



SHORT COMMUNICATION

Histopathology of the gill of *Lutjanus russelli* infected with *Learnanthropus* species (Copepoda: Anthosomatidae)

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Abstract

Histopathologic changes caused by copepods in the gills of *Lutjanus russelli* were studied. For histological sections, samples were stained by haematoxylin, eosin and mounted permanently in Canada balsam. Microphotographs of selected portions were prepared in support of the damage caused by the parasites. The histopathologic changes caused by the *Learnanthropus* species (Copepoda: Anthosomatidae) include several destruction and necrotic changes in gill filaments and secondary lamellae were recorded and the results were analysed.

Keywords: canada balsam, copepods, eosin, haematoxylin, histopathology

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Introduction

Fish diseases due to copepods are one of the important problem in fish culture and fish farming. Fishes of Visakhapatnam Coast are most commonly infested by copepod parasites. The presence of copepod parasites up to a large extent detrimental for a fish population consequently, imposes big losses of fisheries and the fishing industry. Most popular and edible marine fishes, *Lutjanus russelli* Bleeker (1849) were examined from Dec' 2010 to Nov' 2012. *Lutjanus* are commonly known as, Snappers and belongs to the family, Lutjanidae. These are rocky fish and abundantly occur throughout the Indian coast. These fishes are commercially known for their delicacy as food fish and have good quality of proteins and other nutrients. They harbour a wide variety of copepod parasitic fauna. The gill of the most fishes infested by copepod parasite, *Learnanthropus* species.

Learnanthropus is the most common genus of parasitic copepods. All species are parasitic on the gills of

marine teleosts, most of them inhabiting warmer waters. Some species of *Learnanthropus* are strictly specific, but many are parasitic on several species of fish belonging to one genus, or on several genera of one family (Kabata, 1979). There are several studies on the infestations of *Learnanthropus* (Luque and Farfan, 1990; Deets and Kabata, 1991; Timi and Etchegoin, 1996; Olivier et al., 1997; Tokşen, 1999). Ju-shey and Il-Hoi (2004) in the different regions of the world.

Material and Methods

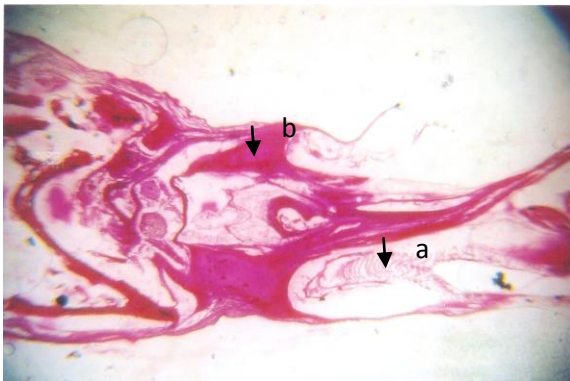
Specimens of the *L.russelli* were collected from the Visakhapatnam coast for pathological observations. After the dissection of the fish, the whole gill was removed from fish and examined for copepod parasites. Pieces of gill tissue with attached parasites were fixed in susa, dehydrated with alcohol and embedded in paraffin. Afterwards, these blocks were serially sectioned at about 5 µm and stained with haematoxylin-eosin. The stained

sections were observed under light microscope and micro photographs were taken for pathological observations.

Results

In the present study, gill is parasitized by *Lernanthropus* species. The parasite occupies all over the gill and damage the tissue. Gills of the *L.russelli* show the histopathological alterations in the gills. They included proliferation in the epithelium of gill filaments and secondary lamellae, resulting in fusion of secondary lamellae, severe degenerative and necrotic changes in gill filaments and secondary lamellae, curling of secondary lamellae and mucous cells proliferation. Edematous changes, characterized by epithelial detachment, were observed in gill filaments and secondary lamellae. Moreover, aggregations of inflammatory cells were noticed in gill filaments. Marked proliferation of mucous cells, curling of secondary lamellae, and haemorrhage between gill filaments, dilation and congestion in blood vessels of gill filaments were observed telangiectasis in secondary lamellae was observed. Atrophy of secondary lamellae was seen.

Fig. 1. Histopathology of gill section showing *Lernanthropus* parasite. a. Gill raches b. *Lernanthropus* species



Discussion

Lernanthropus is known to cause some pathological effects such as, necrosis in epithelial tissue and ligament,

increase of mucus secretion, narrowing in capillary veins meanwhile *Lernanthropus* attaches to the gill filaments with third legs. *Lernanthropus kroyeri* has been recorded (Van Beneden, 1851) from many localities along the coast of Europe, from the Adriatic Sea to the Southern North Sea. Two *Lernanthropus* species have been reported along the coast of Turkey; *Lernanthropus mugilis* on *Liza aurata* and *Lernanthropus kroyeri* on *Dicentrarchus labrax* (Altunel, 1983; Tokşen, 1999). Ju-shey and Il-Hoi (2004) studied *Lernanthropid* copepods parasitic on fishes of the Gulf of Thailand. *Lernanthropus* are largely parasites of warm-water fishes, 44 species are known from India (Pillai, 1985). Ho and Kim (2004) reported parasitic copepods on fishes of the Gulf of Thailand, *Lernanthropus corniger*, *L. latis* and *L. nemipteri*. *Lernanthropus* can often cause pathological effects like desquamation, erosion, and necrosis of the host's gill filaments (Manera and Dezfuli, 2003) and in cases of heavy infection, may lead to asphyxiation, anemia, and secondary bacterial infections (Tokşen et al., 2006). Liu et al. (2009a, b) reported 12 species of *Lernanthropus* from Taiwan. In the present study, *Lernanthropus* occupies entire gill raches and destruct the lamellae.

Histopathological observations as a whole, affect the health background of the host fish resulting in the depletion of muscle quality, growth, susceptibility for other diseases etc. Though one cannot suggest remedial programs for a marine fish health, it is only interesting and important observation to record which suggests that there may be depletion of muscle quality in infected fish if not mortality. The damage in intestinal wall results in poor absorption, at the same time the parasite is also competing with the host for the digested nutrients there by affecting the health status of the host.

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