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Analyziz Ecological Importance of Floral Biodiversity Along the Natural Stadium Pissan Valley Distric Nager

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ABSTRACT

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The world's highest natural Cricket Stadium is located in Pissan Valley at District Nagar of Gilgit Baltistan, Pakistan at an elevation of 8,500 feet above sea level. Cricket Stadium is around 1.5 km above the Main Bazar. Stadium is located under the shoulder of the ferocious snow-covered Rakaposhi and Diran peaks. The present study was carried out from August-September 2024. The collected specimens consist of (51) plant species that belonged to 44 genera and 27 families. The life forms of the collected species were 26 (50.98%) where Hemicryptophyte were dominant, 12 (23.52%) Chaemophyte, 7 (13.72%) Phanerophyte, 6 (11.76%) Therophytes and Geophytes were 0 (0%). The breakup of the habit categories shows that the herbs with 31 (60.78%) species were dominant to show the flora of the study area, followed by shrubs with 10 (19.60%) species which shows the flora of the study area. Subshrubs by 8 (15.68%) and trees 2 (3.92%) contained the flora of the study area. We studied three stands and, in each stand, we placed sixty quadrat to recognize the dominant flora based on IVI. We recognized the dominant lifeform Hemicryptophytes. The phytosociological studies provided all required information from each stand like dominant habit categories, dominant life forms, and dominant taxa in the study area.

Introduction

Biodiversity has been increasingly in the focus of scientific and public attention over the past decades, culminating in the United Nations declaring 2010 to be the International Year of Biodiversity. The analysis of plant species diversity and distribution in an area can be analyzed by examining its floristic composition (Ali et al. 2018; Bano et al. 2018). Studying floristic composition within a specific environment reveals valuable insights into vegetation traits (Batalha and Martins 2002).

The study of flora is a common global endeavor aimed at acquiring further insights into the world of plants. It is a universally practiced approach to amass additional knowledge about various plant species (Gul et al. 2018; Hussain et al. 2020). The

presence of all plant species in a particular region characterizes its flora, whereas vegetation encompasses the significance of these species, their life forms, population dynamics, and their interactions within a specific environment. Floristic diversity indicates the vegetation variety in a region, supporting plant species identification and sustainable use (Rafay et al. 2013). Understanding the plant life in an area is key to assessing biodiversity and environmental conditions, supporting informed conservation and land management choices (Ali et al. 2022). These studies provide vital local plant data and a starting point for further research, as plants are grouped by their adaptations to the environment. Plants are categorized into life-forms based on their functions, structures, and responses to prevailing environmental conditions (Yatsenko et al. 2021). A floristic inventory can enhance our comprehension of vegetation characteristics. (Mehmood et al. 2015, 2017; Rahman et al. 2016; Zhao et al. 2021). systemic collection of data over space and time with effective and rigorous documentation of change (Kutt et al. 2009). The floristic composition of any area gives us important information about different plant species diversity and their distribution (Ali et al., 2018; Bano et al., 2018; Gul et al., 2018). Floristic diversity is used to describe plant species of any geographical area, whether cultivated or wild in their nature (Farooq et al., 2019; Khan and Badshah, 2019).

The life form classified on the basis adaptation of their perennation organs to tide over the unfavorable conditions. Raunkiaer (1934) used it as descriptive tool for classifying plant life forms based on the position and degree of protection of the renewing buds, which are responsible for the renewal of the plant's aerial body when the favorable season comes. According to this system, plant species can be grouped into five main classes: phanerophytes, chamaephytes, hemicryptophytes, cryptophytes and therophytes. The percentage of various lifeform classes put together is called as the biological spectrum. When working with a species list, every species has the same weightage in the biological spectrum. This is called a floristic biological spectrum (Raunkiaer, 1934; Costa et al., 2007). However, when the number of individuals, instead of species, of each life form is counted each class can be weighted by its density, giving rise to the vegetation biological spectrum, which indicates phenomena relative to the vegetation rather than to the flora (Batalha and Martins, 2002).

The recent studies recommend vegetation spectrum when working at smaller scales, due to under representation of therophytes population and overrepresentation of phanerophytes (Batalha and Martins, 2004). Increased diversity has been suggested to lead to an enhanced production (Bai et al. 2007; Bullock et al. 2007; Flora refers to the total number of plant species found in a given geographic region, as well as plant species that are unique to a geological period or ecosystem. Floristic diversity expresses the variety of flora found in a given geographic place, which provides a platform for the proper identification and sustainable utilization of plants. Floristic diversity of a region refers to the number of species found within its borders, whether wild or cultivated and is an indicator of the region's flora and plant resources. Biodiversity is defined as the variety and number of species, as well as their distribution patterns. Biodiversity research focuses on species diversity, which is one of the main goals and is utilized to assist ecosystems in a variety of ways.

Main aim and objectives of the study were

1. To prepare the inventory of the flora in the study area.
2. To identify the dominant taxa using the importance value index.
3. To explore the biological spectrum and floristic structure of the flora in the study area.

Materials and Methods

Investigation site

The world's highest natural cricket stadium is located in Pissan valley at District Nager of Gilgit Baltistan, Pakistan at an elevation of 8500 feet above the sea level. Nager cricket natural stadium became an aspiration for cricket lovers across Pakistan.

Cricket stadium is within walking distance of 1 hour from Pissan main bazar. Stadium is located under the shoulder of the ferocious snow-covered Rakaposhi and Diran peaks. It has a lush green carpet under the mountain nest. Map of study area is shown in (Fig. 1).

Fig. 1: Map of the study area

Materials and equipment

The Equipment were used during the field survey are plastic bages, field notebook, pen, gloves, inch tab, steel nail, string, and mobile (Sujjad *et al.*, 2024).

Data collection and species identification

During the field survey, we collected significant qualitative and quantitative data, which included field observations, plant specimens, and altitudes to identify ecological zones. Then pressed the collected plant specimens using a presser and dried by dryer.

Data Analysis

Quadrade method

A quadrade method is important if we are studying vegetation structure in a particular habitat. Quadrade is a basic sampling unit of varying sizes and shape. American ecologists selected stands subjectively, but they used many quadrades randomly rather than a single large plot (like relieve method) for investigations.

Phytosociological studies

We used the quadrat method for phytosociological studies, taking thirty (30) quadrats randomly in each stand (Onoda *et al.* 2017). Each stand had 10 quadrates. The samples were taken from the both sides pissan natural stadium (Left and Right). The plot size is usually based on the vegetation type. But we used 1m x 1m plot during sampling. The GPS values were taken with the help of Global Positioning System (GPS) (Thomas, (1985) and Mc Cully *et al.*, (1991).

The following formulas were used to calculate different attributes (Arif and Haider 2022):

Absolute density= Total no of all individuals of a species in all quadrade

The total area of the sample plot

Relative density = No of individual of a species ×100

Total no of all individual of a species

Absolute Frequency = No of quadrade which species occur

Total point taken

Relative Frequency = F1 of a species ×100

Sum of F1 of all species

Absolute cover = $\frac{\text{Total cover of a species}}{\text{Total no of plant of a species}}$

Total no of plant of a species

Relative Frequency = $\frac{\text{Total cover of all plants of a species}}{\text{Total cover of all plants of all species}} \times 100$

Total cover of all plants of all species

Important value index (IVI) = Relative density + Relative frequency + Relative dominance.

Results

Composition of Flora

The study was carried out along the flora of Pissan Natural stadium during 2024. The current study recorded the composition of flora on pissan stadium the floristic composition was comprised on 51 species belonging to 44 genera followed by 27 families. Similarly, after mention documented flora categorized in habit categories 31 Herb, 10 shrubs, 8 subshrub followed by, while life form were 7, Phanerophytes, 26 Hemicryptophytes, 12 Chamaephytes, 6 Therophytes followed by 0 Geophytes but here we only present the inventory of the species were recorded from pissan stadium (table 1).

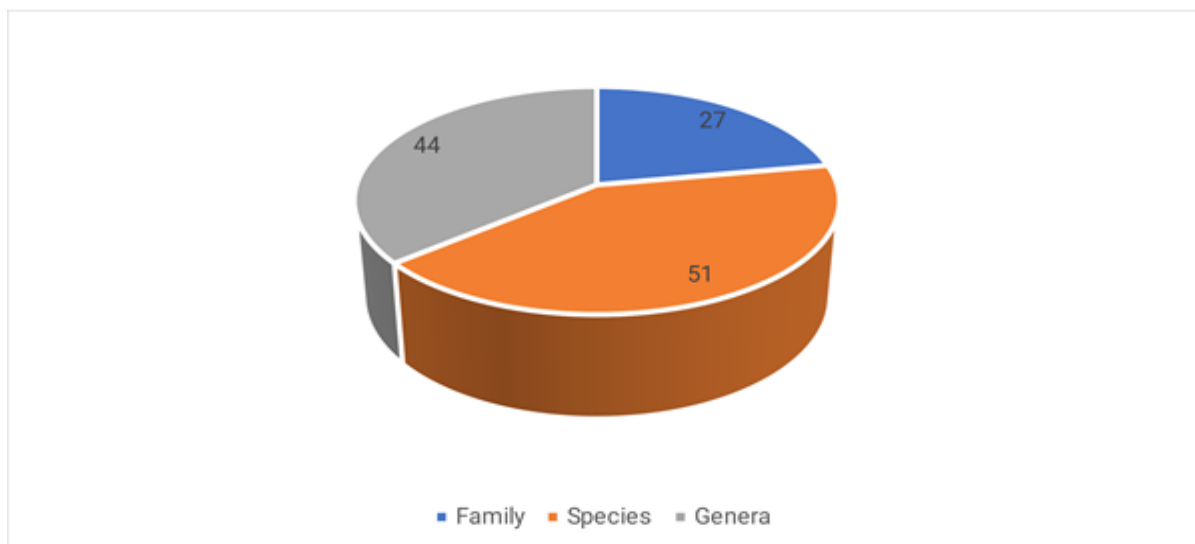
Table 1: Checklist of floristic diversity in the study area

