

## A new species of *Austrofilius* (Crustacea, Isopoda, Janiridae) from the Western Mediterranean\*

JOSÉ CASTELLÓ

Departament de Didàctica de les Ciències Experimentals i de la Matemàtica, Universitat de Barcelona;  
Passeg de la Vall d'Hebron, 171, 08035 Barcelona, Spain. E-mail: jcastello@d5.ub.es

**SUMMARY:** A new species of janiridean isopod, *Austrofilius mediterraneus* sp. nov., from the Columbretes Islands (Castellón de la Plana), Mediterranean coast of the Iberian Peninsula, is described, given it is the first record of the genus in the Northern Hemisphere. It is mainly distinguished from the other two species of the genus by the male pleopod 1, which is wider at the apex and with hooked lateral lobes, curved and nearly surpassing medial lobes. Furthermore, the female operculum shows only four distolateral setae. The rostrum of *Austrofilius mediterraneus* sp. nov. is extended into single frontolateral tips but is shorter than in *A. furcatus* Hodgson, 1910.

**Key words:** Isopoda, Asellota, Janiridae, *Austrofilius mediterraneus* sp. nov., Mediterranean Sea.

**RESUMEN:** NUEVA ESPECIE DE *AUSTROFILIIUS* (CRUSTACEA, ISOPODA, JANIRIDAE) DEL MEDITERRÁNEO OCCIDENTAL. – En este artículo se describe una nueva especie de crustáceo isópodo janirido, *Austrofilius mediterraneus* sp. nov., recolectado en las islas Columbretes (Castellón de la Plana), costa mediterránea de la península ibérica. Se trata de la primera cita del género en el hemisferio norte. La especie se distingue de las otras dos incluidas en el género principalmente por el pleópodo 1 del macho, más ancho en el ápice y con lóbulos laterales en forma de gancho, los cuales están curvados y sobrepasan ligeramente los lóbulos medios. Además, el opérculo de la hembra presenta sólo cuatro sedas distolaterales. El rostro de *A. mediterraneus* sp. nov. se alarga a través de dos puntas frontolaterales pero es más corto que en *A. furcatus* Hodgson, 1910.

**Palabras clave:** Isopoda, Asellota, Janiridae, *Austrofilius mediterraneus* sp. nov., mar Mediterráneo.

### INTRODUCTION

A new species of the asellote isopod family Janiridae is described from the Mediterranean coast of Spain (Columbretes Islands, Castellón de la Plana): *Austrofilius mediterraneus* sp. nov. To date, only two species of the genus are known: *A. furcatus* Hodgson, 1910 and *A. serratus* Vanhöffen, 1914, both from the waters of the Antarctica. One additional species, *A. arnaudi* Kussakin and Vasina,

1980 is currently placed as a janirid genus *incertae sedis* (Wilson and Wägele, 1994). This report is the first record of the genus *Austrofilius* Hodgson, 1910 in the Northern Hemisphere. The new species is compared with the main features of other species of the genus.

### MATERIAL AND METHODS

The material was collected in July 1994 during the oceanographic expedition "Fauna III" off the

\*Received December 13, 2001. Accepted February 26, 2002.

Eastern coast of the Iberian Peninsula (Columbretes and Balearic Islands). In this expedition, 99 sites were sampled with classical methods of trawling and pelagic fishing and by scuba diving. Specimens of *Austrofilius* were collected on only one occasion: sample 273B1, 12.07.94, by scuba diving. Specimens were fixed in alcohol 70% and examined in glycerine. Drawings were prepared with a stereoscopic microscope Wild M5 and a microscope Olympus CH-2, both equipped with a camera lucida. Type specimens are in the Museo Nacional de Ciencias Naturales, Madrid (MNCN), Repository data: MNCN 20.04/5342a (holotype), MNCN 20.04/5342b (paratypes).

## RESULTS

Suborder ASELOTIA Latreille, 1803  
Superfamily JANIROIDEA Sars, 1897  
Family JANIRIDAE Sars, 1897  
Genus *Austrofilius* Hodgson, 1910

**Brief diagnosis.** Cephalon with broad, quadrate rostrum. Uropods shorter than pleotelson, with endopod longer than sympod. For a complete diagnosis, see: Wilson and Wägele (1994).

*Austrofilius mediterraneus* sp. nov.  
(Figs. 1-5)

**Material examined.** Sample 273B1, Collection "Fauna III", MNCN. Data from recorder: associated with *Cliona viridis*, maërl bottom. Holotype: Male 1.6 mm body length, excluding antennae and uropods. Paratypes: Eight males (one of them damaged) from 1.18 mm to 1.57 mm body length, three females (two of them broken) from 1 mm to 1.7 mm body length, and one damaged specimen, all collected with holotype.

