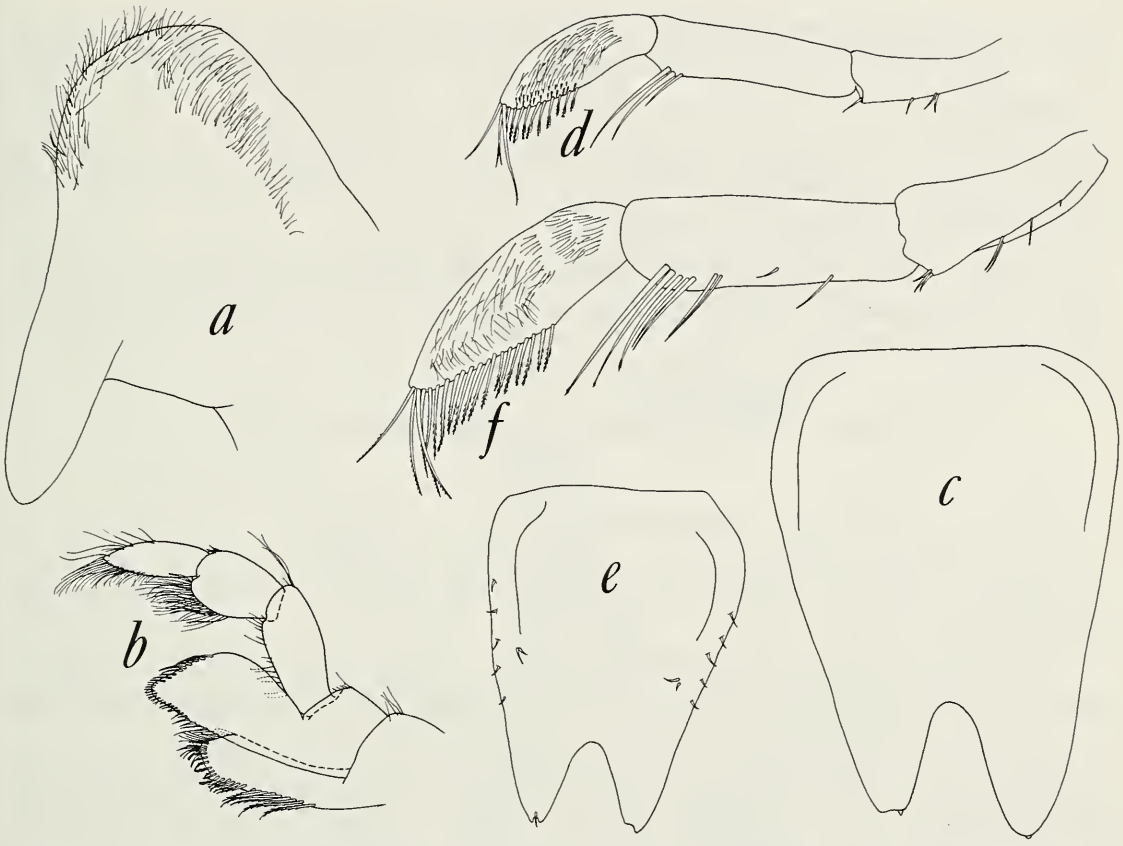

Fig. 8. *Gnathiphimedia sexdentata incerta* male. *Eltanin* Sta. 1003: a, Lower lip; b, Maxilliped; c, Telson. Male *Eltanin* Sta. 418: d, Mandible palp; e, Telson. Female *Eltanin* Sta. 1003: f, Mandible palp.

ticulate, of variable length; maxilliped palp exceeding outer plate, 3-articulate, article 2 produced medially along article 3; gnathopod 1 chelate; gnathopod 2 chelate or subchelate; telson variably emarginate or incised.

Remarks.—The above synonymy and current list of accepted species for this genus is discussed in detail in Watling and Holman (1980).

Iphimedia joubini (Chevreux 1912)

Panoploea joubini Chevreux, 1912:212; 1913:114, figs. 19–21.—Nicholls, 1938:64, fig. 33 (var. *bidentata*).—Bellan-Santini, 1972:175, pl. 5.

Material.—*Eltanin* Cruise 6, Sta. 418, 2 Jan. 1963, 62°39–40′S, 56°08–10′W, 311–426 m, 1 ♀; Cruise 12, Sta. 1003, 15 Mar. 1964, 64°41′S, 54°43′W, 210–220 m, 3 ♂♂, 1 juvenile. *Hero* Cruise 731, Sta. 1946, 11 Mar. 1973, 64°52–53′S, 62°52–53′W, 264–272 m, 1 juvenile. *Burton Island* Cruise 592, Sta. 5, 29 Jan. 1958, 66°32.9′S, 92°54′E, 1 juvenile.

Diagnosis.—Body with elongate, paired dorsal processes on pereonite 7 and pleonites 1 and 2, with mid-dorsal keel on pleonite 3 extended poste-

riorly as acute process; pereopod 7 basis posterior margin excavate distally, coxa 7 with single posterodistal tooth; coxa 5 posterior margin produced as strong point.

Distribution.—Around most of the Antarctic Continent, from Davis Sea to Adelie Coast, through western Antarctic to Palmer Archipelago and South Shetland Islands, 45–540 m.

Remarks.—The specimens examined fit the original description of Chevreux very well, and thus would be assigned to the subspecies *joubini* as diagnosed by Nicholls (1938).

Iphimedia multidentata (Schellenberg 1931)
Fig. 9

Panoploea multidentata Schellenberg, 1931:117, fig. 63.

Material.—Hero Cruise 715, Sta. 894, 2 Nov. 1971, 54°55′S, 64°18–20′W, 263–285 m, 1 ♂.

Diagnosis.—Body with paired dorsal processes on pereonite 7 and pleonites 1 and 2; pleonite 3 with dorsal keel; pereopod 7 basis with 4 large teeth on posterior margin; coxa 7 with 2 teeth on posterior margin.

Description.—The following supplements the description of Schellenberg (1931). Head, anteroventral corner an acute process. Antenna 1 peduncle article 1 with ventrodistal tooth extending to end of article 2; peduncle article 2 with distal tooth dorsally, extending to end of article 3. Mandible long and slender; incisor narrow, smooth; accessory plates on both mandibles, that on right mandible bidentate; palp article 3 half the length of article 2. Maxilla 1 palp biarticulate, shorter than outer plate, article 2 twice the length of article 1; inner plate not seen. Maxilliped palp 3-articulate, article 2 strongly produced medially along article 3, the latter blunt distally; outer and inner plates distally tapering. Gnathopod 1 chelate, dactyl tip overhanging end of propodus fixed finger, each with a long plumose seta; basis attached to coxa on inside of anterior margin and is directed forwards.

Distribution.—Falkland Islands and Magellanic area, 5–285 m.

Iphimediella Chevreux

Iphimediella Chevreux, 1911.
Pariphimediella Schellenberg, 1931 (part).—Watling and Holman, 1980.

Type-species.—I. margueritei Chevreux, 1912.

Diagnosis (modified from J. L. Barnard, 1969).—Antenna 1 accessory flagellum uniarticulate; epistome not broad, less than 3 times as wide as high; upper lip entire or weakly incised; mandible incisor elongate, not excessively thickened or broadened, oriented to cut in transverse plane; lower lip without inner lobes, distal apices generally subacute; maxilla 1 palp bi-

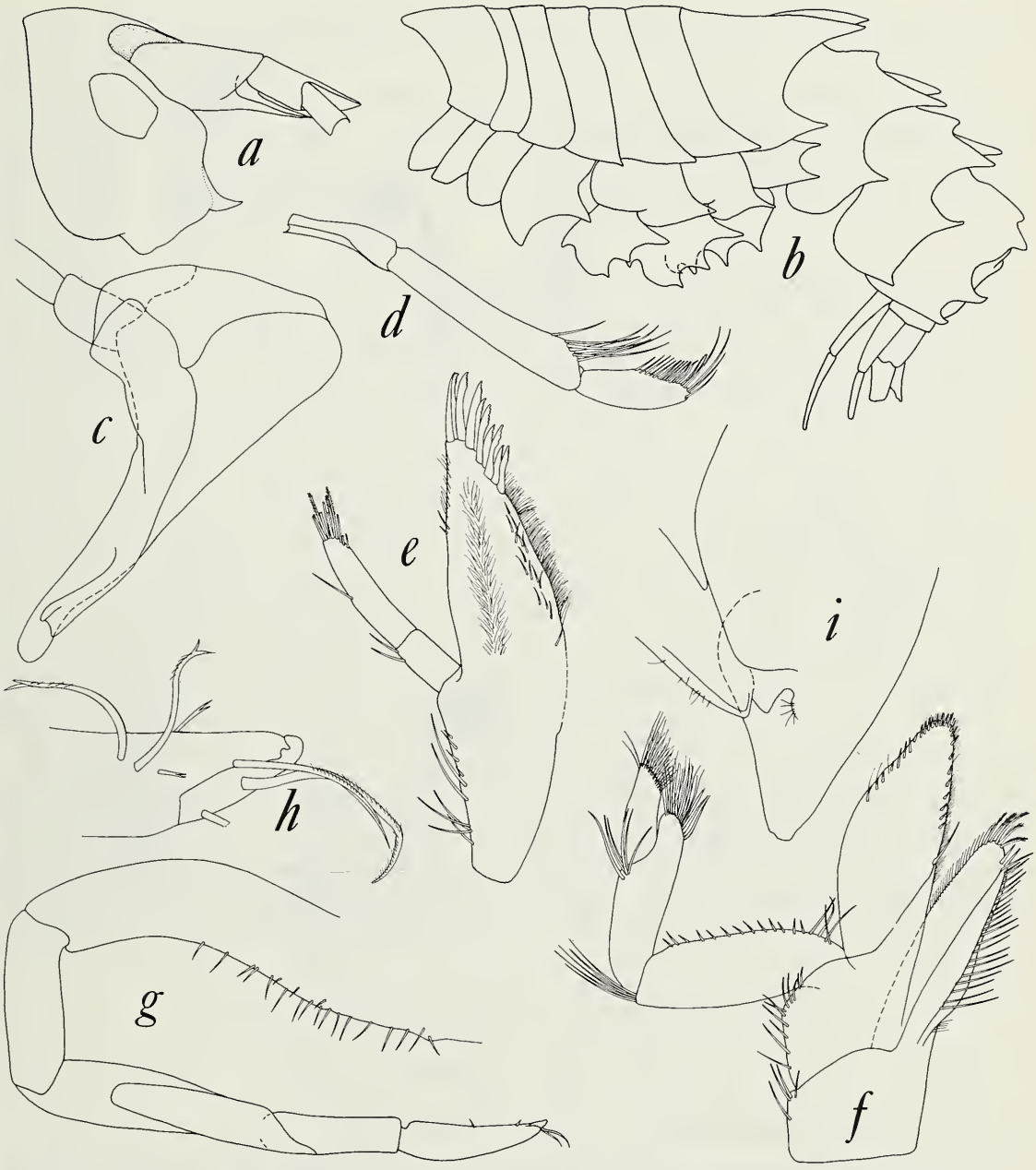

Fig. 9. *Iphimedia multidentata, Hero* Sta. 894: a, Head and antenna 1 peduncle; b, Body side view; c, Right mandible; d, Mandible palp; e, Maxilla 1. inner plate missing; f, Maxilliped; g, Gnathopod 1; h, Gnathopod 1 propodus and dactylus; i, Coxa 1 inside showing position of attachment to basis.

articulate, reaching end of outer plate; maxilliped palp 4-articulate, article 2 scarcely or not produced; gnathopods 1 and 2 chelate; telson slightly cleft.

Remarks.—The above synonymy, list of accepted species, and significance of mandible incisor orientation are discussed in detail in Watling and Holman (1980).

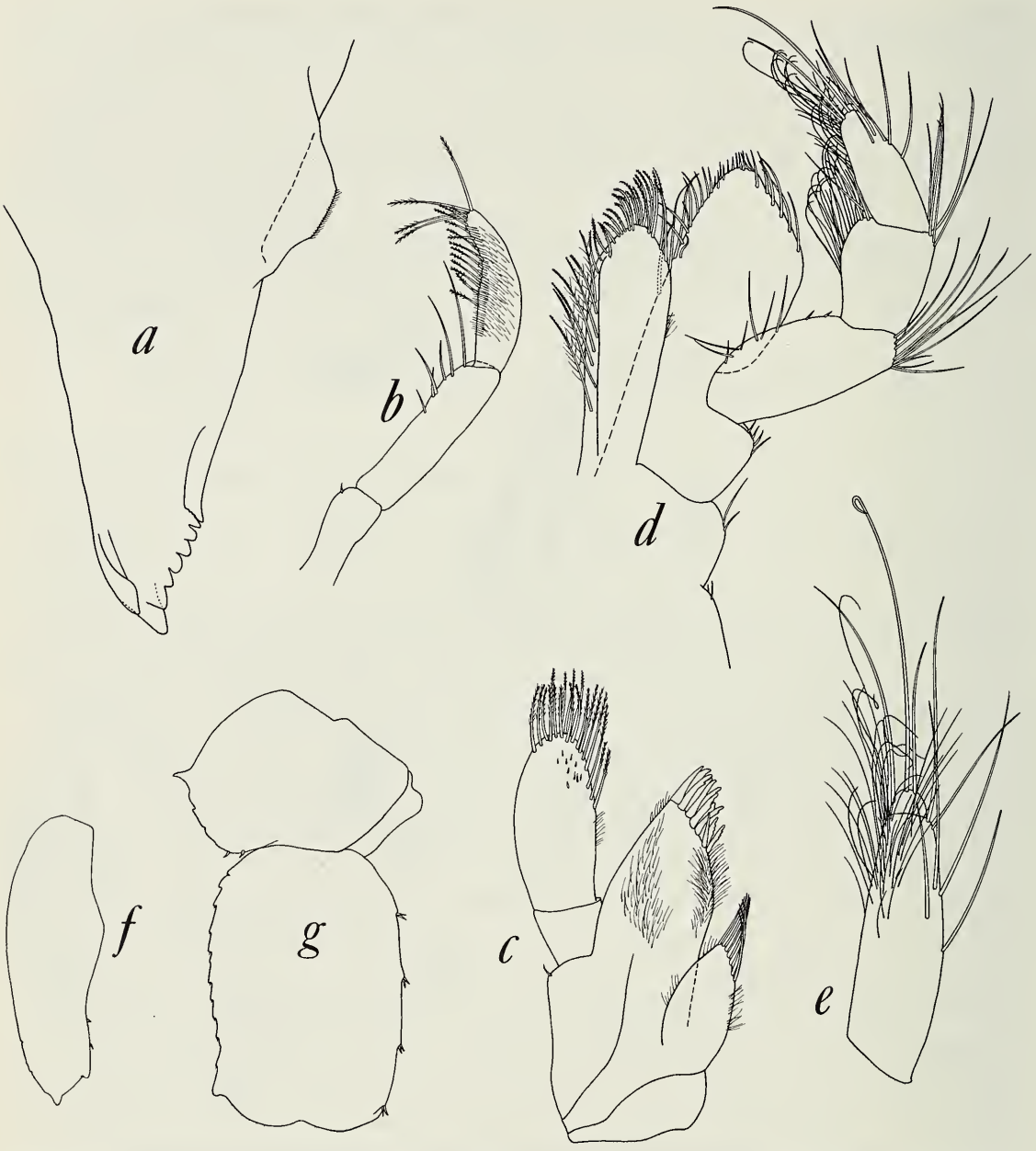

Fig. 10. *Iphimediella margueritei*, *Eltanin* Sta. 1003: a, Mandible; b, Mandible palp; c, Maxilla 1; d, Maxilliped; e, Maxilliped palp articles 3 and 4; f, Coxa 1; g, Pereopod 6 coxa and basis.

