

A SURVEY OF ETHNOBOTANICALLY IMPORTANT HERBACEOUS PLANTS OF TEHSIL JATOI, DISTRICT MUZAFFAR GARH, PUNJAB, PAKISTAN

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ABSTRACT

An ethnobotanical documentation of the plants of Tehsil Jatoi, District Muzaffar Garh, Punjab, Pakistan was carried out during 2013-2014 to collect information regarding ethnobotanically important herbaceous plants of the area through interviews and questionnaire. A total of 45 herbaceous species documented in the present study belonging to 22 families. Out of which 21(47%) were single-usage herbaceous species that are used as fodder, medicinal and vegetable where as dual-usage plants were 18(40%) in number falling in 7 categories, i.e., medicinal and fodder, fodder and fuel, fodder and vegetables, etc. There are 4(9%) multi-usage plants which are belonging to 4 categories and 2(4%) herbaceous species which are poisonous. The wealth of local knowledge about the plants is decreasing generation after generation while deforestation by the local people to earn livelihood is abundantly occurred in the study area. Therefore, recommendations have been made for the sustainable usage of the plants of Tehsil Jatoi District Muzaffar Garh.

KEYWORDS: Ethnobotany, Herbs, Jatoi, Muzaffar Garh, Pakistan.

INTRODUCTION

Ethnobotany is the study of the wide spectrum of complex interaction present between humans and plants from the prehistoric time. Advancement in agriculture and industries, plants are facing adverse effects today. Ethnobotanical research on indigenous plants is continuing rapidly for the treatment of AIDS, cancer and inflammation (Balick *et al.*, 1996). There are a variety of plants species which have been used by humans for the prevention and treatment of various diseases. With the passage of time, a number of systems of therapy have been introduced. These include Unani, Homeopathy, ayurveda, etc., and all these mainly depending on medicinal plants. Medicinal plants are those plants which are occurred in a particular area and used as medicine by the indigenous people of that area, although there are many synthetic drugs introduced in the market but still people throughout the world preferred plant based medicines (Hussain *et al.*, 2008; Ajaib *et al.*, 2014).

Pakistan which is rich in biodiversity, lies in between 60° 55' to 75° 30' E longitude and 23° 45' to 36° 50' N latitude (Ali and Qaiser, 1986). It has an altitude ranging from 0 to 8611 m, therefore, has a variety of climatic zones and a unique biodiversity. It has about 6,000 species of higher plants, out of which 600 to 700 species are used for medicinal purposes. It has also been estimated that 70% of the total species are endemic (native) and about 30% exotic or invasive. The country has four phytogeographical regions such as Irano-Turanian (45% of species), Sino-Himalayan (10%), Saharo-Sindian (9.5%) and Indian element (6%). Among all these the Saharo-Sindian Region occupies the largest area but the diversity of species confined to this area is lowest for any phytogeographical region (Ali and Qaiser, 1986).

Keeping in view the significance of rich floral biodiversity in Tehsil Jatoi, District Muzaffar Garh, the present study was conducted. Latitude and Longitude of the city Jatoi is 29.5097 / 70.8458 (GPS Garmin, Nuvi). The climate of Tehsil Jatoi is cold in winter but very hot in summer season. The annual rainfall in Tehsil Jatoi is 282.46 mm. Humidity is more in the morning than in the evening.

MATERIALS AND METHODS

The material required included: Notebook, blotting paper, pencil, newspaper, knife, polythene bags, map and plant pressers.

The ethnobotanical study was carried out in the following steps:

Survey of the area: In order to document the ethnobotanical uses on the basis of plant resources of the study area, 29 villages were visited on weekly basis and plants were collected from these areas. Information regarding plants was collected from the local endemics of the area, i.e. herbal practitioners, shopkeepers, pansaries, farmers and wood sellers, etc. by interviewing and filing a questionnaire. The information collected includes the local name of the plants, their uses, parts used and methods for preparations of medicines along with other relevant information. Personal observations also added more information to the research work. Main areas visited include Samma Wali, Permat Chowk, Hamza wali, Chandar Bhan Nala, Baiti Nala, Ali Shah, Murad Pur, Mouchi Wala, Kallar Wali, Kallar Wali Pull, Massu Shah, Hathyan, Bait Meer Hazar Khan, Bhambho Sandhela and Kotla Gammu.

