

ANTIPYRETIC POTENTIAL OF *GALEGA PURPUREA* ROOTPeriyasamy Gomathi^{1*}, Upal Kanti Mazumder², Malaya Gupta²¹Department of Pharmaceutical Chemistry, Vaagdevi College of Pharmacy, Ramnagar, Warangal, Andhra Pradesh-506 001, India²Department of Pharmaceutical Technology, Jadavpur University, Kolkata, WB – 700 032, India

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ABSTRACT

The methanolic extract of the roots of *Galega purpurea* (MEGP) was investigated for its antipyretic activity in rats. Hyperpyrexia was induced by subcutaneous administration of Brewer's yeast suspension. The extracts were screened for alkaloids, flavonoids, tannins and saponins. Preliminary phytochemical screening revealed the presence of flavonoids, alkaloids and steroids in MEGP. The administration of MEGP (100, 250 and 500 mg/kg p.o) showed significant antipyretic activity in the tested animals. The results obtained were dose-dependent and it was comparable to that of the standard drug paracetamol.

Keywords: *Galega purpurea*, antipyretic activity, Brewer's yeast, MEGP.

INTRODUCTION

Galega purpurea (Papilionaceae) a plant popularly known as 'kolinji' in Tamil, and 'vempalichettu' in Telugu which thrives in Southern parts of India. It grows on hard stony ground too difficult to be rooted. The various parts of the plant are widely used in the folk medicine for the treatment of fever, pain, cough, asthma, bilious febrile attacks, arthritis and rheumatism. Decoction of the root useful in the management of enlargement and obstruction of the liver, spleen and kidney. Also the root is useful in the treatment of dyspepsia, chronic diarrhoea and ulcers¹. However, no data were found regarding the pharmacological activity of the roots of *Galega purpurea*. The present study was performed in order to investigate the antipyretic activity of the methanol extract of roots of *Galega purpurea* in rats.

MATERIALS AND METHODS

Plant material

The roots of the plant *Galega purpurea* (Family: Papilionaceae) were collected from Erode district of Tamilnadu, India. The plant material was taxonomically identified by Botanical Survey of India, Kolkata. A voucher specimen (No. GMG 03/05) has been preserved in our laboratory for future reference. The collected plant material was dried under shade and then powdered with a mechanical grinder and stored in airtight container.

Preparation of extract

The dried powder material of the roots was defatted with petroleum ether and the marc thus obtained was then extracted with methanol in a Soxhlet apparatus. The solvent was completely removed under reduced pressure and a semisolid mass was obtained (MEGP, yield 7.3 % w/w). The dried MEGP was suspended in normal saline and used for the present study.

Animals

Studies were carried out using male Wistar albino rats weighing 180-200 g. They were obtained from the animal house of Jadavpur University, Kolkata. The rats were grouped and housed in poly acrylic cages (38x23x10 cm) with not more than six animals per cage and maintained under standard laboratory conditions (temperature 25 ± 2°C) with dark/ light cycle (14/10 h). They were allowed free access to standard dry pellet diet (Hindustan Lever, Kolkata, India) and water *ad libitum*. The animals were acclimatized to laboratory conditions for 10 days before commencement of the experiment. All procedures described were reviewed and approved by the University Animal Ethical Committee.

Antipyretic activity

The rats were divided into five groups containing six animals in each group and trained to remain quiet in a restraint cage.

Hyperpyrexia was induced in rats by subcutaneous injection of 10 ml/kg of a 15 % aqueous suspension of Brewer's yeast in the back below the nape of the rat². Initial rectal temperature was recorded. After 18 h animals that showed an increase of 0.3 – 0.5°C in rectal temperature were selected. The animals were then fasted for the duration of the experiment, water *ad libitum*. The test extract MEGP at different doses (100, 250 and 500 mg/kg) was administered orally to groups 2, 3 and 4 respectively. Control group received 5 ml/kg p.o of normal saline. Paracetamol (100 mg/kg p.o) was used as reference drug. Rectal temperature was determined by thermal probe Ellab Themistor thermometer 1 - 4 h after test extract and reference drug administration.