S /NO	Family name	Species Name	Habit	Habitat	Life form	Elevation
1	Asteraceae	<i>Cirsium arvense</i> (L.) Scop.	Herb	moist	He	1200
2	Astereaceae	<i>Artemisia rutifolia</i> stephan ex spreng	Sub shrub	sandy	He	8000
3	Astereaceae	<i>Taraxcum officinale</i>	Herb	moist soil	He	7500
4	Astereaceae	<i>Artemisia sieversiana</i> Ehrh. Ex Willd.	Sub shrub	Dry	Ch	5003
5	Astereaceae	<i>Taraxacum glaucanthos</i> (Ledeb.)	Herb	on the rock	He	4200
6	Astereaceae	<i>Cirsium vulgare</i> (savi)Ten.	Herb	most	He	2703
7	Astereaceae	<i>Artimisia cappillaris</i> Miq.	Sub shrub	Dry	Ch	1890
8	Astereaceae	<i>Conyza</i> Less.	Herb	Dry	Th	1800
9	Astereaceae	<i>Crepis pulchra</i> L.	Herb	Dry	He	1578
10	Astereaceae	<i>Artimisia Vulgaris</i> L.	Sub shrub	wetland	Ch	800
11	Astereaceae	<i>Ligularia thomsonii</i> (C.B.Clarke) pojark	Herb	moist	he	470
12	Berberisdaceae	<i>Berberis calliobotrys</i> Bien.ex koehne	shrub	clay	Ph	4000
13	Brassicaceae	<i>Desurainia Sophia</i> (L.) Webb	Herb	Dry	Th	3000
14	Brassicaceae	<i>Mathiola flava</i> Boiss.	Herb	rocky	Th	1995
15	Broginaceaea	<i>Arnebi guttata</i> bunge	Herb	on the rock	He	8300
16	Campanulaceae	<i>Campanula cashmeriana</i> Royle	Herb	moist	He	1299
17	Chenopodiaceae	<i>Chenopodium album</i> L.	Herb	sandy	Th	2006
18	Chenopodiaceae	<i>Chenopodium botrys</i> L.	Herb	on the rock	Th	1995
19	Chenopodiaceae	<i>Krasscheninnikovia ceratoides</i> (L.) Gueldenst	Sub shrub	rocky	Ch	1860
20	Convoluacea	<i>Convolvulus arvensis</i> L.	Herb	moist	He	3200
21	Crassulaceae	<i>Crassula pentandra</i> (Royle ex Edgew.)	Sub shrub	Dry	Ch	3302
22	Cupressaceae	<i>Juniperus squamata</i> lamb	Shrub	on the rock	Ph	7700
23	Cupressaceae	<i>Juniperus excelsa</i> M. Bieb	Tree	dry	Ph	2370
24	Elaegnaceae	<i>Hippophae rhamnoides</i> Mill.	Shurb	Dry	Ph	1480
25	Geraniaceae	<i>Geranium sibiricum</i> L.	Herb	wetland	He	192
26	Iridaceae	<i>Iris Lactea</i> Pall.	Herb	Clay	He	950
27	Labiatae	<i>Isodon rugosus</i> (Wall.ex Benth.)Codd	Shrub	Dry	Ch	4488
28	Labiatae	<i>Nepta cateria</i> L.	Herb	moist	He	1608

29	Labiatae	<i>Thymus linearis</i> Benth	Sub shrub	rocky	Ch	1600
30	Labiatae	<i>Perovskia abrotanoides</i> Kar.	Sub shrub	Dry	Ch	1550
31	Labiatae	<i>Mentha royleana</i> Benth.	Herb	moist	He	1550
32	Orchidaceae	<i>Dactylorhiza hatagirea</i> D.don	Herb	moist	He	2100
33	Papilionaceae	<i>Colutea nepalensis</i> Sims	Shrub	on the rock	Ph	2565
34	papilionaceae	<i>Sophora mollis</i> (Royal) Baker	Shrub	Dry	PH	7788
35	papilionaceae	<i>Trifolium pratense</i> L.	Herb	Dry	He	6003
36	papilionaceae	<i>Medicago sativa</i> L.	Herb	clay	He	5998
37	Plantagenaceae	<i>Plantago major</i> L.	Herb	moist	He	3550
38	poaceae	<i>Sorghum halepense</i> (L.) Pers.	Herb	wetland	He	3700
39	poaceae	<i>Poa alpina</i> L.	Herb	Clay	He	2400
40	poaceae	<i>Phragmites karka</i> (Retz) Trin.ex Steud.	Herb	moist	He	2205
41	poaceae	<i>Dactylis glomerata</i> L.	Herb	moist	He	1300
42	poaceae	<i>Melica nutans</i> L.	Herb	clay	He	1001
43	Polygonaceae	<i>Rumex nepalensis</i> Spreng	Herb	clay	He	4445
44	primulaceae	<i>Androsace lanuginosa</i> Wall.	Herb	sandy	Ch	5700
45	Ranunculaceae	<i>Clematis orientalis</i> L.	Shrub	clay	He	3200
46	Scrophulariaceae	<i>Scrophularia scabiosifolia</i> Benth.	Herb	Dry	He	999
47	Salicaceae	<i>Salix alba</i> L.	Tree	moist	Ph	2502
48	Tamaricaceae	<i>Myricaria elegans</i> Royle	Shrub	on the rock	Ch	3160
49	Thymelaeaceae	<i>Daphne mucronata</i> Royle	Shrub	sandy	Ch	3690
50	Umbelliferae	<i>Trachyspermum ammi</i> (L.) Sprague	Herb	Dry	Th	870
51	Zygophyllaceae	<i>Peganum harmala</i> L.	Shrub	dry	Ch	290

Taxonomic breakup of the flora study area

The result revealed that the study area comprised of total 51 diverse species belonging to 44 genera followed by 27 families. Among these recorded taxa. **(Figure 2).**



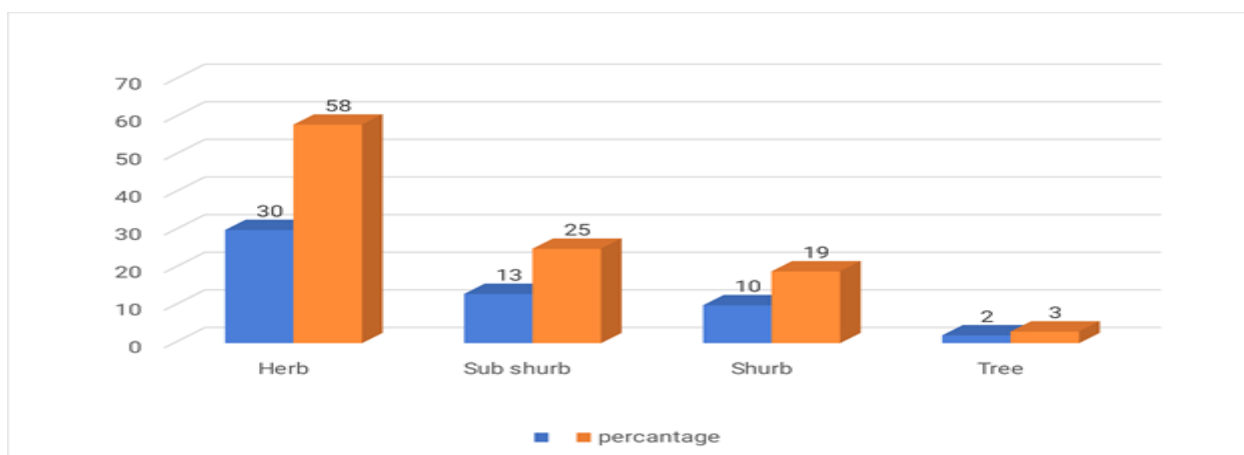


Figure 3: Show habit categories of the study area and its percentage

The habit categories of the recorded flora. Herbs were recognized the dominant habit in the study area Herb with 31 species which contributes 60.78 % of the flora in the study area, followed by shrubs with 10 species contributing 19.60% in vegetation of the study area followed by sub shrub with 8 species contributing 15.68% and trees with 2 species 3.92%. **(Figure 3).**

Life form categories of the study area

Life form classes are very important ecological characteristics of flora, which show the climatic condition of the area. Hence, we categorized the different life form classes of recorded flora. Interestingly only four life form were observed namely Hemicryptophytes 50.98%, followed by, Chamaephytes 23.52%, Phanerophytes 13.72%, and Therophytes 12 % **(Figure 4).**

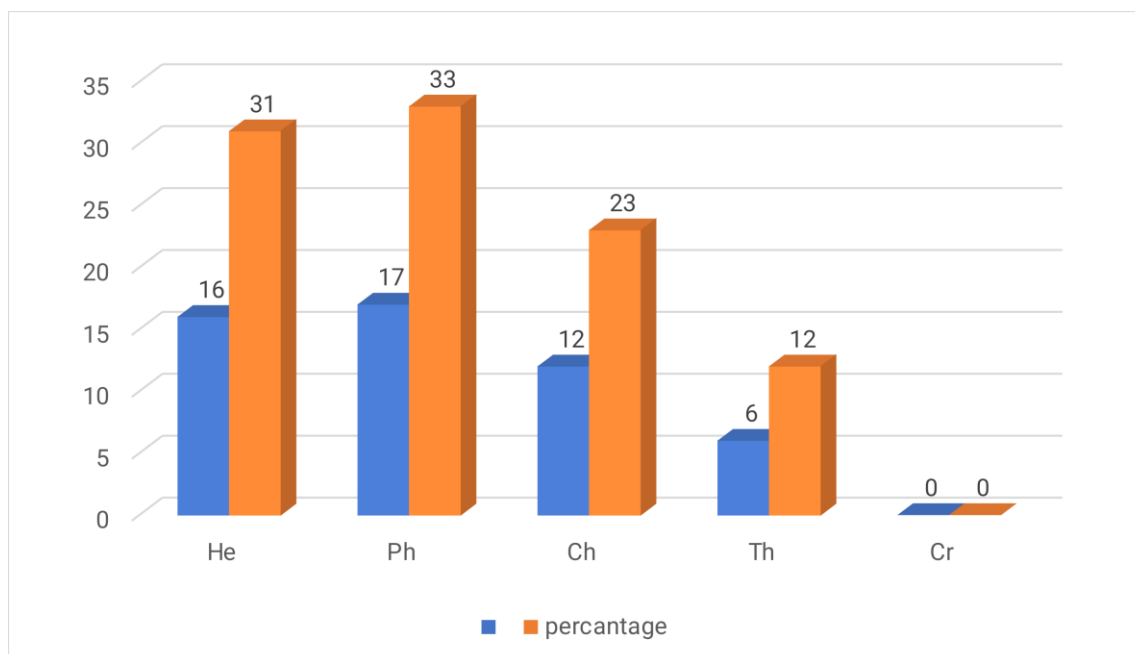


Figure 4: shows Life form categories of the study area

The largest taxa in the study area was recognized on the bases of highest number genera and species with in family which contributes the vegetation of the study area similarity the largest family in the study area was Asteraceae families having 10 species which contributes (19%) of the flora of study area followed by followed Poaceae and Labiatae family with 5, species (9%) Papilionaceae , Chenopodiaceae, were contributing (7%) Cupressaceae, plantagenaceae and Brassceae were contributing (3%) and remaining families were contributing 1% of the flora respectively. **(Figure 5).**

