Chapter 56

Ethnobotanical Uses of Native Flora Through Traditional Wisdom in Punjab, Pakistan

Ahmed Muneeb[1], Iftikhar Ahmad[2] Iqra Parvez[3] Muhammad Imran[3], Kashif Ali[4], Afza Arif[4], Naveed Ahsan[4], Areesha Malik[4] Aliza Kalim[4] and Muhammad Khawar Hayyat[4]

[1]Department of Botany, Division of Science and Technology, University of Education, Lahore, Pakistan
[2]Department of Botany, Government College of Science, Faisalabad
[3]Department of Botany, University of Sargodha, Sargodha
[4]Department of Zoology, Division of Science and Technology, University of Education, Lahore, Punjab, Pakistan
*Corresponding author: amuneebmalik@gmail.com

ABSTRACT

In this chapter, an attempt has been made to present a contribution to the ethnobotanical knowledge of punjab pakistan regarding cultural, ecological and long term benefits. The flora of Punjab, owing to millennia-long cultural depth and some historical epochs from the periphery, is as rich as to be both unique and important. How this body of knowledge has evolved from Ayurvedic, Unani, Persian to Mughal and British colonial periods speaks volumes about the resilience of Punjab traditions. Traditional healers are known as Hakims, and elders are honoured for their continued stewardship of knowledge around how to use local plants - medicinally, in foods and spiritually. The chapter looks at the implications for conservation-the loss of biodiversity, deforestation and urbanisation. This calls for community based conservation efforts and sustainable ways of managing Punjab's botanical heritage. The future prospect in the field of ethnobotanical research offer a hope to provide new drugs that is not only based on ancient-knowledge but also surprising with technology innovation or it can say injection of science. This chapter, as a whole, highlights the symbiotic nature of Punjab's flora with its people and the cultural, medical and ecological bequest left by generations past for posterity to live in harmony.

KEYWORDS
Ethnobotany, Traditional knowledge, Biodiversity conservation, Cultural heritage, Sustainable management

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INTRODUCTION

Overview of Ethnobotany and Its Significance

Harmonising the cultural with ecological, historical and economic considerations to capture the broad synthesis of plants and humanity defines access in ethnobotany - a multidisciplinary field capturing aspects of plant-human relationships (Gras et al., 2021). The conversation in this paper addresses the application of plants for food, medicinal, building and religious requirements among various societies of the globe (Balick and Cox, 2020). By understanding these traditional practices and that knowledge system, ethnobotany is able to provide important insights into conservation of biodiversity, sustainable management of resources, as well as the preservation of Indigenous cultures (Kumar et al., 2021). It is essentiality stems from its capability to fill in the gap of knowledge between traditional ecological knowledge and modern science leading to a clearer understanding of the different roles played by plants both in the environment and human cultures (Balick and Cox, 2020). Additionally, through revealing potential for manufacturing sector and health that remain largely unknown about plants, ethnobotanical studies help preserve cultural heritage while also promoting environmentally friendly methods for future generations (Heywood, 2011).

Brief Introduction to Punjab, Pakistan

Pakistan has diverse ecosystems and a rich cultural mosaic particularly in Punjab making it an interesting case study for ethnobotany research (Chaturvedi and Singhal, 2020). This area is recognized as Pakistan's heartland with lots of indigenous flora that have been used over time because of traditional wisdom (Ezcurra, 2006). The ethnobotanical use of plants among people in Punjab shows their strong affinity towards nature (Amjad et al., 2020). Punjab's flora is abundant with information passed down through generations starting from culinary herbs used to enrich regional recipes to medicinal plants employed as ancient curative techniques (Shar, 2022).

Exploring the ethnobotanical landscape of Punjab helps to reveal how these interdependencies have worked and indicates that benefits can be created by combining ancient knowledge with contemporary needs for environmental well-being and global sustainability (Milbank, 2023).

Importance of Native Flora in Traditional Practices

Considering that many cultural, medical, and spiritual traditions of the world are based on the native flora, its importance in traditional practices cannot be overemphasized (Reyes-García 2010). The reality, however, is that indigenous people are strongly reliant on the great number of plants growing in the respective habitats for ceremony, medicine and subsistence (Heywood 2011).

