The deep-sea lysianassoid genus *Eurythenes* (Crustacea, Amphipoda, Eurytheneidae n. fam.)

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ABSTRACT
Eurythenes gryllus is redescribed based on the holotype of *Gammarus gryllus* Lichtenstein *in* Mandt, 1822; the holotype of *Lysianassa magellanica* H. Milne Edwards, 1848; and one of the specimens used by Lilljeborg (1865a) when establishing the genus *Eurythenes*. *Eurythenes obesus* (Chevreux, 1905), is redescribed and a neotype is established. New material of *E. gryllus* and *E. obesus* is recorded from Australasian waters. *Eurythenes thurstoni* n. sp. is described and Eurytheneidae n. fam. is established for this genus within the Lysianassoidea.

KEY WORDS
Crustacea,
Amphipoda,
Eurytheneidae n. fam.,
Eurythenes,
deep-sea,
new family,
new species.

RÉSUMÉ
Le genre d'eaux profondes Eurythenes *(Crustacea, Amphipoda, Lysianassoidea, Eurytheneidae n. fam.).*
Eurythenes gryllus est redécrit à partir de l'holotype de *Gammarus gryllus* Lichtenstein *in* Mandt, 1822 ; de l'holotype de *Lysianassa magellanica* H. Milne Edwards, 1848 ; et d'un des spécimens utilisés par Lilljeborg (1865a) pour établir le genre *Eurythenes*. *Eurythenes obesus* (Chevreux, 1905), est redécrit et un néotype est établi. Du nouveau matériel d'*E. gryllus* et d'*E. obesus* est mentionné des eaux d'Australasie. *Eurythenes thurstoni* n. sp. est décrit et la famille Eurytheneidae n. fam. est établie pour ce genre dans les Lysianassoidea.

MOTS CLÉS
Crustacea,
Amphipoda,
Eurytheneidae n. fam.,
Eurythenes,
mer profonde,
nouvelle famille,
nouvelle espèce.

INTRODUCTION

The large, deep-sea scavenging lysianassoid amphipod *Eurythenes gryllus* (Lichtenstein *in* Mandt, 1822) is now a well known and frequently recorded species. It has featured prominently in studies of deep-sea ecosystems (e.g., Lampitt *et al.* 1983; Smith *et al*. 1992; Christiansen 1996; Janssen *et al*. 2000) and has been the subject of many specific ecological (e.g., Wickins 1983; Baldwin & Smith 1987; Charmasson & Calmet 1987) and physiological studies (e.g., Hargrave *et al*. 1994, 1995; France & Kocher 1996a; Matsumasa *et al*. 1998; Takeuchi & Watanabe 1998). It has been recorded from all major marine water bodies, with the singular exception of the Mediterranean Sea.

The species was first described by Lichtenstein (*in* Mandt 1822) as *Gammarus gryllus*, from a single specimen vomited by a Northern Fulmar, *Fulmarus glacialis* (Linnaeus, 1761), near Greenland. H. Milne Edwards (1848) briefly described *Lysianassa magellanica*, from a single large specimen taken from the stomach of a large fish caught near Cape Horn, Drake Passage. Lilljeborg (1865a) reported three specimens, which he initially called *Lysianassa magellanica*, from Bear Island, Norwegian Sea. Later in the same paper he established a new genus, *Eurytenes* (a pre-occupied name later replaced by *Eurythenes*), for this bipolar species. Lilljeborg was apparently unaware of Lichtenstein's description of *Gammarus gryllus*. Goes (1866) illustrated some parts of the type specimen of *G. gryllus* and synonymised *Eurytenes magellanica* with Lichtenstein's species, under the generic name *Lysianassa*. In 1905 Chevreux described *Katius obesus*, another deep-sea lysianassoid amphipod. K. H. Barnard (1932) suggested that *Katius* was a junior synonym of *Eurythenes*. Stephensen (1933) synonymised not only the two genera, but the two species as well. This synonymy was only briefly accepted; Schellenberg (1955) argued for the separate identity of *E. gryllus* and *E. obesus*; and Shoemaker (1956) and J. L. Barnard (1961) conclusively rejected the synonymy, based on records of both males and females of both *E. gryllus* and *E. obesus*. J. L. Barnard also raised the question of species within the *E. gryllus* complex. This question has been amplified by more recent workers who have had access to or knowledge of increasingly large numbers of specimens from geographically diverse areas. Variation has been noted in characters such as the dorsal carinae, the shape of gnathopodal palms, the number of oostegites, colour and the genetic make-up. Discussion of the "identity of *Eurythenes gryllus*" was well reviewed and summarised by Thurston & Bett (1995).

We cannot resolve the question as to whether "*Eurythenes gryllus*" represents one cosmopolitan species or several species, subspecies, races or populations. However, because of the complexity of its early taxonomic treatment, we give here new illustrations and descriptions of three important specimens from the early taxonomic history of *E. gryllus*. We also record material of *E. gryllus* and *E. obesus* from Australia and the south-west Pacific Ocean and describe a new species of *Eurythenes*, which may remove one set of variables from the *E. gryllus* complex.

ABBREVIATIONS

A	antenna;
E	epistome and upper lip;
EP	epimeron;
G	gnathopod;
H	head;
MD	mandible;
MP	maxilliped;
MX	maxilla;
P	pereopod;
ST	setal tooth
T	telson;
U	uropod;
l	left;
r	right;
lat	lateral.

Material is deposited in the following institutions:

AM	Australian Museum, Sydney;
BMNH	The Natural History Museum, London;
GCRL	Gulf Coast Research Laboratory, Ocean Springs, Mississippi;
MNHN	Muséum national d'Histoire naturelle, Paris;
NMV	Museum of Victoria, Melbourne;
QM	Queensland Museum, Brisbane;
ZMB	Museum für Naturkunde, Berlin.

The setae of the mandibular palp are designated by the codes established in Lowry & Stoddart (1993). The setal-teeth of the maxilla 1 outer plate are designated by the codes established by Lowry & Stoddart (1992, 1993). All body length measurements are of curved length, from the anterior margin of the head to the base of the telson.

SYSTEMATICS

Superfamily LYSIANASSOIDEA Dana, 1849

Family EURYTHENEIDAE n. fam.

DIAGNOSIS. — Head exposed, much deeper than long, not extending much below insertion of antenna 2, without cheek notch. Antennae with calceoli present in male, absent in female. Antenna 1 with well developed two-field callynophore in male and female. Antenna 2 peduncular article 3 without distal hook. Mouthpart bundle subquadrate. Epistome and upper lip separate. Mandible incisors present, well developed, symmetrical, convex, smooth; right lacinia mobilis absent; accessory setal row without distal setal tuft; molar a setose tongue, with small triturating surface; palp present, inserted approximately mid-anteriorly. Maxilla 1 inner plate with more than two apical pappose setae; outer plate narrow with setal-teeth in 8/3 crown arrangement, setal-teeth large, ST6 and ST7 slender, ST7 slightly displaced from ST6; palp large, with apical robust setae. Maxilla 2 inner plate significantly shorter than outer plate. Maxilliped outer plate present, medial setae small, blunt or bead-shaped; palp four-articulate, article 4 well developed. Gnathopod 1 subchelate to parachelate; coxa vestigial; merus and carpus not rotated; carpus short; propodus large, palm straight to convex; dactylus slightly curved, not hidden by setae. Gnathopod 2 coxa small, shorter than coxa 3. Pereopods all simple; distal spurs absent. Pereopod 3 coxa large. Pereopod 4 coxa large with well developed posteroventral lobe. Pereopod 5 coxa with anterior and posterior lobes subequal. Uropod 2 inner ramus without constriction. Uropod 3 biramous. Telson present, cleft.

GENUS INCLUDED. — *Eurythenes* Smith, 1882.

REMARKS

Among the amphipods generally considered to be members of the Lysianassoidea, the Eurytheneidae n. fam. occur in the most basal clade, along with the *Hirondellea*-group, the Opisidae Lowry & Stoddart, 1995, the Podoprionidae Lowry & Stoddart, 1996 and the Uristidae Hurley, 1963 (*s.s.*). The most common lifestyle in all of these groups (except the Opisidae) is scavenging. In general, species in these groups have callynophores in both sexes, molars in the form of a setose tongue or flap, setal-teeth of maxilla 1 outer plate in a crown arrangement (except in the Podoprionidae), well developed third uropods and a long, deeply cleft telson.

There are two forms of crown-type arrangements of the maxilla 1 setal-teeth: the 8/3 crown (Lowry & Stoddart 1995: 140) which occurs fully-formed in the *Alicella*-group, eurytheneids, opisids and some species of *Hirondellea* and slightly modified in the *Cebocaris*-group and *Thoriella*-group; and the 7/4 crown (Lowry & Stoddart 1992: 186) which occurs in *Cyclocaris*, *Eclecticus* and uristids. We suspect that each of these types has arisen independently on more than one occasion.

The eurytheneids appear to be the sister taxon to the *Hirondellea*-group. Species of *Hirondellea* differ from eurytheneids in having a setose flap molar, a distal setose tuft at the end of the accessory setal row, only two apical setae on the inner plate of maxilla 1 and coxa 2 about the same size as coxa 3.

Eurytheneids also appear to be closely related to uristids (*s.s.*). Most genera in this group have scavenging members. Uristids differ from eurytheneids in having a shorter head, the maxilla 1 setal-teeth in a 7/4 crown and setal-tooth 7 strongly displaced from setal-tooth 6.

Many uristids, *Hirondellea* species and eurytheneids are scavengers. Although opisids have many of the characters of scavenging lysianassoids, they are generally considered to be ectoparasites/micropredators of fishes – a lifestyle probably only one step removed from scavenging. Apparently they share a common ancestor with the scavenging groups and appear to be related to eurytheneids. In opisids the head is not as deep as in eurytheneids, the inner plate of maxilla 1 has two or less apical setae, the outer plate setal-tooth 7 is not displaced from setal-tooth 6, the coxa of gnathopood 1 is large or reduced, but never vestigial as in eurytheneids, and coxa 2 is as large as coxa 3.

The podoprionid scavengers also occur in the basal lysianassoid group. They have similarities to the eurytheneids, but their strongly serrate mandibular incisors, non-crown-like setal-teeth arrangement on maxilla 1, strongly chelate first gnathopods and strongly serrate posterior margin on the basis of pereopod 5 easily distinguish them from the eurytheneids.

Eurytheneids also share characters with the *Alicella*-group, but are immediately distinguished from this marginal lysianassoid group by the absence of a lacinia mobilis on the right mandible in *Eurythenes*.

Genus *Eurythenes* Smith, 1882

Eurytenes Lilljeborg, 1865a: 11 (non *Eurytenes* Förster, 1862, Hymenoptera); 1865b: 6. — Boeck 1871: 105; 1872: 143. Type species: *Lysianassa magellanica* H. Milne Edwards, 1848, a junior synonym of *Gammarus gryllus* Lichtenstein *in* Mandt, 1822; by original designation.

Eurythenes Smith, 1882: 135 (nom. nov. for *Eurytenes* Lilljeborg, 1865). — Stebbing 1906: 72. — Schellenberg 1927: 678. — K. H. Barnard 1932: 58. — Stephensen 1933: 12. — Gurjanova 1951: 265. — J. L. Barnard 1961: 34; 1969: 343. — Hurley 1963: 58. — Barnard & Karaman 1991: 485.

Euryporeia Sars, 1891: 85 (invalid replacement for *Eurytenes* Lilljeborg, 1865). — Della Valle 1893: 847.

Katius Chevreux, 1905: 1. — Schellenberg 1927: 681. — K. H. Barnard 1932: 55. Type species: *Katius obesus* Chevreux, 1905; by original designation.

The generic name *Eurythenes* and the name of the type species

Mandt (1822) included in his published thesis a description of the species *Gammarus gryllus*, which he attributed to Lichtenstein (according to Stebbing 1888: 117). In 1848 H. Milne Edwards established the species *Lysianassa magellanica*. Lilljeborg (1865a) recorded material which he identified as *Lysianassa magellanica*, but considered the species to represent a new genus, which he called *Eurytenes*. Lilljeborg (1865a: 10) clearly stated that "we are accordingly induced to consider it [*Lysianassa magellanica*] as the type of a separate genus". It seems that Lilljeborg was unaware of Mandt's publication, but Goes (1866) synonymised *Lysianassa magellanica* with *Gammarus gryllus*, where it has remained ever since. According to the *International Code of Zoological Nomenclature* (ICZN 1999: Article 67.1.2 and Recommendation 67B), the type species of the genus *Eurythenes* should be cited as: "*Lysianassa magellanica* H. Milne Edwards, 1848, a junior synonym of *Gammarus gryllus* Lichtenstein *in* Mandt, 1822".

Goes (1866) did not accept Lilljeborg's new genus *Eurytenes*, and referred to the species as *Lysianassa gryllus*. Boeck (1871, 1872) and Stuxberg (1880) used the combination *Eurytenes gryllus*. However, the generic name *Eurytenes* Lilljeborg is pre-occupied by the braconid wasp genus *Eurytenes* Förster, 1862. Smith (*in* Scudder 1882) recorded the name *Eurythenes*, which he attributed to Lilljeborg, 1865. It is not clear whether this slight change in spelling was intentional or accidental (Smith did not include the name *Eurytenes* in his list). Smith (1884a) reported collections of *Eurythenes gryllus* from the east coast of America, the first full use of the now familiar name (the English reprint of Smith's report [Smith 1884b] printed the name as *Eurysthenes gryllus*). Chevreux (1889) acknowledged that *Eurytenes* was a pre-occupied name and reservedly accepted Smith's modification. Sars (1891) recognised the homonymy of *Eurytenes* Förster and *Eurytenes* Lilljeborg, but was either unaware of or disregarded Smith's modification of the name and Chevreux's acceptance of this modification. He introduced the new generic name *Euryporeia*. Bonnier (1893) agreed with the hesitancy Chevreux had about Smith's very slight modification and accepted Sars' name. *Euryporeia* was used as the name of the genus until Stebbing (1906) re-instated Smith's *Eurythenes.* The name *Euryporeia* persisted for a little time (Brüggen 1907; Chevreux 1910; Grieg 1925) but has now been replaced by the nomenclaturally correct *Eurythenes*. Neave (1939) incorrectly attributed the modification to K. H. Barnard (1932).

According to Lilljeborg, the name *Eurytenes* is derived from Greek, to signify "widely

stretched", referring to the geographic distribution of the species.

The following synonymy for *E. gryllus* (and that for *E. obesus*) is provided as a guide to the extensive historical and near-recent literature. There are no doubt more citations of which we are not aware, especially in the recent proliferation of technical reports concerning deep-sea faunas.

Eurythenes gryllus (Lichtenstein *in* Mandt, 1822) (Figs 1-11)

Gammarus gryllus Lichtenstein *in* Mandt, 1822: 34.

Lysianassa magellanica Milne Edwards 1848: 398. — Lucas 1857: 13, pl. 1 fig. 3. — Bate 1862: 66, pl. 10 fig. 5; 1866: 330. — Lilljeborg 1865a: 3; 1865b: 2. — Bethune 1869: 431. — M. Sars 1869: 260.

Eurytenes magellanicus – Lilljeborg 1865a: 11, pls 1-3; 1865b: 6. — Sars 1891: pl. 30.

Lysianassa gryllus – Goes 1866: 517, pl. 36 fig. 1. — Bate 1867: 229.

Eurytenes gryllus – Boeck 1871: 105; 1872: 144. — Stuxberg 1880: 62. — Stephensen 1912b: 528.

Eurythenes gryllus – Smith 1884a: 54. — Hansen 1888: 67. — Chevreux 1889: 298, fig.; 1935: 50, pl. 1, figs 6, 7 — Stebbing 1893: 80; 1906: 73. — Chilton 1911: 563. — Stephensen 1925: 110; 1932: 356 (in part, part = *E. obesus*); 1933: 12, figs 4, 5 (in part, part = *E. obesus*); 1935: 91; 1942: 474 (in part, part = *E. obesus*); 1949: 3 (?in part, part may = *E. obesus*). — Schellenberg 1927: 679, fig. 70; 1955: 192. — K. H. Barnard 1937: 144. — Shoemaker 1945: 186 (in part, part = *E. obesus*); 1956: 177. — Gorbunov 1946: 43. — Gurjanova 1951: 265, fig. 134; 1962: 340; 1964: 277. — Dahl 1954: 3. — Birstein & Vinogradov 1955: 225; 1958: 228; 1960: 183; 1962: 36; 1970: 420 (table 1). — Hurley 1957: 2 (in part, part may = *E. obesus*, part probably = *E. thurstoni*). — J. L. Barnard 1958: 92; 1961: 35 (in part), fig. 5 (material from South Pacific and figs 6, 7 = *E. thurstoni*). — Oldevig 1959: 19. — Templeman 1967: 215, figs 1-3. — Beck 1969: 34, 35. — Bowman & Manning 1972: 193, figs 2-5. — Paul 1973: 289. — Rannou & Nouguier 1974: 142. — Shulenberger & Hessler 1974: 185. — Dahl *et al.* 1976: 75, 78. — Lowry & Bullock 1976: 90. — Shulenberger & Barnard 1976: 241. — Griffiths 1977: 97. — Intes 1978: 4, fig. 4. — Andres 1979: 96; 1983: 186; 1987: 96. — Dahl 1979: 168, fig. 6. — George 1979a: 283; 1979b: 63. — Hessler *et al.* 1979: 704. — Ortiz 1979: 19. — Smith *et al.* 1979: 57. — Thurston 1979: 56; 1990: 262; 1994: 14, unnumbered fig.; 2000: 684 (table 2), 688, 690. — Hallberg *et al.* 1980: 280. — Just 1980: 164 (table 2), 167, 171. — Prince 1980: 63 (table 4). — Hessler 1981: 397. — Kamenskaya 1981: 95, figs 1, 2. — Umezu 1982: 2; 1984: 128. — Ingram & Hessler 1983: 683; 1987: 1889. — Lampitt *et al.* 1983: 73. — Petter 1983: 177, fig. 1. — Smith & Present 1983: 183. — Wickins 1983: 83. — Smith & Baldwin 1984: 1179. — Desbruyères *et al.* 1985: 233. — Hargrave 1985: 443. — Hopkins 1985: 202, 206, 210. — Laver *et al.* 1985: 1136. — Rauschert 1985: 319. — Wilson *et al.* 1985: 1248. — Ainley *et al.* 1986: 848. — Hasegawa *et al.* 1986: 70. — Reinhardt & Van Vleet 1986: 151, 157. — Baldwin & Smith 1987: 425. — Bucklin *et al.* 1987: 1795. — Charmasson & Calmet 1987: 1509; 1989: 159; 1990: 227. — Sainte-Marie & Hargrave 1987: 436. — Calmet & Charmasson 1989: 163. — Costello *et al.* 1989: 32. — Christiansen *et al.* 1990: 35; 2001: 2409. — Rauschert 1990: 454. —Vinogradov 1990: 42, 92; 1997: 77. — Wakabara *et al.* 1990: 5; 1996: 355 (table 1), 360 (table 2). — Barnard & Karaman 1991: 486. — Boudrias 1991: 13, figs 1, 2; 2002: 581. — Gage & Tyler 1991: 78. — Gonzalez 1991: 59. — Palerud & Vader 1991: 35. — Rauschert 1991: 37, 39. — Sainte-Marie 1991: 217; 1992: 105. — Steele & Steele 1991: 1250, figs 3, 4. — Hargrave *et al.* 1992a: 37; 1992b: 41; 1994: 1489; 1995: 1905. — Smith 1992: 1040. — Smith *et al.* 1992: 669, 671 (table 3). — Britton & Morton 1993: 369; 1994: 391. — Christiansen & Thiel 1993: 12. — De Broyer & Jazdzewski 1993: 67. — Heinrich *et al.* 1993: 6. — Lopes *et al.* 1993: 209. — Ishimaru 1994: 58. — Kaufmann 1994: 54. — Thurston & Bett 1995: 201. — Christiansen 1996: 345. — France & Kocher 1996a: 633 (in part, part = *E. thurstoni*); 1996b: 304. — Vinogradov *et al.* 1996: 8. — Gebruk *et al.* 1997: 116. — Jones *et al.* 1998: 1124. — Matsumasa *et al.* 1998: 686. — Takeuchi & Watanabe 1998: 285. — Creasey & Rogers 1999: 28, 32, 42, 43, 50, 78, 81, 87, 96, fig. 11. — Witte 1999: 142. — Christiansen & Martin 2000: 3027. — Janssen *et al.* 2000: 3011 (table 5). — Bluhm *et al.* 2001: 642. — Bühring & Christiansen 2001: 369. — Dauby *et al.* 2001: 81. — Johnson *et al.* 2001: 198 (table 3). — Klages *et al.* 2001: 293. — Takeuchi *et al.* 2001: 653. — Cherel *et al.* 2002a: 272 (table 6); 2002b: 288 (table 3), 292 (table 4). — Thurston *et al.* 2002: 205. — Treude *et al.* 2002: 1281. — Premke *et al.* 2003: 283.

