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ETHNOECOLOGICAL STUDIES OF HERBS AND SHRUBS OF MIANI SAHIB GRAVEYARD, LAHORE CITY, PUNJAB, PAKISTAN

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ABSTRACT

This survey was carried out to prepare a plant inventory for the exploration of the ethnobotanical importance of the plants in the Miani Sahib Graveyard and to understand the effectiveness of graveyards in conserving plant diversity. Plants were collected in different seasons of the year and were dried, pressed, mounted and identified with the help of Flora of Pakistan. Our ethnobotanical study was carried out by interviewing the herbal drug dealers, timber dealers, fuel wood sellers, and the local elderly people residing in the adjacent areas of Miani Sahib and hakims through a questionnaire. Cyperaceae was noticed as the dominant plant family, showing the highest FIVI value. They are used in fever, flue, cough, asthma, digestive troubles, piles, diabetes, urinary diseases, male sexual diseases, gynecological diseases, joint pains and inflammation, ear diseases, tooth problems, cuts and wounds, dermal problems, and as cooling agents and other miscellaneous uses.

Keywords: Ethnobotany, Graveyard, Protected areas, Miani Sahib.

INTRODUCTION

Pakistan covers many ecoregions of the world and is quite rich in biodiversity with economically and commercially significant plants (Ali *et al.*, 2001; Ali, 2008). Plant diversity throughout the world is lost through multiple threats including habitat loss and degradation, introduction of exotic species, various diseases, pollutants, rapid climatic change, over-exploitation of natural resources and through massive growth in human population (Alam and Ali, 2010; Abbas *et al.*, 2010). Protected areas are the only hope we have of stopping many threatened or endangered species from being extinct, and are essential for the conservation of plant diversity (Defries *et al.*, 2005). It is generally assumed that these areas are now secure, which is a relief for conservationists, but this is certainly not true. Those areas that are declared protected

in the government statistics face a broad range of threats from infiltration to damaging effects of air pollution or climate change (Carey *et al.*, 2000). Only about 11.5% of earth's surface is declared protected, which is crucial in minimizing the loss of plant diversity. Although protected areas are highly effective in protecting biodiversity, the existing protected area network provides a priceless service in protecting habitat from destructive uses (Rodrigues *et al.*, 2004). Even though there is an agreement on the vital role of protected areas in conserving plant biodiversity, the total area declared protected is frequently less than desirable. The level of funding provided for management of protected areas is almost always insufficient. The benefits from protected areas to the society are often underestimated, and the cost of protection appears huge (Dixon and Sherman, 1991). In fact, the long term integrity of protected

areas in developing nations depends upon the support of rural communities that live near these areas (Ferraro, 2002).

Biodiversity is strongly related to the survival and function of the ecosystem (Hooper *et al.*, 2005). Decrease in biodiversity is alarming and its disappearance is even more threatening to the global ecological balance. Anthropogenic activities are continuously decreasing biodiversity at a rapid rate (Krishnamurthy, 2003). Humans have deteriorated the environment ferociously without considering habitat lost. It is only our ecosystem which provides space for species richness and environmental stability. Fragmentation due to construction of roads and deforestation are some of the major reasons of rapid reduction in plant diversity (Mohammed and Ahmed, 2012). Urban protected areas are one of the crucial sites for the conservation of plant diversity in the 21st Century, e.g. London has more than two thousand wild plant species (McNeely, 2001; McDonald *et al.*, 2009).

Graveyards can be considered as sites for environmental conservation and as a genetic resource for valuable, endangered medicinal plants. Graveyards are the least disturbed areas due to religious beliefs of the local people. The valuable gene pool must be conserved by the involvement of the local communities. Elder people and conservation authorities must create awareness among the local communities not to destroy plant habitats. Graveyards must be protected in a real sense to conserve plant diversity (Ahmad and Rabbi, 2009).

