Poore & Ton, 1988

Memoirs of the Museum of Victoria 49(1): 85-106 (1988) ISSN 0814-1827

MORE AUSTRALIAN SPECIES OF *HALIOPHASMA* (CRUSTACEA: ISOPODA: ANTHURIDAE)

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Abstract

Poore, G.C.B. and Lew Ton, H.M., 1988. More Australian species of *Haliophasma* (Crustacea: Isopoda: Anthuridae). *Memoirs of the Museum of Victoria* 49: 85-106.

Six new species of *Haliophasma* Haswell (*H. beaufortia* and *H. dillwynia* from north-western Australia; *H. darwinia* from north Queensland; *H. swainsonia* and *H. templetonia* from south-eastern Australia; and *H. blandfordia* from all these areas) are described and figured. New distributional records of eight other south-eastern Australian species are added. A key to all known species of *Haliophasma* from Australia is presented and the generic composition discussed.

Introduction

This paper follows an earlier contribution on species of *Haliophasma* from south-eastern Australia (Poore, 1975). It is based on additional material from the same region and from tropical Australia. Material upon which the work is based has come from the collections of Australian museums and the Commonwealth Scientific and Industrial Research Organization (CSIRO), Division of Fisheries North-west Shelf Survey.

Material is lodged in the Museum of Victoria, Melbourne (NMV), Australian Museum, Sydney (AM), Queensland Museum, Brisbane (QM), Tasmanian Museum, Hobart (TM), South Australian Museum, Adelaide (SAM) and Western Australian Museum, Perth (WAM). Poore and Lew Ton (1986) explained the abbreviations used in figures. Species names are derived from the Australian flora and follow a pattern established by Poore (1984) for *Paranthura*. Scale marks are 1.0 mm and refer to the whole animal only.

Haliophasma Haswell, 1881

Haliophasma Haswell, 1881: 476. – Barnard, 1925: 131; 1940: 382. – Menzies and Barnard, 1959: 17. – Poore, 1975: 504. – Kensley, 1982: 116. – Negoescu and Wägele, 1984: 118, 135, 136.

Exanthura Barnard, 1914: 336a. Type species *Exanthura macrura* Barnard, 1914. Synonymised by Kensley, 1982: 116.

Nemanthura Wägele, 1981: 114. Type species *Haliophasma valeriae* Paul and Menzies, 1971. New synonymy.

Silophasma Schultz, 1977: 840. Type species *Haliophasma geminatum* Menzies and Barnard, 1959. Synonymised by Negoescu and Wägele, 1984.

Type species. Haliophasma purpureum Haswell, 1881.

Remarks. Poore's (1975) generic diagnosis is generally adequate and requires only a few additions.

The flagellum of antenna 2 is of 3 articles (the small basal article was overlooked by Poore). The mandibles are asymmetrical, the left molar having a small tooth which is absent in the right molar (see fig. 1). Pereopod 1 article 6 has a submarginal row of setae along the palm and also a mesial row. On pereopods 2 and 3 article 6 is barely more swollen than on succeeding legs and bears a stout seta on its posterodistal margin. Pereopods 4-7 have a stout seta on the posterodistal margins of articles 5 and 6.

Negoescu and Wägele (1984: 135) referred to *Haliophasma* as a "collecting pot". To some extent this is true and attempts to divide it into smaller genera have not been successful. Poore (1975) recognised three groups of species from south-eastern Australia separated on the basis of the rostrum, pereopod 1, mandible, maxilliped and shape of head. Attempts to place species from other regions in these groups have not been successful. Exclusion of *H. geminatum* on the basis of absence of dorsal grooves and pits is not warranted and *Silophasma* Schultz is thereby synonymised.

Negoescu and Wägele (1984) regarded both *Exanthura* Barnard and *Nemanthura* Wägele as valid genera. *Exanthura* was differentiated from *Haliophasma* on the basis of two autapomorphies – pleonites fused dorsally only and hook-like projections on the peduncle of antenna 1. With the discovery of *Haliophasma beaufortia* sp. nov. which has hook-like projections on an-

Key to Australian species of *Haliophasma*

1. Rostrum prominent, about one-fifth length of head; dactylus of pereopod 1 strongly curved, article 6 cylindrical ..... *H. falcatum*
— Rostrum small; dactylus of pereopod 1 curvilinear, palm blade-like, article 6 flattened 2
2. Head wider than long; rostrum broad, rounded-truncate; pereon and pleon strongly pitted or sculptured dorsally and laterally 3
— Head as long as or longer than wide; rostrum acute to subacute; pereon and pleon weakly or not pitted laterally and dorsally 5
3. Pereopod 1 propodal palm strongly oblique ..... *H. pugnatum*
— Pereopod 1 Propodal palm on axis of limb 4
4. Pereon with 2 pairs of low carinae dorsally, separated by deep pitted grooves ..... *H. canale*
— Pereon with dorsolateral grooves and few pits dorsally . . . *H. cribense*
5. Antenna 1 with hook extending over top of head ..... *H. beaufortia*
— Antenna 1 without hook 6
6. Exopod of uropod cleft ..... *H. purpureum*
— Exopod of uropod with sinuous dorsal margin, not cleft 7
7. Maxillipedal palp terminal article well exceeding first 8
— Maxillipedal palp terminal article level with or barely exceeding apex of first 10
8. Pereopod 1 propodal palm strongly produced, chelate .... *H. darwinia*
— Pereopod 1 propodal palm axial, subchelate 9
9. Telson more or less paralel-sided, apex acute ..... *H. dillwynia*
— Telson sharply tapered or waisted at mid-point, apex bluntly rounded *H. blandfordia*
10. Telson not sculptured or ridged dorsally, a simple dome 11
— Telson with crest, ridges or pits dorsally 13
11. Pereopod 1 propodal palm with proximal blunt tooth .... *H. cycneum*
— Pereopod 1 propodal palm straight 12
12. Dorsally pigmented; head wider than long ..... *H. swainsonia*
— Not pigmented; head longer than wide ..... *H. yarra*
13. Telson with a high, narrow dorsal crest ..... *H. pinnatum*
— Telson without a crest 14
14. Telson strongly tapering to acute upturned apex ..... *H. elongatum*
— Telson with rounded or broadly angled apex 15
15. Uropodal exopod twice as long as wide; telson apex broadly triangular *H. templetonia*
— Uropodal exopod 3 times as long as wide; telson apex rounded *H. syrtis*

tenna 1, but otherwise can be regarded as a good species of *Haliophasma,* this character cannot be considered generically significant. The dorsally fused pleonites cannot, on their own, be used to differentiate the genus. In *Malacanthura,* a related genus, the pleon may have dorsally complete grooves (e.g. *M. schotteae* Kensley), grooves absent dorsally (e.g. *M. transkei* Kensley) or no grooves at all (e.g. *M. pseudocarinata* (Barnard)).

Nemanthura was differentiated from *Haliophasma* on the basis of its slender body, elongate form of pereopod 1 and (again) the hook on the peduncle of antenna 1 (Negoescu and Wägele, 1984). A similarly slender body is found in *Haliophasma darwinia* sp. nov., which is otherwise a species of *Haliophasma.* On its own the morphology of pereopod 1 is not sufficent to warrant the maintenance of *Nemanthura* and the genus is placed in synonymy with *Haliophasma.*

Other characters explored by us have not been more useful in dividing the genus. For example, there is a tendency for the terminal article of the maxilliped to be larger in tropical species than tem-

perate ones but this is not correlated with other characters.

In male adults the flagellum of antenna 1 is of two forms. In some species (e.g. *Haliophasma cribense* Poore) the flagellum is of about 15 discoidal articles and reaches a little beyond the posterior margin of the head (see fig. 6). In other species the flagellum is of 16-20 isometric articles and reaches beyond the posterior margin of pereonite 1 (see figs. 5, 7, 13 and 15).

The identification of isolated males is extremely difficult. Elongation of the body and limbs obscures many of the characters useful in species recognition, e.g. shape of head, telson and pereopod 1.

Haliophasma beaufortia sp. nov.

Figures 1, 2

Material examined. 9 juveniles; 5.4-11.7 mm.

Holotype: WA, North-west Shelf, between Port Hedland and Dampier (18°41.6′S, 118°39.4′E), mud-sand-shell, 134 m, epibenthic sled, G.C.B. Poore and H.M. Lew Ton on FRV "Soela", 4 Jun 1983 (stn NWA-21), NMV J12426 (with 1 slide), juvenile, 6.0 mm.

Paratypes: WA, North-west Shelf, between Port Hedland and Dampier: 19°05′S, 117°26′E, 120 m, muddy sand (stn NWA-52), NMV J12447(1); 19°37′S, 118°53′E, 31 m, coarse shell (stn NWA-14), J12452(1); 19°49′S, 117°52′E, 52 m, epibenthic sled, T. Ward on FRV "Soela" (CSIRO stn B13), J12453(1), J12469(2); 19°59′S, 117°51′E, 42 m (CSIRO stn B1), J12470(1), J12471(1); 19°05′S, 118°54′E, 83 m (CSIRO stn B4), J12472(1); 19°28′S, 118°55′E, 38 m (CSIRO stn B9), J12718(1).

Description. Head and pereon with scattered small pits. Head about 1.4 times as long as wide, tapering anteriorly; anterolateral lobesnot swollen; rostrum as long as anterolateral lobes, apex acute. Pereonite 1 with pair of small rounded bosses on posterior margin. Pereonites 4-6 with distinct elongate pits anteriorly. Pereonite 7 slightly longer than wide, anteriorly with round depression. Pleon longer than wide, little longer than pereonite 7. Pleonites 1-5 with broad, poorly defined mid-dorsal and lateral keels, double row of small pits running length of mid-dorsal keel; lateral keels with several transverse rows of smaller pits. Telson 3.3 times as long as wide, 1.8 times as long as pleon; waisted close to base, broadening,lateral margins largely parallel, apex broadly rounded; dorsally with narrow, well-defined keel.

Mandibular palp exceeding incisor by half its length, article 3 with 9 setae. Maxillipedal palp article 2 clearly exceeding first. Antenna 1, article 1 of peduncle produced posterolaterally to form hook-like projection. Pereopod 1 subchelate, propodal palm axial, crenellate, setal rows sparse. Uropodal endopod not reaching apex of telson, little more than twice as long as broad, about as long as peduncle; broadest over proximal one-third, tapering to acute apex. Uropodal exopod reaching beyond peduncle, convex medially, lateral margin sinuous and crenellate, 2.6 times as long as wide.

Distribution. Western Australia, North-west Shelf, 31-134 m.

Remarks. The hook-like projections on the peduncle of antenna 1 are unique among Australian *Haliophasma*. However, two species from South Africa, *Haliophasma austroafricanum* Kensley and *H. macrurum* (Barnard), also share this character. *H. beaufortia* is readily distinguished from these. *Haliophasma austroafricanum* has a broader uropodal exopod and *H. macrurum* an exceptionally wide telson.

Haliophasma blandfordia sp. nov.

Figures 3-5

Material examined. 2 males, 25 juveniles; 7.4-21.9 mm.

Holotype: WA, North-west Shelf, between Port Hedland and Dampier (19°04′S, 119°00′E), 82 m, epibenthic sled, T. Ward on FRV "Soela", 1 Sep 1983 (CSIRO stn B11), NMV J12478, juvenile, 21.9 mm.