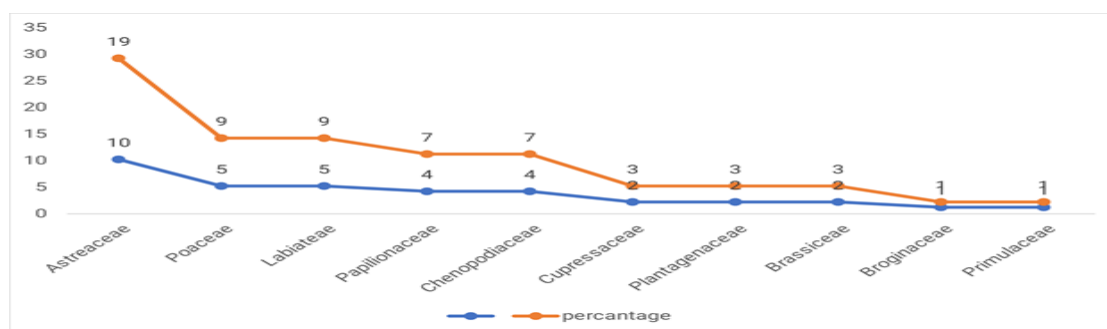


Figure 5: Number of largest taxa and its percentage found in study area

Phytoclimatic conditions

The Phytoclimatic conditions refers the reorganization of climatic conditions based on dominant life form of the flora of the study area. The flora is very important to predict the climatic condition of the. Each life form class show the special climatic conditions, like Phanerophytes shows that hot climatic condition, Chamaephytes and Hemicryptophytes cold climatic conditions, Geophytes show harsh and cold climatic conditions while Therophytes shows hot or desert conditions (Saxena et al.,1982), (Table 2).

Table 2: Phytoclimatic conditions of flora.

Normal Spectrum	Climatic Conditions
Phanerophytes	Hot climate
Chamaephytes	Cold Climate
Hemicryptophytes	Cold Climate
Therophytes	Desert Climate
Geophytes	Cold and Harsh Climate

Comparison of life form of study area with Raunkiaer normal spectrum

To assess the Phytoclimatic conditions of the flora are compared the life form of the recorded flora with Raunkiaer normal spectrum shows the Phanerophytes was dominance class, followed by, Therophytes and while lesser number with Geophytes where as in the study area observed Hemicryptophytes were dominant followed by Chamaephytes followed by Phanerophytes and, Therophytes. The Therophytes were with lesser number, and Geophytes were absent the comparison show that over data is different from normal spectrum. It means the dominant life form in study area were Hemicryptophytes and Chamaephytes and it shows cold climatic conditions in the study area. Apparently, this result is quite feasible or suitable conditions match with ground conditions of the study area. (Figure 6).

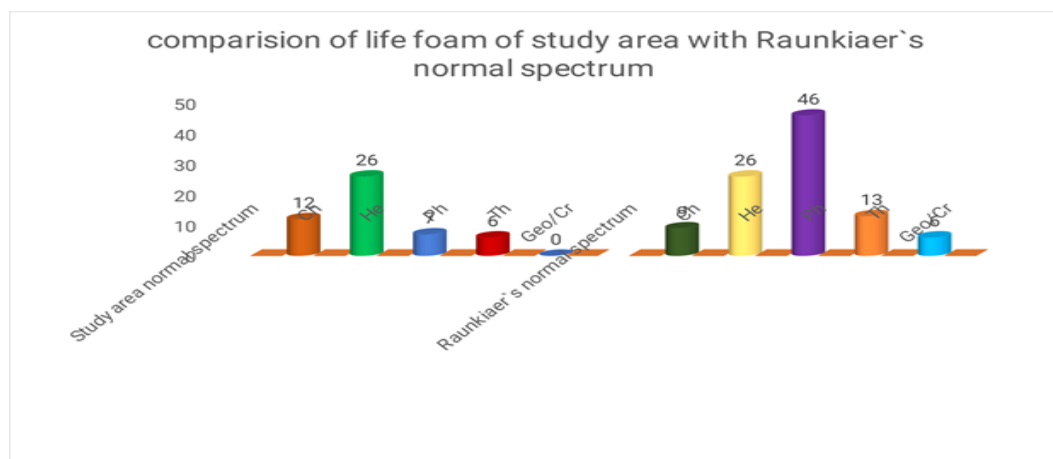


Figure 6: Comparison of life form of study area with Raunkiaer's normal spectrum

Stand-1 Pissan Natural stadium Nager Valley**Floristic Composition of stand 1**

The number of taxa found on left site of stand 1 of Pissan natural stadium was comprised on 11 families belonging to 14 genera and 14 species while the number of taxa recorded on right site of the stand 1 at pissan natural stadium was 11 families followed by 12 genera and 12 species.

Dominant Habit category and life form stand 1

The inventory of the documented species along both sites of Pissan natural stadium in stand 1 showed that the dominant habit category observed on left site of the Pissan natural stadium was herbs with 9 species, followed by shrubs 3 species, but subshrub was 3 species, and tree were not found. Where on right site the dominant habit category was herbs with 7 species, shrubs with 3 species, subshrub 2 species, and trees were not found. Interestingly both sides were showed more or lesser distribution of habit categories. (Nawaz, I. (2026))

similarly, the dominant life form of left site was Hemicryptophytes followed by Chamaephytes, and Therophytes, while on the right site of the Pissan natural stadium the dominant life form was Hemicryptophytes followed by

Chamaephytes. (table 3)

Check list of pissan natural stadium left and Right site stand 1

left site			
Family name	species name	habit	Life form
Asteraceae	<i>Artemisia rutifolia</i> stephan ex spreng	Sub shrub	He
Thymelaeaceae	<i>Daphne mucronata</i> Royle	Shrub	Ch
Ranunculaceae	<i>Clematis Orientalis</i> L.	Shrub	He
Labiatae	<i>Perovskia abrotanoides</i> Kar.	Sub shrub	Ch
Poaceae	<i>Sorghum halepense</i>	Herb	He
Poaceae	<i>Dactylis glomerata</i>	Herb	He
Polygonaceae	<i>Rumex nepalensis</i>	Herb	He
Primulaceae	<i>Androsace lanuginosa</i>	Herb	Ch
Plantaginaceae	<i>Plantago major</i>	Herb	He
Labiatae	<i>Nepeta Cataria</i>	Herb	He
Boraginaceae	<i>Arnebia guttata</i> bunge	Herb	He
Papilionaceae	<i>Medicago sativa</i>	Herb	He
Labiatae	<i>Isodon rogosus</i>	Shrub	Ch
Chenopodiaceae	<i>Chenopodium album</i>	Herb	Th
Right site			
Family	species name	habit	life form
Polygonaceae	<i>Rumex nepalensis</i>	Herb	He
Poaceae	<i>Sorghum halepense</i>	Shrub	He
Labiatae	<i>Isodon rugosis</i>	Shrub	Ch
Poaceae	<i>Phragmites karka</i>	Herb	He
Poaceae	<i>Dactylis glomerata</i>	Herb	He
Asteraceae	<i>Arthemisia rutifolia</i>	Sub shrub	He
Labiatae	<i>Perovskia abrotanoides</i>	Sub shrub	Ch
papilionaceae	<i>Medicago sativa</i>	Herb	He
Iridaceae	<i>Iris Lactea</i>	Herb	He
Plantaginaceae	<i>Plantago major</i>	Herb	He
Thymelaeaceae	<i>Daphne mucronata</i>	Shrub	Ch
Labiatae	<i>Nepeta Cataria</i>	Herb	He

Taxonomic breakup

Comparison vegetation taxonomic breakup at the stand 1 of left and Right Site pissan natural stadium Nager valley.

The number of taxa found in stand 1 left side was 11 families followed by 14 genera and 14 species respectively while the number of taxa found in stand 1 right side of the Shahrah Nager was 11 families followed by 12 genera and 12 species (**fig 7**).

