



Documentation and Evaluation of Buckwheat Based Traditional Food Products – Review Article

Ruchika Thakur¹, Dr. Y. S. Dhaliwal²

¹Research Scholar, CSKHPKV, Palampur, Himachal Pradesh, India

²Supervisor, CSKHPKV, Palampur, Himachal Pradesh, India

Abstract:

Himachal Pradesh is a diverse state. It exhibits diversity in its ethnography, terrain, and environment, as well as in its culture. Their architecture, fashion taste, cuisines, and eating habits all reflect this. The inhabitants of this state create various food formulae depending on local environmental factors, raw material availability, and cultural traditions from various areas. Some of the items are staple foods in the state's rural districts, while others are produced and consumed on special occasions like weddings and local festivals and represent an important part of the sociocultural life of the hill people. But most of these meals and drinks are only produced at home. Due to its nutritional and health-promoting qualities, buckwheat is introduced into the diet as a substitute crop of fresh interest. Buckwheat flour has shown promise in the treatment of diabetes, obesity, hypertension, and hypercholesterolemia in studies using animal models. The grains of buckwheat and other tissues contain a variety of nutraceutical substances. These are a great source of protein, dietary fiber, antioxidants, carbohydrates, and trace minerals. Buckwheat proteins' biological value (BV) is on par with that of proteins from other sources. Buckwheat grains also include preventive substances such as flavonoids, fagopyrins, and thiamin-binding proteins in addition to high-quality proteins. Buckwheat grains are a key raw resource for the food industry to employ in the creation of functional meals. Buckwheat flour may be an important and useful addition to diets and foods due to its high nutrient content and potential health benefits.

Keywords: Traditional Food Products, Buckwheat, Tribal, Traditional Recipes.

1. INTRODUCTION

Environmental factors and biological variety were significant contributors to the rise of human civilization. Native food plants have a well-established role in nutrition and offer a number of health advantages [1]. For persons with little resources, they are crucial nutritional supplements and sources of trace elements, proteins, minerals, and vitamins. Nutritionally, wild plants are on par with or even superior to their domesticated and imported counterparts [2]. Most are high in beneficial nutrients such as iron, zinc, vitamins A, C, and E, folate, protein, and carbs [3]. These traditional food plants are those that rural or tribal populations have adopted as part of their traditions, rituals, and habits. Since ancient times, people have been used to them and are skilled at preparing them for eating [4].

Traditional cuisine is "often consumed or connected with certain festivities and/or seasons, generally transferred from one generation to another," according to Guerrero et al. (2009: 348) [5]. Local agricultural groups have promoted the use of cultivated as well as wild edible plant species to ensure the security of food and nutrition. In tribal and hilly locations, a significant amount of the food consumed by locals comes from wild edible plants. Locals are quite skilled at recognizing these, their palatability, goods, and. These traditional food plants meet cultural demands and are less harmful to the environment. Due to the fact that diverse tribes have developed their own dietary tastes and customs, it is impossible to include all traditional food plants.

The population, races, and cultures of the state of Himachal Pradesh are varied. In order to prepare meals from locally available ingredients, people in Himachal Pradesh have developed traditional food processing techniques. These techniques are significantly impacted by racial preferences, agro-climatic conditions, socio-cultural ethos, and religion. Regional variations, however, could exist from one location to the next. There are many different types of traditional meals that have been ingrained in the social and cultural lives of the hill people of Himachal Pradesh throughout the years. However, the size of the house has been the only place where these traditional foods and drinks have been produced. Through the decades, traditional techniques and technologies utilized to create these products have been passed down to subsequent generations. [6].

1.1 Buckwheat

Buckwheat (*Fagopyrum esculentum* Möench) is an annual crop that is classified as a pseudocereal but whose grains really fall into the category of cereals due to similarities in its uses and chemical makeup [7]. Nine different buckwheat species provide agronomic and nutritional benefits. Common buckwheat (*F. esculentum*) and Tartary buckwheat (*F. tartaricum*) are the two buckwheat species most often grown [8].

Some of the world's largest buckwheat harvests come from China, Russia, Ukraine, and Kazakhstan. Additionally, it is made in Brazil, Poland, Hungary, and Slovenia [9]. The capacity to control development without the use of chemical fertilisers or pesticides is one of the parallels between buckwheat and weeds in terms of their biology and physiology [10]. Additionally, buckwheat takes less minerals and less water from the soil than other major crops [11].

