A survey on helminth infections among Grass carp in the Mountainous region, of Pakistan

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I. LETTER

Fish is the cheapest source of high-quality proteins and its demand increasing day by day due to the explosion of population in the world. The production of fish is directly affected due to helminth parasites and indirectly affected the health of humans (Ahmad et al., 2021). Therefore, the present study was investigating the helminth parasites among grass carp in freshwater reservoirs of Lower Dir. A total of 100 fish samples were collected through a sample net and by hand. The collection was done from four freshwater reservoirs in the summer and autumn seasons of 2022 and the process was performed in four shifts. The fish specimens were dissected longitudinally through a scalper blade and scissors. The intestine was removed and incised in Petri dishes. Different species of helminth parasites were recovered and preserved in a separate closed vial containing 70% ethanol. For further identification of parasites, the Cestodes (tapeworm) were stained with borax carmine and the nematodes were directly observed in an electric microscope. Out of 100 fish samples, 60% (n=60) were found to be infected with helminth parasites. The species-wise prevalence of helminth parasites showed 45% Cestode (i.e Bothriocephalus sp.) and 15% Nematode (i.e Rhabdochona sp.). The highest intensity was recorded for Bothriocephalus sp. (3.0). The gender-wise prevalence of helminth parasites showed higher in female fish as compared to males. The standard length and weight-wise prevalence of helminth parasites were recorded higher in fishes with maximum length and high body weight compared to small size and low body weight fish. The season-wise prevalence of helminthic worms was recorded higher in the summer season.

Asian countries are progressively developing in aquaculture, contributing more than 90% of the global production and they are now becoming very effective producers of aquatic foods (Gajardo and Laikre 2003). Aquaculture is highly beneficial, but some problems are challenges affect this profitable technique which is considered a serious loss of aquatic biodiversity (Reading et al., 2011). Fish provide a cheap source of proteins as compared to other animals and has considered profitable animals which have a good taste of white meat all over the world (Khalid et al., 2021). The most diverse and abundant one of freshwater fish is Cypriniformes which has accommodated more than 278 species and one of the most important herbivores fish species is grass carp (Ctenopharyngodon idella Valenciennes, 1844) which was introduced from the Amur river (Russia) to central Europe, America and Asia (Cicek et al., 2020). This fish was successfully reared in a polyculture system and mostly used as a biological control due to its herbivorous nature. The habitat of grass carp is still or slow-moving water with lots of plankton. The adult grass fish consume only aquatic plants and the juvenile fish feed on phytoplankton and zooplankton (Stevanovski et al., 2015). Some major issues (factors) which badly affect the freshwater grass carp such as degradation of habitat, the introduction of new species, transferring from one region to another, insufficient water quality, and pollution which often result in weak immunity of fish and more chances to parasites and diseases (Biu et al., 2014). Grass carp are easily susceptible to various parasitic organisms and are very common throughout the world and also have particular importance in the tropics (Soliman and Nasr 2015).

Intestinal helminth parasites are the important pathogenic agents among various parasitic diseases in non-indigenous grass carp and snow trout which highly affect them in different ways and reported the Nematode Rhabdochona sp. (Khan et al., 2022). Therefore, the present study investigated the helminthic worm in profitable grass carp. The Cestode (Bothriocephalus sp.) and Nematode (Rhabdochona sp.) were present in the intestinal tract of grass carp in freshwater reservoirs of Lower Dir.

This study concluded that the Cestode parasite was more prevalent than Nematode, while trematodes and acanthocephalan components were absent among grass carp in freshwater reservoirs of Lower Dir, Pakistan. The management of reservoirs should be focused on the disease control strategy. Furthermore, treatment should be evaluated in the control of helminthic infection in grass carp especially.

Fig. 1. Showing the visceral organs after dissection of a fish specimen for helminth parasites

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