



Research Article

Unraveling the Tree Diversity of Torghar District to Provide a Baseline for Future Scientific Studies

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Abstract | A study on tree diversity was conducted in Torghar District, Khyber Pakhtunkhwa, Pakistan. The study aimed to identify and document the region's tree diversity, which is essential for providing basis for future scientific research. In August 2024, a research team from the Pakistan Forest Institute, Peshawar, conducted an extensive field survey, collecting tree specimens from diverse localities across the district. The collected samples and associated data were subsequently analyzed at the institute. The findings revealed a remarkable diversity of 95 tree species, representing 57 genera and 31 plant families. Notably, 8 species were identified from gymnosperms (cone-bearing plants), and 87 species from angiosperms (Flowering plants) representing 51 genera and 28 families. The study highlighted the dominance of families Rosaceae, Fabaceae, Moraceae, and Pinaceae, which collectively contribute to the region's unique botanical heritage. This initial botanical survey aimed to identify and document the area's tree species, providing a crucial baseline for future research in forestry, conservation, and ecological studies. The data will support informed decisions for sustainable forest management, trees' diversity conservation and environmental planning.

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Introduction

District Torghar, formerly known as Kala Dhaka, is a newly established district in the Hazara division of Khyber Pakhtunkhwa province, Pakistan. It was officially separated from Mansehra district and declared the 25th district of Khyber Pakhtunkhwa on January 28, 2011, under article 246 of the constitution of the Islamic Republic of Pakistan. Torghar is characterized by blue pine forests, dominated by Kail, Fir and Spruce trees. Despite extensive botanical exploration in Pakistan, certain regions, including

Torghar, remain unexplored. Therefore, it is essential to identify and document the region's tree diversity as a basis for future scientific studies. Torghar is one of the most neglected and deprived region of Khyber Pakhtunkhwa province where people lack basic needs of life (Mehmood *et al.*, 2015). People of the area are mostly illiterate and not aware of loss of biodiversity and its implications. They are using natural resources ruthlessly. They use livestock for milk, meat, transportation and farming. Enlisting tree diversity helps in species nomenclature and identification (Ilyas *et al.*, 2013). A thorough floristic description of the

area based on collections and accurate identification is necessary to design conservation plans and assess the changes occurring in the vegetation patterns of any given area (Manikandan and Lakshminarasimhan, 2012; Khan and Ahmad, 2014). Pakistan has a rich tree diversity and a strategic location. There have been reports of about 6000 vascular plants in the area (Stewart, 1972). Pakistan's northern and western mountains are home to over 80% of the country's endemic plants (Ali and Qaiser, 1986).

The majority of Pakistan's natural forest resources are found in the Himalayan Mountain range. One of the uncharted regions is Torghar district, which is located in Pakistan's Khyber Pakhtunkhwa province. In terms of flora, it belongs to the Irano Turanian Region's Western Himalayan Province (Takhtadzhian and Cronquist, 1986). Extensive legal and illegal cuttings have severely damaged the forests, highlighting the urgent need for sustainable resource management. Deforestation and overgrazing on steep slopes have led to soil erosion and frequent landslides. The area's climate is subtropical at lower elevations, gradually transitioning to moist temperate and subalpine types at higher altitudes (Mehmood *et al.*, 2015). Although most regions of Pakistan have been explored by botanists and foresters, some areas, including the study site in District Torghar, remained unexplored for its trees' diversity until this study. The lack of prior data and various social, administrative, and communication challenges hindered earlier research. Given the significance of this first exploration, the study aimed to identify and document the area's tree species, providing a foundation for future forestry research and other aligned disciplines.

Study site description

District Torghar is situated on the western edge of the Himalayas Range at coordinates 34° 36' 48.86' N, 72° 47' 17.52' E. Elevation-wise, the district ranges from 450 to 3,000 meters above sea level. It is bounded on the south by Tanawal, on the east by Agror Valley (Mansehra), on the north by the River Indus across which lies Thakot of Battagram district, on the northwest by Shangla district, and on the southwest by Buner district. The district is administratively divided into two Tehsils, Judbah and Kandar and one Sub tehsil Karor Madakhel. During our field visit we explored various key locations of the study area as directed by the concerned Divisional Forest Officer (DFO). The study sites include Mangri

valley, Shingaldar, Judbah, Panja Gali, Shagai, Machai Sar, Maira Madakhel and their surrounding villages. The aforementioned study sites represent different forest types and ecological zones such as Sub-tropical and Moist Temperate. Climate of Torghar is pleasant in spring and autumn but winter remains very harsh due to heavy snow fall. The snow fall occurs generally between December and February each year. In 2013, the total annual rainfall was 980 mm, with the highest precipitation occurring in early spring and early autumn, particularly in February. Due to the absence of a meteorological station in Torghar, climatic data were sourced from the nearest station in Oghi.

