



EVALUATION OF ANTI-INFLAMMATORY ACTIVITY OF *IPOMOEA STAPHYLINA* IN CARRAGEENAN-INDUCED PAW EDEMA IN RATS

C.A.Suresh kumar*, M.Thamizhmozhi, C.Saravanan, Gude Sureshkumar, K.Sasi
Aadhibhagawan College of Pharmacy, Rantham, Cheyyar-604407, Tamilnadu, India.

*Corresponding author's E-mail: casureshkumar1985@gmail.com

Accepted on: 08-08-2012; Finalized on: 29-09-2012.

ABSTRACT

The present study was designed to investigate the anti-inflammatory activity of the Methanolic extract of *Ipomoea staphylina*. Inflammatory diseases including different types of rheumatic diseases are very common throughout the world. Therefore the search for a better tolerated anti-inflammatory agent appears to be a necessity. *Ipomoea staphylina* is used as a folk medicine for the treatment of inflammation in India. Present study revealed that the plant *Ipomoea staphylina* possesses a significant anti-inflammatory activity as evidenced in carrageenan induced paw edema method, which supports the folkloric claim of the anti-inflammatory activity of the plant. Our finding supports the reported therapeutic use of herb *Ipomoea staphylina* in tribal medicine for the treatment of inflammation. The most active extracts can be subjected to isolation and used for the therapeutic as anti-inflammatory agents and also to undertaken further pharmacological studies.

Keywords: Inflammatory disease, *Ipomoea staphylina*, Convolvulaceae, Herbal drugs.

INTRODUCTION

Traditional medical practices are an important part of the primary health care system in the developing world herbal medicines are comparatively safer than synthetic drugs. Plant-based traditional knowledge has become a recognized tool in search for new sources of drugs and nutraceuticals¹

According to World Health Organization (WHO) more than 80% of the world's population relies on traditional medicine for their primary healthcare needs. Use of herbal medicines in Asia represents a long history of human interactions with the environment. Plants used for traditional medicine contain a wide range of substances that can be used to treat chronic as well as infectious diseases. A vast knowledge of how to use the plants against different illnesses may be expected to have accumulated in areas where the use of plants is still of great importance².

Ipomoea staphylina Linn family Convolvulaceae commonly called as onnankodi, Thendra teega *Ipomoea staphylina* is Perennial, large straggling or climbing, woody, glabrous, shrubs Common, Gregarious in heavy masses on thickets, trees etc, Plains to 1200 m. Sri Lanka through India to China. Flowers Pink, numerous, in lax panicles, with a darker throat in crowded showy clusters. Flowering peaks from December-March. Leaves are ovate, 6-15 x 4-10 cm, base sub-cordate, margin entire, apex acute, glabrescent, and petiole up to 7 cm long. Fruit a capsule ovoid, glabrous, seeds 4, clothed with long white silky hairs, Seeds oblong, fruiting from January onwards³.

The plant *Ipomoea staphylina* Linn has been used in different systems of traditional medication for the treatment of diseases and ailments of human beings. It

has been reported as the analgesic⁴, anti-inflammatory⁵, anti-diarrheal⁶, gastro protective effect⁷. For this all reasons we take a plant to bring out in official manner by the thorough investigation on this plant such as phytochemical¹⁰⁻¹¹, pharmacological and analytical studies on the leaves of *Ipomoea staphylina* Linn.

MATERIALS AND METHODS

Plant materials

The plant *Ipomoea staphylina* is widely found throughout India. They found along the sides of the lake. For our project work the plant *Ipomoea staphylina* was collected from Abdullapuram which is about 12km away from Vellore. The plant was identified by Dr. P. Jayaraman Ph.D., a director of plant anatomy research center, Tambaram, Chennai; who authenticated the plant with available literature. The fresh plant material leaves were collected and shade dried. The dried leaves material was powdered by using mixer grinder and sieved by using sieve no: 60 then the final uniform powder was used for the extraction of active constituent of the leaves.

Preparations of plant extract^{8,9}

The dried and ground plant powder (250gm) was extracting successively with methanol and water by using soxhlet apparatus for 24 hrs. All the extracts were evaporated on a water bath and finally dried in vacuum. The extractive value of the residue (percentage yield) was calculated. The yield of methanol and aqueous extracts were 15.5 %w/w and 17.8 %w/w. Extracts were dried in a desiccator and preserved in refrigerated condition. Both petroleum ether and methanol extracts were suspended in 0.3 % CMC just before administration to rats.