Iphimediella margueritei Chevreux 1912
Fig. 10

Iphimediella margueritei Chevreux, 1912:213.—Chevreux, 1913:120, figs. 22–24.—K. H. Barnard, 1930:348, fig. 22.
I. margueritei var. *acuta* Nicholls, 1938:69, fig. 36.

Material.—*Eltanin* Cruise 12, Sta. 1003, 15 Mar. 1964, 62°41′S, 54°43′W, 210–220 m, 2 ♂♂.

Diagnosis.—Body with paired, broad-based, smooth dorsal processes on pereonite 7 and pleonites 1–3; coxa 1 distally bidenticulate; antenna 1 peduncle article 1 ventrodistal tooth extending beyond peduncle article 3; head lateral margin with deep notch bounded above and below by acute processes.

Description.—The following supplements the description given by Chevreux (1913). Antenna 1 with minute accessory flagellum. Mandible incisor in smaller specimens multidenticulate. Maxilla 1 palp slightly longer than outer plate, article 2 broadened, armed with plumose setae along distal half of medial margin; outer plate distal margin tapering, armed with distal group of strong spines, proximal margin with fine setae; inner plate subovate, short, with few setae. Maxilliped palp article 4 small, partly covered by hood-like extension of article 3; palp article 1 longer than article 3, article 2 slightly broadened; outer plate distal margin armed with few widely spaced setae. Coxa 1 distally tapering, bidenticulate, teeth widely separated. Pereopods 6 and 7 coxae pointed posteriorly; bases posterior margin serrate.

Distribution.—Adelie Coast, Ross Sea, Antarctic Peninsula, Bransfield Strait, Shag Rocks, South Georgia, South Sandwich Islands, 10–720 m.

Remarks.—The specimens described here differ only slightly from the description given by Chevreux (1913). Some of these differences may be related to the size of the individual; however it appears that the mandible incisor becomes more robust and smooth as it wears. In both individuals examined, the newly formed incisor, which could be seen through the old exoskeleton, was finely dentate.

Iphimediella octodentata (Nicholls 1938)

Pariphimediella octodentata Nicholls, 1938:75, fig. 39.

Material.—*Aurora,* Sta. 2, 28 Dec. 1913, Commonwealth Bay, 527–550 m. (Holotype, Australian Museum #P18720.)

Diagnosis.—Body with paired dorsal processes on pereonites 6 and 7 and pleonites 1 and 2, pleonite 3 with single, strong dorsal process; paired processes noticeably serrate along upper margin.

Distribution.—Commonwealth Bay, 527–550 m.

Remarks.—Referring to *I. octodentata,* Nicholls (1938:75) stated "As seen in profile this is scarcely to be distinguished from *P. serrata* Schell. from which, however it differs in that the high median tooth on pleon 3 of the latter is replaced in this present species by a pair of dorsal spines." This statement was interpreted to mean that while *I. octodentata* carried paired dorsal processes on pleonite 3, Nicholls believed *I. serrata* carried only a single tooth. As will be pointed out below *I. serrata* does, in fact, have

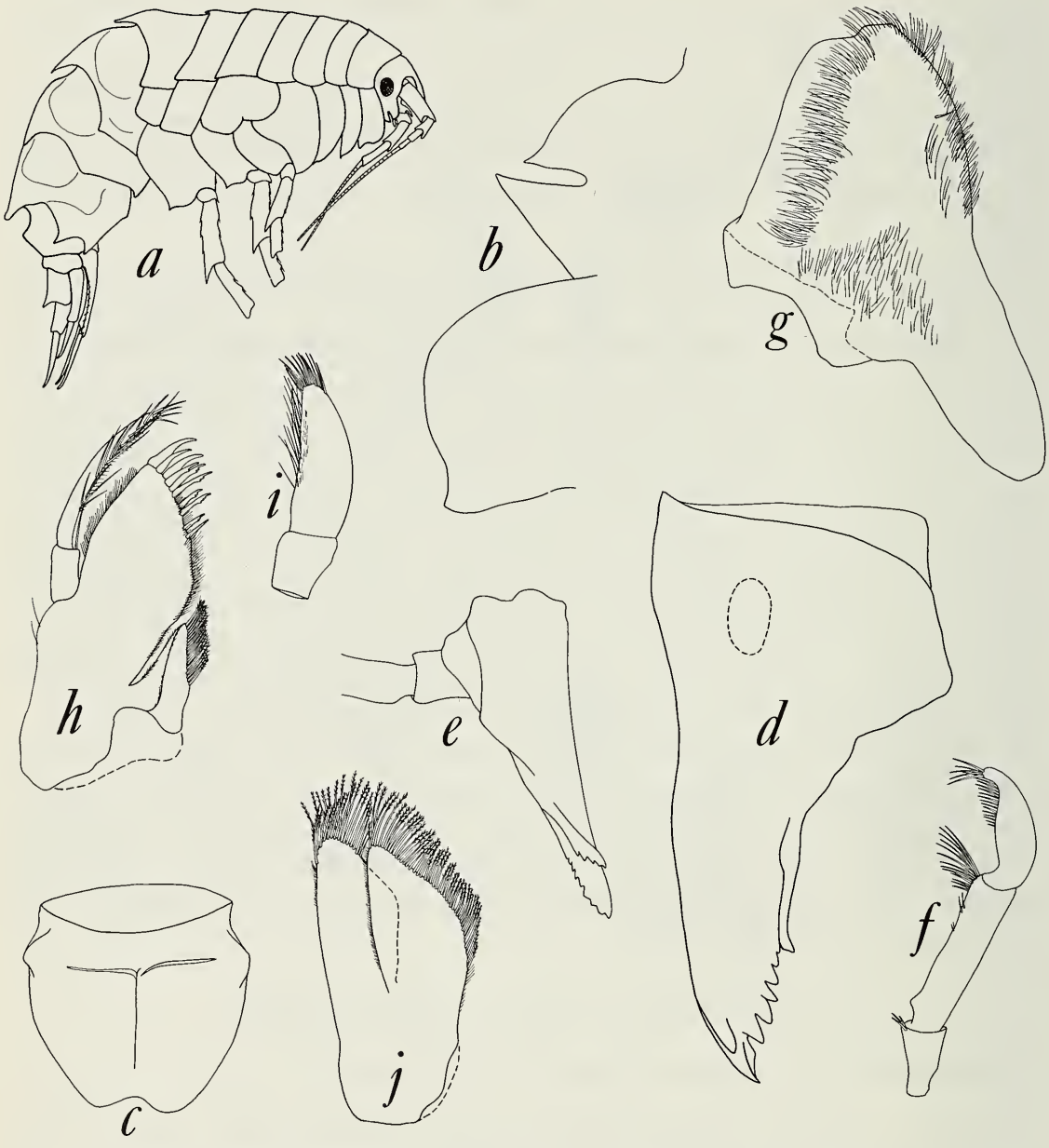

Fig. 11. *Iphimediella rigida, Eltanin* Sta. 1002: a, Body side view; b, Anteroventral corner of head and distal end coxa 1; c, Upper lip; d, Left mandible; e, Right mandible; f, Mandible palp; g, Lower lip; h, Maxilla 1; i, Maxilla 1 palp.

paired dorsal processes on pleonite 3, suggesting that *I. octodentata* and *I. serrata* may be synonymous. Examination of the holotype of *I. octodentata* showed that *I. octodentata* rather than *I. serrata* possessed the high median tooth and the two species are therefore quite distinct.

Iphimediella rigida K. H. Barnard 1930
Figs. 11, 12

Iphimediella rigida K. H. Barnard, 1930:351, fig. 25.

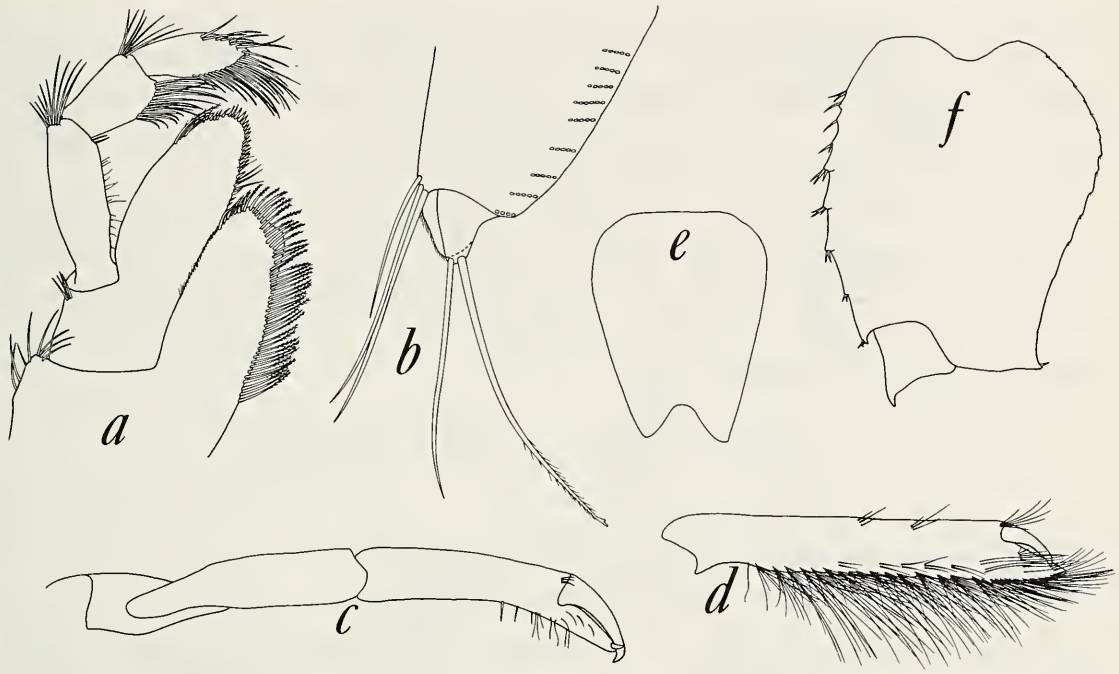

Fig. 12. *Iphimediella rigida, Eltanin* Sta. 1002: a, Maxilliped; b, Articles 3 and 4 of maxilliped palp; c, Distal end gnathopod 1; d, Distal end gnathopod 2; e, Telson; f, Basis pereopod 7.

Material.—*Eltanin* Cruise 12, Sta. 1002, 15 Mar. 1964, 64°40′S, 54°44–45′W, 265 m, 1 ♀. *Terra Nova* Sta. 339, McMurdo Sound, 256 m, 1 ♂ (BMNH Cat. No. 1930. 8.1. 188).

Diagnosis.—Body with paired, short, smooth dorsal processes on pereonite 7 and pleonites 1–3; coxa 1 anteroventral corner broadly rounded; antenna 1 peduncle article 1 medial ventrodistal tooth not extending beyond article 3; head lateral margin with narrow notch bounded below by acute process; maxilla 1 outer plate and maxilliped inner plate broadened.

Description.—The following supplements the short description given by K. H. Barnard (1930). Head lateral margin with narrow notch bounded above by a lobe bearing a short point, below by an acute process. Urosomite 1 with strong middorsal carina. Coxa 1 anteroventral corner rounded, ventral margin slightly excavate. Coxa 2 and 3 anterior margins rounded, tapering posterodistally to short points. Antenna 1 with minute accessory flagellum. Upper lip slightly excavate. Mandible distally tapering, incisor multidentate; molar conical without setae; accessory cutting plate multidentate on right side, with fewer teeth on left side. Lower lip slightly emarginate distally, inner lobes absent. Maxilla 1 palp article 2 with setae along three-fourths of inner margin; outer plate broad, rhomboidal; inner plate short, subtriangular. Maxilla 2 inner and outer plates broadened distally. Maxilliped palp article 4 minute, covered by hood-like extension of article 3; outer plate narrow, armed distally with short, plumose and non-plumose setae;

inner plate truncate distally, as broad as outer plate. Gnathopod 1 dactyl overhangs fixed finger of propodus, scarcely setose. Gnathopod 2 dactyl shorter than fixed finger of propodus, the latter elongate and heavily setose. Pereopod 7, basis posterior margin slightly serrate. Telson shallowly cleft.

Distribution.—McMurdo Sound, Bransfield Straits, 210–256 m.