Paratypes: WA, North-west Shelf, between Port Hedland and Dampier (same collector): 19°29′S, 118°52′E, 36 m (CSIRO stn B8), NMV J12479(1); 19°30′S, 118°52′E, 37 m (CSIRO stn D2), J12480(1); 19°59′S, 118°51′E, 42 m (CSIRO stn B1), J12481(1); 19°29′S, 118°52′E, 37 m (CSIRO stn D1), J12482(1).

Other material: WA, North-west Shelf, between Port Hedland and Dampier (same collector): CSIRO stn B6, NMV J12483 (1 male); CSIRO stn B7, J12484 (1 male); (G.C.B. Poore and H.M. Lew Ton) stn NWA-14, J12594(1); stn NWA-12, J12595(1); stn NWA-21, J12597(1).

Qld, off Townsville, 26-45 m, muddy sand, dredge, G.C.B. Poore and H.M. Lew Ton, 24 Nov 1982: stn AIMS-3, NMV J12593(1); stn AIMS-7, J12596(3). Lizard Island, coral rubble, 6 m, P.C. Terrill, 7 Sep 1978, NMV J12598(1).

Eastern Bass Strait: stn BSS-32, NMV J8416(2); stn BSS-33, J8418(1); stn BSS-35, J8417(1); stn BSS-162, J8414(1); stn BSS-167, J12474(1, with 1 slide), J8412(4); stn BSS-168, NMV J8413(1) (See Wilson and Poore, 1987, for station details.)

Description. Head and pereon with scattered pits. Head as long as wide, tapering anteriorly, anterolateral lobes swollen distally. Rostrum as long as anterolateral lobes, acute. Pereonite 1 distolateral margin tuberculate, posterior margin with pair of angular bosses. Pereonites 4-6 with distinct elongate pits anteriorly. Pereonite 7 as long as wide,

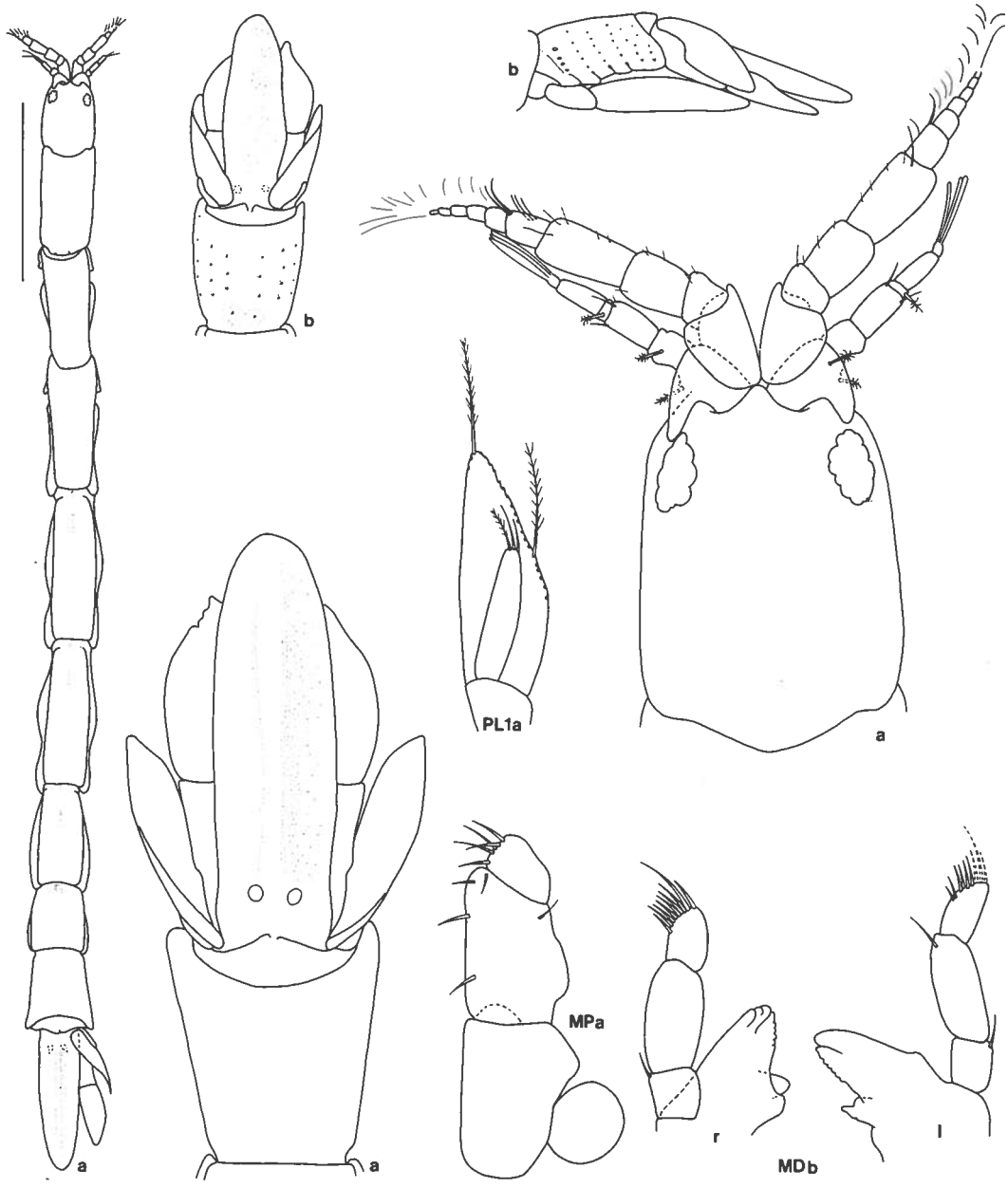

Figure 1. *Haliophasma beaufortia.* a, holotype juvenile, 6.0 mm; b, paratype juvenile, 11.7 mm, NMV J12453.

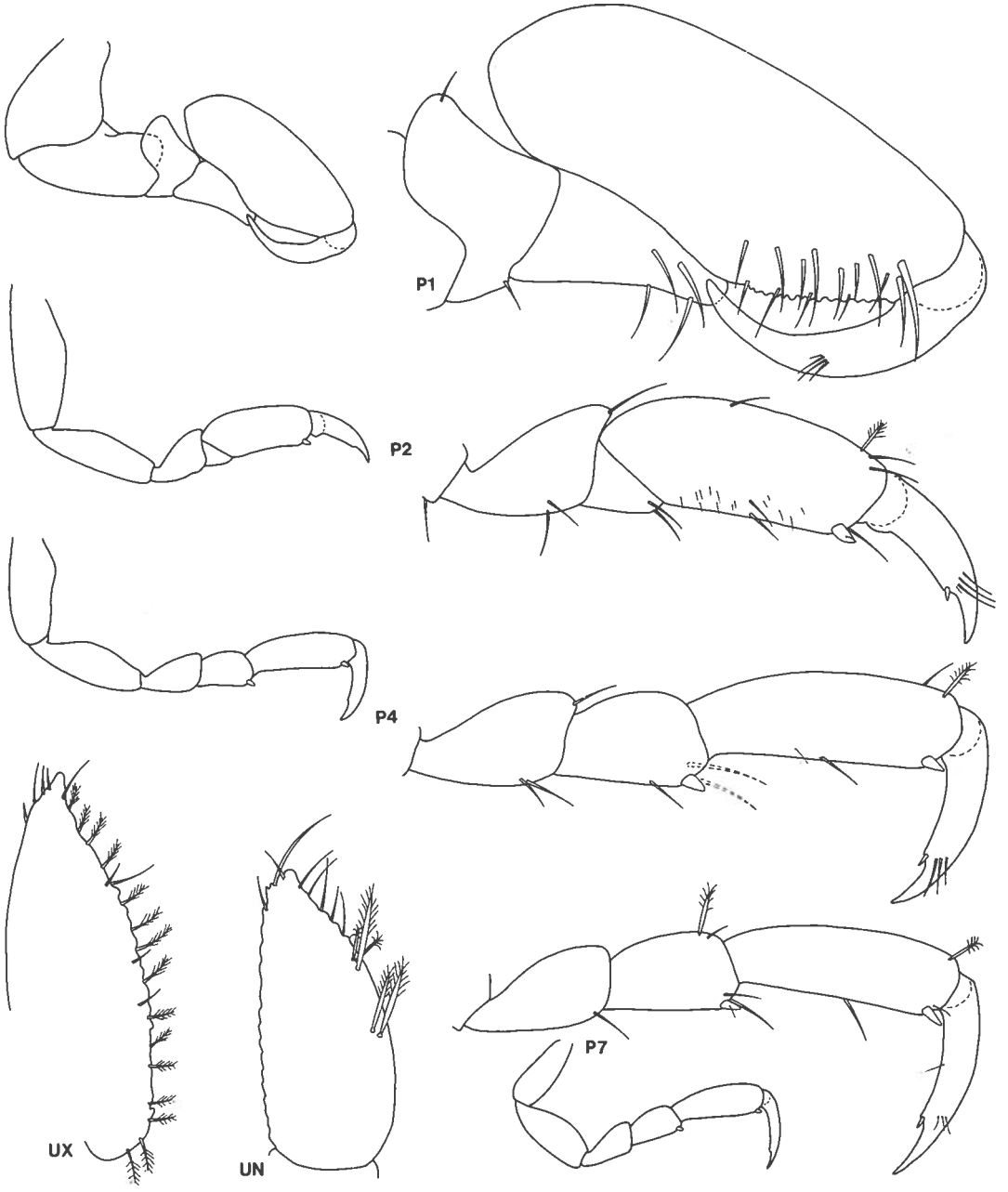

Figure 2. *Haliophasma beaufortia.* Holotype juvenile, 6.0 mm.

