

ETHNOBOTANICAL USES OF SOME NATIVE AND ALIEN PLANTS OF THE JHOK
RESERVE FOREST, PUNJAB, PAKISTAN

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ABSTRACT

The flora of Jhok Reserve Forest, a protected area near Lahore, Pakistan was surveyed for its ethno-medicinal potential. Forty-one plant species were found as ethno-botanically important for the local communities who utilize them in traditional medicine and practice. Many of these plants are also reported as common weeds, of which some are considered invasive alien species. Elders in the locality were interviewed about the utilization of these plant species growing in the reserve forest using a questionnaire approach. Out of 41 plant species (22 families) documented, 13 were those where all plant parts (roots, stems, leaves, flowers and seeds) were used in curing different ailments while for others one or more parts used. Some plants were described for their unique uses, for instance, the latex of *Calotropis procera* Aiton and *Launaea procumbens* Roxb. is used by local people for the treatment of toothache and skin infection, respectively.

Keywords: Ethno-medicine, Jhok reserve forest, protected areas, traditional knowledge, weeds.

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INTRODUCTION

Forests have been playing a vital role in the life of man since the prehistoric times and in different ways, such as for food, shelter, fire and fuel wood, curing of diseases and many others. These forests resources have become more important for the people living in or around the forests (Yemiru et al., 2010). Generally, people living near forests are knowledgeable about the utility of the plants of forests (Qureshi and Ghufuran, 2005). The sections of forests located on or near the banks of rivers show comparatively greater plant diversity, hence considered more beneficial to man (Shukla and Bisen, 2006).

People have been benefiting from the services provided by plants since many generations. By hit and trial method, they recognized the medicinal values of many plants. From one generation to the next, this knowledge was transferred with some new and refined additions. With the rapid urbanization and industrialization, the utility of the plants has been changed in different ways and now people are more dependent on modern medicine. Consequently, the valuable ethnobotanical knowledge has been restricted to the elders only and young generation has become increasingly unaware of this wealthy knowledge. Ethno-botanists must play their role to document the wealth of traditional knowledge on plants and highlight its importance and threats to it, so that this may be saved for future generations (Rao and Henry, 1997).

Local people of Pakistan inhabiting different areas have been using local herbs as remedies of various ailments (Jamal et al., 2012). Approximately 80% people of Pakistan are living in rural areas where medicinal herbs are easily available. These people have limited access to the modern health care approaches and some reluctant to use synthetic medicines (Zaidi, 2001; Kayani et al., 2014).

Throughout the world, ethnobotanists are striving for the collection and documentation of local flora

knowledge (Amri and Kisangau, 2012; Betti, 2004; Ghimireet et al., 1999). A considerable work has been done on the ethnobotanical uses of native plants in Pakistan, especially in the northern parts of the country, for example, Shinwari et al. (2000) reported the ethno medicinal plants from Hindu-Kush mountainous region. Many other ethnobotanic studies are reported from Swat, Kohat, Gilgit, Muzaffarabad (Gilani and Khan 2003; Qureshi et al. 2006; Rizwan et al. 2007; Ihsan, 2008; Ishtiaq et al. 2012; Ahmad et al. 2013). However, not much work is done on ethno-botanical uses of plants of the forests in central and southern parts of the country.

The Jhok Reserve Forest of Lahore-Sheikupura district has not been studied for its ethno-botanical potential despite the fact it has been a rich repository of plants for a long time. The current research work was therefore, aimed to document the ethno-botanical importance of the plant species of this reserve forest.

MATERIALS AND METHODS

Site description

The Jhok Forest is among one of the reserve forests in the Punjab Province of Pakistan. The forest is situated on the banks of the river Ravi 31.4343 N, 74.1387 E. The length of the forest is 30 km to the South West of the Lahore city and Sheikhpura with total area of 1,243 hectares (Saeed, 2005). The Jhok reserve forest is divided into various blocks, block No. 09, 10 and 11 are located about 1 km away from the Chung village and block No.12, 15, 18 and 19 are located 100 m away from Mohlanwal (Fig. 1). Block No. 14 and 16 are attached with small villages i.e., Dhana, Bhaini and Sharqpur lengthwise along the riverbanks of the river Ravi (Fig. 1).

