

Original Article

Medicinal plants and their traditional uses in Thana Village, District Malakand, Khyber Pakhtunkhwa, Pakistan

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Abstract

Background: Local herbalists share valuable contribution in usages of plants for different medicinal purposes. The field of ethnobotany plays a key role for modern medicines. Due to the rapid advancement of medical sciences, the use of plant species in traditional ways is getting declining. Documentation of such knowledge was much more necessary for awareness of the local community. Current research was conducted in the village Thana, district Malakand.

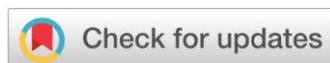
Methodology: An ethnobotanical survey was conducted through an open-ended and semi-structured questionnaire. The questionnaire collected information about plant species, its therapeutic uses and data about the customary values of these species. Mostly people belonging to rural areas and of more than 40 years of age were interviewed due to their vast experience and knowledge. Several informants were interviewed to confirm information regarding the uses of each plant species. These plants were taken to the local hakims and pansaris additionally. In the majority of cases, single plant species were found to be used in several ways and therefore can be said having numerous roles.

Results: On the basis of collected data a total of 50 plant species were documented in the area which plays a key role in improving the health and wealth of local inhabitants. Lamiaceae is being ranked on the top as it contributes number to collected species. Out of 50 plant species, 46 species were recorded best for medicinal purposes, 10 plant species were found good as fodder, 4 species for ornamental purposes, 14 as food and vegetable, 12 as firewood, 8 for furniture and hedges purposes, 3 species were documented as poisonous and 4 species were found to be utilized for ornamental purpose.

Conclusion: The study area is found rich in terms of floral diversity. Local inhabitants of the area use the plant species in traditional ways for the curving of different diseases since early times. Due to anthropogenic pressure and natural disasters flora of the area facing huge pressure of extinction.

Keywords

Medicinal Plants, Traditional Uses, Ethnobotany, Indigenous Knowledge



Introduction

The ethnobotanical information besides listing the traditional uses of plants, helps ecologists, pharmacologists, taxonomists, watershed and wildlife managers in their efforts for improving the wealth of area¹. These plants are being utilized since early ages by local communities^{2&3} as a food, fodder, source of drugs, hunting material, for clothing in local traditions and a remedy for a number of diseases since time immemoria⁴. Till now 53,000 different plants species are recorded using for medicinal purposes in a number of ways⁵. It is supposed that the trade of therapeutic plant species will touch the figure of 5 trillion dollars (US) by 2050^{6&7}. Apart from medicinal uses, plants also playing a key role in upholding the economic status of the local people^{8&9}. Almost 80% of the people across the globe working on the medicinal flora for their ultimate fitness care, because of easy accessibility and having negligible adverse effects as the other pharmaceuticals have¹⁰. A significant number of traditionally used plants are now facing threats of extinction due to anthropogenic and natural exposures¹¹.

Pakistan is broadly divided into 9 ecological regions with about 6000 plant species¹². About 10 to 12 % of these are used for medicinal purposes⁶. According to Hocking in 1958, including a good number of villagers (84%) of the Pakistani population are practicing from experts of traditional drugs till date¹³, due to either lack of proper health facilities¹⁴, or experience of elders of several decades¹⁵. Field of ethnobotany holding strength in Pakistan with time as a significant amount of work has been observed in different areas of the country^{1, 2, 16-20}. Literature review shows that previously no such study was carried in the studied area. The knowledge of traditional uses was passed

from generation to generation through practices. Current work is the first attempt to document the valuable information about the usages of plants by inhabitants of the area.

The main aim of the present study was to document the medicinal plants of the area, which are being consumed by the people of the study area for centuries. One of the objectives was to increase awareness in the local community about the consumption of the plants for medicinal purposes. It was also under consideration to deliver knowledge to the inhabitants of the area about the economic values of certain plant species.

Methodology

An ethnobotanical survey was conducted in May 2016 till the end of July 2016 in different areas like that having lack of basic health facilities were given preference for the sampling. A questionnaire consisting of three different portions was used for data collection regarding the therapeutically vital plant species. Portion "A" of the questionnaire was about the informants, portion "B" consisted of the general data about the plant species, while the portion "C" incorporated data about the restorative employments of the floral species. In the current survey, data's about the local names, part utilized for remedies, use, showcasing, dispersion, accessibility, wealth and way the part is utilized for diseases.

