

ETHNOBOTANICAL STUDIES OF HERBACEOUS PLANTS OF TEHSIL AHMAD PUR EAST, DISTRICT BAHAWALPUR, PAKISTAN

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ABSTRACT

Plants are beneficial and recognized by almost every society on earth. In the present study, 32 villages of Tehsil Ahmad Pur East, District Bahawalpur were studied because of richness of biodiversity due to its proximity of two canals, i.e. Abu Zhabi and Abbasia, almost no ethnobotanical research was carried out in this area. 45 herbaceous species belong to 40 genera and 16 families, all the families belonged to angiosperm in which 4 families (Poaceae, Alliaceae, Cyperaceae and Asphodelaceae) were monocots (16 spp.) and remaining 12 families belong to dicots (29 spp.) predominantly Poaceae was recorded, of which 11 (60%) were (24%) were single-usage, 27 (60%) were dual-usage and 7 (16%) were multi-usage herbs were consumed as medicinal (18%), fodder (73%) and handicraft (9%). Unfortunately, the knowledge of medicinal plants initially gained by trial and error, inherited to generations is lost within the urge of industrialization as no written form of data exists. Therefore, the documentation of plants along with their important uses will be beneficial, not only for the indigenous people of the area but also for the country as a whole. Also, there is a need of sustainable use of the plants to preserve them for future generations and prevent their extinction.

Key-words: Herbaceous plants, Ahmad Pur, Bahawalpur, Ethnobotanical study.

INTRODUCTION

Ethnic people around the world keep unique knowledge of plant resources on which they depend for food, medicine, and general utility, including human dependence on native plants for livelihood (Cotton, 1996; Martin, 1995). The history of man has always been associated to the surrounding environment. The first civilizations take in that there were plants with healing potential. The sureness in the healing potential of herbs decreased with the rise of the pharmaceutical industry (Lima *et al.*, 2007).

Inhabitants of the distant areas have good knowledge about the utilization of plants. Local people choose medicinal plants due to their easy availability and cheapness. Local people have discovered the therapeutic activity of medicinal plants against certain diseases through their indigenous experiences transferred from generation to generation to their ancestors (Qureshi, 2004).

Numerous ethnomedicinal plants extracted from the wild are being used by local communities of different geographical regions having century's old traditional knowledge on such plants. A number of medicinal plants are well known about their properties and proper use at the community level, however many are yet to be explored for their medicinal values (Khan, 2003; Ajaib *et al.*, 2010).

Keeping in view the importance of natural resources of Pakistan, the present ethnobotanical study was carried out for the purpose of documentation of the aboriginal knowledge of Tehsil Ahmad Pur East, District Bahawalpur. The average height of Tehsil Ahmad Pur East is 105 m (344.49 feet) from sea level. It is situated at 29° 14 N and 71° 26 E (GPS Garmin Nuvi). The climate of Tehsil Ahmad Pur East is variable, i.e. it is cold in winter but very hot in summer season. Summer season extends from March to October and during peak season; temperature may increase up to 49°C – 52°C. Winter season starts from November and remains till February and is very pleasant. The minimum temperature in winter may drops to 10°C – 6°C. The annual rainfall in Tehsil Ahmad Pur East is 194.34 mm. Humidity is more in the morning than in the evening.

MATERIAL AND METHODS

The current research work was accomplished during 2013 and 2014 and the study area was visited on weekly basis along with relevant guider of these areas throughout the year. A total of 32 villages with 57 respondents along with personal observations were recorded. The purpose of the study was to collect the plants particularly desert area and to document the ethnobotanical knowledge of Tehsil Ahmad Pur East, District Bahawalpur.

The material required included:

Notebook, blotting paper, pencil, newspaper, knife, polythene bags, map and plant presser. Other required information was collected from the linked City Government Office of Tehsil Ahmad Pur East.

