Redescription of Lophoura gracilis (Wilson, 1919) (Copepoda: Sphyriidae) from Synaphobranchus kaupi in the Northwest Atlantic Ocean

Article *in* Canadian Journal of Zoology · June 1985

DOI: 10.1139/z85-440

CITATIONS
7

READS
99

2 authors, including:

Michael J. Dadswell
Acadia University
258 PUBLICATIONS **3,198** CITATIONS

SEE PROFILE

Redescription of *Lophoura gracilis* (Wilson, 1919) (Copepoda: Sphyriidae) from *Synaphobranchus kaupi* in the Northwest Atlantic Ocean

WILLIAM E. HOGANS
Atlantic Reference Centre, Huntsman Marine Laboratory, St. Andrews, N.B., Canada E0G 2X0

AND

MICHAEL J. DADSWELL
Fisheries Research Branch, Department of Fisheries and Oceans, Biological Station, St. Andrews, N.B., Canada E0G 2X0

Received March 13, 1985

HOGANS, W. E., and M. J. DADSWELL. 1985. Redescription of *Lophoura gracilis* (Wilson, 1919) (Copepoda: Sphyriidae) from *Synaphobranchus kaupi* in the Northwest Atlantic Ocean. Can. J. Zool. **63**: 2940–2943.

The mesoparasitic copepod *Lophoura gracilis* is redescribed from eight female specimens recovered from synaphobranchid eels captured at 600 m on the Scotian Shelf. This is the first documentation of *L. gracilis* since the original description. We conclude that *L. gracilis* is a valid species distinct from the other North Atlantic representatives of this genus.

HOGANS, W. E., et M. J. DADSWELL. 1985. Redescription of *Lophoura gracilis* (Wilson, 1919) (Copepoda: Sphyriidae) from *Synaphobranchus kaupi* in the Northwest Atlantic Ocean. Can. J. Zool. **63**: 2940–2943.

Le copépode mésoparasite *Lophoura gracilis* est décrit de nouveau à la suite de l'examen de huit femelles trouvées chez des anguilles égorgées (Synaphobranchidae) capturées à 600 m sur la plate-forme néo-écossaise. Il s'agit là de la première mention de *L. gracilis* depuis la publication de sa description originale. *Lophoura gracilis* constitue donc une espèce valide, distincte des autres représentants du genre dans les eaux de l'Atlantique Nord.

[Traduit par le journal]

Introduction

Lophoura gracilis (Wilson, 1919) (syn. *Rebelula gracilis*), mesoparasitic on synaphobranchid eels in the northwest Atlantic Ocean, was first described by Wilson (1919). The original description was based on four adult females (males of *L. gracilis* are unknown), three from *Synaphobranchus kaupi* Johnston, 1862 and one from *Histiobranchus infernalis* Jordan and Evermann, 1893 (syn. *Synaphobranchus infernalis*). The description is rather short and many of the morphological features are incompletely described. Herein we redescribe this rarely observed copepod. This is the first documentation of *L. gracilis* since the original description.

Materials and methods

Specimens of *L. gracilis* were recovered from five *S. kaupi* collected during a faunal survey of the continental slope of the Scotian Shelf in October 1984. Fish were captured at a depth of 604 m in Western IIA 14-m (length of footrope) bottom trawls. Immediately upon landing, the fish were frozen whole and later thawed and examined in the laboratory. Seven of eight *L. gracilis* dissected from the flesh of the hosts were fixed in 70% ethanol; the remaining specimen was examined in an unfixed condition. Parasites were examined with a low-power (20×) dissecting microscope for general appearance and fine structures were examined with phase contrast or dark-field microscopy (up to 800×). The cephalothorax of fixed specimens were dehydrated in absolute alcohol and cleared in methyl salicylate to reveal appendage structure. Figures were drawn with the aid of a camera lucida or drawing tube and means of measurements are in millimetres unless otherwise noted, with ranges in parentheses.

Lophoura gracilis (Wilson, 1919) (Fig. 1)

LOCALITY: Scotian Shelf

HOST: *Synaphobranchus kaupi*

SITE OF INFESTATION: Base of dorsal fin in flesh

Description of adult female (based on 6 specimens)