**Type locality.** Columbrete Grande, Columbretes Islands, Castellón de la Plana, Spain; 39°54.02'N 0°41.15'E; 47 m depth.

**Accompanying isopods.** *Astacilla* sp., *Gnathia vorax* (Lucas, 1849), *Microjaera anisopoda* Bocquet and Lévi, 1955, *Munna fabricii* Kröyer, 1846, *Paranthura nigropunctata* (Lucas, 1849).

**Etymology:** From the Latin, *mediterraneus*, from the Mediterranean Sea.

**Diagnosis:** Rostrum extended into single frontolateral tips, rounded and with smooth lateral margins (Fig. 1A), often denticulate at the upper level in the male (Fig. 1B). Male pleopod 1 wider distally and with curved hooked lateral lobes and nearly surpassing medial lobes (Fig. 4A). Female operculum with four distolateral setae (Fig. 5B).

**Description:** Body depressed, broad, with length-width ratio of 3, dorsally smooth (Fig. 1A). Cephalon (Figs. 1A,B,C ; 5C,D) broader than long, with smooth lateral margins (often serrated: 5 teeth observed in one male paratype). Smooth lateral upper margins of rostrum (often serrated: 4 acute teeth observed in the same male paratype). Rostrum lower margin pointed frontolaterally and medial margin indented. Inconspicuous dorsal eyes, with two ocelli. Pereonites 1-3 acute on frontolateral corners. Pleotelson (Figs. 1A; 5A) broader than long, with rounded lateral margins and apex slightly acute. Margins with many setae; one is particularly robust, directed laterally, near a distolateral small point in the female.

Male antenna 1 (Fig 1D) more slender than in the female. Basal article robust with few small spines (two stout ones in the female), article 2 the longest with two long penicillate setae, article 3 the shortest. Two flagellar articles, first 40% length of second. One aesthetasc and one apical seta. Antenna 2 broken off in material studied. Peduncular article 3 (Fig 1E) with exopod bearing three setae.

Mandible (Fig 2A) with palp of three articles, the first bearing a single seta. The second is the longest, with two short, stout setae on ventral margin. The third has a ventral row of five setulated setae, the apical being the longest. Pars incisiva of left mandible with 6-7 teeth and lacinia mobilis 3 toothed. Pars molaris cylindrical, indented, with acute protuberances on molar process, and with a dorsal row of 5 setae.

Maxilla 1 (Fig 2B) with endite bearing about 10 serrated strong setae. Maxilla 2 (Fig. 2C) with about 3 setae at the apex of each lobe, shorter in the inner one, which bears many serrated setae.

Maxillipedal endite (Fig. 2D) with fine setae distally. Two coupling hooks. Epipod slightly surpassing distal margin of second palp article. Relative length of palp articles 2-5, 1.3 : 0.8 : 1 : 1. No setae on mesial margin.

Pereopods 1-7 similar, slightly increasing in length, especially carpus and propodus (Figs. 3A-E). Relative lengths of articles are: basis>carpus=propodus>ischium>merus>dactylus. The number of setae decreases from pereopod 1 to pereopod 7. All dactyli with two claws. Pereopods 3 and 5 not seen, broken off.

Length of male pleopod 1 (Fig. 4A) twice its width. Apex more than twice as wide as minimum width of base. Lateral lobes hook-like, slightly surpassing medial lobes. Each medial lobe bears 17

