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Original Article

EVALUATION OF ANTI-PYRETIC AND WOUNDHEALING ACTIVITIES OF EVOLVULUS NUMMULARIUS LEAVES IN ALBINO WISTAR RATS

RAM MOHAN MANDA[1*], SRINIVAS REDDY KARKA[2], GANAPATY SERU[3]

[1]Dept. of Pharmacognosy & Phytochemistry, Talla Padmavathi Pharmacy College, Warangal-506002, Telangana, India, [2]Dept. of Pharmacognosy & Phytochemistry, Vaagdevi Pharmacy College, warangal, Telangana, India, [3]GITAM Institute of Pharmacy GITAM University,Vishakapatnam 530003, Andhrapradesh ,India,
Email: rammohanmanda56@gmail.com

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ABSRACT

Objective: The present study was to evaluate the anti-pyretic and wound healing activity of hydro alcoholic extracts of Evolvulus nummularius leaves in albino wistar rats.

Methods: Anti-pyretic potential was determined by yeast-induced pyrexia and for testing the wound healing property, excision method used in wistar albino rats

Results: The present result shows that the hydroalcoholc extract of leaf possesses significant anti-pyretic effect in yeast-provoked elevation of body temperature and The hydro alcoholic extract and leaf juices showed a significant wound healing activity which was well comparable with the standard drug used.

Conclusions: The most significant inhibition of wound healing and also the significant reduction in hyperpyrexia in rats when treated with standard drugs as well as different extracts.

Keywords: Anti-pyretic, Wound healing activity, Evolvulus nummularius, Albino wistar rats.

INTRODUCTION

Evolvulus nummularius Linn. Belongs to the family: Convolvulaceae. It is a small prostrate herb with a small woody branched rootstock; this herb is widely distributed in India, Nepal, Bhutan, Tropical America and Africa. The plant is found as a common weed in lawns, roadsides, grasslands etc. especially in moist places, in India, Madagascan and tropical Africa [1-3]. In Indian traditional folk medicine, the whole plant is used as a medicine for hysteria, to cure burns, cuts, wounds and scorpion stings [4]. In Nepal, the paste of the plant is used to treat scabies [5]. The hot water extract of the dried entire plant is reported to be used in gastric disorder and as sedative [6]. The entire plant is reported to contain evolvuside A and Bluteolin and hentriacontane N and triacontane N [7], Sitosterol and its glucoside, stigmasterol, Alpha-mannitol, Ursolic acid and Oleanolic acid [8]and reported to pharmacological activities like anhelmintic [9], anti bacterial and anti oxidant [10] and insecticidal activity [11].

The author has selected plant for to give scientific evidence to the anti pyretic and wound healing based on the folklore claim,

METHERIALS AND METHODS

Plant material

The leaves were collected (3 kg) from the rural belt of Pakala, Warangal district and authenticated by the Botanical Survey of India, Howrah. A voucher specimen (MRM/09/2012) was deposited in the Department of Pharmaceutical Sciences, Andhra University, and Visakhapatnam. The collected plant material was dried under shade and pulverised in a mechanical grinder. The powder was passed through sieve no. 40 and used for further studies.

Preparation of extract

The powdered plant material (500 g) was extracted with 2 liters of water-ethanol (1:1) by maceration in closed vessels for 7 days. The solvents were then removed under reduced pressure. The hydro alcoholic extract was brown coloured greasy residue (yield- 5.35% w/w with respect to dry material). The dried extracts (residue) were suspended in 1% gum acacia in normal saline (vehicle) and used for the Anti-pyretic and wound healing studies. All the experimental procedures were approved by an Institutional animal ethical committee of Talla Padmavathi College of Pharmacy, Warangal, Telangana, India vide approval No. 1505/po/a/11/CPCSEA.

Anti-pyretic activity of leaf hydroalcoholic extract of enummularius

Hyperthermia was induced in rat sub-cutaneously with 10 ml/kg of 15% aqueous suspension of brewer's yeast, and the rectal temperature was recorded initially and at 18 h. Animals with 1 °C or more elevation in body temperature were used. Hydroalcoholic extract and (100 mg/kg and 200mg/kg, i. p.), paracetamol (100 mg/kg,i. p.) and control vehicle (5 ml/kg, i. p.) were given intraperitoneally after the 18 h yeast injection when the temperature increase was at its peak. The body temperature was measured at 1 h intervals up to 4 h after administration of drug or plant extracts [13].

