



## Analysis of elements from the leaves and seeds of *Polyalthia longifolia* and its medicinal importance

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### Abstract

*Polyalthia longifolia* (Sonn.)Thw. commonly called as, 'Ashok' is an evergreen tree native to India. The different extracts of leaves and seeds of the plant have been used in traditional system of medicine. Therefore, the metal analysis of leaves and seeds of the plant has been carried out. The powder of leaves and seeds of *Polyalthia longifolia* (Sonn.)Thw. were analyzed for metal contents. Analysis was carried out by using different standard methods such as kjheldal's, Colorimetric, Flame photometry and Atomic adsorption spectrophotometer. It was found that Nitrogen, Phosphorous, Potash was found in negligible amount but Zinc, Copper, Iron and Manganese were found in large amount. It was observed that Zinc, Copper, Iron and Manganese were present in large amount in leaves than the seeds. The present study indicates that leaves and seeds of *Polyalthia longifolia* (Sonn.)Thw were potential source of Zinc, Copper, Iron and Manganese.

**Keywords:** *Polyalthia longifolia* (Sonn.)Thw, Zinc, Copper, Iron and Manganese

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### INTRODUCTION

*Polyalthia longifolia* (Sonn.) Thw belongs to the family Annonaceae. It is a lofty evergreen tree, native to India, commonly planted due to effectiveness in alleviating noise pollution. It exhibits symmetrical pyramidal growth with willowy wiping pendulous branches and long narrow lanceolate leaves with undulate margins. The tree is known to grow over 30 feet in height.

The plant has been used in traditional system of medicine for the treatment of fever, skin diseases, diabetes, hyper tension and helminthiasis. [1] A number of biologically active compounds have been isolated from this plant.[2, 3] The plant extracts and isolated compounds

were studied for various biological activities like antibacterial activity, antifungal activity.[4-6] The ethanol extract of leaves of the plant also shows antiulcer activity.[7]

The present study was undertaken to analyze the metal content of the leaves and seeds of the plant.

### MATERIALS AND METHODS

The seeds and leaves of *Polyalthia longifolia* were collected from Pune, Maharashtra, India. The plant was authenticated in Botanical Survey of India, Pune – 411001. Its Voucher No. is POLMK1.

The leaves and seeds of the plant were washed and air dried. Ash was prepared using leaves and seeds sample (1 gm) separately in a silica crucible and kept in a muffle furnace at 550<sup>0</sup>C till constant weight obtained. The major constituents of ash were determined qualitatively and quantitatively. For the determination of metals, ash was converted to chloride by dissolving in 10 % HCl ( 5.0 ml ) The treated ash was then filtered through Whatmann filter paper No. 40. The residue was made chloride free by washing with hot water (tested with AgNO<sub>3</sub>). The percentage of acid soluble and acid insoluble ash was determined. The filtrate was diluted to 100 ml and the quantitative estimation of metals was carried out by using Perkin Elmer 3110 Atomic Absorption Spectrophotometer. Nitrogen was estimated using kjheldal's method, Photometric colorimeter of systronics, model 113 was utilized for Phosphorus estimation. Determination of Alkali and Alkaline earth metals were performed on the flame photometer of Madiflame, model 127<sup>8</sup>. The results obtained were showed in Table No. 1

**Table 1: Element contents in leaves and seeds of *Polyalthia longifolia* (Sonn.)Thw**

Metals	Method used	Leaves	Seed
Nitrogen	Kjheldal's method	1.05(%)	0.91(%)
Phosphorus	Colorimetric method	0.08(%)	0.11(%)
Potash	Flame Photometry	0.31(%)	0.40(%)
Zinc	Atomic Absorption Spectrophotometer	42.0ppm	44.0 ppm
Copper	Atomic Absorption Spectrophotometer	163.0 ppm	120.0 ppm
Iron	Atomic Absorption Spectrophotometer	204.0 ppm	128.0 ppm
Manganese	Atomic Absorption Spectrophotometer	312.0 ppm	8.0 ppm

## RESULTS AND DISCUSSION

The analysis of leaves and seeds indicates that it was rich source of Zinc, Copper, Iron and Manganese. The deficiency of these elements causes different diseases. Zinc though essential and beneficial for human health, cause a bitter astringent taste beyond 5 mg/lit. Zinc enters the domestic water supply from deterioration of galvanized iron pipe and dezincification of brass and from industrial waste pollution. The BIS drinking water desirable standard limit for Zn is 5 mg/lit. Zinc deficiency is associated with chronic liver disease, chronic renal disease, sickle cell disease, diabetes and other chronic illness. Zinc deficiency is also observed in plants as a most common micro nutrient deficiency. It is common in high pH soils. Plants that grow in zinc deficient soil are more susceptible. Copper is involved in numerous biological reactions in human cells. Copper deficiency causes malnutrition. Iron is considered as an essential mineral because it is needed to make part of blood cells. The low iron levels over a long period of time can lead to iron deficiency anemia. The elevated iron levels in water can cause stains in plumbing, laundry and cooking utensils and can impart objectionable taste and color to foods. Generally the ground water with hand pump tube wells has the problem of Iron. The BIS drinking water desirable standard limit for Fe is 0.3mg/lit. Manganese is essential to plants for growth and to higher animals to promote the action of many enzymes. The BIS drinking water desirable standard limit for Mn is 0.1mg/lit.

## CONCLUSION

The leaves and seeds of *Polyalthia longifolia* can be used to overcome the deficiencies caused due to Iron, Copper, Zinc and Manganese as they are rich source of these elements. They also contain Nitrogen, Phosphorus and Potash in a considerable amount. The leaves are the rich source of Copper, Iron and Manganese than the seeds of the plant.

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