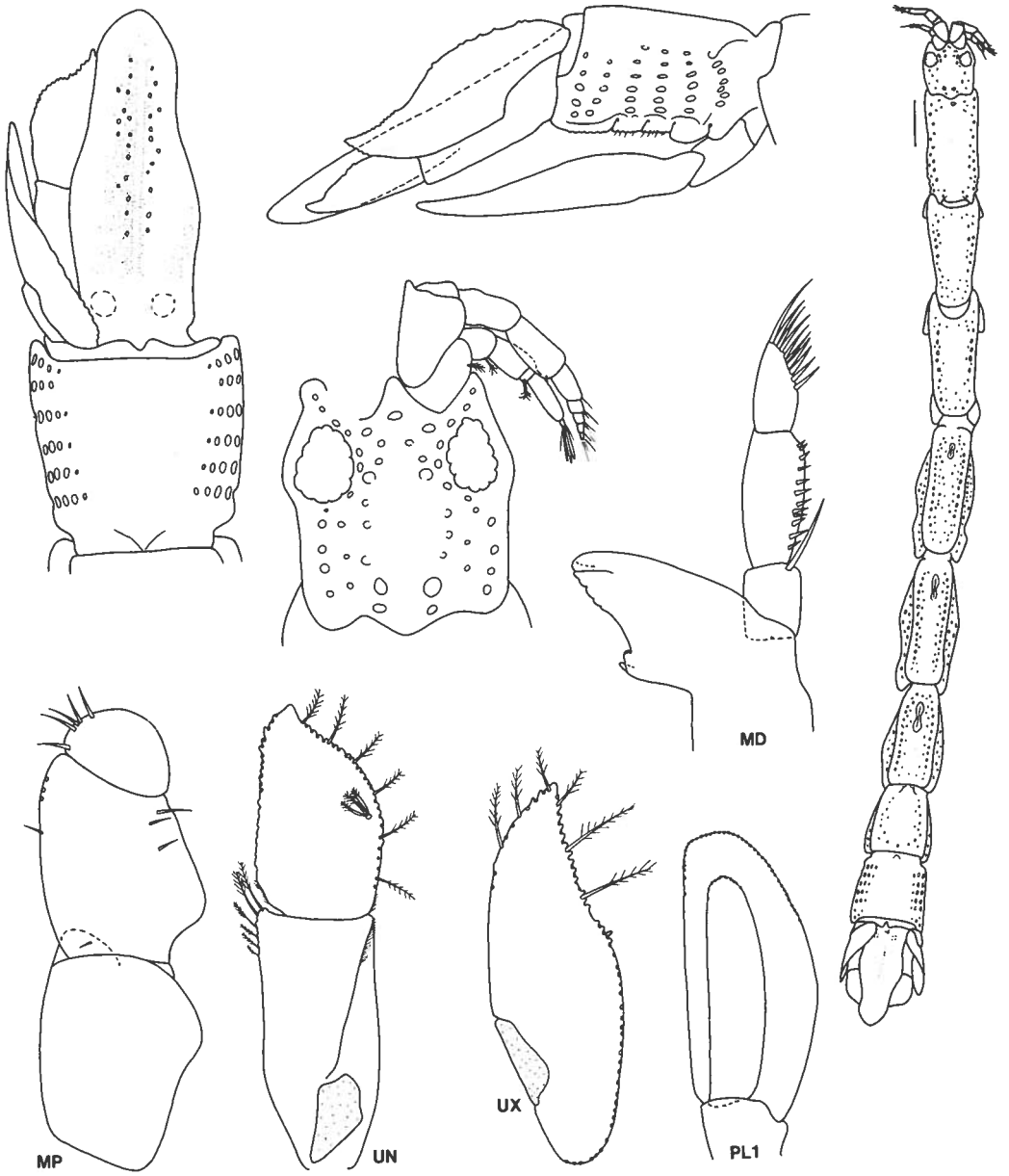

Figure 3. *Haliophasma blandfordia.* Holotype juvenile, 21.9 mm.

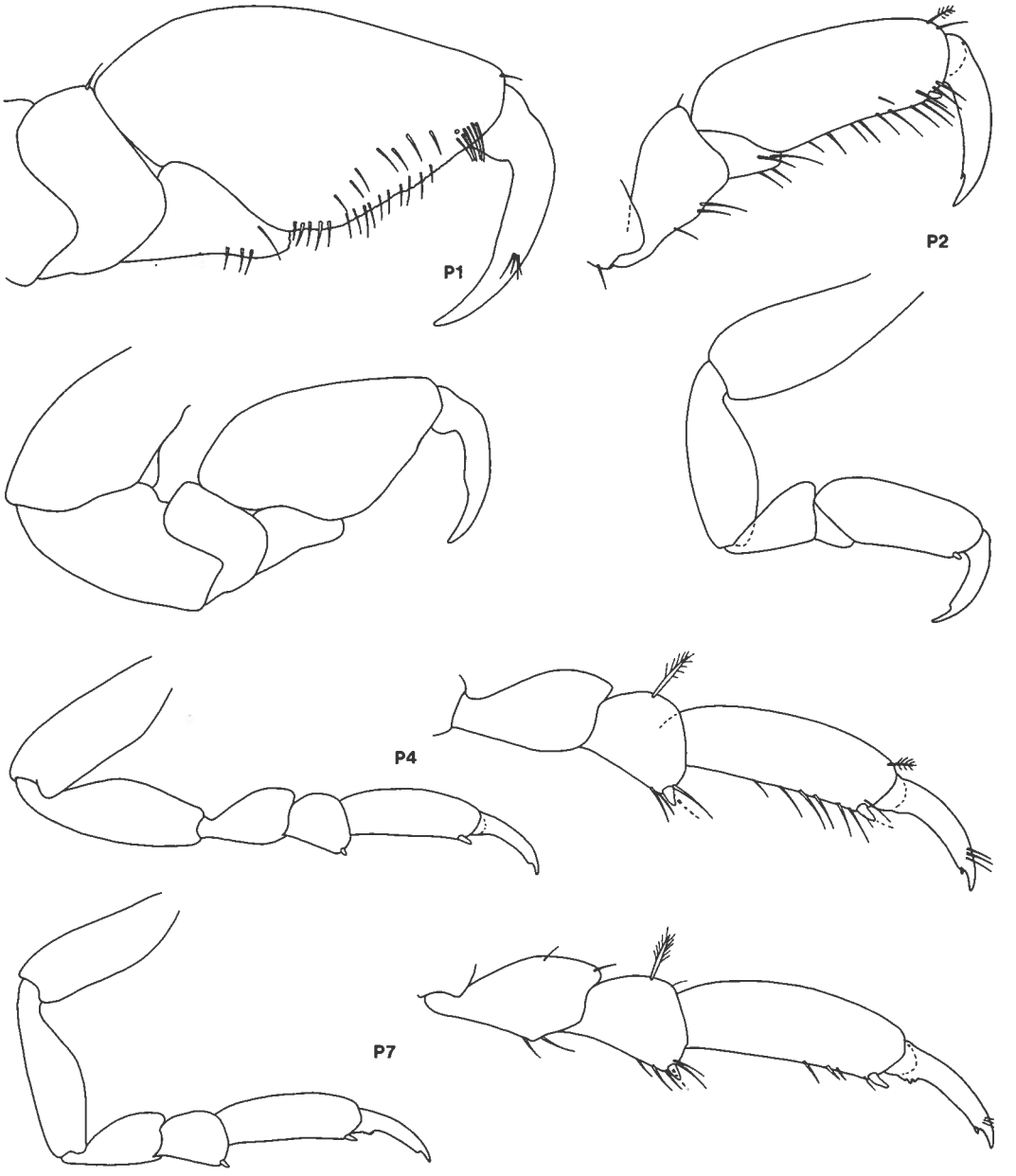

Figure 4. *Haliophasma blandfordia.* Holotype juvenile, 21.9 mm.

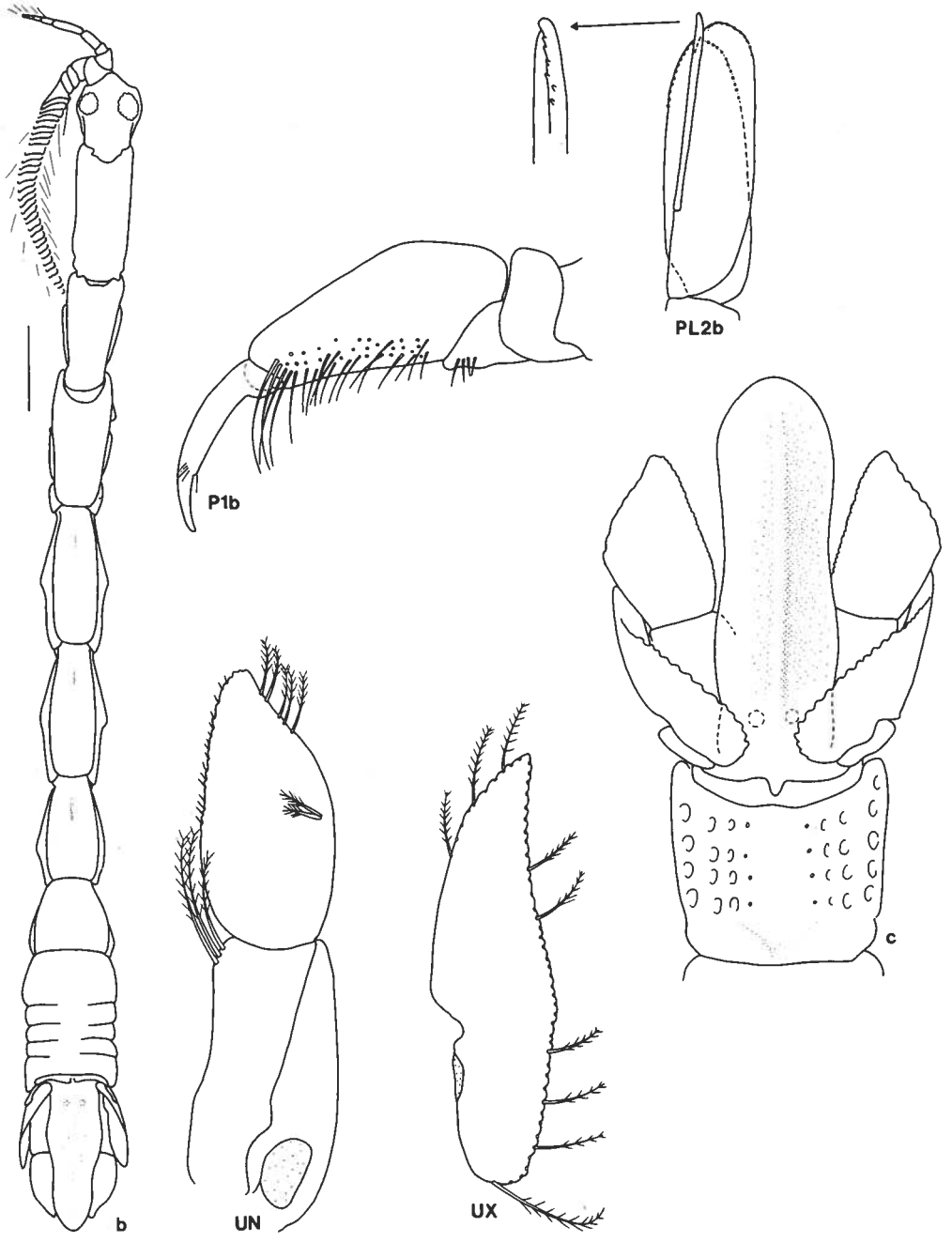

Figure 5. *Haliophasma blandfordia.* b, male, 14.3 mm, NMV J12483. c, juvenile, Bass Strait, 8.8 mm, NMV J12474.

with large round depression near anterior margin. Pleon about as long as wide, about as long as pereonite 7. Pleonites 1-5 without dorsal keel, anteriorly with large complex pit; laterally with transverse row of pits. Telson 2.5 times as long as wide, 1.6 times as long as pleon; widest at midpoint, tapering abruptly to give shouldered effect, apex rounded; with well developed dorsal keel.

Mandibular palp exceeding incisor by half its length, article 3 with a comb of 10 setae. Maxillipedal palp article 2 clearly exceeding first. Antenna 1, peduncle article 1 not modified. Pereopod 1 subchelate, propodal palm oblique, smooth, with 2 setal rows. Uropodal endopod not reaching apex of telson, 1.6 times as long as wide, about as long as peduncle, broadest over proximal half, tapering to acute apex. Uropodal exopod reaching beyond peduncle; convex medially, lateral margin sinuous and crenellate; 3 times as long as wide.

