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New observations on *Periclimenes kornii* (Lo Bianco, 1903) (Crustacea, Decapoda, Caridea)

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Abstract

Three adult specimens of the extremely rare and poorly known bathyal pontoniine shrimp *Periclimenes kornii* (Lo Bianco) were discovered in the Sollaud's collection, now deposited in the Muséum National d'Histoire Naturelle, Paris. These specimens, trawled in the Alboran Sea, make it possible to complete the description of the species. A male specimen is studied for the first time, and the first figures of mouthparts are given

Key words: *Periclimenes*, Pontoniinae, Caridea, Decapoda, taxonomy, Eastern Atlantic, Mediterranean, deepwater.

Résumé

Trois spécimens adultes d'une crevette Pontoniinae bathyale, rarissime et peu connue, *Periclimenes kornii* (Lo Bianco) ont été découverts dans la collection Sollaud, maintenant déposée au Muséum National d'Histoire Naturelle, Paris. Ces spécimens, obtenus par chalutage dans la Mer d'Alboran permettent de compléter la description de l'espèce. Un spécimen mâle est étudié pour la première fois, et les pièces buccales, jamais illustrées auparavant, sont figurées.

Mots-clés: *Periclimenes*, Pontoniinae, Caridea, Decapoda, taxonomie, Atlantique Oriental, Méditerranée, eaux profondes.

Introduction

Three adult specimens of the extremely rare bathyal pontoniine shrimp *Periclimenes kornii* (Lo Bianco, 1903) have been found in the Sollaud's collection, now deposited in the Muséum National d'Histoire Naturelle, Paris. These specimens that were collected in the Alboran Sea and previously recorded by Sollaud (1955) as "*Periclimenes (Periclimenes)* sp. vois[ine] de *P. granulatus* Holthuis" make it possible to complete the redescription of de Saint Laurent & García-Raso (1993) based on only one female, and to illustrate the mouthparts as well as the two first male pleopods.

Systematics

Periclimenes kornii (Lo Bianco, 1903)
(Figs. 1-3)

Anchistia Kornii Lo Bianco, 1903: 250, pl. 7 fig. 3
Periclimenes sp. Coutière, 1905a: 1113 (no description)
Periclimenes sp. Coutière, 1905b: 34
Periclimenes sp. Coutière, 1907: 59, fig. 22
Periclimenes Korni; Kemp, 1910: 411
Urocaris korni; Borradaile, 1917: 354 (key)
Periclimenes (Ancylocaris) korni; Kemp, 1922: 169 (key),185 (list)
Periclimenes sp. Coutière, 1938a: 189 (no description)
Periclimenes sp. Coutière, 1938b: 211
Periclimenes sp. Coutière, 1938c: 257, pl. 8 fig. 11
Periclimenes (Harpilius) korni; Holthuis, 1952: 10 (list)
Periclimenes (Periclimenes) sp. Sollaud, 1955: 116 (no description)
Periclimenes n. sp. Noël, 1992: 62 (list)
Periclimenes kornii; Noël, 1992: 62 (list)
Periclimenes n. sp? Noël, 1992: 62 (list)
Periclimenes korni; de Saint Laurent & García-Raso, 1992: 133
Periclimenes korni; de Saint Laurent & García-Raso, 1993: 101, fig. 1a-i
Periclimenes kornii; Chace & Bruce, 1993: 57 (list)
Periclimenes korni; Grippa & d'Udekem d'Acoz, 1996: 402 (list), 409 (key)
Periclimenes kornii; Koukouras & Türkay, 1996: 135 (list), 141 (key)
Periclimenes kornii; d'Udekem d'Acoz, 1996: 143 (list)
Periclimenes kornii; d'Udekem d'Acoz, 1999: 100 (list)

MATERIAL

Professeur Lacaze-Duthiers, campaign of Algeria, Station 58, 36°44'N-02°20'E to 36°44'30"-02°25'E [Spain, Alboran Sea, near Almeria], 330-500 m, mud, trawl, June 30th, 1952 : 1 adult male and 2 adult females (one ovigerous), MNHN Na 12155.