Individuals having age more than 40 years were given preference during the sampling because of their practical experience about the usages of local flora. Documented flora was brought to the nearby herbalists (natural specialists) and pansaris (conventional business people) for further verification of their uses. The business people were interviewed and information about the marketing of the plant species was

recorded. Collected data were then analyzed using SPSS version 21.0 32B and AMOS version 21.0 32B. To make the study easier specific keys were used (as given below) for the parts of the plant species utilized for restorative purposes.

Study area and its climatic conditions

The study area is Thana village, District Malakand, Khyber Pakhtunkhwa, Pakistan. The latitude and longitude of Thana are 34.630922 and 72.076444 respectively. Thana village is bounded by Dir lower on the north, by Swat at East and by Bunair in the south. District Malakand is characterized by

uneven terrain and vales with elevation ranging from 700-898 m²¹. Among all ecological zones of Pakistan, Malakand district is considered to be the hub to vegetation that lies in the Sino-Japanese phytogeographical region of the world²². Different areas of Malakand possess homogenous climate.

However, climatic data of the study were obtained from meteorological stations Swat area shown in. January was found the coldest month among the others. February was known for significant precipitation. June was documented in the hottest month for the study area.

Table I: Showing the keys of the plant parts used for medicinal purposes

Part used	Keys
Branches	Bs
Bark	Bk
Bulb	Bb
Flower	Fr
Fruit	Ft
Gums	Gm
Latex	Lx
Leaves	Ls
Resin	Rn
Rhizome	Re
Root	Rt
Seed	Sd
Shoot	St
Stem	Sm
Spikes	Ss
Whole plant	Wp

Results

Plant Habit

In the present work, it was reported that the

studied area consisted of diverse vegetation having valuable medicinally significant plant species. A total of 52 plant species were documented in the present work.

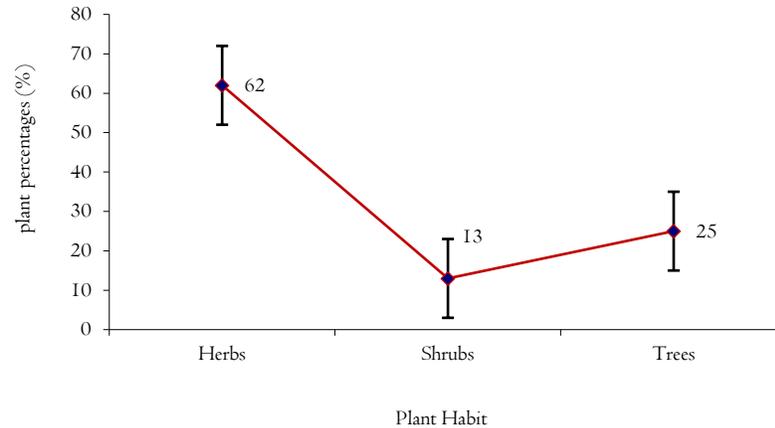


Figure 1: Plants of different habitats

Out of the total, 62% of the recorded species were herbs. Trees comprising 25% of the total documented species, while shrubs added the least (13 %) to the total.

Ethnobotanical survey

Keeping in view, the aim of consumption the documented plant species were pooled into different groups. The groups were designed as, for Medicines (46 spp), as a fodder (10 spp), for ornamental purposes (4 spp), as food and vegetable (14 spp), for fuelwood (12 spp), for furniture thatching and hedges (8 spp) and Poisonous (3spp) (Figure 2).

