

***Vemakylindrus cantabricus*, a new species of Diastylidae (Crustacea, Cumacea) from the northern Iberian coasts**

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ABSTRACT: Eleven species of the genus *Vemakylindrus* Bacescu, 1961 are known at present. A hitherto unknown species is described herein as *V. cantabricus*, sp. nov., and is compared with the more closely related congeneric species: *V. hastatus* (Hansen, 1920) and *V. stebbingi* Day, 1980. *Vemakylindrus cantabricus* may be distinguished from its congeners by a combination of the following characters: (1) carapace densely covered by hooked denticles and hairs; (2) pseudorostrum shorter than carapace; (3) telson of "*Diastylis* type" with 5-6 pairs of lateral spines; and (4) external process of basis of third maxilliped with 4 long plumose setae.

INTRODUCTION

Bacescu (1961b) erected the subgenus *Vemakylindrus* within the genus *Makrokylindrus* Stebbing, 1912 for *M. (Vemakylindrus) costaricanus* and *M. (Vemakylindrus) gladiger*, two species he described based on specimens collected on the Pacific coast of Costa Rica and Colombia, respectively. Later, Day (1980) elevated *Vemakylindrus* to generic level, based mainly on the presence of a long pseudorostrum. With respect to the telson, some species of *Vemakylindrus* are close to *Diastylis* Say, 1818, while others are close to *Makrokylindrus*. Most of the species currently included in *Vemakylindrus* were initially described in the genus *Diastylis* and *Makrokylindrus* (Hansen, 1920; Fage, 1940; Bacescu, 1961a, 1961b; Jones, 1969; Gamo, 1971; Reyss, 1974). Moreover, Day (1980) described the later species of this genus, *Vemakylindrus stebbingi*, and elaborated a key to the recognized species. Subsequently, Bacescu (1992) listed in his Crustaceorum Catalogus the eleven species hitherto considered in *Vemakylindrus*, including *V. gibraltarensis* (Bacescu, 1961a) which had been omitted by Day (1980) and included provisionally in *Makrokylindrus*.

Through the courtesy of Dr. José Templado and Dr. M. Angeles Ramos of the Museo Nacional de Ciencias Naturales of Madrid (Spain), we were able to study two collections of cumacean made in the southern and northern Iberian peninsula in 1989 and 1991, during the Fauna-I and Fauna-II expeditions, respectively, both being within the Iberian project "Fauna Ibérica" (PB87-0397 and PB89-0081).

Among the specimens examined from the Fauna-II expedition, a single marsupial female belonging to the genus *Vemakylindrus* was detected. A detailed study of this spe-

cimen revealed that it did not correspond to any known species. In this paper, *Vemakylindrus cantabricus*, sp. nov., is described and compared with its congeners. Furthermore, a new arrangement of the species included in this genus is proposed.

MATERIAL AND METHODS

The new species was collected by trawl at the station 148-A, northern Iberian Peninsula, off San Sebastián, during the Fauna-II expedition in the Bay of Biscay ("Mar Cantábrico").

The cumacean was stained with chlorazole black and dissected under a stereomicroscope; permanent mounts were made using lactophenol. All figures were drawn with the aid of a camera lucida. In the captions to the figures, the capitals (A, B, etc.) refer to the scale at which the figures were drawn.

RESULTS

Diastylidae Bate, 1856

Vemakylindrus Bacescu, 1961

Vemakylindrus cantabricus, sp. nov.

(Figs 1 and 2)

Type material: Fauna-II, station 148-A (43°29.56'–43°29.88') 135–143 m depth, muddy bottom: 1 marsupial female. The holotype has been deposited in the Museo Nacional de Ciencias Naturales of Madrid, Spain (MNCN 20-04/944).

Adult female description: Length: 3.4 mm (from tip of pseudorostrum to end of telson).

Carapace (Fig. 1a) 1.8 times longer than high and two-sixths of the total body length (including telson). Pseudorostrum produced, nearly straight and possibly broken, with the branchial siphon projecting forward, lobe short. Dorsal part of the carapace slightly elevated. Lateral and dorsal surfaces of carapace densely covered with hooked denticles and hairs. Antennal notch slightly excavated. Lower and anterior edges of carapace denticulated, posterior edges smooth. Ventral border of carapace denticulated, dorsal one smooth.

Thorax (Fig. 1a) with all segments exposed, combined lengths slightly shorter than carapace.

Abdomen as long as carapace and thorax combined. Abdominal somites with some lateral spines and setules. Telsonic somite (Fig. 1b) wider than long, about 0.4 times length of telson.

Telson (Fig. 1b) about 3.5 times as wide proximally as distally; pre-anal part shorter than post-anal part and smooth laterally, with several rows of spinules posterior to anus. Post-anal part with 5–6 pairs of stout lateral spines plus two terminal spines.