Materials and Methods

The research site was visited in August 2024, during the field survey, branches and leaves from various tree species were collected from multiple locations within the study area. For each sample, the exact coordinates and elevations were carefully recorded using a GPS device to ensure accurate geospatial data. This systematic approach allowed for precise mapping of the plant specimens and their respective environmental contexts across the region (Figure 1).

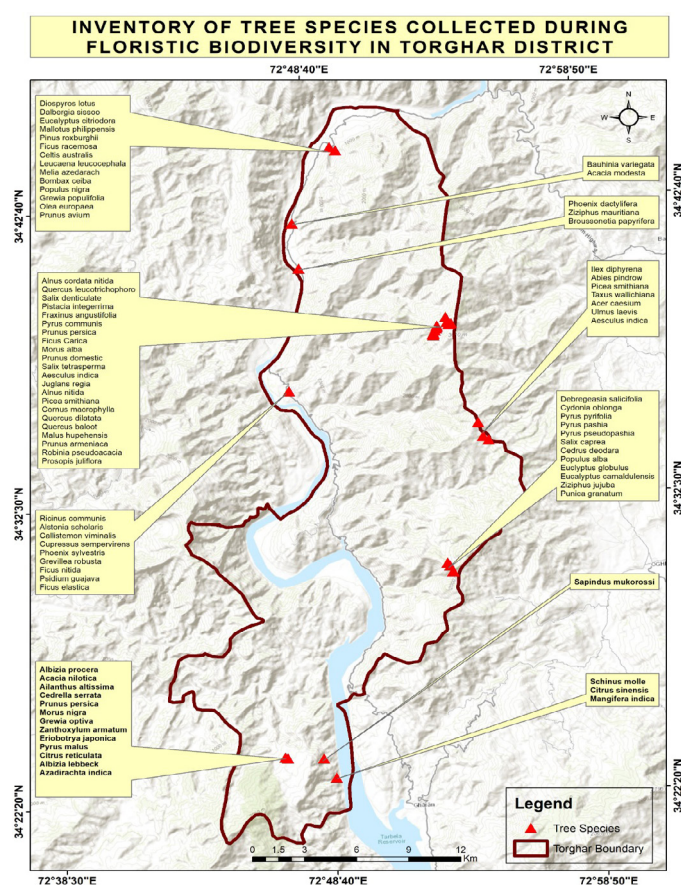


Figure 1: Map showing diversity of tree species collected from various localities of Torgbar district.



Figure 2: Showing the captivating views of different study sites from district Torghar: (A) Mangri valley (B) River valley near Judbah (C) Machai sar top (D) Panjagali.



Figure 3: Showing photoshoots of research activities carried out by PFI team at various localities of district Torghar.

As part of the preservation process, the collected plant specimens were carefully placed between blotting papers and pressed using a plant pressor to ensure proper drying and preservation. All recorded data, along with the tree specimens gathered from various locations within District Torghar during the field

visits, were subsequently transferred to the herbarium at the Pakistan Forest Institute, Peshawar. There, the specimens were mounted on herbarium sheets for further analysis and long-term storage.



Figure 4: Photoshoots of various trees species during field study.

After completing the identification process, a visit was made to the Department of Botany at the University of Peshawar, where the botanical names of the collected species were cross-checked with those already cataloged in the department's herbarium. This comparison with the herbarium's existing collection allowed for confirmation and accurate identification of the species, with the help of expert plant taxonomist Dr. Ghulam Jelani (Figure 2, 3 and 4).

Additionally, local and regional floras, such as those by Ali and Qaiser (1995-2012), were consulted to aid in the identification of the collected specimens. These resources provided valuable references to cross-check and verify the species identified during the fieldwork. The data gathered from the various field visits across District Torghar were then carefully compiled to create a comprehensive list of tree species. This list includes essential details such as the botanical names, local names, English names, families, and corresponding altitudes of each species, offering a thorough record for further research and conservation efforts.