Male. Pereon little modified. Pleon more swollen than in juvenile. Antenna 1 of about 30 aesthetasc-bearing articles, reaching to pereonite 2. Pereopod 1 propodal palm setose. Uropodal rami and telson more elongate than in juvenile. Pleopod 2 appendix masculina as long as endopod, apex with setules.

Distribution. Western Australia, North-west Shelf, 31-122 m; Queensland, 6-45 m; Bass Strait, 51-329 m.

Remarks. Haliophasma blandfordia is readily distinguished by the combination of the shape of the telson and the palm of pereopod 1.

The two male specimens were assigned to this species on the basis of the shape of the telson although they differ in size and head shape.

The specimens from Bass Strait were somewhat smaller (maximum 9.0 mm) than those from tropical Australia (maximum 21.9 mm). The telson is broader apically but otherwise they cannot be easily distinguished from larger tropical specimens.

Haliophasma canale Poore

Haliophasma canale Poore, 1975: 505-507, figs. 1, 2.—Wägele, 1981: 83.—Negoescu and Wägele, 1984: 119.

Material examined. Qld, Middle Banks, Moreton Bay, S. Cook, Dec 1973 (QUBS stn), QM collection.

NSW, off South Head (33°52′S, 151°23′E), 44 m, 11 Dec 1980 (NSW State Fisheries stn K80-20-11), AM P32652(3), AM P32655(1). Off Nowra (34°59.52′S, 151°05.94′E), 204 m, G.C.B. Poore et al. on RV "Franklin", 14 Jul 1986, NMV J14467(1).

Bass Strait, 55-329 m: stn BSS-32, NMV J8386(1); stn BSS-33, J8385(1); stn BSS-154, J8561(1); stn BSS-158, J8382(1); stn BSS-165, J8381(1); stn BSS-167, J8384(1); stn BSS-202, J8383(1). (See Wilson and Poore, 1987, for details.)

Tas., N. of Northdown (41°11′S, 146°11′E), Wesley Vale Offshore Survey stn 25g, Tasmanian Sea Fisheries Division, 11 Jun 1971, TM G1715(1). Maria Island, 2 km E. of Cape Boullanger (42°34′S, 148°06′E), 50 m, R.S. Wilson on RV "Challenger", 23 Apr 1985, NMV J11978(1). Off Woodbridge (43°10′S, 147°17′E), 27 m, fine black mud and shell, 17 Apr 1985, R.S. Wilson on FV "Penghana", NMV J11980(2).

Remarks. New material of this species extends its distribution to Queensland, New South Wales, Tasmania and Bass Strait. *Haliophasma canale* is now known from bays and the shelf over a depth range of 3-329 m.

Haliophasma cribense Poore

Figure 6a

Haliophasma cribensis Poore, 1975: 508-510, figs. 3, 4.—Negoescu and Wägele, 1984: 119.

Material examined. NSW, off South Head (33°52′S, 151°23′E), 44 m, 11 Dec 1980 (NSW State Fisheries stn K80-20-11), AM P32654(5 specimens), P33606(1). Twofold Bay (37°05′S, 149°54′E), AM P36058(1).

Vic., Wilsons Promontory, Hobbs Head (39°02′S, 146°28′E), 10 m, R. Wilson and C. Jordan, NMV J11974(1).

Bass Strait, 55-101 m: stn BSS-79, NMV J8409(1); stn BSS-119, J8419(1); stn BSS-120, J8411(3); stn BSS-181, J8410(1); stn BSS-184, J8408(1). (See Wilson and Poore, 1987, for details.)

Tas., off Point Sorell (41°10′S, 146°34′E), Wesley Vale Offshore Survey stn 16, Tasmanian Sea Fisheries Division, 10 Jun 1973, TM G1716(1). Off Woodbridge (43°10′S, 147°17′E), 27 m, fine black mud and shell, 17 Apr 1985, R.S. Wilson on FV "Penghana", NMV J11973(1). Off Woodbridge (43°11′S, 147°15′E), 10 m, fine black mud, 17 Apr 1985, R.S. Wilson on FV "Penghana", NMV J11972 (1).

Remarks. Haliophasma cribense is typical of many southern species in that the male antenna 1 flagellum is only as long as the head (fig. 6a). New material of this species extends its distribution from Victoria to New South Wales and Tasmania in bays and on the shelf over a depth range of 7-101 m.

Haliophasma cycneum Poore

Figure 6b

Haliophasma cycneum Poore, 1975: 511-512, fig. 5.—Negoescu and Wägele, 1984: 119.

Material examined. Bass Strait, 82-124 m: stn BSS-167, NMV J11975(1 specimen with 1 slide); stn BSS-158, J8415(1), J8554(1). (See Wilson and Poore, 1987, for details.)

SA, Spencer Gulf, 10 m, SA Fisheries collection, SAM collection.

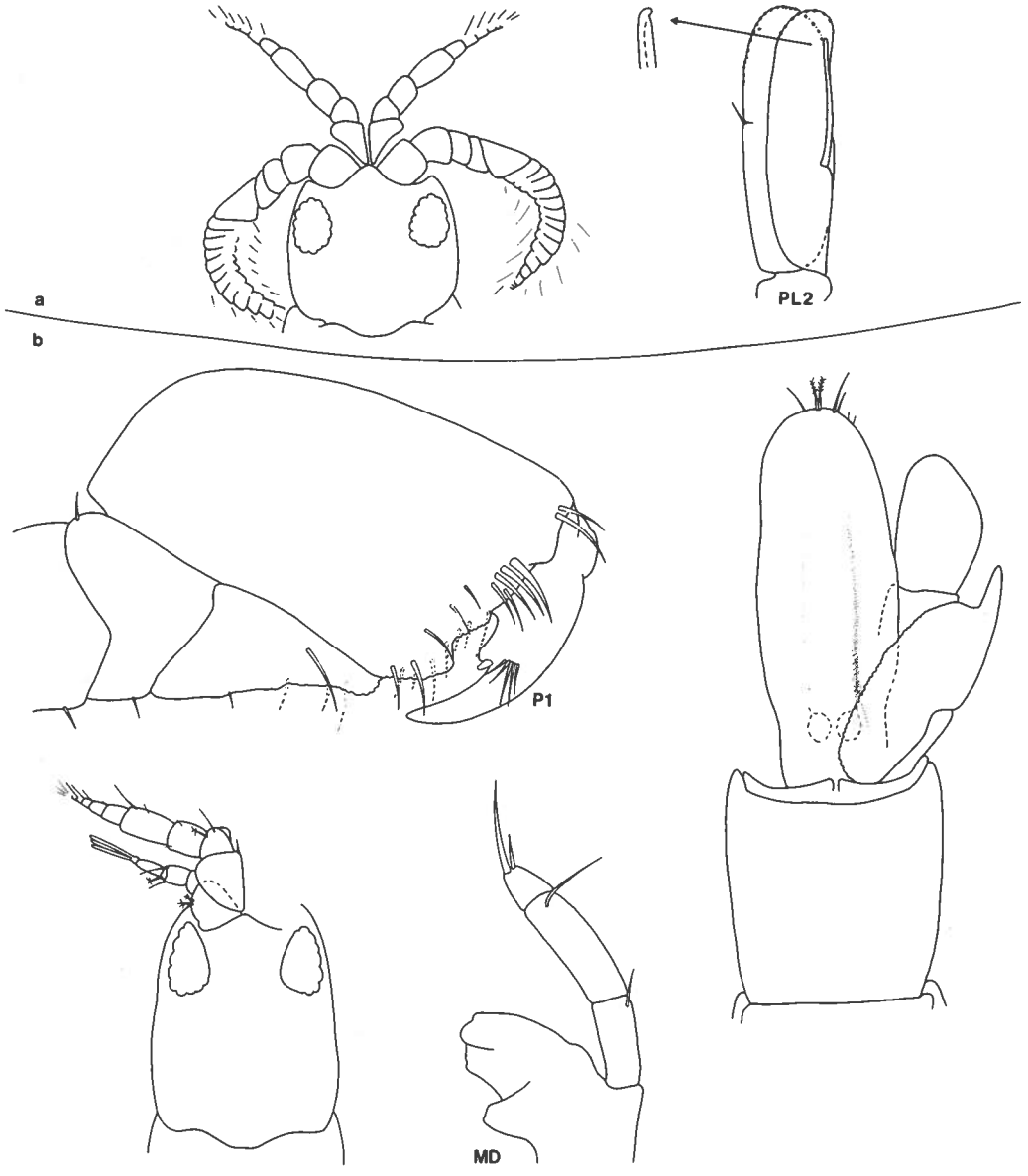

Figure 6. a. *Haliophasma cribense.* Male, 11.7 mm, NMV J8419. b, *Haliophasma cycneum.* Juvenile, 8.6 mm, NMV J11975.

Distribution. Bays in Victoria and South Australia (to 10 m) and Bass Strait, 82-124 m.

Remarks. Originally described from a specimen from a shallow bay within Port Phillip Bay, the new Bass Strait material considerably expands the bathymetric range of this species. There are minor differences between the Bass Strait material and the holotype (shape of head, telson, mandibular palp, palm of pereopod 1) but these are not considered to be of specific value.

A specimen from Bass Strait is figured to show these differences.

Haliophasma darwinia sp. nov.

Figures 7, 8

Material examined. 1 male, 3 juveniles; 8.0-12.8 mm.

Holotype: Qld, Bowling Green Bay (19° 18′S, 147°07′E), coarse silt, P. Arnold, 23 Oct 1974 (Three Bays Survey), NMV J12465(with 1 slide), juvenile, 10.1 mm.

Paratypes: Qld, NE. of Townsville (18°56′S, 146°50′E), muddy sand, 24 m, G.C.B. Poore and H.M. Lew Ton on RV "The Harry Messel", 24 Nov 1982, NMV J12466(1).

WA, North-west Shelf, between Port Hedland and Dampier, T. Ward on FRV "Soela", 19°30′S, 118°52′E, 36 m (CSIRO stn B8), NMV J12467(1); 19°30′S, 118°52′E, 37 m (CSIRO stn D1), J12468 (male).

Description. Head and pereon with sparse irregular pits dorsally, pereonites 1-7 with lateral row of pits. Head longer than wide, tapering; anterolateral lobes swollen distally only. Rostrum as long as anterolateral lobes, acute. Pereonite 1, posterior margin with pair of angular bosses. Pereonites 4-6 with elongate pits anteriorly. Pereonite 7 twice as long as wide, without anterior depression. Pleon 2.1 times as long as wide, longer than pereonite 7. Pleonites 1-5 without keels, with small scattered pits concentrated at lateral margins. Telson 3 times as long as wide, about as long as pleon; narrow at base, broad over middle one-third, tapering gently to rounded apex; with well-defined, narrow dorsal keel.

Mandibular palp exceeding incisor by half its length, article 3 with 2 terminal setae. Maxillipedal palp article 2 clearly exceeding first. Antenna 1, peduncle article 1 not modified. Pereopod 1 subchelate, propodal palm strongly produced, dactylus closed against this projection. Uropodal endopod reaching almost to apex of telson, about as long as peduncle, 2.4 times as long as broad, broadest over proximal one-third, tapering to acute apex. Uropodal exopod reaching beyond peduncle; convex medially, lateral margins sinuous and crenellate; 3 times as long as wide.

