

***Henneguya shackletoni* sp. nov. (Myxosporea, Bivalvulida, Myxobolidae) from the Falklands mullet, *Eleginops maclovinus* (Cuvier) (Teleostei, Eleginopidae) in the Falkland Islands**

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Abstract

During a survey of the parasite fauna of the euryhaline notothenioid fish *Eleginops maclovinus* (Cuvier) caught in brackish water creeks in the Falkland Islands, small white cysts were observed in the mesenteries and on the surfaces of the visceral organs and heart. On dissection these proved to be plasmodia of a species of the myxosporean genus *Henneguya*. This is the first record of a member of this genus from a marine or euryhaline fish in the south-west Atlantic. A comparison of the spore of our species with other species in the genus convinced us that our species is new. This paper describes it as *Henneguya shackletoni* sp. nov. after the Shackleton Fund which funded the study.

Key words

Henneguya shackletoni sp. nov., Myxosporea, *Eleginops maclovinus*, fish, Falkland Islands

Introduction

The Falklands mullet, *Eleginops maclovinus* (Cuvier) is a euryhaline fish found in coastal waters around the Falkland Islands and in estuaries and rivers along the coasts of the southern half of the South American continent (De Witt *et al.* 1990). During a survey of the parasites of *E. maclovinus* caught in the Falkland Islands in 2002, small white cysts were observed on the surfaces of the visceral organs and heart. On dissection these cysts were found to be plasmodia of a species of the myxosporean genus *Henneguya*. No member of this genus has been previously described from *E. maclovinus* or from any other marine or euryhaline fish in the south-west Atlantic. Our description of this species follows the guidelines of Lom and Arthur (1989).

Materials and methods

Samples of *E. maclovinus* were collected by beach seine from two brackish water creeks in East Falkland in January and

February 2002. The fish were deep-frozen and later defrosted for examination in the laboratory of the Falkland Islands Government Fisheries Department in Stanley by PB and KM. Some cysts were dissected and fresh *Henneguya* spores were photographed. Pieces of gonad containing cysts (plasmodia) were fixed in 10% buffered formal saline and sent to the Department of Zoology, Andhra University, India, for examination and description by CK. Unstained spores were examined in a drop of saline under dark ground and phase contrast illuminations at magnifications of up to $\times 2000$. Some spores were treated with Lugol's solution to detect the presence of iodophilous vacuoles in the sporoplasm, or with Indian ink to detect the presence of a mucous envelope (Lom and Vávra 1963). Smears were either air-dried, fixed in methyl alcohol and stained with Giemsa, or wet-fixed in Schaudinn's or Carnoy's fluid and stained with either Ehrlich's haematoxylin or according to Feulgen's technique. Illustrations were made with the aid of camera lucida and measurements are given in micrometres.

Collection numbers quoted refer to specimens deposited at the Natural History Museum, London, U.K.

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Table I. A comparison of *Heneguya shackletoni* with other species of *Heneguya* with similar spore dimensions