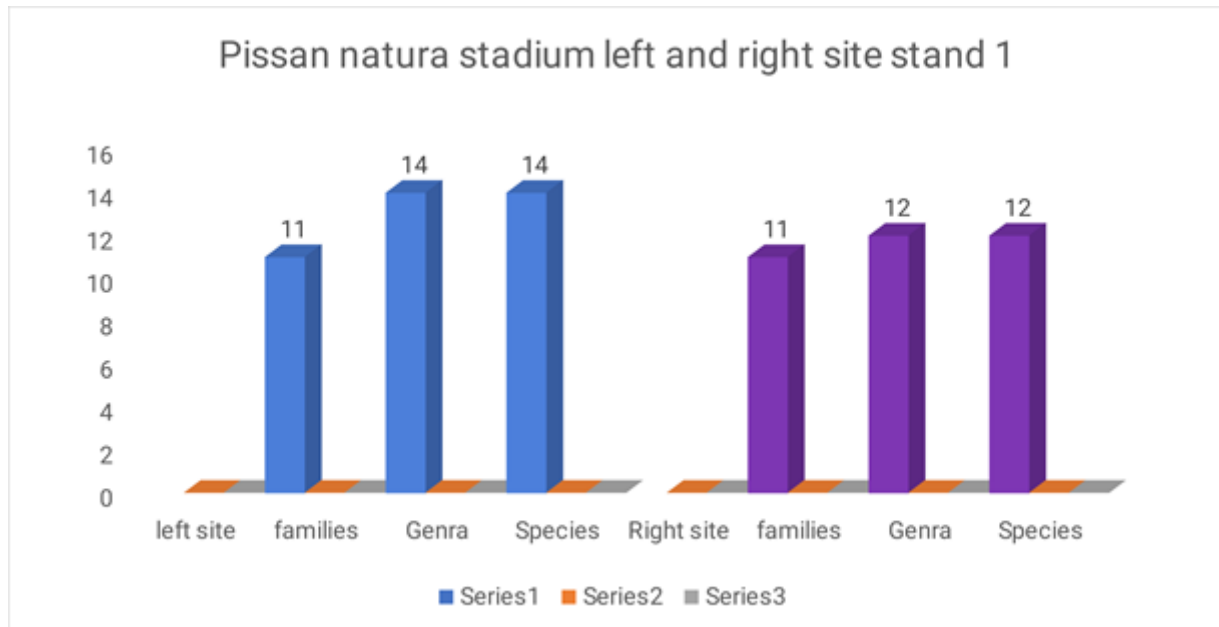


Figure 7

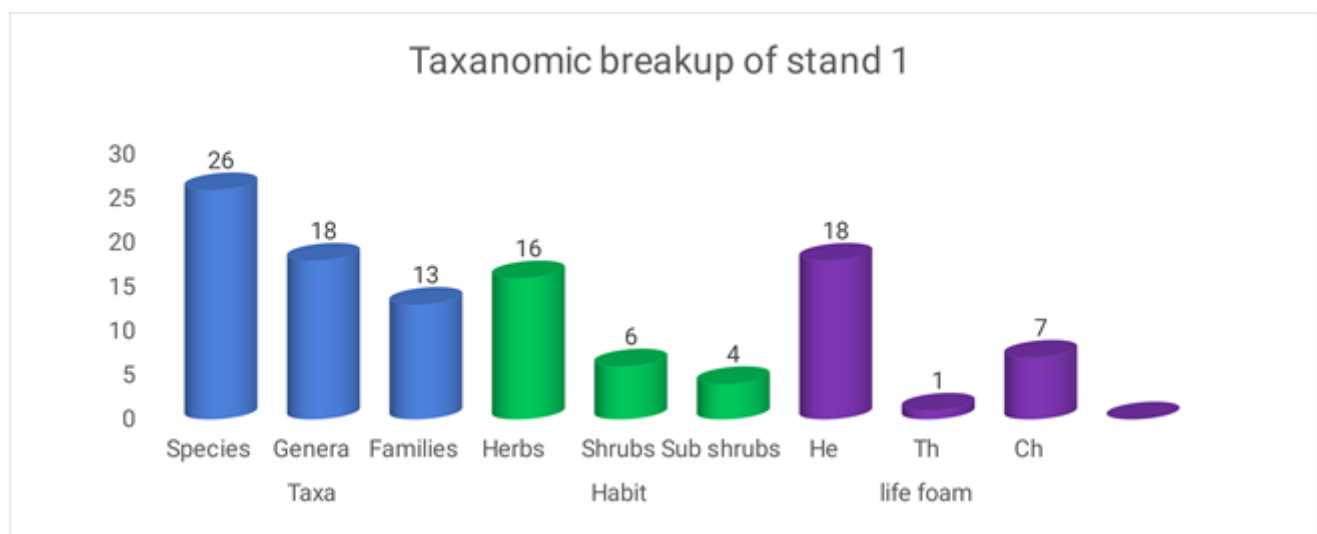


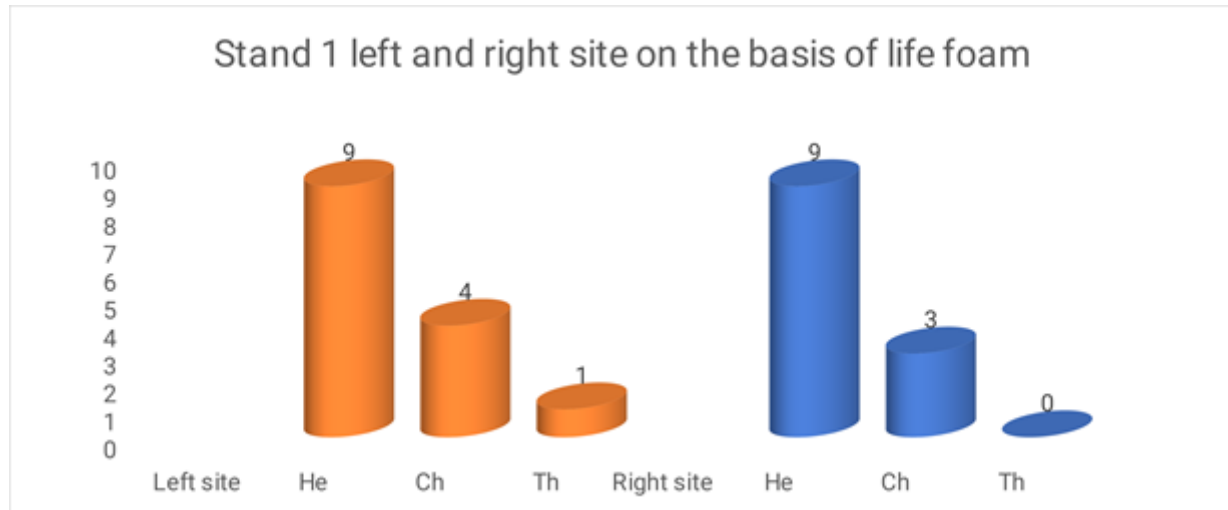
Fig. 8: Taxonomic breakup of stand 1

Comparison of dominant families left site and Right site stand 1 of pissan natural stadium Nager.

The most dominant number of largest family in the pissan natural stadium stand 1 was Asteraceae, followed by Papilionaceae while all other families show equal occurrence respectively.

Comparison right site and left site Life form in the stand 1 of the pissan natural stadium Nager

The dominant life form of the flora of the stand 1 left side of pissan natural stadium was Hemicryptophytes and Therophytes and Chamaephytes but the Phanerophytes, Geophyte were absent. Similarly, on right site the dominant life form was also Hemicryptophytes followed by Chamaephytes, and Therophytes, Phanerophytes and Geophytes were absent. (**fig.9**)



Dominant habit Categories on both sites of pissan natural stadium Nager in stand 1

The habit categories of the recorded flora from both site of pissan natural stadium was categorized. The dominant habit categories on left site were herbs with 9 species followed by shrub with 3 species and subshrub were had 2 species and tree were absent. While on right site the stand 1 had the dominant habit categories also herbs with 7 species followed by shrub with 3 species and subshrub had 2 species and tree was also absent. But the tree was absent on both sites of the stand 1. (fig 10)

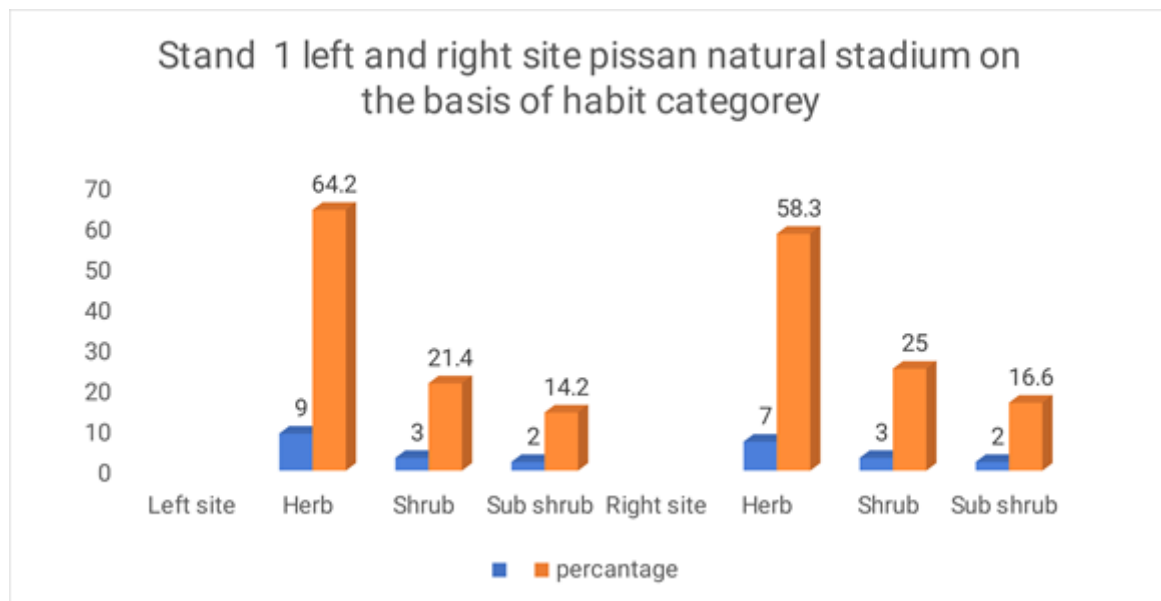


Figure 10. Habit Category of the stand 1 of the pissan natural stadium Nager right site compare to left side

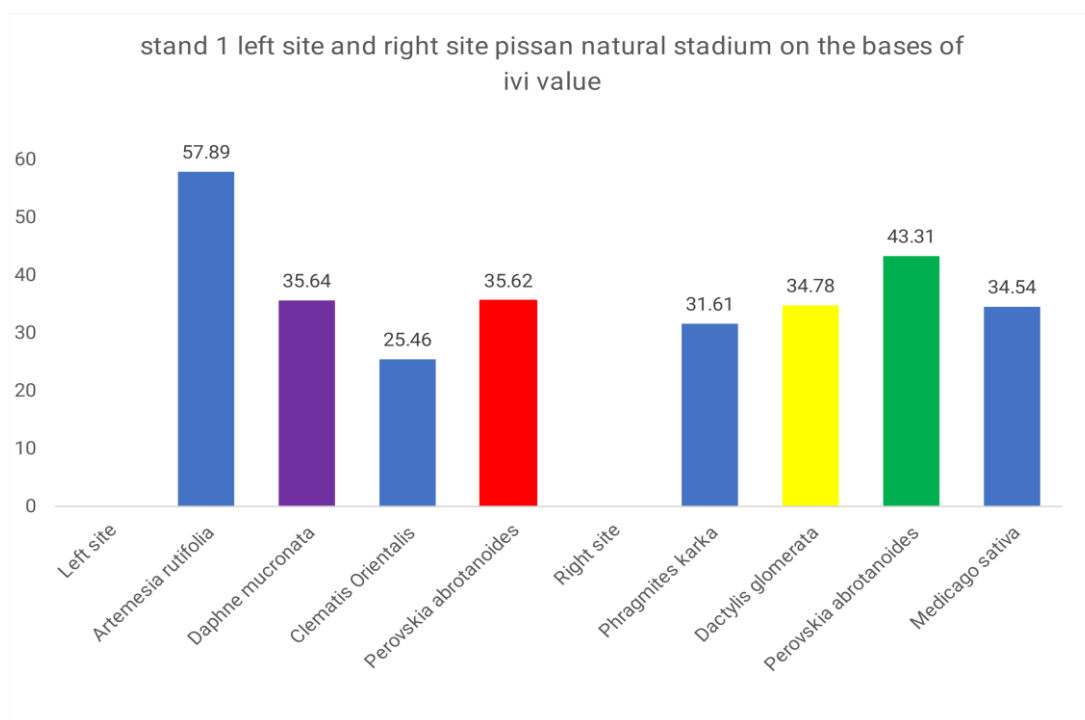
Dominant taxa recorded in stand 1

The Dominant species in left site of stand 1 of the pissan natural stadium was *Artemesia rutifolia* having the highest IVI 57.89 followed by *Daphne mucronata* 35.64 IVI, followed by *Perovskia abrotanoides* 35.62 IVI, whereas the lowest IVI, value was observed with *Plantago major* 7.33 IVI followed while at the right side of pissan natural stadium *Perovskia abrotanoides* with 43.31 IVI followed by *Dactylis glomerata* with 34.78 IVI, *Medicago sativa* with 34.54 IVI both sides of the pissan natural stadium Nager shows great variation in floral composition vegetation distribution pattern (Table 4).

