

A new species of *Aciconula* (Amphipoda: Corophiidea) from Brazilian waters

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A new species, Aciconula tridentata sp. nov., is described from the Brazilian coast. The type material were collected from Praia de Suape, Cabo de Santo Agostinho, Pernambuco, Brazil. This new species differs from all its congeners in having the propodus palm of male gnathopod 2 bearing a 3-dentate projection. Additionally, A. tridentata sp. nov. can be distinguished from A. australiensis and A. miranda in lacking a setose hump proximally in article 1 of the peduncle of antenna 1; the outer plate of maxilliped reaching the end of palp article 1, and the female pereopod 4 is 3-articulate. A key to species of the genus is provided.

Keywords: Caprellidae, benthic communities, north-east Brazil, taxonomy, Corophiidea, Peracarida, South Atlantic

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INTRODUCTION

The members of the family Caprellidae are considered to constitute a keystone part of shallow-water marine ecosystems as secondary and tertiary producers (Guerra-Garcia & Takeuchi, 2004). They are very abundant members of the marine benthos living as epibionts on a variety of substrata from the littoral zone to a depth of 4790 m (McCain, 1968; Arimoto, 1976; Guerra-Garcia & Takeuchi, 2004). Despite its abundance and role on marine ecology, little is known about the caprellids amphipods on the north-east Brazilian coast. Indeed, only three species have been recorded (Wakabara & Serejo, 1998).

The genus *Aciconula* was erected by Mayer (1903) based on two female specimens of *A. miranda* Mayer, 1903 collected from Singapore, Malaysia and Koh Krau, Thailand. Mayer (1912) described the male of *A. miranda* based on material collected from Shark Bay, Australia. Later on, Chess (1989) described the second species of the genus, *A. acanthosoma* from Santa Catalina Island, Southern California. Recently, a third species, *A. australiensis*, was described by Guerra-Garcia (2004a) from Lizard Island, Queensland, Australia. Additionally, Guerra-García (2004b) and Guerra-García *et al.* (2006) recorded this genus as undescribed species (*Aciconula* sp.) from Phuket, Thailand and the Caribbean coast of Colombia, respectively. Hence, only three valid species have been described for this genus, with a worldwide and very disjoint biogeographical distribution.

In this paper we describe a new species of *Aciconula* from an intertidal exposed zone of beach rocks, in association with seaweeds from the Pernambuco State coast, Brazil. Furthermore,

this is the first record of this genus from Brazilian waters. Also a key to all species of *Aciconula* is provided.

MATERIALS AND METHODS

Type material is deposited in the Museu de Oceanografia–Petrônio Alves Coelho/Universidade Federal de Pernambuco (MOUFPE). Appendages and mouthparts were mounted on glass slides and sealed with glycerol gel after staining with Chlorazol Black. The illustrations were drawn under optic microscope with a camera lucida and digitally prepared according to methods described by Coleman (2003). The crustacean spines and setae classification follows Watling (1989). Terminology in describing gnathopodal palm follows Poore & Lowry (1997). The following abbreviations are used in the figures: A, antenna; Ab, abdomen; G, gnathopod; Gi, gill; Ha, habitus; Hd, head; LL, lower lip; Md, mandible; Mx, maxilla; Mxp, maxilliped; P, pereopod; m, male; f, female; l, left; r, right.

RESULTS

SYSTEMATICS

Order AMPHIPODA Latreille, 1816
Suborder COROPHIIDEA Leach, 1814
Family CAPRELLIDAE Leach, 1814
Genus *Aciconula* Mayer, 1903
Aciconula tridentata sp. nov.
(Figures 1–5)

TYPE MATERIAL

Holotype: male (2.4 mm), Praia de Suape (8°23′03.31″S–34°57′20.64″W), Pernambuco State, Brazil, in intertidal