Euryporeia gryllus – Sars 1891: 86, [pl. 30 as *Eurytenes gryllus*]. — Della Valle 1893: 848, pl. 60 fig. 58. — Chevreux 1895: 426; 1899a: 147, 148; 1899b: 152; 1900: 24, pl. 14 fig. 4; 1903: 96; 1905: 7; 1910: 4. — Holmes 1903: 277. — Brüggen 1907: 215. — Grieg 1925: 21.

Eurythenes magellanicus – K. H. Barnard 1932: 59. — J. L. Barnard 1958: 92. — Beck 1969: 35. — Conroy 1972: 56. — Arnaud 1974: 592 (list).

Eurysthenes gryllus – Smith 1884b: 181 (*lapsus calami*).

Eurythenes grillus – Gilchrist & MacDonald 1980: 35 (*lapsus calami*).

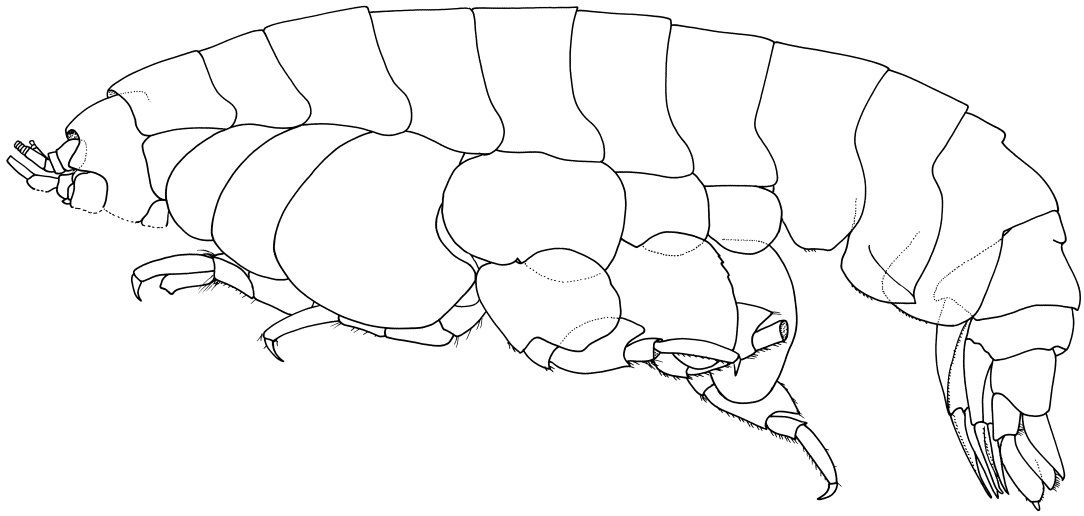

FIG. 1. — *Eurythenes gryllus* (Lichtenstein *in* Mandt, 1822), holotype ♀ 81 mm (ZMB 1265).

Eurythennes gryllus – Poupin *et al.* 1990: 94, pl. 2 fig. g. — Poupin 1994: 16; 1996: 42, fig. h. (*lapsus calami*).

Eurythenes cf. *gryllus* – Lowry & Stoddart 1994: 158 (in part, part = *E. thurstoni*).

Unnamed specimen in photograph – Yayanos 1978: 1056, fig. 1.

Not *Eurythenes gryllus* – Murdoch 1885 (= *Anonyx nugax*). — K. H. Barnard 1940: 440, 515 (list) (= *E. obesus*). — Springer & Bullis 1956: 6 (= *E. obesus*). — Lowry & Stoddart 1993: 72 (= *E. thurstoni*).

DIAGNOSIS. — Anterodorsal margin of head smooth. Gnathopod 1 parachelate; basis length 2 to 2.5 times breadth; propodus slightly tapering distally. Pereopods 3 to 7 dactyli short. Pereopod 4 coxa as deep as wide. Pereopod 7 basis, length of anterior margin subequal to breadth; posteroventral margin straight. Pleonite 3 with anterodorsal notch. Epimeron 3 posteroventral corner broadly rounded. Urosomite 1 not dorsodistally produced over urosomite 2. Uropod 3 peduncle, medial face without robust setae.

LICHTENSTEIN'S SPECIMEN (FIGS 1-3)

Holotype (of *Gammarus gryllus* Lichtenstein *in* Mandt, 1822), female, 81 mm, with well developed setose oostegites, from stomach of Northern Fulmar, Greenland Sea (ZMB 1265).

This specimen was described by Lichtenstein (*in* Mandt 1822), but not illustrated. The illustrations in Goes (1866) are the first (and only) of this specimen. The whole mouthpart bundle (including the upper lip and epistome) has been removed from the specimen and all these parts are now lost. This had probably occurred before Goes saw the specimen, as he did not illustrate any mouthparts. Other parts of the specimen are also missing, and may have been missing when it was first collected.

Description

Head much deeper than long, not extending much below insertion of antenna 2, anterodorsal margin smooth; lateral cephalic lobe small, narrowly rounded; rostrum absent; eyes not apparent. Antenna 1 peduncular article 1 short, length subequal to breadth, distal margin without significant protrusions; peduncular article 2 short, 0.35 times article 1; peduncular article 3 short, 0.13 times article 1; accessory flagellum 3+-articulate [broken], article 1 long, 5.3 times article 2; flagellum with strong two-field callynophore, 5+-articulate [broken], calceoli absent. Antenna 2 peduncle without brush setae; peduncular article 1 greatly enlarged, covering article 2 laterally; article 3 short, about 0.6 times article 4; flagellum 14+-articulate [broken]; calceoli absent.

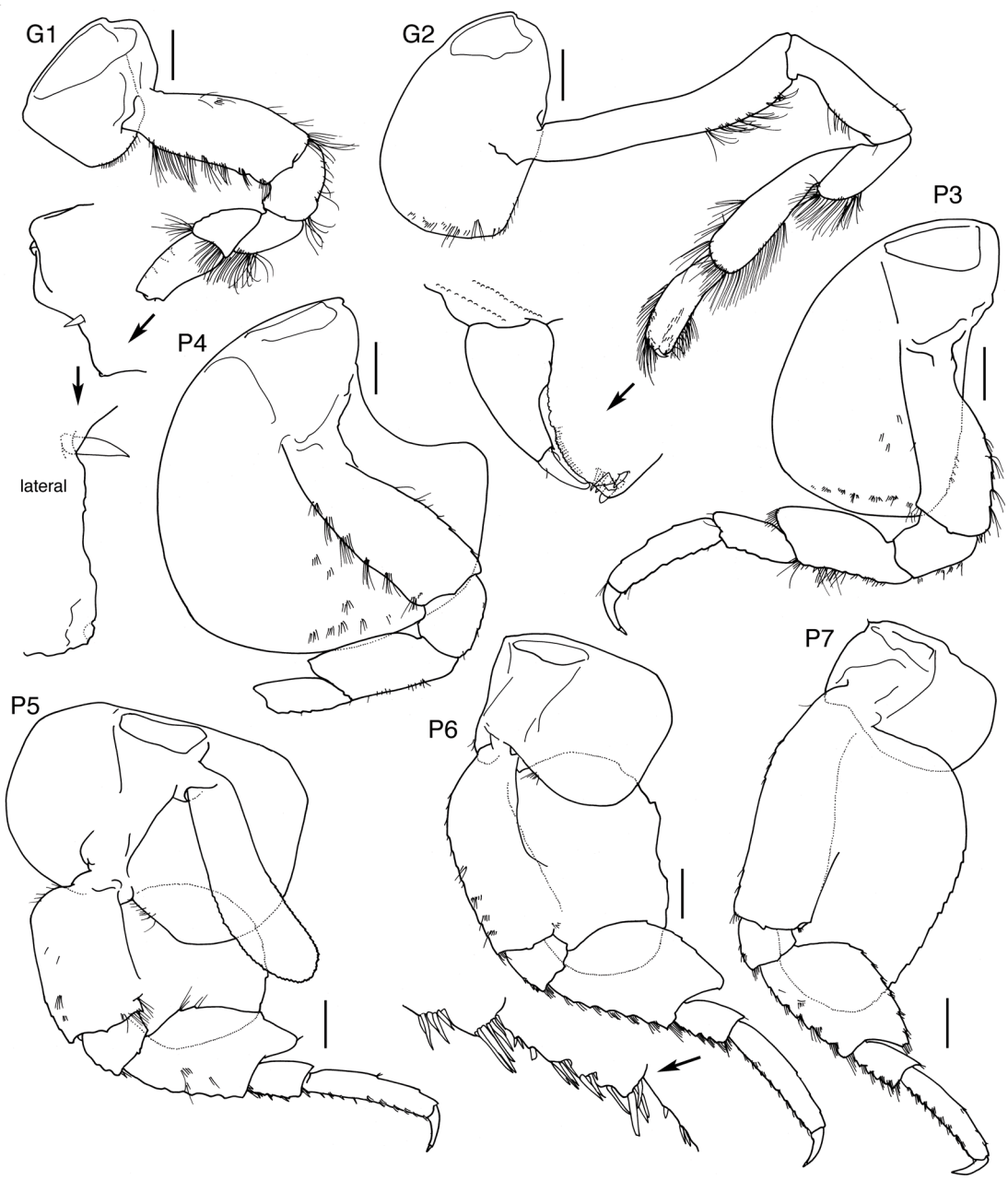

FIG. 2. — *Eurythenes gryllus* (Lichtenstein *in* Mandt, 1822), holotype ♀ 81 mm (ZMB 1265). Abbreviations: **G1**, **G2**, gnathopods 1, 2; **P3**-**P7**, pereopods 3-7. Scale bars: 2.0 mm.

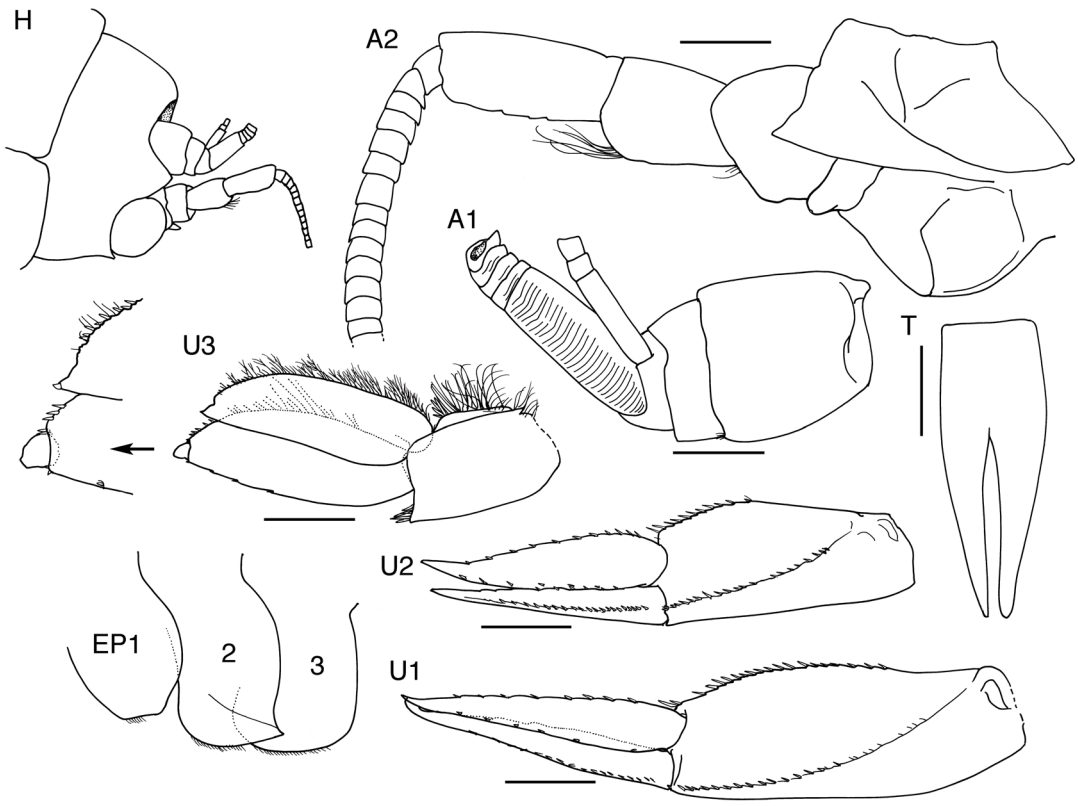

FIG. 3. — *Eurythenes gryllus* (Lichtenstein *in* Mandt, 1822), holotype ♀ 81 mm (ZMB 1265). Abbreviations: **A1**, **A2**, antennae 1, 2; **EP1**-**EP3**, epimera 1-3; **H**, head; **T**, telson; **U1**-**U3**, uropods 1-3. Scale bars: U1-3, T, 2.0 mm; A1, A2, 1.0 mm.

Mouthparts unknown.

Pereonites 1 to 5 dorsally smooth; pereonites 6 and 7 with weak dorsal ridge. Gnathopod 1 subchelate or parachelate [dactyl missing]; coxa vestigial; basis long, slender, length 2.3 times breadth, anterior margin smooth, with tufts of slender setae; ischium short, length 1.4 times breadth; merus with tuft of long slender setae near posterodistal corner; carpus wedge-shaped, produced anteriorly, short, length 1.5 times breadth, shorter than (0.9 times) propodus, with tuft of long slender setae on anterodistal corner and long slender setae near posterodistal corner; propodus large, subrectangular, length 1.9 times breadth, slightly tapering distally, posterior margin subtly sinusoidal, smooth, with some setae [most missing], palm transverse, margin straight, minutely serrate, posterodistal corner with at least one medial robust seta [broken, but socket visible; lateral area too damaged to assess]; dactylus unknown. Gnathopod 2 minutely chelate; coxa small, shorter than coxa 3; ischium long, length 3.6 times breadth; carpus long, length 4.3 times breadth, posterior margin straight; propodus subrectangular, long, length 3.1 times breadth; palm obtuse with convex rugose margin, with three medial and one lateral robust setae; dactylus not quite reaching corner of palm, posterior margin smooth. Pereopod 3 coxa large; merus expanded anteriorly; propodus with at least eight sets of setae on posterior margin [all broken] and one posterodistal robust seta; dactylus short, slender. Pereopod 4 coxa as deep as wide (length 1.03 times breadth), with large pos-

teroventral lobe, anterior margin slightly rounded; merus expanded anteriorly; propodus and dactylus missing. Pereopod 5 coxa with anterior and posterior lobes subequal; basis expanded posteriorly, posterior margin minutely crenate; merus expanded posteriorly, with curved posterior margin; propodus with nine groups of robust setae along anterior margin and two anterodistal robust setae; dactylus short, slender. Pereopod 6 coxa small, not lobate posteriorly; merus expanded posteriorly, with curved posterior margin; propodus with 10 groups of robust setae along anterior margin and two anterodistal robust setae; dactylus short, slender. Pereopod 7 basis expanded posteriorly, anterior length 1.1 times breadth, posterior margin slightly rounded, minutely crenate, posteroventral corner rounded, posteroventral margin straight; merus expanded posteriorly, with curved posterior margin; propodus with 10 groups of robust setae along anterior margin, two anterodistal robust setae and three pairs of robust setae along posterior margin; dactylus short, slender.

Oostegites present from gnathopod 2 to pereopod 5, long, setose [but with most setae missing]. Gills present from gnathopod 2 to pereopod 7.

Pleonites 1 to 3 with weak dorsal ridge; pleonite 3 with anterodorsal notch. Epimeron 1 anteroventral corner rounded, with a few slender setae. Epimeron 2 ventral margin lined with short fine setae, posteroventral corner produced into sharp spine. Epimeron 3 ventral margin lined with short fine setae, posteroventral corner broadly rounded. Urosomite 1 with anterodorsal notch. Uropod 1 peduncle with 26 dorsolateral, one apicolateral, 18 dorsomedial and two apicomedial robust setae, without plumose setae; rami subequal in length; outer ramus with 17 lateral and at least five medial robust setae; inner ramus with seven lateral and eight medial robust setae. Uropod 2 peduncle with 20 dorsolateral, two apicolateral, 11 dorsomedial and one apicomedial robust setae; rami subequal in length; outer ramus with 21 lateral and eight or nine medial robust setae; inner ramus with eight lateral and 11 medial robust setae, without constriction. Uropod 3 peduncle short, length 1.8 times breadth, without dorsolateral flange, with four apicomedial robust setae, without midmedial setae, with 10 distoventral robust setae, with lightly plumose setae on dorsomedial margin; rami paddle-like, subequal in length, inner ramus about 0.9 times outer ramus; outer ramus two-articulate, article 2 short, article 1 with four lateral and seven medial robust setae; inner ramus with 11 medial robust setae; slender plumose setae present on both rami. Telson longer than broad, length 2.6 times breadth, deeply cleft (65%), without dorsal setae, distally tapered, without apical setae.

H. MILNE EDWARDS' SPECIMEN (FIGS 4-7)

Holotype (of *Lysianassa magellanica* H. Milne Edwards, 1848), female, *c.* 85 mm, with well developed setose oostegites, collected by d'Orbigny from stomach of a large fish caught off Cape Horn, Drake Passage, [*c.* 56°S, 67°W] (MNHN-Am 3148).