Ethnobotanical Study

The ethnobotanical study was completed in the following steps:

1. Survey of the area
2. Laboratory study

1. Survey of the area

To document the ethnobotanical uses of plant resources of the area, 32 villages were visited on weekly basis and plants were collected from these areas. Information about these plants was collected from the local endemics of the area, i.e. hakims, shopkeepers, pansaries, farmers, shepherd, old women and wood sellers, etc. by interviewing and filing questionnaire. The information collected includes the local name of the plants, their uses, parts used, habitat and recipe for the preparations of different medicines, their uses and other relevant information. Personal observations also further more information to the research work and knows many plants uses in Homeopathy. Main areas visited includes Ram Kali, Rajoor Rahoo, Mehmood Mahtam, Kot Khalifa, Chani Goth, Bait Bakhtari, Shikrani, Chak Kehal, Gamani, Jholan Wali, Tahir wali, Ban Wala, Kora Kulyar, Siraj Pur, Uttera, Sojla Tanwari, Kulab, Faridabad, Nizam Pur, Anyat Pur, Mehmoodabad, Chak Wahni, Sukhail, Malkani Basti, Rashidabad, Khuda Bakhsh Maher, Muhammad Bakhsh Maher, Mehrab Wala, Nonari, Dhor Kot, Palla Hamshira and Abbas Kharbi.

2. Laboratory study

The laboratory work was carried out by pressing, drying, mounting, identification, labeling and preservation of the plants.

Pressing and drying

The plants collected from the field were pressed properly before wilting in between the sheets of newspaper. The bolting papers were then changed with the newspapers so as to eliminate all the remaining moisture contents of the plants specimens. The plants were then pressed with the help of wooden presser in order to do away with all the folds. Newspapers were exchanged periodically and the plants were dried by natural drying process so that the bloom of the plant specimens could not be permitted.

Mounting and identification

The plants specimens after dehydrating were mounted on the standard herbarium sheets with the help of glue. One specimen was fixed on one herbarium sheet. The mounted specimens were the identified with the help of available literature such as Flora of Pakistan. Herbarium sheets were provided with local name, botanical name, family name, habit, habitat and other applicable information of the plant specimens.

Preservation

The plant specimens collected from Tehsil Ahmad Pur East were submitted to Dr. Sultan Ahmad Herbarium, Botany Department GC University Lahore, Pakistan after assigning the voucher numbers.

RESULTS AND DISCUSSION

In study area, 45 herbaceous species were collected from Tehsil Ahmad Pur East, District Bahawalpur. Among the herbaceous species, monocots included 16 species of 4 families i.e. Poaceae, Alliaceae, Cyperaceae and Asphodelaceae, each having 12, 2, 1 and 1 species respectively. Poaceae was the dominant family of monocot having 12 species. The remaining 29 plant species were belonging to dicot families: Asteraceae with 6 species is the dominant dicots family; Zygophyllaceae having 4 species; Amaranthaceae, Chenopodiaceae, Convolvulaceae, Cucubitaceae, are represented by 3 species each; Aizoaceae, represented by 2 species. The remaining families represented by only one species which were Brassicaceae, Euphorbiaceae, Malvaceae, Boraginaceae and Solanaceae.

The people of Tehsil Ahmad Pur East live an area that has a great diversity of vegetation because of its proximity to Head Punjn and, Abbasia and Abu Zhabi canals. But due to change in social status, most of the people used allopathic products. They do not know much about the plants and therefore, ethnobotanical knowledge is only

limited to old aged people and shepherd of desert area. The people living in remote area totally rely on plants for their daily requirements. Most of the wanderers in the area depend upon plants for their livelihood. They cut the trees and sell them as fuel wood. Because of poverty, lack of education, ignorance and lack of health facilities, most of the people in villages are yet hanged on herbal medicines for their daily ailments as reported by Azaizeh *et al.*, 2003, whereas reported Medicinal plants used by local people in Vellore District Tamilnadu, India.

