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Antipyretic activity of roots of *Cicer arietinum* Linn

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ABSTRACT

Cicer arietinum Linn belonging to family Leguminosae is commonly used in the traditional system of medicine for the treatment of antibacterial, antifungal, antipyretic, antidiarrhoeal etc. In the present study, we investigated the antipyretic activities of the Hydroalcoholic extract, acetone fraction and methanol fraction of the roots of this plant. The antipyretic activity of the hydroalcoholic extract and its acetone and methanol fraction was studied based on the basis of their effect on Brewer's yeast-induced pyrexia in rats. The extracts were screened for alkaloids, steroids, proteins, flavonoids, saponins, carbohydrates, fats and oils etc. Preliminary phytochemical screening revealed the presence of carbohydrates, proteins, amino acid and saponin in the roots of *cicer arietinum* linn The hydro-alcoholic extract and methanol fraction produced significant antipyretic activity ($p < 0.05$), while acetone fraction did not. Hydro-alcoholic extract and methanol fraction of *Cicer arietinum* roots have antipyretic activity.

Keywords: *Cicer arietinum*, Antipyretic activity, root extract and fractions.

INTRODUCTION

Cicer arietinum Linn belonging to family Leguminosae is an annual herb that is spread into Southern Europe, India, Egypt and Southern America. It is extensively cultivated in India mainly in Rajasthan, Hyderabad, Patiala, East Punjab, Haryana and Madhya Pradesh. It needs warm and moist climatic conditions to propagate. Its black gram is native of India but the white species

commonly called Kabuli came to India in 18th century from European countries and area like Afghanistan etc [1]. It contains good amount of carbohydrates in the seeds. Various proteins and minerals have also been found in it [2] [3]. In India it is very often used as a crash diet and it is one of the most widely made recipes in India kitchen due to its good taste and nutritive values. Traditionally it is used as antibacterial, antifungal, antipyretic, antidiarrhoeal etc [1] [4]. The present study deals with the antipyretic activity of the hydroalcoholic extract, and its acetone and methanol fractions of the roots of the plant.

EXPERIMENTAL SECTION

Collection and authentication of plant material

The Plant *Cicer arietinum* was collected during February to March from different region of Haryana and authenticated through NISCAIR, New Delhi and a voucher specimen has been preserved for further references.

Preparation of extracts

The roots were dried under shade, coarsely powdered and the hydroalcoholic extract was prepared by maceration. Further the acetone and methanol fractions of the concentrated hydroalcoholic extract were prepared by using percolator.

Animals

Wistar rats of both sexes, weighing 150-200 gm were used for the study. The animals were kept in polypropylene cages in a room maintained under controlled atmospheric conditions. The animals were fed with standard diet (Hindustan liver, Mumbai, India) and had free access to clean drinking water. The experimental protocol was approved by the Institutional Animal Ethics Committee (IAEC) of College of Pharmacy, I.F.T.M Moradabad, U.P, India.

Antipyretic Activity

Animals were selected for the experiment after confirmation of approximate constant rectal temperature for 7 days. The antipyretic activity of the hydro-alcoholic extract and its various fractions were evaluated based on Brewer's yeast-induced pyrexia in rats [5] [6]. Pyrexia was induced by subcutaneous injection of 10 ml/kg of 15% w/v Brewer's yeast suspension below the nape of the neck. The rectal temperature of each rat was measured at time, 0 h, using a telethermometer and before injection of the yeast, at 18 h following yeast injection, the different groups were treated with the vehicle, hydro-alcoholic extract (200 and 400 mg/kg), its different fractions (100 mg/kg) and standard drug, aspirin (100 mg/kg). The rectal temperature was then recorded over a period of 6 h.

Statistical analysis

The results were expressed as mean \pm S.E.M. Statistical analysis of the data were carried out using Student's t-test and results were considered significant when $p < 0.05$.

RESULTS AND DISCUSSION

Hydro-alcoholic extract and methanol fraction produced significant antipyretic activity ($p < 0.05$), while acetone fraction did not. In general, non-steroidal anti-inflammatory drugs

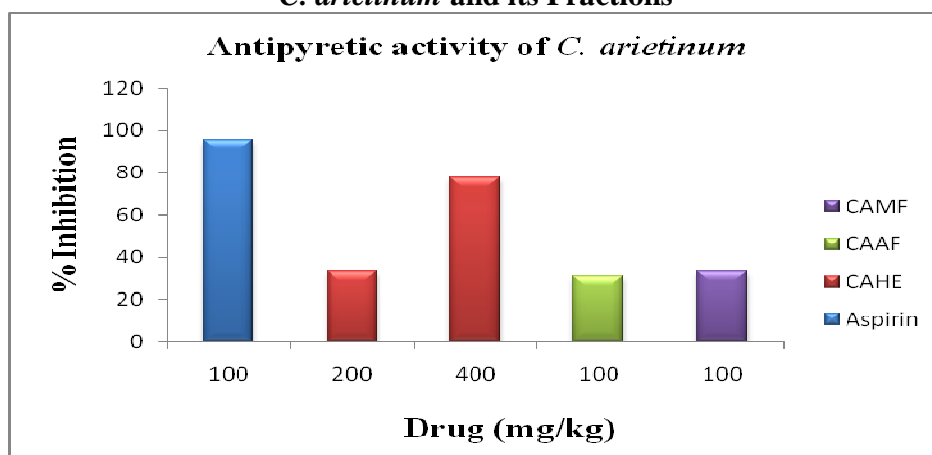
Table-1: Effect of Hydro-alcoholic Extract and Different Fractions of *C. arietinum* Root and its Various Fractions on Brewer's yeast-Induced Pyrexia in Rats.

