FLORISTIC COMPOSITION AND BIOLOGICAL SPECTRUM OF BARANAI VALLEY, MADYAN DISTRICT, SWAT PAKISTAN

Shahid Khan[1], Fazal Hadi[1], Uzair Rabnawaz[1], Farhan Akhtar[2], Asad Ullah[3] and Nizam Uddin[3]

1. *Ethnobotanical & Medicinal Plants Lab. Department of Botany, University of Peshawar*
2. *Phycology and Mycology Lab. Department of Botany, University of Peshawar, Pakistan*
3. *Phytoecology Lab. Department of Botany, University of Peshawar, Pakistan*

Abstract

In the present research study, a comprehensive floristic list of Baranai Valley, Madyan, District Swat, Pakistan was carried out during 2022-23. A comprehensive enumeration documented a sum of 197 vascular species, exhibiting botanical diversity across 76 distinct families. Pteridophytes were manifested by 8 species classified under 6 families, Gymnosperms displayed representation through 2 families comprising 07 species, Monocotyledons showcased 26 species dispersed among 08 families, and Dicotyledons exhibited a more significant presence, encompassing 156 species spanning 60 families. Poaceae, Lamiaceae, Rosacaeae were the dominant families with 12 species each followed by Asteraceae, Papilionaceae, with 09 species each and Solanaceae 8 species. Herbs asserted their dominance with a numerical preeminence of 140 species, succeeded by trees encompassing 28 species, shrubs contributing 21 species, and climbers represented by a more modest count of 08 species. The life form spectra delineated Therophytes as the prevailing category, exhibiting a prominence with 70 species, succeeded by geophytes comprising 37 species, Nanophanerophytes accounting for 35 species, Hemicryptophytes totaling 23 species, and chamaephytes represented by a more modest count of 08 species. The leaf size spectra showed that Mesophylls were dominant in the area with 61 species, followed by Microphylls 59 species, Nanophylls 58 species, Leptophylls 09 species, Macrophylls 05 species, Megaphylls 02 species and the Aphyllous with 03 species. The dominance of Mesophylls showed dry climate with intermediate precipitation seasonality.

Keywords: Floristic Composition, Ecological Spectrum, Baranai Valley, Swat Pakistan.

Introduction

The diversity found in a specific region adds to the botanical and agricultural importance of that region. Swat is a district in the north of Pakistan with rich flora and botanical diversity. Since flora which is the collection of various plant species in a certain area, makes the foundation of the environmental and ecological importance of a place, its floristic study and understanding are crucial parts. The Floristic inventories for other mountain ranges of Pakistan that contributed to local flora were recorded by several workers Tareen and Qadir (1993). Plants support humans ecologically and economically. Therefore, its floristic composition must be studied for the well-being of the entire community. It provides deep insight into its botanical richness, environmental dynamics, and conversation of natural resources. This study focuses on the floristic and ecological composition of Madyan Valley, an essential and attractive region in Swat. The area has plenty of environmental importance, including mountain range, topographical variations, and climatic gradients. Thus, Madyan has rich plant diversity.

This study focuses on the assessment of the botanical diversity found in the Madyan region, with an aim to document various species and their distribution patterns within the region. The purpose is to examine and elucidate the floral composition with a focus on their ecological significance and conversation. In the pursuit of achieving these objectives, we carried out a multidisciplinary approach to carry out surveys, collect specimens, and identify their taxonomical analysis. We also used different sampling techniques, such as transect and quadrant sampling, to capture spatial and taxonomic dimensions of botanical diversity in Madyan Valley. Biologists have not yet thoroughly explored numerous species, emphasizing the importance of a plant checklist as the primary repository of botanical information for a region. Such checklists often act as a valuable initial resource for in-depth studies. Typically, the enumeration of flora aids in the precise identification and nomenclature of various species. It is anticipated that the results of this study will provide significant contributions to our understanding of the floral composition of Madyan, emphasizing the occurrence of plant species that are rare, endemic, and have economic significance. In addition, the evaluation will make a valuable contribution towards the creation of an extensive repository of the local plant life in the area. This database will serve as a crucial asset for forthcoming investigations, as well as for the formulation of strategies for conservation and sustainable development endeavors. Many foreign researchers, exemplified by Alsherif et al. (2013), significantly contribute to the compilation of floristic lists.

Description of the Research Area

General Introduction

Swat is a picturesque valley situated among mountains of various heights. The mountain range that Swat lies in is Hindu Kush Mountains. The coordinates of Swat Valley are 34^0 – 34'' to 35^0 – 55'' North latitudes, and longitudinally, Swat is 72^0 – 08'' to 72^0 – 50'' East. The access to Swat is through the Swat Expressway that connects various places of Khyber Pakhtunkhwa with this tourist-friendly locality. On the four sides of Swat lies various districts. District Dir is located on the West, Chitral on the North side, Shangla and Indus Kohistan on the East, and District Buner on the South region. The mountains in Swat Valley are high and rich in natural resources. "Falakser" counts to be the highest peak in Swat that extends around 6096 m above sea level. Swat is known to be the most beautiful natural habitat that attracts not only humans but also various species of flora and fauna due to excessive forests and humid climates. Therefore, it is a suitable habitat for a plethora of animals and plants. This study is focused on the floristic composition in a specific region of the District Swat, known as Madyan.

Study Area

The selected area for this research work is the Madyan region of District Swat, located on the northern side of Pakistan. It is situated at a distance of 55 kilometers from Mingora (the only city in Swat) and is nearly about 330 km from the capital of Pakistan, Islamabad. The Madyan valley is blessed with the flowing River Swat that comes from the Kalam side and flows down to the Kabul River near Charsadda. The area lies between 35°08′ North latitude and 72°32′ towards East longitude. The Madyan hill station is elevated at 1320 m or 4330 feet from the sea level.

The specific region that we studied and worked on various floral species is "Baranai." Baranai is a small unexplored mountainous area on a short distance from Madyan. It comes on the road to Chail Valley with a turn to the right side of the road. It is elevated nearly about 5000 ft from the sea level. Geographically, Baranai has diverse localities on the four sides. To the North lies Kalam Valley, Miandiam lies towards the South, while West counts for Lower Swat and East for Bashigram. Baranai includes the diverse flora of the Sino-Japanese region that lies in a moist temperate region.

Floristic Diversity

Floral diversity within a region encompasses the collective presence of all species, both cultivated and wild, reflecting the available resources for plant life. Flora serves as a metric for

vegetation and plant resources, representing the total count of plant species, including both wild and cultivated varieties, specific to an area and its ecosystem (Qureshi et al., 2011). Understanding the general function and structure of an ecosystem requires insight into its floral composition, often documented through a flora, a comprehensive list of plant species from a defined geographic location (Venu, 2002). Plant taxonomists routinely compile floras to gather data about the plant life in a region. These floras, ranging from extensive study floras to condensed versions, serve as primary sources of botanical knowledge and aid in species identification and nomenclature (Qureshi et al., 2011). Flora essentially represents the entirety of plant species within a particular location, and in Pakistan, known for its rich biodiversity, approximately 400 medicinal plants coexist among its 6,000 plant species (Badshah et al., 2013). The fluctuations in a region's flora are influenced not only by factors like elevation but also by time, latitude, inclination, exposure, rainfall, and moisture, all contributing to the composition and development of plant life (Kharkwal et al., 2005). Flora diversity, an account of species in a specific area, undergoes changes throughout the year due to various elements such as humidity levels, geography, geomorphologic features, and human impacts (Al-Rubai et al., 2013).

