

Indigenous *Karil* (Bamboo shoot) processing

■ Yogesh Kumar, Soumitra Tiwari, Yashwant Kumar and Navneet Khare

Received : 10.04.2018; Accepted : 13.04.2018

See end of the Paper for authors' affiliation

Correspondence to :

Yogesh Kumar

Department of Food Processing and Technology, Bilaspur University, Bilaspur (C.G.) India

■ **Abstract** : Bamboo shoot is one of the indigenous foods mostly consumed by the tribes of Chhattisgarh and North-east states of India. It is belonging to *Poaceae* family. This is popularly known as *Karil* in Chhattisgarh. The shoot can be mainly consumed after fermentation. This fermentation process was accomplished by the anaerobic microorganisms with the help of lactobacillus, streptococcus and streptomycin etc. It has various health benefits for human body. In this review paper the processing aspects of the shoot has been discussed.

■ **Key words** : Indigenous, Bamboo shoot, Karil, Processing

■ **How to cite this paper** : Kumar, Yogesh, Tiwari, Soumitra, Kumar, Yashwant and Khare, Navneet (2018). Indigenous *Karil* (Bamboo shoot) processing. *Internat. J. Agric. Engg.*, **11**(Sp. Issue) : 169-172, DOI: 10.15740/HAS/IJAE/11.Sp. Issue/169-172.

Man's dependence on plant is unquestionably the very essence of life a good number of crop plants have been studied and analyzed their nutritional and medicinal purposes the increasing trend of human population have drawn the attention of the planner toward the identification and exploitation of plant resources for a sustainable development among the plant bamboo are important raw materials. Bamboo a group of taller boras and grasses have intimately been associated with mankind since ancient times. It belongs to the grass family pose and found in all contents except Europe and Antarctica. It is estimated that about 85% of bamboo area are confined in south and south Asia.

In the India sub-continent bamboo are dominant plants of tropical and sub-topical moist desert as forest. It also found in semi evergreen forest about hundred and thirteen spaces of bamboo was reported in India. The recorded forest area in Chhattisgarh is 59,772 km², which is 44.21 per cent of its geographical area. Reserved, Protected and Unclassed Forests constitute 43.13 percent, 40.21 per cent, and 16.65 per cent of the total

forest area, respectively. The extent of bamboo bearing area in the forests of the state is 11,368 km².

Chattisgarh is a North-Eastern state of India. Due to its forest cover and availability of bamboo, make this state major producer of bamboo products. The tribal regions of Chattisgarh are main centres for production of bamboo craft.

The tribal craftsmen here make many kinds of bamboo items. Chhattisgarh is well known and reputed for its intricate and beautiful bamboo work. Finest ever bamboo work in Chhattisgarh can be seen in the form of wall hangings, table lamps and table mats. It is believed that bamboo work in Chhattisgarh, India has been developed and initiated by the tribal families is the medium adopted by them to express their rich and attractive form of art. The Bamboo work of the tribes in Chhattisgarh is well known for their utilitarian significance. Attractive furniture, mats, baskets, home utilities, office utilities are few of the pieces of work of Bastar tribes. The Bamboo craft is practiced in Narayanpur, Bastar, Bilaspur and Gariyabandh district of the State.



Fig. 1 : New bamboo shoots



Fig. 2 : Bamboo craft

especially on the middle and lower slope o hills and well drained valleys (Behari, 2001). All the bamboos start giving shoots in the month of May to September. The suits are cut after one week of shooting when they are wanted two feet tall. The larger form neighboring villages collect a young from far –off – hills then sell to the vegetable market. Some sellers are sold ferment bamboo shoots in market. Local bamboo is consumed by Chhattisgarh people. There are fermented bamboo shoots available in Chhattisgarh.

Fermented shoots :

Fermentation, a chemical change produced through

The succulent and soft shoots are consumed as vegetables by the natives of this state. The nutrient contains of these vegetables have been described by several expert from south Asia countries. Estimation of main components of the fermented bamboo shoots like protein, free amino acids reducing sugar, total sugar, vitamin c, vitamin b1, H₂O, fiber, fat and starts etc and contains of total nitrogen ash nitrate, nitrite,, sodium, potassium, calcium, iron and manganese were also found out. The people of Chhattisgarh processed these young bamboo shoots into sole vegetable by fermentation. The traditional production by fermentation gives it the specific taste and aroma. It can be met from different varieties of bamboos grown in the state but the most famous bamboo is *D. strictus*. *D. strictus* occurs principally as an under storey in moist and dry deciduous forests



Fig. 3 : Freshly harvested and peeled shoots



Fig. 4 : Earthen pots filled with sliced shoots for fermentation

the breakdown of carbohydrates and proteins by yeast, bacteria, or molds, is a process used for centuries in order to make and preserve certain types of food. Wine, cheese, beer, yogurt, pickles, ketchup, and sauerkraut are examples of foods that are made through the process of fermentation. Not only is fermentation a process to preserve food, it also adds to the nutrient value, enhances flavor, and improves pharmacological values. The unique micro flora in each fermented food increases the protein, vitamin, and fatty acid levels. Probiotics or “good bacteria” are also formed through the process of fermentation.