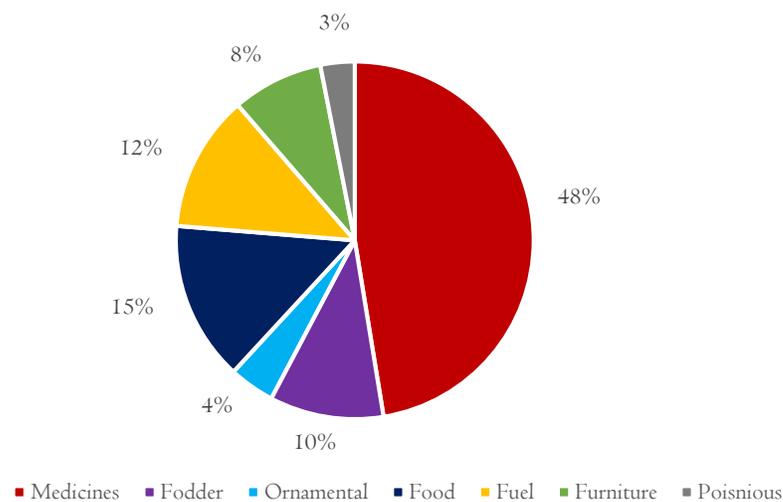


Figure 2: Plants percentage utilized in different ways

A total of 17 plant species were used locally for the treatment of digestive disorders such as stomach ache, diarrhea, constipation, dysentery and as purgative. The results also disclosed that some of the plant's species are used for respiratory tract related ailments such as cough throat pain. Among them, 4 species for the treatment of jaundice and hepatitis.

Families of ethnobotanical importance

Recorded medicinal plant species belonged to 34 different families. Out of these families, 10 were considered dominant as they share number in comparison to others.

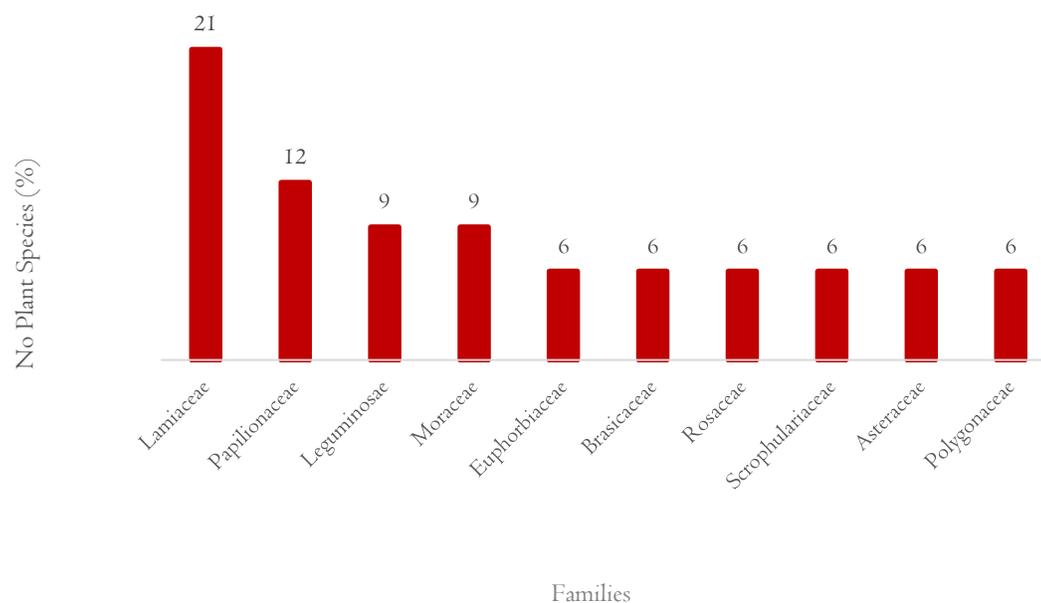


Figure 3: Plants belonging to different families

Family Lamiaceae occupy the topmost rank by adding 21% of the recorded species followed by Papilionaceae i.e. 12%. Moraceae and Leguminosae comprising (9%) each. Other eight families added 6% each to the total as shown in Figure 3.

Economic aspects of the species

A significant portion of the documented plant species are wild and naturally growing, while few species, particularly trees are cultivated for traditional as well as other purposes. The life system of the people of village Thana mostly depending on agriculture that's why they generally cultivate crops like wheat, maize, rice, onion, sweet pea, peaches, apricot etc. Onion is considered to be the most important crop of this area cultivated by the local farmers each year. Moreover, it is a great source of income for the farmers and is exported from the local vegetable market to all over the country. In addition, peach and apple are also important crops that are exported to all over the country.

Table 2: Ethnobotanical information of Village Thana District Malakand, Khyber Pakhtunkhwa, Pakistan.

