

EFFECT OF ETHANOLIC EXTRACT OF *IPOMEA CARNEA* LEAVES ON GUPPY, *POECILIA RETICULATA* (PETERS)

D. D. Wanule and J. V. Balkhande

Dept. of Zoology & Fishery Science,
N. E. S. Science College, Nanded - 431606
balkhandejay1986@gmail.com

ABSTRACT

Ipomea carnea is a toxic plant causes severe damage to intestine, liver and kidney. In the present investigation ethanolic extract of *I. carnea* leaves was tested for its toxicity against fresh water fish guppy *Poecilia reticulata* using 0.025, 0.050, 0.075 and 0.1 mg/ml concentrations. The experiment was run in triplicate along with suitable control. Ethanolic extract of *Ipomea carnea* leaves showed toxic effect, causes mortality in guppy fishes. All concentrations of ethanolic extracts of *I. carnea* leaves were found toxic. Mortality of fishes increases with increase of time and concentrations. The 0.1mg/ml concentration of ethanolic extract of *I. carnea* leaves showed three times higher mortality than control in guppy fishes, *Poecilia reticulata* Peters. Further study is needed to isolate toxic principles present in *I. carnea* leaves and to be studied separately against guppy fishes to determine their toxicity.

Keywords: *Ipomea carnea*, toxicity, *Poecilia reticulata*, mortality.

INTRODUCTION

Ipomea carnea is a toxic plant found throughout India. It grows to a height of 5 m. the stem is thick and develops into a solid trunk over several years with many branches from base. The leaves are light green, heart shape or somewhat lanceolate and 10 to 25 cm long. It acts as toxic to cattle Rios *et al.*, (2008). According to <http://www.vedicconcept.com> it is reported to have stimulatory allelopathic effects, roots are boiled to use laxative and to provoke menstruation, milky juice of plant has been used for treatment of Leucoderma and other skin related disease. It has depressant effect on central nervous system Rios *et al.*, (2008).

Poecilia reticulata, small benthic pelagic, non migratory fish, occupies wide range of aquatic habitats such as estuaries, lakes, ponds, weedy ditches and canals. Guppy is hardy fish which tolerates even poorly oxygenated water. Guppy is known as biological indicator in eco-toxicological studies Lawal and Samuel (2010).

Present investigation was carried out to study the effect of ethanolic extract of *I. carnea* leaves on guppy fishes.

MATERIALS AND METHODS

Guppy fishes were collected from Science College Nanded (MS) Water tank, and brought to the laboratory. Guppies were then kept in laboratory for 8 days for acclimatization. Leaves of *I. carnea* were collected from Shankar Sagar Reservoir, Vishnupuri project Dist. Nanded (MS). Leaves of *I. carnea* were brought in laboratory and washed thoroughly with distilled water to remove dust and foreign material. After washing leaves were dried in oven at $45\pm 1^{\circ}\text{C}$ for 24 hrs. Dried leaves of *I. carnea* weighed 55 gm. Dried leaves were then used to prepare fine powder using grinder. 55 gm. fine powder of *I. carnea* was dissolved in 250 ml of ethanol (Pure) into 500 ml conical flask. This mixture was kept at room temperature for 24hrs. After 24 hrs. this mixture was filtered through Whatman filter paper No. 1. The residue part of mixture was dried in oven at $45\pm 1^{\circ}\text{C}$ and weighed as 49.5 gm. The filtrate part was evaporated and the solid filtrate weighed 5.5 gm. This solid part of filtrate was then used to study its toxic effect on guppy. 10 guppies were selected irrespective of sex for each set. For experiment a set of beakers of 500 ml capacity were taken and labeled as 0.025, 0.050, 0.075 and 0.1. In each beaker 400 ml of water and 10 guppies were kept.

