



New Species of Genus *Pontocrates* Boeck, 1871 (Amphipoda: Oedicerotidae) from the Red Sea Soft Bottom Substrates, Egypt

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ABSTRACT

Pontocrates genus has been assigned to the family Oedicerotidae since 1871. The five species recognized within this family share a similar biogeographical distribution in cold and temperate seawater of Europe and the northern Mediterranean Sea. However, this genus has never been recorded from tropical or subtropical waters elsewhere. The present collected materials from the northern Red Sea (Egyptian coast) indicated an expansion of the distribution area to cover warmer waters. The present species is distinguished from the other congeners by having long dactyl of pereopod six in both male and female, which is the longest among the other species of the genus and subequal to propodus length. A detailed description and fully illustrated material of this species, along with an identification key of worldwide species of *Pontocrates*, are provided.

INTRODUCTION

Oedicerotidae, Lilljeborg, 1865, is one of gammaridean amphipods believed to be a group that serves as live food items for fish larvae in coastal areas worldwide (Hirayama & Takeuchi, 1993). This group was observed dwelling at variable depths, ranging from the littoral zone to the deep sandy or muddy substrates (Lincoln, 1979). A lot of amphipod species were assigned to the Red Sea species list, including a species of family Oedicerotidae (Attallah *et al.*, 2021). The Oedicerotidae family has been recognized and is distributed globally, comprising 46 genera. Among these genera, *Perioculodes aequimanus* Kossmann, 1880 from the genus *Perioculodes* Sars, 1892 is the only one recorded from the Red Sea. This information was documented during the revision of the Red Sea amphipods by Barnard (1965).

Pontocrates (Boeck, 1871) is one of Oedicerotid genera with five species currently assigned. Most species of *Pontocrates* are typically found in gravel, coarse sand, or medium/fine sand, occupying depths ranging from the intertidal zone to near-continental shelf areas with cold seawater temperatures (Myers & Ashelby, 2022). Genus *Pontocrates* is well known and represented by the following species: *Pontocrates altamarinus* (Bate & Westwood, 1862), *Pontocrates arcticus* Sars, 1895, *Pontocrates arenarius* Bate, 1858, *Pontocrates moorei* (Myers & Ashelby, 2022), and *Pontocrates norvegicus* Boeck, 1860.

The distribution of *Pontocrates* species has primarily been recorded in the waters around Scotland and the British Isles, extending northern to southwest Norway and southward to the Mediterranean Sea. The present study aimed to describe and illustrate new materials belonging to genus *Pontocrates* collected from the Egyptian Red Sea coast.

MATERIALS AND METHODS

All material examined during this work were collected from fisheries research project covering the Egyptian Red Sea coast. Surveys covered a range of habitats and depths, from intertidal to 35m depth. Intertidal samples were collected using (15cm x 15cm) nylon bag with mesh size of 0.5mm by snorkeling, while subtidal samples were collected via SCUBA diving with the same type of nylon bags (Attallah *et al.*, 2021). All samples were sorted and identified to the family level, and then *Pontocrates* specimens were selected for further examination and confirmation.

The material was dissected in 70% alcohol and glycerin ca, 1:1, and the parts mounted on glass microscope slides in dissecting media. They were examined under a LEICA DM LS2 compound microscope, and drawings were made with a Camera Lucida. The type material was deposited in the Al-Azhar Zoological Museum Cairo (AZMC) collections under registration number (AZMCCam280201).

Abbreviations used in figures. A1–2 = antenna 1 and 2; G1–2 = gnathopods 1 and 2; H = head; P3–7 = pereopods 3–7; UL = upper lip; Mx1–2 = maxilla 1 and 2; MxP = maxilliped; MnP = Mandibles pulp; LL = lower lip; LMn – RMn = left and right mandible; Ep = epimereon; U 1–3 = uropods 1, 2 and 3; ♂ = male; ♀ = female.

