

TOXICITY OF NEEM EXTRACT FOR POST-LARVAE TILAPIA

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The intensification of fish farming in Brazil has led to the emergence of disease in the cultivation system. The study of these diseases is essential due to the high mortality rates they can cause. The treatment of fish diseases is generally implemented using synthetic chemicals. However, a global concern in reducing the use of chemical agents in the environment is being noted, in order to minimize the environmental impacts they cause. For this same end, antimicrobial substances resistance problems have already been reported. Thus, alternative methods, such as the use of vegetable originated substances are demanded. One of the substances studied for the aquatic environment is azadirachtin, which is an active principle of the neem *Azadirachta indica*, with bactericidal and fungicidal properties and used as a herbicide in agriculture. However, in order to make neem useful for this purpose studies establishing insurance criteria are still necessary. In this sense, the present study aimed to evaluate the acute toxicity of extracts on the post-larvae of Nile tilapia *Oreochromis niloticus*. The experiment was conducted in 2009 at *Universidade Federal Rural de Pernambuco*, and the specimens of *O. niloticus* (average weight of 0.43 g) investigated belonged to the fish culture research station this institution. In order to obtain the aqueous extract, neem leaves were dried at 45 °C for 60 hours and macerated therein. Then, a suspension containing 10 g of dry leaves of crushed neem was prepared, for one liter of filtered water. The neem leaves were maintained in suspension for 24 hours, and then filtered to be used in the experiments. We used 15 experimental units in total (aquariums of five-liters-volume maintained in a static system with constant aeration). Five treatments (0; 50; 100; 150 and 200 mL of extract for one liter of water, equivalent to 0.0; 0.59; 1.18; 1.77 and 2.36 mg of azadirachtin /L) with three repetitions (10 post-larvae each) were distributed in a randomized fashion. The equivalent concentrations of azadirachtin were determined using methodology proposed by Menezes et al. (2004), with chromatography of high efficiency. The mean value of lethal concentration was calculated using a logistic regression of survival probability in function of the aqueous neem extract concentration. Mortality rates were registered at every 12 hours period during 96 hours of experiment, in which fish were not fed. Larvae exposed to concentrations above 100 mL of aqueous extract/L exhibited sub-lethality behavior in the first 12 hours of exposure, such as swimming problems and prolonged periods next to the surface for ventilation. The estimated mean lethal concentration for post-larvae of Nile tilapia was 1.28 mg azadirachtin/L, which is equivalent to 108.88 mL of aqueous extract (Figure 1). In conclusion, aqueous extracts of neem can be used in for the treatment and prevention of the Nile tilapia diseases, regarding the concentrations of azadirachtin limits for the species.

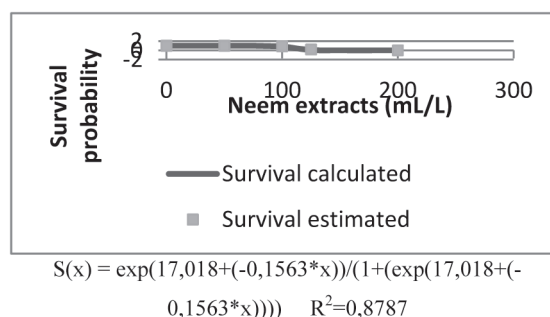


Figure 1- Survival curve of post-larvae of tilapia *Oreochromis niloticus* exposed to aqueous extract of neem *Azadirachta indica*.