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Antipyretic activity of Chloroform extracts of *Geniosporum prostratum* (L) Benth.

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Geniosporum prostratum (L) Benth belongs to family Lamiaceae grow only in Tamil Nadu. It is traditionally used for relief from fiver. Beta sitoserol is a chemical constituent of this plant it is responsible for Antipyretic activity. It has not yet been studied antipyretic Activity. The aim of the present research work is to study the Antipyretic Activity. The chloroform extract produced significant ($P < 0.05$) antipyretic effect in boiled milk induced pyrexia in rabbit model. At a dose of 500 mg/kg and 1000 mg/kg body weight, temperature reduced 39.12 ± 0.14 and 39.22 ± 0.15, respectively, of elevated rectal temperature compared to aspirin (39.1 ±0.07 after 3 h).

Key Words

Geniosporum prostratum, Antipyretic, Beta sitoserol.

Introduction

Geniosporum prostratum (L) Benth Belongs to Lamiaceae family and is found on sandy ground in Deccan peninsula, especially near the coast grow only in Tamil Nadu. It is known as nazel-nagai, Bhutulasi in Tamil and is reported to have febrifugal properties (wealth of India). This plant has three chemical component (1) b- sitoserol (2) ursolic acid (3) 5-0 demethylnobiletin. **(Natarajan R.K et al., 1984).** Beta sitoserol is responsible for Antipyretic and Anti inflammatory Activity. And also use in Treatment of male hair loss, prostatic hypertrophy (BPH), prostatic carcinoma **(Dr Stephen B et al., 2008),** breast cancer **(Awad, AB et al., 2008).**

The whole plant have traditionally used as-

(a) 100 gm of fresh leaves squeezed and obtained juice .10-15 ml juice taken orally twice in a

day for 30-40 days to get relief from asthma.

(b) Leaf decoction taken orally to get relief from fiver.

(c) Plant considered as febrifuge. **(Bharath Kumar et al., 2002)**

Antipyretics from the Greek anti, against, and pyreticus, pertaining to fever are drugs or herbs that reduce fever. They will not normally lower body temperature if one does not have a fever. Antipyretics cause the hypothalamus to override an interleukin-induced increase in temperature. The body will then work to lower the temperature and the result is a reduction in fever.

Most antipyretic medications have other purposes. The most common antipyretics in the United States are ibuprofen and aspirin, which are used primarily as pain relievers. Non-steroidal anti-inflammatory drugs (NSAIDs) are antipyretic, anti-inflammatory, and pain relievers. There is some debate over the appropriate use of such medications, as fever is part of the body's immune response to infection.

The effectiveness of acetaminophen (paracetamol) alone as an antipyretic in children is uncertain with some evidence showing it is no better than physical methods. **(Meremikwu M. et al., 2002)** Therapies involving the combination of acetaminophen and aspirin, or alternating doses of acetaminophen and ibuprofen have shown somewhat greater antipyretic effect than acetaminophen alone. **(E. Michael Sarrell et al., 2006)**

Treatment with antipyretics has been very important in the pre-antibiotic era. Nevertheless, for treatment of acute viral diseases and for treatment of protozoal infections like malaria reduction of elevated body temperature by antipyretics is still necessary. An antipyretic activity is regarded as a positive side effect. To evaluate these properties, fever is induced in rabbits or rats by injection of Boiled Milk.

The subcutaneous injection of Boiled Milk is known to produce fever in Rabbit. A decrease in temperature can be achieved by administration of compounds with antipyretic activity.

Groups of 6 male or female Wistar rats with a body weight of 150 g are used. By insertion of a thermocouple to a depth of 2 cm into the rectum the initial rectal temperatures are recorded. The animals are fevered by injection of 10 ml/kg of Boiled Milk suspension subcutaneously in the back below the nape of the neck. The site of injection is massaged in order to spread the suspension beneath the skin.

The room temperature is kept at 22–24 °C. Immediately after yeast administration, food is withdrawn. 18 h post challenge, the rise in rectal temperature is recorded. The measurement is repeated after 30 min. Only animals with a body temperature of at least 38 °C are taken into the test. The animals receive the test compound or the standard drug by oral administration. Rectal temperatures are recorded again 30, 60, 120 and 180 min post dosing. **(H. Gerhard Vogel et al., 2002)**

Material and Method

Plant Material

Plant *Geniosporum prostratum* was collected from Cheranmadevi, Tirunelveli district, Tamil Nadu, with the help of a local herbalist and identified by V. Chelladurai Ex. Research Officer- Botany central council for Research in Ayurveda & Siddha Govt. of India .The leaves were air-dried and ground into powder.

Preparation of Chloroform extract

The powder materials were defatted with Hexane by cold percolation method .Then extracted with Chloroform in a Soxhlet apparatus. The extraction was continued for 72 h at 65 ºC. The extract was filtered through filter paper. The filtrate was concentrated under reduced pressure at 50 ºC and green mass was collected.