Poaceae ■ Alliaceae
Cyperaceae ■ Asphodelaceae

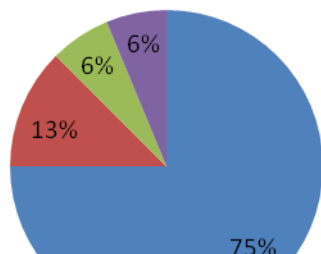


Fig 1. The pie chart showing percentages of monocots families of herbaceous species.

Fodder ■ Medicinal ■ Handicrafts

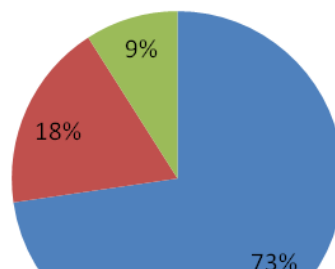


Fig 3. The pie chart showing percentages of single-usage herbaceous species.

Asteraceae ■ Zygophyllaceae ■ Amaranthaceae
Chenopodiaceae ■ Convolvulaceae ■ Cucurbitaceae
Aizoaceae ■ Boraginaceae ■ Brassicaceae
Euphorbiaceae ■ Malvaceae ■ Solanaceae

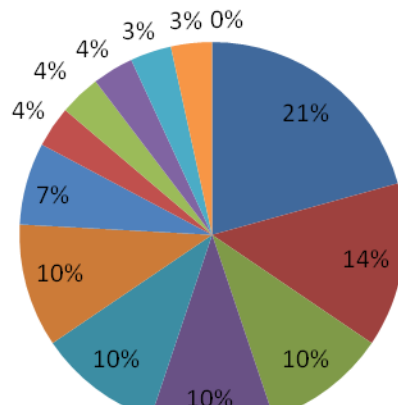


Fig 2. The pie chart showing percentages of dicot families of herbaceous species.

Herbaceous Plants

Among the herbaceous species, monocots included 16 species of 4 families i.e. Poaceae, Alliaceae, Cyperaceae and Asphodelaceae, each having 12, 2, 1 and 1 species respectively (Fig. 1). Poaceae was the dominant family of monocot having 12 species. The remaining 29 plant species were belonging to dicot families: Asteraceae with 6

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Single-Usage herbaceous plants

Single-usage plants are those plants which are used for only one specific purpose e.g. *Paspalum paspalodes* (Michx.) Scribner. is used as fodder only. Out of 45 plant species documented in the present study, 11 were single-usage herbs species *Asphodelus tenuifolius* Cav., *Citrullus colocynthis* (L.) Schard., *Paspalum paspalodes* (Michx.) Scribner, *Imperata cylindrical* (L.) P .Beauv., *Phalaris minor* Retz., *Phragmites australis* (Cay.) Trin., *Aerva javanica* var. *Bovei* Webb., *Tribulus longipetalus* Viv., *Cyperus rotundus* L., *Convolvulus arvensis* L. and *Saccharum spontaneum* L. The percentage of single usage plants was 24%. Single usage plants must be divided into 3 categories. Fodder plants were more with percentage of 73%, followed by medicinal plants 18% and handicrafts 9%. Out of 11 plants, fodder were 8, medicinal 2 and handicrafts were represented 1 species (Fig 3).

Among single-usage plants, out of 8 fodder species, 4 were monocots and 4 were represent dicots. 2 medicinal plants 1 was monocot and 1 was dicot but 1 species belong to handicraft were also represented monocots. All the single-usage plants along with their local names and families are printed in Table 1.

