

Ichthyotoxic effect of *Ageratum Conyzoides* leaf

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Abstract

This work reports on ichthyotoxic effect of ethanol and aqueous extracts of *Ageratum conyzoides* leaf on *Clarias gariepinus* fingerlings. The investigation was carried out for 96h. The present work shows that the ethanol extract is more toxic to the fishes than the aqueous extract. The fishes showed pathological changes like moribund behavior, de-pigmentation and erratic swimming before death. The LC₅₀ for the ethanol and aqueous extracts were observed at 5.3 and 8mgdm⁻³ respectively. No pathological changes were observed in the control. *Ageratum conyzoides* leaf is therefore unsuitable for in cooperation into fish feed.

Keywords: *Ageratum conyzoides*, *Clarias gariepinus*, ichthyotoxic effect, survival rate

1. Introduction

Many plants are known to be toxic to fishes [1-3]. Some of these ichthyotoxic plants are used to harvest fishes [2]. *Ageratum conyzoides* is an annual weed that grows all over the tropics. It flourishes in the tropical and subtropical regions of the world. It is known for its wound healing properties [4-8]. The crude extract was shown to be superior to vaseline gauze in wound healing [9, 10]. It has antimicrobial and anticonvulsant activity [7, 11, 12]. It is now known to have broad spectrum insecticidal activity [7, 12].

Clarias gariepinus is widely and naturally distributed in all parts of Africa. Ecologically, it requires calm waters like lakes, ponds, and pools but may occur in fast flowing streams and rivers. It is an air-breather capable of tolerating a wide fluctuations of dissolved oxygen and other extreme environmental conditions because of possession of accessory breathing organs which enables it to breath in air when exposed to adverse environmental conditions like lack of dissolved oxygen. It is one of the most important aquaculture candidates because of its ability to tolerate a wide range of environmental conditions, high stocking densities under culture conditions, high growth rate, high fecundity air breathing characteristics and high market value [13]. The present work is therefore focused on ichthyotoxic activity of *Ageratum conyzoides* against the African catfish, *Clarias gariepinus*.

2. Materials and Methods

Fresh leaves of *Ageratum conyzoides* were collected around the Chemistry Department, University of Calabar, Nigeria. The leaves were rinsed with distilled water, air-dried for three days and powdered. The powdered dry leaf (200g) was soaked in absolute ethanol (400cm³) for about 24h and filtered. The filtrate was distilled down to give a dark paste as the ethanol extract. Another 200g of the powdered leaf was extracted in a similar way with water to get the aqueous extract. Both extracts were stored in a refrigerator prior to use. The fingerlings of *Clarias gariepinus* were obtained from a commercial fish farm in Calabar. They were placed in an aquarium in the laboratory for one week to stabilize to the aquarium/laboratory environment. Each of the ethanol and water extracts (0.4g) was separately dissolved in 200cm³ of water to get a stock solution of 2gdm⁻³. From these solutions of each extract containing 0, 4, 8, 12, 16 and 20mgdm⁻³ were made. The fingerlings were moved to different aquaria containing each of these levels of the extract. The work was done in replicate. The aquaria were observed after 24h. Dead fishes, were applicable were removed. Fresh water with the appropriate levels of the extract was used to replace the earlier one in each aquarium. This was repeated for four days. The effect of the extracts on the fingerlings was observed by noting any changes in the physical appearance and movement of the fingerlings.

3. Results and Discussion

Table 1: Effect of ethanol extract of *Ageratum conyzoides* leaf on the survivability of *Clarias gariepinus* fingerlings

Concentration/Time	0 gdm ⁻³	4 mgdm ⁻³	8 mgdm ⁻³	12 mgdm ⁻³	16 mgdm ⁻³	20 mgdm ⁻³
24h	0.0%	0.0%	0.0%	0.0%	10%	40%
48h	0.0%	0.0%	0.0%	10%	30%	70%
72h	10%	10%	20%	50%	60%	90%
96h	20%	30%	60%	100%	100%	100%

Table 2: Effect of aqueous extract of *Ageratum conyzoides* on the survivability of *Clarias gariepinus* fingerling

Concentration/Time	0 gdm ⁻³	4 mgdm ⁻³	8 mgdm ⁻³	12 mgdm ⁻³	16 mgdm ⁻³	20mgdm ⁻³
24h	0.0%	0.0%	0.0%	0.0%	0.0%	10%
48h	0.0%	0.0%	10%	10%	20%	40%
72h	0.0%	10%	30%	30%	50%	80%
96h	20%	20%	50%	90%	100%	100%

Table 1 shows the survival rate of *Clarias gariepinus* exposed to the ethanol extract while Table 2 shows that of the fish exposed to aqueous extract of *Ageratum conyzoides*.

The observed mortality rate is concentration dependent as it is directly proportional to the level of the extract in the aquarium water. After four days (96h) the LC₅₀ occurred at 5.3mgdm⁻³ in the ethanol extract and at 8mgdm⁻³ in the aqueous extract. This shows that the ethanol extract is more toxic to *Clarias gariepinus* than the aqueous extract. This shows further that the ichthyotoxic constituents of *Ageratum conyzoides* are more soluble in ethanol than in water. The affected fishes started with moribund behavior, erratic swimming raising their head up apparently to get oxygen and depigmentation before their death. The death of the fishes must have occurred as a result of the plant fish poison as well as the effect of the plant material which lowers the level of dissolved oxygen and affects other water parameters. Toxicity of fish poisons is known to be inversely proportional to the concentration of dissolved oxygen in water^[14].

Over fifty natural products have been isolate from *Ageratum conyzoides*. Some of these are believed to be responsible for its toxicity to fishes^[2]. It is therefore conceivable that some of these are responsible for its acute toxicity to *Clarias gariepinus*. *Ageratum conyzoides* is therefore not suitable for use in compounding fish feed.

4. References

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