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Ethno-medicinal Uses of the Floristic Wealth of Upper Giri-Khad Watershed, District Shimla, Himachal Pradesh, North-Western (NW) Himalaya

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ABSTRACT: Traditional healthcare system making use of the plants and plant parts for treatment of common diseases is prevalent among the rural population and inhabitants of across different parts of India. Plants have a long-standing relationship with humans, with traditional medicinal methods being affordable and accessible, particularly in rural areas. The present study was carried out to assess the medicinal plant wealth of Upper Giri Khad Watershed of district Shimla, Himachal Pradesh to investigate the important medicinal plants used by local inhabitants. The field surveys conducted between 2021 and 2024 and revealed a total of 70 medicinal plants belonging to 65 genera and 44 families used by the local people. The maximum number of medicinal plants belong to Asteraceae (07 species) followed by Lamiaceae (06) and Rosaceae (06), Asparagaceae, Berberidaceae and Rutaceae (03) family each. These plants were utilized for treating various ailments with different habit forms such as herbs (36), shrubs (19) and trees (15) being employed. Leaves (37 species) are the most commonly used plant part followed by roots (20), fruit (09), flowers (07), whole plant (04), twigs and wood (03) and seeds (02). The study emphasizes the importance of documentation of ethno-medicinal knowledge, particularly in rural areas, as it is at risk of being lost due to urbanization and modernization. The further research is helpful to the discovery of new phytoconstituents for human welfare, aiding in scientific exploration and validating the efficacy and therapeutic benefits of medicinal plants.

Keywords: Inhabitants, medicinal plants, traditional knowledge, Giri Khad, Himalayan region.

INTRODUCTION

The relationship between plants and human beings is long and the practice of using plants for medicinal purposes has continued for centuries. Medicinal plants have been used for millennia, with over 50,000 species used worldwide for healing purposes, with undiscovered cures in undiscovered plant species. The medicinal plants have been used for millions of years to treat various ailments, with approximately 80000 flowering plants currently utilized for medicinal purposes (Schippmann *et al*., 2002). A very large proportion of the global population (about >80 %) utilize the locally available medicinal plants for treatment of the various ailments (Verma and Singh 2008). The usage of traditional and indigenous knowledge in public health care is gaining attention worldwide especially in developing countries. In Indian context also, ethno-medicinal uses of different plants in various classical health care system such as Ayurveda, Unani, and Siddha are largely reported (Dubey *et al*., 2004; Balunas and Kinghorn 2005; Baig, 2013; Jishtu *et al*., 2021). From the time immemorial plants have been playing significant role in the life of human beings as a great source of food, clothing, shelter and medicine (Kumar and Singh 2023). The Mewar of Rajasthan are inhabited by many tribes, like Meena, Bhil, Garasia, Damor and out of these Kathodia is major tribe. In their daily lives, these tribes employ the plants for a variety of uses (Upadhyay and Kapoor 2023). It has been observed that amazingly family Asteraceae plant species are traditionally used as indigenous drugs by the natives of Tungnath region (Sharma, 2016). The traditional method is most affordable and accessible among people to cure many diseases and a big number of people residing in rural areas in our country depends upon traditional health care practices and use formulations prepared by local health care practitioners (Vidyarthi *et al*., 2013; Pandey *et al*., 2013). The Himalayan region is one of the youngest mountain ecosystems, globally known for its vast biodiversity, and serves as a perpetual repository of medicinal plants (Shrestha, 2005). It harbours huge number of plant species used for their therapeutic properties and reputed as centre of vast ethnomedicinal flora (Malik *et al*., 2015; Basant and Chaurasia 2009). The Indian Himalaya Region (IHR) is a globally recognised mega-hotspot of biodiversity harbouring a large number of fauna and flora. This young, massive, and diverse mountain region is a unique geographic and ecological entity, renowned for its overwhelming richness, representativeness, and unique biodiversity (Rawal *et al*., 2013). The IHR is mainly spread across 09 states (Himachal Pradesh, Uttarakhand, Sikkim, Arunachal Pradesh, Nagaland, Manipur, Mizoram, Tripura,