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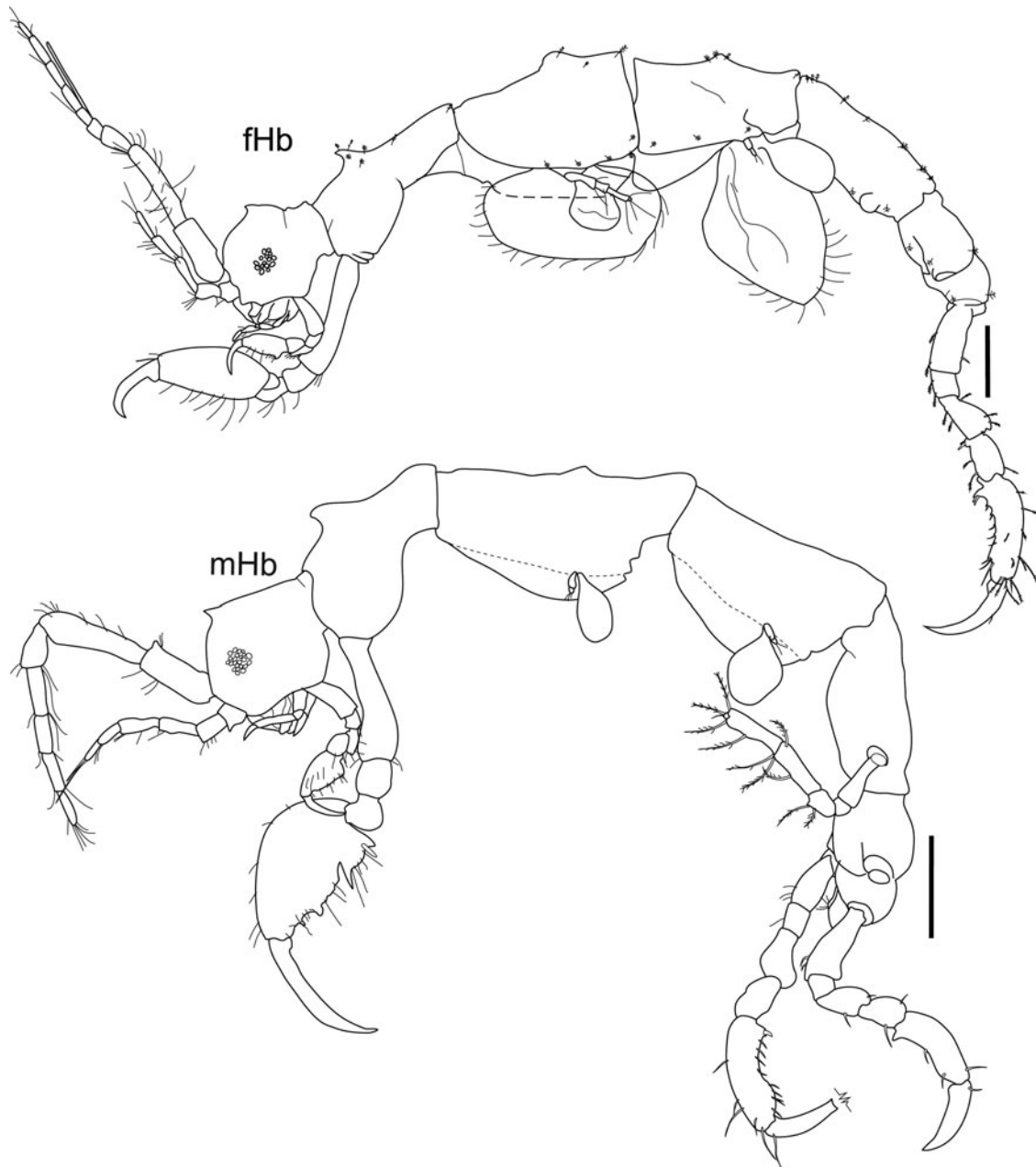


Fig. 1. *Aciconula tridentata* sp. nov., holotype male (2.4 mm) Praia de Suape, Pernambuco State, Brazil, July 2009, MOUFPE 15070. Paratype female (2.6 mm) from the same locality of holotype, MOUFPE 15013. Scale bars: 0.2 mm.

seaweeds' bed on beachrock, July 2009, T.N.V. Reis col., MOUFPE 15070.

