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Research Article

MINERAL CONTENTS OF SOME COMMONLY CONSUMED TRIBAL FOODS OF TRIPURA, INDIA

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ABSTRACT

The Sodium, Magnesium, Calcium, Manganese, Iron, Copper and Zinc contents of twenty eight commonly consumed Tribal food samples, classified as Leafy vegetables, roots and Tubers, fruit, bulb were collected from different books, journals and research thesis. The mineral content of the food samples varied widely from one food sample to another even within a similar class of food material. For example, Calcium content in cereal ranges from 7.10 µg in millet whereas, the calcium content of legumes ranges from 7.10 µg in groundnut to 84.5 µg in soya beans. Cereal and legumes are seen to be batter source of mineral elements than food in the category of root, fruit and vegetable.

Keywords: Mineral element, Foods, Tubers, Grains, Fruits, Legumes.

INTRODUCTION

There has been an increase in consumption of cereals (e.g. corn, maize), root and stem tubers (e.g. yam, potato), bulbs (e.g. Onion), fruits (e.g. guava, banana) in Tripura.

The reason is due to the fact they are grown locally and easily available. Some Tribals in Tripura are used to particular type of food material that they only vary the cooking procedure and eat it many times a day. Thus, different vegetables can be eaten as boiled or in different forms in the morning, afternoon, or evening. This practice can result in high dietary intake for some minerals and low intake for another. In recent years, poor economy in Tripura has contributed immensely to the poor consumption of animal products hence, some people particularly the low income earners feed mainly on minerals obtained from plant materials.

Table 1: Mineral contents of the leafy vegetables

Samples	Elemental concentration in (mg/100g)							
	Na	Mg	K	Ca	Mn	Fe	Cu	Zn
Kalmisak (*Ipomoea reptans Poir.*)	135.00 ± 2.50	301.64 ± 12.69	5,458.33 ± 954.70	110.00	2.14 ± 0.22	3.90	0.36 ± 0.01	2.47 ± 0.27
Thankuni (*Centella asiatica Linn.*)	-	-	-	176.00	-	12.00	-	-
Bathusag (*Chenopodium album Linn.*)	43.00	34.00	452.00	150.00	0.782	4.20	0.293	24.00
Mula (*Raphanus sativums Linn.*)	_	_	_	310.00	-	16.10	-	-
Spinach (*Spinacia oleracea L.*)	58.5	84.0	206.0	73.0	-	10.9	0.01	-
Lettuce (*Lactuca sativa L.*)	-	-	140.0	22.0	-	0.5	-	-
Fenugreek (*Trigonella foenumgraecum L.*)	76.0	67.0	31.0	360.0	-	17.2	0.26	

Table 2: Mineral contents of the roots and tubers

Samples	Elemental concentration in mg/100g							
	Na	Mg	K	Ca	Mn	Fe	Cu	Zn
Chupri Alu (*Dioscorea alata Linn.*)	-	-	911.20	16.00	0.50	0.50	-	-
Banalu (*Dioscorea bulbifera Linn.*)	-	-	911.20	20.00	0.50	1.00	-	-
Suthnialu (*Dioscorea esculenta Burkill.*)	-	-	911.20	24.00	0.50	-	-	-
Thankun (*Dioscorea hamiltonii Hook.*)	64.00 ± 0.14	104.00 ± 0.34	1134 ± 0.94	52.00	5.44 ± 0.04	51.10 ± 0.12	1.34 ± 0.01	2.18 ± 0.03
Kukuralu (*Dioscorea puber Blume.*)	-	-	911.20	16.00	0.50	-	-	-
Suaralu (*Dioscorea pentaphyla Linn.*)	95.20 ± 0.12	380.00 ± 0.74	1322 ± 2.40	25.00	1.32 ± 0.01	103.48 ± 0.94	12.60 ± 0.14	3.10 ± 0.01
Simul Alu (*Manihot esculenta Crantz.*)	-	-	-	50.00	-	0.90	-	-
Lal Alu (*Ipomoea batatas Linn.*)	9.00	-	393.00	20.00	-	0.80	-	-
Ol (*Amorphophallus campanulatus Blume*)	-	-	-	50.00	-	0.60	-	-
Karul (*Bambusa sp.*)	91.00 (tender shoots)	32.00 (tender shoots)		20.00 (bamboo Shoots), 20.00 (tender Shoots)		0.10 (bamboo Shoots), 0.10 (tender shoots)	0.19 (tender shoots)	-

