PHYSICO-CHEMICAL VARIATION ON *TIKHUR* POWDER OBTAINED FROM MOTHER AND FINGER RHIZOMES

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Abstract: *Tikhur* is economically and medicinally important product of India as well as Chhattisgarh. The edible rhizome rich in powder content is processed to obtain *Tikhur* flour (powder). Powder recovery from mother and finger rhizomes 13.0% was obtained in traditional method of powder extraction. Mother rhizomes contain 3.0 % more powder as compare to finger rhizomes. Physico-chemical variation on *Tikhur* powder obtained from mother and finger rhizomes slightly differ in protein and fat but no more significant variation find therefore use of both part as powder are more economical. Powder content is 3% more compare to the finger rhizomes. *Tikhur* production in Chhattisgarh is fairly high but this area of study is still untouched and not much information is available on the production, processing and value addition of this valuable crop. Therefore, it was attempted to study the processing of *Tikhur*.

Key words: *Tikhur*, *Curmuma angustifolia*, herbs, rhizome, physico-chemical

INTRODUCTION

Tikhur (*Curcuma angustifolia*) is a herb with medicinal properties. In English, it is called Wild or East Indian arrowroot. It is widely grown in Chhattisgarh and Madhya Pradesh states of India. Medicinally, it is a cardiac tonic, diuretic, antipyretic and reduces burning sensation (Ravindran, 2007). It is reported that Abujhmaria tribes use fresh rhizomes of tikhur to prepare starchy flour, which has a medicinal potential and is considered good for peptic ulcer patients, as it provides cooling effect(Singh & Palta, 2004). It's rhizomes are good source of powder and fiber (Misra & Dixit, 1983). *Tikhur* is commonly found in moist deciduous sal and mixed forest of Madhya Pradesh, Chhattisgarh and Jharkhand. It is generally propagated by rhizomes. The total production of *Tikhur* rhizome in Chhattisgarh is 200.00 tones (www.cgvanoushadhi.gov.in/ Annual%20Production.html). The fresh rhizomes of *Tikhur* are used for the preparation of powdery flour, which has medicinal value and effective for of many diseases. The powder obtained from the rhizomes is highly nutritious and easily digestible, therefore, it is recommended for infants, weak children and invalids. It is used for the preparation of many sweetmeats like *halwa*, *barfi*, *jalebi etc*. The rhizome pulp is a remedy for fever, joint pain ad leucorrhoea.

Looking to the importance of the crop for people of the Chhattisgarh an investigation carried out through conventional study entitled "Physico-Chemical Variation on *Tikhur* Powder Obtained from Mother and Finger Rhizomes" was conducted at SG College of Agriculture and Research Station, Jagdalpur and Faculty of agricultural Engineering, Raipur, Chhattisgarh.

MATERIAL AND METHOD

The study was conducted at SG College of Agriculture and Research Station, Jagdalpur in Horticulture and Soil Science Laboratory during the winter 2010-2011. The method of extraction of powder from the *Curcuma angustifolia* rhizomes is follows: The Fresh *Curcuma angustifolia* bulbs were collected and washed it thoroughly with water and clean by removal of roots. The cleaned rhizomes were separated in finger and mother rhizomes. Both separated rhizomes were passed through the cruser or manually cruse.

Fig. 1: *Tikhur* rhizomes

The obtained paste was passed though muslin cloth after mixing of same quantity of water. The penetrated mixture of water and powder collected in the Mataka (earthen pot) for more yield and kept for sediment of powder particles for 4-6 hour.

The residue is washed repeatedly until the colour of the residue becomes pure white. The pure white powder (residue) was dried through sun drying for 7-8 hours till it was completely dry.

The determination of various physical properties of fresh rhizome and freshly prepared tikhur powder was done using standard techniques Extracted powder was studied for Moisture, Fat, Protein, carbohydrate, Acidity, Ash value, Bulk Density and Angle of repose. The moisture content was determined following the method described in A.O.A.C. (1995). The titeratable acidity of *Tikhur* powder was determined as per the procedure of Ranganna (1986).

Protein of the *Tikhur* powder was determined by Kjeldahl method (Jackson, 1958) by digesting 0.2 gm of powder sample in 10 ml di-acid containing conc. H_2SO_4 and perchloric acid in 5:1 ratio and catalyst mixture of sodium sulphide and copper sulphate followed by distillation and titration. The obtained value of nitrogen was multiplied with the factor 6.25 to get powder protein per cent.

The total fat content was calculated by the Soxhlet method as described in the A.O.A.C. (1995) method no. 920.39C. In this technique 2 g of sample was taken into the thimble. With the help of anhydrous ether (boiling point 60 – 80^0C) and "*Socs Plus*" (extraction equipment) fat was extracted.

