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Diversity, Religious Significance and Nutritional Potential of Traditional Cereals and Millets in the Indian Himalayan Region

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The Indian Himalayan Region (IHR), with its diverse agroecological zones and rich cultural heritage, supports a unique integration of agriculture and spirituality. This study explores the distribution and religious applications of 11 traditional crops of IHR which includes seven millets and four cereal species. These grains, belonging to the Poaceae family, play significant roles in traditional ceremonies, seasonal festivals, and Tantric practices, symbolizing fertility, prosperity, and cosmic balance. The study, based on revisionary surveys, documents their altitudinal adaptability across tropical to temperate zones and emphasizes their ritualistic use in Hindu customs such as weddings, naming ceremonies, and ancestral rites. Nutritional analysis reveals their rich composition, especially in antioxidants, fibers, and essential minerals, with species like Eleusine coracana and Sorghum bicolor offering notable health benefits. The study underscores the grains' dual role as nutritional staples and cultural artifacts, advocating for the preservation of this ethno-agricultural knowledge amid modern shifts in food systems and cultural practices.

Keywords: IHR, tradition cereals and millets, Kumaun religious activities, conservation

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1. Introduction

The Indian Himalayan Region (IHR), which stretches from Jammu and Kashmir to the country's northeast, has significant differences in climatic, edaphic, geological, vegetation, and other characteristics due to the intricate variation of agroecosystems, resulting in a variety of agroecological zones (Das, *et al*., 2018). IHR is 250-300 km broad and extends over 2500 km from Arunachal Pradesh in the east to Jammu & Kashmir in the west. Its latitudes vary from 21°57′ to 37°5′ N and longitudes from 72°40′ to 97°25′E (Bhatt, *et al*., 1999). This massive mountain range in Indian territory extends along the country's northern border, which runs from the eastern border of Pakistan in the west to the western border of Myanmar in the east. It passes through 12 states in total, including West Bengal in the east, Sikkim, Arunachal Pradesh, Nagaland, Manipur, Mizoram, Tripura, Meghalaya, and the hills of Assam in the northeast, and Jammu and Kashmir, Himachal Pradesh, Uttarakhand, and the Sivaliks of Punjab and Haryana in the west (Samal, *et al*.,1996). The region relies heavily on agriculture for its livelihood, with the three primary crops of the entire IHR including maize (*Zea mays*), wheat (*Triticum aestivum*), and rice (*Oryza sativa*). The Himalayan area of India has a diverse fabric of religious, agricultural, and cultural customs that are intricately linked to the environment. Several crops and plant species, many of which are of great religious and cultural significance, are supported by the region's varied agroecological zones. The customs and rituals that have been upheld through the ages demonstrate the interaction between religion and agriculture, supporting the preservation of biodiversity and cultural legacy.

Cereals and millets are containing edible seeds or grains, and they are important food crops that contribute significantly to global food security and nutrition. Cereals, which include wheat, rice, maize, and barley, are produced worldwide, and they are the primary source of energy that humans consume due to their high carbohydrate content. Additionally, they often contain minerals (1–3%), lipids (2–5%), fiber (0.5–2%), water (12–13%), and protein (9–13%) (Das Graças and de Souza, 2023). Millets, on other hand are small-seeded cereals, including the main millets such as pearl millet and sorghum, as well as minor millets such as foxtail, finger, Kodo and barnyard that are a potential source of food and fodder in various countries (Saleh, *et al*., 2013; Shahidi and Chandrasekara, 2013). Apart from providing food and fodder, they are also considered robust crops, surviving in difficult climatic conditions marked by unpredictability and nutrient-poor soils (Sharma, *et al*., 2000). In addition to being a basic food, they represent fertility, riches, and the cyclical aspect of existence. They are served at communal feasts, offered to gods during festivals, and utilized in birth and death rites. As the fruits of the earth, these grains are frequently regarded as symbols of divine generosity that need to be revered and ceremoniously returned. In many Himalayan cultures, grain is not just food but a medium of communication with the divine. It becomes part of a larger cosmological order, where agriculture is both a livelihood and a form of worship.