The young bamboo shoot are washed and chopped into small pieces after removing the hard scales. Earthen pots are used as fermentation pots about 2/3 of the pot is filled with water and the bamboo shoots slices are deep into the water. Live in a room for 3 -7 days. The fermentation is noticed from the evolution of the characteristic smell of *D. strictus*. The procedure continues till the pot is filled with the water. However the local people are not aware of the important and role of microorganisms in the process particularly the role of lactobacillus, streptococcus and streptomycin spaces in the anaerobic fermentation. Today the consumption of fermented bamboo shoot is increasing as the population increases.

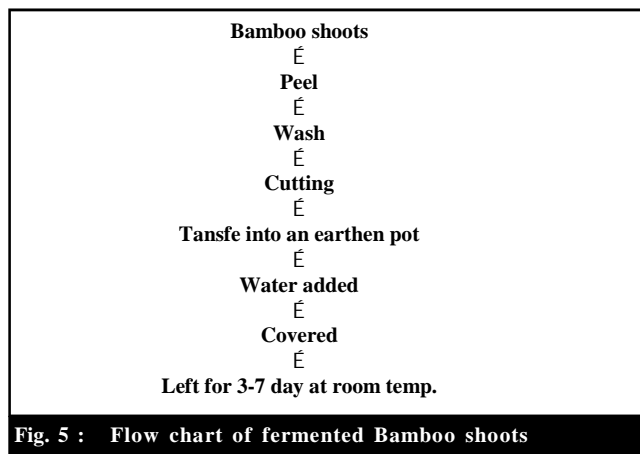


Fig. 5 : Flow chart of fermented Bamboo shoots

No preservative is used and after complete fermentation, the shoots can be stored 1 to 2 y before marketing, thus making them available throughout the seasons. The microorganisms involved in fermentation of bamboo shoots are *Bacillus subtilis*, *B. licheniformis*, *B. coagulans* and *Micrococcus luteus* (Sarangthem and Singh, 2003).

Bamboo shoots is benefits for human body and medicinal value :

Bamboo shoots have immense potential of being used as important health food (Rai, 2007). Bamboo plants play a significant role in traditional Asian medicine, especially in China and Japan (RFRI, 2008). The bamboo shoots have been recognised to be associated with an array of health benefit likes anti-oxidant, anti-free radical, anti-aging, anti-cancer, prevent cardiovascular disease, weight loss, to improve digestion, decrease blood pressure, and anti-microbial activity due to the presence of different flavones, glycosides (Sonar and Halami, 2014; Anonymous, 2004; Bisht *et al.*, 2014; Shi and Yang, 1992; RFRI, 2008 and Sarkar *et al.*, 2015). Since time immortal, Ayurveda has recommended bamboo shoots for patients having piles and burning sensation during urination with honey (Chongtham *et al.*, 2011).

Authors' affiliations:

Soumitra Tiwari and Yashwant Kumar, Department of Food Processing and Technology, Bilaspur University, Bilaspur (C.G.) India
Navneet Khare, Department of Agricultural Processing and Food Engineerng, S.V. College of Agricultural Engineering and Technology (IGKV), Raipur (C.G.) India

■ REFERENCES

Anonymus (2004). Cyanogenic glycosides in cassava and bamboo shoots, a human health risk assessment. Food Standards Australia, New Zealand.

Behari, Bipin (2001). Agroforestry model of bamboo cultivation on degraded agricultural land. Ph.D. Thesis. Guru Ghasidas University Bilaspur.

Bisht, M.S., Chongtham, N. and Nongdam, P. (2014). Bamboo shoot as a resource for health food, food security and income generation in North- East India.

Chongtham, N., Bisht, M.S. and Haorongbam, S. (2011). Nutritional properties of bamboo shoots: potential and prospects for utilization as a health food. *Comprehensive Rev.*

Food Sci. & Food Safety, **10**: 153-168.

RFRI (2008). *Bamboo as food and medicine*. Report of Rain Forest Research Institute (RFRI). Jorhat, India.

Rai, S. (2007). Edible bamboo shoot - a review. *Bull. Arunachal Forest Res.*, **23**(1-2): 39-44.

Sarkar, P., Kumar, D.H.L., Dhumal, C., Panigrahi, S.S. and Choudhary, R. (2015). Traditional and ayurvedic foods of Indian origin. *J. Ethn. Foods*, **2**(3): 97-109.

Sonar, R.N. and Halami, M.P. (2014). Phenotypic identification and technological attributes of native lactic acid bacteria present in fermented bamboo shoot products from North-East India. *Internat. J. Food Sci. Tech.*, **51**(12): 4143-4148.

1st
Year
★★★★★ of Excellence ★★★★★