Ash content of the raw materials was estimated by the dry ashing method as described in the A.O.A.C.(1995). 5 g of sample was taken into the pre – dried crucible and it was kept into the muffle furnace at 550 ^{0}C for 18 – 19 hours.

The total carbohydrates were calculated by the "By – difference" method as described in the A.O.A.C. (1995).

Bulk density was determined by filling a measuring cylinder of 100ml with *Tikhur* powder by pouring it form a certain height, striking off the top level and weighing the contents on a balance. The ratio of weight of the sample and volume occupied by it is expresses as the bulk density.

This is the maximum angle possible between the surface of a pile of powder and the horizontal plane. The powder mixture was allowed to flow through the funnel fixed to a stand at definite height. The angle of repose was then calculated by measuring the height and radius of the heap of powder formed.

RESULT AND DISCUSSION

Tikhur powder obtained after sun drying was taken for determination of proximate composition. Pie chart (fig.:2) exhibits the result of proximate analysis. On an average the powder contains 13% moisture, 1.6 % protein, 0.9 % fat, 83% carbohydrate and 1.2 % ash. Since there is absent of published data in the literature hence it is not possible to compare. However, it is possible to have different results based on the location, environmental condition and soil fertility etc. The effect of genetic variability could not be assessed due to unavailability of variable genotype of this particular crop. After comparison these two mother rhizomes have greater powder recovery as compare finger rhizomes at least about 3% approximate.

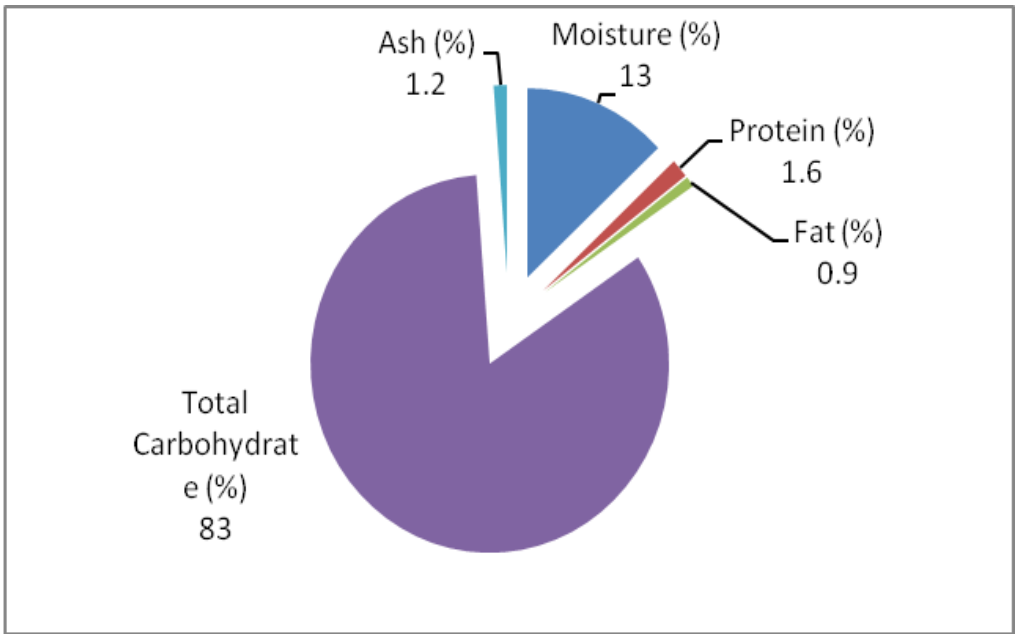

Fig. 2: Proximate composition of tikhur (Finger +Mother Rhizomes) powder

Mother rhizomes have slightly rich in every constituent especially in protein content about 0.3 percentage then finger rhizome and other constitute have no significant variation found. The details are given below in this table-

Table: Physico-chemical variation of finger and mother rhizomes

S. No.	Constituents	Powder of Finger rhizomes	Powder of mother rhizomes
1	Powder recovery (%)	11.5	14.5
2	Moisture (%)	12.2	12.4
3	Fat (%)	0.9	0.9
4	Protein (%)	1.6	1.9
5	Ash (%)	1.1	1.2
6	Total Carbohydrate (%)	84	82.4
7	Acidity	0.5	0.4
8	Bulk Density(g/cc)	0.470	0.475
9	Angle of repose (Degree)	26.40	26.35

CONCLUSION

Tikhur is processed traditionally for isolation of powder. Mother rhizomes have great powder recovery about 3% more than finger rhizomes. Composition of powder obtained by mother and finger rhizomes has no more significant difference except protein content. Thus, utilization of both were more economical except single use of mother rhizome.

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