Meghalaya), 02 states partially (hilly districts of Assam, and West Bengal) and 02 Union Territories fully (Jammu & Kashmir and Ladakh) and divided into 03 bio-geographical zones (Trans-Himalaya, Himalaya and North-East) and 09 bio-geographic provinces (Sharma *et al*., 2016; Rawal *et al*., 2021). The traditional and indigenous knowledge about medicinal plants is truly a treasure-trove and passed on from generation to generation by the local and tribal communities (Bhat *et al*., 2021). But recently, somehow the good practice of preservation the traditional wisdom about medicinal usages of plants is losing importance. Thus, documentation of ethno-medicinal uses of floristic wealth of any region assumes immense significance. Himachal Pradesh is a small state under the North Western Himalayan which is bio-geographic province of the IHR. The perennial hydrological sources and catchment forests are the precious natural entities of the hilly state. There exists a mosaic of forest ecosystems spreading across the various climatic zones in Himachal Pradesh. These forest ecosystems distributed from the foothills to the alpine region of State are known for the abundant medicinal wealth. Out of the 3500 knowns plant species from the state, there are about 1,500 number of species have immense ethno-medicinal values and therapeutic uses (Chauhan, 1999). These species are being used by the rural populace for the treatment of various ailments (Sharma *et al*., 2014). The ethnobotanical studies conducted in different parts of the Himachal Himalayas have revealed rich traditional knowledge among local communities. Several workers have carried out ethno-botanical studies in different parts of the Himachal Himalayas and explored the rich traditional knowledge existing in different regions and valleys of state (Samant *et al*., 2001; 2007; Rai *et al*., 2000; Samant and Pant, 2006; Guleria and Vasishth 2009; Kaur *et al*., 2011; Kharwal and Rawat 2012; Verma *et al*., 2012; Rani *et al*., 2013; Sharma and Sood, 2013; Dutt *et al*., 2014; Pal *et al*., 2014: Singh and Thakur, 2014; Thakur *et al*., 2016; Radha and Puri 2018; Kumar and Duggal 2019a; Kumar and Duggal 2019b; Chander and Sharma 2020; Singh *et al*., 2020; Kumar *et al*., 2021; Prakash *et al*., 2021; Kumari and Verma 2022; Thakur *et al*., 2024; Sharma *et al*., 2024). Despite this, there are still many areas which are underexplored. In this backdrop, the documentation of ethno-medicinal knowledge is crucial, especially considering the significant reliance of rural populations on medicinal plants. However, this knowledge is at risk of being lost due to urbanization and modernization. Therefore, there is a pressing need for systematic documentation and preservation of this valuable traditional wisdom. Additionally, further research into the phytochemical and pharmaceutical investigations of these medicinal plants is warranted to validate their efficacy and explore their potential therapeutic benefits. In the present investigation, an endeavour has been made to enumerate the important medicinal plants used by the inhabitants of different villages under Upper Giri Khad catchment in district Shimla, Himachal Pradesh.

MATERIAL AND METHODS

Giri Khad is one of the main tributaries of Yamuna River and the snout point is Kuppar Peak and spreaded over an altitudinal range of 1231 m to 3290 m from the above mean sea level (amsl). Giri Khad Watershed is the biggest hydrological source supplying water to the Shimla - state capital of Himachal Pradesh (Sharma *et al*., 2015). The Watershed is located between 31°03'59.70"N to 31°04'15.90"N latitude and 77°22'27.78"E to 77°39'2.14"E (Fig. 1). The climate is predominantly temperate and similar to Shimla, though at lower reaches, sub-tropical conditions prevail. The winter months are prolonged, and the summer season is short. There is snowfall in the months of December to March in the high altitudinal ranges, but low-lying areas experience only rains. The forest is the major Land Use and different forest types like 12/C1 a ban oak forest, 12/C1/ c moist deodar forest, 12/C1/ d western mixed coniferous forest, 12/C1/ f low level blue pine (*Pinus wallichiana*), 12/C1 b moru oak forest, 12/C2 a kharsu oak forest (*Quercus semecarpifolia*) and 9/C1 a lower or shiwalik chirpine forest are distributed in the catchment area. The main area of the watershed falls in the Theog Forest Division having three forest ranges namely Theog, Balson and Kotkhai forest range covering 30 forest beats, and some part occurs in Kotgarh Forest Divisions. The Watershed has a total population of 66839, with 267 inhabited villages under 46 panchayats.

