REDESCRIPTION OF *CAPRELLINA LONGICOLLIS* (NICOLET, 1849) (AMPHIPODA, CAPRELLIDEA, PHTISICIDAE) FROM CHILE, WITH NOTES ON ONTOGENETIC DEVELOPMENT AND CLINGING BEHAVIOUR

BY

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ABSTRACT

*Caprellina longicollis* (Nicolet, 1849) is redescribed and figured in detail based on specimens newly collected from Coquimbo, central-northern Chile, which represents the northernmost record of the species. The dominant posture observed for this species in clinging behaviour on its substrate was the “upright posture”. The combination of weak swimming setae on antenna 2 and the long gnathopod 2 basis suggests a predatory mode of life. A key to the species of the genus *Caprellina* is here included.

INTRODUCTION

Although the caprellidean amphipods are ecologically important as secondary and tertiary producers in benthic marine communities, they have been scarcely studied on the coast of South America (McCain & Steinberg, 1970). The taxonomy of amphipods is likewise poorly known for Chile (González, 1991). The lack of literature has discouraged investigation of the group, which has been overlooked for years. This has led to the exclusion of amphipods from many biological and ecological studies done in Chile.

González (1991) recently reviewed the taxonomy of the gammaridean Amphipoda of Chile, including a catalogue of the species. However, no recent research...
dealing with caprellidean amphipods has developed in Chile so far. This is evident when consulting a zoogeographic revision of benthic macroinvertebrates of the Chilean coast (Lancellotti & Vasquez, 2000) in which the caprellid species are not included in the list of taxa.

During a short stay at Coquimbo, central-northern Chile, the author collected abundant material of Caprellina longicollis (Nicolet, 1849). Although this is a common species and its presence has been frequently reported from the Southern Hemisphere, a complete taxonomic description was lacking and is provided herein.

MATERIAL AND METHODS

Specimens of Caprellina longicollis were collected by snorkelling in shallow waters (0-5 meters depth). The samples of habitat (seaweeds, seagrasses, etc.) were fixed using formalin 4% in seawater and the caprellids were subsequently placed in ethylalcohol 70%. Several specimens were dissected under a stereomicroscope. Permanent mounts were made in polyvinyl-lactophenol. All figures have been drawn with the aid of a camera lucida. Clinging behaviour was observed in the laboratory under a binocular microscope. Live specimens were placed in Petri dishes and their clinging behaviour was measured following the methodology used by Takeuchi & Hirano (1995).

Specimens of Caprellina longicollis have been deposited in the “Museo Nacional de Historia Natural de Santiago de Chile” (MNHN AMPH-N°11309).

Caprellina longicollis (Nicolet, 1849) (figs. 1-5)

Caprella longicollis Nicolet, 1849: 251-252, pl. 4 fig. 3.
Caprella brevicollis Nicolet, 1849: 252-253, pl. 4 fig. 4.
Caprellina longicollis, Mayer, 1882: 27-28, figs. 4-5; 1890: 15-16, pl. 6 fig. 4; 1903: 30; Thompson & Clinton, 1886: 141; Stebbing, 1910: 440; McCain, 1969: 289-290, fig. 2; McCain & Steinberg, 1970: 46.
Caprellinopsis longicollet, Hutton, 1904: 261.

Description of male “a”, collected from *Gracilaria chilensis*, “El Totoralillo”; body length 11.6 mm.

Colour of live specimen black red to brown. Body with numerous scattered red-brown chromatophores.

Head rounded dorsally. Pereonites 1, 2, 3, and 4 subequal; pereonite 5 about 1.3 times as long as pereonite 4; pereonite 5 and 6 subequal; pereonite 7 the shortest. Body smooth. Gills oval, length about 2.5 times width.

Upper lip symmetrically bilobed, with short setae around the cleft. Mandibles with 3-articulate palp; distal article with 4 setae and distally serrate; penultimate article with 9 setae; mandibular molar absent; right mandible with incisor divided into 5 teeth and lacinia mobilis minutely serrate followed by accessory plates and setal row; left mandible with incisor and lacinia mobilis divided into 5 teeth followed by accessory plates; lower lip with inner lobes well demarcated; outer lobes slender; inner and outer lobes carrying short setae apically. Maxilla 1 outer lobe carrying 6 teeth; distal article of the palp with 9 plumose setae on apical end and 9 plumose setae medially. Maxilla 2 outer and inner lobe similar in size, with plumose setae apically. Maxilliped inner plate carrying 3 serrate teeth and 3 plumose setae; outer plate, shorter than inner plate, provided with simple setae; palp setose; penultimate article of the palp with a slight projection carrying a row of small setae.

Antenna 1 about 4/5th of body length; distal segment of peduncle provided with setae; flagellum 8-articulate.

