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Parasitology

*CERATOMYXA AMERICANA* N.SP. (MYXOSPORA, BIVALVULIDA),  
A PARASITE OF MACKEREL (*SCOMBER SCOMBRUS* L.)

*CERATOMYXA AMERICANA* SP.N. (MYXOSPORA, BIVALVULIDA)  
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A new sporozoan species, *Ceratomyxa americana* n.sp. is described. The parasites were found in the gall bladder of mackerel (*Scomber scombrus* L.). The infected fishes were caught in NW Atlantic (off Cape Hatteras). Data on the invasion incidence and intensity are provided.

INTRODUCTION

Parasitic species of the genus *Ceratomyxa* Thélohan, 1892 dwell mostly in the gall bladder and, less commonly, in the excretory system of marine fishes. So far, two species have been found in the gall bladder of mackerel (*Scomber scombrus* L.). One of them was originally described as *Leptotheca parva* Thélohan, 1895 from NE Atlantic (off French and Norwegian coasts and in the Mediterranean Sea) (Kudo 1919). The species was subsequently transferred by Kudo (1933) to the genus *Ceratomyxa*. Šulman (1966), too, placed the species in this genus. Additionally, Pogorelceva (1964) who studied i.a., mackerel in the Black Sea, published a description and a drawing of a *C. parva* spore. The other species found in the mackerel gall bladder was *Leptotheca scombri* Pogorelceva, 1964 found in the Black Sea.

Apart from the two species mentioned above, sporozoans found in the kidney canaliculi of mackerel were described as *Leptotheca renicola* Thélohan, 1895. The original description is rather vague and not accompanied by a drawing (Kudo 1919). Kudo (1933) left this species in the genus *Leptotheca* Thélohan 1895.

Sporozoans found recently in the mackerel gall bladder differ from the *Ceratomyxa* *protozoans* described in the available literature. The differences observed have prompted the author to describe the sporozoans as a new species, *Ceratomyxa americana* n.sp.

## MATERIALS AND METHODS

The mackerel (*Scomber scombrus* L.) studied were caught on April 3, 1984 off Cape Hatteras, NW Atlantic coasts of the United States (the capture site coordinates: 35°54'N; 75°20'W). The individuals caught were frozen and delivered to the laboratory. Parasitologic examinations were made on 35 individuals ranging within 27–48 cm in length and 100–710 g in weight.

After thawing the fish, mounts were made of the gall bladder content suspension and the urinary bladder scrape-off. The mounts were examined under immersion. The protozoans found were measured and drawn from unpreserved samples. A total of 25 spores from 3 fish individuals were measured.

## RESULTS

*Ceratomyxa americana* n.sp. (Fig. 1)

Host: mackerel (*Scomber scombrus* L.)

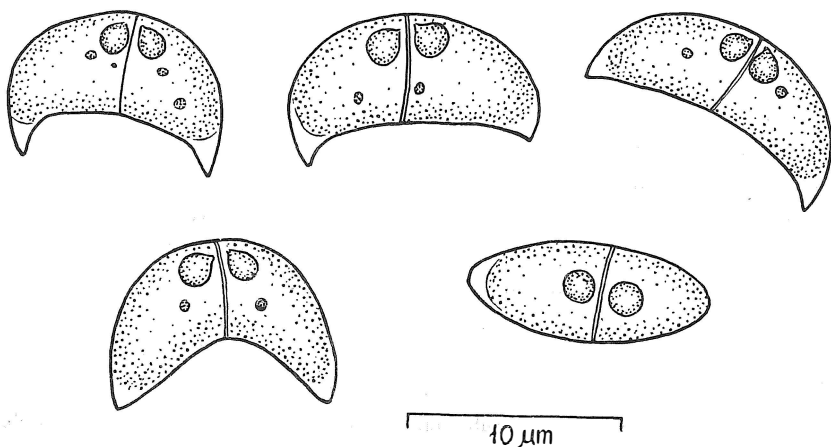


Fig. 1. *Ceratomyxa americana* n.sp. spores

Location in host: gall bladder

Site: NW Atlantic (Cape Hatteras fishing grounds)

Extent of invasion: the species was found in 14 fish individuals; invasion incidence 40%.

