



RESEARCH PAPER

OPEN ACCESS

Exploration of floristic diversity of Khanpur valley, District Haripur, Khyber Pakhtunkhwa, Pakistan

Zeeshan Siddique^{*1}, Sobia Nisa¹, Ghulam Mujtaba Shah², Abdullah Khan¹, Alia Naz¹, Salman Khan¹, Noureen Aurangzeb¹, Shah Masaud Khan³, Abid Farid⁴, Muhammad Mohiuddin⁵

¹*Department of Environmental Sciences, University of Haripur, Khyber Pakhtunkhwa, Pakistan*

²*Department of Botany, Hazara University Manshera, Khyber Pakhtunkhwa, Pakistan*

³*Directorate of AS&R, University of Haripur, Khyber Pakhtunkhwa, Pakistan*

⁴*Dean of Basic & Applied Sciences, University of Haripur, Khyber Pakhtunkhwa, Pakistan*

⁵*Department of Environmental Sciences, COMSATS Institute of Information Technology, Abbottabad, Khyber Pakhtunkhwa, Pakistan*

Article published on September 28, 2016

Key words: Khanpur valley, District haripur, Floristic studies, Flora of Khanpur, Plants of Khanpur

Abstract

A floristic inventory was carried out during 2012-2014 in Khanpur Valley, District Haripur, Khyber Pakhtunkhwa, Pakistan. Data pertaining to floral composition and other relevant information was collected through questionnaires, interviews & transect walks during the field visits. As a result total 283 plant species belonging to 101 families were documented. Fungi consisted of 1 species belonging to 1 family, algae 3 species belonging to 3 families, bryophytes 3 species belonging to 3 families, pteridophytes 3 species belonging to 1 family, gymnosperms 2 species belonging to 2 families, angiosperms 271 species belonging to 89 families (monocots represented by 38 species belonging to 11 families and dicots 233 species belonging to 78 families). There were 120 herbs, 80 shrubs, 64 trees and 19 climbers species. Of the total plant species recorded, there were 65 (22.96%) annuals, 5 (1.76%) biennials, and 213 (75.26%) perennials plants. Plants reported were tabulated according to botanical name, vernacular name, family, habit, life span, height, flower colour and flowering season. The study also indicated that flora of Khanpur Valley is under severe pressure due to deforestation, over grazing, over exploitation and subsequent fires. As a result valuable flora is getting depleted at alarming rate. Plant specimens collected were identified, preserved, mounted and voucher was deposited at the Department of Environmental Sciences, University of Haripur, KP, Pakistan for future references.

*Corresponding Author: Zeeshan Siddique ✉ zssbio@gmail.com

Introduction

Exploration of flora by plant taxonomists is proverbial throughout the world to have information about the plants. A flora is a compilation of all plant species growing in any geographic area. Through these floristic studies, valuable data is recorded which could be used as reference for future studies. Floristic studies are helpful in proper identification of plant-wealth for their utilization on a scientific and systematic basis. The identification of local plants along with the description of an area is very important because it can show specific species of the local area and their occurrence, growing season, species hardness, distinct species, finding new species and the effect of climatic conditions like drought and overgrazing on vegetation (Ali, 2008).

The study of floristic composition of the vegetation is crucial for conservation management and the ecologically sustainable management of natural resources that provides the starting point for more detailed study (Ejtehadi *et al.*, 2005; Tastad *et al.*, 2010). It aids in the identification and correct naming of species, essential resources for biodiversity estimates and biogeographic studies. Furthermore, this information provides important public outreach and fundamental information to use in addressing the biodiversity crisis (Funk *et al.*, 2007).

Floristic study and diversity assessments are necessary to understand the present diversity status and conservation of biodiversity. Floristic studies acquire increasing importance in recent years in response to the need of developing and under developing countries to assess their plant wealth (Vediya and Kharadi, 2011). Natural resources survey like floristic study plays an important role in the economic development of developing country like Pakistan.

Pakistan is a fairly large country endowed with a variety of climates, ecological zones and topographical regions. The flora is, likewise, extremely varied and diverse and highly fascinating.

Nearly 6000 species of flowering plants are reported from Pakistan and Kashmir (Shinwari, 1996). Literature regarding the research reveal that in recent years many researchers like Siddique *et al.*, 2016; Shaheen *et al.*, 2014; Qureshi *et al.*, 2014; Haq *et al.*, 2012; Qureshi *et al.*, 2011; Qureshi and Bhatti, 2010; Fazal *et al.*, 2010; Hussain and Ch, 2009; Ahmed *et al.*, 2008; Hussain *et al.*, 2008; and Shah and Khan, 2006; have visited most parts of Pakistan, but no area has been thoroughly explored. Regarding floristic studies, Khanpur Valley of District Haripur (Pakistan) is also virgin. No floristic studies have been conducted by any researcher in this valley till today. So at first, it was dire need to explore & document the floristic diversity of this important un-explored valley. The aim of this study was to provide floristic checklist of the study area. This will provide baseline date for future researches. This will serve as baseline information to taxonomists, phytosociologist, range managers, conservationists, herbal medicine manufacturers and policy makers for future research in the area under study.

Materials and methods

Study area

Khanpur valley (also Upper Khanpur or Hilly area of Khanpur) is the part of Haro Valley situated at the back of federal capital Islamabad and in District Haripur of Khyber Pakhtunkhwa (KP), Pakistan. Khanpur itself is a large and beautiful village in Valley and one of the 44 union council administrative subdivisions of Haripur District. It is located to the south of the District Capital Haripur at 33°48'53N 72°56'22E. It is famous throughout the Pakistan for its Oranges and is also known for the Khanpur Dam built over the Haro River. Whole Valley is drained by Haro River or its tributaries. Valley has beautiful pine, scrub and shrub forests, streams, waterfalls, peaks and gorges to watch. Valley has thick and enormous flora. The weather of the valley remains pleasant (Siddique *et al.*, 2016). Most part of valley is backward and is deprived of modern facilities. People are dependent on plant resources for their daily life requirements. Some Pictures of Khanpur valley are given in Figure 1.

Study design

The present study was carried out from March 2012 to March 2014. The study was completed in three steps i.e review of literature, visiting study area for data collection (field work) and documentation of data obtained during field visits.

Field visits

The whole study area was frequently visited, for the identification of local flora and to collect the information pertinent to floristic diversity. Field visits included observations, interviews, questionnaires, guided field walks, field note book and plants collection & preservation.

Observations

Keen observations were made during the field visits so as to study the local plants in Khanpur valley. Most plants were identified botanically during keen personal observations.

Interviews

The interviews were conducted in local community, to investigate local people and knowledgeable persons (Hakims, Pansaries, Women and Herdsmen) who are attached with plants. The local names of plants, habit, life span, flower colour, flowering/fruit season & other relevant information was documented during the interviews.

Questionnaires

Pre-planned questionnaires were served to draw the floristic information directly & indirectly. Questionnaire method was an effective approach to investigate females via children and students. Questionnaires provided useful information about the local names, habit, life span, flower colour, flowering/fruit season etc of the local flora.

Guided field walks

Guided field walks with experts & knowledgeable elder people of the study area helped a lot to explore, collect & identify the plants.

Field note book

Relevant field data i.e botanical name, vernacular name, family, habit, life span, height of plant, flower colour, flowering/fruit season was noted on field note book during the field visits.

Plants collection & preservation

During autumn and spring seasons plants in flowering/fruitlet stage were collected from various parts of Khanpur Valley. The plant specimens were pressed and dried properly for two weeks at room temperature using blotting papers. Plant specimens were poisoned with Mercuric chloride and absolute alcohol (2gm Mercuric chloride dissolved in 100ml of absolute alcohol) and mounted on herbarium sheets. Data taken in field was transferred to slips pasted on herbarium sheets. Each specimen was also given a collection number. Plants were identified with the help of available literature and taxonomic keys (Stewart, 1972; Nasir and Ali, 1970-2001; Ali and Qaiser, 1995-2005). Fungi specimen were collected in aluminum foil and preserved in distilled water. Algae & bryophytes, specimens were collected in polythene bags and then washed with water and preserved in Formalin-acetic acid-alcohol. The specimens were deposited in the Herbarium, Department of Environmental Sciences, University of Haripur, Khyber Pakhtunkhwa, Pakistan, for future references.

Documentation

Last phase of the research study was documentation of data collected from the field.

Results and discussions*Floristic diversity of Khanpur valley*

During the study total 283 plant species belonging to 101 families were documented. Fungi consisted of 1 species belonging to 1 family, algae 3 species belonging to 3 families, bryophytes 3 species belonging to 3 families, pteridophytes 3 species belonging to 1 family, gymnosperms 2 species belonging to 2 families, angiosperms 271 species belonging to 89 families (monocots represented by 38 species belonging to 11 families and dicots 233 species belonging to 78 families) as shown in Figure 2. Plants reported from the valley were tabulated according to botanical name, Vernacular name, family, habit, life span, height, flower colour and flowering season (Table 1).

Table 1. Floristic diversity of Khanpur valley.

