

Caligus uranoscopi Vaissière, 1955 (Copepoda, Caligidae), a rare parasitic copepod from Algeria

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Abstract

Caligus uranoscopi Vaissière, 1955 (Copepoda, Caligidae) is redescribed based on specimens collected from the gill arches of red mullet, *Mullus barbatus barbatus* L., 1758, caught off the Algerian coast. *Caligus uranoscopi* is reported for the first time from the east coast of Algeria and *M. barbatus barbatus* is a newly recorded host for this parasite. The parasite is uncommon and may be restricted to Algerian coasts. Some remarks are given on the species of Caligidae known from Algeria.

Keywords

Copepoda, Caligidae, *Caligus uranoscopi*, *Mullus barbatus barbatus*, Algeria

Introduction

Algerian fishes have rarely been examined for parasitic copepods. Sea lice (Caligidae) is the largest group of parasitic copepods of fish, comprising more than 450 species (Lin and Ho 2001, Boxshall and Halsey 2004, Ho *et al.* 2004). According to Raibaut *et al.* (1998), 36 species of caligids are known from the fishes of the Mediterranean Sea. But so far as we are aware, only eight of those 36 species have been recorded from Algerian marine fishes. They are *Caligus centrodoni* Baird, 1850; *C. diaphanus* Nordmann, 1832; *C. dieuzeidei* Brian, 1932; *C. pageti* (Russel, 1925) (Argilaz 1931; Brian 1931a, b; Brian 1935); and *Lepeophtheirus rotundiventris* Bassett-Smith, 1898 (Brian 1931c). The occurrence of *Caligus uranoscopi* Vaissière, 1955 was not mentioned in the review of Raibaut *et al.* (1998). Thus our knowledge on Algerian parasitic copepods, especially those belonging to the genus *Caligus*, needs to be improved.

In this paper, we redescribe the female of *Caligus uranoscopi*, based on the specimens collected from red mullet, *Mullus barbatus barbatus* L., 1758, landed at the fishing port of Béjaïa (east coast of Algeria). Since this species was inadequately described by Vaissière (1955), a redescription based on the newly collected specimens is given below to provide information on fine structure of the appendages that is indispensable for accurate identification.

Materials and methods

Host fishes were purchased from the Béjaïa fishing port (east coast of Algeria) and transferred to the laboratory, for examination of parasitic copepods. Parasites were removed from the hosts and preserved in 70% ethanol. They were later cleared in 85% lactic acid for 1 to 2 h before dissection in a drop of lactic acid on a wooden slide under a dissecting microscope (Humes and Gooding 1964). The body parts and appendages were mounted on slides and examined under a compound microscope. Drawings were made using a microscope equipped with a camera lucida. Measurements were made with a micrometre eyepiece and given as means followed by the range in the parentheses.

Results

Caligus uranoscopi Vaissière, 1955 (Figs 1–4)

Material examined: 3 females collected from the gills of *Mullus barbatus barbatus*, between 2005 and 2006. Among the 912 fishes examined, only 3 specimens were infected with *C. uranoscopi* (prevalence = 0.32%).

A voucher specimen was deposited in the collection of the Museum National d'Histoire Naturelle, Paris, MNHN-Cp6048.

Female: Body (Fig. 1A), 4.21 (4.10–4.30) mm long, excluding setae on caudal rami. Cephalothoracic shield suborbicular, 2.24 (2.12–2.33) mm long and 2.18 (2.06–2.27) mm wide, excluding marginal membranes; posterior lobe of cephalothoracic shield between two notches broad, wider than half of cephalothorax. Fourth pediger small, wider than long, 0.67 (0.66–0.69) × 0.22 (0.21–0.23) mm. Genital complex subrectangular, 1.61 (1.50–1.70) × 1.51 (1.40–1.60) mm, with

rounded anterior corners and slightly protruded postero-lateral corners. Abdomen short, one-segmented, subtriangular, and slightly longer than wide, 0.40 (0.39–0.41) × 0.20 (0.19–0.23) mm (Fig. 1A). Caudal rami slightly wider than long, 0.08 (0.07–0.09) × 0.1 (0.09–0.11) mm, with 3 short and 3 long plumose setae (Fig. 4A). Egg sacs 3.62 mm long, uniseriate.

