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Anti-inflammatory activity of *Murraya koenigii* Spreng on experimental animals

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ABSTRACT

The aim of the present study is to evaluate the anti-inflammatory activity of Murraya koenigii leaves. The leaves and roots are bitter, acrid, cooling, anthelmintic, analgesic, it cures piles, allays heat of the body, reduces inflammation and itching. It is also useful in leucoderma and blood disorders. An infusion of the toasted leaves in used to stop vomiting. Crushed leaves are applied externally cures skin eruption and to relieves burn. For screening the activity The male wistar rats having weight (150-200g) were used. The petroleum Ether, chloroform and ethanol extracts were prepared by using soxhlet extraction method. The petroleum ether, chloroform and ethanol extracts of Murraya koenigii were screened at dose of (250mg/kg) for anti inflammatory activity by using acute carrageen induced paw oedema method and yeast induces hyperpyrexia method respectively. The ethanolic extract shows significant effects in anti-inflammatory activity. This study had rationalized the ethanomedicinal use of the plant for cut, injury & alignment of body temperature by treble people.

Key Words: *Murraya koenigii*, anti inflammatory, carrageenan, yeast.

INTRODUCTION

Murraya koenigii spreng. Synonym: *Bergera koenigii* (L.) Roxb.(Rutaceae) commonly known as *kari patta* or *meetha neem* is use to evaluate the anti-inflammatory activity. The roots and leaves are bitter, acrid. This plant use for cooling, anthelmintic, analgesic, piles, allays heat of the body, reduces inflammation and itching. It is also useful in leucoderma and blood disorders. An infusion of the toasted leaves in used to stop vomiting[1]. Crushed leaves are applied externally cures skin eruption and to relieves burn. The pastes of leaves are applied externally to treat the bites of poisonous animals[2].Steam distillate of the leaves can be used as stomachic, purgative, febrifuge and anti emetic[3]. Leaves are applied externally to bruises and eruption[4].

The plant have been reported to possess positive inotropic effect[5] Antidiabetic and cholesterol reducing property[6,7,8]. Antimicrobial, antibacterial and other microbiological Activity[9,10]. Antiulcer Activity[11]. Antioxidative Property, Cytotoxic Activity[12]. The study was undertaken to evaluate the anti inflammatory of *Murraya koenigii* in rats.

MATERIAL AND METHODS

Freshly collected leaves of *Murraya koenigii* from local habitat after authentication were shade dried and powdered to course powder size.

Extraction

The powdered material was subjected to successive hot extraction (soxhlet) with various solvents in increasing order of polarity from Petroleum ether, Chloroform and Ethanol. After the complete extraction, the solvent was distilled off and concentrated on a water bath[13].

Preliminary Phytochemical Screening of extracts

The plants may be considered as biosynthetic laboratory for multitude of compounds like alkaloids, glycosides, volatile oils, tannins, saponins, flavonoids, sugar etc. that exerted physiological effect. These compounds are termed as secondary metabolites. To check the presence or absence of primary and secondary metabolites all the extracts were subjected to a battery of chemical tests [14].

Pharmacological Screening

Animal

Albino rats, Wister strain, of weighing 150-200 gm were used for acute model. Rats were kept in polypropylene cages and fed on standard laboratory diet. The animals were exposed to 12 hours of darkness and light each. The bedding material of cages was changed everyday.

Acute Toxicity Study

Acute toxicity study was carried out according to OECD guidelines. The extracts were suspended in saline. The extracts were given to rats by oral route at a dose level of 500, 1000 and 2500 mg/kg body weight, to groups of 4 animals. After administration of extracts the rats were observed for gross behavioral, neurological, autonomic and toxic effects. The toxicological effects were observed in terms of mortality. No death occurred within 24 h of dose of 500, 1500 mg/kg but at a dose of 2500 mg/kg 50% mortality was observed. As dose was increased further up to 5000 mg/kg, at that dose all the animals were died. Hence 2500 mg/kg dose was considered as LD_{50}. $1/10^{th}$ of the LD_{50} was considered as an effective dose i.e. 250 mg/kg[15].

Assessment of Anti-Inflammatory Activity

Carrageenan Induced Rat Paw Edema Method. [16]

Procedure

Thirty minutes after drug or test compound (extracts) administration, 0.1 ml. of 1% carrageenan in distilled water was injected into the sub plantar region of right hind paws of all groups. A mark was put on the leg at the malleolus to facilitate uniform dipping at subsequent readings. The paw edema volume was measured with the help of plethysmometer at zero hr. (Immediately after injecting carrageenan). The same procedure was repeated at 30 minutes 1, 2, 3 hours. The difference between 1 hours and subsequent hours reading was taken as actual edema volume.

The percentage inhibition of paw edema in the various treated groups was then calculated by using the formula;

Percentage inhibition = (1 – Vt/Vc) X 100
Where Vt = is the edema volume in the drug treated group.
Vc = is the edema volume in the control group.

- Group I : Served as control and received 1ml water.
- Group ll : Treated with Carrageenan only.
- Group Ill : Standard group Ibuprofen 50mg/kg.
- Group IV : Petroleum ether extract 250 mg/kg.
- Group V : Chloroform extract 250 mg/kg.
- Group VI : Ethanol extract 250 mg/kg.

RESULTS

Extraction

Table No.1:- The Percentage Yield of Petroleum Ether, Chloroform and Ethanol

Sr.No.	Solvent	Nature of Extract	Color	%Yield
1	Pet.Ether(40-60˚C)	Semisolid	Greenish black	3.9
2	Chloroform	Semisolid	Dark green	3.1
3	Ethanol	Semisolid	Green	6.3

Table 2: The result of preliminary phytochemical screening of the plant extract.

