



## Original Research Article

## Laxative Activity of Ethanolic Extract of *Polyalthia longifolia* Bark in Experimental Animals

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### ABSTRACT

*Polyalthia longifolia* is native to the drier regions and commonly used in for the treatment of various ailments including constipation. The present study was carried out to investigate the laxative activity of *Polyalthia longifolia* bark in albino's Wistar rats. The animals were divided in to 4 groups of 6 rats in each group. Group I, served as control received saline (1 ml/kg, p. o.), Group II served as reference control received sodium picosulfate (5 mg/kg, p.o) and groups III and IV received 200 and 400 mg/kg of ethanolic extract of *Polyalthia longifolia* bark extract respectively through oral administration. The laxative activity was determined based on the total weight of normal as well as wet faeces production in all 4 groups was monitored for 16 h. The ethanolic extract of *Polyalthia longifolia* enhanced the wet faces production at the doses of 200 and 400 mg/kg. The effect of the extract at 200 and 400 mg/kg (p.o.) was similar to that of reference drug sodium picosulfate (5 mg/kg, p.o). Conclusions: The results showed that the ethanolic extract of *Polyalthia longifolia* bark has a significant laxative activity and supports its traditional use in herbal medicine.

**Keywords:** *Polyalthia longifolia*, Purgative activity, Laxative

### INTRODUCTION

Plant and plant products are being used as a source of medicine since long. According to the World Health Organization, more than 80% of the world's

population, mostly in poor and less developed countries depends on traditional plant-based medicines for their primary health care needs [1].

*Polyalthia longifolia* cv. *pendula* (Annonaceae) is native to the drier regions of India and is locally known as "Ashoka" and is commonly cultivated in India, Pakistan, and Sri Lanka. *P. longifolia*, although an ornamental tree, finds its reference in Indian medicinal literature owing to its popular Hindi name Ashoka. Ashoka (Latin name: *Saracaasoka* (Roxb) De Wilde) is also a Sanskrit name in Ayurveda of a drug used for the treatment of uterine disorders [2]. This plant is used as an antipyretic agent in indigenous systems of medicine [3]. Pharmacologic studies on the bark and leaves of this plant display effective skin disease, antimicrobial activity [4], cytotoxic function [5] and hypotensive effects [6].

In Ayurveda, particularly, the bark of *Polyalthia longifolia* has significant medicinal properties like purgative, antihypertensive, anti allergic, and antipyretic activity. Literature were also supports the anti cancer, anti microbial, anti inflammatory, hypotensive, antihyperglycaemic activity, anti ulcer activity and anti oxidant activities of *Polyalthia longifolia* [7].

Although most of scientific investigations have been undertaken to authenticate the ethno- botanical use of *Polyalthia longifolia*, there seems to be no report on the purgative activity of the bark of the plant. The present study was intended to evaluate the laxative activity of the ethanolic extract of *Polyalthia longifolia* barks

## MATERIALS AND METHODS

### Plant material

The barks of *Polyalthia longifolia* were collected from outskirts of Erode, in the month of May. The barks of *Polyalthia longifolia* were identified and authenticated by the botanist, Botanical Survey of India, Agricultural University, Coimbatore. The (voucher no:92/614) specimen had been deposited in the herbarium for future reference.

### Preparation of extract

100 g of powdered drug was soaked in 250 ml of 95% ethanol solution for 24 h followed by cold maceration for further 48 h with occasional shaking. The mixture was filtered using muslin cloth followed by removal of excess of solvent by means of rotatory evaporator. The dried extract was used for the study.

