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Evaluation of Carrageenan Induced Anti-Inflammatory & Anti Pyretic Activity of Various Extracts of Bauhina Variegata Linn in Rats

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Original Research Article

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Abstract: The aim of the present study was to explore the probable anti-inflammatory activity of different extracts of Bauhina Variegata Linn using Carrageenan induced inflammation in the mice. Rats were treated orally with normal saline (as control group) and Bauhina Variegata Linn (200 and 400 mg/kg), 60 min before 0.1 mL 1% carrageenan injection. Paw volume was measured before and 1, 2, and 3 h after the injection of carrageenan. The results were expressed as the Mean ±SEM and the statistical significance of differences between groups was analyzed by One Way Analysis of Variance (ANOVA) followed by Dunnett's test. The sub plantar injection of carrageenan caused a time-dependent paw edema in the Rats. Oral administration of Bauhina Variegata Linnextract (200 and 400 mg/kg) inhibited paw swelling dose-dependently at 1, 2, and 3, h after Carrageenan injection. We can conclude from the outcome of the present work that Bauhina Variegata Linnexert an excellent anti-inflammatory effect in the mice.
Keywords: Bauhina Variegata Linn, carrageenan, Subplantar, anti-inflammatory.

INTRODUCTION

Inflammation is defined as the local response of living mammalian tissues to injury due to any agent. It is a body defence reaction in order to eliminate or limit the spread of injurious agent, followed by removal of the necroses cells and tissues. Since time immemorial indigenous plants have been a major source of medicine because of the different components they contain have immense therapeutic value .

The history of inflammation is as old as man's existence in this planet. It is one of the most fundamental response of the cells and tissue to injury. It is essentially a defense reaction but sometimes it over do itself either in intensity or in duration and cause lot of suffering and pain. Steroidal and Non-steroidal anti-inflammatory drugs are available but their prolonged administration is known to be associated with various adverse effects. Herbal drugs have lesser side effects and are largely replacing synthetic drugs.

Plant Profile [1-4]

Bauhinia variegata L (Synonyms: *Phanera variegata* Benth**),** which commonly known as mountain ebony, orchid-tree, poor-man's orchid, camel's foot and Napoleon's hat, belongs to the family Leguminosae. It was planted in garden, park and roadsides as ornamental plant in many warm temperate and subtropical regions. It was native to Southeast Asia and grows in tropical and subtropical climate. All parts of the plant (leaves, flower buds, flower, stem, stem bark, seeds and roots) were used in traditional medicine. It was traditionally used in the treatment of bronchitis, leprosy, and tumors. The stem bark was used as astringent, tonic, anthelmintic and antidiabetic. Infusion of the leaves was used as a laxative and for piles. Dried buds were used in the treatment of worm infestations, tumors, diarrhea, and piles.

Experimental Procedure

Anti-inflammatory activity

Carrageenan Induced Rat Paw Edema

The method of Winter *et al*. [13] was used to study acute inflammation. Ten groups of six rats in each group were treated with vehicle, various extracts (100,200 and 400mg/kg, p. o.), standard (50 and100mg/kg, p .o.) onehour prior to Carrageenan injection. 0.1ml of 1% Carrageenan was injected into the sub plantar tissue of left hind paw of each rat[5].

Swelling of Carrageenan injected feet were measured at 0, 1, 2, 3,4hr using Plethysmometer (Ugo Basile, Italy).

MATERIAL & METHODS

- Animals: Wistar albino rats of both sexes (180 to 200g)
- Chemicals: CMC and Diclofenac
- Equipment: Plethysmometer

Anti-Pyretic Activity

Yeast induced pyrxia

Pyrexia was induced by subcutaneous injection of 20 % w/v of brewer's yeast (10ml/kg) in distilled water. Basal rectal temperature was measured before the injection of yeast, by inserting digital clinical thermometer to a depth of 2 cm into the rectum. Therise in rectal temperature was recorded 19 h after yeast injection. Paracetamol 150mg/kg body weight was used as the standard antipyretic drug. Rectal temperature of animals was noted at regular intervals following the respective treatments. The temperature was measured at 1st, 2nd, and 3rd hour after drug administration [7-12].