Family name	species name	F3	C3	D3	IVI
Astreraceae	<i>Artemesia rutifolia</i> stephan ex spreng	16.98	23.61	17.3	57.89
Thymelaeaceae	<i>Daphne mucronata</i> Royle	9.43	16.6	9.61	35.64
Ranumalacea	<i>Clematis Orientalis</i> L.	11.32	4.53	9.61	25.46
Labiatae	<i>Perovskia abrotanoides</i> Kar.	13.2	10.89	11.53	35.62
Poaceae	<i>Sorghum halepense</i>	5.66	4.25	5.76	15.67

Poaceae	<i>Dactylis glomerata</i>	7.54	9.09	7.69	24.32
Polygonaceae	<i>Rumex nepalensis</i>	7.54	6.13	7.64	21.31
Primulaceae	<i>Androsace lanuginosa</i>	3.77	3.21	3.84	10.82
Plantaginaceae	<i>Plantago major</i>	1.88	1.61	3.84	7.33
Labiatae	<i>Nepeta Cataria</i>	5.66	1.65	3.84	11.15
Borageneae	<i>Arnebia guttata bunge</i>	1.88	2.35	3.84	8.07
Papilionaceae	<i>Medicago sativa</i>	3.77	2.48	3.84	10.09
Labiatae	<i>Isodon rogosus</i>	5.66	5.19	3.84	14.69
Chenopodiaceae	<i>Chenopodium album</i>	5.66	8.26	7.69	21.01
		99.95	99.86	99.92	299.07
Right site					
Polygonaceae	<i>Rumex nepalensis</i>	5.12	7.77	6.52	19.41
Poaceae	<i>Sorghum halepense</i>	5.12	9.36	4.34	18.82
Labiatae	<i>Isodon rugosus</i>	2.56	6.14	4.17	12.87
Poaceae	<i>Phragmites karka</i>	12.8	10.12	8.69	31.61
Poaceae	<i>Dactylis glomerata</i>	10.25	13.67	10.86	34.78
Asteraceae	<i>Artemisia rutifolia</i>	12.8	5.16	10.86	28.82
Labiatae	<i>Perovskia abrotanoides</i>	15.38	10.54	17.39	43.31
Papilionaceae	<i>Medicago sativa</i>	10.25	15.60	8.69	34.54
Iridaceae	<i>Iris Lactea</i>	2.56	4.22	6.17	12.95
Plantaginaceae	<i>Plantago major</i>	7.6	4.20	6.52	18.32
Thymelaeaceae	<i>Daphne mucronata</i>	10.25	9.02	8.69	27.96
Labiatae	<i>Nepeta Cataria</i>	5.12	4.80	7.34	17.26
		99.81	100.6	100.24	300.65

Beside the dominant species we also recorded the dominant family present in stand 1 (Figure 11).



Stand-2 Pissan Natural stadium Nager Valley

Floristic Composition of stand 2

The number of taxa found on left site of stand 1 of Pissan natural stadium was comprised on 9 families belonging to 15 genera and 16 species while the number of taxa recorded on right site of the stand 1 at pissan natural stadium was 7 families followed by 10 genera and 10 species.

Dominant Habit category and life form stand 2

The inventory of the documented species along both sites of Pissan natural stadium in stand 2 showed that the dominant habit category observed on left site of the Pissan natural stadium was herbs with 8 species, followed by sub shrubs 5 species, but shrub was 2 species, and tree was 1 species. Where on right site the dominant habit category was herbs with 5 species, shrubs with 2 species, subshrub 3 species, and trees were not found. Interestingly both sides were showed more or lesser distribution of habit categories. Similarly, the dominant life form of left site was Hemicryptophytes followed by Chamaephytes, and Phanerophytes, while on the right site of the Pissan natural stadium the dominant life form was Hemicryptophytes followed by Phanerophytes and Chamaephytes. (table 5)

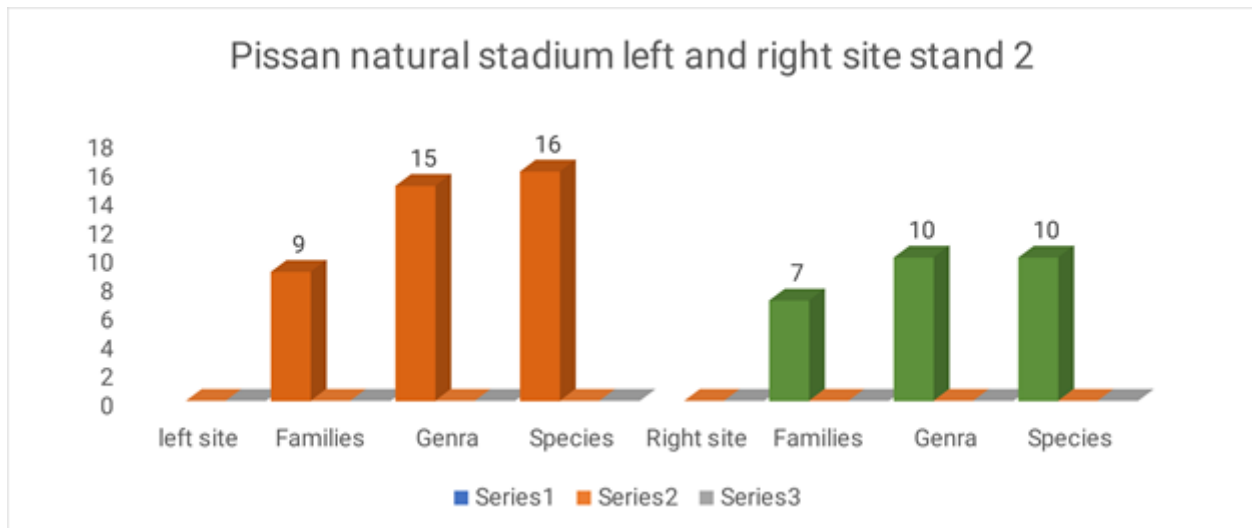
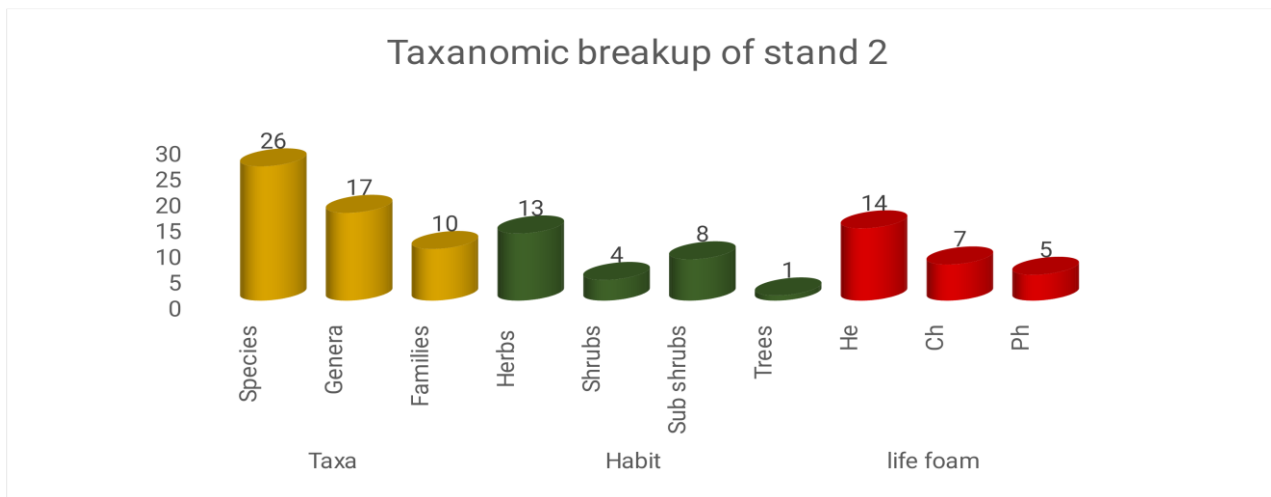
Check list of pissan natural stadium left and Right site stand 2

left site			
Family	species name	habit	life form
Labiatae	Thymus linearis	Sub shrub	Ch
Asteraceae	Artemisia rutifolia	Sub shrub	He
Asteraceae	Artemisia sieversiana	Sub shrub	Ch
Capressecacae	Juniperus excelsa	Tree	ph
Poaceae	Melica nutans	Herb	He
Poaceae	Phargmites karka	Herb	He
Polygonaceae	Rumex nepalensis	Herb	He
Campanulaceae	Campanula cashmeriana	Herb	He
Labiata	Perovskia abrotanoidea	Sub shrub	Ch
Poaceae	Sorghum halepense	Herb	He
Labiatae	Isodon rugosus	Shrub	Ch
Primulaceae	Androsace launginosa	Herb	Ch
Asteraceae	Cirsium vulgare	Herb	He
Poaceae	Dactylis glomerata	Herb	He
Papilionaceae	Sophora mollis	Shrub	ph
Crossulaceae	Crassula pentandra	Sub shrub	Ch
Right site			
Family	species name	habit	life form
Polygonaceae	Rumex nepalensis	Herb	He
Capressecacae	Juniperus squamata	Shrub	Ph
Asteraceae	Taraxacum officinale	Sub shrub	ph
Boraginaceae	Arnebia guttata	Herb	He
Papilionaceae	Sophora mollis	Shrub	Ph
Poaceae	Dactylis glomerata	Herb	He
Labiatae	Thymus linearis	Sub shrub	Ch
Asteraceae	Artemisia rutifolia	Sub shrub	He
Poaceae	Sorghum halepense	Herb	He
Poaceae	Phargmites karka	Herb	He

Taxonomic breakup

Comparison vegetation taxonomic breakup at the stand 2 of left and Right Site pissan natural stadium nager valley.