Plants heal many health issues and disorders, which uses in traditional medicine as a main component (Muthu et al., 2006). In addition, these plants are important symbols in many types of cultural rites and spiritual practices as a result of the fact that they embody the connections with their ancestors and their natural environment (Balick and Cox, 2020). In addition to their important cultural values, native plant species play a key role in sustainable agriculture and ecosystem resilience because they are often better adapted to the local conditions (Shelef et al., 2017). It is not only important to maintain and understand the customary usage of local plants, but for protecting biodiversity and the long-term future of our planet (Willis et al. 2007).

Historical Perspectives

Footprints of talked and unspoken word exchange, needbased ecological managerial machineries, likewise the path Trodden by ancientpeople can be studied while focusing on ethnobotanical information from Punjab,since time immemorial (Sengupta et al., 2019). Punjab's fertile land and di-verse ecosystem had attracted botanists to work with it for number of years (Shukla and Behera, 2019). It reflects the many uses of local flora which have beenrecorded, tried upon by local people and handed over to generations in thepast as well (Aziz et al., 2017). Migrations, invasions, contacts with other cultures and new natural settings hasteneditin its course of history (Hoerder, 2002).

Evolution of Ethnobotanical Knowledge in Punjab

The long journey of centuries of cultural exchange, environmental adjustment, and sharing of ancient wisdom is reflected in the history of ethnobotanical knowledge in Punjab (Brush, 2008). The neighbouring cultures' association; invaders; migrants; changing ecological context over time have contributed towards its development (Davis et al., 2005). Sources contributing to ethnobotanical knowledge regarding plants of Punjab are varied. Few examples include ancient Ayurvedic-Unani plant based medicine;, Persian period;, Mughals; British colonial period and present era as well (Kizhakkeveettil et al., 2024). In contemporary era it has become a nodal body reflecting their age-old health care tradition.; eco-friendly agricultural cultural heritage ;Persian period;) people's adaptability related with environment climatic change) and interdependence interaction between human natural world (Finn et al., 2017).

Role of Traditional Healers (Hakims) and Elders

The knowledgeable seniors or traditional healers, mostly referred to as Hakims in the community are pivotal for the transmission and possession of ethnobotanical information (Gupta et al., 2014). These people hold great awareness on therapeutic properties and uses of local plants in various ethnicities (Pan et al., .2014). They are known to own a deep understanding on plants and their usage. Hence they hold respect as elderly possessing knowledge on plant use along with age old methods for healing handed down since generations (Jacob et al., 2023). They treat variety of diseases and thus play significant roles in healthcare systems where access to modern medicine is limited or not available (Bodeker and Kronenberg, 2002). Community elders serve as living libraries of indigenous knowledge as they share beliefs that are learned through years of plant work (Nicholas and, Markey, 2014) .They encourage future generation under their guide recognizing influences from the cultural identity and relationship with the natural environment following ethnobotanical activities (Hunter,, 2022). The respect exhibited by people towards these healers reveals dependency as well as respect shown referencing to an ancient practice holds much evident importance explaining logical attitude towards maintenance of health, livelihood among societies (Sorin, 2007).

Traditional Practices and Their Cultural Significance

Traditional ways of using indigenous plants are dated back to cultural significant and they are inevitable resources in many societies across the globe (Cocks, 2006). These habits which are learnt over the years are part of the society's knowledge and ethical fabric in order to depict how such civilization deals with the natural world (Griswold, 2012). These customs involve the use of native plants with individuals' social, religious, temporal, and generational associations (Balick and Cox, 2020). Such activities give an identity that is history related in the present with several people feeling they belong to a certain community (Damásio et al., 2012). Examples include preparing teas from natural herbs for such ails as cancer and ulcers, preparing ornate flower arrangements for events such as weddings and funerals and use of oratures during musical events such as festivals (Rodrigues and Spence, 2023). Therefore, by accepting and cherishing those traditions, it becomes possible to respect the natives' rooted identity as well as obtain a better insight into the relations between people and the environment (Nepal, 2024).

Influence of Historical Events on Ethnobotanical Traditions

The narrative of adaptation, survival, and cultural exchange which is revealed through the history of ethnobotanical knowledge affected by historical events is quite interesting (Lujan Escalante and Mortime, 2022). The manner or means through which mankind has interacted and utilized natural vegetation has been distorted over time by famous victories, battles among other social changes (Steinberg, 2002). For example, the exchange of plants and seeds across continents due to colonialism modified the species in numerous settings and also altered the pharmacopoeial inventory (Cook and Walker, 2013). Of the ancient Silk Road and other trade routes, the ethnobotanical practices of the civilizations were progressed by the sharing of therapeutic plants and spice (Shi et al., 2022). Also, the precluding crises encouraged people to seek novel lifestyles and occupy new territories that shaped ethnobotanical knowledge's preservation and development (Joseph et al., 2022). These events did not only determine the specific plant geographies of these regions but they also emphasized the historicity of human plants aspects, the relations between people and cultivation as well as changes in ecology (McLain et al., 2012).