Laboratory study: The laboratory work was done by:

- **Pressing and drying:** The plants collected from the Tehsil Jatoi were pressed immediately before wilting in between the sheets of newspaper or blotting papers then replaced after every 24 hours with the newspapers or blotting paper so as to remove all the remaining moisture contents of the plants specimens
- **Mounting and identification:** The plants specimens after drying were mounted on the herbarium sheets with the help of glue and fibre tape (one plant specimen per herbarium sheet). The mounted specimens were the identified with the help of flora of Pakistan. Herbarium sheets were provided with local name, botanical name, family name, habit, habitat and other relevant information of the plant specimens.
- **Preservation:** The plant specimens collected from Tehsil Jatoi were then submitted to Dr. Sultan Ahmad Herbarium, Botany Department GC University Lahore, Pakistan after allocating the voucher numbers.

RESULTS AND DISCUSSION

In the study area a total of 45 herb species were recorded belonging to 22 families, out of which, monocots included 8 species of families, i.e., Poaceae and Cyperaceae each having 5 and 3 species respectively (Fig. 1). Among monocots Poaceae was the dominant family having 5 species. The remaining 37 plants were belonging to dicot families (Fig. 2); Amaranthaceae with 5 species; Solanaceae with 4 species. The remaining families are Polygonaceae, Brassicaceae, Euphorbiaceae, Aizoaceae, Boraginaceae, Cannabaceae, Chenopodiaceae, Convolvulaceae, Capparidaceae, Cucurbitaceae, Papilionaceae, and zygophyllaceae (Table 1).

Single-Usage plants are those plants which are used for only one specific purpose. Single-usage plants are *Achyranthes aspera* L., *Conyza Canadensis* L., *Cotula anthemoides* L., *Ecliptaalba* (L.) Hassak, *Cannabis sativa* L., *Convolvulus arvensis* L., *Convolvulus prostrates* Forssk., *Citrullus colocynthis* (L.) Schard., *Malvastrum coromandelianum* (L.) Garcke, *Solanum surattense* Burm.f., *Withania somnifera* (L.) Dunal., *Nicotiana plumbaginifolia* Viv., *Tribulus longipetalus* Viv., Pl., *Phalaris minor* Retz., *Phragmites australis* (Cay.) Trin., *Cyperus rotundus* L., *Bolboschoenus glaucus* (Lam.) S.G. Smith, *Sphenoclea zeylanica* Gaertner and *Polygonum effusum* Meisn and. Out of 45 herbaceous species, 21 (47%) were single-usage (Fig. 3). Single usage plants must be divided into 3 categories. Medical plants have highest percentage of 67% followed by fodder plants 24% and vegetable plants 9%. Out of 22 plants, medicinal plants were 14, fodder plants were 5 and vegetable 2.

Among single-usage plants medicinal species were all dicot, 4 plant species in fodder were belonging to monocots.

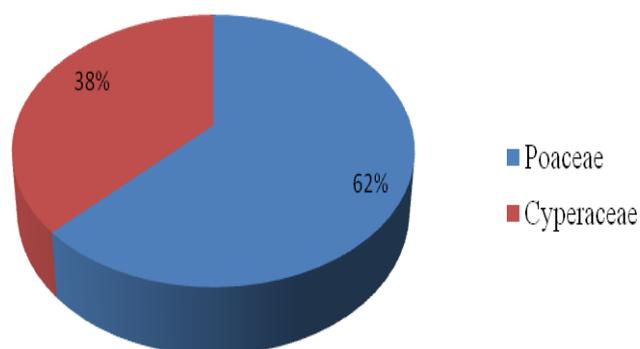


Fig. 1. Chart showing percentage contribution of herbaceous plant of monocot families.

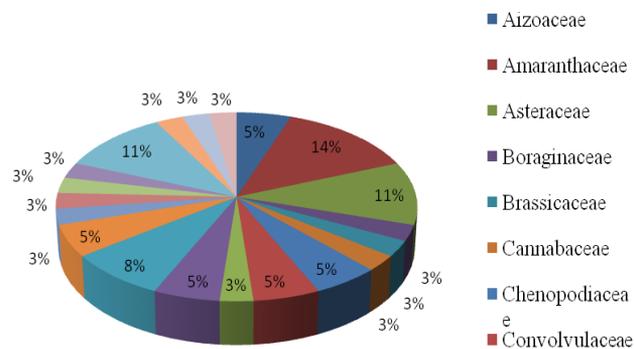


Fig. 2. Chart showing percentage contribution of herbaceous plant of dicot families.