Species of <i>Heneguya</i>	Spore			Polar capsule		No. of coils in filament	Length of caudal appendage	Host species	Locality
	length	width	thickness	length	width				
<i>H. shackletoni</i> sp. nov.	11.8 (9.6–14.4)	8.5 (7.2–11.2)	7.0 (5.4–8.6)	3.7 (3.2–4.8)	3.1 (2.6–3.6)	6–7	37.3 (24.8–51.2)	<i>Eleginops maclovinus</i>	Falkland Islands
<i>H. brachydeuteri</i> Kpatcha, Faye, Diebakate, Fall et Toguebaye, 1997	11.5 (10.0–12.0)	8.3 (7.0–9.0)	ND	4.3 (4.0–5.0)	2.6 (2.0–3.0)	ND	26.9 (26.0–29.0)	<i>Brachydeuterus auritus</i>	Senegal
<i>H. lateolabraxis</i> Yokoyama, Kawakami, Yasuda et Tanaka, 2003	10.7 (9.9–11.9)	7.5 (6.4–7.8)	6.2 (5.9–6.4)	3.4 (3.0–4.0)	1.7 (1.5–2.0)	about 3	37.7 (30.7–49.5)	<i>Lateolabrax</i> sp.	Japan
<i>H. lutjani</i> Kpatcha, Faye, Diebakate, Fall et Toguebaye, 1997	11.6 (11.2–13.0)	7.2 (6.0–8.0)	ND	3.8 (3.0–4.5)	2.9 (2.2–3.5)	ND	37.2 (36.0–38.2)	<i>Lutjanus agennes</i>	Senegal
<i>H. ntemensis</i> Fomena et Bouix, 1996	10.5 (9.2–12.0)	8.0 (7.0–8.9)	7.0 (ND)	6.0 (5.0–7.0)	3.4 (3.0–3.9)	5–6	5.1 (3.2–9.6)	<i>Brienomyrus brachyistius</i>	Cameroon
<i>H. otolithi</i> Ganapati, 1941	ND (10.0–12.0)	ND (6.0–8.5)	ND (4.0–5.0)	ND (3.0–4.0)	ND (2.0–2.5)	ND	ND (35.0–40.0)	<i>Otolithus</i> spp.	Bay of Bengal
<i>H. thermalis</i> Seenappa, Manohar et Prabhu, 1981	11.8 (12.0–13.2)	7.6 (6.0–8.0)	ND	*(4.0–5.0) (3.0–4.0)	ND	ND	12.1 (11.0–13.0)	<i>Lepidocephalus thermalis</i>	India
<i>H. wisconsinensis</i> Mavor et Strasser, 1916	11.5 (ND)	7.0 (ND)	ND	3.5 (ND)	2.5 (ND)	5	9.6 (ND)	<i>Perca flavescens</i>	U.S.A.
<i>H. yoffensis</i> Kpatcha, Faye, Diebakate, Fall et Toguebaye, 1997	13.3 (12.0–15.0)	9.1 (8.0–11.0)	ND	3.4 (3.0–4.0)	1.3 (2.0–3.0)	ND	32.1 (24.0–36.0)	<i>Sparus caeruleostictus</i>	Senegal

Measurements are in micrometres with ranges in parentheses below. ND = no data. *In *H. thermalis* the polar capsules are unequal.

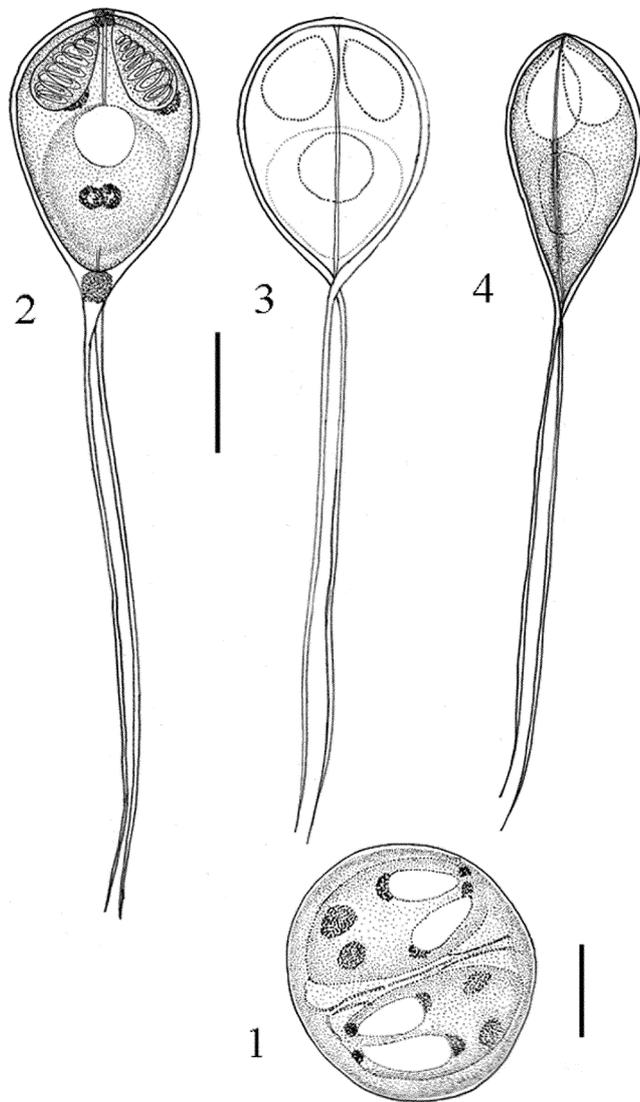
Results

Family: Myxobolidae

Genus: *Henneguya* Thélohan, 1892

Henneguya shackletoni sp. nov. (Figs 1–4)