Dual-Usage herbaceous species

Two-usage plants are those plants which are used for two purposes, e.g. *Echinops echinatus* DC. is used as both medicinal and as well as a fodder. Out of 45 plant species, 27 plants were two-usage plants (Fig.4) *Echinops echinatus* DC., *Euphorbia prostrata* Ait., Hort., *Fagonia indica* Burm.f., *Tribulus terrestris* L., *Heliotropium strigosum* Willd., *Launea procumbens* L., *Trianthema particulastrum* L., *Salsola imbricata* Forssk., *Zygophyllum simplex* L., *Chenopodium album* L., *Chenopodium murale* L., *Convolvulus prostrata* Forssk., *Ipomoea aquatica* Forssk., Al., *Aerva javanica* var. *javanica* (Burm. f.) Juss. ex Journ. A. Schults., *Cenchrus ciliaris* L., *Kochia indica* Wight, Icon., *Sorghum bicolor* (L.) Moench., *Dactylacteneum aegyptium* (L.) Willd., *Celosia argentea* L., *Cirsium arvense* (L.) Scop., *Helianthus annuus* L., *Cucumis melo* ssp. *agrestis* L., *Allium cepa* L., *Allium sativa* L., *Carthamus oxyacantha* L., *Xanthium strumarium* L., and *Luffa cylindrica* (L.) Roem. The percentage of Two-usage plants was 60%. 27 plant species falling in 9 categories were represented two-usage plants, i.e. medicinal & fodder (7), Fodder and Fuel (2), Fodder and vegetables (4), Medicinal & Flavoring agent (2), Fodder & food (6), Fodder & Ornamental (3), Fodder & fencing (1), Fencing & Fuel (1) and Vegetable & Dish Washing (1)

All the 27 plant species falling under 9 categories of double use in which 2 species of food & Fodder and 2 species of Medicinal & Flavoring agents were monocots while the all other belonging to dicots (Fig 4).

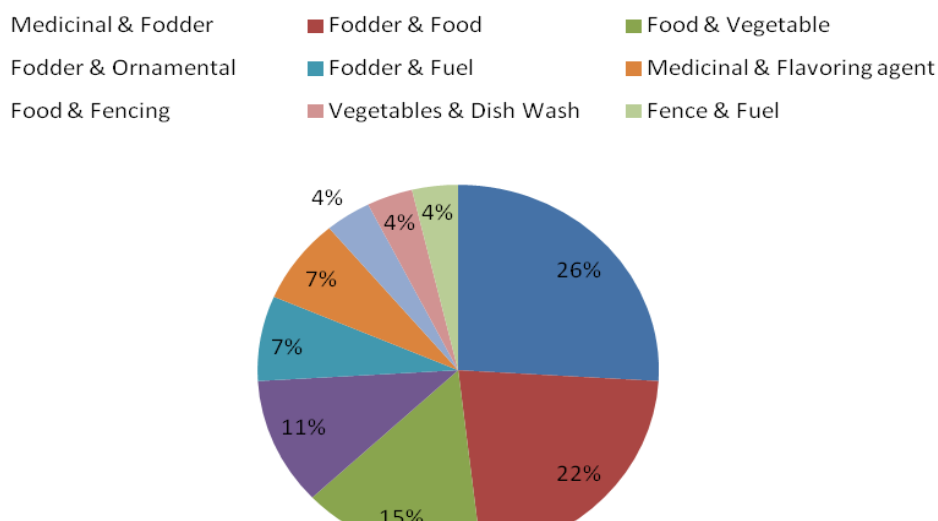


Fig 4. The pie chart showing percentages of dual-usage herbaceous species.

Multi-Usage herbaceous species

The plants which are used for more than two purposes are called multi-usage plants, i.e. *Zaleya pentandra* L. is used as medicinal, fodder & vegetable. Out of 45 plant species 7 were of multi-usage *Poa annua* L., *Zaleya pentandra* L., *Brassica rapa ssp. campestris* L., *Cynodon dactylon* L., *Saccharum bengalense* Retz., *Abutilon bidentatum* A.Rich. and *Solanum nigrum* L. The percentage of multi-usage plants is 16%. Of all the 7 multi-usage plants; 2 plant species were monocotyledons while remaining 5 were dicotyledons. These plants were categorized into 6 categories (Fig 5).