Because of the benefits its grains have for health, buckwheat planting has lately been seen to be increasing after years of decline. Numerous nutraceutical compounds [11] and a wealth of vitamins, notably those of the B group [12] may be found in buckwheat grains and other tissues. However, the protein digestibility is low. They have a high biological value and are well-balanced to boot.

Microelements like zinc, copper, manganese, and selenium (to name a few) [13] and macroelements like potassium, sodium, calcium, and magnesium (to name a few) are all abundant in buckwheat grains. More than 40% of the fatty acid makeup is made up of polyunsaturated fatty acids (PUFA), while the remaining 80% are unsaturated [8]. The high levels of rutin, catechins, and other polyphenols, as well as their putative antioxidant action, add significantly to the nutritional benefit [14]. In addition, buckwheat grains are a useful tool in the fight against obesity and diabetes because of the high levels of both soluble and total dietary fibre they contain.

Protein/amino acids, carbohydrates, fats, fibre, minerals, vitamins, and other useful components are all chemical components of buckwheat (e.g., flavonoids, phytosterols, and fagopyrins). The testa and pericarp of a buckwheat grain typically include dietary fibre, ash, and flavonoids, whereas the aleurone layer and embryo are rich in protein. Table 1 shows the compound components present in buckwheat. [15]

Table 1, buckwheat has a wide variety of beneficial nutrients [15]

Components	Buckwheat seeds (%)	Buckwheat groats (%)
Moisture	12-14	12.3
Carbohydrate	58.5-73.5	70.9
Protein	10-14.5	9.7
Fat	2.0-2.6	1.8
Fiber	9.3-10.9	3.7
Ash	2.0-2.5	1.7

2. REVIEW ON DOCUMENT BUCKWHEAT BASED TRADITIONAL RECIPES CONSUMED IN TRIBAL AREA

In this present work we are going to review buckwheat and their products consumed in tribal areas and especially in Himachal Pradesh tribal areas. In this section we review buckwheat based traditional product and recipes such thukpa, momos, khura, zan, puta and their consumption in tribal area. Table 2 shows that the research work done by various researcher on document buckwheat based traditional recipes consumed in tribal area.

Here, Chandra Prakash Kala [16] tries to learn more about the customs and history of the several transhumance pastoral tribes that live in the Himalayan area of Bhutan and India, particularly concerning the planning and utilization of their special ethnic food varieties and drinks. Fieldwork was conducted in many Himalayan states in India and Bhutan, in addition to a comprehensive literature study. According to the data, the pastoral communities cooked a diverse array of dishes, with barley, wheat, rice, legumes, vegetables, mutton, and dairy items all playing important roles in 32 of the most often produced meals. With the exception of the Ban gujjars and the Bakarwal, pastoral communities preferred traditional alcoholic drinks since they were an important element of their diet and culture. It is determined that, due to their high nutritional value and overall health, traditional foods from pastoral communities will benefit society's overall health and the sustainability of food systems if vigorously promoted.

Traditional food diets are seen as being very nourishing and healthful in this essay by Kala et al., [17]. Thankfully, only a small number of pastoral communities still follow the custom of producing native meals and drinks. In addition to traditional meals, drinking local alcoholic drinks is a crucial component of their sociocultural fabric. Given this context, the current study's goal is to investigate and record the many traditional meals and beverages as they are made and consumed by the various pastoral tribes in India and Bhutan's Himalayan area. The report goes on to analyse the difficulties and opportunities facing the conventional food system in the current environment.

The Monpa tribe in the Tawang area of Arunachal Pradesh was the subject of the current study by Nitin Kumar Pandey et al. [18]. 120 people from this tribe were included in the study's sample size. Data gathering techniques included the utilisation of personal interviews with a pre-tested planned agenda and targeted group discussions. The creation of a variety of foods and beverages was a skill that the Monpa tribe had acquired, according to the findings. Rice, wheat, maize, barley, finger millet, buckwheat, and oats are just few of the grains that go into making dishes like thukpa, momos, khura, zan, puta, khazi, bresi, khapse, and chhurpi. Fermenting, distilling, and brewing food grains resulted in locally famous beverages such as Sing-chang, Baang-chang, Aarak, Marchang, and Monpa tea. India has to maintain this type of cultural variety in order to have a distinguishing trait with excellent potential for the tourist sector.