Plant constituents	Ethanolic Extract	Pet. Ether Extract	Chloroform Extract
Alkaloid	+ve	+ve	+ve
Carbohydrates	-ve	-ve	-ve
Proteins	+ve	+ve	+ve
Tannins	–ve	-ve	-ve
Steroids	+ve	+ve	+ve
Saponins	–ve	-ve	–ve
Amino acids	–ve	-ve	+ve

*+ indicate **Present** and – Indicate **Absent***

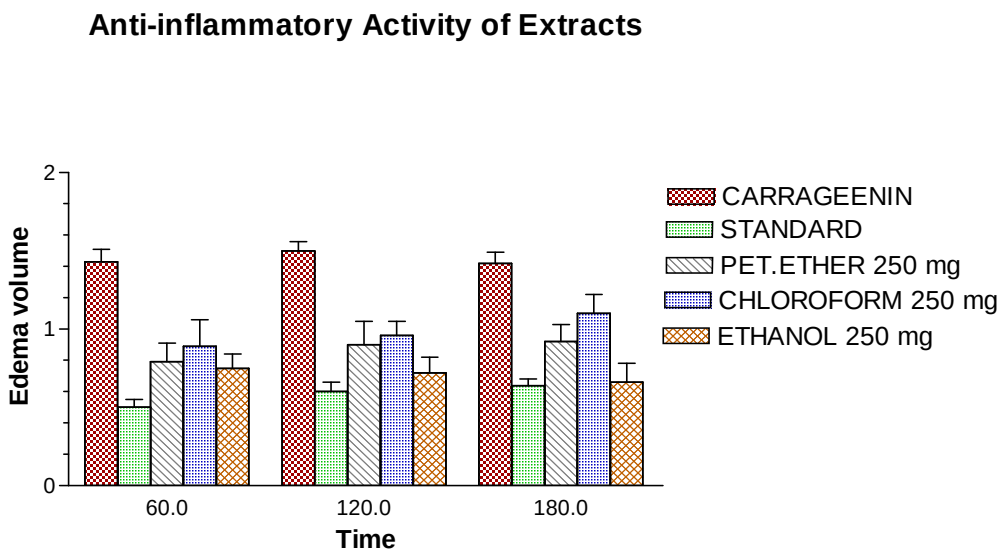
Table No. 3:- Results of Anti-inflammatory activity of extracts

Group No.	Treatment	Dose	1hr	2hr	3hr	Average reading	% Inhibition
			Mean±S.D.	Mean±S.D.	Mean±S.D.		
1.	Carrageenan	0.1mL.1% sol.	1.43±0.08	1.50±0.06	1.42±0.04	1.45	--------
2	Ibuprofen	50mg/kg	0.50±0.05	0.60±0.06	0.64±0.04	0.58	60
3	Pet. Ether extract	250mg/kg	0.79±0.12	0.92±0.15	0.96±0.11	0.89	39
4	Chloroform extract	250mg/kg	0.89±0.17	0.90±0.09	1.10±0.12	0.93	36
5	Ethanol extract	250mg/kg	0.75±0.09	0.72±0.1	0.66±0.12	0.71	52

Evaluation of Anti- inflammatory Activity of Extract

It was observed that Petroleum ether and chloroform extract did not show significant decrease in paw edema volume with respect to corresponding control. The Ethanolic extract gives significantly reduced paw edema volume. Results are given in Table No.2

Histogram No. 1 : Histogram of Anti-inflammatory Activity.
Histogram Showing Effect of Extracts of Leaves of *Murraya koenigii* spreng. on Carrageenan Induced Rat Paw Edema Method



DISCUSSION

The fresh leaves of *Murraya koenigii* was collected from local habitat after authentication were shade dried and powdered to course powder size. The powdered material was subjected to successive hot extraction (soxhlet) with various solvents in increasing order of polarity from Petroleum ether, Chloroform and Ethanol. After the complete extraction, the solvent was distilled off and concentrated on a water bath. The preliminary phytochemical screening of extracts of *Murraya koenigii* shows presence of mucilage, proteins, sterols and Triterpenoids, alkaloids, flavonoids, phenolic compounds. Thus these activities of *Murraya koenigii* could be due to alkaloids, flavonoids and triterpenoids. Albino rats, Wister strain, of weighing 150-200 gm were used for acute model. Acute toxicity study was carried out according to OECD guidelines. The extracts were given to rats by oral route at a dose level of 500, 1000 and 2500 mg/kg body weight, to groups of 4 animals. No death occurred within 24 h of dose of 500, 1500 mg/kg but at a dose of 2500 mg/kg 50% mortality was observed. As dose was increased further up to 5000 mg/kg, at that dose all the animals were died. Hence 2500 mg/kg dose was considered as LD_{50}. $1/10^{th}$ of the LD_{50} was considered as an effective dose i.e. 250 mg/kg. The Carrageenan induced rat paw oedema has been a popular inflammatory model to investigate the anti inflammatory effect of compounds. It has a biphasic effect. The first phase is due to release of histamine and serotonin (5HT) (0-2hr), plateau phase is maintained by kinin like substance (3hr) and second accelerating phase of swelling is attributed to P.G. release (>4hr)[10]. In this study ethanolic extract of *Murraya koenigii* (250mg/kg, p. o.) significantly reduces oedema induced by carrageenan in all the phases. Hence it can be concluded that ethanolic extract of *Murraya koenigii* possess anti inflammatory activity that may be mediated by alkaloids, flavonoids and triterpenoids.

CONCLUSION

In this study ethanolic extract of *Murraya koenigii* (250mg/kg, p. o.) significantly reduces oedema induced by carrageenan in all the phases. Hence it can be concluded that ethanolic extract of *Murraya koenigii* possess anti inflammatory activity.

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