Food, Fodder & Ornamental ■ Food, Vegetable & Medicinal
 Fodder, Ornamental & Medicinal ■ Fodder, Fencing & Stationary
 Fodder, Fibre & Dyes ■ Food, Fodder, Vegetable & Medicinal

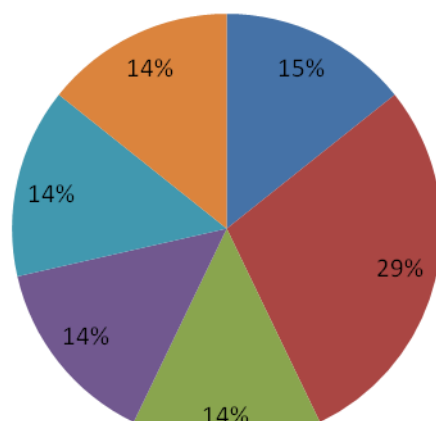


Fig 5. The pie chart showing percentages of multi-usage herbaceous species.

Single-Usage ■ Dual-Usage ■ Multi-Usage

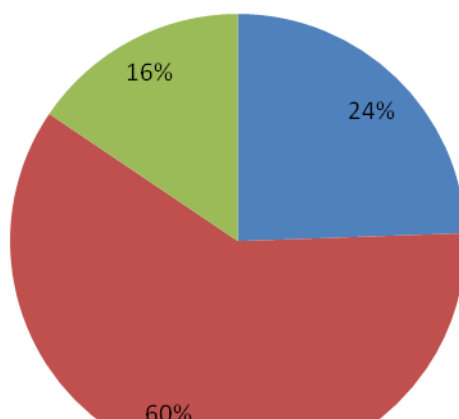


Fig. 6. Proportion of the herbaceous plants on the basis of usage.

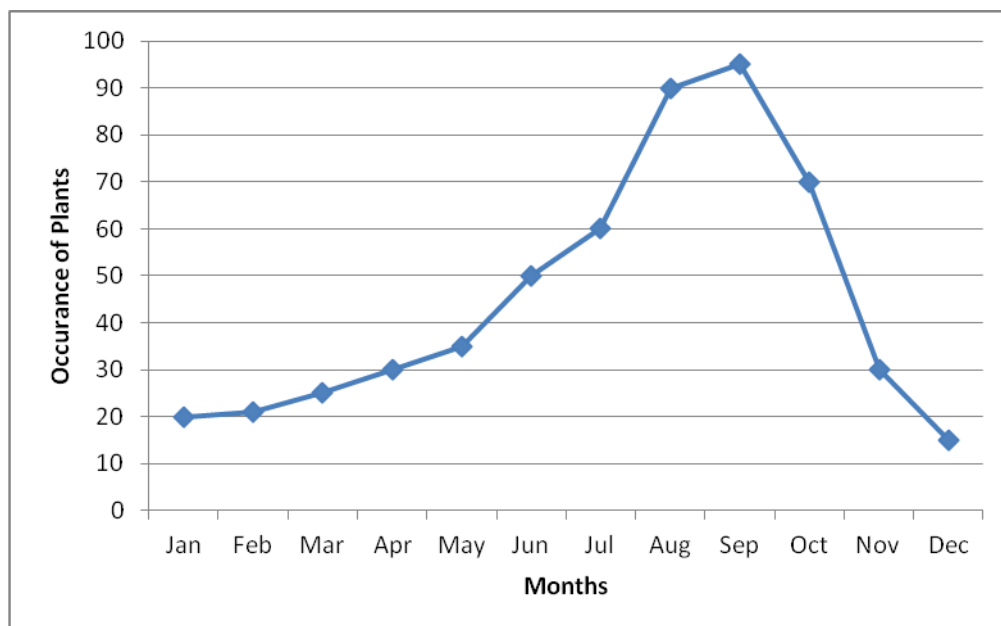


Fig 7. Annual Distribution of ethnobotanically important herbs of Tehsil Ahmad Pur East, District Bahawalpur