This study explores the distribution of cereals and millets across the Indian Himalayan Region (IHR) and their significance in religious festivals and rituals. By examining the traditional and nutritional value of these crops, the research exhibits their deep-rooted connection with cultural and spiritual practices. Additionally, the study offers views into the intricate relationship between humans, nature, and spirituality, underscoring the importance of preserving both biodiversity and cultural heritage in the region.

2. Martials and Methods

The present investigation was made by utilizing available information collected from secondary sources to explore the distribution and religious use of millets and cereals across the Indian Himalayan Region. The study aims to analyse previously published information to gain knowledge on traditional grain practices associated with cultural and religious rituals. for the study various academic publications including Nautiyal, *et al*. (2008); Sharma, *et al*. (2000); Shahidi, *et al*. (2013); Saleh, *et al*. (2013); Thakur, *et al*. (2022); Das, *et al*. (2023); Chandra, *et al*. (2022) and Ankita and Seth, (2025); Das, *et al*. (2018); Champion and Seth (1968) were used. Additionally, web databases such as Google Scholar, ResearchGate etc.

3. Sample Collection and Identification of Cereals and Millets

Samples of all recorded crop specimens were collected from local villages Almora district in the Kumaun region and preserved at the Department of Botany, SSJ University Campus, Almora (Uttarakhand). The specimens were identified using authoritative taxonomic databases, includingPlants of the World Online (POWO),e-Flora, and verified botanical references.

4. Result and Discussion

During the study, a total of eleven crop species were documented belonging to Poaceae family, which hold religious significance and are applied in various rituals and festivals across the Indian Himalayan Region. Out of 11, seven species were recorded as millets, followed by four cereals. These seven millets crop species include- *Echinochloa frumentacea*, *Eleusine coracana*, *Panicum sumatrense*, *Paspalum scrobiculatum*, *Pennisetum glaucum*, *Setaria italica*, and *Sorghum bicolor*. Likewise, four cereal crop species which includes *Hordeum vulgare*, *Oryza sativa*, *Triticum aestivum*, and *Zea mays* were also recorded. Furthermore, their distribution throughout Indian regions, major nutrients, and health advantages have also been documented.

Geographical Distribution of Major Crops in India: The 11 crop species, including cereal and millet species, are adapted across multiple altitudinal zones in India (Champion and Seth, 1968): 1968)-tropical (up to 1000m), subtropical (1000 m–1800 m), and temperate (1800–3000m). Out of eleven species (Table 1), the highest number of crop species (11) was recorded in the subtropical region, followed by the temperate region (10), and 9 species were recorded in the tropical region. However, species like *Echinochloa frumentacea* (Jhangora), *Eleusine coracana* (Mandua), *Hordeum vulgare* (barley), *Paspalum scrobiculatum* (Kodo millet), *Panicum sumatrense* (Kutki), *Triticum aestivum* (wheat), and *Zea mays* (corn) show wide adaptability, occurring in all three zones. This evidence suggests a resilient genetic makeup capable of withstanding varied climatic conditions.

On the other hand, *Pennisetum glaucum* (bajra), *Setaria italica* (Kauni), *Sorghum bicolor* (Jowar), and *Oryza sativa* (rice) show limited altitude preference, with *P. glaucum* and *S. italica* restricted primarily to subtropical and temperate regions and *S. bicolor* and *O. sativa* best adapted to tropical and subtropical areas.

