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## Anti-inflammatory and Analgesic Activities of *Flemingia strobilifera* (Linn)

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### ABSTRACT

Alcoholic and aqueous extracts of roots of *Flemingia strobilifera* were evaluated for Anti-inflammatory and Analgesic activities. The result revealed that the both alcoholic and aqueous extract produced significant anti-inflammatory and Analgesic activities. Indomethacin and Diclofenec sodium were used as standard drug for anti-inflammatory and analgesic activities respectively.

**Keywords:** *Flemingia strobilifera* (Linn), Anti-inflammatory activity, Analgesic activity.

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## INTRODUCTION

*Flemingia strobilifera* Lin (Fabaceae) [1], commonly known as Kusruni is widely distributed throughout India, (Bengal, Bihar, South India, Sindh Rajputana, and Andaman). It is an erect much branched shrub, slender, terete and pubescent, tapered the tips. Leaves 1-foliolate, petioles, and stipules, lanceolate, acute green and glabrous. The leaf and root of this plant are being traditionally used for the treatment of epilepsy, hysteria, insomnia and to relieve pain [7]. The leaves are reported to be used in Java as vermifuge for children. In Arabia it is employed as a cosmetic, anthelmintic and the remedy coughs and chills [8]. The vast ethno-medical uses insisted us to investigate anti-inflammatory and analgesic activities of the root of *Flemingia strobilifera*.

## MATERIALS AND METHODS

### Plant Material

The roots of *Flemingia strobilifera* were collected from Ranikhet, Uttarakhand, India during November to December and authenticated through Govt research institute Tadikhet, Ranikhet, India. A voucher specimen has been deposited at the department of pharmaceutical sciences in the Pharmacognosy IFTM Moradabad. The roots were dried under shade and coarsely powdered.

### Preparation of Extract

The powdered plant material was extracted with alcohol and water using Soxhlet apparatus. Finally the aqueous extract was prepared by decoction. The yield of alcoholic and aqueous extracts was 6.2% and 4.2 % respectively. The prepared extracts were tested for anti-inflammatory and analgesic activities.

### Phytochemical Screening

All the extracts were subjected to preliminary phytochemical screening and it was observed that the petroleum ether extract of root contains fixed oils and fats; chloroform extract of root contains flavonoids, steroids, proteins and fats; Alcoholic extract of root contains flavonoids and Carbohydrates and aqueous extract of root contains tannins and Carbohydrates.

### Study of anti-inflammatory activity

The anti-inflammatory activity was evaluated by Carrageenan- induced paw edema method. The albino rats of either sex were divided into six groups of six animals each. Group I received 0.2 ml of 2% w/v carboxy methyl cellulose suspension orally for 7 days as a control group, Group II received 400 mg/kg body weight of Ethanolic extract of *Flemingia strobilifera* (EFS-I) orally for 7 days, Group III received 600 mg/kg body weight of Ethanolic extract of

*Flemingia strobilifera* (EFS-II) orally for 7 days, Group IV received 400 mg/kg body weight of aqueous extract of *Flemingia strobilifera* (AFS-I) orally for 7 days, Group V received 600 mg/kg body weight of aqueous extract of *Flemingia strobilifera* (AFS-II) orally for 7 days and Group VI received 10 mg/kg of body weight of Indomethacin intraperitoneally for 7 days as a standard drug. Acute inflammation was induced in all groups by injecting 0.1 ml of 1% w/v Carrageenan into the sub-plantar region of the right hind paw of rats. On 7th day, paw volume was measured 1 hr prior to Carrageenan injection using plethysmometer and at 0 and 3 h after the Carrageenan injection. Mean increase in the paw volume was measured and percent inhibition was calculated.

### Study of Analgesic activity

The Analgesic activity was evaluated by Tail flick method. The albino mice were divided into six groups of six animals each. Group I received 0.2 ml of 2% w/v carboxy methyl cellulose suspension orally for 7 days as a control group, Group II received 400 mg/kg body weight of Ethanolic extract of *Flemingia strobilifera* (EFS-I) orally for 7 days Group, III received 600 mg/kg body weight of ethanolic extract of *Flemingia strobilifera* (EFS-II) orally for 7 days, Group IV received 400 mg/kg body weight of aqueous extract of *Flemingia strobilifera* (AFS-I) orally for 7 days, Group V received 600 mg/kg body weight of aqueous extract of *Flemingia strobilifera* (AFS-II) orally for 7 days and Group VI received 10 mg/kg of body weight of Diclofenec sodium intraperitoneally for 7 days as a standard drug. The reaction time was recorded using tail flick analgesiometer at 0, 30, 60, 90, 120 and 180 minutes time interval after the drug administration. The temperature was maintained at 50-55<sup>0</sup>c and data are recorded.