S.No	Botanical name	Vernacular name	Family	Habit	Life-span	Height	Flower color	Flowering/ fruit season
FUNGI								
1	<i>Morchella esculenta</i> Fr.	Sirhli	Morchellaceae	Herb	Spring ephemeral	2.9 cm	---	---
ALGAE								
2	<i>Hydrodictyon</i> sp.	---	Hydrodictyaceae	Herb	Perennial	---	---	---
3	<i>Pithophora</i> sp.	---	Cladophoraceae	Herb	Perennial	---	---	---
4	<i>Spirogyra</i> sp.	Saawul	Zygnemataceae	Herb	Perennial	---	---	---
BRYOPHYTES								
5	<i>Funaria hygrometrica</i> Hedw.	---	Funariaceae	Herb	Annual	3-5 cm	---	---
6	<i>Marchantia polymorpha</i> L.	---	Marchantiaceae	Herb	Annual	10 cm	---	---
7	<i>Pellia epiphylla</i> (Raddi.) Dum.	---	Pelliaceae	Herb	Annual	10 cm	---	---
PTERIDOPHYTES								
8	<i>Adiantum capillus-veneris</i> L.	---	Pteridaceae	Herb	Perennial	15-30 cm	---	---
9	<i>Dryopteris blanfordi</i> C.Hope.	Kunjee	Pteridaceae	Herb	Perennial	90 cm	---	---
10	<i>Pteridium aquilinum</i> (L.) Kuhn	Kunji	Pteridaceae	Herb	Perennial	1-2 m	---	---
GYMNOSPERMS								
11	<i>Cupressus sempervirens</i> L.	Monrhpank	Cupressaceae	Tree	Perennial	20 m	---	---
12	<i>Juglans regia</i> Linn.	Akhrot	Juglanaceae	Tree	Perennial	25 m	---	---
ANGIOSPERMS (MONOCOTS)								
13	<i>Allium jacquemontii</i> Kunth	Jangli piaz	Alliaceae	Herb	Perennial	15-35 cm	Perianth pale red to pale purple	March-April
14	<i>Aloe barbadensis</i> Mill.	Kanwar-ghandal	Liliaceae	Herb	Perennial	0.6-1 m	Yellow corolla	Summer
15	<i>Apluda mutica</i> L.	Lundar	Poaceae	Herb	Perennial	1.3 m	Cream with violet margins	Aug-Nov
16	<i>Aristida cyanantha</i> Nees	---	Poaceae	Herb	Annual	2 m	Purplish	May-Sep
17	<i>Arundo donax</i> Linn.	Saroot	Poaceae	Herb	Perennial	5 m	Creamy yellow	June-Dec
18	<i>Asparagus gracilis</i> Royle.	Shahghandal	Asparagaceae	Subshrub	Perennial	1-2 m	Yellowish	March-June
19	<i>Asphodelus tenuifolius</i> Cav	Piazi	Liliaceae	Herb	Annual	15-50 cm	White	Nov-April
20	<i>Avena sativa</i> L.	kandal	Poaceae	Herb	Annual	1.5 m	Yellowish	May-August
21	<i>Bothriochloa intermedia</i> (R. Br.) A. Camus	---	Poaceae	Herb	Perennial	50-150 cm	Purplish	Jul-Oct
22	<i>Chrysopogon aucheri</i> Boiss.	---	Poaceae	Herb	Perennial	60 cm	Green	March-May & Sep-Nov
23	<i>Cymbopogon martinii</i> Roxb.	---	Poaceae	Herb	Perennial	3 m	Green & straw	Sep-Nov
24	<i>Cynodon dactylon</i> L.	Khabal	Poaceae	Herb	Perennial	10-40 cm	Purplish or green	July-Sep
25	<i>Cyperus rotundus</i> Linn.	Deela ghass	Cyperaceae	Grass	Perennial	140 cm	Purple to red	Summer
26	<i>Dactyloctenium aegyptium</i> (L.) P. Beauv.	Madhana Ghaas	Poaceae	Herb	Annual	60 cm	Greenish yellow	Summer
27	<i>Dichanthium annulatum</i> (Forssk.) Stapf in Praia	Palwan	Poaceae	Herb	Perennial	25-100 cm	Brownish	March-Nov
28	<i>Digitaria ischaemum</i> (Schreb.) Muhl.	---	Poaceae	Herb	Annual	10-1540 cm	Green or purple	July-Aug
29	<i>Dioscorea deltoidea</i> Wall. ex Griseb.	Kunj	Dioscoreaceae	Climber	Perennial	3 m	Brown	May-June
30	<i>Eleusine indica</i> (Linn.) Gaertn	---	Poaceae	Herb	Annual	15-85 cm	Whitish	June-Aug
31	<i>Eragrostis minor</i> Host.	---	Poaceae	Herb	Annual	6-60 cm	Yellowish green	May-Sep
32	<i>Hedera helix</i> auct. non Linn.: Brandis	---	Araliaceae	Climber	Perennial	30 m	Yellow	Oct-April
33	<i>Heteropogon contortus</i> (L.) P. Beauv.	---	Poaceae	Herb	Perennial	20-100 cm	Brown	Apr-Dec
34	<i>Imperata cylindrica</i> (L.) P. Beauv.	Siru	Poaceae	Herb	Perennial	10-120 cm	Grey	April-June
35	<i>Koeleria macrantha</i> (Ledebour) Schultes	---	Poaceae	Herb	Perennial	5-60 cm	Green	June-July

36	<i>Narcissus tazetta</i> L.	Gul-e-nargis	Amaryllidaceae	Herb	Perennial	80 cm	White or yellow	Feb-Mar	
37	<i>Phoenix sylvestris</i> (L.) Roxb.	Jangli Khajoor	Arecaceae/ Palmaceae	Tree	Perennial	7.5-15 m	White	March-April	
38	<i>Peganum harmala</i> L.	Harmal	Zygophyllaceae	Herb	Perennial	25-60 cm	White or yellowish white	March-April	
39	<i>Poa annua</i> L.	Kaaha	Poaceae	Herb	Annual	5-30 cm	pale or bright green	March-Sep	
40	<i>Polypogon fugax</i> Nees ex Steudel	Malhar	Poaceae	Herb	Annual	10-75 cm	pale green	Apr-Sep	
41	<i>Reinwardtia trigyna</i> Roxb.	---	Liliaceae	Sub-shrub	Perennial	1 m	Yellow	Feb-May	
42	<i>Rottboellia cochinchinensis</i> (Loureiro) Clayton	---	Poaceae	Herb	Annual	1-3 m	Yellow and green	Jul-Oct	
43	<i>Saccharum arundinaceum</i> Retzius	Sarkanda	Poaceae	Herb	Perennial	0.7-6 m	Pink	Aug-Dec	
44	<i>Saccharum spontaneum</i> Linn.	Kahi	Poaceae	Herb	Perennial	3 m	White	July-Sep	
45	<i>Setaria pumila</i> (Poir.) Roem. & Schult.	Band kangni	Poaceae	Herb	Annual	5-130 cm	Yellow	June-Oct	
46	<i>Smilax aspera</i> L.	Birari	Liliaceae	Climber	Perennial	3m	White	Sept-March	
47	<i>Sorghum halepense</i> (Linn.) Pers.	Barun	Poaceae	Herb	Perennial	0.5-3 m	Purple	May-Oct	
48	<i>Themeda anathera</i> Nees	---	Poaceae	Herb	Perennial	30-120 cm	Brownish	June-Oct	
49	<i>Tribulus terrestris</i> L.	Ghokru	Zygophyllaceae	Herb	Annual or biennial	20-60 cm	Yellow	Around the year	
50	<i>Typha angustifolia</i> L.	Kundor	Typhaceae	Herb	Perennial	1.5-3 m	Brownish	Jun-Sep	
ANGIOSPERMS (DICOTS)									
51	<i>Acacia catechu</i> (L. f.) Willd.	Khair, Katha	Mimosaceae	Tree	Perennial	15 m	White to pale yellow	April-Aug	
52	<i>Acacia farnesiana</i> (L.) Willd.	Vilaiti kikar	Mimosaceae	Shrub	Perennial	8 m	Orange	Nov-Mar	
53	<i>Acacia modesta</i> Wall.	Phulai	Mimosaceae	Tree	Perennial	3-5 m	Pale Yellow	Mar-May.	
54	<i>Acacia nilotica</i> (L.) Delile.	Kikar	Mimosaceae	Tree	Perennial	5-20 m	Golden-yellow	Mar-May	
55	<i>Acer caesium</i> Wall.	Tarkanni	Aceraceae	Tree	Perennial	25 m	white	May-Jun	
56	<i>Acer oblongum</i> Wall. ex DC.		Aceraceae	Tree	Perennial	12-15 m	Greenish-white	Feb-Mar	
57	<i>Acer pentapomicum</i> J.L. Stewart	Kilpattar.	Aceraceae	Shrub	Perennial	1.5 cm	Greenish	Mar-April	
58	<i>Achillea millefolium</i> L.	Akarkara	Asteraceae/ Compositae	Herb	Perennial	6-65 cm	White	Spring	
59	<i>Achyranthes aspera</i> Linn.	Puthkanda	<i>Amaranthaceae</i>	Herb	Perennial	0.2-2 m	Whitish or pale green to red or purple	Jun-Aug	
60	<i>Adhatoda vasica</i> Nees	Bhaikur, aroosa	Acanthaceae	Shrub	Perennial	2-2.5 m	White	Dec-April	
61	<i>Aechmanthera tomentosa</i> Nees	Pedar	Acanthaceae	Sub shrub	Perennial	1 m	Pale blue	Jun-Dec	
62	<i>Ailanthus altissima</i> (Mill) Swingle.	Darawa	<u>Simaroubaceae</u>	Tree	Perennial	30 m	Light green	May-June	
63	<i>Ajuga bracteosa</i> Wall.		Lamiaceae/ Labiataeae	Herb	Perennial	10-30 cm	Brown-black, corolla purple	April-June	
64	<i>Albizia chinensis</i> (Osbeck) Merrill		Mimosaceae	Tree	Perennial	30 m	Yellow	April-June	
65	<i>Albizia lebbek</i> (L.) Benth. in Hook	Sirin	Mimosaceae	Tree	Perennial	8-12 m	Green-yellow	April-May	
66	<i>Althaea officinalis</i> Linn.	Khatmi	Malvaceae	Herb	Annual	1 m	Corolla pink	Feb-May	
67	<i>Amaranthus spinosus</i> L.	Ganhar	<i>Amaranthaceae</i>	Herb	Annual	1.5 m	Green	Summer	
68	<i>Amaranthus viridis</i> L.	Chaleray	<i>Amaranthaceae</i>	Herb	Annual	40-80 cm	Green	Jun-Aug	
69	<i>Anagallis arvensis</i> L.	Dhaber booti	Primulaceae	Herb	Annual	10-30 cm	Blue to deep blue	May-Aug	
70	<i>Andrachne cordifolia</i> Wall.	Kurkuni	Euphorbiaceae	Shrub	Biennial or perennial	0.6-1.5 m	Pale greenish-yellow	June-Oct	
71	<i>Artemisia absinthium</i> Linn.	---	Asteraceae/ Compositae	Herb	Perennial	1.25 m	Yellow	June-Sep	
72	<i>Azadirachta indica</i> Adr. Juss.	Nim	Meliaceae	Tree	Perennial	15 m	White	April-May	