In the Pakistani landscape, distinguished by heterogeneous topographies spanning from coastal regions to elevated alpine mountain ranges, an extensive botanical panorama unfolds. Globally, more than 200 plant families, encompassing a staggering 414,000 species, have been recognized, with a noteworthy compilation of around 6,000 flowering plants specifically documented within the confines of the nation. (Said et al., 2022). However, the sustainable use and conservation of biological resources pose significant challenges due to escalating human activity linked to population growth, leading to the depletion of natural resources (Khan et al., 2017). Raunkiaer's (1934) taxonomy of life forms, predicated on the mechanisms plants employ to shield their buds across temporal scales, stratifies them into distinct categories, namely Therophytes, Cryptophytes, Hemicryptophytes, Chamaephytes, and Phanerophytes.. These classifications aid in understanding different climates based on the dominating life forms within plant communities (Khan et al., 2014). The biological spectrum, representing a site's phytoclimatic scale, is derived from the variety of life forms comprising the site's flora, serving as an indication of ecological conditions and adaptive responses to environmental gradients (Khan et al., 2013). In essence, the term "flora" encapsulates all plant species within a geographical region, unique to a specific geological epoch or a particular ecosystem. While the total number of species is reflected in the flora, the vegetation provides insight into the proportion of individuals, their distribution, and their relative significance (Ali, 2008). Compiling a flora involves capturing significant data, acting as a reference for future studies (Qureshi, 2008).

Climatology

The valley is acknowledged as a humid temperate zone, exhibiting climatic nuances ranging from sub-tropical boreal to humid temperate conditions. In the elevated expanse of Madyan Valley, the climatic delineation shifts from temperate, ranging between 1500 to 2500 m, to alpine altitudes exceeding 2500 m. As altitude increases, precipitation rises while evaporation decreases. Normal temperatures range between a maximum of 21°C and a minimum of 7°C, maintaining a generally moderate temperature (10°C to 25°C). This contributes to the picturesque lush green meadows and dense forests of Pinus and Cedrus in the area. The monsoon season heightens rainfall up to an altitude of 2500 m, with a subsequent decline, followed by a rise around 3500 m. Consequently, the upper regions of the valley are categorized as humid. Two distinct rainy seasons characterize the year: Rabi-winter rainfall from January to April and Kharif-summer rainfall in July and August, influenced by the monsoon from the southern subtropical regions (Arabian Sea). May and June experience dry, sunny weather, while the cloudiest months are January and December. During spring, the temperature in Madyan Valley gradually increases from 15 to 25°C. Summers are pleasant due to a moderate temperature rise, while autumn brings a slight chill. Winters are notably cold, with temperatures dropping to 10°C and -5°C during the night. Summer conditions vary between very dry and those with exceptionally high precipitation. Integrated regional development project (Nasi *et al*., 1998). Lastly, the wind is not the common attribute of Madyan Valley alongside fog. Since Madyan is a high-lying area, fog and mist are not common observable features.

Geology

The geological characteristics of the Madyan region play a significant role in the genesis and development of various soil types. The soil composition is influenced by the presence of sedimentary rocks, including sandstones, siltstones, and mudstones. Over the course of time, these rocks undergo weathering processes, resulting in the formation of a blend of minuscule particles that constitute fertile soils. These types of soils typically exhibit good drainage characteristics and provide a conducive environment for a wide variety of plant species, encompassing grasses, herbs,

shrubs, and trees. The geological process of uplift and tectonic activity has resulted in the creation of pronounced inclines, valleys, and crests. The presence of diverse topographic features gives rise to a multitude of microclimates, which in turn exert a significant influence on the spatial patterns of plant species distribution. Various elevations provide different ecological zones, encompassing subtropical, temperate, and alpine ecosystems, each harboring a distinct array of plant species. Sedimentary rocks, which are commonly found in the region, frequently exhibit favorable water retention capabilities. The permeability of rocks plays a significant role in the hydrological processes, impacting the movement of water and exerting influence on the he creation of springs, streams, and rivers in the region is vital for providing essential moisture to plant ecosystems. Positioned along the Main Mantle Thrust (MMT), which acts as a demarcation between the Indian Plate and the Kohistan Island Arc, the valley is prone to frequent earthquakes occurring at regular intervals. These seismic events generally register at a strength of 2-4 on the Richter scale, with occasional occurrences reaching up to 6 on the Richter scale, as documented in the Integrated Regional Development Report (Nasi et al., 1998). The existence of these geological formations gives rise to microhabitats within the terrain, fostering a diverse array of plant species, such as mosses, ferns, lichens, and other flora, that have evolved to thrive in these conditions.

People and Tribes

The people of the study area are few and are generally poor. Most of them depend upon agriculture. Furthermore, everyone loves to work in fields, taking care of their plants and crops. Therefore, this area has a rich natural resource, making a great deal of their income from their crops. Conventionally, the youth of the area works outside the country, making a huge part of the remittances of the Pakistani economy.

Economy and Cereal Crops

The majority of the inhabitants in the research area rely on agro-forestry mountain resources and engage in agriculture as their primary means of sustenance. These residents traditionally gather a variety of plants for diverse purposes, encompassing medicinal plants, fodder, firewood, and timber from local forests. The challenging winter conditions, marked by heavy rainfall and snowfall, make it impractical to cultivate seasonal crops during this period, resulting in snow-covered fields and mountains. Consequently, the main crops cultivated by the locals in winter include Pea plants, Potatoes, Okra, Tomatoes, Maize, among others, with Potatoes being a particularly significant source of income.The vegetation in the chosen area faces considerable strain due to extensive overgrazing and cultivation, contributing to a decline in the diversity of wild plants. Consequently, there is a pressing need to shift focus towards the conservation of natural resources, particularly plants, to ensure sustainable practices and preserve biodiversity.

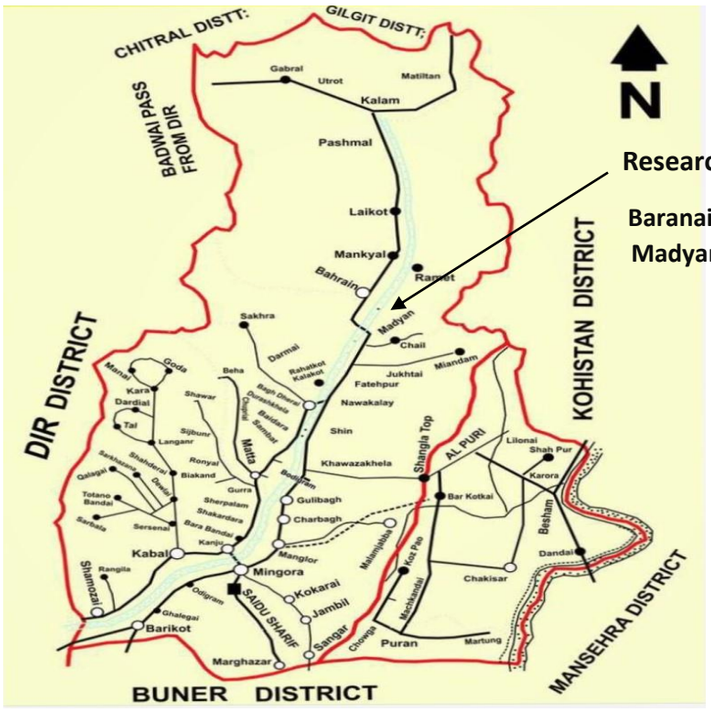

Fig 1.1 Map of Research Area

Objectives of the Study

1. To explore the floristic and ecological status of plant species in the study area.
2. To highlight the ethnobotanical profile of the area.

Materials and Methods

Research on the floristic and ecological composition of Baranai in Madyan, a valley located in Swat district, was undertaken in the year 2023. Before commencing the study, an initial phase involved gathering general information about the research area. Similarly, personal references with the locals of the region helped us find the plants and obtain samples from the investigated area.