Description: Plasmodia opaque white, spherical or ellipsoidal, measuring 500–800. Large plasmodia contained spores only, while smaller ones measuring < 200 also contained sporoblasts in their peripheral regions (Fig. 1). These sporoblasts were spherical, lightly staining and disporous, diameter 15.0–26.5 (based on 20 fixed specimens).



Figs 1–4. *Henneguya shackletoni* sp. nov.: **1.** Fixed sporoblast stained with Giemsa. **2.** Fixed spore in frontal view, stained with Giemsa. **3.** Fixed unstained spore in frontal view. **4.** Fixed unstained spore in sutural view. Scale bar = 5 µm

Spore (Figs 2–4) pyriform with rounded anterior and pointed posterior ends in frontal view (Figs 2 and 3), lenticular in sutural view (Fig. 4). Spore valves thin, smooth, extending into two long, thin, straight caudal processes that are usually parallel throughout their lengths. At the junction of the caudal processes there is a deeply staining body. Polar capsules equal, pyriform, subterminal, converging anteriorly and occupying one third of the spore length. Polar filament with 6–7 coils. At the anterior tips of the polar capsules there is a distinct deeply staining body. Sporoplasm lightly staining with two nuclei. One large vacuole (diameter 2.0–3.0) between the posterior ends of the polar capsules and the sporoplasm. Dimensions, based on 50 fixed spores, as ranges with means \pm SD in parentheses: spore length, including caudal processes 34.5–65.5 (49.0 ± 9.0); spore length excluding caudal processes 9.5–14.5 (11.5 ± 1.5); spore width 7.0–11.0 (8.5 ± 1.0); spore thickness 5.4–8.6 (7.0 ± 1.0); length of caudal processes 25.0–51.0 (37.0 ± 8.0); polar capsule length 3.0–5.0 (3.5 ± 0.5); polar capsule width 2.5–3.5 (3.1 ± 0.5); sporoplasm length 3.0–5.0 (4.5 ± 0.5). Spore length:spore width ratio = 1.3:1. Spore length:polar capsule length ratio = 2.3–4.3:1.

Host: *Eleginops maclovinus* (Cuvier), Elegendinopidae.

Site of infection: Wall of alimentary tract, mesenteries and surfaces of gonad and heart.

Localities and dates: (1) 51°40'S, 59°36'W (Port Louis, East Falkland), 21 January, 2002; (2) 51°48'S, 58°55'W (Teal Creek, East Falkland), 27 February, 2002.

Prevalence: (1) 10 of 30 (23%); (2) 7 of 30 (33%).

Host length range: (1) 24–51 cm; (2) 16–76 cm.

Collection numbers: 2005:4:14:1, 2005:4:14:2, 2005:4:14:3, 2005:4:14:4.

Discussion

In his synopsis of the species in the genus *Henneguya*, Eiras (2002) listed 146 species. A further fifteen species have since been described. The majority of the hosts are freshwater fishes. The species described above is closest in spore size to the eight others shown in Table I, but differs markedly from each of them in some aspect of dimensions and/or form. In spore size it most closely resembles *H. lateolabracis* and *H. lutjani*, but differs from the former in the number of coils of the polar filament (6–7 compared to “about 3”) and from both species in the overall shape of the spore, which is pyriform in *H. shackletoni* but more ovoid in *H. lateolabracis* and *H. lutjani*. In fact the only species in Table I with a pyriform spore shape similar to *H. shackletoni* is *H. thermalis*, but in the latter species the caudal processes are quite different, being shorter, thinner and bifurcated. *Henneguya otolithi* differs principally in having a distinct transverse band across the spore. These differences, together with its occurrence in a host and locality from which no species of *Henneguya* has previously been reported, convinced us that this is a new species. It is named *Henneguya shackletoni* because it was found during a visit to

the Falkland Islands by KM funded by a Shackleton Fund Science Scholarship.

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