Paratypes: 1 female (2.6 mm), dissected and drawn, Praia de Suape ($8^{\circ}23'03.31''S-34^{\circ}57'20.64''W$), Pernambuco State, Brazil, in intertidal seaweeds' bed on beachrock, July 2009, T.N.V. Reis col., MOUFPE 15013. 1 female, Praia de Suape ($8^{\circ}23'03.31''S-34^{\circ}57'20.64''W$), Pernambuco State, Brazil, in intertidal seaweeds' bed on beachrock, July 2009, T.N.V. Reis col., MOUFPE 15064. 1 male, Praia de Suape ($8^{\circ}23'03.31''S-34^{\circ}57'20.64''W$), Pernambuco State, Brazil, in intertidal seaweeds' bed on beachrock, July 2009, T.N.V. Reis col., MOUFPE 15065. 1 female, Praia de Suape ($8^{\circ}23'03.31''S-34^{\circ}57'20.64''W$), Pernambuco State, Brazil, in intertidal seaweeds' bed on beachrock, July 2009, T.N.V. Reis col., MOUFPE 15066.

DIAGNOSIS

Head with a small sharp median forward projection. Antenna 1 about $1/3$ of body length. Lower lip with inner lobes bilobed. Maxilliped outer plate reaching end of palp article 1. Gnathopod 2 male propodus ovate, palm extremely acute, occupying the entire posterior margin, first half with a 3-dentate projection, followed by a large excavation leading to a projection with two sharp processes and one very robust seta defining the end of palm. Pereopods 3 and 4 of male rudimentary, two-articulate, article 2 shorter than article 1 ($0.3\times$), with three simple setae distally. Female pereopods 3 and 4 more developed than the male; pereopod 3 4-articulate and pereopod 4 3-articulate. Pereonite 5 female bearing a pair of lobes on ventral margin.

