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Bothriocephalus gowkongensis in the *Neogobius fluviatilis* Fish of Alborz Dam from Iran

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Abstract: Gobies the largest marine fish family and present relatively varied ways of life, but in the atolls the majority of the species live on the bottoms. *Neogobius fluviatilis* is a species of fish in the Gobiidae family. The head crown, nape, back, gill covers (on one third), bases of pectoral fins, posterior half of the throat and belly are covered with cycloid scales. *Bothriocephalidae* is a cestode which parasities freshwater fish, Adult worms are hermaphroditic, each proglottid has a complete set of both male and female reproductive organs and produces eggs through self-fertilization. In the present study, detection of *Bothriocephalus gowkongensis* in a *Neogobius fluviatilis* in Iran was described. Which was first report of *Bothriocephalus gowkongensis* infected *Neogobius fluviatilis* in Iran.

Key words: *Bothriocephalus gowkongensis* · *Neogobius fluviatilis* · Fish · Iran

INTRODUCTION

Gobies, the largest marine fish family and present relatively varied ways of life, but in the atolls the majority of the species live on the bottoms. Originally it was found especially in the countries near the Black Sea.The natural area of this species are Benthopelagic, fresh and brackish waters of basins of Black Sea and Sea of Marmara. The smallest fishes in the world belong to this family Compared with other fish; the activity level of this family tends to be normal [1].

Neogobius fluviatilis is a species of fish in the Gobiidae family, It is now found in Bulgaria, Hungary, Moldova, Romania, Russia, Serbia, Montenegro, Turkey, Turkmenistan, Asia and Ukraine. The head crown, nape, back, gill covers (on one third), bases of pectoral fins, posterior half of the throat and belly are covered with cycloid scales [2, 3]. Body color is brown-gray or yellowish-gray, usually with very pale brown pattern of dark merged spots. Dorsalsoft rays: 14 - 18, Analspines: 1, Analsoft rays 12 - 17. Spawns for the first time at 2 years, spawning season in April to July, locally until September, when temperature is above 13°C, females may repeat spawning during a season. Males with body completely black with yellow fin margins during the spawning season, these excavate nests under any kind of hard substrate and guard eggs until hatching, with adhesive eggs deposited on stones, shells and aquatic plants. Feeds on a variety of invertebrates, especially mollusks, Amphipoda, fish larvae, Balanidae and shrimps *Palaemonelegans* play the important role in its diet all the year [4, 5].

Bothriocephalidae is a cestode which parasities freshwater fish, Adult worms are hermaphroditic, each proglottid has a complete set of both male and female reproductive organs and produces eggs through self-fertilization. The eggs are shed into the water with the host's fecal material, where they hatch into free-swimming hexacanth (six-hooked) larvae. The free-swimming larvae, called coracidia, are consumed by cyclopoid copepods (tiny crustaceans) [6]. They then burrow into the copepod's haemocoel (body cavity), where they develop into a second larval stage called a procercoid. This process also depends upon water temperature; larvae become able to infect their final host in 11-18 days at 29-31°C and in 49 days at 20°C. While fish are normally infected by consuming infected copepods, there is some evidence that adult worms can be transmitted directly to

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piscivorous fish that prey on infected fish [7]. Once within the host fish's intestine, the larvae mature into adult worms over the course of 21-23 days at 28-29°C. Common carp (*Cyprinus carpio*) and grass carp (*Ctenopharyngodon idella*) are the principle native hosts for the Asian tapeworm, but it has an extremely low degree of host specificity and has been found in fish species from 12 families and 6 orders worldwide [8]. *Bothriocephalus gowkongensis* of great economic importance owing to the high mortality of the host caused by the infection and consequently heavy losses to the freshwater fishery industry, competing with intestinal parasites for nutrients may lead to reduced body condition, anemia, reduced growth and temperature-dependent mortality, especially in juvenile fish [9, 10]. In the present study, detection of *Bothriocephalus gowkongensis* in a *Neogobius fluviatilis* in Iran was described. Which was first report of *Bothriocephalus gowkongensis* infected *Neogobius fluviatilis* in Iran.

Case Report: In November 2010 in Alborz Dam, Babol city (Latitude 36n14 and longitude 52e48, North of Iran), Mazandaran province after fishing of *Neogobius fluviatilis*, they were transferred to Department of Veterinary Parasitology of Islamic Azad University, Babol-Branch and after dissection in digestion system were found. The specimens were fixed and preserved in a solution composed of 70 % ethanol and formalin 10% then studied in wet and temporary mounts. For definitive identification we sent samples to veterinary Parasitology museum in University of Tehran. Worm recovery, fixing the staining by carmine acid procedures. Identification was done according to Yamaguti [11], conformation and definitive identification of samples was carried out by researcher of the Veterinary Parasitology Museum, Tehran University, Faculty of Veterinary Medicine.

Description of Parasite: The size of adult *Bothriocephalus gowkongensis (syn: Bothriocephalus acheilognathi)* around 2.5 ± 0.5 cm and size of the heart-shaped scolex was 0.9 mm with two lateral, deep botheria as described for other species. The bottom of bothria showed a special arrangement of microtriches and the neck was absent. Proglottids begin directly behind the scolex. The proglottids are relatively elongate and much narrower than the scolex. Each proglottid has a complete set of both male and female reproductive organs and produces eggs through self-fertilization. Immature segment mean (length is 0.57 mm and width is 0.16 mm), mature segment mean (length is 0.59 mm and width is 0.23 mm) and Gravid segment mean (length is 0.61 mm and width is 0.39 mm).

Fig. 1: Scolex *Bothriocephalus gowkongensis* detected in *Neogobius fluviatilis*

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