Sphyriidae: cephalothorax (Fig. 1) sub-cylindridal anteriorly becoming dorsoventrally flattened, slender, elongate and transversely wrinkled posteriorly. Length and width variable, dependent on and influenced by site of attachment in host. Cephalothorax length 20.0 (14–27); width 1.25 (1.0–2.3). Junction of posterior end of cephalothorax and anterior end of neck armed with holdfast of 3–5 irregularly shaped, knoblike chitinous processes (Fig. 1). Neck cylindrical, slender; length 18.8 (15–21.5); width 1.9 (1.5–2.5). Posterior end of neck slightly expanded at junction with trunk. Trunk ovoid, dorsoventrally flattened; length 18.9 (14.5–23). Dorsal and ventral surfaces of trunk with 2 rows of 4 pits each. Pits variable in shape and proportional in size of size of trunk. Ventral posterior processes 2, small, subspherical, each divided into 2 indistinct lobes by oviduct orifices. Two branched, posterior processes, each covered with 18–27 elongate and clavate cones (Fig. 2). Egg sacs 2, cylindrical, rounded posteriorly, approximately $\frac{3}{4}$ length of entire parasite, width 3–5. Eggs spherical. Perianal swelling (Fig. 2) situated at posterior end of trunk, dorsal to uropods; truncate, divided into two portions by the anus. Cephalic region (Figs. 3*a* and 3*b*) a subcylindrical lobe on the anterior end of the cephalothorax, separated from it by a distinct constriction. Length of cephalic lobe 0.9 (0.8–1.0), width 1.4 (1.3–1.6). Anterior margin of cephalic lobe (Figs. 4*a* and 4*b*) with two padlike, dorsoventrally compressed projections. First antennae (Fig. 5) one-segmented, reduced to two small knobs on dorsal surface; length 0.08 (0.07–0.09), width 0.07 (0.06–0.08). Second antennae (Fig. 6) one-segmented, origin on dorsal surface immediately anterior to first antennae; length 0.20 (0.23–0.34), width 0.23 (0.19–0.25). Mouth tube siphonostome, on ventral surface of cephalic lobe near anterior margin. First maxillae (Fig. 7) digitiform, located on either side of mouth; length 0.020 (0.010–0.025), width 0.007 (0.006–0.009). Second maxillae (Fig. 8) small, knoblike, with one digitiform seta at apex; length 0.15 (0.13–0.16), width 0.17 (0.15–0.18). Maxillipeds absent. Mean total length of specimens (excluding egg sacs) 50.7 (36–76).

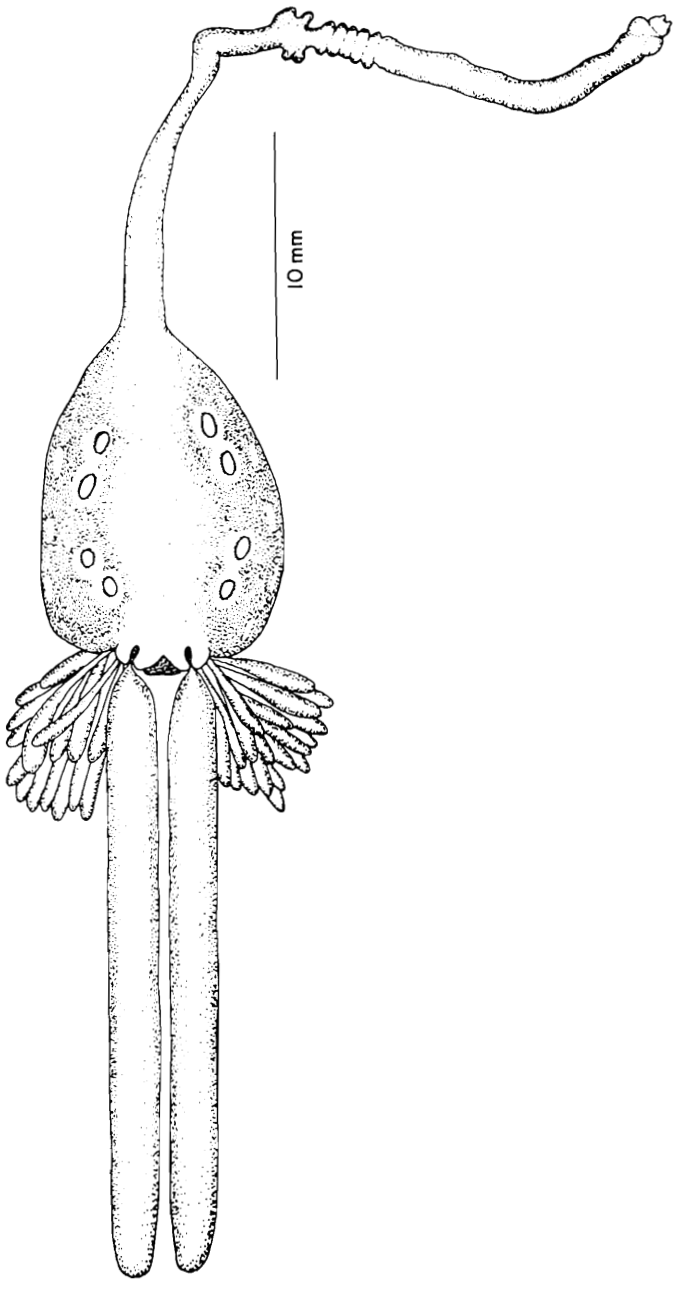
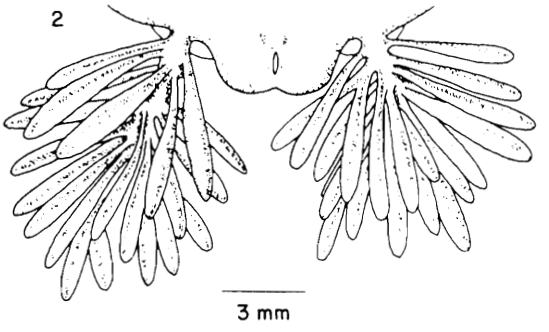