Data collection

Frequent visits were made in the study sites and sub-sections to collect the specimens of plant species. These specimens were mounted on herbarium sheets and were properly identified with the help of available literature (Ali and Nasir, 1992; Ali and Qaiser, 2007). These

mounted and fresh specimens were brought to different plant collectors and Hakims (local practitioners) for their local usage. A questionnaire was developed (appendix 1) and meetings were arranged with the local elders belonging to different professions, such as boatmen/sailors -, Imam masjid (a religious leader), a saniasi (a local expert in knowledge on plants) and farmers, to gather traditional knowledge on plants of the reserve forest. The common names of the plants along with their medicinal uses were documented.

RESULTS AND DISCUSSION

Total of ninety-one plant species were collected, out of which forty-one were found to be used by local people in local medicine. Most of the herbs were used for digestive disorders and skin infections. These 41 plant species belonged to 22 plant families of which, members of family Asteraceae and Fabaceae (6 plant species in each) were most commonly used followed by Euphorbiaceae, Boraginaceae, Chenopodiaceae, Convolvulaceae, Malvaceae and Polygonaceae (Table-1). Different parts of plants are used for different purposes. Thirteen plant species were used as a whole (root, stem, leaf, flowers and seeds), five for their stem, leaves and flowers while another three were utilized for their leaves and flowers. For rest of species, bark, wood, seeds, roots or only leaves are used for the treatment of different ailments. Latex and gums are also collected by hakims and used to cure different ailments (Table-1).

The study has revealed some interesting and novel uses of some of the plants. For instance, when the mixture of latex of *Calotropis procera* Aiton and hot desi ghee (a product made from milk cream) is applied inside the tooth cavity, it gives relief in pain and reduces infection. Similarly, the leaves of *Eclipta alba* L. are applied in the form of paste between the fingers of feet, to cure Athlete's foot disease (Table-1). According to the local experts, three to four applications of this paste are effective to completely cure the disease, indicating the

herb's effective antifungal activity that needs to be further explored. The application of a paste of leaves of *Cannabis sativa* (L.) and fowl's fat is effective for the treatment of piles. Furthermore, a drink made from the overnight soaked seeds of *Salvia plebeia* R. Br. is recommended in summers to prevent heatstroke. Similarly, a unique use of alcohol prepared from the bark of *Vachellia nilotica* (L.) P. J. H. Hurter & Mabbin and decoction of leaves of *Phyllanthus nodiflora* (L.) Greene, is effective in treatment of urinary bladder problems. A detailed account on different uses of forty-one plant species is given in Table-1.

The Jhok Reserve Forest is one of the neglected forests as far as its herbal potential is concerned. When we met with elders of different villages near the forest, we came to know that many medicinally important species that were once common here are no longer found in the forest, one of them is *Lallemantia royleana* (Tukham-e-balangoo). Key factor for the destruction of ethno-botanically important plants is the deforestation. Pakistan has about 2.5% forest cover with annual 2.1% deforestation rate, which is the highest rate of deforestation in Asia (WWF, 2010).

Jhok reserve forest is invaded by many alien plant species, of them *Parthenium hysterophorus* L. and *Lantana camara* L. are worst invaders that responsible for declining the valuable herbs that may lead to the local extinction (Shabbir and Bajwa, 2006; Mujahid, 2015). Despite these threats, Jhok reserve forest is still considered as a rich repository of natural herbs on which local communities depend for traditional medicine. The herbal diversity of the forest need to be conserved and local people should be informed to use these resources sustainably. At government level, with the cooperation and awareness of locals, effective policies can check the degradation of forests (Kibria et al., 2011). Further, alien invasive species should be managed before they take over the local flora of the forest.