Out of about 258,650 species of higher plants reported from the world, more than 10% are used to cure ailing communities. Traditional botanical knowledge has uncovered the usage of many beneficial drugs, e.g. tubocurarine, reserpine, aspirin and morphine. Many people in Pakistan are using these valuable

medicinal plants not only for curing minor diseases, but also for major diseases. There is a growing trend in using wild plants for medicinal purposes. The number of medicinal plant collectors has increased, giving rise to the comprehensive trade. The medicinal plants are exported to other countries of the world, as well. Pansars are using these valuable medicinal plants for commercial purposes and many of these are also exported. Animals are also treated from these wild medicinal plants. Many plants speculated to treat a particular disease are used for many other purposes. Drug dealers, local collectors, and vendors are threatening the flora of Pakistan, leading to the extinction of many medicinal plants. Improper management of these valuable medicinal plants will not only result in the extinction of plant species, but may also deteriorate the natural habitat. Sustainable utilization of these valuable medicinal plants is required to preserve the plant diversity (Shinwari, 2010). The immense decrease in plant biodiversity needs *ex-situ* and *in-situ* conservation (Shinwari and Gilani, 2003).

The majority of people throughout the world are facing problems in trying to raise their living standard and to improve the health care delivery in the face of increasing poverty and a growing population. It has been estimated that 70% - 80% of people in the developing countries use traditional herbal remedies for their ailments due to the high cost of pharmaceutical products. Increasing demand of medicinal plants in the developing countries cannot be overlooked.

Ethnobotany explains the utilization of plants by traditional societies and has immense potential to help the world by providing beneficial plants and plant products (Veilleux and King, 2002). It also explains the utilization of plants in horticulture (Hurrel, 2016). Ethnobotany is

“the scientific investigation of indigenous cultures for food, medicine, pesticides, clothing, shelter, and other purposes”. It can help us develop new products in pharmaceuticals and food industries (Kendler *et al.*, 1992; Anjalam *et al.*, 2016). The World Health Organization has recognized the role of traditional medicinal plants in providing healthcare to the local people (Lalramnghinglova and Jha, 1999). Wild medicinal plants play a very crucial role in treating human ailments. Wild plants provide “green social security” to people all over the world. These crucial, role-playing plant species are pushed beyond recovery due to habitat deterioration and the excessive utilization of natural resources (Cunningham, 2001).

Ethnobotanical knowledge has been widely used in recent years for the discovery of new drugs and new drug development (Sheng-Ji, 2001; Heinrich, 2000). Ethnobotanical knowledge in Pakistan is preserved in bulk amounts and is transferred to succeeding generations. Ethnobotanical knowledge is extensively used in the treatment of various human ailments and other diseases. Medicinal plants in Pakistan are becoming popular as the principle source of medicines. In the past century, allopathic treatments were widely used to cure various human disorders. Allopathic drugs also have side effects and people now prefer herbal healers for safe and secure drugs. Moreover, the herbal drugs are cheaper, easily available, and have no side effects. History of ancient folk healers has helped in the discovery of many herbal drugs. Unfortunately, this knowledge is destined to extinct due to rapid acculturation and westernization in many parts of the earth where indigenous people still live peacefully. The loss of ethnobotanical knowledge will result in a barrier in the advancement of numerous aspects of environmental conservation (Schultes, 1994).

MATERIALS AND METHODS

The study area is the Miani Sahib Graveyard of Lahore city. The graveyard is divided into seven blocks, i.e. Block A to G. The total area covered by the graveyard is 215 acres (City government). Although the land is protected by a boundary wall, there are encroachments by the local people in the construction of shops, residential buildings, etc. Ethnobotanical data on the traditional uses of plants was collected by interviewing the herbal drug dealers, timber dealers, fuel wood sellers, and local elderly people residing in the adjacent areas of Miani Sahib and local hakims, through a questionnaire. Plant specimens collected from the area were dried, pressed and mounted properly. The plants were identified with the help of Flora of Pakistan, by Nasir and Ali (1970-1989), Ali and Nasir (1990-1992), Nasir and Rubina (1995) and Ali and Qaisar (1992-2007). The plant specimens were given to Dr. Sultan Ahmad Herbarium, at the GC University, Lahore, Pakistan after pasting voucher numbers. Field trips were carried out in different seasons throughout the year.

