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COMPARATIVE STUDY ON THE NUTRITIVE VALUE OF TWO VARIETIES OF BANANA PEEL

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ABSTRACT

The present study aims to evaluate the nutritive value of two varieties banana peel (Nenthran and Red Banana) which is discarded as waste. The study also aims to provide a useful way of waste management. The moisture content, ash content, total phenolic content, protein, dietary fiber and Beta carotenoids were analyzed in the two-banana peel varieties. The results have shown that both variety of peel contains good amount of vital nutrients. Hence from the study it may be concluded that the agrowaste banana peel can be used as source for animal feed preparation and bacterial growth media.

KEYWORDS: Banana peel, Animal feed, Bacterial growth media, Varieties and Nutritive value

INTRODUCTION

Banana, fruit of the genus musa, of the family Musaceae, one of the most important fruit crops of the world. Each banana has a protective layer called peel or Skin. There is a fleshy part inside that readily splits into three sigments. It is the only known tri-segmented fruit in the world. Both the skin and inner part Can be eaten.

Nutritional Values of Banana

Bananas are an are excellent source of potassium. They are also an excellent source of vitamins, including:

1. A - aids in healthy teeths, bones, Soft tissue
2. B6 - aids the body's immune brain health, heart health system, promotes
3. C - aids in healing, growth of tissues, ligament
4. D-helps the body to absorb calcium.

Eating bananas helps to increan focus and mental acuity. In addition bananas aid im Vitality, which means that will have more energy both mentally and physically. Bananas are also an excellent food for people who want to lose weight. Although they are rather high in calories (200 per bananas) and carbs (51g), they are a great source of energy.

Banana peel

The banana peel is rich in phytochemical Compounds than its pulp. The antifungal, antibiotic properties of banana peel can put to be good use. The banana peel waste is normally disposed in municipal landfills, which contributes to the existing environmental problems. However, the problem can be recovered by Utilizing ith high - added Value Compounds, including the dietary fibre fraction that has a great potential in the preparation of functional foods. In the present study two commonly used banana variety peel (Red banana and Nenthran Banana) are used.

Red Banana

Red Bananas Or Dacca bananas are quite popular. The are very soft and Sweeter than the regular ones and alkaline in nature. Red banana is intrinsically rich in healthy Carbs such as sucrose and fructose and also packed with eesential minerals like potassium, magnesium phosphorus helps in maintaining electrolyte balance. Red Banana Contains more beta carotene and Vitamin C that Supports building a robust immune system.

Nenthran Banana

Nenthran pazham or changalikodon are one of the most popular bananas in kerala. They are large and yellow, sweet in flavour with a distinct texture. It's loaded with essential Vitamins and minerale such as Potassium, Calcium, Manganese, Iron, Niacin, Riboflavin and B6. They offer a low calorie but high fibre addition to meals, Snacks and nourishing deserts.

MATERIALS AND METHODS

Banana peel-preparation

2 types of Banana. bananas were used 1.Red Banana 2. Nenthran Banana

1. The banana peels (Red and Nenthran banana) were Collected, and cut them into small pieces.

2. Shade dried at room temperature and the Samples were ground into a fine powder using a mixer grinder.

Red Banana Peel

Nenthran Banana Peel

3. The powdered samples were then stored in the air tight Container.

Dried Red Banana Peel powder Dried Nenthran Banana Peel powder


i) Determination of Moisture Content

The moisture Content of Red and Nenthran banana was determined. 10g of fresh sample, dried in an oven at 100 to 150°c and cooled in a desiccator. The process of heating repeated till a Constant was achieved . The formula to calculate moisture Content is

Moisture (%)=(Initial weight - Final weight) x 100/weight of sample

ii) Determination of Ash Content

The ash content of Red and Nenthran banana was determined. 5 g of Sample was weighed into a Ceramic Crucial bowl. Place the ceramic crucial bowll inside the muffle furnace under 500°C for 2 hours. Then the total ash content was calculated as:

Ash content (%) = weight of as x 100/weight of Sample taken.

iii) Estimation of Total Phenolic Content

Estimation of total phenol was done by folin's phenol reagent method. 20 ul of Stock was taken in a test tube followed by 180 ul of distilled water. 0.5 ml & folin's phenol reagent was added followed by 1 ml of 75% Sodium Corbonate. 0.5 ml of distilled water was added and incubate 2 hours and read at 728 nm.