Antenna 2 about ¼ as long as antenna 1; swimming setae absent; flagellum 5-articulate.

Gnathopod 1 basis as long as ischium to carpus combined; propodus triangular; palm setose, with 2 grasping spines proximally; grasping margin of dactylus not serrate.

Gnathopod 2 inserted on the posterior half of pereonite 2; basis 1.5 times as long as pereonite 2; ischium and carpus short, subequal; merus elongate, twice as long as carpus; propodus as long as basis, provided with a grasping spine medially and a membranous sac distally; dactylus short and curved, not reaching midlength of propodus, margin smooth.

Pereopods 3 and 4 absent. Pereopod 5 reduced to 3 articles; distal article in form of dactylus. Pereopods 6 and 7 subequal, respectively, increasing in length; palm of propodus provided with rows of grasping spines.

Penes large, 2 times as long as long as wide.

Abdomen with a pair of little protuberances, as reduced pleopods, apically setose, and 2 pairs of uropods. Uropod 1 cylindrical and curved inwards; ramus a little shorter than peduncle, margin serrate. Uropod 2 a little shorter than uropod 1, serrate, without ramus.
Female “b” collected from *Gracilaria chilensis*, “El Totoralillo”; body length 6.4 mm.

Pereonite 1 not elongate. Flagellum of antenna 1 6-articulate. Flagellum of antenna 2 with 3 articles. Gnathopod 2 inserted on the anterior half of pereonite 2; palm of propodus with 3 grasping spines proximally and lacking the membranous sac distally. Abdomen without pleopods or protuberances. Second pair of gills slightly shorter than first pair. Oostegites not setose.

Intraspecific variation. — Body length: males 7.14±2.07 mm (mean±standard deviation), range (4.20-11.60 mm), \( N = 33 \); females 4.74 ± 0.75 (3.50-6.80), \( N = 38 \); premature females 3.60±0.67 (2.90-4.50), \( N = 15 \); juveniles 2.58±0.60 (1.70-3.50), \( N = 11 \).

Antennae. The number of articles in antenna 2 varies between 3 and 5 in males and between 3 and 4 in females.

Mouthparts. The maxilliped inner plate has always 3 teeth and the outer lobe of maxilla 1 has 6 teeth. Nevertheless, the number of apical setae on the distal article of the mandibular palp varies, being 3 or 4, i.e., generally 3 in females and 4 in
Fig. 2. *Caprellina longicollis* (Nicolet, 1849), male. A, maxilla 1; B, maxilla 2; C, upper lip; D, lower lip. Scale bars: A, 0.2 mm; B, 0.1 mm; C, D, 0.3 mm.
Fig. 3. Caprellina longicollis (Nicolet, 1849), male. A, maxilliped; B, left mandible; C, right mandible. Scale bar: 0.3 mm.
Fig. 4. *Caprellina longicollis* (Nicolet, 1849). A-D, male: A, antenna 1; B, antenna 2; C, gnathopod 1; D, gnathopod 2. E, female, gnathopod 2. Scale bars: A, 1 mm; B, 0.5 mm; C, 0.3 mm; D, 1 mm; E, 0.5 mm.
Fig. 5. *Caprellina longicollis* (Nicolet, 1849). A-E, male: A, pereopod 5; B, pereopod 6; C, pereopod 7; D, abdomen (ventral view); E, abdomen (lateral view). F, female abdomen (ventral view).

Scale bars: A, 0.3 mm; B, C, 1 mm; D, E, 0.2 mm; F, 0.1 mm.
males. The incisor is usually divided into 5 teeth, only rarely some males present a 6-toothed incisor.

The morphology of gnathopods and pereopods is rather constant, and minor differences could be due to the developmental stage of specimens.

Ontogenetic development. — The number of articles in the flagellum of the antennae increases in the course of development. Figure 6 shows a detail of the flagellum of antenna 1 (A) and antenna 2 (B) in males. The number of articles in antenna 1 increases from 4 in the first stages of development to 8 in the final stage. In antenna 2, the increase is from 2 to 4.

The aspect of male gnathopod 2 (C) changes considerably during development. Initially, the propodus is wider, provided with 2 grasping spines proximally, and without a membranous sac. One of the grasping spines is lost and the other one moves to mid-length of the palp. The distal seta of the margin disappears and a membranous sac appears at the same time as the propodus becomes elongated.

The tiny pleopods are already present in the first stages of development. Nevertheless, uropod 1 lacks a ramus in early stages (D).