Antennule (Fig. 2A, B) 2-segmented, with shorter distal segment; proximal segment, with 25 plumose and 2 simple

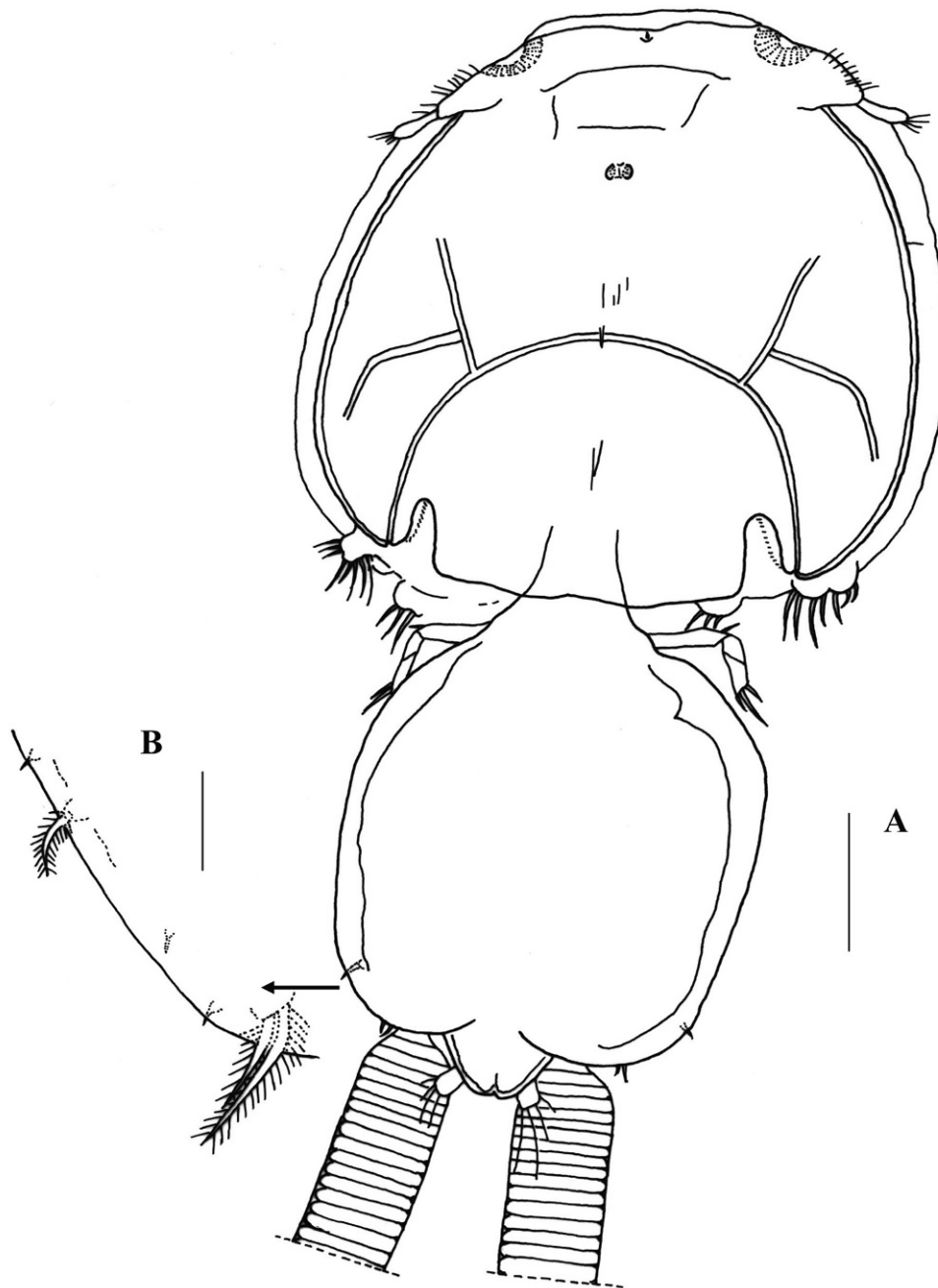


Fig. 1. *Caligus uranoscopi* Vaissière, 1955 female: **A.** Habitus, dorsal. **B.** Detail of postero-lateral setae (leg 5). Scale bars = 0.5 mm (A), 0.2 mm (B)