H. Milne Edwards (1848) gave only a brief description of a few characters and no illustrations of his new species, *Lysianassa magellanica*. Lucas (1857) repeated some of Milne Edwards' description and provided a whole animal figure. Bate (1862: 66) gave a brief description of *Lysianassa magellanica*, and a whole animal figure taken from a tracing of Lucas' plate which he said he had "corrected from a specimen – the original type, I believe, of M. Milne-Edwards". Bate's figure is somewhat stylised compared to that of Lucas, and at least two of Bate's "corrections" are wrong. Firstly, Lucas' figure shows antenna 2 about twice the length of antenna 1, and he states that the first antennae are "courtes, […] ne dépassent pas la partie médiane du premier anneau thoracique" but the second antennae "atteignent le quatrième anneau du thorax"; Bates' figure shows antennae 1 and 2 subequal, and his description states "Antennae subequal". Lilljeborg (1865a: 3, footnote 1) wrote that in Bate's (1862) British Museum Catalogue, "neither the description nor the drawing is good". Bate (1866: 331) responded in defence of his illustration: "[…] we feel assured that both the short description and the figure may be depended

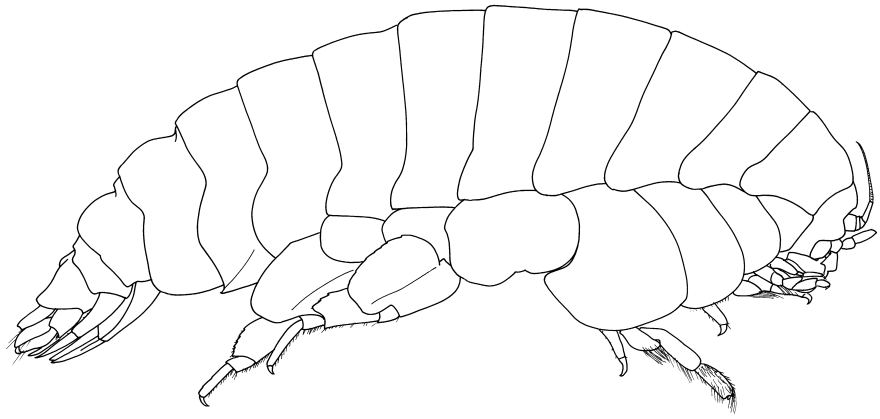

FIG. 4. — *Eurythenes gryllus* (Lichtenstein *in* Mandt, 1822), holotype of *Lysianassa magellanica* H. Milne Edwards, 1848, ♀ *c.* 85 mm, (MNHN-Am 3148).

upon, except perhaps that of one of the inferior antennae, which was broken off when we saw it […] but which, if our memory is not treacherous, was ascertained by comparison with the same organ on the opposite side; or it may have been hypothetically inserted". Unfortunately both second antennae are now missing from the specimen, but there seems no reason to doubt Lucas' description and figure; all specimens of *Eurythenes* that we have seen have the second antenna about twice the length of the first antenna. Secondly, the deep anterodorsal notches on pleonite 3 and urosomite 1 are clearly shown in Lucas' figure, but have been omitted entirely in Bate's figure. Bate's (1862: 66) description of uropod 3 (the "posterior pair of pleopoda") as "having the rami styliform, clean, scarcely longer than the base" is puzzling, wrong, and probably in part a misreading of both Milne Edwards' and Lucas' description of the telson as "deux appendices styliformes très forts représentent le septième anneau". Bate's confusion about uropods and telson is compounded in his 1866 report. He did not accept Lilljeborg's genus *Eurytenes* and suggested that Lilljeborg's material would fit just as well to *Anonyx*, "into which the species described as *Lysianassa magellanica*, with its squamiform, undivided telson, cannot enter" (Bate 1866: 332). Bate further states that "the superior antennae […] carry a secondary appendage that itself reaches beyond that of the primary branch in *L. magellanica*" (Bate 1866: 331). This statement was presumably based on Lucas' figure, which actually shows both left and right antenna 1, not antenna 1 with its accessory flagellum. K. H. Barnard (1932) noted some of Bate's confusing statements and re-published Milne Edwards' original description. The specimen has never been adequately described or figured.

When we received this specimen it was mounted with glue onto a slab of glass. It was photographed *in situ* and then carefully removed from the glass. It is in relatively good condition, considering its history. The right gnathopod 1 and pereopod 5 were missing from the specimen and both antennae 2 were broken off at the end of the peduncle, the flagella missing. Many margins are abraded or worn, particularly those of the pereopods and uropods, so that many setae are missing, represented only by their insertion points or broken stumps. The apparently stocky dactyls of pereopods 3 and 6 are probably an artefact; the extremity of the cuticle seems abraded or maybe digested.

Description

Head much deeper than long, not extending much below insertion of antenna 2, anterodorsal

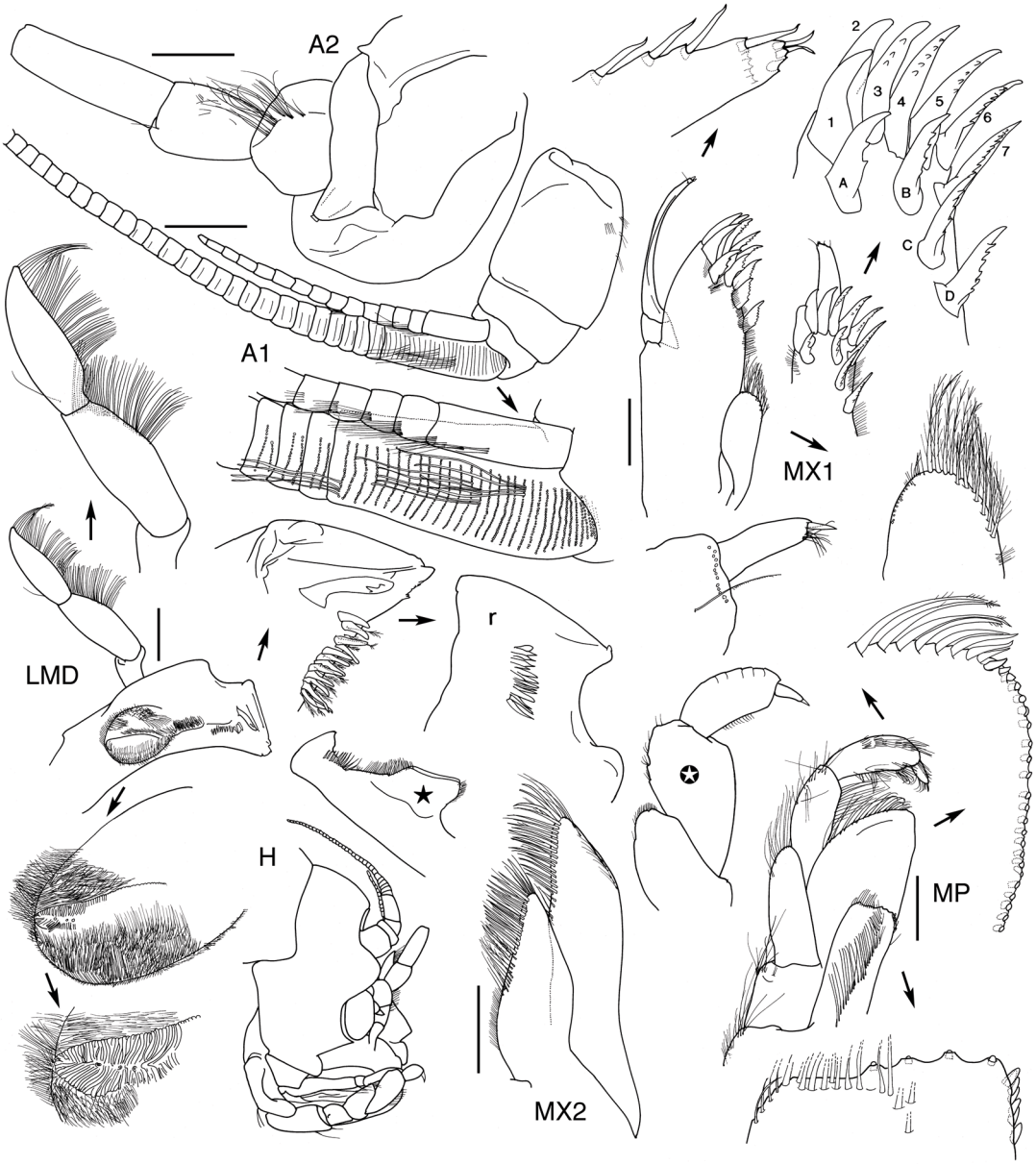

FIG. 5. — *Eurythenes gryllus* (Lichtenstein *in* Mandt, 1822), holotype of *Lysianassa magellanica* H. Milne Edwards, 1848, ♀ *c.* 85 mm (MNHN-Am 3148). Abbreviations: **A1**, **A2**, antennae 1, 2; **H**, head; **LMD**, left mandible; **MP**, maxilliped; **MX1**, **MX2**, maxillae 1, 2; ★, lateral view of right mandible; ✪, maxilliped palp completely flattened. Scale bars: 1.0 mm.

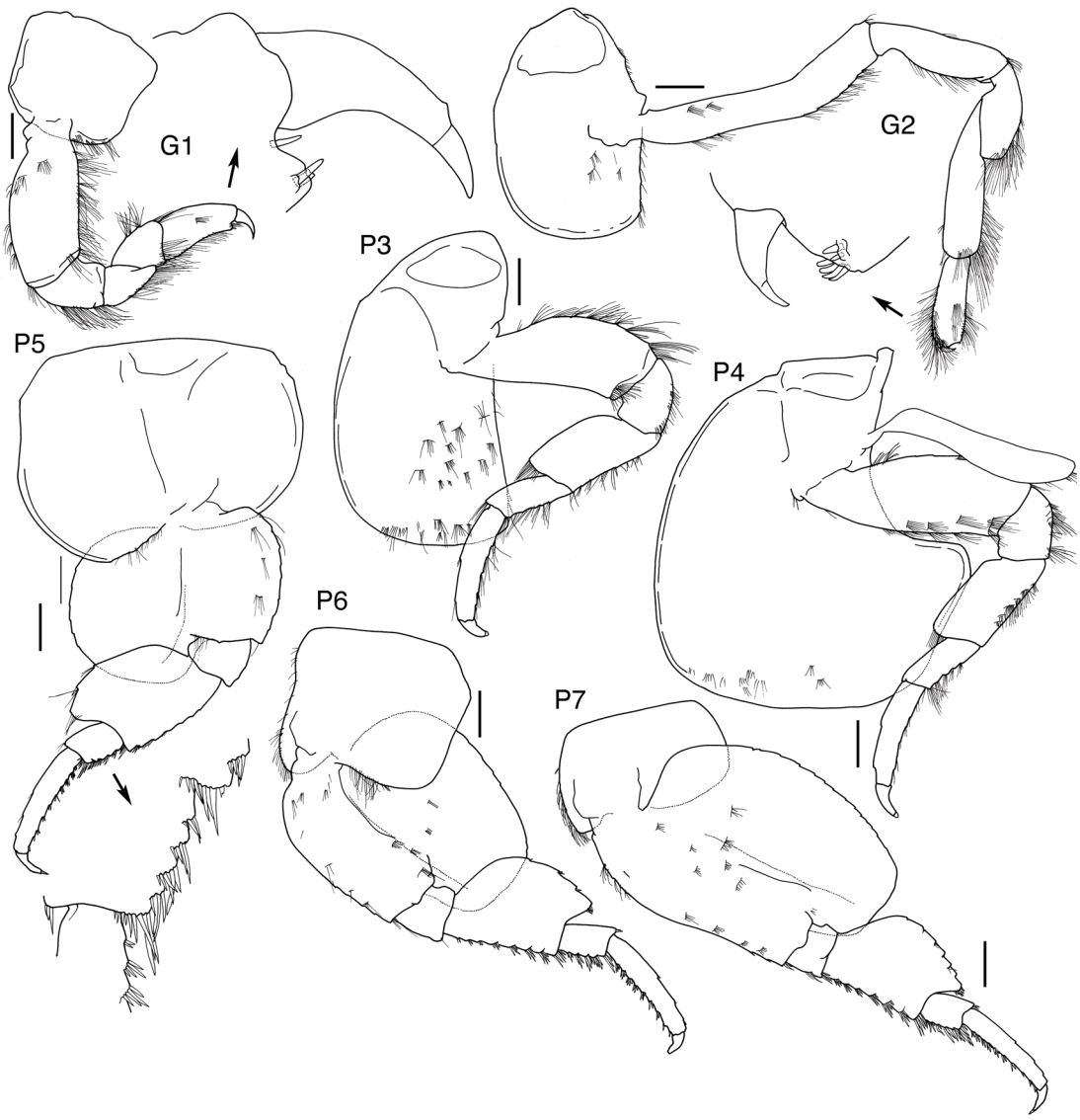

FIG. 6. — *Eurythenes gryllus* (Lichtenstein *in* Mandt, 1822), holotype of *Lysianassa magellanica* H. Milne Edwards, 1848, ♀ *c.* 85 mm (MNHN-Am 3148). Abbreviations: **G1**, **G2**, gnathopods 1, 2; **P3**-**P7**, pereopods 3-7. Scale bars: 2.0 mm.

margin smooth; lateral cephalic lobe small, narrowly rounded; rostrum absent; eyes not apparent. Antenna 1 short, 0.1 times body; peduncular article 1 short, length 1.2 times breadth, distal margin without significant protrusions; peduncular article 2 short, 0.22 times article 1; peduncular article 3 short, 0.19 times article 1; accessory flagellum medium length (about 0.5 times primary flagellum), 15-articulate, article 1 long, 4.3 times article 2; flagellum 30+-articulate [broken], with strong two-field callynophore, calceoli absent. Antenna 2 relative length not known [both flagella missing]; peduncle without brush setae; peduncular article 1

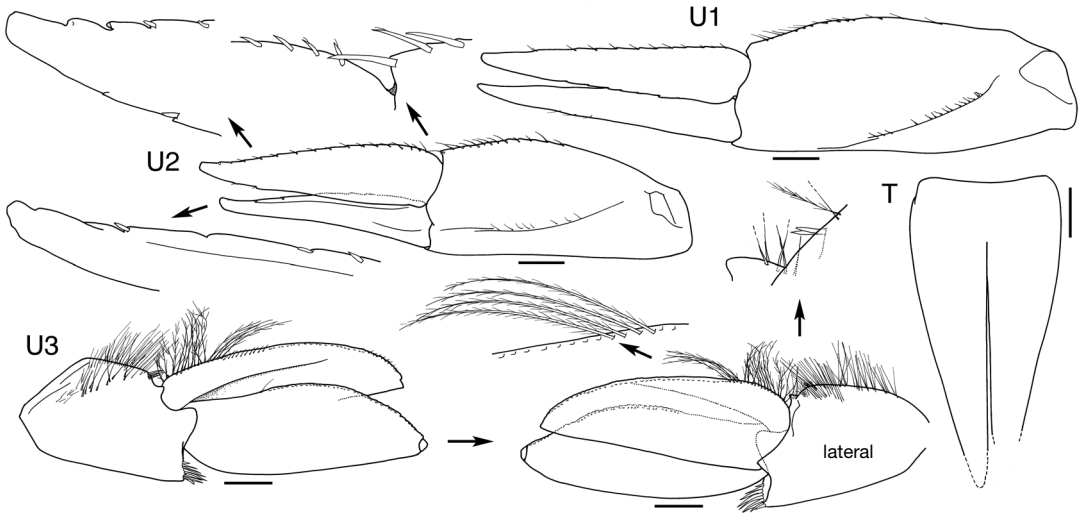

FIG. 7. — *Eurythenes gryllus* (Lichtenstein *in* Mandt, 1822), holotype of *Lysianassa magellanica* H. Milne Edwards, 1848, ♀ *c.* 85 mm (MNHN-Am 3148). Abbreviations: **T**, telson; **U1**-**U3**, uropods 1-3. Scale bars: 1.0 mm.

greatly enlarged, covering article 2 laterally; peduncular article 3 short, 0.7 times article 4; [flagellum missing].

Mouthpart bundle subquadrate. Epistome and upper lip separate; epistome produced, angular; upper lip not produced, slightly rounded. Mandible incisors symmetrical, large, with smooth slightly convex margins; lacinia mobilis a long slender distally-cuspidate robust seta; accessory setal row left row with 13, right row with 15, short, slender, robust setae; intermediate setae pappose; molar large, setose with vestigial distal triturating patch; palp attached midway, article 1 short, length 1.3 times breadth, article 2 slender, length 2.6 times breadth, once article 3, with many submarginal posterodistal A2-setae, without D2-setae, article 3 falcate, long, length 3.2 times breadth, with one proximal A3-seta, with 46 D3-setae along most of posterior margin, with eight to 10 apical and subapical E3-setae. Maxilla 1 inner plate narrow, with 15 apical pappose setae; outer plate narrow, with 11 setal-teeth in 8/3 crown arrangement, with ST1 to ST3 large, slender, smooth to weakly cuspidate, ST4 to ST6 large, slender, four- to six-cuspidate, ST7 slightly displaced from ST6, long, slender, curved, nine-cuspidate medially; STA to STD large, broad, two- to six-cuspidate; palp large, two-articulate, with three apical and four subapical long robust setae and four subapical slender setae, flag seta absent, distomedial margin smooth. Maxilla 2 inner and outer plates broad; inner plate length 0.7 times outer plate. Maxilliped inner plate large, subrectangular, with four apical nodular robust setae and seven distal robust setae on lateral face near inner margin, oblique setal row well developed, with 14 pappose setae; outer plate medium size, subovate, with 18 apical pappose setae, with three apical robust setae, medial setae small, bead-shaped, submarginal setae absent; palp large, four-articulate, article 2 very broad, length 1.5 times breadth, 1.3 times article 3, article 3 long, slender, length 2.6 times breadth, dactylus well developed, with 10 subapical setae, unguis present.

Pereonites 1 and 2 dorsally smooth, pereonites 3 to 7 with mid-dorsal ridge. Gnathopod 1 parachelate; coxa vestigial; basis long, slender, length 2.2 times breadth, anterior margin smooth, with many slender setae; ischium short, length 1.4 times breadth; merus posterior margin lined with long slender setae; carpus wedge-shaped, not

produced anteriorly, short, length 1.4 times breadth, shorter than (0.85 times) propodus, with long slender setae near posterodistal corner; propodus large, subrectangular, length twice breadth, tapering distally, posterior margin subtly sinusoidal, smooth, with slender setae, palm transverse, margin convex (posterior to small robust seta near insertion of dactylus), smooth, posterodistal corner with one medial and one lateral robust seta; dactylus simple, without subapical spines or slender setae. Gnathopod 2 minutely subchelate; coxa small, shorter than coxa 3; ischium long, length 3.6 times breadth; carpus long, length 4.2 times breadth, posterior margin straight; propodus subrectangular, long, length 3 times breadth, palm transverse, with straight, smooth margin, with two medial and four lateral robust setae; dactylus reaching corner of palm, posterior margin smooth. Pereopod 3 coxa large; merus expanded anteriorly; propodus with many slender setae along posterior margin and one posterodistal robust seta; dactylus short, stocky. Pereopod 4 coxa about as deep as wide (length 1.1 times breadth), with large posteroventral lobe, anterior margin slightly rounded; merus expanded anteriorly; dactylus short, slender. Pereopod 5 coxa with anterior and posterior lobes subequal; basis expanded posteriorly, posterior margin minutely crenate; merus expanded posteriorly, with curved posterior margin; propodus with nine groups of robust setae along anterior margin and two anterodistal robust setae; dactylus short, slender. Pereopod 6 coxa small, not lobate posteriorly; basis expanded posteriorly with minutely crenate posterior margin; merus expanded posteriorly, with slightly curved posteroproximal margin and slightly curved posterodistal margin; propodus with eight groups of robust setae along anterior margin and two anterodistal robust setae; dactylus short, stocky. Pereopod 7 basis expanded posteriorly, anterior length 1.2 times breadth, posterior margin slightly rounded, minutely crenate, posteroventral corner rounded, posteroventral margin straight; merus expanded posteriorly, with sloping straight posteroproximal margin and straight posterodistal margin; propodus with nine groups of robust setae along anterior margin, two anterodistal robust setae and three pairs of robust setae along posterior margin; dactylus short, stocky.

Oostegites present from gnathopod 2 to pereopod 5, long, setose. Gills present from gnathopod 2 to pereopod 7.