Scientific Name	Local Name	Habit	Family	Parts Utilized	Local Use
<i>Acacia modesta</i> Wall.	Palosa	Tree	Mimosaceae	Bk, Sd, Gm, Ls.	Gum is used in bandages for fractures. Dissolved gum is good for headaches. They are also used for curing cough and chest problems. The wood is useful for furniture.
<i>Adiantum venustum</i> L.	Sumbal	Herb	Adiantaceae	St.	Aqueous extract used as a body cooling agent and for curing toothache and eye diseases.
<i>Ajugabraceosa</i> Wall. Ex Benth.	Boti	Herb	Lamiaceae	St.	It is used for the ailment of diabetes, chest and throat pain. Its aqueous extract used as a blood purifier, healing of external wounds in nasal infections.
<i>Ailanthus altissima</i> L.	Spena Shanday	Tree	Simaroubaceae	Ls, St.	Fodder for cattle and a source of wood. Leaves can be used as anti-diabetic.
<i>Calendula arvensis</i> L.	Zyarrgule	Herb	Asteraceae	Fr, Sm, Rt, Ls.	For hepatitis, as a cooling agent, blood purifier. Also good in healing wounds. Leaf powder is used for extraction of pus.
<i>Cannabis sativa</i> L.	Bhang	Herb	Cannabaceae	St.	Useful in pain considered as pain reliever particularly colic pain, while excessive use can cause madness.
<i>Carthamus oxycantha</i> L.	Kareza	Herb	Asteraceae	Sd.	The seeds contain oil and are used for controlling urination. It is also used for stomach ache.
<i>Chenopodium alba</i> L.	Chalwai	Herb	Chenopodiaceae	St, Ls, Rt.	Used as vegetable, as laxative, anthelmintic, used in hepatic disorder, and in enlarged spleen. The roots are used in urinary diseases, rheumatism.
<i>Dilbergia sisso</i> L.	Shawa	Tree	Leguminosae	Bs.	Grinded seeds are used for the softening wounds having clotted blood. Utilized as a fuel.
<i>Dodonea viscosa</i> (L.)	Ghwaraskay	Shrub	Sapindaceae	Sm, Ls, Rt.	Used as a plaster for fractured or misplaced bones. Powdered seeds are used for body pains. The leaves are used as bandages for wounds healing and for discharging of pus.
<i>Eucalyptus camaldulensis</i> L.	Lachi	Tree	Myrtaceae	Sd, Sm.	It is used as fuel, timber, and thatching wood. The powdered seeds are used for curing cough.
<i>Euphorbia helioscopia</i> L.	Mandanru	Herb	Euphorbiaceae	St.	Local hakims use this plant as a laxative. The latex produces swelling on the skin. Used as a rodenticide in homes.
<i>Ficus palmate</i> L.	Enzar	Tree	Moraceae	Ft, Lx.	Fruit is used to treat constipation. Latex for the removal of spines from the body.
<i>Geranium rotundifolium</i> L.	Geraniace	Herb	Tiliaceae	Wp.	It is Diuretic and astringent. Also used as a fodder.
<i>Heteropogon contortus</i> L.	Bogar	Herb	Poaceae	Sm, Ls.	For making grooms and roofs. The culms of the grass are used for thatching, also used in mats and in roofs of mud houses.
<i>Juglan regia</i> L.	Ghwaz	Tree	Juglandaceae	Bk, Ls, Sm	The bark and the leaves are used for toothaches and for cleaning of teeth. The wood is valuable as furniture and some other tools.
<i>Lepidium perfoliatum</i> L.	Shal dana	Shrub	Brassicaceae	St.	Helpful in menstrual problems and conceiving.
<i>Malva neglecta</i> Wall.	Panerak	Herb	Malvaceae	St.	Used as food. Also used in some stomach problems.
<i>Marrubium vulgare</i>	Teeray	Herb	Lamiaceae	Ls,	It help in digestion. Helpful in throats infections, and relieve inflammation.

