



Elemental Analysis of Fruits of *C. Equisetifolia* and Seeds of *P. Longifolia* by Using Different Techniques

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Abstract: *Polyalthia longifolia* and *C. Equisetifolia* is evergreen tree native to India. The extracts of seeds of *P. Longifolia* and fruits of *C. Equisetifolia* have been used in traditional system of medicine⁵. Hence, the metal investigation of seeds and fruits of the *P. Longifolia* and *C. Equisetifolia* has been supported. The fine powder of seeds and fruit of *P. Longifolia* and *C. Equisetifolia* were analyzed for finding the metal contents. Analysis of a sample was carried out by using various standard techniques like Colorimetric, Kjeldahl's, Atomic adsorption spectrophotometer and Flame photometry. It was observed that Phosphorous, Nitrogen, Calcium was found in small 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 fruits of *C. Equisetifolia* than the seeds of *P. Longifolia*. The existing study shows that fruits of *C. Equisetifolia* were potential source of Iron, Zinc, Manganese and Copper.

Keywords: *C. Equisetifolia* fruit, *P. Longifolia* seed, Kjeldahl's method, Flame Photometry and Atomic Absorption Spectrophotometer, Colorimetry

I. INTRODUCTION

Medicinal plants are gift from nature to mankind to lead a healthy life¹⁰. They play a very important part in protecting our health. India is one of the most medico culturally valued country in the world, where the sector of medicinal plant is part of a time-honoured tradition that is appreciated even today. Medicinal plants are supposed to be much safer and showed as medicine in the cure of different sicknesses. In India, more than 2000 medicinal plants are documented¹³. *Polyalthia longifolia* (Annonaceae) is native to the drier regions of India and is locally known as "Ashoka".

Common names of *Casuarina equisetifolia* are Horsetail or Coastal She-oak¹¹. The *Casuarina* fruits and leaves are generally used for ornamental purposes in the urban region, other than decorative purposes, the *Casuarina* was also discovered for its potential in treatment of textile dye wastewater. *Casuarina* fruits and leaves were found to be beneficial as a good absorbent raw material for the elimination of textile dyes like Rhodamine B,¹⁹ reactive orange 16⁸ malachite green⁷, methylene blue³, and methyl violet 2b.⁵ *Casuarina equisetifolia* (Casuarinaceae) has been traditionally used for treatment of cancer, inflammation and other diseases,

Considering the large number of medicinal uses of the *C. Equisetifolia* and *P. Longifolia*, an effort is made to practically investigate the plant material. Present work is an analytical study by using different instruments to find out the elements present in the fruit of *C. Equisetifolia* and seed of *P. Longifolia* ⁵

II. MATERIALS AND METHODS

The *C. equisetifolia* fruits and *P. longifolia* seeds were cleaned by washing and air dried. Ash was prepared separately for sample of *C. equisetifolia* and *P. Longifolia* (1 g) in a silica crucible and it was kept in a muffle furnace at 600°C till constant weight of crucible is obtained. The foremost ingredients of ash were determined qualitative and quantitative analysis¹⁶. Ash was transformed into chloride by dissolving in 5.0 ml 10 % HCl for the purpose of metals determination, Then treated ash was filtered through Whatmann filter paper No. 40. The deposit was washed with hot water tested with AgNO₃ to make it chloride free. Acid insoluble and acid soluble percentage of ash was calculated by gravimetric analysis. Quantitative estimation of metals was done by taking 100 ml filtrate using Perkin Elmer 3110 Atomic Absorption Spectrophotometer, also by using kjheldal's method Nitrogen estimation was carried out, Photometric colorimeter of systronics was utilized for estimation of Phosphorus. Metals of group 1st and 2nd i.e. alkali group and alkaline earth metal were performed on the flame photometer of Madiflame, model 127⁸. The results obtained were showed in Table No. 1 and 2.

Sr.No.	Particulars	C. Equisetifolia fruit	P. Longifolia seed
1	Acid soluble ash	5.90 %	4.73%
2	Acid insoluble ash	0.31 %	0.21%

Table 1: Gravimetric analysis of samples

Sr.No.	Element	Method	Percentage	
			C. Equisetifolia fruits	P. Longifolia seeds
1	Nitrogen	Kjheldal's method	0.48 %	0.36%
2	Phosphorous	Colorimetric method	0.07%	0.11%
3	Potassium	Flame Photometry	249.2 ppm	255.3 ppm
4	Calcium	Atomic Absorption Spectrophotometer	0.087%	17.2 %
5	Copper	Atomic Absorption Spectrophotometer	16.30 ppm	122.0 ppm
6	Zinc	Atomic Absorption Spectrophotometer	221.1 ppm	50.0 ppm
7	Iron	Atomic Absorption Spectrophotometer	227.6 ppm	125 ppm
8	Manganese	Atomic Absorption Spectrophotometer	121.7 ppm	9 ppm

