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A NEW RECORD OF *GALATHEA CAPILLATA* FOR EUROPE AND SPAIN,
AND NOTES ON *PHILOCHERAS BISPINOSUS* (DECAPODA)

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ABSTRACT

A study of the specimens obtained during the "Fauna I" Expedition, held in the south of Spain in 1989, has provided the first record of *Galathea capillata* for Europe. Also, we found in these Spanish waters the morph *P. neglectus* of *Philocheras bispinosus*, which remains of uncertain taxonomic status.

In addition, a check-list of *Galathea* species known from the south of Spain is given herein.

RÉSUMÉ

L'étude de spécimens récoltés lors de l'expédition "Fauna I" au Sud de l'Espagne en 1989 a montré la présence de *Galathea capillata*, nouvelle pour la faune espagnole et pour les mers d'Europe, ainsi que des morphes *P. neglectus* de *Philocheras bispinosus*, dont le statut taxonomique reste incertain.

En complément, une liste des espèces du genre *Galathea* du sud de l'Espagne est présentée.

INTRODUCTION

The decapod crustaceans from the south of Spain are relatively well known (Zariquiey Alvarez, 1968; García Raso, 1996; d'Udekem d'Acoz, 1999). However, the geographical position of the area, i.e., between the Mediterranean Sea and Atlantic Ocean on the one hand, and the continents of Europe and Africa, on the other, makes this a dynamic and interesting transition zone. Thus, constant monitoring is required in order to detect any interchange of species from one body of water to the other, as well as to describe morphological variability between the Atlantic and Mediterranean populations as consequence of the different physical and chemical characteristics of these waters.

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During the “Fauna I” Expedition, July 1989, the research vessel “García del Cid” collected along the coast of southern Spain, in both Atlantic and Mediterranean waters. Samples were obtained by pelagic trawling, benthic trawling, and dredging, between 13 and 1250 m of depth. A narrative of the expedition, with the list of stations, their characteristics, and a preliminary lists with 86 species of decapods, was given by Templado et al. (1993). However, some rare species were not recorded then.

The purpose of this paper is to provide notes on two interesting species, one new to Spain and European waters, the other one rarely found in this region.

RESULTS AND DISCUSSION

***Galathea capillata* Miyake & Baba, 1970 (fig. 1)**

Galathea capillata Miyake & Baba, 1970: 68-71, fig. 2.

Material examined. — “Fauna I” Expedition: (43-A) 18/vii/1989, 36°36.76'-36°36.76'N 06°26.66'-06°26.65'W, depth 24-20 m, 2 ovigerous ♀♀ and 3 ♂♂. Maximum size of carapace, length × width: female, 12.9 × 8.5 mm; male, 13.7 × 8.5 mm.

Remarks. — *G. capillata* was known from French Guinea only, whence its collection represents a new record for Spain and thus for Europe as a whole. The present specimens agree well with the description given by Miyake & Baba (1970). The only differences, some of which are mentioned below, are in the number of spines and the length/wide relationships in several structures, which apparently depend on sex and size. In addition, new figures of both sexes, including the oral appendices and the male sexual pleopods, until now never illustrated, are given (fig. 1).

Among the differences found, the following are worth being mentioned. On the third maxilliped (fig. 1C), the ischium has up to 25 denticles in the crista dentata (toothed ridge), with two inner distal marginal spines and two such spines in the distal outer margin; the merus has 4 to 7 spines on the distal third of the inner margin, outer margin with 1 spine at the distal corner. The chelipeds are both similar; in males (fig. 1N) they can be twice as long as the carapace, and the length/width relationship of the propodus (including the fixed finger) ranges from 3.6 to 1.7 (in larger males, the palm is wider). Also, the chelipeds can have more spines than mentioned by Miyake & Baba (1970). More small differences, the morphology of the oral appendices, and the male sexual pleopods, can be observed in the figures.