Male. More elongate than juvenile, pereopod 1 propodal palm with strong projection, telson with paired longitudinal carinae. Pleopod 2, appendix masculina not reaching apex of endopod, covered with setules; apex with smalllateral flange.

Distribution. North-eastern and north-western Australian shelf, 24-37 m.

Remarks. The extremely narrow body of *Haliophasma darwinia* and the strongly produced palm of pereopod 1 distinguish it from other Australian species. Other species which have a strongly produced palm are *H. tricarinatum* Barnard from South Africa and *H. cycneum* Poore from southern Australia. Neither is as narrow or has such a prominent palmar tooth as *H. darwinia.*

Haliophasma dillwynia sp. nov.

Figures 9, 10

Material examined. 1 juvenile, 5.9 mm; 1 post-manca, 5.0 mm.

Holotype: juvenile, 5.9 mm, NMV J12473 (with 1 slide). Western Australia, North-west Shelf, between Port Hedland and Dampier (18°41.6′S, 118°39.4′E), mud-sand-shell, 134 m, epibenthic sled, G.C.B. Poore and H.M. Lew Ton FRV "Soela", 4 Jun 1983 (stn NWA-21).

Paratype: WA, North-west Shelf, between Port Hedland and Dampier (19°05′S, 117°26′E), muddy sand, 122 m, epibenthic sled, G.C.B. Poore and H.M. Lew Ton on FRV "Soela", 12 Jun 1983 (stn NWA-52), NMV J12592 (post-manca).

Description. Head and pereon smooth. Head about as long as wide, anterolateral lobes broadly based Rostrum not as long as anterolateral lobes, apex acute. Pereonite 1 with pair of small rounded bosses on posterior margin. Pereonites 4-6 with distinct elongate pits anteriorly. Pleon about as long as wide, about as long as pereonite 7. Pleonites lacking keels and pits. Telson 3 times as long as broad and 1.7 times as long as pleon; sides parallel over most of length, tapering to angular apex; with dorsal keel.

Mandibular palp exceeding incisor by more than half its length, article 3 with 4 terminal setae. Maxillipedal palp article 2 clearly exceeding first. Antenna 1, peduncle article 1 not modified. Pereopod 1 subchelate, propodal palm linear, not crenellate; submarginal and mesial setae sparse. Uropodal endopod not reaching apex of telson, twice as long as broad and about as long as peduncle; broadest proximal to midpoint, tapering to acute apex. Uropodal exopod reaching beyond peduncle; convex medially, lateral margin sinuous and crenellate.

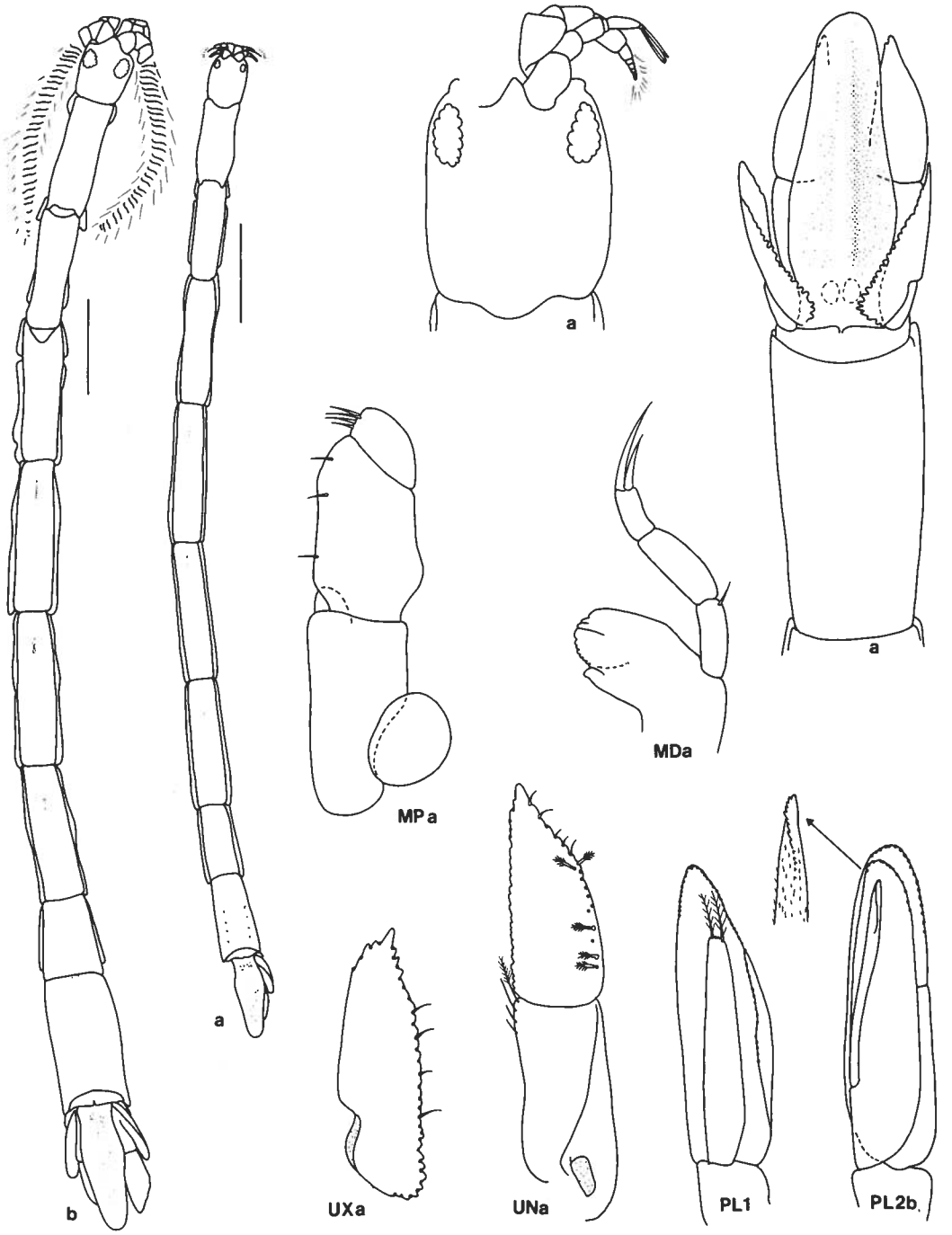

Figure 7. *Haliophasma darwinia*. a, holotype juvenile, 10.1 mm; b, paratype male, 12.8 mm, NMV J12468.

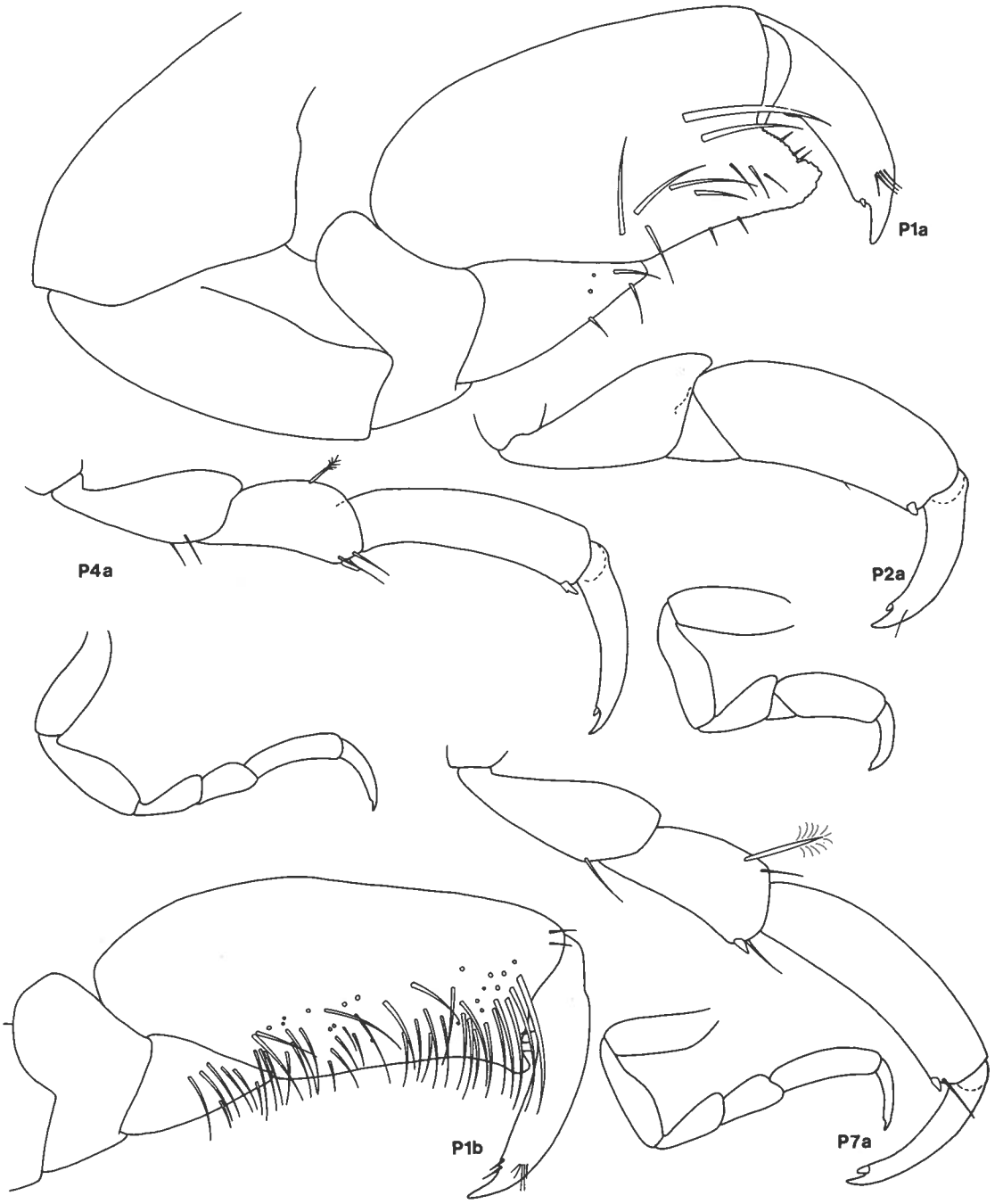

Figure 8. *Haliophasma darwinia.* a, holotype juvenile, 10.1 mm; b, paratype male, 12.8 mm, NMV J12468.