The research area was accordingly divided into different sites. Locals were helpful in providing information about botanical diversity since they had information about those plants from their ancestors. They talked about the flora and the different purposes in their life. We obtained information on demographics with the help of semi-structured, close-end questions. Moreover, during trips, herbs and shrubs were collected, and trees were also collected for identification. We observed over 197 plants from the investigated area.

Simultaneously, plants with associated details, such as local traditional and medicinal uses, along with local names, were meticulously gathered during the flowering and fruiting stages. The collected specimens were passed through the process of pressing while being regularly observed. Once the plants were entirely dry, they were affixed to standardized herbarium sheets using scotch tape. To identify the collected plant specimens, a comparison was made with voucher specimens, referencing available literature, including (Asghar Ali et al., 2016). The accuracy of nomenclature was subsequently verified by the Department of Botany at the University of Peshawar. Identification was facilitated using the Flora of Pakistan (Nasir & Ali, 1971-1991; Ali & Qaisar, 1995-2009). The authenticated plant specimens were deposited in the mentioned department at the University of Peshawar. The arrangement of plant diversity in this study followed taxonomic or alphabetic order for listing purposes.

Results and Discussion

Floristic Composition

The entirety of plant life within a specific geographic region, encompassing both wild and cultivated species, constitutes the floristic composition. The diversity of flora in an area serves as a reflection of the prevailing climatic conditions, physiographic features, altitude, soil characteristics, anthropogenic influences, and various environmental or natural stressors. Thus, the comprehensive understanding of the floristic composition and ecological attributes of the region is presented in (Table 1).

The flora out of these present study area Baranai, Madyan Valley comprised of total 197 plants species belonging to 76 families. These 08 plants species (4.07%) belong to 06 families of Pteridophytes and 07 plants species (3.55%) belong to 02 families of Gymnosperms. Monocots of Angiosperm were represented by 26 species (13.20%) belong to 8 families, while the rest of 156 plants species (79.18%) belong to 60 families were represented as dicots. Poaceae, Lamiaceae, and Rosacaeae were dominant families having 12 species each (6.10%), followed by Asteraceae and Papilionaceae 9 species each (4.57%), Solanaceae 8 species (4.07%) and and rest of the families having 7 species or least. Habit of the plants showed that herbs were dominant in the area with 140 species, followed by trees 28 species and shrubs 21 species and 08 species of climbers (Table 1, Fig 4). In the study conducted by Ali et al. (2017) identified Poaceae, Asteraceae, and Papilionaceae as the predominant families, highlighting the prevalence of herbs in region. Similarly, Ibrahim et al. (2019) reported Asteraceae and Poaceae as the dominant families. They noted that the count of wild species and herbaceous plants surpassed other statuses and habits, respectively. Ullah et al. (2016) conducted a parallel study in Bannu, reinforcing the consistent pattern of family dominance. Corroborating these findings, Amjad et al. (2016) observed similar trends, attributing it to the broad ecological amplitude of members within these families. Khan et al. (2013), focusing on Sheikh Maltoon in Mardan, reported Asteraceae and Poaceae as dominant families, emphasizing the parallelism in plain areas with similar climatic conditions. Saeed et al. (2018), Khan et al. (2014), and Anjum et al. (2020) also echoed these results, noting Poaceae and Asteraceae as dominant families, with a prevalence of herbs in the region, aligning with the present study. Various researchers, including Mehmood et al. (2015), affirmed the dominance of Poaceae and Asteraceae in their studies, reflecting the consistent prevalence of these families in the flora of Pakistan. Recent studies on floristic composition and ecological aspects in different regions of the country, such as those conducted by Muhammad et al. (2020), Haq et al. (2020), and Khan and Asad (2019), also supported and extended these established patterns.

Table 4.1 Percentage distribution of Taxonomic diversity of flora

S.NO	Taxonomic Group	No of species	%AGE
1.	Dicot	156	79.18%
2.	Monocot	26	13.20%
3.	Pteridophytes	08	4.07%
4.	Gymnosperm	07	3.55%
Total species		**197**	**100%**

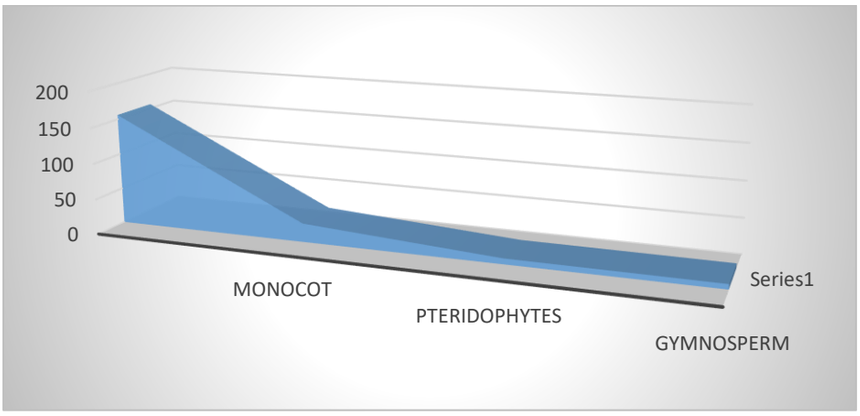

Fig 4.1 Showing no, of plants

Table 4.2 Floral diversity, life form and leaf size spectrum of Baranai Valley Madyan Swat

S. No	Family/Botanical Name	Local Name	Seasonality				Life Form	Leaf Size	Habit	Habitat
			Spring	Summer	Autumn	Winter				
Pteridophytes										
Adiantaceae										
1	*Adiantum incisum* Forsk.	persoshan	+	+	+	+	Gp	Np	H b	W
2	*Adiantum capillus-veneris* L.	Sumbal	+	+	+	+	Gp	Np	H b	W
Athyriaceae										
3	*Athyriumfilix-femina* (L.) Roth	Lewny kwanjay	+	+			Gp	Mic p	H b	W
Dryopteridaceae										
4	*Dryopteris jaxtaposta* Christ.	kwanjay	+	+			Cp	Mic p	H b	W
Equisetaceae										
5	*Equesetum arvensis* L	Bandakay	+	+			Gp	Ap	H b	W
Psilotaceae										
6	*Psilotum nudum* (L.) P. Beauv.	Kamrdaky	+	+			Gp	Ap	H b	MS
Pteridaceae										
7	*Pteris cretica* L.	ShenBotay		+	+		Hcp	Mic p	H b	W
8	*Pteris vittata* L.	ShenBotay		+	+		Hcp	Mic p	H b	W
Gymnosperms										
Cupressaceae										
9	*Juniperus communis* L	Sanober	+	+	+	+	Micpp	Np	Sb	I
10	*Thuja orientalis* L.	Sarwa	+	+	+	+	Npp	Lp	H b	I
Pinaceae										
11	*Abies pindrow* Royle.	Mangazai	+	+	+	+	Megpp	Np	Tr	F
13	*Pinus wallichiana* A.B. Jackson	Peuch	+	+	+	+	Megpp	Np	Tr	F
12	*Cedrus deodara* (Roxb. ex D. Don) G. Don	Ranzra/Luoo	+	+	+	+	Megpp	Np	Tr	F
14	*Pinus roxburghii* Sargent	Nakhtar	+	+	+	+	Megpp	Np	Tr	F