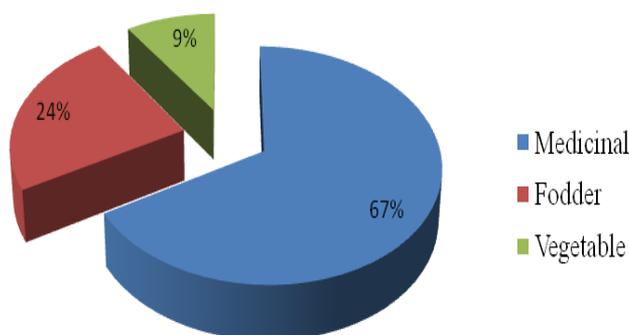


Fig. 3. Chart showing the percentage contribution of single-usage herbaceous plant.

Table 1. List of ethnobotanically useful herbs of Tehsil Jatoi, District Muzaffar Garh

Species and Voucher No.	Family	Local name	Traditional local uses
1. <i>Achyranthes aspera</i> L. GC. Herb. Bot. 2325	Amaranthaceae	Puthkanda	Stem is used for blood purification where as whole plant ash is given to treat the asthma and cough.
2. <i>Aerva javanica</i> M. Bieb. GC. Herb. Bot. 2326	Amaranthaceae	Boee	Whole plant is used as fodder for animals and for ornamental purposes.
3. <i>Alhagi maurorum</i> Medic. GC. Herb. Bot. 2327	Papilionaceae	Jhawan	Whole plant is used as fodder for camel. It has a great role in fencing and hedging fields. The decoction of plant is given for skin allergic and as a blood purifier.
4. <i>Anagallis arvensis</i> L. GC. Herb. Bot. 2328	Primulaceae	Bili buti	Leaves are used as a salad. It is used for the treatment of coughing, skin infections and disorders of the liver and gall bladder.
5. <i>Alternanthera sessilis</i> (L.) R.Br. ex DC. GC. Herb. Bot. 2329	Amaranthaceae	Gandi buti	Leaves are used as vegetable. Leaves are also used anti-inflammatory and antipyretic.
6. <i>Amaranthus viridis</i> L. GC. Herb. Bot. 2330	Amaranthaceae	Chulai	Whole plant is used as vegetable. It is also used as diuretic.
7. <i>Bolboschoenus glaucus</i> (Lam.) S.G. Smith, GC. Herb. Bot. 2331	Cyperaceae	Buti	Whole plant is used as fodder for goats and sheep.
8. <i>Brassica campestris</i> L. GC. Herb. Bot. 2332	Brassicaceae	Sarson	Leaves and stem are used as vegetable saag. Seed oil obtained called "Mustard oil" is used as hair oil and oil cake known as "Khal" is used as food for cattle.
9. <i>Cannabis sativa</i> L. GC. Herb. Bot. 2333	Cannabaceae	Bhang	Flowers and leaves are narcotics and sedative where as leaves are used to cure constipation, piles, stomach disorders and whooping cough.
10. <i>Chenopodium album</i> L. GC. Herb. Bot. 2334	Chenopodiaceae	Bathu	Whole plant is used as fodder for cattle while leaves are used as vegetable.
11. <i>Chenopodium murale</i> L. GC. Herb. Bot. 2335	Chenopodiaceae	Doshag	Whole plant is used as fodder for goats and sheep but leaves also used as vegetable.
12. <i>Chrozophora tinctoria</i> (L.) A. Juss. GC. Herb. Bot. 2336	Euphorbiaceae	Turn sole	Flowers and fruits are edible. Seeds, fruits and sap is used for obtaining red and blue dyes.
13. <i>Cirsium arvense</i> (L.) Scop. GC. Herb. Bot. 2337	Asteraceae	Leu	Whole plant is used as forage for cattle which increase the production of milk and roots are edible with high nutrient value.
14. <i>Citrullus colocynthis</i> (L.) Schard GC. Herb. Bot. 2338	Cucurbitaceae	Kortumbba	Whole plant powder is used in digestion of man and cattle roots are used as tooth sticks to relieve toothache. It is also used for the treatment of hepatitis.
15. <i>Cleome gynandra</i> L. GC. Herb. Bot. 2339	Capparidaceae	Booti	The leaves are used as food because high concentration of nutrients. Leaves are also used for the treatment of skin diseases.
16. <i>Coccinia grandis</i> (L.) Voigt GC. Herb. Bot. 2340	Cucurbitaceae	Booti	Leaves paste is used for the treatment of scabies while fruits are used to treat fever, asthma, and jaundice.
17. <i>Convolvulus arvensis</i> L. GC. Herb. Bot. 2341	Convolvulaceae	Khewari	Leaves are used as an antidote for spider bite where as flower tea used to reduce fever and wounds healing.
18. <i>Convolvulus prostrates</i> Forssk. GC. Herb. Bot. 2342	Convolvulaceae	Khewari	Leaves are used as a source of herbal medicines for liver disorders.
19. <i>Conyza Canadensis</i> L. GC. Herb. Bot. 2343	Asteraceae	Booti	Whole plant is used in clotting of blood and for the treatment of goiter where as flower tincture is made from the dried flowers present at the top.
20. <i>Cotula anthemoides</i> L. GC. Herb. Bot. 2344	Asteraceae	Peelibooti	The powdered of capitula mixed with oil is used for the treatment of rheumatic pain.
21. <i>Cyperus iria</i> L. GC. Herb. Bot. 2345	Cyperaceae	Rice flat sedge	Adversely affect the germination of rice seedlings.
22. <i>Cyperus rotundus</i> L. GC. Herb. Bot. 2346	Cyperaceae	Kambha	Whole plant is used as fodder for goats, sheep and cattle.