RESULTS AND DISCUSSION

Graveyard soil is fertile due to nutrients released from the decomposition of human bodies. Graveyards are rich in plant diversity because of nutrient rich soil (Rahman *et al.*, 2008). Table 1 lists the numerous medicinal and important plants found in the study site. High frequency weeds i.e., *Rumex dentatus*, *Poa annua*, *Coronopus didymus*, *Convolvulus arvensis*, *Euphorbia prostrata*, *Cynodon dactylon* and Less frequently weeds i.e., *Amaranthus viridis*, *Cirsium arvense*, *Stellaria media*, *Chenopodium murale*, *C. album*, *Fumaria indica*, *Oxalis corniculata*, *R. scleratus*, *Solanum nigrum*, *Parthenium hysterophorus*, *Sonchus asper*, *Euphorbia*

Table 1: The details of plants collected from the Miani Sahib Graveyard and their traditional uses.

Family	Botanical Name	Local Name	Parts Used	Traditional Uses
Aizoaceae	<i>Trianthema portulacastrum</i> L.	Kaan-gund (Punjabi), Narma (Urdu)	Roots, leaves	To prevent early abortion.
	<i>Zaleya pentandra</i> (L.) C. Jeffrey	Wasanh (Punjabi)	Leaves, roots	Used to treat skin and Gynecological disorders.
Amaranthaceae	<i>Achyranthes aspera</i> L.	Putkhanda (Punjabi)	Whole plant	Used as laxative and to treat piles, rheumatism.
	<i>Alternanthera paronychioides</i> A. St.-Hil.	Nanthra (Punjabi)	Stem	Decoction cures abdominal pain of children.
	<i>Alternanthera sessilis</i> (L.) R. Br. ex DC.	Kanchari (Punjabi)	Leaves	used to treat inflammation
	<i>Amaranthus viridis</i> L.	Chulai (Punjabi)	Leaves	Leaves are emolient. Used in scorpion sting and snake bite.
	<i>Chenopodium album</i> L.	Bathu (Punjabi)	Leaves	A paste is made from leaves and is applied on wounds of cattle.
Apiaceae	<i>Chenopodium murale</i> L.	Bathu (Punjabi)	Leaves	Plant is laxative and is used in hepatic disorder.
	<i>Anethum graveolens</i> L.	Sowa (Urdu)	Fruit	Fruit is carminative. Oil is obtained from the seeds used to treat flatulence of children.
Apocyanaceae	<i>Calotropis procera</i> (Aiton) R. Br.	Ak (Urdu)	Whole plant	Leaf extract is used against scorpion bite.
	<i>Nerium indicum</i> Mill.	Kanair (Punjabi)	Roots, leaves	Oil from root bark used in skin diseases and leprosy.
Asparagaceae	<i>Asparagus officinalis</i> L.	Phala-moosa	Leaves	Herb is diuretic, laxative, cardiac and sedative.
Asteraceae	<i>Ageratum conyzoides</i> L.	Ageera (Urdu)	Leaves, stem	Used to treat wounds and dermal problems.
	<i>Cirsium arvense</i> (L.) Scop.	Kandyari (Urdu), Pohli (Punjabi)	Whole plant	Plant is ammetic, diaphoretic and tonic.
	<i>Conyza ambigua</i> DC.	Phuljharri (Punjabi)	Leaves	Leaf extract is used in curing liver diseases.
	<i>Parthenium hysterophorus</i> L.	Parthenium (Urdu)	Whole plant	Whole plant is stimulating, anti-hysterical and flea repellent.
	<i>Pulicaria crispa</i> (Forssk.) Benth. and	Bui (Punjabi)	Whole plant	Bruised leaves are applied in headache.