15	*Picea smithiana* (Wall.) Boiss	Raunn	+	+	+	+	Megpp	Np	Tr	F
Angiosperms		**Monocots**								
Alliaceae										
16	*Allium sativum* L.	Ugaa	+				Gp	Mesp	Hb	Cul
17	*Allium cepa* L.	Pyaz	+				Gp	Mesp	Hb	Cul
Colchicaceae										
18	*Colchicum luteum* Baker	Suranjan Talkh	+				Gp	Np	Hb	R
Asparagaceae										
19	*Polygonatum verticillatum* (L.) All.	Nooryalum		+			Gp	Np	Hb	DS
Cyperaceae										
20	*Cyperus cyperoides* (L.)			+			Gp	Mesp	Hb	MP
21	*Cyperus rotundus* L.	Surmal		+			Gp	Np	Hb	MP
Dioscoreaceae										
22	*Dioscorea deltoidei* Wall. ex Griseb.	Knis		+			Gp	Mesp	Hb	DS
Iridaceae										
23	*Iris germanica* L.	Qabar Botay	+				Gp	Mesp	Hb	R
24	*Iris hookeriana* Foster		+	+			Gp	Mesp	Hb	R
Juncaceae										
25	*Juncus articulatus* L.			+			Gp	Np	Hb	DS
26	*Juncus benghalensis* Kunth			+			Gp	Np	Hb	DS
27	*Juncus inflexus* L.			+			Gp	Np	Hb	MP
Liliaceae										
28	*Gagea elegans* Wall. ex D. Don			+			Gp	Mesp	Hb	DS
29	*Tulipa clusiana* DC.	Ghantol	+				Gp	Mesp	Hb	R
Poaceae										
30	*Avena fatua* L.	Jamdalay		+			Tp	Micp	Hb	Fi
31	*Avena sativa* L.	Mastaki		+			Tp	Micp	Hb	Fi
32	*Cynodon dactylon* (L.) pers.	Kbal		+	+		Hcp	Micp	Hb	DS
33	*Dactylis glomerata* L.			+			Gp	Np	Hb	DS
34	*Eragrostis minor* Host			+			Hcp	Np	Hb	DS
35	*Lolium temulentum* L.			+			Tp	Np	Hb	DS
36	*Panicum miliaceum* L.		+	+			Tp	Micp	Hb	DS
37	*Pennisetum orientale* L.C. Rich.	Wakha	+	+			Tp	Micp	Hb	DS
38	*Poa annua* L.	Wakha	+	+			Hcp	Np	Hb	DS
39	*Stipa sibirica* (L.) Lam.			+	+		Hcp	Micp	Hb	DS
40	*Triticum aestivum* L.	Ghanam		+	+		Tp	Micp	Hb	DS
41	*Zea mays* L.	Jowar		+	+		Tp	Mesp	Sb	Cul
Angiosperms		**Dicots**								

Acanthaceae										
42	*Dicliptera bupleuroides* Nees	Spaay boty	+	+	+		Npp	Me gp	H b	Cul
43	*Justicia adhatoda* L.	Bikar	+	+	+	+	Npp	Mes p	H b	Fi
Adoxaceae										
44	*Cotinifolium* D. Don	Asos		+			Npp	Mic p	Tr	DS
45	*Viburnum grandiflorum* Wall.EX DC	Ksarboty	+	+			Npp	mic p	H b	DS
Anacardiaceae										
46	*Rhus javanica* L.	Bambara	+	+	+	+	Micpp	Mic p	Sb	F
Apiaceae										
47	*Pimpinella stewartia* (Dunn) Nasir	Gaya		+	+		Tp	Mes p	Sb	Fi
48	*Foeniculum vulgare* Mill.	Kaga		+	+		Tp	Np	H b	DS
49	*Bupleurum longicaule* Wall.ex DC			+	+		Tp	Mic p	Sb	DS
50	*Scandix pecten-veneris* L.	Gangahae	+			+	Tp	Mic p	H b	DS
Araliaceae										
51	*Hedera nepalensis* K. Koch	Zelai	+	+	+	+	Npp	Mes p	H b	F
Asteraceae										
52	*Lactuca serriola* L.	Shodapay	+	+			Tp	Mes p	H b	DS
53	*Lactuca dissecta* D. Don	Shodapay	+	+			Tp	Mic p	H b	OM
54	*Cichorium intybus* L.	Aspa butay		+	+	+	Tp	Mic p	H b	OM
55	*Artemisia vulgaris* L.	Asli Tarkha		+			Cp	Mic p	H b	OM
56	*Artemisia absinthium* L.	Tarkha		+	+		Tp	Np	H b	R
57	*Senecio chrysanthemoides* DC.	Ghupga	+	+			Tp	Mes p	H b	OM
58	*Taraxacum officinale* F.H.	Hann/Badh budai					Tp	Mic p	H b	DS
59	*Tagetes minuta* L.	Gulamesh		+			Tp	Mic p	H b	DS
60	*Tagetes erecta* L.	Gulamesh		+			Tp	Np	H b	F
Balsaminaceae										
61	*Impatiens bicolor* Royle	Atrang butae		+			Tp	Mes p	H b	MP
Berberidaceae										
62	*Berberis lycium* Royle	Kwarae	+	+	+	+	Npp	Np	Sb	F
Boraginaceae										
63	*Onosma dichrantha* Boiss.	Gaozban	+			+	Tp	Np	H b	Fi
64	*Cynoglossum lancolatum* Forssk.	Katmulai		+			Hcp	Np	H b	MP
65	*Buglossoides arvensis* (L.) Johns.	Bashka	+	+			Tp	Np	H b	OM
Brassicaceae										
66	*Thlaspi andersonii* (Hk. F.&Thoms.) O.E Schulz		+	+		+	Tp	Np	H b	Fi
67	*Nasturtium officinale* R. Br.	Talmera	+	+		+	Gp	Mic p	H b	MP
68	*Descurainia sophia* (Linn.) Webb&Berth.		+				Npp	Lp	H b	OM
69	*Capsella bursa-pastoris* (L.) Medik.	Bambesa	+				Tp	Mic p	H b	OM

70	*Brassica rapa* L. ssp. *campestris* L.	Sharsham	+				Tp	Micp	Hb	Cul
71	*Brassica rapa* L. spp. Rapa	Tepar	+				Tp	Mesp	Hb	Cul
Buddlejaceae										
72	*Buddleja crispa* Bth.	Sperkay	+	+	+	+	Npp	Micp	Hb	DS
Buxaceae										
73	*Sarcococca saligna* (D. Don) Muell.Arg	Ladden	+	+	+	+	Npp	Micp	Sb	DS
Campanulaceae										
74	*Codonopsis clematidea* (Schrenk) C.B. Clarke			+			Tp	Np	Hb	OM
Cannabaceae										
75	*Cannabis sativa* L.	Bhang	+	+			Tp	Micp	Hb	Fi
Caryophyllaceae										
76	*Silene vulgaris* (Moench) Garcke	Bashka	+	+			Npp	Lp	Hb	DS
77	*Stellaria media* (L.) Vill.	Olalai	+	+			Cp	Np	Hb	MP
78	*Silene conoidea* L.	Pasta bashka	+	+			Tp	Micp	Hb	MP
79	*Arenaria serpyllifolia* L.	Mangotay	+	+			Tp	Lp	Hb	MP
Chenopodiaceae										
80	*Chenopodium album* L.	Skhawonay		+			Tp	Mesp	Hb	DS
81	*Chenopodium ambrosioides* L.	Skhabotai		+			Tp	Micp	Hb	DS
Convolvulaceae										
82	*Ipomoea eriocarpa* R. Br.	sahrgulay		+	+		Tp	Mesp	Cl	Fi
83	*Convolvulus arvensis* L.	Sahrgul	+			+	Tp	Mesp	Cl	Fi
Crassulaceae										
84	*Rhodiola fastigiata* (Hook.F.&Thomson) S.H.Fu			+			Gp	Lp	Hb	OM
Cucurbitaceae										
85	*Luffa cylindrica* (L.) Roem.	Torai		+	+		Tp	Macp	Cl	Cul
86	*Cucurbita maxima* Duch.ex Lam.	Shakr kado		+	+		Tp	Macp	Cl	Cul
87	*Cucumis sativus* L.	Badrang		+	+		Tp	Macp	Cl	Cul
Cuscutaceae										
88	*Cusuta europaea* L.	Papra	+	+			P	Ap	Cl	Epi
Ebenaceae										
89	*Diospyros lotus* L.	Tor amlook	+	+	+	+	Megpp	Mesp	Tr	DS
90	*Diospyros kaki* L.	Sur amlook	+	+	+	+	Megpp	Mesp	Tr	Cul
Euphorbiaceae										
91	*Ricinus communis* L.	Arhanda	+	+	+	+	Npp	Macp	Hb	Fi
92	*Euphorbia wallichii* Hook.f.	shngla		+	+		Tp	Micp	Hb	DS
93	*Euphorbia helioscopia* L.	Mandano		+			Tp	Np	Hb	Fi
Fagaceae										
94	*Quercus incana* Roxb.	Spin banj	+	+	+	+	Mespp	Micp	Tr	F
95	*Quercus baloot* Griffth.	Banj	+	+	+	+	Mespp	Micp	Tr	F