Table 2: Elemental analysis by various techniques

III. RESULTS AND CONCLUSION

Many enzymatic reactions take place with the help of activating agents; elements which are present in very less amount are act as activating agents¹⁵. On the basis of amount of minerals present in herbs, herbs are categorised as sedative and stimulatory. Potassium, iron and phosphorus are present in higher percentage in Stimulatory herbs while those splendid in magnesium and calcium are said to be sedative herbs⁶. The fruits of *C. equisetifolia* and seeds of *P. longifolia* showed the existence of common elements like calcium, potassium, iron, phosphorus, manganese, zinc and copper. Quantities of potassium, zinc, Manganese and iron were found to be large, but nitrogen, phosphorus, calcium are minor constituents. As *C. equisetifolia* fruit sample is rich in manganese, iron zinc and potassium it is suggested in traditional and folk medicines. Potassium plays vital role in treatment of diabetes due to its action on insulin secretion.. Deficiency of zinc⁴ shows symptoms illness, stress, greater thyroid activity, hyper adrenal function¹¹, skin lesions, stretch marks, slower healing wounds, spot on nails,

sickle cell anaemia and juvenile diabetes⁶. Deficiency of iron¹⁶ results in sweating, fast pulse and prolonged sleep⁶. Estimation of both the samples by qualitatively and quantitatively shows presence of different elements which are medicinally useful and responsible for the traditional use of the plant material in medicines.

VIII. REFERENCES

1. Chopra R. N. Nayar S. L. and Chopra R. C. Glossary of Indian Medicinal Plants (Including the Supplement) Council of Scientific and Industrial Research, p.11, New Delhi, 1986.
2. Duke J. A. Handbook of Energy Crops, 269, 1983.
3. Bown D. Encyclopedia of Herbs & their uses., Darling Kinderley, London (1995) ISBN O-7513 -020-31.
4. Duke J.A. and Ayensu E. S., Medicinal Plants of China Reference Publications, Inc. (1985) ISBN O-917256-20-4.
5. D.L.Watts, Trace Elements and Other Essential Nutrients, Clinical Application of Tissue Mineral Analysis, Writer's B-L-O-C-K Edition, USA,1997.
6. M.Hidiroglu and J. E. Knipfel, J. Dairy Sci.67, 1141, 1984.
7. N.P. Singh and S. Karthikeyan, Flora of Maharashtra State, Dicotyledones, 1, pp.175, 2000.
8. M. Marthanda Murthy, M.Subramanyam, M. Hima Bindu and Annapurna, Antimicrobial activity of Clerodane Di terpenoids from Polyalthia longifolia seeds, Fitoterapia, 76 (3-4), pp.336-339, 2005.
9. Jayaveera K.N.; Sridhar C.; Kumanan R.; Yogananda Reddy K.; Tarakaram K.; Mahesh M., Phytochemical, antibacterial and anthelmintic potential of flowers of Polyalthia longifolia, Journal of Pharmacy and Chemistry, 4(2), pp. 66-69, 2010.
10. Sashidhara Koneni V., Singh Suriya P., Shukla P.K., Antimicrobial evaluation of clerodane diterpenes from P. longifolia var.pendula, Natural Product Communications, 4(3), pp. 327-330, 2009.
11. Shaheen Khan,; Rashid Ali,; Azher Soobia; Khan, Shajeel A hmed; T auseef, Saima; Ahmad Aqeel, Plant Medica, 69 (4),pp. 350-355, 2003.
12. Dr. C.K.Kokate, textbook of Pharmacognosy, 29 Ed. Nirali Prakashan, Pune, 108-109, 2004
13. Doss, M.Pugalenth, D. R agendrakumaran and V. Vadivel, Phenols, Flavonoids, and Antioxidant activity of underutilized legume seeds, ASIAN J. EXP.BIOL. SCI., 1(3), pp. 700-705, 2010.
14. Dr. C.K.Kokate , Practical Pharmacognosy, 4 Ed. Vallabh prakashan, New Delhi, 107-11, 2008.
15. Evans R and Collins P, The wealth of India-Raw Materials, 5th ed., New Age International Publishers Ltd., New Delhi, 55-57, 2005
16. Dr. S. Ravi Shankar, Text book of Pharmaceutical Analysis, Page no: 15.8, 2010.
17. Vijyalakshmi R, Ravindran R. Preliminary comparative phytochemical screening of root extracts of Diospyrus ferrea (Wild.) Bakh and Arva lanata (L.) Juss. Ex Schultes. Asian J Plant Sci Res; 2:581-587, 2012
18. Doss A. Preliminary phytochemical screening of some Indian medicinal plants. Anc Sci Life 2009; 29:12-16.
19. Pandey P, Mehta R, Upadhyay R. Physico-chemical and preliminary phytochemical screening of Psoralea corylifolia. Arch Appl Sci Res 2013; 5:261-265
20. Yadav M, Chatterji S., Gupta S. K. and Watal G., "Preliminary Phytochemical Screening Of Six Medicinal Plants Used In Traditional Medicine" International Journal of Pharmacy and Pharmaceutical Sciences, 2014; Vol 6, Issue 5, ISSN- 0975-1491.
21. Oliveira I, Sousa A, Ferreira I, Bento A, Estevinho L, Pereira JA. Total phenols, antioxidant potential and antimicrobial activity of walnut (Juglans regia L.) green husks. Food Chem Toxicol 2008; 46: 2326-2331.
22. Nair VD, Paneerselvam R, Gopi R. Studies on methanolic extract of Rawolfia species from Southern Western Ghats of India - In vitro antioxidant properties, characterization of nutrients and phytochemicals. Ind Crop Prod 2012; 39: 17-25.