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	<i>Saussurea heteromalla</i> (D. Don) Hand.-Mazz.	Kali ziri (Punjabi)	Seeds	Extract of the seeds is used to treat inflammation and arthritis.
	<i>Sonchus asper</i> (L.) Hill	Dodak (Punjabi)	Whole plant	Pounded herb is used to treat wounds or boils.
	<i>Ehretia obtusifolia</i> Hochst. ex A. DC.	Chamror (Urdu)	Root	Decoction of fresh root is given in venereal diseases.
Brassicaceae	<i>Coronopus didymus</i> (L.) Sm.	Charini boti (Punjabi)	Seeds, Roots, Leaves	Decoction is laxative. Seeds are used in dyspepsia.
	<i>Eruca sativa</i> Mill.	Tara mera (Urdu)	Seeds	Oil used for anti lice. Young leaves are considered diuretic, stimulant and stomachic.
	<i>Sisymbrium irio</i> L.	Jangli sarrun (Punjabi)	Seeds, leaves	Seeds are anti-pyretic, analgesic. Used to treat white facial spots. Leaves are used to cure throat and chest infections.
	Cactaceae	<i>Opuntia monacantha</i> Haw.	Chithar thor (Punjabi)	Stem, fruit
Casalpinaceae	<i>Cassia occidentalis</i> L.	Chasku (Urdu)	Leaves, root	Fresh leaves are used to treat jaundice.
Cannabaceae	<i>Cannabis sativa</i> L.	Bhang (Punjabi)	Whole plant	Asthma, cataract, headache, Leucorrhoea, nose bleeding and palpitation.
Caryophyllaceae	<i>Stellaria media</i> (L.) Cirillo	Climatus (Urdu)	Leaves	Tender leaves and stalk eaten as vegetable. Plant used in the inflammation of digestive, renal, reproductive tracts.
Convolvulaceae	<i>Convolvulus arvensis</i> L.	Hiran khuri (Urdu)	Roots, leaves	Used as fodder. Root is purgative and diarrhetic.
Crassulaceae	<i>Bryophyllum pinnatum</i> (Lam.) Oken	Pathar chat (Urdu)	Leaves	Leaves are used to treat kidney stones.
Cyperaceae	<i>Cyperus rotundus</i> L.	Nagar ghah (Punjabi)	Tuber	The decoction of the tuber given in fever along with salt. Tuber is anthelmintic, diuretic, used in stomach diseases and in irritation of bowels.
Euphorbiaceae	<i>Euphorbia helioscopia</i> L.	Mohri-booti (Punjabi)	Whole plant	Herb is cathartic. Oil from seeds is purgative. Root is anthelmintic.
	<i>Euphorbia prostrata</i>	Hazar-dani	Leaves,	Leaves are used as fodder.