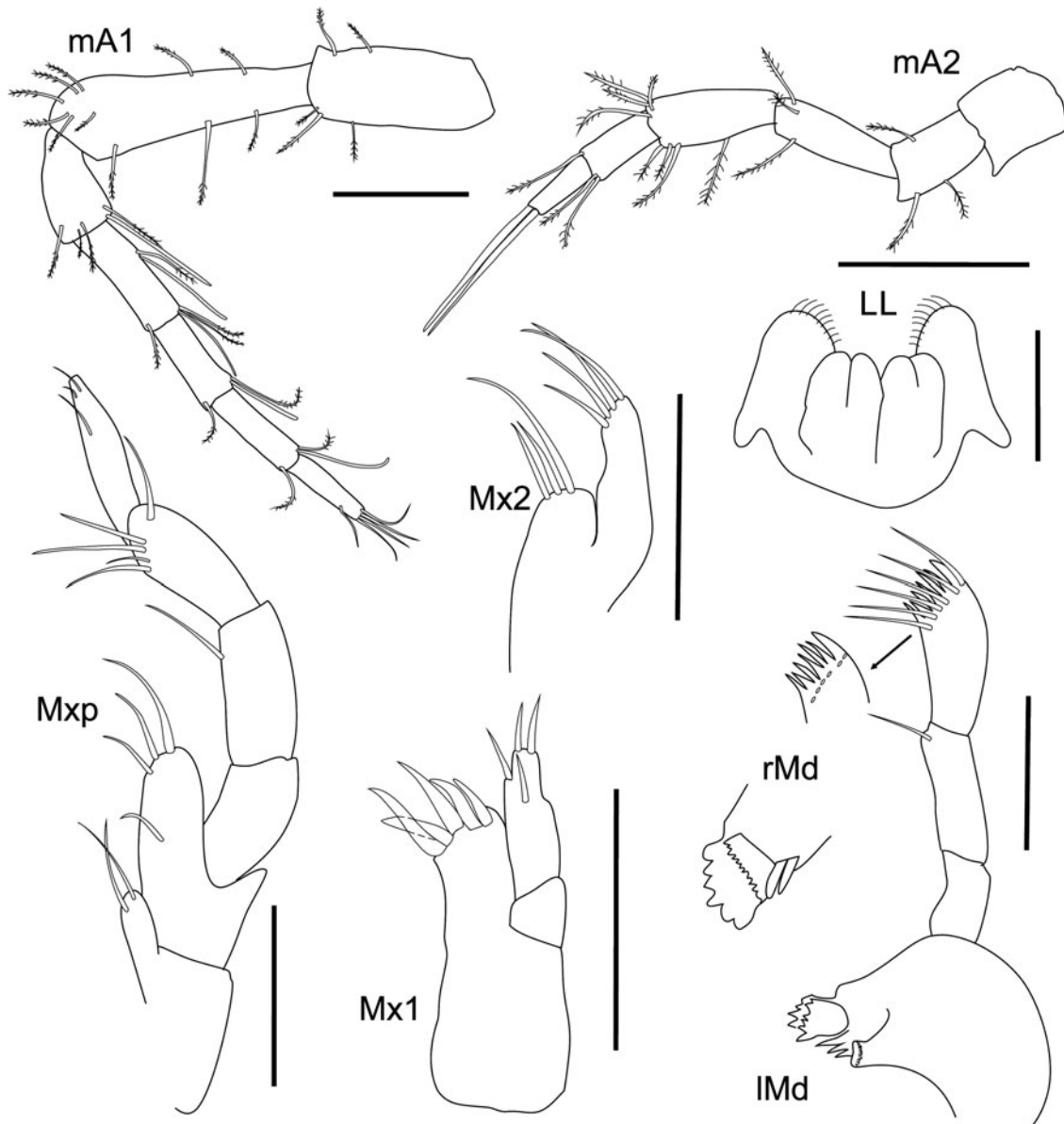


Fig. 2. *Aciconula tridentata* sp. nov., holotype male, Praia de Suape, Pernambuco State, Brazil, July 2009, MOUFPE 15070. Paratype female from the same locality of holotype, MOUFPE 15013. Scale bars: 0.1 mm for mA1 and mA2; and 0.05 mm for the remainder.

DESCRIPTION—BASED ON HOLOTYPE MALE

Head with a small sharp median forward projection. Pereonite 2 with a small sharp median forward projection. Pereonite 3 and 4 subequal, the first with a small hump medially. Pereonites 5–7 decreasing in length, respectively.

Antenna 1 about $1/3$ of body length; article 1 longer than article 3 ($1.5\times$); article 2 longer than article 3 ($2.3\times$); flagellum 4-articulate and shorter than peduncle. Antenna 2 reaching end of article 2 of antenna 1; peduncle article 1 with a posterodistal subacute projection; flagellum 2-articulate. Upper lip symmetrically bilobed, not setose apically. Mandibles palp 3-articulate; article 2 with a single distal seta; article 3 dentated distally, with six simple setae; mandibular molar present; left mandible with incisor 6-toothed, lacinia mobilis large and 4-toothed followed by three setae; right mandible incisor 4-toothed, lacinia mobilis large and serrate distally, followed by two setae. Lower lip with inner lobes bilobed, well

demarcated. Maxilla 1 outer lobe with five robust setae; palp 2-articulate, article 2 surpassing well inner plate, with a seta medially and three setae distally. Maxilla 2 inner lobe shorter than outer lobe ($0.5\times$), with three and four setae distally, respectively. Maxilliped inner plate short with two setae distally; outer plate reaching end of palp article 1, with a seta medially and three setae apically; palp 4-articulate, scarcely setose; articles subequal in length.

Gnathopod 1 basis as long as ischium, merus and carpus together; propodus triangular, palm acute, poorly setose, with robust setae defining palm. Gnathopod 2 inserted ventrally on the anterior half of pereonite 2; basis long and slender, $3.3\times$ longer than wide; ischium rectangular, $1.25\times$ longer than wide; merus rounded; carpus very short and triangular, $0.13\times$ propodus length; propodus ovate, palm extremely acute, occupying entire posterior margin, first half with a 3-dentate projection, followed by a large excavation leading to