Flora Diversity of Punjab

The neem tree, the mango tree, several herbs, and flowers are grown all over Punjab (Grewa, 2004). Such is the richness of plants, which forms the basis for the region's traditional ways of life, farming, and environmental equilibrium. There could be reed and lotus around the river sides, whereas, there could be woods having Mango and neem trees in Punjab (Dhammika, 2015). Creole plants cure along with the main products of the agriculture such as the cotton, sugarcane, grain or rice. These helped ministers have a diversified spread that improved Punjab's ecological and thereby sociocultural fabric and best proved how elastic Punjab's flora is, according to (Frank, 2011).

Significance of Biodiversity in Ethnobotanical Practices

As it shall be observed in ethnobotanical exercises in this work, the loss of species is a big issue as it underpins the conventional global knowledge systems (Singh, 2012). The rich source of food, medicine, shelter and other materials and the preserved culture are available with this variety of plant species. We ensure that the diverse ecosystems on which communities have relied on for many generations for plants' use are preserved (Bharucha and Pretty, 2010). Furthermore, the element of biodiversity contributes to resilience against change since it ensures that a constant supply of resources will be available for a sustainable existence in the future. Ethnobotanical methods consider all the relationships between the species within ecosystems, and each plant makes a specific contribution to equilibrium within ecosystems (Ryan, 2014). To sum up, the concept of conservation and appreciation of the biological diversity is of utmost importance if global groups' traditions, health, and welfare are to be maintained.

Traditional Medicinal Uses

Herbal Treatments for Illnesses

Punjab is the most fertile province of Pakistan rich in vegetation from where multiplicity of plants are used to treat various diseases since ancient times. Some of the plants that are used frequently to cure diseases are tulsi, or holy basil, which is supposed to boost the immune system of the human body and neem, which possess antibacterial properties. Additional herbal medications related to the enhancement of lung function, skin, and digestive diseases are in relation to these plants, and other like aloe vera and turmeric (Debjit Bhowmik et al., 2009).

Healing Herbs for Culinary Purposes

It is remarkable that a vast number of mediums used in making Punjabi dishes possess medicinal qualities. For instance, garlic has antic microbial properties apart from enhancing the taste of food (Wani et al., 2022). receive its aid in lowering blood sugar levels with the help of fenugreek seeds and improvement in digestion. These herbs when incorporated into daily meals not only enhances the taste of the food but also will have the benefits of serving the other general purposes of the body (Khalsa, 2003).

Herbal Infusions and Teas

Following the state of Punjab with reference to its flora, herbal teas are said to be used in managing various ailments (Ahmed et al., 2015). Whereas chamomile is used to induce sleep and to calm the body, mint is known for its ability to help to sooth head aches and upset the stomach. These teas are most favoured in holistic medicine and modern day pharmaceutical system in Punjab; they are normally blended with other spices like ginger or lemongrass (Kaur et al., 2018).

Incorporation into Ayurvedic Practices

The medicinal system native to the Indian subcontinent, namely Ayurveda, does not leave Punjab's wealth of plant life unnoticed. Ayurvedic doctors use herbs such as ashwagandha which has adaptogenic property, giloy that enhances the body immunity system and Brahmi that enhances a sound mind. According to Ayurvedic standards, all these herbs are useful for maintaining the body's balance and health. It has been widely used in Ayurvedic system of medicine (Chopra and Doiphode, 2002).

Therefore, it becomes clear that having embraced the western theories of the disease's causation, there is tremendous respect to the natural world evident in Punjab region's diverse plant use in traditional medicine (Rahman et al., 2019).

Culinary and Nutritional Uses of Flora in Punjab

The plant life of Punjab comprises a rich odourous and a flavourful bounty of foods that are both delicious and healthy that are well incorporated in the traditions of the Punjabies (Ahmed and Farooq, 2014). The best thing about the Punjabi food is the distinct and vivid colors, and the food is generally garnished with regional vegetables, herbs and spices.