Pleonites 1 to 3 with mid-dorsal ridge, increasing in size posteriorly; pleonite 3 with anterodorsal notch. Epimeron 1 anteroventral corner rounded with a few short slender setae. Epimeron 2 ventral margin lined with short fine setae; posteroventral corner produced into sharp spine. Epimeron 3 ventral margin lined with short fine setae; posteroventral corner broadly rounded. Urosomite 1 with anterodorsal notch. Uropod 1 peduncle with 35 dorsolateral, 19 dorsomedial and three apicomedial robust setae; rami subequal in length; outer ramus with 20 lateral and seven medial robust setae; inner ramus with 11 lateral and 11 medial robust setae. Uropod 2 peduncle with 21 dorsolateral, 12 dorsomedial and one apicomedial robust setae; rami subequal in length; outer ramus with 21 lateral and eight medial robust setae; inner ramus with 13 lateral and 16 medial robust setae, without constriction. Uropod 3 peduncle short, length 1.7 times breadth, without dorsolateral flange, with three apicomedial robust setae, without midmedial slender or robust setae, with at least 10 distoventral robust setae, with lightly plumose setae on dorsomedial margin; rami paddle-like, subequal in length, inner ramus about 0.9 times outer ramus; outer ramus two-articulate; both rami with a few small robust setae on distolateral margin, slender plumose setae present on both rami; [most of the distal setae are missing, only insertion points remain]. Telson longer than broad, length twice breadth, deeply cleft (80%), without dorsal setae, distally tapered, tips of both lobes damaged.

Remarks

The mid-dorsal ridge is distinct but low from pereonite 3 to pleonite 1; from pleonite 2 to urosomite 1 the ridge is strong enough to be described as a slight carina, strongest on pleonite 3. On all segments the ridge is slightly more pronounced posteriorly.

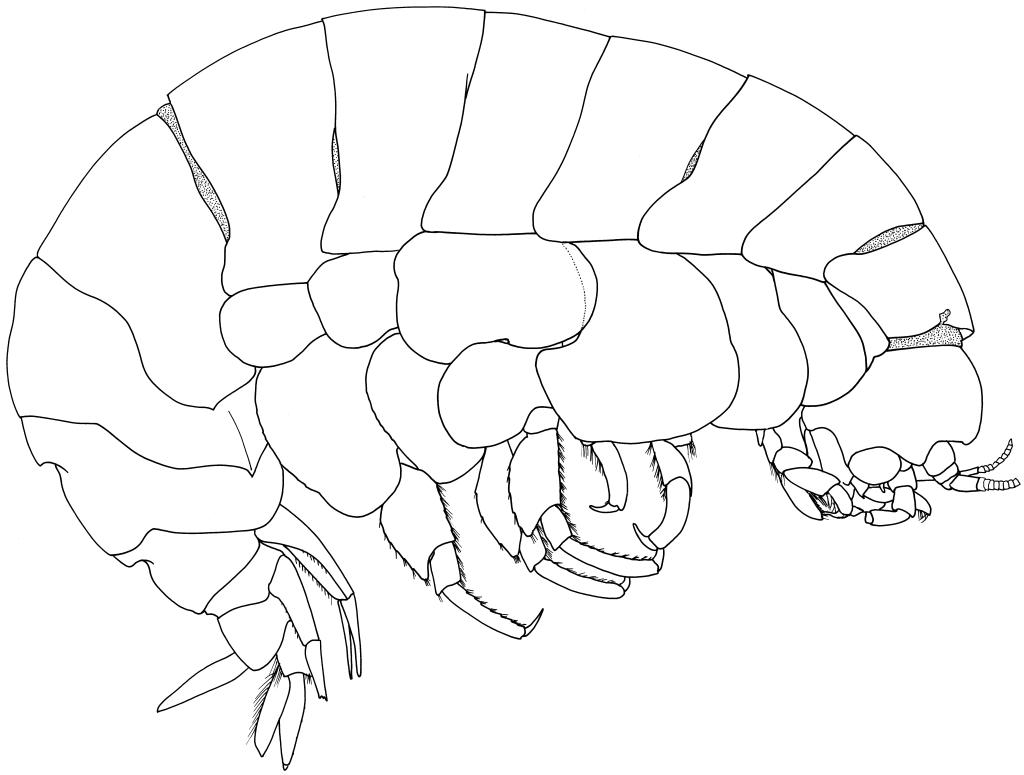

FIG. 8. — *Eurythenes gryllus* (Lichtenstein *in* Mandt, 1822), material reported as *Eurytenes magellanicus* by Lilljeborg (1865a), immature ♀ 55 mm (MNHN-Am 4479).

LILLJEBORG'S SPECIMEN (FIGS 8-10)

Material of Lilljeborg 1865a (as *Eurytenes magellanicus*), immature female, 55 mm, with short non-setose oostegites, Bear Island, Arctic Ocean, [*c.* 74°N, 19°E], from stomach of *Scymnus borealis* (MNHN-Am 4479).

The label with this specimen reads: "*Eurythenes magellanicus*. Île Boeren. Mer Glaciale. Lilljeborg. 133-67". Lilljeborg (1865a: 3, 4), recorded three specimens of *Lysianassa magellanica* brought to the Zoological Museum by Mr Th. M. Fries, who "had received them from a shipper in Hammerfest, who had found them in the belly of an 'Haaskierding' […], on the banks by Beeren Island". Bate (1867), writing in the *Zoological Record for 1866*, commented that he had received a letter from M. Alphonse Milne-Edwards saying that "J'ai reçu dernièrement de M. le Prof. Lilljeborg un exemplaire de son *Eurytenes magellanicus* […]". With the agreement of Drs Saint Laurent and Defaye of MNHN, we believe the specimen we illustrate here is the one sent to Paris by Lilljeborg, and one of the three specimens he used when establishing the genus *Eurytenes*.

Description

Head much deeper than long, not extending much below insertion of antenna 2, anterodorsal margin smooth; lateral cephalic lobe small, narrowly rounded; rostrum absent; eyes not apparent. Antenna 1 short; peduncular article 1 short, length equals breadth, distal margin with small midmedial swelling; peduncular article 2 short, 0.37 times article 1; peduncular article 3 short, 0.19 times article 1; accessory flagellum 10+-

articulate [broken], article 1 long, 4.4 times article 2; flagellum 10+-articulate [broken], with strong two-field callynophore, flagellum without robust setae, calceoli absent. Antenna 2 length not known; peduncle with weak brush setae [setae missing but insertion points visible]; peduncular article 1 enlarged, covering article 2 laterally; peduncular article 3 short, subequal to article 4; flagellum missing.

Mouthpart bundle subquadrate. Epistome and upper lip separate, epistome produced, rounded; upper lip not produced, slightly rounded. Mandible incisors large, with slightly convex margins; lacinia mobilis a long slender distally-cuspidate robust seta; accessory setal row left and right with nine short, slender, robust setae; intermediate setae pappose; molar large, setose with vestigial distal triturating patch; palp attached midway; article 1 short, length 1.4 times breadth; article 2 slender, length 2.9 times breadth, 1.1 times article 3, with many submarginal posterodistal A2-setae, without D2-setae; article 3 falcate, long, length 3.1 times breadth, with one proximal A3-seta, with about 50 D3-setae along most of posterior margin, with two apical and six subapical E3-setae. Maxilla 1 inner plate narrow, with eight apical and subapical pappose setae; outer plate narrow, with 11 setal-teeth in 8/3 crown arrangement; ST1 to ST6 large, slender, weakly cuspidate, ST7 slightly displaced from ST6, elongate, slender, curved, eight-cuspidate medially; STA large, broad, two-cuspidate; STB and STC large, broad, five-cuspidate; STD large, broad, six-cuspidate; palp large, two-articulate, with five apical and one apicolateral long robust setae, with three subapical setae, flag setae absent, distomedial margin smooth. Maxilla 2 inner and outer plates broad; inner plate length 0.6 times outer plate. Maxilliped inner plate large, subrectangular, with three apical nodular robust setae; oblique setal row well developed, with at least 16 pappose setae; outer plate medium sized, subovate, with 18 apical pappose setae and three apical robust setae, medial setae small, bead-shaped, submarginal setae vestigial; palp large, four-articulate, article 2 very broad, length 1.8 times breadth (when completely flattened), 1.4 times article 3, article 3 long, slender, length 2.8 times breadth, dactylus well developed, with seven subapical setae, unguis present.

Pereonites 1 to 4 dorsally smooth; pereonites 5 to 7 with slight mid-dorsal ridge. Gnathopod 1 parachelate; coxa vestigial; basis long, slender, length 2.3 times breadth, anterior margin smooth, with tufts of slender setae; ischium short, length 1.3 times breadth; merus posterior margin lined with long slender setae; carpus wedge-shaped, produced anteriorly, short, length 1.5 times breadth, shorter than (0.79 times) propodus, with long slender setae near posterodistal corner; propodus large, subrectangular, length twice breadth, slightly tapering distally, posterior margin subtly sinusoidal, smooth, with tufts of slender setae, palm transverse, margin straight, minutely serrate, posterodistal corner with one medial and one lateral robust seta; dactylus simple, without subapical spines or slender setae, reaching beyond palm. Gnathopod 2 minutely subchelate; coxa large, shorter than coxa 3; ischium long, length 3.4 times breadth; carpus long, length 4.3 times breadth, posterior margin straight; propodus subrectangular, long, length 3.1 times breadth, palm slightly obtuse, with convex, rugose margin, with two medial and two lateral robust setae; dactylus reaching corner of palm, posterior margin smooth. Pereopod 3 coxa large; merus expanded anteriorly; propodus with seven tufts of slender setae along posterior margin [some setae missing, insertion points visible] and one posterodistal robust seta; dactylus short, slender. Pereopod 4 coxa as deep as wide (length 1.02 times breadth), with large posteroventral lobe, anterior margin slightly rounded; merus expanded anteriorly; propodus with five tufts of slender setae along posterior margin and one posterodistal robust seta; dactylus short, slender. Pereopod 5 coxa anterior and posterior lobes subequal; basis expanded posteriorly, posterior margin minutely crenate; merus expanded posteriorly, with curved posterior margin; propodus with eight groups of two or three short robust setae along anterior margin and two anterodistal robust setae; dactylus short, slender. Pereopod 6 coxa small, not lobate posteriorly; basis expanded

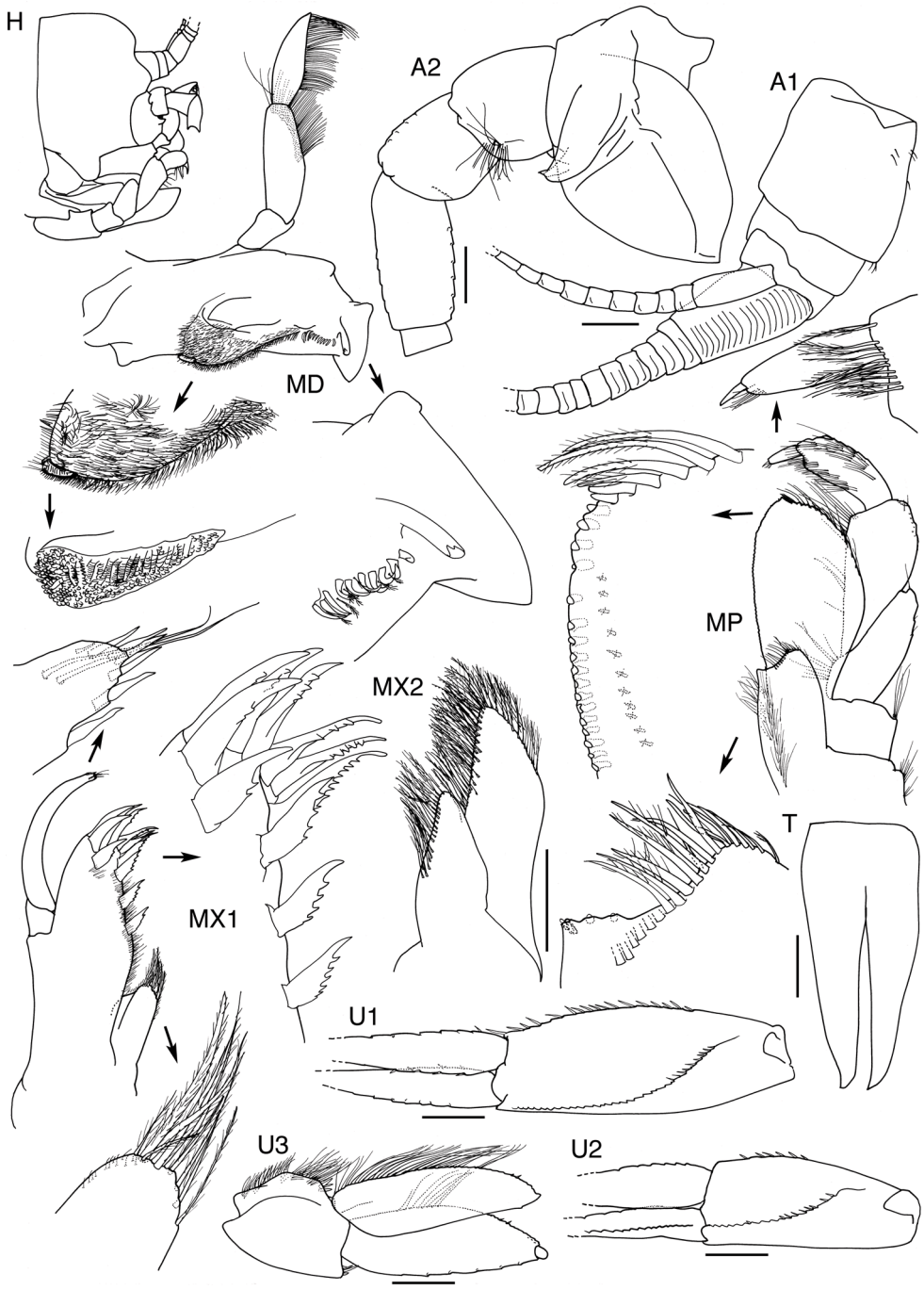

FIG. 9. — *Eurythenes gryllus* (Lichtenstein *in* Mandt, 1822), material reported as *Eurytenes magellanicus* by Lilljeborg (1865a), immature ♀ 55 mm (MNHN-Am 4479). Abbreviations: **A1**, **A2**, antennae 1, 2; **H**, head; **MD**, mandible; **MP**, maxilliped; **MX1**, **MX2**, maxillae 1, 2; **U1**-**U3**, uropods 1-3; **T**, telson. Scale bars: A1, A2, 0.5 mm; others, 1.0 mm.

posteriorly, posterior margin minutely crenate; merus expanded posteriorly, with curved posterior margin; propodus with eight groups of three or four short robust setae along anterior margin and two anterodistal robust setae; dactylus short, slender. Pereopod 7 basis expanded posteriorly, anterior length 1.1 times breadth, posterior margin slightly rounded, minutely crenate, posteroventral corner rounded, posteroventral margin straight; merus expanded posteriorly, with curved posterior margin; propodus with eight groups of two to five short robust setae along anterior margin and two anterodistal robust setae, with three pairs of robust setae along posterior margin; dactylus short, slender.

Oostegites present from gnathopod 2 to pereopod 5, short, non-setose. Gills present from gnathopod 2 to pereopod 7.

Pleonites 1 to 3 with slight but distinct middorsal ridge. Pleonite 3 with a deep anterodorsal notch. Epimeron 1 anteroventral corner rounded with a few short slender setae. Epimeron 2 ventral margin lined with short fine setae; posteroventral corner produced into sharp spine. Epimeron 3 ventral margin lined with short fine setae; posteroventral corner broadly rounded. Urosomite 1 with anterodorsal notch. Uropod 1 peduncle with 33 dorsolateral, at least 18 dorsomedial and one apicomedial robust setae; outer ramus with at least eight lateral and at least three medial robust setae; inner ramus with five lateral and at least eight medial robust setae [both rami missing distal portion]. Uropod 2 peduncle with 17 dorsolateral and about 10 dorsomedial robust setae; outer ramus with about 15 lateral and seven medial robust setae; inner ramus with at least two lateral and six medial robust setae [both rami missing distal portion]. Uropod 3 peduncle short, length 1.9 times breadth, without dorsolateral flange, with three apicomedial robust setae, without midmedial setae, with four distoventral robust setae, with lightly plumose setae on dorsomedial margin; rami paddle-like, subequal in length, inner ramus about 0.9 times outer ramus; outer ramus two-articulate, article 2 short, article 1 with six lateral and two medial robust setae; inner ramus with one lateral and two medial robust setae, slender plumose setae present on both rami. Telson longer than broad, length 2.3 times breadth, deeply cleft (79%), without dorsal setae, distally tapered, distal margins without setae [but both slightly damaged].

Comparison of the three specimens

These three specimens differ in many points, most of which are very slight and some of which may be due to difference in overall size. Differences in numbers of setae – for example in the accessory setal row of the mandible, on the inner plate of maxilla 1, on the inner and outer plates of the maxilliped, on the pereopods and on the uropods – are most likely size-related. So too is the development of the dorsal ridge. There are other small differences which do not appear to be size-related – for example the length to breadth of antenna 1 peduncular article 1 in the Milne Edwards specimen is slightly greater than in the other two specimens; the lateral cephalic lobe is slightly more rounded in the Lichtenstein specimen; the epistome is rounded in the Lilljeborg specimen but slightly angular in the Milne Edwards specimen; coxa 4 of the Milne Edwards specimen is slightly longer (relative to its breadth) than in the other two specimens.

The gnathopodal palms vary more than do other characters. Unfortunately neither of the gnathopod 1 dactyli is present in the Lichtenstein specimen, so it is not known if the dactyl overhung the palm or not. The size and shape of the gnathopod 1 palm in the Lichtenstein specimen is very similar to that of the Lilljeborg specimen (small, straight), but that of the Milne Edwards specimen is quite different (very small, convex). It is similar to that illustrated by Bowman & Manning (1972) for material from Guadalupe Island, eastern North Pacific Ocean. No other *Eurythenes* material that we have seen has this type of gnathopod 1, but it may be similar to that of the material recorded by Thurston *et al.* (2002) from the Atacama Trench, off northern Chile. The geographically closest specimens of the material recorded below – the large female from Macquarie Island and specimens from French Polynesia – have a small but straight,

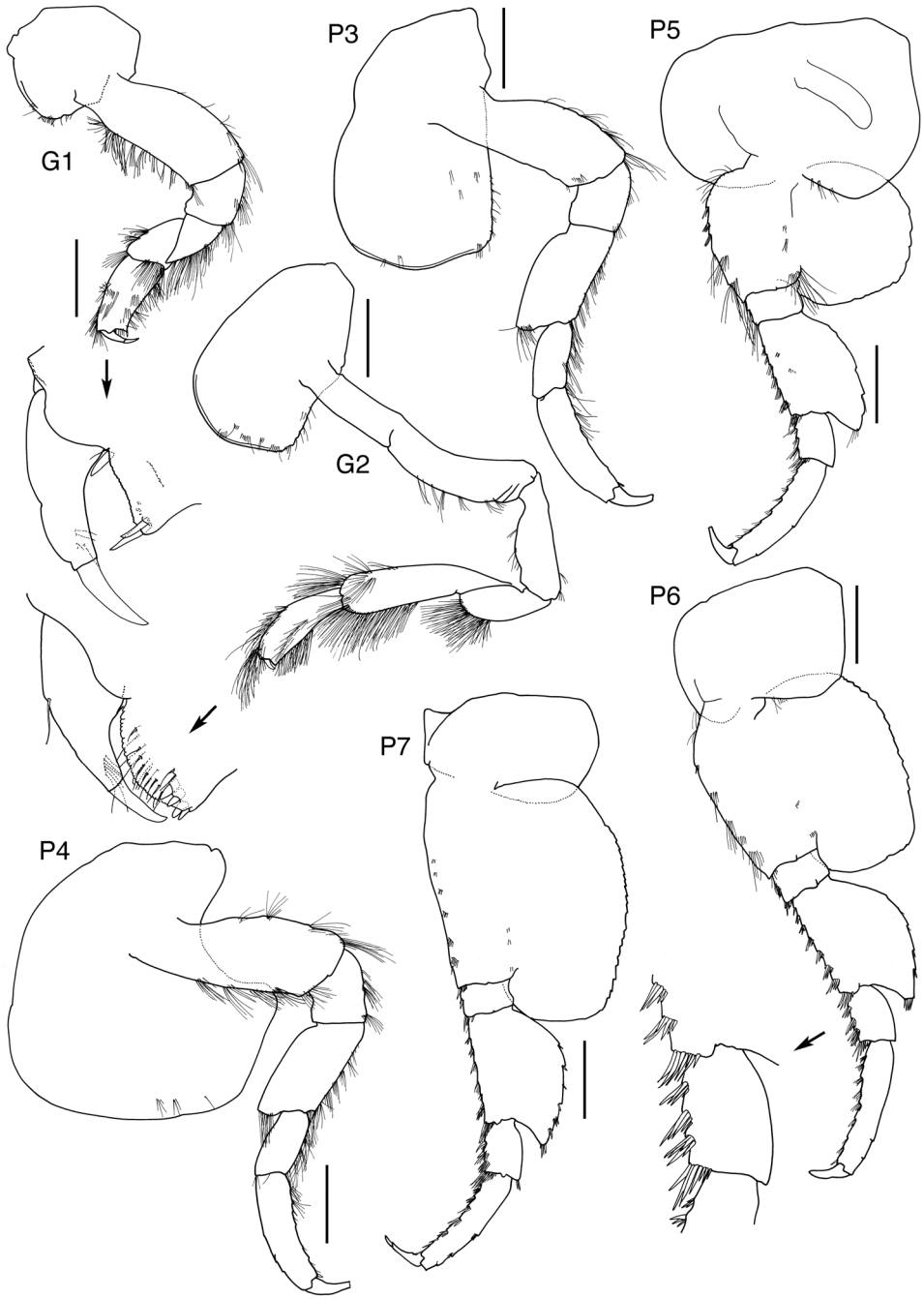

FIG. 10. — *Eurythenes gryllus* (Lichtenstein *in* Mandt, 1822), material reported as *Eurytenes magellanicus* by Lilljeborg (1865a), immature ♀ 55 mm (MNHN-Am 4479). Abbreviations: **G1**, **G2**, gnathopods 1, 2; **P3**-**P7**, pereopods 3-7. Scale bars: 1.0 mm.

