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Bioscience Research

Print ISSN: 1811-9506 Online ISSN: 2218-3973

Journal by Innovative Scientific Information & Services Network



RESEARCH ARTICLE

BIOSCIENCE RESEARCH, 2020 17(2): 681-687.

OPEN ACCESS

Floristic diversity and ecological characteristics of flora of Kharawo Talash, Dir lower, Khyber Pakhtunkhwa, Pakistan

Ali Hazrat^{*12}, Zubair Shah², Khan Sher², Zakia Ahmad⁴, Shabana Bibi¹², Gul Rahim¹, Shah Zaman¹, Zahid Fazal⁵, Muhammad Mukhtiar³, Tabinda Newsheen^{1, 2}, Jehan Zada¹ and Arshad Khan¹

¹Department of Botany University of Malakand, Chakdara, Dir Lower, **Pakistan**

²Department of Botany Shaheed Benazir Bhutto University Sheringal Dir Upper, **Pakistan**

³Department of Pharmacy, University of Poonch Rawalakot, Azad Kashmir, **Pakistan**

⁴Department of Botany University of Swat, KP, **Pakistan**

⁵Department of Botany University of Peshawar, **Pakistan**

*Correspondence: aliuom@gmail.com Received 16-03-2020, Revised: 26-04-2020, Accepted: 11-05-2020 e-Published: 15-05-2020

The present study was conducted to investigate the floristic composition, phenology, life structure, leaf size and plant habit for the different plant in Kharawo Talash Dir Lower from March 2015 to November 2017. The flora of Kharawo Talash comprises of 165 species having belonged to 79 families and 129 genera. As per the plant habit, there are 115 species of herb, 27 species of shrub, 18 species of the tree, 02 species of grasses and climbers and one species sedge. The well-represented families were Asteraceae contributing 19 taxa, Lamiaceae 14, Rosaceae or Solanaceae 07, Papilionaceae and Polygonaceae and Euphorbiaceae 05, Brassicaceae contributing 04 taxa. The Life form classes were controlled by Raunkiaers strategy which uncovers that the most predominant living thing was Therophytes half species, followed by Nanophanerophytes 15%, Megaphanerophytes 09%, Chameophytes 08%, Hemicryptophytes 07%, Geophyte 05%, Cryptophyte 4.6%, and Liana 02%. As for as the leaf size is concerned, Microphyll was the most pervasive leaf size with 52% species, followed by Nanophyll 25%, Mesophyll 15%, Leptophyll 7% and Megaphyll with 1.2%. Study the overall ecological scenario and might be helpful as a reference study for protection and manageable utilization of plants.

Keywords: Floristic composition , Ecological characteristics , Kharawo Talash, Pakistan

INTRODUCTION

Nature has consistently been reliant on flora which is a valuable natural blessing. The true learning of plants basis on the technique for experimentation and has passed on starting with one age then into the next in the wake of being refined and included (Khan et al., 2013). List of floras by plant taxonomists is a general watch everywhere throughout the world to have information about plants. Flora is a compiled checklist of plant species developing in any

geographic region. Through this training, valuable information is recorded which could be utilized as a sign for future examinations. Since the world is amazingly factor, consequently an immense scope of floras are accessible. The distinguishing proof of nearby plants alongside the description of a region is significant in light of the fact that it can demonstrate explicit types of the neighborhood their event, blossoming season, species hardness, particular species, finding new species and the impact of climatic conditions like dry spell and over-

touching on vegetation (Ali, 2008). The geological and Ecological varieties zone of the world support various types of floristic composition. This composition of flora of a district distinguishes and ensure plants riches on the systematic way (Masroor, 2011).

The ideal cultivated plants have supplanted non-cultivated plants which have greatly influenced the accessibility of plants in their normal natural habitat. The immediate human use mainly changes the overall land spread through horticulture, pastur area forest and improvement. These methods diminish the normal natural habitat which has less area available for nearby species (Qureshi et al., 2010). The human is utilizing plants assets brutally in some part of the globe including the Himalayan area. In the last century, the zone was exposed to colossal auxiliary changes which lead to a decline of about 50% of forest zone. The natural forest lost which clearly demonstrates a decrease in the quantity of species and hereditary decent variety of population (Ibrar, 2003).