73	<i>Bacopa monnieri</i> (L.) Wettst.	Brahmi	<i>Scrophulariaceae</i>	Herb	Perennial	5 to 20 cm	White	May-Oct
74	<i>Barleria cristata</i> Linn	Bansa siyah	<i>Acanthaceae</i>	Shrub	Perennial	1.5 m	purple blue	Aug-Dec
75	<i>Bauhinia variegata</i> Linn.	Kalyarh, kichnar	<i>Caesalpinaceae</i>	Tree	Perennial	15 m	White or pale purple	Feb-April
76	<i>Berberis lycium</i> Royle	Sumbul	<i>Berberidaceae</i>	Shrub	Perennial	2-3 m	Pale-yellow	April-May
77	<i>Boerhavia diffusa</i> Linn.	Mehdevi	<i>Nyctaginaceae</i>	Herb	Perennial	2 m	White	Spring-autumn
78	<i>Bombax ceiba</i> Linn.	Sumbul	<i>Bombacaceae</i>	Tree	Perennial	25 m	Red	Mar-Apr
79	<i>Brassica campestris</i> Linn	Sarian	<i>Brassicaceae/</i> <i>Cruciferae</i>	Herb	Annual	100 cm	Yellow	Jan-March
80	<i>Broussonetia papyrifera</i> Linn.	Jangli toot	<i>Moraceae</i>	Tree	Perennial	3-12 m	Green to red	March-Aug
81	<i>Butea monosperma</i> (Lam.) Palas, dhak, chichra Taub		<i>Papilionaceae</i>	Tree	Perennial	12-15 m	brown velvety	Spring
82	<i>Buxus sempervirens</i> sensu Stewart & Brandis	shamshad, papra	<i>Buxaceae</i>	Shrub	Perennial	3-5 m	Green	Jan-May
83	<i>Caesalpinia decapetala</i> (Roth) Alston	Urian	<i>Caesalpinaceae</i>	Climber	Perennial	3 m	Yellow	March-April
84	<i>Calendula officinalis</i> Linn		<i>Asteraceae/</i> <i>Compositae</i>	Herb	Annual	20-75 cm	Yellow or orange	Apr-Sep
85	<i>Callistemon lanceolatus</i> (Sm.) Sweet	Bottle bursh	<i>Myrtaceae</i>	Tree	Perennial	3-4 m	Red	Mar-June
86	<i>Calotropis procera</i> (Ait.) Ait. f.	Ak	<i>Asclepiadaceae</i>	Shrub	Perennial	2-3 m	white or pinkish	Throughout the year
87	<i>Cannabis sativa</i> L.	Pang, bhang	<i>Cannabinaceae</i>	Sub shrub	Annual	0.2-6 m	Greenish-white	April-Oct
88	<i>Caralluma edulis</i> (Edgew.) Hook. f.	Chongaam	<i>Apocynaceae</i>	Herb	Perennial	15-45 cm	Whitish	Sep
89	<i>Carissa opaca</i> Stapf ex Haines	Grinda	<i>Apocynaceae</i>	Shrub	Perennial	3.5 meter	White	April-June
90	<i>Carthamus oxyacantha</i> M. Bieb.	Kantiari, pohli	<i>Asteraceae/</i> <i>Compositae</i>	Sub shrub	Annual	0.3-1 m	Yellow	May-Aug
91	<i>Casia fistula</i> Linn.	Kinjal, Amaltas	<i>Caesalpinaceae</i>	Tree	Perennial	20 m	Yellow	April-June
92	<i>Cassia sophora</i>	---	<i>Caesalpinaceae</i>	Shrub	Perennial	1-3 m	Yellow	Nov-Jan
93	<i>Cassytha filiformis</i> L.	Akash bail, amar bail	<i>Lauraceae</i>	Climber	Perennial	1-20 m	White	May-Jul
94	<i>Catharanthus roseus</i> (Linn.) G. Don	Sada bahar	<i>Apocynaceae</i>	Sub shrub	Perennial	30-60 cm	Pink or white	Throughout the year.
95	<i>Cedrela serrata</i> Royle	---	<i>Meliaceae</i>	Tree	Perennial	20 m	Ceramic	May-June
96	<i>Cedrela toona</i> Roxb. ex Willd.	Drawa	<i>Meliaceae</i>	Tree	Perennial	18-20 m	Ceramic	Mar-April
97	<i>Celtis australis</i> auct. non L.; Brandis	Batkhar	<i>Ulmaceae</i>	Tree	Perennial	15 m	Pale green	March-May
98	<i>Centella asiatica</i> L.	Barhami	<i>Apiaceae</i> (<i>Umbelliferae</i>)	Herb	Perennial	0.2 m	white	July-Aug
99	<i>Centratherum anthelminticum</i> (L.) Kuntze.	Kalijiri	<i>Asteraceae/</i> <i>Compositae</i>	Herb	Annual	60 cm	Pink	Nov-Feb
100	<i>Cestrum nocturnum</i> L.	Rat ki rani	<i>Solanaceae</i>	Shrub	Perennial	1-3 m	Greenish -yellow	March-May
101	<i>Chenopodium album</i> Linn.	b-thawa	<i>Chenopodiaceae</i>	Herb	Annual	0.1-1.5 m	Green-white	Jan-Sep
102	<i>Chenopodium ambrosoides</i> L.	Bathoo	<i>Chenopodiaceae</i>	Herb	Annual or perennial	1.2 m	Green	April-Jan
103	<i>Chenopodium murale</i> L.	Kurund	<i>Chenopodiaceae</i>	Herb	Annual	70-90 cm	Green	Jan-July
104	<i>Cichorium intybus</i> Linn.	Kasini	<i>Asteraceae/</i> <i>Compositae</i>	Herb	Annual	40-110 cm	Blue	May-Oct
105	<i>Cissampelos pareira</i> Linn.	Phalaan jarhi, Ghora sum	<i>Menispermaceae</i>	Climber (Herb)	Perennial	3-5 m	Yellow	July-Sep
106	<i>Citrus sinensis</i> (Linn.) Osbeck	Mausami Malta	<i>Rutaceae</i>	Tree	Perennial	10 m	Whitish	March-May
107	<i>Clematis connata</i> DC.	Bhail	<i>Ranunculaceae</i>	Climber	Perennial	5-7 m	Whitish	July-Aug
108	<i>Clematis gouriana</i> Roxb	Bhail	<i>Ranunculaceae</i>	Climber	Perennial	5-7 m	Greenish-white	Aug-Sep
109	<i>Clematis grata</i> Wall.	chamaan	<i>Ranunculaceae</i>	Climber	Perennial	3-5 m	Creamy-white	Aug-Sep
110	<i>Colebrookea oppositifolia</i> Smith	shakardana	<i>Lamiaceae/</i> <i>Labiatae</i>	Shrub	Perennial	2.5 m	Greenish white to mauve	Jan-April
111	<i>Conyza canadensis</i> (L.) Cronquist	Paleet	<i>Asteraceae/</i> <i>Compositae</i>	Herb	Annual	3-350 cm	Whitish flower	July-Sep

