

## PTERIDOPHYTIC FLORA OF MAIDAN VALLEY DIR (L) KHYBER PAKHTUNKHWA, PAKISTAN

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### ABSTRACT

Twenty five taxa of pteridophytes belonging to 8 families and 13 genera were collected during the present study from 10 different localities i.e. Abdullah Banda, Borany, Chinarkot, Fazal Abad, Konaye Khwarh, Kotkay, Monrh, Muslim Khwarh, Shahe Kot and Tarano. Pteridaceae was the leading family with 4 genera (30.76%) and 9 species (36%); followed by Dryopteridaceae with 3 genera (23.07%) and 4 species (16%); Aspleniaceae with one genus (7.69%) and 4 species (16%). Thelypteridaceae, Equisetaceae and Selaginellaceae with one genus (7.69%) and two species (8%) each. Athyriaceae and Marsilaceae with one genus and one species each. The most frequently occurring genera were *Pteris* L., *Adiantum* L., *Asplenium* L., *Athyrium* Hook., *Dryopteris* (Bedd.) Hay., *Selaginella* L., *Lastrea* Hook., *Anogramma* Link., *Cheilanthes* Swartz., *Equisetum* L., *Marsilea* L., *Polypodium* L. and *Polystichum* L.

**Keywords:** Chinarkot, Khyber Pakhtunkhwa, Maidan valley, Pteridophytes, Tarano.

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### INTRODUCTION

Maidan valley is situated in Dir (L) and is further divided into lower and upper Maidan lying at 34° 37' to 35° 07' N latitudes and 71° 31' to 72° 14' E longitudes. The total area of Maidan valley is 300 km<sup>2</sup> and is surrounded by the famous series of Hinduraj Mountains. There is a great altitudinal variation ranging from 1000 m to 4012 m. The valley having famous and highest peaks including Monrh and Sheklai which are part of Hinduraj Mountains (Anonymous, 1998). The entire valley is a mountainous terrain, which is dominated by rain fed land. The total cultivated area is 15664 Hectares, the forest cover is 2522 Hectares and the range land is 18434 Hectares. The area occupied by shrubs and bushes is 3037 hectares and the river beds are covering an area of 109 Hectares. The valley has a diverse flora and according to previous findings 29 Bryophytes, 19 Pteridophytes, 10 gymnosperms and 757 Angiosperms are reported from the area (Sirajuddin, 2007).

Maidan is a bowl shaped valley surrounded by mountains and its topography, geography, winds coming from the surrounding snow covered peaks, exposure, altitude are supporting the ferns distribution in the valley. Pteridophytes grow in various habitats ranging from the most primitive living to fossil vascular plants present in terrestrial and aquatic habitats, while few species are epiphytic. The less diurnal fluctuation in climatic conditions and the semi shade situation, soil fertility and rich humus are supporting ferns diversity. The ground floor has rich humus and moisture and the humidity is also supporting the rich distribution of ferns in the moist shady condition (Saleem *et al.*, 2000). Further, due to availability of favorable climatic condition and suitable habitats for growth and development, the pteridophytes are widely distributed in the valley.

Some work has been carried out by various workers on adjoining areas i.e. (Sheikh, 1962, Shah *et al.*, 1985 a&b, Saleem *et al.*, 2000 and Murad *et al.*, 2000). Recently, Saleem (2011) reported 37 ferns species and their allies from the surrounding areas in District Dir (Upper). Similarly Ilyas *et al.* (2013) reported a preliminary checklist of twenty species of ferns and their allies. Since Fern flora of Maidan valley is unexplored therefore, the present research was initiated to prepare a preliminary checklist of the Ferns growing in the Valley. Iltaf *et al.*, 2012 collected 36 Ferns species belonging to 18 genera and 13 families from Punjab. Stewart, 1972 collected 133 species of Ferns, belonging to 41 genera and 9 families from West Pakistan and Kashmir, in which most of the species were found and collected from coniferous Forest, mountainous regions and terrestrial plant communities. Since the pteridophytes flora of the valley is unexplored therefore, the present research was initiated to document the baseline information regarding the Pteridophytic flora of the neglected areas of the valley.

### MATERIAL AND METHODS

Pteridophytes species were collected during March to August 2013 and from ten (10) different localities in Maidan valley. The plants were collected, pressed in the newspaper and after drying these were mounted on herbarium sheets. During the process of collection photographs were also taken. Identification was carried out on the basis of morphological characters with the help of available literature i.e. (Beddome, 1866 and 1873; Clarke, 1880;

Hope, 1899-1902; Stewart, 1957; Faser-Jenkins, 1991; Nakaike and Malik, 1992 and 1993; Murad *et al.*, 2000 and Saleem *et al.*, 2000). Voucher specimens were deposited in the Herbarium of Centre of Plant Biodiversity/Botanical Garden, University of Peshawar (UPBG).