The number of taxa found in stand 2 left side was 9 families followed by 15 genera and 16 species respectively while the number of taxa found in stand 2 right side of the pissan natural stadium Nager was 7 families followed by 10 genera and 10 species. (fig 12)

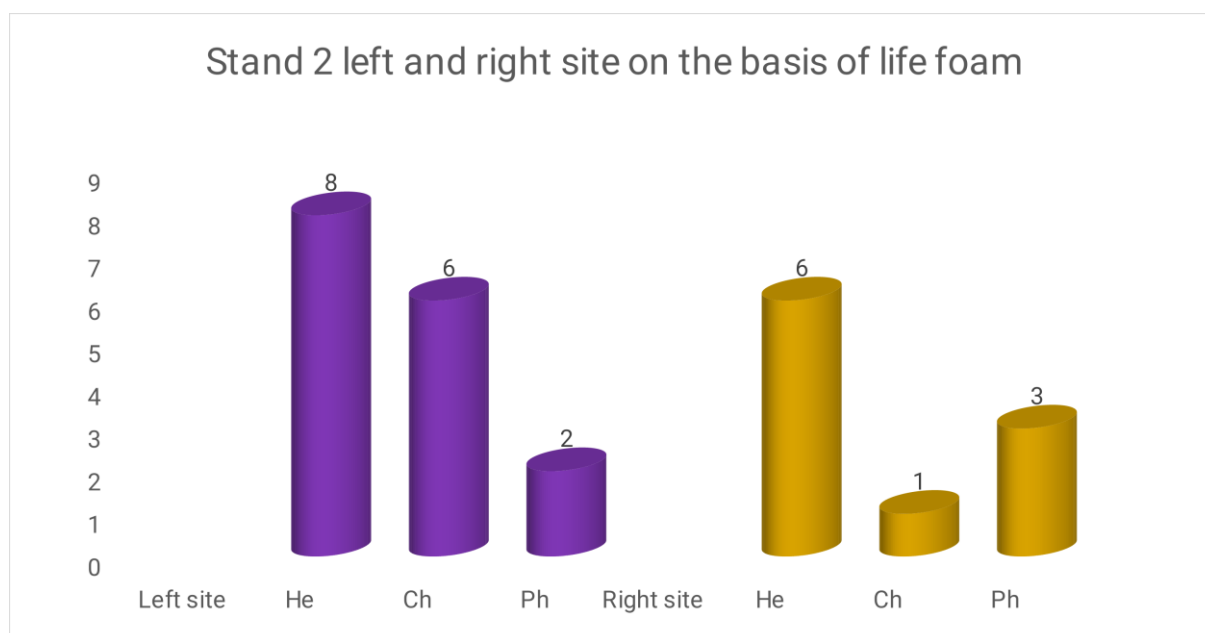


Comparison of dominant families left site and Right site stand 2 of pissan natural stadium Nager.

The most dominant number of largest family in the pissan natural stadium stand 2 was Labiatae, followed by papilionaceae while all other families show equal occurrence respectively.

Comparison right site and left site Life form in the stand 2 of the pissan natural stadium Nager.

The dominant life form of the flora of the stand 2 left side of pissan natural stadium was Hemicryptophytes and Chamaephytes, Phanerophytes, but the Therophytes and Geophyte were absent. Similarly, on right site the dominant life form was also Hemicryptophytes followed by Phanerophytes followed by Chamaephytes, and Therophytes, and Geophytes were absent. (fig 13)



Dominant habit Categories on both sites of pissan natural stadium Nager in stand 2

The habit categories of the recorded flora from both site of pissan natural stadium was categorized. The dominant habit categories on left site were herbs with 8 species followed by sub shrub with 5 species and shrub were had 2 species and tree was 1 species. While on right site the stand 2 had the dominant habit categories also herbs with 5 species followed by sub shrub with 3 species and shrub had 2 species and tree was absent. (fig 14)

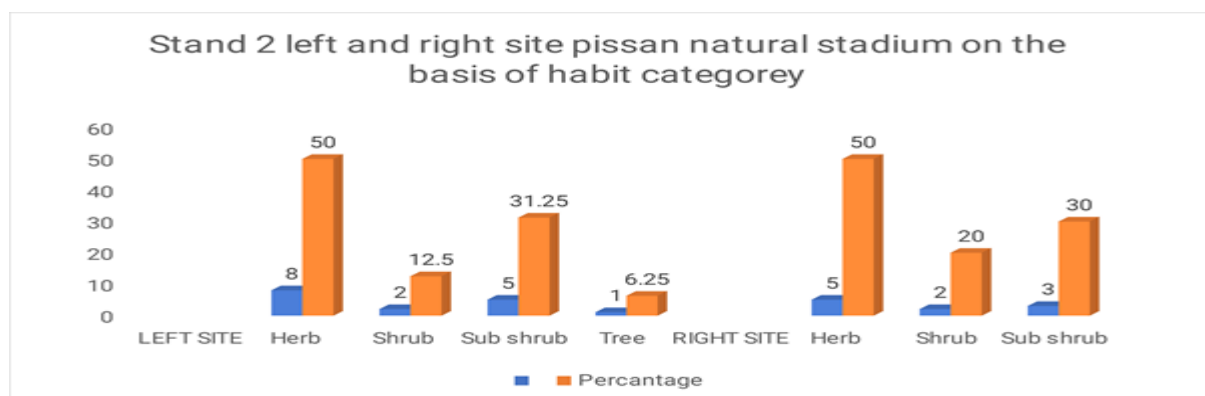


Figure 14. Habit Category of the stand 2 of the pissan natural stadium Nager right site compare to left side

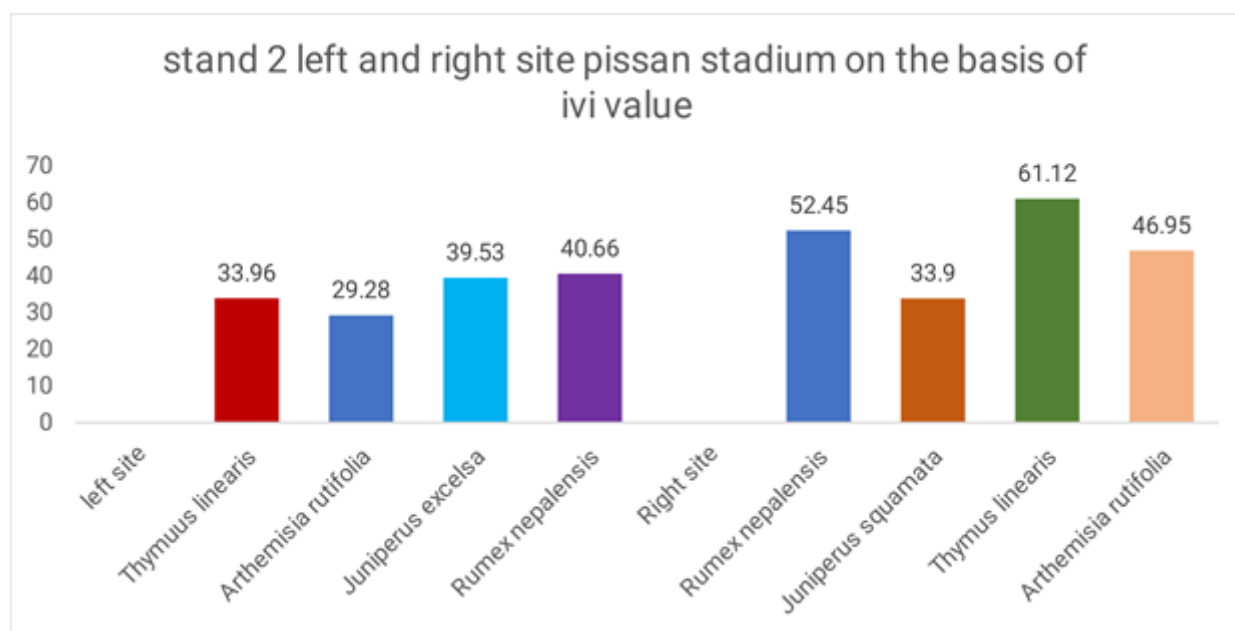
Dominant taxa recorded in stand 2

The Dominant species in left site of stand 2 of the pissan natural stadium was *Rumex nepalensis* having the highest IVI 40.66 followed by *Juniperus excelsa* 39.53 IVI, followed by *Thymus linearis* 33.96 IVI, whereas the lowest IVI, value was observed with *Isodon rugosus* 6.52 IVI while at the right side of pissan natural stadium *Thymus linearis* with 61.12 followed by *Rumex nepalensis* with 52.45 IVI followed by *Artemisia rutifolia* with 46.95 IVI both sides of the pissan natural stadium Nager shows great variation in floral composition vegetation distribution pattern. (Table 6)

Family	species name	F3	C3	D3	IVI
Labiatae	<i>Thymus linearis</i>	15.51	2.45	16	33.96
Astreraceae	<i>Artemisia rutifolia</i>	8.62	8.66	12	29.28
Astreraceae	<i>Artemisia sieversiana</i>	3.44	2.67	4	10.11
Capressecae	<i>Juniperus excelsa</i>	8.62	18.91	12	39.53
Poaceae	<i>Melica nutans</i>	2.72	2.87	4	9.59