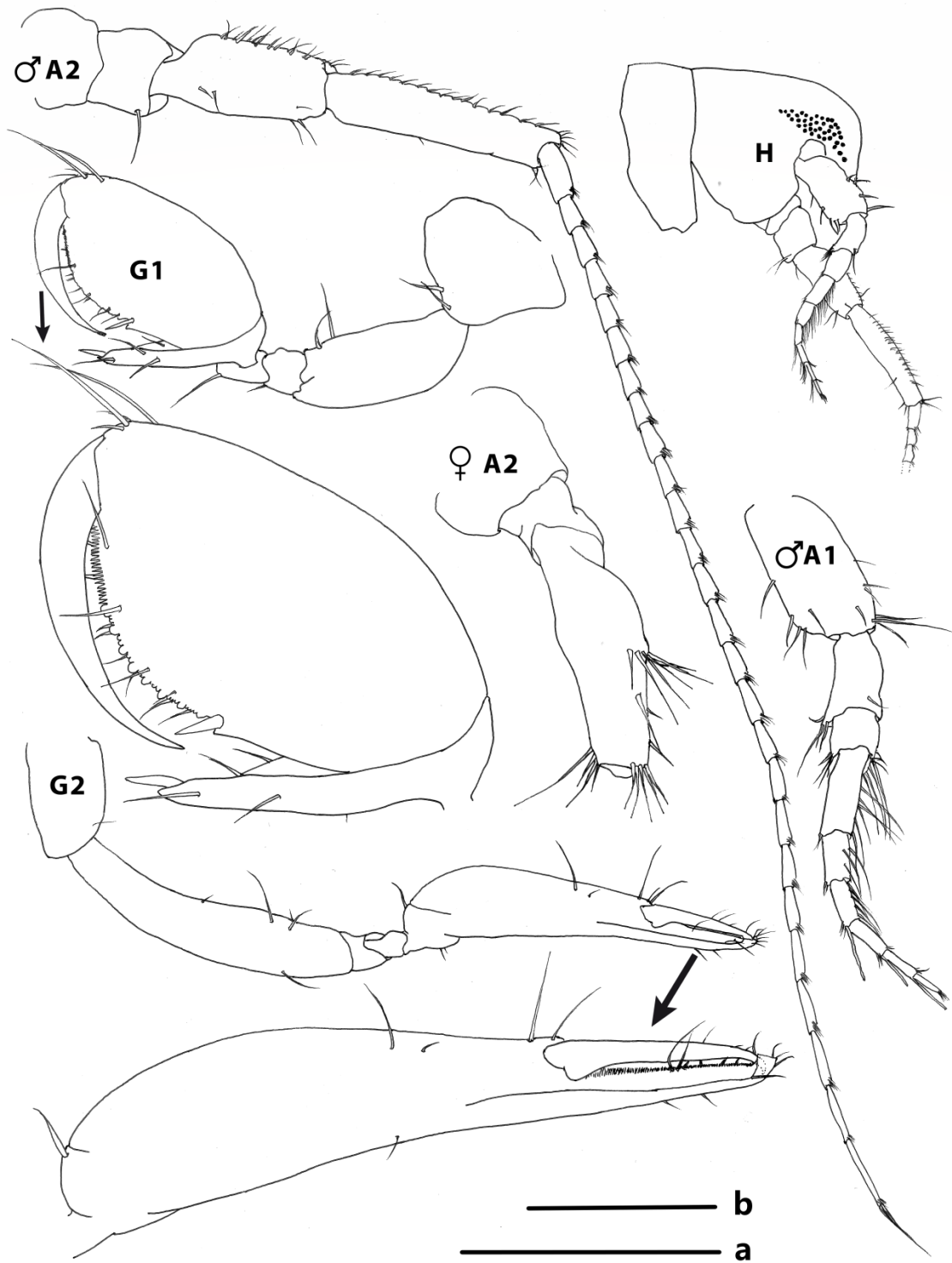


Fig. 1. *Pontocrates longidactylus* sp. nov., Holotype (AZMCcam280201) male “a” 3.2 mm; head, antenna 1-2, gnathopods 1-2 with palm magnification, Paratype female “b”; antenna 2 peduncle articles 2, 3 and 4, Scales: a = 0.3mm and b = 0.1mm