Table-1. Some ethnobotanically important plants of the Jhok reserve forest.

Family	Scientific name	Common name	Life form	Status	Parts used	Use
Amaranthaceae	<i>Achyranthes aspera</i> L.	Puthkunda	Herb	Native	whole plant	For the treatment of stomach-ache, leaves and/or roots are ground and their juice are administered. Seed powder mixed with black pepper in honey is also used to cure cough problems. Stem juice is also a diuretic agent while juice of whole plant is useful incur against snake poisoning (Ahmad, 2007).
	<i>Amaranthus viridis</i> L.	Chulai	Herb	Alien	Leaves	Leaves are used in paste form against scorpion or snake bites. Leaves are also used as vegetable.
Apocynaceae	<i>Calotropis procera</i> Aiton	Ak	Shrub / small tree	Native, common weed	whole plant	Fresh roots are used as toothbrush to relieve from toothache. Latex (milk) is mixed with sheep milk and recommended for joints problems etc. In the past, fresh flowers were used to treat cholera. Roots and bark of the plant in dried and powdered when mixed with black pepper are used as a snake antidote.
Asteraceae	<i>Conyza ambigua</i> (L.) Cronq	Brush booti	Herb	Alien	Seeds	The powder of seeds releases a sort of fragrance that has insect repellent properties. When dried plants as whole put to fire, the smoke coming out of it is reported to have mosquito repellent properties (Duke, 2005).
	<i>Eclipta alba</i> L.	Bhangra sufaid	Herb	Native	Complete plant	Complete plant body is roasted in mustard oil and then oil is used as a hair tonic. Paste of fresh leaves is applied on skin for Athlete's foot disease. Roots and leaves of this plant along with seeds of Ajwain (<i>Trachyspermum ammi</i> L.) are useful for liver and gall bladder problems (Christybapita et al., 2007).
	<i>Launaea procumbens</i> L.	Jangli gobi	Herb	Alien	Stem and leaves	Its stem and leaves are used in making kushta (an energy supplement) and useful remedy for respiratory problems (Parekh and Chanda, 2006). The latex of the plant has reported anthelmintic properties.

	<i>Pulicaria crispa</i> Forssk.	Peeli booti	Herb	Alien, invasive weed	Stem, leaves and flowers	Commonly used in the form of leaves paste applied on skin problems such as simple cuts and wounds etc.
	<i>Silybum marianum</i> (L.) Gaertn.	Kandali	Herb	Alien, invasive weed	Stem, leaves and seeds	Extract of stem and seeds are used in case of liver problems. Milk of leaves is useful against urinary system and gall bladder problems (Kalla et al., 2014).
	<i>Saussuria heteromala</i> Clarke.	Morang	Herb	Native	Leaves	Fresh leaves are used on skin wounds and cuts. The extract of leaves is useful for treatment of snake bite.
Bombacaceae	<i>Bombax cieba</i> L.	Simbel	Tree	Native	Seeds fibres and wood	Seeds are covered by cotton type cellulose fibres; they are collected by people and used to fill pillows etc. Wood of the tree is used in furniture and as building material
Boraginaceae	<i>Heliotropium corassavicum</i> L.	Uontktara	Herb	Alien	Roots	Roots are dried, and powder is mixed with kushta-e-murjan (a kind of energy supplement) along with sharbat-e-bazoori (a kind of drink) to treat the Hepatitis C.
	<i>H. strigosum</i> Willd.	Gorakhpaa n, Khrasan, Paanchowanni	Herb	Native	whole plant	Complete plant is collected, dried and stored. At the time of use, the plant body is soaked in water for overnight, water turns red then it is used for liver problems, Hepatitis A and semen leakage problems. Paste of fresh leaves is also used on wounds. Paste of leaves is useful against sting of nettles and insects. It is also useful against snakebite. Whole plant is ground and used as laxative and diuretic agent. Filtered juice of leaves is also useful for treatment of soreness of eyes.
Brassicaceae	<i>Lepidium didymium</i> L.	Pitpapra, janglihalon	Herb	Alien, Invasive	whole plant	Paste of leaves and extract is applied on hands and feet to repel mosquitoes and other insects.