setae on anterodistal surface (Fig. 2A); distal segment with 1 subterminal seta on posterior margin and 11 setae plus 2 aesthetascs on distal margin. Antenna (Fig. 2C) 3-segmented; proximal segment protruded into small knob at posteromedial corner; middle segment unarmed; distal segment forming curved, sharp claw bearing 1 small basal seta. Small, blunt-

tipped post-antennal process (Fig. 2C) bearing 2 basal papillae, each carrying 4 setules. Mandible (Fig. 2F) with four sections, basal 2 sections short and intermediate segment longest, 12 teeth on medial margin of distal blade. Maxillule (Fig. 2C) with pointed dentiform process and papilla bearing 3 setae. Maxilla (Fig. 3C) 2-segmented; proximal segment (lacertus)



Fig. 2. *Caligus uranoscopi* Vaissière, 1955 female: **A.** Antennule. **B.** Tip of antennule. **C.** Antenna, post-antennary process and maxillule. **D.** Maxilliped. **E.** Sternal furca. **F.** Mandible. Scale bars = 0.1 mm (A, C, D and E), 0.03 mm (B), 0.05 mm (F)

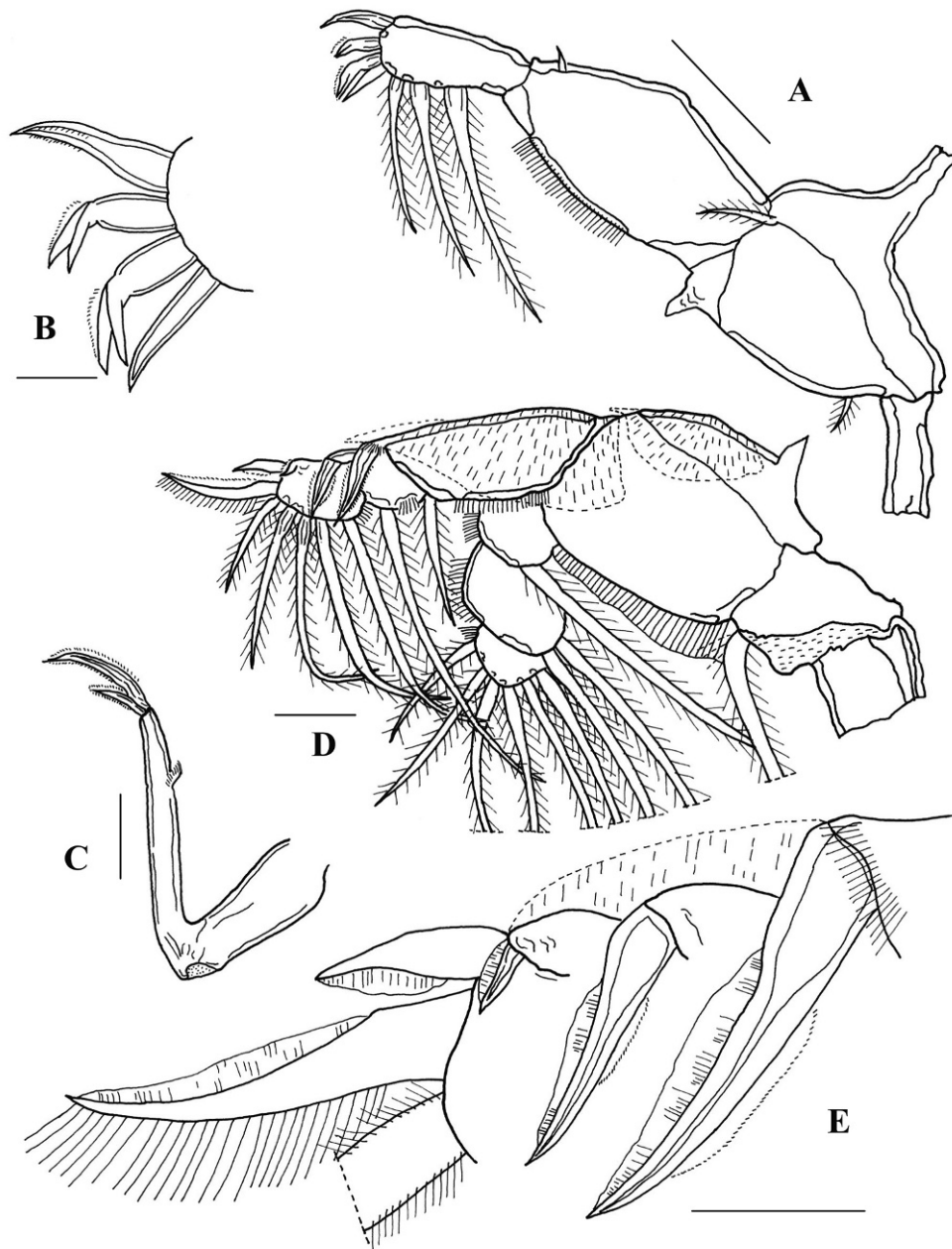


