



***Thambema thunderstruckae* sp. n.,
the first record of Thambematidae (Isopoda: Asellota)
from the Southern Hemisphere shelf**

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Abstract: A new thambematid species, *Thambema thunderstruckae* sp. n., is described from King George Island, South Shetland Islands, Antarctic. Specimens of the new species were collected during two Polish Antarctic Expeditions in 1985 and 2007. It is the first record of this family from the Southern Hemisphere. The new species most closely resembles *Thambema golanachum* Harrison, 1987 and *T. fiatum* Harrison, 1987 but can be distinguished from both species by the shape of male pleopod 1, the number of claws on pereopods 2–7 and the setation of pereopod 1 and 2 carpus, respectively. A key to all known genera and species in the family Thambematidae is also provided.

Key words: Antarctic, King George Island, Admiralty Bay, janiroid isopods.

Introduction

The janiroidean family Thambematidae was established by Stebbing in 1912 and currently contains five species in two genera. In the present paper we follow the systematics of Janiroidea proposed by Wilson and Wägele (1994, but see Kusakin 1988). The genus *Thambema* Stebbing, 1912 comprises four species – *Thambema amicorum* Stebbing, 1912, *T. golanachum* Harrison, 1987, *T. tanum* Harrison, 1987 and *T. fiatum* Harrison, 1987. In 1961, Birstein erected the genus *Microthambema* to hold a new species from the North-western Pacific – *Microthambema tenuis* Birstein, 1961.

To date, thambematid species have only been described from the Northern hemisphere (North Atlantic and North Pacific respectively), and here exclusively from the deep sea (1300 m and below; see Birstein 1961, Harrison 1987). During

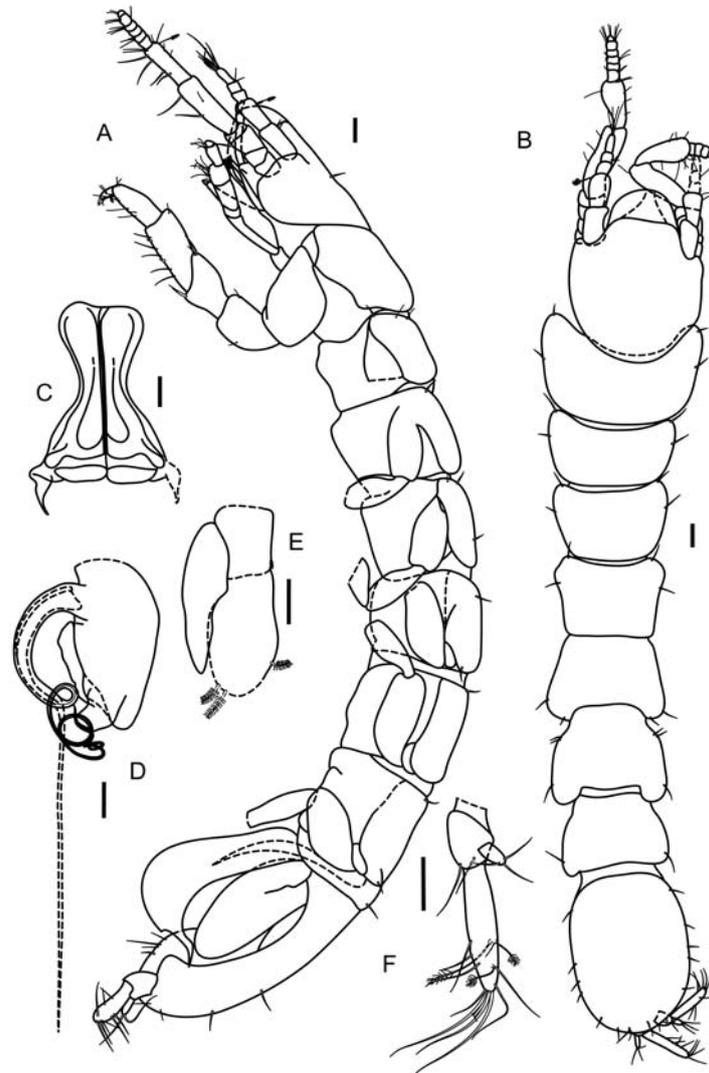


Fig. 1. *Thambema thunderstruckae* sp. n. **A, B.** Holotype male (ZMH K-43145): A, habitus laterally; B, habitus dorsally. **C–F.** Paratype male (ZMH K-43146): C, Plp 1; D, Plp 2; E, Plp 3; F, Urp. Scale bar = 100 μ m.

two Polish Antarctic Expeditions to Admiralty Bay (King George Island, South Shetland Islands) in 1985 and 2007 respectively, thambematid specimens were collected using a Van Veen grab at the depths between 45 and 212 m. These specimens could be assigned to a new species in the genus *Thambema*. Therefore the current paper is the first record of the family Thambematidae from the Southern Hemisphere shelf. Morphological differences of the five species belonging to this genus are discussed and a key to all known genera and species in the family Thambematidae is provided.

