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Research article

STUDY OF ANTIPYRETIC ACTIVITY OF *Scaevola taccada* Roxb LEAF EXTRACT

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ABSTRACT

In the present investigation preliminary phytochemical screening leaves extract of *Scaevola taccada* revealed the presence of alkaloids, flavonoids, lipids, terpenoids, glycosides and saponins. The antipyretic activity of ethanolic and aqueous extract of leaves of *Scaevola taccada* was evaluated in albino rats. The ethanolic and aqueous extracts was showed significant activity against yeast induced pyrexia. The antipyretic effects of the extracts were comparable to that of standard drug (paracetamol 150 mg/kg).

Key words: *Scaevola taccada* Roxb, Phytochemistry, Anti-pyretic activity, Yeast Induced Pyrexia Method.

INTRODUCTION

Scaevola taccada Roxb belongs to the family Goodeniaceae, in vernacular language it is known as vellamuttagam, found in sea coasts of all around India and in the Andaman Islands. The ethno pharmacology of the leaves revealed the uses of digestive, carminative, antitumour and antiinflammatory properties. Fruit juice internally used to induce menstruation. The roots are used for dysentery. A decoction of the leaves and the bark was reported to combat tachycardia, one of the principal symptoms of beriberi. The drug reduces the frequency of heart beat, slow down the pulse rate and stimulates the heart for normal contraction. It exhibits diuretic property by increasing the tension in the renal arteries without causing irritation of the kidney parenchyma and used for dropsy. The phytochemical studies of aerial part of the plant revealed the presence of loganin, sylvestroside-III, dimethyl

acetal, cantleyoside and its dimethyl acetal compounds.¹

Spreading freely branching shrub with thick stems, up to 3m in height. Leaves opposite, short-petiolate, fleshy, glossy, light-green, obovate, variable in size, but usually about 15 cm long and 5 cm wide. Flowers white, zygomorphic, moderate sized, 5-lobed, borne on few flowered axillary inflorescences. Fruit a white juicy, globose drupe containing 1-2 seeds.²⁻⁴

Plant is reported to have Chemical constituents of scaevolin, chlorogenicacid, saponins, glycosides, lipids(seeds),alkaloids. Liquid from the leaves is used to treat weakness after childbirth which leads to pneumonia. The roots are used to treat stomachache. A decoction of the bark and leaves is used to treat a relapse after an illness. The juice from the bark is used in treating ringworm. The roots are used to treat beri-beri, syphilis and dysentery. Parts of the plant are used to treat coughs, tuberculosis and stings from the stingray⁵.

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Scaevola species have been used in various traditional medicines. They are usually prepared in decoction form. However some are used as an application on the surface. Different parts of the plant are used to treat various illness, diseases or wounds. The crushed fruit of *Scaevola taccada* has been used by early settlers to treat tinea. It is said that the leaves were taken when having indigestion. They are also used in a poultice to cure headache. In addition there are also reports indicating the use of leaf decoction and the flesh of the seeds as a contraceptive. The juice from ripe fruit has been used to treat sores and infected eyes whereas a combination of juices from ripe fruit and stem has been used as a remedy for bites and stings. This plant has also been used as a dermatological aid in Hawaii. A mixture of pounded root bark with salt is used for cut and skin diseases. In Indonesia the root is used as an antidote when poisonous fish and crabs are consumed⁶.

Based on the above information the present study was carried out to evaluate the antipyretic activity of the leaves of this plant in an experimental animal model using rats.

MATERIALS AND METHODS

Preparation of the plant extract

The leaves of the plant was dried under shade at 27-30°C for 30 days and the plant material was grounded into coarse powder. The powder was extracted with ethanol by continuous hot percolation by using soxhlet apparatus⁷. The extract was filtered, concentrated and dried under reduced pressure using a rotary evaporator.

Preliminary Phytochemical Screening

Extract was subjected to Preliminary phytochemical screening followed by standard methods showed the presence of alkaloids, flavonoids, glycosides, terpenoids, lipids and saponins^[7,8].

Animals used

Adult Albino rats of both sexes weighing between 120-180g, provided with standard diet and water *ad-libitum*, maintained under standard laboratory conditions were used for the study. The animal experiment was performed according to the institute's ethical committee approval and guidelines

(Registration No. 1525/PO/a/11/CBCSEA, PGP College of Pharmaceutical Science and Research Institute, Namakkal, Tamilnadu state, India).

Antipyretic activity

Yeast Induced Pyrexia Method⁹⁻¹⁰

A suspension of Brewer's yeast (15%) in saline (0.9%) was prepared. Six groups each containing 6 rats of either sex were taken. The thermocouple was inserted 2 cm deep into the rectum and the rectal temperatures were recorded. After measuring the basal rectal temperature, the animals were febrer by injection of brewer's yeast suspension (10 mg/kg) subcutaneously in the back below the nape of the neck. The sight of injection was massaged in order to spread the suspension beneath the skin. Immediately after yeast administration, food was withdrawn, and the animals were returned to their housing cages. After 19hrs of yeast injection the rise in rectal temperature was recorded. The dose of the test compound and standard drug was given orally. The rectal temperature was recorded again after 1, 2, 3 and 4 hrs. Paracetamol (150 mg/kg) was selected as a standard drug. The various extracts were dissolved in saline with the help of Gum acacia (2% w/v). Thereafter treatment was carried out as follows,

Group I: Control – Normal saline.