<i>Medicago minima</i> L.	Shpeshtarey	Herb	Papilionaceae	Ls.	Used for cold and fever treatment. It is used as a vegetable and as a fodder plant.
<i>Melia azedarach</i> L.	Tora Bekandrha, Asleeshanda y.	Tree	Meliaceae	Fr, Ls, Sm.	Powdered fruit is used to cure flatulence, gastric problems, and cough. It is also used as antihelminthic. The leaves are used as fodder. The wood is used for thatching purposes and for making furniture and as an as fuel.
<i>Mentha longifolia</i> (Linn) Huds.	Enaley	Herb	Lamiaceae	Ls.	Used for the disorders of the digestive system. The leaves are dried, powdered, and then used for stomach ache and as a carminative.
<i>Mentha arvensis</i> L.	Podena	Herb	Lamiaceae	Ls.	Use for diarrhea, for abdominal pain, and for digestive disorders.
<i>Micromeria biflora</i> Benth.	NarayShamak ay	Herb	Lamiaceae	Ls.	Good for curing of cold and fever. It is also effective in strengthening of gums and cleaning of mouth.
<i>Mirabilis jalapa</i> L.	Gul-e-bad	Herb	Nyctaginaceae	Ls.	It is cultivated for ornamental purposes. The leaves are used as bandages for discharging pus.
<i>Morus nigra</i> L.	Toor toot	Tree	Moraceae	Ls, Ft, Sm.	Leaves are utilized in silk production and for throat infections. The fruit is used for dyspepsia. Wood is used as a fuel. Also used in furniture
<i>Morus lavaegata</i> L.	Shah toot	Tree	Moraceae	Ft, Sm.	Fruit is edible, wood is used as a fuel and for furniture.
<i>Nasturtium officinale</i> L.	Tameera	Herb	Brassicaceae	Ls.	Used as a vegetable. Local hakims used it in tablets that are useful for stomach ache.
<i>Otostegia limbata</i> L.	Spin Azghe	Herb	Lamiaceae	St.	Good in diabetes. Used as a Laxative in the treatment of skin infections.
<i>Oxalis corniculata</i> L.	Manzakeenta rooki	Herb	Oxalidaceae	Ls.	The plant is directly eaten by the people due to its sour taste. It is also used as a vegetable. Used for toothache and also used against ringworms.
<i>Papaver pavonium</i> L.	Redey	Herb	Papaveraceae	Sd.	Dried powdered seeds are used to cure a cough. It is also used as fodder.
<i>Pinus roxburghii</i> Sargent.	Nakhtar	Tree	Pinaceae	Gm Br, Rn, Sm.	The resins are used as bandages for discharging pus, and an antidiabetic. The bark is used as a dye for the edges of the soles of shoes. Seed is sex tonic. Wood is used for fuel and furniture.
<i>Platanus orientalis</i> L.	Chinar	Tree	Platanaceae	Sm, Ls.	Bandages of bark are used to discharge pus. Wood is used as timber and is used for making furniture.
<i>Portulaca oleracea</i> L.	Warkharey	Herb	Portulacaceae	Ls.	It is used for kidney disorders and urinary disorders. It is also used as a vegetable.
<i>Ricinus communis</i> L.	Aranda	Herb	Euphorbiaceae	Sd.	The seeds are used in sexual disorders. The seeds are considered to be poisonous when eaten excessively. Seed oil is used for curing constipation.
<i>Rosa canina</i> L.	Palwary	Herb	Rosaceae	Fr.	Rose water is used for eye infection.
<i>Rumex hastatus</i> L.	Tarokey	Herb	Polygonaceae	Ls.	Used in food for its sour taste, also antidiarrheal and hypotensive
<i>Rumex dentatus</i> L.	Shalkhey	Herb	Polygonaceae	Ls.	It is used as a vegetable and as a purgative. Also used as antidiabetic.
<i>Rubus fruticosus</i> Agg.	Karwarha	Shrub	Rosaceae	Ft, St.	The fruits are edible and used as a carminative. The young shoot is boiled with <i>Adiantum venustum</i> and is used as a tonic for curing sexual disability (aphrodisiac). It is also used for making hedge around fields.