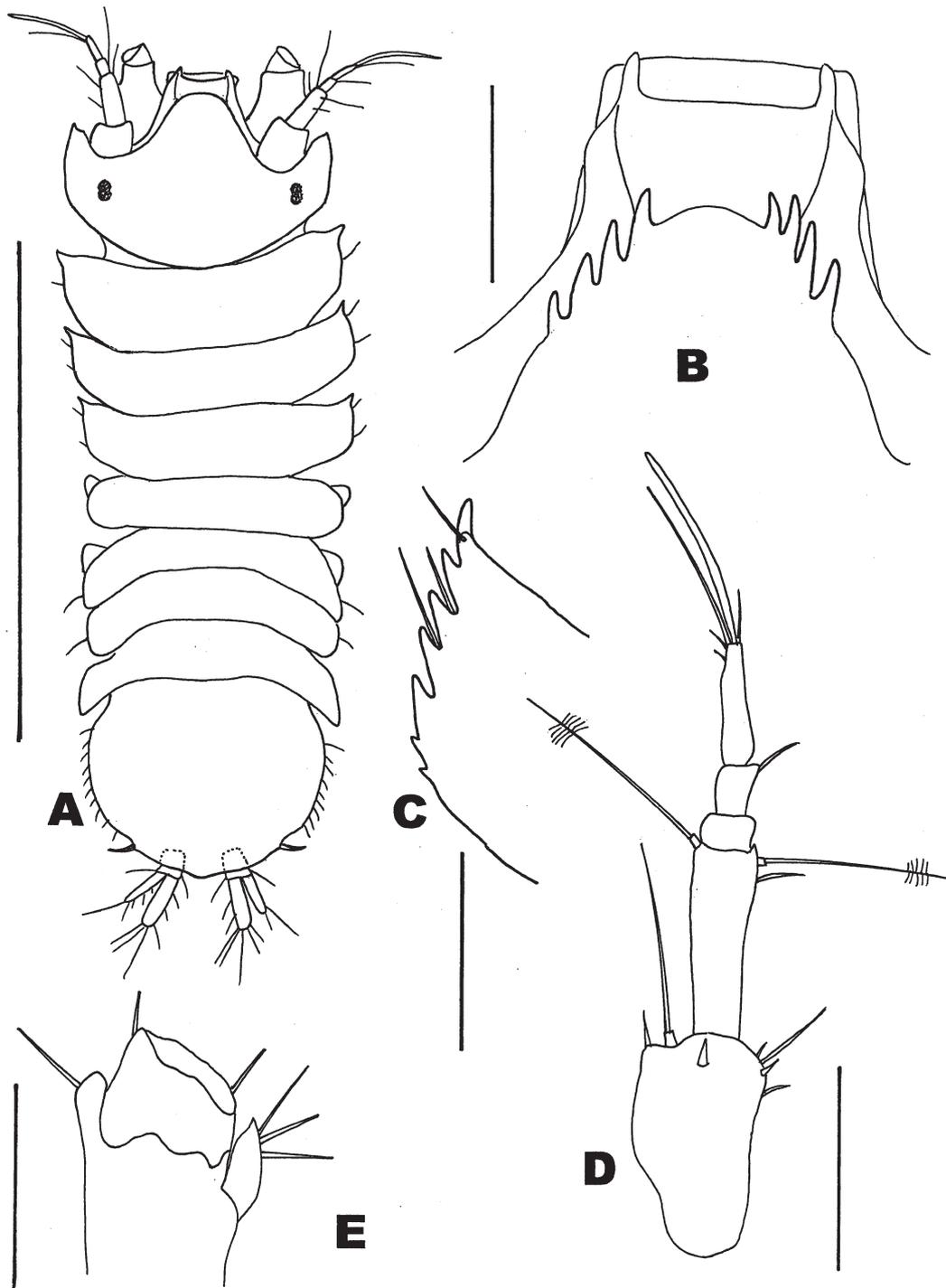


FIG. 1. – *Austrofilius mediterraneus* sp. nov., male holotype: **A**, habitus in dorsal view; **B**, rostrum of a male paratype showing different levels; **C**, margin of cephalon of the same male paratype; **D**, antenna 1; **E**, antenna 2 peduncle. Scale bars: A, 1 mm; B-E, 0.1 mm.

setae. Sympod of male pleopod 2 (Fig. 4B) robust, with eight distolateral simple setae. Endopod stylet-like surpassing sympod and exopod bearing external fine setae. Pleopod 3 (Fig. 4C) with exopod biarticulate. Distomedial margin surrounded by fine

setules. The first article has one seta on externodistal corner and the last article has one single distal seta. Endopod with three distal plumose setae. Pleopods 4 and 5 with oval endopod. Reduced exopod in pleopod 4 (Fig. 4D).

