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Therapeutic Effects of Metronidazole Benzoate in Combination with Melatonin in Diplomonad Parasite Infection on Anabas testudineus

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ABSTRACT

The diplomonad fish parasite of the Hexamitadae family frequently infects the fish *Anabas testudineus* during the warm season, leading to economic loss in the fish farming industry. Parasitic infection causes the generation of a large number of free radicals that promote oxidative stress in the fish body. This oxidative stress may cause direct tissue damage and affects the natural health condition of the fish population. Metronidazole benzoate (MB) is a widely accepted anti-protozoan drug, used to treat the protozoan infection in fish farming. The neurohormone melatonin is a potent free radical scavenger that is well known for its antioxidant, anti-inflammatory, and wound healing properties which can decrease the free-radical damage in liver tissue and reduce oxidative stress in fish body. The use of melatonin alone or in combination with other drugs to treat parasitic infection in fish has not been reported previously. Our current study shows a strong therapeutic potentiality of MB in combination with melatonin to treat the parasitic infection. The combination therapy caused a significant reduction of the lesion marks and the formation of new skin over the scar area. Complete recovery of liver histopathology was observed in the treated groups. The combination therapy also significantly improved blood cell counts to maintain body homeostasis recovery after infection. MB in combination with melatonin treatment gradually decreased the level of oxidative stress biomarker in parasite-infected fish. The level of antioxidative enzymes likes, CAT, SOD, and GPx was also significantly increased after treatment, which promotes the health recovery of infected fish. Thus, our study demonstrates that combination therapy of MB and melatonin effectively controls parasitic infection in *Anabas testudineus* which can be used to enhance the productivity in the fish farming industry.

KEY WORDS: AQUACULTURE, HEXAMITADAE, MELATONIN, METRONIDAZOLE BENZOATE (MB), OXIDATIVE STRESS.

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INTRODUCTION

The spread of infectious diseases in intensive fish farming is of major concern because it causes huge loss annually for the fish culture industry. Protozoan parasites are among the most common cause of fish disease in the culture system than any other fish parasites (Lom and Dyková, 1992; Abowei, Briyai, and Bassey, 2011). The diplomonad flagellate protozoa of the Hexamitadae family are generally intestinal parasites of fish and have

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