Table 1: Inventory of tree species collected during floristic biodiversity in Torghar district.

No.	Family name	No.	Botanical name	English name	Local name	Locality	Elevation (m)
1	Anacardiaceae	1	<i>Pistacia integerrima</i>	Pistachio	Kangu	Mangri (Neray khur)	1772
		2	<i>Schinus molle</i>	Pepper tree	Kali mirch	Maira Madakhel	478
		3	<i>Mangifera indica</i>	Mango	Aam	-	-
2	Apocynaceae	4	<i>Alstonia scholaris</i>	Devil tree	Shaitan tree	Judbah	581
3	Areaceae	5	<i>Phoenix dactylifera</i>	Date	Kajoor	Shagai	491
		6	<i>Phoenix sylvestris</i>	Wild date	Jungli kajoor	Judbah	581
4	Aquifoliaceae	7	<i>Ilex diphyrena</i>	Himalayan holly	Chilgoza	Machai Sar	2675
5	Betulaceae	8	<i>Alnus cordata</i>	Indian alder	Suiri	Mangri	1726
		9	<i>Alnus nitida</i>	Black alder	Suiri	Mangri (Savi feza)	1898
6	Cannabaceae	10	<i>Celtis australis</i>	Hackberry	Batkar	Mangri (Dawar mera)	721
7	Cornaceae	11	<i>Cornus macrophylla</i>	Large-leaf dogwood	Zallat	Mangri (Savi feza)	1948
8	Cupressaceae	12	<i>Cupressus sempervirens</i>	Cypress tree	Saroo	Judbah	581
9	Ebenaceae	13	<i>Diospyros kaki</i>	Japanese persimmon	Amlook	Mangri	1725
		14	<i>Diospyros lotus</i>	Date plum	Jungli Amlook	Mangri (Dawar khwar)	721
10	Euphorbiaceae	15	<i>Mallotus philippensis</i>	Kamala tree	Kamala	-	-
		16	<i>Ricinus communis</i>	Castor oil	Arand	Judbah	581
11	Fabaceae	17	<i>Butea monosperma</i>	Bastard teak	Badar/Dhak	Mangri	1725
		18	<i>Leucaena leucocephala</i>	Lpil lpil	Subabul	Mangri (Dawar mera)	721
		19	<i>Albizia procera</i>	White siris	Sufaid siris	Maira Madakhel	600
		20	<i>Acacia nilotica</i>	Arabic Tree	Keekar	-	-
		21	<i>Robinia pseudoacacia</i>	Black locust	Gul-i-Shah	Mangri (Bagro feza)	1875
		22	<i>Prosopis juliflora</i>	Mesquite	Daivi/ Vilayati Kikar	-	-
		23	<i>Bauhinia variegata</i>	Camels foot tree	Kachnar	Suri kamar	585
		24	<i>Acacia modesta</i>	Acacia	Phulai	-	-
		25	<i>Pongamia pinnata</i>	Indian beech	Sukh Chain	Judbah	553
		26	<i>Albizia lebbeck</i>	Black Siris	Kala siris	Maira Madakhel	600
		27	<i>Dalbergia sissoo</i>	Rose wood	Shesham	Mangri (Dawar khwar)	721
12	Fagaceae	28	<i>Quercus leucotrichophora</i>	Banj oak	Banj	Mangri	1697
		29	<i>Quercus incana</i>	Oak	Spin Banj	Panjagali	2218
		30	<i>Quercus dilatata</i>	Holly oak	Barungi	Mangri (Bagro feza)	1966
		31	<i>Quercus baloot</i>	Brungi oak	Barungi	-	-
13	Juglandaceae	32	<i>Juglans regia</i>	Walnut	Akhrot	Mangri (Neray khur)	1840
14	Lythraceae	33	<i>Punica granatum</i>	Pomegranate	Anaar	Panjagali	2175
15	Meliaceae	34	<i>Cedrella serrata</i>	The hill toon	Daravi	Maira Madakhel	1200
		35	<i>Azadirachta indica</i>	Margosa tree	Neem	-	600
		36	<i>Melia azedarach</i>	Persian lilac	Bakain / Dhrek	Mangri (Dawar mera)	729
16	Malvaceae	37	<i>Bombax ceiba</i>	Silk cotton tree	Simbal	-	-
		38	<i>Grewia populifolia</i>	Grewia	Ganjar	-	-
		39	<i>Grewia optiva</i>	Bhimal	Phalsa	Maira Madakhel	1200
17	Moraceae	40	<i>Ficus carica</i>	Fig	Anjeer	Mangri (Neray khur)	1772
		41	<i>Ficus benghalensis</i>	Banyan	Bargad	Judbah	553
		42	<i>Ficus nitida</i>	Indian laurel fig	Injeer	-	581
		43	<i>Ficus racemosa</i>	Bodhi tree	Gular/Rumbal	Mangri (Dawar khwar)	721
		44	<i>Broussonetia papyrifera</i>	Paper Mulberry	Jungli Toot	Shagai	491
		45	<i>Ficus elastica</i>	Indian rubber	Rubber tree	Judbah	581
		46	<i>Morus nigra</i>	Mullberry	Kala toot	Maira Madakhel	1200
		47	<i>Ficus palmata</i>	Wild Fig	Jungli injeer	Panjagali	2218