Uropod (Fig. 1b). Peduncle shorter than telson, inner margin with two setules and two stout spines distally. Rami broken distally. Endopod 3-articulate with some setules on the inner margin. Exopod 2-articulate, first article with three stout spines, second article with four stout spines and one small subdistal setula.

First antenna (Fig.1c). Peduncle, first article slightly shorter than second and

third combined, with a sparsely plumose long seta and 5 setae. Second article slightly shorter than third, with 10 setae. Third article with one medial seta, 4 distal setae plus 2 sensory setules. Main flagellum 4-articulate with 6 distal setae on fourth article; accessory flagellum 3-articulate with one sensory setule on second segment, and 4 distal setae plus one sensory setule on third article.

Second antenna (Fig. 1d) developed, without clear limits of segments, with three distal setulated setae.

Third maxilliped (Fig. 1e). Basis longer than combined length of other articles, inner margin with 7 setulated setae; external distal process developed with a row of setules laterally and 4 plumose long setae. Ischium with 2 inner setulated setae. Merus with 2 inner setulated setae and a long plumose seta. Carpus with 4 barbed inner setae. Propodus with 4 setulated setae on inner margin plus one row of minute setules, and one sparsely plumose seta. Dactylus with 8 simple setae.

First pereopod (Fig. 2a). Basis about 0.6 times the combined lengths of other articles, with 16 long plumose setae, one setule and one spine on the inner margin and 4 long setae and a shorter plumose seta on the outer margin. Ischium short, with 2 long plumose setae on the inner margin. Merus 1.5 times longer than ischium, with 3 distal plumose setae and one setule. Carpus longer than combined lengths of ischium and merus, bearing some small setae distally. Propodus as long as carpus, with 2 medial setules and one distal seta. Dactylus shorter than propodus, with 2 setules, 2 subdistal setae and 4 setae distally.

Second pereopod (Fig. 2b). Basis about 0.5 times the combined lengths of other articles, inner margin with 9 long plumose setae, about 12 short simple setae and 4 stout more distal spines; outer margin with 2 short setae and 8 stout spines. Ischium short, with one plumose seta and two stout distal spines on inner margin. Merus about 3 times longer than ischium, with 2 plumose long setae, 2 simple setae, 2 stout spines and one smaller distal spine on inner margin; and one small seta on outer margin. Carpus longer than combined lengths of ischium and merus, with 3 long plumose setae and 2 simple setae on inner margin; one long plumose seta plus one simple seta distally; and 4 small setae on inner margin. Propodus and dactylus with simple setae, combined length about 0.7 times longer than carpus. Dactylus about 1.5 times longer than propodus, bearing distally 4 setae and 1 small setule, and two setae at median half on outer margin.

Third pereopod (Fig. 2c). Basis about 0.8 times the combined lengths of other articles, with several plumose setae and setules. Ischium short, with one distal simple seta. Merus 2.5 times longer than ischium, with one simple seta and one plumose distal seta. Carpus shorter than merus, bearing distally 2 long simple setae, one subdistal seta and 2 more small setae. Propodus 0.4 times longer than carpus, with 1 distal long simple seta and one special setule. Dactylus shorter than propodus, one long simple seta and one setule.

Fourth pereopod (Fig. 2d) similar to third except basis 0.6 times the combined lengths of other articles. Some slight differences in setation.

Fifth pereopod (Fig. 2e) similar to third and fourth except basis 0.5 times the combined lengths of other articles. Some slight differences in setation.

Male unknown.

Reproduction: The marsupial female (holotype) collected in June 1991 bearing 19 larvae at stage III according to the classification of Corey (1984).

Etymology: The species was named after the "Mar Cantábrico" (Bay of Biscay), where this specimen was collected.