Within this context, we consider it of interest to give a short list of the *Galathea* species collected from the south of Spain, because some of these have never been

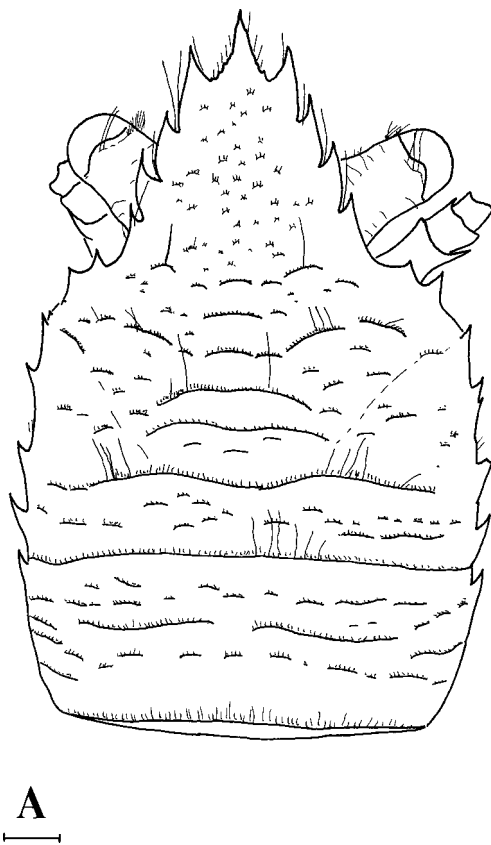


Fig. 1. *Galathea capillata* Miyake & Baba, 1970. A, dorsal view of carapace; B, sternum; C, third right maxilliped, (a) outer view and (b) inner view (without setae); D, right second maxilliped, outer view; E, first maxilliped, outer view; F, right maxilla and endites of left maxilla, outer view; G, right maxillula, outer view; H, right mandible (outer view); I, basal segment of second left antenna; J, second right leg, without setae, outer view; K, dorsal view of a male; L, right first male pleopod, outer and inner view; M, right second male pleopod, outer and distal inner view; N, right cheliped, (a) dorsal and (b) ventral view of male appendage (the squamiferous tubercles are more or less denticulate or with lobes and with short setae). A-J, ovigerous female, 12.9 mm carapace length; K-N male, 10.43 mm carapace length; both from the Strait of Gibraltar ("Fauna I" Expedition, Fauna Ibérica). All scales: 1 mm.

cited as such and this summarizes the information available on the genus in this geographical area:

G. bolivari Zariquiey Alvarez, 1950. Species common in shallow waters. In the Alborán Sea (Málaga, Granada, Almería, and north of Morocco), between 2 and 15 m, on rocky bottoms, under stones, on calcareous concretions, and in *Posidonia oceanica* beds (García Raso, 1988a, b, 1990; García Raso & Fernández Muñoz, 1987; García Raso et al., 1996; López de la Rosa & García Raso, 1992).

