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Research Article

EVALUATION OF ANTI PYRETIC ACTIVITY OF AERIAL PARTS OF *PHYLLANTHUS LONGIFLORUS* HEYNE EX HOOK.

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ABSTRACT

The present study was designed to investigate antipyretic activity of aerial parts of *Phyllanthus longiflorus* (PHL) in albino rats. Methanol and aqueous extracts of PHL at the doses 100 and 200 mg/kg body weight significantly ($p < 0.001$) normalized the Brewer's yeast induced pyrexia in a dose dependant manner. Paracetamol 150 mg/kg body weight was included in the study as reference drug.

Keywords: *Phyllanthus longiflorus*, yeast, anti pyretic, aerial parts.

INTRODUCTION

Phyllanthus longiflorus Heyne ex Hook, Syn- *Reidia longiflora* Gamble; *Reidia ovalifolia* wright, (Tamil-Nallapullati; Malayalam-Malenkizhanelli), is a small bush, distributed in the western ghats of southern India[1]. In traditional medicine, several species of the genus Phyllanthus have used for their hypotensive[2], anti inflammatory[3], hepatoprotective[4], hypoglycemic[5] anti microbial[6] activities. In this view, the present study was aimed to carryout antipyretic activity of methanol and aqueous extract of aerial parts of PHL on yeast induced pyrexia in albino rats.

MATERIALS AND METHOD

Plant collection and authentication

Fresh aerial parts of the plant were collected from the Western Ghats, Tamilnadu, India during February 2008. It was identified and authenticated by Dr.V.Chelladurai, Govt. Research officer, Botany C.C.R.A.S. Govt. of India, (Retired), Tirunelveli, Tamilnadu, India. A voucher specimen (PHL001) has been deposited in our laboratory for future reference.

Preparation of extract

The collected plant material was dried under shade, milled using mechanical grinder and about 1 kg of coarse powder was extracted exhaustively with methanol (3×150 ml) using Soxhlet apparatus[7] by continuous hot extraction method. Aqueous extract was prepared using distilled water by cold maceration process. The solvents were removed under controlled temperature to obtain solid mass. The dried extract was then made into suspension using 1% aqueous tween 80 to ease administration.

Animals

Male Wistar albino rats weighing 120-150 g were procured from the central animal house of our institute. They were housed in standard polypropylene cages and maintained in room temperature 22º±1º C in a 12 h light-dark cycle. The rats were given a standard laboratory diet (Hidustan Lever Ltd, Mumbai, India) and water *ad libitum*. The experimental procedure was approved by the Institutional animal ethics committee (509/02/C/CPCSEA).

Acute toxicity study

Graded dose method was followed for studying acute toxicity. The extract of PHL was administered in graded doses of 100 to 2000 mg/kg body weight. The animals were observed continuously for the first 1 h, intermittently for the next 4 h for any behavioral changes like sedation, loss of righting reflex, hyper activity, convulsion and periodically for first after 24 h for mortality and the study was continued for fourteen days[8].

Anti pyretic activity

Anti pyretic activity was evaluated on Brewer's yeast induced pyrexia in rats[9]. Rectal temperature for all the animals was at time 0 h for using digital clinical thermometer (MT 101 Ranbaxy, New Delhi, India). After that, pyrexia was induced immediately by subcutaneous injection of 10 ml/kg of 20 % w/v solution of Brewer's yeast in normal saline. At 18 hrs after yeast injection the rise in rectal temperature was recorded. The feverish rats were divided in to six groups (each group consist of six animals) and treated as follows.

Group1: 1% aqueous Tween 80 *p.o.*
Group2: Paracetamol (150mg/kg) *p.o.*
Group3: Aqueous extract of PHL (100 mg/kg) *p.o.*
Group4: Aqueous extract PHL (200mg/kg) *p.o.*
Group5: Methanol extract of PHL (100mg/kg) *p.o.*
Group6: Methanol extract of PHL (200 mg/kg) *p.o.*

After the administration of extracts and respective drugs the rectal temperature was recorded at 30, 60, 120, 180 and 300 minutes using digital clinical thermometer.

Statistical analysis

The results were statistically analyzed by Student's "t"-test and values are expressed as mean ± SEM. $p < 0.001$ was considered significant.

RESULTS AND DISCUSSION

18h after yeast injection, the experimental rats showed a mean increase of about 1.3ºC in rectal temperature. Aqueous and methanol extract of PHL at the doses 200 and 400 mg/kg, significantly ($P < 0.001$) normalized the yeast induced pyrexia in rats in a dose dependent manner. The higher response was obtained at 400 mg/kg throughout the observation period of 5 hrs.

The present study was supported by a related study in which *Emblica officinalis* Gaertn (*Phllanthus emblica*)[10] was found to inhibit

yeast induced pyrexia in rats. Phytoconstituents such as alkaloids, flavonoids, tannins and phenolic compounds were identified in the crude extracts of PHL. Flavonoids and phenolic compounds were reported in various studies to possess anti pyretic activity most probably by inhibiting the enzymes cyclooxygenase or/and lipooxygenase[11, 12]. Therefore we conclude that, the extracts of PHL may have some influence on these enzymes due to the presence of these phytoconstituents. Further studies are in progress to isolate the active phytoconstituent responsible for the activity. However the results of the present study revealed that aqueous and methanol extract of PHL possesses significant antipyretic activity.

Table.1: Anti pyretic activity of aerial parts of *Phyllanthus longiflorus* on Brewer's yeast induced pyrexia.

Drugs	Dose	Rectal temperature in ºC at time (h)					
		-18h	0h	1h	2h	3h	5h
Tween	-	36.02±0.39	37.19±0.49 (1.17)[a]	37.18±0.35	37.20±0.19	37.21±0.40	37.15±0.12
Paracetamol	150	36.09±0.42	37.41 ±0.56 (1.32) [a]	36.11 ±0.27	36.05±0.31	36.05±0.52	36.03±0.16
MPHL	100	36.25±0.25	37.72 ±0.46 (1.47) [a]	37.27±0.67	36.75±0.37	36.26±0.54	36.27±0.28
MPHL	200	36.13±0.41	37.43 ±0.47 (1.30) [a]	36.61±0.27	36.15±0.25	36.13±0.15	36.14±0.59
APHL	100	36.25±0.05	37.55±0.39 (1.30) [a]	37.42±0.79	37.06±0.32	36.27±0.75	36.29±0.15
APHL	200	36.21±0.51	37.45±0.52 (1.24) [a]	37.16±0.36	36.27±0.91	36.23±0.61	36.25±0.19

n=six animals in each group; values are mean ± SEM; P<0.001 when compared to control. -18h: temperature just before yeast injection; 0 h: temperature just before drug administration; a : change in temperature following yeast injection.

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