## RESULT

The lush green valley of Maidan which is presenting forests of conifers that provides semi shade situation and ideal habitat for Ferns and their allies growth. During the present research 25 species of 13 genera belonging to Athyriaceae, Pteridaceae, Aspleniaceae, Dryopteridaceae, Equisetaceae, Marsilaceae, Selaginellaceae and Thelypteraceae were reported. Pteridaceae was the leading having 4 genera *Pteris* (4 spp.); *Adiantum* (3 spp.); *Anogramma* (1 sp.); *Cheilanthes* (1 sp.); followed by Dryopteridaceae with three genus *Dryopteris* (1 sp.); *Polypodium* (1 sp.); *Polystichum* (2 spp.); Aspleniaceae had one genus *Asplenium* (4 spp.); Equisetaceae had one genus *Equisetum* (2 spp.); Selaginellaceae had one genus *Selaginella* (2 spp.); Thelypteraceae had one genus *Lestrea* (2 spp.); Athyriaceae had one genus *Athyrium* (1 sp.); and Marsilaceae with one genus *Marsilea* (1 sp.).

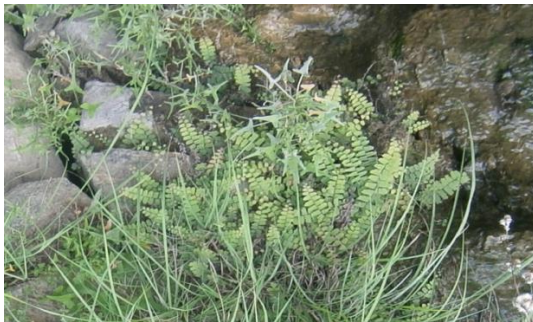
Table 1. Information regarding family, genus, species, voucher number and distribution of Pteridophytes collected from Maidan valley, District Dir (L) Khyber Pakhtunkhwa, Pakistan.

S #	Family	Genus	Species	Voucher No.	Locality
1.	Aspleniaceae	<i>Asplenium</i> L.	<i>A. adiantum-nigrum</i> L.	Fazalullah1 (UPBG)	Monrh
			<i>A. alternans</i> Wall.	Fazalullah 2 (UPBG)	Muslim Khwarh
			<i>A. septentrionale</i> L.	Fazalullah 3 (UPBG)	Abdullah Banda
			<i>A. trichomanes</i> L.	Fazalullah 4 (UPBG)	Borany
2.	Athyriaceae	<i>Athyrium</i> Hook.	<i>A. oxyphyllum</i> Hook.	Fazalullah 5 (UPBG)	Monrh
3.	Dryopteridaceae	<i>Dryopteris</i> Adanson.	<i>D. serrato-dentata</i> (Bedd.) Hay	Fazalullah 23 (UPBG)	Monrh
		<i>Polypodium</i> Hook.	<i>P. dryoteris</i> L.	Fazalullah 6 (UPBG)	Chinarkot
		<i>Polystichum</i> L.	<i>P. discretum</i> D. Don.	Fazalullah 7 (UPBG)	Monrh
<i>P. lonchitis</i> L.	Fazalullah 8 (UPBG)		Chinarkot		
4.	Equisetaceae	<i>Equisetum</i> L.	<i>E. arvense</i> L.	Fazalullah 9 (UPBG)	Konye Khwarh
			<i>E. debile</i> Roxb.	Fazalullah 10 (UPBG)	Chinarkot
5.	Marsileaceae	<i>Marsilea</i> L.	<i>M. quadrifolia</i> L.	Fazalullah 11 (UPBG)	Konye Khwarh
6.	Pteridaceae	<i>Adiantum</i> L.	<i>A. capillus-veneris</i> L.	Fazalullah 12 (UPBG)	Shahe Kot
			<i>A. incisum</i> L.	Fazalullah 13 (UPBG)	Chinarkot
			<i>A. venustum</i> D. Don.	Fazalullah 14 (UPBG)	Kotkay
		<i>Anogramma</i> Link.	<i>A. leptophylla</i> L.	Fazalullah 15 (UPBG)	Tarano
		<i>Cheilanthes</i> Swartz.	<i>C. acrostica</i> L.	Fazalullah 16 (UPBG)	Fazalabad
		<i>Pteris</i> L.	<i>P. blechnoides</i> Willd.	Fazalullah 17 (UPBG)	Chinarkot
			<i>P. cretica</i> L.	Fazalullah 18 (UPBG)	Chinarkot
			<i>P. dactylina</i> Hook.	Fazalullah 19 (UPBG)	Chinarkot
<i>P. vittata</i> L.	Fazalullah 20 (UPBG)		Chinarkot		
7.	Selaginellaceae	<i>Selaginella</i> L.	<i>S. jacquemontii</i> Spring. Bull. Acad.	Fazalullah 21 (UPBG)	Monrh
			<i>S. sanguinolenta</i> var. <i>compressa</i> L.	Fazalullah 22 (UPBG)	Monrh
8.	Thelypteridaceae	<i>Lastrea</i> Hook.	<i>L. melanopus</i> Hook.	Fazalullah 24 (UPBG)	Chinarkot
			<i>L. splendens</i> Wall.	Fazalullah 25 (UPBG)	Chinarkot