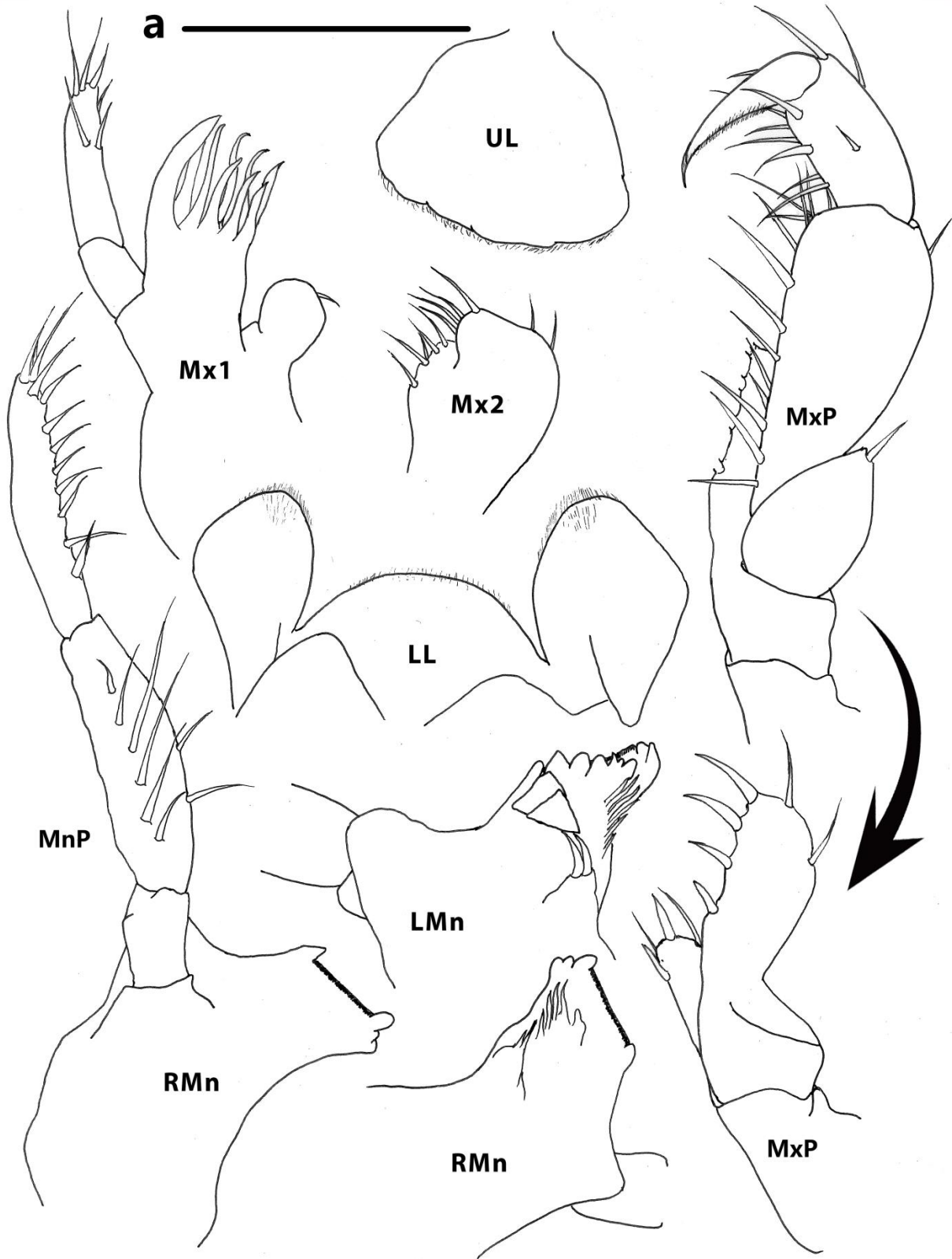


Fig. 2. *Pontocrates longidactylus* sp. nov., Holotype (AZMCcam280201) male “a” 3.2 mm; mouthparts, Scale: a = 0.3mm

RESULTS

Diagnostic characters of genus *Pontocrates* Boeck, 1871

Pontocrates species is characterized by having an elongated and weakly compressed body form. Gnathopod 2 carpus coalesced partially with propodus, extending apically in front of the chela apex. Separate inner lobes of lower lip but coalesced with an outer one. Molar spinous is degraded, with reduced dactyls of pereopods 3 and 4 (Ruffo, 1993).