Cannabaceae	<i>Cannabis sativa</i> L.	Bhang	Herb	Native, common weed	whole plant	Leaves and seeds in dried and powdered form used for diarrhoea and gonorrhoea. Fresh leaves are used in the form of paste on wounds. Juice of leaves causes sleepiness and proved to be useful in whooping cough and asthma. Extract of seeds is also used for earache.
Chenopodiaceae	<i>Chenopodium album</i> L.	Bathu	Herb	Native, common weed	leaves and seeds	Leaf juice is used as laxative commonly. Anthelmintic activity is also observed when the extract of the plant is taken. Juice of seeds is used for treatment of liver problems and spleen enlargement. Leaves and tender stem are also used as vegetable or as fodder.
	<i>Chenopodium ambrosioides</i> L.	Khushboo booti	Herb	Alien	Leaves and seeds	Anthelmintic activity of the plant is reported. Its leaves paste, and juice is very effective in controlling intestinal parasites such as Hookworms and Ascaris. Seeds are also given to the patients suffering from digestive problems, in the form of powder.
Combretaceae	<i>Terminalia arjuna</i> (Roxb.) Wight and Arn.	Arjun	Tree	Native	Stem bark	Bark is removed from the stem and ground. Extract of the bark is given to the patients of heart problems. It is also useful for the treatment of Asthma as well. In case of Tuberculosis, leaf juice is given along with cow ghee and honey and proved effective and stops blood in sputum.
Convolvulaceae	<i>Convolvulus arvensis</i> L.	Harnkhuri, Rwadi	Herb	Native, common weed	whole plant	Along with kushta-e-shingruf, seeds are administered to the patients of semen leakage problems. Juice of leaves is administered as a purgative agent. Paste of leaves and roots along with black pepper is useful against bleeding piles.
	<i>Ipomoea carnea</i> L.	Gul-e-abbasi	Shrub	Alien	leaves	The extract of the leaves is used to cure the skin problems especially for lesions etc. The whole leaf may be used in a way that it is coated with mustard oil and placed on the infected part of skin. In some cases, ash of the stem is also applied on wounds.

Euphorbiaceae	Croton bonplandianum L.	Ben tulsi	Herb	Alien, Invasive	Leaves	Leaves' extract of this plant is commonly used for the healing of wounds, skin cuts and other skin problems.
	Euphorbia hirta L.	Dhudghass	Herb	Native	Leaves and milky latex	The leaves of this plant are used to cure warts problems. Cattle that feed on the plants also show increase in milk production and ease in release of milk. Extract of the plant also shows increase in urine quantity in man. Anti-inflammatory activity is also reported.
	Ricinus cummunis L.	Rind plant	Shrub	Alien, Invasive	Oil from the seeds, leaves and roots	In case of diarrhoea along with opium (small quantity) extract of leaves given to adults, much effectiveness is proved. At the time of delivery, oil is given to females and it makes easy delivery. The oil is also used to cure inflammatory problems of respiratory diseases. Extract of roots is used for nervous problems. Leaves warmed and applied on breasts to increase the milk production and ease in milk release in women.
Fabaceae	Albizia lebbek Benth.	Shareen	Tree	Alien	Bark of stem, leaves, flowers and seeds	Extract of bark is used in respiratory problems such as bronchitis and flowers are used in case of Asthma. Extract of leaves is also useful in case of snakebite and scorpion sting and in the form of drops used in eyes. Leaves or branches are thought to be anti-evil spirits in some areas.
	Dalbergia sissou Roxb.	Tahli, Sheesham	Tree	Native	Bark of stem and leaves	Juice of leaves, bark and wood powder is used in case of semen leakage and Hepatitis A problems. Wood is much valuable and commonly used in furniture and building materials. The tree has also been declared as folk tree.
	Pongamia pinnata L.	Sukh chain	Tree	Native	Bark, leaves and	Twigs are used as miswak (toothbrush). The extract of leaves has anti-fungal and anti-inflammatory activity. Wood is used as in furniture and as fuel. Extract of seeds proved