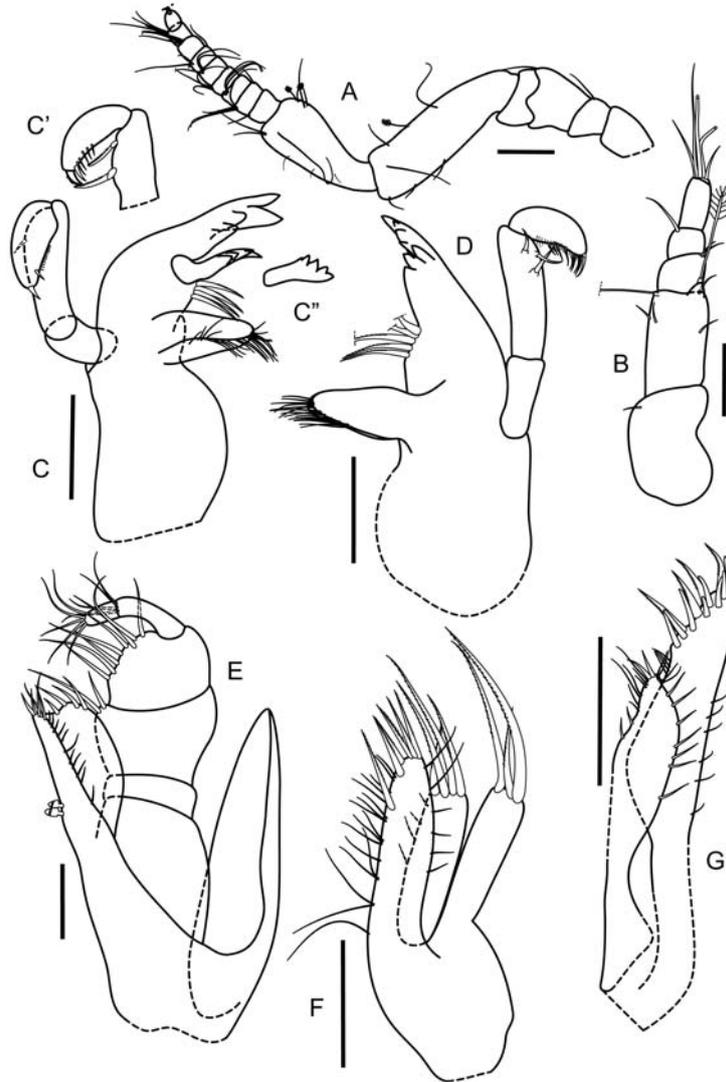


Fig. 2. *Thambema thunderstruckae* sp. n., paratype male (ZMH K-43146): A, A2; B, A1; C, IMd; C', IMd palp; C'', IMd Lm; D, rMd; E, Mxp; F, Mx 2; G, Mx 1. Scale bar = 100 μ m.

Material and methods

Specimens of the new species were collected during two Antarctic expeditions, viz.: the Polish Antarctic Expedition on board of m/v *Polar Pioneer* in 2007 and the Polish Academy of Science Expedition to *H. Arctowski* Antarctic Station in 1985. Material was taken in the Ezcurra Inlet (Admiralty Bay King George Island, South Shetland Islands), between 45 and 212 m depth. In total 18 Van Veen grab (catching area 0.1 m²) samples were taken. Samples were sieved through a

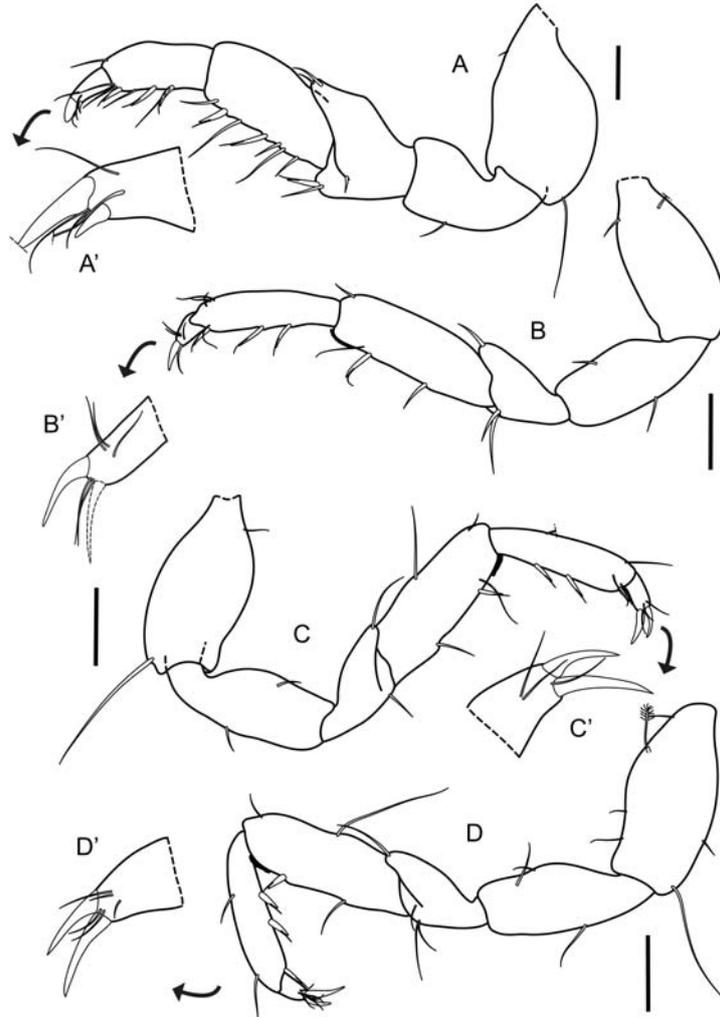


Fig. 3. *Thambema thunderstruckae* sp. n., paratype male (ZMH K-43146): A, Prp 1; A', Prp 1 ung; B, Prp 2; B', Prp 2 ung; C, Prp 3; C', Prp 3 ung; D, Prp 4; D', Prp 4 ung. Scale bar = 100 μ m.

500 μ m mesh, fixed in 4% neutralized formalin and later transferred to 70% ethanol. Totally 32 specimens were collected.

For the illustration of the habitus the male holotype (ZMH K-43145) and one female paratype (ZMH K-43147) were used. Specimens were kept in stained (methylene green) glycerine. All appendages necessary for further taxonomic analyses were dissected from selected paratypes (ZMH K-43146 and ZMH K-43148) and the appendages were fixed in stained glycerine gelatine. Pencil drawings of the new species were prepared using a *Leica DM 2500* compound microscope with a camera lucida. Figures were digitalized with a WACOM drawing board using Adobe Illustrator CS5 software. Furthermore, scanning electron microscope (SEM) pictures of