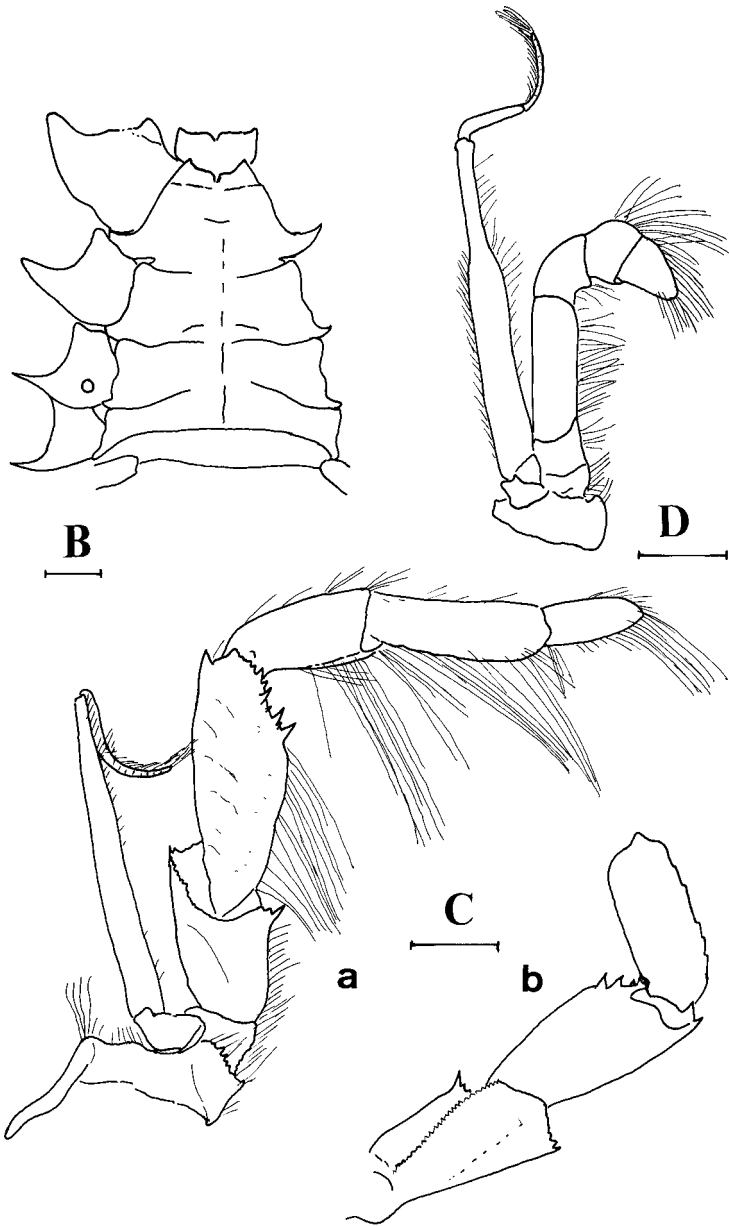


Fig. 1. (Continued: see fig. 1A for caption.)

G. dispersa Bate, 1859. In the Alborán Sea (area east of Malaga littoral) between 48 and 100 m (personal data J. E. García Raso).

G. intermedia Lilljeborg, 1851. Common in the Alborán Sea (Almería to Málaga and north of Morocco) and the Gulf of Cadiz. It lives on a large variety of