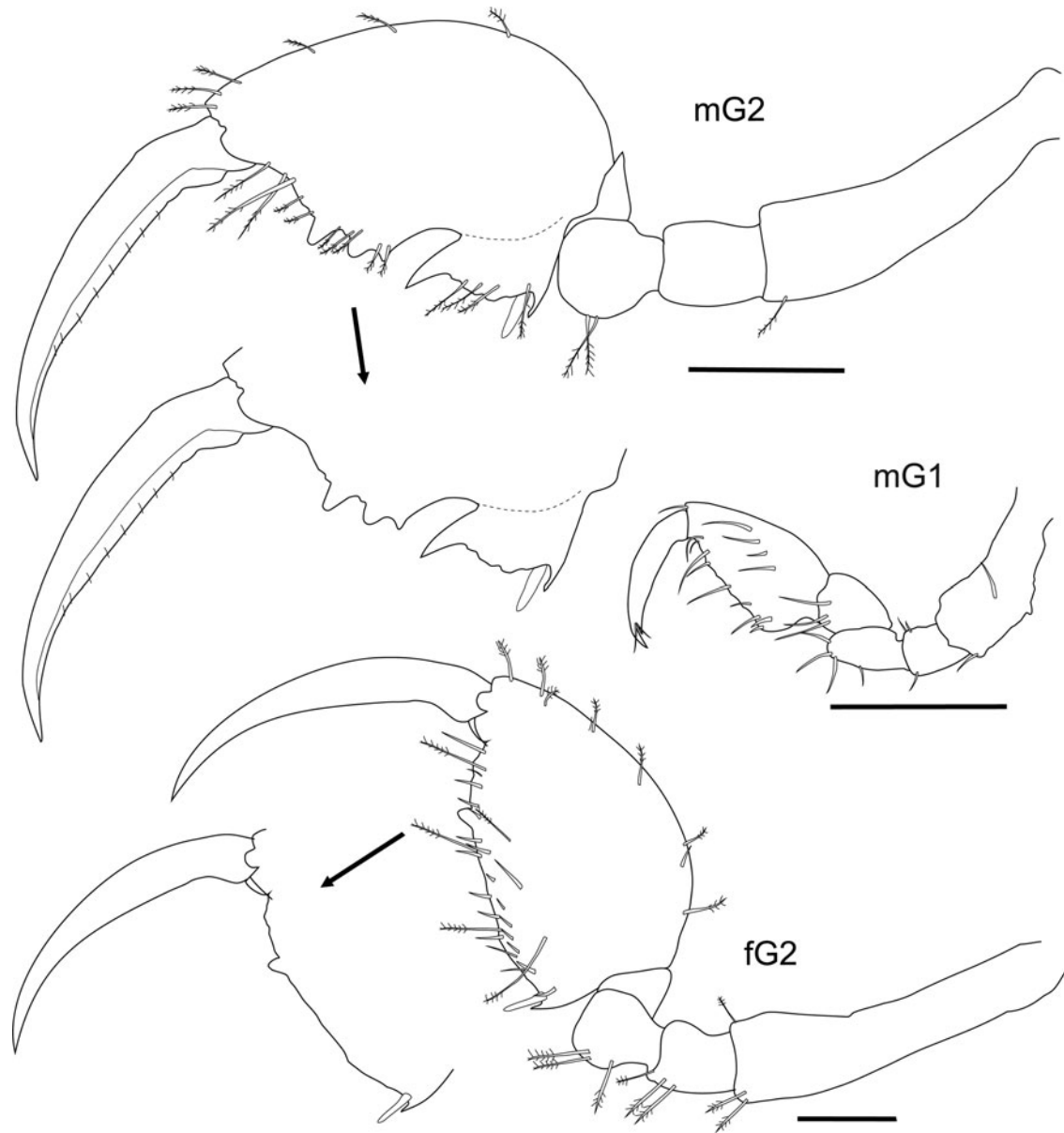


Fig. 3. *Aciconula tridentata* sp. nov., holotype male, Praia de Suape, Pernambuco State, Brazil, July 2009, MOUFPE 15070. Paratype female from the same locality of holotype, MOUFPE 15013. Scale bars: 0.1 mm.

a projection with two sharp processes and one very robust seta defining ending of palm.