Poaceae	<i>Phargmites karka</i>	8.62	7.07	6	21.69
Polygonaceae	<i>Rumex nepalensis</i>	15.51	15.15	10	40.66
Campanulaceae	<i>Campanula cashmeriana</i>	3.44	2.09	4	9.53
Labiata	<i>Perovskia abrotanoidea</i>	5.17	4.61	4	13.78
Poaceae	<i>Sorghum halepensa</i>	6.89	6.92	6	19.81
Labiatae	<i>Isodon rugosus</i>	3.44	1.08	2	6.52
Primulaceae	<i>Androsace lauginosa</i>	2.72	1.8	4	8.52
Asteraceae	<i>Cirsium vulgura</i>	3.44	10.03	4	17.47
Poaceae	<i>Dactylis glomerata</i>	5.17	10.03	2	17.2
Papilionaceae	<i>Sophora mollis</i>	2.72	3.53	6	12.25
Crossulaceae	<i>Crassula pentandra</i>	3.44	1.94	4	9.38
		99.47	100.17	100	299.28
Right site					
Polygonaceae	<i>Rumex nepalensis</i>	16.66	17.19	18.6	52.45
Capressecae	<i>Juniperus squamata</i>	11.9	10.38	11.62	33.9
Astereaceae	<i>Taraxacum Officinal</i>	4.76	5.94	4.65	15.35
Borageneae	<i>Arnebia guttata</i>	2.38	3.32	2.32	8.02
Papilionaceae	<i>Sophora mollis</i>	4.76	5.38	4.65	14.79
Poaceae	<i>Dactylis glomerata</i>	4.76	15.53	4.65	24.94
Labiatae	<i>Thymus linearis</i>	19.04	21.15	20.93	61.12
Asteraceae	<i>Arthemisia rutifolia</i>	19.04	11.64	16.27	46.95
Poaceae	<i>Sorghum halepense</i>	4.76	3.64	4.65	13.05
Poaceae	<i>Phargmites karka</i>	11.9	5.78	11.62	29.3
		99.96	99.95	99.98	299.87

Beside the dominant species we also recorded the dominant family present in stand 2 (Figure 15)



Stand-3 Pissan Natural stadium Nager Valley

Floristic Composition of stand 3

The number of taxa found on left site of stand 3 of Pissan natural stadium was comprised on 10 families belonging to 13 genera and 13 species while the number of taxa recorded on right site of the stand 2 at pissan natural stadium was 7 families followed by 11 genera and 11 species.

Dominant Habit category and life form stand 3

The inventory of the documented species along both sites of Pissan natural stadium in stand 3 showed that the dominant habit category observed on left site of the Pissan natural stadium was herbs with 7 species, followed by shrubs 4 species, but sub shrub was 2 species, and tree were not found. Where on right site the dominant habit category was herbs with 5 species, shrub and subshrub was 3 species, and trees were not found. Interestingly both sides were showed more or lesser distribution of habit categories. Similarly, the dominant life form of left site was Hemicryptophytes followed by Chamaephytes, and Phanerophytes, while on the right site of the Pissan natural stadium the dominant life form was Hemicryptophytes followed by Phanerophytes and Chamaephytes. (Table 7)

Check list of pissan natural stadium left and Right site stand 2

left site			
family	species name	habit	life form
Labiatae	Thymus linearis	Sub shrub	Ch
Asteraceae	Artemisia rutifolia	Sub shrub	He
Asteraceae	Artemisia sieversiana	Sub shrub	Ch
Capressecacae	Juniperus excelsa	Tree	ph
Poaceae	Melica nutans	Herb	He
Poaceae	Phargmites karka	Herb	He
Polygonaceae	Rumex nepalensis	Herb	He
Campanulaceae	Campanula cashmeriana	Herb	He
Labiata	Perovskia abrotanoidea	Sub shrub	Ch
Poaceae	Sorghum halepensa	Herb	He
Labiatae	Isodon rugosus	Shrub	Ch
Primulaceae	Androsace launginosa	Herb	Ch
Asteraceae	Cirsium vulgare	Herb	He
Poaceae	Dactylis glomerata	Herb	He
Papilionaceae	Sophora mollis	Shrub	ph
Crossulaceae	Crassula pentandra	Sub shrub	Ch
Right site			
family	species name	habit	life form
Polygonaceae	Rumex nepalensis	Herb	He
Capressecacae	Juniperus squamata	Shrub	Ph
Asteraceae	Taraxacum Officinal	Sub shrub	ph
Boragencae	Arnebia guttata	Herb	He
Papilionaceae	Sophora mollis	Shrub	Ph
Poaceae	Dactylis glomerata	Herb	He
Labiatae	Thymus linearis	Sub shrub	Ch
Asteraceae	Artemisia rutifolia	Sub shrub	He
Poaceae	Sorghum halepense	Herb	He

Taxonomic breakup

Comparison vegetation taxonomic breakup at the stand 3 of left and Right Site pissan natural stadium Nager valley.

The number of taxa found in stand 3 left side was 10 families followed by 13 genera and 13 species respectively while the number of taxa found in stand 3 right side of the pissan natural stadium Nager was 7 families followed by 11 genera and 11 species. (fig 16)

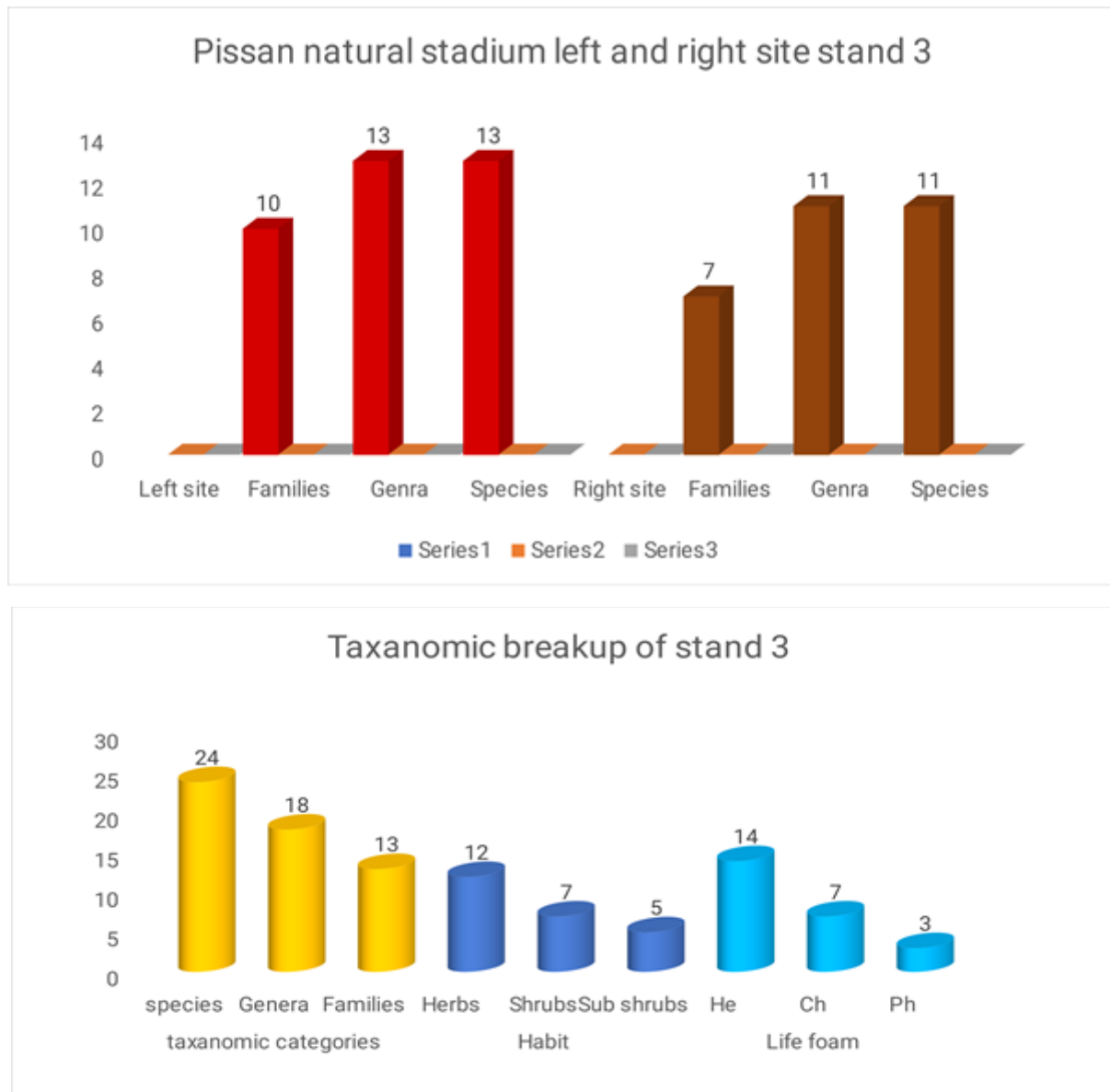


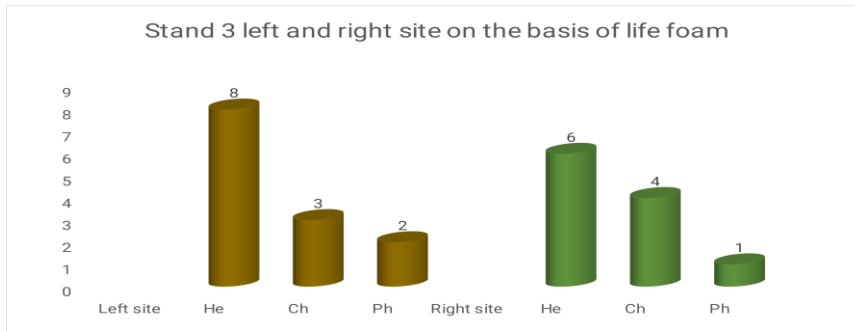
Fig. 17: Taxonomic breakup of stand 3

Comparison of dominant families left site and Right site stand 3 of pissan natural stadium Nager.

The most dominant number of largest family in the pissan natural stadium stand 3 was Poaceae followed by Astreraceae while all other families show equal occurrence respectively.

Comparison right site and left site Life form in the stand 3 of the pissan natural stadium Nager.