Remarks.—This species is distinctive in the genus in its possession of a strongly tapering mandible, broadened maxillae and maxilliped, and carinae on pleonites 1–3 and urosomite 1. The ovigerous female obtained from the *Eltanin* material does not differ perceptibly from the male K. H. Barnard described from McMurdo Sound.

Iphimediella serrata (Schellenberg 1926)
Fig. 13

Iphimedia serrata Schellenberg, 1926:328, fig. 43.
Pariphimediella serrata.—Schellenberg, 1931:121.

Material.—*Eltanin* Cruise 6, Sta. 418, 2 Jan. 1963, 62°39–40′S, 56°08–10′W, 311–426 m, 1 juvenile.

Diagnosis.—Body with paired dorsally-serrate dorsal processes on pereonites 6 and 7 and pleonites 1–3; coxa 1 ventral margin serrate; head lateral margin with broad, shallow notch.

Description.—The following description supplements that given by Schellenberg (1926). Right mandible with multidenticulate accessory plate; molar small, conical. Lower lip distally narrow. Maxilla 1 palp article 2 with setae only on distal margin; outer plate distally tapering; inner plate short, acute, with few setae on medial margin. Maxilla 2 outer plate distal setae nearly as long as article. Maxilliped palp article 4 minute, covered by hood-like extension of article 3; palp articles 1–3 subequal in length. Gnathopod 1 dactyl and fixed finger of propodus armed with long setae bearing recurved setules. Gnathopod 2 fixed finger of propodus with row of minute setae.

Distribution.—Davis Sea (off Wilhelm II Coast), Bransfield Straits, 311–426 m.

Remarks.—Much of the distinctiveness in the mouthparts of this species is due to reduced or unusual setation. Since the mouthparts of an adult have not been examined, it is difficult to determine whether these differences are size-dependent. The form of the dorsal body processes distinguish *I. serrata* from all other *Iphimediella* species. Our finding of this species in the Bransfield Straits extends the known distribution of this species to the opposite side of Antarctica.

Maxilliphimedia K. H. Barnard

Maxilliphimedia K. H. Barnard, 1930:355.

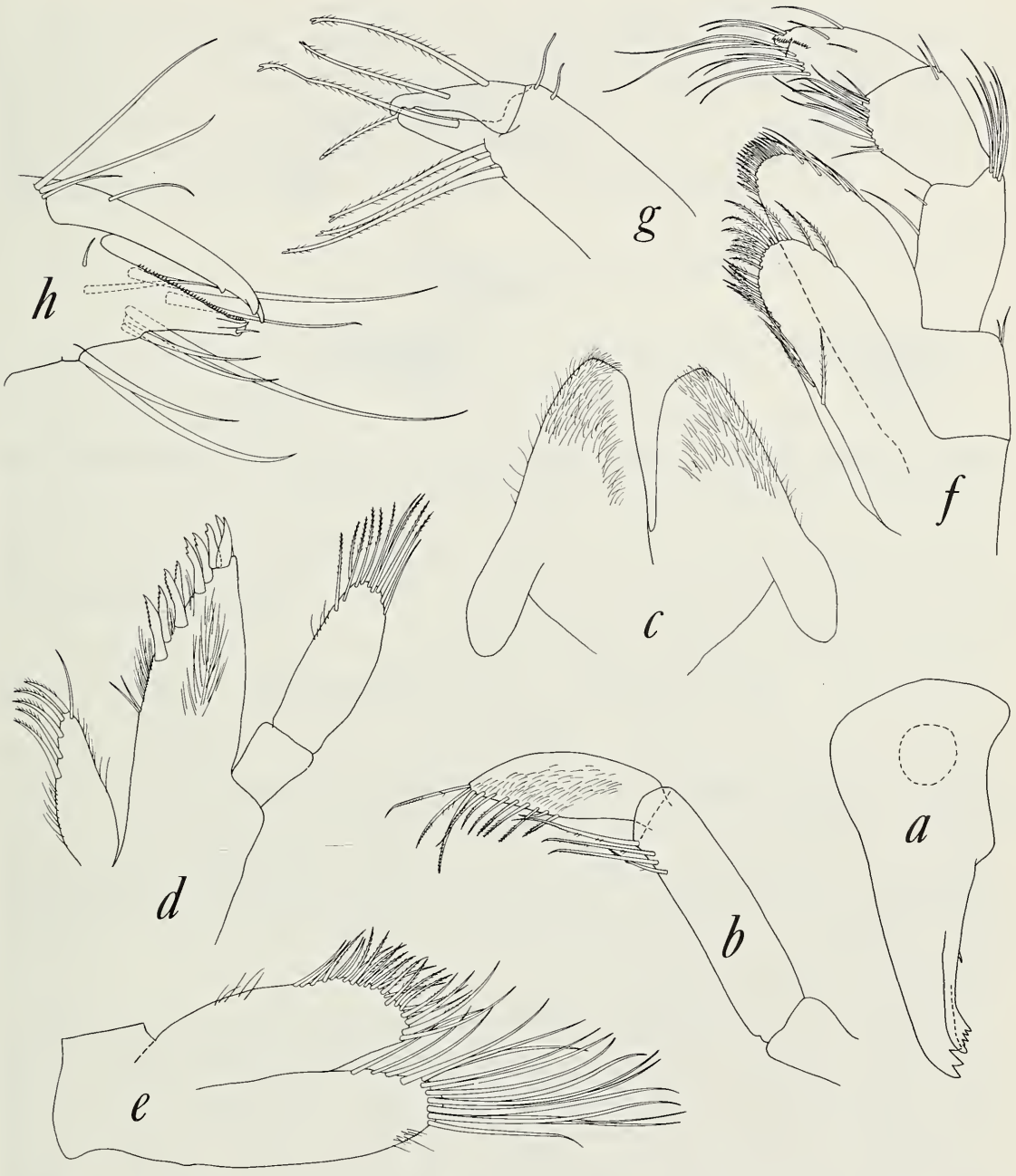

Fig. 13. *Iphimediella serrata, Eltanin* Sta. 418: a, Mandible; b, Mandible palp; c, Lower lip; d, Maxilla 1; e, Maxilla 2; f, Maxilliped; g, Gnathopod 1 tip; h, Gnathopod 2 tip.

Type-species.—*Maxilliphimedia longipes* (Walker 1906).

Diagnosis.—Epistome moderately broadened; upper lip broad, asymmetrically incised; mandible incisor broad but flattened, cutting edge multi-dentate, oriented to cut in frontal plane; lower lip without inner lobes; maxilla 1 palp biarticulate, article 2 greatly expanded; maxilla 2 inner and outer

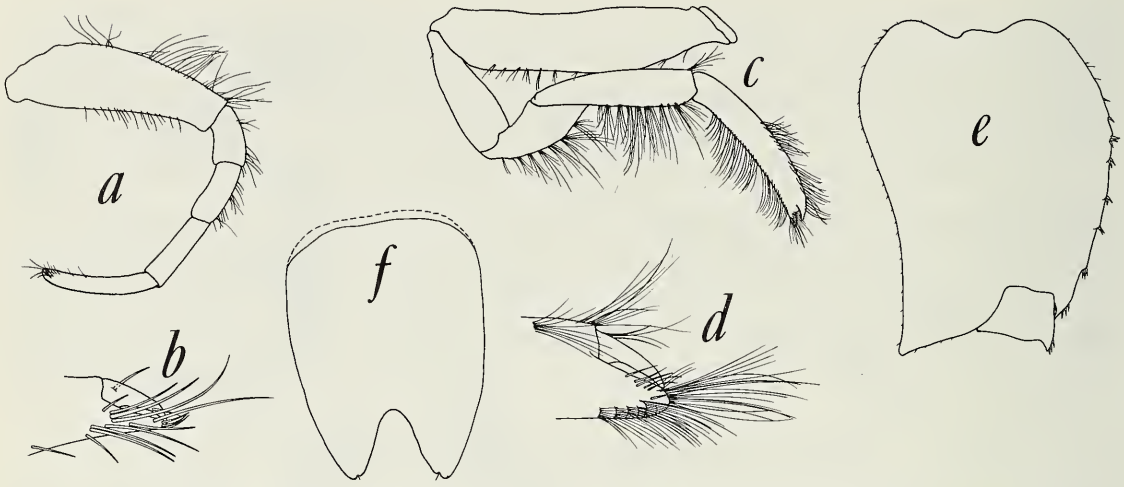

Fig. 14. *Maxilliphimedia longipes*, *Eltanin* Sta. 1002: a, Gnathopod 1; b, Gnathopod 1 tip; c, Gnathopod 2; d, Gnathopod 2 tip; e, Basis pereopod 7; f, Telson.

plates obovate; maxilliped palp 3-articulate, article 2 expanded but not produced along article 3; gnathopods chelate.

Maxilliphimedia longipes (Walker 1906)
Fig. 14

Iphimedia longipes Walker, 1906:151; 1907:29, pl. 9, fig. 17.
Maxilliphimedia longipes.—K. H. Barnard, 1930:355, fig. 28.

Material.—*Eltanin* Cruise 12, Sta. 997, 14 Mar. 1964, 61°44–46′S, 55°54–56′W, 769 m, 1 ♀ ovigerous; Cruise 12, Sta. 1002, 15 Mar. 1964, 62°40′S, 54°44–45′W, 265 m, 1 ♂, 1 ♀.

Diagnosis.—As for genus.

Description.—The following supplements the description of K. H. Barnard (1930). Gnathopod 1 chelate, basis with long setae along distal part of lateral margin; article 6 longer than 5; fixed finger of propodus with several hairs, partly covering dactyl. Gnathopod 2 chelate; article 6 longer than 5, both articles with dense covering of setae; fixed finger of propodus longer and thicker than dactyl, apically rounded. Pereopod 7 basis posterior margin slightly concave distally.

Distribution.—Ross Sea to Bransfield Strait, 100–769 m.

Remarks.—This record extends the known range of the species from the Ross Sea region to the tip of the Antarctic Peninsula.

Odius Lilljeborg

Otus Bate, 1862:125.
Odius Lilljeborg, 1865:19.—Stebbing, 1906:210.

Type-species.—*Otus carinatus* Bate, 1862 (original designation).

Diagnosis (emended from J. L. Barnard, 1969).—Upper lip narrow, incised; mandible with narrow, dentate apex, molar prominent; palp of maxilla 1 uniarticulate, of varying length; maxilliped palp 4-articulate, article 2 slightly expanded but not produced along article 3; gnathopod 1 slender, chelate; gnathopod 2 stout, subchelate; telson notched.

Odius antarcticus, new species
Figs. 15–17

Material.—*Eltanin* Cruise 12, Sta. 1003, 15 Mar. 1964, 62°41′S, 54°43′W, 210–220 m, 3 ovigerous ♀♀, 5 mm maximum size.

Diagnosis.—Pleonites 1–3 and urosomite 1 dorsally smooth, without upright teeth; pleonite 3 posterior margin slightly gibbous; pereopods 5–7 bases smoothly rounded behind without posterior teeth; eye small, not reniform; maxilla 1 palp uniarticulate, long, reaching end of outer plate; maxilliped palp 4-articulate, article 4 strongly reduced, only about $^1/_{10}$ length of article 3; telson visibly cleft.

Description.—Body smooth dorsally, pleonite 3 slightly gibbous. Rostrum well-developed, extending past antenna 1 peduncle article 1 distal margin. Coxa 1–3 longer than wide. Coxa 4 ventral margin straight. Eye small, not reniform. Antenna 1 shorter than antenna 2; lacking accessory flagellum. Upper lip longer than wide; distal margin asymmetrically incised. Mandible incisor multidentate; accessory plate present on left side; molar prominent, setose; strong spine row present between incisor and molar; on left mandible, spines closest to incisor widened distally and become multidentate, similar in shape to the accessory plate; palp 3-articulate, articles 2 and 3 subequal in length. Lower lip notched along midline; apices narrow, setose. Maxilla 1 with uniarticulate palp exceeding length of outer plate; outer plate carrying short, heavy spines distally, densely setose proximally; inner plate with 3 plumose setae distally. Maxilla 2 outer plate narrower than inner; setae on outer plate twice length of those on inner. Maxilliped palp 4-articulate, article 2 slightly expanded medially, article 4 small. Gnathopod 1 chelate, articles 5 and 6 subequal. Gnathopod 2 strongly subchelate, palm border serrate. Pereopods 5–7 similar, posterior margin bases smooth, pereopod 7 basis slightly more elongate. All uropods biramous; uropod 1 inner and outer rami subequal; uropod 2 inner ramus longer and wider than outer; uropod 3 inner ramus approximately 1.5 × length of outer; telson longer than wide, cleft ⅓.

Distribution.—Known only from type-locality.

