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STUDY OF TRADITIONAL MEDICINAL PLANTS USED TO TREAT VARIOUS AILMENTS IN LAKSAR BLOCK HARIDWAR, UTTARAKHAND, INDIA

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ABSTRACT

Haridwar, Uttarakhand, India has been the reservoir of enormous natural resources including vegetational wealth. A lot of work is ongoing in the field of exploring the medicinal values of plants in various regions of Uttarakhand, but Laksar block is relatively unexplored despite its rich flora worth extensive value if further explored or worked upon. So this research is specifically pertaining to attempt for extracting the medicinal benefits of plants and preserving this knowledge for future generations. This research study explores the traditional plant knowledge among local communities in Laksar block. The objective was to document the indigenous use of plants for treating various ailments. Information was gathered through open interviews with local residents, revealing that these communities continue to rely on their ancestral knowledge for healthcare. A total of 61 medicinal plant species were identified. Key details such as local names, families, useful parts, and medicinal significance were recorded. These plants are employed in the treatment of diverse ailments, including gastrointestinal disorders, respiratory issues, skin diseases, urinary complications, fever, gynecological conditions, muscular problems, and wounds. The study underscores the need for preserving this valuable knowledge to advance modern healthcare and support conservation efforts.

Keywords: Medicinal, Indigenous use, Healthcare, Diseases, Conservation

INTRODUCTION

Medicines derived from Plants play an essential role in treating various human diseases. According to the World Health Organization (WHO), about 80% of the people in developing countries still depend on local medicinal plants to fulfil their primary health needs (Uniyal 2005; Verma 2010). The Indian Himalayan region spreads across Jammu and Kashmir, Himachal Pradesh, Uttarakhand, West Bengal and Arunachal Pradesh. Jammu and Kashmir are a treasure of floral and faunal diversity. At least 500 million people in India directly or indirectly depend on medicinal plants derived drugs for their health care needs (Noorjahan and Saranya 2018). In India, most of the rural communities depend on Ayurveda and medicinal plants for healthcare needs, highlighting the vital role of traditional medicine. Indigenous knowledge, largely transmitted orally from one generation to another & this knowledge is extensively used in various regions, particularly among elderly community members, tribal populations, and traditional healers.

This knowledge holds immense potential for discovering new medicinal compounds, as traditional plants use has served as the foundation for many modern medicines. In Uttarakhand's Laksar block, Haridwar district, indigenous communities such as the Gujjars—a nomadic tribal group living within forest divisions—have acquired a vast knowledge of medicinal flora. However, much of this knowledge remains unexplored by the broader scientific community. Scientific exploration and validation of traditional knowledge could significantly advance modern healthcare by providing new treatment methods for various ailments. This study aims to document and analyze the traditional knowledge of medicinal plants in Laksar block Haridwar, focusing on preserving and advancing knowledge for future generations.

MATERIALS AND METHODS

Description of the study area

The Laksar Block in Haridwar district spans approximately 283.6 km² and is located in the southwestern part of Uttarakhand, India. Its geographical coordinates are 78.02° E longitude and 29.749° N latitude. The district lies between the villages of Khanpur and Sultanpur. The Ganga River forms the eastern boundary of the block, covering a distance of 28.9 km, at an elevation of 227 meters above sea level.

In Laksar Block, Haridwar, Uttarakhand, the wet season is hot and oppressive, the dry season is warm, and it is mostly clear year round. Over the course of the year, the temperature typically varies from *9.5°C* to *39°C* and is rarely below *6.5°C* or above *43°C*. The region mostly receives rainfall in the month of July and August, with an average 382.57 mm of precipitation. The monsoon season accounts for about 82% of annual rainfall, while the balance is accounted in post monsoon and pre monsoon (Official website of Laksar, https://weatherspark.com/) The average humidity round the year is approximately 437% (https://weatherandclimate.com/india/uttarakhand/laksar) These conditions make this region suitable for the growth of a wide and rich variety of Medicinal flora, which has set up the foundation to choose this region for this research The most of area of Laksar block is covered by Orchards (mainly Mango, Litchi, Guava, Mulberry and Jaamun etc.) , Agriculture land (Crops like wheat, rice, sugarcane, etc., Trees as Poplar plants (Populus), Eucalyptus plants (*Eucalyptus globulus*) , Wetland, urban land, barren land and Water body (river, canals and ponds).

Field Surveys & Documentation of local traditional knowledge

Field surveys were conducted in Laksar block of the Haridwar in year 2023-2024. Semi-structured interviews were carried out with traditional healers, local residents, and Ayurvedic practitioners (Vaidyas). The surveys aimed to document the local names of medicinal plants, ailment and corresponding plant parts used for treatment.