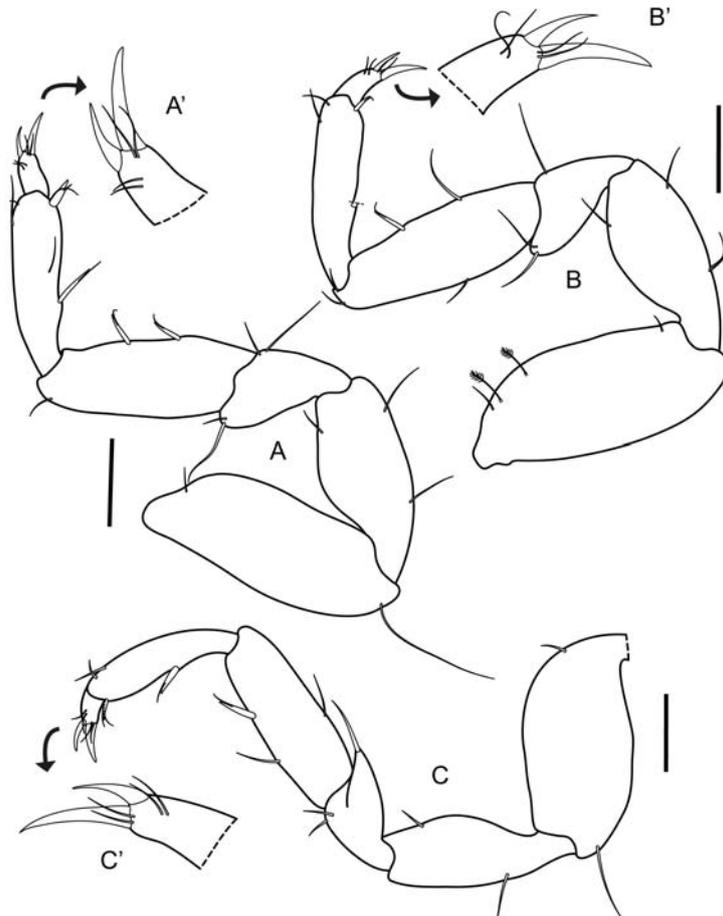


Fig. 4. *Thambema thunderstruckae* sp. n., paratype male (ZMH K-43146): A, Prp 5; A', Prp 5 ung; B, Prp 6; B', Prp 6 ung; C, Prp 7; C', Prp 7 ung. Scale bar = 100 μ m.

two paratypes were taken: one ovigerous (ZMH K-43150) and one non-ovigerous female (ZMH K-43149), respectively. The terminology of setal types follows Hessler (1970), Larsen (2003), Garm (2004) and Riehl and Brandt (2010).

The holotype and paratypes of the new species are deposited at the Zoological Museum in Hamburg (ZMH). For comparison, the following type material from Natural History Museum in London (NHM) was borrowed:

Thambema amicorum Stebbing, 1912 (no 1911: 11: 8)

Thambema golanachum Harrison, 1987 (no 1986: 119: 3)

Thambema tanum Harrison, 1987 (no 1986: 113: 1)

Thambema fiatum Harrison, 1987 (no 1986: 127: 2)

Abbreviations used in the text and figures: A1 – antennula; A2 – antenna; l/rMd – left or right mandible; Mx1 – maxillula; Mx2 – maxilla; Lm – lacinia mobilis; Mp – molar process; Ip – incisor process; Mxp – maxilliped; Op –

operculum; Prp1–7 – pereopods 2–7; ung – unguis; Plt – pleotelson; Plp1–5 – pleopods 1–5; Prn1–7 – pereonites 1–7; Urp – uropods; VVG – Van Veen grab; ZMH – Zoological Museum, Hamburg; NHM – Natural History Museum, London.

Taxonomy

Suborder Asellota Latreille, 1803

Superfamily Janiroidea Sars, 1897

Family Thambematidae Stebbing, 1912

Remarks. — Thambematids are characterised by an elongated, subcylindrical body shape, lack of eyes, a slender, oval pleotelson and a prehensile first pereopod (Birstein 1961; Wolff 1962; Harrison 1987). Due to some plesiomorphic features (such as a relatively large, free first pleonite) as well as similarities in body shape a relationship with the families Microparasellidae Karaman, 1933 and janirid subfamily Microjanirinae Bocquet *et* Lévi, 1955 has been suggested (Birstein 1961). However it is very likely that the slender body form represents a convergent adaptation related to a similar (infaunal) lifestyle in these families (compare Just and Poore 1992). The only character clearly distinguishing Thambematidae from Microjanirinae and Microparasellidae is the number of large claws on pereopods 2–7 (Birstein 1961; Wolff 1962; Wilson and Wägele 1994). In the present paper we refer to claw as a sharp and curved structure on the pereopodal dactylus, while seta is defined as elongate projection, with a more or less circular base and a continuous lumen (Garm 2004).

The number of claws has also been used to separate genera within Thambematidae. Birstein (1961) claimed that in contrast to *Thambema amicorum*, *Microthambema tenuis* bears only one claw, while Wolff (1962) stated that both, *M. tenuis* and *T. amicorum*, possess only one claw on pereopods 2–7. According to Menzies (1962) both species bear two claws. Illustrations by Harrison (1987) show one large and one small claw on pereopods 2–7 in *T. golanachum*, *T. fiatum* and *T. amicorum*, whereas the new species bears two large claws on pereopods 2–7 (Table 1). The examination of the type material of *T. golanachum* and *T. amicorum* revealed that both species bear only one large claw on pereopod 1. Unfortunately the examination of type material of *T. fiatum* and *T. tanum* was impossible as the slides were empty. So, we cannot draw any final conclusions about the actual number of claws on pereopods 2–7 in thambematids and therefore this character does not seem to be useful to separate genera within Thambematidae or even different families.

