Rev. Bras. Parasitol. Vet., Jaboticabal, v. 20, n. 4, p. 331-333, out.-dez. 2011
ISSN 0103-846X (impresso) / ISSN 1984-2961 (eletrônico)

First record of *Neobenedenia melleni* (Monogenea: Capsalidae) in sea-farmed cobia (*Rachycentron canadum*) in Brazil

Primeiro registro de *Neobenedenia melleni* (Monogenea: Capsalidae) em cultivo de bijupirás (*Rachycentron canadum*) no Brasil

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Received February 7, 2011
Accepted April 5, 2011

Abstract

Neobenedenia melleni (MacCallum, 1927) (Monogenea) is a widespread pathogen in marine teleost cultures all over the world. The present paper reports this parasite species in farmed cobia (*Rachycentron canadum*) in Brazil, for the first time. Some comments on preventive actions for avoiding the disease are made.

Keywords: Mariculture, pathogens, ectoparasites.

Resumo

Neobenedenia melleni (MacCallum, 1927) (Monogenea) é um patógeno amplamente distribuído em cultivo de teleósteos marinhos no mundo. Este estudo relata pela primeira vez essa espécie de parasito em cultivo de cobia, *Rachycentron canadum*, no Brasil. Comentários sobre prevenção para evitar a doença são discutidos.

Palavras-chave: Maricultura, patógenos, ectoparasitos.

Research relating to sea-farmed cobia (*Rachycentron canadum* Linnaeus, 1766) has been increasing recently. The great growth potential of cobia, their easy adaptability and ability to breed in captivity, excellent meat quality and carcass utilization, among other attributes, have induced rapid growth of cobia farming all over the world (CHANG et al., 2007). However, one of the main limitations affecting cobia culture is the diseases caused by helminth ectoparasites (monogeneans) (LIAO et al., 2004), especially *Neobenedenia* species (OGAWA et al., 2006).

Infestations by ectoparasites in farmed fish have been recorded since the late 1950s (OGAWA et al., 1995). Deveney et al. (2001) described an outbreak of *Neobenedenia elleni* (MacCallum, 1927) parasitizing *Lates calcarifer* in Australian waters that resulted in the loss of 200,000 fish due to secondary infection. This parasite has been found in many species of ornamental marine fish and sea farming in different countries, thus demonstrating its low specificity to the hosts (BULLARD et al., 2003). In Brazil, Sanches and Vianna (2007) described occurrences of *N. melleni* in dusky grouper (*Epinephelus marginatus*), with associated high mortality, under farmed conditions in Ubatuba, state of São Paulo. Luque and Cezar (2004) identified monogenean species in wild pampos (*Trachinotus goodei*) off the coast of Rio de Janeiro and, recently, Carvalho and Luque (2009) recorded parasitism of *N. melleni* in a wild host (*Trichiurus lepturus*) off the coast of Rio de Janeiro.

Capsalid monogeneans have a monoxenic, short life cycle, which allows epizootic outbreaks especially in hosts subjected to high stocking densities (THONEY; HARGIS JUNIOR, 1991). It has been demonstrated that water temperature influences the growth, maturity, egg production and infestation levels of *Neobenedenia* species (HIRAZAWA et al., 2010). These parasites feeds on mucus and epithelial cells of the host, which leads to changes in fish behavior: they drag their bodies against a substrate, such as net cages, thereby causing injuries culminating in secondary infections. Parasitized fish presents lesions in the cornea and skin, blindness, weakness, loss of appetite, hemorrhage, mucus hypersecretion and death due to secondary infections (OGAWA et al., 1995; HIRAYAMA et al., 2009). Our purpose in this paper was to document the first occurrence of capsalid monogeneans in cobia (*R. canadum*) farmed in Brazil. We have also suggested procedures that can be adopted for disease prevention.