Table continues on next page.....

No.	Family name	No.	Botanical name	English name	Local name	Locality	Elevation (m)
18	Myrtaceae	48	<i>Morus alba</i>	White mulberry	Shahtoot	Mangri (Neray khur)	1775
		49	<i>Eucalyptus citriodora</i>	Lemon eucalyptus	Safaida	Mangri (Dawar khwar)	721
		50	<i>Callistemon viminalis</i>	Bottle Brush	Bottle Brush	Judbah	581
		51	<i>Psidium guajava</i>	Guava	Amrood	-	-
		52	<i>Euclyptus globulus</i>	Tasmanian blue gum	Sufaida	Panjagali	2175
19	Oleaceae	53	<i>Eucalyptus camaldulensis</i>	Red gum	Surkh Sufaida	-	-
		54	<i>Fraxinus angustifolia</i>	Narrow-leaf ash	Simbal	Mangri (Neray khur)	1772
		55	<i>Olea ferruginea</i>	Olive	Zaitoon	Panjagali	2150
		56	<i>Olea europaea</i>	European Olive	Zaitoon	Mangri (Dawar mera)	729
20	Proteaceae	57	<i>Grevillea robusta</i>	Silver oak	-	Judbah	581
21	Pinaceae	58	<i>Pinus wallichiana</i>	Blue pine	Kail/Biyar	Mangri	1725
		59	<i>Pinus roxburghii</i>	Chir pine	Chir	Shingaldar	1621
		60	<i>Picea smithiana</i>	Himalayan spruce	Kachal	Mangri (Savi feza)	1948
		61	<i>Cedrus deodara</i>	Cedar	Deodar	Panjagali	2175
		62	<i>Abies pindrow</i>	Himalayan Fir	Fir	Machaisar	2991
22	Platanaceae	63	<i>Pinus halepensis</i>	Pine	Aleppo pine	Shingaldar	1560
		64	<i>Platanus orientalis</i>	Oriental piana tree	Chenar	Mangri	1688
23	Rosaceae	65	<i>Pyrus communis</i>	Common pear	Nashpati	Mangri (Neray khur)	1772
		66	<i>Prunus persica</i>	Peach	Aaroo	-	-
		67	<i>Cydonia oblonga</i>	Quince	Pub	Panjagali	2088
		68	<i>Pyrus pyrifolia</i>	Asian pear	Nashpati	-	-
		69	<i>Pyrus pashia</i>	Wild pear	Batang	-	-
		70	<i>Pyrus pseudopashia</i>	Wild pear	Tangi	-	-
		71	<i>Eriobotrya japonica</i>	Loquat	Loquat	Maira Madakhel	600
		72	<i>Pyrus malus</i>	Apple	Saib	-	-
		73	<i>Prunus persica</i>	Peach	Aaroo	-	1200
		74	<i>Prunus domestic</i>	European Plum	Aloo Bukhara	Mangri (Neray khur)	1796
		75	<i>Prunus avium</i>	Wild cherry	Shereen cherry	Mangri (Dawar mera)	729
		76	<i>Malus hupehensis</i>	Chinese crabapple	Seb (wild)	Mangri (Bagro feza)	1966
		77	<i>Prunus armeniaca</i>	Apricot	Khubani	-	1875
24	Rhamnaceae	78	<i>Ziziphus mauritiana</i>	Indian jujube	Beer	Shagai	491
		79	<i>Ziziphus jujuba</i>	Chinese jujube	Ber	Panjagali	2175
25	Rutaceae	80	<i>Citrus sinensis</i>	Sweet orange	Malta	Maira Madakhel	478
		81	<i>Zanthoxylum armatum</i>	Prickly Ash	Tambar	-	1226
		82	<i>Citrus reticulata</i>	Mandarin Orange	Kenoo	-	600
		83	<i>Salix denticulate</i>	Toothed willow	Bara chenar	Mangri	1688
26	Salicaceae	84	<i>Salix caprea</i>	Pussy Willow	walla	Panjagali	2175
		85	<i>Populus alba</i>	White poplar	Safeda	-	-
		86	<i>Populus nigra</i>	Blake Popular	Sufiada	Mangri (Dawar mera)	729
		87	<i>Salix tetrasperma</i>	Indian willow	Baid liala	Mangri (Neray khur)	1840
		88	<i>Aesculus indica</i>	Indian horse chest-nut	Bankhor	-	-
27	Sapindaceae	89	<i>Sapindus mukorossi</i>	Indian soap berry	Rita	Maira Madakhel	900
		90	<i>Aesculus indica</i>	Horse chestnut	Ashanr	Machaisar	2675
		91	<i>Acer caesium</i>	Maple	Trekhan	-	-
		92	<i>Ailanthus altissima</i>	Tree of Heaven	Barg Raiz Darakht	Maira Madakhel	600
29	Taxaceae	93	<i>Taxus wallichiana</i>	Himalayan yew	Barmi	Machaisar	2612
30	Urticaceae	94	<i>Debregeasia salicifolia</i>	-	Ajali	Panjagali	2150
31	Ulmaceae	95	<i>Ulmus laevis</i>	Elm	Elm	Machaisar	2675