According by Raunkiers (1934), the plant is ordered into five groups which are Chamaephyte, Therophytes, Phanerophytes, Hemicryptophyes, Cryptophytes (Costa et al., 2007; Batalha and Mantovani, 2001; Hussain and Perveen, 2009). The literature review show uncommon work been done as the existence structure spectra in Pakistan (Malik et al., 2007; Hadi et al., 2009; Rahmatullah and Ahmad, 2010). Similarly, the Leaf size spectrum gives an idea of the floristic adjustment that investigates plants association in connection to the predominant climatic variables. It is useful in studying vegetation at a local level (Rashid et al., 2014).

The aim of this study is to give standard data of the current flora to create herbarium at Shaheed Benazir Bhutto University Sheringal with correctly identified plant specimens of kharawo Talash and its encompassing territories. This paper shows the flora and life-form of the investigation area which will serve in teaching and research in different fields of plant sciences.

MATERIALS AND METHODS

The present study was conducted in Kharawo Talash District dir lower of KP Pakistan. Kharawo is a town of Tehsil Timergara which is situated at the northern side of district Dir lower. The height of the area ranges from 1600m to 2400m. Kharawo (about 6000—7000 Feet) above sea level is a lush green scenic spot in lower. The area is situated at a distance 17km from Talash and about 33 km from chakdara. Timergara the main town of Dir is lying

on its western side with famous modern tourist resort of Malam jaba being on its eastern side. On its south eastern side is the famous historical Adenzi valley. Kharawo top can be reached from different areas like Talash, Ouch, Rabat and timergara. It is also accessible by three roads one from Ouch about 21 km long ,second goes from Rabat bazaar and third road from Nasafa Talash bazaar about 17km. From Peshawar to kharawo top via Ouch the total distance is about 178km. The mountain top has a radar system and TV booster.

Three samples were collected of each species from selected areas then were used ethyle alcohol, copper sulphate and mercuric chloride for poisoning the selected medicinal plants. The collected species were also dried from bacterial and fungal attack. The plants (poisoned plants) were mounted on herbarium sheets (16.5"x11.5"). During accumulation of medicinal plants local name, place of living, flowering time, life form and size of leaf of each plant species were also determined. Total plant species leaf size and life form were also resolved and classified trailed Raunkiers (1934) and Ellenberg (1974). Identified the scientific names, floristic composition of all medicinal species with the help of flora of Pakistan (Ali and Nasir 1990, 1992; Ali and Qaiser, 2009). The voucher specimen was placed in the herbarium of Shaheed Benazir Bhutto University Sheringal.

For further analysis the recorded data put in MS Excel for the determination of various variables such as plants species, their usage and by the handlings of different illnesses. For the analysis of various data different methodologies like Relative Frequency of Citation (RFC), Informants' Consensus Factor (FIC), Fidelity Level (FL), Used Values (UVs), Relative Popularity Level (RPL) and Rank Order Priority (ROP) were used.

RESULTS AND DISCUSSION

Floristic composition of the current study can be summarized in Table 1. In this research work recorded a total of 165 medicinal plants mostly wild plants belonging to 129 genera and 79 families from study area (fig.1). Asteraceae was the prevailing family having 19 (12%) species, followed by Lamiaceae 14 (9%) species, Rosaceae 08 (5%) species and Solanaceae with 07 (4%). Papilionaceae, Polygonaceae and Euphorbiaceae with 5 species each. These families were followed by Brassicaceae and Amaranthaceae with 4 species each. Ranunculaceae, Valerianaceae, Chenopodiaceae, Pinaceae, Oleaceae, Rhamnaceae, Apiaceae, Plantaginaceae having

