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Title: Physiological and Biochemical Responses of Nile Tilapia (*Oreochromis niloticus*) Exposed to Aqueous Extracts of Neem (*Azadirachta indica*)

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Abstract: In this study, the physiological and biochemical response of Nile tilapia (*Oreochromis niloticus*) after 96 and 24 h exposure to aqueous extracts of neem (*Azadirachta indica*) in extract concentrations ranging from 0 to 32,000 mg/l was evaluated. After 96 h and 24 h exposure, the LC₅₀ of neem extract was estimated at 3,200 and 6,800 mg/l, respectively. Plasma cortisol increased beyond pre-treatment levels at neem extract concentrations above 2,000 mg/l over 96 h and above 4,000 mg/l over 24 h. Blood glucose increased at neem extract concentrations above 1,000 and 5,000 mg/l at 24 and 96 h, respectively. Neem extract concentration had little effect on serum sodium and plasma chloride. Hematocrit was higher than the control at neem concentrations above 1,000 mg/l in the 96 h exposure and above 2,000 mg/l in the 24 h exposure. Plasma ammonia increased significantly at neem extract concentrations above 2,000 mg/l for both the 96h and 24h tests. Immediately after beginning treatment, cortisol levels increased significantly at neem extract concentrations above 2,000 mg/l in the 96 h test and 4,000 mg/l in the 24 h toxicity test. Exposure to neem extract interfered with the antioxidant defense system of the fish by reducing liver catalase activity. Even though extracts of neem are less toxic at low concentrations, concentrations exceeding 3,200 mg/l influence physiological and biochemical disturbances in fish.

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