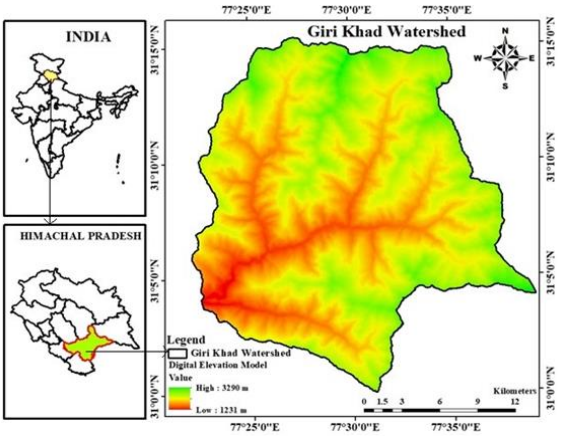

Fig. 1. Map Giri Khad Watershed, Shimla (H.P.).

The regular field survey for the collection of the ethnomedicinal data was conducted between 2021 to 2024 along different altitudinal zones of Upper Giri Khad Watershed and plants were collected from different locations. The different villages *viz.*, Kharapathar, Bhog, Sandhu, Mahasu, Garawag, Sainj, Tahu, Gajeri, Deha, Kalbog, Baghi, Kot-Shilaru, Manan, Shaloha, Ghoond, Kandyali, Shari, Batlot, Sihal, Kyara, Mohri and Annu etc. located in the watershed, were selected and surveyed. The questionnaire was also prepared for collecting the ethnomedicinal information from the villagers. The villages were selected randomly and 10 number of households were surveyed from each selected village. The survey was done to collect the information from the old people and traditional practitioners. The collected plant specimens were shown to the informant and information about local name, medicinal use, parts used, diseases treated, etc. was collected. The plants samples collected from the field were identified with the voucher specimens at ICFRE-Himalayan Forest Research Institute (HFRI), Shimla, herbarium and available floras (Collett, 1921; Chowdhery and Wadhwa 1984).

RESULTS AND DISCUSSION

The present investigation revealed that people of the watershed are immensely dependent upon the plant wealth present in their surroundings. During the survey, total 70 plants species of 65 genera belonging 44 botanical families of ethno medicinal importance were observed from the Watershed (Table 1) (Fig. 2). The dominant families are Asteraceae (07 species) followed by Lamiaceae (06) and Rosaceae (06) having highest ethnomedicinal uses by the local people. Out of 70 plant species, maximum herbs (32 species) followed by shrubs (20) and trees (13) species were recorded (Fig. 3). The most commonly plants parts used was leaves (31) followed by roots (12), whole plant (09), flowers (08), bark (06), fruit (06) and stem (02) (Fig. 4). The plant parts are commonly used for treating a wide range of conditions such as stomachache, gastric problems, wound healing, pain relief and digestive issues.

Various medicinal plants have been used since ancient times with modern scientific approaches have been used to observe their efficacy in treating various ailments (Kumar *et al*., 2022). The elder people in the area have extensive knowledge about the use and locations of certain species in the wild, have been using these resources for generations without written documentation. This traditional knowledge has been passed orally and local inhabitants have collected these species from surrounding villages, forests, and from alpine areas (Jishtu *et al*., 2021). People said that their ancestors were having more knowledge of traditional medicinal plant species. However, the preservation of this traditional wisdom is decreasing and facing challenges due to various reasons. Similar studies were reported on the traditional uses of ethnomedicinal plants in the state of Himachal Pradesh by Kumar *et al.* (2021); Prakash *et al*. (2021); Radha and Puri (2018); Kumari and Verma (2022); Sharma (2022); Lata and Paul (2024); Thakur *et al*. (2024); Sharma *et al*. (2024). The study reveals that most plants, including jaundice, fever and dysentery are used in their natural form for treating various ailments. Since it has been demonstrated that these plants are effective in treating a variety of illnesses, including fever, dysentery and jaundice. The documentation of ethno-medicinal knowledge is crucial, especially considering the significant reliance of rural populations on medicinal plants. A systematic enumeration of the plant species is given in alphabetical order of their botanical names along with their local name, families and uses.

Table 1: List of ethno-medicinal plants used by local people of Upper Giri Khad Watershed in Shimla district, Himachal Pradesh.