### Animals

Male Wistar Albino rats weighing between 150–220 g were used for the study. The animals were obtained from animal house of Nandha College of Pharmacy, Erode, India. On arrival the animals were placed at random and allocated to treatment groups in polypropylene cages with paddy husk as bedding. Animals were housed at a temperature of  $24 \pm 2^\circ\text{C}$  and relative humidity of 30–70 %. A 12:12 light: dark cycle was followed. All animals were allowed free access to water and fed with standard commercial pelleted rat chaw (Hindustan Lever Ltd, Mumbai). All the experimental procedures and protocols used in this study were reviewed by the Institutional Animal Ethics Committee (688/2/C-CPCSEA) and were in accordance with the guidelines of the CPCSEA.

### LAXATIVE ACTIVITY [8]

Rats fasted for 12 h before the experiment, were placed individually in cages lined with clean filter paper. The animals were divided in to 4 groups of 6 rats in each group. Group I, served as control received saline (1 ml/kg, p. o.), Group II served as reference control received sodium picosulfate (5 mg/kg, p.o) and groups III and IV received 200 and 400 mg/kg of ethanolic extract of *Polyalthia longifolia* bark extract respectively through oral administration. The total weight of normal as well

as wet faeces production in all 4 groups was monitored for 16 h.

### STATISTICAL ANALYSIS

Results were expressed as mean  $\pm$  SEM. The data were analyzed by using one way analysis of variance (ANOVA) followed by Dunnet's t test. P values < 0.05 were considered as significant.

### RESULTS

The ethanolic extract of *Polyalthia longifolia* bark was studied for its laxative activity in Wistar Albino rats. The laxative activity was assessed by measuring the wet faeces in all test drug administered groups. The extract showed significant ( $P < 0.001$ ) dose dependent laxative activity as compare to normal control animals. The laxative activity produced by the extract was similar to that of the reference control sodium picosulfate.

The laxative activity of *Polyalthia longifolia* was studied in rats. The results showed that an oral administration of the bark extract of *Polyalthia longifolia* produced significant and dose dependant increase in faeces output of rats. Sodium picosulfate is a member of the poly phenolic group of stimulant laxatives. Following oral administration, it is converted in the colon to an active form through the action of bacterial enzymes[9]. As a result, its effects are directed the colon, where it stimulates peristalsis and, in common with other laxatives, reduces water reabsorption leading to the softening of stools. The results suggest that the ethanolic extract of *Polyalthia longifolia* might also be produced its laxative activity by reducing the water reabsorption in the colon which might soften the stool.

**Table I: Laxative activity of *Polyalthia longifolia* bark extract in rats.**

Groups	Drug Treatment	Faeces out put (gms)
I	Control Saline (1ml/kg)	3.56 $\pm$ 0.26
II	Sodium picosulfate (5mg/kg)	11.95 $\pm$ 1.05***
III	<i>Polyalthialongifolia</i> (200mg/kg)	10.22 $\pm$ 0.95***
IV	<i>Polyalthialongifolia</i> (400mg/kg)	11.69 $\pm$ 0.94***

Values are in Mean  $\pm$  SEM; (n = 6); \*P < 0.05, \*\*P < 0.01, \*\*\* P < 0.001 Vs Control

### DISCUSSION

The laxative activity of *Polyalthia longifolia* was studied in rats. The results showed that an oral administration of the bark extract of *Polyalthia longifolia* produced significant and dose dependant increase in faeces output of rats. Sodium picosulfate is a member of the poly phenolic group of stimulant laxatives. Following oral administration, it is converted in the colon to an active form through the action of bacterial enzymes [9]. As a result, its effects are directed the colon, where it stimulates peristalsis and, in common with other laxatives, reduces water reabsorption leading to the softening of stools. The results suggest that the ethanolic extract of *Polyalthia longifolia* might also be produced its laxative activity by reducing the water reabsorption in the colon which might soften the stool.

### CONCLUSION

From the result it could be concluded that oral administration of ethanolic bark extract of *Polyalthia longifolia* shows significant laxative activity in rats. Further phyto-chemical studies are required to isolate the active compounds

responsible for laxative activity which could be a major contribution to prove the claims in Indian systems of medicine.

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