Results

During this study, a total of 95 tree species representing 57 genera and 31 families were documented (Table 1). Among these, gymnosperms (cone-bearing plants) accounted for 8 species from 6 genera across 3 families: Cupressaceae, Pinaceae, and Taxaceae. The remaining 87 species belonged to the angiosperms (flowering plants), which were further categorized into monocotyledons and dicotyledons. Monocots were represented solely by the family Arecaceae, comprising one genus (*Phoenix*) and two species. The majority, however, were dicotyledons, with 30 families comprising 56 genera and 93 species.

The most species-rich family was Rosaceae, contributing 13.68% of the total species, followed by Fabaceae (11.57%), Moraceae (9.47%), and Pinaceae (6.31%). Myrtaceae and Salicaceae each made up 5.26%, while Fagaceae and Sapindaceae contributed 4.21% each. These eight dominant families together accounted for 60% of all recorded species, indicating their significant ecological presence in the region. The remaining families were represented by three or fewer species, highlighting a more limited distribution or specialization within the study area. This diversity reflects a rich and varied tree flora, underscoring the ecological significance of the region and the need for its continued documentation and conservation. All plant names were family wise alphabetically arranged and presented in Table 1.

Discussions

The earliest comprehensive botanical exploration of Pakistan is documented in *Hooker's Flora of British India (1872–1897)*, which covered much of the region. Subsequently, R.R. Stewart conducted extensive plant collection across nearly all parts of the country, contributing around 6,000 species to the Herbarium at Gardon College, Rawalpindi. The *Flora of Pakistan* is a comprehensive inventory of the country's plant biodiversity, with contributions from approximately 47 botanists. *Fazal et al. (2010)* documented 211 species across 170 genera and 66 families in District Haripur. In Siran Valley, Mansehra, *Shah and Khan (2006)* recorded 80 plant species from 49 families, many of which are traditionally used for medicinal purposes. Several regions have recently gained attention in floristic studies. For instance, *Haq et al. (2010)* reported 402 vascular plant species from 110

families in Nandiar Valley, located in the western Himalayas. Additionally, *Khan et al. (2013)* conducted a research project focusing on ecosystem services in Naran Valley.