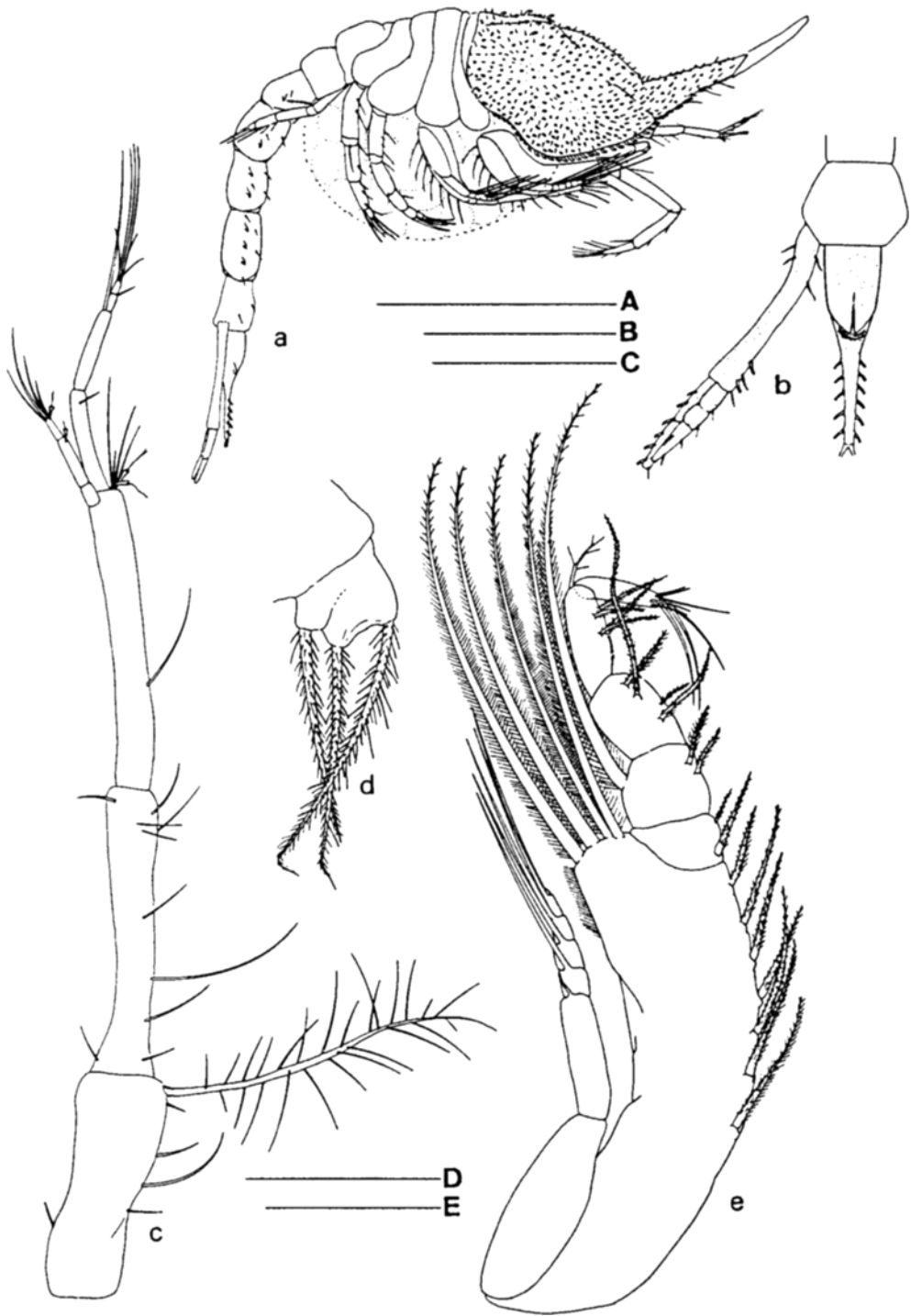


Fig. 1. *Vemakylindrus cantabricus*, female (holotype): a, lateral view (A); b, sixth pleonite, telson and left uropod from below (B); c, first antenna (C); d, second antenna (D); e, third maxilliped (E). Scale bars, A: 1 mm; B: 500 μm ; C: 150 μm ; D: 125 μm ; E: 150 μm



Fig. 2. *Vemakylindrus cantabricus*, female (holotype): a, first pereopod; b, second pereopod; c, third pereopod; d, fourth pereopod; e, fifth pereopod. Scale bar, 250 μ m

DISCUSSION

Eleven species have hitherto been referred to the genus *Vemakylindrus* (Bacescu, 1992). They differ in the relative proportions of the length of the pseudorostrum with respect to the length of the rest of the carapace, the angle between pseudorostrum and dorsum of carapace, the proportions of the carapace, the shape and armature of post-anal part of telson, the segmentation of the endopod of uropod and ornamentation of carapace, among other features (Day, 1980). With the description of *Vemakylindrus cantabricus*, twelve species of the genus are known up now.

Vemakylindrus may be considered as a genus in an intermediate position between *Makrokylindrus* and *Diastylis*. Two clear subgroups can be made considering the shape of the telson. In the first subgroup, where the pre-anal part of the telson is more or less conical and equal in length or shorter than the post-anal part with lateral spines usually present on, at least, the distal half (*Diastylis* type), we can include *V. stebbingi* Day, 1980, *V. vema* (Bacescu, 1961), *V. hastatus* (Hansen, 1920), *V. doryphorus* (Fage, 1940), *V. charcoti* (Reyss, 1974) and *V. cantabricus* (see Hansen, 1920; Fage, 1940; Bacescu, 1961a; Reyss, 1974; Day, 1980; present account).

