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Research Article

Isolation of Phytochemical and Evaluation of Antiasthmatic Potency of *Ficus racemosa*

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ABSTRACT

The Present study reports important secondary metabolites present in *Ficus racemosa*. The *Ficus racemosa* belong to the family Moraceae, it is popularly known as Glomerata, Cluster fig tree as well as 'Udumbara' in Marathi. Various plant parts such as bark, root, leaf, fruits are used as astringent, carminative, anti-dysentery, diabetes, leucoderma, antiasthmatic, hepatoprotective, antioxidant. The powdered Bark was subjected for extraction by using ethanol. These extract were evaluated for detection of various secondary metabolites, like Steroids, Glycosides, tannins, Terpenoids, Alkaloids, Flavonoids. This work evaluated the stem bark of this plant for its Phytochemical and Antiasthmatic activity.

Keywords: *Ficus racemosa*, Steroids, Antiasthmatic, Moraceae

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INTRODUCTION

Medicinal plants are of great importance in the field of medicine and cure of diseases. Practical experience and several modern research studies have shown that therapy using plant is better than using synthetic chemicals. There is still large number of medicinal plant in which all active constituents have not yet been investigated even though their medicinal effect is established by folklore and traditional system of medicine¹.

The present definition of asthma is a chronic inflammatory disease of the airways with reversible type of airway obstruction, either spontaneously or with therapy.

Asthma is a complex disease characterized by bronchial hyperresponsiveness, inflammation, mucus production and intermittent airway obstruction².

In susceptible individual, inflammation causes recurrent episodes of wheezing, breathlessness (shortness of breath), chest tightness & coughing, particularly at night or early in the morning, otherwise after exposure to an allergen, cold air, exercise and when emotional³.

MATERIAL AND METHODS

Collection : Fresh sample of bark of *Ficus racemosa* were collected from Ahmednagar district, Loni, cleaned and dried at room temperature in shade, away from direct sunlight and

coarsely powdered in grinder and powder material was passed through 120 mesh to remove fine powders and coarse powder was used for extractions.

Authentication: Mr. C.R. Jadhav, Botanists, Botanical Survey of India, Koregaon Road, Pune, authenticated plant by comparing morphological features and a sample voucher specimen of plant was deposited for future reference (BSI/WRC/IDEN.CER./2019/H3).

Extraction: The bark of *Ficus racemosa* was collected and dried in the shade. Then the dried material is pulverized in grinder. The powdered material was passed through 120 mesh sieve to remove fine powder and coarse powder was used for extraction⁴.

Animals: Male albino mice (Swiss strain) weighing 25-28 g were housed under standard laboratory conditions, in groups of six each. The animal had free access to food and water. The ethical committee of the institute approved the protocol of the study.

Drugs and Chemicals: The following drugs and chemicals were used. Drugs: Clonidine (Unichem, India) and Chlorheniramine maleate purchased from commercial source.

Chemicals: Ethanol AR, tween 80 AR.

Antiasthmatic activity:

Species & Strain: Mice

Gender: Either sex

Swiss albino mice will be divided into three groups (n=6) as follows:

Group I: Vehicle control [Maintained on regular mice food and drinking water *ad libitum* and received distilled water (0.5 ml/100 gm p.o.)]

Group II- Standard

Group III: Ethanol extract

Statistical Analysis: The data is presented as mean \pm SEM. The data was analyzed by one-way ANOVA followed by Dunnett's test. Prism Graph pad 3 was used for statistical analysis. * P<0.05 was considered significant.

1) Clonidine induced catalepsy in mice

Albino mice Will be divided into Three groups (n=6).Control group received distilled water (10ml/kg) and Standard group received chlorpheniramina malate (10mg/kg, i.p.). And group 3rd will be received single dose of ethanolic extract. All the groups will be received Clonidine (1g/kg s. c.)1 hr after the drug administration and the duration of catalepsy will be measured at (15,30, 60, 90, 120, 150 and 180 min)^{5,6}.