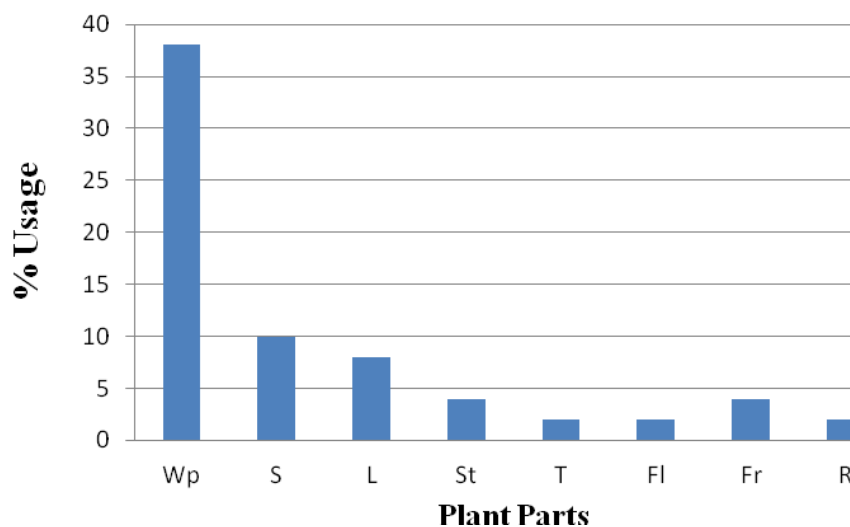


Fig. 8 % plant parts used ethnobotanically in Tehsil Ahmad Pur East, District Bahawalpur.

Note: More than one part of some plants is used. Fr: Fruit, Fl: Flower, L: Leaf, R: Root, S: Seed, St: Stem, T: Tuber, Wp: Whole plant.

Recommendations

For the sustainable use of the plants of Tehsil Ahmad Pur East, District Bahawalpur, some important suggestions are as follows:

- ❖ Awareness regarding preservation and sustainable uses of plants should be provided to local community.
- ❖ Cultivation of more plants should be practiced.
- ❖ Educate the people about the worth of the plants and consequences followed from lack of plants.
- ❖ There should be alternative way of earnings for nomads in order to prevent deforestation.
- ❖ Awareness about the organized cultivation should be provided.

Table 3. List of ethnobotanically useful herbaceous plants of Tehsil Ahmed Pur East, District Bahawalpur.