In the second subgroup, with the pre-anal part cylindrical and longer than the post-anal part with lateral spines usually confined to distal third or less (*Makrokylindrus* type), we can include *V. costaricanus* (Bacescu, 1961), *V. gladiger* (Bacescu, 1961), *V. gibraltariensis* (Bacescu, 1961), *V. prolatus* (Jones, 1969), *V. grandidentatus* Gamo, 1988 and *V. oxycanthus* Gamo, 1988 (see Bacescu, 1961a, 1961b; Jones, 1969; Gamo, 1988).

In this paper a complete description of *Vemakylindrus cantabricus* is made. However, some features in the chaetotaxy of the proximal segments of leg 1, segmentation of leg 3 and caudal rami need a more detailed study in the future, when some more perfect specimens of *V. cantabricus* are available. We will not use these appendages to establish differences between species, until more information about the structure of these appendages is known.

Among the species included in the first subgroup (*Diastylis* type), *Vemakylindrus doryphorus* is distinguished from all other members by having a carapace, thoracic and urosomal segment smooth; only one pair of anterolateral spines are located on the carapace. The remaining five species have a more or less spinose carapace. *Vemakylindrus stebbingi* can be distinguished from *V. hastatus*, *V. vema*, *V. charcoti* and *V. cantabricus* by its smooth thoracic and abdominal segment. Moreover, the number of pairs of lateral spines on the post-anal part of the telson is different in the six species considered: 4 pairs for *V. doryphorus*, 9 for *V. stebbingi* (data from a subadult male), 5-6 for *V. cantabricus*, 5 for *V. hastatus*, 2 for *V. vema* and 2 for *V. charcoti*. The two latter species have 2 additional pairs on the pre-anal part of the telson.

With regard to the relative length of the pseudorostrum, *V. vema* and *V. charcoti* are distinguished from the remaining species of their subgroup by having, in lateral view, a pseudorostrum (or siphon if longer) that is longer than the distance from the anterior tip of the eyelobe to the posterior tip of carapace. Regarding the angle between the pseudorostrum and dorsum of carapace, *V. hastatus*, *V. doryphorus* and *V. cantabricus* have an angle larger than 90°, while in *V. vema*, *V. charcoti* and *V. stebbingi* this angle is about 90°.

In this way, *Vemakylindrus cantabricus* is more closely related to *V. hastatus* and *V. stebbingi*. However, it differs from these two species by having a carapace completely

covered by anterior recurved spines and hairs, while *V. hastatus* has only spines, and *V. stebbingi* has a few spines or denticles.

Vemakylindrus cantabricus is easily distinguished from *V. hastatus* by having the carapace completely covered by spines and hairs, while *V. hastatus* has irregularly distributed spines. Moreover, *V. hastatus* possesses a first segment of the peduncle of the first antenna with two teeth and similar in length to the second segment, while *V. cantabricus* has a long plumose seta and some naked setae on this segment, and it is 0.7 times the length of the second segment. The third segment of the peduncle is shorter than the second in *V. hastatus*, and longer than the second in *V. cantabricus*. Main flagellum is 3-segmented in *V. hastatus*, and 4-segmented in *V. cantabricus*. Basis of third maxilliped, called "second joint" by Hansen (1920), with several teeth along the distal part of its inner margin in *V. hastatus*, and with 7 setulated setae in *V. cantabricus*. Ischium of third maxilliped with a tooth on the inner margin in *V. hastatus*, and two setulated setae in *V. cantabricus*. Basis and carpus of fourth legs proportionally longer in *V. hastatus* (see Hansen, 1920, Pl. IV, Fig. 4d) than in *V. cantabricus*. Peduncle of uropods equal or longer than the telson in *V. hastatus*, and shorter in *V. cantabricus*. Besides, the marsupial female of *V. hastatus* is 6 mm in length, while *V. cantabricus* is only 3.4 mm.

Vemakylindrus cantabricus and *V. stebbingi* can be distinguished by a group of features. First and second legs are much more setose in *V. cantabricus* than in *V. stebbingi*. Third maxilliped, basis with 7 plumose setae on the inner margin, and outer distal process developed with 4 plumose long setae in *V. cantabricus*, while *V. stebbingi* has 4 stout spines and one plumose seta on the inner margin, and only 3 plumose long setae on the outer distal process. Pseudorostrum with ventral border not denticulate in *V. stebbingi*, while denticulate with some long hairs in *V. cantabricus*. Besides, the merus has a long plumose seta on the external margin in *V. cantabricus*, while this seta is absent in *V. stebbingi*.

In order to clearly establish differences in the chaetotaxy and proportions of the articles of the first antenna, second antenna, third maxilliped, legs 1-5 and caudal rami between *V. cantabricus* and the remaining species of its subgroup, more complete descriptions based on adult specimens of *V. hastatus*, *V. doryphorus*, *V. vema*, *V. charcoti* and *V. stebbingi* are necessary.

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