2) Mast cell Degranulation

Mice will be divided in three groups,(n=6).the 3 days drug treatment schedule will be followed. Control group will be received distilled water (10ml/kg, p. o.)and Standard group was treated with Disodium cromaglycate (0.5mg/kg, I.p.) Group-3rd will be treated with ethanolic extract of *Ficus racemosa* (100mg/kg p.o.). On 4th day, each animal will be injected with 4ml/kg 0.9% Nacl solution into peritoneal cavity. The abdomen will be gently massaged for few mints. The peritoneal cavity will be carefully opened and fluid containing mast cells will be aspirated and collected in test-tube containing 8ml of animal cell culture media RPMI-1640 buffer solution (7.2-7.4).The mast cell will be then washed with same buffer solution centrifugation at a speed of 400-500 rpm and the pellet of mast cells will be collected. Then 0.5 μ g/ml clonidine solution will be added to the mast cell suspension and incubated at 37°C in a water bath in 10 min. Later day will be stained with 1% toluidine blue die and observed under high power microscope(400X). Total 100 cells will be counted from different visual areas and percent protection against clonidine induced mast cell degranulation will be calculated^{7,8}.

RESULT

1) Clonidine induced catalepsy in mice

Table No. 1): Effect of various extracts of *F. racemosa* bark (10 mg/kg, p.o.) on clonidine-induced catalepsy in mice.

Group	Duration of catalepsy (sec) at Mean \pm SEM							
	0 min	15 min	30 min	60 min	90 min	120 min	150 min	180 min
Control	24.6 \pm 0.19	24.4 \pm 0.20	24.8 \pm 0.18	25.2 \pm 0.20	25.3 \pm 0.29	25.4 \pm 0.23	25.5 \pm 0.23	25.7 \pm 0.20
Standard	27.8 \pm 0.24***	27.6 \pm 0.38***	30.3 \pm 0.31***	29.6 \pm 0.19***	28.2 \pm 0.42***	36.7 \pm 0.18***	36.8 \pm 0.40***	37.3 \pm 0.39***
Test	25.8 \pm 0.31***	26.5 \pm 0.37***	28.9 \pm 0.24***	28.1 \pm 0.26***	26.6 \pm 0.27*	34.8 \pm 0.31***	35.1 \pm 0.33***	36.0 \pm 0.61***

All the data are expressed as mean \pm SEM, n=six, Control = Vehicle, d.w. (10 ml/kg, p.o.). Std. = Chlorpheniramine maleate (10 mg/kg, I.p.). Test= Ethanolic extract of *Ficus racemosa* (10 mg/kg, p.o.). = Ethanolic extract of *Ficus racemosa* Statistical analysis done by using ANOVA followed by Dunnett's test. ***P< 0.001 considered significant compared to control group.

