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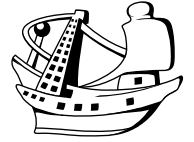
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SHORT NOTE

## First record of *Cabirops marsupialis* (Caroli, 1953) (Isopoda: Cabiropidae) from Sea of Marmara, Turkey

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**Abstract:** In August 2014, four mature females and two cryptoniscium of *Cabirops marsupialis* were collected from the marsupium of female *Bopyrina ocellata* in the Sea of Marmara, Turkey. This is the first record of *C. marsupialis*, a previously unknown species in Turkish waters.

**Résumé :** Premier signalement de *Cabirops marsupialis* (Caroli, 1953) (Isopoda : Cabiropidae) en Mer de Marmara, Turquie. En août 2014, quatre femelles matures et deux cryptoniscium de *Cabirops marsupialis* provenant du marsupium de l'isopode *Bopyrina ocellata* ont été récoltés en Mer de Marmara, en Turquie. Ceci est le premier enregistrement de *C. marsupialis*, une espèce précédemment inconnue dans les eaux turques.

**Keywords:** Sea of Marmara • Parasitism • Cryptoniscium • Hyperparasite • Bopyrid isopod

### Introduction

*Cabirops* spp. are typically parasitic within the marsupium of bopyrid isopods which are branchial parasites of shrimps and crabs (Sassaman, 1985). The genus *Cabirops* is composed of the most diverse genus of the Cabiropidae family, represented by 14 species (Boyko & Schotte, 2015).

Despite a worldwide distribution, only 3 or 4 species have been reported from the Mediterranean Sea; *Cabirops ibizae* Bourdon, 1967 from Balearic islands (Junoy & Castelló, 2011); *Cabirops marsupialis* (Caroli, 1953) from Gulf of Napoli (Restivo, 1975); *Cabirops reverberii* Restivo, 1971 from Italian exclusive economic zone (Boyko & Schotte, 2015) and *Cabirops* sp. from Italy (Romano, 1953). Due to their lower occurrence, there is very few information on the distribution of *Cabirops* in the Mediterranean Sea. No *Cabirops* species has yet been reported from Turkish waters

## Material and Methods

The materials were sampled in August 2014 by scuba diving or snorkelling, dependent on depth, in four different stations located in the North-West of the Sea of Marmara, associated with *Posidonia oceanica* (Linnaeus) Delile, 1813 and *Zostera (Zostera) marina* Linnaeus, 1753 meadows, as part of MAREM (Marmara Environmental Monitoring) Project survey (inside of edge coordinates 40°31.222'N-26°52.386'E / 40°30.751'N-26°52.706'E and 40°33.294'N-26°58.696'E / 40°32.660'N-26°58.872'E) (Fig 1).

Species density was screened and collected within 100 cm × 100 cm frame both for *P. oceanica* and for *Z. marina* meadows for each species. Each frame was regularly hauled using hand net with 20 cm × 15 cm hoop and 40 cm tor length with 0.09 mm mesh size. The material examined also for parasitism. All materials collected were preserved in a 5% formalin/seawater solution, identified in the main taxa and recorded to the MAREM Project.

## Results

**Material examined:** One female (~2.6 mm) with one male (1.2 mm), Station P01, 40°33.083'N-026°58.250'E, Depth 6.5 m; one female (~2.4 mm), Station P02, 40°32.900'N-026°57.817'E, Depth 7 m; one female (~2.5 mm), Station P05, 40°31.683'N-026°53.300'E, Depth 6.5 m; one female (~2.5 mm) with one male (1.1 mm), Station Z04, 40°31.983'N-026°54.183'E, Depth 6 m, infesting female *Bopyrina ocellata* (Czerniavsky, 1868), infesting all the left branchial chamber of male *Hippolyte inermis* Leach, 1816 (5.3; 5.5; 5.7; 5.6 mm CL respectively).

One hundred and seventy eight individuals of *H. inermis* were collected, of which 21 specimens were parasitized on the branchial chamber by *B. ocellata* during the entire work (Artüz, 2017). A total of six specimens, four mature females and two cryptoniscium were found in the marsupium that located on the left sides of the thorax of decapod crustacean *Hippolyte inermis*, associated with parasitic isopoda *Bopyrina ocellata* in the Sea of Marmara, Turkey. Brief descriptions based on common features of the external morphology are given below.

### *Cryptoniscium*

Body well developed, length 1.1 mm, a brown stain string extends from the cephalic end to the second thoracic disc comprising the lateral edges of the eyes which are well developed and pigmented in brownish red, a brownish blot affects the entire posterior aspect of the body and extends through several segments almost up to the lateral edges, on another five segments occupies the middle part. There is no pigment in the four subsequent thoracic segments,



**Figure 1.** Map of the location area of the sampling stations. The indicated part is the frame of the area that the stations are located.

antennas, antennules and in pereopods and pleopods. Antennules formed by two big articles with a distal bristles tuft. Antennas composed of four large articles, each longer than the previous, and followed by five threadlike articles and a final bristle. Base of each article also exceeds a small bristle.