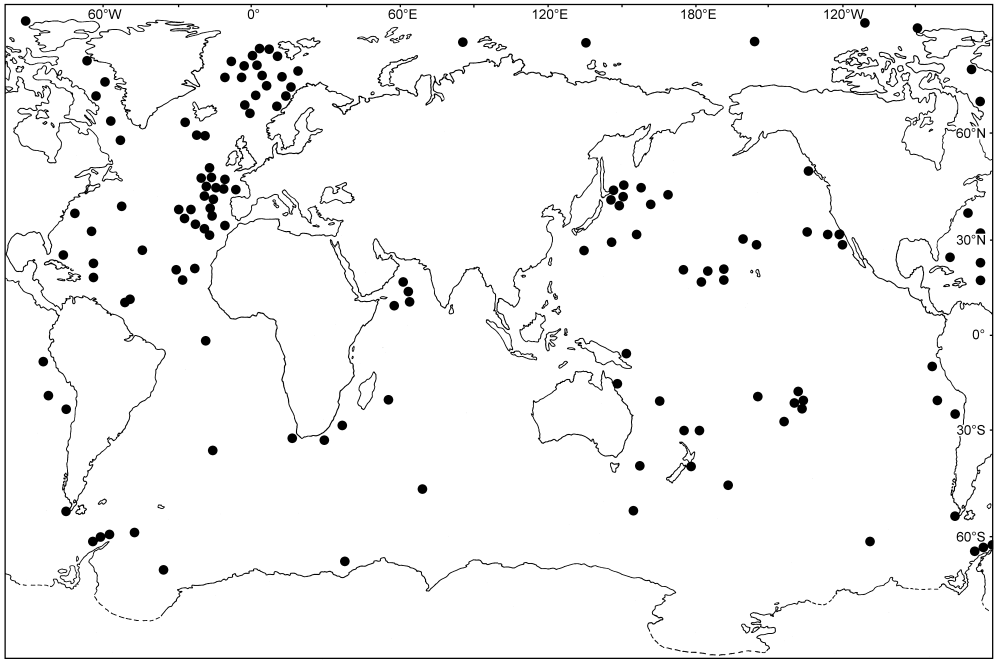

FIG. 11. — Recorded distribution of *Eurythenes gryllus* (Lichtenstein *in* Mandt, 1822).

transverse palm on gnathopod 1, similar to that of the Lichtenstein and Lilljeborg specimens. The gnathopod 2 palm is different in all three specimens: obtuse in the Lichtenstein specimen, slightly obtuse in the Lilljeborg specimen and transverse in the Milne Edwards specimen. There are five illustrations of *E. gryllus* gnathopods in the literature: Lilljeborg (1865a), Goes (1866), Sars (1891), Bowman & Manning (1972) and Rauschert (1985). They also show a diversity of size and shape in the propodus/palm of both gnathopods. There is no clear pattern to this variation.

It is possible that "*Lysianassa magellanica*" represents a valid species, but until additional material of this form is recognised the name remains a junior synonym.

OTHER MATERIAL EXAMINED. — **Australia.** E of Flynn Reef, Queensland, RV *Sunbird*, SEAS, stn QLD-930, 16°37.81'S, 146°23.08'E, 1000 m, baited trap, bottom temperature 5.2°C, 6-7.VI.1993, J. K. Lowry, P. Freewater & W. Vader, 1 immature ♀ with short non-setose oostegites, 48 mm; 2 immature ♂♂ without calceoli, 48 and 51 mm; 3 juveniles 31, 36 and 38 mm (AM P61826). — Same data, SEAS, stn QLD-931, 20 immature and juvenile specimens 16-30 mm (AM P50237). — Same data, SEAS, stn QLD-932, 3 juveniles 16-17 mm (AM P57605); 10 juveniles 16-25 mm (AM P50242). — Same data, SEAS, stn QLD-948, 23 immature and juvenile specimens 16-48 mm (AM P50290). — Same data, SEAS, stn QLD-949, 4 juveniles 17-24 mm (AM P50296). — Same data, SEAS, stn QLD-950, 7 immature specimens 22-28 mm (AM P61827). — E of Cairns, Queensland, RV *Franklin*, CIDARIS-1, stn 35.4, 16°54.4'S, 147°14.35'E, 1473-1590 m, beam trawl, 14.V.1986, M. Pichon, P. W. Arnold & R. A. Birtles, 1 ♂ without calceoli, 50 mm; 1 ♂ with calceoli, 65 mm (QM 2684).

Western South Pacific Ocean (material recorded as *Eurythenes* cf. *gryllus* in Lowry & Stoddart 1994): **New Caledonia.** RV *Vauban*, stn CA-1, 20°44'S, 166°27'E, 1000 m, baited fish trap, A. Intes, 19.II.1977, 2 ♂♂ with calceoli, 52 and 64 mm; 1 immature specimen 46 mm (AM P28855).

Loyalty Islands. W of Lifou, 20°48.12'S, 166°53'E, 1620-1630 m, beam trawl, 1.V.1987, BIOGEOCAL, stn CP 317, 1 ♂ without calceoli, 50 mm (MNHN-Am 4403).

French Polynesia. Fangataufa Atoll, Tuamotu Archipelago, 22°16'S, 138°42'W, 900-1000 m, baited trap, J. Poupin, 1 ♀ with setose oostegites, 90 mm; 2 ♂♂ with calceoli, 62 and 78 mm (AM P42139). —

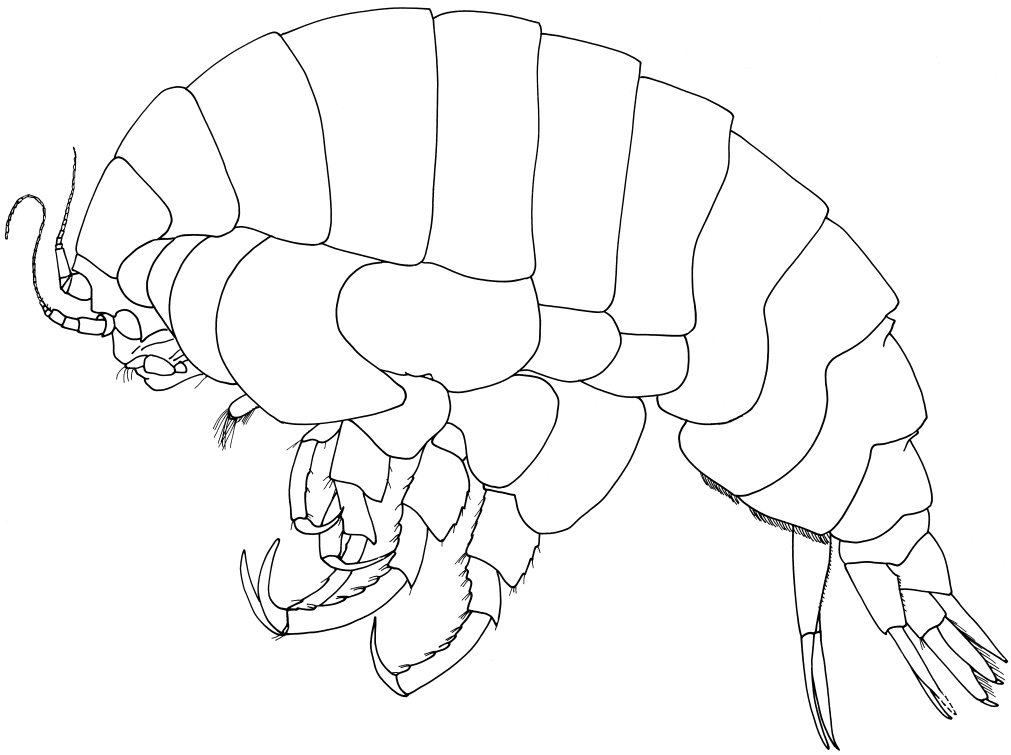

FIG. 12. — *Eurythenes obesus* (Chevreux, 1905), neotype ♀ 48 mm (BMNH 2003.1059).

Just off Rapa, Austral Isles, RV *Marara*, SMCB, stn FRP-54, 27°35.3'S, 144°15.5'W, 870 m, baited trap, J. K. Lowry & J. Poupin, 17-18.VIII.1991, 1 ♂ without calceoli, 50 mm (AM P42138).
Southern Ocean: **Macquarie Island**. Bauer Bay, [*c.* 54°33'S 158°58'E], regurgitated by chick of Light-mantled Sooty Albatross, 3.I.1964, K. G. Simpson, Ser. No. M/64/Ar/1, 1 mature ♀ with setose oostegites, 120 mm (AM P62147).

REMARKS

None of the specimens from trap samples on the east coast of Australia were mature. The largest female (48 mm) was only beginning to develop oostegites. However, the deepest trapset used in the project in which these specimens were caught was at 1000 m depth. This is probably the very top of the species' bathymetric range in this area. Traps set at shallower depths in the same locality did not collect any *Eurythenes*.

The very large (120 mm) female from Macquarie Island has a well developed oostegite on gnathopod 1. It is the only specimen in this collection to have five pairs of oostegites. The next largest (90 mm) female, from French Polynesia, has four pairs of long, well developed, setose oostegites but no trace of an oostegite on gnathopod 1.

Eurythenes obesus (Chevreux, 1905) (Figs 12-15)

Katius obesus Chevreux, 1905: 1, figs 1-3; 1935: 63. — Stebbing 1906: 721. — Tattersall 1906: 29; 1909: 210. — Stephensen 1912a: 89; 1912b: 614; 1913: 123; 1915: 37; 1925: 126; 1933: 12, 13, 18, figs 6, 7. — Shoemaker 1920: 8E; 1956: 177. — Schellenberg 1926: 217, fig. 26d; 1927: 681, fig. 72; 1931: 16. — K. H. Barnard 1932: 56, fig. 21, pl. 1 fig. 1. — Belloc 1960: 7. — Costello *et al.* 1989: 32.

Eurythenes obesus – Schellenberg 1955: 183, 192. — Shoemaker 1956: 178. — J. L. Barnard 1958: 92; 1961: 38, fig. 8. — Birstein & Vinogradov 1960: 184; 1962: 36; 1964: 163; 1970: 420 (table 1). — Hurley 1963: 59. — Brusca 1967: 384. — Imber 1973: 652. — Bellan-Santini & Ledoyer 1974: 681, pl. 25. — Griffiths 1975: 145; 1976: 56, 100. — Lowry & Bullock 1976: 89. — Ortiz 1979: 19. — Andres 1983: 186; 1987: 96, 97. — Umezu 1984: 128. — Hopkins 1985: 202. — Costello *et al.* 1989: 32. — Barnard & Karaman 1991: 486. — Boudrias 1991: 13. — Palerud & Vader 1991: 35. — De Broyer & Jazdzewski 1993: 68. — Kaufmann 1994: 54. — Piatkowski *et al.* 1994: 19 (table 1). — Thurston & Bett 1995: 201. — Johnson *et al.* 2001: 198 (table 3). — Cherel *et al.* 2002a: 268 (table 3); 2002b: 288 (table 3), 292 (table 4).

Eurythenes gryllus – K. H. Barnard 1940: 440, 515 (list). — Springer & Bullis 1956: 6.

Eurythenes gryllus – Stephensen 1932: 356 (in part).

TYPE MATERIAL. — Chevreux's type specimen of *E. obesus*, a 12 mm ?♂ taken near the Azores, eastern North Atlantic Ocean, is now lost, according to Dr Christian Carpine of the Musée océanographique, Monaco. Because of the increasing complexity of species concepts in the genus *Eurythenes* it is important to fix the identity of *E. obesus* and establish the state of characters which are now considered important for delimiting species. Dr M. Thurston of the Southampton Oceanography Centre has made available a mature female specimen, taken near the Cape Verde Islands, eastern North Atlantic Ocean, which we here designate as the neotype for *E. obesus*. This is the specimen recorded and studied by Thurston & Bett (1995).
Neotype: ♀ 48 mm, with setose oostegites and hatchlings (BMNH 2003.1059), RRS *Discovery*, stn 9541#30, NE of Cape Verde Islands, eastern North Atlantic Ocean, 20°1.8'N, 21°19.8'W-20°1.3'N, 21°20.0'W, 995-1500 m over bottom depth 3800-3850 m, rectangular midwater trawl RMT 8, 1921-2321 hours, 22.IV.1977.

ADDITIONAL MATERIAL EXAMINED. — **Eastern North Atlantic Ocean.** RRS *Discovery*, stn 8508#13, 44°4.3'N, 12°44.7'W-44°4.8'N, 12°47.9'W, 590-610 m, rectangular midwater trawl RMT 8, 0551-0651 hours, 14.IV.1974, ♂ with calceoli, 18 mm (BMNH 2003.1060).
Australia. Western Front, Eddy J, E of Sydney, NSW, 33°33'S, 152°34'E, 271 m, 1835-1935 hours, 2.X.1979, stn SP 10-79, B. Jeffries & R. Fritz, 1 ♀ with oostegite buds, 25 mm (AM P31001). — SE of Montague Island, NSW, FRV *Kapala*, stn K77-19-01, 36°24'S, 150°18'E-36°30'S, 150°17'E, 128 m over bottom depth 146 m, midwater trawl, 0900-1125 hours, 1.XI.1977, 1 ♀ with setose oostegites, 80 mm (AM P30498). — S of Point Hicks, Victoria, RV *Franklin*, stn SLOPE 38, 38°39.23'S, 149°15.00'E, 1500 m over bottom depth 2900-3200 m, 8 m rectangular midwater trawl, 24.VII.1986, M. F. Gomon *et al.*, 1 ♀ with oostegite buds, 24 mm (NMV J 52806). — Off Freycinet Peninsula, Tasmania, RV *Franklin*, stn SLOPE 42, 42°03.30'S, 148°57.90'E, 900-1000 m over bottom depth 2100-2300 m, 8 m rectangular midwater trawl, 26.VII.1986, M. F. Gomon & L. Hamond, 1 juvenile 16 mm (NMV J 52807). — Off Freycinet Peninsula, Tasmania, RV *Franklin*, stn SLOPE 44, 42°13.00'S, 148°46.10'E, 500-1000 m over bottom depth 1700 m, 8 m rectangular midwater trawl, 27.VII.1986, M. F. Gomon *et al.*, 1 juvenile 22 mm (NMV J 52808). — 61 km ENE of Cape Tourville, Tasmania, RV *Franklin*, stn SLOPE 75, 41°58.49'S, 149°04.41'E, 3 m Isaacs-Kidd midwater trawl over bottom depth 1685-2524 m, 28.X.1988, G. C. B. Poore *et al.*, 1 ovigerous ♀ 34 mm; 1 ♀ with oostegite buds, 24 mm (NMV J 52805).
Macquarie Island. Southern Ocean, [*c.* 54°35'S, 158°55'E], regurgitated by Northern Giant Petrel chick, *Macronectes halli*, 1970, G. W. Johnstone, 1 ♀ with setose oostegites, 53 mm (AM P20352).
Southern Ocean. 55°01.9'S, 99°53.7'E, to 1000 m, stn 125, rectangular midwater trawl, 0815-0900 hours, 15.III.1981, J. Kirkwood, 1 ♀ with setose oostegites, 50 mm (AM P62437). — 64°18.3'S, 78°43.9'E, to 980 m, stn 80, rectangular midwater trawl, 1742-1812 hours, 18.II.1981, J. Kirkwood, 1 juvenile, 16 mm (AM P62438).

DIAGNOSIS. — Anterodorsal margin of head smooth. Gnathopod 1 parachelate; basis length 2 to 2.5 times breadth; propodus slightly tapering distally. Pereopods 3 to 7 dactyli long. Pereopod 4 coxa as deep as wide. Pereopod 7 basis length of anterior margin subequal to breadth; posteroventral margin rounded. Pleonite 3 with anterodorsal notch. Epimeron 3 posteroventral corner subquadrate. Urosomite 1 not dorsodistally produced over urosomite 2. Uropod 3 peduncle, medial face with robust setae.