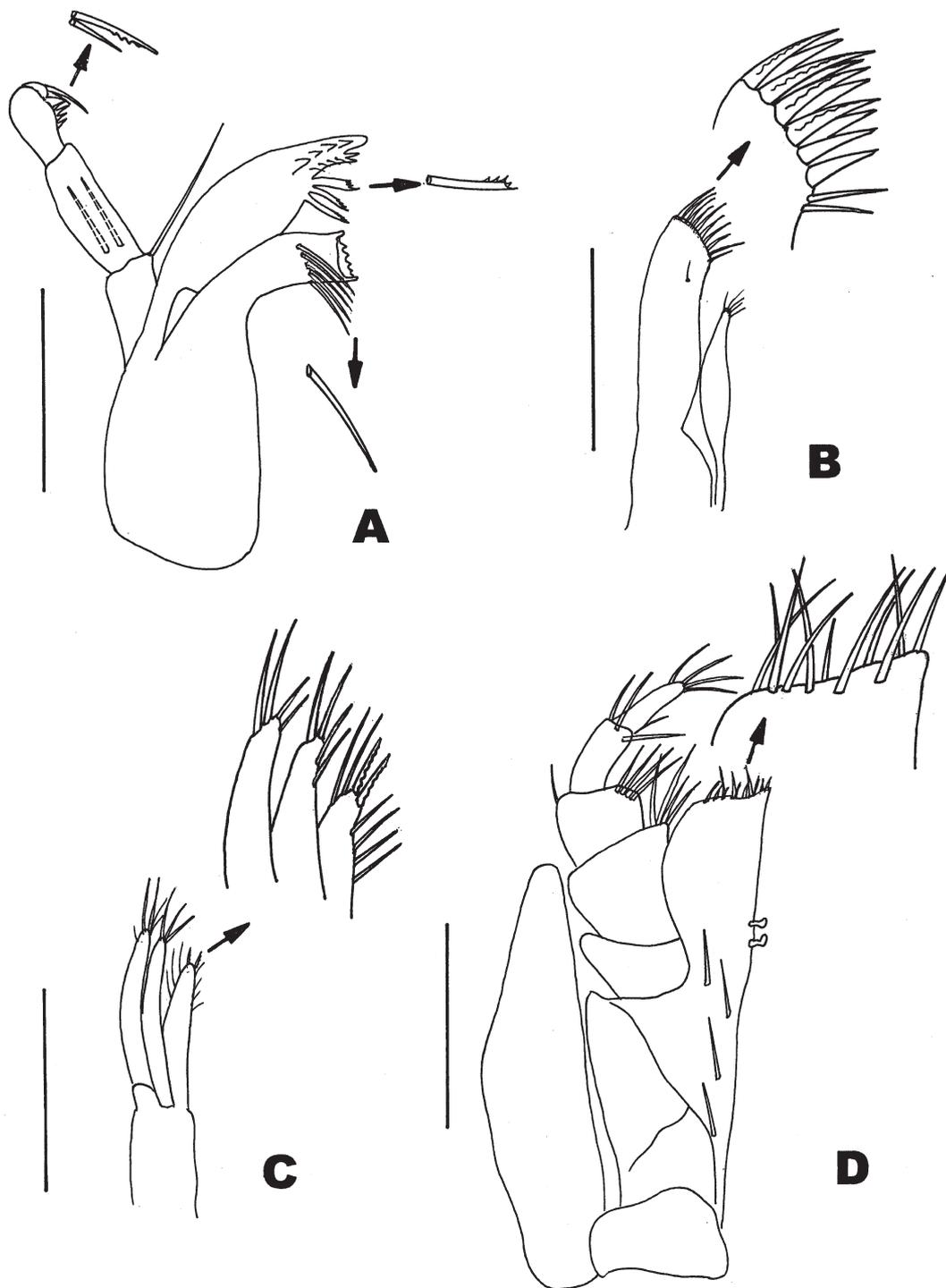


FIG. 2. – *Austrofilius mediterraneus* sp. nov., male holotype: **A**, left mandible; **B**, maxilla 1; **C**, maxilla 2; **D**, maxilliped. Scale bar: 0.1 mm.

Uropod (Fig. 4E) with sympod bearing about five setae. Endopod longer and broader than exopod, both having simple setae.

Female pleopod 2 (operculum, Fig. 5B) ovate with four distolateral setae and some fine and short hairs on distal margin.

#### DISCUSSION

Using the key for genera in Wilson and Wägele (1994), the species can be included in the genus *Austrofilius* Hodgson, 1910, above all because of its wide, square rostrum, the fact that the uropods are