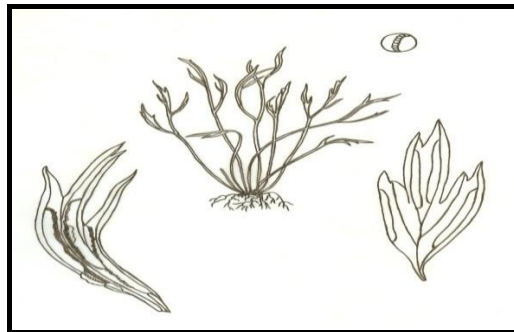
**Key to the families**

1. + Frond monomorphic, rarely; with fertile leaves taller and more erect ----- Aspleniaceae  
 - Frond are scales basally attached and creeping ----- 2
2. + Frond remote from one another with segment anadromously arranged ----- Dryopteridaceae  
 - Frond reduced scale like, whorled ----- 3
3. + Rhizome creeping, branched with node ----- Equisetaceae  
 - Rhizomes sleder, covered with short side attached hairs or glabrous ----- 4
4. + Spores formed inside bean shaped sporocarp attached to stipe by a short peduncle; sporocarp  
 Containing 2 to 30 sori ----- Marsileaceae  
 - Sporophylls various, ranging from ovate to ovate lanceolate; sporangia single per sporophyll ----- 5
5. + Plants epilithic, or occasionally epiphytic. Rhizome erect ----- Selaginellaceae  
 - Plants terrestrial on rock. Rhizomes stout, dictyostele radially symmetrical ----- 6
6. + Laminae herbaceous or papery; Unicellular acicular hairs, rarely glabrous ----- Thelypteridaceae  
 - Laminae variously dissected; Scaly; Hair unicellular or multicellular ----- 7
7. + Sori various, linear, J shaped, horseshoe shaped; frond orbicular reniform/orbicular ----- Athyriaceae  
 - Sori Mostly confluent along veins or marginal commissures, frond usually scaly ----- Pteridaceae

**PLATE-I**



1. *Adiantum incisum* L.



2. *Asplenium septentrionale* L.



3. *Asplenium alternans* Wall.



4. *Pteris cretica* L.



5. *Marsilea quadrifolia* L.



6. *Equisetum debile* Roxb.



## PLATE-II

7. *Adiantum capillus-veneris* L.8. *Adiantum venustum* D. Don.9. *Dryopteris serrato-dentata* (Bedd.) Hay.10. *Cheilanthes acrostica* L.11. *Pteris vittata* L.12. *Athyrium oxyphlyum* Hook.

## DISCUSSION

Maidan valley has rich vegetation and forest cover with developed underground flora. Most of the above mentioned species are growing in shaded hilly areas and wet soil. *Marsilea quadrifolia* is the only species growing in aquatic habitat. Mostly pteridophytes were found in reproductive stage. The collection of these specimens can help for further research by providing baseline information. These pteridophytes species are mostly collected from stream side, hilly areas and shady places. These species were collected from different localities of Maidan vally i.e. 10 species from Chinarkot, 6 species from Monrh, 2 species Konye Khwarh, 1 species from Abdullah Banda, Borany, Fazalabad, Kotkay, Muslim Khwarh, Shahe Kot and Tarano each. Fourteen similar species were collected from District Swat and Dir by Murad *et al.*, 2000 and Saleem (2000) respectively, but none of them have reported even a single species from Maidan Valley. Nine similar species were also collected from Punjab (Iltaf *et al.*, 2012). The present research shows that there is a good diversity among the Pteridophytes and their allies growing in the valley.

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