					seeds	to be useful to cure semen leakage problems.
	Alhagi maurorum Desv.	Jawasa	Herb	Alien, Invasive	whole plant	Stem, leaves and flowers are used as general tonic as well as for the treatment of liver problems and constipation. Seeds along with honey are also used as expectorant.
	Cassia aungustifolia Vahl	Senna	Shrub	Alien, Invasive	Leaves, flowers and seeds	The paste of leaves is used in lowering bowel, constipation and curing indigestion. Extract of leaves, flowers and seeds is used as expectorant. Fresh leaves are also used as wound dresser and in arthritis problems. Plant is also used as fodder.
	Indigofera linifolia Retz.	Torki	Herb	Native	Leaves, flowers and seeds	Seeds are highly nutritive and whole plant is used as fodder. Extract of leaves is used in febrile eruption and amenorrhea.
Fumaraceae	Fumaria indica L.	Shahtra	Herb	Native	whole plant	Complete plant is boiled and its water is used as blood purifier. Leaves and stem is used as tonic, diuretic and laxative. Anthelmintic activity of the extract is also reported. This plant is also commonly used in syphilis, leprosy and in dyspepsia. Paste with black pepper used in jaundice and skin diseases.
Gentianaceae	Centaurium pulchellum Swartz.	Khetchiriata	Herb	Alien	Stem, leaves and flowers	Extract of whole plant is used as a remedy for skin problems.
Lamiaceae	Salvia plebeia R. Brown	Samundarsok, kamarkush	Herb	Alien, Invasive	Seeds	Seeds are used in the form of compound along with fresh cow milk semen leakage and premature ejaculation. Seeds are soaked in water, after they get swell up just like Lallemani aroyleana (Tukham-e-balangoo) they are used for liver and urinary bladder problems.

Malvaceae	Abutilon indicum G. Don.	Peelibooti, Kangheebooti	Shrub	Native, common weed	Roots, leaves, bark and seeds	Leaves or roots infusion in water are commonly used as diuretic and demulcent in case of fever, chest infection and gonorrhoea. Decoction of leaves is also used for mouth and eye wash. Leaves in powder form and flowers are given to patients of ulcer. Seed-powder is used to cure piles and cough.
	Malva parviflora L.	Khbazi, Okra, Gumbo	Herb	Alien	Seeds	Seeds are demulcent and used in cough and ulcer also proved useful in the problems of urinary bladder.
	Malvestrum coromendelianum (L.) Garcke.	Kharenti	Herb	Alien,	Leaves, flowers and seeds	Leaves in the form of paste in water are used for skin problems and for wounds. Seeds and leaves extract is also analgesic in nature. The extract of flowers and leaves is also used in case of injured udder of goats and cow etc.
Mimosaceae	Vachellia nilotica L.	Keekar, babool	Tree	Native	whole plant	Roots are used in cough and expectorant. Tender shoots are very commonly used as tooth brush. Leaves are favourite fodder of goats etc. Bark is used in colouring of cloth and also used in locally alcohol preparation. Gum and immature pods are used in cough, backbone ache and semen leakage problems. Wood is very valuable and used in furniture, making huts and sports items.
Oxalidaceae	Oxalis corniculata L.	Khatkal, Khattimithi, Changari	Herb	Obscure	Leaves and flowers	Excellent remedy for digestive problems and appetizing. Plant is soaked in water overnight and then water is used for eyewash. Leaves and stem extract is useful in fever due to the cooling properties of the plant. Juice of leaves is mixed with onion juice and used to remove warts and if mixed in honey useful in dysentery problems.
Polygonaceae	Polygonum plebeium L.	Andrani booti, Machhachh	Herb	Native	whole plant	The plant is dried and in powder form used for forgetfulness (dementia) and used for the thickness of semen.

