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SEQUENTIAL EXTRACTION OF MICRONUTRIENT IN *O. GRATISSIMUM*

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ABSTRACT

The ancient Ayurvedic scriptures have mentioned the medicinal plant in the management of several diseases. *O. gratissimum* is a sacred plant of the Hindus and is worshipped at homes and temples. Medicinal properties have been attributed to this plant in several ayurveda literature. The plant extract was analyzed for certain trace metals viz. copper, zinc, manganese and iron. Concentrations of these metals in plant extract were found to be zinc (55 μg/g), iron (59 μg/g), copper (29 μg/g) and manganese (9 ug/g). These trace metals impart therapeutic values to this herb specified in Indian Ayurvedic medicinal system.

Key words: *O. gratissimum,* Zinc, Copper, Iron, Manganese –

INTRODUCTION

Rigveda and Ayurveda reveal that ancient Indians had rich knowledge of medicinal value of different plants. 0. *gratissimum* (labiatae) commonly known as "Tulsi" is found throughout India.[1] The ancient and modern literature reveals the usefulness of the plant in various diseases. It is used as antiseptic, antipyretic, aromatic, diaphoretic, stimulant, anticatarrhal, antidysenteric and for chronic diarrhea [2]. Aromatic use in whooping cough, its juice is used as nasal drops in cold, cough and for ringworms[3,4]. The empirical basis of the therapeutic use of the species has been laid down in texts of Ayurveda [5]. *O.gratissimum* has been a subject of extensive phytochemical studies for trace metals because elaborate studies have been made on medicinal values pertaining to their organic constituents. However, studies on trace metals are available and still further investigation is required. Thus, the current investigation has therefore been carried out on analysis of trace metals.

EXPERIMENTAL

The leaves of *O. gratissimum* are collected from botanical garden of Department of Botany, J.N.V.University, Jodhpur and were grind to 1 g of sample, 12 mL of digestion

mixture (Conc. HNO_3 : $HClO_4$: H_2SO_4 in 2 : 1 : 9) was added and digestion was carried out for one and half-hour on a hot plate to oxidize all the organic matter. The digested matter was reconstituted in 12 mL of double distilled water. For trace metal analysis, 1 mL of extract was submitted for Atomic Absorption Spectroscopic analysis (A.A.S.). (Perkin Elmer Model, A.A.S. -100) with hollow cathode lamp for element analysis.

RESULTS AND DISCUSSION

In present study, the trace elemental level in *O. gratissimum* with respect to iron, zinc, copper and manganese are shown in Table 1. High concentration of metals clearly define the role of *O. gratissimum* for a healthy metabolism associated with hemoglobin. The requirement of iron for an adult is 20 mg per day and for a child it is l0 mg per day. Our results have shown iron content to be 60 mg, which supports the recommended use of tulsi leaves to compensate for iron deficiency and in stomach disorders. The medicinal property of tulsi also includes its use and antifertility agent due to presence of zinc content in Ram tulsi as 55 µg/g. Zinc is essential for enzyme responsible for DNA and RNA synthesis and hence for growth and multiplication, skin integrity, bone metabolism, functioning of taste and eyesight.[6] The observed copper content of tulsi 29 µg/g is lower than that reported for shank humpy *{Canscora decussata* as 55.2 µg/g)[7]. Copper is recommended for leprosy treatment. The manganese content of tulsi species under study is found to be 9 µg/g, which is in close agreement with the neutron activation analysis results.

Table 1. Analysis of trace element in 0cimum species

Species	Fe (µg/g)	Cu (µg/g)	Zn (µg/g)	Mn (µg/g)
O. gratissimum	59	29	55	09
0. *sanctum*	(72.3)[8]	-	(17.9)[8]	(54.1)[8]
0. *sanctum*	(48.0)[9]	-	-	(59)[9]

A comparison between the elemental content found for *O.gratissimum* species under study and values reported by other woman are given Table 1: Although the results cannot be same because the concentration is dependent on species, environmental condition and PH of soil.

Thus, with the advent of newer analytical technologies, there has been a renaissance in the field of phytochemical investigations of trace metals in the plant of *O. gratissimum* because geographic area of origin and yearly variation in environmental

conditions.[1] Even different provenance of *O. gratissimum* tree and last bioactivity of the *O. gratissimum* extract also varied[11]. Khan. et al.[12] (2005) analyzed heavy metal contents in *Raphanus sativus* from Atomic Absorption Spectrophotometer. Plant material contained 1.25 mg/g of zinc, 0.835 mg/g of copper[12] .Taher[13] determined cobalt by AAS where Yilmaz et al.[14] determined minerals by atomic absorption spectrometry after microwave digestion Cu- 0.13 µg/g, Fe- 2.20 µg/g, Mn- 0.39 µg/g and Zn- 1.62 µg/g.

CONCLUSION

The metal like iron, copper, zinc and manganese are essential metals since they play an important role in biological system. The decrease in amount of these elements causes malnutrition in plants. On the other hand, increase in the amount of these element has hazardous effects. Thus, accurate amount of these trace metals has been analyzed by AAS.

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Thanks to Generator of Diversity for putting through. My faith, the mythical phoenix, rising renewed and ready to begin again.

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