Identification key for worldwide species of *Pontocrates*

- | | | |
|---|---|-------------------------|
| 1 | Pereopod 5; dactyle longer than one third of propodus..... | 2 |
| – | Pereopod 5; dactyle shorter than one third of propodus..... | 4 |
| 2 | Pereopod 3; carpus shorter than propodus..... | 3 |
| – | Pereopod 3; carpus longer than propodus..... | <i>P. arcticus</i> |
| 3 | Pereopod 6; dactyle shorter than half of propodus..... | <i>P. moorei</i> |
| – | Pereopod 6; dactyle as long as propodus..... | <i>P. longidactylus</i> |
| 4 | Gnathopod 2 coxa substraight | 5 |
| – | Gnathopod 2 coxa posterior margin sinuous | <i>P. arenarius</i> |
| 5 | Gnathopod 1 carpus less than half of propodus | <i>P. altamarinus</i> |
| – | Gnathopod 1 carpus more than half of propodus | <i>P. norvegicus</i> |

Systematic section

Suborder Amphilochidea Boeck, 1871

Infraorder Amphilochida Boeck, 1871

Parvorder Oedicerotidira Lilljeborg, 1865

Superfamily Oedicerotoidea Lilljeborg, 1865

Family Oedicerotoidea Lilljeborg, 1865

Genus *Pontocrates*, Boeck, 1871

***Pontocrates longidactylus* sp. nov.**

Figs. 1-4

Material examined: Holotype; 1 mature male 3.2mm from Lahmi site, (24°12'17.88"N, 35°26'1.97"E) during winter season (AZMCcam280201). Paratypes; 1 mature male 3.1mm, 1 destroyed female (head & gnathopods) from Hurghada (27°14'52.94"N, 33°50'56.64"E) from a 15m depth during winter season. Other paratypes; 3 mature males ranging from 2.3 to 3mm, and 1 mature female (without antennas & urosome) from Lahmi site, (24°12'17.88"N, 35°26'1.97"E) during winter season. All materials were collected from soft sand at a 15m depth.

Etymology: Name "*longidactylus*" refers to the length of dactyl of six pereopod as long as the propodus.

Holotype description: fully mature male 3.2mm.

Head. Head length subequal to first 3 pereonites combined, rostrum present, eye compound, located medially (Fig. 1). Antenna 1 one third of antenna 2; peduncle setose; article 1 subequal articles 2 & 3 combined, without facial setae; article 3 the smallest; flagellum dorsally setose, 6 articulates; article 1 double length, aesthetasce present. Antenna 2 about 50% of body length; peduncle less setose, about 0.5x of flagellum; article 5 the longest, facial setae present on articles 4& 5; flagellum more than 20 articles, dorsally setose (Fig. 1). Maxilliped pulp 4 articulates, setose internally; article 2 the longest, stout; article 4 as long as article 3, ductyle-like; outer plate shorter than inner plate and stouter, with robust setae marginally; inner plate with few setae distally (Fig. 2). Mandibles pulp 3 articulates; article 2 & 3 sub-equal, setose; right mandible 5 toothed incisors, small inner plate, row of 4 setae, reduced molar process with two apical setae; left mandible 4 toothed incisors, 5 toothed lecinia mobiles, with two inner reduced plates, row of 5 setae, reduced molar process with two setae apically. Maxilla 1 pulp biarticulate; article 2 with 3 apical setae and 3 setae marginally; outer plate spines 8 + 1 large spine; inner plate oval shape, with one apical seta. Maxilla 2 outer lobe with 4 apical setae and 2 marginal setae; inner lobe with 5 setae. Upper lip semi-quadrate shape. lower lip inner lobe not forked (Fig. 2).