<i>Salvia plebeia</i> L.	Ghwamrey	Herb	Lamiaceae	St.	The seeds are antidiarrheal. Shoots are used for curing skin and urinary tract irritation.
<i>Scrophularia condulus</i> L.	Teeray	Herb	Scrophulariaceae	St.	The name <i>Scrophularia</i> comes from <i>scrofula</i> , a form of tuberculosis (TB), because several species have been used to treat this disease.
<i>Silene conoidea</i> L.	Mangotey	Herb	Caryophyllaceae	St.	Used as fodder for cattles.
<i>Sisymbium irio</i> L.	Jinjarrh	Herb	Asteraceae	St.	It is used for chest and throat infection. The seeds are expectorant and antiseptic.
<i>Solanum nigrum</i> Auct.	Kachmacho	Herb	Solonaceae	Ft, St.	Fruit is anti-hepatitis and edible. And a cure for internal abdominal inflammations. Leaves are used for kidney stones.
<i>Sophora mollis</i> L.	Nazboo	Shrub	Leguminosae	Ls, Sd.	Leaves juice are used to control sexual weaknesses. The seed is considered useful for destroying vermin. Wood is hard but mainly used as a fuel.
<i>Trifolium spinosa</i> L.	Awang	Herb	Leguminosae	Ls.	Leaves are used as fodder for the cattles.
<i>Verbascum thapsus</i> L.	Khardhag	Herb	Scrophulariaceae	Ls.	Leaves are wrapped around the fractured body parts to reduce pain. It is also used as anticancer. Also used in diarrhoea, cough and febrifuge.
<i>Vicia faba</i> L.	Marghaykha	Herb	Papilionaceae	Ls.	Used as a vegetable. Fruit is not good, it cause head related problems in children when engulfed. The plant is also used as anti-poison.
<i>Zanthoxylum armatum</i> Dc.	Dambara	Tree	Rutaceae	Ft, Br.	The dried fruit is used as a spice. Also used for blood purification and for stomach disorders. Branches are used as walking sticks and firewood.
<i>Ziziphus mauritiana</i> L.	Beera	Tree	Zhamnaceae	Ft, Ls.	Fruit is edible. Leaves are anti-lice and used as fodder. The decoction of leaves and bark is used in dysentery. The pulp of the fruit is demulcent, sialagogue.

Discussion

The use of plants or their products by the traditional way are common practice from decades²¹. Ethnobotany is possibly the most imperative way to study plants as natural property and their supervision by native peoples. It allows us to spent time with native inhabitants to investigate information based on the experience of a number of years²². Unluckily, there are no terms and regulation for the protection of awareness of local peoples⁵. Herbal medicines even today play a vital part in far and sided areas and numbers of natively produced medicines are used as domestic ailments for numerous diseases especially in these areas¹⁹. The aim of the current study

was to find out medicinal plants, their distribution in the local vicinity and their traditional medicinal use in the local area i.e., Thana village, District Malakand, Khyber Pakhtunkhwa, Pakistan. The latitude and longitude of Thana are 34.630922 and 72.076444 respectively. Numerous plants have been found to be used in various diseases and infections as listed in the results sections (Table 2) and also been studied by other researchers²³⁻²⁵. These results are found similar to a study of Ahmad et al., (2011) who conducted a study of an adjacent district i.e., Kabal, Swat, Khyber Pakhtunkhwa, Pakistan²⁴.

Numerous plant species have been identified in mountainous and hilly parts of Pakistan²³ which support the findings of the current study as medicinal plants and their traditional uses of local plants of Thana village, District Malakand, Khyber Pakhtunkhwa (Table 2). The present study correlates with the findings of Hassan et al., (2014) who also reported various local plants with significant medicinal uses²⁵. The northern areas of Pakistan which are mostly hilly areas, due to the improper gathering, the flora in general and remedial plants particularly below intense pressure in the form of human increasing population, cutting of forests, overexploitation, wood extraction for fuels and land clearing for agriculture and vegetation etc.,²⁶.

Moreover, endophytic bacteria found in the medicinal plants have also been reported to be useful for agriculture as biofertilizer^{27&28}. In a case, 75 endophytic bacteria were isolated from a medicinal plant *Olea ferruginea* and used as biocontrol and biofertilizers²⁸. It suggests that medicinal plants of an area are not only important for the cure of a disease but it also boosts the economy of that area, as it is using as fodder, ornamental, food, fuelwood and furniture (Figure 2). These results indicated that medicinal plants are not only used as medicine but it can also be used for other important aspects. However, lack of knowledge for growth, collection and utilization of aromatic plants is the key issue, which comprises of the absence of clear resources, little understanding of defensible supervising restriction of data and sell necessities⁶. From the number of years, the local inhabitant have used the medicinal plant for curing of different diseases. Through personal experience and familial training and extended service, the native inhabitants are familiar with the useful flora and extraction of medicines. For the improvement and preservation of this

valuable flora suggested so as to the neighbouring people must be well-informed relating to the significance of modern harvesting techniques.

Conclusion

It was concluded that the majority of the local inhabitants in the study area are illiterate and needs to be trained about the medicinal plants on the scientific basis for harvesting and preservation. A number of plant species are used for various ailments in the study area. However, there is a need to manage these medicinally important species on a sustainable basis. There is an urgent need for more detailed analysis of the economic value and cultural practices associated with the collected species.

Conflicts of Interest

None.

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