FIG. 1. *Lophoura gracilis* (Wilson, 1919), ventral (unfixed specimen).



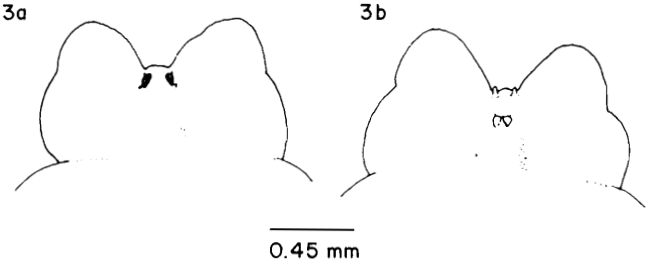


FIG. 2. Perianal swelling and uropods. FIG. 3. Cephalic lobe. (*a*) Dorsal (*b*) Ventral.

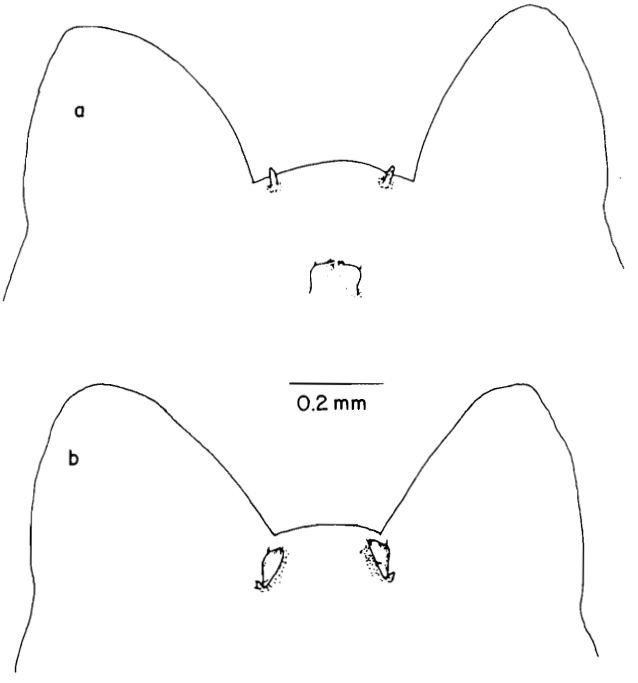
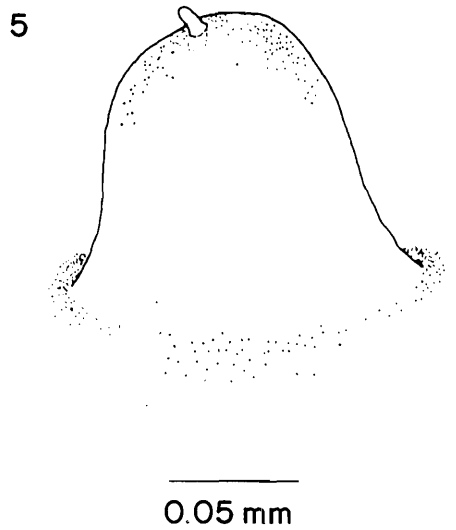
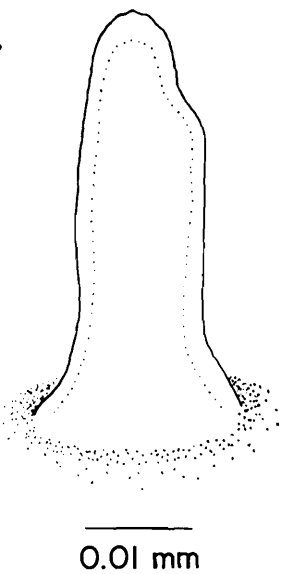