Table 1. List of ethnobotanically useful herbs of Tehsil Jatoi, District Muzaffar Garh

Species and Voucher No.	Family	Local name	Traditional local uses
23. <i>Digera muricata</i> (L.) Mart. GC.Herb.Bot.2347	Amaranthaceae	Booti	Leaves and young shoots are used as vegetable. Leaves are also used in curries or the whole plant is boiled into the water and seasoned with salt and chilly. Flowers are rich with nectar and sucked by the local people. Seeds and flowers are used for the treatment of urinary disorders.
24. <i>Eclipta alba</i> (L.) Hassak GC. Herb. Bot. 2348	Asteraceae	Baski	The plant extract used for expectorant and tonic purpose.
25. <i>Euphorbia prostrata</i> Ait. Hort. GC. Herb. Bot. 2349	Euphorbiaceae	Ghaa	Whole plant is used as a fodder by animals and its paste is used to stop the bleeding from wounds.
26. <i>Euphorbia hirta</i> L. GC. Herb. Bot. 2350	Euphorbiaceae	Washah	Plant is served as fodder for cattle where as leaves are used as vegetable.
27. <i>Heliotropium europaeum</i> L. GC. Herb. Bot. 2351	Boraginaceae	HathiSundda	It is a poisonous plant.
28. <i>Kochia indica</i> GC. Herb. Bot. 2352	Poaceae	Russain ghash	It is used as an ornamental plant as well as fodder for cattle.
29. <i>Malvastrum coromandelianum</i> (L.) Garcke GC. Herb. Bot. 2353	Malvaceae	Kharenti	Leaves are used to clean the wounds.
30. <i>Mentha spicata</i> L. GC. Herb. Bot. 2354	Lamiaceae	Pudina	Fresh leaves are used as flavoring agent and in making sauces. Decoction of dried leaves is given for digestion and for stomach disorders.
31. <i>Nicotiana plumbaginifolia</i> Viv. GC. Herb. Bot. 2355	Solanaceae	Babolan	It is used in the treatment of piles wounds and skin problems.
32. <i>Ocimum bacilicum</i> L. GC. Herb. Bot. 2356	Lamiaceae	Niazbo	The seeds are used for the treatment of diarrhea and dysentery and have cooling effect.
33. <i>Phalaris minor</i> Retz. GC. Herb. Bot. 2357	Poaceae	Dumbisitti	Whole plant is used as a fodder for cattle, goat and sheep.
34. <i>Phragmites australis</i> (Cay.) Trin. GC. Herb. Bot. 2358	Poaceae	Ghaa	It is used as fodder for animals.
35. <i>Phyla nodiflora</i> (L.) Greene. GC. Herb. Bot. 2359	Verbinaceae	Booti	It is used as an ornamental plant. It is also used for the treatment of common cold.
36. <i>Poa annua</i> L. GC. Herb. Bot. 2360	Poaceae	Talla	It is used as fodder for cattle and also grown in home Lawns.
37. <i>Polygonum effusum</i> Meisn GC. Herb. Bot. 2361	Polygonaceae	Ars-smerte	Plant is eaten by the human beings.
38. <i>Saccharum bengalense</i> Retz. GC. Herb. Bot. 2362	Poaceae	Kanna	Leaves are used as a source of fodder for animals. The culms are used for making roller blind, hand fans and pens.
39. <i>Solanum nigrum</i> L. GC. Herb. Bot. 2363	Solanaceae	Makao	It is used as a fodder for cattle. Fruits are edible. Fresh plant parts are used as vegetable which control diabetes.
40. <i>Solanum surattense</i> Burm.f. GC. Herb. Bot. 2364	Solanaceae	Mokri	Curry of fruits is taken for the patients of asthma. It is also useful for healing of internal injuries and relieves pain.
41. <i>Sphenoclea zeylanica</i> Gaertner GC. Herb. Bot. 2365	Sphenocleaceae	Mirchbooti	Tender twigs are steamed and eaten as a vegetable.
42. <i>Trianthema particulastrum</i> L. GC. Herb. Bot. 2366	Aizoaceae	Wese	It is commonly used as fodder for cattle. It is also used for the treatment of diarrhea.
43. <i>Tribulus longipetalus</i> Viv. GC. Herb. Bot. 2367	Zygophyllaceae	Boti	Plant is used as a fodder for animals.
44. <i>Withania somnifera</i> (L.) Dunal. GC. Herb. Bot. 2368	Solanaceae	Cherry	Leaves and fruits are used as panacea, amulet and aphrodisiac.
45. <i>Zaleya pentandra</i> L. GC. Herb. Bot. 2369	Aizoaceae	Lunak	Whole plant is used as fodder for buffaloes and cows and leaves are used for vegetables and given to treat stomach complaints and snake bite.