Sr. No.	Species Name	Local Name	Family	Habit	Part used	Uses
1.	*Abies pindrow* Royle	Tosh	Pinaceae	Tree	Leaves	Paste of the leaves is used to cure swelling of udder in cow.
2.	*Achyranthes aspera* L.	Puth kanda	Amaranthaceae	Shrub	Roots	Leaf and root paste are used to cure wounds, cuts, continuous body-ache and skin eruptions.
3.	*Aconitum heterophyllum* Wall. ex Royle	Patish	Ranunculaceae	Herb	Roots	Use to cure cough, throat infection, vomiting, abdominal pain and stomach-ache.
4.	*Adiantum venustum* D. Don	Dumni	Adiantaceae	Herb	Twigs	Due to antiseptic properties twigs used for piercing ears and nose.
5.	*Aesculus indica* (Wall. ex Cambess.) Hook.	Khanor, Bankhor	Sapindaceae	Tree	Bark	Paste of bark is used to treat dislocated joints and rheumatism.
6.	*Ajuga integrifolia* Buch.-Ham. ex D.Don	Nilkanthi, Nilkanthi, Ratpatha	Lamiaceae	Herb	Leaves	Paste of leaves used to treat cuts and wounds. Decoction of leaves used for controlling diabetes. Crushed leaves along with 'desi-ghee' are given to cattle to cure cold.
7.	*Aloe vera* (L.) Burm.f.	Ghrit-kumari, Indian Aloe	Asphodelaceae	Herb	Leaves	Gel from leaves is used to cure skin problems and severe itch in head and its tender inflorescences used as vegetable.
8.	*Anaphalis contorta* (D.	Bung	Asteraceae	Herb	Flowers	Flower is commonly used to stop

	Don) Hook.f.					bleeding and exhibits antibacterial properties.
9.	*Angelica glauca* Edgew	Chaura, Chora	Apiaceae	Herb	Roots	Root powder is commonly used to treat gastric, constipation, stomach-ache and also used as spices in food.
10.	*Artemisia dubia* Wall. ex Besser	Chambar	Asteraceae	Shrub	Leaves	Leaf paste/juice is used to cure skin burns, cuts and wounds.
11.	*Artemisia roxburghiana* Wall. ex Besser	Chambar	Asteraceae	Herb	Leaves	Leaf-paste is applied on burns and wounds.
12	*Asparagus adscendens* Roxb.	Kleunti, Shatavari, Safed-musli	Asparagaceae	Herb	Roots	Root powder is used as tonic with milk to cure general weakness and debility.
13.	*Bauhinia variegata* L.	Kachnar, Karail	Fabaceae	Tree	Flower, wood and pods	Flowers and pods are edible and used in preparation of raita and chutney and also helpful to treat mouth ulcer, sore throat and ulcers and diarrhoea. Charcoal of wood used for brushing teeth to cure toothache.
14.	*Berberis aristata* DC.	Kashmal	Berberidaceae	Shrub	Roots, fruits	Fruits edible and root decoction is used to cure fever, jaundice and piles.
15.	*Berberis lycium* Royle	Kashmal	Berberidaceae	Shrub	Root, Fruits	Fruits edible and root decoction used to cure fever, jaundice and piles.
16.	*Bergenia ciliata* (Haw.) Sternb.	Patharchatt	Saxifragaceae	Herb	Root	Root powder is used to cure kidney, piles and gall bladder stones.
17.	*Cannabis sativa* L.	Bhang, Bhanga	Cannabaceae	Herb	Leaves	Leaf balls used to treat intestinal worms and body pain of cattle.
18.	*Carissa carandas* L.	Karundu, Karaunda, Karamarda	Apocynaceae	Shrub	Fruits	Fruits are edible and roots are used to cure stomach-ache and have anthelmintic properties.
19.	*Cedrus deodara* (Roxb. ex D.Don) G.Don	Dyar, Deodar	Pinaceae	Tree	Wood	Wood contains oil that are used to cure ulcers and skin diseases.
20.	*Cotoneaster microphyllus* Wall. ex Lindl.	Jhwarwa	Rosaceae	Shrub	Leaves	Leaf paste is utilized for treating acute dermatitis in animals.
21.	*Chrysanthemum indicum* L.	Galdao	Asteraceae	Herb	Leaves	Leaves is sniffed for relieving headache.
22.	*Cynodon dactylon* (L.) Pers.	Dub-grass	Poaceae	Herb	Whole plant	To cure throat infections in cattle.
23.	*Dalbergia sissoo* Roxb.	Shisham, Tali	Papilionaceae	Tree	Wood	Decoction of wood used for relieving joint-pain. Leaf-
24.	*Daphne papyracea* Wall. ex G.Don	Bursha, Satpura	Thymelaeaceae	Shrub	Leaves, Roots	Paste of leaves and flower is used to treat parasitic infection in animals. Crushed roots used to cure toothache.
25.	*Delphinium denudatum* Wall. ex Hook.f. &	Jadwar	Ranunculaceae	Herb	Roots	Root powder is used to cure toothache, stomach-ache and fever.
26.	*Dioscorea deltoidea* Wall. ex Griseb.	Radkh, Singli-mingli	Dioscoreaceae	Herb	Tubers	Tubers are edible and useful for gastric and stomach problems.
27.	*Deutzia compacta* Craib	Dalichi	Hydrangeaceae	Shrub	Leaves	Paste of leaves is used to cure skin infections.
28.	*Erigeron bonariensis* L.		Asteraceae	Herb	Leaves	Leaf paste is applied on cuts and wound to stop bleeding.
29.	*Euphorbia royleana* Boiss.	Sru, Saru, Surai	Euphorbiaceae	Tree	Leaves	Leaves used to cure cough and asthma, but it is injurious to the eyes
30.	*Ficus palmata* Forssk.	Phegra, Phegra, Anjiri, Bedu	Moraceae	Tree	Fruits	Fruits are edible and used to cure constipation. Milky latex of leaves used to cure skin infections and warts.
31.	*Fragaria vesca* L.	Bhumbal	Rosaceae	Herb	Fruits, Leaves	Fruits edible and leaf is used to cure diarrhoea and urinary disorders.
32.	*Geranium nepalense* Sweet	--	Geraniaceae	Herb	Roots	Roots used to cure toothache and fever.