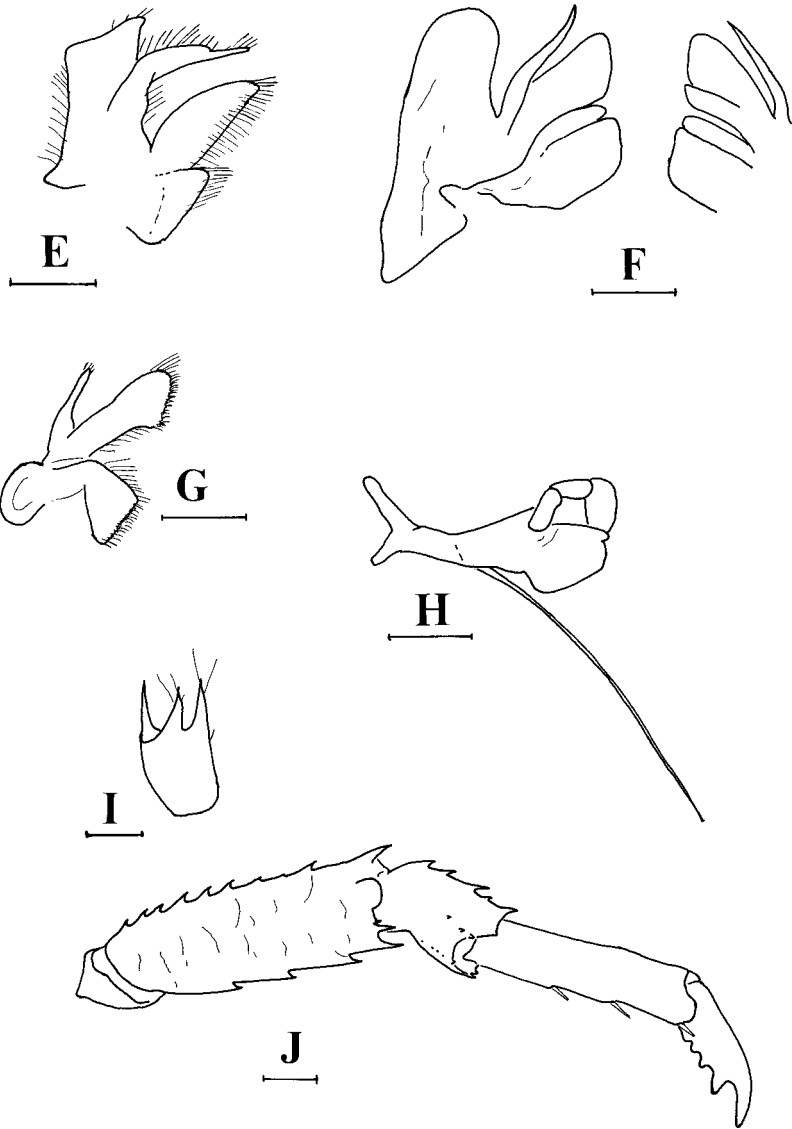


Fig. 1. (Continued: see fig. 1A for caption.)

bottoms: rocky, sandy with stones and/or seaweeds, detritic, mud, and in *Zostera* meadows; usually between 2 and 158 m but it has also been found up to 237-252 m (García Raso, 1985, 1988a, 1989, 1996; Manjón-Cabeza & García Raso, 1998). Also, in Malaga it is relatively frequent between 12 and 90 m, with a maximum abundance from 16 to 32 m. Ovigerous females are present during the whole year (personal data, J. E. García Raso). This species was caught during the "Fauna I" Expedition (Templado et al., 1993).

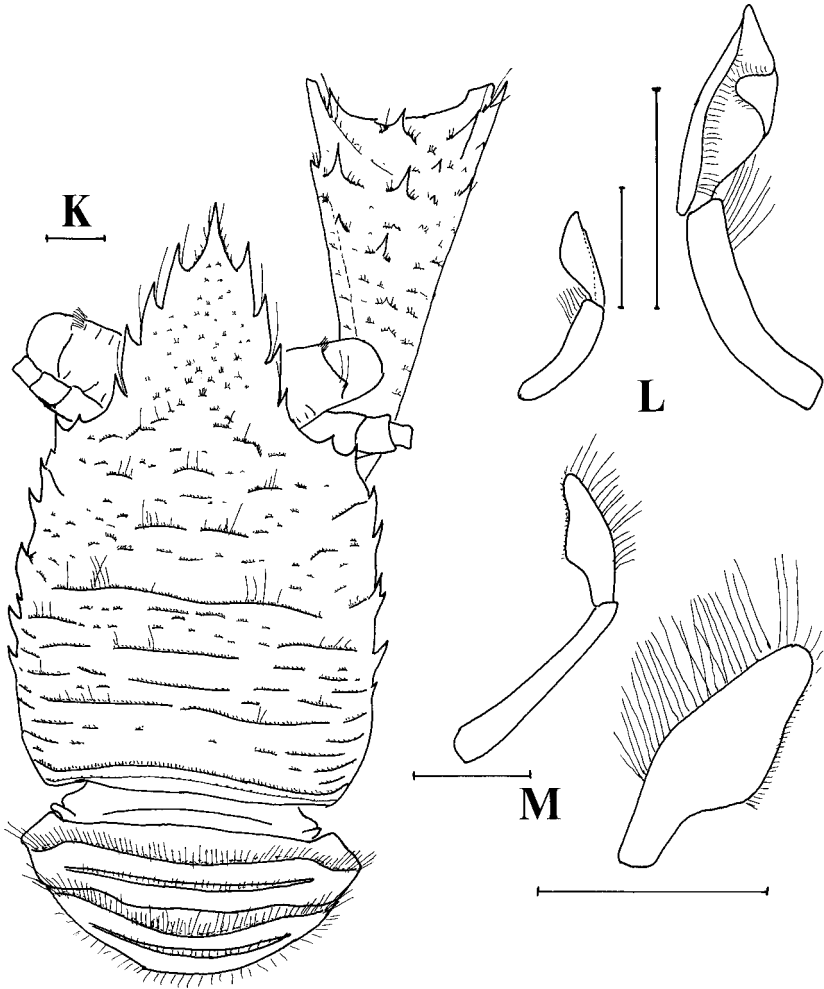


Fig. 1. (Continued: see fig. 1A for caption.)

