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Research Article

Analgesic and Anti-inflammatory Activity of Whole Plant of *Amorphophyllus Sylvaticus* (Roxb)

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Abstract

Amorphophallus sylvaticus (Roxb.) Kunth, a member of Araceae is a coronus herb, highly valuable in the Indian traditional system of medicine for the treatment of piles, urinary troubles, arthritis, inflammation and liver diseases. The main objective of the present work is to find out the pharmacological investigations of hydro alcoholic extracts of dried whole plant of *Amorphophyllus sylvaticus* (Roxb) against Anti-inflammatory activity in rats and Analgesic activity in mice. The results of the anti-inflammatory revealed that the hydro alcoholic extract showed significant anti-inflammatory activity at all tested dose levels. The extract exhibited consistent anti-inflammatory activity. In analgesic experiments, the extract showed significant analgesic activity at all tested dose levels.

1. INTRODUCTON

Amorphophallus sylvaticus (Roxb.)Kunth, a member of Araceae is a coronus herb; it is commonly known as Devils Tongue. The plant is highly valuable in the traditional Indian medicine for the treatment of piles and Fistula, tuber part is to treat the urinary trouble. The seed powder is mixed with water to form a paste and used in tooth ache[1]. Corms are used to treat the various diseases like vomiting, cough, dysentery, arthritis, amenorrhea, asthma, inflammation, liver diseases. Corms used as vegetable pickles [2-5].Tuber used by folk and tribal medicinal practitioners of Bangladesh for treatment of Elephantiasis [6]

2. MATERIALS AND METHODS

2.1 Collection and authentication of plant material

The fresh whole plant of *A. sylvaticus* (3 kg) were procured from the rural belt of Annaram, Nizamabad district and authenticated by Prof. V.S. Raju, Taxonomist, Kakatiya University and Warangal. A voucher specimen (MRM/03/2012) was deposited in the Department of Pharmaceutical Sciences, Andhra University and Visakhapatnam. The collected material was air dried, pulverized, passed through sieve no. 40 and used for further studies.

2.2 Preparation of extract

The dried and powdered material (500 g) was extracted with 3 litre of ethanol: water (3:2) at room temperature for 72 h. The hydro alcoholic extract was then used for the toxicity studies and for the anti-inflammatory and analgesic assays, after removing the solvent under reduced pressure (yield: 8.49% w/w). The extract so obtained was suspended in 0.5% w/v sodium carboxy methyl cellulose and used for further studies.

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2.3 Experimental animals for anti-inflammatory and analgesic activity

Adult Wistar albino rats of either sex weighing between 170 to 190gm (for the anti-inflammatory screening) and adult Swiss albino mice of either sex weighing 25 to 30g (for the analgesic screening and gross behavioral study) were used in this study. The selected animals were maintained under standard diet and water under laboratory conditions (35 ± 2^{0}C). All the experimental procedures were approved by Institutional animal ethical committee of Talla Padmavathi College of Pharmacy, Warangal, Telangana, India vide approval No. 1505/po/a/11/CPCSEA.

2.4 Gross behavioral and toxicity studies of hydro alcoholic extract of A. sylvaticus

The hydro alcoholic extract of whole plant of *A. sylvaticus* was screened for the gross behavioral and toxicity studies in selected Swiss albino mice. Groups of mice comprising six animals each were treated with 100, 200, 400, 800, 1000, 2000 and 3000mg/kg of the extract suspended in 0.5% w/v sodium carboxy methyl cellulose were administered orally, via a gastric catheter. The animals were then observed continuously for first four hours for any behavioral changes [7] and for mortality if any at the end of 72 h. However, no mortality was observed in the animals.

2.5 Anti-inflammatory activity of hydroalcoholic extract of A. sylvaticus *on carrageenan induced paw edema*

The anti-inflammatory activity was evaluated in adult wistar rats in groups of six animals for each dose. The test samples (extract 100 and 200 mg/kg or ibuprofen-10 mg/kg or 0.5%w/v sodium CMC, 0.2 ml/100 gm) were administered orally 1h before the subcutaneous injection of 0.1 ml of sterile saline carrageenan (1%w/v) in the subplantar region of left hind paw. The control ateral paw was injected with an equal volume of saline. Paw volume was measured with a plethysmograph immediately and at 0h, 1h, 2 h and 4 h after administration of test samples. The anti-inflammatory effect was expressed as percent inhibition of edema.[8-9] the significance of the drug-induced changes was estimated using Student's- *t* test.

Table 1.1: Anti-inflammatory activity of the hydroalcoholic extract of *A. sylvaticus* on carrageenan induced paw edema in albino rats.

Group	Treatment	Dose	Volume of mercury displaced in ml			
			0h	1h	2h	4h, % Protection at 4th h
I	0.5% w/v Sodium CMC	2ml/Kg	0.75±0.03	0.99±0.02	1.26±0.06	1.47±0.01
II	Indomethacin	10mg/Kg	0.706±0.06	1.08±0.05*	1.25±0.03*	0.98±0.02* (64.02)
III	Hydroalcoholic extract of A.S	100mg/Kg	0.72±0.02	1.06±0.03*	1.05±0.03*	1.05±0.02* (53.56)
IV	Hydroalcoholic extract of A.S	200mg/Kg	0.75±0.07	0.96±0.08*	1.02±0.03*	0.99±0.04* (56.52)

*Result expressed as mean± SEM from six observation * p < 0.001*

2.6 Analgesic activity of hydro alcoholic extract of *A. sylvaticus* by Tail flick method

Swiss albino mice were screened for sensitivity test by placing the tip of the tail on the radiant heat source. Any animal that failed to withdraw its tail in 5 sec was rejected from the study. The selected animals were then divided into four groups of six mice each. Each of the groups received one of the following; extract (100, 200 mg/kg), pentazocin (30 mg/kg) and 0.5% w/v sodium CMC (0.1 ml/10 gm) in normal saline intraperitoneally. The basal reaction time was measured initially and at the end of 15, 30 and 60 min. A cut-off period of 10 sec was observed to avoid damaged to the tail.[8-9]

Table 1.2: Analgesic activity of the hydro alcoholic extract of *A. sylvaticus* by Tail flick method

Groups	Treatment	Dose	Basal Reaction Time (sec)	Basal Reaction Time (sec)		
				15 min	30 min	60 min
I	0.5%w/v Sodium CMC	0.1ml/kg	2.5±0.203	2.15±0.28	2.33±0.19	2.66±0.19
II	Pentazocine	30mg/kg	2.33±0.19	4.16±0.36*	5.5±0.31**	8.6±0.20**
III	Hydroalcoholic extract of A.S	100mg/kg	2.16±0.15	3.66±0.19*	4.5±0.20**	7.0±0.56*
IV	Hydroalcoholic extract of A.S	200mg/kg	2.33±0.19	3.83±0.25*	4.8±0.43*	7.83±0.45*

Results expressed as mean ± SEM from six observations. p < 0.01, ** p < 0.001*

3. RESULTS AND DISCUSSION

The results of the anti-inflammatory study revealed that the hydro alcoholic extract showed significant anti-inflammatory activity at all tested dose levels. The percentage inhibition with 100 mg and 200 mg/kg in carrageenan induced paw edema was found to be 53.52 and 56.52 respectively. The extract exhibited consistent anti-inflammatory activity with carrageenan. The anti-inflammatory effect may be due to inhibition of prostaglandin synthesis. In analgesic experiments, the extract showed significant analgesic activity at all tested dose levels.

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