Gills present on pereonites 3–4, oval, length about $1.2\times$ width. Pereopods 3 and 4 rudimentary, about $1/3$ of gill length, 2-articulate, article 1 inflated; article 2 shorter than article 1 ($0.3\times$), with three simple setae distally. Pereopod 5 elongate and 6-articulate, basis short, slightly expanded distally with two plumose setae on anterior margin; merus longer than ischium ($1.75\times$) with two plumose setae on posterior margin; carpus and propodus subequal in length, both with plumose setae medially and distally; dactylus rudimentary and triangular. Pereopod 6 basis subequal to ischium and merus combined; carpus short, $0.4\times$ of propodus length; propodus curved, palm excavated and defined by a subacute process bearing a pair of grasping spines; dactylus falcate, robust and slightly shorter than propodus ($0.9\times$). Pereopod 7 subequal to pereopod 6, basis subequal to

ischium and merus combined; carpus short, $0.45\times$ of propodus length; propodus curved, palm excavated and defined by a subacute process bearing a pair of grasping spines; dactylus falcate, robust and slightly shorter than propodus ($0.9\times$).

Penes rounded, as long than wide ($2.8\times$). Abdomen, bearing a pair of lateral lobes, each of one with two groups of three setae, the first one in proximal half and the second in the distal half; a single dorsal lobe present with two short setae distally.

SEXUALLY DIMORPHIC CHARACTERS—BASED ON PARATYPE FEMALE

Pereonites 3 and 4 subequal, both with a small hump medially. Pereopods 3 and 4 more developed than in male. Pereopod 3 4-articulate (instead of 2-articulate); all articles with plumose setae distally; article 1 longer than article 3 ($1.25\times$); article 2 about $1/2$ length of article 3; article 4 reduced to a small

