



ANTI-GRANULOMA ACTIVITY OF THE FRESH LEAVE SAP OF *MUKIA MADERASPATNA*.LINN

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ARTICLE INFO

Article History:

Received 11th May, 2017

Received in revised form 5th

June, 2017 Accepted 6th July, 2017

Published online 28th August, 2017

Key words:

Anti-Granuloma, *Mukia Maderaspatna*, Cotton-Pellets, Leave Sap

ABSTRACT

The study was aimed to evaluate the anti-granuloma activity of the fresh leave sap of *Mukia maderaspatna*. Anti -granuloma this was evaluated using the subcutaneous cotton pellet implantation of cotton pellets-induced granuloma formation in rats. Diclofenac Sodium (25mg/kg) has been used as the drug of reference. The inhibition of granuloma-tissue formation by the fresh leave sap of *Mukia maderaspatna* was found to be statistically Significant ($p < 0.05$). There was lesser weight gain noted in dry granuloma test models compared to the control models. Anti-inflammatory action of the leave sap was comparable to that of the effect of standard, the Diclofenac Sodium. Results of the present study demonstrate that there is considerable anti-granuloma activity in the leaves of *Mukia maderaspatna*.

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INTRODUCTION

Mukia maderaspatana (Linn) (Family- Cucurbitaceae), a well reputed plant drug of traditional medicine found throughout India, China, Taiwan, Malaysia, Australia, New Zealand and in Africa.¹ It is a prostrate or climbing, muchbranched, annual herb with spreading bristle hairs and simple tendrils. The leaves are alternate and broadly triangular in outline. Flowers are small, pale yellow in color. Male flowers are fascicled on very short peduncles while the female flowers are usually solitary and sessile. Fruits are popularly known as berry and are globose-ellipsoid. These are pale green in color with longitudinal cream stripes and turn reddish when ripen.²⁻⁵ Decoctions of leaves of *M. Maderaspatana* have been used for the treatment of livestock diseases such as adenitis, proplasmosis, theileriasis, plague, anthrax, rabies, madness and anaplasmosis.⁶ As there is no work on anti-granuloma activity of the leaves, the present study was focused on to investigate the anti-granuloma potential of the fresh leaf extract of *M. maderaspatana*.

MATERIALS AND METHODS

Materials: The fresh leaves of *Mukia maderaspatana* (Linn) were collected from local areas of Nilaveli, Sri Lanka. It was authenticated at Botany division of Unit of Siddha medicine. The provision of utensils and chemicals were given by the Experimental pharmacology division of Trincomalee Campus.

Drugs: Fresh leave sap of *Mukia maderaspatana* was tested

at the dose of 100mg/kg in each group of experimental models. Diclofenac sodium, a widely used nonsteroidal anti-inflammatory drug (NSAID) was used as the standard drug at a dose of 25 mg/Kg of body weight of rats.

Experimental protocol

Colony bred Wistar male albino rats weighing 175 - 200 g, 10 -12 weeks old were used in the present study. They were randomly divided into three groups. (n=3), namely control group, standard drug group and test drug group.

Group I: Animals administered distilled water 250mg/kg and served as control group

Group II: Animals administered diclofenac sodium, 25 mg/kg, i.p. and served as standard group

Group III: Animals administered fresh leaf sap of *M.maderaspatna*, 250 mg/kg, p.o. and served as test group

Method

The anti-inflammatory activity of the fresh leaf sap was evaluated using cotton pellets-induced granuloma by employing the method of Winter and Porter (1957). Cotton pellets weighing 10 ± 1 mg were sterilized in an autoclave for 30 min at 120 °C under 15 Ib pressure. Granulomatous lesions were induced by surgically implanting two cotton pellets subcutaneously in the dorsal region of the rats, one pellet under each axilla. *M.maderaspatna* fresh leaf sap was administered orally. The rats of the control group were administered with the same volume of vehicle. After 20 min, autoclaved sterile pellets of cotton, weighing 10 ± 1 mg