Thambematidae share further characters with some janirid genera (e.g. *Microjaera* and *Ectias*), such as a subcylindrical molar process and a prehensile pereopod 1 (see Table 1). The latter is however only slightly differentiated in the Micro-

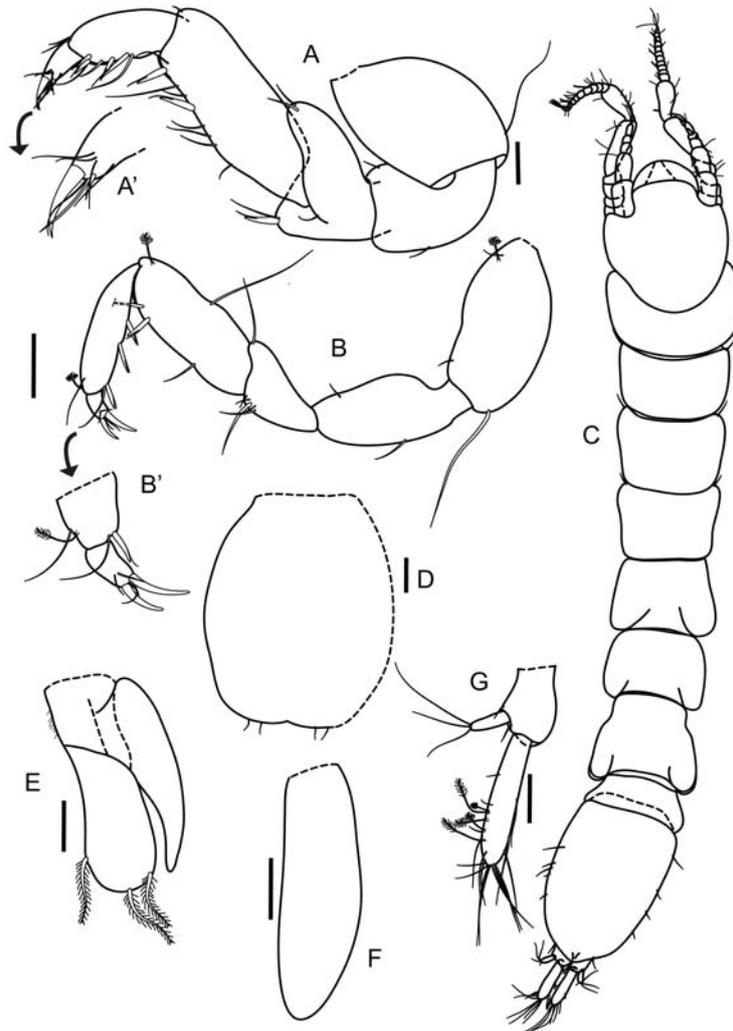


Fig. 5. *Thambema thunderstruckae* sp. n., paratype female (ZMH K-43148): A, Prp 1; A', Prp 1 ung; B, Prp 2; B', Prp 2 ung; C, habitus dorsally; D, Op; E, Plp 3; F, Plp 4; G, Urp. Scale bar = 100 µm.

janirinae (Wolff 1962). Thus, based on the shape of the first pereopod, its large body size (compared to *Microjaera*), the length of central lobe of maxilla 2 as well as the absence of pleopod 5 (compared to Microparasellidae) the new species has closer affinities to the Thambematidae and so we provisionally place it within this family. However, further systematic analyses should be considered in order to elucidate the phylogenetic position of the Thambematidae and its relationship to morphologically similar families.

Generic composition. — *Microthambema* Birstein, 1961, *Thambema* Stebbing, 1912.

Table 1
 Comparison of the characters segregating genera within Microjanirinae, Microparasellidae and Thambematidae; Y – yes, N – no.

	Length 2.3 mm	Cephalothorax shape	A 2 squama Y/N	Mx 2 central lobe length	mp shape	Pm 1	Pp 1	Pp 2-7 no of claws	Pleonite 1	Pp 1 form	Pp 3-4 bi/uni -ramous	Pp 5 Y/N	Urp
Microjanirinae Bocquet <i>et</i> Levi, 1955													
<i>Microjaera</i> Bocquet <i>et</i> Levi, 1955	<	head slightly longer than wide, posterior margin of head convex, cephalon quadrate subrectangular	N	inner lobe the longest, 2,3 subequal in length	well developed subcylindrical	as wide as head, shorter than Pm 2-7	slightly different or not	2	short, narrower than Pm 7	lateral lobes elongated into copulatory horns	3-bi 4-uni	N	biramous
<i>Macinia</i> Matsumoto, 1956	>	cephalon lateral margin rounded	N	—	subcylindrical, thin	Pm 1-7 subequal widths	leg like, similar to Pp 2-7	2	short, narrower than Pm 7	lateral lobes reduced	3-bi 4-?	Y	biramous
<i>Caecianiropsis</i> Menzies <i>et</i> Pettit, 1956	< / >	cephalon anterior margin with rounded rostrum	N	three lobes subequal in length	well developer, truncate, tapering	relatively large, as wide as head	leg like, similar to Pp 2-7	2	nearly as wide as Pm 7	medial lobes distally rounded, lateral lobes angular	3-bi 4-?	Y	biramous
<i>Protochiron</i> Chappuis, Delamare-Debout teville <i>et</i> Paulian, 1956	< / >	cephalon rounded, lacking rostrum	Y	—	subcylindrical thin, setose	—	slightly different or not	2	short or not visible	tapering posteriorly	biramous	N	biramous
<i>Microjanira</i> Schiecke <i>et</i> Fresi, 1970	>	cephalon lateral margin rounded	N	—	truncate, distally tapering	—	leg like, similar to Pp 2-7	2	short, narrower than Pm 7	distally truncate, not laterally expanded	biramous	N	biramous
<i>Ectias</i> Richardson, 1906	>	cephalon lateral margin rounded, head broader than long	N	three lobes subequal in length	subcylindrical	as wide as head, relatively large	prehensile	3	short, narrower than Pm 7	narrow, distally V-shaped	biramous	Y	biramous