Fig. 3. *Caligus uranoscopi* Vaissière, 1955 female: **A.** Leg 1. **B.** Tip of leg 1. **C.** Maxilla. **D.** Leg 2. **E.** Enlarged exopodal spines of leg 2. Scale bars = 0.1 mm (A, C and D), 0.02 mm (B), 0.05 mm (E)

robust and unarmed; distal segment (brachium) slender and slightly longer, carrying subterminal hyaline membrane on outer edge and short canna and long calamus at tip. Maxilliped (Fig. 2D) 2-segmented; proximal segment (corpus) large and without armature or ornamentation, distal segment (subchela) comprising long and slender shaft and sharply pointed short claw bearing basal seta. Sternal furca (Fig. 2E) with subrectangular box and diverging tines, with blunt tip.

Armature of rami of legs 1–4 (Figs 3 and 4) as follows (Roman numerals for spines and Arabic numerals for setae):

	Exopod	Endopod
Leg 1	I-0; IV, 3	(vestigial)
Leg 2	I-1; I-1; II, I, 5	0-1; 0-2; 6
Leg 3	I-0; I-1; III, 4	0-1; 6
Leg 4	I-0; III	(missing)

Leg 1 (Fig. 3A, B) basis with plumose outer (anterior) seta and another small plumose inner (posterior) seta; vestigial endopod unarmed; first segment of exopod with row of setules on posterior edge and short spiniform seta at outer distal corner; middle 2 of 4 terminal elements on last segment of exo-