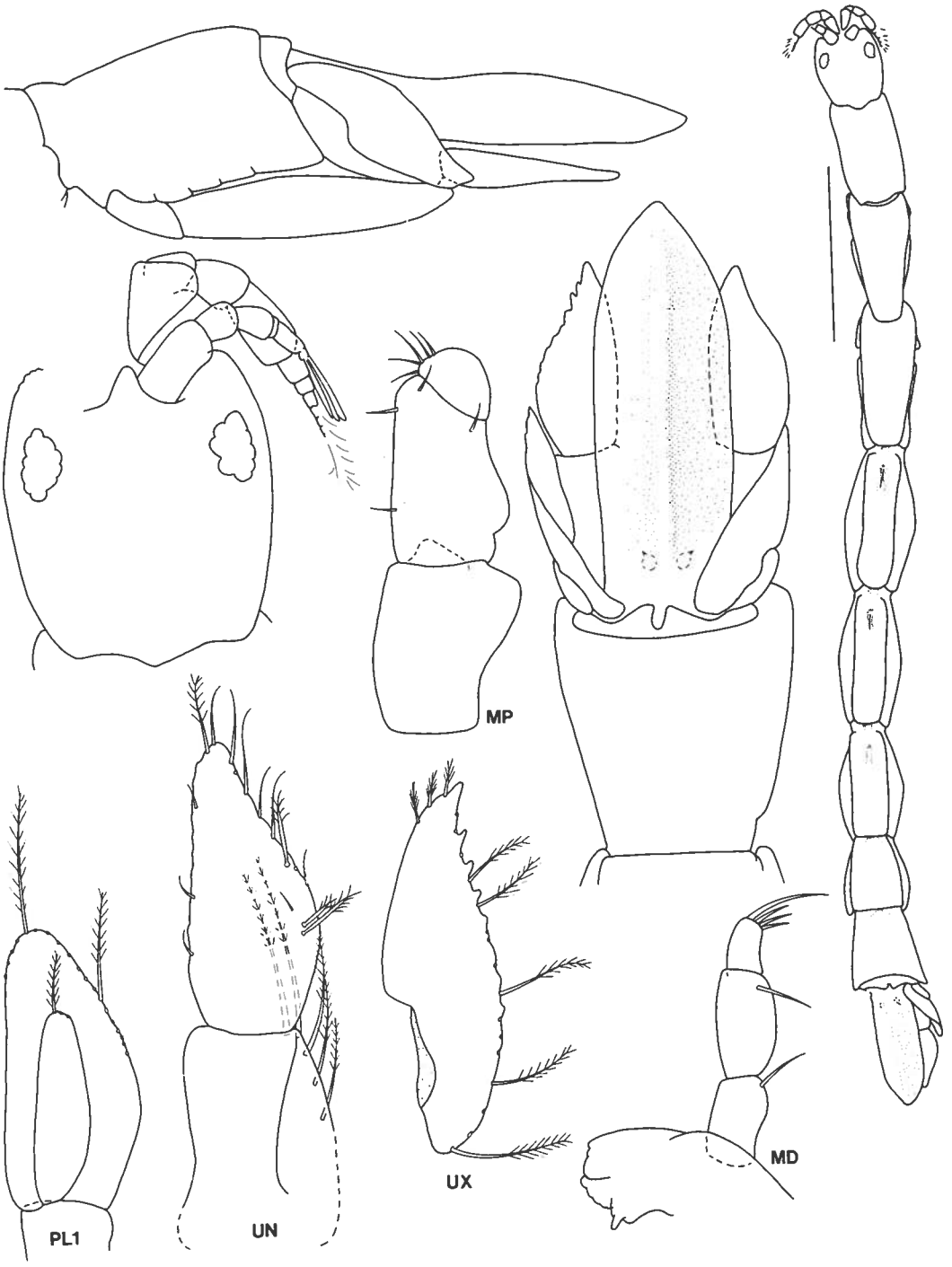

Figure 9. *Haliophasma dillwynia.* Holotype juvenile, 5.9 mm.

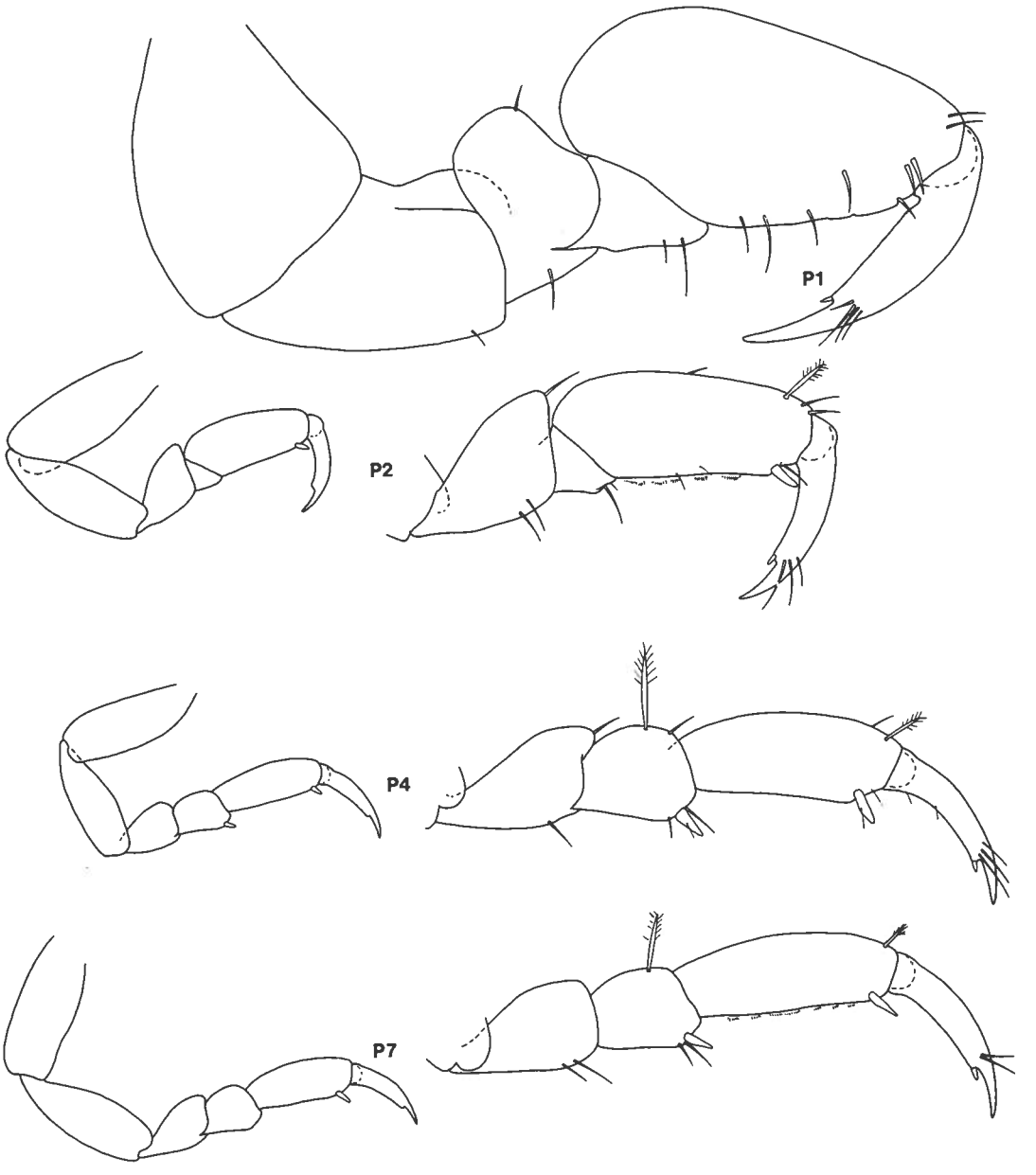

Figure 10. *Haliophasma dillwynia.* Holotype juvenile, 5.9 mm.

Distribution. Western Australia, North-west Shelf, 122-134 m.

Remarks. The smooth pereon and bullet-shaped telson distinguish *Haliophasma dillwynia* from the other species of this region.

Haliophasma elongatum Poore

Haliophasma elongatum Poore, 1975: 513-515, figs. 6, 7.—Negoescu and Wägele, 1984: 119.

Material examined. Tas., Sandy Bay, Derwent River off Nutgrove (42°54′S, 147°20′E), 18 Oct 1977, TM G2949(2 specimens).

NSW, east of Long Bay, 66 m, Australian Museum Shelf Benthic Survey stations, AM P24357, P22802. East of Malabar, 66 m, Australian Museum Shelf Benthic Survey stations, AM P22794-P22800, P22802-P22806.

Distribution. NSW and Tasmania, shelf and bays, 21-72 m.

Haliophasma pinnatum Poore

Haliophasma pinnatum Poore, 1975: 518-520, figs. 9, 10.—Negoescu and Wägele 1984: 119.

Material examined. NSW, Port Hacking (34°05′S, 151°10′E), New South Wales State Fisheries, AM P24354 (1 specimen), P32636(1).

Distribution. NSW central coast, shelf and bays, 28-66 m.

Haliophasma pugnatum Poore

Haliophasma pugnatum Poore, 1975: 521-523, figs. 11, 12.—Negoescu and Wägele 1984: 120.

Material examined. SA, N. of side West Island (32°31′S, 133°15′E), sand patch in *Heterozostera* meadow, 5 m, G.C.B. Poore and H.M. Lew Ton, Mar 1985, NMV J11976(1 specimen). Spencer Gulf, South Australian Fisheries, SAM.

Tas., Dover Jetty (43°19′S, 147°01′E), 2 m, muddy fine shell under *Zostera,* R.S. Wilson, NMV J11977(1).

Remarks. New records extend the range of this species from the Victorian coast to South Australia and Tasmania. All records are from less than 16 m depth.

Haliophasma swainsonia sp. nov.

Figures 11, 12

Material examined. 32 juveniles, 11 mancas; 4.3-13.2 mm.

Holotype: NSW, south-east of Legges Beach, Quarantine Bay, Twofold Bay (37°05′E), 8 m, dredge, S. Keable et al., 22 Feb 1985, AM P 36761 (with 1 slide), juvenile, 13.2 mm.

Paratypes: NSW, type locality, AM P36056(1 specimen). South-east of Legges Beach, Quarantine Bay, Twofold Bay, 5-11 m, S. Keable et al., 22 Feb 1985, AM P36133(2), P36134(3), NMV J12249(1). North-east of Boydtown Beach, Twofold Bay, 9 m, S. Keable et al., 22 Feb 1985, AM P36057(5). South of Oman Point, Quarantine Bay, Twofold Bay, 8 m, S. Keable et al., 22 Feb 1985, AM P36135(1).

Other material. Vic., 3 km off McGaurans Beach (38°23′S, 147°11′E), 18-20 m, J.E. Watson, 6 Mar 1980, NMV J14997 (1 specimen)

Description. Head and pereon smooth, with irregular pigment pattern. Head not as long as wide, tapering anteriorly, anterolateral lobes not swollen distally. Rostrum as long as anterolateral lobes, apex obtuse. Pereonite 1 without tubercles or bosses on posterior margin. Pereonite 7 wider than long, without anterior depressions. Pleon about as long as wide, 1.5 times as long as pereonite 7; pleonites with distinct lateral grooves, lacking pits and keels. Telson twice as long as broad, 1.3 times as long as pleon; broadest at midpoint, tapering evenly to gently rounded apex; dorsally domed, smooth and without keels.

Mandibular palp reashing tip of incisor, article 3 with 6 terminal setae. Maxillipedal palp article 2 barely exceeding first. Antenna 1, article 1 of peduncle not modified. Pereopod 1 subchelate, propodal palm oblique, smooth, setal rows dense. Uropodal endopod not reaching apex of telson, about 1.5 times as long as broad, broadest at base, tapering to a broadly rounded apex. Uropodal exopod not reaching to base of endopod, convex medially, lateral margin sinuous and crenellate, 3 times as long as wide. Uropodal peduncle produced medially.

Male. Not known.

Distribution. Southern New South Wales (Twofold Bay) and Victoria (McGaurans Beach) 5-20 m.

