

## Comparative Evaluation of CNS Depressant Activity of the Flavonoid Fractions from the Fresh Leaves and Flowers of *Ixora coccinea* Linn.

Sen AK<sup>1</sup>, Bose S, Dutta SK

<sup>1</sup>Department of Pharmaceutics, Gupta College of Technological Sciences, Ashram More, G.T. Road, Asansol-713301, West Bengal, India

### Abstract

*Ixora coccinea* Linn belonging to the family Rubiaceae is a plant native to India and Sri Lanka. It is also called Jungle Jeranium. It has been traditionally used in eczema, irregular menstruation, diarrhoea, hypertension skin ulcers, as an antiseptic, antipyretic, anti-inflammatory and anti-cancer agent. Our present work is the study of its CNS depression activity so that it can be used a herbal sedative. The flavonoid fractions of leaves and flowers were tested for CNS depressant activity using Actophotometer where both the leaf and flower extracts showed marked CNS depression up to 87.36% and 95.40%, respectively.

**Keywords:** *Ixora coccinea* Linn, CNS depression, actophotometer.

### Introduction

*Ixora coccinea*, known as the Jungle Geranium, Flame of the Woods, and Jungle Flame, is a common flowering shrub native to Asia. Its name derives from an Indian deity. Although there are some 400 species in the genus *Ixora*, only a handful are commonly cultivated, and the common name, *Ixora*, is usually used for *I. coccinea*. *I. coccinea* is a dense, multi-branched evergreen shrub, commonly 4-6 ft (1.2-2 m) in height, but capable of reaching up to 12 ft (3.6 m) high. It has a rounded form, with a spread that may exceed its height. The glossy, leathery, oblong leaves are about 4 in (10 cm) long, with entire margins, and are carried in opposite pairs or whorled on the stems. Small tubular, scarlet flowers in dense rounded clusters 2-5 in (5-13 cm) across are produced almost all year long. There are numerous named cultivars differing in flower colour (yellow, pink, orange) and plant size. Several popular cultivars are dwarfs, usually staying under 3 ft (1 m) in height. *Ixora* 'Nora Grant' is a popular dwarf and 'Super King' is a popular hybrid with much larger flower clusters than other species. *I. coccinea* is native to tropical south-east Asia, including Southern India and Sri Lanka. It has become one of the most popular flowering shrubs in South Florida gardens and landscapes. The species prefers slightly acid soils with good fertility and becomes chlorotic under alkaline conditions. It tolerates mild salt spray. Jungle geranium is cold sensitive and will partially defoliate after chilling.<sup>1</sup> It has been

traditionally used in eczema, irregular menstruation, diarrhoea, hypertension skin ulcers, as an antiseptic, antipyretic, anti-inflammatory and anti-cancer agent.

Now, in the present study we have made an attempt to see the CNS depression activity of the flavonoid fractions from the leaves and flowers of *Ixora coccinea* Linn.

### Materials and Methods

#### Plant Materials

The leaves and flowers of *Ixora coccinea* Linn was collected from the Gupta College Medicinal Plant Garden during the months of November-December between 9 to 10 am and the plant materials were being authenticated by the Director of Shibpur Botanical Garden, Howrah, West Bengal, India. The reference number of the authentication letter is: CNH/ 1-1/ (201)/ 2007/ Tech. II/ 2. Fresh leaves and flowers were washed and cut into small pieces and were kept soaked in 50% (v/v) ethanol water mixture for seven days after which the marc was separated from the extracts by filtration.

#### Methods

##### Extraction procedure

About 2 kg of fresh leaves and flowers of the plant *Ixora coccinea* Linn were taken, washed and then cut into small pieces which were then allowed to macerate in 50% (v/v) ethanol water for seven days. After this the marc was separated from the filtrate by the process of filtration. The extracts proved the presence of flavonoids. The extracts were then dried in a vacuum dessicator. The dried flavonoidal fractions were then used for further study.