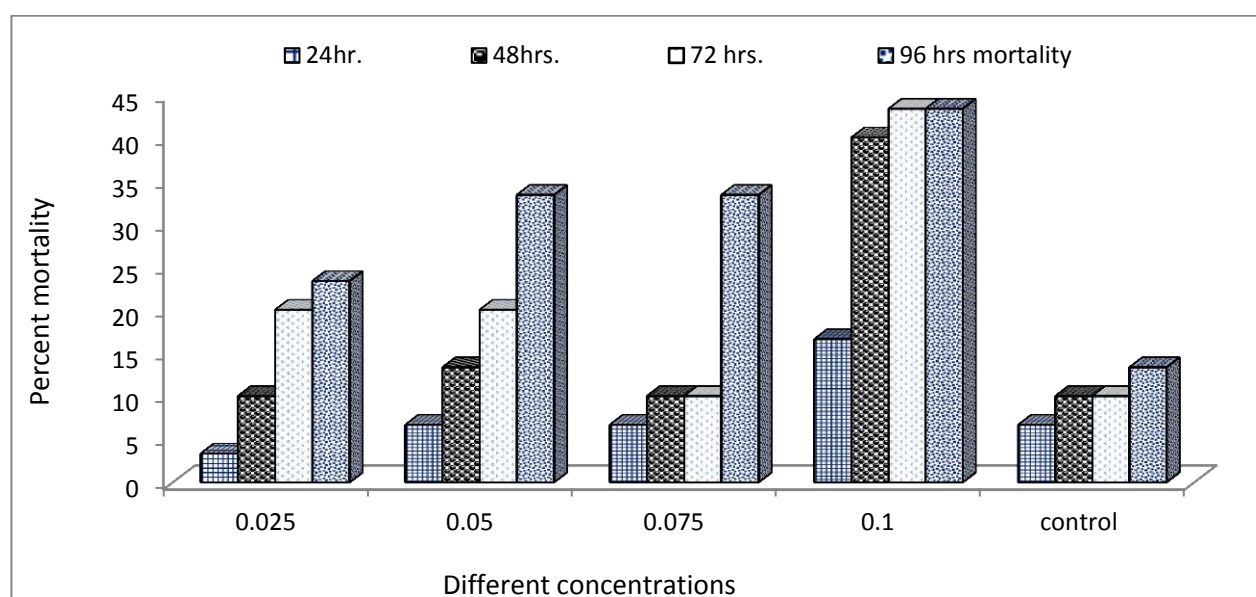
In respective beaker 0.025, 0.050, 0.075 and 0.1 mg/ml of dried solid ethanolic extract of *I. carnea* was added. Simultaneously control was run without adding dried solid ethanolic extract of *I. carnea*. The experiment was conducted in triplicate. All sets were observed for up to 96 hrs. All sets were simultaneously checked for some physicochemical properties like pH, Temp. and Total dissolved solid. Change in behavior pattern such as surfacing, gulping, mucous secretion from skin, omitting, increase in rate of gill opercular movement, loss of body balance and change in body colour were observed. Mortality of guppy if

any was recorded and dead individuals were removed immediately.

RESULTS AND DISCUSSION

The physicochemical condition of the test media during toxicity test were found fairly constant. The pH was found between range 7.6 to 7.9, temperature of test media was found between 31^o C to 34^o C while room temperature range was observed 27^o C to 34^o C. Total dissolved solid (TDS) of test media range between 500 to 600 ppm was recorded over the 96 hrs.

Graph No. 1: Percent mortality of guppy fishes after 96 hours of exposure to ethanolic extract of *Ipomea carnea* leaves *



* Mean of three replicates.

On exposure of guppy fishes to various concentrations of solid ethanolic extract of *I. carnea* leaves it shows change in behavior like surfacing, gulping, mucous secretion from skin, omitting, increase in rate of gill opercular movement, loss of body balance and change in body colour to white. The present investigation showed that Ethanolic extract of leaves of *I. carnea* was found to be toxic for Guppy *Poecilia reticulata* fishes. Percent mortality of guppy fishes at various concentrations for 96 hrs was shown in graph No. 1. Highest mortality of guppy fishes were found at 0.1 % concentration of *Ipomea carnea* leaves which is three times higher than control experiment. During 96 hrs observation in a set of 0.075 %

concentration of *I. carnea* leaves extract 3 newly hatched young once were also found dead. Present investigation showed that percent mortality of guppy fishes were increase with increase of concentration of ethanolic leaf extract of *I. carnea* leaves. Ikeda *et al.*, (2003) reported that *I. carnea* leaves had damage to intestine, liver and kidney which probably contribute Phytochemical investigation demonstrated the presence of Swainsonine, 2-epilentiginosine, calystegines B1, B2, B3 and C1 and N-methyl-trans 4 hydroxy – I – proline in *Ipomea carnea* leaves (Ikeda *et al.*, 2003). Mortality of guppy fishes may be due to presence of these toxic chemicals present in *I. carnea* leaves.

Toxic effect of phytochemicals present in *I. carnea* leaf causes sequential changes in liver of goats, sheep and calves (Adam *et al.*, 1973) produce normochromic anemia (Tartour *et al.*, 1974). In Brazil Armien *et al.*, (2007) reported intoxication in goats is characterized by cytoplasmic vacuolation in neurons of central nervous system (CNS) and autonomic nervous system (ANS.)

This may be because of increase in the active principle in the *I. carnea* leaves. Studies on toxic effect of *I. carnea* leaves on Wistar Rat found that the organ damage from 2% *I. carnea* leaves was less intense than 10% Amna *et al.*, (2011). The death of newly hatched young ones may be because of the active principles present in *I. carnea* leaves. In our study do not confirmed actual place of death of young ones (either in womb or outside the body). Hueza *et al.*, (2003) suggested that the toxic constituent of *I. carnea* i.e. swainsonine could

pass through the placenta and endanger the lives of rats pups.

CONCLUSION

Our study revealed that ethanolic extract of *I. carnea* leaves possesses toxic principle which causes the mortality of guppy fishes. Study also revealed that higher concentration of leaf extract causes higher mortality in guppy fishes.

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