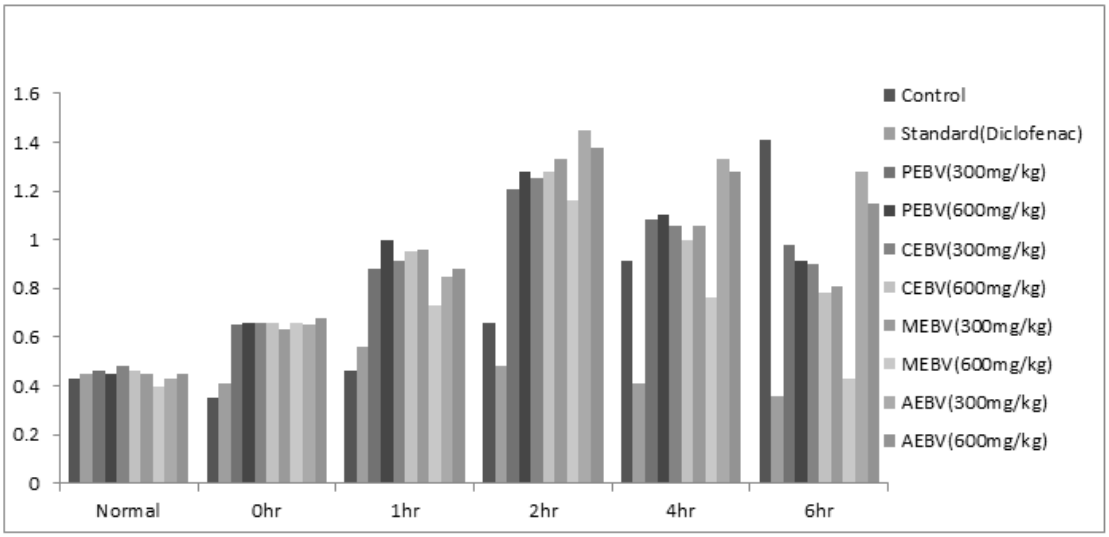
MATERIALS & METHOD

- Animals : Wistar albino rats of both sexes weighing 180-200g.
- Chemicals: 0.5% CMC, 15% aqueous solution of Brewer's yeast, Saline solution, Paracetamol
- Equipment: Digital Tele thermometer (Hartmann, Germany).

RESULTS & DISCUSSION

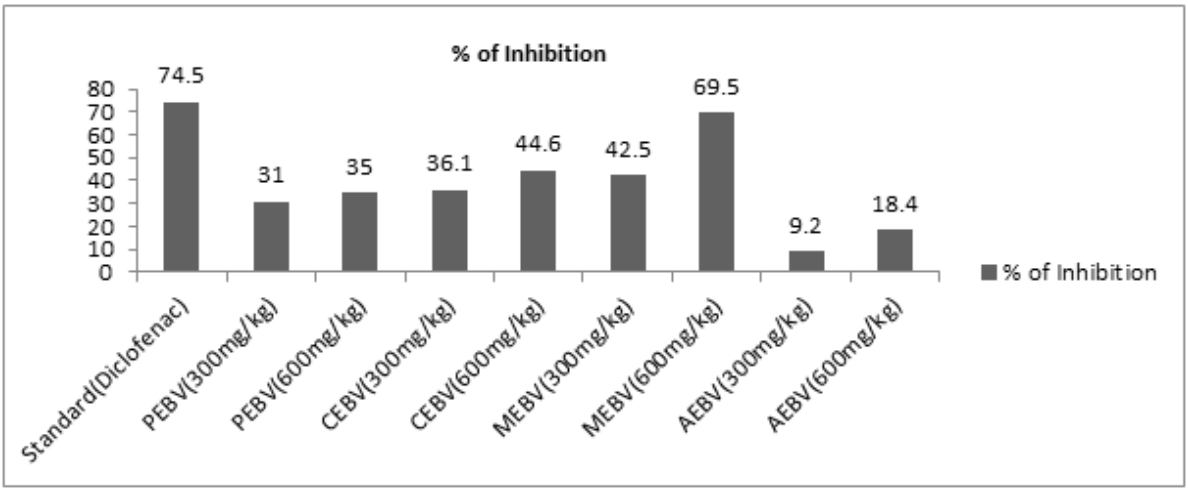
Table−1: Effect of leaf extracts of *Bauhinia variegate* on paw oedema induced by Carrageenan in rats.

Group	Mean Paw volume differences (ml)					
	Normal	0hr	1hr	2hr	4hr	6hr
Group I	0.43±0.05	0.35±0.02	0.46±0.02	0.66±0.02	0.91±0.03	1.41±0.09
Group II	0.45±0.06	0.41±0.02	0.56±0.02	0.48±0.03	0.41±0.02	0.36±0.02(74.5)
Group III	0.46±0.03	0.65±0.03	0.88±0.05	1.21±0.05	1.08±0.08	0.98±0.07(31)
Group IV	0.45±0.05	0.66±0.05	1±0.09	1.28±0.05	1.1±0.07	0.91±0.11(35)
Group V	0.48±0.03	0.66±0.02	0.91±0.05	1.25±0.03	1.06±0.05	0.9±0.08(36.1)
Group VI	0.46±0.05	0.66±0.04	0.95±0.04	1.28±0.06	1±0.07	0.78±0.07(44.6)
Group VII	0.45±0.05	0.63±0.03	0.96±0.03	1.33±0.02	1.06±0.08	0.81±0.06(42.5)
Group VIII	0.4±0.02	0.66±0.03	0.73±0.03	1.16±0.06	0.76±0.05	0.43±0.04(69.5)
Group IX	0.43±0.05	0.65±0.04	0.85±0.04	1.45±0.06	1.33±0.08	1.28±0.1(9.2)
Group X	0.45±0.06	0.68±0.05	0.88±0.03	1.38±0.03	1.28±0.09	1.15±0.11(18.4)



Fig−1: Anti-Inflammatory activity of leaf extracts of *Bauhinia variegate* on paw oedema induced by Carrageenan in rats.