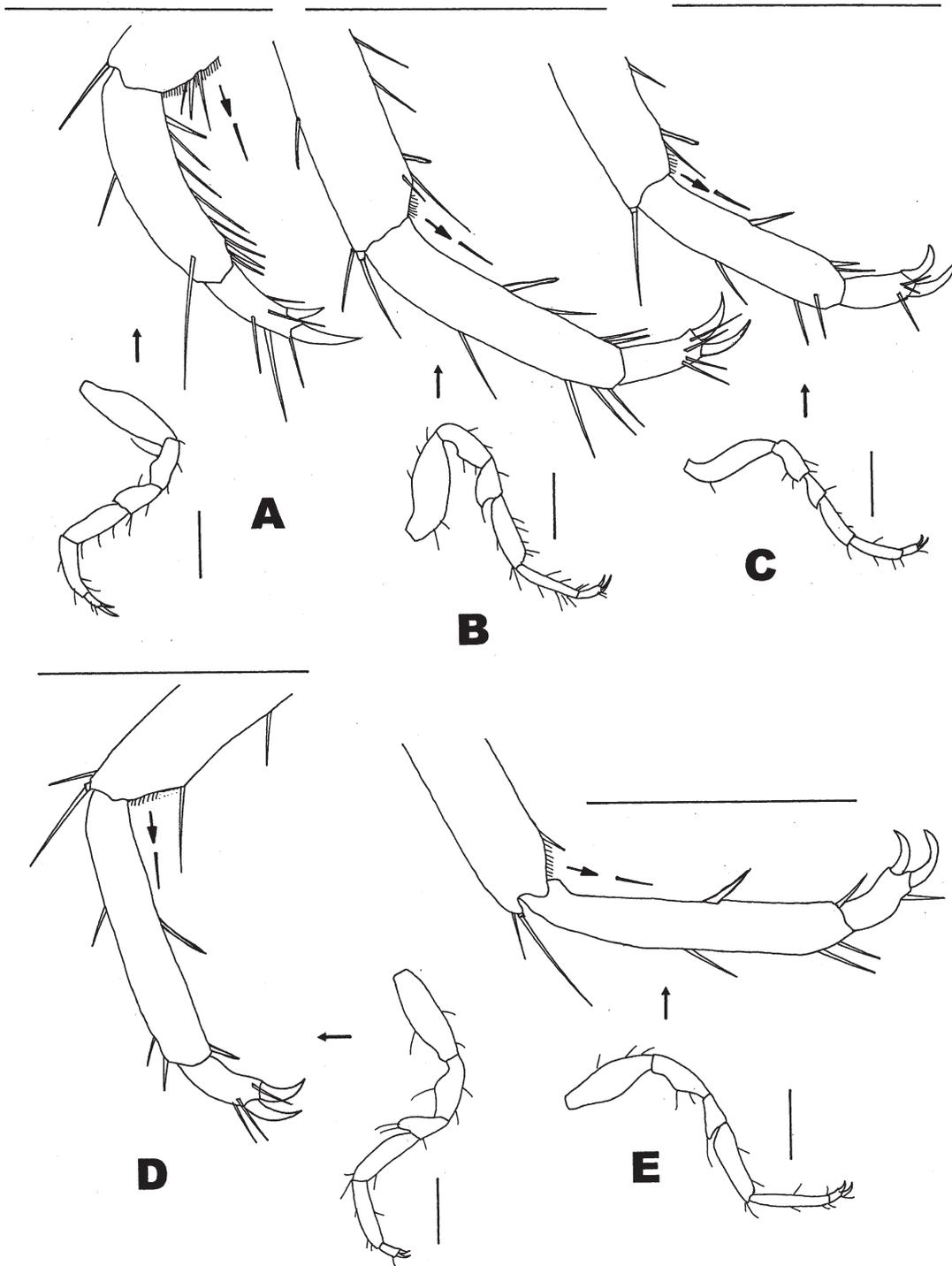


FIG. 3. – *Austrofilius mediterraneus* sp. nov., male holotype: A, pereopod 1; B, pereopod 2; C, pereopod 4 of a male paratype; D, pereopod 6; E, pereopod 7. Scale bar: 0.1 mm.

shorter than the pleotelson and the endopod longer than the sympod. The closest genus is *Neojaera*, erected by Nordenstam (1933), which was mistakenly considered synonymous with *Austrofilius* by Menzies (1962) though it does not have a wide rostrum. *A. mediterraneus* sp. nov. corresponds to the

diagnosis of the genus by Wilson and Wägele (1994) and does not add any new features.

Winkler and Brandt (1993) redescribed the only two known species of the genus, *A. furcatus* described by Hodgson (1910), and *A. serratus* described by Vanhöffen (1914). According to their

