

Traditional Fermentations: Green Pastures for Academia and Industry

Fermentation has been used as a means of improving the shelf-life and adding quality to food for more than 6000 years. Earlier, the transformation of basic food materials into fermented foods was considered as a mystery. Probably, the first fermentation was discovered accidentally when salt was added to food materials which caused the selection of some harmless microorganisms that could ferment the raw material to give nutritious and acceptable food. Since that time, it has been practiced to improve both preservation and organoleptic characteristics of the food. In the world, there are large varieties of fermented foods and beverages with traditional, religious and cultural value. The diversity of such fermented products is derived from the heterogeneity of traditions prevalent in the world, cultural preference, geographical origin and the staple or by-products used in the fermentation. In many instances it is likely that the methods of production were unknown and came out by chance and passed down by cultural and traditional values to the subsequent generations.



In India, a lot of diversity prevails in the food habits of the people living in different states and many of the states especially the hilly states have their conventional fermented products. *Idli, dosa, bhatoora, kulcha, dhokhla, nan, jalebi, chhang* and *lassi* (buttermilk) are some popular traditional fermented foods and beverages of India. Traditional fermented foods and beverages have also been integral components of diets in various parts of Himachal Pradesh. The types of traditional fermented products of Himachal are unique and different from other areas. Most of the fermented foods prepared in the state are cereal based (wheat/barley/buckwheat) but some legume and milk based fermented foods are also common. A number of cereal, fruit, jaggery and millet based fermented beverages are also prepared and consumed traditionally in rural areas of Himachal Pradesh. *Bhatooru, chilra, seera, siddu, gulgule, bagpinni, marchu, sepubari* and pickles made from locally available fruits and vegetables and different beverages like *kinnauri, chhang, sura, behmi, angoori, chakti, ark*, etc. are some indigenous fermented products of Himachal Pradesh. These form an important component of the staple diet of the people belonging to the tribal/rural belts and some of them are made especially during religious ceremonies, cultural festivals and marriages. Traditional alcoholic beverages also constitute an integral part of social activities in tribal areas which require provision and consumption of appreciable quantities of alcohol. These fermented foods are also considered nutritionally more beneficial than unfermented cereals/fruits/vegetables.

Traditional food fermentation in Himachal is a home based industry mostly carried out by rural women using their indigenous knowledge. Many of the indigenous foods and beverages of the tribal and rural belts of the Himachal Pradesh are little known outside. A major threat to the traditional food/beverage technologies is that the older generations who have knowledge and expertise are phasing out and the younger generations are reluctant to learn and preserve the traditional knowledge. So there is a need to characterize the traditional fermented products by studying their biochemical, microbiological and the nutritional aspects, to provide scientific base for their present status and improvement by quality addition. Further, indigenous fermented foods or beverages offer the opportunity for scale-up to make the household confined fermented food products available to a much wider population. Thus, fermented products can play an important role in livelihoods of rural and urban people through enhanced food security and income generation *via* a valuable small scale enterprise option.

In addition, fermented foods as functional foods are gaining importance all over the world. These products have emerged as not only the source of nutrition but also as functional and probiotic foods, which besides nutritional value have health promotory effects. So, increasing the awareness of such products among the common man is important. Further, research should be



Fig. 1: Some traditional fermented foods and beverages of Himachal Pradesh

(a) *Marchu*, (b) *Sepubari*, (c) *Baingan ka aachar*, (d) *Phab* (traditional starter), (e) *Dheli* preparation, (f) *Chhang*, (g) *Churpa* and (h) *Rice chhang*

directed towards identifying the role of microorganisms during fermentation and incorporation of these useful/probiotic strains into fermented foods which will improve the overall quality of these foods with desirable health benefits.

From basic and applied research point of view, we need to explore traditional fermented foods and beverages with focus on: i) microbiological, biochemical and nutritional characterization; ii) popularization; iii) characterization of traditional fermentation processes and their improvements if desired; iv) characterization of inocula used; v) quality addition vi) exploration as probiotic and functional food and vii) encouraging entrepreneur to set up production and merchandising units for traditional fermented products.

There is tremendous scope in undertaking basic and applied research work in this area. Exploration with emphasis on above aspects by academia and industry will provide new dimensions to traditional fermented products including Himachal Pradesh and this will transform production of many of the traditional fermented products at household level to small scale industry thus, generating employment and additional avenues of income to the people involved in this venture.

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