The Monpa people, as shown by the work of Ranjay K. Singh et al. [19], ferment a wide range of cereals, including finger millet (*Eleusine coracana* Gaertn.), maize (*Zea mays* Linn.), barley (*Hordeum vulgare* Linn.), and rice, to produce a number of alcoholic beverages (*Oryza sativa* Linn.). Diets traditionally rely on yak milk, soybeans (*Glycine max* Merrill.), buckwheat (*Fagopyrum esculentum* Moench), amaranthus, maize, barley, chilli, and many native fruits and vegetables. The diet of the Monpa tribe is full of nutrient-dense foods that are also appropriate for their heritage. The preservation, choice, and consumption patterns of ethnic cuisines are influenced by altitude variations as well as sociocultural and ecological differences. The several food groups consumed on a daily basis represent the women's network of knowledge and education, which is overseen by numerous institutions such as the mila, lakpa, and barter system as well as societal elders. The preservation of indigenous biodiversity has been made feasible by the diversity in the dietary staples and culturally significant foods. Cultural and social gatherings offer opportunities to share cuisines and learn about linked knowledge systems.

Table 1: Review on Buckwheat Based Traditional Recipes Consumed in Tribal Area

Title	Journal	Keywords	Summary	Authors
Ethnic food knowledge of highland pastoral communities in the Himalayas and prospects for its sustainability	International Journal of Gastronomy and Food Science	Transhumance , Himalaya, milk products	The traditional meals of pastoral communities are particularly nourishing and wholesome, and if actively promoted, they will enhance societal well-being and the sustainability of food systems.	Chandra Prakash kala [16]
The impact of pastoralism, plant protection, and local disputes on the spread of Himalayan knotweed in India's Western Himalayan protected areas at high elevation.	Biodiversity Conservation	Traditional food, Indigenous Alcoholic beverages, Pastoral groups, Pastoral communities	The paper examines the difficulties and opportunities facing the conventional food system in the current environment.	C.P. Kala [17]
Analysis of Indigenous Food Items of Monpa Tribal Community in Tawang District of Arunachal Pradesh, India	International Journal of Current Microbiology and Applied Sciences	Traditional wisdom, Traditional cuisine, drink, and fermented foods from the Monpa people.	Government policies need to be coupled with systematic identification, recording, value addition, and improvement of traditional food. This would preserve the tribe's traditional wisdom.	Nitin Kumar Pandey [18]
Traditional Foods of Monpa tribe of West Kameng, Arunachal Pradesh.	Indian Journal of Traditional Knowledge	Traditional meals and drinks from the Monpa people of Arunachal Pradesh, emphasising the importance of biodiversity preservation and lacto-fermentation.	The preservation, selection, and consumption patterns of ethnic cuisines are impacted by the altitude fluctuation as well as the sociocultural and ecological margins. The mila, lakpa, and barter system, along with the more senior members of society, all have a hand in determining what kinds of meals are available to the public each day, and these foods serve as a metaphor for the women's knowledge and learning network.	Ranjay K Singh et al., [19]

3. REVIEW ON STANDARDIZE, ENRICH AND EVALUATE QUALITY ATTRIBUTES OF BUCKWHEAT BASED TRADITIONAL FOOD PRODUCTS

The current study was conducted by Latika Yadav et al., [20] with the goal of standardising, formulating, and evaluating gluten-free flour mix food items for celiac disease/gluten intolerance patients. Ragi, amaranth, buckwheat, and fava bean flour were used to create a gluten-free flour blend. Standardized and created gluten-free flour mix recipes for poori, mathri, handcrafted sewai, litti, and cake. The sensory and nutritional evaluations of these goods were done in comparison to the control. All goods made from gluten-free flour mix were more widely accepted overall than the control. When compared to a control, the gluten-free flour mix's calcium, iron, fibre, and protein contents were much greater.

To maximise the use of buckwheat flour in bread, Arjun Ghimire et al. [21] conducted this investigation. The product formulation was based on the DOE (Design of Expert) v. 7.1.5 findings. Bread made with buckwheat flour was made by mixing it with wheat flour at concentrations of 10%, 17.5%, 20%, 25%, 30%, 32.5%, and 40%. Both the varied physical qualities of the finished product and the physical properties of buckwheat were examined. The proximate, iron content, and sensory evaluation of bread containing buckwheat in varying quantities were done, and the means were compared at a 5% level of significance. Buckwheat has a l/b ratio of 1.51, a bulk density of 70.23 Kg/HL, and a weight per 1000 kernels of 22.12g, all of which are measurable in terms of its physical properties. Breads formulated with buckwheat flour had a lower loaf volume and lower specific loaf volume and a higher weight, according to physical analysis. Loaf volume (204 cm³) and specific loaf volume (1.86 cm³/g) were both lowest for the bread made with 40% buckwheat inclusion and an increased weight of 109.40g. Nutritional analysis of bread with 25% buckwheat flour revealed the following: 12.5% protein, 4.89% fat, 1.56% crude fibre, 2.43% ash, and 3.27 mg/100 g iron. Color, flavour, crumb appearance, and overall acceptance were all rated higher for the version using 25% buckwheat flour. In light of this, it was concluded that the optimal formulation for creating composite bread was bread containing 25% buckwheat flour.