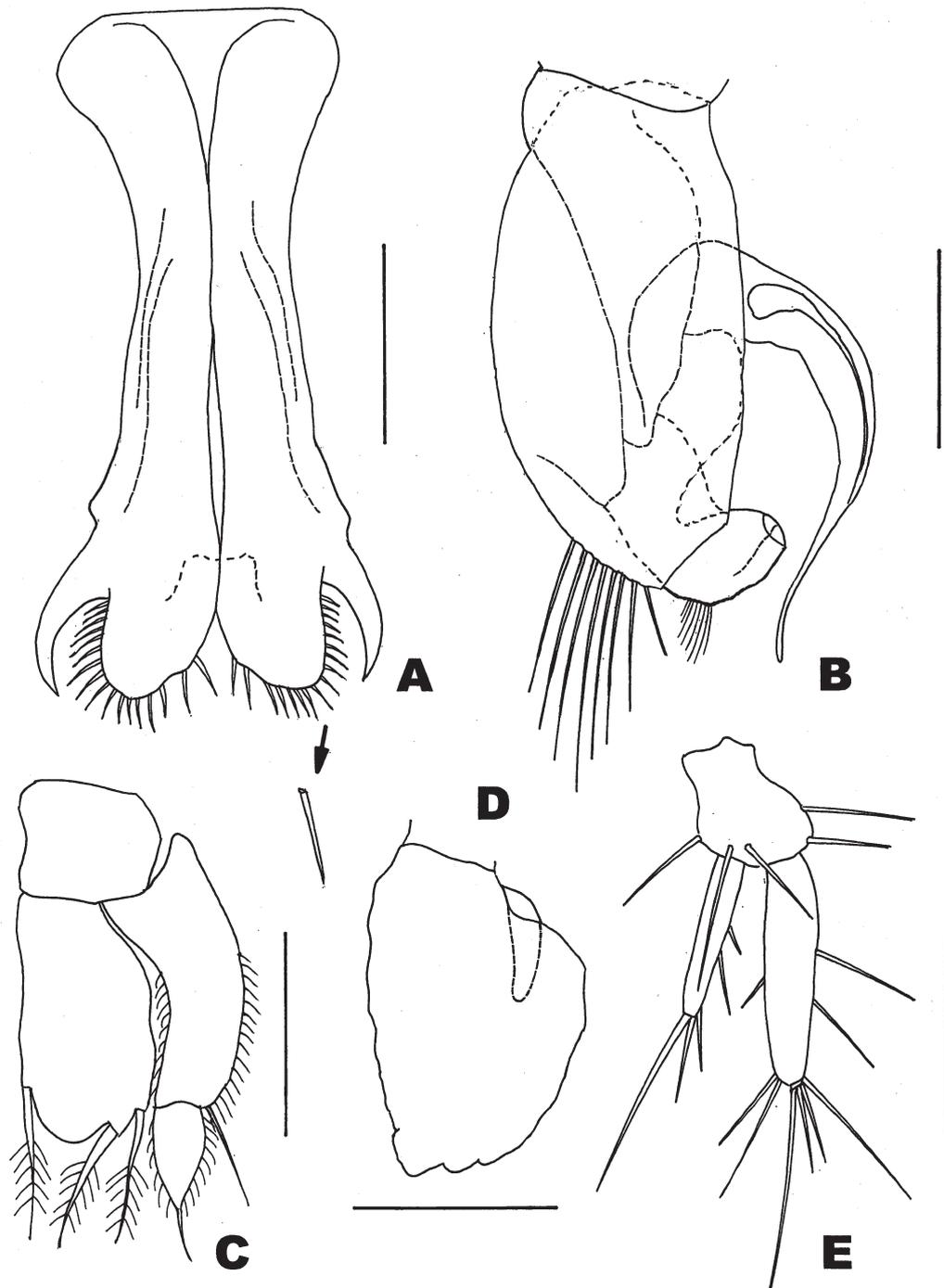


FIG. 4. – *Austrofilius mediterraneus* sp. nov., male holotype: A, pleopod 1; B, pleopod 2; C, pleopod 3; D, pleopod 4; E, uropod. Scale bar: 0.1 mm.

figures, the rostrum of *A. furcatus* is more extended into two frontolateral tips and the medial margin is more indented than in *A. mediterraneus* sp. nov. The upper lateral margins of the rostrum of *A. mediterraneus* sp. nov. may be denticulate in males (but not in the female), like in *A. serratus*. The male pleopod 1 of *A. mediterraneus* sp. nov. differs from those of

*A. furcatus* and *A. serratus* in its shape, being wider at the apex in *A. mediterraneus* sp. nov. The curved hook-like lateral horns, nearly surpassing the medial lobes, are the main feature that distinguishes the new species from the others. Furthermore, the female operculum of both Antarctic species shows numerous setae on the distal margin. In *A. mediter-*