Invasion intensity varied markedly: most often single spores were found in mounts, numerous or very numerous protozoans occurring much less commonly.

When viewed from the suture, the spores are slightly curved, symmetrical. Polar capsules are placed next to the anterior, archlike curved margin; the posterior margin is almost straight. Spore endings are pointed and directed downward. A rather well-visible straight line of the suture runs through the middle of the spore. The walls are thin and delicate. The almost spherical polar capsules are located close to each other in the anterior part of the spore next to the suture line; their endings are short and pointed.

The spore is almost completely, except for its narrowed endings, filled with sporoplasm. The sporoplasm in unstained mounts shows single small, strongly light-refractory, bodies; they are presumably nuclei.

Spore dimensions (as measured on individuals from thawed fish) are given below following the system of Šulman (1966): length  $4.4\text{--}5.2\text{ }\mu\text{m}$  ( $4.82 \pm 0.22\text{ }\mu\text{m}$ )\*; inter-apical distance  $8.8\text{--}11.2\text{ }\mu\text{m}$  ( $9.83 \pm 0.63\text{ }\mu\text{m}$ ); height  $6.2\text{--}8.0\text{ }\mu\text{m}$  ( $7.27 \pm 0.47\text{ }\mu\text{m}$ ); width  $5.0\text{--}5.6\text{ }\mu\text{m}$  ( $5.29 \pm 0.24\text{ }\mu\text{m}$ ); polar capsule width  $1.6\text{--}1.8\text{ }\mu\text{m}$  ( $1.63 \pm 0.07\text{ }\mu\text{m}$ ).

Vegetative stages were difficult to identify since the examinations were made on frozen materials.

## DISCUSSION

Well-marked differences exist between *Ceratomyxa americana* n.sp. spores and other sporozoans found in *Scomber scombrus* L. described in the literature. The newly-described species resembles *C.parva* (Thélohan, 1895) in shape; however, the latter has slightly rounded ends (Kudo 1919, Pogorelceva 1964), clearly sharpened endings being seen in *C.americana*. *C.parva* is somewhat smaller ( $3\text{--}4\text{ }\mu\text{m}$  in length) than *C.americana* ( $4.4\text{--}5.2\text{ }\mu\text{m}$  in length). The main difference is in the shape of polar capsules. Drawings in Kudo (1919) and Pogorelceva (1964) show the *C.parva* capsules to be clearly elongated, tearshaped, while *C.americana* has almost spherical capsules.

The shape of spores and polar capsules in the other species, *Leptotheca scombri* Pogorelceva, 1964 is almost identical as in *C.parva*, spore dimensions differing, though. Consequently, the species should be thoroughly revised, as pointed out by Šulman (1966).

The newly-found sporozoans *C.americana* n.sp. differ from *Leptotheca renicola* Thélohan, 1895 living in the mackerel renal canaliculi. The latter species' spores are

\* arithmetic mean  $\pm$  standard deviation

similar in shape to *Sphaerospora*; moreover, the spores are 8  $\mu\text{m}$  long, i.e., longer than *C.americana*.

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#### STRESZCZENIE

Podano opis i wymiary spor nowego gatunku pierwotniaków *Ceratomyxa americana* sp.n. (Fig. 1), które znaleziono w woreczku żółciowym makreli, *Scomber scombrus* L. Ryby pochodziły z północno-zachodniego Atlantyku z łowiska przylądka Hatteras, odłowiono je 3 kwietnia 1984 roku. Pasożyty stwierdzono u 14 makreli na 35 zbadanych (40%). Stopień zarażenia był bardzo różny, najczęściej notowano pojedyncze spory, znacznie rzadziej obserwowano licznie lub bardzo licznie występujące pierwotniaki.

W pracy zwrócono także uwagę na konieczność przeprowadzenia wnikliwej analizy gatunku *Leptotheca scombri* Pogorelceva, 1964, który był opisany z woreczka żółciowego makreli z Morza Czarnego.

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