Ritual and Cultural Significance of Flora of Punjab

Indeed, the vegetation of Punjab is very much associated to symbolism and religious rites and ceremonies that serve an important role in the manifestation of culture of the region (Michon and Bhatti, 2004). Cultural practices such as below religious festivals and rites demands flowers like marigolds and roses in the observed cultures hence are used to tap from these sources to get the flowers for house, shrines, and temples (Lehner and Lehner, 2003). The type of tree that has a lot of therapeutic properties, neem, is also widely used in cultural beliefs in security and purifying signs (Gurib-Fakim, 2006). Herbs that are believed to be sacred such as holy basil (tulsi) are often grown in the courtyards for veneration. In addition, mangoes, known as the ''king of fruits'', is a cultural symbol of health and wealth among the Punjabi people apart from being a delicious fruit. In many cases, these plants are employed in rituals, healing, and other practices that make their community connected with the nature Punjabi people have a rich connection with the earth (Anand, 2024). This link makes it possible to follow native customs and extend the supply of consolidating the cultural memory of the population.

Conservation Challenges and Efforts

Threats to Native Flora in Punjab

As identified by various studies, several factors pose a serious threat to Punjab's indigenous plant species and habitats, underlining the vulnerability of the province's bio diverse regions (Sharma et al., 2022). Problem 3 states that natural ecosystems are rapidly disappearing due to interaction with light industrialization, unplanned growth and expansion of the population base of any country pressing on vegetative cover. Tabernilla is native plants which are threatened most by the agricultural practices that always employ chemical fertilizers and pesticides, which hampers growth and subsistence.

Whether intentionally or accidentally brought, invasive species displace native plants for resources and significantly change the environment (McNeely, 2001). Increasing temperatures and unpredictable weather conditions overwhelm the region's flora beyond tolerance, which is made worse by climate change. To counter these challenges, there has to be a concentrated effort put into sustainability, environmentally friendly land employ, and raising public consciousness of the need to protect Punjab's unique biological legacy (Ghosh, 2008).

Deforestation and Urbanization

Urbanization and deforestation are mutually reinforcing issues that seriously threaten biodiversity and the environment (Kumar et al., 2022). The loss of vital habitats for many species due to forest clearing for infrastructure construction and urban growth causes a fall in biodiversity. The loss of trees also upsets water cycles, climatic patterns, and soil fertility, among other ecological balances (Kimmins, 2011). Increased resource demand brought on by urbanization causes unsustainable consumption levels and more deforestation. To reduce the negative consequences of deforestation and urbanization and ensure a sustainable future for both human populations and the natural world, it is imperative to strike a balance between the need for urban expansion and conservation initiatives (Enuoh and Bisong, 2014).

Climate Change Impacts

The impacts of the warming world are becoming increasingly horrific with increase in frequency and severity of incidences of weather related incidents (Singh and Singh, 2012). It can be severe summer like heat episodes and storms on one hand and long prolonged dry spells and melting of polar ice on the other. People in communities are affected by food and water insecurity, environments collapse and species can potentially be wiped out (Arenas-Sánchez, 2016). Emissions cuts, infrastructure improvement, and funding for renewable resources are some of the most important of those measures that need to be taken in order to minimize the negative impact and determine sustainable future.

Overharvesting of Medicinal Plants

Across the world, traditional medical methods and biodiversity are being jeopardized by the excessive agriculture of therapeutic plants (Tomlinson and Akerele, 2015). The lack of populations and extinction of important species have resulted from the unrelenting extraction of these plants for use in medicines, herbal treatments, and other applications. This inappropriate approach disturbs ecosystems and the lives of populations who rely on these resources, in addition to putting medicinal plants in jeopardy (Buhner, 2002). To guarantee that these priceless plants remain available for subsequent generations to enjoy, made to support sustainable techniques for harvesting and their protection.

Community-Based Conservation Initiatives

The measures which involve the promotion of the local people in the preservation of the natural surroundings can indeed be regarded as strategic plans that are instrumental in making the neighbouring populations take on the responsibility of the environment's protection (Berkes, 2004). Since the locals are enlisted to play an active role in the protection and proper use of the ecosystems in their immediate environment, the burden of proper usage and utilization of the consulted resources takes root and it also enhances the aspect of ownership of natural resources (Weber, 2003). These are some of the outcomes of involving the communities in the decision-making process, other than contributing to the social and economic development, and of course, the conservation of the biodiversity. Such efforts often lead to development of unique intervention strategies and practices that help people and animals working with the cooperation of specialists, authorities, and charitable foundations (Kiss et al., 2022).

