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ANTI-INFLAMMATORY ACTIVITY OF METHANOLIC LEAF EXTRACT OF *ENTADA PURSAETHA* DC

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ABSTRACT

In the present study, *Entada pursaetha* leaves were extracted with methonal and evaluated for anti-inflammatory activity in rats using a carrageenan induced paw edema method. Methonalic extracts exhibits potent anti-inflammatory activity at 100 mg/kg at 3 hours after administration is compared with reference standard drug. Observed pharmacological activity in the present study provides scientific validation of ethnomedicinal use of this plant leaf in treating acute inflammation.

KEYWORDS: *Entada pursaetha*, Kolli Hills, Anti-Inflammatory, Acute Inflammation, Methonalic extracts.

INTRODUCTION

Naturally plants have the ability to synthesize a wide variety of biologically important functional chemical compounds. Patil *et al.*[1] and Achrekar *et al.*[2] stated that ethno medicinal plant sources of natural medicinal compounds have had an identical to the current uses of active synthetic drugs. Ananthanarayanan and Panikar,[3] and Augusti,[4] reported that many of the pharmaceutical companies currently available to physicians have a long history of use as herbal remedies, including aspirin, digitalis, quinine, opium and etc. The use of herbs to treat disease is almost universal among non-industrialized societies. Almost one fourth of pharmaceutical drugs are derived from plants. About 12,000 compounds have been isolated so far; a number estimated to be less than 10% of the total.[5] The plant has been traditionally used in Ayurvedic medicine for centuries as an anti-inflammatory, analgesic, antipyretic, antiarthritis, antidiabetic, antioxidant, cytotoxic, hepatoprotective, antimicrobial and molluscidal agent. Deepa and and Shinde[6] reviewed and summarized the current

knowledge on reported medicinal plants properties and their pharmacological actions.

In the present study plant is an Elephant creeper (*Entada pursaetha*) which is a very large gigantic woody climbing shrub (liana) among legumes with much twisted stem, Leaves bipinnate, pinnae 2-3 pairs, leaflets 3.8-7.5 cm, oblong or obovate-oblong, rigidly coriaceous. Flowers are in panicle or simple spikes, 15-25 cm long, axillary or from the nodes of old leafless branches. Flowers are small, corolla 2.5-3 mm long, yellow. Pods 30-90 cm long, slightly curved, woody, indented between the seeds.

Entada pursaetha is most commonly found in forests at low and medium altitudes, and is also widely distributed in tropical Africa and extending to South Africa, India, China, Philippines, Guam and Northern Australia.[7] In India, *E. pursaetha* is found in damp forest of eastern Bengal, Bihar and Orissa, in forest region of eastern and Western Ghats and hilly forest tract of northern district of Bengal and Deccan. It is also growing in central and eastern Himalayas[8]. Yusuf *et al.*,[9] reported that *Entada pursaetha* seeds are emetic, febrifuge, alexiteric, narcotic, antiperiodic and anthelmintic; used in pains of the loins and joints, in debility and in glandular swellings; also as a remedy in cerebral hemorrhage. Roasted seeds are purgative. Seeds are used for joint pain, as well as contraceptive. Roots are used for diarrhea.

Plant Collection

The mature leaf of *Entada pursaetha* was collected from Kolli Hills, Biosphere Reserve, Tamil Nadu, India. The plant was identified with the help of local flora and authenticated in Govt. of India, Botanical Survey of India, Southern Circle, Coimbatore, Tamil Nadu, India.

MATERIALS AND METHODS

Preparation of leaf extract for anti-inflammatory activity. The dried leafs of *Entada pursaetha* DC was powdered in a Wiley mill. 100 grams of leaf powder was packed in a Soxhlet apparatus and extracted with methanol. The methanol extract was concentrated in a rotary evaporator. The concentrated methanol extract was used for acute toxicity and anti-inflammatory activity.

Acute toxicity study

Adult Wistar Albino rats of either sex (150- 200g) were used for the present investigation. Animals were housed under standard environmental conditions at temperature (25 ± 2ºC) and

light and dark (12:12hrs). For toxicity studies, six Albino rats of either sex were administered orally with the test substance in the range of 25-100 µg/kg and the mortality rates were observed after 72hrs. The extract of *Entada pursaetha* exhibiting no mortality at 100 µg/kg dose was considered as LD50 cut off dose (safe dose). So 1/10 and 1/5 of that were selected (50 and 100 µg/kg) for the experiment as sub maximal and maximal dose.

Anti-inflammatory Activity

Albino rats of either sex weighing 200-300 grams were divided into four groups of six animals each. The dosage of the drugs administered to the different groups was as follows. Group I - Control (normal saline 0.5 ml/kg), Group II – Indomethacin (25µg/kg, p.o.), Group - III and IV - *Entada pursaetha* (75µg/kg and 100 µg/kg, p.o.). All the drugs were administered orally. After one hour of the administration of the drugs, 0.1 ml of 1% W/V carrageenan solution in normal saline was injected into the sub-plantar tissue of the left hind paw of the rat and the right hind paw was served as the control. The paw volume of the rats was measured at the end of 0 min., 60min., 120min., 180min., and 240min. The percentage increase in paw edema of the treated groups was compared with that of the control and the inhibitory effect of the drugs was studied. The relative potency of the drugs under investigation was calculated based upon the percentage inhibition of the inflammation.

RESULTS AND DISCUSSION

The leaf extract did not exhibit any mortality up to the dose level of 25µg/kg. So at this concentration the extracts were found to be safe for long term administration. The methanolic leaf extract of *Entada pursaetha* at the dose level of 50 and 100µg/kg decreased the edema significantly ($p < 0.001$) at 3rd and 4th hrs after administration of the extract when compared to the control group. The effect was compared to the activity ($p < 0.001$) produced by standard drug Indomethacin at 3rd and 4th hr after administration (Table -1).

Table 1: Anti-inflammatory activity of methanolic leaf extracts of *Entada pursaetha.*

Group	Dose (µg/ Kg)	0 min	60 min	120 min	180 min	240 min
Group I	-	15.90±2.1	32.70 ± 3.8	43.7 ± 3.2	61.7 ± 2.8	62.5 ± 2.4
Group II	25	10.24±1.4 ***	26.58 ±2.4**	21.2 ± 4.1**	22.4 ±4.8***	8.21 ±3.1***
Group III	50	15.22±2.6**	27.13 ± 2.8**	30.3±3.8*	21.60±3.6***	22.05±6.1***
Group IV	100	13.31±1.7***	20.40±2.9***	23.2±3.6**	12.35±4.8***	10.90±5.6***

*P < 0.05 when compared to control. ** P < 0.01. *** P < 0.001 when compared to control. Number of animal / in each group = 6 Data expressed in mean ± SEM; EP = *Entada pursaetha.*

The anti-inflammatory activity of the leaf extract of *Entada pursaetha* has been established in the present study. The extract is found to significantly inhibit the carrageenan induced rat paw edema, a test which has significant predictive value for anti-inflammatory agents acting by inhibiting the mediators of acute inflammation.[10-15] The leaf extract of *Entada pursaetha* possesses varying degree of anti-inflammatory activity when tested at two different doses. The leaf extract of *Entada pursaetha* at the dose of 100 mg/kg shows high significant anti-inflammatory activity at 4th hours. The leaf compounds may have the role in antioxidant and anti-inflammatory effect.

CONCLUSION

The present study on leaf extract of *Entada pursaetha* has demonstrated that this plant has significant anti-inflammatory properties, and it justifies the traditional use of this plant in the treatment of various types of pains and inflammation.

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