Microparasellidae Karaman, 1933													
	<	lateral margin rounded, no rostrum	Y	—	reduced, pointed	as wide as head, shorter than Prp 2-7	not prehensile, similar to Prp 2-7	2/3 claws	enlarged	medial lobes distally rounded	3-bi 4-?	Y	uni-ramous
<i>Microparasellus</i> Karaman, 1933	<	lateral margin rounded, no rostrum	Y	—	reduced, pointed	as wide as head, shorter than Prp 2-7	not prehensile, similar to Prp 2-7	2/3 claws	enlarged	medial lobes distally rounded	3-bi 4-?	Y	uni-ramous
<i>Paracharon</i> Coineau, 1968	<	nearly rectangular	N	—	no grinding surface	—	leg like, similar to Prp 2-7	2 claws	short	medial lobes distally rounded, lateral lobes hook-like	3-bi 4-?	Y	biramous
<i>Microcharon</i> Karaman, 1934	<	anteriorly broader than posteriorly, no rostrum	Y	inner lobe the longest, 2,3 subequal in length	reduced	—	leg like, similar to Prp 2-7	2/3 claws	enlarged	medial lobes distally rounded	3-bi 4-?	Y	biramous
<i>Angeliera</i> Chappuis et Delamare, 1952	<	anteriorly broader than posteriorly, no rostrum	N	—	absent	—	leg like, similar to Prp 2-7	3 claws	enlarged, width similar to pereonites	medial lobes distally rounded, lateral lobes reduced	3-uni 4-absent	N	biramous
Thambematidae Stebbing, 1912													
<i>Microthambema</i> Birstein, 1961	>	round prominent frontal area, head longer than broad	N	three lobes subequal in length	subcylindrical, truncated at apex	relatively large	prehensile	1	movable pleonite 1 and 2	anchor shaped, broad in its base	uni-ramous	N	biramous
<i>Thambema</i> Stebbing, 1912	>	frons projecting anteriorly	N	the shortest	subcylindrical	shorter than the rest, pereonites, relatively large	prehensile	1	pleonite 1 forming a distinct annulus	tapering to acute apices, broad in its base	biramous	N	biramous
<i>Thambema thunderstruckae</i> sp. n.	>	head longer than broad, no rostrum, lateran margin rounded	N	the shortest	subcylindrical	wider than head, relatively large	prehensile	2	pleonite 1 forming a distinct annulus	anchor shaped, base rounded	3-bi 4-uni	N	biramous

Genus *Thambema* Stebbing, 1912.

Thambema: Stebbing 1912: 42, 1913: 237; Birstein 1961: 132, 136–137; Menzies 1962: 185; Wolff 1962: 37–38, 49, 236, 279, 281, 290; Schiecke 1975: 169, 171; Harrison 1987: 52–54; Kussakin 1988: 17–19.

Diagnosis (modified from Harrison 1987). — A1 with six articles, terminal article minute; central lobe of Mx 2 the shortest; Plp 3 biramous; A2 peduncle articles 1–4 broader than long, article 3 the longest.

Type species. — *Thambema amicorum* Stebbing, 1912.

Remarks. — Birstein (1961) erected *Microthambema* based on the fact that pleopods 3 and 4 are uniramous in *Microthambema* and biramous in *Thambema*. The new species has a biramous pleopod 3 and a uniramous pleopod 4. Furthermore, in *Thambema* females oostegites are present on pereonites 1–4 (Harrison 1987), while the new species bears oostegites only on pereonites 2–4 (Fig. 7 C, D). As there are no further characters associated with the absence of the exopod in pleopod 4 or number of oostegites we assign the new species to *Thambema*.

Species composition. — *Thambema amicorum* Stebbing, 1912; *T. fiatum* Harrison, 1987; *T. golanachum* Harrison, 1987; *T. tanum* Harrison, 1987; *T. thunderstruckae* sp. n.

Distribution of the genus. — North Atlantic, Mediterranean, Scotia Sea (Antarctic), 45–2875 m.

Thambema thunderstruckae sp. n.
(Figs 1–8)

Material. — Holotype, 1 adult male, 4.3 mm in length (ZMH K-43145), King George Island, Admiralty Bay, Ezcurra Inlet, St. BIV/2, 62°09.463'S, 58°29.747'W, depth 107 m, 28 March 2007. Paratypes (all from Admiralty Bay): 1 adult male, appendages dissected (ZMH K-43146), St. BIII/4 (62°09.547'S, 58°30.013'W), depth 141 m, 28 March 2007; 1 non-ovigerous female (6.0 mm) (ZMH K-43147), St. BIV/5, 62°09.464'S, 58°29.764'W, depth 142 m, 28 March 2007; 1 ovigerous female, appendages dissected (ZMH K-43148), St. BIII/3, 62°09.547'S, 58°30.013'W, depth 112 m, 28 March 2007; 1 non-ovigerous female, SEM (ZMH K-43149), St. BIII/2, 62°09.535'S, 58°30.011'W, depth 122 m, 28 March 2007; 1 ovigerous female, SEM (ZMH K-43150), St. BIV/3, 62°09.458'S, 58°29.745'W, depth 106 m, 28 March 2007.

Other material examined. — 1 non-ovigerous female (ZMH K-43151), St. BIII/3, 62°09.547'S, 58°30.013'W, depth 112 m, 28 March 2007; 1 non-ovigerous female, damaged, 1 adult male (ZMH K-43152), St. BIII/2, 62°09.535'S, 58°30.011'W, depth 122 m, 28 March 2007; 1 non-ovigerous female (ZMH K-43153), St. BIV/3, 62°09.458' S 58°29.745' W depth 106 m, 28 March 2007; 2 adult male, 1 non-ovigerous female, 1 non-ovigerous female (damaged) (ZMH K-43154), St.