In Vivo- Anti-inflammatory activity**Carrageenan-induced paw edema in rats**

The animals were divided into 4 groups each having six animals. A freshly prepared suspension of carrageenan (1% w/v, 0.1 ml) was injected to the planter region of left hind paw of each rat. One group was kept as control and the animals of the other groups were pretreated with Standard and Methanolic and aqueous extracts of *Ipomoea staphylina* administered through orally 60 min before the carrageenan treatment. The paw volumes of the test compounds, standard and control groups were measured at 60,240,360 minutes of carrageenan treatment with the help of Digital Plethysmometer (Ugo basile, Italy). Mean increase in paw volume was measured and the percentage of inhibition was calculated by using formula:

$$\% \text{ Anti-inflammatory activity} = (V_c - V_t / V_c) \times 100$$

Where, V_t - Mean increase in paw volume in rats treated with test compounds,

V_c - Mean increase in paw volume in control group of rats.

RESULTS AND DISCUSSION

The methanol soluble and water-soluble extractive values were found to be 15.5 % and 17.8% w/w respectively. The results of extractive value were given in Table No.1.

In-vivo anti-inflammatory activity¹²⁻¹⁴

Various extracts such as MEIS and AEIS at a dose of 200mg/kg were tested for their Anti- inflammatory activity by using carrageenan Induced rat paw edema method and the results are tabulated in Table No. 2.

Methanolic extract of *Ipomoea staphylina* (200mg/kg I.S) was given 1 hour prior to the injection of carrageenan (1%, 0.1 ml) into planter region of hind paw of rat produced edema (02.88±0.65 ml) and the aqueous extract of *ipomoea staphylina* produced edema (2.72±0.50 ml) when compared with the mean of initial paw volume (6.55±0.90 ml). The Methanolic and aqueous extract of *ipomoea staphylina* exhibited significant anti-inflammatory activity against carrageenan-induced rat paw edema.

The Methanolic and aqueous extract of *ipomoea staphylina* at the dose of 200 mg/kg I.S inhibited the edema formation significantly induced by carrageenan to an extent of 56.03% and 58.47% respectively. Diclofenac sodium as a reference standard inhibited the edema formation due to carrageenan to an extent of 70.22 % at the dose of 10 mg/kg (table No.2, Fig No.1).

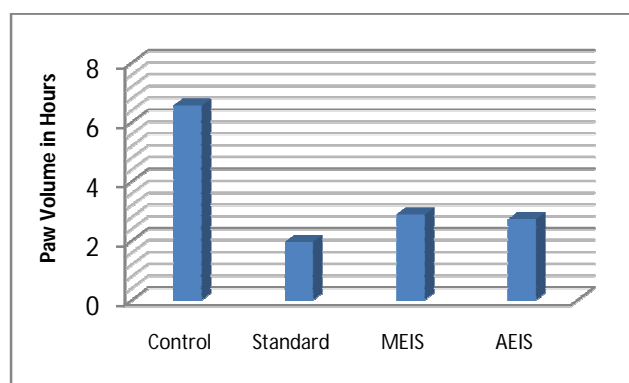


Figure 1: Shows Effect of Methanolic and Aqueous leaf extract of *Ipomoea Staphylina* on Carrageenan-Induced Rat Paw Edema

Table 1: Extractive values of leaves of *Ipomoea Staphylina linn*

Plant name	Part used	Methanol soluble extractive	Water soluble extractive
<i>IPOMOEA STAPHYLINA LINN.</i>	LEAVES	15.5% w/w	17.8% w/w

Table 2: In-vivo anti-inflammatory activity of MEIS and AEIS

Treatment	Dose (mg/kg)	Paw volume(ml) as measured by mercury displacement at 6 hour	Percentage inhibition of paw edema
Group I (Normal saline)	10ml/kg orally	6.55±0.90	0.00 %
Group II (Standard)	10mg/kg I.P.Diclofenac sodium	1.95±0.31	70.22%*a
Group III (MEIS)	200mg/kg.orally.	2.88±0.65	56.03%*a
Group IV (AEIS)	200mg/kg.orally	2.72±0.50	58.47%*a

Data are expressed as Mean ± S.E.M.

*Data were analyzed by one way ANOVA followed by Newman's keul's multiple range tests, to determine the significance of the difference between the control group and rats treated with the test compounds.