Remarks.—Three other species are included within the genus *Odius*: *O. carinatus* Bate 1852; *O. kelleri* Brüggen, 1907; *O. cassigerus* Gurjanova, 1972. All 3 of the above species have a minute uniarticulate palp on maxilla

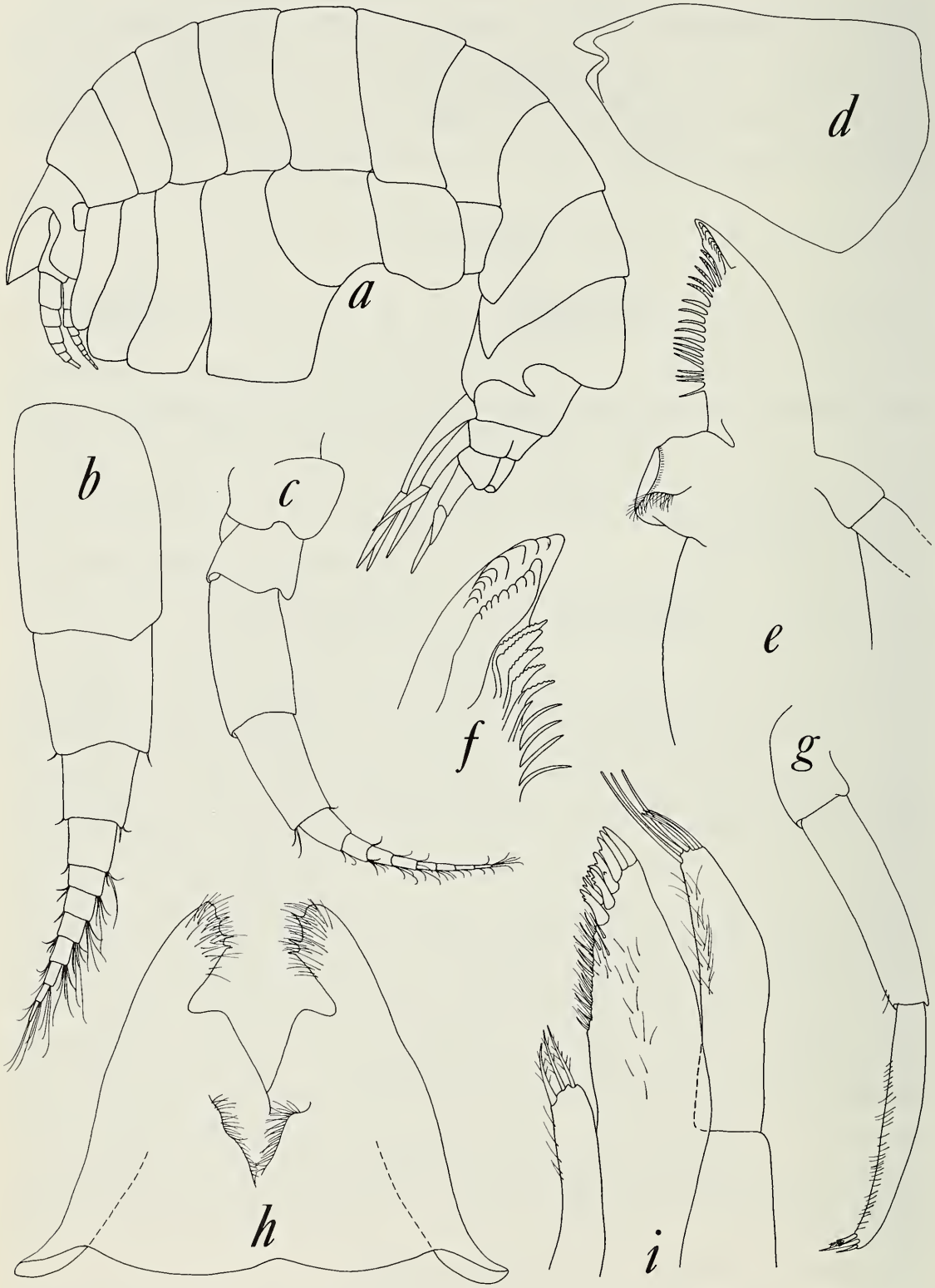

Fig. 15. *Odius antarcticus, Eltanin* Sta. 1003: a, Body side view; b, Antenna 1; c, Antenna 2; d, Upper lip; e, Mandible; f, Mandible incisor and spine row; g, Mandible palp; h, Lower lip; i, Maxilla 1.

Fig. 16. *Odius antarcticus*, *Eltanin* Sta. 1003: a, Maxilla 2; b, Maxilliped; c, Gnathopod 1; d, Gnathopod 1 tip; e, Gnathopod 2; f, Pereopod 5; g, Pereopod 6.

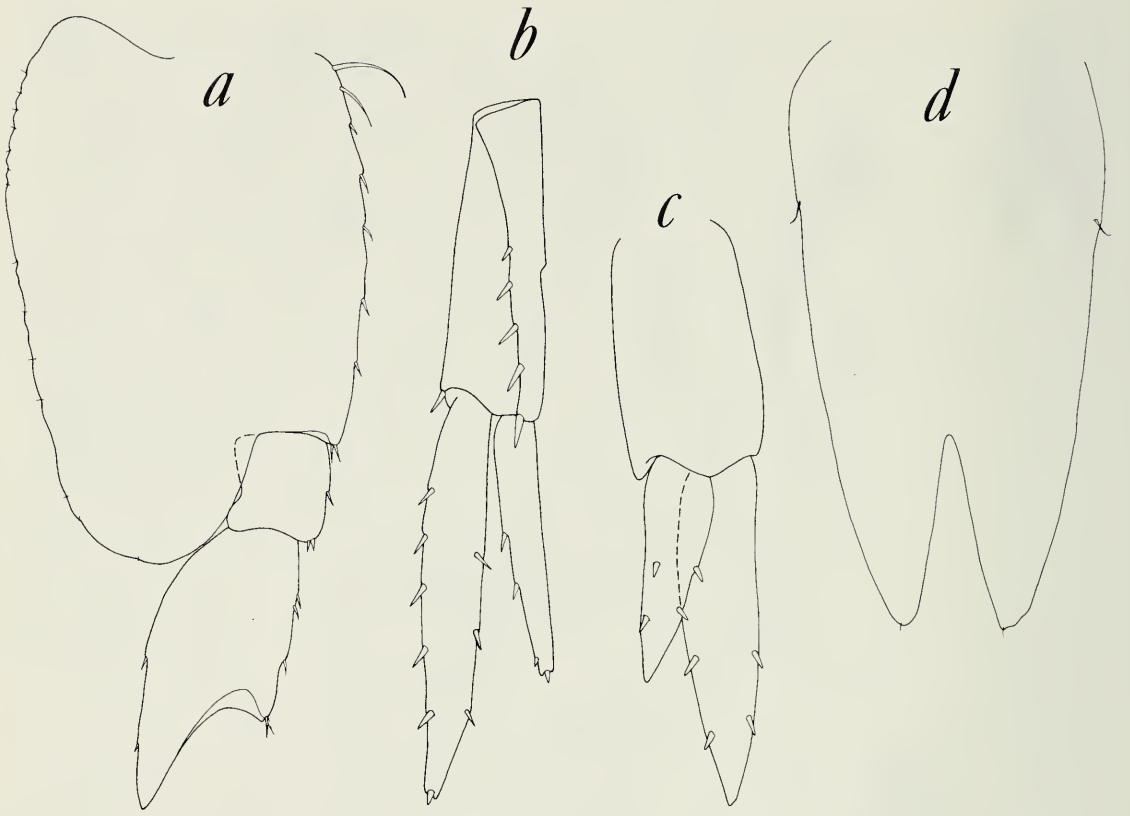

Fig. 17. *Odius antarcticus*, *Eltanin* Sta. 1003: a, Pereopod 7 articles 2–4; b, Uropod 2; c, Uropod 3; d, Telson.

1 whereas the palp is quite large for the new species described here. Similarities in basic body shape and in most other mouthparts, especially the mandibles, serve as unifying features, however, and the difference in palp length was not considered to be outside the scope of the genus. *O. antarcticus* is also distinctive from all other species of *Odius* heretofore described by its smooth body profile, small fourth article on the maxilliped palp, smooth bases of the pereopods, and the degree to which the telson is cleft.

Etymology.—This is the first known species of *Odius* to be described from the Antarctic.

Holotype.—USNM 181323; 2 ♀ paratypes USNM 181324.

Parapanoploea Nicholls

Parapanoploea Nicholls, 1938:65.

Type-species.—*Parapanoploea oxygnathia* Nicholls, 1938, p. 66.

Diagnosis (modified from J. L. Barnard, 1969).—Upper lip broad, faintly emarginate; mandible incisor narrow, elongate; lower lip lobes not incised; maxilla 1 palp biarticulate, reaching end of outer plate; maxilliped palp

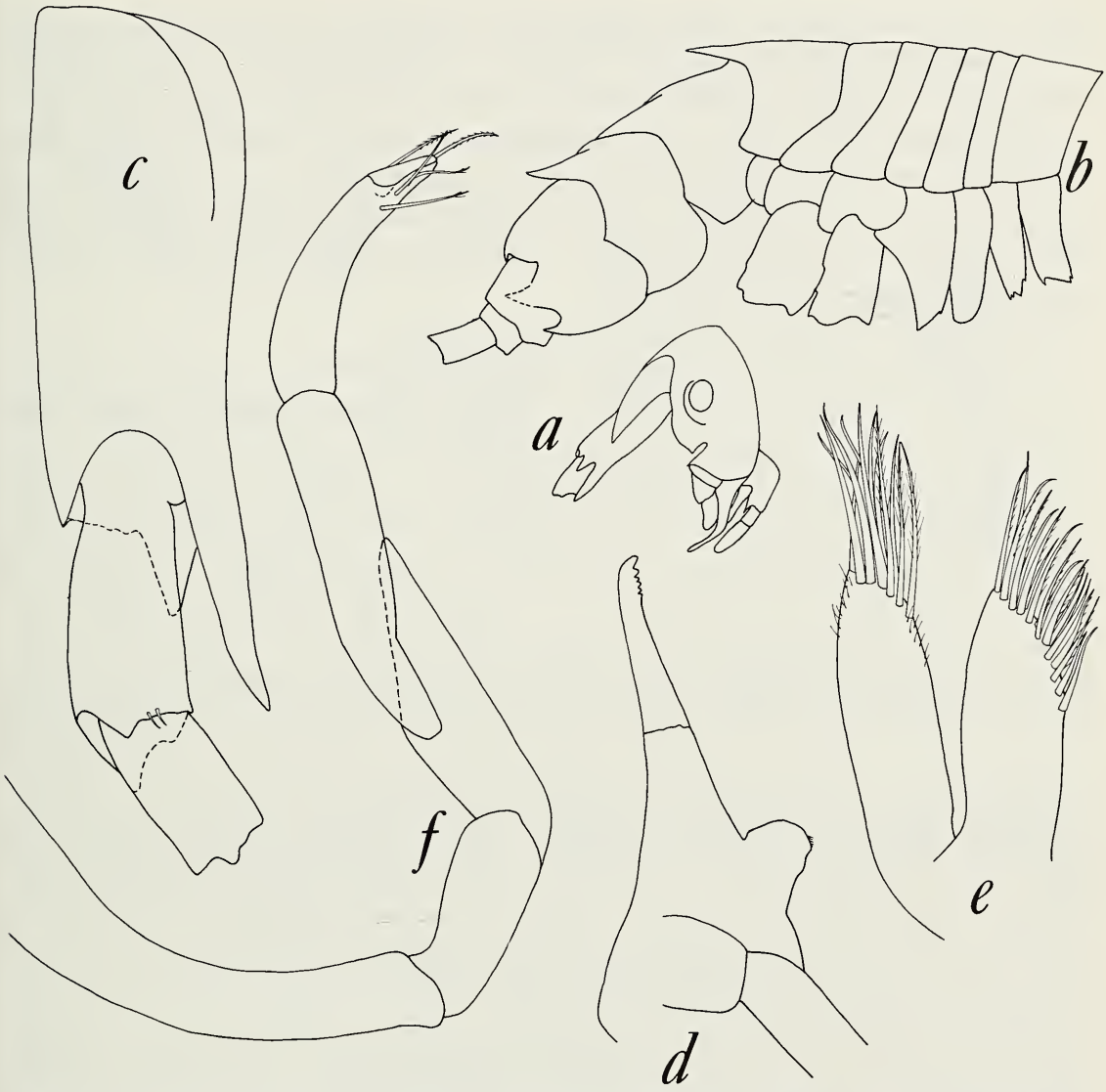

Fig. 18. *Parapanoploea oxygnathia, Eltanin* Sta. 5769: a, Head; b, Body side view; c, Antenna 1 peduncle; d, Mandible; e, Maxilla 2; f, Gnathopod 1.

4-articulate, article 2 slightly expanded but not produced along article 3; gnathopods 1 and 2 chelate; telson notched.

Parapanoploea oxygnathia Nicholls 1938
Fig. 18

Parapanoploea oxygnathia Nicholls, 1938:66, figs. 34, 35.

Material.—*Eltanin* Cruise 51, Sta. 5769, 9 Feb. 1972, 77°09.1′S, 158°59.6′–159°00.2′W, 344–357 m, 1 juvenile.

Diagnosis.—Rostrum one-half of antenna 1 peduncle article 1;

distal tooth on antenna 1 peduncle article 1 extends at least to distal margin of peduncle article 2; gnathopod 1 article 6 $^4/_5$ the length of article 5; dorsal processes on pereonite 7 and pleonites 1 and 2 directed posteriorly.

Description.—The following supplements the description of Nicholls (1938). Body with paired dorsal processes, separated by wide U-shaped gap, on pereonite 7 and pleonites 1 and 2; processes on pleonite 1 parallel with dorsal margin of pleonite. Antenna 1 peduncle article 1 distal tooth extends to distal margin peduncle article 2.

Distribution.—Davis Sea and Ross Sea, 216–357 m.

Remarks.—Since the specimen at hand is a juvenile, it is with some hesitation that we have assigned it to *P. oxygnathia*. While it agrees with Nicholls' (1938) description in terms of the distal tooth on antenna 1 peduncle article 1, and the length of gnathopod 1 article 6, it otherwise was very similar to *P. longirostris* Bellan-Santini (1972), who differentiated the 2 species using the following characters: (1) lateral margin of the head at the level of the eye is sinuous in *P. longirostris,* simply rounded in *P. oxygnathia*; (2) mandible incisor possesses 8 teeth in *P. longirostris,* 6 in *P. oxygnathia*; (3) rostrum extends $^4/_5$ the length of antenna 1 peduncle article 1 in *P. longirostris,* versus one-half in *P. oxygnathia*; (4) gnathopod 1 merus/carpus ratio is opposite in the 2 species; (5) uropod 3 rami equal in *P. longirostris,* unequal in *P. oxygnathia.* Characters (1), (2), (3), and (4) are slight differences which eventually may be found to be gradational (to date, only 2 specimens of *P. oxygnathia* and 1 of *P. longirostris* are known). Nicholls' illustration of uropod 3 suggests that the inequality of the rami is due to the outer ramus being broken. Our specimen was missing both rami of uropod 3 so this could not be checked. Thus, it appears for the present that the real differences between these 2 species are: (1) the presence of the long distal tooth on antenna 1 peduncle article 1 in *P. oxygnathia*; and (2) the backwardly-directed paired dorsal processes on pleonites 1 and 2 in *P. oxygnathia* versus the upwardly-directed paired dorsal processes on pleonites 1 and 2 in *P. longirostris.* Bellan-Santini does not figure the paired dorsal processes on pereonite 7 in *P. longirostris,* therefore no comparison of this feature can be made with *P. oxygnathia.*

Paramphithoidae
Epimeria Costa

Epimeria Costa in Hope, 1851:46.
Pseudepimeria Chevreux, 1911:1167.
Subepimeria Bellan-Santini, 1972:225.—Watling and Holman, 1980.