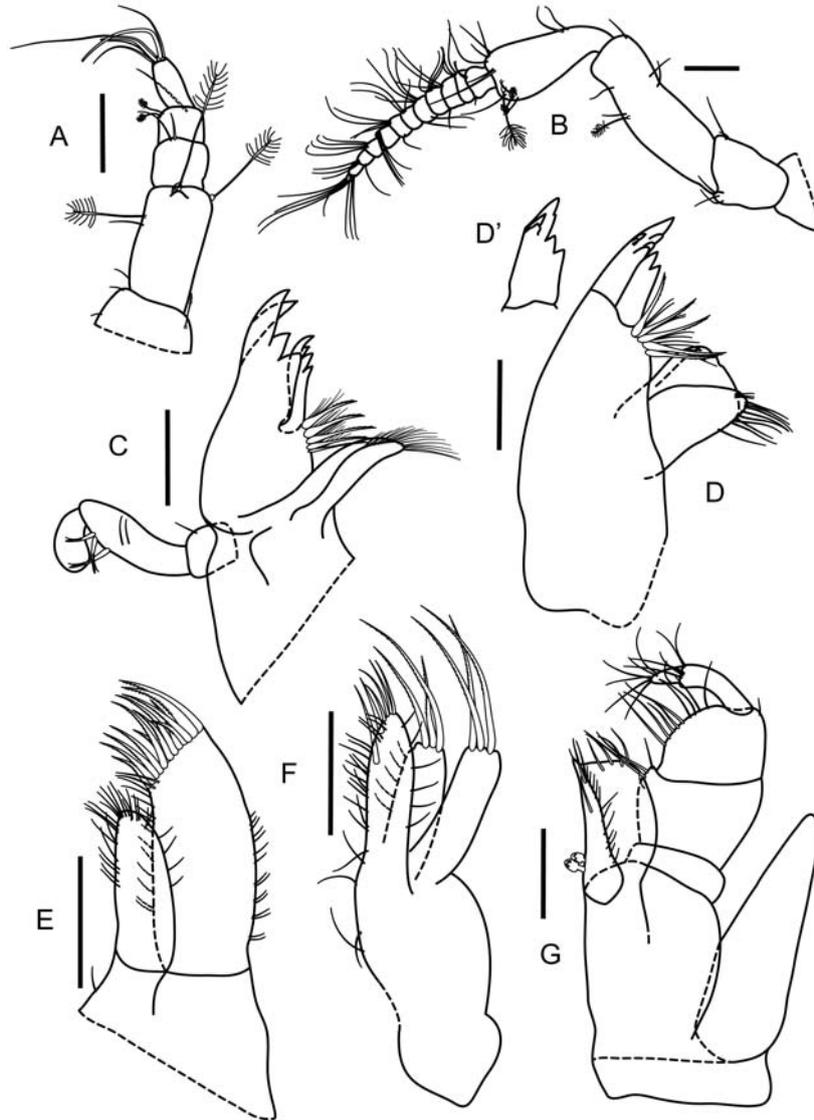


Fig. 6. *Thambema thunderstuckae* sp. n., paratype female (ZMH K-43148): A, A1; B, A2; C, lMd; D, rMd; D', rMd Mp; E, Mx 1; F, Mx 2; G, Mxp. Scale bar = 100 μ m.

BI/1, 62°09.703'S, 58°30.273'W, depth 105 m, 27 March 2007; 1 adult male (ZMH K-43155), St. BII/2, 62°09.639'S, 58°30.145'W, depth 122 m, 27 March 2007; 1 ovigerous female (damaged) (ZMH K-43156), St. BII/3, 62°09.624'S, 58°30.157'W, depth 109 m, 27 March 2007; 1 adult male (ZMH K-43157), St. OC524, Section 1, 62°10.180'S, 58°34.825'W, depth 48 m, 6 November 1985; 1 adult male (ZMH K-43158), St. OC526, Section 1, 62°10.152'S, 58°34.454'W, depth 45 m, 6 November 1985; 1 ovigerous female (ZMH K-43159), St. OC517,

Section 1, 62°09.149'S, 58°26.927'W, depth 212 m, 30 October 1985; 1 specimen (badly damaged, gender not known) (ZMH K-43160), St. BIV/2, 62°09.463'S, 58°29.747'W, depth 107 m, 27 March 2007; 1 ovigerous female (ZMH K-43160), St. BII/2, 62°09.639'S, 58°30.145'W, depth 122 m, 27 March 2007; 1 juvenile female (ZMH K-43161), St. BII/2, 62°09.639'S, 58°30.145'W, depth 122 m, 27 March 2007; 1 manca 3 (damaged), 2 adult males (ZMH K-43162), 62°09.290'S, 58°29.439'W, St. BV/1, depth 100 m, 29 March 2007; 1 manca 3, 1 non-ovigerous female (damaged), 4 adult males (ZMH K-43163), St. BIV/4, 62°09.464'S, 58°29.764'W, depth 108 m, 28 March 2007; 2 non-ovigerous females (ZMH K-43164), St. BIII/5, 62°09.519' S, 58°29.992' W, depth 132 m, 28 March 2007.

Etymology. — The name is derived from “*Thunderstruck*”, the first author’s favourite song, from The Razor’s Edge album, denoting a big come back of the band AC/DC.

Diagnosis. — Body length 7.4 times Prn 2 width. Prn 5–7 rectangular. Prp 2–7 with two claws, Prp 1 carpus with two unequally bifid setae. Male Plp 1 anchor shape, Plp 2 endopod with long stylet (length 2.8 times sympod length). In female oostegites on Prn 2–4.

Description of holotype male. — Habitus (Fig. 1): Body length 7.4 times Prn 2 width. Head free, as long as wide. Clypeal frons curved. Prn 1 width 1.1 times head width in dorsal view. Prn 1 length 1.2 times Prn 2 length, width 1.3 times Prn 2 width. Prn 3 and Prn 4 of similar width and length. Prn 5–7 rectangular. Prn 5 width 1.6 times length. Prn 6 and Prn 7 width approximately 1.1 times length. Prn 1–4 coxae not produced. Prn 1–7 lateral margin with few short simple setae. Plt oval, length 1.9 times width, lateral margins with several short simple setae.

Antennula (Fig. 2) 0.1 times body length, with 6 articles. Articles 1–6 length ratio: 1: 0.8: 0.3: 0.2: 0.4: 0.04. Article 1 1.5 times as long as wide, with one simple seta laterally. Article 2 length 1.7 times width, with four simple setae and two long broom setae distally (one broken off). Article 3 with two simple setae distally. Article 4 with one long simple seta distally. Article 5 with one seta and one aesthetasc terminally. Terminal article minute, with one aesthetasc, one plumose seta and three simple setae.