G. nexa Embleton, 1834. In the Alborán Sea between 68 and 100 m up to 205-270 m (García Raso, 1985, 1989). This species was caught during the "Fauna I" Expedition, but it is not mentioned by Templado et al. (1993). Material examined: 35°57.8'-35°57.6'N 03°00.1'-03°00.8'W, 70-74 m, 3 ovigerous ♀♀, 1 ♀, 2 ♂♂.

G. squamifera Leach, 1814. A littoral species, common in the Alborán Sea. It lives on rocky bottoms with or without seaweed, on calcareous concretions, and in the rhizome stratum of the seagrass, *Posidonia oceanica* (L.) Delile, between 2 and 24 m depth (García Raso, 1984, 1988a, b, 1990; López de la Rosa & García Raso, 1992; personal data J. E. García Raso).

G. strigosa (Linnaeus, 1767). Malaga and Granada: 5-25 m, rocky bottoms (personal data J. E. García Raso).

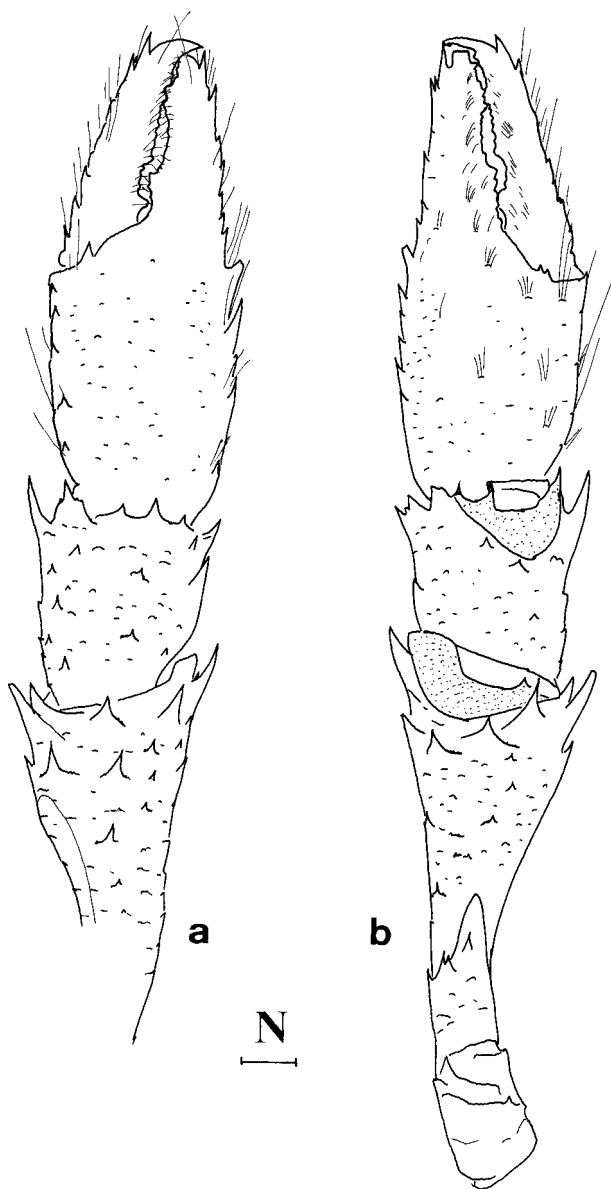


Fig. 1. (Continued: see fig. 1A for caption.)

