AgriCos e-Newsletter
ISSN: 2582-7049
AgriCos e-Newsletter
Open Access Multidisciplinary Monthly Online Magazine
Volume: 03 Issue: 03 March 2022 Article No: 26

Value Addition of Bamboo

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SUMMARY

Bamboo is mainly used for fodder, wood substitute and their utilization in food is not enlightened to the human kind. This reveals that products made from bamboo were gaining importance. Such expansion in value addition is bound to provide various opportunities to population by meeting their employment needs thereby, exploring the value of bamboo resource as underutilized health food like preserve, candy, chutney, nuggets, cracker, chukh, biscuits, dried shoot etc.

INTRODUCTION

Bamboos (*Dendrocalamus hamiltonii)* have an extended history of being versatile and a widely used bio-resource. Bamboos belong to the tribe *Bambuseae* of the family *Poaceae*. A total of about 128 species belonging to 18 genera are reported to grow in India where they cover an estimated 13.96 million hectares and with the government focus on growing and utilizing bamboos, the areas under bamboos is on the increase. Bamboos are also used for table purposes in many countries, however India lags behind for its use as a food.

Uses:

Bamboo is one reasonably of idle vegetable for it being pollution free, low in fat, high in edible fibre and rich in mineral elements mainly potassium, calcium, manganese, zinc, chromium, copper, iron and lower amount of phosphorus and selenium (Nirmala *et al.,* 2007) but having a considerable proportion of poly unsaturated fatty acids, thus, indicating its potential as a source of great therapeutic value. Presence of high quality vitamins such as vitamin A, vitamin B1, vitamin B3, vitamin B6 and vitamin E (Shi and Yang, 1992) carbohydrates, proteins and minerals in bamboo shoots and their easy availability to common man may also help in solving nutritional deficiency of rural poor. Bamboos are low in calories and high in fibre which aids in prevention of colon cancer and in controlling cholesterol level in blood. It is also a good source of potassium which is a heart healthy mineral

Chemical Composition:

Shoots also contain various flavonoids, phenols and phenolic acids (phytochemicals) which are potent anti-oxidants and may have anti-cancer, anti-bacterial and anti-fungal properties (Pandey *et al.,* 2011; Gupta *et al.,* 2010). Therefore, it is necessary to create more options in bamboo shoot processing. Unfortunately, the common man is not aware of their virtues as a food supplement and bamboos are mainly used for pulping for paper, fuel and fodder purposes. There is an urgent need to exploit the inherent values of bamboos which are rich in all the goodness of nature to be promoted as health foods.

Product Preparation

The products were prepared by using preservation techniques as per FPO specification and further analyzed for chemical composition.

The different products were prepared as per the methods described below:

Bamboo Candy and Preserve:

Was prepared from bamboo shoots. Bamboo shoots were received, cut, washed and then boiled in water for 30 minutes. The boiled soft bamboo shoots steep in pre prepared syrup of 40°B TSS for 1 day. Nest day removed the shoots and increased the consistency of syrup up to 60°Brix by boiling and addition of more sugar. Repeated the process while raising strength of syrup by 5°Brix to 70°Brix for preserve and 75°Brix for candy on alternative days. Once it reaches the desired concentration then kept it for one week. After that in case of preserve, drained the syrup and filled in jar and covered with fresh syrup of 68°Brix. But in case of candy, syrup is drained and bamboo shoot pieces were washed with hot water and then dried it for 2 hrs thereafter rolled in sugar powder, dried and packed in air tight containers (Sood *et al.,* 2013).

Bamboo Chutney:

It was prepared by standardized method. The bamboo shoots were boiled in water for 30min after which the soft boiled shoots were ground to make the bamboo pulp. Bamboo pulp was mixed with sugar and spices. Then heated to obtain the thick mass like consistency. After reaching the desired concentration, 2% glacial acetic acid was added as a preservative and final product was transferred to air tight containers for storage (Sood *et al.*, 2013).

Chutney is a relish used along with main course. Effort was made to prepare chutney by blending the shoots in a mixer just to get homogenized pulp, concentrated by the addition of spices etc. till the time to get the desired consistency. This product was also tested objectively and subjectively.

Bamboo Chukh:

Chukh is a speciality of Chamba district of Himachal Pradesh (India). It is basically prepared by using red chili with citrus juice. Presently, an effort was made to add Bamboo chunks just to improve the nutritive value and add variety. Chukh also prepared from bamboo shoots which were first mixed in oil and heated for 10 min. According to Sood *et al.*, 2013, spices such as coarse ground red chili powder, coriander powder, cumin seeds, black pepper were added furtherly and mixed properly with continuous heating. Citrus juice was added at the rate of 5% and then boiled until mixture became thick in consistency. After reaching the end point, filled the product into a jar and stored in cool dry place

Bamboo Nuggets:

Nuggets are also a conventional variety of food product also known as wadia. This product is generally wellknown in the northern region of India. It is generally roasted and then boiled in a curry and served with main meal. The values for fibre, and protein were 6.40 and 2.92% respectively. Nuggets were prepared by the modified method of (Pandey *et al.*, 2012). 100g of boiled bamboo shoots were mixed with 50g of soaked pulse of green gram (Moong), and Black gram (Urad) in 1:1 ratio and then 3g red chili powder, 3g turmeric powder and 4g salt was also added in the mixture. The mixture was then ground to a coarse paste. Small equal sized balls were then made and transferred directly to preheated and greased oven trays and dried in an oven for 24 hrs at 45-50°C. Dried nuggets were then stored in airtight glass or poly propylene containers.

Bamboo Cracker (Papad):

Papad was also prepared according to the modified method of Pandey *et al.* (2012). This is a very famous thin, circular in shape, crispy wafer like dish. 100 g of boiled bamboo shoots were mixed with 100 g of boiled potatoes and 3g red chili powder, 3g black pepper powder, 3g teaspoon cumin seeds to which 2.5g salt was also added. Mixture was then kneaded and dough was prepared. Dough was divided into equal sized balls and rolled with the help of rolling pins in circular movements to make round papads. Papad were then dried in an oven for 36 hrs at 50-55°C. Dried papad were then stored in airtight containers. The values for protein, fat and fibre were 2.35, 7.88 and 3.90% respectively (Sood *et al.*, 2013).

Bamboo Biscuits:

Edible shoots were chopped into small chunks and made into paste and powder. Biscuits are prepared by using wheat flour by mixing 20% in paste form of shoots and 10% in powder form of shoots. The other ingredients used for each batch were as follows: ghee or clarified butter (30 g), sugar (40 g), milk (60 ml) and baking powder (2 g). Dough was prepared by mixing all the ingredients and circular biscuits of 2.5 cm diameter with uniform thickness of 3 mm were cut and baked for 15-20 minutes in a baking oven (Sood *et al.*, 2013).

Bamboo Dried Shoot:

Bamboo shoot is called mang (“mahng”) in Vietnamese and dried bamboo shoot is mang kho (“mahng koh”). Dried bamboo shoots are not hard, but rather leathery. Once reconstituted and boiled until chewy-tender, dried bamboo shoots have a chewy-tenderness and pleasant sweetness that’s not found in fresh or canned bamboo

CONCLUSION

The immense nutritive value and with good source of mineral and fibre content of fresh bamboo shoots got to be explored by exhibiting the potentiality of edible purposes. The products made were very easy as well as possessing nutritional value and bamboo shoots are getting importance as healthy and nutritionally supplemented edible. Numerous products can be made by incorporating bamboo shoots and infusions. It has a wide unrealised ways to be developed as a novel and promising food industry in India.

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