Pereon. Gnathopods 1 coxa postero-dorsally convex, coxa large, few setae antero-distally; basis stout, two times ischium and merus length, few setae antero-distal sub-marginally; ischium the smallest, with one postero-distal seta; merus reduced, with long postero-distal seta; carpus boat-like, distally with one long robust seta and few normal setae; propodus oval, anteriorly setose, with serrated margin distally and cupola ornamentation margin proximally, setose and one grasping spine; dactylus long, smooth (Fig. 1). Gnathopods 2 two folds of gnathopod 1; coxa quadrate, without setae; basis elongated, subequal in length to carpus, propodus combined, with few setae; merus the smallest part; carpus and propodus semi-fused, slender, beak-like, suture not complete, less setose dorsally and ventrally, grasping margin serrated, with peripheral setae; dactylus smooth (Fig. 1). Pereopod 3 coxa oval, with few short setae marginally; basis

less than half of pereopod length, with few long setae antero-distally; ischium the smallest article; merus triangle-shape, with very long setae anteriorly; carpus and propodus subequal in length with many spines ventrally; dactylus reduced (Fig. 3). Gills elongated rectangular shape, present on pereonites 2– 6. Pereopod 4 totally similar to Pereopod 3, except for coxa enlarged oval shape; basis with postero-distal row of bipinnate setae; merus with shorter setae anteriorly; propodus with very small setae externally. Pereopod 5 coxa 2.5x of basis, subquadrate, without setae; basis spindle, totally setose; ischium the smallest article; merus subequal basis; carpus and propodus subequal, setose; dactylus slightly shorter than propodus, leaf-like tapering distally (Fig. 3). Pereopod 6 coxa subquadrate, without setae; basis spindle shape, with normal and plumose setae; ischium the smallest article; merus similar to pereopod 5 merus; carpus, propodus and dactylus lost in holotype specimen, and propodus and dactylus are subequal in length as in female paratype materials (Fig. 4). Pereopod 7 very long; basis large, triangle; ischium reduced; merus, carpus, and propodus similar in size and shape; dactylus, propodus subequal, with two apical setae (Fig. 3).

Pleon. Epimeron rounded marginally, without setae. Telson semi-rounded, with few short setae. Uropods 1– 3 reduced in length; Uropod 1 peduncle the longest, dorsally spinose, with 2 similar rami, outer ramus dorsally spinose; Uropod 2 similar, less longer; Uropod 3 the smallest, without spines, all rami with fine setae peripheral (Fig. 4).

Sexual dimorphism characters: Only two females in bad condition with destroyed antennas and missed Urosomite. Therefore, based on the available parts of these materials, female A2 peduncular fourth article is without facial setae.

