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Physico chemical analysis of *Plectranthus rotundifolius*

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ABSTRACT

Plectranthus rotundifolius is a rare tuber and almost lost its cultivation in African Countries. This potato is harvested in south Tamil Nadu during the month of January-March. This potato is also found to be a rich source of carbohydrates, protein, fat and fiber content. This potato almost gives 400 calories/100g dry sample in the form of boiling and frying.

Keywords: Total sugars, tubers, crude fibres, waste.

INTRODUCTION

Plectranthus rotundifolius is a perennial herbaceous plant of the mint family native to topical Africa .*P.rotundifolius* is called as Chinese potato, coleus potato or Hausa potato. It is cultivated in Africa and south east Asia for its edible tubers.(lost crops of Africa).Flesh colour is white, reddish yellow dark brown and light grey[1].

Plectranthus rotundifolius is an erect, semi-succulent annual herb. It is bushy from the base upto 30cm tall, has a succulent stem and thick leaves. The flowers are blue pinkish white or pale violet in a distal inflorescence[2]. Plant is highly tolerant of more drought and rainfall. It grows well in loose or sandy soil and direct sunlight. The tubers are harvested about four to five months after planting flowering and aerial parts of plant have died. Tubers of *P. rotundifolius* can be used as edible potatoes in Tamil Nadu. This tuber is oval shaped and smaller than commercial potatoes. They are usually cooked by baking and frying. The taste of potato is fairly bland than sweet potato. This potato leaves can be used as treatment for dysentry.

P. rotundifolius contains high amount of carbohydrate, protein and ash content. The main objective of study to find out chemical constituents of *P. rotundifolius* variety of South Tamil Nadu.

EXPERIMENTAL SECTION

P.rotundifolius samples were collected from market during the month of January - March season. The moisture content of tuber and waste were determined according to standard methods [3]. To determine the Ash content by 5 g of potato sample and waste were kept in a muffle furnance and ashed at a temperature of 525^{o}C for 6 hours. The ash was then cooled in a dessicator and weighed. The ash content was recorded as 9 per 100 g. Fresh weight (g/100 g Fw).

Citric acid content of tubers were measured by weighing 10 g of potato tuber and waste were mixed with 200 ml distilled water, boiled for 1 hour, cooled and filtered.10 ml of filtrate was titrated with 0.1M Sodium hydroxide upto PH 8.1 measured by pH meter. The results were expressed as % Citric acid [4].

Carbohydrate content of this potato tuber and waste were analyzed by anthrone method[5]. The reducing sugar content in Chinese potato samples were determined quantitatively by using 3$^{'}$5$^{'}$ dinitrosalicylic acid [6,7].Protein content in potato tuber and waste were measured by Lowry et.al[8].Crude fat was determined from Chinese potato

tubers and waste. The samples were put into a thimble covered with fat free cotton and then put into Soxhlet apparatus. The flask was filled with 150 cm^3 petroleum ether and extration was done for 16 hours in waterbath. The samples were dried at 100^0 C in oven for one hour, cooled and re-weighed. The difference in weights give the fat soluble materials present in the sample. Crude fibre was determined from the residue after the crude fat determination [4]. Minerals like iron content of potato present in tuber and waste were analyzed.

Table:- 1. Chemical constituents of P.rotundifolius per 100g.

Sl.No.	Parameters	Tuberpulp	Waste
1.	Moisture content	61%	79%
2.	Ash content	3.6%	0.2%
3.	pH	3.5	5
4.	Turbidity	300	668
5.	Temperature	31^{o}C	38^{o}C
6.	Vitamin C	10 mg	14 mg
7.	Total Sugars	85%	76%
8.	Reducing sugar	26 mg	21 mg
9.	Non-reducing sugar	8.24 mg	6.85 mg
10.	Protein	13.6 mg	15.6mg
` 11.	Crude fat	1.2.%	0.9 %
12.	Crude fibre	1.6%	4.8%
13.	Iron	8 mg.	6.4 mg.

RESULTS AND DISCUSSION

The pH of pulp and waste were found to be 3.5 and 5. This was due to the Presence of ascorbic acid. The maximum turbidity was observed in waste samples (668). The maximum temperature and turbidity also observed highly in waste (38^{o}C). The low amount of ash content was observed in (0.2%) waste. Leung reported that *S.rotundifolius* tuber showed 4% of ash content[10].The biochemical constituents of *P.rotundifolius* pulp and waste were summarized in Table 1. The moisture content of pulp was found to be higher (79%) than waste (61%). Leung 2008 also reported that *S.rotundifolius* showed 76% moisture content[10].

Tubers are rich source of carbohydrates. The maximum amount of carbohydrate was observed in pulp sample (85%) when compared with waste (76%). Recent studies on nutritional value of *P.esculentus* in South Africa reported that 81% of Carbohydrates 13.5% Crude proteins 4% ash and 1% fat[9]. *P.rotundifolius* pulp also contained high amount of protein in waste (15.2mg/100g) than pulp (13.6mg/100g). Therefore *P. rotundifolius* also used as substrate for fermentation process to yield ethanol.

The reducing sugar content *in P.rotundifolius* pulp showed maximum (26 mg/100g) When compared with waste (21 mg/100g). The non –reducing sugar was found to be higher in pulp (8.24 mg/100g) than waste (6.85mg/100g). The crude fat and crude fibre was observed highly in pulp (1.2%) and in waste (4.8%). Allemann et.al reported that *P.esculentus* showed 1% crude fat and well endowed with essential aminoacids.Vitamin C also found to be higher (14 mg) in waste than pulp[11] . Iron content of *P.rotundifolius* showed 8 mg in pulp than waste. The tuber material contained vitamin A, thiamine, vitamin C, Phosphorus, Potassium, Calcium and Iron (9.9 mg) [10]

CONCLUSION

His work evaluated the physicochemical characterstics of *P.rotundifolius* pulp and waste. Maximum use of pulp used for cooking purpose to yield 392 calories per 100 g. After cultivation of plant, soil is used as good organic manure for cotton in South Tamil Nadu. Thus *P.rotundifoliius* is used as seasonal and traditional crop for celebration of Farmer's Festival of Tamil Nadu

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