33.	*Chrysojasminum humile* (L.) Banfi	Chameli	Oleaceae	Shrub	Leaves	Leaf paste is used to cure cuts, wounds, skin diseases and ulcers.
34.	*Juglans regia* L.	Aakhrot, Khor	Juglandaceae	Tree	Whole plant	Leaf, twigs and bark used for brushing teeth. Paste of bark is used to cure oral diseases in cattle.
35.	*Justicia adhatoda* L.	Bainshta	Acanthaceae	Shrub	Leaves, Roots, Flowers	Leaf juice is used to cure diarrhoea, and dysentery. Leaves, flowers and roots are used for treating cough, chronic bronchitis and asthma.
36.	*Mentha longifolia* (L.) L.	Pudina	Lamiaceae	Herb	Leaves	Fresh leaves are used to cure stomach infection and in digestion.
37.	*Morchella esculenta* Fr.	Guchhi	Morchellaceae	Herb	Whole plant	Fruiting body eaten as vegetable, and used to cure diabetes, body weakness and blood pressure.
38.	*Bergera koenigii* L.	Ghandela	Rutaceae	Shrub	Leaves	Leaves used as spice and also used for treating diarrhoea and dysentery.
39.	*Oxalis corniculata* L.	Khat-maroli	Oxalidaceae	Herb	Leaves	Paste of leaves is used to treat poisoning in animals.
	Pistacia integerrima (J.L.Stewart) Rech.f.	Kakkar	Anacardiaceae	Tree	Galls, Resin	Gall is used in asthma and respiratory disorders.
40.	*Polygonatum cirrhifolium* (Wall.) Royle	Mahameda	Asparagaceae	Herb	Roots	Powder of root taken with milk as a tonic for vitality and strength in body.
41.	*Polygonatum verticillatum* (L.) All.	Meda	Asparagaceae	Herb	Roots	Roots are used to cure gastric problems and stomach-ache.
42.	*Primula denticulata* Sm.		Primulaceae	Herb	Flowers	Flower paste is used to treat poisoning in cattle.
43.	*Prinsepia utilis* Royle	Bekhli, Bhekal	Rosaceae	Shrub	Seeds	Oil obtained from seed is used to cure joint and body pain.
44.	*Prunus cerasoides* Buch. Ham. ex D.Don	Pajja	Rosaceae	Tree	Leaves and Twigs	Decoction of leaves used to control high blood pressure, cough and cold. Twigs used for brushing teeth.
45.	*Punica granatum* L.	Daru	Lythraceae	Shrub	Fruit-rind, Seeds	Fruits are edible. Fruits rind and seeds used to cure cough and cold and bleeding nose.
46.	*Roylea cinerea* (D. Don) Baillon	Kadwi	Lamiaceae	Herb	Leaves and Roots	Leaf and root decoction used to cure fever and body ache.
47.	*Pyrus pashia* Buch. Ham. ex D.Don	Kainth	Rosaceae	Tree	Fruits	Fruits are edible and used to controlling diabetes.
48.	*Quercus floribunda* Lindl. ex A.Camus	Moru	Fagaceae	Tree	Leaves	Paste of fresh leaves are applied on skin to cure skin infection and also for relieving throat infections.
49.	*Quercus leucotrichophora* A. Camus	Ban	Fagaceae	Tree	Leaves	Fresh leaves are fed to cattle to enhance the milk secretion.
50.	*Rhododendron arboreum* Sm.	Buransh	Ericaceae	Tree	Flower	Fresh juice of flowers is used in the treatment of cough and nose bleeding.
51.	*Rubus ellipticus* Sm.	Heinra, Hinser	Rosaceae	Shrub	Roots, Fruits	Fruits are edible. Juice of the root is used to cure indigestion and diarrhoea
52.	*Rumex nepalensis* Spreng.	Marmela	Polygonaceae	Herb	Root, Leaves	Paste of leaves used to stop bleeding from cuts and wounds. Leaves used to cure stinging sensation caused by *Urtica dioica*. Root paste used to cure fracture in cattles.
53.	*Rumex hastatus* D.Don	Khat-marora	Polygonaceae	Herb	Leaves	Leaves given to cattle when they get sick.
54.	*Sarcococca saligna* (D.Don) Müll.Arg.		Buxaceae	Shrub	Leaves	Paste of leaves is used to treat rashes, skin diseases and rheumatism.
55.	*Podophyllum hexandrum* Royle	Bankakri	Berberidaceae	Herb	Leaves	Used to treat body ulcers, cuts, wounds and skin diseases.
56.	*Skimmia laureola* (DC.) Decne.		Rutaceae	Shrub	Leaves	Leaves used as flavouring agent in food and to cure cough.