#### \*Address for Correspondence:

E-mail: arjunkumarsen@gmail.com

Tel. 9433511883

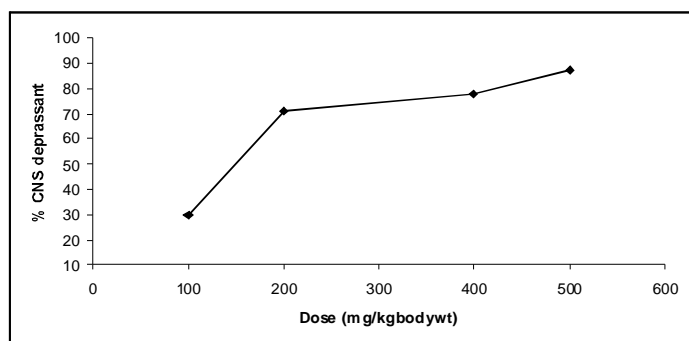
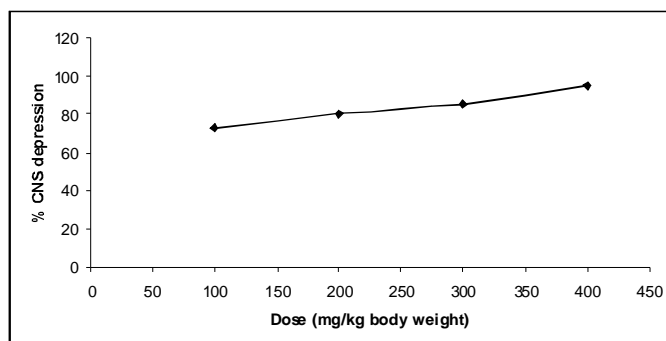
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**Table 1:** % CNS depression with dose by leaf extract

Serial No.	Dose (mg/kg BW.)	% CNS depression by leaf extract
1	100	29.75
2	200	70.75
3	400	77.70
4	500	87.36

**Table 2:** % CNS depression with dose by flower extract

Serial No.	Dose (mg/kg BW)	% CNS depression by leaf extract
1	100	72.97
2	200	80.28
3	300	85.31
4	400	95.40

**Fig. 1:** Dose-response curve (Leaf Extract)**Fig. 2:** Dose-response curve (Flower Extract)

### *CNS depressant activity*

In this experiment animals (Albino mice of weight  $20 \pm 10$  gm) used were kept in 18 hrs fasting condition which was then divided into five groups according to the dose, each containing 6 animals. The animals were weighed and doses were calculated. Then firstly the animals were placed on the instrument (Actophotometer) and the responses were recorded. After this they were treated with the standard drug (Chlorpromazine), leaf and flower extracts in above mentioned doses. After the drug treatment the animals were kept still for 30 min allowing the intra peritoneally administered drug to reach the CNS. After 30 min the animals were placed in the Actophotometer for 10 min and the readings were collected which were then justified<sup>2,3</sup>. For

determination of the CNS depressant activity of the leaf extract, the doses taken were: 100, 200, 400, 500 mg/kg body weight; and that for the flower extract, the doses were: 100, 200, 300, 400 mg/kg body weight.

### **Results and Discussions**

#### *CNS depressant activity*

Both the leaf and flower's flavonoid fractions showed marked CNS depressant activity. LD<sub>50</sub> of both the leaf and flower were calculated according to the method of Litchfield and Wilcoxon (1949).<sup>4</sup>The LD<sub>50</sub> of the leaf extract was found to be 925.68 mg/kg body weight whereas that of flower extract was found to be 1623.77 mg/kg body weight.

The leaf extract at dose of 500 mg/kg body weight showed CNS depression upto 87.36% and the flower extract showed CNS depression till 95.40% at the dose of 400 mg/kg body weight.  $EC_{50}$  of the leaf extract was found to be 220.20 mg/kg body weight and that of flower extract was 38.85 mg/kg body weight.

Therapeutic indexes of the leaf and flower extracts were found to be 4.20 and 41.20, respectively. From Table 1, Fig. 1 and Table 2, Fig. 2, it can be concluded that the flower extract has greater Central Nervous System (CNS) depression activity in comparison to the leaf extract. The  $ED_{50}$  (Leaf, 220.20 mg/kg body weight) is greater than  $ED_{50}$  (Flower, 38.85 mg/kg body weight). Thus, it can be inferred that the flower extract is more potent in causing CNS depression than the leaf extract.

The Therapeutic index of leaf extract (4.20) is lesser than the therapeutic index of the flower extract (41.80). So, it is evident that the flower extract is safer than the leaf extract.

### Conclusion

As a whole after going through all the data it can be seen that both the leaf and the flower extracts show marked CNS depression activity.

In the case of CNS depression, the flower proved to be more potent than the leaf extract.

potent and safe whereas in the case of antioxidant activity, though the flower showed greater antioxidant effects, but the This plant may also be used as a sedative though its addictive and dependence power is yet to be studied.

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