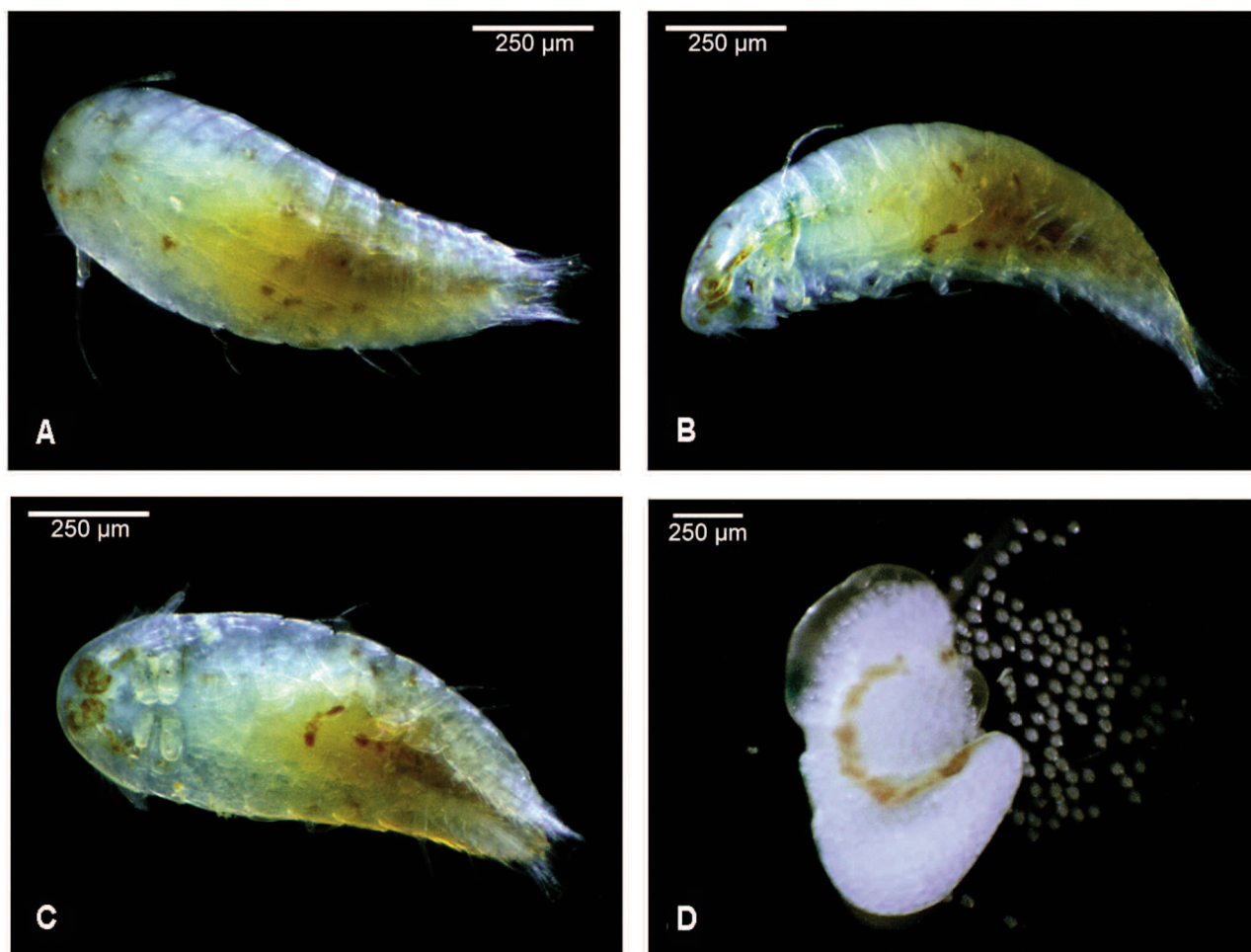
Fourteen segments contour the whole body. The seven segments of the thorax are subequal, and each segment with pereopods. The first two pairs of pereopods are short and thick, composed of three articles; inner edge of the dactylus toothed and ends with a spine. The five subsequent pereopods very elongated and thin, composed of three articles that carry small sensitive bristles. Dactylus serrated on the flexor margin and with a terminal spine.

Cephalothorax less broad than the head. The six abdominal segments pronounced and narrowing until the last segment that formed the uropods. Pleopods uniform and carrying an article on the basal two branches each, almost ovoid with long bristles.

Endopodite of uropods with a stylet-shaped, most of them stretched, with distal bristles (Fig 2 A-C). Also matches with dentition of 3, 3, 1, on first 3 coxal plate respectively; bifidity of dactyli P1 and P2; lacking internal apophysis on article 2 of antenna 2, according to the table of selected morphological characters of the cyptoniscid stage in Boyko (2013).

### *Mature female*

Looks like a sac of about ~2.5 mm long and ~1.4 mm wide, whole body filled with hatched epicaridium larvae. There are four distinct bulges: one cephalic, two sides welded together that correspond to the incubation chamber and one caudal (the longest). The internal cavity communicates with the outside by means of two tiny openings ventrally. The specimens in vivo have a whitish colour with an orange-brown continuous line all around ventrally (Fig 2C).



**Figure 2.** *Cabirops marsupialis*. **A.** Cryptoniscium dorsal view. **B.** Cryptoniscium lateral view. **C.** Cryptoniscium ventral view. **D.** Mature female, filled with hatched epicaridium larvae.

### Conclusion

Boyko (2013) has associated *Cabirops marsupialis* with bopyrid host *Gyge branchialis* Cornalia & Panceri, 1861 and as their decapod host *Upogebia litoralis* Petagna, 1792, in the list of all described and undescribed *Cabirops* spp. In addition, in same list, a *Cabirops* sp. from Italy is indicated with the host *Bopyrina ocellata* and as decapods host *Hippolyte inermis* together with unknown morphological characters, but in present study, the bopyrid host of *Cabirops marsupialis* has been identified as *Bopyrina ocellata* and decapod host has been identified as *Hippolyte inermis*.

The prevalence rate of the decapods hosts *H. inermis* infested by *B. ocellata*, was 11.80% in the total collected material with a rate of *C. marsupialis* parasitisation of 19.05% of infested hosts by the present work.

Continuous efforts are needed to characterize and better understand the parasitic relationships in the unique ecosystem of the Sea of Marmara that is mainly constituted

by water influxes from adjacent basins and under the constant influence of increasing anthropological impacts.

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