	Aiton	(Punjabi)	Root	Smoke inhaled from burnt root is helpful to stop sneezing.
	<i>Euphorbia royleana</i> Boiss.	Danda thor (Punjabi)	Stem, Root	Extract is useful in treating hepatitis.
	<i>Ricinus communis</i> L.	Arind (Urdu), Harnoli (Punjabi)	Leaves, fruit	Due to bitter taste of bark, it is used to treat asthma and dysentery.
Fumariaceae	<i>Fumaria indica</i> Pugsley	Papra (Urdu)	Whole plant	Herb is diuretic and diaphoretic. Infusion of herb is recommended is constipation, leprosy and syphilis.
	<i>Ocimum basilicum</i> L.	Niazbo (Urdu)	Leaves	Leaves are user to treat throat infection and serve as alternative of strepsils. Also used to treat skin infection.
Lamiaceae	<i>Salvia plebeia</i> R. Br.	Sage (Urdu)	Seeds, Leaves	Seeds are used in gonorrhea, menorrhagia, diarrhea, and hemorrhoids.
	<i>Linum usitatissimum</i> L.	Alsi (Urdu)	Seeds, Bark, Leaves, Flower	Bark and leaves are used in gonorrhea. Seeds used to treat irritation of urogenital system.
	<i>Abutilon indicum</i> (L.) Sweet	Peeli booti (Punjabi), Khanghi (Urdu)	Leaves, bark, root	Leaves are used against bronchitis, diarrhoea and bladder inflammation.
Malvaceae	<i>Malva coromandelianum</i> (L.) Gareke	Jhar (Punjabi)	Whole plant	Leaves are cooling and are applied to inflamed sour and wounds.
	<i>Malva parviflora</i> L.	Sonchal (Urdu)	Leaves, Seeds	Plant is emollient. Seeds are used in cough and to treat ulcers in bladder.
Myrtaceae	<i>Eucalyptus camaldulensis</i>	Sufaida (Urdu)	Leaves, Stem	Leaves are used to treat asthma. Matchstick is also formed.

Nyctaginaceae	<i>Boerhavia procumbens</i> Banks ex Roxb	Itsit (Punjabi)	Roots, Leaves	Roots are boiled in water to obtain extract which is used as liver tonic.
Oxalidaceae	<i>Oxalis corniculata</i> L.	Khat-mith (Punjabi)	Seeds, leaves	Leaves are stomachic and laxative.
Papilionaceae	<i>Melilotus indica</i> (L.) All.	Seinchi (Urdu)	Whole plant	Plant is use as discutient and emolient.
	<i>Avena sativa</i> L.	Jangli jae (Urdu)	Seeds	Seeds are laxative and nerve tonic.
	<i>Cenchrus biflorus</i> Roxb.	Bhurt (Punjabi)	Fruit	Decocation of fruit considered pectoral and diuretic.
	<i>Cenchrus pennisetiformis</i> Hochst. and Steud.	Pampus grass (Urdu)	Shoot	Shoot is used as fodder and help to burn wood.
	<i>Cynodon dactylon</i> (L.) Pers.	Ghaas (Urdu)	Leaves	The extraction prepared from this plant along with garlic and warm mustard oil is rubbed on the body to relieve body pain.
Poaceae	<i>Dactyloctenium aegyptium</i> (L.) Richt.	Madana (Urdu)	Seeds	Seeds are used to treat kidney disorders. Also used as fodder.
	<i>Desmostachya bipinnata</i> (L.) Stapf	Dabh (Punjabi)	Roots	Culm is stimulant, diuretic and is also used in dysentery.
	<i>Dichanthium annulatum</i> (Forssk.) Stapf	Palwan (Urdu)	Stem, Leaves	Ash of the leaves is applied on injured portion to heal wound.
	<i>Digitaria timorensis</i> (Kunth) Balansa	Ralia (Urdu)	Stem	Stem extract mixed with boiled corn is used to treat respiratory paralysis.
	<i>Eragrostis paeoides</i>	Aragon (Urdu)	Seeds	Seeds are used to treat constipation.