X-axis: Time at which the recordings are taken
Y-axis: Mean paw volume in cm^3

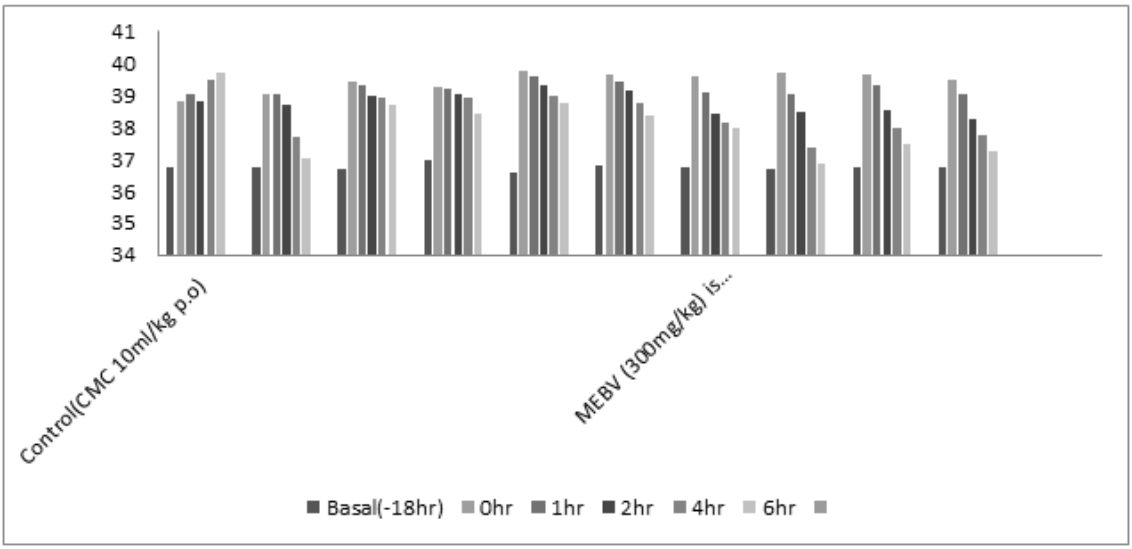


Fig−2: Percentage of inhibition of different leaf extracts of *Bauhinia variegate*

- Maximum inhibition was found at 6th hr by the methanolic extract of 600mg/kg

Table−2: Effect of leaf extracts of *Bauhinia variegate* on rectal temperature for anti-pyretic activity

Group	Mean rectal temperature (in ^{o}C)					
	Basal(-18hr)	0hr	1hr	2hr	4hr	6hr
Group I	36.75±0.12	38.81±0.07	39.03±0.12	38.83±0.07	39.51±0.1	39.71±0.06
Group II	36.73±0.11	39.06±0.14	39.01±0.11	38.7±0.14	37.7±0.27	37±0.09
Group III	36.68±0.13	39.43±0.11	39.31±0.1	38.98±0.11	38.91±0.23	38.7±0.22
Group IV	36.98±0.1	39.28±0.15	39.23±0.11	39.03±0.15	38.91±0.11	38.41±0.05
Group V	36.58±0.16	39.78±0.06	39.58±0.08	39.33±0.1	38.96±0.05	38.73±0.05
Group VI	36.83±0.13	39.63±0.1	39.41±0.01	39.13±0.09	38.73±0.12	38.36±0.08
Group VII	36.75±0.14	39.6±0.08	39.11±0.04	38.4±0.06	38.16±0.09	38±0.06
Group VIII	36.68±0.13	39.7±0.13	39.05±0.14	38.46±0.17	37.35±0.12	36.85±0.11
Group IX	36.76±0.15	39.66±0.13	39.33±0.10	38.55±0.11	37.98±0.11	37.48±0.17
Group X	36.73±0.15	39.51±0.12	39.06±0.10	38.26±0.11	37.76±0.08	37.25±0.11



Fig−3: Anti-Pyretic activity of leaf extracts of *Bauhinia variegate*

- Methanolic and aqueous extracts produced significant antipyretic activity and Petroleum ether and chloroform extracts shows moderate effect.

CONCLUSION

Methanolic and chloroform extracts of leaves of the plant have shown significant anti-inflammatory activity when compared to the control group animals. Methanolic extract has more activity than the chloroform extract.Pyrexia has been induced by giving brewer's yeast subcutaneously. Methanolic and aqueous extracts of the plant showed significant reduce in the increased temperature rather than the other groups when compared to the control group animals.

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