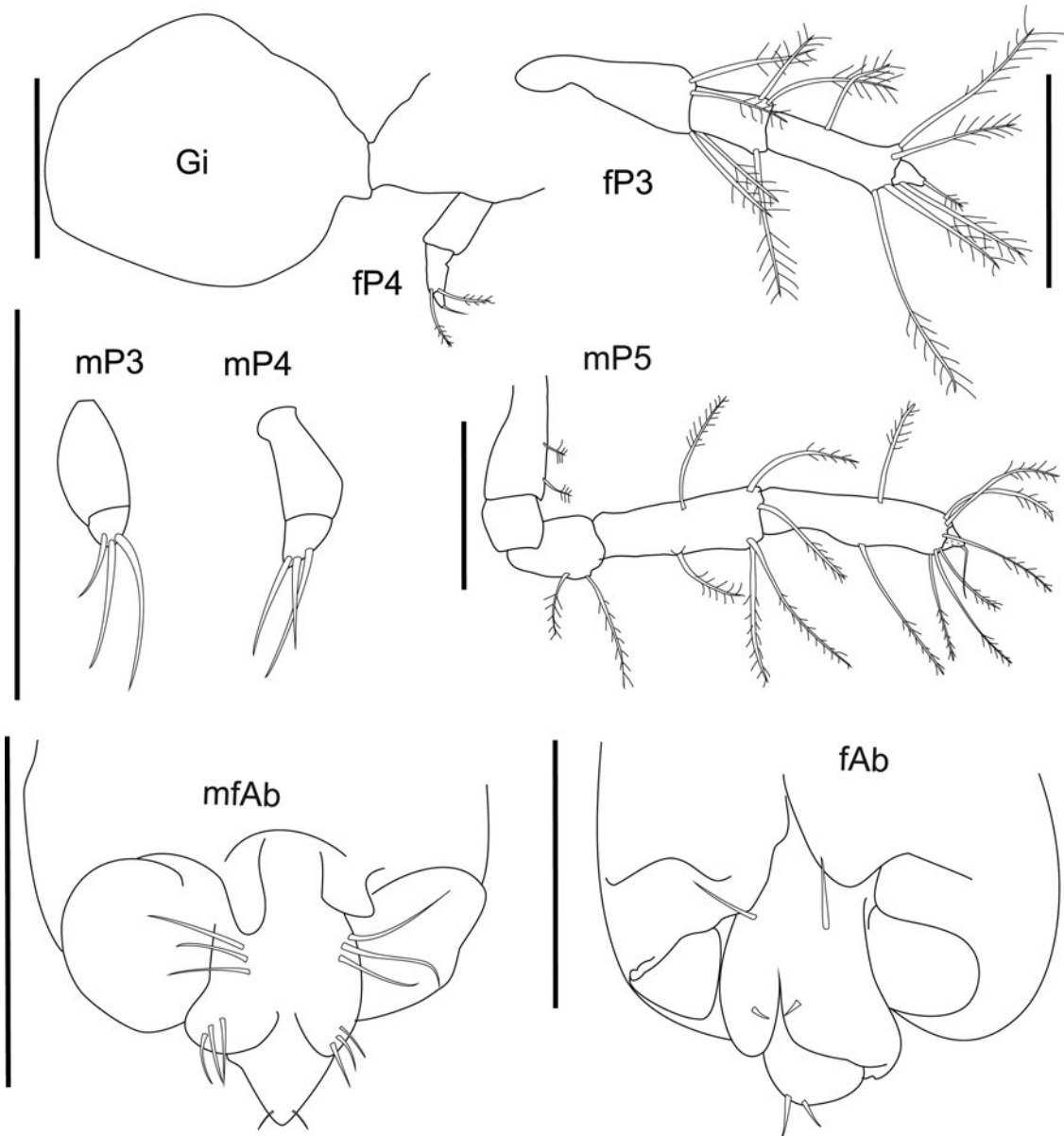


Fig. 4. *Aciconula tridentata* sp. nov., holotype male, Praia de Suape, Pernambuco State, Brazil, July 2009, MOUFPE 15070. Paratype female from the same locality of holotype, MOUFPE 15013. Scale bars: 0.1 mm.

cone, about $0.2\times$ of article 3 length, with a plumose seta distally. Pereopod 4 3-articulate (instead of 2-articulate), articles 1 and 2 rectangular, subequal in length; article 2 with two plumose setae distally; article 3 reduced to a small cone distal article with a short seta distally. Oostegites present on pereonites 3 and 4. Pereonite 5 bearing a pair of lobes on ventral margin. Abdomen, bearing a pair of lateral lobes each of one with two groups of one seta, the first one in proximal half and the second in the distal half; a single dorsal lobe present with two short setae distally.

TYPE LOCALITY

Praia de Suape ($8^{\circ}23'03.31''S-34^{\circ}57'20.64''W$), Cabo de Santo Agostinho, Pernambuco, Brazil.

ETYMOLOGY

The epithet *tridentata* refers to the 3-dentate projection on the palm of male gnathopod 2.

REMARKS

As a whole, *Aciconula tridentata* sp. nov. differs from its congeners in having propodus palm of male gnathopod 2 bearing a 3-dentate projection. Also, it is very different from *A. acanthosoma* by the body dorsally not spinose, shape of male and female gnathopods 1 and 2 and female pereopods 3 and 4 4- and 3-articulate (instead 2-articulate). However, the new species is closely related to *A. miranda* and *A. australiensis* by the general feature of body and appendages, but in the former the inner lobe of lower lip is simple and the female pereopod 3 has the fourth article (distally) tiny and almost not tabicated (Guerra-Garcia, 2004a), whereas it is bilobed and clearly 4-articulate in *A. australiensis* and *A. tridentata* sp. nov.

Finally, *A. tridentata* sp. nov. can be distinguished from *A. australiensis* by the following combination of characters: article 1 of peduncle of antenna 1 lacking a setose hump proximally; outer plate of maxilliped reaching the end of palp article 1 (versus reaching $1/2$ palp article 1 length);