The dominant life form of the flora of the stand 3 left side of pissan natural stadium was Hemicryptophytes and Chamaephytes, Phanerophytes, but the Therophytes and Geophyte were absent. Similarly, on right site the dominant life form was also Hemicryptophytes followed by Phanerophytes followed by Chamaephytes, and Therophytes, and Geophytes were absent. (fig 18)



Dominant habit Categories on both sites of pissan natural stadium Nager in stand 3

The habit categories of the recorded flora from both site of pissan natural stadium was categorized. The dominant habit categories on left site were herbs with 7 species followed by shrub with 4 species and shrub had 2 species and tree was not found. While on right site the stand 3 had the dominant habit categories also herbs with 5 species followed by sub shrub and shrub had 3 species and tree was absent. (fig 19)

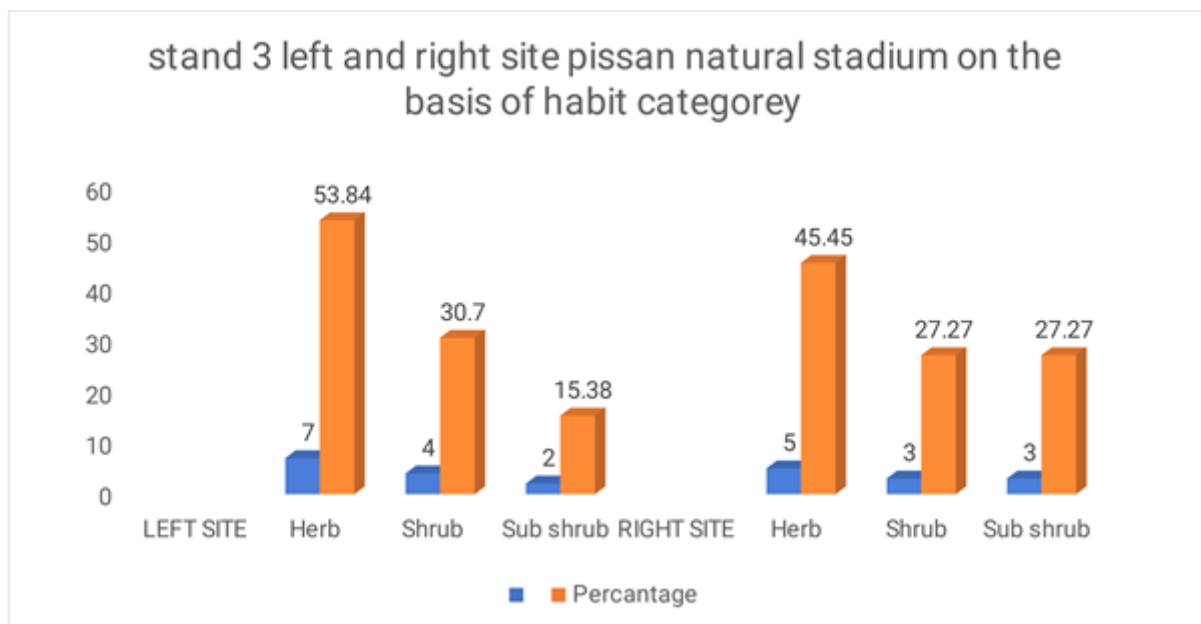


Figure 19. Habit Category of the stand 3 of the pissan natural stadium Nager right site compare to left side

Dominant taxa recorded in stand 3

The Dominant species in left site of stand 3 of the pissan natural stadium was *Arthemisia rutifolia* having the highest IVI 55.5 followed by *Sorghum halepense* 48.59 IVI, followed by *Daphne mucronata* 40.86 IVI, whereas the lowest IVI, value was observed with *Clematis Orientalis* 5.84 IVI while at the right side of pissan natural stadium *Sorghum halepense* with 50.18 followed by *Arthemisia rutifolia* with 46.95 IVI followed by *Rumex nepalensis* with 33.47 IVI both sides of the pissan natural stadium Nager shows great variation in floral composition vegetation distribution pattern. (table 8)

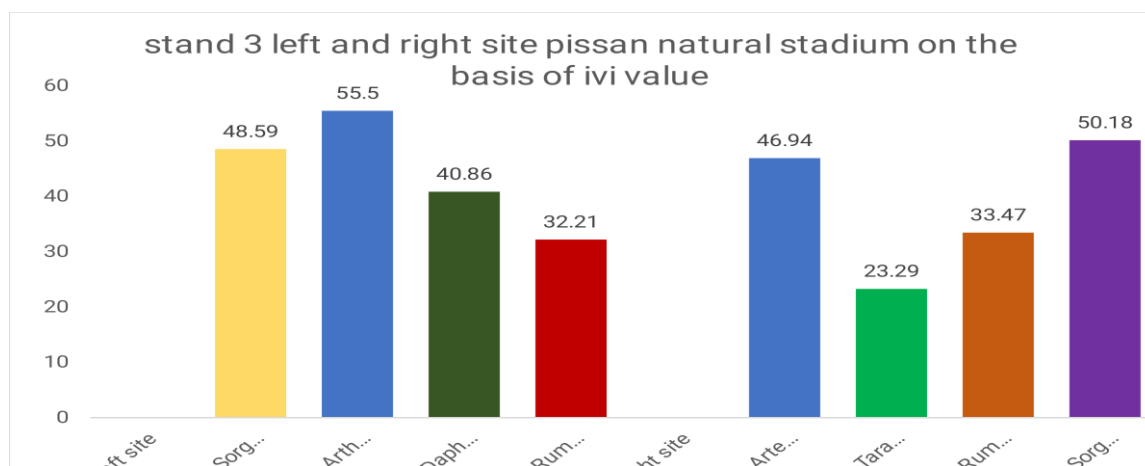
Family	Species name	F3	C3	D3	IVI
Poaceae	<i>Sorghum halepense</i>	17.34	14.59	16.66	48.59
Crassulaceae	<i>Crassula pentandra</i>	4.34	2.85	2.77	9.96
Ranunculaceae	<i>Clematis Orientalis</i>	2.17	0.9	2.77	5.84
Asteraceae	<i>Arthemisia rutifolia</i>	17.34	13.16	25	55.5
Capressecae	<i>Juniperus squamata</i>	4.34	4.43	5.55	14.32
Poaceae	<i>Melica nutans</i>	2.17	3.91	5.55	11.63
Thymalaceae	<i>Daphne mucronata</i>	10.86	24.45	5.55	40.86

Polygonaceae	Rumex nepalensis	8.69	12.41	11.11	32.21
Iridaceae	Iris Lactea	6.52	3.23	8.33	18.08
Papilionaceae	Sophora mollis	4.34	2.03	2.77	9.14
Asteraceae	Taraxacum officinale	13.04	12.11	2.77	27.92
papilionaceae	Medicago sativa	4.34	2.85	5.55	12.74
Primulaceae	Androsace launginosa	4.34	3.0	5.55	12.89
		99.93	99.92	99.93	299.68

Right site

Family	Species name	F3	C3	D3	IVI
Asteraceae	Artemisia rutifolia	17.77	12.1	17.07	46.94
Asteraceae	Taraxacum officinale	6.66	6.88	9.75	23.29
Lebiatace	Thymus linearis	8.88	4.68	9.75	23.31
Polygonaceae	Rumex nepalensis	8.88	14.84	9.75	33.47
Thymalaceae	Daphne mucronata	8.88	3.47	7.31	19.66
Poaceae	Sorghum halepense	15.55	20	14.63	50.18
Lebiatace	Isodon rugosus	6.66	6.35	7.31	20.32
Lebiatace	Perovskia abrotanoides	6.66	8.96	7.31	22.93
Capressecacae	Juniperus squamata	8.88	11.03	7.31	27.22
Poaceae	Phragmites Karka	6.66	8.09	4.87	19.62
Campanulacae	Campanula cashmeriana	4.44	3.74	4.87	13.05
		99.92	100.14	99.93	299.99

Beside the dominant species we also recorded the dominant family present in stand 3 (Figure 20)



Discussion

Present study was carried out during August- September 2024 in Pissan natural stadium Nager valley GB. The current study yielded about 51 species with 44 genera which belonging to families 27 (fig 2). Karima et al. (2024), study conducted in rahimabad Gilgit his research 111 distinct plant species, which followed 93 genera from 43 families, which differed from our findings (Karima et al. 2024). Sobia et al. (2022), A study conducted in Tissot valley Jalalabad, the study yielded about 156 species with 119 genera which belonging to families 49, which is differ from our findings (Sobia et al.2022). A study in Swat Rinzai where the recorded plant species were 246 from 202 genera which belongs to 90 families (Khan and Khan 2017), which differed from our findings.

The breakup of the habit categories shows that the herbs were 31 species which were (60.7%) of the total habit categories were dominant habit category of the flora in the study area, followed by shrubs with 10 species were (15.6%) of flora in the study area, sub-shrubs by 8 species which were (15.6%) and trees were 2 species (3.9%) of the flora in the study area (fig 3).

A study conducted by Karima 2024 has different results. The life forms of the collected species were 26 (50.9%) Hemicryptophyte were dominant, 12 (23.5%) Chamaephyte, 7 (13.7%) Phanerophyte, 6 (11.7%) Therophytes, and Geophytes were 0 (0%) shown in (fig.4). Karima et al. 2024 shows the different results as compared to our findings, our study showed the life form in stand-1 (Left and right) was, hemicryptophyte were (69.23%), chamaephyte with (26.92), followed by therophyte (3.84%), phanerophyte and geophyte with 0 species. Habit category in stand-1, herb (61.53%), shrub (23.07%), sub shrub (15.38%) and tree (0%) (fig 8). In stand 2 (Left and right), we observed 26 distinct plant species belonging to 17 genera, from 10 different families. The recorded data indicated that hemicryptophytes accounted for 14 species (53.84%), phanerophytes for 5 species (19.23%), and there were no therophytes and chamaephyte species. In terms of habit categories, herbs comprised 13 plant species (50%), shrubs included 4 (15.38%), subshrubs 8 (30.76%), and trees 1 (3.84%) fig (12). The study of Karima 2024 was differed to our findings (Karima 2024). In stand 3 (Left and right), the research revealed 24 different plant species, from 18 genera and belonging to 13 families. The life forms, hemicryptophytes, comprised 14 species (58.33 %), phanerophytes 3 species (12.5 %), and Chamaephytes 7 species (29.16%), while no therophytes and geophytes were found. The distribution of habit categories included (50%) herb species, (29.16 %) shrub species, 0 tree species, and (20.83 %) subshrub species (fig 17). On the basis of IVI Value, the dominant species in each stands. In stand 1, *Artemisia rutifolia*. was dominant being dominant. Stand-2 was dominated by *Thymus linearis*. and in Stand-3, *Artemisia rutifolia* showed dominance.

The current study produced the inventory of 51 species followed by 44 genera belonging to 27 families. This also studied the dominant life form present in the study area was the Hemicryptophytes followed by chamaephyte. The results of the studies were differed from Raunkiaer normal spectrum (Sharma 2018). The dominance of Hemicryptophytes shows the Harsh climatic conditions in the study area. This study also recognizes on the dominant habit categories, and the dominant taxa present in the study area was recognized based on Important value index.

Conclusion

Present study was carried out during August- September 2024 and identified taxa Natural Stadium Pissan valley District Nager in Gilgit Baltistan. We record were the families, genera and species. We identified area dominant life form Hemicryptophytes and phanerophytes and dominant taxa *Thymus linearis* on the basis of IVI.

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