Fumariaceae										
96	*Fumaria indica* (Hausskn.) pugsley	Paprra	+				Tp	Np	H b	OM
Geraniaceae										
97	*Geranium rotundifolium* L.	Chinglwani	+				Tp	Mic p	H b	DS
98	*Geranium himalayense* Klotzsch	Rattanjuk		+			Tp	Mic p	H b	F
Juglandaceae										
99	*Juglans regia* L.	Ghuz	+	+	+	+	Mespp	Mic p	Tr	DS
Lamiaceae										
100	*Ajuga bracteosa* Wall. ex Bth.	Panr kash/Buteey	+	+	+		Hcp	Mic p	H b	DS
101	*Lamium amplexicaule* L.	Butyalay		+			Tp	Mic p	H b	OM
102	*Leonurus cardiaca* L.			+			Tp	Mes p	H b	MP
103	*Mentha arvensis* L.	Podina	+	+			Gp	Np	H b	MP
104	*Mentha longifolia* (L.) L.	Velanay	+	+			Gp	Np	H b	MP
105	*Micromeria biflora* (Buch. -Ham.ex D. Don) Bth	shamakay		+			Tp	Lp	H b	OM
106	*Nepeta govaniana* (Wall. ex Bth.) Bth.			+			Tp	Mic p	H b	F
107	*Prunella vulgaris* L.		+			+	Hcp	Mes p	H b	MP
108	*Origanum vulgare* L.	Shamakay		+	+		Cp	Mic p	H b	DS
109	*Salvia lanata* Roxb.	Mattarjarri	+			+	Tp	Mes p	H b	DS
110	*Teucrium stocksianum* Boiss. var. incanum (Aitch. & Hemsley) Hedge & Lamon	Espabutay	+	+			Hcp	Mic p	H b	OM
111	*Thymus linearis* Bth. ssp. linearis Jalas	Mashoo		+			Hcp	Lp	H b	DS
Malvaceae										
112	*Abelmoschus esculentus* (L.) Moench	Bendi		+	+		Tp	Mes p	H b	Cul
113	*Malva neglecta* Wall.	Samchal	+	+			Tp	Mes p	H b	Fi
Meliaceae										
114	*Melia azedarach* L.	Bakyana	+	+	+	+	Megpp	Np	Tr	DS
Moraceae										
115	*Morus nigra* L.	Tuth	+	+	+	+	Megpp	Mes p	Tr	DS
116	*Morus alba* L.	Tuth	+	+	+	+	Megpp	Mes p	Tr	DS
117	*Ficus carica* L. ssp carica	Enzar	+	+	+	+	Megpp	Mes p	Tr	DS
Myrisinaceae										
118	*Myrsine Africana* L.	Marrurung	+	+	+	+	Npp	Np	Sb	F
Oleaceae										
119	*Jasminum humile* L.	Zelai	+	+	+	+	Npp	Mic p	H b	DS
120	*Olea ferruginea* Royle	Khonna	+	+	+	+	Mespp	Mic p	Tr	DS
Onagraceae										
121	*Epilobium hirsutum* L.	Sumbal	+	+	+	+	Gp	Mes p	H b	MS
122	*Oenothera rosea* L' Her. Ex Ait.			+	+		Hcp	Mic p	H b	MS
Orobanchaceae										

123	*Pedicularis bicornuta* Klotzsch var. bicornuta			+	+		Tp	Np	H b	DS
Oxalidaceae										
124	*Oxalis corniculata* L.	Zmakin taruki	+	+	+		Tp	Np	H b	Fi
Paeoniaceae										
125	*Paeonia emodi* Wall. ex Royle	Mamikh	+	+		+	Cp	Mes p	H b	F
Papilionaceae										
126	*Vicia sativa* L.	Marghai khpa		+	+		Tp	Np	H b	OM
127	*Trigonella emodi* Bth.	Malkhwazi		+	+		Tp	Np	H b	Fi
128	*Trifolium repens* L.	Shaftal	+	+			Hcp	Np	H b	Fi
129	*Pisum sativum* L. var. sativum	Matar	+				Tp	Mic p	H b	Cul
130	*Medicago polymorpha* L.	Gat sphestaray	+			+	Tp	Np	H b	DS
131	*Medicago minima* (L.) Grufb.	Shpeshtarae	+			+	Tp	Np	H b	DS
132	*Lathyrus aphaca* L.	Kurkumaney	+			+	Tp	Mic p	H b	Fi
133	*Indigofera heterantha* Wall. ex Brandis var. heterantha	Ghoreja	+	+	+	+	Npp	Lp	Sb	F
134	*Argyrolobium roseum* (Camb.) Jaub. & Spach	Patukhana	+				Hcp	Np	H b	DS
Plantaginaceae										
135	*Plantago lanceolate* L.	Nairai Jabai		+			Tp	Mes p	H b	OM
136	*Plantago major* L.	Ghata jabai		+			Tp	Mes p	H b	OM
Plumbaginaceae										
137	*Limonium cabulicum* (Boiss.) O. Kuntze		+	+	+	+	Npp	Lp	H b	DS
Podophylaceae										
138	*Podophyllum emodi* Wall. ex Royle	Bannasher	+	+			Hcp	Mic p	H b	F
Polygonaceae										
139	*Bistorta amplexicaulis* (D. Don) Green	Anajbar		+	+		Hcp	Mes p	H b	F
140	*Polygonum aviculare* L.	Bandakae		+	+		Tp	Np	H b	MS
141	*Persicaria maculosa* Gray			+	+		Npp	Mes p	H b	OM
142	*Rumex dentatus* L.	Shalkhay		+	+		Cp	Mes p	H b	MS
143	*Rumex hastatus* D. Don	Tarokay		+	+		Cp	Np	H b	MS
Primulaceae										
144	*Primula rosea* Royle	Zangali gul		+			Gp	Mic p	H b	F
145	*Primula denticulata* Smith	Zangali Surma/Mamera	+			+	Gp	Mic p	H b	F
146	*Androsace rotundifolia* Hardw. ssp. rotundifolia Y. Nasir	Suraswa	+	+			Hcp	Mes p	H b	DS
Punicaceae										
147	*Punica granatum* L.	Anarr	+	+	+	+	Micpp	Mic p	Tr	Cul
Ranunculaceae										
148	*Aconitum violaceum* Jacqeum ex. Stapf	Zahre Mora		+			Gp	Np	H b	DS
149	*Ranunculus Muricatus* L.	Ght Zyrgulay	+	+			Gp	Np	H b	OM

