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Research Article

STUDY OF SOME WILD TUBERS /RHIZOMES AS POTENTIAL MICRONUTRIENT SUPPLEMENTS TO THE VEGETARIAN DIETS OF INDIGENOUS POPULATION OF JHARKHAND

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ABSTRACT
In Jharkhand, tribal and other people who reside in the forest area are dependent on forest produces besides agriculture for their livelihood. Many tubers and rhizomes are consumed by the population of this area as vegetable or raw which provide them nutritional supplement. Some of these tubers and rhizomes are sold in the village markets. Authors have surveyed village areas and forest with an aim to identify scientifically those tubers and rhizomes and also to get information about their medicinal value. Present communication reports about the micronutrient of some less known tubers and rhizomes which are wild in nature in Jharkhand.

Keywords: *Wild Tubers and Rhizomes, Food Supplement, Micronutrient, Jharkhand*

INTRODUCTION
With ever-increasing population pressure and fast depletion of natural resources, it has become extremely important to diversify the present day agriculture with the cultivation of some nutritionally potent varieties of tubers, rhizomes (surveyed in present study) in order to meet various human nutrient needs. The ethnic people use a wide variety of wild plants and plant products as their food. India has one of the largest concentrations of tribal population in the world. The forest plays a vital role in the economy as well as daily needs of the tribal. In times of scarcity when the staple food is in short of supply tribal collect many types of wild roots and tubers to supplement their meager food available at home (Vidyarthi, 1987).
Information regarding the chemical and nutritional content of Indian wild edible tubers, rhizomes, corms, roots and stems is meager (Gopalan *et al.*, 1971; Babu *et al.*, 1990; Nair and Nair, 1992; Rajyalakshmi and Geervani, 1994; Shanthakumari *et al.*, 2008, Udensi *et al.*, 2008). Jharkhand is also not an exception. Therefore, in the present investigation, an attempt has been made to understand the chemical composition especially the micronutrients of the wild edible tubers, rhizome, corm, roots, and stems consumed by the tribal of Jharkhand. Studies on nutritional value of wild plant food are of considerable significance since it may help to identify long forgotten food resources.
Considering these aspect a systematic approach have been undertaken to study the micronutrients *viz Fe*, Cu, Zn and Mn in some less known wild underground roots commonly intake in the diet by local people in Jharkhand.

MATERIALS AND METHODS
Fifteen species of less known wild tubers and rhizomes were collected from randomly selected villages like Kathikund, Nijhor of Dumka district, Taimara and Norhi from Ranchi district Mahesh pur and Pakuria in Pakur district and Lili and kote and Runtukel from Khunti districts during (2013 -2015). Plants were identified scientifically after considering Haines (1921-1925) and Ghosh (1971) recent nomenclatures of these taxa were confirmed on the basis of Singh *et al.*, (2001). The plant materials collected were processed for cleaning, washing and drying as per prescribed scientific method. The materials were oven dried at 500C for 4 days and kept in airtight containers. 0.5 gm processed plant samples digested with 10 ml tri-acid (HNO_3; $HClO_4$; H_2SO_4 in 10:4:1 ratio) and final volume was made

50 ml. analysis of cationic micronutrient was done in Atomic absorption spectrophotometer (ECIL – 4141) using specific cathode lamps at Birsa Agriculture University, Kanke, Ranchi.

RESULTS AND DISCUSSION

The results of micronutrient analysis of fifteen non conventional tubers and rhizomes are presented in Table 1. It was noted that these underground vegetables and spices are good source of micronutrients. Iron content varied from 152 **µg /g** [*Sauromatum venosum* (Aiton) Kunth] to 760 **µg/ g [***Zingiber purpureum* Roscoe] among all tested plant species. In respect to Zinc content *Lasia spinosa* (L.) Thwaites (221 **µg/ g**), *Zingiber zerumbet* (L.) Roscoe ex. Sm (125.5 **µg/ g**), *Curcuma amda* Roxb (114.5 **µg/ g**) and *Zingiber purpureum* Roscoe (105 **µg/ g**) showed higher values indicating them as a good source of this vital trace element. Strangely *Holostemma ada-kodien* Schult. (31.5 **µg/ g**) contain least Zinc content. Copper content was found highest in *Abelmoschus crinitus* Wallich (**419 µg/ g**) while lowest content of Cu was observed in both *Dioscorea esculenta* (Lour.) and *Lasia spinosa* (L.) (8.5 **µg/ g**). Manganese content in all tested 15 plant species was varied from 4 **µg/ g** *(Dioscorea glabra* Roxb.) to 535 **µg/ g** (*Lasia spinosa* (L.) Thwaites). Wide variation of Mn accumulation in plant species showed the genetic potential of wild tested plant species and need detail survey and study on this important aspect.

Table 1: Micronutrient analysis of fifteen non conventional tubers and rhizomes

SN	Botanical Name	Iron Fe Wave Length- 2.47 .9 nm µg g-/	Zinc Zn Wave Length- 213.6 nm µg g-/	Copper Cu Wave Length- 324.2 nm µg g-/	Manganese Mn Wave Length- 279.2 nm µg g-/
1	*Dioscorea Glabra* Roxb.	199.5	36.5	9	4
2	*Zingiber Zerumbet* (L.) Roscoe ex. Sm	306	125.5	14.5	162.5
3	*Plesmonium Margaritiferum* (Roxb.) Schott.	269	51.5	13	44
4	*Holostemma Ada-Kodien* Schult.	233.5	31.5	10.5	18.5
5	*Zingiber Purpureum* Roscoe	760	105	13	87.5
6	*Curcuma Amda*	245	114.5	33.5	15.5
7	*Sauromatum Venosum* (Aiton) Kunth	152	94.5	10	14.5
8	*Dioscorea Pentaphylla* L.	410	37	19	45
9	*Dioscorea Esculenta* (Lour.) Burkill	185	39	8.5	8.5
10	*Lasia Spinosa* (L.)	153.5	221	8.5	535
11	*Bombax Ceiba* L.	172	41.5	10	81.5
12	*Schoenoplectus Grossus (L.f)* Palla	152	94.5	10	14.5
13	*Butea Monosperma* (Lam.) Taub	307.5	40	23.5	29.5
14	*Vigna Vexillata* (L.) A. Rich Var Vaxillata	438.5	76	126.5	142.5
15	*Abelmoschus Crinitus* Wallich	407	76	419	53.5

The iron and the copper content in the *Dioscorea pentaphylla* var. *pentaphylla* is found to be higher when compared with the earlier reports in the tubers of *D. oppositifolia, D. pentaphylla, D. bulbifera* and *D. hispida* (Rajyalakshmi and Geervani, 1994) and *D. oppositifolia* (Murugesan and Ananthalakshmi, 1991). In present study the iron and copper content of *Dioscorea pentaphylla* is also higher than *D. glabra* and *D. esculenta.* Mohan and Kalids (2010) analyzed mineral composition of several edible tubers, rhizome, corms, roots and stems including *Dioscorea pentaphylla.* They found iron content 1034.8 **µg/ g,** copper content 126 **µg/ g** and zinc and manganese content 31 **µg/ g** and 13.2 **µg/ g** respectively in *D.pentaphylla.* Iron and copper content of *D. pentaphylla* was found higher than all Dioscoreas they analyzed (*D. oppositifolia, D. hamiltonii, D. tomentosa* and *D. spicata).*
The present result indicates the potentiality of these underground roots as source of unconventional foods. Being wild, they also are easily accessible and cheaper mineral resources.

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