112	<i>Cordia obliqua</i> Willd.	Phytogr	Lasura	Boraginaceae	Tree	Perennial	3-5 m	Not seen	March-April
113	<i>Coriaria nepalensis</i> Wallich		Balel	<u>Coriariaceae</u>	Shrub	Perennial	1.5-2.5 m	Greenish-yellow	Feb-May
114	<i>Cornus macrophylla</i> Wall.		Kandar	Cornaceae	Tree	Perennial	12-15 m	White	April-June
115	<i>Coronopus didymus</i> (L.) Sm.		---	Brassicaceae/ Cruciferae	Herb	Annual or biennial	15-30 cm	White	March-June
116	<i>Cotoneaster bacillaris</i> Wall.	ex Luni Lindl.		Rosaceae	Small tree	Perennial	5 m	White	June
117	<i>Cryptolepis buchanani</i> Roem. & Schult.		---	Asclepiadaceae	Climber	Perennial	7-10 m	Pale yellow	May-July
118	<i>Cuscuta reflexa</i> Roxburgh		Bail	<i>Cuscutaceae</i>	Climber	Perennial	20 m	Ivory white	Aug-Nov
119	<i>Cynoglossum officinale</i> L.		---	<i>Boraginaceae</i>	Herb	Biennial/ Perennial	0.5 m	reddish-purple	Jun to Aug
120	<i>Dalbergia sissoo</i> Roxb.	Ex DC	Taali, sheesham	Papilionaceae	Tree	Perennial	30 m	Yellowish white	May-July
121	<i>Daphne mucronata</i> Royle		Kutilal	Thymelaeaceae	Shrub	Perennial	2.5 m	White	April-Sep
122	<i>Datura stramonium</i> L.		Datura	Solanaceae	Sub shrub	Annual	1.5 m	White	March-Sep
123	<i>Debregeasia salicifolia</i> D. Don		Sandoori, chenjul	Urticaceae	Tall shrub	Perennial	5-7m	Red/orange	March-June
124	<i>Desmodium latifolium</i> Roxb.		Chamra DC.	Caesalpinaceae	Under shrub	Perennial	60-120 cm	Purple to pink	July-Aug
125	<i>Dicliptera roxburghiana</i> Nees		---	Acanthaceae	Herb	Annual	90 cm	Pink	Nov-May
126	<i>Diospyrus lotus</i> L.		Amlok	Ebenaceae	Tree	Perennial	2-10 m	Pale green to reddish greenish yellow	to May-June
127	<i>Dodonaea viscosa</i> (Linn.) Jacq., Enum.		Sanatha	Sapindaceae	Shrub	Perennial	5 m	greenish yellow	May-June
128	<i>Echinops echinatus</i> Roxb.		Unt katara	Asteraceae/ Compositae	Sub shrub	Annual	1 m	white	Dec-Jan
129	<i>Eclipta prostrata</i> L.		Bhangra	Asteraceae/ Compositae	Herb	Annual	0.6 m	White	August
130	<i>Ehretia laevis</i> Roxb		Sakkar	Boraginaceae	Tree	Perennial	9 m	White	Feb-April
131	<i>Eruca Sativa</i>		Jamian	Brassicaceae/ Cruciferae	Herb	Annual	10-80 cm	Dirty white	April-June
132	<i>Eucalyptus globulus</i> Labill.		Gond	Myrtaceae	Tree	Perennial	55 m	White	Dec-May
133	<i>Euphorbia helioscopia</i> L.		Chhatri Dodak	Euphorbiaceae	Herb	Annual	50 cm	Yellowish green	Jan - July
134	<i>Euphorbia hirta</i> L.		Dudhi	Euphorbiaceae	Herb	Annual	60 cm	Bright green	July-Dec.
135	<i>Euphorbia nerifolia</i> L.		Thoar	Euphorbiaceae	Shrub	Perennial	3-5 m	Yellowish	Jun-Sep.
136	<i>Euphorbia prostrata</i> Ait.		Dodal	Euphorbiaceae	Herb	Annual	30 cm	Green	Around the year
137	<i>Euphorbia royleana</i> Boiss.		Lenthoar	Euphorbiaceae	Shrub	Perennial	5-7 m	Yellowish	Hot weather
138	<i>Ficus benghalensis</i> L.		Bohr	Moraceae	Tree	Perennial	20-25 m	Pinkish-red	Around the year
139	<i>Ficus carica</i> L.		Anjeer	Moraceae	Tree	Perennial	5-9 m	Not seen	Feb-Mar
140	<i>Ficus elastica</i> Roxb.	ex Hornem.	Ruber plant	Moraceae	Tree	Perennial	30 m	White	March-April
141	<i>Ficus glomerata</i> Roxb.		Rombal	Moraceae	Tree	Perennial	10-20 m	White	March-May
142	<i>Ficus johannis</i> Boiss.		Trekani	Moraceae	Shrub	Perennial	3-4 m	Not seen	May-Aug
143	<i>Ficus palmata</i> Forssk.		Phagwari	Moraceae	Shrub	Perennial	10 m	Not seen	May-Nov
144	<i>Ficus religiosa</i> L.		Peepal	Moraceae	Tree	Perennial	20 m	Green	February
145	<i>Flacourtia indica</i> (Burman f.) Merrill		kokoh	Flacourtiaceae	Tree	Perennial	3-6 m	White	March-April
146	<i>Foeniculum vulgare</i> Mill.		Sonf	<i>Apiaceae</i> (Umbelliferae)	Herb	Perennial	2 m	Yellow	May-Jun
147	<i>Fumaria indica</i> (Hauskn.) H.N. Pugsley		Papra	Fumariaceae	Herb	Annual	5-40 cm	Pale pinkish	March-June
148	<i>Geranium rotundifolium</i> L.		Choti rattanjot	Geraniaceae	Herb	Annual	10-40 cm	Purplish	March-April
149	<i>Glochidion velutinum</i> Wight		Gor kamila	Euphorbiaceae	Small tree	Perennial	9 m	Yellow	May-July
150	<i>Grevillea robusta</i> A.Cunn. R.Br.		ex	Proteaceae	Tree	Perennial	10-25 m	Orange yellow	March-April
151	<i>Grewia asiatica</i> Linn		Falsa	Tiliaceae	Tree	Perennial	8 m	Orange-yellow	March-Sep
152	<i>Grewia optiva</i> J. R. Drumm. Burret		ex Taman	Tiliaceae	Tree	Perennial	15 m	Yellowish-red	June-July

