

Study on Antipyretic Activity of a *Mollugo pentaphylla* Linn in Albino Mice

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Abstract: The present investigation was carried out to evaluate antipyretic activity of methanolic extract of the whole plant of *Mollugo pentaphylla*. Subcutaneous injection of sterilized brewer's yeast suspended in 12 % in saline at the dose of 10 ml / Kg body weight in albino mice leads to pyrexia. The study showed that the extract is safe at doses 0.5 ml / Kg body weight. The results conclude that the extract of *Mollugo pentaphylla* exhibited significant antipyretic activity.

Introduction

Pyrexia or fever is caused as a secondary impact of infection, malignancy or other diseased states. It is the body's natural defense to create an environment where infection agent or damaged tissue cannot survive. Most of the antipyretic drugs inhibits Cox-2 expression to reduce the elevated body temperature by inhibiting prostaglandin E₂ (PGE₂) biosynthesis. Moreover these synthetic agents irreversibly inhibit Cox-2 with high selectivity but are toxic to the hepatic cells, glomeruli, cortex of brain and heart muscles, whereas the natural Cox-2 inhibitors have lower selectivity with fewer side effects. A natural antipyretic agent with reduced or no toxicity is therefore essential. The demand for herbal medicines is increasing rapidly due to their lack of side effects. Further as health care costs continue to escalate, the attraction for low- cost remedies has stimulated consumers to re- evaluate the potential of alternatives¹. Approximately 60-80% of the world's population still depends on traditional medicines for the treatment of common ailments and diseases². Inadequate medicinal

facilities that are often too far from communities living in isolated villages and insufficient access to the most current diseases therapies, make it difficult to successfully treat certain health conditions in world.

The present study deals with antipyretic activity of *Mollugo pentaphylla* Linn. Many species have been used for some medicinal treatments including scabies, tumors and inflammatory affections. Especially leaves are eaten as a bitter pot herb in India. In India, the whole plant is used as a mild laxative medicine, also as stomachic, antiseptic and emmenagogue, while a decoction of the roots is used to treat eye diseases.

Experimental

The whole plant was collected from Tirunelveli district, TamilNadu in the month of June 2008. The plant was authenticated by a botanist and voucher specimens was deposited in our laboratory for further research work.

Preparation of Extract

The plant was shade dried and powdered. The plant material was extracted with methanol for 24 h by using Soxhlet apparatus³. The extract was filtered using Whatmann filter paper no.1 and the filtrates were then evaporated under reduced pressure and dried using a rotator evaporator at 55°C.

Chemicals

All chemicals were of the high quality from BDH Chemicals, sigma Aldrich Chemicals Co. All other reagents were of analytical grade. All solutions were prepared in double- distilled deionized water.

Experimental Animals

Adult wistar albino rats of either sex weighing between 150-200 gm were used for the study. They were kept under standard laboratory conditions and were fed with commercial rat pellets and drinking water *ad libitum*. The experiment was performed under the guidance of the Institutional Animal Ethics Committee.

Acute Toxicity Studies

Wistar albino rats (150-200 g) maintained under standard laboratory condition was used. A total of three animals were used for each extract which received a single oral dose (200 mg/kg, body weight) of the extract. Animals were kept over night fasting prior to drug administration. After the administration of the extracts, food was withheld for further 3-4 hrs.

Animals were observed individually once during the first 30 min. after dosing, periodically during the first 24 hrs. Once daily case side observation included changes in skin and fur, eyes and mucous membrane, and also respiratory rate, circulatory, autonomic and CNS changes^{4,5}.

Selection of Dose of the Extract

LD₅₀ was determine as per OECD guidelines for fixing the dose for biological evaluation. The LD₅₀ of the extract as per OECD doses of 2000 mg/kg. Hence the biological evaluation of the extracts was carried out at a dose of 200 mg/kg body weight.

Antipyretic activity^{6,7}

Anti – hyperthermic activity study was carried out in male albino rats weighing 150-200 g. The rats were injected subcutaneously with 12% (10 ml/kg) aqueous suspension of dried Brewer's yeast. Rats developing 1° or more rise in rectal temperature 18 hrs after injection were divided into groups of three. One group was dosed with the test drug (0.5 ml/kg) through S.C. route and another group with paracetamol (25 mg /kg). The rectal temperature was recorded after 2 hrs and the results of the 2 groups were compared.

Statistical Analysis

Values were represented as mean ± SEM. Data were analyzed by one way analysis of variance (ANOVA) followed by Dunnett's test. P < 0.01 was considered to be statistically significant.

Table -1 Anti- pyretic activity of *Mollugo pentaphylla* Linn

Sl. No	Design of treatment	Dose mg/kg	Normal Temp.in°C	Rise in Temp.in°C	Decrease in Temp.after 2 hrs in°C
1.	Saline	25 ml /kg	37.55 ±0.9	39.75 ±0.42	38.95 ± 0.40
2.	Standard (Paracetamol)	25 mg /kg	37.18±0.14	38.52 ± 0.20	37.14± 0.12
3.	Test drug	0.5 ml /kg	37.17± 0.16	38.4± 0.12	37.57± 0.20

P < 0.01

Results and Discussion

Fever may be a result of infection or one of the sequelae of tissue damage, inflammation, graft rejection, or other disease states. Anti – pyretic are drugs, which reduce elevated body temperature. Regulation of body temperature requires a delicate balance between the production and loss of heat, and the hypothalamus regulates the set point at which body temperature is maintained. In fever, this set point is elevated and drug like paracetamol do not influence body temperature when it is elevated by factors like exercise or increase in ambient temperature.^{8,9}

Search for herbal remedies with potent antipyretic activity received momentum recently as the available antipyretics, such as paracetamol, nimusulide

etc, have toxic effect to the various organs of the body.¹⁰

Preliminary phytochemical investigation of the methanolic extract showed presence of flavonoids, tannis and saponons.

The methanolic extract of *Mollugo pentaphylla* extract at 0.5 ml/kg is having Anti-pyretic activity nearly equal to that of the standard drug, Paracetamol (Table- 1). The anti-pyretic action may be due to the inhibition of prostaglandin synthesis. However , to know the exact mechanism of action of *Mollugo pentaphylla* extracts further study with purified fractions / bioactive compounds are warranted.

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