150	*Ranunculus laetus* Wall. ex Hk. f. & Thoms	Zyar gulae	+				Gp	Np	Hb	OM
151	*Ranunculus arvensis* L.	Zyar gulae	+				Gp	Np	Hb	Fi
152	*Clematis grata* Wall.	Zelai	+	+	+	+	Npp	Micp	Hb	DS
153	*Caltha alba* Camb. var. alba	Makhanpth		+			Hcp	Np	Hb	MP
154	*Anemone faloneri* Thoms.			+			Hcp	Micp	Hb	Fi
Rhamnaceae										
155	*Sageretia thea* (Osbeck) M.C. Johnston var. thea	Mumanara	+	+	+	+	Npp	Mesp	Sb	F
156	*Ziziphus jujuba* mill.	Markhany		+	+		Npp	Mesp	Tr	F
157	*Zizipus mucronata*	karkandy		+	+		Npp	Mesp	Tr	F
Rosaceae										
158	*Sorbaria tomentosa* (Lindl.) Rehdr	Beray	+	+	+	+	Npp	Micp	Tr	OM
159	*Rubus ulmifolius* Schott.	Karwara	+	+	+	+	Npp	Mesp	Sb	DS
160	*Rubus fruticosus* L.	Krawara	+	+	+	+	Npp	Mesp	Sb	DS
161	*Rosa webbiana* wall.	Palwary	+	+	+	+	Npp	Np	Sb	F
162	*Pyrus pashia* Ham. ex D. Don	Tangai	+	+	+	+	Micpp	Mesp	Tr	Cul
163	*Rosa alba* L.	Gul sadbar	+	+	+	+	Npp	Np	Sb	Cul
164	*Prunus persica* (L.) Batsch	Shaftalo	+	+	+	+	Micpp	Mesp	Tr	Cul
165	*Prunus armeniaca* L.	Khubanai	+	+	+	+	Micpp	Mesp	Tr	Cul
166	*Potentilla nepalensis* Hk.f.	Spngja		+			Gp	Np	Tr	DS
167	*Malus pumila* Mill.	Manra	+	+			Npp	Mesp	Tr	Cul
168	*Fragaria vesca* L.	Zmkin Tut	+	+			Hcp	Micp	Hb	DS
169	*Cotoneaster nummularia* Fisch.	Mamanna	+	+	+	+	Npp	Np	Hb	F
Rubiaceae										
170	*Rubia cordifolia* L.	Kikar		+	+		Hcp	Micp	Tr	DS
171	*Galium aparine* L.	Zylai	+	+			Tp	Np	Tr	OM
Rutaceae										
172	*Skimmia laureola* (DC.) Siebold. & Zucc. ex Walp.	Namir	+	+	+	+	Npp	Mesp	Sb	F
173	*Zanthoxylum armatum* DC.	Dambara	+	+	+	+	Micpp	Mesp	Sb	DS
Scrophulariaceae										
174	*Scrophularia calycina* Bth.			+			Tp	Micp	Hb	DS
175	*Verbascum thapsus* L	Kharghwug		+			Tp	Megp	Hb	MP
Saxifragaceae										
176	*Bergenia ciliata* (Haw.) Sternb. f. ciliata Yeo	Barmea	+	+			Gp	Mesp	Hb	DS
177	*Bergenia stracheyi* (Hk.f. & Thoms.) Engl.	Barmea		+			Gp	Mesp	Hb	DS
Simaroubaceae										
178	*Ailanthus altissima* (Mill.) Swingle	Spena shandai	+	+	+	+	Megpp	Mesp	Tr	DS
Solanaceae										
179	*Capsicum annuum* L.	Marchaky		+	+		Tp	Micp	Hb	Cul
180	*Capsicum frutescens* L.	Ghat Marchaky	+	+	+	+	Npp	Mesp	Hb	DS

181	*Datura stramonium* L.	Batura		+			Tp	Mesp	Hb	DS
182	*Hyoscyamus niger* L.	Bargug	+				Tp	Mesp	Hb	DS
183	*Solanum nigrum* L. var. nigrum	Kachmacho		+	+		Tp	Micp	Sb	Fi
184	*Solanum surattense* Burm. f.	Marghunay		+			Hcp	Mesp	Sb	OM
185	*Solanum tuberosum* L.	Aloo		+			Gp	Mesp	Hb	Cul
186	*Wathania somnifera* (L.) Dunal	Kutilal		+			Cp	Macp	Hb	Fi
Thymeleaeceae										
187	*Daphne mucronata* Royle	Leghonay	+	+	+	+	Npp	Np	Sb	F
188	*Wikstroemia canescens* Meisn.	Zair gulai	+	+	+	+	Npp	Np	Sb	F
Urticaceae										
189	*Urtica dioca* L.	Sezonkay	+	+			Tp	Micp	Hb	Fi
190	*Debregeasia salicifolia* (D. Don) Rendle	Ajlay	+	+	+	+	Npp	Mesp	Hb	MS
Valerianaceae										
191	*Valeriana jatamansi* Jones	Mushki bala	+	+			Gp	Np	Hb	OM
Verbenaceae										
192	*Verbena officinalis* L.	Shamakai	+	+	+	+	Tp	Micp	Hb	Fi
193	*Vitex negundo* L.	Marwandai	+	+	+	+	Npp	Mesp	Sb	OM
Violaceae										
194	*Viola canescens* Wall. ex Roxb.	Banafsha	+				Tp	Micp	Hb	OM
Vitaceae										
195	*Vitis vinifera* L.	Zangali kwar	+	+	+	+	Npp	Mesp	Cl	Cul
196	*Vitis jacquemontii* parker	Gedarkwar	+	+	+	+	Npp	Mesp	Cl	Cul
Zygophyllaceae										
197	Tribulus terrestris L.	Markunday		+			Hcp	Np	Hb	DS

Keys:

Life Form: Cp = Chamaephytes, Gp = Geophytes, Hcp = Haemicryptophytes, Megpp=Megaphanerophytes, Micpp= Microphanerophytes, Mespp= Mesophanerophytes, Npp = Nanophanerophytes, Tp = Therophytes, P = Parasite.

Leaf Size: Aphyllous = Ap, Leptophylls = Lp, Macrophylls =Macp, Microphylls = Micp, Megaphylls =Megp, Mesophylls = Mesp, Nanophylls = Np.

Habit: Cl, Climber**,** Hb, Herb**,** Sb, Shrub**,** Tr, Tree.

Habitat: Fi-Agricultural fields**,** Cul-Cultivated, DS-Dry slopes**,** Epi-Epiphyte**,** F-Forest**,** I-Implanted**,** OM-Open meadows**,** Mp- Moist places**,** MS-Moist Shady places**,** R-Rock crevices**,** W-Wet places.

Table 4.3 Family wise distribution of flora of Baranai, Madyan Valley, Swat

S.NO	Family	Species	%AGE
1.	Poaceae	12	6.10%
2.	Lamiaceae	12	6.10%
3.	Rosaceae	12	6.10%
4.	Asteraceae	9	4.57%
5.	Papilionaceae	9	4.57%
6.	Solanaceae	8	4.07%
7.	Ranunculaceae	7	3.56%
8.	Brassicaceae	6	3.04%
9.	Pinaceae	5	2.54%
10.	Polygonaceae	5	2.54%
11.	Apiaceae	4	2.04%
12.	Caryophyllaceae	4	2.04%