Statistical analysis

Values are mean ± S.E.M. Statistical significance was determined by ANOVA, followed by student *t*-test. Values with P<0.01 were considered as statistically significant.

RESULTS

Effect of MEGP on normal body temperature in rats is shown in Table 1. It was found that the extract at a dose of 100 mg/kg caused significant lowering of body temperature at 4 h following its administration. This effect was maximal at doses of 250 and 500 mg/kg and it caused significant lowering of body temperature in a dose-dependent manner.

The subcutaneous injection of yeast suspension markedly elevated the rectal temperature after 18 h of administration. The antipyretic effect of MEGP started as early as 1 h and was maintained for 4 h after administration. Treatment with MEGP at the doses of 100, 250 and 500 mg/kg decreased the rectal temperature of the rats in a dose-dependent manner. The results were comparable to that of the reference drug paracetamol (100 mg/kg).

DISCUSSION

Fever may be a result of infection or one of the sequelae of tissue damage, inflammation and graft rejection or other disease states. Antipyretics are drugs, which can reduce elevated body temperature. Regulation of body temperature requires a delicate balance between production and loss of heat, and the hypothalamus which regulate the set point of body temperature. In fever, the set point is elevated. Drugs like paracetamol do not influence body temperature when it is elevated by factors such as exercise or increase in ambient temperature³. Since antipyretic activity is commonly mentioned as a characteristic of drugs or compounds, which have an inhibitory activity on prostaglandins biosynthesis⁴, the yeast-induced hyperpyrexia in rat model was employed to investigate the antipyretic activity of the extract. The present investigation indicated that MEGP showed significant antipyretic effect. Administration of

yeast suspension markedly increased the rectal temperature after 18 h. it was found that MEGP administration caused a significant decrease in rectal temperature similar to that of the standard drug. The result indicates that the extract has some influence on prostaglandin biosynthesis because prostaglandin is believed to be a regulator of body temperature⁵.

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Table 1. Effect of methanol extract of *Galega purpurea* on normal body temperature

Treatment	Dose (mg kg ⁻¹)	Rectal temperature (°C) before and after treatment				
		0 h	1 h	2 h	3 h	4 h
Control (0.9% NaCl)	5 ml	37.4±0.1	37.2±0.1	37.0±0.1	37.1±0.1	37.0±0.1
MEGP	100	37.3±0.2*	36.9±0.2*	36.5±0.1*	36.3±0.3*	36.1±0.1*
MEGP	250	37.4±0.3*	36.6±0.1*	36.2±0.2*	35.9±0.2*	35.6±0.3*
MEGP	500	37.2±0.3*	36.4±0.1*	36.0±0.1*	35.7±0.1*	35.5±0.2*

Values are mean ± S.E.M. (n=6)

*P<0.01, Experimental groups compared with control group.

Table 2. Effect of methanol extract of *Galega purpurea* on Brewer's yeast-induced hyperpyrexia in rats

Treatment	Dose (mg kg ⁻¹)	Rectal temperature (°C) before and after treatment					
		0 h	19 h	20 h	21 h	22 h	23 h
Control (0.9% NaCl)	5 ml	37.4±0.1	39.5±0.4	39.3±0.1	39.2±0.3	39.2±0.1	39.1±0.3
MEGP	100	37.2±0.2*	39.6±0.1*	39.3±0.2*	39.0±0.1*	38.7±0.2*	37.8±0.2**
MEGP	250	37.4±0.3*	39.6±0.1*	39.1±0.1*	38.8±0.2*	38.0±0.1	37.6±0.1*
MEGP	500	37.1±0.2*	39.7±0.1*	38.9±0.1*	38.5±0.2*	37.9±0.1*	37.5±0.1**
Paracetamol	100	37.4±0.3*	39.6±0.2*	38.3±0.2*	37.9±0.1*	37.5±0.1*	37.2±0.2

Values are mean ± S.E.M. (n=6)

*P<0.01, **P<0.001, Experimental groups compared with control group.

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