153	<i>Gymnosporia royleana</i> (Wall.) Patakhi ex Lawson		<u>Celastraceae</u>	Shrub	Perennial	1-3 m	Whitish	Around the year
154	<i>Hiptage madablota</i> Gaertn.	---	<u>Malpighiaceae</u>	Climber	perennial	30 feet	Creamish white	March-April
155	<i>Hypericum oblongifolium</i>	---	<u>Hypericaceae/</u> <u>Guttiferae</u>	Shrub	Perennial	0.4-2 m	Yellow	March-Aug
156	<i>Ichnocarpus frutescens</i> (L.) W. Bhakhara T. Aiton		<u>Apocynaceae</u>	Shrub	Perennial	10 m	White	Aug-Dec
157	<i>Indigofera gerardiana</i> Wall. ex Kainthi Baker.		<u>Caesalpinaceae</u>	Shrub	Perennial	1.8-2.5 m	Pink	May July
158	<i>Indigofera pulchella</i> Roxb.	Kainthi	<u>Caesalpinaceae</u>	Shrub	Perennial	10-15 cm	Pink	March-May
159	<i>Inula cappa</i> Buch.-Ham. DC.	Kuchi	<u>Asteraceae</u>	Shrub	Perennial	1.8 m	Yellow	June-Aug
160	<i>Ipomoea carnea</i> Jacq.	Akri	<u>Convolvulaceae</u>	Shrub	Perennial	1-5m	Pinkish	Spring
161	<i>Jasminum humile var humile f. pubigerum</i> (D.Don) Grohmann	Peeli chambeli	<u>Oleaceae</u>	Shrub	Perennial	0.5-3 m	Yellow	Apr-Jul
162	<i>Jasminum officinale</i> Linn.	Chambeli	<u>Oleaceae</u>	Climber	Perennial	0.4-5 m	White	May-July
163	<i>Jasminum sambac</i> (Linn.) Ait., Hort.		<u>Oleaceae</u>	Shrub	Perennial	3 m	White	Warm season
164	<i>Kalanchoe laciniata</i> (Linn.) de Candolle	Zakhm e hayat	<u>Crassulaceae</u>	Herb	Perennial	20-100 cm	Yellowish orange	Mar
165	<i>Kydia calycina</i> Roxb.	---	<u>Malvaceae</u>	Tree	Perennial	20 m	Brown	Sep-Nov
166	<i>Lagerstroemia indica</i> Linn.	---	<u>Lythraceae</u>	Shrub	Perennial	7 m	Purple	Spring and summer months
167	<i>Lanena coromandelica</i> (Houtt) Merrill	Kamlai	<u>Anacardiaceae</u>	Small tree	Perennial	10 m	Green yellow	March-Apr
168	<i>Lantana camara</i> L.	Panch phali	<u>Verbenaceae</u>	Shrub	Perennial	1-4 m	Orange or yellow	Throughout the year
169	<i>Lantana indica</i> Roxb.	Ghaneri	<u>Verbenaceae</u>	Shrub	Perennial	1-2.5 m	Whitish, or pinkish	July-Sep
170	<i>Leucas capitata</i> Desf.	Goma booti	<u>Lamiaceae/Labiatae</u>	Herb	Annual	10-50 cm	White	July-Oct
171	<i>Ligustrum lucidum</i> W. T. Aiton		<u>Oleaceae</u>	Shrub or tree	Perennial	25 m	Creamish-white	May-Jul
172	<i>Lonicera quinquelocularis</i> Phut Hardw.		<u>Caprifoliaceae</u>	Large shrub	Perennial	6 m	White	April-July
173	<i>Mallotus philippensis</i> (Lam.) Muell. Arg	kamila	<u>Euphorbiaceae</u>	Shrub	Perennial	3-6 m	Redish-brown	Aug-Sep
174	<i>Malva neglecta</i> Wallr.	Sonchal	<u>Malvaceae</u>	Herb	Annual	0.6 m	Light pink	Mid-summer
175	<i>Malva sylvestris</i> Linn.	Khabazi	<u>Malvaceae</u>	Herb	Biennial	1.25 m	Pink-purple	Jun to Sep
176	<i>Malvestrum coromendelianum</i> (L.) Garcke	Dhamni boti	<u>Malvaceae</u>	Sub shrub	Annual or biennial	1-1.5 m	Yellow	Mid-summer
177	<i>Martynia annua</i> L.	---	<u>Martyniaceae</u>	Herb	Annual	1.5 m	Blue or yellow	Aug-Nov
178	<i>Matricaria chamomilla</i> L.	---	<u>Asteraceae/</u> <u>Compositae</u>	Herb	Annual	10-40 cm	Yellow	May-Jul
179	<i>Melia azedarach</i> L.	Daraik, bakain	<u>Meliaceae</u>	Tree	Perennial	10 m	lilac	Mar-May
180	<i>Melilotus indica</i> (L.) All.	Senji	<u>Papilionaceae</u>	Herb	Annual	15-60 cm	Yellow	March-Aug
181	<i>Mentha arvensis</i> L.	Podina	<u>Lamiaceae/</u> <u>Labiatae</u>	Herb	Perennial	30-120 cm	light purple	July-Sep
182	<i>Mentha longifolia</i> L.	Chita podna	<u>Lamiaceae/</u> <u>Labiatae</u>	Herb	Perennial	30-120 cm	light purple or white	May-Nov
183	<i>Mentha X piperita</i> L.	Podna	<u>Lamiaceae/</u> <u>Labiatae</u>	Herb	Perennial	30-100 cm	tinged purple and white	July
184	<i>Micromeria biflora</i> (Buch.-Ham. ex D. Don) Benth.	Chai boti	<u>Lamiaceae/</u> <u>Labiatae</u>	Herb	Perennial	30 cm	Reddish	Around the year
185	<i>Mimosa rubicaulis</i> Lamarck.	Shiah-kanta	<u>Mimosaceae</u>	Climber	Perennial	6m	Pinkish	September
186	<i>Mirabilis jalapa</i> Linn.	Gul-e-abbasi	<u>Nyctaginaceae</u>	Herb	Perennial	1.5 m	Reddish	Sept.-Oct
187	<i>Monothecha buxifolia</i> (Falc.) DC.	A. Kala meva	<u>Sapotaceae</u>	Small tree	Perennial	1-3m	Rusty	April-May
188	<i>Moringa Oleifera</i> Lam.	Sohanjna	<u>Moringaceae</u>	Tree	Perennial	10-12m	White	Jan.-April

189	<i>Morus alba</i> L.	Chita toot	Moraceae	Tree	Perennial	8-15 m	Green	April-Sep
190	<i>Morus nigra</i> L.	Kala toot, she-toot	Moraceae	Tree	Perennial	10 m tall	Green	March-July
191	<i>Myrsine africana</i> L.	khokonr	<i>Myrsinaceae</i>	Shrub	Perennial	1 m	Yellowish white	March-May
192	<i>Nasturtium officinale</i> W. T. Aiton	Tara meera	Brassicaceae/ Cruciferae	Herb	Perennial	10-80 cm	White	April-July
193	<i>Nelumbo nucifera</i> Gaertn.	Kanwal	Nymphaeaceae	Herb	Perennial	1 m	Pinkish red or white	Around the year
194	<i>Nepeta cataria</i> L.	---	Lamiaceae/ Labiatae	Herb	Perennial	40-150 cm	White	June-July
195	<i>Nerium oleander</i> L. <i>Syn: N. indicum</i> Mill.	Kundair	Apocynaceae	Shrub	Perennial	6 m	Pink or dark red	April-June
196	<i>Nymphaea alba</i> L.	Kanwal	Nymphaeaceae	Herb	Perennial	30-150 cm	White-yellowish green	July-Aug
197	<i>Ocimum basilicum</i> L.	Niaz-bo	Lamiaceae/Labiatae	Herb	Annual	20-80 cm	Purplish white	July-Dec
198	<i>Olea europaea</i> L.	Zaitoon	Oleaceae	Tree	Perennial	7 m	Whitish	April-May
199	<i>Olea ferruginea</i> Royle.	Kaho	Oleaceae	Tree	Perennial	10 m	Whitish	April-May
200	<i>Olea glandulifera</i> Wall.	Barkao	Oleaceae	Tree	Perennial	5-20 m	Cream	April-May
201	<i>Opuntia dillenii</i> (Ker Gawler) Haworth	---	Cactaceae	Shrub	Perennial	1-3 m	Bright yellow	Jun-Oct(-Dec)
202	<i>Opuntia monacantha</i> Haw.	Nagphana	Cactaceae	Shrub	Perennial	1.3-4 m	Yellow to orange	Apr-Aug
203	<i>Otostegia limbata</i> (Benth.) Boiss.	Bombuli, kanda	Lamiaceae/Labiatae	Shrub	Perennial	40-60 cm	Pale	April-May
204	<i>Oxalis acetosella</i> L.	khatkurla	Oxalidaceae	Herb	Perennial	4-18 cm	White	April-May
205	<i>Oxalis corniculata</i> L.	Khatti buti	Oxalidaceae	Herb	Annual or Perennial	50 cm	Bright yellow	March-June
206	<i>Parkinsonia aculeate</i> L.	Vilayeti kikar	Caesalpinaceae	Shrub	Perennial	4 m	yellow	March-May
207	<i>Parrotia Jacquemontiana</i> Decne.	Pasher	Hamamelidaceae	Shrub	Perennial	5 m	White or green	March-May
208	<i>Parthenium hysterophorus</i> L.	---	Asteraceae/ Compositae	Herb	Annual	30-120 cm	White	Apr-Aug
209	<i>Periploca aphylla</i> Dcne.	Butra	<i>Periplocaceae</i>	shrub	Perennial	1.8-3 m	Greenish	March-May
210	<i>Phyla nodiflora</i> (L.) Greene	Makra	Verbenaceae	Herb	Perennial	7-14 cm	White	Around the year
211	<i>Phyllanthus emblica</i> L.	Amla	Phyllanthaceae	Tree	Perennial	15-20 m	Green	March-May
212	<i>Pinus roxburghii</i> Sargent	Cheer	Pinaceae	Tree	Perennial	30 m	---	---
213	<i>Pistacia integerrima</i> J. L. Stewart ex Brandis	L. kangur	<i>Anacardiaceae</i>	Tree	Perennial	18 m	reddish in lateral panicles	March-May
214	<i>Pistia stratiotes</i> L.	---	Araceae	Aquatic herb	Perennial	50 cm	Spath white	Hot season
215	<i>Pisum sativum</i> L.	Mattar	<i>Papilionaceae</i>	Climber	Annual	0.5-2 m	White	Feb-Sep
216	<i>Platanus orientalis</i> L.	Chinar	<i>Platanaceae</i>	Tree	Perennial	25 m	Salmon	April-May
217	<i>Plectranthus rugosus</i> Wall. ex Benth.	---	Lamiaceae/ Labiatae	Shrub	Perennial	30-160 cm	White	March-Oct
218	<i>Plumbago zeylanica</i>	Chetra	Plumbaginaceae	Shrub	Perennial	1 - 3 m	White	July-Sep
219	<i>Populus ciliata</i> Wall. ex Royle	safeda	<u>Salicaceae</u>	Tree	Perennial	20 m	Green	March-April
220	<i>Porana paniculata</i> Roxb.	Safed bel	<i>Convolvulaceae</i>	Climber	Perennial		White	Oct - Mar
221	<i>Portulaca oleracea</i> Linn.	Khurfa , kolfa	<u>Portulacaceae</u>	Herb	Annual or Perennial	25 cm	White or purplish	Around the year
222	<i>Prosopis juliflora</i> Swartz	Velayti kikar	Mimosaceae	Large shrub	Perennial	5 m	Greenish yellow	March-June
223	<i>Prunus armeniaca</i> L.	Hari	Rosaceae	Tree	Perennial	9 m	White	Feb-March
224	<i>Prunus domestica</i> L.	Alucha	Rosaceae	Tree	Perennial	9 m	White	Feb-March
225	<i>Punica granatum</i> L.	Daruna	Punicaceae	Shrub	Perennial	1.5-5 m	Red or white	April-July
226	<i>Pyrus pashia</i> Buchanan Hamilton ex D. Don	Batangi	Rosaceae	Tree	Perennial	12 m	White	Feb-March
227	<i>Quercus dilatata</i> Royle	Barungi	Fagaceae	Tree	Perennial	20 m	Greenish	April-May
228	<i>Quercus glauca</i> Thunb	Barin	Fagaceae	Tree	Perennial	15 m	Greenish	March-April
229	<i>Quercus ilex</i> L.	---	Fagaceae	Small tree	Perennial	2.5-8 m	Yellow catkins	April-May