DESCRIPTION

Based on neotype female. Head much deeper than long, not extending much below insertion of antenna 2, anterodorsal margin smooth; lateral cephalic lobe small, subacute; rostrum absent; eyes not apparent. Antenna 1 short; peduncular article 1 short, length 1.1 times breadth, distal margin without midmedial tooth; peduncular article 2 short, 0.2 times article 1; peduncular article 3 short; accessory flagellum 11-articulate, article 1 long, 3.3 times article 2; flagellum 25-articulate, with strong two-field callynophore, calceoli absent. Antenna 2 medium length,

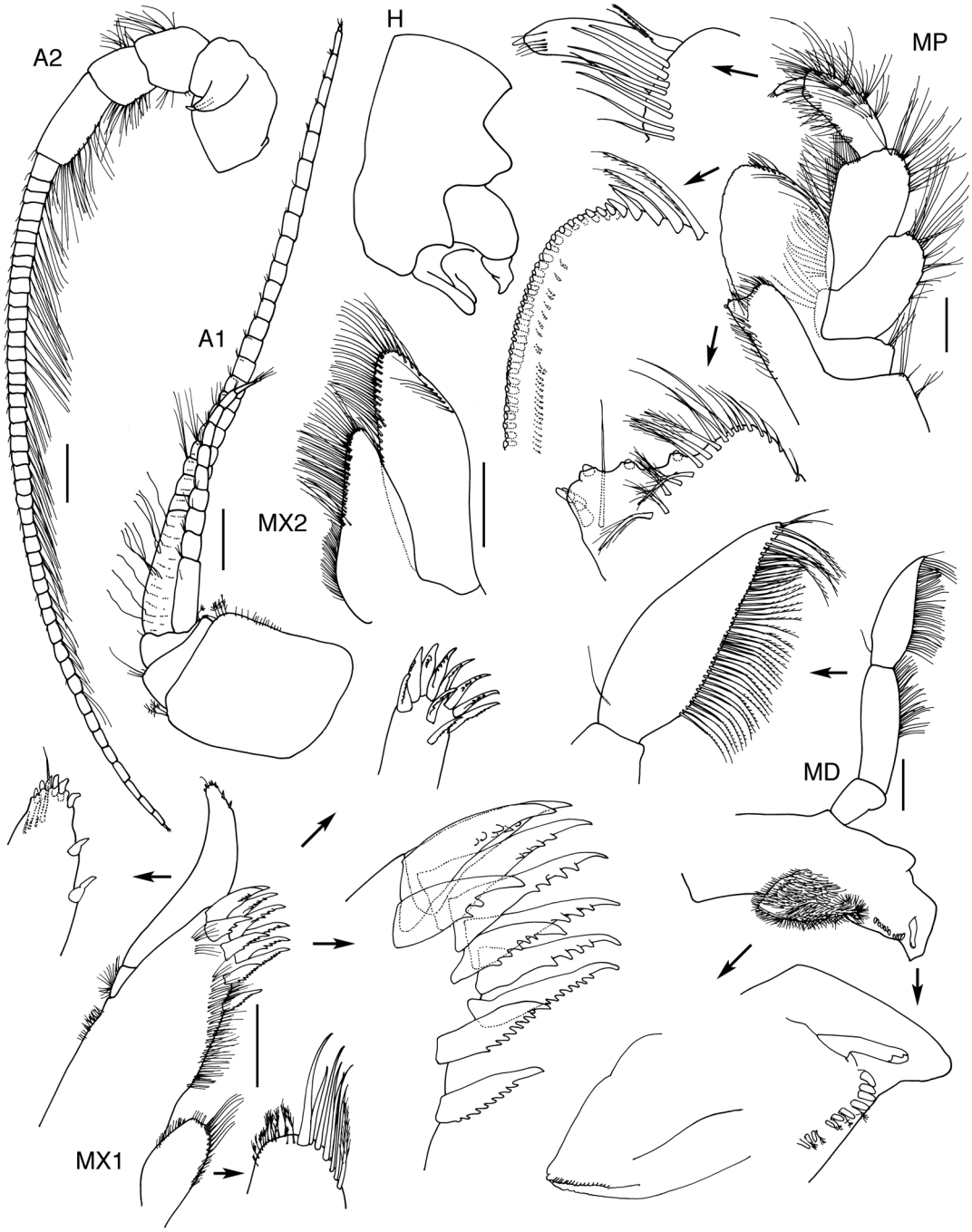

FIG. 13. — *Eurythenes obesus* (Chevreux, 1905), neotype ♀ 48 mm (BMNH 2003.1059). Abbreviations: **A1**, **A2**, antennae 1, 2; **H**, head; **MD**, mandible; **MP**, maxilliped; **MX1**, **MX2**, maxillae 1, 2. Scale bars: 0.5 mm.

1.6 times antenna 1; peduncle without brush setae; peduncular article 1 enlarged, covering article 2 laterally; peduncular article 3 short, 1.3 times article 4; flagellum 46-articulate, calceoli absent.

Mouthpart bundle subquadrate. Epistome and upper lip separate, epistome produced, rounded; upper lip not produced, slightly rounded. Mandible incisors large, symmetrical, with slightly convex smooth margins; lacinia mobilis a long slender distally-cuspidate robust seta; accessory setal row left and right with 10 short, slender, robust setae; intermediate setae pappose; molar large, setose, with vestigial distal triturating patch; palp attached midway; article 1 short, length 1.4 times breadth; article 2 slender, length 3.2 times breadth, 1.1 times article 3, with many submarginal posterodistal A2-setae, without D2-setae; article 3 falcate, long, length 3.2 times breadth, with one proximal A3-seta, with about 44 D3-setae along most of posterior margin, with two apical and four subapical E3-setae. Maxilla 1 inner plate narrow, with eight apical and subapical pappose setae; outer plate narrow, with 11 setal-teeth in 8/3 crown arrangement; ST1 to ST3 large, slender, three- to four-cuspidate, ST4 to ST6 large, slender, four-cuspidate, ST7 slightly displaced from ST6, elongate, slender, nine-cuspidate medially; STA large, broad, two-cuspidate; STB to STD large, broad, five- to eight-cuspidate; palp large, two-articulate, with five apical and three apicolateral short robust setae, and four subapical slender seta, flag seta absent, distomedial margin smooth. Maxilla 2 inner and outer plates broad; inner plate length 0.7 times outer plate. Maxilliped inner plate large, subrectangular, with three apical nodular robust setae and three robust setae on lateral face; oblique setal row well developed, with at least 30 pappose setae; outer plate medium size, subovate, with 10 apical pappose setae and three apical robust setae, medial setae small, bead-shaped, submarginal setae vestigial; palp large, four-articulate, article 2 very broad, length 1.8 times breadth, 1.3 times article 3, article 3 long, slender, length 2.7 times breadth, dactylus well developed, with five subapical setae, unguis present.

Pereonites 1 and 2 dorsally smooth; pereonites 3 to 7 with sharp dorsal ridge. Gnathopod 1 parachelate; coxa vestigial; basis long, slender, length 2.3 times breadth, anterior margin smooth, with tufts of slender setae; ischium short, length 1.4 times breadth; merus posterior margin lined with long slender setae; carpus wedge-shaped, slightly produced anteriorly, short, length 1.4 times breadth, shorter than (0.7 times) propodus, with long slender setae near posterodistal corner; propodus large, subrectangular, length 2.1 times breadth, slightly tapering distally, posterior margin subtly sinusoidal, smooth, with tufts of slender setae, palm transverse, margin slightly convex, minutely serrate, posterodistal corner with one medial and one lateral robust seta; dactylus simple, without subapical spines or slender setae, reaching beyond corner of palm. Gnathopod 2 minutely subchelate; coxa small, shorter than coxa 3; ischium long, length 3.9 times breadth; carpus very long, length 5.2 times breadth, posterior margin straight; propodus subrectangular, long, length 4.0 times breadth, palm transverse, with convex, minutely serrate margin, with one medial and one lateral robust seta; dactylus not reaching corner of palm, posterior margin smooth. Pereopod 3 coxa large; merus weakly expanded anteriorly; propodus with four groups of slender setae along posterior margin and one posterodistal robust seta; dactylus long, slender. Pereopod 4 coxa deeper than wide (length 1.1 times breadth), with large posteroventral lobe, anterior margin curved; merus weakly expanded anteriorly; propodus with four groups of slender setae along posterior margin and one posterodistal robust seta; dactylus long, slender. Pereopod 5 coxa with anterior and posterior lobes subequal; basis expanded posteriorly, posterior margin smooth; merus expanded posteriorly, with sloping posteroproximal margin and straight posterodistal margin; propodus with five short robust setae along anterior margin and two anterodistal robust setae; dactylus long, slender. Pereopod 6 coxa small, not lobate posteriorly; basis expanded posteriorly, posterior margin minutely crenate; merus expanded posteriorly, with curved posterior

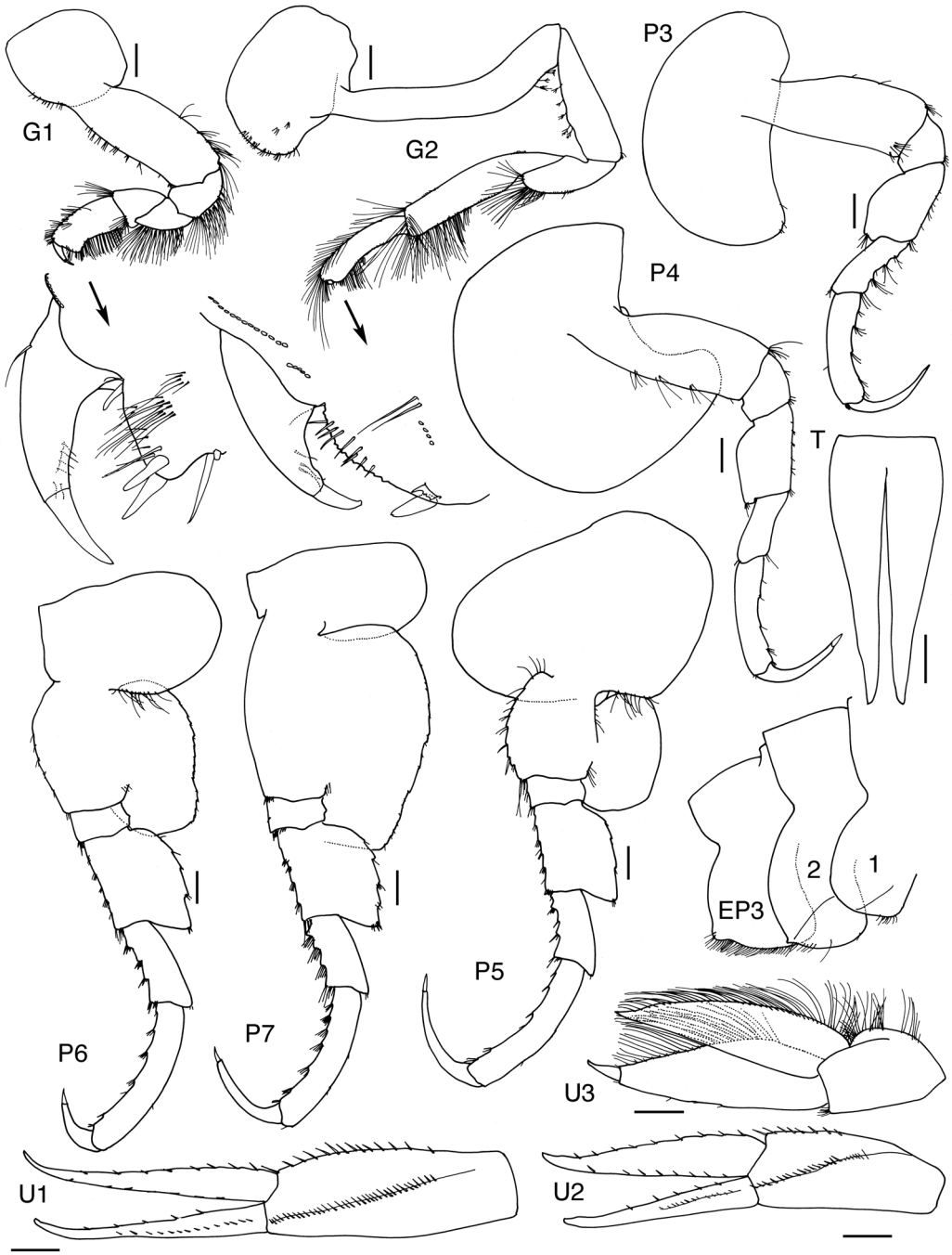

FIG. 14. — *Eurythenes obesus* (Chevreux, 1905), neotype ♀ 48 mm (BMNH 2003.1059). Abbreviations: **EP1**-**EP3**, epimera 1-3; **G1**, **G2**, gnathopods 1, 2; **P3**-**P7**, pereopods 3-7; **T**, telson; **U1**-**U3**, uropods 1-3. Scale bars: 1.0 mm.

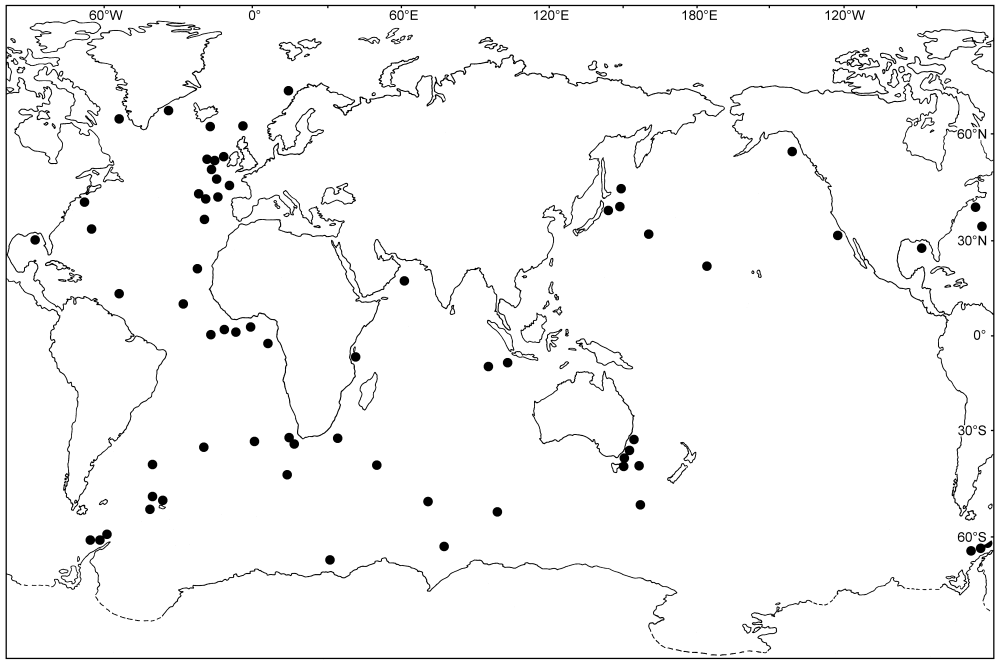

FIG. 15. — Recorded distribution of *Eurythenes obesus* (Chevreux, 1905).

margin; propodus with five groups of short robust setae along anterior margin and two anterodistal robust setae; dactylus long, slender. Pereopod 7 basis expanded posteriorly, anterior length subequal to breadth, posterior margin slightly rounded, minutely crenate, posteroventral corner subquadrate, posteroventral margin straight; merus expanded posteriorly, with curved posterior margin; propodus with five groups of four to eight short robust setae along anterior margin, two anterodistal robust setae and two pairs of robust setae along posterior margin; dactylus long, slender.

Oostegites present from gnathopod 2 to pereopod 5, long, setose. Gills present from gnathopod 2 to pereopod 7.

Pleonites 1 to 3 with sharp dorsal ridge. Pleonite 3 with an anterodorsal notch. Epimeron 1 anteroventral corner subquadrate with a few short slender setae. Epimeron 2 ventral margin lined with short fine setae; posteroventral corner produced into sharp spine. Epimeron 3 ventral margin lined with short fine setae; posteroventral corner subquadrate. Urosomite 1 with anterodorsal notch, with a dorsal ridge. Uropod 1 peduncle with 34 dorsolateral, 12 dorsomedial and one apicomedial robust setae, without plumose setae; rami subequal in length; outer ramus with 14 lateral and five medial robust setae; inner ramus with seven lateral and eight medial robust setae. Uropod 2 peduncle with 23 dorsolateral, two apicolateral, seven dorsomedial and one apicomedial robust setae; rami subequal in length; outer ramus with 16 lateral and five medial robust setae; inner ramus with nine lateral and nine medial robust setae. Uropod 3 peduncle short, length 1.4 times breadth, without dorsolateral flange, with four apicomedial, three midmedial and six distoventral robust setae, with lightly plumose setae on dorsomedial margin; rami paddle-like, subequal in length, inner ramus about 0.9 times outer ramus; outer ramus two-articulate, article 2 short, article 1 with three lateral and 11 distome-

dial robust setae; inner ramus with 11 distomedial robust setae; slender plumose setae present on both rami. Telson longer than broad, length 2.4 times breadth, deeply cleft (83%), without dorsal robust setae, distally tapered, without apical setae.

REMARKS

The 80 mm female from SE Australia (AM P30498) is the largest specimen of *E. obesus* so far recorded. It has long, setose oostegites but was not carrying eggs or young. The oostegites were flat against the sternum; the gonopore is large and the encircling rim of tissue is soft; this female may have been close to producing a brood. There is no trace of an oostegite on gnathopod 1. This specimen is also notable for where it was captured: at 128 m depth over a bottom depth of 146 m. Although *E. gryllus* has occasionally been taken at relatively shallow depths such captures have been made over deep water (e.g., three records at 200 m or less recorded by Andres [1983], but over bottom depths of 3000-4000 m). The previously shallowest recorded bottom depth over which *E. obesus* has been captured is 950 m (Andres 1983).

Very little is known of the life habits of *E. obesus*. It has never been taken in baited traps; has frequently been taken in midwater trawls; and has once been recorded as burrowing into a salp (Stephensen 1915), once as having coelenterate remains in the stomach (Hopkins 1985), once with possibly siliceous sponge spicules in the stomach (Brusca 1967), and once as attacking fish taken in midwater trawls (Thurston & Bett 1995).

Eurythenes thurstoni n. sp.
(Figs 16-20)

Eurythenes gryllus – ?Hurley 1957: 2 (in part). — J. L. Barnard 1961: 35 (in part), figs 6, 7 (material from South Pacific). — Lowry & Stoddart 1993: 72. — France & Kocher 1996a: 633 (in part).

Eurythenes cf. *gryllus* – Lowry & Stoddart 1994: 158 (in part).

Eurythenes sp. – France & Kocher 1996b: 306.

HOLOTYPE. — Australia, Tasman Sea, SE of Twofold Bay, New South Wales, FRV *Kapala*, stn K77-19-03, 37°24'S, 150°30'E-37°28'S, 150°33'E, 550 m over bottom depth 3658 m, midwater trawl, 1.XI.1977, K. Graham, ♀ 33 mm, with 18 juveniles in brood pouch (AM P62435).