three species each, Saxifragaceae, Primuleaceae, Fabaceae, Papaveraceae, Berberidaceae, Canabaceae, Araceae, Scrophulariaceae, Urticaceae, Rubiaceae, Cucurbitaceae, Punicaceae, Hamamelidaceae, Pontederiaceae, Zygophyllaceae, Anacardiaceae, Sapindaceae, Meliaceae, Rutaceae, Iridaceae, Oxalidaceae, Fagaceae, Fumariaceae, Tiliaceae, hypericaceae, Asclepiadaceae, Malvaceae, Poaceae, Caryophyllaceae, Violaceae, Borageneae with two species each. The remaining 52 families Nyctaginaceae, Onagraceae, Myrsinaceae, Buxaceae, Ulmaceae, Amaryllidiaceae, Ebenaceae, Linaceae, Geraniaceae, Caprifoliaceae, Pteridaceae, Borageneae, Papilionaceae and Asteraceae are the larger families in the district Tank, Pakistan. Similar results were obtained and the staying different families has one plant species each. Badshah et al. (2013) reported that Poaceae by many other botanists like Marwat & Qureshi (2000) and Durrani et al. (2005) in their respective study area. Many other studies have indicated the dominance of Asteraceae and Poaceae like Fazal et al. (2010), Saima et al. (2010), Khan et al. (2014), Khan et al. (2015) and Hussain et al. (2015). Correspondingly Yemeni and Sher (2010) announced 189 species having a place with 74 families, for the Asir heap of Saudia Arabia in which the Asteraceae was the predominant family, trailed by Lamiaceae, nearly bolster our present outcome. Hazrat et al. (2011), (2007) and (2012) likewise revealed family Asteraceae and Ranunculaceae with antimicrobial activities of 16 species are most extravagant dicot families and detailed 45, 39 and 16 species individually in Dir Kohistan pass slopes. The after effects of floristic organization demonstrate the considerable decent variety in term of species.

Life Span

Different plant taxa life span demonstrates that the perennial were the Perennial group comprising of 104 species (63%) followed by Annual with 57 species (34.54%). Whereas, Biennial were observed to be less than 2% of the aggregate vegetation. (Fig 3) Similarly, herb species were seen as foremost (leading class) class comprising of 115 (70%) species followed by shrubs 27 (16%) species. trees were also comprising of 18 (11%) species, Climbers and Grasses were spoken to

each with 02 (1%) species individually, whereas the relative extent of sedges was only 01 species (0.6 %) (Table 4 & fig. 5).

Life form classes

The Life form classes demonstrated that there are 7 distinctive Life form classes of species in the examination zone. These Life frame classes are Therophytes (83 species), Phanerophyte (24 species) Hemicryptophyte (15 species), Chamaephyte (13 species), Cryptophyte (12 species), Liana (02 species) and Geophyte (07 species.) Our outcome is in accordance with (Sharma 2003) and Sher and Khan (2007) who took a shot at area Buner and they announced that the predominant life classes were Therophytes trailed by nanophanerophytes and Megaphanerophytes. Khan et al. (2011) announced the floristic piece, living thing and leaf measure spectra of the coal mine zone vegetation of darra Adam khel, Khyber pakhtonkhwa, Pakistan and discovered Therophytes the predominant living thing class in the examination territory. He expressed that Therophytes happens because of un-great conditions.

Leaf size

Plants leaf size range was also investigated which demonstrate that Microphyll (86 species and 52%) Nanophyll (42 species and 25%). Mesophyll (24 species and 15%). Megaphyll (2 species), Leptophyll (11 species to 07%) are available in the table 03 and fig.4.

Plant Habit

The habit of plant demonstrated that there are 6 distinct classes of species in the examination zone. These habits are, tree which recorded according to present investigation (11%), shrub (16%), grass (01%), climber (01%), sedge (0.1%) and herb are found (70%) the more plant was record in this investigation (Table 4 & fig. 5) According to (Hazrat et al., 2011) A total 40 species, belonging to 25 families of wild herbs, shrubs and trees. Yemeni and Sher (2010) announced 189 species having a place with 74 families, for the Asir heap of Saudia Arabia in which the Asteraceae was the predominant family, followed by Lamiaceae, nearly strengthen our present outcome.