Cultural and Religiose uses of Cereals and Millets in Indian Himalayan Region: These 11 crops species include four cereals and seven millets (Table 1) are not only dietary staples but also hold profound religious and spiritual significance in the Indian Himalayan Region. Their ritual use is deeply embedded in agrarian traditions, seasonal festivals, life-cycle ceremonies, and Tantric practices. Three cereal crops out of eleven species- *Oryza sativa* (rice), *Triticum aestivum* (wheat), and *Hordeum vulgare* (barley)-are integral to almost all Hindu religious ceremonies, like weddings, naming, baby first feed, thread, and funeral ceremonies and festivals such as Harela, Navaratri, Deepawali, Makar Sankranti, Basant Panchami, and Lohri. Where *O. sativa* is utilized in the highest number of religious events, include 5 ceremonies- weddings, naming, baby first feedings, funerals, and threading, and four festivals- Harela, Navaratri, Deepawali, and Makar Sakranti where it is employed in various ways. During the wedding ceremony, it is utilized for several activities, such as Akshata, Mangalashtak or Varmala, Havan/Yagya offerings, Bidai (the bride's farewell), Puja, and Kalash rituals. At the naming ceremony parent uses it to write the baby's first letter and in the baby's first feed is given soft-cooked rice to the baby. It is followed by *H. vulgare* which is used in 4 Ceremonies- wedding, naming, thread and funeral and 3 festivals- Navratri, Harela, Basant Panchami. Mostly it is used in Havan/Yagya (grains are offered into the fire during mantras) and its hole plant also used fix with cow dung on the gate or door at the festival of Basant Panchami. And at the end *T. aestivum* last is used only 2 ceremony-wedding and thread and 3 festivals- Navaratri, Lohri, Harela and Makar Sankranti. In Makar Sankranti wheat flour used to make ghughutiya.

Additionally, one cereal- *Zea mays* and two millets- *Panicum sumatrense*, and *Pennisetum glaucum* is used in festivals only. In which *Z. mays* is used, 3 festivals like Lohri, Harela, and Deepawali. In Harela, people grow it in a pot alongside two other cereals like wheat, rice, and pulses during the *Shavan* season.

It's also closely tied to agriculture, prosperity, and nature worship. At the time of Lohri, its popcorn is thrown on fire in Punjab. After it, *Pennisetum glaucum* is used in two festivals such as Lohri and Makar Sankranti and *Panicum sumatrense* is used only in one festival i.e. Navratri (Figure 1). Rest four millets including *Echinochloa frumentacea* (Jhangora), *Eleusine coracana* (Mandua/Ragi), *Setaria italica* (Kangni), and *Sorghum bicolor* (Jowar) are not play a significant role in ceremonies and festivals but it is considered as a part of the Saptanaja (mixture of seven grains), or the sacred mix of seven grains (Figure 2). This combination holds special significance in-

1. Tantric rituals, where it is used to appease deities and energies.
2. Pitrakriya or ancestral worship, where offerings are made to honour and pacify ancestors.
3. Festivals of seasonal transition, where Saptanaja is both consumed and offered to deities as a form of thanksgiving and spiritual protection.

Local Ritual Practices: *Paspalum scrobiculatum* (Kodo millet) plays a role in the Lug Sari valley rituals of Himachal, where it is fermented to prepare Soor, a sacred local wine. This beverage is: Offered to local deities and ancestors.

Symbolism and Ethno-spiritual Relevance: The ritual use of these grains often aligns with astrological and ecological cycles, representing a cosmic harmony between humans, nature, and the divine. Their selection for specific festivals is often guided by traditional Ayurvedic and astrological texts, which prescribe grains based on planetary positions, seasonal energies, and individual constitutions (doshas).

The nutritional profile of these grains is also reviewed, and it is found that 2 crop species (Table 1) *Eleusine coracana* and *Sorghum bicolor* (millets)- have the maximum number of key nutrients and health benefits. Where former crop species are the rich source of fiber, Mg, vitamins, tannins, lecithin, methionine, tryptophan, antioxidants (quercetin, curcumin, ellagic acid), and useful in prevention against diseases like diabetes, cardiovascular diseases, obesity, gastrointestinal disorders, detoxification, and later crop species have nutrients such as polyphenols, which are beneficial for cancer disease, and except for gastrointestinal disease like Eleusine, are also useful for these diseases and have common key nutrients.