## RESULTS AND DISCUSSION

**Table 1. Anti-inflammatory activity of roots of *Flemingia strobilifera* on Carrageenan induced paws edema**

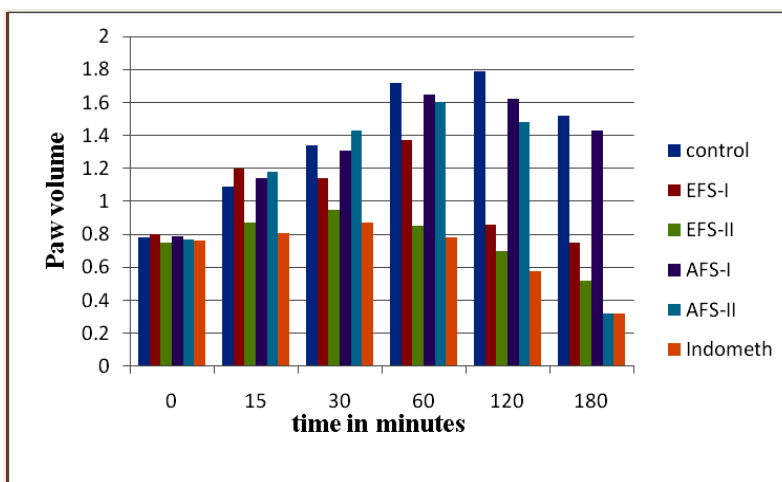
Treatment	Dose (mg/kg)	0 min	15 min	30 min	60 min	120 min	180 min	% Inhibition
Control 2% CMC	-	0.78 ± 0.03	1.09 ± 0.11	1.34 ± 0.15	1.72 ± 0.11	1.79 ± 0.11	1.52 ± 0.03	-
EFS-I	400	0.80±0.10	1.20±0.17	1.44±0.13	1.37±0.17	0.86±0.15	<sup>a</sup> 0.75±0.20	50.94
EFS-II	600	0.75±0.11	0.87±0.14	0.95±0.11	0.85±0.15	0.70±0.14	<sup>a</sup> 0.52±0.14	64.20
AFS-I	400	0.79±0.12	1.14±0.11	1.31±0.14	1.65±0.14	1.62±0.12	<sup>a</sup> 1.43±0.17	4.52
AFS-II	600	0.77±0.14	1.18±0.17	1.43±0.17	1.60±0.11	1.48±0.12	<sup>a</sup> 1.40±0.11	7.21
Indomethacin	10	0.76±0.10	0.81±0.12	0.87±0.11	0.78±0.15	0.58±0.17	<sup>a</sup> 0.32±0.05	78.79

n= 6, Values are expressed as Mean ± SEM, aP < 0.05 When compared with control group

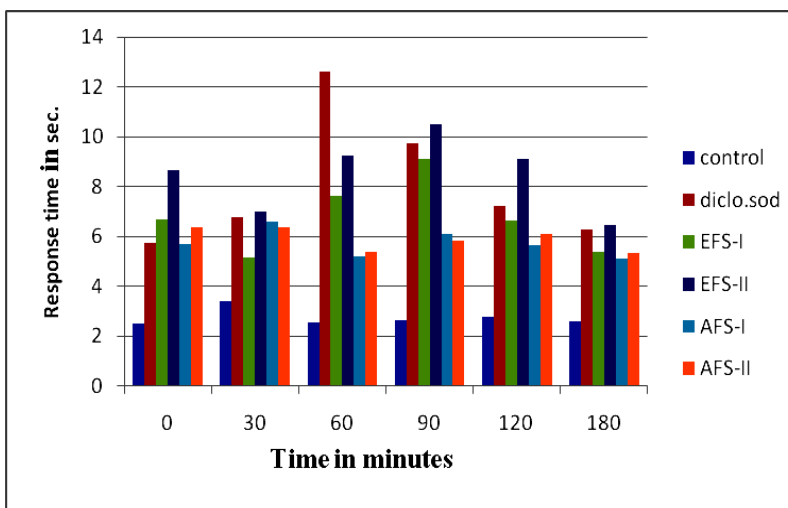
**Table 2. Analgesic activity of roots of *Flemingia strobilifera* by tail flick method**

Treatment	Dose (mg/kg)		Tail flick method				
	mg/kg	0.0	Time in minutes				
			30	60	90	120	180
Control cmc 0.5% w/v	....	2.53±0.12	3.42±0.10	2.58±0.18	2.65±0.12	2.76±0.17	2.62±0.12
Diclofenec sodium	10	5.75±0.12	6.76±0.12	12.6±0.21	9.75±0.12	7.24±0.12	6.26±0.28
Ethanolic extract	400	6.70±0.10	5.14±0.13	7.65±0.20	9.10±0.34	6.62±0.22	5.40±0.24
Ethanolic extract	600	8.65±0.12	7.02±0.18	9.24±0.22	10.5±0.25	9.10±0.18	6.45±0.24
Aqueous extract	400	5.72±0.11	6.60±0.25	5.20±0.25	6.12±0.11	5.65±0.12	5.10±0.10
Aqueous extract	600	6.37±0.12	6.39±0.41	5.38±0.23	5.85±0.11	6.10±0.12	5.35±0.12

n= 6, Values are expressed as Mean ± SEM, aP < 0.05 When compared with control group



**Fig 1. Graphical representation of anti-inflammatory activity**



**Fig 2. Graphical representation of Analgesic activity**



Preliminary Phytochemical investigation showed the presence of flavonoid carbohydrates, proteins, tannins and fats, in the root of *Flemingia strobilifera*.

Table 1 and 2. Shows that the ethanolic extract of root of *Flemingia strobilifera* has significant analgesic and anti-inflammatory activity, whereas aqueous extract showed moderate activity. Flavonoids are known to inhibit the enzyme prostaglandin synthetase, more specifically the endoperoxidase and reported to produce anti-inflammatory effects. So the presence of flavonoid might be responsible for the analgesic and anti-inflammatory activities in ethanolic extract.

### CONCLUSION

From the study it can be concluded that the alcoholic and aqueous extracts of roots of *Flemingia strobilifera* were having both analgesic and anti-inflammatory activities. However the active constituents responsible for these activities can be identified.

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