



BANANA STEM: AN UNDER-UTILISED PART OF THE PLANT

Home Science

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ABSTRACT

Banana is one of the highly consumed and grown fruit crop. It is the second largest fruit produced in the world and India is the country which has the largest production of banana in the world. It is one of the oldest cultivated plants. The banana fruit, peel, and banana stem has been reported to be rich in total carbohydrates, fibre and minerals specially potassium. Banana stem is considered as the waste part of the plant, once they are harvested. It is used for preparing various handicrafts, ropes, fabrics, paper etc but the stem of the banana plant can be utilised in many interesting ways to treat various disorders such as diarrhoea, dysentery, intestinal colitis, inflammation, pain and snake bite. Banana stem has been reported as a potential source of polyphenols or antioxidants, such as gentisic acid, catechin, protocatechuic acid, caffeic acid, ferulic acid and cinnamic acid. Banana stem is a rich source of fibre and helps in weight loss. Pseudo-stem have low glycemic index and have a high content of dietary fibre and antioxidant which is good for diabetes. In many parts of India, the pith or the tender core of the banana pseudo-stem has been used as food after boiling and the addition of spices. Banana central core is rich in fibre and aids in weight loss. It helps to relieve constipation. It is also found to be rich in potassium and vitamin B6. It helps to detoxify the body being a diuretic. It is used in the treatment of kidney stone. It also helps prevent high blood pressure, and maintain fluid balance within the body. Banana stem is said to be a diuretic and helps detoxify the body. It is used prevent and treat kidney stones. It has been reported that a high dietary fibre intake has beneficial effects on human health. Along with this it is also been used to prepare pickles and candies. Banana stem is also a cost efficient food product as it is usually considered as waste product and bringing waste in use which have so many characteristic qualities and developing value added food product from the same is very efficient. Hence this article focus on developing interesting and novel food which is fresh along with converting the waste into a value added product.

KEYWORDS

Carbohydrates, Fibre, Minerals, Potassium, Disorders, Polyphenols, Antioxidants, Gentisic Acid, Catechin, Protocatechuic Acid, Caffeic Acid, Ferulic Acid, Cinnamic Acid, Weight Loss, Constipation, High Blood Pressure, Fluid Balance, Diuretic, Detoxify, Cost Efficient

INTRODUCTION:

Banana is one of the highly consumed and grown fruit crop. It is the second largest fruit produced in the world and India is the country which has the largest production of banana in the world. It is one of the oldest cultivated plants. Globally, banana and plantain are cultivated in 5.14 million hectares with a total production of 105.32 million tonnes (FAO,2012). Thus banana is emerged as one of the important fruit crop, which is in the easy reach of common man. All parts of the banana plant have medicinal applications. The banana fruit, peel, and banana stem has been reported to be rich in total carbohydrates, fibre and minerals specially potassium.

Banana stem is considered as the waste part of the plant, once they are harvested. It is used for preparing various handicrafts, ropes, fabrics, paper etc but the stem of the banana plant can be utilised in many interesting ways to treat various disorders such as diarrhoea, dysentery, intestinal colitis, inflammation, pain and snake bite (Mathew *et al.* 2017). Banana stem comprised of concentric layers of leaf sheath and this biomass is reported to be rich in nutrients such as minerals, sugar, resistant starch, dietary fibres and antioxidant compounds. Banana stem constitute a major part of plant biomass, which are usually left in the plantation or incinerated and wasted. Banana stem is a rich source of fibre, total carbohydrates and cellulose (Saravanan *et al.*, 2011). Thus, wastage of this residual biomass is loss of the nutrient value present within. The antimicrobial compound present in the stem extract such as tannic acid can significantly reduces the chance of food spoilage. The inner core of the stem is used as vegetable and pickles. (Dawn *et al.*, 2016a).

Traditionally, people used to drink stem juice to prevent many diseases such as to prevent urinary disorder and stone formation in gall bladder. Banana stem has been reported as a potential source of polyphenols or antioxidants, such as gentisic acid, catechin, protocatechuic acid, caffeic acid, ferulic acid and cinnamic acid. Banana stem extract has been found very effective anti-diabetic effect. Its consumption ameliorates the diabetes and advanced glycation end products related complications such as hyperglycemia, polyuria, polyphagia, polydipsia, urine sugar failure and AGE accumulation. Central Food Technological Research Institute(CSIR), Mysore has overcome the problem of browning and developed a process for making a beverage preparation by blending it with other juices or their concentrates.