It is followed by *Triticum aestivum*, *Zea mays*, *Pennisetum glaucum*, *Hordeum vulgare*, and *Echinochloa frumentacea*. *Setaria italica*, *Panicum sumatrense* and *Paspalum scrobiculatum* has the lowest number of key nutrients and health benefits.

5. Conclusion

The study found that cereals and millets in the Indian Himalayan Region are far more than just sources of food- they are carriers of tradition, spirituality, and community identity and their use in sacred ceremonies like weddings, funerals, naming and harvest festivals reflects an intimate connection between nature, agriculture, and the divine. However, with the rapid pace of modernization, urbanization, and changing lifestyles, many of these time-honoured traditions and the knowledge associated with them are fading. Market-driven food systems, the dominance of high-yielding commercial crops, and a shift away from traditional diets are contributing to the loss of cultural and agricultural diversity. Due to this Younger generations are increasingly disconnected from the significance of these grains, not only in terms of their nutritional value but also their cultural and spiritual importance. In this context, it becomes crucial to preserve, document, and actively promote the knowledge of traditional grains and their uses. Therefore, educational initiatives- both formal and community-based should be introduced to sensitize the youth to the importance of these crops. By passing this knowledge to the next generation, we not only safeguard our cultural heritage but also foster sustainable food practices that are well-adapted to local environments.

References

1. Das Graças Costa, E., & de Souza, P. M. (2023). Introduction to cereals. in *Cereal-based food products*. Cham: Springer International Publishing, pp. 1-24.

2. Bhatt, D.K., Joshi, V. K., & Arora, R. K. (1999). Conodont biostratigraphy of the lower Triassic in Spiti Himalaya, India. *Journal Geological Society of India*, *54*(2), 153-167.

3. Saleh, A.S., Zhang, Q., Chen, J., & Shen, Q. (2013). Millet grains: nutritional quality, processing, and potential health benefits. *Comprehensive Reviews in Food Science and Food Safety*, *12*(3), 281-295.

4. Semwal, R. L., & Maikhuri, R. K. (1996). Structure and functioning of traditional hill agroecosystems of Garhwal Himalaya. *Biological Agriculture & Horticulture*, *13*(3), 267-289.

5. Shahidi, F., & Chandrasekara, A. (2013). Millet grain phenolics and their role in disease risk reduction and health promotion: A review. *Journal of Functional Foods*, *5*(2), 570-581.

6. Sharma, K. K., & Ortiz, R. (2000). Program for the application of genetic transformation for crop improvement in the semi-arid tropics. in *Vitro Cellular & Developmental Biology-Plant*, *36*, 83-92.

7. Das, A., Thoithoi Devi, M., Babu, S., Ansari, M., Layek, J., Bhowmick, S. N., & Singh, R. (2018). Cereal-legume cropping system in Indian Himalayan region for food and environmental sustainability. *Legumes for Soil Health and Sustainable Management*, 33-76.

8. Chandra, S. (2022). Documentation of the plants used in different Hindu rituals in Uttarakhand, India. *Asian Journal of Ethnobiology*, *5*(2).

9. Nautiyal, S., Bisht, V., Rao, K. S., & Maikhuri, R. K. (2008). The role of cultural values in agrobiodiversity conservation: a case study from Uttarakhand, Himalaya. *Journal of Human Ecology*, *23*(1), 1-6.

10. Rawat, S., & Kumar, R. (2024). The enchanting flora of Chamba: unveiling sacred and magico-religious plants in Himachal Pradesh. *Ethnobotany Research and Applications*, *28*, 1-16.

11. Chandra, S. (2022). Documentation of the plants used in different Hindu rituals in Uttarakhand, India. *Asian Journal of Ethnobiology*, *5*(2).

12. Ankita, & Seth, U. (2025). Millets in India: exploring historical significance, cultural heritage and ethnic foods. *Journal of Ethnic Foods*, *12*(1), 2.

13. Boddupalli, R. S. (2024). Traditional knowledge of Vedic grasses-Their significance and medicinal uses. *Indian Journal of Traditional Knowledge (IJTK)*, *23*(3), 224-238.