Table 1. Life Span, diversity of plants and their percentage

S. No	Life Span	Number of plants	Percentage
01	Perennial	104	63%
02	Annual	57	34.54%
03	Biennial	04	02%

Table 2. Life Form, diversity of plants and their percentage

S. No	Life Form	Number of plants	Percentage
01	Therophytes	83	50%
02	Nanophanerophyte	24	15%
03	Megaphanerophyte	15	09%
04	Mesophanerophyte	02	1.2%
05	Chamaephyte	13	08%
06	Hemicryptophyte	12	07%
07	Geophyte	07	04%
08	Cryptophyte	06	04%
09	Liana	03	02%

Table 3. Leaf Size, diversity of plants and their percentage

S. No	Leaf Size	Number of plants	Percentage
01	Microphylls	86	52%
02	Nanophyll	42	25%
03	Mesophyll	24	15%
04	Leptophyll	11	07%
05	Megaphyll	02	1%

Table 4. Plant habit, diversity of plants and their percentage

S. No	Habit	Number of plants	Percentage
01	Tree	18	11%
02	Shrub	27	16%
03	Herb	115	70%
04	Grass	02	01%
05	Climber	02	01%
06	Sedge	01	0.1%

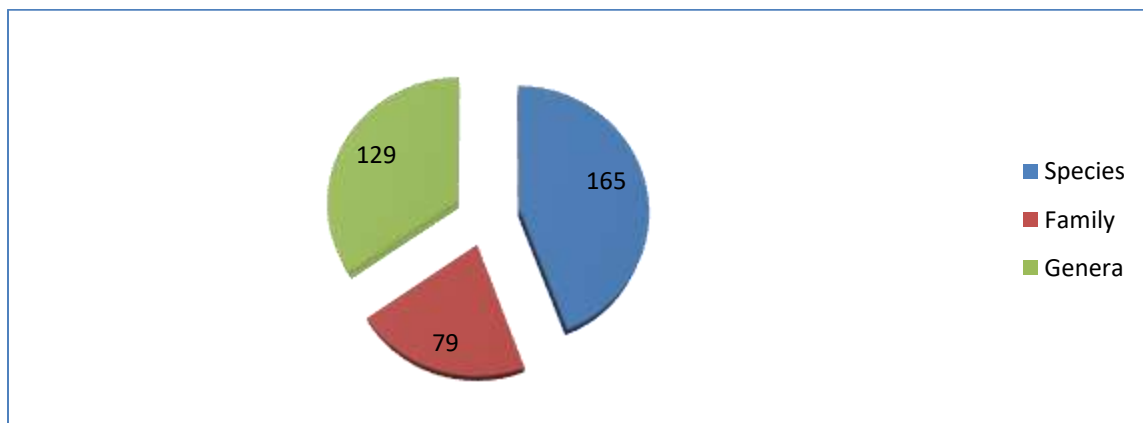


Figure1: Graphical representation of floristic diversity of plants of the selected area

