

Antibacterial Activity of Aqueous Neem Leaf (*Azadirachta indica* A. Juss) Extract on a Pathogenic *Aeromonas* sp. and Immunostimulating Property of the Extract on Koi Carp, *Cyprinus carpio* Linnaeus

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Use of plant extracts that have antibacterial and immunostimulating properties to control common bacterial diseases in aquaculture is environmentally friendly. Present study was carried out to investigate antibacterial activity and immunostimulating property of aqueous neem leaf extract. Using diffusion plate technique, antibiotic sensitivity test (ABST) was carried out with different concentrations (0.1 gL⁻¹ to 5 gL⁻¹) of aqueous neem leaf extracts on a previously isolated pathogenic species of *Aeromonas* to investigate antibacterial activity. Four groups of healthy juvenile koi carps (5.90 ± 0.5 g body weight) were chosen with four replicates for each group to study the immunostimulating property; first two groups were exposed separately to two selected concentrations of aqueous neem leaf extract, viz. 1/4 (0.23 gL⁻¹) and 2/5 (0.37 gL⁻¹) of 96 hour LC₅₀, for two weeks and then were challenged with 0.1 ml of a bacterial suspension (1×10⁶ CFUml⁻¹) made of the pathogenic *Aeromonas*. From the two groups that were not exposed to neem leaf extract, one was challenged with the bacterial suspension (positive control) and the other was not challenged (negative control). Mortality was recorded for two weeks and histology/histopathology was performed with the survived fish. In ABST, neem leaf extract showed antibacterial activity on the pathogenic *Aeromonas* at concentrations above 1 gL⁻¹. Mean percentage cumulative mortality recorded for fish exposed to 0.23 gL⁻¹ leaf extract and then challenged with *Aeromonas* was significantly lower (19.87%± 7.66) than that was recorded for the positive control (68.77% ± 10.60; P < 0.05); the former was not significantly different from that of the negative control. Histology of gills of fish exposed to 0.23 gL⁻¹ of neem leaf extract was similar to that of the fish in negative control indicating an immunostimulating property. Therefore the neem leaf extract at low concentrations can be used as an alternative to broad spectrum antibiotics to control *Aeromonas* infections in koi carp.