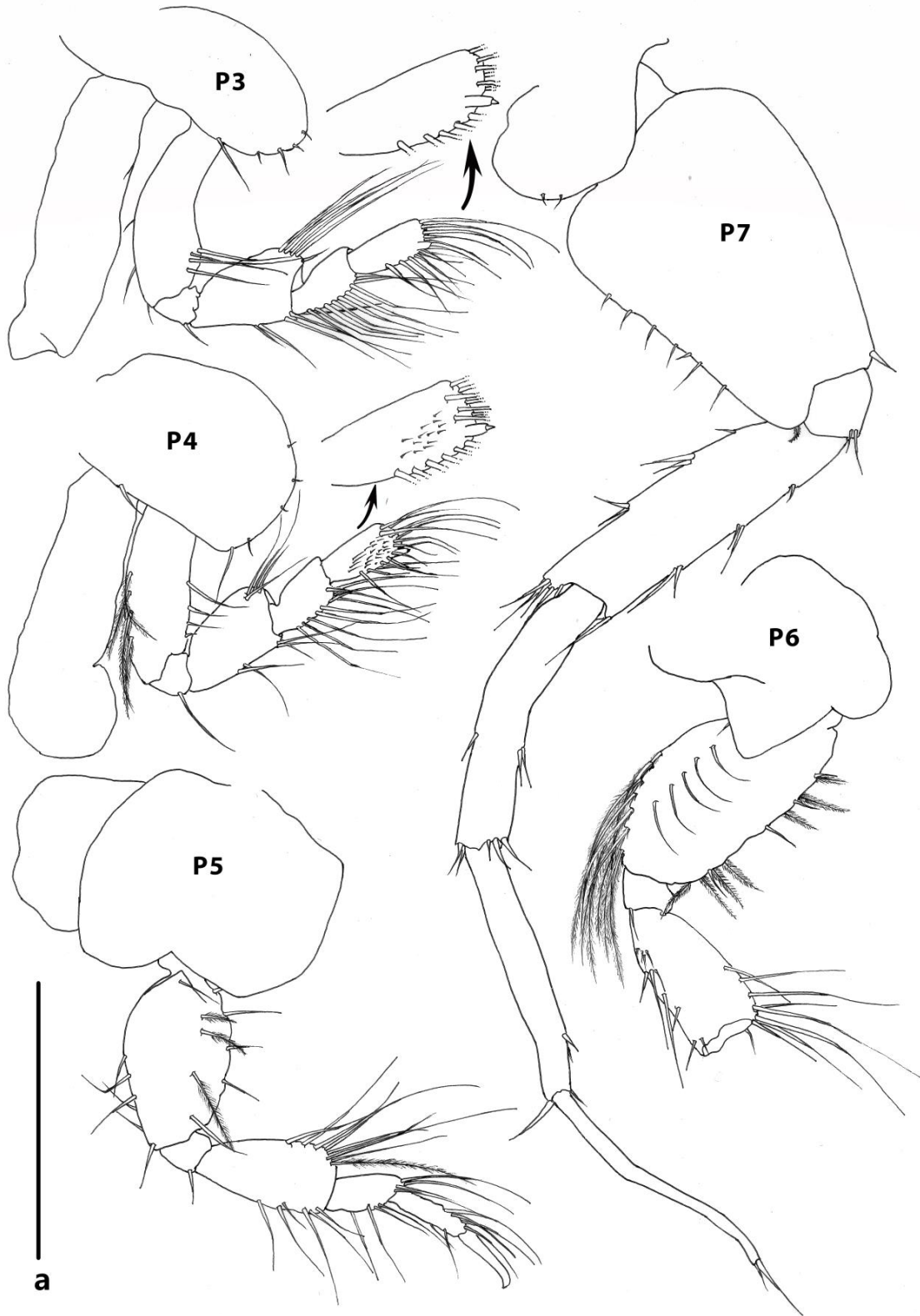


Fig. 3. *Pontocrates longidactylus* sp. nov., Holotype (AZMCcam280201) male “a” 3.2 mm; pereopods 3- 4 with propodus magnification, pereopods 5– 7, Scale: a = 0.3mm