Banana stem is a rich source of fibre and helps in weight loss (Chandrasekaran, 2012). Pseudo-stem have low glycemic index and have a high content of dietary fibre and antioxidant which is good for diabetes (Bhaskar *et al.*, 2011). In many parts of India, the pith or the

tender core of the banana pseudo-stem has been used as food after boiling and the addition of spices. Banana central core is rich in fibre and aids in weight loss. It helps to relieve constipation. It is also found to be rich in potassium and vitamin B6. It helps to detoxify the body being a diuretic. It is used in the treatment of kidney stones (Lakshman *et al.*, 2015). Banana pseudo-stem has potential for providing profitable products such as food source for human consumption. It has caught the attention of food scientists in recent years. It could be used more in food rather than in the feed industry. (Aziz *et al.*, 2011 and Bhaskar *et al.*, 2011) researched the proximate composition of banana pseudostem. The proximate composition of banana pseudostem content on dry weight basis is protein 2.5%, fat 1.7%, free sugar 3.4%, soluble dietary fibre 1.4%, insoluble dietary fibre 27.4%, starch 27.3%, ash 0.3%, moisture 15.1%. Proximate composition of tender core of banana pseudostem flour is moisture 8.8%, fat 1.2%, protein 3.5%, ash 10.1%, crude fibre 19.5, total carbohydrate 56.9%. Mineral contents of banana pseudostem per 100 g of dry sample is sodium 444.1mg, potassium 944.1mg, calcium 1335.3mg, magnesium 255.0mg, phosphorus 137.8mg, iron 3.3mg, zinc 8.1mg, manganese 1.3mg. (Ho *et al.*2012). Vitamin B6 helps in production of haemoglobin and insulin. It improves the ability of the body to fight infection. Potassium helps in the proper functioning of muscles, including the cardiac muscles. It also helps prevent high blood pressure, and maintain fluid balance within the body. Banana stem is said to be a diuretic and helps detoxify the body. It is used prevent and treat kidney stones. It has been reported that a high dietary fibre intake has beneficial effects on human health (Dawn *et al.*, 2016b).

REFERENCES:

1. Aziz, N. A. A., Ho, L. H., Azahari, B., Bhat, R., Cheng, L. H., and Ibrahim, M. N. M.(2011). Chemical and functional properties of the native banana (*Musa acuminata* × *balbisiiana* Colla cv. Awak) pseudostem and pseudostem tender core flours. *Food Chemistry*, 128(3), 748-753.
2. Bhaskar, J.J., Shobha, M.S., Sambaiha, K. and Salimath, P.V. (2011). Beneficial effects of banana (*Musa sp. var. elakki bale*) flower and pseudostem on hyperglycemia and advanced glycation end-products (AGEs) in streptozotocin-induced diabetic rats. *J. Physiol. Biochem.*, 67 (3): 415-425.
3. Chandrasekaran, S.V. (2012). Fibre of health. THE HINDU dated 21.10.2012. Chennai Edition
4. Dawn, C.P., Ambrose, L.K., R. and Naik, Ravindra (2016a). Studies on the drying kinetics and quality assessment of banana pseudostem waste for effective utilization as a value added product. *Internat. J. Farm Sci.*, 6(2): 276-285.
5. Dawn, C.P., Ambrose and Naik, Ravindra (2016b). Development of a process for utilisation of banana waste. *Nat. & Soc. Sci.*, 4(6): 83-88.
6. Ho, Lee-Hoon, Thuan-chew Tan, Noor Aziah Abdul Aziz and Bhat, Rajeev (2015). In vitro starch digestibility of bread with banana (*Musa acuminata* × *balbisiiana* ABB cv. AWAK) pseudo-stem flour and hydrocolloids. *Food Bioscience.*, 12:10-17.
7. Khan, M.Z.H., Sarkar, M.A.R., Md. Forhad, I.A.I. and Raimo, O.M. (2013). Fiber morphology and pulping study of banana pseudo-stem. *Internat. J. Fiber & Textile Res.*,

- 3(1):31–35.
8. Lakshman, R. and Dawn, C.P. Ambrose (2015). Studies on banana centre core flour prepared by different drying methods. *Curr. Agric. Res. J.*, 3(1): 55-59.
 9. Mathew, N.S., Negi, P.S. (2017): Traditional uses, phytochemistry and pharmacology of wild banana (*Musa acuminata* Colla): a review. *Journal of Ethnopharmacology*, 196: 124–140.
 10. Saravanan, Kandasamy and Somaradhya, Mallikarjuna A.(2011). Potential nutraceutical food beverage with antioxidant properties from banana plant bio-waste (Pseudostem and rhizome). *Food Funct.*, 2: 603-610.