230	<i>Quercus inccana</i> Roxb.	Rhin	<u>Fagaceae</u>	Tree	Perennial	6-18 m	Greenish -yellow	April-May
231	<i>Rhamnus purshiana</i> DC.	Kalamewa	Rhamnaceae	Large shrub	Perennial	4.5-10 m	Greenish yellow	Mid spring
232	<i>Rhamnus triquetra</i> Wall.	Jalidar	Rhamnaceae	Tree	Perennial	7m	Greenish white	July-Aug
233	<i>Rhamnus virgatus</i> Roxb.	Sotapaja	Rhamnaceae	Shrub	Perennial	2 m	yellow	
234	<i>Rhus cotinus</i> L.	Phanr	<i>Anacardiaceae</i>	Shrub	Perennial	3-5m	Yellowish-pink	April-May.
235	<i>Rhus javanica</i> L.	Titro	<i>Anacardiaceae</i>	Tree	Perennial	12 m	White	Aug-Sep
236	<i>Rhus succedanea</i> L.	Kakra singhi	<i>Anacardiaceae</i>	Small tree	Perennial	10 m	greenish- yellow	Spring
237	<i>Ricinus communis</i> L.	Arand	Euphorbiaceae	Shrub	Perennial	5 m	Male flower: yellowish-green	At most seasons
238	<i>Rosa moschata</i> Herrm.	Jhal	Rosaceae	Climber	Perennial	10 m	White	June-July
239	<i>Rubus ellipticus</i> Smith.	Akha	Rosaceae	Shrub	Perennial	1-3 m	Pink	Mar-Apr
240	<i>Rubus fruticosus</i> Loureiro	Garacha	Rosaceae	Shrubs	Perennial	3 m	Pink	May-Sep
241	<i>Rumex dentatus</i> L.	Ola	Polygonaceae	Herb	Annual	30-70 cm	White	May-Jun
242	<i>Rumex hastatus</i> D. Don	Katmat, tehtur	Polygonaceae	Shrub	Perennial	1m	Pink	Apr-May
243	<i>Sageretia thea</i> (Osbeck) M.C	Gangeeri	Rhamnaceae	Shrub	Perennial	3 m	Yellow	Jul-Sep
244	<i>Salix acmophylla</i> Boiss.	Bheens	Salicaceae	Large shrub	Perennial	70-130 cm	Silver green	Feb-April
245	<i>Salvia moorcroftiana</i> Wallich ex Bentham	Kallijari	Lamiaceae/ Labiatae	Herb	Perennial	2.5 feet	Pale lilac	May-June
246	<i>Sapindus mukorossi</i> Gaertn.	Rehtaa	Sapindaceae	Tree	Perennial	20 m	Greenish-yellow	May-June
247	<i>Sarcococca pruniformis</i> Lindl.	Ohela	Euphorbiaceae	Shrub	Perennial	2 m	Yellow	Sep-April
248	<i>Senecio chrysanthemoides</i> --- Candolle	---	Asteraceae/ Compositae	Herb	Perennial	40-80 cm	Yellow	April
249	<i>Silybum marianum</i> (L.)Gaertn.	Kandiari	Asteraceae/ Compositae	Herb	Biennial	1 m	Purple	July-Sep
250	<i>Sinapis arvensis</i> L.	Jangli sarson	Brassicaceae/ Cruciferae	Herb	Annual	20-60 cm	Yellow	April-June
251	<i>Sisymbrium irio</i> L.	Khubkalan,khakasi	Brassicaceae/ Cruciferae	Herb	Annual	10-60 cm	Yellow	March-May
252	<i>Solanum erianthum</i> D. Don	---	Solanaceae	Shrub	Perennial	120-150 cm	White	Around the year
253	<i>Solanum nigrum</i> L.	Kach mach	Solanaceae	Herb	Annual	15-60 cm	White	May-Aug
254	<i>Solanum pseudo-capsicum</i> L.	---	Solanaceae	Shrub	Perennial	90-120 cm	White	May-July
255	<i>Solanum surattense</i> Burm. f.	Mohkree	Solanaceae	Herb	Annual	15 cm	Purple	Around the year
256	<i>Solidago canadensis</i> L	---	Asteraceae/ Compositae	Herb	Perennial	150 cm	Golden yellow	Aug-Sep
257	<i>Sonchus asper</i> (Linnaeus) Hill	---	Asteraceae/ Compositae	Herb	Annual	20-50 cm	Yellow	May-Oct
258	<i>Strobilanthes alatus</i> Nees	---	Acanthaceae	Shrub	Perennial	1.2 m	dark-blue	June-Oct
259	<i>Strobilanthes glutinosus</i> Nees in Wall.	---	Acanthaceae	Herb	Perennial	1.5 m	Pale blue	Nov-March
260	<i>Tamarindus indica</i> L.	Imli	Caesalpinaceae	Tree	Perennial	10-15 m	Pale yellow	May -June.
261	<i>Taraxacum officinale</i> Wigg.	F.H. Hand	Asteraceae/ Compositae	Herb	Perennial	15 cm	Yellow	Early Spring
262	<i>Tinospora cordifolia</i> (Willd.) Miers. ex Hook.f. and Thoms.	Gulo	Menispermaceae	Climber	Perennial	4-10m	Yellow or green	Summer
263	<i>Trachyspermum ammi</i> (L.) Sprague	Ajwain	<i>Apiaceae</i> (Umbelliferae)	Herb	Annual	25-140 cm	White	May-Aug
264	<i>Trianthema portulacastrum</i> L.	It-sit	Aizoaceae	Herb	Annual	35 cm	pink or white	Summer
265	<i>Trichodesma indicum</i> (L.) R. Br.	Kali booti	Boraginaceae	Herb	Annual	50cm	lilac	Around the year
266	<i>Trifolium repens</i> L.	shatal	Papilionaceae	Herb	Perennial	10-30 cm	White or pinkish	April-July
267	<i>Trigonella foenum-graecum</i> L.	Methi	<i>Papilionaceae</i>	Herb	Annual	10-50 cm	Yellowish white	April
268	<i>Urtica dioica</i> L.	Bichu booti	Urticaceae	Herb	Perennial	50-150 cm	Pale-greenish, whitish	or May-Sep
269	<i>Verbascum thapsus</i> L.	---	Scrophulariaceae	Herb	Biennial	1.5 m	Yellow	March-Oct
270	<i>Verbena officinalis</i> L.	---	Verbenaceae	Herb	Annual	or 25-100 cm	Pale pink	or June-Dec.

271	<i>Viburnum cotinifolium</i> D.Don.	Taliana	Caprifoliaceae	Shrub	perennial Perennial	3 m	purplish yellow-whitish gray-whitish	or March-May
272	<i>Viburnum grandiflorum</i> Wall. Ex DC.	Ghuch	Caprifoliaceae	Shrub	Perennial	2-3 m	Pinkish whitish	Nov-June
273	<i>Viola odorata</i> L.	Ba-nafsha	Violaceae	Herb	Annual to perennial	3-15 cm	Violet	March-July
274	<i>Vitex negundo</i> L.	Somali, marvand	Verbenaceae	Shrub	Perennial	1-2 m	blue or violet	Around the year
275	<i>Vitis vinifera</i> L.	Dakh	Vitaceae	Climber	Perennial		Greenish	May –July
276	<i>Withania somnifera</i> (L.) in DC.	Dunal Asghand	Solanaceae	Herb	Perennial	60-90 cm	Yellowish green	Around the year
277	<i>Woodfordia fruticosa</i> (L.) S.Kurz.	Taawi, dhawi	Lythraceae	Shrub	Perennial	2.5 m	Red-orange	March-April
278	<i>Xanthium strumarium</i> L.	Chota dhatura	Asteraceae/ Compositae	Herb	Annual	20-120 cm	White	Jul-Aug
279	<i>Xylosma longifolium</i> Clos.	Batti	Flacourtiaceae	Tree	Perennial	14 m	Yellowish	Winter
280	<i>Zanthoxylum armatum</i> DC	Timber	Rutaceae	Shrub,	Perennial	5 m	Pale red	March-April
281	<i>Ziziphus nummularia</i> Burm. <i>Syn: Rhammus nummularia</i> Burn.	Jahri ber	Rhamnaceae	Shrub	Perennial	5 m	Yellow	March-June
282	<i>Ziziphus oxyphylla</i> Edgew.	Pithni	Rhamnaceae	Tree or shrub	Perennial	1.5-2 m	Yellow	June-Sep
283	<i>Zizyphus jujuba</i> Mill.	Sao Bair	Rhamnaceae	Tree or shrub	Perennial	10 m	Yellow-green	June-July

Enumeration of floristic diversity of Khanpur valley
Fungi shares 0.35%, algae 1.06%, bryophytes 1.06%, pteridophytes 1.06%, gymnosperms 0.70% and angiosperms 95.75% (monocots 13.42% and dicots 82.33%) of total explored flora of Khanpur Valley.