Animals

The experiment was carried out on albino rabbits of both sexes, weighing of rabbit between 1.5. They were collected from MJRP College of healthcare and allied science, Jaipur. The animals were fed ad libitum with cauliflower, cabbage, banana diet and had free access to water. Food and water were withdrawn 6 h prior to the experiment. Animals used for experimental work are procured by animal house (1422/PO/a/11/CPCSEA/PN 02) of MJRP University.

Antipyretic

The experiment was carried out on albino rabbits have both sex weighing between 1.5 and 1.6 kg the rabbits were kept in iron cages to adjust to the environment, and fed with cauliflower, cabbage, banana, and tap water for 40 days before the experiment. Food and water were withdrawn 6 h prior to the experiment. The animals were grouped as.

a. Experimental groups: 4 groups; receiving chloroform extract (2 doses; 500 and 1000 mg/kg).

b. Control groups were: i. Aspirin group (+Ve Control): Receiving standard antipyretic agent aspirin.

ii. Solvent group (-Ve Control): receiving solvent (used).

Aspirin as Disprin soluble tablet was obtained from a local market of Reckitt Benckiser (Bangladesh) Ltd and used as an antipyretic agent. The standard solution was prepared by dissolving the tablet in the solvent to obtain 15 mg aspirin per 2 ml solution. The dose of aspirin was maintained at 10 mg/kg body weight.

Before the experiment, rectal temperatures of the rabbits were recorded by inserting a well lubricated bulb of a thermometer in to the rectum. Care was taken to insert it to the same depth each time (about 6 cm). Milk was collected from local cattle.

Rabbits were injected with boiled milk at room temperature at the dose of 0.5 ml/kg body weight to induce pyrexia. Induction of fever took about 1 to 2 h. Then the solvent (2 ml) was given on the negative control group, the known antipyretic agent aspirin solution (2 ml) was given on the positive control group and each

sample solution (2 ml) was given to the corresponding experimental group. Oral route was used to administer boiled milk, aspirin solution, solvent, and sample solutions. Finally, rectal temperatures were recorded at 1 h intervals up to 3 h.

Result And Discussion

According to literature chemical constituent of *Geniosporum Prostratum* have reported to have anti pyretic activity. Hence based on these studies *Geniosporum Prostratum* are very likely to possess *a*nti pyretic activity.

Groups	Dose	Rectal temperature		Rectal temperature after treatment (ºC)			
		Normal	3h after boiled milk admin	30min	60 min	90 min	120 min
Control	2 ml/rabbit	38.88 ±0.16	40.46±0.22	40.72±0.29	40.74±0.32	40.06± 0.26	39.68±0.07
Asprin	10 mg/kg	39.22±0.16	40.52±0.22	39.42±0.09	39.32±0.05	39.16± 0.08	39.1±0.1
CEGP 500mg/kg	500mg/kg	39.26±0.13	40.24±0.20	39.6±0.11	39.24±0.12	39.14± 0.11	39.12±0.14
CEGP 1000mg/kg	1000mg/kg	39.16±0.14	40.46±0.26	39.44±0.09	39.26±0.09	39.22± 0.11	39.22±0.15

Table 1: Effect of Chloroform extract of *Geniosporum Prostratum* on boiled milk induced pyrexia in rabbit.

CEGP= Chloroform extract of Geniosporum Prostratum

Values are expressed as mean ± SEM.

Statistical analysis:

Rectal temperature after treatment (ºC) after 30 min

One-way analysis of variance

P value	0.0001		
P value summary	***		
Are means signif. different? (P < 0.05)	Yes		
	SS	df	MS

ANOVA Table			
Treatment (between columns)	5.802	3	1.934
Residual (within columns)	2.248	16	0.1405
Total	8.050	19	

Rectal temperature after treatment (ºC) after 60 min

One-way analysis of variance	
P value	< 0.0001
P value summary	****
Are means signif. different? (P < 0.05)	Yes

ANOVA Table	SS	df	MS
Treatment (between columns)	8.084	3	2.695
Residual (within columns)	0.5096	16	0.03185
Total	8.594	19	

Rectal temperature after treatment (ºC) after 90 min

One-way analysis of variance	
P value	< 0.0001
P value summary	****
Are means signif. different? (P < 0.05)	Yes

ANOVA Table	SS	df	MS
Treatment (between columns)	2.966	3	0.9885
Residual (within columns)	0.3928	16	0.02455
Total	3.358	19	

Rectal temperature after treatment (ºC) after 120 min.