Type-species.—*Gammarus corniger* J. C. Fabricius, 1779.

Diagnosis (emended from J. L. Barnard, 1969).—Rudimentary accessory flagellum; mandible molar large, ridged; lower lip lacking inner lobes; max-

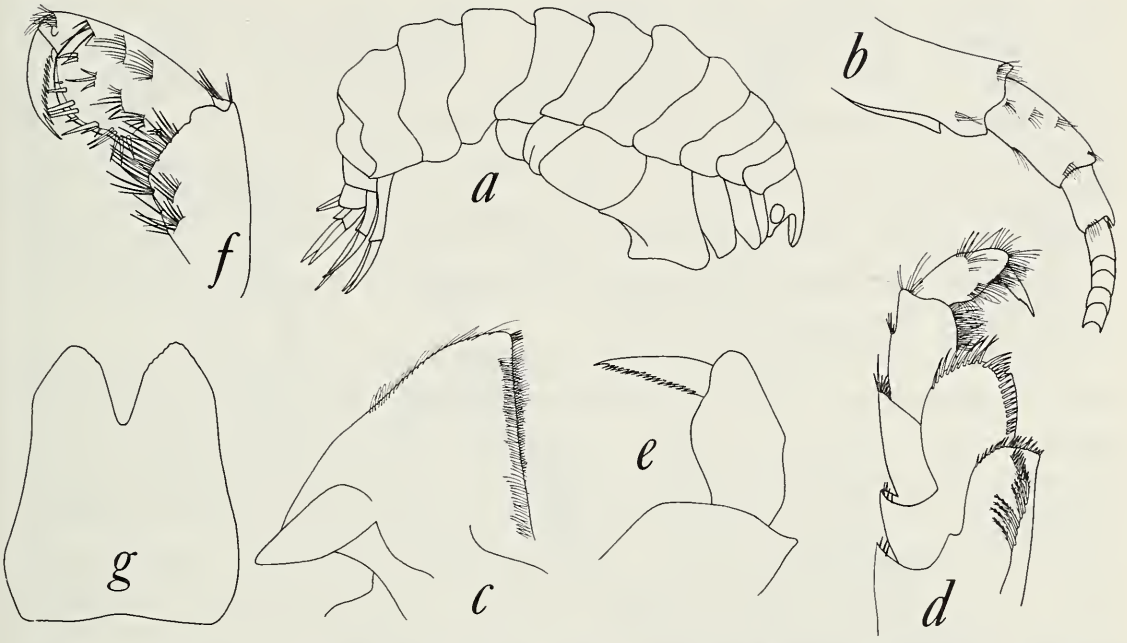

Fig. 19. *Epimeria georgiana, Eltanin* Sta. 1003: a, Body side view; b, Antenna 1; c, Lower lip; d, Maxilliped; e, Maxilliped articles 3 and 4 with setae omitted; f, Gnathopod 1 articles 6, 7; g, Telson.

illiped palp 4-articulate; gnathopods simple to subchelate, dactyls often spinose, much shorter than propodus; coxae 4–5 together forming a more or less crescentic curve below.

Epimeria georgiana Schellenberg 1931
Fig. 19

Epimeria georgiana Schellenberg, 1931:160.
Epimeria excisipes K. H. Barnard, 1932:174, figs. 104e, 106, 107 (new synonymy).

Material.—*Eltanin* Cruise 6, Sta. 410, 31 Dec. 1962, 61°18–20′S, 56°09–10′W, 220–240 m, 1 ♀; Cruise 12, Sta. 1002, 15 Mar. 1964, 62°40′S, 54°44–45′W, 265 m, 9 ♀♀ (6 with eggs, 1 with young), 1 ♂; Cruise 12, Sta. 1003, 15 Mar. 1964, 62°41′S, 54°43′W, 210–220 m, 1 ♀ with eggs; *Discovery* Sta. 42, 1 Apr. 1926, 120–204 m (Br. Mus. #1936. 11.2. 1551–1580); Cumberland Bay, South Georgia (54°11′S, 36°18′W), 5 June 1902, 252–310 m, (Naturhistoriska Riksmuseet Type No. 673).

Diagnosis.—Body with dorsal carinae on at least pereonites 4–7 and pleonites 1–3; coxa 4 anteroventral margin slightly concave, not acutely pointed ventrally; coxa 5 not produced posteriorly; pereopods 5–7 bases, hind margins with distal notch.

Description.—The following supplements the description of Schellenberg (1931) and K. H. Barnard (1932). Antenna 1 with minute accessory flagel-

lum; peduncle article 2 twice as long as wide. Lower lip apex subacute; medial margin with dense cover of setae. Maxilliped palp article 2 longer than articles 1 and 3, article 4 with many closely-spaced short spines on inner margin. Gnathopod 1 subchelate; article 6 three-fourths as wide as long, subequal to article 5; palm circular, finely serrate; dactyl inner margin with many closely-spaced spines. Third epimeral plate posterodistal margin with acute tooth, without accessory tooth. Telson cleft nearly one-third.

Distribution.—Palmer Archipelago, Bransfield Strait, South Shetland Islands, South Georgia, 75–391 m.

Remarks.—K. H. Barnard (1932) suggested that *E. excisipes* was probably a synonym of *E. georgiana* Schellenberg (1931). We examined the types of both species and agree with K. H. Barnard's suggestion. J. L. Barnard (1961) separated the 2 in his key to the species of *Epimeria* by the presence of an accessory tooth above the lower posterior corner of epimeron 3 in *E. excisipes*. McCain (1971) suggested that coxa 4 was "broadly quadrate" in *E. excisipes* and "narrowly truncate" in *E. georgiana*. Neither of the type specimens had an accessory tooth on epimeron 3, and their fourth coxae could both be described as broadly quadrate.

Epimeria macrodonta Walker 1906
Fig. 20

Epimeria macrodonta Walker, 1906:16.—Walker, 1907:24, pl. 8, fig. 14.
Epimeria similis Chevreux, 1912:215; 1913:149, figs. 41–43.
Epimeria macrodonta forma *macrodonta* K. H. Barnard, 1930:372; 1932:172, fig. 105.
Epimeria macrodonta forma *similis* K. H. Barnard, 1930:372; 1932:172.

Material.—*Eltanin* Cruise 6, Sta. 410, 31 Dec. 1962, 61°18–20′S, 56°09–10′W, 220–240 m, 1 ♂ (f. *similis*); Cruise 12, Sta. 1002, 15 Mar. 1964, 62°40′S, 54°44–45′W, 265 m, 3 ♀♀ (f. *similis*); Cruise 12, Sta. 1003, 15 Mar. 1964, 62°41′S, 54°43′W, 210–220 m, 4 ♀♀ (3 ovigerous), 3 juveniles, 2 ♂♂ (f. *similis*). *Hero* Cruise 731, Sta. 1946, 11 Mar. 1973, 64°53′S, 62°53′W, 264–272 m, 1 ♀ (f. *macrodonta*).

Diagnosis.—Body with dorsal carinae on pleonites 1–3 and most pereonites, but never on pereonite 2; urosomite 1 with mid-dorsal upright tooth; coxa 5 acutely produced posteriorly; pereopods 5 and 6 bases posterior margin without notch, posterodistal corners acutely produced, anterior and posterior margins parallel.

Description.—The following supplements the description of Walker (1907) and Chevreux (1913). Antenna 1 with minute accessory flagellum. Upper lip asymmetrically incised. Mandible palp article 3 slightly longer than article 2, with proximal seta group on dorsal margin. Lower lip apex blunt, with tuft of stiff setae on medial margin at apex. Maxilla 1 palp with stout setae

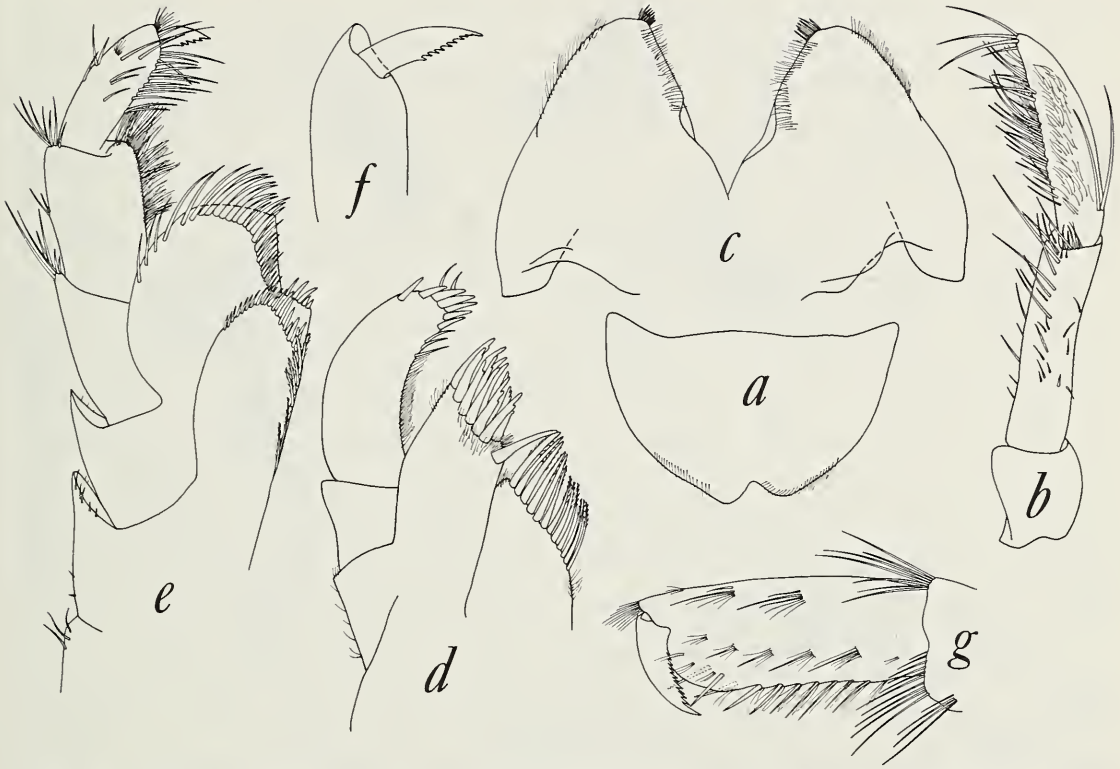

Fig. 20. *Epimeria macrodonta*, *Eltanin* Sta. 1002: a, Upper lip; b, Mandible palp; c, Lower lip; d, Maxilla 1; e, Maxilliped; f, Maxilliped articles 3 and 4 with setae omitted; g, Gnathopod 1.

at tip, grading into fine setae proximally along medial margin; inner plate broader than outer with setae long and thick distally, shorter, thinner and more plumose proximally. Maxilliped palp articles 1–3 subequal in length; article 4 covered proximally by slight extension of third article, with several short spines on medial margin. Gnathopod 1 subchelate; palm narrowly rounded, finely serrate; dactyl with many short, closely-spaced spines on inner margin; propodus linear.

Distribution.—Circum-Antarctic, 30–900 m.

Remarks.—The specimen from Station 410 is similar to the other specimens of *E. macrodonta* f. *similis* except that it does not possess a carina on pereonite 1 and its antenna 1 peduncle article 2 possesses a mid-ventral tooth on the distal margin. This form is presently regarded as being aberrant and not deserving of separate subspecies status.

Epimeria puncticulata Barnard 1930
Fig. 21

Epimeria puncticulata K. H. Barnard, 1930:376, fig. 42; 1932:175, fig. 104d.
Subepimeria geodesiae Bellan-Santini, 1972:225, figs. 33, 34 (new synonymy).

Fig. 21. *Epimeria puncticulata*, *Eltanin* Sta. 1003: a, Pleonites 1–3 dorsal view; b, Antenna 1; c, Mandible palp; d, Lower lip; e, Maxilla 1; f, Maxilliped; g, Maxilliped articles 3 and 4 with setae omitted; h, Gnathopod 1; i, Pereopod 5; j, Pereopod 6; k, Pereopod 7.

Material.—*Eltanin* Cruise 12, Sta. 1003, 15 Mar. 1964, 62°41′S, 54°43′W, 210–220 m, 1 ♀ with eggs; Cruise 32, Sta. 1995, 10 Jan. 1968, 72°04′S, 172°38′E, 360–342 m, 1 juvenile. *Discovery* 1936.11.2, 1581–1590 m, (British Museum), South Georgia, 2 ♀♀.

Diagnosis.—Body without dorsal carinae on pereonites, carinae present

on pleonites 1–3; coxa 5 not produced posteriorly; pereopod 5 basis posterodistal corner subacutely produced, hind margin without notch.

Description.—The following supplements the description of Barnard (1930). Carinae on pleonites 1–3 forming a distinct keel, the second strongly pointed posteriorly. Antenna 1 with minute, uniarticulate accessory flagellum; peduncle article 2 as wide as long. Lower lip apically subacute, with strong group of stiff setae on apex medial margin. Mandible palp article 3 as long as article 2, armed along entire ventral margin with setae, last 3 setae double the length of others. Maxilla 1 palp biarticulate, armed with distal group of stout setae; inner plate apical setae stout, plumose. Maxilliped palp 4-articulate, articles 1–3 subequal in length; article 4 with few spines along medial margin. Gnathopod 1 subchelate; articles 5 and 6 elongate, slightly longer than article 6; dactyl with 6 spines on inner margin; palm excavate near base of dactyl, proximal margin finely serrate. Pereopod 5 basis posterior margin excavate, posterodistal corner subacute. Pereopod 6 basis posterodistal corner rounded. Pereopod 7 basis broader than in pereopods 5 and 6, hind margin convex. Telson cleft one-fourth.