Remarks. Haliophasma swainsonia is the only Australian species of *Haliophasma* with persistent pigment pattern covering the entire dorsal surface.

Haliophasma syrtis Poore

Haliophasma syrtis Poore, 1975: 526-527, figs. 14, 15.—Negoescu and Wägele, 1984: 120.

Material examined. Qld, Moreton Bay, Middle Banks off Tangalooma (27°12′S, 153°22′E), S. Cook and S. Newlands, NMV J1577(1 specimen).

NSW, Ulladulla (35°21′S, 150°29′E), 80 m, coarse sand, K. Sheard, 9 Apr 1944, SAM(1).

Distribution. Southern Queensland and New South Wales, 12-80 m.

Haliophasma templetonia sp. nov.

Figures 13, 14

Material examined. 1 juvenile, 1 submale, 3 mancas; 5.5-13.0 mm.

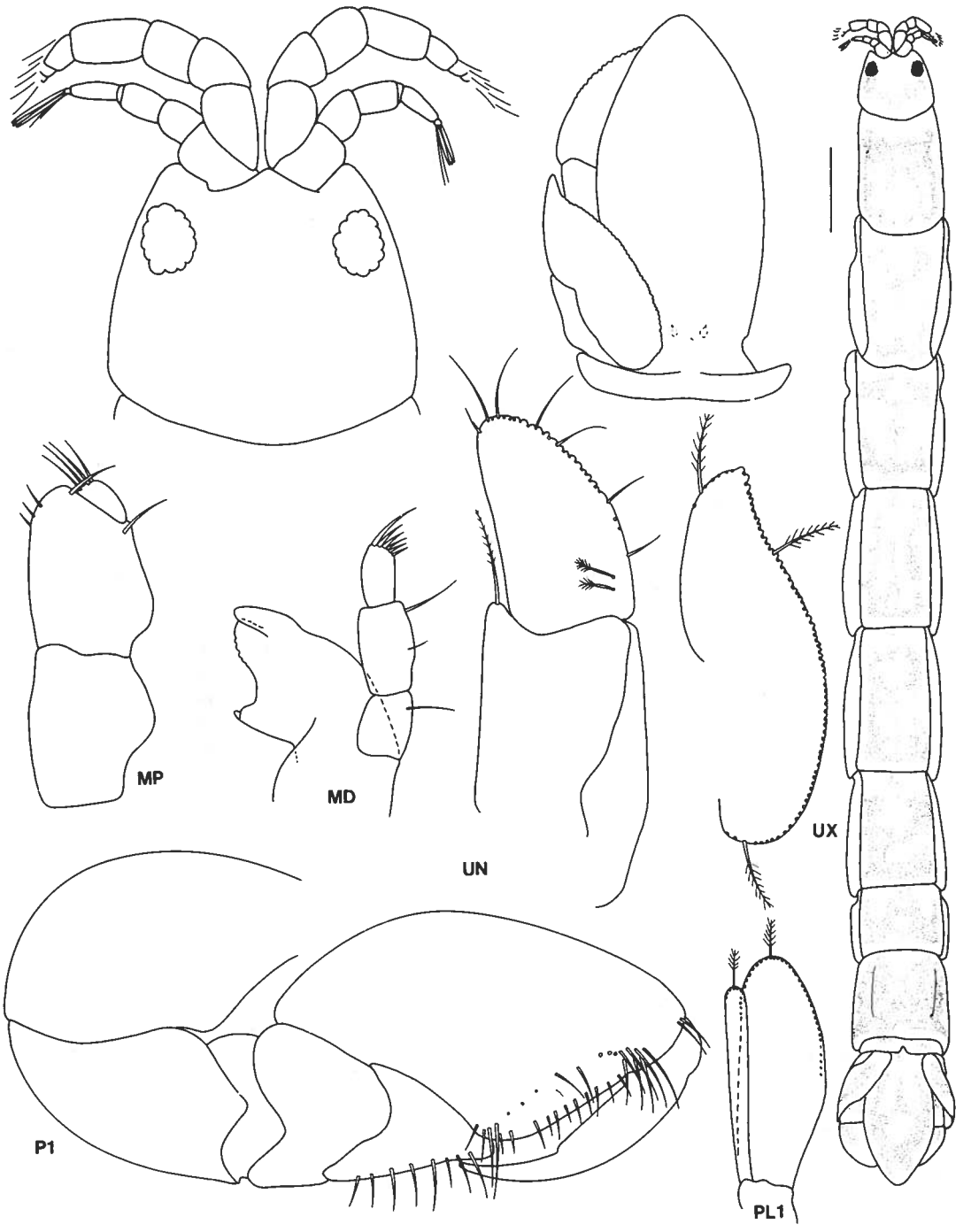

Figure 11. *Haliophasma swainsonia*. Holotype juvenile, 13.2 mm

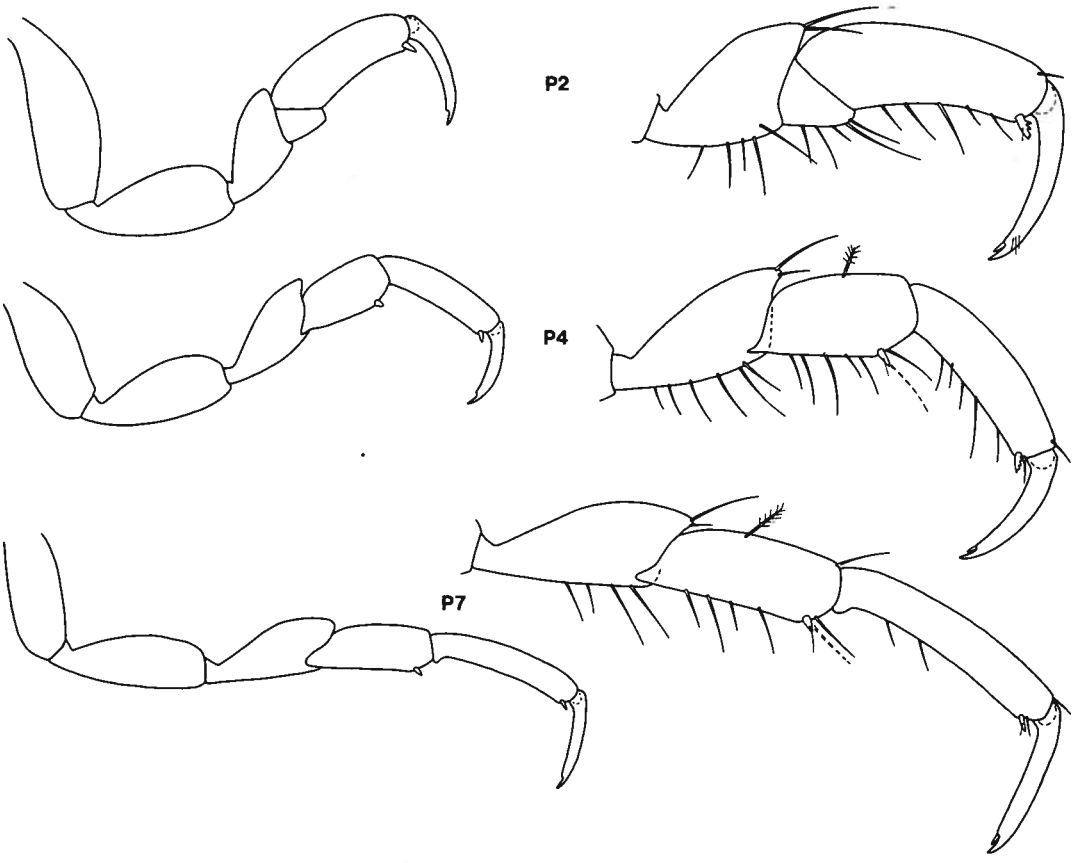

Figure 12. *Haliophasma swainsonia.* Holotype juvenile, 13.2 mm

Holotype: NSW, Munganno Point, Twofold Bay (37°05'S, 149°54'E), subtidal rock platform, 9 m, S. Keable et al., 19 Dec 1985, AM P36592, juvenile, 13.0 mm.

Paratypes: NSW, type locality, AM P36762 (2 mancas, 5.5 mm); type locality, 27 Mar 1985, AM P36061 (manca, 6.4 mm, with 1 slide). Murrumbulga Point, Twofold Bay (37°05'S, 149°54'E), subtidal rock platform, S. Keable et al., 29 Mar 1985, AM P36062 (1 submale).

Description. Head and pereon with scattered pits. Head about 1.3 times as long as wide; anterolateral lobes not swollen; rostrum as long as anterolateral lobes, apex acute. Pereonite 1 without bosses on posterior margin. Pereonites 4-6 with distinct elongate pits anteriorly. Pereonite 7 not as long as wide. Pleon about as long as wide, 1.5 times as long as pereonite 7. Pleonites 1-5 without obvious keels or distinct patterns of pitting. Telson 2.8 times as long as wide, 2.2 times as long as pleon; broadest as midpoint, barely tapering, with broad angular apex; with pair of dorsal keels defining central raised area.

Mandibular palp exceeding incisor by half its length, article 3 with 3 distal setae. Maxillipedal palp article 2 clearly exceeding first. Antenna article 1 not modified. Pereopod 1 subchelate, propodal palm axial and with small step distally; setal rows sparse. Uropodal endopod not reaching apex of telson, 1.3 times as long as wide, shorter than peduncle; broadest at midpoint, tapering to obtuse apex. Uropodal exopod reaching beyond peduncle, with distinct dorsal lobe; 2.1 times as long as wide, convex medially, lateral margin sinuous and crenellate.

Remarks. Only *Haliophasma cycneum, H. purpureum* and *H. yarra* have a uropodal peduncle with a distinct medio-distal lobe. *H. templetonia* can be distinguished from these species by the combination of ridged telson, short angular uropodal endopod and axial palm of pereopod 1. It is the only species of *Haliophasma* from a kelp holdfast; all others are from sedimentary environments.