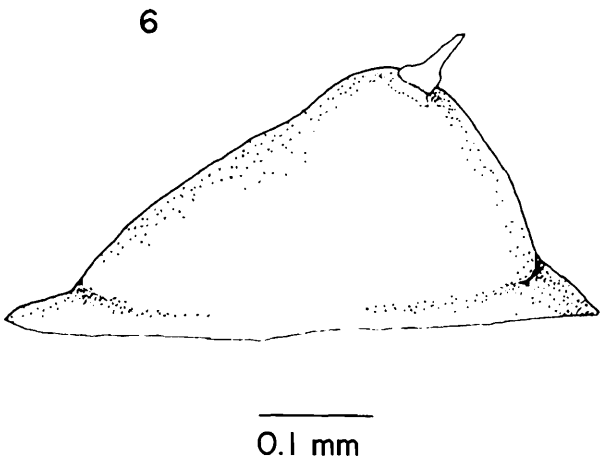
FIG. 4. Anterior margin of cephalic lobe. (*a*) Ventral (*b*) Dorsal.

Discussion

The above agrees with the description given by Wilson (1919) and paratype specimens of *L. gracilis* (USNM 49755, 49756). Wilson (1919) adequately documented the general appearance of *L. gracilis* but failed to give dimensions and specific details of most structures. There is no mention of the perianal swelling in the original description, it is described for the first time. Wilson described the head (cephalic lobe) as "somewhat three-cornered," a feature not distinct in the present material. Instead, the cephalic lobe form has been termed "sub-cylindrical" because of the slight variation in the shape of specimens, most probably due to the site of attachment. The second antennae were originally described as "small transverse ellipsoids" and this was evident in the examined specimens, which possessed second antennae of similar structure. The location and structure of all appendages were only distinct in 3 of 6 specimens. Specimens from which a description of the appendages was obtained were also the smallest in total length. It is possible that parasite age and duration of infestation in the host may influence the reduction and structure of the appendages. Site of attachment may also limit the size and shape of these structures. The position of the first and second maxillae on the cephalic lobe was listed in the original description, but structural details were not included. The maxillae are difficult to see, even in good specimens, and are much reduced.







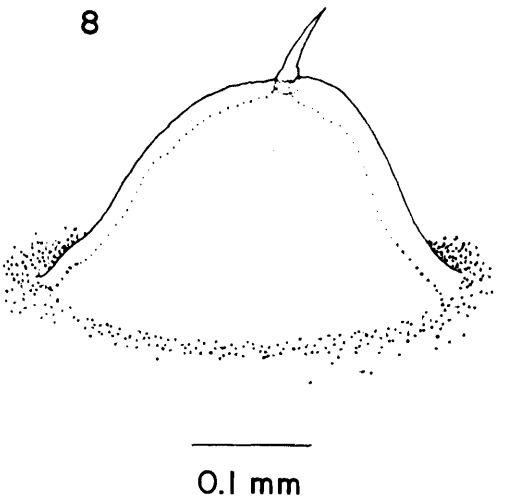


FIG. 5. First antenna, dorsal. FIG. 6. Second antenna, dorsal.

FIG. 7. First maxilla, ventral. FIG. 8. Second maxilla, ventral.

Wilson (1919) lists the following distinguishing features of *L. gracilis*: narrow and elongate cephalothorax, neck and egg strings, three-cornered head lobe, holdfast form of cephalothorax and neck junction, and a large, plump trunk. Although not stated, it is assumed that these features serve to distinguish *L. gracilis* from *L. bouvieri* (Quidor, 1912), the only other species of *Lophoura* Kolliker, 1853 recorded from the northwest Atlantic (Yamaguti 1963). For comparative purposes, we have examined a single adult female specimen of *L. bouvieri* from *Nezumia bairdi* (Goode and Bean 1877), collected off the Scotian Shelf in November 1982. The specimen of *L. bouvieri* (Fig. 9) did differ from specimens of *L. gracilis* based on the distinguishing features listed by Wilson (1919).

The length of the cephalothorax is apparently influenced by the site of the attachment and is a taxonomically unreliable feature. An example of this is shown by the cephalothorax length of two specimens of *L. gracilis*. The total lengths of the specimens were approximately equal (60 and 61 mm) whereas cephalothorax lengths differed substantially at 15 and 26 mm, respectively. Neck length is also probably variable, although this feature was proportional to total length in all the specimens examined (both *L. bouvieri* and *L. gracilis*). Egg sac length and width did vary significantly between the two species; those of *L. bouvieri* are shorter and wider than those of *L. gracilis*.