Distribution.—Ross Sea, Antarctic Peninsula, South Georgia, 60–270 m.

Remarks.—Our specimen from *Eltanin* Sta. 1003 differed from the *Discovery* material examined in lacking a small mid-dorsal tooth on the posterior margin of pereonite 7; however, in all other respects they were indistinguishable. Of the species in this genus which lack dorsal carinae on the pereonites, the following 4 species form a group characterized by distally broad 4th coxae and posterodistally blunt 5th coxae: *E. geodesiae* (Bellan-Santini), *E. monodon* Stephenson, *E. puncticulata* K. H. Barnard and *E. robusta* K. H. Barnard. The posteriorly notched bases on pereopods 5 and 6 readily separate *E. robusta* from this group. Pereopods 6 and 7 bases are both posteriorly expanded in *E. monodon* whereas, in *E. geodesiae* and *E. puncticulata,* only the basis of pereopod 7 is posteriorly expanded. We have elected to synonymize *E. geodesiae* with *E. puncticulata* since the 2 differ only in the presence or relative strength of a mid-dorsal carina on pleonite 1. We have seen some variability in this character as noted above, and as well, K. H. Barnard (1916) found that for large specimens of *E. semiarmata,* such carinae could become obsolete.

Metepimeria Schellenberg

Metepimeria Schellenberg, 1931:162.

Type-species.—*Metepimeria acanthurus* Schellenberg, 1931.

Diagnosis (emended from J. L. Barnard, 1969).—Antenna 1 with accessory flagellum; mandibular molar large, ridged; lower lip without inner lobes; maxilliped palp 3-articulate; gnathopods simple.

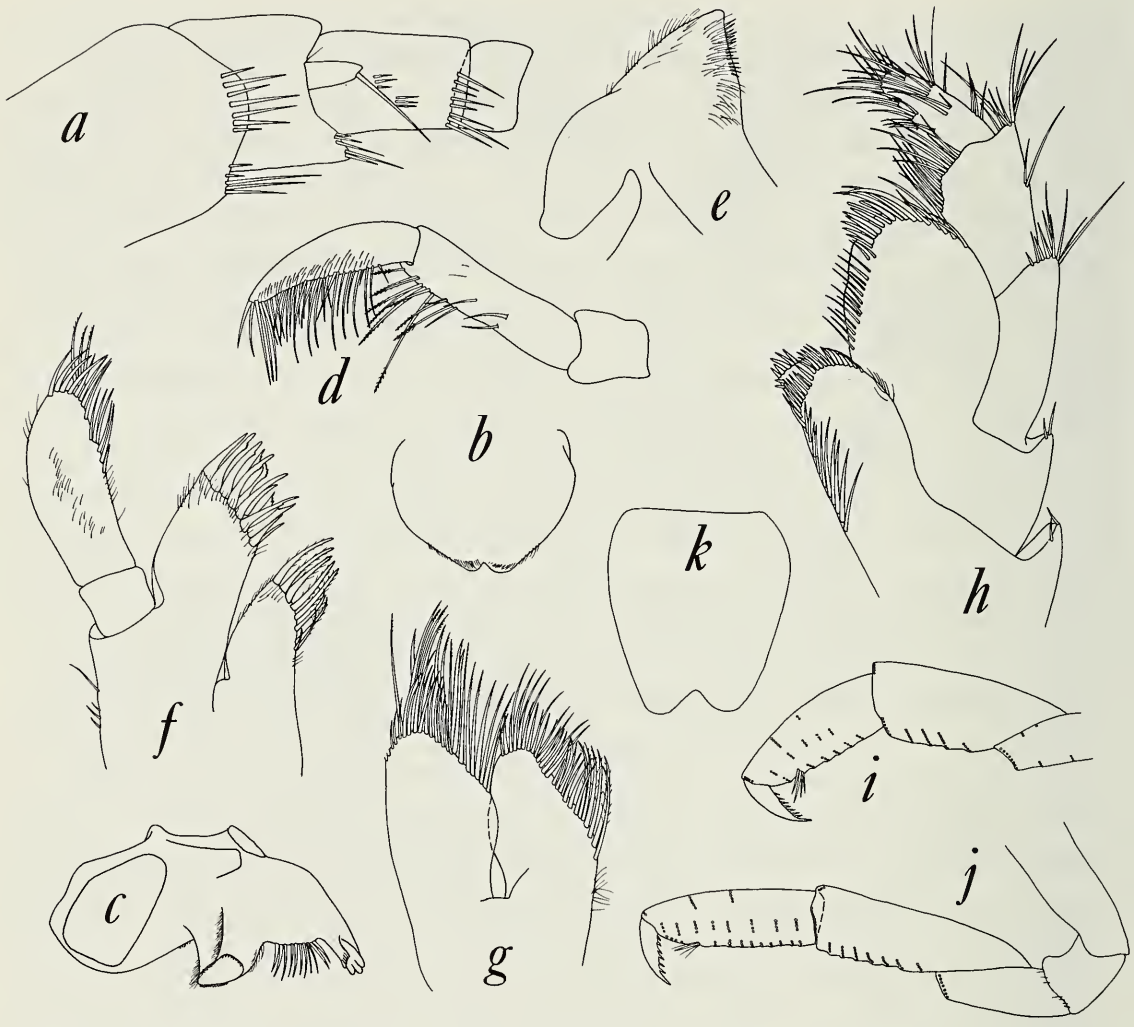

Fig. 22. *Metepimeria acanthurus*, *Hero* Sta. 894: a, Antenna 1; b, Upper lip; c, Mandible; d, Mandible palp; e, Lower lip; f, Maxilla 1; g, Maxilla 2; h, Maxilliped; i, Gnathopod 1 (setae omitted); j, Gnathopod 2 (setae omitted); k, Telson.

Metepimeria acanthurus Schellenberg 1931
Fig. 22

Metepimeria acanthurus Schellenberg, 1931:162, fig. 85, pl. 1, fig. G.
Epimeria acanthurus.—K. H. Barnard, 1932:176, figs. 104B, 108; pl. 1, fig. 2.

Material.—*Eltanin* Cruise 9, Sta. 740, 18 Sept. 1963, 56°06–07′S, 66°19–30′W, 384–494 m, 1 ♀. *Hero* Cruise 715, Sta. 894, 2 Nov. 1971, 54°54.8–55′S, 64°18–20′W, 263–285 m, 1 ♀, 9 ♂♂. *William Scoresby* Sta. 86, 3 Mar. 1927, 53°53′S, 60°34′W, 151–147 m, 1 ♀ ovigerous.

Diagnosis.—As given for genus.

Description.—The following supplements the description of Schellenberg

(1931) and K. H. Barnard (1932). Antenna 1 with minute accessory flagellum, bearing single terminal seta. Upper lip shallowly notched. Mandible incisor multidenticulate, left lacinia mobilis with 6 teeth; molar large, triturative, with lateral and anterior setose ridges; palp articles 2 and 3 subequal in length; palp article 3 with heavy cover of long setae on ventral margin, article 2 with several setae on distal half of ventral margin. Lower lip without inner lobes; medial margin near distal apex with group of short, blunt, stiff setae. Maxilla 1 palp article 2 with setae along distal half of medial margin; inner plate with long, thick, sparsely plumose setae. Maxilla 2 inner and outer plates broadened distally. Maxilliped palp 3-articulate, palp article 2 slightly longer than article 3; palp article 3 with dense apical tuft of setae arranged in 3 whorls; outer plate extends halfway along palp article 2. Gnathopod 1 simple, articles 5 and 6 subequal in length, article 5 wider than article 6; dactyl armed with series of short, stiff spines along inner margin. Gnathopod 2 simple, articles 5 and 6 longer than in gnathopod 1, subequal in length and width; dactyl armed with series of stout, stiff spines. Telson shallowly cleft.

Distribution.—Magellanic area, Falkland Islands, 151–194 m.

Remarks.—This species is very similar to the species in the genus *Epimeria*, especially in the form of the mandible, lower lip and maxillae. The absence of a fourth article on the maxilliped palp combined with the simple gnathopods does not allow its inclusion in the genus *Epimeria* despite its superficial resemblance to *E. puncticulata* (as noted by K. H. Barnard, 1932).

Uschakoviella Gurjanova

Uschakoviella Gurjanova, 1955:199.

Type-species—*U. echinophora* Gurjanova, 1955.

Diagnosis (as modified from J. L. Barnard, 1969).—Body covered with articulated spines; accessory flagellum minute; lower lip lacking inner lobes; mandible molar large, ridged; maxilliped palp 4-articulate; gnathopods scarcely subchelate but palms transverse; telson cleft.

Uschakoviella echinophora Gurjanova 1955
Fig. 23

Uschakoviella echinophora Gurjanova, 1955:200, figs. 14, 15.
U. e. echinophora Gurjanova, 1955:203.
U. e. abyssalis Gurjanova, 1955:203, figs. 16–18.
U. echinophora.—Shoemaker, 1964:417, fig. 12.

Material.—*Islas Orcadas* Cruise 19, Sta. 14, 18 Mar. 1979, 59°48′S, 45°06′W, 1 juvenile.

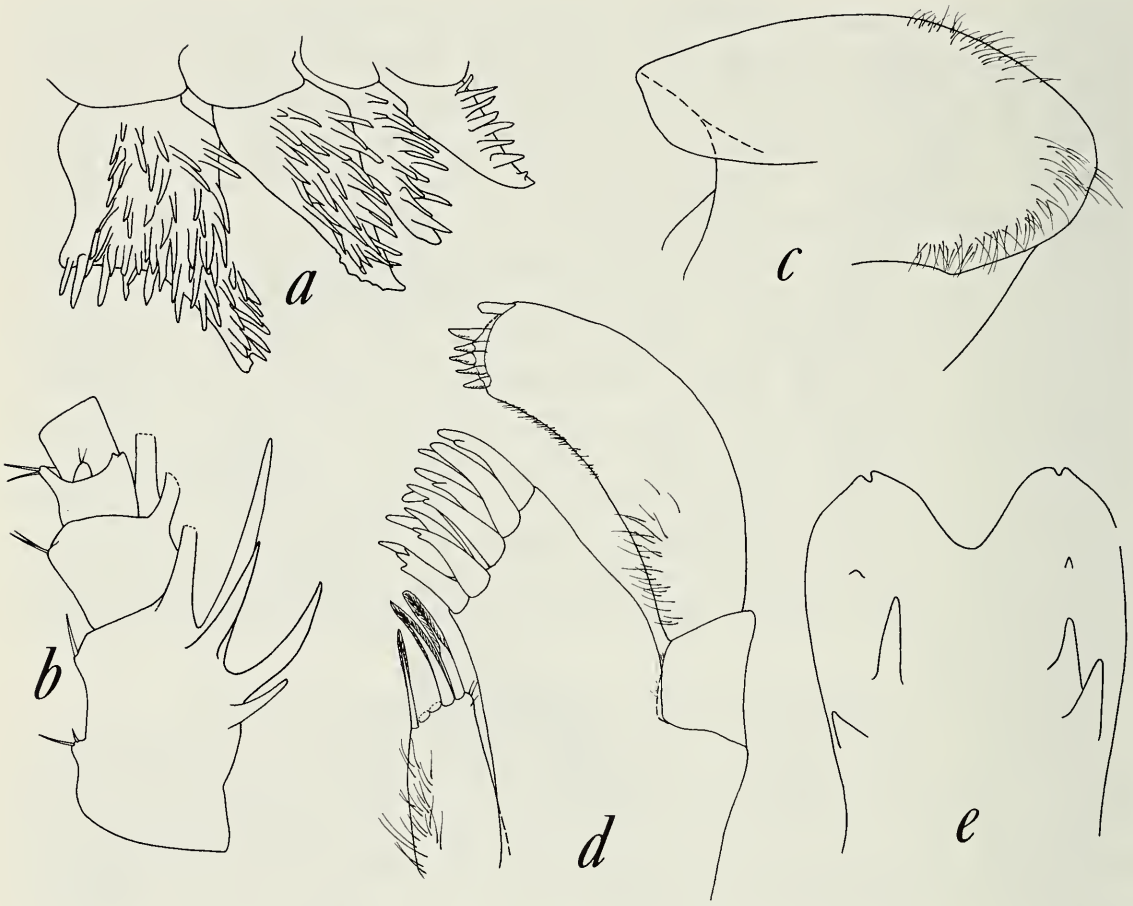

Fig. 23. *Uschakoviella echinophora, Islas Orcadas* Cruise 19, Sta. 14: a, Coxae 1–4; b, Antenna 1; c, Lower lip; d, Maxilla 1; e, Telson.

Diagnosis.—See generic diagnosis.

Description.—The following supplements the description given by Gurjanova (1955) and Shoemaker (1964). Spines on body become slightly heavier at posterior of body. Pleonite 3 has, in addition to single upright dorsal tooth, a slightly more slender tooth at posterior margin. Antenna 1 accessory flagellum minute. Upper lip incised. Maxilla 1, inner plate with 5 "velvety" setae distally; palp with only short spines. Lower lip with single prominent seta at distomedial margin. Telson with 4 prominent dorsal spines, lobes with minute grooves distally.

Distribution.—Boreal North Pacific, Antarctic, 54–2550 m.

Remarks.—Our specimen differs from those of Shoemaker (1964) and Gurjanova (1955) in the possession of short spines on the palp of maxilla 1 instead of longer, tufted setae and in the presence of prominent spines on the telson. The presence of the accessory flagellum and the additional smaller tooth on pleonite 3 was probably overlooked in the earlier studies as both

these characters are difficult to see. The importance of the additional characters is uncertain because of disagreements in the earlier descriptions. Shoemaker described the upper lip of his specimens as broad, symmetrical and not incised while Gurjanova figured an incised upper lip. Gurjanova illustrated 2 distomedial spines on the lower lip whereas Shoemaker figured only fine setae. Because this species has been reported so few times, assessment of possible specific differences is difficult.

