

Rediscovery and first South African records of the parasitic copepod *Cancerilla oblonga* Bartsch, 1975 (Crustacea, Cancerillidae)

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Academic editor: Pavel Stoev | Received 6 July 2016 | Accepted 30 August 2016 | Published 7 October 2016

<http://zoobank.org/4FFFD00B-89AC-498B-9BC4-E4B010E8D902>

Citation: MacKinnon RB, Landschoff J, Griffiths CL (2016) Rediscovery and first South African records of the parasitic copepod *Cancerilla oblonga* Bartsch, 1975 (Crustacea, Cancerillidae). African Invertebrates 57(2): 105–109. doi: 10.3897/AfrInvertebr.57.9775

Abstract

The parasitic copepod *Cancerilla oblonga*, previously known only from the single holotype female collected from Luderitz Bay, Namibia, is rediscovered in Cape Town, South Africa, where it parasitises the brittlestar *Amphiura capensis*. The first photographic and SEM images of this species are presented and prevalence rates estimated. Of 240 hosts examined, 25 (=10.42%) were infected, of these 7.53% carried a single copepod, 2.09% two copepods and 0.84% three copepods. This discovery is the first record of any siphonostomatoid copepod infecting an invertebrate host in South Africa.

Keywords

Copepoda, Siphonostomatoida, parasite, brittlestar, *Amphiura capensis*, prevalence

Introduction

Copepods of the Order Siphonostomatoida form symbiotic relationships with a wide variety of marine and freshwater hosts. Although 429 species, representing 12 of the 39 known families, have been reported from South Africa, all of these infect fish (Dippenaar 2004). Prior to this study, none of the 12 families reported to infect invertebrate hosts had been recorded from South Africa (Dippenaar 2016).

The genus *Cancerilla* (Siphonostomatoida: Cancerillidae) comprises seven species, the adults of which are all ectoparasites of ophiuriids. Three of these species occur in the Antarctic, where *Cancerilla alata* Heegaard, 1951 and *C. setifera* Bartsch, 1994 both parasitise *Ophiacantha antarctica* and *C. ampla* Heegaard, 1951 parasitises *Ophiacantha vivipara*. Of the remaining species *C. durbanensis* Stephensen, 1933, *C. neozelanica* Stephensen, 1927, and *C. tubulata* Dalyell, 1851 have all been reported from the small, widespread, brooding brittlestar *Amphipholis squamata*. *C. tubulata* occurs in Europe, Northwest Africa and the west coast of North America, *C. neozelanica* is found only in New Zealand (Bartsch 1976), while *C. durbanensis* is confined to deeper waters off Durban, South Africa (Barnard 1955). The last species, and the subject of this study, *C. oblonga*, is to date known only from Namibia (Bartsch 1975) where it parasitises *Amphiura capensis*.

Cancerilla oblonga was originally described by Bartsch (1975), based on a single female found in Luderitz Bay, Namibia. The species has not been reported again until 2015, when we recorded numerous individuals living on the same host, *Amphiura capensis*, but on the west coast of the Cape Peninsula, South Africa, some 900 km south of the type locality. This represents the first record of *C. oblonga* (or of any member of the Family Cancerillidae) from South Africa and only the second ever confirmed report of the species. We thus take the opportunity to clarify the taxonomic status of this species, to provide photographic and SEM images of it, and to give details of its habits and infection rates.

Material and methods

Monthly samples of *Amphiura capensis* were collected from beneath intertidal boulders at Mouille Point (33.9008°S; 18.4056°E), a suburb of Cape Town, South Africa, between October 2014 and September 2015. These samples were preserved in 70% alcohol and returned to the laboratory, where they were used primarily for a project investigating the reproductive biology of the species (MacKinnon et al. in press). However, each month 20 specimens were also examined for parasites.

In situ images of parasites were taken using a Nikon DS-5M camera head fitted to a Nikon SMZ1500 stereomicroscope and specimens for scanning electron microscope (SEM) imaging were prepared following the technique outlined by Byrne (1991), then coated with gold palladium alloy and photographed with a Nova NanoSEM.

Representative samples of the parasite and host have been lodged in the Iziko South African Museum collection under catalogue number SAMC-A085807 and SAMC-A085808 respectively.

Results and discussion

Our observations comprise the first record of *Cancerilla oblonga* from South Africa and only the second ever confirmed record of the species. They also represent the first

record of any siphonostomatoid infecting an invertebrate host in South Africa (Dippenaar 2016), although detailed examination of other potential hosts would almost certainly reveal other associations.

One aberrant distribution record of the related northern hemisphere *C. tubulata*, found on the brittle star *Amphipholis squamata*, has been reported from Luderitz, Namibia by Kensley (1970), but that report includes only a most cursory description of a single specimen without any illustrations. Bartsch (1975) was aware of, and accepted, Kensley's record, apparently without re-examining the specimen. However, we feel that a more careful re-examination and illustration of the existing specimen (or collection of additional new material) is required before this record can be confirmed, as it either represents an enormous extension of the known range, or possibly a new undescribed species. Kensley worked at the South African Museum in Cape Town and we searched for his specimen in the collections there. The sample is reflected on the collection database, with catalogue number MB-A012713, collected on 17 February 1969, but we were unable to find the actual sample, so were unable to re-examine his specimen and confirm its identity. The occurrence of *C. tubulata* in Namibia thus remains speculative, and new samples should be collected to confirm this.

During our survey a total of 25 of the 250 examined hosts were infected with *C. oblonga* (prevalence = 10.42%), with a total of 34 parasites recorded from these infected hosts. Of all the potential hosts examined, 7.53% were infected by a single copepod, 2.09% by two copepods and 0.84% by three copepods. There was a weak, but non-significant positive relationship between host disc diameter and number of copepods present ($R^2 = 0.325$, $df = 24$, p -value = 0.113).

Cancerilla oblonga specimens were commonly attached by their antennae near the basal arm segments of *A. capensis*, with the cephalothorax always being directed toward the mouth of the host. Most copepods were attached near the oral frame of the host (Fig. 1). Although living specimens were regularly observed, no movement of the copepods along the arms was noted and all specimens found were females, many of which were ovigerous (see Fig. 1).

SEM images of the specimens conformed closely to the illustrations and description given by Bartsch (1976), as shown in Fig. 2. In particular the relatively elongated oval body, after which the species derives its name, distinguish this from other species in the genus.

The impacts of the parasite on the host are unknown, although in a parallel study of reproduction in this same population of *A. capensis* (MacKinnon et al. in press), we were able to show that parasite infection had no significant effect on numbers of brooded young per host individual. Despite the fact that numerous associations between copepods and their echinoderm hosts have been reported (for review see Jangoux, 1987) these vary widely in type (e.g. ecto- or endoparasitic, cyst-forming, etc) and the exact natures of these associations and their impacts on the host species have seldom been investigated. It seems likely that *C. oblonga* utilise food particles as these are moved along the ventral ciliary tracts of the host's arms towards the mouth.



Figure 1. *Amphiura capensis*, showing three ovigerous female *Cancerilla oblonga* attached to ventral surfaces of arms.



Figure 2. **Left** Scanned electron micrograph of ovigerous female *Cancerilla oblonga* from *Amphiura capensis* in Cape Town **Right** External features of *Cancerilla oblonga* from Luderitz, as drawn by Bartsch (1975).

Acknowledgements

We thank Elizabeth Hoensen and Albe Bosman of the Iziko South African Museum for helping us search for samples and data in their collection and catalogues. Financial support was provided by a National Research Foundation Incentive Grant to C. L. Griffiths.

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