The most reliable features for differentiating between *L. bouvieri* and *L. gracilis* are the following: (*i*) The shape of the processes of the cephalothorax–neck junction; *Lophoura bouvieri* exhibits three spherical processes at this junction, whereas *L. gracilis* bears 3–5 chitinous knobs of variable shape. (*ii*) The shape of the perianal swelling; *Lophoura bouvieri* has a subspherical swelling, *L. gracilis* possesses a perianal swelling that is much more truncate. (*iii*) The shape of the genital processes; *L. bouvieri* exhibits large (in proportion to the trunk), truncate processes, whereas *L. gracilis* has small, spherical processes. (*iv*) The hosts for each species: *L. bouvieri* has been found only on macrurids, specifically *N. bairdi*, whereas *L. gracili* is apparently restricted to synaphobranchid eels. (*v*) The egg sacs of *L. bouvieri* are much wider then those of *L. gracili*; unfortunately these are often missing from specimens of both species.

The sites of infestation for the two species are specific in their respective hosts. *Lophoura bouvieri* is always found immediately posterior to the dorsal fin with the entire cepha-

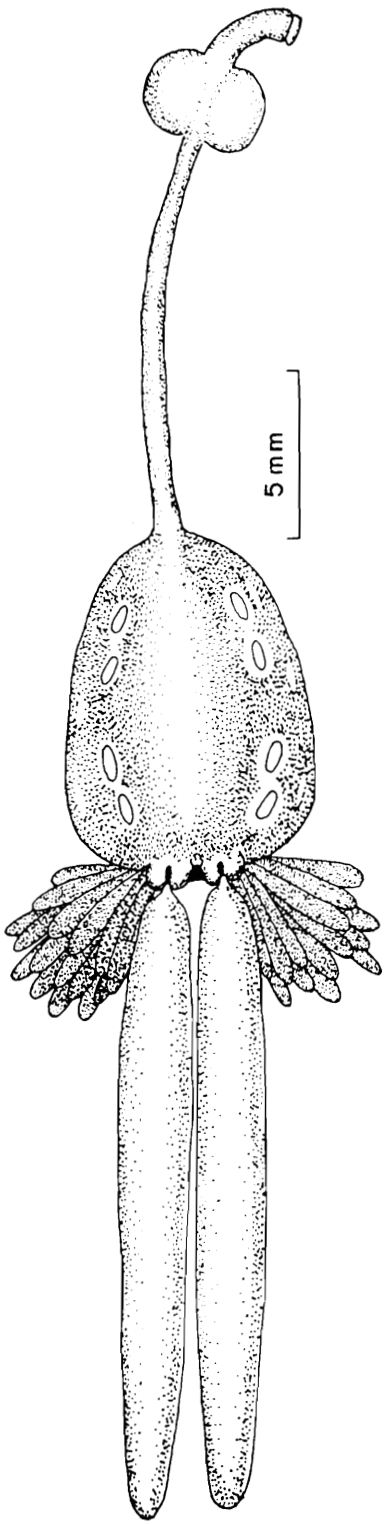


FIG. 9. *Lophoura bouvieri* (Quidor, 1912), ventral.

lothorax and a portion of the neck deeply embedded in the flesh. *Lophoura gracilis* is found penetrating the flesh randomly along the base of the dorsal fin, with a portion of the neck and the entire cephalothorax lying close to the vertebral column, a site of attachment reported for *L. edwardsii* Kolliker, 1853, a parasite of the macrurid, *Coelorinchus coelorhinchus* (Risso), in eastern Atlantic waters (Kabata 1979).

Specimens of *Lophoura gracilis* (Cat. No. 2616) and *Lophoura bouvieri* (Cat. No. 1959-82) are deposited in the Atlantic Reference Collection, Fisheries and Oceans, Biological Station, St. Andrews, New Brunswick, Canada E0G 2X0.

Acknowledgments

We thank D. F. Markle for collecting the hosts, J. S. Scott for reviewing drafts of the manuscript, W. B. Scott for information on host taxonomy, and R. F. Cressey for the loan of paratype specimens from the Smithsonian Institution.

KABATA, Z. 1979. Parasitic Copepoda of British fishes. The Ray Society, London.

WILSON, C. B. 1919. North American parasitic copepods belonging to the new family Sphyriidae. Proc. U.S. Natl. Mus. **55**(2286): 549–604.

YAMAGUTI, S. 1963. Parasitic Copepoda and Branchiura of fishes. Wiley–Interscience Publishers, New York.