Plant Identification

The plants were identified with the help of flora (Raizada and Saxena, 1978). The identified medicinal plants were confirmed by consulting the herbaria of different standards keys in Department of Botany and Microbiology, Gurukul Kangri Vishwavidyalaya, Haridwar. Identification was further validated by consulting local experts and cross-referencing with existing literature.

RESULTS & DISCUSSION

Result of present research work based on the field survey, from lesser explored area of Laksar block of Haridwar district of Uttarakhand ,61 medicinal plants species were identified to be used local community for treatment of various diseases and disorders. These medicinal plants species belonging to 32 families had been collected and identified from the selected sampling zones. The results related to this data have been described in Table 1 .Total 32 families of medicinal plants were recorded from sampling zone in which Apocynaceae family was most dominant family (7species) followed Liliaceae(6species), Acanthaceae (4species), Fabaceae (3species), Malvaceae (2species), Caesalpiniaceae (3 species), Euphorbiaceae (3 species), Solanaceae (3 species),Asclepiadaceae (2 species), Mimosaceae (2 species), Amaranthaceae (2 species),Lauraceae (1 species), Piperaceae (1 species), Punicaceae (1 species), Convolvulaceae (1 species), Zingiberaceae (2 species), Anacardiaceae (1 species), Cannabinaceae (1 species), Caricaceae (1 species), Brassicaceae (1 species), Nyctaginaeeae (1 species), Rosaceae (1 species), Meliaceae (1 species), Menispermaceae (1 species), Verbenaceae (1 species), Lythraceae (1 species), Combretaceae (1 species), Piperaceae (1 species), Umbelliterae (1 species), Poaceae (2 species), Cannabinaceae (1 species).

Similar studies were recorded and the above idea was supported by following findings Medicinal uses of 10 species belonging to 7 families from Pulwama District was reported by (Chak et al. 2009). Total 38 families were recorded from sampling zone 2 in which Asteraceae family was most dominant family (13 species) followed by Lamiaceae (6 species), Rosaceae (5 species), Ranunculaceae (4 species), Polygonaceae (4 species), Apiaceae (3 species), Berberidaceae (3 species) etc. Higher number of plant species may be due to the lower elevation which imply the climate adaption by plant species. Pinus wallichiana was recorded as dominant species (6%) followed by Juglans

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regia (5%), Cedrus deodara (4%), Plantago lanceolate (4%), Capsella bursapastoris (3%), Valeriana jatamansi (3%), Taxus baccata (2%), Ocimum basilicum (2%). (Singh, 1997) conveyed 58 ethno-medicinal plants from Dehradun. (Uniyal, 2003) documented 24 medicinal plant from Wildlife Sanctuary. (Singh, 2004) counted 90 medicinal plant of Western Himalayas. (Singh and Chauhan, 2005) recorded the medicinal plant habit of 43 plant belonging to 25 families.. There is evidence that primarily climatic factors are responsible for spread of J. regia. Climatic change in the environment causes huge impacts on plant species their communities and also on forest ecosystems. (Bisht and Pundir, 2008) reported 67 medicinal plants from Western Himalayas, Uttarakhand. 65 medicinal plants were identified by (Srivastav et al., 2009) in different areas of Manipur.

Table-1: List of medicinal plants of Laksar Block, Haridwar district Uttarakhand India.

Botanical names	**Family**	**Local name**	**Parts used**	**Ethnomedical Preparation and uses**
Abrus precatorius L.	Fabaceae	Gomchi	Root	Root powder is taken orally along with cow's milk to treat scraping sting (bichhu kata)and snake bite(sarpdansh).
Abutilon indicum L.	Malvaceae	Kanghi	Leaf/Root	Leaf Juice and root are taken orally to treat dental problems
Abroma augustum (L.)Lf.	Sterculiaceae	Utal Kambal	Leaves	Leaf juice is applied for skin disease and ring worm disease.(daad)
Achyranthes aspera L.	Amaranthaceae	Chirchita	Leaf	Leaf paste is applied topically to treat cuts and wounds. Dried aerial parts are taken orally in case of diabetes.(madhumeh)
Acorus calamus L.	Araceae	Bach	Rhizome	Juice is used in mental disorder fever and cough (dimagi bukhaar).
Adhatoda vasica Nees.	Acanthaceae	Vasa	Leaf	Leaves are ground with the flowers of *Hibiscus rosa sinensis* and taken orally to treat asthma.(dama rog)
Aegle marmelos L.	Rutaceae	Bel	Leaf	Leaf paste is applied to heal the wounds and Juice is extracted from fresh leaves and administered orally on an empty stomach in case of diabetes.
Albizia lebbeck L. *benth*	Mimosaceae	Siras	Stem	Stem paste is applied and bandaged with wet cloth and changed once an hour in case of sprains.
Allium cepa L.	Liliaceae	Piyaz	Extract	Onion juice with mustard oil is applied as a liniment over painful joints. (Gathia)
Allium sativum L.	Liliaceae	Lahsun	Bulb	Decoction of 3-4 bulbs is given in the dose of two drops in ear twice a day for 4 days.
Aloe barbadensis Mill.	Liliaceae	Gheekwar	Leaf	The fleshy portion of the leaf is used for treating sun burns.
Alstonia scholaris L. *R. Br*	Apocynaceae	Chitvan	Bark	Fresh bark is cut into small pieces and decoction is prepared which is later filtered, concentrated and dried in shade,out of this small pills are made and used to treat asthma
Amaranthus spinosus L.	Amaranthaceae	Katili Chauali	Root	Root paste is used as an external application.