Treatment	Dose (mg/kg)	Rectal temperature in °C at various times (h)						%Reduction
		-18	0	1	3	5	6	
Control	-	36.73±0.15	37.49 ±0.08	37.71±0.11	37.40±0.08	37.36 ±0.12	37.46±0.13	
Aspirin	100	36.75 ±0.11	37.68 ±0.24	37.14 ±0.14*	36.98±0.12*	35.93±0.09*	36.79±0.11*	95.69
CAHE	200	36.43±0.11	37.33±0.08	37.18±0.15*	37.18 ±0.21	36.95±0.26	36.97 ±0.25	33.33
	400	36.68±0.06	37.61 ±0.11	37.39 ±0.15*	37.31±0.07*	37.02±0.11*	36.91±0.08*	77.78
CAAF	100	36.71±0.09	37.91±0.12	37.43±0.17	37.38±0.18	37.31±0.21	37.23±0.24	31.11
CAMF	100	36.61±0.07	37.65±0.09	37.45 ±0.16*	37.39±0.15	37.35±0.19	37.30 ±0.22	33.65

Values are expressed as mean ± S.E.M. (n = 6); * p < 0.05 vs. control. CAHE, Hydroalcoholic extract; CAAF, Acetone fraction; CAMF, Methanol fraction

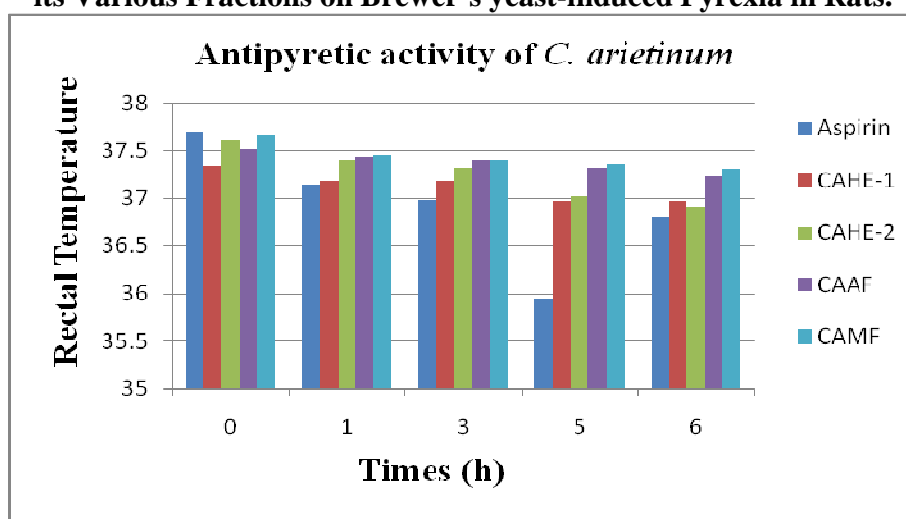
produce their antipyretic action through the inhibition of prostaglandin synthetase within the hypothalamus [7]. Therefore, the antipyretic activity of hydroalcohol extract and methanol fraction of *C. arietinum* is probably by inhibition of prostaglandin synthesis in hypothalamus. Further, the hydroalcoholic extract and its fractions were found to contain carbohydrates, protein and amino acid, through preliminary photochemical screening [3]. The antipyretic activity may be due to one/more group of above Phytoconstituents. The hydroalcoholic extract reduced the hyperthermia at both 200 and 400 mg/kg doses 1 h after administration. The initial and final rectal temperatures in the groups treated with hydro-alcoholic extract (400 mg/kg), and aspirin (100 mg/kg) were 37.61 ± 0.11 and 36.91 ± 0.08 ; 37.68 ± 0.24 and 36.79 ± 0.11 °C, respectively. Hydro-alcoholic extract and aspirin showed significant antipyretic activity throughout the test period of 6 h.

Fig. 1: Percentage Inhibition of Antipyretic Activity by Hydroalcoholic Extract of *C. arietinum* and its Fractions



CAHE, Hydroalcoholic extract; CAAF, Acetone fraction; CAMF, Methanol fraction

Fig. 2: Effect of Hydro-alcoholic Extract and Different Fractions of *C. arietinum* Root and its Various Fractions on Brewer's yeast-induced Pyrexia in Rats.



CAHE, Hydroalcoholic extract; CAAF, Acetone fraction; CAMF, Methanol fraction

CONCLUSION

The results of the present study indicate the antipyretic activity of the roots of *Cicer arietinum*. However, further investigations are required to isolate the active constituents responsible for these activities and to elucidate the exact mechanisms of action.

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