DESCRIPTION OF MATERIAL EXAMINED

Slender outline. Rostrum well developped, narrow, straight or hardly convex, shorter than carapace, followed by sharp

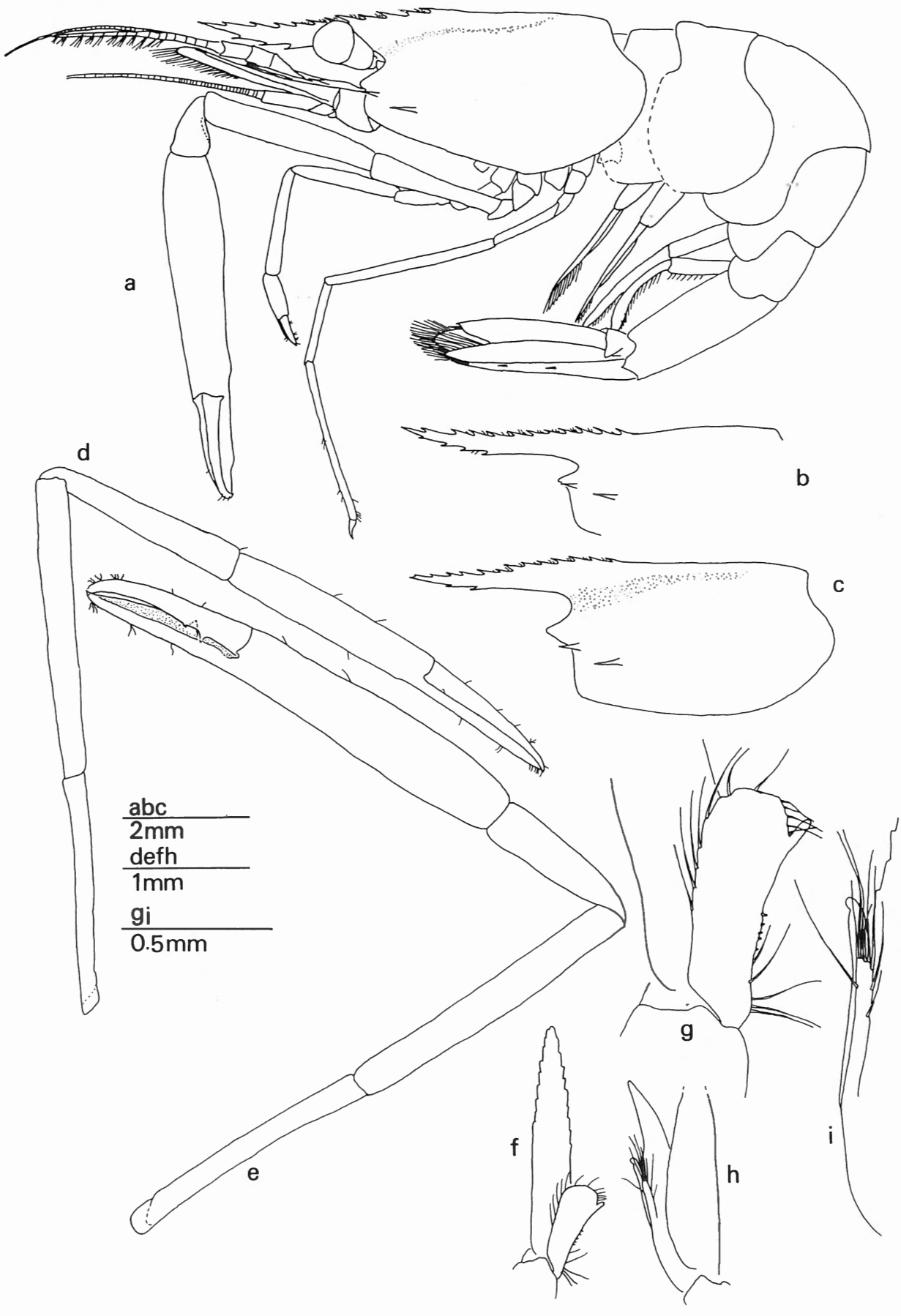

Fig. 1. – *Periclimenes kornii* (LO BIANCO), Alboran Sea. A, adult female; B, other adult female; C-I, adult male. A, shrimp in lateral view; B, undamaged part of carapace; C, carapace; D, right P2; E, left P2; F, first right pleopod; G, idem, details of endopodite; H, second right pleopod; I, idem, details of appendix masculina and interna.

carina on anterior 0.75 of carapace. Rostral formulae (dorsal teeth + dorsal postrostral teeth / ventral teeth): 10 + 3 / 2 (male); 8 + 3 / 3 ; 8 + 3 / 4 (females). Hepatic spine long and sharp.