Andrographis paniculata Nees.	Acanthaceae	Kalmegh	Leaf	Powdered leaf is mixed with cow and goat's milk and taken orally to treat diabetes.
Argemone mexicana L.	Papaveraceae	Peeli kateli	Latex	Latex is taken orally along with milk in case of urinary disorder.
Asparagus racemosus Wild.	Liliaceae	Satawar	Leaves	Dried leaves are powdered and are taken orally to cure stomachache and urinary disorder.
Azadirachta indica A.Juss.	Meliaceae	Neem	Leaf & Twig	Leaf paste is applied on the body to treat small pox and skin diseases. The young twigs are used as tooth brush.
Barleria prionitis L.	Acanthaceae	Kalabansa	Root	2-3 teaspoons of decoction made of 15 gm of root is taken daily twice for one week in case of bronchitis. (khansi)
Bauhinia variegata L.	Caesalpiniaceae	Kachnar	Bulbs	Fresh buds of these plants are given to patient in case of diarrhoea. (dust)
Boerhavia diffusa L.	Nyctaginaeeae	Santh	Root	Root paste is applied to treat Hydrocele.
Brassica campestris	Brassicaceae	Peeli Sarson	Seed	Oil of sarson seeds are applied on skin eruption.
Butea monosperma Lam Kuntze	Fabaceae	Dahk/ Palash	Bark	Juice extracted from bark is applied on cuts and wounds and bark juice is given orally to get rid of intestinal worms.
Catharanthus roseus G. Don	Apocynaceae	Madagascar	Whole Plant	Whole plant is powered and mixed with cow's milk and taken orally to treat diabetes.
Calotropis procera (Aiton)	Asclepiadaceae	Aak	Flowers	Flowers buds are mixed with about 20 gm gur and given once a day for 3-4 days in case of malaria.
Cannabis sativa L.	Cannabinaceae	Bhang	Leaves	A poultice of leaves is applied externally around the anus for one mouth to cure piles(babasir).
Carica papaya L.	Caricaceae	Papita	Latex	Small quantity of milky juice is given in stomachache.
Cassia fistula L.	Caesalpiniaceae	Amaltas	Fruits	Soup is prepared with fruit pulp and taken twice a day in the case of constipation.
Cymbopogon citralus Slaf.	Poaceae	Lemon Grass	Leaves	A paste of the leaves made with butter milk is administered for expelling ringworms.
Convolvulus prostratus Forsk	Convolvulaceae	Shankhpushpi	Whole Plant	About 100ml plant juice is mixed with 1000ml water and used for insomnia. (anidra rog)
Curcuma domestica Vahl	Zingiberaceae	Haldi	Powder	100ml of boiled milk mixed with Haldi and sugar is given for cold and pain.
Coriandrum sativum L.	Umbelliterae	Dhaniya	Fruits	Dried fruits are powdered and taken orally to cure fever.
Cinnamonum tamata (Buch.-Hom.) T.Nees & C.H. Eberm.	Lauraceae	Tejpat	Bark & Leaves	Leaves used in diarrhea ,cold and cough.
Cynodon dactylon (L.) pers	Poaceae	Doob	Whole plant	Decoction of whole plant is taken orally to keep the body cool.
Datura metal. L.	Solanaceae	Dhatura	Leaf/seed	Leaf paste is applied locally in case of pain of skin. Few drops of leaf juice are poured in to ear to treat earache. Seed soaked in water are taken orally initially in case of asthma.

