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## Analgesic activity of methanolic extract of *Flemingia strobilifera*

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### Abstract

The roots of *Flemingia strobilifera* were extracted in absolute methanol to determine their analgesic activity. The analgesic activity was assessed on intact mice by tail flick latency in tail immersion method. Acetylsalicylic acid in the dose of 300 mg/kg is used as standard drug. Plant extracts were given in the doses of 300, 500 and 1000 mg/kg. Control group received 0.9% NaCl (saline) solution. All the doses administered orally. Results showed that *F. strobilifera* had potent analgesic activity.

**Keywords:** Analgesic activity, Albino mice, *Flemingia strobilifera* (R. Br)

### Introduction

During the past decade, the traditional system has gained importance in the field of medicine. In most of the developing countries, who are dependent on medicinal plants to meet their primary health care needs? Since the usage of these herbal medicines has increased due to their quality, safety, and efficacy in industrialized and developing countries. Increasing interest has forced researcher to screen scientifically various traditional claims (Kumar *et al.*, 2010) [13]. The *Flemingia strobilifera* (R.Br.), an important medicinal plant, commonly known as Kusunt, belongs to the family Fabaceae. The plant is found in Sind, Rajputana, Bengal, South India and Andamans. The roots of this plant have been indigenously used in epilepsy and hysteria and the leaves were reported to be used as vermifuge. Arabian it is employed in cosmetic, anthelmintic and a remedy coughs and chills. Previous Phytochemical investigations reported various chalcones, flavonoid glycosides, aurone glycosides and epoxy Chromenes.

### Material and Method

#### Collection of plant material

The roots of *Flemingia strobilifera* were collected from the Uttrakhand, and they were sent for authentication and confirmed by Dr. R. M. Dubey Botanist B.H.U Varanasi. A voucher specimen is kept in the Department of Pharmacognosy, Pharmacy College Azamgarh and Faculty of Pharmacy.

#### Preparation of extract

The ground plant materials approximately 1 kg were soaked in 500 ml absolute methanol for about six weeks. The alcoholic extracts were then evaporated under reduced pressure in rotary evaporator and a syrupy residue so obtained was dissolved in small quantity of water and subjected to freeze drying. Freeze-dried extracts were collected in small glass bottles and kept at -30°C for further evaluation.

#### Preparation of samples for bioassay

Acetylsalicylic acid in a quantity of 300 mg and extracts of *Flemingia strobilifera* in the quantities of 300, 500 and 1000 mg were homogenized in 1.5% aqueous suspension of gum tragacanth. The homogenate including the insoluble fraction was administered orally to animals on the basis of mg/kg of the body weight.

## Animals

Albino mice for analgesic activity studies of either sex bred at the animal house were used in the present study. Weights of the mice and rats ranged from 20-25 g and from 160-210 g respectively. All animals were maintained in groups of five at  $22 \pm 1$  °C with light/dark cycle of 12:12 hours. They were starved overnight but allowed fresh water before administration of the plant extracts.

## Procedure for testing analgesic activity

### Tail immersion method

In present study analgesia was assessed according to the method of Luiz *et al.* Mice divided in the groups of five each, were held in position in a suitable restrainer with the tail extending out. 2-3 cm area of the tail was marked and immersed in the water bath thermo-statistically maintained at 51°C. The withdrawal time of the tail from hot water (in seconds) was noted as the reaction time or tail flick latency. The maximum cut-off time for immersion was 180 seconds to avoid the injury of the tissues of tail. 0.2 ml of 0.9% NaCl solution was administered to control animals; plant extracts in doses of 300, 500 and 1000 mg/kg were given orally by intubation. The initial reading was taken immediately before administration of test and standard drugs and then 60, 90, 120, 150 and 180 minutes after the administration. The criterion for analgesia was post drug latency which was greater than two times the pre-drug average latency as reported by Janssen *et al.* Tail flick latency difference or mean increase in latency after drug administration was used

to indicate the analgesia produced by test and standard drugs.

## Statistical analysis

Values for analgesic activity were expressed as "mean increase in latency after drug administration  $\pm$ SEM" in terms of seconds whereas values for anti-inflammatory activity were expressed as "mean increase in paw volume  $\pm$  SEM". The significance of difference between means was determined by student's t test values of  $p < 0.05$  were considered significant and  $p < 0.01$  as highly significant. All statistical procedures were performed according to the method of Alcaraz.

## Results and Discussion

*Flemingia strobilifera* exhibited potent analgesic activity at the dose levels of 300, 500 and 1000mg/kg. It is worth noting that this extract showed significant analgesic activity at dose of 300 mg/kg even in the first hour of the test. The duration as well as the intensity of analgesia induced by *Flemingia strobilifera* was dose dependent. The analgesic effect at 1000 mg/kg dose level was highest at +180 minutes after which the activity began to decrease. The analgesic activity shown by *Flemingia strobilifera* at 300 mg/kg was almost comparable to that produced by acetylsalicylic acid, while at the dose levels of 500 mg/kg and 1000 mg/kg. *Flemingia strobilifera* showed better analgesic effect than the reference drug and at the dose level of 1000 mg/kg the duration and intensity of analgesia was also greater than acetylsalicylic acid (Table 1).

**Table 1:** Analgesic Effect of Methanolic Extract of *Flemingia strobilifera* by Tail Immersion Method.

| Treatment                     | Dose/kg orally | Analgesia TFLD or Mean increase in $\pm$ SEM Latency after drug administration. |                 |                 |                 |                   |
|-------------------------------|----------------|---|-----------------|-----------------|-----------------|-------------------|
|                               |                | +60   | +90             | +120            | +150            | +180              |
| Min                           |                |   |                 |                 |                 |                   |
| Salin                         | 0.2 ml         | 0.63 $\pm$ 0.16   | 0.385 $\pm$ 0.2 | 0.33 $\pm$ 0.28 | 0.50 $\pm$ 0.13 | 0.368 $\pm$ 0.275 |
| <i>Flemingia Strobilifera</i> | 300            | 0.92 $\pm$ 0.17   | 1.31 $\pm$ 0.80 | 2.91 $\pm$ 0.21 | 2.12 $\pm$ 2.76 | 3.91 $\pm$ 0.22   |
|                               | 500            | 1.03 $\pm$ 0.07   | 2.32 $\pm$ 0.32 | 3.18 $\pm$ 0.35 | 3.61 $\pm$ 0.17 | 4.02 $\pm$ 0.17   |
|                               | 1000           | 2.23 $\pm$ 0.24   | 3.22 $\pm$ 0.35 | 4.47 $\pm$ 0.65 | 5.42 $\pm$ 0.80 | 8.25 $\pm$ 0.39   |
| Acetylsalicylic acid          | 300            | 0.94 $\pm$ 0.16   | 2.22 $\pm$ 0.17 | 2.22 $\pm$ 0.14 | 3.28 $\pm$ 0.28 | 3.73 $\pm$ 0.22   |

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