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EVALUATION OF TRACE METAL IN *M. SPICATA* FOR ITS THERAPEUTIC VALUE

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ABSTRACT

The plant selected in present study has great therapeutic value specified in Indian Ayurvedic Medicinal system. *M. spicata* exhibits digestive effect caused by biologically active compound, e.g. menthol and herbal extract obtained from mint, which gives cool feeling to skin after use. It is soothing, antiseptic, a blood circulation stimulant and mild local anesthetic. Much work has been done on organic constituents of the *M. spicata*; however, little attention has been paid towards their trace metal contents. Thus, plant extract of *M.spicata* was analyzed for certain trace metals viz. copper, zinc, manganese and iron. Concentrations of these metals in plant extract were found to be zinc (122 μg/g), iron (92 μg/g), copper (125 μg/g) and manganese (31 μg/g). These trace metals impart therapeutic values to this herb as specified in Indian Ayurvedic Medicinal System.

Key word - *M. spicata, T. confusum,* Zinc, Copper, Iron, Manganese

INTRODUCTION

Mankind has a long history of using herbal medicines. Indian medicinal plants have been used since ancient times for treatment of human ailments. The families of labiatae, which have commercial and medicinal values, are widespread throughout the world as well as Turkey[1]. *M. spicata* commonly known as spearmint is used as herb with spices to give the food a special flavour and fragrance[2]. It is also used for flavouring chewing gums, toothpaste, confectionaries and pharmaceutical preparations[3]. The herb is considered stimulative, carminative and antispasmodic[4]. Habek Mint *(Mentha longifolid)* known as horsemint is often used in domestic herbal remedy and is being valued especially for its antiseptic properties and its beneficial effects in digestion[5]. The inorganic minerals are component of enzymes and hormones, which regulate processes such as growth, and disease of plant [6]. A lack of micronutrients is responsible for some plant diseases and often causes crops to perish. Many micronutrients constitute the active center of enzymes and vitamin[7]. The investigator characterizes the theoretical and practical studies of micronutrients in different plant species. We have analyzed the trace metals

(iron, zinc, copper and manganese) in *M. spicata.*

EXPERIMENTAL

The leaves of *M. spicata* were collected from botanical garden of department of botany, J. N. V. University, Jodhpur. These were ground to 1 g (plant 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[8].

RESULTS AND DISCUSSION

Mentha species of family labiatae are well known in traditional medicines. For domestic herbal remedy, antiseptic properties and digestion, mint is often used. Higher concentrations of metals clearly defines the role of M. *spicata.* The leaves contain about 0.75 % essential oils. The iron content of mentha species under study is found to be 92 µg/g. Iron remains associated with organic molecules to form chelates, where from these become available for biochemical processes. Zinc content is 122 µg/g and manganese content is 31µg/g. The role of Zn and Mn in the maintenance of normal glucose tolerance and in the release of insulin from pancreatic β-cell is being increasingly recognized[9]. Copper content in mentha species is 125 µg/g. These results are compared with other species of mentha.

Table. 1: Analysis of trace elements in mentha species

Species	Fe (µg/g)	Cu (µg/g)	Zn (µg/g)	Mn (µg/g)
M. spicata	92	125	122	31
M. spicata	(150)[10]	(15)[10]	(90)[10]	(50)[10]
M. arvensis	(183)[11]	(98)[11]	(44.3)[11]	(37)[11]

A comparison between the elemental content found for mentha species in the present study and values reported by other workers are compiled in Table. 1. Due to variable environmental conditions, the results are not similar.

Due to geographic area of origin and annual variations in environmental conditions even different provenance *of M. spicata* tree and *M. spicata* extract also varied[12,13]. Thus, trace metals in the leave extract of *M. spicata* were found different as compared with other species of mentha. There are several analytical techniques for analysis of trace metals. Naseri et al analyzed 7.16 µg/g (Zn), 86.2 µg/g (Cu), 12.2 µg/g (Fe), and 72.16 µg/g (Mn) in *Ziziphus spinachristi* by atomic absorption spectroscopy and Flame Emission Spectrophotometry method.[14]

CONCLUSION

Now a days determination of trace metals in plant samples is essential because of these metals have nutritive values. Various techniques have been reported for the determination of trace metal in plant samples. However, Atomic Absorption Spectrometry has been effectively widely used for the determination of trace metal.

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