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Emblica officinalis Gaertn.	Euphorbiaceae	Amala	Fruits	Fruits eaten to procure scurvy. gastric indigestion.
Euphorbia hirta L.	Euphorbiaceae	Dudhi	Latex	The milky latex is applied to treat wounds and lip cracks.
Hibiscus rosa sinensis L.	Malvaceae	Gudhal	Leaves	Paste of fresh leaves is applied on the hair for healthy and black hair.
Hemidesmus indus (L.)R. Br.MuIL	Asclepiadace	Indian Impecacuanna	Whole plant	Juice extracted from the whole plant is taken internally to keep the body cool.
Lantana camara L.	Verbenaceae	Lantana	Flowers	A hand full of flower is ground with coconut oil and applied topically on the head to get relief from headache.
Lawsonia inermis L.	Lythraceae	Mehndi	Leaf	Leaf powder is mixed with coconut oil and applied topically to treat cuts and wounds.
Mangifera indica L.	Anacardiaceae	Aam	Latex	The latex from leaf and stem bark is used to treat heel cracks.
Mentha pipertia L.	Lamiaceae	Pudina	Leaves	The leaves decoction is used in the treatment of jaundice (peelia).
Mimosa pudica L.	Mimosaceae	Chui-mui	Leaf	Pinch of leaf paste is applied to treat cuts and wounds.
Nerium oleander Sol.	Apocynaceae	Kaner	Stem	Juice prepared from the stem bark is boiled with gingelly oil and two drops are poured in ear to treat ear pain.
Ocimum sanctum L.	Lamiaceae	Tulsi	Leaves	Leaves are crushed with onion bulbs and the juice is taken orally to treat cough, cold and headache.
Plumeria alba L.	Apocynaceae	Frangipani	Root	Root decoction taken orally for intestinal worm.
Piper longum L.	Piperaceae	Piple	Fruits/root	Crushed fruit mixed with jaggery and ginger powder is boiled and is taken thrice daily before food for curing malaria.
Punica granatum L.	Punicaceae	Anar	Fruits/ root	The juice of fruits and leaves is given to patient in case of dysentery.
Rauwolfia serpentina (Benth. ex. kurz)	Apocynaceae	Sarpagandha	Leaf	Leaf juice is taken orally or washed leaves are tied on the breast to increase secretion of milk in women.
Ricinus communis L.	Euphorbiaceae	Arandi	Leaf	Oil coated leaves are used for dressing blistered surface and ulcers.
Rosa centifolia L.	Rosaceae	Gulab	Flowers	Rose water of flowers is used in eye troubles. Used as an excellent uterine tonic.
Saraca asoca (Roxb.) Dewilde	Caesalpiniaceae	Ashok	Leaf	Used as an excellent uterine tonic.
Solanum nigrum L.	Solanaceae	Makoi	Whole plant	Whole plant parts are taken as food to treat cough. Powdered fruits are given orally to reduce fever.
Stevia rebaudiana Bertoni.	Asteraceae	Stevia	Leaf	Powder of leaves is used as a sugar free substitute by diabetic patients.
Tabernaemontana divaricata (L.) R.Br	Apocynaceae	Chandni	Latex	Latex is applied twice daily to prevent cavity

				formation.
Terminalia arjuna (Roxb.) Ex.Dc.Wight & Am	Combretaceae	Arjun	Fruit	Fruit paste is applied on wounds.
Tinospora cordifolia Miers.	Menispermaceae	Giloy	Leaf	Leaf paste is applied to treat wounds.
Vitex negundo L.	Verbenaceae	Nirgundi	Leaves	Leaves are boiled in water and vapor is inhaled twice a day to get relief from headache, cold and fever.
Withania somnifera L.	Solanaceae	Ashwagandha	Root	About 5 gm root powder of the plant is given with goat's milk for about 2 months in case of Arthritis (Gathia baye).
Wrightia tinctoria (Roxb)R.Br.	Apocynaceae	Indrajau	Seeds	Juice of seeds taken orally to treat indigestion.
Zingiber officinale Rose.	Zingiberaceae	Adrak	Rhizomes	Milk boiled with adrak and sugar given for treating cold.

CONCLUSION

A total of 61 medicinal plant species were documented. Each species was analyzed for its medicinal applications along with their local name, family, and the plant part used. The plants were used in various health ailments and categorized as follows: **Gastrointestinal Disorders:** Species such as *Bauhinia variegata*, *Cassia fistula*, *Punica granatum* were used for treating diarrhea, indigestion, and stomach ulcers. **Respiratory Issues:** *Adhatoda vasica*, *Acorus calamus* were employed for managing asthma, cough, and bronchitis. **Skin Diseases:** *Abroma augustum* ,*Achyranthes aspera* were used for treating eczema, burns, and wounds. **Urinary:** *Argemone mexicana*, *Asparagus racemosus* helped address kidney stones and urinary infections. **Fever and Infections***: Cinnamonum tamala*, *Curcuma domestica* were traditionally used to reduce fever and fight infections. The study highlights the deep reliance of rural communities on medicinal plants for their primary healthcare needs and underscores the importance of documenting and preserving traditional medicinal knowledge. However, challenges such as deforestation, modernization, and the declining number of traditional healers threaten the knowledge of extracting medicinal values and uses of plants. The findings contribute to the broader understanding of medicinal plant use in the Laksar block of Haridwar district and provide a foundation for future research and conservation efforts. By integrating traditional knowledge with modern scientific approaches, this research holds the potential to advance healthcare and promote sustainable use of biodiversity

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