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	Rumax dentatus L.	Jangli palak, Chorachitra	Herb	Native, a common weed	Leaves	The young leaves are used as vegetables. Roots are dried and in powder form used to cure skin problems.
Rhamnaceae	Ziziphus nummularia L.	Berry	Tree	Native	Leaves, wood and fruit	Leaves are boiled in water and that water is used for hair wash. Dead bodies are given bath by water in which leaves are boiled, considering that insects may not harm the dead body. Un-ripened berries are used to increase the sexual power and ripened berries are delicious and nutritive to eat. Wood is used in manufacturing furniture and building huts etc.
Solanaceae	Datura alba Nees.	Dhaturo	Herb	Native, common weed	whole plant	The plant body is used with intense care as it is toxic. Leaves are dried and patients of Asthma inhale smoke of the burned leaves. Extract of leaves and roots is useful in case of toothache, epilepsy, headache and piles. Fresh flowers are ground and their juice is dropped in earache. The extract of fruit is used as a hair tonic
Verbenaceae	Phyla nodiflora L.	Bakkan	Herb	Alien, Invasive	whole plant	Fresh and preserved plant bodies are soaked in fresh water for a time then feet are dipped in that water containing plant bodies. This process proved to be relief-full for the problems of urinary bladder.

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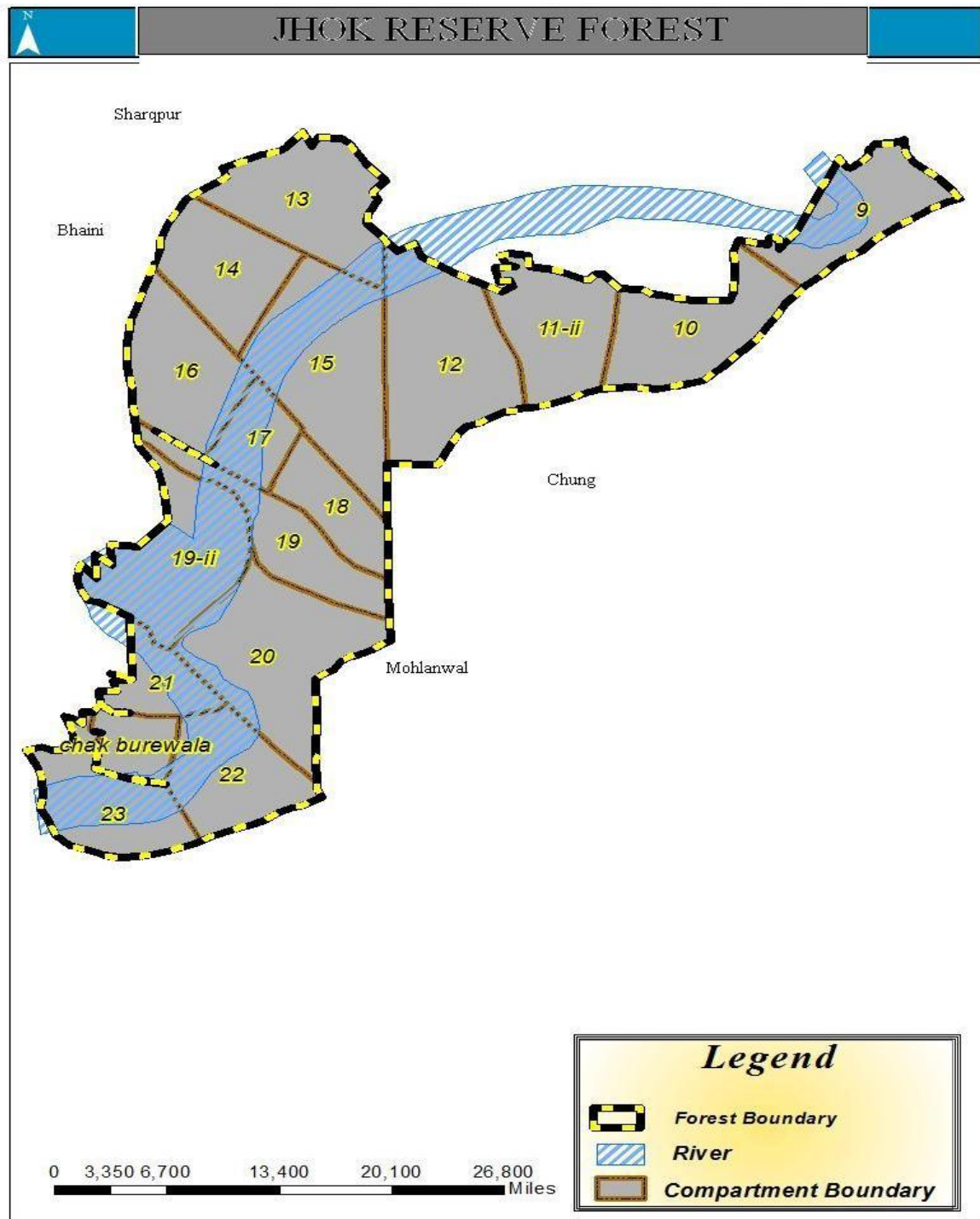


