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ORIGINAL RESEARCH ARTICLE

NUTRITIONAL COMPOSITION OF TWO EDIBLE AROIDS

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Abstract: Two edible tuber plants were selected and chemical composition of their corms and cormels was estimated a field experiment was carried out of two varieties of tube crops. Viz. taro and elephant foot yam were subjected to study the nutritional value of *Colocasia esculenta* CV muktakeshi and *Amorphophallus paeoxii folius* CV Gajendra. These aroids were grown in two different agro-climatic conditions, i.e. G. Udayagiri, Khajuripada block of Kandhamal district and Soroda and Bhanjanagar block of Ganjam district. These two tubers crops were analyzed for dry matter, starch, sugar, crude protein, carbohydrate, cholesterol, sodium, potassium calcium and magnesium content. The analytical study revealed that nutrient context were found more in tubers of Kandhamal and Ganjam District. This worth has a great potential. Presenting the food potential as well as medicinal value of Odisha and other region where as it's productivity supported climatic condition.

Key words: Tuber Crop; Edible; Corms; Cormels; Chemical Composition; Food Value; Medicinal Value.

INTRODUCTION

The tuber bearing plants belonging to the family Araceae viz Taro (*Colocasia esculenta*) and Elephant foot yam (*Amorphophallus paeoniifolius*). These tubers were cultivated on Asia, Africa and pacific as well as Caribbean islands. Taro is cultivated in almost all the state of India. It is originated in South east Asia (Watt., 1889). The occasionally beautiful and often bizarre combination of spathe and spadix called the inflorescence. Tuber crops are the third important food crops after cereals and legumes. World production of the crop is estimated to be 5.5 million tones annually and provides about one third of food intake or more than 400 million people in the tropics. The root crops are rich in starch and poor in protein context but they contain wide variety of minerals, and trace element, including relatively substantial quantities of iron and calcium as well as potassium and magnesium (Engl berger *et al.,* 2003). Taro and elephant foot yam are popular tuber crops in Eastern India especially Odisha. These tubers are consumed as vegetables after boiling and baking many delicious cuisions are prepared from taro and elephant foot yam. The products like taro chips and elephant foot yam pickles are very popular in Eastern India. Araids are not only source of human food but also used as cattle feed and raw material for industry, mixed cropping of taro is the closest or the most resemble forest in heavily modified rural and forest border landscape (marjo korpi and Ruokolainen, 2003; van Nacrdwijk *et al.,* 2007).

Elephant foot yam too has some useful health benefits like the root acts as carminative, restorative, stomachic and toxic. It is dried and used in the treatment of piles and dysentery, the fresh root acts as an acrid stimulant and expectorant.

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It is much use in our country in the treatment of acute rheumatism. Elephant foot yam is considered to be a healthy low. Fat food and sa rich source of essential fatty acids which are known to increase the good cholesterol levels in the blood. Eating elephant yam helps in increasing the estrogen levels in women's babies, thus helping in maintaining the hormonal balance. Elephant food yam companulatus is found to be analgesic and used in treatment of piles (shipi *et al.,* 2005).

MATERIALS AND METHODS

Elephant foot yam and Taro demonstrations were conducted by several National Agricultural Programme, in tribal dominated districts of Kandhamal and Ganjam in Odisha. In Kandhamal district, Khajuripada and G. Udayagiri blocks and in Ganjam district Sorada and Bhanjanagar blocks were selected for demonstration. Gajendra variety of elephant foot yam and Muktakeshi variety of Taro was collected from farmers for demonstration. At harvest corms and cormels of elephant foot yam and taro were sampled for analaysis. The samples were analyzed for carbohydrate, dry malts, starch, sugar, crude protein, cholesterol, sodium, potassium, calcium and magnesium by following standard procedures.

Chemicals

All chemicals and reagents were of analytical grade. NaOH, HCl, $CuSo_4$ petroleum ether, ethanol, sodium hydroxide, sodium carbonate, tannic acid, potassium acetate, phosphate, sodium di-hydrogen, potassium ferri-cyanite (Fisher chemic Ltd.) Cupric sulphate (Universal Laboratory Pvt. Ltd.) and Methanol from Qualigens (Glaxo India Ltd.)

