BIOCHEMICAL CHARACTERIZATION OF THREE SPECIES OF BANANA (MUSA PARADISIACA) GROWING IN KANJAMALAI.

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ABSTRACT

Three banana species namely Musa ab thaeen kunnan, Musa abb monthan and Musa aab mysore collected from Kanjamalai, Salem District, were analyzed for biochemical constituents. The results suggest that among the three banana varieties the level of storage polysaccharides cholesterol and ascorbic acid seem to be higher in Musa ab thaeen kunnan. The amount of Protein in Musa aab mysore showed higher concentration than the rest of the banana species. Calcium content was higher in Musa abb monthan. The Musa ab thaeen kunnan showed higher level of phosphorus and iron as compared to other spices. The Musa ab thaeen kunnan was also found to contain iron and other biochemical constituents. The results emphasis that the banana species selected from Kanjamalai area were very good source of minerals especially iron Musa ab thaeen kunnan and may be recommended as a natural iron supplement food.

Key words: Musa abb monthan, Musa aab mysore, Ascorbic acid, Total carbohydrate, Banana.

INTRODUCTION

Banana has originated from South –East Asia with M. acuminata and M. balbisiana as its ancestral species. Banana is a herbaceous plant of the family Musaceae (Leslie. 1976). India is the largest producer of banana in the world with an annual production of 16.81 million. tons. (Ferris, 1997). Banana is one of the nature’s ideal snacks. Musa ab thaeen kunnan is a popular variety of Kerala and Tamil Nadu and it has a shorter lifecycle is semittal and tolarent to nematodes and leaf spot diseases. It bears a good bunch of 14-16kg with parthenocarpic edible fruits with a delicious taste (Selvarajan et al.,2000). Musa abb monthan is a widely cultivated variety and is fairly tall robust plant and bears bunches of 18-20kg after 12 months. The fruits are bold, sticky, knobbled and pale green in colors. Musa aab mysore is the popular variety grown commercially in different regions due to its wider adaptability and high degree of tolerance to drought in a perennial cropping system and is the leading commercial cultivar of Tamilnadu. High in Iron banana can stimulate the hemoglobin synthesis in the blood and helps in cases of anemia. Its role to regulate blood pressure has been associated with the high content of potassium (Akinyosoye 1991). Bananas help in solving the problem of constipation and also cure heart burn, stress, strokes, ulcers and other ailments (Wath et al., 1962). Some plant decoctions of great value in the treatment of diarrhoea or gastrointestinal disorder, urinary tract infections, skin infections, wound and cutaneous abscesses (Meyer et al.,1996). Considering the upsurge in the prizes of livestock feeds and their increasing demand this study was conducted to provide information about the biochemical composition and nutritional qualities of Musa ab thaeen kunnan, Musa abb monthan and Musa aab
mysores which is often ignored and considered as waste could be domesticated for proper utilization of livestock feeds.

**MATERIALS AND METHODS**

**Selection of fruits sample:**

The species selected were *Musa ab thaen kunnan*, *Musa abb monthan* and *Musa aab mysore*. These species were collected from Kanjamalai, Salem district, Tamilnadu, India.

**Sample preparations:**

**Total carbohydrate**

Weigh 2g of the sample into a boiling tube. Hydrolyze the sample by keeping it in a boiling water bath for 3 hours. Add 15ml of 2.5N Hydrochloric acid and cool to room temperature. Neutralize it with solid sodium carbonate until the effervescence ceases, make up the volume to 100 ml and centrifuge and save the supernatant.

**Starch**

Homogenize 1.5g of the sample in hot 80% ethanol to remove sugars. Centrifuge and retain the residue. Wash the residue repeatedly with hot 80% ethanol till the washings do not give colour with anthrone reagent. Dry the residue well over a water-bath. The residue is used for further estimation.

**Protein**

Extraction is usually carried out with buffers used for the enzyme assay. Weigh 2g of the sample and grind well with a pestle and mortar in 10 ml of the phosphate buffer. Centrifuge the homogenate at 1000 rpm for 20 minutes and use the supernatant.

**Ascorbic acid**

Grind 2g of the sample material either mechanically or using a pestle and mortar in 10ml of 4% oxalic acid solution. Centrifuge or filter and collect the liquid. Transfer an aliquot (10 ml) to a conical flask and add bromine water drop wise with constant mixing. The enolic hydrogen atoms in ascorbic acid are removed by bromine. When the extract turns orange yellow due to excess bromine, expel it by blowing in air. Make up to a known volume (25 or 50 ml) with 4% oxalic acid solution.

**Minerals**

Weigh 3g of the sample was taken in conical flask and digested with a mixture of 10 ml concentrated nitric acid, sulphuric acid and perchloric acid in 9:2:1 ratio. Initial digestion was done in a cold state and then digested over a hot plate until an ashy white digest was obtained. The triple acid extract was made up to 100 ml after filtration with distilled water.

**PARAMETERS ANALYZED**

- **Estimation of Total carbohydrate** – Sadasivam and Manickam., 2005.
- **Estimation of Protein** - Sadasivam and Manickam.,2005.
- **Estimation of Cholesterol** - Zak 1957.
- **Estimation of Ascorbic Acid** - Sadasivam and Manickam., 2005.
- **Estimation of Iron** - Wong 1928.

**RESULTS AND DISCUSSION**

By comparing the carbohydrate content in the three banana species *Musa ab thaen kunnan* is a good variety with high level of carbohydrate (Table 1). The lowest carbohydrate content was recorded in *Musa aab mysore*. The values indicate *Musa ab thaen kunnan* could be a good source of carbohydrate. Among the three banana varieties the level of starch significantly increased in *Musa ab thaen kunnan*. Musa variety exhibited a very high input of protein content in *Musa aab mysore*.Ripe banana contains 1.2% protein, 0.3%fat, 0.8% minerals, 0.4%fibre, 27.2%carbohydrates,17mg % calcium,0.4%iron per 100g edible part (Ramakrishnan and Venkat Rao,1995). The amount of cholesterol and ascorbic acid was found to be high in *Musa ab thaen kunnan*. The above study indicated the
presence of ascorbic acid as a good antioxidant store present in the fruit it fight against vulnerable diseases. Banana provide a good source of beta carotene, calcium, fibre and vitamin C (Whirter et al., 2003). The results of mineral content shows the concentration of calcium, phosphorus and iron. The level of calcium is high in *Musa abb monthan*, phosphorus and iron is high in *Musa ab thaen kunnan* variety which signifies its nutritive potential of this fruit. Ripe banana contains 1.2% protein, 31.8% carbohydrates, 85mg/100g calcium, 0.6mg/100g iron and 7.0mg/100g ascorbic aci. (Gopalan et al., 1989). A comparative profile performed among the three banana varieties *Musa ab thaen kunnan* showed very impressive biochemical constituents and is highly nutritive. Studies on development and nutritional evaluation of heart millet rich banana cake was carried by Anu et al. (2008) and suggested that balanced heart millet up to 30% could be incorporated in the preparation of nutritious and acceptable banana cake.

**ACKNOWLEDGEMENT**

I express my profound gratitude to Department of Biochemistry, Periyar University and Forest Office of Kanjamalai at Salem district for timely help through out the course of my thesis research.

**REFERENCES**