14. Mahalik, G. Plant *resources used in Kartika Purnima for worshipping lord Kartikeya in Odisha, India*.

15. Thakur, S., Jamwal, R., & Negi, S. (2023). Ethnobotanical survey of plants used in magico-religious practices in Kullu district of Himachal Pradesh, India. *Ethnobotany Research and Applications*, *25*, 1-18.

16. Champion, H. G., & Seth, S. K. (1968). *A revised survey of the forest types of India*. Manager of Publications.

17. Lata, S., Sharma, S., & Maurya, C. (2022). Traditional uses of plants in various rituals and ceremonies among Tharu tribe of Udham Singh Nagar, Kumaun Himalaya Uttarakhand, India. *Plant Archives*, *22*(1), 334-342.

18. Agarwal, p. (2014). Study of sacred plants used by people in Fatehpur district of Uttar Pradesh (India). *Life sciences*, *54*, 91-98.

19. Sahoo, R. N., Kumar, S., Suryavanshi, A., Kain, D., Arya, A., & Chaudhry, B. (2021). Venerated and medicinal aspects of plants used in India: An ethnobotanical review. *Journal of Drug Research in Ayurvedic Sciences*, *6*(3), 128-140.

20. Sahu, P. K., Kumari, A., Sao, S., Singh, M., & Pandey, P. (2013). Sacred plants and their Ethno-botanical importance in central India: A mini review. *International Journal of Pharmacy and Life Sciences*, *4*(8), 2910-2914.

21. Montonen, J., Knekt, P., Järvinen, R., Aroma, A., & Reunanen, A. (2003). Whole-grain and fiber intake and the incidence of type 2 diabetes. *The American Journal of Clinical Nutrition*, *77*(3), 622-629.

22. Gómez-Cordovés, C., Bartolomé, B., Vieira, W., & Virador, V. M. (2001). Effects of wine phenolics and sorghum tannins on tyrosinase activity and growth of melanoma cells. *Journal of Agricultural and Food Chemistry*, *49*(3), 1620-1624.

23. Lee, S. H., Chung, I. M., Cha, Y. S., & Park, Y. (2010). Millet consumption decreased serum concentration of triglyceride and C-reactive protein but not oxidative status in hyperlipidemic rats. *Nutrition Research*, *30*(4), 290-296.

24. Eduru, A., Kamboj, A., Reddy, P. M., & Pal, B. (2021). Nutritional and health benefits of millets, present status and future prospects: A review. *The Pharma Innovation Journal*, *10*(5), 859-868.

25. Carr, T. P., Weller, C. L., Schlegel, V. L., Cuppett, S. L., Guderian Jr, D. M., & Johnson, K. R. (2005). Grain sorghum lipid extract reduces cholesterol absorption and plasma non-HDL cholesterol concentration in hamsters. *The Journal of Nutrition*, *135*(9), 2236-2240.

26. Dykes, L., & Rooney, L. W. (2006). Sorghum and millet phenols and antioxidants. *Journal of Cereal Science*, *44*(3), 236-251.

27. Ciacci, C., Maiuri, L., Caporaso, N., Bucci, C., Del Giudice, L., Massardo, D. R., and Londei, M. (2007). Celiac disease: in vitro and in vivo safety and palatability of wheat-free sorghum food products. *Clinical Nutrition*, *26*(6), 799-805.

28. Choi, Y. Y., Osada, K., Ito, Y., Nagasawa, T., Choi, M. R., & Nishizawa, N. (2005). Effects of dietary protein of Korean foxtail millet [Setaria italica] on plasma adiponectin, HDL-cholesterol, and insulin levels in genetically type 2 diabetic mice. *Bioscience, Biotechnology, and Biochemistry (Japan)*, *69*(1).

29. Ali, M. A., El Tinay, A. H., & Abdalla, A. H. (2003). Effect of fermentation on the in vitro protein digestibility of pearl millet. *Food Chemistry*, *80*(1), 51-54.