Anonymous (1990) procedures were used for biochemical analysis for estimation of fat, crude protein, crude fiber etc.

Fresh corms were homogenized in 80% ethanol (8 to 10 hours). Extracts were evaporated to dryness following the method described by Frankova *et al.,* (2003). Using anthrone method (Trevelyan and Harrison, 1952), total soluble sugar was quantified. For extraction of starch, Rose *et al.,* (1991) method and for estimation Anthrone method (Trevelyan and Harrison, 1952) were followed.

For minerals (Na, K, Ca, Mg) were estimated using wet ash procedure. Na and K were estimated using flame photometer as described by Tothet *et al.,* (1948). Ca and Mg were estimated using complexiметric titration with ethylene diamminetitra acetic acid (EDTA) using the method described by Ringbomet *et al.,* (1958).

RESULTS AND DISCUSSION

The proximate composition of elephant foot yam corms was presented in Table 1. In elephant foot yam corms, higher dry matter (22.5%), starch (13.60%), sugar (1.08%), crude protein (2.14%), fat (0.46%), potassium (40.63 mg 100 g^{-1} dwb), magnesium (1.28 mg 100 g^{-1} dwb) were found from G. Udayagiri block. Calcium (3.21 mg 100 g^{-1} dwb) sodium (33.21 mg 100 g^{-1} dwb) were higher in Bhanjanagar block. Crude fiber (1.68%) in Sorada block. Lower dry matter (19.5%), starch (10.13%), sugar (0.82%), crude protein (1.10%), fat (0.22%), magnesium (1.06 mg 100g^{-1} dwb) in Bhanjanagar block, potassium (39.80 mg 100 g^{-1} dwb) in Sorada block, crude fiber (1.22%) and sodium (32.90 mg 100 g^{-1} dwb) in Khajuripada block , calcium (2.90 mg 100 g^{-1} dwb) in G. Udayagiri block were noticed, The variation in nutrient composition might be due to variation of soil nutrient status.

Proximate composition of taro cormels was presented in the Table 2. Higher dry matter (25.51%) in Bhanjanagar and Khajuripada Block. Protein (2.48%) and sodium (26.70 mg 100 g^{-1} dwb) were noticed in G. Udayagiri block. Fat (1.18%), sugar (1.72%) and magnesium (1.41 mg 100 g^{-1} dwb) were higher in Khajuripada block. Dietary fiber (3.30%), starch (14.50%) and calcium (2.26 mg 100 g^{-1} dwb) were rich in Bhanjanagar block. Potassium (26.90 mg 100 g^{-1} dwb) was higher in Sorada block. Lower dietary fiber (2.67%) in G. Udayagiri block, potassium (26.56 mg 100 g^{-1} dwb), calcium (2.04 mg 100 g^{-1} dwb) from Khajuripada block, protein (2.26%), fat (0.76%) and sodium (26.14 mg 100 g^{-1} dwb) in Bhanjanagar block, starch (14.0%), sugar (1.27%) and magnesium (1.20 mg 100 g^{-1} dwb) in Sorada block were observed. The variation in nutrient composition might be due to variation of soil nutrient status.

Table 1: Nutrient composition of corns of *A. paeonifolius*

Composition	Ganjam		Kandhamal	
	Sorada	Bhanjanagar	G. Udayagiri	Khajuripada
Dry matter (%)	20.50	19.50	22.50	22.00
Starch (%)	10.50	10.13	13.60	13.10
Sugar (%)	1.00	0.82	1.08	0.98
Protein (%)	1.27	1.10	2.14	1.34
Fat (%)	0.25	0.22	0.46	0.30
Fibre (%)	1.68	1.62	1.27	1.22
Na (mg/100gm of dry wt.)	33.00	33.21	33.10	32.90
K (mg/100gm of dry wt.)	39.80	40.41	40.63	40.59
Ca (mg/100gm of dry wt.)	3.10	3.21	2.90	2.96
Mg (mg/100gm of dry wt.)	1.14	1.06	1.28	1.26

N.B.: All data are fresh weight basis except minerals, which are expressed in mg 100g^{-1} on dry weight.

