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MINERAL COMPOSITION OF SOME WILD EDIBLE FRUITS FROM KOLHAPUR DISTRICT

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ABSTRACT: The mineral compositions of the 8 wild edible fruits were investigated. Nitrogen, sodium, potassium, calcium, magnesium and phosphorus were analyzed as the major constituents of the fruits and iron, zinc, copper and manganese were identified as a minor constituent. Among all the mineral, Potassium were found in large quantity in all fruits. *Ficus racemosa* L., fruit contain the highest amount of calcium, sodium and potassium. *Grewia tiliifolia* Vahl. fruit is rich in potassium and magnesium whereas iron content is more in Meyna *laxiflora* Robyns, *Flacourtia indica* (Burm. f.)Merr. fruit is rich in copper and manganese, while *Cordia dichotoma* fruit rich in zinc.

Key Words: Wild edible fruits, Minerals.

INTRODUCTION

Fruits are generally acceptable as good source of nutrient and supplement for food in a world faced with problem of food scarcity. They are known to be excellent source of nutrients such as minerals and vitamins (Nahar et.al,1990). Mineral ions are of prime importance in determining the fruit nutritional value. Potassium , calcium, and magnesium are the major ones. In the tissue of many fruits, calcium is one of the mineral believed to be an important factor governing fruit storage quality (Lechaudel et al(2005). It has been reported to delay ripening and senescence (Fergusan,1984) and to reduce storage disorder (Bangeruh,1979). The importance of minerals such as potassium, calcium, sodium *etc.* to human health is well known. Required amounts of these elements must be in human diet to pursue good healthy life (San,2009). The content of mineral elements in plants depends to a high degree on the soils abundance, including the intensity of fertilization (kruczek, 2005).

In this study, the main objective is to determine the mineral composition in wild edible fruits found in the kolhapur districts.

MATERIAL AND METHODS:

Selected wild edible fruits were collected from various localities of kolhapur district,viz. *Ficus racemosa*L., *Elaeagnus conferta* Roxb., *Flacourtia indica* (Burm. f.)Merr., *Glycosmis pentaphylla* (Retz.) DC., *Ziziphus rugosa* Lamk., Meyna *laxiflora* Robyns., *Cordia dichotoma* Linn., *Grewia tiliifolia* Vahl. etc. Efforts made to collect these plants in flowering and fruiting conditions for the correct botanical identification. Healthy and disease free fruits selected and dried them under shade so as to prevent the decomposition of chemical compounds present in them. All the dried material powdered in blander for further study.

Total nitrogen was estimated according to the method of Hawk *et al.* (1948).

Phosphorus was estimated from the same acid digest by following the method described by Sekine *et al.* (1965).The acid digestion method of Toth et al. (1948) has been followed for the analysis of inorganic constituents. Sodium and Potassium were estimated flame photometrically following the standard method of flame photometer (Model-Elico, ch-22A).The remaining inorganic elements viz. Calcium, Potassium, Magnesium, Iron, Manganese, Zinc, Copper and Cobalt were estimated by using Atomic absorption spectrophotometer (Perkin-Elmer, 3030 A).

Table 1: MINERAL CONENT OF THE WILD EDIBLE FRUITS

S.No	Name of the fruits	MACROELEMENT(mg/100g)						MICROELEMENT(mg/100g)			
		N	P	K	Ca	Mg	Na	Fe	Zn	Cu	Mn
1	*Grewia tiliifolia*	0.96 ±0.020	2.52 ±0.04	1302 ±2	109.4 ±0.20	402.2 ±0.15	239.3 ±1.15	31.13 ±0.05	5.4 ±0.43	2.3 ±0.05	2.7 ±0.015
2	*Cordia dichotoma*	0.67 ±0.025	2.20 ±0.030	1561.3 ±1.52	615.4 ±0.30	123.6 ±0.020	200 ±2	24.15 ±0.01	3.85 ±0.03	0.667 ±0.015	1.56 ±0.032
3	*Ziziphus rugosa*	0.42 ±0.041	0.45 ±0.03	1502.3 ±4.9	256.2 ±0.15	156.4 ±0.41	181.6 ±2.08	23.87 ±0.01	3.68 ±0.02	2.06 ±0.03	4.26 ±0.20
4	*Ficus racemosa*	0.68 ±0.02	1.5 ±0.45	1922 ±2	928.4 ±0.41	272.9 ±0.78	259.6 ±1.5	33.28 ±0.24	5 ±0.08	0.43 ±0.03	0.95 ±0.055
5	*Meyna laxiflora*	0.44 ±0.04	0.15 ±0.04	1278 ±2.6	325.1 ±0.66	99.5 ±0.90	221 ±1.7	35.55 ±0.47	5.21 ±0.09	0.84 ±0.03	0.94 ±0.04
6	*Flacourtia indica*	0.64 ±0.025	0.13 ±0.017	1184.3 ±4.5	434.8 ±0.1	130 ±1.3	146.3 ±1.5	15.23 ±0.19	2.13 ±0.32	7.6 ±0.06	10.37 ±0.49
7	*Elaeagnus conferta*	0.57 ±0.015	1.29 ±0.08	1338.6 ±3.2	280.1 ±0.78	140.1 ±1.12	184.3 ±0.57	21.33 ±0.58	5.51 ±0.01	0.94 ±0.04	3.80 ±0.08
8	*Glycosmis pentaphylla*	0.37 ±0.025	0.94 ±0.037	1432.3 ±2.51	505.1 ±1.01	332 ±0.89	213 ±1.7	32.3 ±0.43	1.46 ±0.15	1.14 ±0.04	2.60 ±0.16