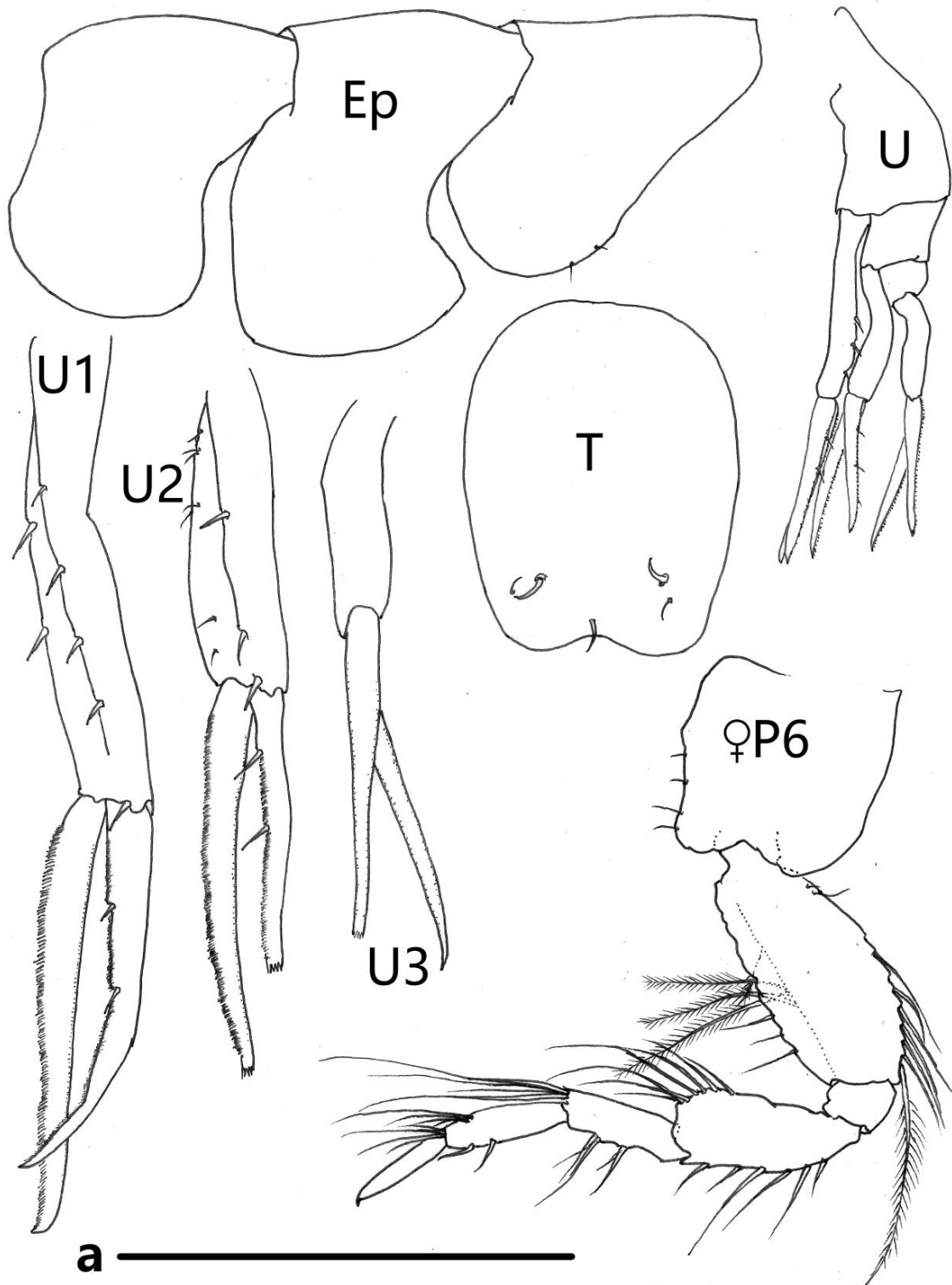


Fig. 4. *Pontocrates longidactylus* sp. nov., Holotype (AZMCcam280201) male “a” 3.2 mm; epimereon, urosomite, uropods 1– 3 and telson, Paratype female “b”; pereopod 6, Scale: a = 0.3mm

Remarks

Genus *Pontocrates* is characterized by the following features: Gnathopod 2 chelate, with carpus and propodus not completely fused, and the carpus process extending apically in front of the chela. Labium with separated inner lobes and coalesced outer lobes. Molar spinous though reduced. Pereopod 3 and pereopod 4 dactylus reduced (Ruffo, 1993).

Pontocrates includes five species which are *P. altamarinus*, *P. arcticus*, *P. arenarius*, *P. moorei*, and *P. norvegicus*. The examined new materials have long P5 and P6 dactylus in both males and females which differs it from other *Pontocrates* species, in addition to that, P5 and P6 dactylus subequal to propodus in the new materials, while the rest species dactylus less than one third of their propodus except *P. arcticus*, where P5 and P6 dactylus are more than one third length of propodus.

The new materials are similar to most of the other species like general shape, antenna 1 and 2 and urosome, particularly are similar to G1 merus of *P. altamarinus* which is reduced on both. On the other side, the new materials differ from *P. altamarinus* in having G1 article 6 anteriorly setose, with serrated margin distally and cupola ornamentation margin proximally, while in *P. altamarinus* the whole G1 article 6 is serrated. Furthermore, the new materials have G2 chelate in which the palm median anterior margin is serrated with one grasping spine, while in *P. altamarinus*, G2 palm is not serrated marginally. The third difference is the epimeron of new materials without setae, while in *P. altamarinus* epimerons 1- 2 have many lateral and peripheral setae.

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ETHICAL STATEMENT

The sampling techniques in this study were conducted to preserve the wellbeing of the ecosystem.

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