Pleura of the fifth pleonite rounded. Sixth pleonite 2.7 times as long as high (length dorsally measured), 2.4 times as long as fifth pleonite, 0.9 times as long as telson. Telson with dorsal spines at 0.43 and 0.70, and 5 times as long as its largest distal spine.

Eyestalk with short stalk and wide globular cornea, without ocella.

Outer antennular flagellum with 6 fused segments and 9 segments on accessory branch (in dissected female). Accessory branch slightly longer than fused part. Stylocerite styliform, overreaching mid of first segment of antennular peduncle. One long styliform outer tooth on distal part of first segment of antennular peduncle.

Scaphocerite 3.5 times as long as wide, with outer tooth far from reaching tip of blade. Basicerite with short distal outer tooth.

Mouthparts as illustrated, of normal morphology. Incisor process of mandible with 4 teeth (1 mandible examined). Third maxilliped without arthrobranch.

P1 merus slightly longer than carpus, distinctly longer than propodus. P1 dactylus shorter than palm.

Left male P2 longer than right. Only left P2, probably largest one, present in females examined. Left P2 stronger in females than in male. Fingers much shorter than palm in all P2. Dactylus of large P2 with 2 large teeth on cutting edge in both sexes. Small male P2 with a weak proximal denticle on its immovable finger. Ratio length/width of P2 carpus showing considerable variations, possibly connected with sex : 1.5 in large female cheliped, 3.7 in large male cheliped, 6.0 in small male cheliped.

P3 < P4 < P5. P3-P5 very long and slender. P3-P4 propodus with 4 spines or pairs of spines on distal 0.25; P5 propodus with 5 spines or pairs of spines on distal 0.5 in dissected female. Dactylus of P3-P5 uniunguiculate, short, acute and strongly curved.

Endopodite of first male pleopod distally rounded, very wide, and with a little tubular appendix on the subdistal part of its inner border. Appendix masculina much shorter than interna and with setae on its distal 0.6.

MAXIMAL LENGTH OF MATERIAL EXAMINED

Total: 18 mm; carapace without rostrum: 4 mm (female).

COLOUR

The juveniles of Lo Bianco (1903) were colourless.

DISTRIBUTION AND ECOLOGY

The species has been recorded off Capri (near Naples) between 1000 and 1100 m (Lo Bianco, 1903), in the Alboran Sea between 330 and 500 m (present material), in the Ibero-moroccan Gulf between 568 and 604 m (de Saint Laurent & García-Raso, 1993), in the Northern part of the Bay of Biscay at 754 m (Kemp, 1910), and off the Azores (Coutière, 1905a, 1905b, 1907 as *Periclimenes* sp.). Identity of Coutière's species had previously not been established and his account is incomplete. However, his figure of anterior part of carapace agrees so perfectly with present material that I think there is little doubt that it is *P. kornii.*

The fact that 3 specimens of this extremely rare species were caught in one trawling haul suggests that it forms very local populations. It is probable that, as most *Periclimenes*, *P. kornii* lives in association with other organisms. This or these hosts are currently unknown but it is not impossible that they are deepwater hard or soft corals. Indeed, the specimen of de Saint Laurent & García-Raso was captured on a rocky bottom with corals, and the station of the Kemp's specimen included many corals and coral-like organisms belonging to several species : *Corallium maderense* (Johnson) [1 specimen], *Isidella elongata* Gray [1 specimen], *Acanthogorgia ridleyi* Wright & Studer [5 specimens], *Antipathes spiralis* (Pourtalès) [4 specimens], *Parantipathes larix* (Esper) [6 specimens], *Schizopathes crassa* Brook [1 specimen], *Lophohelia prolifera* Pallas [many specimens] (Hickson, 1907). These corals were often covered by hydroids (Browne, 1907).

Ovigerous females were found in April (de Saint Laurent & García-Raso, 1993) and in June (present material).

A shrimp of adult size (at least 21 mm) and of adult appearance but still bearing exopodites on its periopods -a larval character- has been reported by Coutière (1905b, 1907 as *Periclimenes* sp.). Coutière's shrimp has been captured by a pelagic net. This suggests an unusually long larval/postlarval development and pelagic life, at least under certain conditions. The capacity for the young shrimp to prolonge its pelagic life would increase the probability to find its host, which is possibly rare.