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each, were aseptically implanted in the interscapular distance under the skin on the previously shaved back of the rats which were anesthetized with thiopental sodium (25 mg/kg, i.p). All drugs doses and vehicle were administered for seven consecutive days. On 8th day the animals were anaesthetized and the pellets together with the granuloma tissues were carefully removed and made free from extraneous tissues. The wet pellets were weighed for the determination of wet weight, and then dried in an incubator at 60 °C for 18 h until a constant weight obtained (all the exudates dried); after that the dried pellets were weighed again. The exudate amount (mg) was calculated by subtracting the constant dry weight of pellet from the immediate wet weight of pellet. The granulation tissue formation (dry weight of granuloma) was calculated after deducting the weight of cotton pellet (10 mg) from the constant dry weight of pellet and taken as a measure of granuloma tissue formation. The percentage inhibition of exudate and granuloma tissue formation were determined.

Statistical analysis

The results are expressed as the mean ± SEM. The results were analyzed for statistical significance using student-‘t’ test. P value of less than 0.05 was considered statistically significance

RESULTS AND DISCUSSION

Table 1 Effects on mean weight of exudates and inhibition of exudates (%) in cotton pellet-induced chronic inflammation in rats.

Group	Treatment (mg/kg)	Weight of granuloma (in mg)	% inhibition of granuloma formation
I	Control	64.13 ± 2.56	-
II	Diclofenac sodium, 25 mg/kg, i.p.	38.42 ± 0.99 ^a	45.29%
III	Fresh leaf sap of <i>M.maderaspatna</i> 250 mg/kg, p.o.	36.00 ± 1.04 ^b	51.72%

Data are expressed as mean ± standard error; n = 6 animals in each group; *significantly different compared to control (P < 0.05); values with non-identical superscripts (a, b) were considered significantly different (P < 0.05).

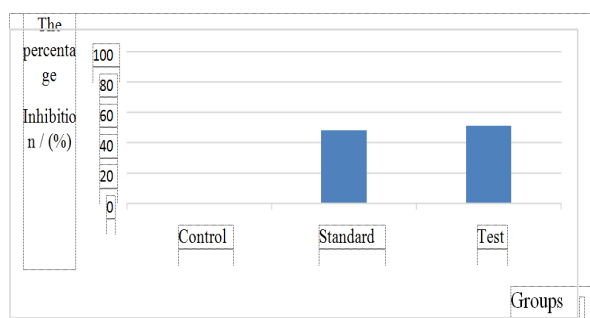


Fig 1 The percentage inhibition of *M.maderaspatna*

The extract has been found to suppress both exudate and granulation tissue formation (Table 1) in the cotton pellet induced model of inflammation in rats. The reduction in the weight of cotton pellet granuloma for standard group, and test group was found 45.29% and 51.72% respectively.

However, the reduction in inflammation by *M.Maderaspatna* 250 mg/kg was more than the drug of reference, the diclofenac sodium, which reduced the weight of cotton pellet granuloma by 51.72%. Cotton pellet granuloma is a model of non-immunological types of inflammation. Efficacy of the leaf sap in this model might be due to an increase in the synthesis of collagen and mucopolysaccharides and increase in the number of fibroblasts needed for granuloma tissue formation. The whole plant of *M.Maderaspatna* is reported to have wide spectrum of alkaloids, flavonoids, saponins and terpenoid⁷. These bioactive compounds posses chemo preventive potential. Hence, the combined action of these active ingredients present in *M. maderaspatana* through their free radical scavenging activity and by inhibition of mediators of inflammation may exert the anti-granuloma activity

CONCLUSION

In conclusion, present study finding Findings of the present study provide a scientific basis for anti-granuloma effect of the fresh leaf sap of *M.maderaspatna*. Further clinical trials using human models are required to confirm the activities before going to investigate this leaf extract as a potential treatment for chronic inflammatory conditions in humans.

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