	<i>Phalaris minor</i> Retz.	Dumbi-siti (Punjabi)	Whole plant	Used in asthma. The root is given in dyspepsia and flatulency.
	<i>Poa annua</i> L.	Maila ghaa (Punjabi)	Roots	Root is given in jaundice.
	<i>Setaria glauca</i> (L.) P.Beauv.	Sawank (Urdu)	Leaves, seeds	Used as fodder. Leaf extract is considered efficacious in cases of eruptions.
	<i>Sorghum halepense</i> (L.) Pers.	Baru (Urdu), Jangli jawar (Punjabi)	Seeds	Seeds are diuretic and demulcent. Used as fodder.
Polygonaceae	<i>Polygonum plebeium</i> R. Br.	Kheera wal (Punjabi)	Whole plant	Dried and powdered plant is taken internally in pneumonia.
	<i>Rumax dentatus</i> L.	Jungli palak (Punjabi)	Whole plant	Effective in removal of kidney stones.
Portulacaceae	<i>Portulaca oleracea</i> L.	Lunak (Urdu)	Whole plant	Water extract of plant is used to treat asthma.
Ranunculaceae	<i>Ranunculus sceleratus</i> L.	Kabikaj (Urdu)	Fruit, Leaves	The plant is used to treat earache, coryza, gout, liver pain and nose ulceration.
Rhamnaceae	<i>Ziziphus mauritiana</i> Lam.	Ber	Root, fruit, leaves	Blood purifier and is used to treat skin spots.
Scrophulariaceae	<i>Leucophyllum frutescens</i> (Berl.) I.M. Johnston	Sabhaloo (Urdu)	Leaves	Extract from the leaves can be used to treat cough and fever. Also used for decorative purposes along road sides.
Solanaceae	<i>Datura innoxia</i> Mill.	Dhatoora (Punjabi)	Whole plant	Used to treat joints. Also used in drugs.

	<i>Lycium edgeworthii</i> Dunal	Hamliya (Urdu)	Whole plant	The glands and the hairs on the fruit useful in scabies, ringworm and other skin diseases.
	<i>Nicotiana plumbaginifolia</i> Viv.	Jangli tambaku (Punjabi)	Leaves	Used in drugs.
	<i>Solanum nigrum</i> L.	Makoh (Urdu)	Leaves, fruits	It is used to treat liver disorders. Inflammation can also be treatment by cooking its leaves as sarson.
	<i>Withania somnifera</i> (L.) Dunal	Aksan (Urdu)	Root, fruit	Roots of this plant are used in rheumatism and painful swellings. Used to treat pain in joints.
Tilliaceae	<i>Grewia damine</i> Gaertn.	Bather (Urdu)	Seeds, Leaves	Seeds are used in anemia. Leaves are used to treat tumor.
	<i>Grewia tenax</i> (Forssk.) Fiori	Ganger (Urdu)	Bark	Bark used to treat female sexual disorders.
Verbenaceae	<i>Lantana camara</i> L.	Panch-phooli (Punjabi)	Whole plant	Plant is carminative, diaphoretic and antispasmodic.
Xanthorrhoeaceae	<i>Aloe vera</i> (L.) Burm. f.	Kwargandal (Punjabi)	Leaves	The extract is used to reduce hair fall and also provides nourishment to the growing hairs.
	<i>Asphodelus tenuifolius</i> Cav.	Piazi (Punjabi)	Seeds	Seeds are diuretic and are externally applied to treat ulcer.

heleosopia and *Solanum nigrum* were reported from different areas of Lahore (Riaz *et al.*, 2007). In the present study Cyperaceae was noticed as the dominant plant family. showing the highest family Importance Value Index (FIVI) value, i.e. 2.18, followed by Cannabaceae (1.97), Tamaricaceae (1.89), Tilliaceae (1.71),

Salvadoraceae (1.68), Fumariaceae (1.62), Solanaceae (1.45), Asteraceae (1.35), Polygonaceae (1.33), Fabaceae (1.27), Malvaceae (1.23), Nyctiginaceae (1.14), Meliaceae (1.11), Xanthorrhoeaceae (1.11) and Crassulaceae (1.03). The FIVI values of other plant families ranged from 0.14 to 2.18.

This study provides evidence that graveyards are gene pools of many crucial medicinal plants and should be conserved to protect natural resources for the benefit of humanity. It is essential to conserve the vegetation of graveyards by involving local communities. Religious scholars and elder people should be involved in the conservation programs. Areas adjacent to these graveyards should also be protected to conserve local vegetation.

CONCLUSION

Graveyards are one of the protected areas and are sites for the conservation of plant diversity. It is important to document the ethnobotanical knowledge of graveyards so that these plants can be utilized by the local peoples.

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