Species and Voucher No.	Family	Local Name	Traditional local uses
<i>Amaranthus biocentatus</i> A. Räch. GC. Herb. Bot. 2280	Malvaceae	Kangri Buti	L: Its leaves are used as fodder St: when plants are ripped their fruits are removed and remaining plants are used as "torri" by local people and also obtained fibers and dyes.
<i>Aerva javanica</i> var. Borei Webb. GC. Herb. Bot. 2281	Amaranthaceae	Boee	Wp: Whole plant is used as fodder.
<i>Aerva javanica</i> var. <i>javanica</i> (Burn. f.) Juss. ex Journ. A. Schults. GC. Herb. Bot. 2282	Amaranthaceae	Boee	Wp: Whole plant is used as fodder as well as for ornamental purposes.
<i>Allium cepa</i> L. GC. Herb. Bot. 2283	Alliaceae	Wasal	T: Bulbs are used in curries and as a salad. It is heated with ghee and used to heal the hilum of child's after their birth.
<i>Allium sativa</i> L. GC. Herb. Bot. 2284	Alliaceae	Thome	T: Bulbs are used as flavoring agent, spices and condiments in daily food. The bulbs are chewed to lower the blood pressure.
<i>Asphodelus tenuifolius</i> Cav. GC. Herb. Bot. 2285	Asphodelaceae	Prazi	Wp: Plant extract is given to the patients of measles and pile and also used to remove pimples.
<i>Brassica rapa</i> ssp. <i>campestris</i> L. GC. Herb. Bot. 2286	Brassicaceae	Sarsoon	L&St: Leaves and stems are used as vegetable (saag). St: oil obtained from it called "Mustard oil" is used as hair oil and oil cake known as "Khat" is used as food for cattle and oil is also used for massage to treat itchiness.
<i>Carthamus oxyacantha</i> L. GC. Herb. Bot. 2287	Asteraceae	Kandheri	Wp: It is used as fodder in juvenile forms but in mature forms it is used for fencing purpose.
<i>Celostia argentea</i> L. GC. Herb. Bot. 2288	Amaranthaceae	Salara	Wp: Whole plant is used as fodder L: but young leaves which are less cellulose are used by local people as vegetable (Saag).
<i>Cenchrus ciliaris</i> L. GC. Herb. Bot. 2289	Poaceae	Savank Chaa	Wp: It is used as fodder for cattle and also cultivated in home lawn.
<i>Chenopodium album</i> L. GC. Herb. Bot. 2290	Chenopodiaceae	Doshag	Wp: Plant is used as fodder for cattle but young portion of plant used as vegetable.
<i>Chenopodium murale</i> L. GC. Herb. Bot. 2291	Chenopodiaceae	Dosaag	Wp: Plant is used as fodder for cattle but young portion used as vegetable.
<i>Cirsium arvense</i> (L.) Scop. GC. Herb. Bot. 2292	Asteraceae	Leu	Wp: It is used as forage for cattle which increase milk production R: roots are edible with high nutrient value.
<i>Citrullus colocynthis</i> (L.) Schard. GC. Herb. Bot. 2293	Cucurbitaceae	Tuma	Wp: It is used to cure many human diseases but particularly for Hepatitis S: oil obtained from seeds are applied on head for hair loss. Fr: Fruit are given to animal for treating ingestion and internal worms.
<i>Convolvulus arvensis</i> GC. Herb. Bot. 2294	Convolvulaceae	Kheweri	Wp: Whole plant is used as forage for goats and sheep.
<i>Convolvulus prostrata</i> Forsk. GC. Herb. Bot. 2295	Convolvulaceae	Kheweri	Wp: Whole plant is used as fodder for goats and sheep and also for vegetable.
<i>Cucumis melo</i> ssp. GC. Herb. Bot. 2295	Cucurbitaceae	Chibber	Fr: Ripened fruits are cut and dried which are used as condiment for vegetable and also eaten by

<i>agrestis</i> L. GC. Herb. Bot. 2296				local people as a lunch. Wp: Whole plant is used as forage for goats.
<i>Cynodon dactylon</i> L. GC. Herb. Bot. 2297	Poaceae	Bharat Ghara		Wp: It is used as ornamental purposes and whole plant used as fodder.
<i>Cyperus rotundatus</i> L. GC. Herb. Bot. 2298	Cyperaceae	Kamthia		L: Leaves extract used for asthma Wp: Whole plant is used as fodder.
<i>Dactyloctenium aegyptium</i> (L.) Willd. GC. Herb. Bot. 2299	Poaceae	Ghunar		Wp: It is used as fodder for cattle, support sustainable land care S: seeds are eaten which are protein rich.
<i>Echinops echinatus</i> DC. GC. Herb. Bot. 2300	Asteraceae	Desi Leu		Wp: Whole plant is used as fodder for cattle which increase lactation R: root bark powder along with water given to treat sexual debility.
<i>Euphorbia prostrata</i> Att. Hort. GC. Herb. Bot. 2301	Euphorbiaceae	Khewari		Wp: It is used as fodder while plant paste is applied to stop bleeding from wound.
<i>Fagonia indica</i> Burm. f. GC. Herb. Bot. 2302	Zygophyllaceae	Jhawan		Wp: Whole plant is used as fodder whereas plant paste liquid drunk to cure Hepatitis.
<i>Helianthus annuus</i> L. GC. Herb. Bot. 2303	Asteraceae	Suraj Mukhi		Fl: Flowers are used as oils while leaves St: stem are used as fodder commonly known as "Tori". S: Seeds are edibles.
<i>Heliotropium strigosum</i> Willd. GC. Herb. Bot. 2304	Borraginaceae	Markand		Wp: Whole plant is used as fodder for desert animals S: seed are ground to cure backache.
<i>Imperata cylindrica</i> (L.) P. Beauv. GC. Herb. Bot. 2305	Poaceae	Sawari		Wp: Whole plant is used as fodder.
<i>Ipomoea aquatica</i> Forssk. GC. Herb. Bot. 2306	Convolvulaceae	Bari Khewari		Wp: It is used as fodder for goat Fl: Flower for vegetable purposes by local people.
<i>Kochia indica</i> Wight, Icom. Pl. GC. Herb. Bot. 2307	Poaceae	Russian Grass		Wp: It is an ornamental grass cultivated in parks and used as forage for cattle and sheep.
<i>Laurea procumbens</i> L. GC. Herb. Bot. 2308	Asteraceae	Bhatar		Wp: Whole plant is used as forage for cattle whereas plant is grind with water and given to treat orally painful micturition.
<i>Luffa cylindrica</i> (L.) Roem. GC. Herb. Bot. 2309	Cucurbitaceae	Ghia Tori		Frt: Fruit is used as vegetable while dried fruit is used for dish washer.
<i>Paspalum paspalodes</i> (Metcx.) Scribn. GC. Herb. Bot. 2310	Poaceae	Sawari		Wp: It is used as fodder for cattle.
<i>Phalaris minor</i> Retz. GC. Herb. Bot. 2311	Poaceae	Dumbi Sitti		Wp: Whole plant is used as fodder for cattle.
<i>Phragmites australis</i> (Cav.) Trin.	Poaceae	Ghaa		Wp: It is used as forage for animals.