The data are mean values ± Standard deviation (SD) of three replicates.

RESULTS AND DISCUSSION

The highest values of nitrogen , phosphorus and magnesium was observed in a *Grewia tiliifolia* fruits, calcium, sodium and potassium in *Ficus racemosa* fruits respectively and microelement found like iron, which is higher in *Meyna laxiflora* fruits, Zinc in *Elaeagnus conferta* fruits, while Copper and manganese are present abundant in *Flacourtia indica* fruits.

Adepoju (2009) analysed mineral composition from wild fruits in Nigeria. He was selected 3 wild fruits such as *Sponias mombim ,Diallum guineese* and *Mordii whytii.* In all fruits magnesium was higher and *S. mombin* fruit contains the higher value of magnesium (465.0 ± 21.21), sodium (400.0 ± 12.43) and copper (1.0 ± 0.14) Whereas M. whytii is high in potassium (410.0 ± 12.20) calcium (300.0 ± 12.20), phosphorus (170.0 ± 7.50), zinc(2.2 ± 0.12), manganese (6.2 ± 0.15). In present study all mineral values are higher than previous auther. This observed variation might have resulted from geographic, climatic and seasonal variation.

Agrahar-Murugkar and Subbulakshmi (2005) studied the nutritive value of wild edible fruits, berries, nuts, roots and spices consumed by the khasi tribes of India. He analysed 8 fruits. *Solanum indicum* is rich in calcium, *Solanum gilo* is rich in phosphorus and magnesium, iron is more in *Prunus nepalensis,* manganese in *Viburnum corylifolia, Solanum xanthocarpum* contain higher amount of sodium and copper. *Vangeria spinosa* is higher in zinc. *Gomphogyne cissiformis* is rich in potassium. In present work the potassium is higher among all, but previous author detected the higher amount of calcium.