Stegocephalidae
Andaniotes Stebbing

Andaniotes Stebbing, 1897:30.
Metandania Stephensen, 1925:136.

Type-species.—*Anonyx corpulentus* Thomson, 1882.

Diagnosis (from J. L. Barnard, 1969).—Antenna 1 flagellar article 1 equal to or shorter than peduncle; antenna 2 peduncle article 5 equal to or shorter than article 4; mandible incisor not toothed; maxilla 1 palp uniarticulate; maxilla 2 outer plate not geniculate or gaping; maxilliped palp article 2 not produced; pereopod 5 article 2 slender; pereopods 6 and 7 article 2 broad; pleonite 6 longer than uropod 3 peduncle.

Andaniotes corpulentus (Thomson 1882)
Fig. 24

Anonyx corpulentus Thomson, 1882:231, pl. 17, fig. 1.
Andania abyssorum Stebbing, 1888:739, pl. 37.
Andaniotes corpulentus.—Stebbing, 1897:31, pl. 8; 1906:96, fig. 21.—Schellenberg, 1931:51.—J. L. Barnard, 1972:307 (key).

Material.—*Eltanin* Cruise 6, Sta. 410, 31 Dec. 1962, 61°18–20′S, 56°09–10′W, 220–240 m, 2 individuals; Cruise 6, Sta. 428, 5 Jan. 1963, 62°39–41′S, 57°46–51′W, 622–1120 m, 1 ♀ ovigerous; Cruise 9, Sta. 740, 18 Sept. 1963, 56°06–07′S, 66°19–30′W, 384–494 m, 1 ♀, 3 juveniles, 1 sex unknown; Cruise 12, Sta. 1003, 15 Mar. 1964, 62°41′S, 54°43′W, 210–220 m, 1 individual; Cruise 12, Sta. 1079, 13 Apr. 1964, 61°25–26′S, 40°55′W, 593–598 m, 1 ♀.

Diagnosis.—Maxilla 1 palp not reaching end of outer plate; maxilliped palp 4-articulate; pereopod 6 article 2 slightly expanded, posterior margin distally rounded, article 2 more than twice width article 3.

Description.—The following supplements the description of Stebbing (1888). Antenna 1 accessory flagellum uniarticulate. Epistome tall, usually with small conical projection from ventral margin, one specimen (?male) from *Eltanin* Sta. 410 with large, ventral, anteriorly-directed recurved

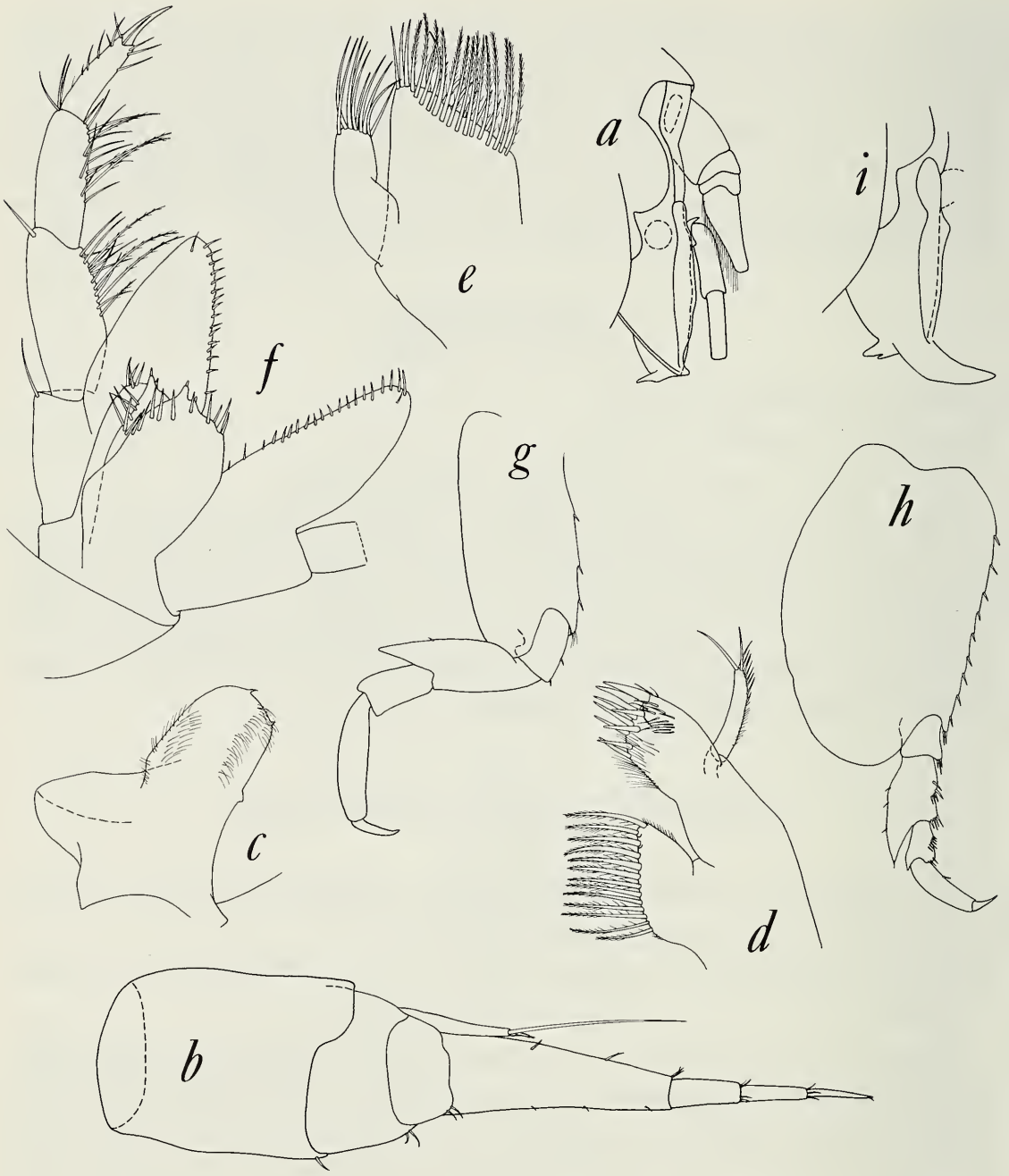

Fig. 24. *Andaniotes corpulentus*, *Eltanin* Sta. 410: a, Head; b, Antenna 1; c, Lower lip; d, Maxilla 1; e, Maxilla 2; f, Maxilliped; g, Pereopod 6; h, Pereopod 7; i, Head with unusual epistome.

tooth. Maxilla 1 more heavily setose than described by Stebbing. Maxilliped inner plate truncate distally, inner corner produced as a tooth; palp article 1 more than twice as long as wide. Pereopod 6 basis hind margin slightly convex. Pereopod 7 basis broadly rounded posteriorly.

Distribution.—Falkland Islands, Magellanic Area, South Shetland Is-

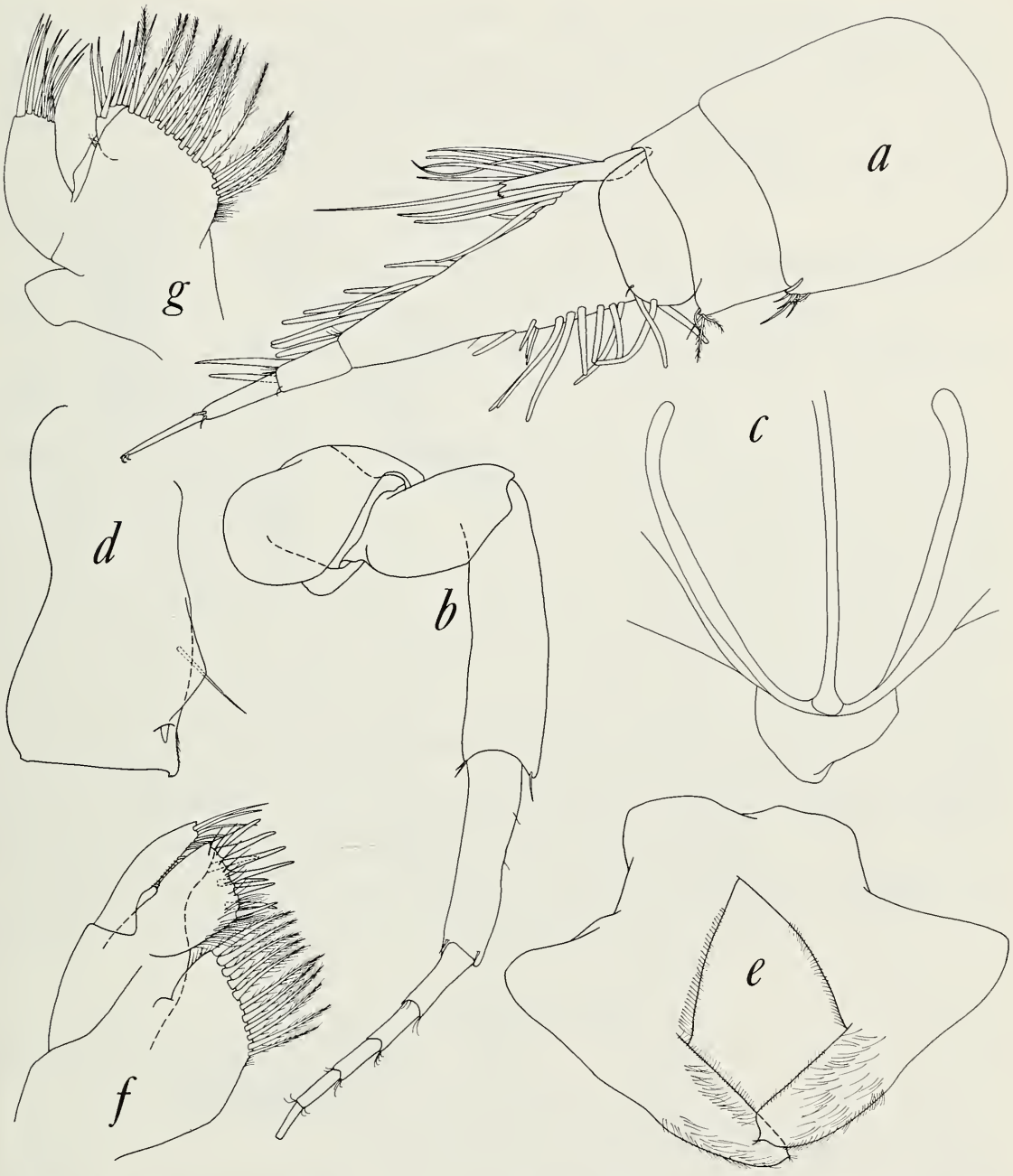

Fig. 25. *Andaniotes linearis*, *Islas Orcadas* Cruise 575, Sta. 91: a, Antenna 1; b, Antenna 2; c, Epistome and upper lip; d, Mandible; e, Lower lip; f, Maxilla 1; g, Maxilla 2.

lands, South Orkney Islands, Atlantic sector of Southern Ocean, and New Zealand, low tide to 1120 m.

Andaniotes linearis K. H. Barnard 1932
Figs. 25, 26

Andaniotes linearis K. H. Barnard, 1932:80, fig. 36.—Nicholls, 1938:41, fig. 21.

Fig. 26. *Andaniotes linearis, Islas Orcadas* Cruise 575, Sta. 91: a, Maxilliped; b, Gnathopod 1; c, Gnathopod 2; d, Pereopod 5; e, Pereopod 6; f, Pereopod 7; g, Telson.

Material.—Eltanin Cruise 6, Sta. 410, 31 Dec. 1962, 61°18–20′S, 56°09–10′W, 220–240 m, 7 ♀♀, 8 juveniles; Cruise 6, Sta. 428, 5 Jan. 1963, 62°39–41′S, 57°46–51′W, 622–1120 m, 1 ♀ with young, 1 juvenile; Cruise 7, Sta. 558, 14 Mar. 1963, 51°58′–52°01′S, 56°38′W, 646–845 m, 1 ♀; Cruise 9, Sta. 684, 25 Aug. 1963, 54°55′S, 38°05–07′W, 595–677 m, 11 ♀♀, 1 ♂; Cruise 9, Sta. 740; 18 Sept. 1963, 56°06–07′S, 66°19–30′W, 384–494 m, 2 ♀♀, 1 sex

unknown; Cruise 11, Sta. 977, 13 Feb. 1964, 52°32′S, 63°53′W, 229 m, 1 ♀ ovigerous, 3 juveniles. *Islas Orcadas* Cruise 575, Sta. 82, 6 June 1975, 55°29.0′S, 35°20.5′W, 413–462 m, 1 juvenile; Cruise 575, Sta. 90, 7 June 1975, 54°50.6′S, 37°23.8′W, 223–227 m, 4 ♀♀ (3 with eggs), 3 ♂♂, 1 juvenile; Cruise 575, Sta. 91, 7 June 1975, 55°00.6′S, 37°42.6′W, 494–501 m, 1 ♀ with eggs, 6 ♂♂, 4 juveniles. *Hero* Cruise 715, Sta. 894, 2 Nov. 1971, 54°55′–54.8′S, 64°20–18′W, 263–285 m, 1 juvenile.

Diagnosis.—Maxilla 1 palp reaching outer plate; maxilliped palp 4-articulate; pereopod 6 article 2 rectilinear, twice as wide as article 3.