Fig. 1. A map of the Jhok reserve forest showing its various blocks along the river Ravi (Forest department, Lahore division, Punjab, Pakistan).

Appendix 1. A sample questionnaire form, used to collect data of ethnobotanically important plants of Jhok reserve forest.

ETHNOBOTANICAL USES OF COMMON NON-NATIVE AND NATIVE PLANTS OF THE
JHOK RESERVE FOREST, LAHORE-SHEIKHUPURA, PUNJAB, PAKISTAN
(A questionnaire to document the use of the plants of Jhok reserve forest by the locals)

Sr.No.-----

Name ----- S/O-----

Age_____ Gender: Male /Female

Address/Locality_____

1. Living in the locality:

Less than 1Yr	1-5Yrs	6-10 Yrs	10-15 Yrs	More than 15 yrs
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2. Occupation:

Farmer	Hakim	Saniasi	Pansaar	Other
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3. Education:

Illiterate	Primary	Middle	High	College/University
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4. Knowing the Plant X for the period:

Less than 1Yr	1-5Yrs	6-10 Yrs	10-15 Yrs	More than 15 yrs
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5. Common name of the plant?

6. Part(s) used () Tick the relevant:

Root	Stem	Leaves	Seeds	Flowers
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7. Used by:

Personal	By others	By family member	Unknown
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8. How many times used the plant?

Once	Twice	Less frequently	Frequently	More frequently
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9. What is the taste of the plant/ part?

Bitter	Sour	Sweet	Salty	Not clear
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10. In which period plant is collected?

Winter season	Spring	Summer	Rainy	Round the year
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11. Do your family members agree with this use of the plant?

Agree	Not agree	Some agree some not	No idea
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12. The plant is used as:

Medicine for man	Medicine for cattle	For both	Other uses
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13. Which ailment the plant is used for?

Digestive	Respiratory	Reproductive	Urinal	General
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14. How to use the plant?

15. Side effects:

Common, on which body organ	Less common	Not any	Unknown
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16. Status of the plant:

Common	Less common	Decreasing	Rare	Unknown
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