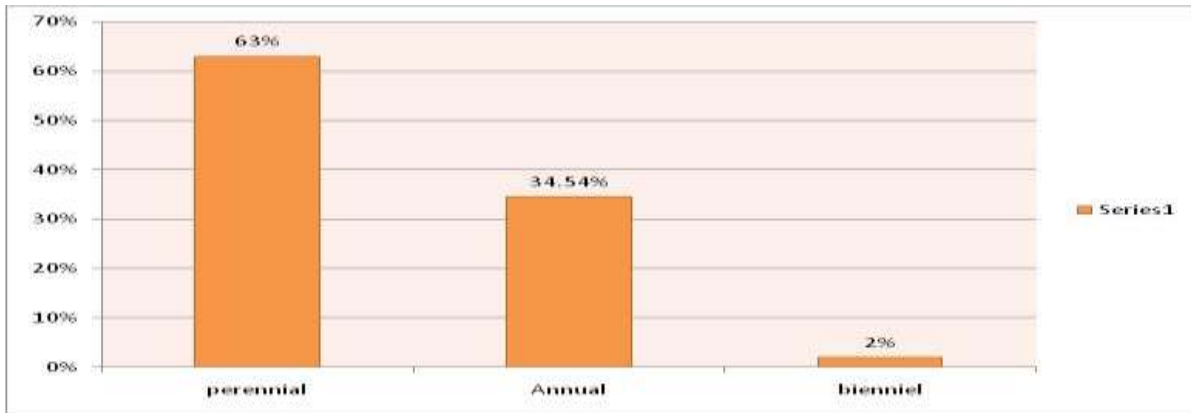


Figure 2: Relative proportions of annual, biennial and perennials in the study area

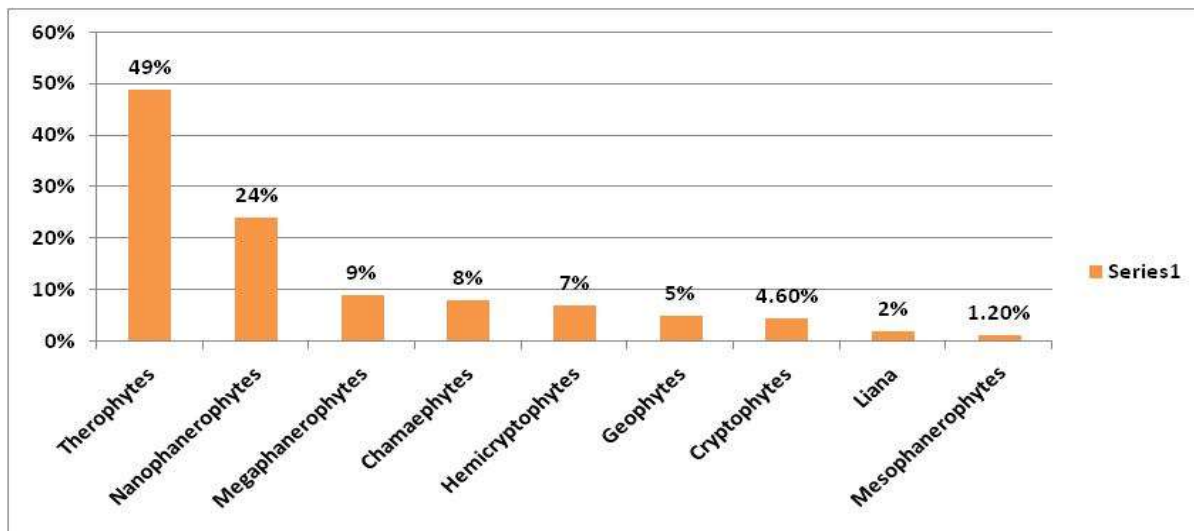


Figure 3: Graphical representation of life form of the plant species recorded from the study area