Clinging behaviour. — The dominant posture observed for this species in clinging behaviour over its substrate was the “upright posture”, as categorized by Takeuchi & Hirano (1995). The “parallel posture” associated to grasping the substrate was not observed. Although attached to the substrate in the upright position, the frequency of “grooming” associated to filtering was low. These characteristics, together with the combination of weak swimming setae on antenna 2 and the long gnathopod 2 basis, indicate that this species probably has developed a predatory mode of life (cf. Takeuchi & Hirano, 1995).

**KEY TO THE SPECIES OF CAPRELLINA**

(see also fig. 7)

1. Body completely smooth ........................................... *C. longicollis* (Nicolet, 1849)
   – Body with acute projection dorsally .................................................. 2


**REMARKS**

The genus *Caprellina* Thomson, 1879 comprises three species until now: *Caprellina bispinosa* Müller, 1990, *Caprellina longicollis* (Nicolet, 1849) and *Caprellina spiniger* Barnard, 1916. *Caprellina longicollis* was established by Nicolet (1849) as *Caprella longicollis* without designation of a holotype.
Fig. 6. Caprellina longicollis (Nicola, 1849), male ontogenetic development. A, flagellum of antenna 1; B, flagellum of antenna 2; C, gnathopod 2; D, abdomen (ventral view). Scale bars: A, B, 0.5 mm; C, 1 mm; D, 0.3 mm.
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Fig. 7. Lateral views of the species in the genus *Caprellina*. A, B, *Caprellina longicollis* (Nicolet, 1849) (male and female, respectively); C, D, *Caprellina bispinosa* Müller, 1990 (male and female, respectively); E, *Caprellina spiniger* Barnard, 1916 (male). Scale bar: 1 mm.

*Caprellina bispinosa* and *C. spiniger* are, so far, endemic for the Society Islands and South Africa, respectively (Müller, 1990; Griffiths, 1976). *Caprellina longicollis* presents a wider distribution along the Southern Hemisphere. This species
has been found along the coast of Chile, South Africa, the North and South Islands of New Zealand, Stewart Island, Snares Islands, Brothers Island, Kaikoura, the Antipodes Islands, and the Aukland Islands (McCain, 1969; McCain & Steinberg, 1970). A species like *C. longicollis*, which has been found in New Zealand and South Africa, could probably belong to the cold-temperate region identified by Lancellotti & Vásques (1999, 2000). The region of Coquimbo, central-northern Chile, where the present specimens of *C. longicollis* were collected, belongs to the warm-temperate region but it is still affected by the oscillations of the Humboldt Current system, representing the most northern record for *C. longicollis* so far.

*Caprellina longicollis* is easily distinguishable from the remaining two species of *Caprellina* through the absence of dorsal projections.

The genus *Caprellina* can be differentiated from *Pseudocaprellina* Sundara Raj, 1927 by the flagellum of antenna 2, which is 2-articulate in *Pseudocaprellina* and more than 2-articulate in *Caprellina* (cf. Takeuchi, 1993). However, while *Caprellina longicollis* and *C. spiniger* have 3-5 articles in the flagellum of antenna 2, *C. bispinosa* has a 2-articulate flagellum as has the genus *Pseudocaprellina*. This indicates that *Caprellina bispinosa* could probably be transferred to the genus *Pseudocaprellina*. However, the presence of a pereopod 5 with 2 articles instead of a 3-articulate condition in *C. bispinosa*, together with the two pairs of 2-articulate uropods on the abdomen, both are conditions differing from those in the remaining species of both *Caprellina* and *Pseudocaprellina*. This would make us consider the possibility of merging the two genera to one, to include the 4 species accommodated in them at present: *Caprellina bispinosa*, *C. longicollis*, *C. spiniger*, and *Pseudocaprellina pambanensis*, the latter being the only species described in the genus *Pseudocaprellina*.

Ecological data on *C. longicollis* are very scarce in the literature. Nicolet (1849) and Mayer (1882) did not report habitats or substrates for this species. The depth range is between 0 and 30 m (McCain & Steinberg, 1970). *Caprellina longicollis* seems not to be very specific in choosing its substrate. Specimens comprised in the present study have been collected from seagrasses, from different species of seaweeds, under rocks, and attached to buoys. Four other species of Caprellidea were found living together with *Caprellina longicollis* along the coasts of Coquimbo: *Caprella scaura* Templeton, 1836, *C. verrucosa* Boeck, 1871, *C. equilibra* Say, 1818, and *Deutella venenosa* Mayer, 1890.

ACKNOWLEDGEMENTS

The author is very grateful to Dr. Martin Thiel for hospitality and facilities provided during his stay at the Facultad de Ciencias del Mar, Universidad Católica del Norte, Coquimbo, Chile. Special thanks to the Ministerio de Educación, Cultura y Deporte from Spain for financial support of the costs of travelling.
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First received 26 June 2001.
Final version accepted 10 July 2001.