*a Values were significantly different from normal control at P< 0.01

CONCLUSION

In present study *Ipomoea Staphylina* was taken to evaluate *in vivo* anti-inflammatory activity. Present study revealed that the plant *Ipomoea Staphylina* possesses a significant anti -inflammatory activity in carrageenan induced paw edema method, which supports the folkloric claim of the plant. Further studies are needed to isolate

the active constituents, elucidate structure and mechanism of action of these extracts.

Acknowledgements: The authors are thankful to our chairman and directors, Aadhibhagawan College of pharmacy, Rantham, Cheyyar, Thiruvannamalai district, Tamilnadu for providing necessary facilities to carry out this research work.



REFERENCES

1. Kuru Suresh, R.Kottaimuthu, T.Selvin Jebaraj Normen, R.Kumuthakalavalli, Sabu M Simon; Ethnobotanical study of medicinal plants used by malayali Tribals In kolli hills of Tamilnadu, India; IJRAP 2(2): 2011; 502-508.
2. R. Sivaperumal, S. Ramya, A. Veera Ravi, C. Rajasekaran and R.Jayakumararaj; Ethnopharmacological studies on the Medicinal Plants used by Tribal Inhabitants of Kottur Hills, Dharmapuri, Tamilnadu, India; Environ. We Int. J. Sci. Tech. 5:2010; 57-64.
3. P.Jayaraman; A new midge gall on Ipomoea staphylina R.&S. (Convolvulaceae); current science, 55(4):1986; 190-191.
4. A K Nagariya, A K Meena, Dipika Jain, B P Gupta, A K Yadav, M R Gupta, A K Pathak and Neelam; Medicinal plants used in the healing of skin diseases in different regions of India: A Review; International Journal of Chemical and Analytical Science 1(5): 2010; 110-113.
5. R. Sivaperumal, S. Ramya, A. Veera Ravi, C. Rajasekaran and R.Jayakumararaj; Ethnopharmacological studies on the Medicinal Plants used by Tribal Inhabitants of Kottur Hills, Dharmapuri, Tamilnadu, India; Environ. We Int. J. Sci. Tech. 5:2010; 57-64.
6. A.Sarvalingam, A.Rajendran, V.Aravindhan; Curative climbers of Maruthamalai Hills in the Southern Western Ghats of tamil Nadu, India Int.J.Med.Arom.Plants, 1(3):2011; 326-332.
7. Kuru Suresh, R.Kottaimuthu, T.Selvin Jebaraj Normen, R.Kumuthakalavalli, Sabu M Simon; Ethnobotanical study of medicinal plants used by malayali Tribals In kolli hills of Tamilnadu, India; IJRAP; 2(2):2011; 502-508.
8. Dr Kokate, C.K.; Practical Pharmacognosy, 1986; 112-117.
9. Khandelwal, K.R.; Practical Pharmacognosy, Nirali Prakashan Publishers, 1998, 137-138.
10. H. Benmehdi, O. Hasnaoui, O. Benali, F. Salhi; Phytochemical investigation of leaves and fruits extracts of *Chamaerops humilis* L; J. Mater. Environ. Sci. 3(2): 2012; 320-237.
11. Smita nayak and Sushma mengi; preliminary physicochemical and phytochemical evaluation of *morinda citrifolia* fruit extractives; *International Journal of Pharmacy and Pharmaceutical Sciences*, 2(4):2010; 150-154.
12. Yasser Abdelaal Selim and Nabil Hassan Ouf; Anti-inflammatory new coumarin from the *Ammimajus* L; Selim and Ouf, *Organic and Medicinal Chemistry Letters* 2:2012; 1.
13. Georgia Melagraki, Antreas Afantitis, Olga Igglessi-Markopoulou, Anastasia Detsi Maria Koufaki, Christos Kontogiorgis, Dimitra J. Hadjipavlou-Litina; Synthesis and evaluation of the antioxidant and anti-inflammatory activity of novel coumarin-3-aminoamides and their alpha-lipoic acid adducts; *European Journal of Medicinal Chemistry*, 44: 2009; 3020–3026.
14. Iranshahi M, Askari M, Sahebkar A, Hadjipavlou-Litina D; Evaluation of antioxidant, anti-inflammatory and lipoxigenase inhibitory activities of the prenylated coumarin umbelliprenin; *DARU* 17(2):2009; 99-103.