There are 120 herbs, 80 shrubs, 64 trees and 19 climbers species as shown in Figure 3. Of the total plant species there are 65 (22.96%) annuals, 5 (1.76%) biennials, and 213 (75.26%) perennials plants as shown in Figure 4.

Families share of flora of Khanpur valley

Family Poaceae/Gramineae was the largest family with 24 species, followed by Asteraceae/Compositae with 18 species, Lamiaceae/Labiatae 12 species, *Moraceae* & *Euphorbiaceae* 10 each, *Caesalpinaceae* 9, *Mimosaceae* 8, *Oleaceae*, *Rhamnaceae*, *Rosaceae* & *Solanaceae* 7 each, *Acanthaceae*, *Brassicaceae* & *Papilionaceae* 6 each, *Anacardiaceae*, *Apocynaceae*, *Malvaceae* & *Verbenaceae* 5 each, *Boraginaceae*,

Fagaceae, *Liliaceae* & *Meliaceae* 4 each, *Aceraceae*, *Amaranthaceae*, *Apiaceae*, *Caprifoliaceae*, *Chenopodiaceae* & *Ranunculaceae* 3 each, *Asclepiadaceae*, *Cactaceae*, *Convolvulaceae*, *Flacourtiaceae*, *Fumariaceae*, *Lythraceae*, *Menispermaceae*, *Myrtaceae*, *Nyctaginaceae*, *Nymphaeaceae*, *Oxalidaceae*, *Polygonaceae*, *Rutaceae*, *Salicaceae*, *Sapindaceae*, *Scrophulariaceae*, *Tiliaceae*, *Urticaceae* & *Zygophyllaceae* 2 each, *Aizoaceae*, *Alliaceae*, *Amaryllidaceae*, *Araceae*, *Araliaceae*, *Arecaceae/Palmaceae*, *Asparagaceae*, *Berberidaceae*, *Bombacaceae*, *Buxaceae*, *Cannabinaceae*, *Celastraceae*, *Coriariaceae*, *Cornaceae*, *Crassulaceae*, *Cupressaceae*, *Cuscutaceae*, *Cyperaceae*, *Dioscoreaceae*, *Ebenaceae*, *Funariaceae*, *Geraniaceae*, *Hamamelidaceae*, *Hypericaceae/Guttiferae*, *Juglanceae*, *Lauraceae*, *Malpighiaceae*, *Marchantiaceae*, *Martyniaceae*, *Morchellaceae*, *Moringaceae*, *Myrsinaceae*, *Pelliaceae*, *Periplocaceae*, *Phyllanthaceae*, *Pinaceae*, *Platanaceae*,

Plumbaginaceae, Portulacaceae, Primulaceae, Proteaceae, Pteridaceae, Punicaceae, Sapotaceae, Simaroubaceae, Thymelaeaceae, Tiliaceae, Typhaceae, Ulmaceae, Violaceae & Vitaceae with 1 species each as shown in Figure 5.

Description of families

Fungi is represented by 1 family, algae & bryophytes 3 families each, pteridophytes 1 family, gymnosperms 2 families and angiosperms represented by 89 families (monocots represented by 11 families and dicots 78 families).



Fig. 1. Introduction to Khanpur valley.

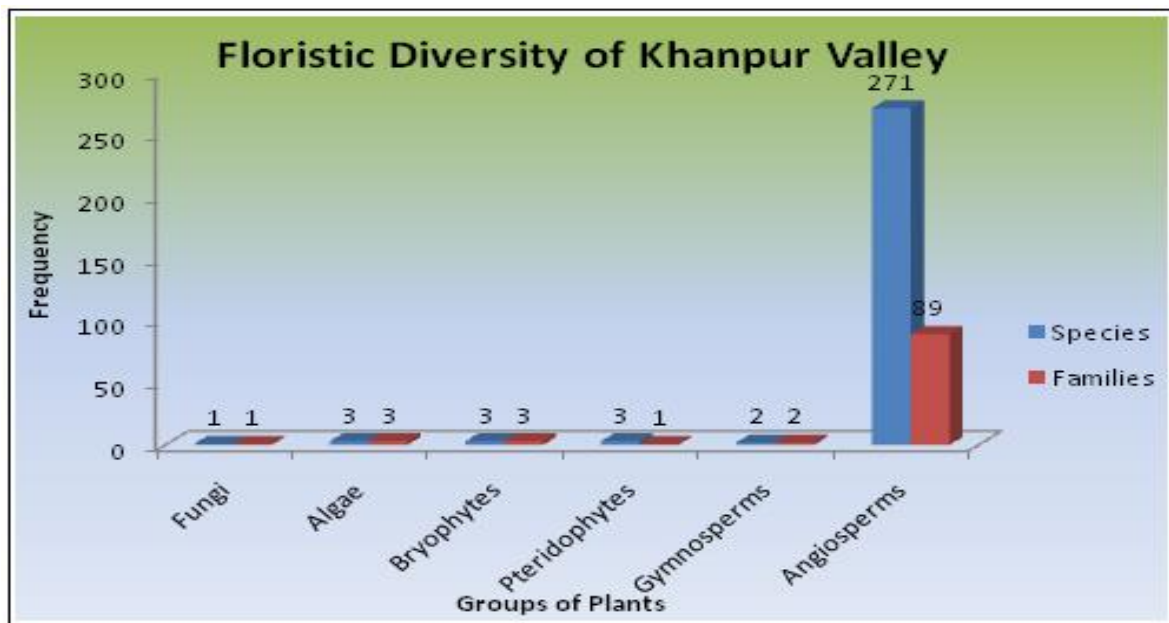


Fig. 2. Floristic diversity of Khanpur valley.

Species to family analysis

Results showed that number of species against respective family is much lower as there are only 283 species reported against 101 families. This reflects that there is not only rapid declination of flora due to

anthropogenic activities but also there is much floristic diversity in Khanpur valley. Furthermore, comprehensive floristic research studies are required for complete exploration of further plant species of the Khanpur area.

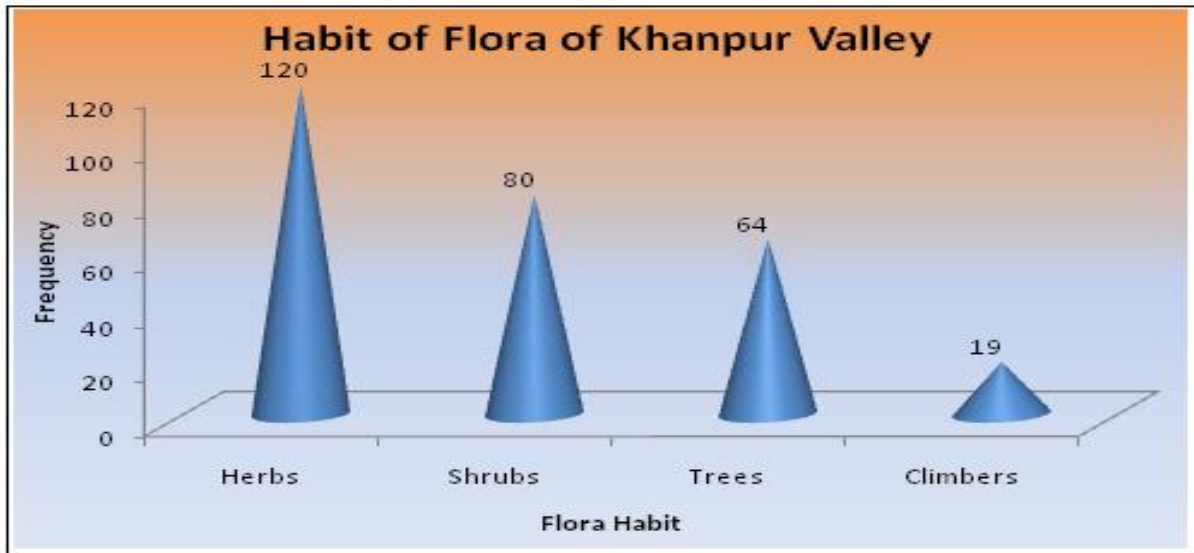


Fig. 3. Habit of flora of Khanpur valley.

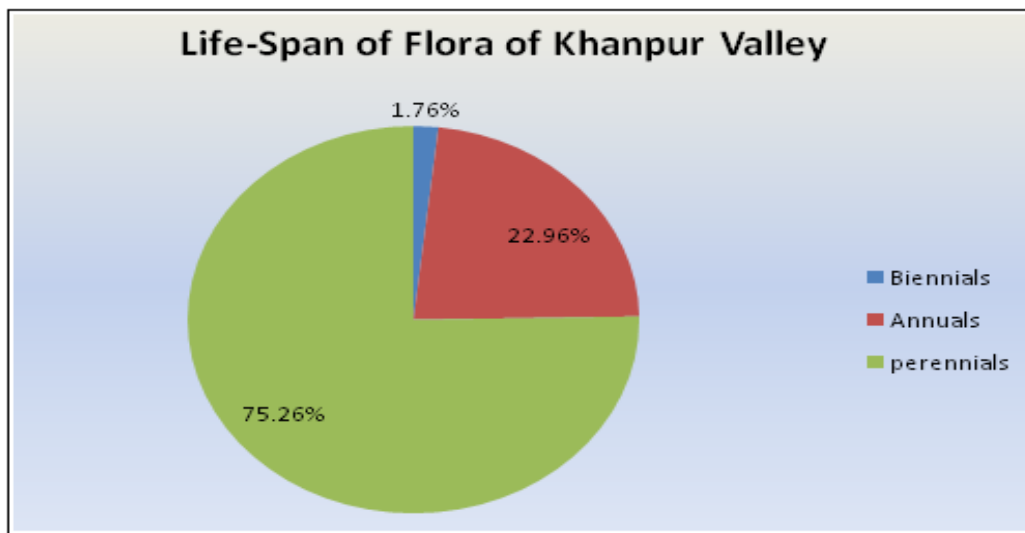


Fig. 4. Life span of flora of Khanpur valley.