They identified 101 plant species from 52 families that local inhabitants use for various medicinal purposes. *Haq et al. (2015)* reported 157 plant species from the subtropical zone of the Nandiar Khuwar catchment area in the Western Himalayas, noting that nanophytes were the dominant life form, followed by therophytes. *Urooj et al. (2015)* conducted a study on the herbaceous flora surrounding Mangla Dam, identifying 37 species across 17 families. A thorough review of existing literature revealed that, prior to this study, no plant specimens had been recorded or collected from District Torghar.

Previously known as Kala Dhaka, this region remained largely unexplored in terms of its plant biodiversity. With this gap in knowledge, the present study was undertaken to explore and document the area's tree diversity in specific. The findings aim to serve as a valuable baseline for future ecological, ethnobotanical, and conservation research. Our results reveal that the region boasts a rich and varied ecological landscape, supporting a high level of tree diversity. Despite its generally harsh climate, the area hosts a number of tree species, highlighting its significant biodiversity. The vegetation reflects a mix of subtropical, moist temperate, and subalpine ecological zones. Key timber-yielding species in the region include *Abies pindrow*, *Aesculus indica*, *Acacia modesta*, *Juglans regia*, *Picea smithiana*, *Pinus roxburghii*, *Pinus wallichiana*, and *Taxus wallichiana* (*Haq et al., 2010; Awan et al., 2013*).

This checklist of tree species from District Torghar is believed to be the first comprehensive documentation of the area's tree diversity. It offers valuable baseline data that can serve as a reference for future scientific research. Similar checklists for previously unexplored regions have been published by various researchers and are available in the literature, including works by *Zaheer and Sardar (2008)*, *Fazal et al. (2010)*, *Ilyas et al. (2013)*, and *Waris et al. (2013)*. *Badshah et al. (2013)* identified Poaceae, Papilionaceae, and Asteraceae as the dominant families in District Tank, Pakistan a pattern also observed by other botanists such as *Marwat and Qureshi (2000)* and *Durrani et al. (2005)* in their respective study areas. The dominance

of Asteraceae and Poaceae has been further supported by studies from [Saima *et al.* \(2010\)](#), [Hussain *et al.* \(2015\)](#), indicating a recurring trend across different ecological zones of Pakistan.

Our findings also highlight the dominance of Rosaceae, Fabaceae, Moraceae, and Pinaceae as the major plant families in the study area. Further research will be valuable in exploring the potential uses of these species for various purposes.

Conclusions and Recommendations

Recognizing the importance of this initial trees' diversity exploration, the study was designed to identify, record, and classify the tree species present in the study area. By documenting this previously unexplored tree species, the research aims to establish a foundational reference for future studies in forestry, biodiversity conservation, ecological assessment, and other related scientific fields. This baseline data will support informed decision-making for sustainable forest management and environmental planning in the region. Additionally, it is crucial to educate and raise public awareness about the significance of natural resources and plant biodiversity. Conserving the biodiversity of this specific area is essential to prevent its gradual loss and to avoid further environmental challenges, including climate change and its far-reaching consequences.

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Novelty Statement

The present study is novel because no such study has been conducted before to solely identify and document the area's tree species diversity, providing

a foundation for future forestry research and other aligned disciplines.

Author's Contribution

Wadood Shah: Conceptualization and writing original draft.

Muhammad Ilyas: Critical analysis, review and editing.

Sanam Zarif Satti: Provided resources.

Conflict of interest

The authors have declared no conflict of interest.