Group II: Paracetamol (150mg/kg)

Group III: Alcoholic extract of *Scaevola taccada* (200mg/kg,p.o)

Group IV: Alcoholic extract of *Scaevola taccada* (400mg/kg,p.o)

Group V: Aqueous extract of *Scaevola taccada* (200mg/kg,p.o)

Group VI: Aqueous extract of *Scaevola taccada* (400mg/kg,p.o)

Statistical analysis

Data is expressed as mean±standard error of means. Statistical analysis was made by using the difference between experimental groups was compared by one-way analysis of variance (ANOVA) followed by Newman-Keuls test.

Results and Discussion

Subcutaneous injection of Brewer's yeast induces pyrexia by increasing the synthesis of prostaglandins. It is considered as a useful test for the screening of

plants materials as well as synthetic drugs for their anti-pyretic effect. Yeast induced pyrexia is called pathogenic fever and its etiology could be the production of prostaglandins. The inhibition of prostaglandin synthesis could be the possible mechanism of antipyretic action as that of paracetamol and the inhibition of prostaglandin can be achieved by blocking the cyclo-oxygenase enzyme activity. There are several mediators for pyrexia and the inhibitions of these mediators are responsible for the anti-pyretic effect¹¹.

The effect of extract of *Scaevola taccada* leaves on yeast-induced pyrexia has been shown in table-1. Treatment with the leaves extract at the doses of 200

and 400 mg/kg of body weight and the paracetamol decreased the yeast-induced elevation of temperature in rats. The results thus obtained from both the standard group and leaves extract treated groups were compared with the control group. The significance in reduction of yeast elevated rectal temperature was observed in all the groups.

The present results showed that the ethanol extract of *scaevola taccada* leaves possess a significant antipyretic effect in yeast provoked elevation of body temperature in rats and it exhibit moderate antipyretic effect when compared with standard drug paracetamol.

Figure 1: Antipyretic activity by Yeast Induced Pyrexia Method

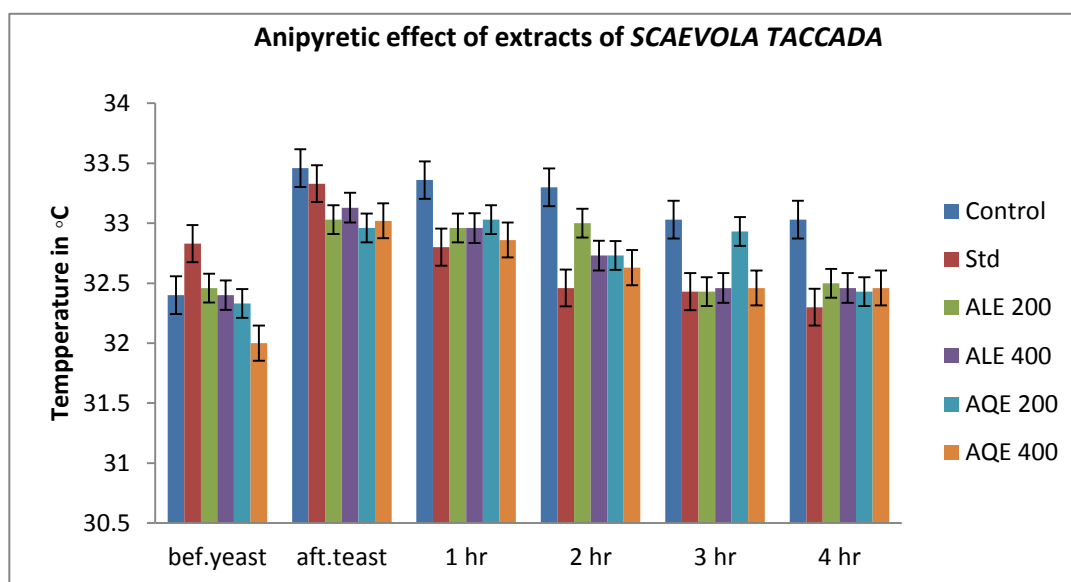


Table 1: Antipyretic activity by Yeast Induced Pyrexia Method

Drug dose	Before yeast	After yeast	After drug administration			
			1 hr	2 hr	3 hr	4 hr
Control	32.4±0.05	33.46±0.06	33.36±0.08	33.3±0.05	33.03±0.08	33.03±0.06
Std Paracetamol (150mg/kg)	32.83±0.03	33.33±0.23	32.8±0.11	32.46±0.14*	32.43±0.08*	32.3±0.05**
ALE 200	32.46±0.12	33.03±0.08	32.96±0.08	33±0.11	32.43±0.08*	32.5±0.05**
ALE 400	32.4±0.10	33.13±0.03	32.96±0.08	32.73±0.08	32.46±0.08*	32.46±0.12**
AQE 200	32.33±0.12	32.96±0.08	33.03±0.03	32.73±0.12*	32.93±0.06	32.43±0.03**
AQE 400	32±0.15	33.02±0.12	32.86±0.13*	32.63±0.12*	32.46±0.08*	32.46±0.03**

All values were expressed as mean±S.E.M of six rats at each group. Values are statistically significant at P<0.001*** P<0.01** P<0.05*

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