Philocheras bispinosus (Hailstone, 1835) (fig. 2)

Material examined. — “Fauna I” Expedition: (51-A) 19/vii/1989, 36°24.23′-36°24.11′N 06°18.08′-06°18.48′W, depth 27-28 m, 1 ovigerous ♀. (56-A) 20/vii/1989, 36°09.81′-36°10.97′N 06°09.21′-06°09.55′W, 24 m, 1 ♂. (60-A) 21/vii/1989, 36°03.33′-36°03.29′N 05°41.23′-05°42.10′W, depth 12-15 m, 4 ♀♀ (3 ovigerous), 13 ♂♂ and 2 very small specimens.

Málaga: 1 ovigerous ♀ (fig. 2B, D).

From the decapod collection of R. Zariquiey Alvarez (preserved in the "Institut de Ciències del Mar", Barcelona): ICMZ 0881/1993, 28/v/1958, 42° 18' N 3° 17' E, 1 ♀; ICMZ 0860/1993, 1 small specimen; ICMZ 0861/1993, 1 small specimen; ICMZ 0880/1993, 2 small specimens; ICMZ 0884/1993, 1 small specimen; ICMZ 0875/1993, 1 small specimen; ICMZ 0872/1993, 0419, 1 small specimen.

Remarks. — From Norway, Sars (1883) described the species *Cheraphilus neglectus*, which Kemp (1910) later considered as a variety of *Philocheras bispinosus*, because of the existence of intermediate forms. In fact, the same phenomenon had been observed by Hansen (1908) in material from Iceland.

In Spain, Zariquiey Alvarez (1968) found *P. bispinosus* (and copied the figures of Kemp, 1910) but he did not mention if his specimens belong to the morphs or subspecies *P. b. bispinosus* or *P. b. neglectus*, nor if morphological variability existed. We have studied some specimens from the collection of Zariquiey Alvarez from Mediterranean Sea, and have found that they are close to the typical *P. bispinosus* but with some variability, mainly in the rostrum and related to their sex. The rostrum in males (all are small specimens) is typically of the *bispinosus* type, but in females (larger sizes) it is more rounded, and in the largest specimen it may be almost truncated.

The specimen from Malaga, (Mediterranean Sea; García Raso, 1982), is a typical *P. bispinosus*.

However, the morphology of all specimens from collected during the "Fauna I" Expedition (fig. 2A, C; from the Strait of Gibraltar, i.e., with influence of Atlantic waters and with strong hydrodynamic conditions) fit the description of *neglectus*. They differ from the typical *bispinosus* by the characters stated by Hansen (1908) and Kemp (1910): a smooth carapace; the rostrum rounded at the apex; also shorter and wider; and the posterior spine in the median line of the carapace (2nd gastric spine) reduced to a tubercle.

In this situation, two possibilities may be considered: both are different species, or there is one species with two forms (two dominant phenotypes). The existence of two subspecies is unacceptable, because both have been found in the same area. In this context, the statement of Kemp (1910) is interesting "... the two forms are quite distinct in certain areas, while in others they occur in company with intermediate forms". Also, the morph *neglectus* is practically restricted to Atlantic waters (see d'Udekem d'Acoz 1999); in fact, the records of *P. b. neglectus* in the Mediterranean are rare (Pessani & Godino, 1991), and the specimens collected in the south of Spain could be assigned to either form without intermediates.

Perhaps the environmental conditions could be a factor to take into consideration. In this way, d'Udekem d'Acoz (1999) hints towards the conclusion: "probably both are forms of one species".