Stock - 20 mg Sample + 2ml of distilled water.

iv) Estimation of Protein

Estimation of protein was done by Bradford method.10 ul of Stock were taken in a test tube followed by 3 ml of CBB reagent, incubate 2 hours and read at 595 nm.

v) Estimation of Beta caroteroids

The Beta Carotenoide assay was done by spectrophotometry analysis method. 1g of Sample taken in a Volumetric flask, 5 ml of ethanol were added, and heated for 5 minutes. The mixture then filtered and the filtrate was Kept in a Conical flask, the crude was collected at the bottom of the flask, then 5 ml DCM was added. The solution was Condensation for 5 minutes. Then separate Supernatant and add it to the first filtrate, this step was three time repeated. The filtrate was collected in a separation funnel, then 10 ml of Saturated Nacl Solution was

added. The Contents were shaken gently then the lower layer was collected. The one teaspoon anhydrous Na2So4 was added, allow to stand for 5 minutes and read at 460nm.

vi) Estimation of Dietary fibre.

The total dietary fibre assay was done by AOAC method.1g of Sample Were taken in a beaker followed by 10 ml of distilled water. Add 500 ul Alpha amylase enzyme and allow to incubate for I hour. After 1 hour add 500 ul of protease enzyme and inubate for 1 hour. Then add 500 ul of pancreatin enzyme and incubate I hour. Filter the solution and double the Volume of filtrate by by adding adding ethanol, which forms precipitate. Then Centrifuge for 10 minutes and remove the pellet. The pellet was poured into a plate and allow it to dry for one day. collect the dried pellet. Calulate the amount of total dietary fibre by adding the ash Content and protein weight.

RESULTS

The following table contents shows the nutritive Value of Red and Nenthran Banana.

Table 1 Represents the Ash and moisture content of 2 varieties of banana peel.

SAMPLE	Ash content %	Moisture content %
Red Banana	8.4	32.7
Nenthran Banana	10.5	57.5

Table 2 Represents the level of protein and dietary fibre of 2 varities of banana peel

SAMPLE	Protein g/100g	Dietary fibre g/100g
Red Banana	5.8	8.5
Nenthran Banana	11.24	13.5

Table 3 Represents the level of Total phenolic content and Beta carotenoids of 2 varieties of banana peel

SAMPLE	Total Phenol g/100g	Beta carotenoids g/100g
Red Banana	1.280	0.388
Nenthran Banana	1.432	0.438

DISCUSSION

In the present study the banana peel of two varieties namely red and nenthran banana peel was analysed for nutritive value with the aim of exploiting the potential value of these peels. The following parameters were evaluated. [Moisture content, Ash Content, Protein, Dietary fibre, Beta carotenoids and Total phenolic content].

The results have shown that the banana peels contain vital nutrients both red banana and Nenthran banana. The water content plays a significant role in determining the shelf life of the product. Water content is dependent on the genetic makeup of varieties and agronomic as well as climatic conditions. According to Hausmann., etal,[2016] products with lower moisture content generally are less subject to degradation by microorganisms. The red banana variety had comparatively a low moisture content compared to nenthran peel.

Adeyenni O.S., etal,[2009] showed that ash is the residue remaining after water and organic matter has been removed by heating. High ash content is indication that the food is good source of minerals. The result of ash content shows that both the varieties are good sources of minerals. From this it is clear that banana peel agro-waste, could be used as substrate for bacterial growth.

The results of protein level in two varieties of banana peel shows that Nenthran variety has a higher amount of protein compared to the red banana variety. Protein is an essential component of diet needed for survival of animals and humans and their basic function in nutrition is to supply adequate amount of required amino acids [Hassan H F., etal,2018].

The two varieties of banana peel investigated was high in crude fibre content. High fibre content in diets have been reported to result in increased removal of mutagens. [Isong and Idiong, 1997] steroids and xenobiotics by binding or absorbing to dietary fat components and thereby aids digestion, hence these wastes will therefore have health promoting benefits for livestock and fish farming [Elease., etal,2015]

Antioxidant are substances which are both nutrients like Vitamins E, C, Beta carotenoids and non-nutrients like phenols etc. It is well established that fruit, fruit peels, legumes, spices are excellent sources of antioxidants. Both varieties of banana peel have good amount of phenol and Beta carotenoids as shown in table 3.

Hence the findings of this study suggested that agro-waste like banana peel has the potential to be used as growth media for bacteria. It can also be used for production of animal feeds which reduces the menace of banana peel waste in the environment

CONCLUSION

From the present study it is evident that both the varieties of banana peel are good sources of protein, fibre, minerals, antioxidants (phenol) and Beta carotenoids and can serve as Basal materials or components of animal feed. Hence the banana peel wastes pose to be potential good source of nutrients for the production of animal feeds, livestock feeds and also as a source for culture media for microbes.The results of the study concludes the dual benefits of banana peels use as animal feed and waste management strategy, as the waste would have constitute nuisance to the environment. In future the research may be carried out to study the effect of the growth media and animal feed prepared from banana peel waste .

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