Periclimenes kornii has second pereiopods larger in females than in males (at least in material studied), which is extremely unusual for shrimps, the rule being to have second pereiopods equal in both sexes or larger in male. Of course, it can be argued that very few specimens have been examined and that the second pereiopods of the male examined are perhaps regenerated. However, I would

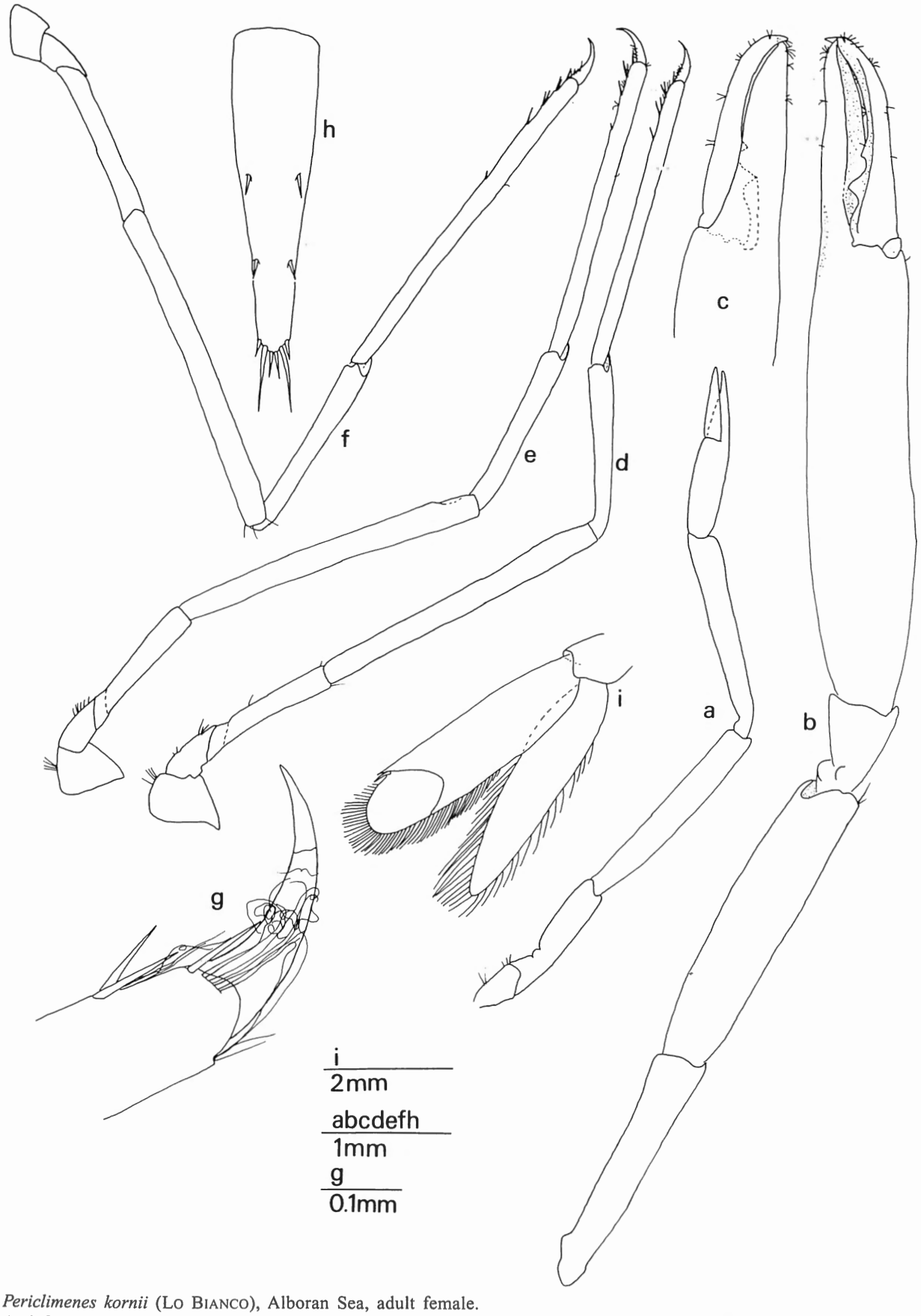

Fig. 2. – *Periclimenes kornii* (LO BIANCO), Alboran Sea, adult female.
A, left P1; B, left P2, ventral view; C, left P2, dorsal view of anterior part (structures seen by transparency in dotted line); D, left P3; E, left P4; F, left P5; G, left P4 dactylus; H, telson; I, left uropods.