References

- Ali, S.I. and M. Qaiser, 1986. A phytogeographic analysis of the phanerogams of Pakistan and Kashmir. *Proc. R. Soc. Edinburgh*, 89B: 89-101. <https://doi.org/10.1017/S0269727000008939>
- Ali, S.I. and M. Qaiser. 1995-2012. *Flora of Pakistan*. Department of Botany, University of Karachi.
- Awan, M.R., Z. Jamal and A. Khan. 2013. Ethnobotanical studies of economically important plants from mountainous region of Gilgit- Baltistan, Pakistan. *Sci. Tech. Dev.*, 32(4): 308-318.
- Badshah, L., F. Hussain and Z. Sher. 2013. Floristic inventory, ecological characteristics and biological spectrum of rangeland, District Tank, Pakistan. *Pak. J. Bot.*, 45(4): 1159-1168.
- Durrani, M.J., F. Hussain and S.U. Rehman. 2005. Ecological characteristics of plants of Harboi rangeland, Kalat, Pakistan. *J. Trop. Sub Trop. Bot.*, 13(2): 130-138
- Fazal, H., N. Ahmad, A. Rashid and S. Farooq. 2010. A checklist of phanerogamic - Flora of Haripur Hazara, Khyber Pakhtunkhwa, Pakistan. *Pak. J. Bot.*, 42(3): 1511-1522.
- Haq, F.U., H. Ahmad and Z. Iqbal. 2015. Vegetation description and phytoclimatic gradients of Subtropical forests of Nandiar Khuwar catchment district Battagram. *Pak. J. Bot.*, 47(4): 1399-1405.
- Haq, F.U., H. Ahmad, M. Alam, I. Ahmad and R. Ullah. 2010. Species diversity of vascular plants of Nandiar Valley Western Himalaya, Pakistan. *Pak. J. Bot.*, 42(SI): 213-229.
- Hooker, J.D., 1872-1897. *The Flora of British India*. 7 vols. London: Reeve and Co. pp. 5568.

- Hussain, F., S.M. Shah, L. Badshah and M.J. Durrani. 2015. Diversity and ecological characteristics of flora of Mastuj Valley, district Chitral, Hindukush range, Pakistan. *Pak. J. Bot.*, 47(2): 495-510.
- Ilyas, M., R. Qureshi, M. Arshad and S.N. Mirza. 2013. A preliminary chick list of the vascular Flora of Kabal Valley, Swat, Pakistan. *Pak. J. Bot.*, 45(2): 605-615.
- Khan, S.M. and H. Ahmad, 2014. Role of indigenous arqiyat distillery in conservation of Rosa species. *Int. J. Phyt.*, 6(2): 162-164.
- Khan, S.M., S. Page, H. Ahmad and D.M. Harper, 2013. Sustainable utilization and conservation of plant biodiversity in montane ecosystems; using the Western Himalayas as a case study. *Ann. Bot.*, 112(3). <https://doi.org/10.1093/aob/mct125>
- Manikandan, R. and P. Lakshminarasimhan. 2012. Flowering plants of Rajiv Gandhi National Park, Karnataka, India. *Check List.*, 8(6): 1052-1084. <https://doi.org/10.15560/8.6.1052>
- Marwat, Q. and R.A. Qureshi. 2000. A checklist of the vascular plants found in upper Siran reserved and guzara forests, District Manshera, Pakistan. *Pak. J. Pl. Sci.*, 6(1-2): 43-57.
- Mehmood, A., S.M., Khan, A. Shah, A.H. Shah and H. Ahmad. 2015. First floristic exploration of the district Torghar, Khyber Pakhtunkhwa, Pakistan. *Pak. J. Bot.*, 47: 57-70.
- Saima, S., A.A. Dasti, Q. Abbas and F. Hussain. 2010. Floristic diversity during moon soon in Ayubia National Park, Distt. Abbottabad, Pakistan. *Pak. J. Pl. Sci.*, 16(1): 43-50.
- Shah, G.M. and M.A. Khan. 2006. Check list of medicinal plants of Sirin Valley Mansehra, Pakistan. *Ethnobot. Leaflets*, 10: 63-71.
- Stewart, R.R., 1972. An annotated catalogue of vascular plants of west- Pakistan and Kashmir. Karachi: Fakhri Printing Press.
- Takhtadzhian, A.L. and A. Cronquist. 1986. Floristic regions of the world. University of California press, Berkeley, Calif. London.
- Urooj, R., S.S. Ahmad, M.N. Ahmad and S. Khan. 2015. Ordinal classification of vegetation along Mangla dam, Mirpur, AJK. *Pak. J. Bot.*, 47(4): 1423-1428.
- Waris, H.M., M. Mukhtar, S. Anjum, G.R. Bhatti, S.A. Pirzada and K. Alam. 2013. Floristic composition of the plants of the Cholistan Desert, Pakistan. *Am. J. Plant Sci.*, 4: 58-65. <https://doi.org/10.4236/ajps.2013.412A1009>
- Zaheer, D. and A.A. Sardar. 2008. A checklist of the vascular plants of Tehsil Shakargarh, District Narowal, Pakistan. *Pak. J. Pl. Sci.*, 14(1): 15-19.