PARATYPES. — **Australia.** Tasman Sea, SE of Twofold Bay, New South Wales, FRV *Kapala*, stn K77-19-03, 37°24'S, 150°30'E-37°28'S, 150°33'E, 550 m over bottom depth 3658 m, midwater trawl, 1.XI.1977, K. Graham, 1 ♂ with calceoli, 29 mm (AM P62436). — E of Flynn Reef, Queensland, RV *Sunbird*, SEAS, stn QLD-930, 16°37.81'S, 146°23.08'E, 1000 m, baited trap, bottom temperature 5.2°C, 6-7.VI.1993, J. K. Lowry, P. Freewater & W. Vader, 2 ♀♀ with non-setose oostegites, 30 mm; ♂ without calceoli, 21 mm (AM P62420). — Same data, SEAS, stn QLD-931, 1 ♂ with calceoli, 28 mm; 1 ♂ without calceoli, 20 mm; 3 immature specimens 16-19 mm (AM P62421). — Between Norah Head and Port Stephens, NSW, FRV *Kapala*, stn K79-19-02, 33°03'S, 152°58'E-32°59'S, 153°03'E, 640 m over bottom depth 2743 m, midwater trawl, 27.XI.1979, J. Paxton *et al.*, 1 ♀ with non-setose oostegites, 24 mm (AM P62422). — E of Botany Bay, NSW, HMAS *Cook*, stn JP 89-5, 33°44.5'S, 152°24.4'E-34°8.9'S, 152°9.7'E, 0-1800 m over bottom depth 2994-3828 m, midwater trawl, 27-28.IV.1989, J. Paxton, 1 ovigerous ♀ 34 mm (AM P62423). — Off Wollongong, NSW, MV *Robin E*, SEAS, stn NSW-788, 34°33.41'S, 151°21.35'E, 1000 m, baited trap, *Globigerina* ooze, bottom temperature 5.9°C, 6-7.V.1993, P. Freewater, S. Keable & W. Vader, 12 specimens (AM P44370). — Same data, SEAS, stn NSW-789, 2 juveniles 8.5 and 9 mm (AM P44380). — Same data, SEAS, stn NSW-808, 26 specimens (AM P44388). — E of Nowra, NSW, RV *Franklin*, stn SLOPE 11, 34°57.60'S, 151°16.20'E, 1402 m, 5 m otter trawl, 16.VII.1986, M. F. Gomon *et al.*, 1 ♀ with setose oostegites, 33 mm (NMV J14605). — 52 km ESE of Nowra, NSW, RV *Franklin*, stn SLOPE 51, 34°56.10'S, 151°14.69'E, 3 m Isaacs-Kidd midwater trawl, 21.X.1988, G. C. B. Poore *et al.*, 1 immature specimen 12 mm (NMV J15790). — S of Point Hicks, Victoria, RV *Franklin*, stn SLOPE 23, 38°31.60'S, 149°23.80'E, 1960 m, 8 m rectangular midwater trawl, 21.VII.1986, M. F. Gomon *et al.*, 25 specimens; 8 juveniles (NMV J15784). — Same locality, RV *Franklin*, stn SLOPE 35, 38°20.30'S, 149°18.40'E, 400-500 m over bottom depth 800 m, 8 m rectangular midwater trawl, 23.VII.1986, G. C. B. Poore *et al.*, 2 immature specimens 16 and 18 mm (NMV J13717). — Same locality, RV *Franklin*, stn SLOPE 38, 38°39.23'S 149°15.00'E, 1500 m over bottom depth 2900-3200 m, 8 m rectangular midwater trawl, 24.VII.1986, M. F. Gomon *et al.*, 22 specimens; 17 juveniles (NMV J15785); 1 ♀ with short non-setose oostegites, 17 mm; 2 ♂♂ with calceoli, 18 and 22 mm; 2 immature specimens 15.5

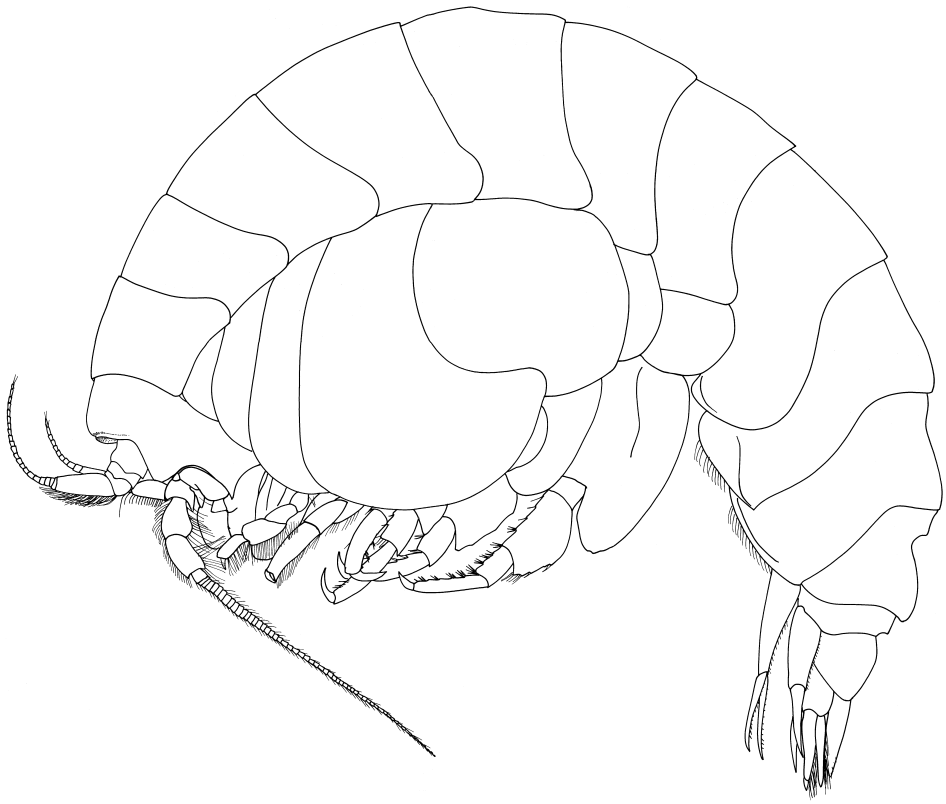

FIG. 16. — *Eurythenes thurstoni* n. sp., holotype ♀ 33 mm (AM P62435).

and 16 mm (NMV J13718). — 78 km S of Point Hicks, Victoria, RV *Franklin*, stn SLOPE 65, 38°30.13'S, 149°15.52'E, 3 m Isaacs-Kidd midwater trawl over bottom depth 1960-1990 m, 25.X.1988, G. C. B. Poore *et al.*, 8 ♀♀ with non-setose oostegites, 24-29 mm; 3 ♂♂ with calceoli, 22-24 mm; 1 immature specimen 13 mm (NMV J17158). — Off Freycinet Peninsula, Tasmania, RV *Franklin*, stn SLOPE 42, 42°03.3'S, 148°57.9'E-42°07.0'S, 148°57.0'E, 900-1000 m over bottom depth 2100-2300 m, 8 m rectangular midwater trawl, 26.VII.1986, M. F. Gomon & L. Hamond, 1 ovigerous ♀ 30 mm; 1 ♀ with setose oostegites, 31 mm; 2 ♀♀ with non-setose oostegites, 22 and 23 mm; 4 ♂♂ with calceoli, 19-24 mm; 1 immature specimen 17 mm (NMV J13719). — Same locality, RV *Franklin*, stn SLOPE 44, 42°13.00'S, 148°46.10'E, 500-1000 m over bottom depth 1700 m, 8 m rectangular midwater trawl, 27.VII.1986, M. F. Gomon *et al.*, 19 specimens (NMV J15786). — 61 km ENE of Cape Tourville, Tasmania, RV *Franklin*, stn SLOPE 75, 41°58.49'S, 149°04.41'E, 3 m Isaacs-Kidd midwater trawl over bottom depth 1685-2524 m, 28.X.1988, G. C. B. Poore *et al.*, 3 ovigerous ♀♀ 29-36.5 mm; 3 ♀♀ with non-setose oostegites, 17-15.5 mm; 1 ♂ with calceoli, 22 mm; 1 ♂ without calceoli, 20 mm (NMV J17157). — 52 km ENE of Cape Tourville, Tasmania, RV *Franklin*, stn SLOPE 76, 42°02.39'S, 148°58.26'E, 3 m Isaacs-Kidd midwater trawl over bottom depth 1695-2029 m, 28.X.1988, G. C. B. Poore *et al.*, 3 ovigerous ♀♀ 28-30 mm; 5 ♀♀ with non-setose oostegites, 18-29 mm; 6 ♂♂ with calceoli, 21-25.5 mm; 7 immature specimens 8-20 mm (NMV J17156). — Off St Patricks Head, Tasmania, FRV *Soela*, stn SO5/87/10, [*c.* 41°25'S, 148°43'E], 1000 m, 16.VII.1987, K. Graham, 1 ♀ with embryos, 30 mm; 3 ♀♀ with setose oostegites, 24-30 mm; 2 ♀♀ with non-setose oostegites, 18 and 20 mm; 7 ♂♂ with calceoli, 21-25 mm (AM P62424). — Same locality, FRV *Soela*, stn SO3/87/ gut #20, 800-900 m, from orange roughy stomachs, IV-V.1987, 1 ♀ with setose oostegites, 29 mm (AM P62425). — Same data, stn SO3/87/ gut #211, 1 ovigerous ♀ 29 mm (AM P62426). — Same data, 800-1000 m, stn SO3/87/08 gut #368, 1 ♀ with non-setose oostegites, 22 mm (AM P62427). — Same

data, stn SO4/87/06, 900-1000 m, VI.1987, 1 ♀ with setose oostegites, 29 mm (AM P62428). — Off Sandy Cape, Tasmania, FRV *Soela*, stn SO4/87/12 gut #447, [*c.* 41°13'S, 144°00'E], 840-940 m, from orange roughy stomachs, 9.VI.1987, 1 ♀ 22 mm; 1 immature specimen 20 mm (AM P62429). — Same data, stn SO4/87/12 gut #422, 1 ♀ with short non-setose oostegites, 22 mm (AM P62430). — Same data, stn SO4/87/13 gut #466, 750-840 m, VI.1987, 1 ♀ with juveniles, 31 mm (AM P62431). — Same data, stn SO4/87/19 gut #579, 750-820 m, 10.VI.1987, 1 ♂ 22 mm (AM P62432). — Same data, stn SO4/87/26, 100-1000 m, 14.VI.1987, 2 ♀♀ with setose oostegites, 21 and 31 mm (AM P62433). — South of Kangaroo Island, South Australia, FRV *Soela*, stn SO1/88/09 gut #13, [*c.* 37°00'S, 137°30'E], 700-1200 m, from orange roughy stomachs, I-II.1988, 1 ♀ with setose oostegites, 29 mm (AM P62434).

OTHER MATERIAL EXAMINED. — **Indonesia** (recorded as *Eurythenes gryllus* by Lowry & Stoddart 1993). Tanimbar Island, KARUBAR, stn CC 57, 8°19'S, 131°53'E, 603-620 m, otter trawl, 31.X.1991, 1 ♀ with non-setose oostegites, 24 mm.
Western South Pacific Ocean (some recorded as *Eurythenes* cf. *gryllus* by Lowry & Stoddart 1994): **Loyalty Islands Basin.** BIOGEOCAL, stn CP 265, 21°04.09'S, 166°00.40'E, 1760-1870 m, beam trawl, 18.IV.1987, 1 immature specimen 19 mm (MNHN-Am 4465).
Wallis and Futuna Islands. Combe Bank, MUSORSTOM 7, stn CP 550, 12°14.8'S, 177°28.0'W, 800-810 m, beam trawl, 18.V.1992, 1 ♀ with non-setose oostegites, 40 mm (MNHN-Am 4778). — Bayonnaise Bank, MUSORSTOM 7, stn CP 627, 11°54.2'S, 179°31.4'W, 597-600 m, beam trawl, 29.V.1992, 3 ♀♀ with non-setose oostegites, 46, 39.5 and 33 mm; 2 ♂♂ with calceoli, 36 and 34 mm; 1 immature specimen, 25 mm (MNHN-Am 4779). — Bayonnaise Bank, MUSORSTOM 7, stn CP 632, 11°54.0'S, 179°31.5'W, 595-600 m, beam trawl, 29.V.1992, 1 ♂ with calceoli, 34 mm (MNHN-Am 4780).
Tonga. [*c.* 20°S, 175°W], 617-747 m, trapped, M. King, 2 ♀♀ with non-setose oostegites, 42 and 40 mm; 1 ♂ with calceoli, 30.5 mm (AM P62439).
Tasman Sea. RV *Tangaroa*, NORFANZ, stn TAN0308/111, 32°36.30'S 167°47.44'E, 1008-1029 m, beam trawl, 29.V.2003, P. B. Berents, 1 ♀ with calceoli, 20.5 mm (AM P66424). — Tasman Sea, RV *Tangaroa*, NORFANZ, stn TAN0308/129, 33°29.24'S, 170°00.71'E, 1158-1230 m, orange roughy trawl, 1.VI.2003, P. B. Berents, 1 immature ♂ 18.5 mm (AM P66433). — Tasman Sea, RV *Tangaroa*, NORFANZ, stn TAN0308/166, 35°17.17'S, 169°33.63'E, 815-867 m, orange roughy trawl, 5.VI.2003, P. B. Berents, 1 ♀ with setose oostegites, 27.5 mm and 1 ♂ with calceoli, 23 mm (AM P66447).
Western North Atlantic Ocean: **Gulf of Mexico.** MARFIN-*Geryon* cruise, Area 1, [*c.* 29°N, 88°W], 370 fm [677 m], baited crab trap, 3.VIII.1987, 1 ♀ with long non-setose oostegites, 25.5 mm, 1 ♂ with calceoli, 30.5 mm (GCRL 2050).
Caribbean Sea: **French West Indies.** Guadeloupe, *Polka*, ORSTOM-IRPM-SMCB, stn GC10, 16°19.15'N, 61°51.91'W, 1000 m, baited fish trap, IV.1993, 1 ♀ with long non-setose oostegites, 30 mm (AM P67536).
Material identified by M. H. Thurston. **Southern Ocean.** Australia, S of Tasmania, *Discovery*, stn 1689, 48°09.9'S, 146°26.4'E, 750-1000 m over 2776 m, tow net N70V, 7.III.1936, 1 immature ♀ 27 mm. — SE of New Zealand, *Discovery*, stn 943, 45°28.4'S, 179°06.4'E, 0-128 m over 2552 m, tow net N100B, 1.IX.1932, 1 juvenile ♂ 13 mm.

ETYMOLOGY. — This species is named for Mike Thurston in recognition of his great contribution to our knowledge of deep-sea amphipods and *Eurythenes* in particular.

HABITAT. — *Eurythenes thurstoni* n. sp. has been taken in benthic trawls, midwater trawls and benthic baited traps. It is obviously an epibenthic scavenger, like *E. gryllus*, but its presence in relatively large numbers in midwater trawls suggests it also acts as a midwater predator or scavenger, as does *E. obesus*.

DISTRIBUTION. — Western South Pacific Ocean: Indonesia, eastern and southern Australia, New Zealand, Loyalty Islands Basin, Wallis and Futuna Islands, Tonga; 128-4670 m depth, up to 3000 m above bottom. Western North Atlantic Ocean: Gulf of Mexico, Bahamas, Caribbean Sea; 677-1000 m depth.

DIAGNOSIS. — Anterodorsal margin of head forming an upturned ridge. Gnathopod 1 subchelate; basis length more than 3 times breadth; propodus margins subparallel. Pereopods 3 to 7 dactyli short. Pereopod 4 coxa deeper than wide. Pereopod 7 basis length of anterior margin about 1.5 times breadth; posteroventral margin straight but angled. Pleonite 3 without anterodorsal notch. Epimeron 3 posteroventral corner subquadrate. Urosomite 1 dorsodistally produced over urosomite 2. Uropod 3 peduncle, medial face with robust setae.

DESCRIPTION

Female

Based on holotype. Head much deeper than long, not extending much below insertion of antenna 2, anterodorsal margin forming an upturned ridge; lateral cephalic lobe small, subacute; rostrum absent; eyes not apparent. Antenna 1 short; peduncular article 1 short, length once breadth, distal margin without midmedial tooth; peduncular article 2 short, 0.2 times article 1; peduncular

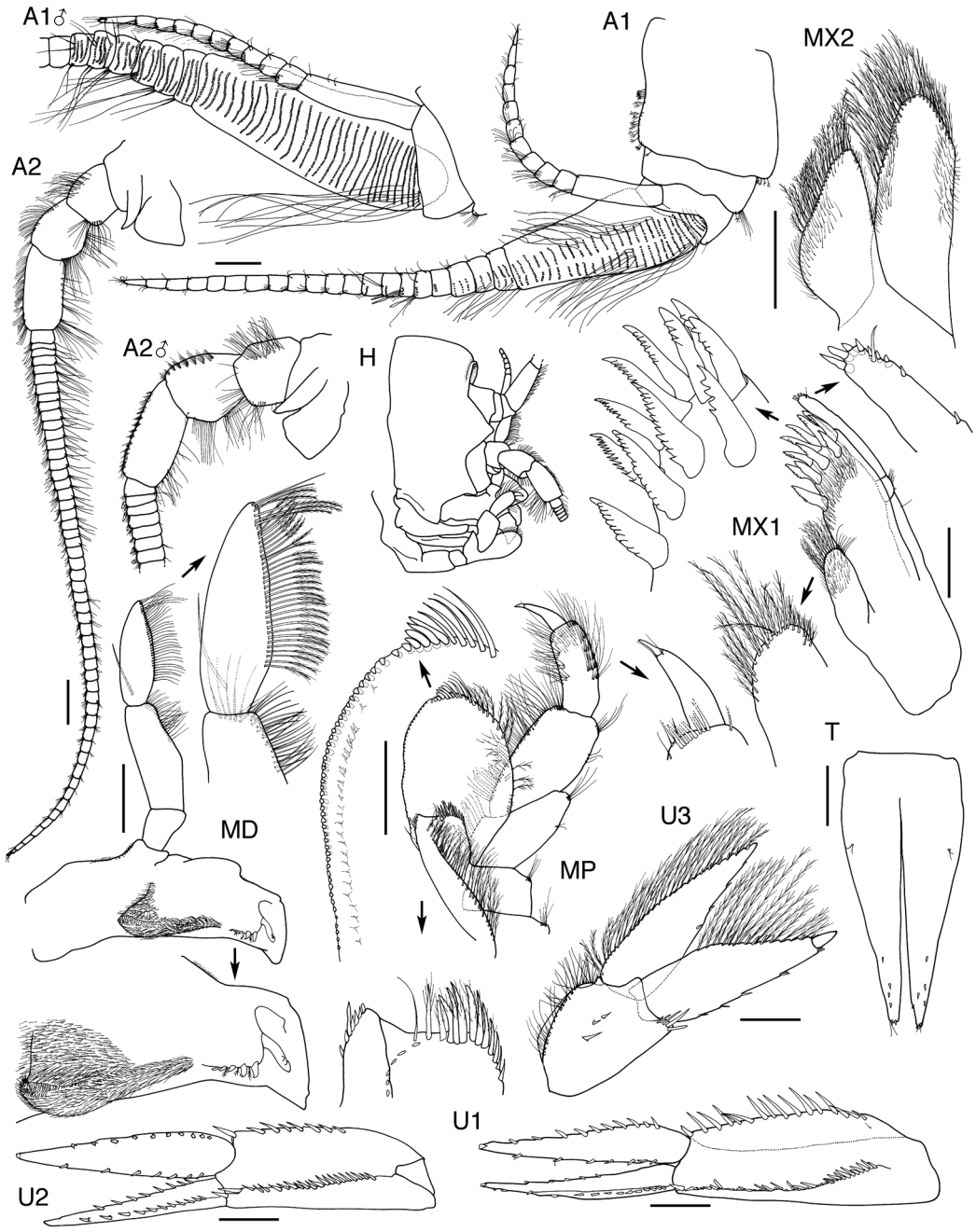

Fig. 17. — *Eurythenes thurstoni* n. sp., holotype ♀ 33 mm (AM P62435), paratype ♂ 29 mm (AM P62436). Abbreviations: **A1**, **A2**, antennae 1, 2; **H**, head; **MD**, mandible; **MP**, maxilliped; **MX1**, **MX2**, maxillae 1, 2; **T**, telson; **U1**-**U3**, uropods 1-3. Scale bars: 0.5 mm.

article 3 short, 0.13 times article 1; accessory flagellum 11-articulate, article 1 long, 4.8 times article 2; flagellum 21-articulate, with strong two-field callynophore, calceoli absent. Antenna 2 medium length, 1.7 times antenna 1; peduncle with brush setae; peduncular article 1 enlarged, not covering article 2 laterally; peduncular article 3 short, 0.9 times article 4; flagellum 53-articulate, calceoli absent.

Mouthpart bundle subquadrate. Epistome and upper lip separate, epistome produced, angular; upper lip not produced, slightly rounded. Mandible incisors large, symmetrical, with slightly convex smooth margins; lacinia mobilis a long slender distally-cuspidate robust seta; accessory setal row left and right with five short, slender, robust setae; intermediate setae pappose; molar large, setose, with vestigial distal triturating patch; palp attached midway; article 1 short, length 1.2 times breadth; article 2 slender, length 2.5 times breadth, subequal to article 3, with many submarginal posterodistal A2-setae, without D2-setae; article 3 falcate, long, length 3.5 times breadth, with one proximal A3-seta, with about 36 D3-setae along most of posterior margin, with two apical and four subapical E3-setae. Maxilla 1 inner plate narrow, with about 20 apical and subapical pappose setae; outer plate narrow, with 11 setal-teeth in 8/3 crown arrangement; ST1 to ST3 large, slender, three- to four-cuspidate, ST4 to ST6 large, slender, six- to nine-cuspidate, ST7 slightly displaced from ST6, elongate, slender, 12-cuspidate medially; STA large, broad, four-cuspidate; STB to STD large, broad, 11- to 13-cuspidate; palp large, two-articulate, with four apical long robust setae, four apicolateral short robust setae and one subapical slender seta, flag seta absent, distomedial margin smooth. Maxilla 2 inner and outer plates broad; inner plate length 0.7 times outer plate. Maxilliped inner plate large, subrectangular, with four apical nodular robust setae and three robust setae on lateral face; oblique setal row well developed, with at least 30 pappose setae; outer plate medium size, subovate, with 20 apical pappose setae and four apical robust setae, medial setae small, bead-shaped, submarginal setae short, simple; palp large, four-articulate, article 2 very broad, length 1.9 times breadth, 1.3 times article 3, article 3 long, slender, length 2.5 times breadth, dactylus well developed, with three subapical setae, unguis present.

