

RESEARCH ARTICLE

TOXICITY OF MORINDA LUCIDA LEAVES TO CLARIAS GARIEPINUS

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ABSTRACT

The study is on ichthyotoxic activity of *Morinda lucida* leaf on African catfish, *Clarias gariepinus*. The work shows that introduction of *Morinda lucida* leaf extract into the aquarium resulted in death of the fishes. Increase in concentration of the extracts lowered the survival rate of the fishes. The aqueous extract has the LC₅₀ of 8.42 mgdm⁻³ while that of the ethanol extract is 9.51mgdm⁻³ showing that the aqueous extract is more toxic to the African catfish.

KEY WORDS: *Clarias gariepinus*, *Morinda lucida*, Ichthyotoxic effect, Survival rate.

INTRODUCTION

Fish poisoning plants contain such toxic constituents as saponins, coumarins, cyanogen glycosides, alkaloids and 2-cyclopentenones etc (Morah, 1986). Fish poisonous plants are known to cause decrease in dissolved oxygen and physiological changes in the fish which eventually lead to the death of aquatic life (Morah *et al.*, 2015). *Morinda lucida* is a versatile African medicinal plant. So many anthraquinones have been isolated from it and some of these are known dyes. It has strong anti-malarial activity which is attributed to its anthraquinone content (Koumoto *et al.*, 1992, Rath *et al.*, 1995). It has very strong anti-diabetic, activity (Burkill, 1997, Tona *et al.*, 1999), antibacterial activities (Akiyemi *et al.*, 2005, Fakoya *et al.*, 2014) and antioxidant activity (Ogulana *et al.*, 2008). Many ichthyotoxic plants are used to remove fish and other aquatic fauna from water bodies (Morah *et al.*, 2015). There appears to be scanty reports on ichthyotoxic activity of *Morinda lucida* apart from a symposium paper on its effect on tilapia (Fagbenro and Akinduyite, 2011). The present work is therefore focused on the effect of ethanol and aqueous extracts of *Morinda lucida* leaf on the survival rate of *Clarias gariepinus*.

MATERIALS AND METHODS

Clarias gariepinus fingerlings were obtained from a local fish farm in Calabar. *Morinda lucida* leaves were harvested in the month of April from the University of Calabar nursery botanical garden and was authenticated by Frank Apeoye of the herbarium unit of the Botany Department, University of Calabar. The fresh leaves were rinsed with distilled water, dried in air for three days and powdered. The powdered plant material was Soxhlet-extracted with absolute alcohol and the solvent was distilled off over a steam bath to give a dark paste as the ethanol extract. Another batch of powdered plant material was extracted in a similar manner with distilled water

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to give the aqueous extract. The fingerlings were kept in aquarium for one week to acclimatize to the laboratory environment. They were distributed to different aquaria containing 12 fingerlings each. Four aquaria were used for each extract and the experiment was replicated. The four aquaria contained 0.0, 4.0, 8.0 and 12 mgdm⁻³ of *Morinda lucida* leaf extract. Observation was made for 96h for external changes, behavior and mortality of the fishes.

RESULTS AND DISCUSSION

Table 1 shows the effect of *Morinda lucida* extracts on the mortality rate of *Clarias gariepinus*. Both ethanol and aqueous extracts of *Morinda lucida* are toxic to *Clarias gariepinus*. The fishes exposed to the *Morinda lucida* extracts showed erratic swimming motions, loss of reflex, vertical swimming and discoloration before dying. These are indicative of physiological stress which must have lead to the observed mortality (Chan, 1982). The presence of ichthyotoxic plants in water usually results in decrease in dissolved oxygen and also affects some other water parameters (Morah *et al.*, 2015) All these result in the stress that leads to the fish mortality.

Table 1. Effect of *Morinda lucida* extracts on mortality rate of *Clarias gariepinus*

Conc.	0.0 mgdm ⁻³		4 mgdm ⁻³		8 mgdm ⁻³		12 mgdm ⁻³	
	A	E	A	E	A	E	A	E
24h	0.0	0.0	0.0	12.5	8.3	8.3	8.3	12.5
48h	4.2	4.2	16.6	16.6	21.0	16.6	25.0	21.0
72h	8.3	4.2	25.0	21.0	25.0	25.0	42.0	42.0
96h	12.5	8.3	33.3	25.0	47.5	46.0	70.8	56.6

A = aqueous extract; E = ethanol extract.

This abnormal behavior is concentration dependent as it increases with an increase in the concentration of the plant extract in water. The mortality rate increase with time and it is directly proportional to the concentration of the extracts. These abnormal behaviors did not occur in the control. Hence the mortality is attributed to the presence of the plant extract. Mortality of 50% of the fish (ie LC₅₀) occurred at a concentration of 8.42 mgdm⁻³ for the aqueous extract and

9.51mgdm⁻³ for the ethanol extract. This shows that the aqueous extract is more toxic to the fishes than the ethanol extract. It is therefore conceivable that ichthyotoxic constituents of *Morinda lucida* leaf is more soluble in water than in ethanol.

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