GC. Herb. Bot. 2312	Poaceae	Talla	Wp: Whole plant is used as fodder for cattle and also grown in home lawn S: seeds are eaten.
<i>Poa annua</i> L. GC. Herb. Bot. 2313	Poaceae	Kara	St: The culms are used for making roller blind, hand fans and pens for writing and fencing. L: Its tender leaves are a source of low quality fodder for cattle.
<i>Saccharum bengalense</i> Retz. GC. Herb. Bot. 2314	Poaceae	Grass	L: Its leaves are used for mopping purpose.
<i>Saccharum spontaneum</i> L. GC. Herb. Bot. 2315	Chenopodiaceae	Larran	Wp: It is used as fodder and fuel purpose.
<i>Salsola imbricata</i> Forsk. GC. Herb. Bot. 2316	Solanaceae	Makao	Wp: Whole plant is used as fodder for cattle Fr: fruits are Eatable L: Fresh part is used as vegetable which control diabetes.
<i>Solanum nigrum</i> L. GC. Herb. Bot. 2317	Poaceae	Jowar	Wp: It is used as fodder for cattle S: grains are used as food St: stem is also sucked.
<i>Sorghum bicolor</i> (L.) Moench. GC. Herb. Bot. 2318	Wesa		Wp: Most commonly used as fodder for buffaloes and camels. S: Seeds are heavy and control diarrhea of cattle.
<i>Trichisma paniculatum</i> L. GC. Herb. Bot. 2319	Boti		Wp: Whole plant is used as fodder.
<i>Tribulus longipetalus</i> Viv., Pl. GC. Herb. Bot. 2320	Phail		Wp: It is used as fodder but thorn fruits get to stuck grazing animals S: seed are believed to useful for kidney, liver, cough, urinary tract diseases and dietary supplements.
<i>Tribulus terrestris</i> L. GC. Herb. Bot. 2321	Gandi Boti		S: Seed containing spines and used for fencing.
<i>Xanthium strumarium</i> L. GC. Herb. Bot. 2322	Lunak		Wp: Whole plant is used as fodder for buffaloes and cows L: leaves are used for vegetables and given to treat stomach complaints and snake bite.
<i>Zaleya pentandra</i> L. GC. Herb. Bot. 2323	Lami		Wp: It is used as fodder and fuel purpose.
<i>Zygophyllum simplex</i> L. GC. Herb. Bot. 2324			

Fr: Fruit, Fl: Flower, L: Leaf, R: Root, S: Seed, St: Stem, T: Tuber, Wp: Whole plant.

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