Table 3 summarises the findings of a study conducted by Alessandra Marti et al. [22] to assess various qualities of commercial pasta made using a mixture of buckwheat flour and durum wheat semolina. Products from different manufacturers were characterised primarily by their chemical and physical characteristics, including their water absorption rate, mechanical properties before and after cooking, and surface features. In order to assess stiffness, resistance to breaking, and general acceptance, a sensory study was also carried out. The findings revealed significant variation in the samples' solid loss, water absorption, and mechanical characteristics. The significant variation might be attributed to the various processing methods each producer uses, notably the method utilised to form and shape the dough into the finished product.

Table 3: Review on Standardize, Enrich and Evaluate Quality Attributes of Buckwheat Based Traditional Food Products

Title	Journal	Keywords	Summary	Authors
Standardization, Formulation and Evaluation of Food Products Developed from Gluten Free Flour Mix.	International Journal of Current Microbiology and Applied Sciences	Gluten free flour mix, Standardization, Formulation, Sensory	Extensive testing revealed that gluten-free flour mix produced much more favourable results than controls when applied to a variety of different food products. Thus, it can be inferred from sensory ratings that gluten-free flour mix may be utilised to make nutrient-rich food products for those who have a gluten sensitivity and low-income populations.	Latika Yadav et al., [20] http://www.ijcmas.com
Evaluation of the Flavor and Texture in Bread Made with Buckwheat	Auctors research publication	Buckwheat, Key Words: Composite Bread, Iron Content, Sensory Characteristics, Emulsifiers, Anti-Staling Agents, Potassium Persulfate, Saccharomyces Cerevisiae, Department of Energy.	It is possible to properly prepare bread with buckwheat inclusion. Due to the addition of buckwheat flour, the recipes' iron content increased and was greater than that of control bread. It was also discovered that bread had a high iron retention rate. Therefore, it may be inferred that bread with buckwheat flour added may be healthier than bread without buckwheat.	Arjun Ghimire et al., [21] https://doi.org/10.31579/2637-8914/058
Quality characteristics of dried pasta enriched with buckwheat flour	International Journal of Food Science plus Technology	Pseudocereal flours, chemical and physical properties, overall acceptability	The findings revealed significant variation in the samples' solid loss, water absorption, and mechanical characteristics.	Alessandra Marti et al., [22] https://doi.org/10.1111/j.13652621.2011.02762.x

4. CONCLUSION AND FUTURE WORK

In the present era, where everything is available with ease, no one or only few people are interested in growing and utilizing these traditional food crops. Because current agricultural systems are mainly concerned with encouraging the growth of a small number of crop species, native crops are ignored and

underused. Not only that, but the general interest of the populace has turned away from subsistence farming and toward cash crops like pea, apple, plum, potato, rajma, and peach, among others, rather than embracing these traditional food plants. In the present, these cash crops are undoubtedly giving people additional economic options, but they are unaware of the negative consequences. Locals use a lot of pesticides and inorganic fertilisers on these cash crops, which has a negative impact on people's health, the quality of the soil and water, and the food chain. Traditional food crops have great nutritional, medicinal, and economic qualities in addition to being resistant to pests and diseases. More education on the value of these traditional food plants, the use of appropriate agro-techniques, and effective marketing are all necessary to improve the production of traditional crops. More cultivation of indigenous foods would undoubtedly give the residents in tribal regions where conditions are difficult and resources are scarce food, nutrition, health, and economic advantages.

In addition, it is an ancient custom of these tribal people to use wild plant resources in their daily lives. This custom should be protected for future generations. Unfortunately, due to easy access to commercial veggies and young people's ignorance of the health and nutritional advantages, the traditional harvest of wild food plants is now in decline. By creating effective cultivation methods for these wild veggies, locals may produce them throughout the year and sell them for a profit that will support their lifestyles. In addition, overexploitation, habitat loss, forest fires, and the introduction of invasive exotic species pose threats to the continued availability of many of these wild food plants in the future.

Therefore, efforts must be made to preserve both the traditional knowledge and these wild food plants in order to manage this unique plant resource sustainably. The current study finds that preserving traditional knowledge about these food plants is a fundamental prerequisite for increasing their production and consumption.

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