Out of 45 plants species, 18 (40%) plants were dual usage (Fig. 4) that were used for two purposes. Dual-usage plants were *Euphorbia prostrata* Ait., Hort., *Trianthema particulastrum* L., *Cirsium arvense* (L.) Scop., *Chenopodium album* L., *Chenopodium murale* L., *Euphorbia hirta* L., *Poa annua* L., *Aerva javanica* M. Bieb., *Kochia indica*, *Alternanthera sessilis* (L.) R.Br. ex DC., *Amaranthus viridis* L., *Digera muricata* (L.) Mart., *Cleome gynandra* L., *Mentha spicata* L., *Anagallis arvensis* L., *Phyla nodiflora* (L.) Greene., *Saccharum bengalense* Retz. and *Chrozophora tinctoria* (L.) A. Juss.

18 plants species falling in 7 categories were representing two-usage plants, i.e. medicinal and fodder (2), fodder and vegetable (5), fodder and ornamental (2), medicinal and vegetable (6), medicinal and ornamental (1), fodder and handcrafting (1) fruit and dye (1). All the plants included in these categories belong to dicot families except one species of fodder and handicrafts (Fig. 4).

Those herbs which are used for more than two purposes are called multi-usage plants (Fig. 5). The multi-usage plants are *Alhagi maurorum* Medic., *Zaleya pentandra* L., *Solanum nigrum* L. and *Brassica campestris* L. Out of 45 plant species 4 were of multi usage. The percentage of multi-usage plants is 9%. These plants were categorized in 4 categories. Two plant species are poisonous which are *Heliotropium europaeum* L. and *Cyperus iria* L.

According to different usage and poisonous effect the herbs of studied area are classified into four categories i.e. single, dual, multi and poisonous are presented in Fig. 6. Different leaf parts of herbs from Tehsil Jatoi District Muzaffar Garh used ethnobotanically are presented in Fig. 7.

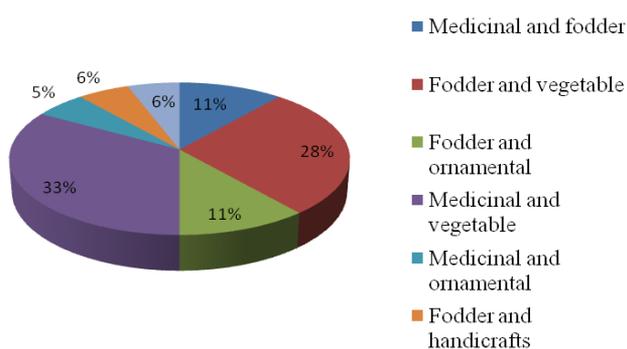


Fig. 4. Chart showing percentage contribution of dual-usage herbaceous plants.