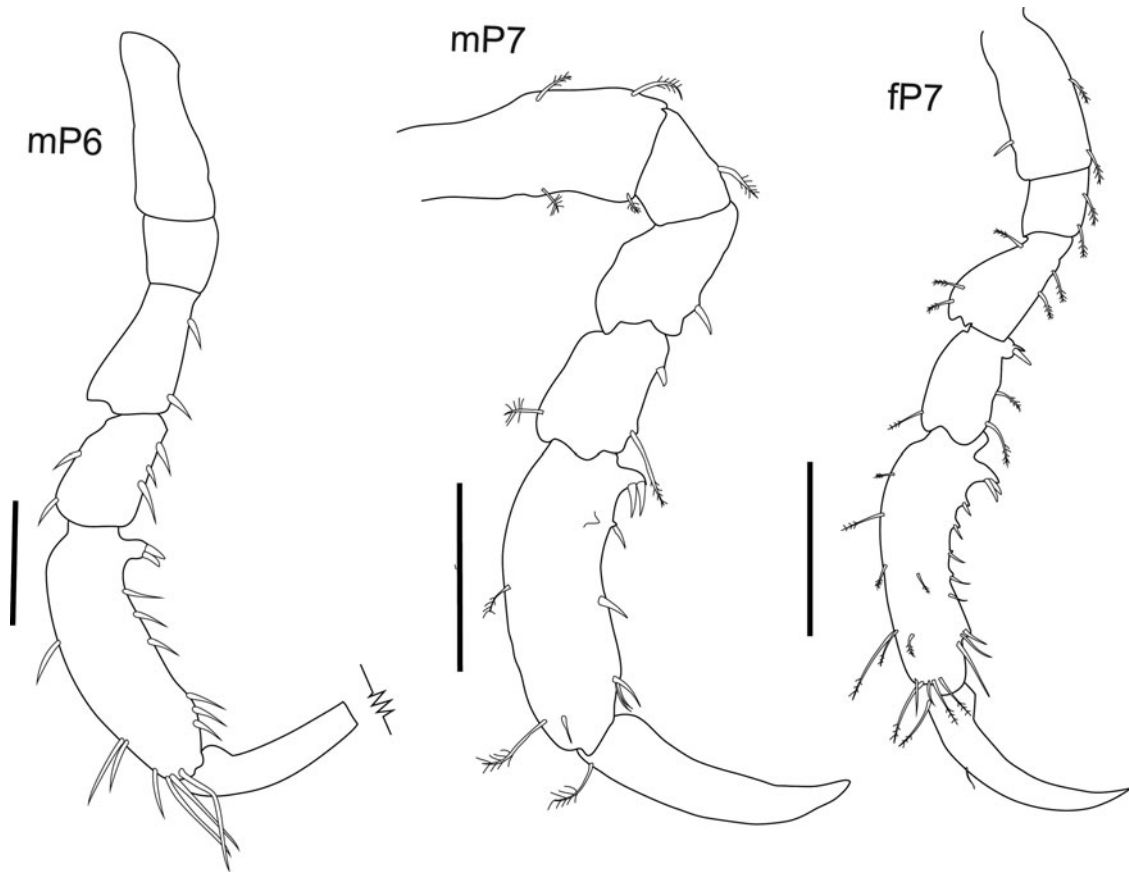


Fig. 5. *Aciconula tridentata* sp. nov., holotype male, Praia de Suape, Pernambuco State, Brazil, July 2009, MOUFPE 15070. Paratype female from the same locality of holotype, MOUFPE 15013. Scale bars: 0.1 mm.

female pereopod 4 3-articulate (instead of 2-articulate); and male pereopods 3 and 4 with article 2 about 1/3 of length of article 1, instead of being subequal.

KEY TO SPECIES OF *ACICONULA*

1. Body dorsally strongly spinose, pereopods 3 and 4 in both male and female 2-articulate, abdominal appendages present.....*Aciconula acanthosoma* Chess, 1989*
- Body dorsally not spinose, pereopods 3 and 4 in male 2-articulate, but in female pereopods +3-articulate, abdominal appendages absent.....2
2. Head lacking a small sharp median forward projection; lower lip inner lobe simple.....*Aciconula miranda* Mayer, 1903
- Head with a small sharp median forward projection; lower lip inner lobe bilobed3
3. Antenna 1 article 1 lacking setose hump proximally; outer plate of maxilliped reaching the end of palp article 1; female pereopod 4 3-articulate.....*Aciconula tridentata* sp. nov.
- Antenna 1 article 1 bearing a setose hump proximally; outer plate of maxilliped reaching 1/2 length of palp article 1 length; female pereopod 4 2-articulate.....*A. australiensis* Guerra-García, 2004a

*According to Guerra-García (2004a) based on these characters *A. acanthosoma* could be transferred to a different genus.

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