57.	*Salvia cana* Wall. ex Benth.		Lamiaceae	Herb	Leaves	Used to cure cuts, wounds, infections and other skin diseases.
58.	*Taraxacum officinale* F.H.Wigg.	Dudhli	Asteraceae	Herb	Roots	Root used to cure stomach-ache, dog bite and liver disorders.
59.	*Taxus wallichiana* Zucc.	Thuna, Rakhal	Taxaceae	Tree	Bark	Bark used for making tea which is beneficial for cough and congestion.
60.	*Thymus linearis* Benth.	Van Ajwain	Lamiaceae	Herb	Whole plant	Paste of flowers and leaves are used to cure stomach infection and stomach-ache.
61.	*Trillium govanianum* Wall. ex D.Don	Nagchattri	Melanthiaceae	Herb	Leaves, Roots	Paste of leaves and root is used to cure cuts, wounds, foot cracks and joint pain.
62.	*Urtica dioica* L.	Bichhu-buti	Urticaceae	Herb	Leaves	Paste of leaves mixed with salt and oil and tied with cloth on joints for relieving in joint pain and sprain or clotting of blood.
63.	*Valeriana jatamansi* Jones ex Roxb.	Vantulsi	Caprifoliaceae	Herb	Root and Leaves	Decoction of root and leaves is a beneficial remedy for gastric problems and acute stomach-ache. Paste of root and leaves is used to cure wounds and skin infections.
64.	*Verbascum thapsus* L.	Van-tambakhu	Scrophulariaceae	Herb	Leaves	Leaves is applied with clarified butter and used as a bandage for pus relieving and other skin diseases.
65.	*Viburnum cotinifolium* D.Don	Bankunch	Viburnaceae	Shrub	Leaves	Paste of leaves are used in constipation.
66.	*Viola canescens* Wall.	Banaksha	Violaceae	Herb	Flowers and Leaves	Decoction of leaves and flowers is used to treat fever, sore throat, cough, cold, skin infections, and paste of the leaves used to cure skin infections.
67.	*Vitex negundo* L.	Banna	Lamiaceae	Shrub	Leaves, Flowers	Leaves used to cure headache, rheumatic affections. Decoction of flowers are used in diarrhoea, fever and liver disorders.
68. 69.	*Xanthium strumarium* L.	Banokra	Asteraceae	Herb	Leaves	Used to cure rashes and infections in skin diseases.
70.	*Zanthoxylum armatum* DC.	Timbra	Rutaceae	Shrub	Twigs, Leaves, Fruits	Leaves, fruits, and seeds are consumed for gum related problems and toothache, while twigs are used for brushing teeth.