The nutritive and energy values of some wild fruit spices in southestern Nigerian were studied by Effiong in 2009. The *Xylopia aethiopica, Tetrapluera tetraptera and Piper guineense* fruits were studied for their nutrient values. The mineral study indicated high content of P (1215.00 + 4.90 mg/100g), Mn (52.15 + 1.02 mg/100g) zinc (9.6 + 0.71 mg/100g) and copper (14.84 + 3.90 mg/100g) for *Xylopia aethiopica* and *Piper guineense* is rich in Calcium (31.15 + 3.10 mg/1oog), Magnesium (19.65 + 0.42 mg/100g) and Pottasium (308.95 + 1.74mg/100g) while high level of Sodium (201.5 + 4.90 mg/100g) and Iron (47.49 + 1.87 mg/100g) found in *Tetrapluera tetraptera*. This implying that fruits are good source of nutrients. The value which is obtained is more than that of the present study. San et.al (2009) were studied the mineral composition of leaves and fruits of some promising jujube (*Ziziphus jujube* Miller) genotype. The nitrogen (2353.30), potassium (1078.30)and phosporus (126.10)values obtained in jujube genotype are higher than values obtained in present study, whereas the Calcium (928.4±0.41),Magnesium (402.2±0.15), Iron (35.55±0.47), Zinc (5.51±0.01) values of present study, are higher than that of jujube genotype. Tchepeleva et.al. (1998) were studied vitamins and mineral substances in fruit and nuts of wild siberian plants. Potassium content is found to be higher in cranberry (2760). Bilberry is rich in Sodium (794 mg/l), Magnesium (736 mg/l), and manganese (393 mg/l)and low in copper (not detected). Calcium (750 mg/l) is higher in fox berry. Zinc (30 mg/l) is more in both bileberry and blueberry. The potassium values (1922±2mg/100g) of present study are somewhat similar to previous author. Latermea et al. (2006) analysed the mineral content of tropical fruits and conventional foods of the andes and the tropical rain forest of Colombia. He studied total 68 species of starchy food, tropical fruits, leaves and tubers. All these species analysed for mineral content. These foods were generally high in Pottasium (1.782mg/100g) and low in sodium (45mg/100g). The observed values are low than the values obtained in present study. The mineral content of wild plum (prunus sp.) were analysed by Calisir et.al. (2005) and these fruits were contain the highest amount of Pottasium (9879.57 mg/kg) ,Ca(920.2mg/kg),Magnesium (916.68mg/kg), Pottasium (659.15mg/kg), Sulphur (122.69mg/kg), Sodium (40.46mg/kg), Iron (301mg/kg). All these values analysed are higher than the present study. Musinguzi et.al (2007) had carried out the chemical analysis of *Physalis minima* and *carissa edulis*. And they showed that these fruits were rich in mineral composition. The high content of potassium and iron were present in Carrisa edulis, Sodium, calcium, magnesium and phosphorus in *Physalis minima.* The values of mineral assessed in present study are higher than previous author. Wehmeyer (1966) worked on the nutrient composition of some wild edible fruits found in Transvaal. He studied the 9 species of wild edible fruits. The high values of Calcium, Magnesium, Phosphorus and iron are present in *Adansonia digitata,* Copper in *Landolphia capensis.* Sodium is more in *Bequartiodendron magalismontanum.* Potassium in *Xamenia caffra*. *Sclerocarya birrea,* a wide spread indigenous fruit bearing tree is studied by Mojeremene and Tshwenyane (2004) for their nutrient composition. Calcium is more in this fruit followed by Magnesium, Phosphorus, Iron, and sodium. The copper manganese, zinc and molybdenum not detected in this fruit. Phosphorus calcium and magnesium is higher in this fruit than the present study. *Balanites aegyptiaca*, the tree is valued for its fruits and seeds. The study was carried out by Elfeel in (2010) to assess the variability in seed kernel chemical contents between locations and individual trees with locations. Seed kernel from three distinct ecological zones in Sudan and individual trees within each zone were analyzed for minerals (N, P, K, Ca, Mg and Fe), oil and protein contents. *B. aegyptica var. aegyptica,* which were collected from Um Abdalla is rich in nitrogen, phosphorus, iron, potassium and magnesium, where as calcium is more in this fruit which were collected from Rashad. The values obtained in present study are lower than previous author**.** New Zealand 'Hass' avocado *(Persea americana* Mill.) orchards were surveyed by Thorp et. al in 1997, to determine if an imbalance in fruit mineral concentrations (Calcium (Ca), Magnesium (Mg), and Potassium (K)) was associated with poor fruit quality.

Ranges for average fruit mineral concentrations on surveyed orchards were rich in potassium, Magnesium, and then calcium. The obtained values of these mineral is somewhat similar to present study.

Smith and Reuther (1953) worked on the mineral content of Oranges in relation to fruit age and some fertilization practices. 5 samples of 24 valencisa oranges were collected from plots of 12 tree each. The various mineral element enter the maturing fruit at different rates. Calcium is taken up only in the first few months of fruit development. Potassium is dominant element in the fruit and is taken in continuously, as the fruit develops to maturity. This is true to lesser extent for Nitrogen, Sodium, Boron. Aluminium and iron. while Manganese, Phosphorus, Magnesium, copper and zinc appears to stop entering the fruit in the fall. The result obtained incase of potassium is related to present study. The baobab (*Adansonia digitata*) fruits were studied by baobab fruit company Senegal, for its nutritional properties. The value of calcium is high, followed by phosphorus, iron, potassium, sodium, magnesium and zinc. In present study values of potassium are high.

Living organism require a continuous supply of large number of substances (food) from outside the body to complete their life cycle. This supply is called as nutrition. The mineral nutrition is an important aspect and its pivotal role in human life for healthy growth. Such type of mineral easily available in wild edible plants. Thus it was thought worth to study the mineral nutrition of wild edible fruits.

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