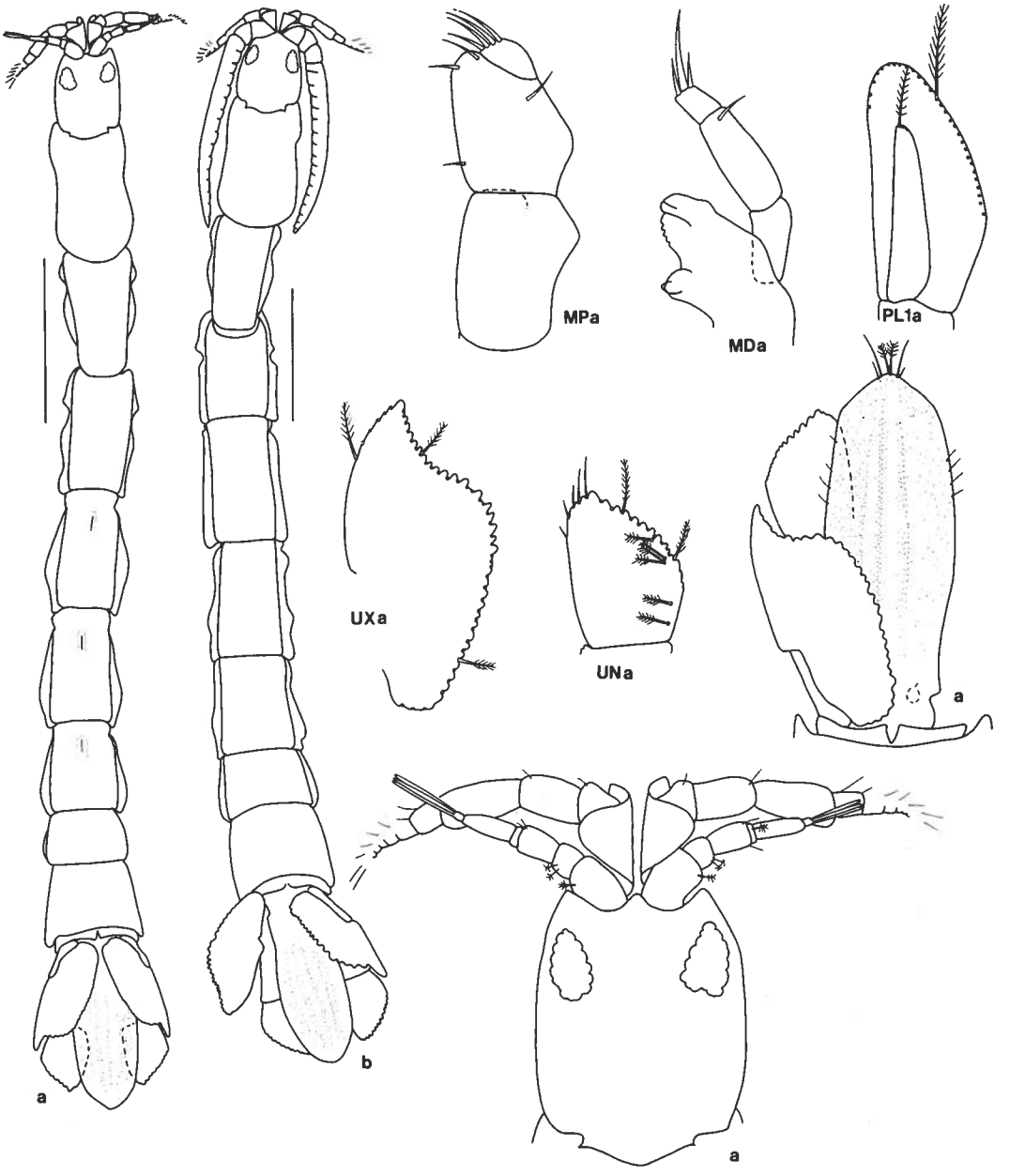

Figure 13. *Haliophasma templetonia.* a, paratype manca, 6.4 mm, AM P36061; b, paratype submale, 7.9 mm, AM P36062.

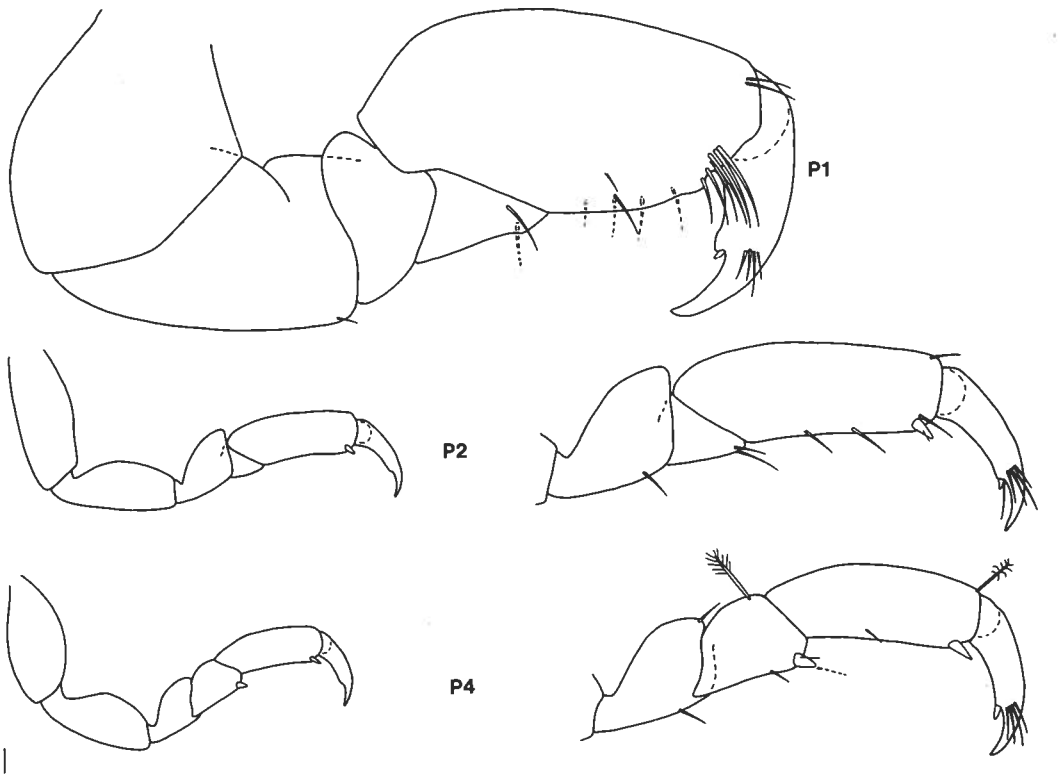

Figure 14. *Haliophasma templetonia.* Holotype manca, 6.4 mm.

Haliophasma yarra Poore

Haliophasma yarra Poore, 1975: 528-529, fig. 16.– Negoescu and Wägele, 184: 120.

Material examined. NSW, Port Hacking, New South Wales State Fisheries, AM(1 specimen); NMV J3059(1).

Bass Strait, south of Point Hicks (38°17.70′S, 149°11.30′E), 400 m, 24 Jul 1986, M.F. Gomon et al. on RV "Franklin", NMV J14465 (1).

Distribution. Bays in New South Wales and Victoria; eastern Bass Strait, 3-400 m.

Unidentified males

Figure 15

Material examined. 3 males.

North-west Shelf between Dampier and Port Hedland: 20°17′S, 116°38′E, 42 m, very coarse sandy shell, 10 Jun 1983 (stn NWA-43), NMV J12475(8.3 mm); 20°19′S, 117°20′E, 30 m, coarse shell and sand, 11 Jun 1983 (stn NWA-51), NMV J12476(9.4 mm); locality unspecified, CSIRO stn, NMV J13477(7.8 mm).

Remarks. Three adult male specimens from the North-west Shelf could not be assigned to any of the species described in this paper. They are illustrated to make clear the difficulties faced when attempting to identify isolated male specimens.

Acknowledgements

This contribution was made possible through an Australian Biological Resources Study grant from the Bureau of Flora and Fauna, Canberra. We are especially grateful to G. Milledge who inked the figures. For the loan of materal we thank J. Lowry (Australian Museum), W. Zeidler (South Australian Museum), T. Ward (CSIRO Division of Fisheries) and P. Arnold (James Cook University).

The Australian Institute of Marine Science, Townsville, and CSIRO Division of Fisheries, Hobart, allowed us to join their cruises on the Great Barrier Reef and the North-west Shelf. The Museum of Victoria collections from Bass Strait

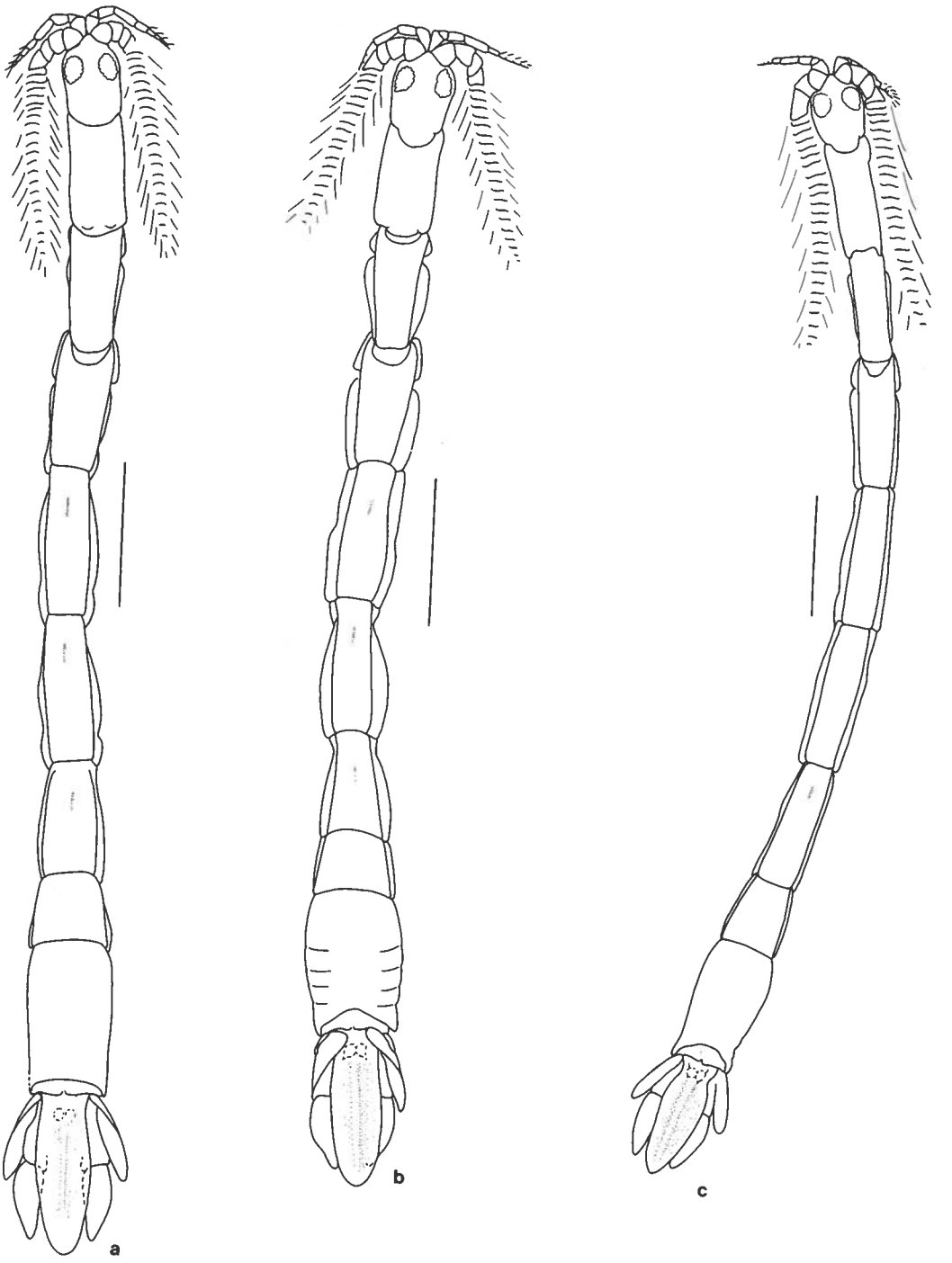

Figure 15. Unidentified males from the North-west Shelf. a, 8.3 mm, NMV J12475; b, 7.8 mm, NMV J12477; c, 9.4 mm, NMV J12476.

and the Tasmanian coast were made possible by Marine Sciences and Technologies grants to the Museum of Victoria. We are grateful to R. Wilson for processing these samples.

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