Table 3: Mineral contents of the fruits

Samples	Elemental concentration in mg/100g							
	Na	Mg	K	Ca	Mn	Fe	Cu	Zn
Brihati (*Solanum torvum Swartz.*)	-	-	-	390.0	-	22.20	-	-
Jhum Begun (*Solanum melongena Linn.*)	3.00	16.0	200.0	18.0	-	0.90	0.17	
Ram Kala (*Musa cavendishii Lamb.*)	-	-	-	0.03 (flower), 25.00 (stem)	-	0.10 (flower), 1.10 (stem)	-	-
Sagina (*Moringa pterygosperma Gaertn.*)	-	-	-	30.00 (pods), 51.00 (flower)	-	5.30 (pods), –	3.10 (pods), –	-
Arhar (*Cajanus cajan Linn.*)	93.00	58.00	463.00	57.00	-	1.10	0.40	-
Dheras (*Abelmoschus esculentus Linn.*)	6.9	38.00	220.00	0.09	-	1.50	0.19	-
Tomato (Lycopersion esculentum Mill)	3.0	11.0	268.0	11.0	0.19	0.6	0.1	-
Chilli (Capsicum annum L.)	6.5	24.0	217.0	30.0	-	1.2	1.55	-

Table 4: Mineral contents of the bulbs

Samples	Elemental concentration in mg/100g							
	Na	Mg	K	Ca	Mn	Fe	Cu	Zn
Onion (Allium cepa L.)	-	-	-	0.18 (Big onion) 0.04 (Small onion)	-	0.7 (Big onion) 1.2 (Small onion)	-	-
Garlic (Allium sativum L.)	-	-	-	30.0	-	1.3	-	-
Leek (Allium porrum)	-	-	-	50.0	-	2.3	-	-

The importance of mineral contents of foods is well documented in different parts of the world, e.g. U.S.A.[1], Malawi[2], and Papa New Guinea[2]. The importance if adequate minerals in diet for healthy growth are also well recognized[3,4,5]. Cereal , roots and stem tubers, vegetables and fruits have been shown to contain such elements as Na, K, Ca, Zn, Cu, Fe, Cl etc which are concerned quite essential for proper health and growth of humans. They are needed in balanced diets like essential amino acids. Most of these elements are important part of enzymes. It has been reported that deficiency of different minerals usually leads to skeletal deformities, growth retardation and other ill health conditions[6].

The study is therefore designed to investigate the concentration of mineral elements in the commonly consumed food samples to have an idea of which combination will likely produced a balance diet or those to be taken when a particular deficiency is noticed.

Classification of vegetables

The vegetables are normally classified into five broad groups:

1. Leafy vegetables 2. Roots and Tubers 3. Fruit vegetable 4. Bulb

Tribal people are using some plants as edible parts traditionally without knowing their active principle. The following information was collected by travelling all the districts of the state through interviews with the Tribal people. The plants were identified and authenticated by Tribal Research Institute, Government of Tripura, Agartala. Secondary information was collected from the library of Aranya Bhaban, Gurkhabasti, Agartala, from the library of College of Agriculture, Tripura, different electronic and non-electronic sources and reports also.

The mineral contents of the commonly consumed leafy vegetables by Tribals of Tripura are presented in Table 1 [7,8]. The mineral content in roots and tuber, fruits and bulbs are given in table 2 [7], 3 [7,8], 4 [8] respectively which are consumed by Tribals of Tripura. The data provides good information on the mineral content of foods consumed by Tribal people of Tripura.

RESULTS AND DISCUSSION

Among the leafy vegetables *Ipomoea reptans* and *Chenopodium album Linn* recorded the highest mineral content with comparable concentrations. In fact, they are commonly used as weaning food for babies[3]. They possess relatively higher concentrations of Potassium compared with others leafy vegetables. Potassium is a very important mineral for the proper function of all cells, tissues, and organs in the human body. Potassium is crucial to heart function and plays a key role in skeletal and smooth muscle contraction, making it important for normal digestive and muscular function. The chemical content of the soil on which the food samples were grown can contribute to the elemental composition of the samples.

Roots and Tubers are consumed as main staple foods. They have lower concentration of mineral elements when compared with leafy vegetables. They are mainly sources of Magnesium. Mg plays fundamental role in most reactions involving phosphate transfer and also believed to be essential in the structural stability of nucleic acids and intestinal absorption[9]. To avoid malnutrition, they should be taken along with some complements such as fruits and vegetables that contain higher mineral contents.

Fruits are eaten as complements and the result shows that they are good sources of mineral elements. They are also better sources of Potassium and Calcium.

In general, bulbs contain low Potassium. The results show that better K supplements can be obtained from fruits that are eaten along with bulbs as side complements.

Maximum vegetables are also a good source of Ca, which is an important macronutrient needed for bone formation.

Leafy, roots and tubers, and fruits are shown to be better sources of Fe. Iron is said to be an important element in the diet of pregnant women, nursing mothers, infants, convalescing patients and elderly to prevent anemia.

Among all *Chenopodium album Linn* was seen as good sources of Zinc. Zn is said to be an essential trace element for protein and nucleic acid synthesis and normal development[10,11].

Among all the vegetables *Ipomoea reptans* contains major amount of Sodium which helps to develop our brain.

CONCLUSION

The result shows that bulbs contain low mineral elements then others and it will be better if they are taking along with supplements such as leafy vegetables and fruits. No single food material contains all the required mineral elements which indicate that no single food material can supply the required balanced diet.

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