Description.—Antenna 1 accessory flagellum long but uniarticulate, armed distally with a single long seta; main flagellum of 4 articles, first article more than half length of peduncle. Antenna 2 peduncle article 4 longer than article 5. Epistome triangular, as long as basal width, with low medial keel. Upper lip asymmetrically incised. Mandible greater than twice as long as broad; molar conical. Lower lip distal apices elongate, densely covered with setae, proximal apices short, subacute. Maxilla 1 palp reaching end of outer plate; inner plate not as broad as outer plate. Maxilla 2 inner plate 3 times width of outer plate at apex. Maxilliped palp 4-articulate; palp article 1 less than twice as long as wide; outer and inner plates broad. Gnathopod 1 propodus with dense covering of setae on distal half of dorsal margin. Gnathopod 2 propodus linear, without well-defined palm. Pereopod 5 basis linear, as wide as article 3. Pereopod 6 basis rectilinear, twice width article 3. Pereopod 7 basis hind margin broadly rounded, tapering distally. Uropod 3 outer ramus biarticulate. Telson cleft one-half.

Distribution.—Adelie Coast, around western Antarctica to Palmer Archipelago, South Georgia and Falkland Islands, 81–1120 m.

Euandania Stebbing

Euandania Stebbing, 1899:206.

Type-species.—*Andania gigantea* Stebbing, 1888.

Diagnosis (from J. L. Barnard, 1969).—Mandibular incisor not toothed; maxilla 1 palp uniarticulate; maxilla 2 outer plate not geniculate or gaping; maxilliped palp article 2 not produced; pereopod 5 article 2 slender; pereopod 6 article 2 broad or slender; pereopod 7 article 2 broad; telson cleft one-third; antenna 1 flagellar article 1 much longer than peduncle; pleonite 6 shorter than peduncle of uropod 3.

Euandania gigantea (Stebbing 1883)
Fig. 27a–d

Andania gigantea Stebbing, 1883:206; 1888:730, pl. 35.
Euandania gigantea.—Stebbing, 1899:206.—K. H. Barnard, 1932:80.

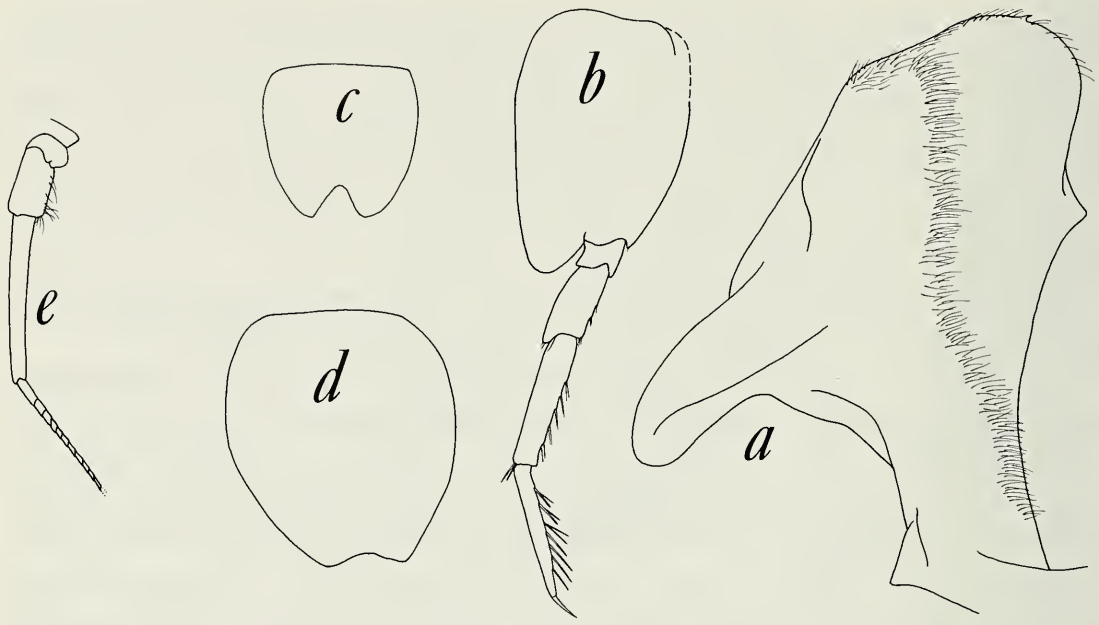

Fig. 27. *Euandania gigantea, Islas Orcadas* Cruise 575, Sta. 6: a, Lower lip; b, Pereopod 7; c, Adult telson; d, Juvenile telson. *Parandania boecki, Eltanin* Sta. 466: e, Antenna 2.

Material.—*Eltanin* Cruise 9, Sta. 720, 7 Sept. 1963, 56°05–07′S, 34°00–03′W, 2818–2873 m, 1 juvenile; Cruise 10, Sta. 862, 21 Nov. 1963, 61°17–26′S, 78°55–57′W, 4575 m, 1 juvenile. *Islas Orcadas* Cruise 575, Sta. 6, 9 May 1975, 51°02.2′S, 42°47.6′W, 1480–1545 m, 1 ♀.

Diagnosis.—Antenna 1 flagellar article 1 much longer than peduncle; antenna 2 peduncle article 5 longer than article 4; pleonite 6 shorter than peduncle of uropod 3; pereopod 6 article 2 broad.

Description.—The following supplements the description of Stebbing (1888). Lower lip medial margin with small protuberance near distal apex. Pereopod 7 basis broad, tapering distally. Telson widely cleft.

Distribution.—Ross Sea, Prince Edward Islands, Indian and Pacific sectors of Southern Ocean, Kermadec Trench, South and Northwest Atlantic Oceans, bathypelagic, 0–4575 m.

Remarks.—Our specimens differed from that illustrated by Stebbing (1888:35) in having pereopod 7 basis slightly more expanded. There appeared to be some slight variation in the degree to which the telson was cleft; that of one junveile was only slightly cleft.

Parandania Stebbing

Parandania Stebbing, 1899:206.

Type-species.—*Andania boecki* Stebbing, 1888.

Diagnosis (from J. L. Barnard, 1969).—Mandible incisor not toothed;

maxilla 1 palp uniarticulate; maxilla 2 outer plate not geniculate or gaping; maxilliped palp article 2 not produced; pereopod 5 article 2 slender; pereopods 6 and 7, article 2 broad; telson entire.

Parandania boecki (Stebbing 1888)
Fig. 27e

Andania boecki Stebbing, 1888:735, pl. 36.
Parandania boecki.—Stebbing, 1899:206; 1906:95, figs. 19, 20.

Material.—*Eltanin* Cruise 7, Sta. 466, 12 Feb. 1963, 55°02–03′S, 44°27–38′W, 3348–3596 m, 1 ♂.

Diagnosis.—As for genus.

Distribution.—Cosmopolitan, bathypelagic.

Remarks.—We have figured antenna 2 from our specimen since it differs from that illustrated by Stebbing (1888, pl. 36) and J. L. Barnard (1961, fig. 27). Stebbing showed peduncle article 5 to be 3 times the length of article 4 whereas Barnard indicated article 5 to be less than twice the length of article 4. In both cases the flagellum was longer than the peduncle. In our specimen peduncle article 5 was 2½ times the length of article 4.

Acknowledgments

The material for this study was provided by the Smithsonian Oceanographic Sorting Center, Washington, D.C., and was collected under the U.S. Antarctic Research Program. Additional specimens were generously provided by Drs. Robert Y. George (University of North Carolina, Wilmington) and L. R. McKinney (Moody Marine Lab. of Texas A&M University). We would like to thank the following persons for their loans of museum specimens: Dr. Denise Bellan-Santini, Station Marine d'Endoume; Ms. Joan Ellis, British Museum (Natural History); Ms. Elizabeth Louw, South African Museum; Dr. H.-E. Gruner, Zoologisches Museum der Humboldt-Universität zu Berlin; Dr. Roy Olerod, Swedish Museum of Natural History; Dr. J. K. Lowry, The Australian Museum; Prof. Jacques Forest, Muséum National d'Histoire Naturelle, Paris; and Dr. M. E. Christiansen, Zoologisk Museum, Norway. This research was supported by the Smithsonian Oceanographic Sorting Center's program "Cooperative Systematics and Analyses of Polar Biological Materials" (National Science Foundation Grant, DPP 76-23979, B. J. Landrum, Principal Investigator). We would like also to acknowledge the work of Ms. Patrice Rossi who produced the figures.

Literature Cited

Barnard, J. L. 1961. Gammaridean Amphipoda from depths of 400 to 6000 meters.—Galathea Rep. 5:23–128.

———. 1964. Revision of some families, genera and species of gammaridean Amphipoda.—Crustaceana 7:49–74.

———. 1967. *Echiniphimedia*, an amphipod genus from the Antarctic Ocean.—Proc. U.S. Natl. Mus. 124:1–15.

———. 1969. The families and genera of marine gammaridean Amphipoda.—U.S. Natl. Mus. Bull. 271:1–535.

———. 1972. Gammaridean Amphipoda of Australia, Part 1.—Smithsonian Contr. Zool. 103:1–333.

Barnard, K. H. 1916. Contributions to the crustacean fauna of South Africa.—Annls. S. Afr. Mus. 15:105–301.

———. 1930. Crustacea. Part XI.—Amphipoda.—British Antarctic ('Terra Nova') Expedition, 1910, Zoology 8:307–454.

———. 1932. Amphipoda.—Discovery Reports 5:1–326.

———. 1955. Additions to the fauna list of the South African Crustacea and Pycnogonida.—Annls. S. Afr. Mus. 43:1–107.

Bellan-Santini, D. 1972. Invertébrés marins des XII et XV Expéditions Antarctiques Françaises en Terre Adelie 10,—Amphipodes Gammariens.—Tethys 4:683–702.

Chevreux, E. 1911. Sur les amphipodes des Expéditions Antarctiques Françaises.—C. R. Acad. Sci. Paris 153:1166–1168.

———. 1912. Deuxième expédition dans l'Antarctique, dirigée par le Dr. Charcot 1908–1910, diagnoses d'amphipodes nouveaux.—Bull. Mus. Hist. Nat. Paris 4:208–218.

———. 1913. Amphipodes: Deuxième Expédition Antarctique Française (1908–1910) commandeée par le Dr. Jean Charcot.—Sci. Nat. Doc. Sci. 77–186.

Gurjanova, E. 1955. Novye vidy bokoplavov (Amphipoda, Gammaridea) iz severnoi chasti Tixogo Okeana.—Trudy Zool. Inst. Akademiia Nauk SSSR 18:166–218.

Hope, F. W. 1851. Catologo dei Crostacei Italiani e di molti altri del Mediterraneo, Napoli, 48 pp.

Hurley, D. E. 1954. Studies on the New Zealand amphipodan fauna, No. 9, the families Acanthonotozomatidae, Pardaliscidae and Liljeborgiidae.—Trans. Roy. Soc. New Zealand 82:763–802.

Karaman, G. S., and J. L. Barnard. 1979. Classificatory revisions in gammaridean Amphipoda (Crustacea), Part I.—Proc. Biol. Soc. Washington 92(1):106–165.

Krapp-Schickel, G. 1976. Marine amphipods from Pantelleria and Catania (Sicily).—Bull. Zool. Mus. Univ. Amsterdam 5(5):31–45.

McCain, J. C. 1971. A new deep-sea species of *Epimeria* (Amphipoda, Paramphithoidae) from Oregon.—Crustaceana 20:159–166.

Nicholls, G. E. 1938. Amphipoda Gammaridea.—Australasian Antarctic Expedition 1911–14, Sci. Rep. ser. C, 2(4):1–145.

Rathke, H. 1843. Berträge zur Fauna Norwegens.—Verhandl. Kaiserl. Leopolinisch-Carolinischen Akad. Naturforsch., Breslau 20(1):1–264, 264b, 264c.

Schellenberg, A. 1926. Die Gammariden der Deutschen Südpolar-Expedition 1901–1903.—Deutsch. Südpolar Expedition 10, Zool., 18:233–414.

———. 1931. Gammariden und Caprelliden des Magellangebietes, Südgeorgiens und der Westantarktis.—Further Zool. Res. Swedish Antarctic Exped. 1901–1903, 3(6):1–290.

Shoemaker, C. R. 1964. Seven new amphipods from the west coast of North America with notes on some unusual species.—Proc. U.S. Natl. Mus. 115:391–430.

Stebbing, T. R. R. 1883. The Challenger Amphipoda.—Ann. Mag. Nat. Hist., ser. 5, 11:203–207.

———. 1888. Report on the Amphipoda collected by H.M.S. Challenger during the years 1873–1876.—Report on the Scientific Results of the Voyage of H.M.S. Challenger during the years 1873–76, 29:1–1737, pls. 1–210 (in 3 volumes).

———. 1897. Amphipoda from the Copenhagen Museum and other sources.—Trans. Linn. Soc. London, ser. 2, Zool. 7:25–45.
———. 1899. Revision of Amphipoda (continued).—Ann. Mag. Nat. Hist. ser. 7, 4:205–211.
———. 1906. Amphipoda I, Gammaridea.—Das Tierreich 21:1–806.
Stephensen, K. 1925. Amphipoda II. Crustacea Malacostraca. VI.—The Danish Ingolf-Expedition, Vol. III, pt. 9, pp. 101–178.
Thomson, G. M. 1880. New species of Crustacea from New Zealand.—Ann. Mag. Nat. Hist., ser. 5, 6:1–6.
———. 1882. Additions to the crustacean fauna of New Zealand.—Trans. Proc. New Zealand Inst. 14:230–238.
Thurston, M. H. 1974. Crustacea Amphipoda from Graham Land and the Scotia Arc, collected by Operation Tabarin and the Falkland Islands Dependencies Survey, 1944–59.—Br. Antarct. Surv., Sci. Rep. 85:1–89.
Walker, A. O. 1906. Preliminary descriptions of new species of Amphipoda from the "Discovery" Antarctic Expedition, 1902–1904.—Ann. Mag. Nat. Hist., ser. 7, 18:150–154.
———. 1907. Amphipoda.—National Antarctic Expedition 1901–1904, ("Discovery") 3:1–38.
Watling, L., and H. Holman. 1980. New Amphipoda from the Southern Ocean with partial revisions of the Acanthanotozomatidae and Paramphithoidae.—Proc. Biol. Soc. Washington, 93:609–654.

Department of Oceanography, Ira C. Darling Center, University of Maine, Walpole, Maine 04573.