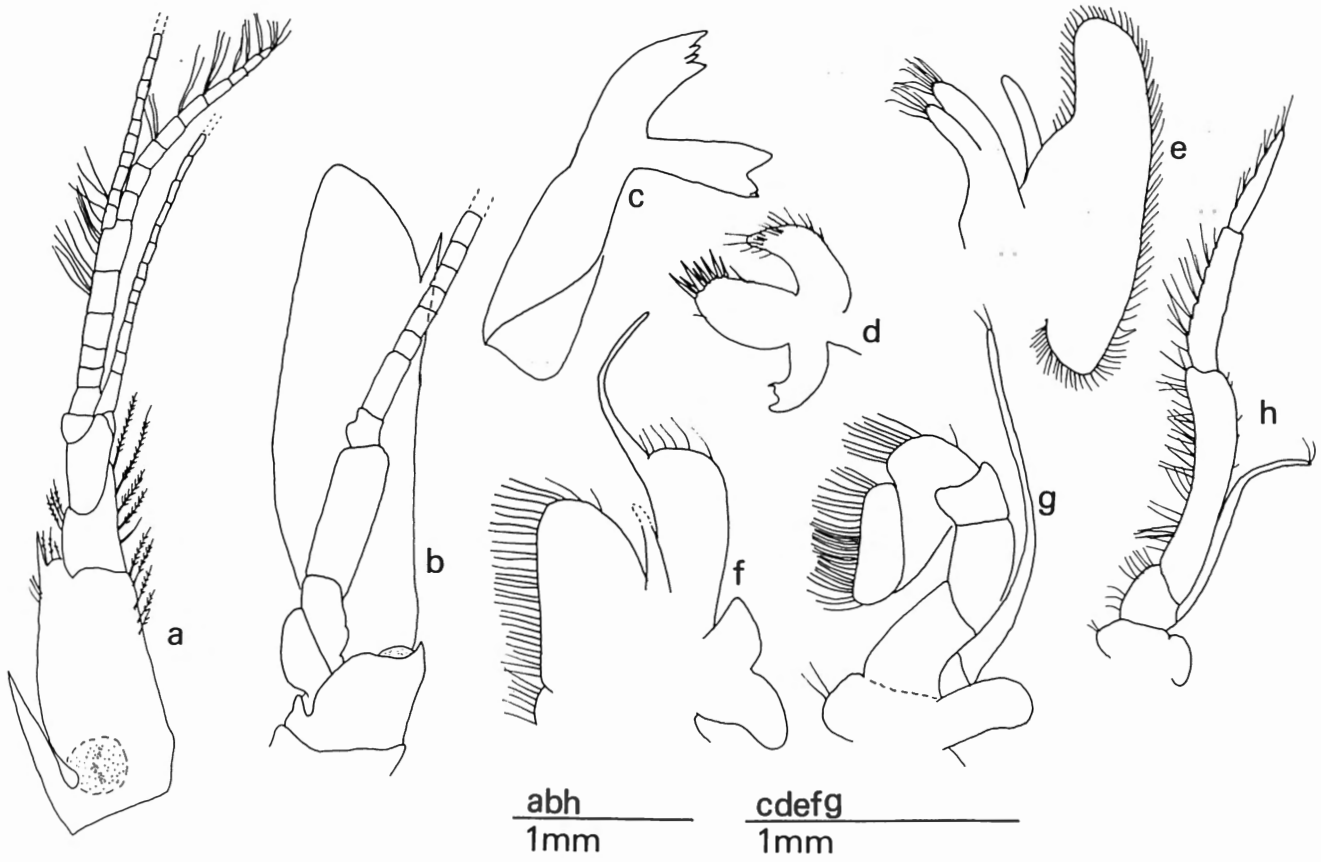

Fig. 3. – *Periclimenes kornii* (Lo Bianco), Alboran Sea, adult female.
A, left antennula; B, left antenna; C, left mandible; D, first left maxilla; E, second left maxilla; F, first left maxilliped; G, second left maxilliped; H, third left maxilliped.

like to point out that this situation definitely exists in another species of the genus *Periclimenes*: *P. wirtzi* d'Udekem d'Acoz, 1996. I have examined many specimens of this last species and I have never seen any male with second pereiopods as large as in intact adult females. Maybe, in these two shrimps, females are more territorial than males (having a closer host association) and competition for host is therefore stronger between females than between males, resulting in the need of more powerful claws for intraspecific fights. Stronger territoriality in females than in males does exist in other *Periclimenes* such as *P. sagittifer* (Norman, 1861), a species which shows high intraspecific agressivity (personnal observations in aquarium). However, in the case of *P. sagittifer*, reversed sexual dimorphism on second pereiopods does not exist.