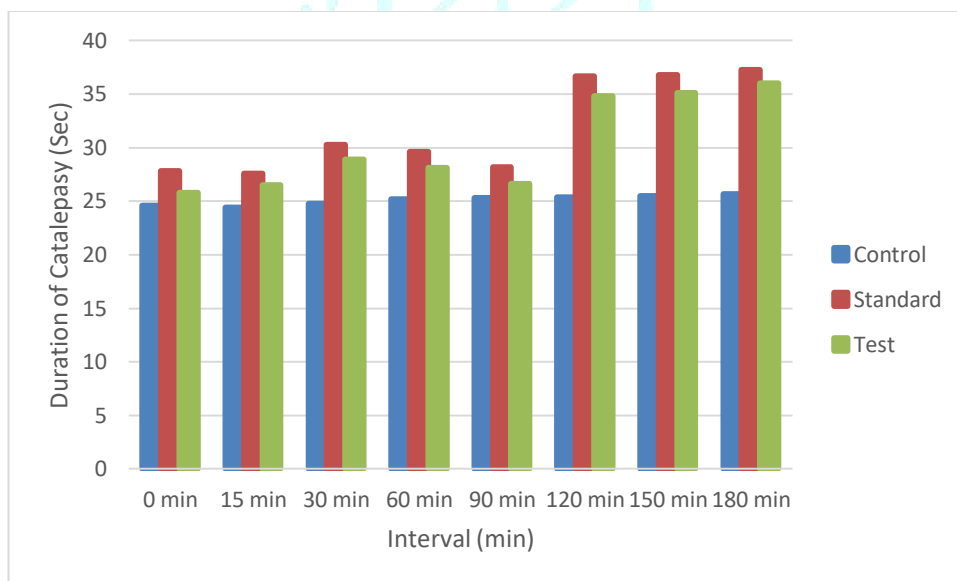


Figure 1). Effect of various extracts of *Ficus racemosa* bark (10 mg/kg, p.o.) on clonidine-induced catalepsy in mice.

All the data are expressed as mean \pm SEM, n=six in each group. ***P< 0.001 compared to control (One way ANOVA followed by Dunnett's test).Where; ETE - Ethanolic extract.

2) Mast cell Degranulation

Table No. 2) Effect of Ethanolic extract of *Ficus racemosa* on mast cell degranulation in mice.

Groups	% of complete granulation	% of partial of incomplete granulation	% of non granulation
Control	28	24	48*
Standard	22	20	58
ETH(100)	29	23	47

n = 5, Values are in Mean \pm SEM. Control = Vehicle, d.w. (10 ml/kg, p.o.). Std. = Disodium cromaglycate (10 mg/kg, p.o.). = Ethanolic extract of *Ficus racemosa* (10 mg/kg, p.o.). Statistical analysis done by using ANOVA followed by Dunnett's test.

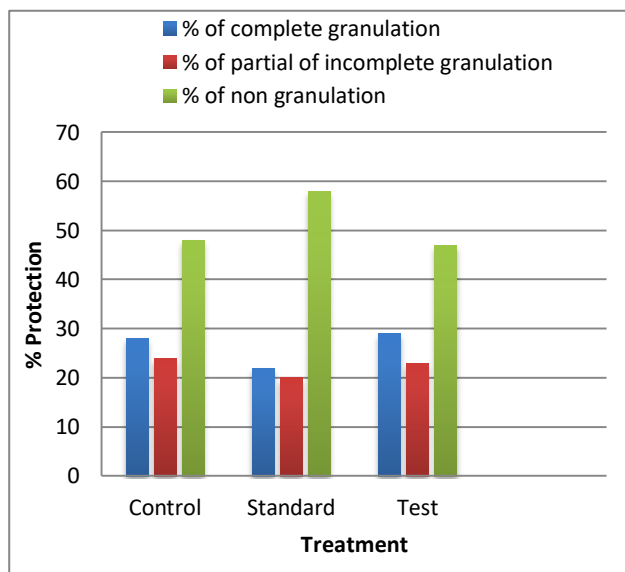


Figure 2). Effect of various extracts of *Ficus racemosa* bark (10 mg/kg, p.o.) on Mast cell degranulation in mice.

DISCUSSION

Antihistaminic, anti-allergic, stabilizing mast cell and characteristics of bronchorelaxation are crucial in drug for the therapy of asthma⁹. Thus, appropriate models have been used in this research to screen the extracts for the above mentioned characteristics¹⁰.

The ethanolic extract significantly inhibited the clonidine induced catalepsy. The inhibition of clonidine induced catalepsy by *Ficus racemosa* may be due to the potential to antagonize H1 receptor or inhibition of mast cell degranulation induced by clonidine¹¹.

Present study showed dose dependent statistically significant stabilization of mast cell by ethanolic extract of *Ficus racemosa*.

CONCLUSION

As the Ethanol extract of *F.racemosa* Bark is having Clonidine-induced catalepsy and mast cell stabilizing property, it can be used in the treatment asthma¹². β -sitosterol was identified from the Ethanol extract having antiasthmatic activity so we can say that the antiasthmatic activity of *F.racemosa* bark is may be due to presence of β -sitosterol.

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