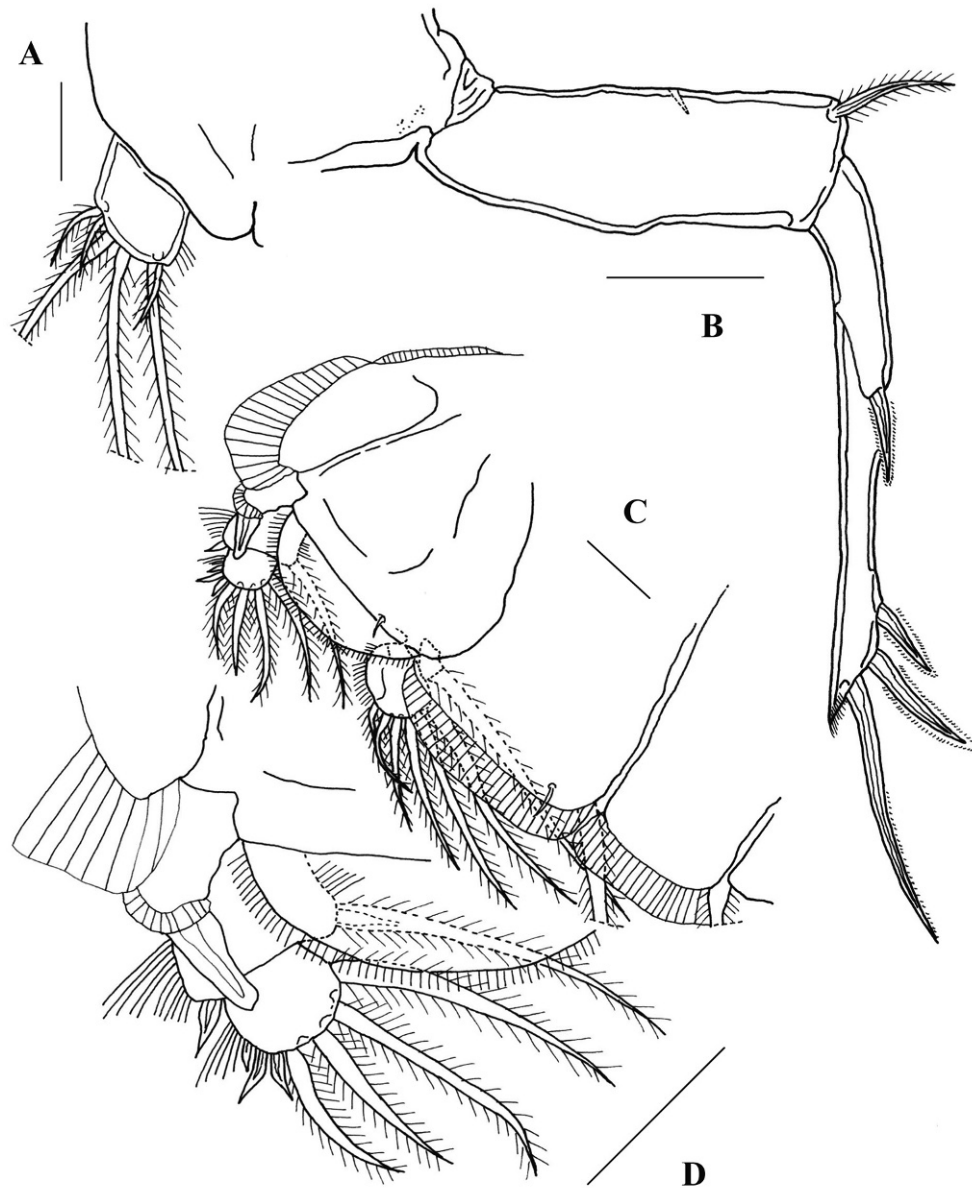


Fig. 4. *Caligus uranoscopi* Vaissière, 1955 female: **A.** Caudal rami. **B.** Leg 4. **C.** Leg 3. **D.** Tip of leg 3 (exopod). Scale bars = 0.1 mm (A, B, C and D)

pod with denticulate margin and accessory process; proximal part of 3 medial setae swollen. Leg 2 (Fig. 3D, E) both rami 3-segmented; coxa small, with large plumose inner seta on posterior edge; basis with long marginal membrane; first exopodal segment with row of fine setules; distal segment of exopod with 5 long plumose setae and 3 unequal, spiniform setae; spines on outer margin of terminal segment of exopod with hyaline membrane on one side only. Leg 3 (Fig. 4C, D) protopod (apron) with large membrane on outer and distal margins. Leg 4 (Fig. 4B) protopod with small, plumose outer seta; exopod 2-segmented, slender, and distinctly longer than protopod, its inner distal corner protruded into pointed tip

fringed with marginal membrane. Leg 5 (Fig. 1B) represented by 1 short and 2 long plumose setae in postero-lateral area of genital complex.

Male: Not found.

Discussion

The original description of *Caligus uranoscopi* by Vaissière (1955) was made more than half a century ago. Since then, no sighting of this species has been recorded from anywhere in the Mediterranean. It is not until our study on ectoparasitic

crustaceans from the Algerian coast that three additional females of this species were found.

The general morphology of our female specimens and those of Vaissière's (1955) specimens are identical: total length (4.10–4.30 mm and 4.70 mm, respectively), size and shape of suborbicular cephalothoracic shield, fourth pediger, genital complex, and abdomen.