Ten juvenile specimens of *R. canadum*, with mean weight 317 ± 155 g, coming from floating net cages of a marine farm in Ilhabela, São Paulo, Brazil, were sent to our laboratory in March 2010, for diagnostic purposes. The fish were stocked in a

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tank of capacity 2000 L, with water exchange of 300% per day and aeration. The fish showed lack of appetite, delayed growth, skin hemorrhage and corneal opacity. External inspection revealed live semitransparent flattened helminth parasites, in the head and over the eyes of the fish (Figure 1). Some parasites were collected and subsequently fixed in formalin saline and processed for identification (EIRAS et al., 2006). Skin lesions caused by abrasion, especially in the head and pectoral fins, were observed. Some animals had eroded fins and extensive destruction of branchial tissue: the high effort that would have been required for breathing and the bleeding suggested that secondary infections were present. All the fish had corneal opacity and three of them showed ulcers in this region. Decreased visual acuity was evident. The water temperature in the fish farm prior to the analysis was 26.1 °C. Moreover, the owners had not been regularly cleaning the net cages, which would have favored accumulation of biofouling. The net cages were composed of floating structures made of high density polyethylene (HDPE), with a diameter of 6 m, which supported a multifilament nylon net of mesh size 5 mm, with a depth of 3 m. The fish density in the net cage was 1.0 $kg.m^{-3}$. For parasite removal, the treatment recommended by Sanches (2008) was followed: immersion of the fish in freshwater for 5 minutes, given that 4 minutes would be sufficient for parasite detachment. However, in the fish farm, the immersion ended up being seven to 10 minutes, because of the higher operational difficulty in treating large numbers of fish.

After the fish had been immersed in freshwater in a dark container in the laboratory, 31 parasites per fish were collected from the bottom of the container. According to morphological characteristics (WHITTINGTON; HORTON, 1996), the parasites were identified as the monogenean *N. melleni*. This is the first report of *N. melleni* in cobia in Brazil. The specimens were similar to those described by Sanches and Vianna (2007) in groupers (*E. marginatus*) in Ubatuba, state of São Paulo, and more recently by Carvalho and Luque (2009) in swordfish (*T. lepturus*) from the coast of Rio de Janeiro. Specimens of *N. melleni* were deposited in the Helminthological Collection of Instituto de Biociências de Botucatu, Universidade Estadual Paulista (CHIBB No. 050L, 051L). The presence of this parasite species in different marine fish species (both wild and cultivated) indicates the importance of this problem for marine fish farming in Brazil.

The cobia specimens studied were not subjected to high stocking density, one of the factors cited as a determinant of disease outbreaks (THONEY; HARGIS JUNIOR, 1991). However, the nets were extensively covered with biofouling, and this together with the small mesh diameter of the net (5 mm) would have resulted in reduced water circulation inside the cages. Biofouling obstructs meshes, thereby causing low water quality inside net cages and enhancing parasite dissemination. The water temperature observed in this marine fish farm probably favored both the development of biofouling and the reproduction and development of monogeneans (HIRAZAWA et al., 2010).

Despite severe parasitism, only one fish died due to extreme debilitation, while one other fish was found in the necropsy to have become severely weakened. In the laboratory, after immersion in freshwater, no parasite could be found in the fish. The fish were then subjected to a new testimony bath three days later, and a search for new parasites resulted negative, thus demonstrating that freshwater is an extremely efficient and safe method for combating parasite infestation (SANCHES et al., 2007; SANCHES, 2008). Among farmed fish that were also subjected to freshwater baths, it was observed that they returned to their usual level of food intake in approximately four days. Thirty days after treatment, no sequelae were observed except for a delay in growth.

Figure 1. Cephalic region of a necropsied specimen of *Rachycentron canadum* showing a great number of parasites around the ocular globe (arrows), cutaneous hemorrhage and keratitis.

Acknowledgements

To Giorgio de Angeli for allowing access to the area used for mariculture development by Kerber Laboratory. José L. Luque was supported by a research fellowship from Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq).

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