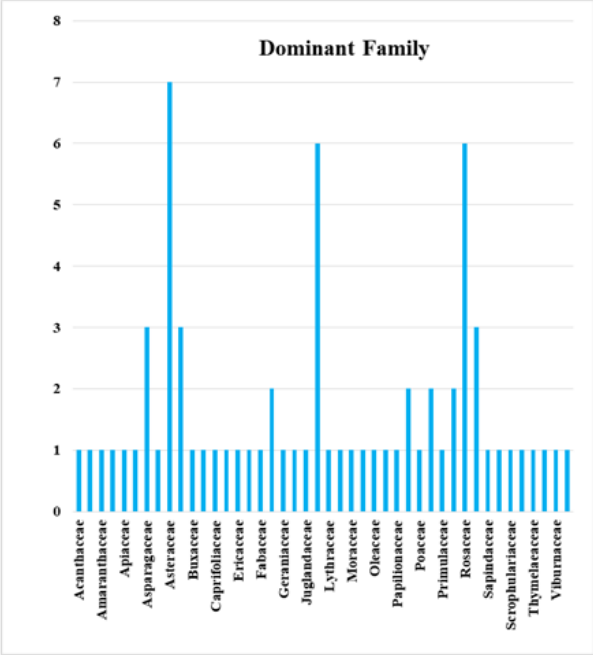

Fig. 2. Dominant families utilized for different purposes.

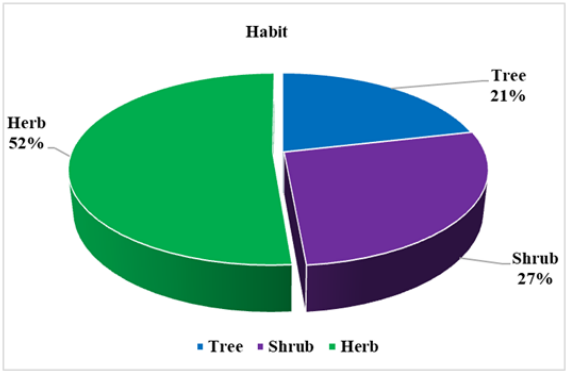

Fig. 3. Percentage of different habit forms utilized by the locals.

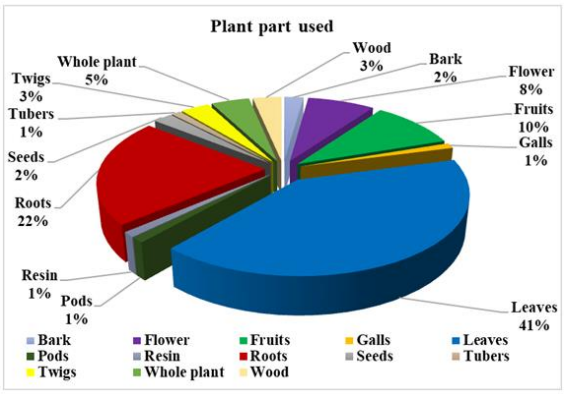

Fig. 4. Usage of plants with respect to plant part used (percentage).

CONCLUSIONS

The study highlights the importance of medicinal plants in traditional Indian healthcare systems for treating various ailments, particularly for humans and cattle. The study of indigenous communities' traditional knowledge of medicinal plants is crucial for documenting the utilization of natural resources. A significant portion of the rural population uses medicinal plants for medicinal purposes. The indigenous people rely on herbal remedies, passing down knowledge from generation to generation. The systematic documentation of ethnomedicinal knowledge is very important but it is lost with urbanization and modernization. It involves a thorough analysis of flora and taxonomic diversity to preserve indigenous knowledge. The study will provide a list of medicinally important flora in the region, aiding in assessment, monitoring and conservation. The high-use plants are recommended for further phytochemical and pharmaceutical investigations, potentially leading to new drug discovery. It also establishes a link between taxonomists, ecologists, and forest departments, which is essential for encouraging active participation in sustainable harvesting, effective management, and conservation of natural resources.

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Conflict of Interest. None.

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