DISCUSSION

The original description of *P. kornii*, based on 13-15 mm long juveniles (apparently without exopodites on pereiopods) captured by pelagic nets, is extremely short and accompanied by only one figure, showing an entire shrimp. This figure is fairly good but rather small, some important details being indistinct. Dr. L.B. Holthuis informed me that two syntypes of *P. kornii* are deposited in the Nationaal Natuurhistorisch Museum, Leiden [D 33 148] and on my request, C.H.J.M. Fransen was so kind as to compare these with a preliminary version of the present paper. His answer leaves no doubts as to the identity of the Alboran specimens : "I checked the two syntype specimens of *Periclimenes kornii* (Lo Bianco, 1903) with the description in your manuscript. I have not found any differences. 1) the accessory flagellum of the antennula is long indeed as in your drawing, and 2) the dactyli of pereiopods 3-5 are uniunguiculate. The large second pereiopods are missing in these specimens. Another four specimens of the species are also present in our collection [D 33149, Italy, near Naples. Don. E. Caroli, No further data]. Among these I found a second pereiopod with chela dentate in the same way you figured it. So I think this is sufficient to be sure about the identity of your material".

In his letter, Fransen also points out that since there are only 2 syntypes at Leiden, 3 other ought to exist elsewhere, since Lo Bianco has based his description on 5 specimens. I think that these specimens are probably not in the Naples Museum since Moncharmont (1979) did not mention *P. kornii* in his list of the Napolitan decapods deposited in this museum.

On the other hand, my specimens agree on the whole quite well with the account of de SAINT LAURENT & GARCÍA-RASO (1993). These authors, who examined an unique complete adult female, mention that it has asymmetrical second pereiopods as in my male. The carpus of the large second pereiopod is 2.1 times as long as wide, i.e. somewhat narrower than in my females and the carpus of the small second pereiopod, absent in my females, is 3.7 times as long as wide. The description of DE SAINT LAURENT & GARCÍA-RASO contains a problematic detail. They say: "mandibula (...) with (...) a narrow incisor process, ending in an acute distal tooth". In my dissected specimen, the incisor process has four teeth and not one. However, this is perhaps just misleading since in the same sentence they say "Mouth part typical of the genus *Periclimenes*", while in this genus the incisor process has almost always several teeth.

P. kornii cannot be confused with any other temperate Northeastern Atlantic and Mediterranean *Periclimenes*. Only three other species from these areas have uniunguiculate dactyli. The first one is the lessepsian immigrant *P. calmani* TATTERSALL, 1921, recently redescribed by BRUCE (1987a and 1987b). In this shallow water species restricted to Port Said, Egypt in the Mediterranean (FOX, 1927; GURNEY, 1927), the accessory branch of the outer antennular flagellum has only 2 segments, contra about 9 in *P. kornii*. The distal external spine of the antennal peduncle is much longer than in *P. kornii*. The pleura of the fifth pleonite are acute and not rounded as in *P. kornii*. The second one is *P. eleftherioui* KOUKOURAS & TÜRKAY, 1996, a species recently discovered in the Aegean Sea and described from an unique badly mutilated specimen (KOUKOURAS & TÜRKAY, 1996). This circalittoral form has a long accessory antennular flagellum just like *P. kornii* but the pleura of the fifth pleonite are acute. The third one, *P. wirtzi* D'UDEKEM D'ACOZ, 1996 is an Atlantic species associated with antipatharians, which has a characteristic very long and styliform rostrum, with less teeth than in *P. kornii*. *P. wirtzi* also has a minute tubercle on P3-P5 dactylus, which does not exist in *P. kornii*.

On the other hand, *P. kornii* shows striking similarities with *P. tenellus* (S.I. SMITH, 1882), a bathyal Northwest Atlantic species described by S.I. SMITH (1882) and HOLTHUIS (1951). It seems important to point out that the last two species have the same kind of first male pleopod. Nevertheless, the two species can be easily distinguished by the dactyli of their P3-P5: they are uniunguiculate in *P. kornii* and distinctly biunguiculate in *P. tenellus*.

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