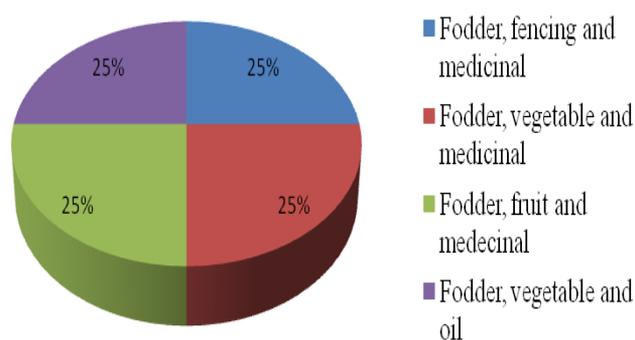


Fig. 5. Chart showing percentage contribution of multi-usage herbaceous plants.

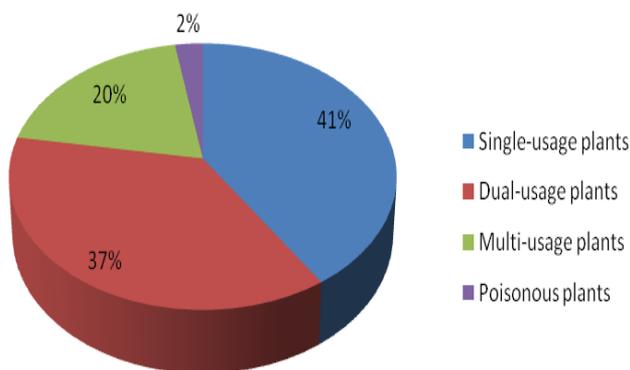


Fig.6. % of herb consumption purpose used ethnobotanically by people in Tehsil Jatoi District Muzaffar Garh.

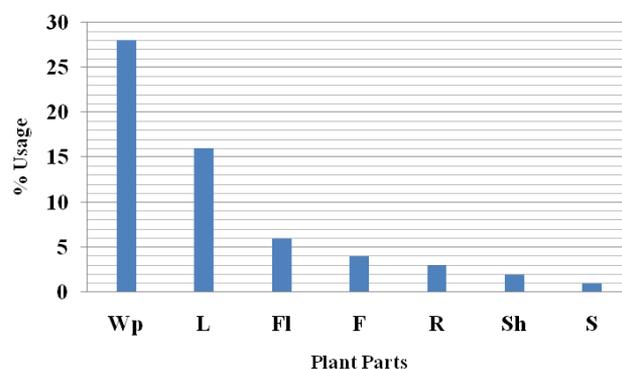


Fig. 7. % plant part used ethnobotanically in Tehsil Jatoi District Muzaffar Garh.

Note: More than one part of some plants is used. F: Fruit, Fl: Flower, L: Leaf, R: Root, S: Seed, Sh: Shoot/Stem, Wp: Whole plant.

Fuelwood was observed to be the most important factor in forest destruction. Due to inflation, nomads had their business to cut the plants and sell that timber to earn their livelihood. Due to this imbalance cutting of valuable trees and shrubs for fuel purposes plant species like *Tamarix aphylla* L. and *Acacia nilotica* (L.) Dalile were frequently vanished from the area. Shinwari (1996) documented a parallel concern related to the use of plant species as fuelwood during their ethnobotanical research of Kharan District, Balochistan.

Medicinal plants are used for curing a number of diseases since ancient times. Even now-a-days, people in the hilly areas depend on the traditional uses of plants (Sher and Hussain, 2009). In the present study it was noticed that different plant parts were utilized either in powdered form, decoction or whole plant extract to cure various diseases, e.g. *Calotropis procera* (Ait) W.T. Aiton is boiled and used to treat skin diseases of buffaloes etc. Similar study was reported by Ajaib *et al.* (2010) while gathering on ethnobotanical data on the shrubs of District Kotli, Azad Jammu and Kashmir, Pakistan during 2007-2008. They collected 38 species of 36 genera belonging to 25 families and the local people of the area were found using shrubs in everyday life such as medicinal, fuel, shelter, fodder/forage and in making agricultural tools.

At past, the ethnobotanical research was not undertaken in District Muzaffar Garh. The knowledge about plants uses is usually transferred in verbal form and there is no written form of data existing. This would lead to the loss of important ethnobotanical information. Therefore, an attempt has been made for the documentation of valuable plants wealth.

Recommendations: For the sustainable usages of the plants of District Muzaffar Garh, some important suggestions are as follows:

1. Awareness regarding conservation and sustainable uses of plants should be provided to indigenous people.
2. Plantation of more plants should be practiced.
3. There should be alternative ways of earning for the local people to prevent deforestation.
4. There should be well developed method for cultivation of plants.

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