Table 2: Nutrient composition of corns of *C. esculenta*

Composition	Ganjam		Kandhamal	
	Sorada	Bhanjanagar	G. Udayagiri	Khajuripada
Dry matter (%)	24.72	25.51	24.99	25.51
Starch (%)	14.00	14.50	14.12	14.02
Sugar (%)	1.27	1.62	1.67	1.72
Protein (%)	2.28	2.26	2.48	2.37
Fat (%)	0.90	0.76	1.00	1.18
Fibre (%)	3.20	3.30	2.67	2.74
Na (mg/100gm of dry wt.)	26.20	26.14	26.70	26.56
K (mg/100gm of dry wt.)	26.90	26.78	26.70	26.56
Ca (mg/100gm of dry wt.)	2.18	2.26	2.08	2.04
Mg (mg/100gm of dry wt.)	1.20	1.25	1.39	1.41

N.B.: All data are fresh weight basis except minerals, which are expressed in mg 100g^{-1} on dry weight.

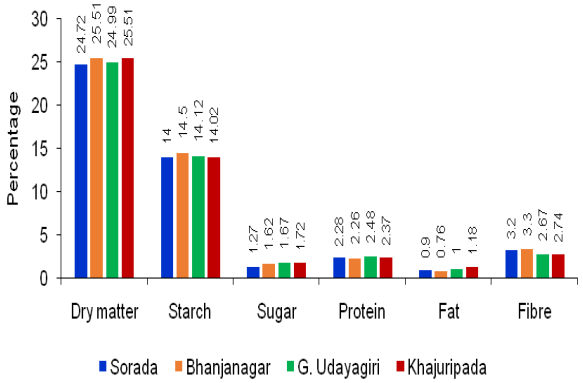

Figure 1 (A): Biochemical constituent in percentage of *A. paeonifulius*

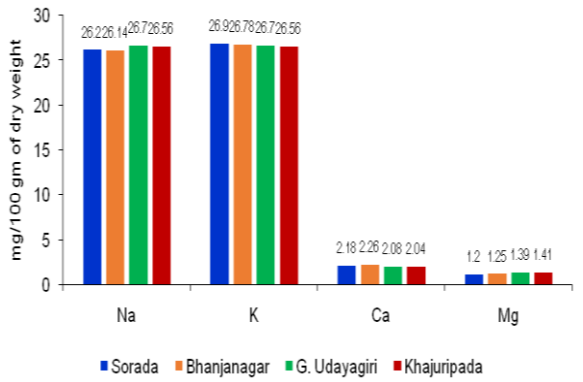

Figure 1 (B): Biochemical constituent in mg/100gm of *A. paeonifulius*

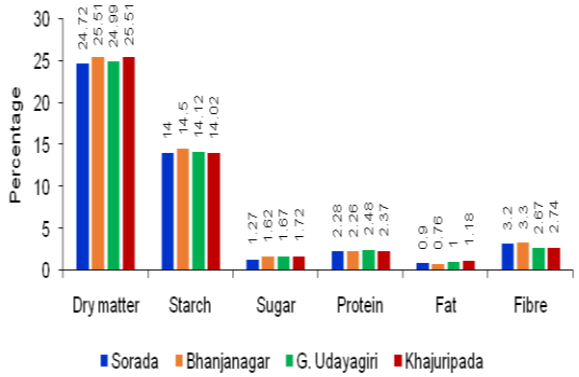

Figure 2(A): Biochemical constituent in percentage of *C. esculenta*

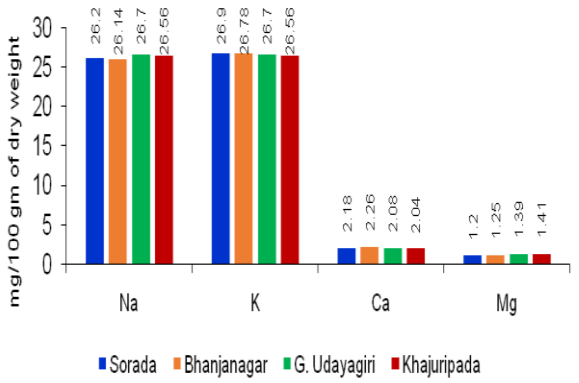

Figure 2(B): Biochemical constituent in mg/100 gm of *C. esculenta*

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