Crops applied during worship in Harela, Deepawali and Makar Sakranti festivals in Kumaun

Figure 1: Illustration of different cereals and millets on various auspicious occasions

Figure 2: Illustration of different millets used in the form of *Saptanja* in traditional rituals in Kumaun

Table 1: Distribution and religious significance of cereals and millets in the Indian Himalayan Region: nutritional and health benefits

S.N.	Species	Common name	Part used	Tropical (Ut to 1000m)	Sub-tropical (1000-1800m)	Temperate (1800-3000m)	Religious use	Key nutrients	Disease prevented
1.	Echinochloa frumentacea Link	Jhangora	Seed	+	+	+	Navaratri, it is component of Saptanaja or seven grains used in Tantric traditions and ceremonies honoring ancestor	Lignin, Antioxidants (Quercetin, Cucurmin, Ellagic acid)	Cardiovascular diseases, detoxification
2.	Eleusine coracana (L.) Gaertn.	Mandua	seed`	+	+	+	It is component of Saptanaja or seven grains used in Tantric traditions and ceremonies honoring ancestor	Fibre, Mg, Vitamins, Tannins, Lecithin, Methionine, Tryptophan, Antioxidants (Quercetin, Cucurmin, Ellagic acid)	Diabetes, Cardiovascular diseases, Obesity, Gastrointestinal Disorders, Detoxification
3.	Hordeum vulgare L	Jau	Whole plant, Seed	_	_	+	Wedding ceremony, thread ceremony, Harela, Navaratri, Basant Panchami	Beta-glucan, tocols	Anti-inflammatory, anti-diabetic, hypo-cholesterol emic
4.	Oryza sativa L.	Dhan	Refind seed	+	+	_	Wedding ceremony, Harela festival, first feeding ceremony, thread ceremony, Makar Sankranti, Deepawali	Carbohydrates, minerals, phenolic compounds	Anticancer, anti-inflammatory, antidiabetic
5.	Paspalum scrobiculatum L.	Kodo millet	Seed	+	+	+	Seeds are used to prepare a strong wine locally known as 'Soor' and offered to the deities of Lug sari valley of Kullu tehsil.	Antioxidants (Quercetin, Cucurmin, Ellagic acid)	Detoxification
6.	Pennisetum glaucum (L.) R.Br. Bajra	Bajra	Seed	_	+	+	Makarskranti and Lohari festival	Antioxidants (Quercetin, Cucurmin, Ellagic acid)	Detoxification
7.	Panicum sumatrense Roth	Kutki	Seed	+	+	+	Navratri	Fibre, Mg, Vitamins, Tannins, alkaline nature, gluten free	Diabetes, Celiac Disease, Gastrointestinal disorders
8.	Setaria italica (L.) P. Beauv	Kangani, Kauni	Fruit	_	+	+	It is component of Saptanaja or seven grains used in Tantric traditions and ceremonies honoring ancestor	Antioxidants (Quercetin, Cucurmin, Ellagic acid)	Detoxification
9.	Sorghum bicolor (L.) Moench	Jowar	Seed	+	+	_	It is component of Saptanaja or seven grains used in Tantric traditions and ceremonies honoring ancestor	Fibre, Mg, Vitamins, Tannins, Sterol, Polyphenols and Tannins, Antioxidants (Quercetin, Cucurmin, Ellagic acid), Gluten free	Diabetes, Obesity, Cancer, Celiac Disease, Detoxification
10.	Triticum aestivum L.	Gehun	Milled seed	+	+	+	Wedding ceremony, Harela and Makarskranti, Navratri, Lohri, Deepawali	Dietary fiber, resistant starch, B-complex vitamins	Anticancer, antimicrobial, antioxidant
11	Zea mays L.	Makka	Whole plant and seed	+	+	+	Harela, Lohri, Deepawali	Carotenoids, phenolic compounds, essential fatty acids	Antioxidant, anti-inflammatory, antidiabetic