One-way analysis of variance	
P value	< 0.0001
P value summary	****
Are means signif. different? (P < 0.05)	Yes

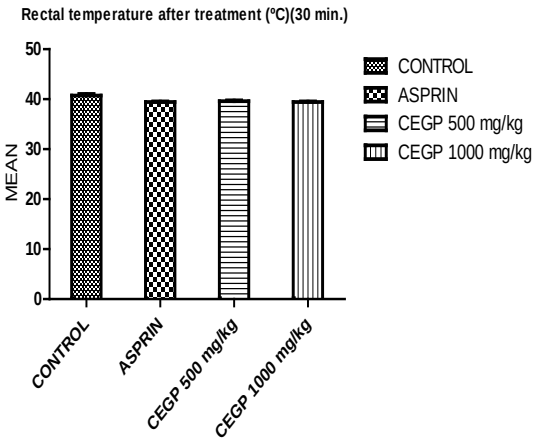
ANOVA Table	SS	df	MS
Treatment (between columns)	1.108	3	0.3693
Residual (within columns)	0.2280	16	0.01425
Total	1.336	19	

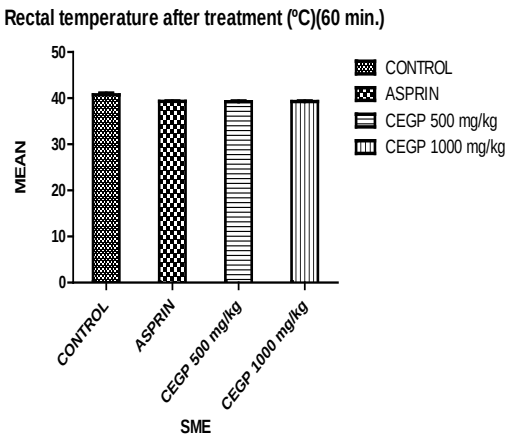
The effects of chloroform extract of *Geniosporum prostratum* whole plant on boiled milk induced

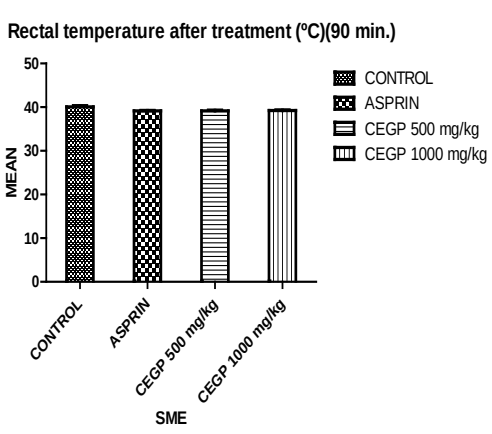
pyrexia in rabbits are depicted in Table 1. At a dose of 500 mg/kg and 1000 mg/kg body weight, temperature reduced 39.12 ± 0.14 and 39.22 ± 0.15, respectively, of elevated rectal temperature compared to aspirin (39.1 ±0.07 after 3 h). Thus the chloroform extract produced significant ($P < 0.05$) antipyretic effect. It was also observed that the solvent have no effect on the reduction of pyrexia of rabbit. Anti Pyretic effect in the maintaining of normal body temperature and reduce boiled milk induced elevated rectal temperature in rabbits and their effect are comparable to that of standard antipyretic drug, aspirin. Such reduction of rectal temperature of the tested animals by chloroform extract at 500mg/kg and 1000mg/kg appears to be due to the presence of a single bioactive substance or a mixture of compounds in them.

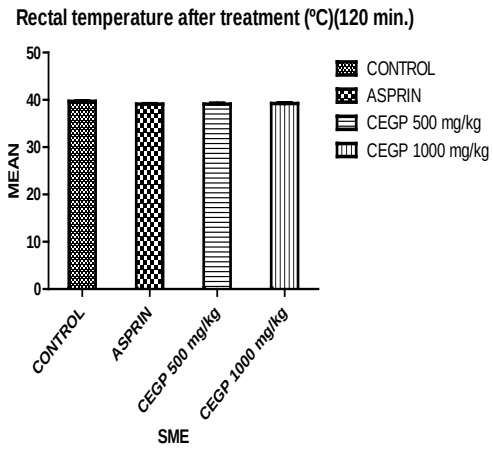
The beta sitoserol is a plasminogen activator and promotes the formation of essential polyunsaturated fatty acids from linoleic acid, but linoleic acid is required for prostaglandin and leukotriene synthesis and thus beta sitoserol reduces prostaglandin and leukotriene synthesis. Beta sitoserol possesses potent anti inflammatory and antipyretic activity by reducing the secretion of proinflammatory cytokines and alpha-TNF . These phytosterols can enhance adaptive immunity through the stimulation of innate immune system termed as the 'adaptogen', which promotes overall health without side effects. It is also evident from the study that the antipyretic activity of chloroform extract of *Geniosporum prostratum* fraction at 500 mg/kg, 1000 mg/kg body weight is almost similar to the standard aspirin group.

The present study, therefore, supports the claims of traditional medicine practitioners as an antipyretic remedy. However, to know the exact mechanism of the action of *Geniosporum prostratum* whole plant extract, further study with purified fractions/bioactive compounds are needed.









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