However, some discrepancies are found in the fine details of the structure of the appendages. For instance, Vaissière (1955) gave the proximal segment of antennule with 10 setae, instead of 25 plumose and 2 naked setae; the distal segment bearing 5 setae, instead of 11 setae and 2 aesthetascs; antenna comprising 2 segments, instead of 3; mandible without 12 teeth on the medial margin of distal blade; and maxillule bearing 2 setae instead of 3 on basal papilla. Describing and drawing very briefly the legs 1–5, Vaissière (1955) did not give full details on the armature of setae and spines. In spite of these discrepancies, judging from the structures of the four thoracic legs given in the original description, we are reasonably sure that the caligids we collected from the red mullet are conspecific with *C. uranoscopi*. However, descriptions of several appendages produced by Vaissière were inaccurate. So, many additional details about their morphology in female specimens have been reported.

Based on the general body form with suborbicular cephalothoracic shield; oblong genital complex (rather longer than broad); and short, 1-segmented abdomen; *C. uranoscopi* seems to be similar to *Caligus brevicaudatus* Scott, 1901. The latter is a parasite of *Eutrigla gurnardus* (Linnaeus, 1758) and *Chelidonichthys lucerna* (Linnaeus, 1758) occurring in the British Isles (Kabata 1979). However, close examination and comparison shows that the Algerian *Caligus* is distinguishable from the British species in possession of a sternal furca with diverging, blunt-tipped tines, and a leg 4 with slender exopod distinctly longer than the protopod (Scott 1901, Kabata 1979).

Vaissière (1955) collected 5 specimens of this species, twice a pair on the dorsal and pelvic fins of *Trigla* (= *Chelidonichthys lucerna*) and one additional female from the branchial cavity of *Uranoscopus scaber* Linnaeus, 1758. However, the author did not give the number of fish examined or the type locality, and the species was called *C. uranoscopi* rather than *C. lucernae*. We examined some specimens of *Chelidonichthys lucerna* L., 1758 (n = 8), *Eutrigla gurnardus* L., 1758 (n = 4) (Triglidae) and *U. scaber* (n = 6) (Uranoscopidae). On these fish, we collected several species of copepod (*Parabrachiella triglae* (Claus, 1860), *Parabrachiella bispinosa* (Nordmann, 1832), *Parabrachiella impudica* (Nordmann, 1832), *Caligus diaphanus*, but never *Caligus uranoscopi*). Also, Benmansour and Ben Hassine (1997), Raibaut et al. (1998), Ökter and Trilles (2004) have studied the same host species but they have never collected *C. uranoscopi*. In our study, we have collected this copepod species on *M. barbatus barbatus* with a very low prevalence (0.32%) on the east coast of Algeria (Béjaïa Gulf). It appears that *C. uranoscopi* is

a very uncommon species and that its distribution is may be restricted to the Algerian coast.

Despite the few specimens collected firstly by Vaissière (1955) (2 males and 3 females) and recently by us (3 females), a preliminary information about the specificity and the ecology of this copepod can be noted.

This ectoparasitic copepod seems to be able to infest several host fishes that are taxonomically diverse but ecologically similar, such as the Triglidae, Uranoscopidae and Mullidae living in coastal areas with sandy, muddy and sandy-muddy bottom. So, *C. uranoscopi* may be considered euryxenic. *Chelidonichthys lucerna* is perhaps the primary host from where *C. uranoscopi* has been transferred to other fish species, such as *U. scaber* and *M. barbatus barbatus*.

Up to the present, six species of Caligidae have been reported from Algerian marine fishes: *Caligus centrodonti*, *C. dieuzeidei*, *C. diaphanus* (Ramdane and Trilles 2007), *C. pageti* (Argilaz 1931; Brian 1931a, b, Brian 1935), *C. uranoscopi* and *Lepeophtheirus rotundiventris* (Brian 1931c, Vaissière 1955). Two other species belonging to the genus *Caligus*, *C. ligusticus* Brian, 1906 and *C. bonito* Wilson, 1905 were recently collected (Ramdane and Trilles 2010). So, eight species of Caligidae are currently known from Algerian coasts.

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