Antenna (Fig. 2) about twice antennula length, 0.2 times body length, with six peduncular and nine flagellar articles. Peduncular articles 1–6 length ratio: 1: 0.6: 1: 0.3: 3.5: 2.6; length-width ratio: 1.1: 0.8: 1.1: 0.3: 3.1: 2.6. Articles 2–3 each with one long simple seta distally. Article 5 with six simple setae of varying size and one short broom seta laterally. Article 6 with three short simple setae laterally, with four long simple setae and two short broom setae distally and one long simple seta medially. Flagellar articles 2, 3 and 7 each with four long simple setae, articles 4, 5, 8 each with three long simple setae. Terminal article with one simple seta (broken off).

Mandibles. (Fig. 2). Left mandible palp article 2 with two serrate setae. Apical article with row of seven spines. Lm with four teeth. Ip with four lobes. Spine row

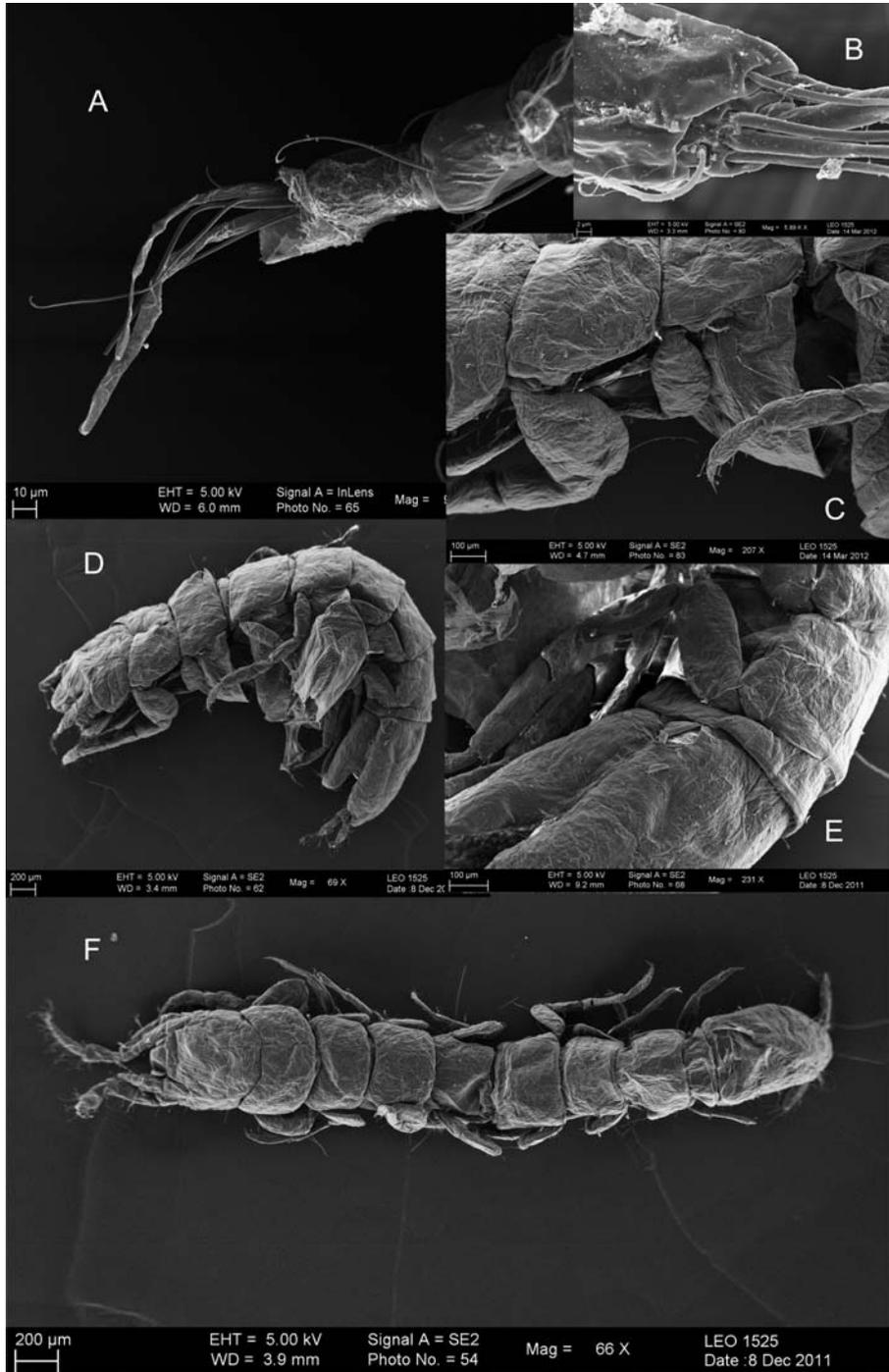


Fig. 7. *Thambema thunderstruckae* sp. n., paratype female, (ZMH K-43149): F, habitus dorsally. Paratype female (ZMH K-43150): A, A1; B, A1 article 6; C, D, habitus; E, pleonite 1.

with four compound setae. Mp triangular with 20 setae. Right mandible palp article 2 with three serrate setae. Apical article with row of nine spines and row of tiny setae. Ip with seven lobes. Spine row with five compound setae (two of them broken in base). Mp triangular with 16 setae.

Maxillula (Fig. 2) inner lobe smaller than outer lobe (length 0.8 times outer lobe length), with 22 setae of varying size on the outer margin. Outer lobe six times longer than wide, with eight tooth-like setae and four serrate setae distally, with six small simple setae laterally.

Maxilla (Fig. 2) inner lobe 3.7 times longer than wide, with several simple setae of varying size laterally, with six serrate setae distally. Central lobe shortest, 3.2 times longer than wide, with few simple setae laterally, with four serrate setae distally. Outer lobe 3.8 times longer than wide, with three serrate setae distally.

Maxilliped (Fig. 2) epipod smooth, length 4.2 times width, almost reaching 0.6 of palp article 2. Endite reaching palp article 3, with two coupling hooks, with nine robust setae and row of short simple setae. Palp article 1 0.3 times width, article 2 length 0.6 times width, inner margin with two robust setae. Article 3 length 0.7 times width, inner margin with eight long robust setae. Article 4 length four times width, terminally with four setae, article 5 length twice width, with five setae terminally.

