

EFFECT OF *SPILANTHES FILICAULIS* LEAF EXTRACT ON THE SURVIVAL RATE OF NILE TILAPIA, *OREOCHROMIS NILOTICUS*

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ABSTRACT

Spilanthes filicaulis is an annual weed and medicinal plant which has insecticidal activity. The present work is focused on its effect on the survival rate of the Nile tilapia, *Oreochromis niloticus*. Introduction of *Spilanthes filicaulis* leaf extract into the aquarium resulted in erratic swimming, loss of reflex, de-colorization and eventually death of the fishes. Mortality rate increased with increase in concentration of the plant extract.

Keywords: *Spilanthes filicaulis*, *Oreochromis niloticus*, Ichthyotoxicity

INTRODUCTION

Ichthyotoxic plants are traditionally used to harvest fish (Morah, 1986) or to remove unwanted aquatic species from water bodies. Extracts of these plants when introduced to the aquatic ecosystem, could lead to physiological stress in aquatic organisms. Environmental factors such as pH, turbidity, alkalinity, dissolved oxygen, temperature and conductivity are altered in the presence of these plant extracts (Morah et al, 2015). Nile tilapia, *Oreochromis niloticus* is the most cultivated fresh water tilapia species and contributes to about 71% of the world tilapia production. It also has tolerance to a wide range of environmental parameters (Yakubu et al, 2014). *Spilanthes filicaulis* (Schum and Thonn) has spicy and pungent flower head which is chewed in Nigeria to relieve toothache and to heal sore gum and abdominal disorders (Etukudo, 2002). The plant has been shown to have antimicrobial activity against drug resistant microbes (Fankeng et al, 2015) and antifungal activity (Donfack et al, 2014, Ilondu et al, 2014). It also has insecticidal and analgesic properties (Eko et al, 2008, Akaochere et al, 2015) The present work is focused on the effect of *Spilanthes filicaulis* on the survival rate of the Nile tilapia, *Oreochromis niloticus*.

MATERIALS AND METHODS

Spilanthes filicaulis leaf was harvested from an abandoned waste land in Calabar South, Cross River State, Nigeria. It was authenticated by Mr. Frank Apeoye

of the herbarium unit of the Botany Department, University of Calabar. The fresh plant material was rinsed with distilled water and dried in the oven at about 50°C, cooled and powdered. The powdered leaf was Soxhlet-extracted for 3h with methanol. The extracted material was distilled down over a steam bath *in vacuo* to give the methanol extract as dark syrup. The methanol extract (4.2g) was dissolved in 15cm³ of dimethylsulphoxide, DMSO, and made up to 500cm³ with distilled water to give a stock solution of 8.4gdm⁻³. This was diluted to give three different solutions containing 0, 28 and 56mgdm⁻³ of the extract. The fish was collected from a commercial fish farm in Calabar. They were left in the laboratory for one week to acclimatize to the laboratory environment. Ten fishes were distributed to each of the three aquaria containing 0, 28 and 56mgdm⁻³ of the extract. Physical changes, movement and behavior of the fishes were observed over a period of 96h.

RESULTS AND DISCUSSION

Table 1. Effect of methanol extract of *Spilanthes filicaulis* leaf on survival rate of *Oreochromis niloticus*

Time/concentration	6h	24h	48h	72h	96h
0.0 mgdm ⁻³	0%	0%	0%	20%	50%
28 mgdm ⁻³	0%	0%	40%	80%	100%
56 mgdm ⁻³	0%	30%	60%	100%	100%

Table 1: shows the effect of *Spilanthes filicaulis* leaf extract on the survival rate of *Oreochromis niloticus*. Before the death there was de-pigmentation of the fishes and also erratic swimming and moribund behavior before cessation of breathing. These pathological changes were not readily observed in the control indicating that the leaf extract was actually toxic to the fishes. The mortality rate increased with an increase in the concentration of the extract showing that it is concentration dependent. The death is partly attributed to the toxic effect of the plant extract. The presence of the plant material in water also lowers the level of dissolved oxygen in the water body and affects other water parameters. Toxicity of fish poisons are known to increase with decrease in the level of dissolved oxygen (Morah *et al*, 2015). This must have also contributed to the potency of the fish poison. Although *Spilanthes filicaulis* does not contain a lot of phytochemicals, it contains much of flavonoids (Ndam *et al*, 2014) which could be considered to be partly responsible for its ichthyotoxic activity.

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