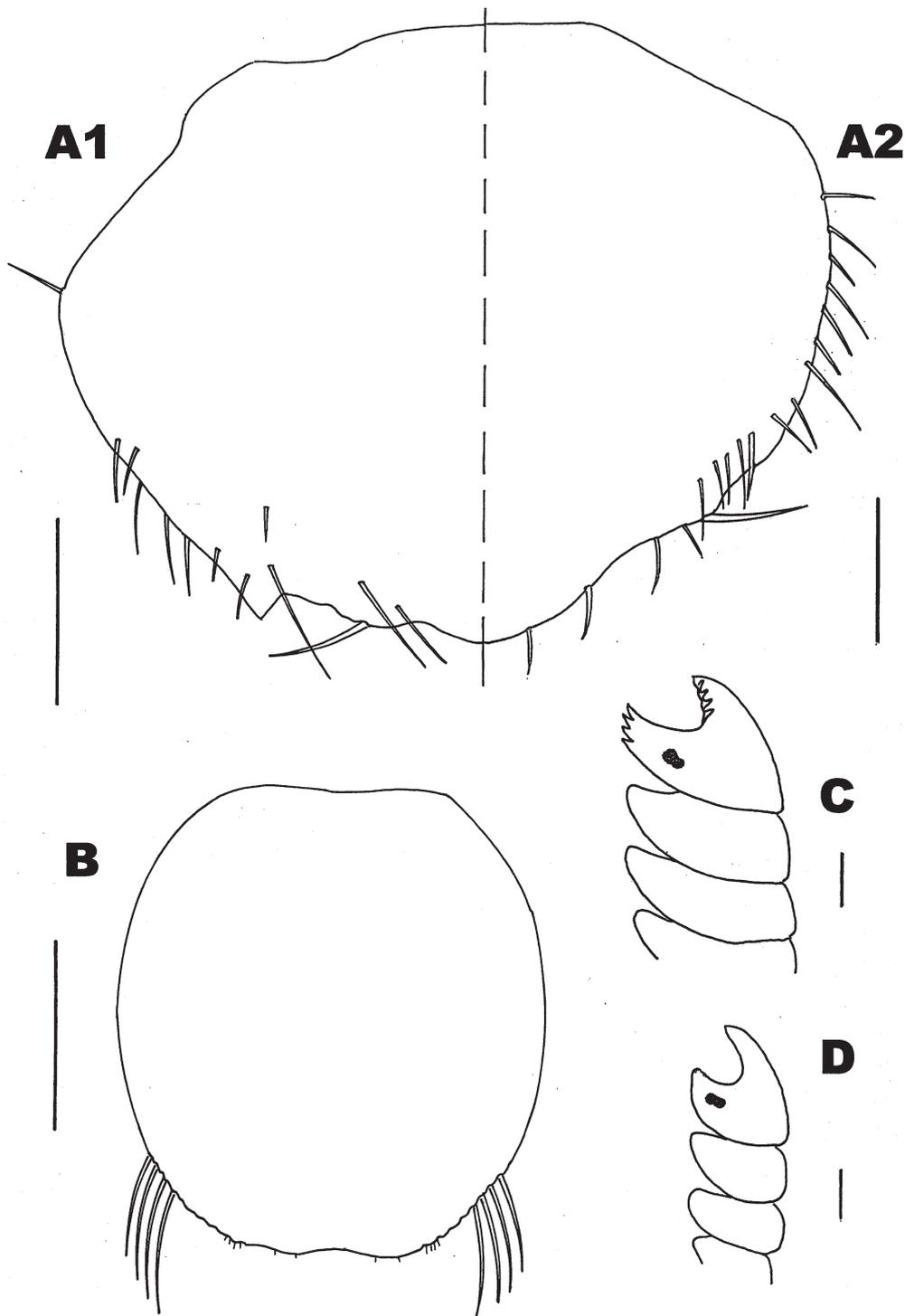


FIG. 5. – *Austrofilius mediterraneus* sp. nov., male holotype: **A2**, righth half of pleotelson; **A1**, left half of pleotelson of a female paratype; **B**, operculum of the same female paratype; **C**, lateral view of cephalon and pereion (partial) of a male paratype; **D**, lateral view of cephalon and pereion (partial) of another female paratype. Scale bar: 0.1 mm.

*raneus* sp. nov., only four distolateral setae have been observed.

The two Antarctic species are also more setose than the new species, especially on the pereopods. Table 1 compares the features of the three species of the genus.

From a biogeographical point of view, since the genus groups species not exceeding 400 m depth, it seems unlikely that it would have reached the Mediterranean from Antarctica via radiation through deep waters, as in the case of the families Serolidae (Sphaeromatidea) and Arcturidae (Valvifera) (Brandt,

TABLE 1. – Comparison of *Austrofiliius* species using data provided by Winkler and Brandt (1993) and the present study.