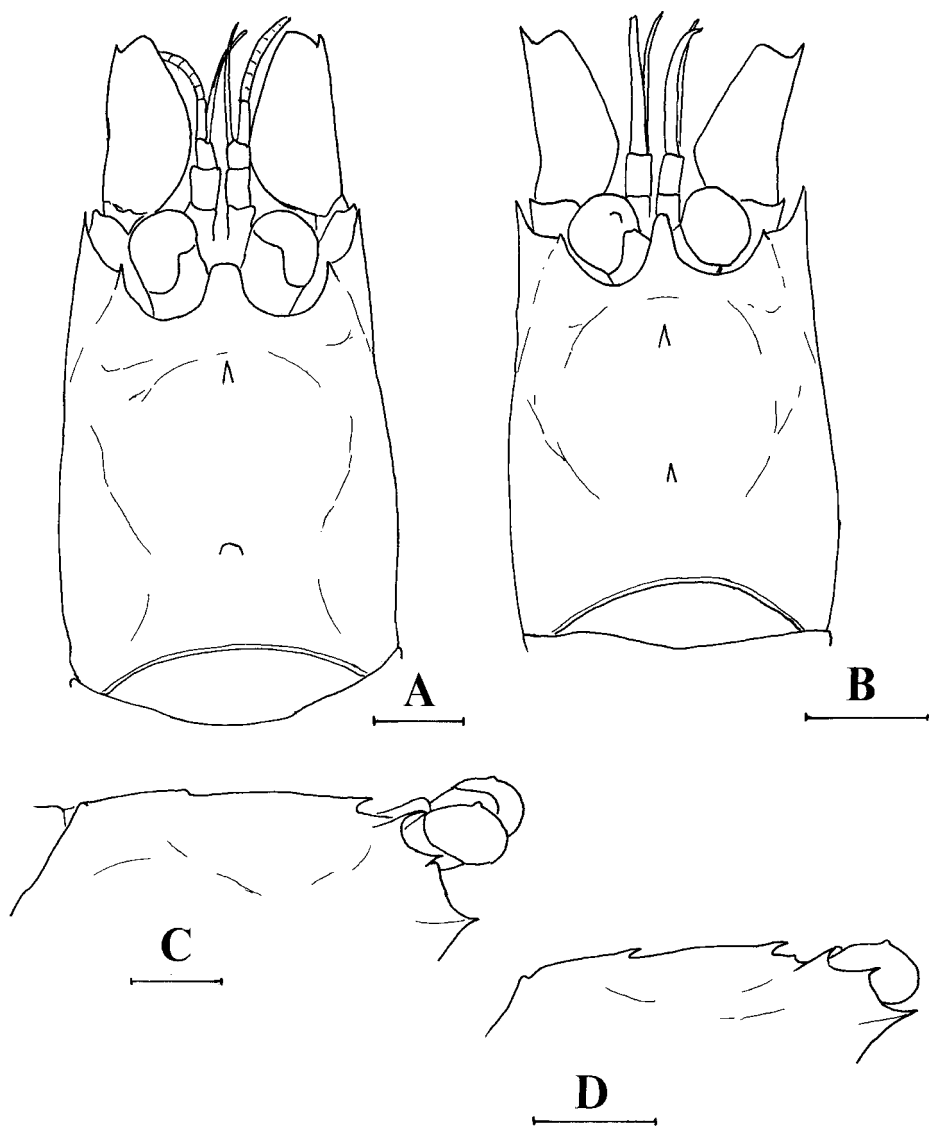


Fig. 2. *Philocheras bispinosus* (Hailstone, 1835). A-B, carapace, dorsal view; C-D, carapace, lateral view. All without setae. A, C, ovigerous female from "Fauna I" Expedition (Fauna Ibérica), morph *neglectus* Sars, 1883 (sample 60-A); B, D, ovigerous female from Malaga. All scales: 1 mm.

On the other hand, the study of larval morphology yields similar problems and does not give a solution either. Pike & Williamson (1961) and Pessani & Godino (1991) found that "both subspecies could be recognized" using the carapace and abdominal spines, but Pessani & Godino (1991) show that these spines are a variable character in *P. trispinosus* (Hailstone, 1835), a very closely similar species: "larvae of *P. trispinosus* with fewer spines or no spines likewise seem

to be more common in northern Europe, but there is considerable variation within the Mediterranean”.

Unfortunately, with this scarce information available on the morphological variations in this/these species in the various areas, the different opinions, and the few specimens examined, the specific status of *P. bispinosus* and *P. neglectus* could neither be confirmed or rejected. To clarify this situation, a large series of specimens from different areas is necessary, even, perhaps, a detailed genetic study.

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