13.	Boraginaceae	3	1.53%
14.	Cucurbitaceae	3	1.53%
15.	Euphorbiaceae	3	1.53%
16.	Junaceae	3	1.53%
17.	Moraceae	3	1.53%
18.	Primulaceae	3	1.53%
19.	Rhamnaceae	3	1.53%
20.	Adiantaceae	2	1.02%
21.	Acanthaceae	2	1.02%
22.	Adoxaceae	2	1.02%
23.	Alliaceae	2	1.02%
24.	Chenopodiaceae	2	1.02%
25.	Convolulaceae	2	1.02%
26.	Cupressaceae	2	1.02%
27.	Cyperaceae	2	1.02%
28.	Ebenaceae	2	1.02%
29.	Fagaceae	2	1.02%
30.	Geraniaceae	2	1.02%
31.	Iridaceae	2	1.02%
32.	Liliaceae	2	1.02%
33.	Malvaceae	2	1.02%
34.	Oleaceae	2	1.02%
35.	Onagraceae	2	1.02%
36.	Plantaginaceae	2	1.02%
37.	Pteridaceae	2	1.02%
38.	Rubiaceae	2	1.02%
39.	Rutaceae	2	1.02%
40.	Saxifragaceae	2	1.02%
41.	Scrophulariaceae	2	1.02%
42.	Thymeleaeceae	2	1.02%
43.	Urticaceae	2	1.02%
44.	Verbenaceae	2	1.02%
45.	Vitaceae	2	1.02%
46.	Athyriaceae	1	0.50%
47.	Dryopteridaceae	1	0.50%
48.	Equisetaceae	1	0.50%
49.	Psilotaceae	1	0.50%
50.	Aspargaceae	1	0.50%
51.	Colchicaceae	1	0.50%
52.	Dioscoreaceae	1	0.50%
53.	Anacadiaceae	1	0.50%
54.	Araliaceae	1	0.50%
55.	Balsaminaceae	1	0.50%
56.	Berberidaceae	1	0.50%
57.	Buddlejaceae	1	0.50%
58.	Buxaceae	1	0.50%
59.	Campanulaceae	1	0.50%
60.	Cannabaceae	1	0.50%
61.	Crassulaceae	1	0.50%
62.	Cuscutaceae	1	0.50%
63.	Fumariaceae	1	0.50%
64.	Juglandaceae	1	0.50%
65.	Meliaceae	1	0.50%
66.	Myrsinaceae	1	0.50%
67.	Orobanchaceae	1	0.50%
68.	Oxalidaceae	1	0.50%
69.	Paeoniaceae	1	0.50%
70.	Plumbaginaceae	1	0.50%

71.	Podophyllaceae	1	0.50%
72.	Punicaceae	1	0.50%
73.	Simaroubaceae	1	0.50%
74.	Valvericeae	1	0.50%
75.	Violaceae	1	0.50%
76.	Zygophyllaceae	1	0.50%
Total		**197**	**100**%

Ecological Characteristics

Life form

The life form class reflects the adaptation and physiognomy of flora and vegetation to climate. The proportional distribution of distinct life forms within a designated region or locality is referred to as its biological spectrum. Life form class based on the (Raukiaer, 1934) is more acceptable and reliable, which is based upon the position and degree of protection to perennating buds during unfavorable condition. On the basis of life form class, the area was dominated by Therophytes with 70 species (35.53%), followed by Geophytes with 37 species (18.79%), Nanophanerophytes with 35 species (17.77%), Hemicryptophyte with 23 species (11.67%), Megaphanerophyte 12 species, Chamephytes 08 species (4.06%), (6.10%), Microphanerophytes 07 species (3.55%), Mesophanerophyte 04 species (2.03%) and Parasite 01 species (0.55%). (Table 1, Fig 2). The prevalence of Therophytes signified that the investigated region experienced substantial biotic pressure, primarily attributed to factors such as deforestation and extensive overgrazing. A notable quantity of plants were uprooted for combustion and subjected to grazing by livestock. Ali *et al.* (2016) reported Therophytes dominant in the floristic composition of Chail valley, district Swat, Ali *et al.* (2018) documented the Therophytes were dominant in the flora of Hazar Nao Hills, district Malakand, Khan *et al.* (2014) explored the same result that the dominant class were Therophytes in his study area Shahbaz Garhi, District Mardan, Sher *et al.* (2011) in the flora of Lahore, district Swabi they showed that Therophytes had highest percentage as life form class which was in correspondence with our research findings. Ullah *et al*. (2016) district Bannu, Qureshi *et al.* (2014) in Khanpur Dam, Shah and Rozina (2013) depicted same results, Ullah and Badshah. (2017 and Badshah *et al.* (2016) in the floristic composition of Parachinar, Kurram agency were dominated by Therophytes which showed resemblance with our findings.

Table 4.4 Percentage distribution of Life form

S.No	Life Form	No of species	%AGE
1	Chamaephytes (Cp)	08	4.06%
2	Geophytes (Gp)	37	18.79%
3	Haemicryptophytes (Hcp)	23	11.67%
4	Megaphanerophytes (Megpp)	12	6.10%
5	Microphanerophytes (Micpp)	07	3.55%
6	Mesophanerophytes (Mespp)	04	2.03%
7	Nanophanerophytes (Npp)	35	17.77%
8	Therophytes (Tp)	70	35.53%
9	Parasite (p)	1	0.50%
Total species		**197**	**100%**

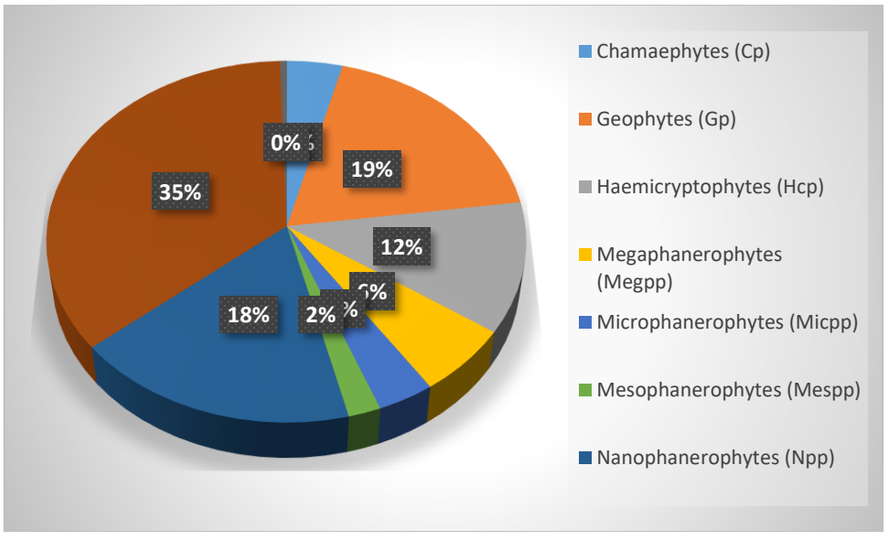

Fig 4.2 Percentage distribution of life form

Table 4.5 Percentage distribution of Habitat

S.NO	Habitat	No of species	%AGE
1	Agricultural Fields (Fi)	22	11.16%
2	Cultivated (Cul)	22	11.16%
3	Dry slopes (DS)	63	31.97%
4	Epiphyte (Epi)	01	0.50%
5	Forest (F)	28	14.21%
6	Implanted (I)	02	1.01%
7	Open meadows (OM)	25	12.71%
8	Moist places (MP)	15	7.62%
9	Moist Shady places (MS)	07	3.56%
10	Rock crevices (R)	05	2.54%
11	Wet places (W)	07	3.56%
Total species		**197**	**100%**