SPECIES	<i>A. furcatus</i> Hodgson, 1910	<i>A. serratus</i> Vanhöffen, 1914	<i>A. mediterraneus</i> sp. nov.
SIZE	Male: 3 mm; female: 3 mm	Male: 2 mm; female: 3.5 mm	Male: 1.6 mm; female: 1.7 mm
ROSTRUM	Prolonged rostrum, possessing frontolateral acute tips; medial margin indented. Rostrum of male a little longer than that of female. Three frontolateral spines in female.	Prolonged rostrum, frontolaterally serrated, medial margin indented and also with a shallow dorsomedial indentation. Male with serrated frontolateral margins not yet developed.	Prolonged rostrum (but less than in <i>A. furcatus</i> ), possessing frontolateral acute tips; lateral upper margins smooth (often serrated in male). Lower and medial margins indented (but less than in <i>A. furcatus</i> ).
CEPHALON	Lateral margins deeply serrated (female). Two ocelli.	Lateral margins deeply serrated. Five ocelli.	Lateral margins smooth (often serrated in male). Inconspicuous dorsal eyes, with two ocelli.
PLEOTELSON	Slightly broader than long, with lateral shallow indentation; apex of pleotelson rounded. Small part of posterolateral margins deeply serrated; caudal margin with a few short setae.	Slightly broader than long, with lateral shallow indentation; apex of pleotelson rounded. Almost entire lateral margins deeply serrated; caudal margin smooth.	One sixth broader than long, with rounded lateral margins and apex slightly acute. Margins with many setae, one more robust directed laterally, near a distolateral small point in the female.
PLEOPOD 1 (male)	Posteriorly directed “horns” laterally on posterior sixth of male pleopod 1; margins of posterior sixth section setose; tips rounded.	Slightly broader than long, with lateral shallow indentation; apex of pleotelson rounded. Lateral margins deeply serrated; caudal margin smooth.	Twice as long as wide. Apex wider than the base. Lateral lobes “hook-like”, slightly surpassing medial lobes. Each medial lobe bears 17 setae.
PLEOPOD 2 (male)	Sympod robust, muscular, long-oval, with 16 long and simple setae distolaterally and 9 short setules on lateral margin.	Sympod robust, muscular, long-oval, with 15 long and simple setae distolaterally and 7 short setules on lateral margin.	Sympod robust, with 8 distolateral simple setae. There are no short setules on lateral margin.
OPERCULUM (female)	Ovate, slightly pear-shaped; distally a dense row of short whip setae.	Ovate; distally a dense row of short whip setae.	Broadly ovate, with 4 distolateral setae and some fine and short hairs on distal margin, indented.

1992). The origin of the genus *Austrofiliius* is more probably the Southern margin of the Gondwana continent during the Jurassic or lower Cretaceous (Mesozoic); it presumably expanded throughout Africa and the Northern hemisphere after the South Atlantic opened and joined the North Atlantic during the upper Cretaceous (Maldonado, 1989). This origin also would account for its presence in Antarctica, as in the case of several families of Sphaeromatidea (Serolidae, Bathynatallidae, and Plakarthriidae) and Valvifera (Arcturidae) (Brandt, 1999).

#### ACKNOWLEDGEMENTS

I wish to thank the Museo Nacional de Ciencias Naturales (MNCN) for the loan of samples from the oceanographic expedition “FAUNA III”. This campaign of sampling was supported by the Ministry of Education and Science of Spain (CICYT Project “FAUNA IBÉRICA III”: PB 92-0121).

I also wish to thank Dr. Torben Wolff, Dr. Juan Junoy, and a third anonymous referee of the manuscript, for their valuable comments on an earlier version of the paper.

#### REFERENCES

- Brandt, A. – 1992. Origin of Antarctic Isopoda (Crustacea, Malacostraca). *Mar. Biol.*, 113: 415-423.
- Brandt, A. – 1999. On the origin and evolution of Antarctic Peracarida (Crustacea, Malacostraca). *Sci. Mar.*, 63 (Supl. 1): 261-274.
- Hodgson, T.V. – 1910. Crustacea. IX. Isopoda. National Antarctic Expedition. *Natural History* 5, 77 pp.
- Kussakin, O.G. and G.S. Vasina. – 1980. Additions to the marine Isopoda and Gnathiida of Kerguelen Islands (Southern Indian Ocean). *Tethys*, 9 (4): 355-369.
- Maldonado, A. – 1989. Evolución de las cuencas mediterráneas y reconstrucción detallada de la Paleooceanografía Cenozoica. In: R. Margalef (dir.). *El Mediterráneo occidental*, pp. 18-61. Ediciones Omega. Barcelona.
- Menzies, R.J. – 1962. The Zoogeography, Ecology, and Systematics of the Chilean Marine Isopods. *Lunds Universitets Arsskrift. N.F. Avd. 2, Bd. 57. Nr. 11*: 1-162.
- Nordenstam, A. – 1933. Marine Isopoda of the families Serolidae, Idotheidae, Pseudidotheidae, Arcturidae, Parasellidae and Stenetriidae mainly from the South Atlantic. In: *Further Zoological Results of the Swedish Antarctic Expedition 1901-1903*, 3 (1): 1-284.
- Vanhöffen, E. – 1914. Die Isopoden der Deutschen Südpolar-Expedition 1901-1903. *Deutsche Südpolar Expedition 1901-1903*, 15. *Zoologie*, 7: 447-598.
- Wilson, G.D.F. and J.W. Wägele. – 1994. Review of the family Janiridae (Crustacea: Isopoda: Asellota). *Invertebr. Taxon.*, 8: 683-747.
- Winkler, H. and A. Brandt. – 1993. Janiridae (Crustacea, Asellota) from the Southern Hemisphere: *Ianiropsis varians* sp. n. and redescriptions of five little-known species. *Zool. Scr.*, 22 (4): 387-424.

Scient. ed.: F. Sardà