Pereonites 1 to 7 dorsally smooth. Gnathopod 1 subchelate; coxa vestigial; basis long, slender, length 3.6 times breadth, anterior margin smooth, with tufts of slender setae; ischium short, length 1.2 times breadth; merus posterior margin lined with long slender setae; carpus wedge-shaped, not produced anteriorly, short, length 1.5 times breadth, shorter than (0.7 times) propodus, with long slender setae near posterodistal corner; propodus large, subrectangular, length 2.2 times breadth, not tapering distally, posterior margin subtly sinusoidal, smooth, with tufts of slender setae, palm slightly obtuse, margin straight, minutely serrate, posterodistal corner with one medial and one lateral robust seta; dactylus simple, without subapical spines or slender setae, reaching corner of palm. Gnathopod 2 minutely chelate; coxa small, shorter than coxa 3; ischium long, length 3.5 times breadth; carpus very long, length 5 times breadth, posterior margin straight; propodus subrectangular, long, length 3.3 times breadth, palm obtuse, with convex, minutely serrate margin, with three medial and four lateral robust setae; dactylus reaching corner of palm, posterior margin smooth. Pereopod 3 coxa large; merus weakly expanded anteriorly; propodus with four groups of slender setae along posterior margin and one posterodistal robust seta; dactylus short, stocky. Pereopod 4 coxa deeper than wide (length 1.25 times breadth), with large posteroventral lobe, anterior margin straight; merus weakly expanded anteriorly; propodus with four groups of slender setae along posterior margin and one posterodistal robust seta; dactylus short, stocky. Pereopod 5 coxa with anterior and posterior lobes subequal; basis expanded posteriorly, posterior margin minutely crenate; merus expanded posteriorly, with curved posterior margin; propodus with five groups of short robust setae along anterior margin and two anterodistal robust setae; dactylus short, slender. Pereopod 6 coxa small, not lobate posteriorly; basis expanded posteriorly, posterior

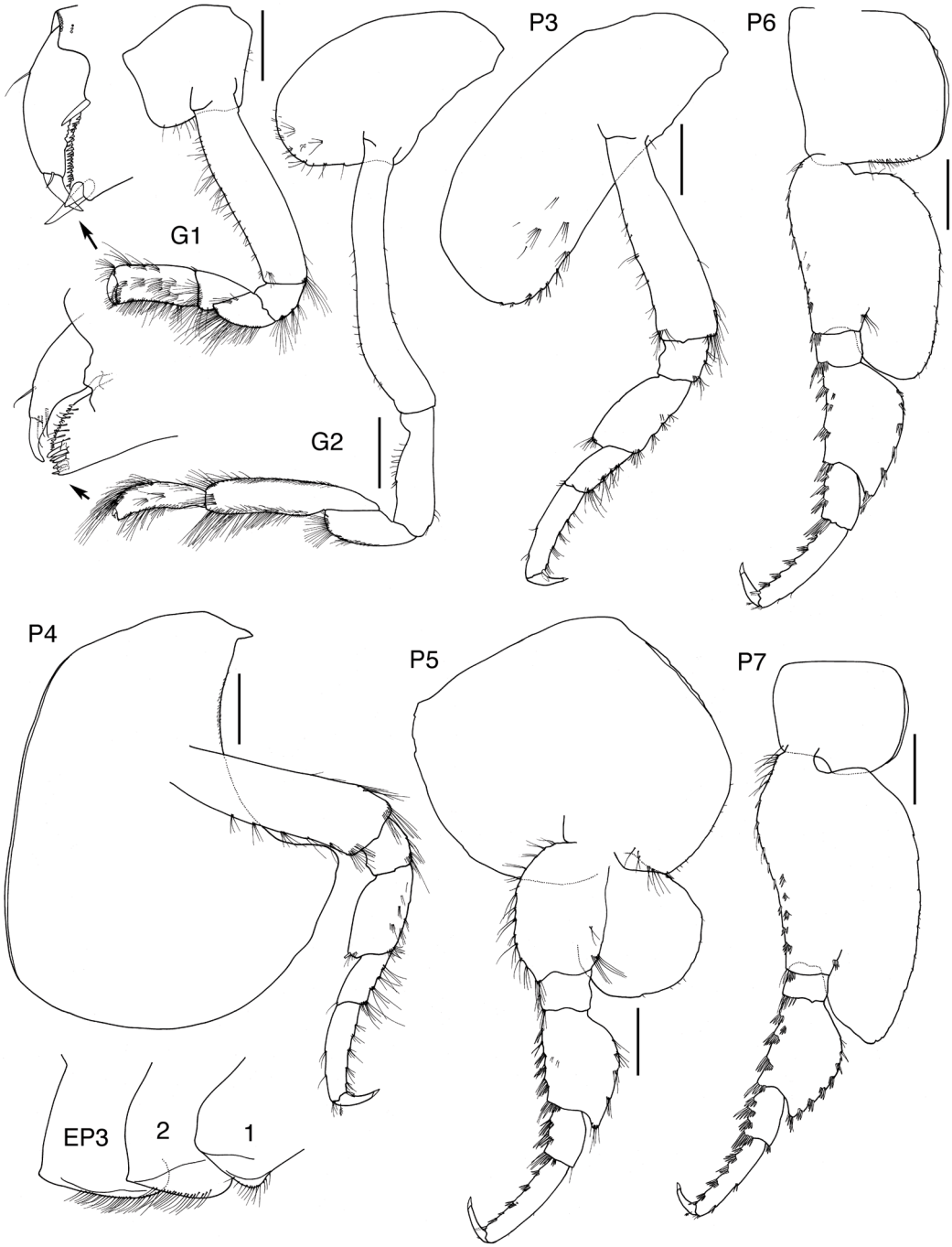

FIG. 18. — *Eurythenes thurstoni* n. sp., holotype ♀ 33 mm (AM P62435). Abbreviations: **EP1**-**EP3**, epimera 1-3; **G1**, **G2**, gnathopods 1, 2; **P3**-**P7**, pereopods 3-7. Scale bars: 1.0 mm.

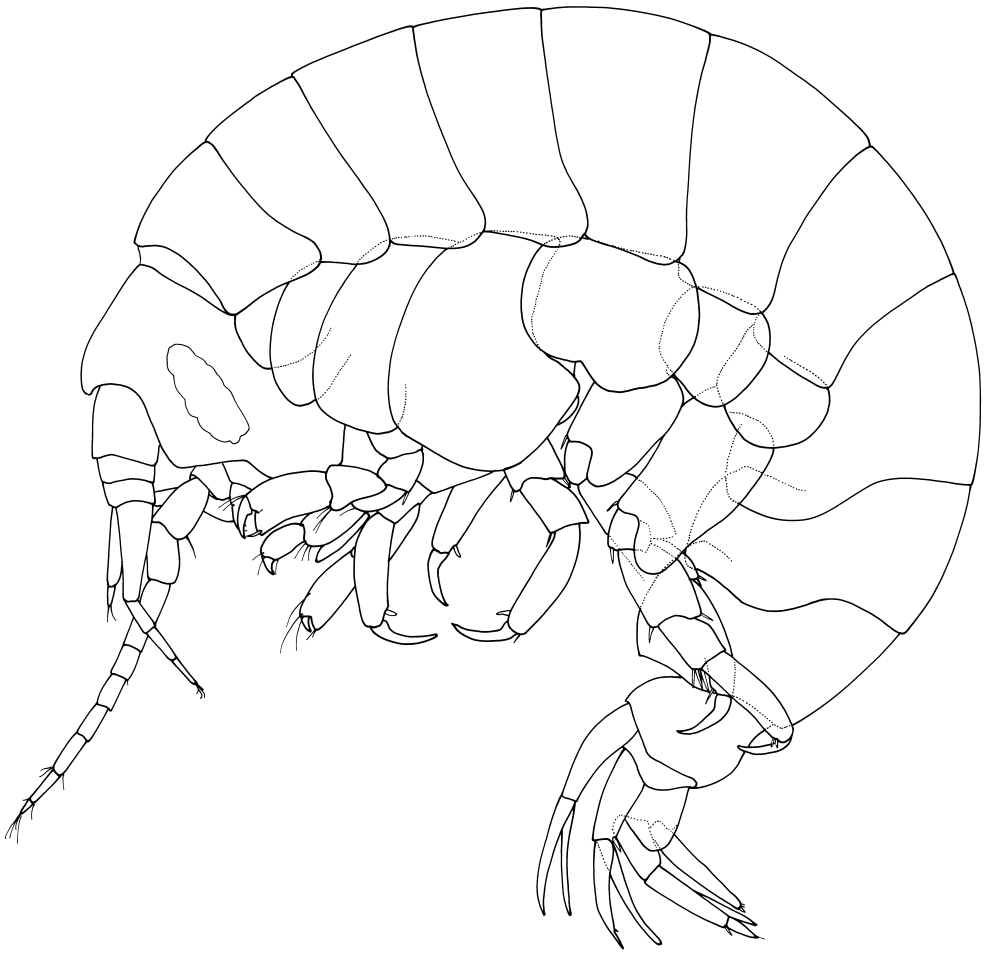

FIG. 19. — *Eurythenes thurstoni* n. sp., hatchling, 6.5 mm, from brood pouch of holotype ♀.

margin minutely crenate; merus expanded posteriorly, with curved posterior margin; propodus with five groups of short robust setae along anterior margin and two anterodistal robust setae; dactylus short, slender. Pereopod 7 basis expanded posteriorly, anterior length 1.5 times breadth, posterior margin slightly rounded, minutely crenate, posteroventral corner rounded, posteroventral margin straight, strongly angled; merus expanded posteriorly, with curved posterior margin; propodus with five groups of four to eight short robust setae along anterior margin, two anterodistal robust setae and two pairs of robust setae along posterior margin; dactylus short, slender.

Oostegites present from gnathopod 2 to pereopod 5, long, setose. Gills present from gnathopod 2 to pereopod 7.

Pleonites 1 to 3 dorsally smooth. Pleonite 3 with a slight anterodorsal depression. Epimeron 1 anteroventral corner rounded with a few short slender setae. Epimeron 2 ventral margin lined with short fine setae; posteroventral corner produced into sharp spine. Epimeron 3 ventral margin lined with short fine setae; posteroventral corner subquadrate. Urosomite 1 with

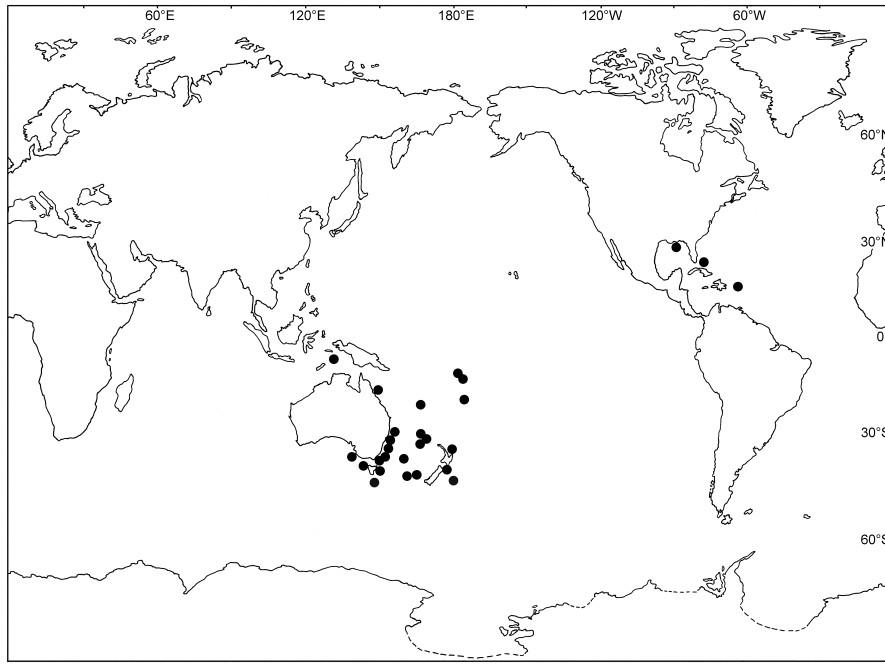

FIG. 20. — Recorded distribution of *Eurythenes thurstoni* n. sp.

anterodorsal notch, posterodistally produced over urosomite 2. Uropod 1 peduncle with 38 dorsolateral, 15 dorsomedial and one apicomedial robust setae, without plumose setae; rami subequal in length; outer ramus with 14 lateral and five medial robust setae; inner ramus with seven lateral and 10 medial robust setae. Uropod 2 peduncle with 20 dorsolateral, one apicolateral, seven dorsomedial and one apicomedial robust setae; rami subequal in length; outer ramus with 11 lateral and eight medial robust setae; inner ramus with seven lateral and 10 medial robust setae. Uropod 3 peduncle short, length 1.4 times breadth, without dorsolateral flange, with three apicomedial, three midmedial and six distoventral robust setae, with lightly plumose setae on dorsomedial margin; rami paddle-like, subequal in length, inner ramus about 0.9 times outer ramus; outer ramus two-articulate, article 2 short, article 1 with six lateral and eight distomedial robust setae; inner ramus with four lateral and six distomedial robust setae; slender plumose setae present on both rami. Telson longer than broad, length 2.3 times breadth, deeply cleft (83%), with three very small dorsal robust setae on each lobe, distally tapered, with three very small apical robust setae and one short slender apical seta on each lobe.

Male

Apart from the presence of calceoli on the antennae there is very little sexual dimorphism. In the 29 mm paratype male (AM P62436) antennae 1 and 2 are both slightly longer (24- and 59-articulate respectively) and there are slightly more (45) D3-setae on article 3 of the mandibular palp. Calceoli are present on the last 12 articles of antenna 1 and on all but the last two articles of antenna 2.

Colour

Relatively fresh material (preserved in formalin, not yet transferred to alcohol) from 1000 m depth, east of Coffs Harbour, New South Wales,

was a fairly uniform reddish-orange colour over most of the body, with a narrow white edge to body segments and coxae; the mouthpart bundle, peduncle of antenna 1 and epistome/upper lip were a deep orange colour; areas of the cuticle normally covered by other parts (for example the anterior half of pereopod 5 basis) had very little colour, and were almost translucent; pleopods were white. The eye appeared as an irregular area of diffuse mauve to purple colour, without ommatidia; the eyes have completely disappeared from material stored in alcohol.

Size

Size ranges for *E. thurstoni* n. sp. from Eastern Australia and the Tasman Sea are: ovigerous females, 28-36 mm; females with setose oostegites, 24-33 mm; females with non-setose oostegites, 17-30 mm; males with calceoli, 18-29 mm; males without calceoli, 20-21 mm; juvenile (unsexable) specimens, to 19 mm. Material from other areas of the western South Pacific includes slightly larger specimens, with females ranging from 24 to 46 mm, males from 30 to 34 mm and juveniles from 19-25 mm.

Hatchling, from brood pouch of holotype

With a body length of about 6.5 mm, this hatchling is as large as the adults of many lysianassoid species. As well as the usual juvenile differences such as fewer setae on pereopods and uropods, it differs from adult *E. thurstoni* n. sp. in three significant characters: the anterodorsal margin of the head does not have the characteristic upturned ridge – it is smoothly produced, forming a slight rostrum; the posteroventral margin of pereopod 7 basis is curved, not strongly angled; and the anterodorsum of urosomite 1 has only a shallow depression, not a deep notch. In the smallest free-living specimens, about 8.5 to 9 mm length, these characters are the same as in adults.

REMARKS

Eurythenes thurstoni n. sp. is distinguished from both *E. gryllus* and *E. obesus* by: the recurved ridge around the anterior margin of the head; the subchelate gnathopod 1 with propodus not tapering distally; the greater length to breadth of gnathopod 1 basis; the strongly chelate gnathopod 2; the greater length to breadth of coxa 4; the narrower pereopod 7 basis with angled posteroventral margin; the absence of an anterodorsal notch on pleonite 3; and the dorsodistal projection of urosomite 1 over urosomite 2. It is further distinguished from *E. gryllus* by, but shares with *E. obesus*: the subquadrate posteroventral corner of epimeron 3 and the presence of robust setae on the medial face of uropod 3 peduncle. It is further distinguished from *E. obesus* by, but shares with *E. gryllus*: short dactyls on pereopods 3 to 7. Apart from the now resolved confusion of *E. gryllus* and *E. obesus*, the first suggestion that there could be more than one species in the *E. gryllus* complex was made by J. L. Barnard (1961) when reporting the material collected by the Danish Deep-Sea Expedition on the *Galathea*. Barnard (1961: 37) referred to his South Pacific material as "young specimens" though some of them were "obviously at sexual maturity" and commented that "The south Pacific material cited herein is only provisionally called *E. gryllus*". The principal difference Barnard cited was the "slightly chelate condition of both pairs of gnathopods", but he also noted that the "third pleonal epimeron is quadrate in the juveniles but rounded in large adults" and "the dorsal notches of pleon segments 3 and 4 are beginning to develop on some of them". These three characters, combined with the relatively small size of sexually mature specimens, the relative length to breadth of coxa 4, the shape of pereopod 7 basis and the posterodistally produced urosomite 1 (all evident in Barnard's fig. 6, of a 23 mm female from the Kermadec Trench), identify this South Pacific material as *Eurythenes thurstoni* n. sp. Thurston & Bett (1995) acknowledged the existence of this species, based on their own observations and the account of J. L. Barnard (1961). From genetic studies, France & Kocher (1996b) also recognised south-east Australian material as separable from *E. gryllus*. The 24 mm female with young in the brood pouch, recorded by Hurley (1957) from Cook Strait, New Zealand, is probably also *E. thurstoni* n. sp., simply because of its small

size; the 53 mm male from the same general area seems too large to be *E. thurstoni* n. sp. and probably is a true *E. gryllus*.

As well as the Australasian/south-west Pacific material, we include in this species material we have examined from the Gulf of Mexico and the Caribbean Sea. These specimens have all the distinguishing characters of the new species. France & Kocher (1996a) studied genetic patterns in populations of *Eurythenes* from the North Pacific Ocean, the western North Atlantic Ocean and the Arctic Ocean. The most divergent of the groupings they identified was a set of three specimens from the Northwest Channel, Bahamas, western North Atlantic Ocean. These specimens were much smaller than any others and France & Kocher (1996a) referred to this group as a "cryptic species". France & Kocher (1996b) grouped these specimens with material from the continental slope of south-east Australia – material which we recognise as *E. thurstoni* n. sp.

France & Kocher (1996a) also reported other material of *E. gryllus* from Tongue of the Ocean, also in the Bahamas, which grouped with material from the Nares Abyssal Plain rather than with the Northwest Channel group. Bowman & Manning (1972) reported material of *E. gryllus* from Andros Island, Bahamas. Their illustrations of gnathopod 2 palm and the basis of pereopod 7 correspond to those of *E. gryllus* rather than *E. thurstoni* n. sp. These other records of *Eurythenes* from the Bahamas show that, as in eastern Australia and the south-west Pacific Ocean, *E. gryllus* and *E. thurstoni* n. sp. can occur in the same geographic area.

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