Flora of Khanpur valley as resource

Study indicates that flora of Khanpur valley serve as a great resource to the local people. People of Khanpur valley rely on local flora for their various daily needs like timber wood, fuel wood, fodder, wild fruits & vegetables, construction, ethnomedicines, ethnoveterinary medicines and agricultural tools etc.

Comparative analysis with published literature

Total 283 plant species are reported from Khanpur valley. Similar studies were also conducted in other areas of Pakistan. Qureshi *et al.*, (2011) reported 130 plant species belonging to 37 families from Pir Mehr Ali Shah Arid Agriculture University research farm at

Koont and its surrounding areas. Fazal *et al.*, (2010) reported 211 plant species belonging to 66 families from Haripur District (KP), Pakistan. Jabeen *et al.*, (2009) explored 245 plant species belonging to 77

families from Margallah Hills National Park, Islamabad, Pakistan. Shah & Khan, (2006) identified 80 plant species belonging to 49 families from Siran Valley Mansehra, Pakistan.

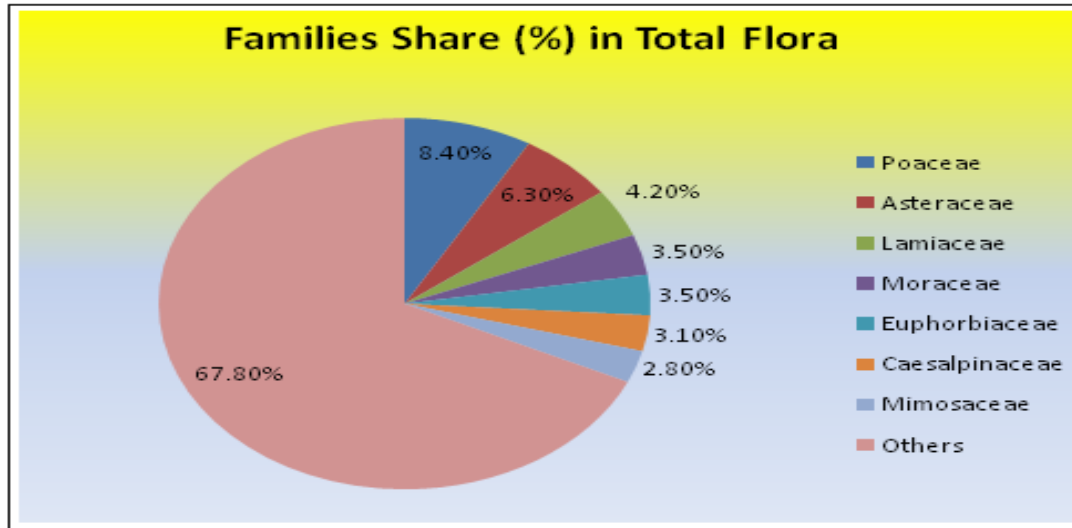


Fig. 5. Families share (%) in total flora of Khanpur valley.



Fig. 6. Threats to the flora of Khanpur valley.

Threats to the flora of Khanpur valley

Flora of Khanpur Valley is under severe pressure/threat due to deforestation, over grazing, over exploitation and subsequent fires as shown in Figure 6.

These anthropogenic activities have degraded the important plant resources have Khanpur valley.

Conclusions

Khanpur Valley is enriched with enormous flora. The exploration of 101 families, for only 283 species, indicates that there is much diversity of flora in Khanpur Valley. Hence more floristic explorations are required in future. Beside this, flora of Khanpur Valley is under severe pressure due to increase number of anthropogenic activities like fire factor, unsustainable cutting of forests, grazing by nomads, agricultural practices, mining activities, over exploitation for fuel wood, fodder collection and other needs. This is the reason that number of species per family are decreasing day by day. Hence the combined conservation efforts are also required to save this important biological resource.

Acknowledgement

I always highly acknowledged the inexpressible cooperation and prayers of my parents, teachers, friends and well-wishers.

References

- Ahmad K, Khan ZI, Ashraf M, Hussain M, Ibrahim M, Valeem EE.** 2008. Status of Plant Diversity at Kufri (Soone Valley) Punjab, Pakistan and Prevailing Threats Therein. *Pakistan Journal of Botany* **40(3)**, 993-997.
- Ali SI, Qaiser M.** 1995-2005. Flora of Pakistan, Botany Department, University of Karachi.
- Ali SI.** 2008. The significance of flora with special reference to Pakistan. *Pakistan Journal of Botany* **40(30)**, 967-971.
- Ejtehadi H, Amini T, Zare H.** 2005. Importance of vegetation studies in conservation of wildlife: a case study in Miankaleh wildlife refuge, Mazandaran Province, Iran. *Archive of SID* 53-58.
- Fazal H, Ahmad N, Rashid A, Farooq S.** 2010. A Checklist of Phanerogamic Flora of Haripur Hazara, Khyber Pakhtunkhwa, Pakistan. *Pakistan Journal of Botany* **42(3)**, 1511-1522.
- Funk V, Hollowell T, Berry P, Kelloff C, Alexander SN.** 2007. Checklist of the Plants of the Guiana Shield (Venezuela: Amazonas, Bolivar, Delta Amacuro; Guyana, Surinam, French Guiana). *Contributions from the United States National Herbarium* **55**, 1- 84.
- Haq F, Ahmad H, Ullah R, Iqbal Z.** 2012. Species Diversity and Ethno Botanical Classes of the Flora of Allai Valley District Battagram Pakistan. *International Journal of Plant Research* **2(4)**, 111-123.
- Hussain K, Shahazad A, Husnain SZ.** 2008. An Ethnobotanical Survey of Important Wild Medicinal Plants of Hattar District Haripur, Pakistan. *Ethnobotanical Leaflets* **12**, 29-35.
- Hussain T, Ch MI.** 2009. A Floristic Description of Flora and Ethnobotany of Samahni Valley (A.K.), Pakistan. *Ethnobotanical Leaflets* **13**, 873-99.
- Jabeen A, Khan MA, Ahmad M, Zafar M, Ahmad F.** 2009. Indigenous uses of economically important flora of Margallah Hills National Park, Islamabad, Pakistan. *African Journal of Biotechnology* **8(5)**, 763-784.
- Nasir E. Ali SI.** 1970-2001. Flora of Pakistan Fascicles. 1-200.
- Qureshi R, Bhatii GR.** 2010. Floristic inventory of Pai Forest, Nawab Shah, Sindh, Pakistan *Journal of Botany* **42(4)**, 2215-2224.
- Qureshi R, Bhatii GR, Shabbir G.** 2011. Floristic Inventory of Pir Mehr Ali Shah Arid Agriculture University Research Farm at Koont and its Surrounding Areas. *Pakistan Journal of Botany* **43(3)**, 1679-1684.
- Qureshi R, Shaheen H, Ilyas M, Ahmed W, Munir M.** 2014. Phytodiversity and Plant Life of Khanpur Dam, Khyber Pakhtunkhwa, Pakistan *Journal of Botany* **46(3)**, 841-849.

Shah GM, Khan MA. 2006. Check List of Medicinal Plants of Siran Valley Mansehra-Pakistan. *Ethnobotanical Leaflets* **10**, 63-71.

Shaheen H, Qureshi R, Akram A, Gulfraz M, Potter D. 2014. A Preliminary Floristic Checklist of Thal desert Punjab, Pakistan. *Pakistan Journal of Botany* **46(1)**, 13-18.

Shinwari ZK. 1996. Ethnobotany in Pakistan: Sustainable and participatory approach. In *Proceedings Ethnobotany and its application to conservation*. Published National Agriculture Research Centre Islamabad, Pakistan 14-25.

Siddique Z, Nisa S, Shah GM, Khan A, Mohiuddin M. 2016. Ethno-Medicinal Inventory of Khanpur Valley and Some Archeological Sites Reflecting Ancient Gandhara Civilization, District Haripur, Pakhtunkhwa, Pakistan. *International Research Journal of Biological Sciences* **5(7)**, 68-84.

Stewart RR. 1972. An annotated catalogue of vascular plants of West- Pakistan and Kashmir. Fakhri Printing Press Karachi.

Tastad A, Salkin K, Battikha N, Jasra AW, Louhaichi M. 2010. Ecological dynamics of protected and unprotected rangelands in three climatic zones of Syria. *Pakistan Journal of Agriculture Sciences* **47**, 89-98.

Vediya SD, Kharadi HS. 2011. Floristic diversity of Isari zone, Megharj range forest District Sabarkantha, Gujarat, India. *International Journal of Pharmaceutical & Life sciences* **2(9)**, 1033-1034.