Evolvulus nummularis in excised rats

The leaves of Evolvulus nummularis are widely used in Indian folk medicine for treating burns. Hence, the author has made an attempt to study the wound healing activity on animal models to support the tribal claim. For testing the wound healing property, a Excision wound model [14] was selected and the procedure was as follows:

The selected Wister rats were divided into four groups of six in each. The skin hair was removed by using a depilatory cream. Light incisions were made on the cleared surface by cutting the skin of the animals under mild ether anesthesia. The area of the wounds was measured (sq. mm) immediately by placing a transparent polythene graph paper over the wound and then tracing the area of the wound on it. This was taken as the initial wound area reading. All the test samples were applied topically.

Group-I served as control. **Group-II** served as reference to which nitrofurazone (0.2 % w/w in simple ointment) was applied topically. **Group-III** animals were treated with the hydro alcoholic extract (10 %w/w in simple ointment I. P. and the Group-IV animals with the juice of the fresh leaves in a similar manner. All the test samples were applied twice daily. The wound area of each animal was measured on 1st, 4th, 8th, 12th and 15th day. The percentage healing

was calculated from the days of measurements of wound area. The results were presented in table 2.1.2 as Mean± S. E. M. Significance of difference between control and treated groups was determined using Student's t-test.

Table 2.1: Anti-pyretic activity of hydro alcoholic extracts of Evolvulus nummularius

Groups	Initial temp (c) before yeast	Rectal temp after 18 h of yeast injection				
		0 hr	1st hr	2nd hr	3rd hr	4th hr
Control	37.21±0.11	38.16±0.15	38.17±0.1	38.17±0.1	38.16±0.11	38.14±0.11
Standard (Paracetamol) (100 mg/kg)	36.98±0.16	38.09±0.18	37.68±0.07*	37.32±0.07**	37.15±0.03**	36.84±0.05**
Hydroaldholicextract(100 mg/. kg)	36.97±0.1	37.70±0.05	37.53±0.06**	37.38±0.07**	37.18±0.11	36.94±0.1**
Hydroaldholicextract(200 mg/kg)	36.93±0.10	37.48±0.04	37.24±0.14**	37.10±0.10**	37.0±0.08**	36.96±0.12**

Each value represents mean ± S. E. M, n = 6. ∗P < 0.05, ∗∗P < 0.001

Table 2.1.2: Wound healing activity of the leaf hydroalcoholic extract and fresh leaf juice of E. nummularius in excised rats

Group	Treatment	Percentage inhibition of wound on the day of study				
		1 st	4 th	8 th	12 th	15 th
I	Control	0	19.27 + 3.26	46.87 + 5.87	56.28 + 2.48	62.73 + 1.16
II	Nitrofurazone (0.2% w/w)	0	24.69 + 7.84	57.35 + 7.36	86.24 + 0.82	95.16 + 0.33*
III	Hydroalcoholic extract of E. nummularius (10% w/w)	0	20.6 + 5.68	48.24 + 4.78	71.61 + 2.91	87.12 + 1.28*
IV	Leaf juice of E. nummularis	0	22.46 + 6.75	57.26 + 6.46	83.26 + 1.83	94.24 + 0.48*

Results expressed as Mean + SEM from six observations.* P < 0.001 on 15th day of study.

RESULTS AND DISCUSSION

The present result shows that the hydroalcoholc extract of leaf possesses significant anti-pyretic effect in yeast-provoked elevation of body temperature in rats, and its effect is comparable to that of paracetamol (standard drug). Furthermore, the hydroalcoholc extract of E. nummularius also shows significantly reduced normal body temperature The studies on wound healing activity revealed that the nitrofurazone treated animals showed 95.16% healing on 15th day of study. On the other hand, the extract treated group showed 87.12% healing and the leaf juice treated groups exhibited 94.4% wound healing, Thus the present study justifies its using in the indigenous system of medicine and folklore remedies as anti-pyretic and wound healing activity.

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