Pereopod 1 (Fig. 3): Basis length 1.4 times width, with one short simple seta dorsally and one long simple seta distoventrally. Ischium length 1.7 times width, with one simple seta ventrally. Merus length 0.9 times width, with two small simple setae distodorsally, with one simple seta medially and with one simple and one unequally bifid seta distoventrally. Carpus length 2.1 times width, with five stout setae and two unequally bifid setae ventrally. Propodus length 2.2 times width, with one slender seta distodorsally, with 3 unequally bifid setae and four simple setae of varying size ventrally. Dactylus length twice width, with two slender simple setae medially, with one large claw dorsally and one small claw ventrally, with two tiny setae between insertion of claws.

Pereopods 2–7 (Figs 3, 4) similar to each other, carpus of Prp 2–4 ventrally with combs of fine hairs inserted in a cuticular membrane. Dactyli of Prp 2–7 with two large claws, ventral claws of Prp 2–7 to dactyli length ratio: 1.2: 1.1: 1.4: 1.0: 1.1: 1.4. Dorsal claw is shorter than ventral, 1.7 times of ventral claws length.

Pleopod 1 (Fig. 1) long, anchor shaped, 1.2 times as long as width of distal part, base rounded, distal margins with triangular pointed lobes. Endopodites oval.

Pleopod 2 (Fig. 1) sympod length twice width; lateral margin rounded, endopod with long stylet (2.8 times sympod length) kept in exopod.

Pleopod 3 (Fig. 1) Protopod 1.6 times as long as wide, 0.6 times endopod length with row of tiny setae on inner margin. Endopod length 1.7 times width, distally with three plumose setae. Exopod 1.2 times longer than endopod.

Uropod (Fig. 1) biramous, length 0.3 times Plt length. Protopod length 1.2 times width, with two simple setae distally. Exopod length 1.7 times width, 0.2 of

endopod length, with three simple setae terminally. Endopod length 4.3 times width, with three broom setae and ten slender setae of varying size.

Differences in paratype female. — Habitus (Fig. 5) similar to holotype male; body length 7.1 times Prn 2 width. Prn 1 slightly shorter and narrower than in male. Lack of setation on Prn 5–7.

Antennula (Fig. 6) first article with one short broom seta, article 2 with three long broom setae. Article 4 with two short broom setae.

Antenna (Fig. 6) with 12 flagellar articles. Article 6 with three broom setae of varying size.

Pereopod 1 (Fig. 5) carpus longer than in male, length 2.2 times width, with combs of fine hairs inserted in cuticular membrane distoventrally. Propodus with four unequally bifid setae and combs of fine hairs inserted in a cuticular membrane. Dactylus with one large claw dorsally, with 3 simple setae of varying size ventrally.

Pleopod 2 (operculum) (Fig. 5) oval, length 1.2 times width, distal margin concave, with four marginal setae.

Pleopod 4 (Fig. 5) uniramous, length 3.2 times width.

Remarks. — *Thambema thunderstruckae* sp. n. can be distinguished from all other species in the genus by an uniramous pleopod 4, an anchor-shaped pleopod 1 and long stylet of male pleopod 2 epipod. The new species most closely resembles *T. golanachum* and *T. fiatum*.

T. golanachum differs from *T. thunderstruckae* sp. n. by the following characters: endopod of pleopod 3 with two plumose setae (three in *T. thunderstruckae* sp. n.); antennula article 2 with two broom setae (*versus* three in sp. n.); pereopod 2 carpus with eight unequally bifid setae ventrally (*versus* one in sp. n.).

T. fiatum can be distinguished from the new species as follows: body 19 times Prn 2 width (*versus* 7.4 in sp. n.); male pereopod 1 carpus with five unequally bifid setae ventrally (*versus* two in sp. n.); endopod of pleopod 3 with two plumose setae (*versus* three in sp. n.); in female oostegites are present on Prn 1–4 (*versus* on Prn 2–4 in the new species); operculum lateral margins nearly straight (*versus* rounded in the new species).

Discussion

Thambematidae seem to have a much wider distribution than previously thought and the number of species is probably greatly underestimated (Wilson and Hessler 1984, Harrison 1987). For example, Schiecke (1975) reported *Thambema amicorum* from the Gulf of Naples (Mediterranean) from 140 m depth. Yet, following Harrison (1987), this species most likely represents a hitherto undescribed species. Members of the genus *Microthambema* were also recorded from the Nova

Scotia Rise (North Atlantic) at 4820 m depth (Thistle and Wilson 1996). Poore *et al.* (1994) collected five putatively new thambematid species from the Southern Australian continental slope, while Wilson (2010) reported thambematid specimens from the Arafura Sea (Northern Australia) at 161 m depth. During DIVA (*Latitudinal Gradients in Biodiversity in the deep Atlantic*) three expeditions at least one species new to science was collected from the Argentinean and Brazil basins (South-West Atlantic, between 4476 and 5192 m depth; Kaiser pers. communication). Furthermore, specimens of Thambematidae have been sampled in the Southern Ocean deep sea (Weddell and Scotia seas, between 3212 and 5000 m depth, see Brandt *et al.* 2007, 2009; Ross Sea, Lörz and Kaiser, unpubl. data).

Key to thambematid genera and species

- 1 Plp 3 uniramous *Microthambema* (*Microthambema tenuis*)
 1' Plp 3 biramous → *Thambema* (2)
 2 Body extremely slender, 19 times as long as broad (Prn 2 width) → *T. tanum*
 2' Body elongated, less than 15 times as long as broad. → (3)
 3 Prp 2–7 with one large claw, Plp 4 biramous, Prn 5–7 not rectangular → (4)
 3' Prp 2–7 with two large claws, Plp 4 uniramous → *T. thunderstruckae* sp. n.
 4. Endopod of Plp 3 with three plumose setae → (5)
 4' Endopod of Plp 3 with two plumose setae → *T. golanachum*
 5 Operculum (Plp 2) distal margin convex, body more than 13 times as long as broad → *T. fiatum*
 5' Operculum (Plp 2) oval, distal margin not convex, body less than 12 times as long as wide → *T. amicornum*

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