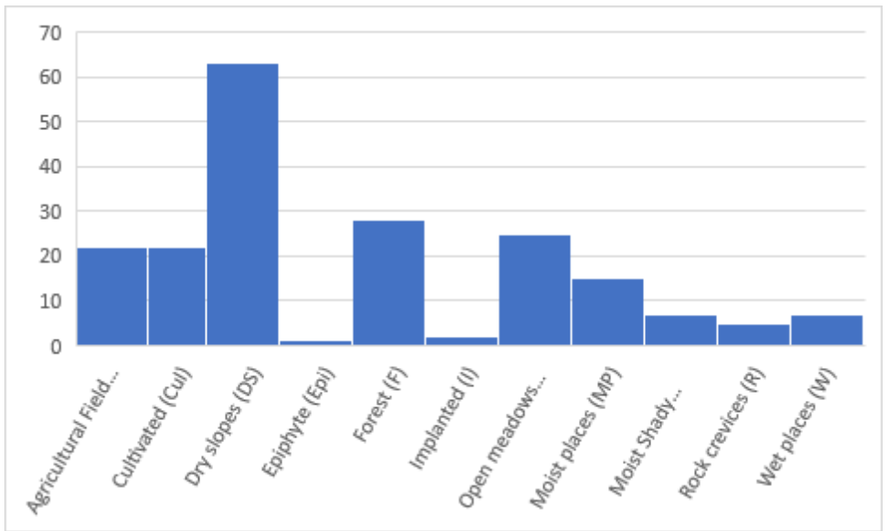

Fig 4.3 Habitat status

Leaf size

Understanding leaf size is crucial for comprehending the physiological processes of plants and plant communities, aiding in the classification of associations. The biological characteristics of flora, particularly leaf size spectra, were investigated to assess both biotic and anthropogenic interferences influencing the current vegetation structure and physiognomy. Examining the relationship between leaf size spectra and ecological factors is essential for identifying and studying vegetation at a regional scale. In the study area, Mesophylls dominated the leaf size spectrum with 61 plant species, followed by Microphylls with 59 species, Nanophylls with 58 species, Leptophylls with 09 species, Macrophylls with 05 species, Aphyllous with 03 plant species, and Megaphylls with 02 species. Khan et al. (2014) presented a floristic list of Shahbaz Garhi, District Mardan, supporting our research data by highlighting the dominance of the same

leaf size class. Sher et al. (2011) explored the floristic composition of Lahore, District Swabi, showcasing the dominant leaf size class in the area, aligning with our findings. Similarly, Khan et al. (2017) in the vegetation of Swat Ranizai, District Malakand, and Ali et al. (2017) in the village Sherpao, District Charsadda, observed leaf size spectra corresponding to our research data. Shah and Rozina (2013) identified the dominant leaf size class through leaf size spectra. Ullah and Badshah (2017) studied the floristic structure revealing a dominant class in the leaf size spectrum, consistent with our results. Additionally, Khan et al. (2014-17) in Sathan Gali, Mansehra, arrived at similar conclusions regarding the dominant leaf size class.

Table 4.6 Percentage distribution of life size of flora

S.NO	Leaf size	No of species	%AGE
1	Aphyllous (Ap)	03	1.52%
2	Leptophylls (Lp)	09	4.56%
3	Macrophylls (Macp)	05	2.53%
4	Microphylls (Micp)	59	29.95%
5	Megaphylls (Megp)	02	1.02%
6	Mesophylls (Mesp)	61	30.97%
7	Nanophylls (Np)	58	29.45%
Total species		**197**	**100%**

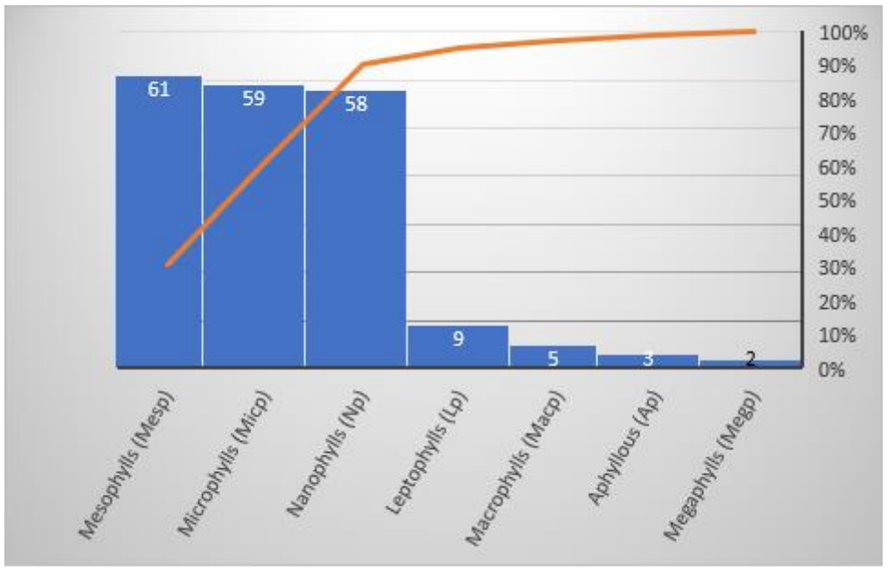

Fig 4.4 Percentage distribution of leaf size

Habit

Based on habit, the study area exhibited dominance by Herbs, constituting 140 plant species (71.06% of the total), followed by Trees with 28 species (14.21%), Shrubs with 21 species (10.65%), and Climbers with 08 species (4.06%). In a similar context, Ali et al. (2018) conducted an inventory highlighting Herbs as the dominant class, aligning with our current findings. Additionally, Haq and Badshah (2021) and Ullah et al. (2020) also affirmed the dominance of Herbs in their reports, providing further support to our research data.

Table 4.7 Percentage distribution of Habit

S.No	Habit	No of species	%AGE
1	Herb (Hb)	140	71.06%
2	Shrub (Sb)	21	10.65%
3	Trees (Tr)	28	14.21%
4	Climber (Cl)	08	4.06%
Total species		**197**	**100%**

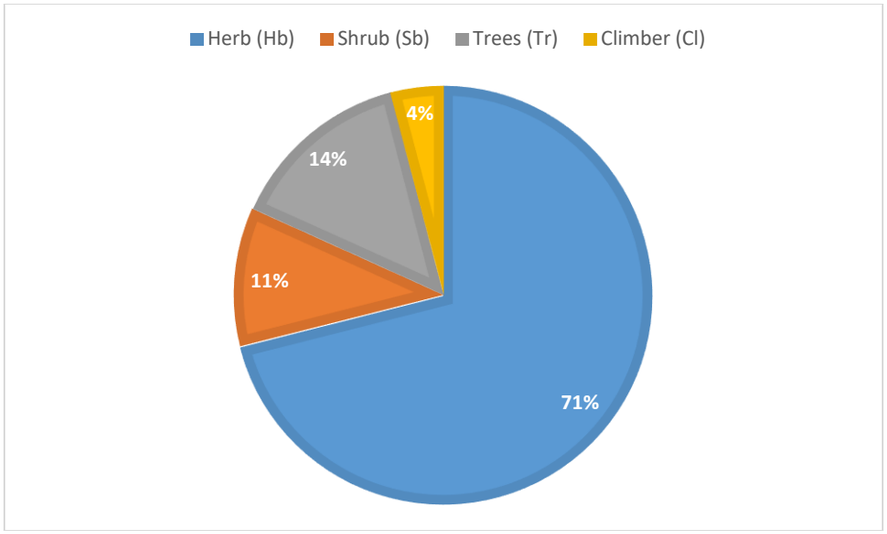

Fig 4.5 Habit status

Conclusion

1. The study was carried out between 2022 and 2023 to document the floristic composition and ecological attributes of plants in the village of Baranai, situated in the Madyan Valley of Swat.
2. The study demonstrated that flora of village of Baranai comprised on 197 plants species belonging to 76 families. Among these 60 families were Angiosperms, having 8 Monocots and 60 were Dicots families. 06 families were Pteridophytes and 02 were Gymnosperms.
3. Family dominancy showing Poaceae, Lamiaceae, and Rosacaeae
4. Based on growth habit, the predominant vegetation in the study area consisted of 140 species of Herbs, followed by 28 species of Trees, 21 species of Shrubs, and 08 species of Climbers.
5. Therophytes were the prevailing life form class in the studied area.
6. Leaf size class was dominated by Mesophylls.

Acknolwgment

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