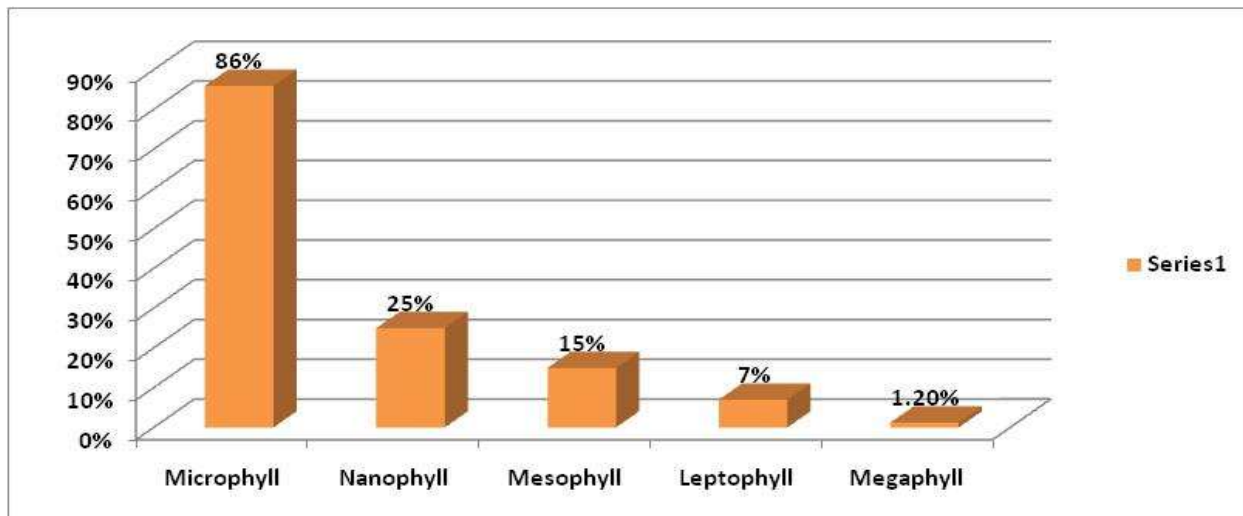


Figure 4: Graphical representation of leaf size of the plant species recorded from the study area

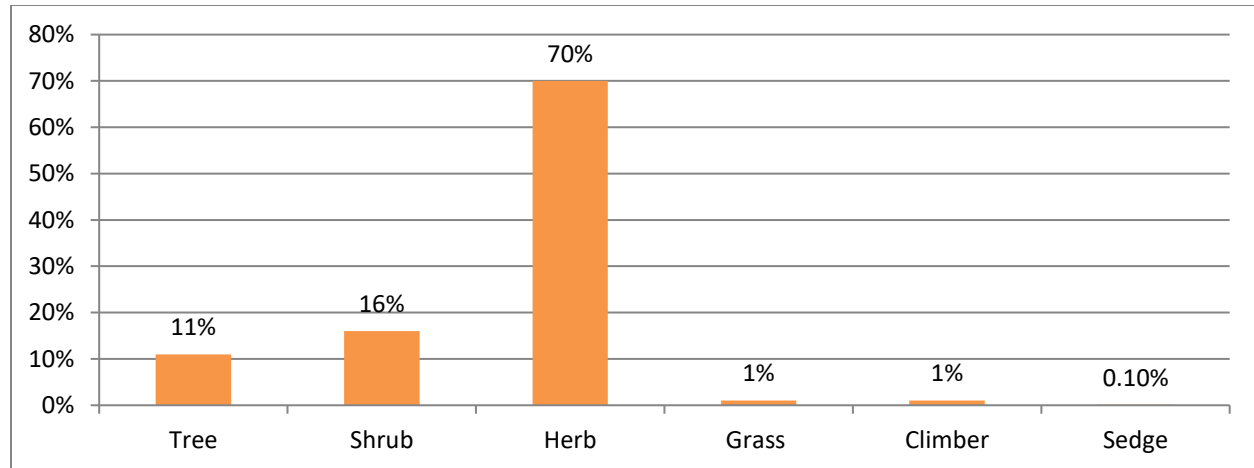


Figure 5: Graphical representation of habit of the plant species recorded from the study area

CONCLUSION

The Kharawo Talash (research area) is rich floristically. In these area very important medicinal plants are growing, but due to forest cutting, over exploitation, lack of awareness there is a great loss of important medicinal resources. The loss of valuable resources due to local habitat or which mostly depends on these plants for survival, making more fields for farming and for high crop yield production. One of the main reason of extinction of plants is the too much uprooting of medicinally valuable plant species by unqualified and unexperienced local people. Soil erosion, loss of habitat and in proper functioning of ecosystem is also due to extinction of important wild medicinal plant species.

CONFLICT OF INTEREST

The authors declared that present study was performed in absence of any conflict of interest.

ACKNOWLEDGEMENT

I am thankful to the chairman Department of Botany and Supervisor University of Malakand Chakdara Dir Lower, for his guidance and constructive criticism during this Research study.

AUTHOR CONTRIBUTIONS

AH and ZH designed and performed the experiments and also wrote the manuscript. KH and ZA identification of plants, SB and GR proof reading, SZ and ZF data analysis, MM, TN and AK reviewed the manuscript. All authors read and approved the final version.

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