Indigenous Knowledge Preservation Programs

The preservation of Indigenous Knowledge is critical in the preservation of biological diversity and latter cultural Endangered cultural assets (Ngulube, 2002). The main objectives of these programmes are to document and indeed archive the indigenous people's traditional ecological knowledge. By recognizing these people's profound insights of their ecosystems, these programmes ensure that lessons learned on sustainable resource management are not discarded. Regarding sharing of traditional knowledge, these programmes engage in establishing relationships with regional elder and leaders for passing on this knowledge to the next generation through these programmes (Kohsaka and Roge, 2021). Besides, it also helps to strengthen cultural values, including cultural individuals, as well as foster a deeper regard towards the preservation of nature, complemented by more effective and traditional conservation schemes based on thousands of years of experience (Verschuuren et al., 2021).

Sustainable Harvesting Practices

Sustainable Harvesting Practices projects that aim at ensuring that communities who depend on natural mineral endowment practice responsible mining (Hilson, 2016). opposite to that, these programs comprise sustainable harvesting techniques such as rotational harvesting and selective extraction and subsequently guarantee long-term sustainability of the forest products. People learn about proper behaviors that have positive effects on ecosystems' health and biological diversity and get most of their needs met from the obtained resources (Vandebroek et al., 2011).

Future Directions and Opportunities

A. Potential for Ethnobotanical Research and Innovation

For the future, ethnobotanical study remains as one of the most promising sources of inspiration for creating new developments in various spheres (Soejarto et al., 2005). Bioprospecting is one of the ways that could be utilized to look for new medicines and products without undermining Indigenous peoples' traditional knowledge. Some of the modern methodological approaches can be combined with centuries-old practices that would help researchers find new therapeutic substances and learn more about the scientific basis of traditional therapies (Chao et al., 2017). Pharmacological studies are particularly highly rated as these appraisal researches explore biochemical basis of existing treatments and may open the search for new treatments. This use of combining conventional knowledge with the biological research is beneficial for health care and also guards and asserts the credibility of diverse indigenous people's history (Finn et al., 2017).

B. Revitalizing Traditional Practices

With regards to the goal of sustainable development, reviving old ethnobotanical practices seems to become a somewhat significant task (Prūse, 2020). Information advocacy moves are also crucial in this approach since they teach indigenous people and other society members the value of ancestral data. By instilling pride and awareness in these practices, we can secure their continued existence and significance (Phipps and Ozanne, 2017). Furthermore, incorporating traditional ethnobotanical knowledge into modern healthcare systems provides a double benefit (Vandebroek, 2013). It not only improves medical procedures by incorporating holistic and time-tested cures, but it also gives communities access to indigenous treatments. This combination fosters equitable medical care while preserving the important heritage of ethnobotanical practices.

C. Collaboration among Scientists and Indigenous Communities

To establish a sustainable route ahead, scientists and indigenous populations must work together (Snively and Corsiglia, 2001). Respecting indigenous knowledge systems and including community people in investigations promotes collaboration and confidence. Scientists can learn from generations of traditional knowledge holders, acquiring knowledge that textbooks and laboratories may not provide (Snively and Corsiglia, 2001). Indigenous communities benefit from scientific understanding, resources, and technology that may help them with conservation and sustainable practices (Rist and Dahdouh-Guebas, 2006). These collaborations foster creative conservation solutions based on cultural legacy and ecological expertise. We are paving the road for a future in which ethnobotanical traditions coexist with contemporary breakthroughs, benefiting both civilization and wildlife (Anand et al., 2023).

Conclusion

Cultural-use information on plant resources of Punjab province of Pakistan highlights and depicts one more aspect of people and plants. This chapter underlines the necessity of this knowledge's preservation, as it is valuable from both a cultural history and historical-humanitarian perspective as well as the application it may have towards sustainable development goals, the protection of global bio-diversity, and the advancement of human health. Looking to the future it is imperative, therefore, to understand that there is much which can be learned from tradition and that it is vital to defend and promote those activities which safeguard this legacy for the future. By joining our efforts together with the enhanced sense on the preservation of the nature, it will be possible to preserve the unique ethnobotanical experience of Punjab for years to come.

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