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Pteridophytic flora of Jelar valley, Dir upper, Khyber Pakhtunkhwa, Pakistan

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The study was conducted in Jelar Valley; district Dir Upper to explore the Pteridophytic diversity of the area. It is the first attempt to document the Pteridophyte species in the selected area. A total of 28 species belonging to 15 genera and 10 families were recorded. These Pteridophytes included 4 species of *Aspleniaceae, Pteridaceae, Dryopteridaceae* and *Equisetaceae* each, 3 species of *Adiantaceae and* Sinopteridaceae, 2 species each of *Aspidiaceae and Athyriaceae*, while both Marsileaceae and Selaginellaceae had 1 species each, in the selected area. Mostly the species of the living pteridophytes are terrestrial, growing in moist and shady places. Some members are aquatic (*Marsilea*) usually occurring in permanent ponds. A few forms are xerophytic like different species of *Equisetum.*

Keywords: Pteridophytes Flora, Dir Upper, Jelar Valley

INTRODUCTION

The vegetation of the research area can be divided into subtropical, dry temperate and alpine type. The low lying heaving loam soil (generally less then 900 meters) are completely used for agriculture as a cropland. Legumes like gram, been and lentil are cultivated on the poor marginal land. The trees like Willow, Platanus, Mulberry and Alnus also with the newly introduce *Ailanthus* and *Robin* species. Adjoin to the arable cropland are dry rugged low hill range with poor soil. Different scientists done their research work, Clarke (1880) worked on the (ferns) of northern India and listed the ferns of mountains of West, Pakistan, Hope (1899-1902) Published 27 ferns from chitral. A checklist of 127 ferns published by Stewart (1957) where 7 species were new records for West Pakistan. These are *Cystopteris dickieana, Dryopteris chrysocarpa, Dryopteri oreades , Actinopteris australi, Pyrrosia mollis, Polypodium nudum* and *Equisetums palustre*. Some ferns of Kaghan valley were reported by Sheikh (1962). Shah et al., (1985) published the ferns of Malakand division the fern of Kurram, agency consist of 11 families 12 genera and 20 species were reported by Wazir (1995) a list of 68 taxies of Pteridophyte with their synonyms, distribution, and photographs, collect from Pakistan, by Toshiyuki and Malik (1992) put out a list of Pteridophyte included 68 species. Singh and Upadhyay (2012) worked on the ethnobotanical importance of Pteridophyte which

are used by the people of the Pachmarhi (India). Looking to the past history Pteridophytes. The present area was unexplored for that reason, the present study was conducted to file the baseline, information about the Pteridophytic flora of the selected Valley.

MATERIALS AND METHODS

Field visit for the collection of Pteridophytes species were made during July to September 2015 to different localities in the selected valley. The plants were collected in spring and then put in the newspaper, pressed and drying for few days and then these specimens/samples were mounted on 11 X 16// size herbarium sheets. The specimen's identification was started on the basis of external morphological characters with the help of existing literature i.e. (Hope, 1899-1902; Stewart, 1957; Clarke, 1880; Faser-Jenkins, 1991; Beddome, 1866 and 1873; Murad *et al.,* 2000 and Saleem *et al.,* 2000; Nakaike and Malik, 1992 and 1993;). Voucher specimens were deposited in the department of Botany Shaheed Benazir Bhutto University Wari campus Dir Upper.

RESULTS AND DISCUSSION

The selected valley is green and mountainous area consist of different type of forests of conifers and Quericus due to these dense and ever green forest the area are provide shady situation and ideal habitat for the growth of Pteridophytes. During the present study 28 species belonging to 15 genera and 10 families. Among these families *the Aspleniaceae, Dryopteridaceae, Pteridaceae and Equisetaceae* have 4 species each. Similarly 3 species each of *Adiantaceae and Sinopteridaceae while 2 sp*ecies each of *Aspidiaceae, Athyriaceae* and 1 species each of *Marsileaceae and Selaginellaceae. Information regarding voucher number, species*, family and distribution of Pteridophytes collected from Jelar valley are available in the following table 01.

Table 1: Species diversity of Pteridophytes from Jelar valley

S.N	V.N	Botanical Name	Family	Local Name	Locality
1.	356	*Athyrium filixfoemina* (L.). Roth.	Athyriaceae	Nil	Gombat
2.	354	*Athyrium mackinnonii* (Hope.) C. Chr.		Nil	Banda
3.	700	*Dryopteris sieboldii* L.	Dryopteridaceae	Nil	Darazo
4.	244	*Polystichum willsonii* Christ		Babozae	Koz chum
5.	350	*Polystichum lonchitis* (L.) Roth		Holly fern	Gul deri
6.	351	*Hypodematiu crenatum* (Forssk.) Kuhr		Kwanjay	Kas
7.	604	*Asplenium trichomanes* L.	Aspleniaceae	Maidenhair Spleenwort.	Lond dasha
8.	41	*Asplenium adiantum-nigrum* L.		Black spleenwort	Bala ada
9.	751	*Asplenium septentrionale* (L.) Hoffm.		Wakha Rangay	Showed
10.	788	*Asplenium dalhousiae* Hk.		Bughma butary	Namako
11.	703	*Cystopteris fragilis* (L.).Bernh.	Aspidiaceae	Brittle Bladder Fern	Nazem Abad
12.	104	*Cystopteris dickieana* (R.). Sim.		Fragile fern	Maratay
13.	103	*Cyrtomium caryotideum* Presl.	Spteridaceae	Nil	Danda
14.	910	*Onychium contiguum* Wall.ex Hope.		Lace fern	Koza ada
15.	678	*Petridum aquilinum* (L.) Kuhn		Nil	Bala ada
16.	605	*Pteris critica* L.		Nil	Chum
17.	719	*Cheilanthes albomarginata* Bedd.	Sinopteridaceae	Nil	Kas
18.	359	*Cheilanthes pteridioides* (Reichb.) C.Chr		Nil	Gut
19.	83	*Cheilanthes acrostica* (Balbis).To		Nil	Banda
20.	744	*Adiantum incisum* Forsk.	Adiantaceae	Sumbel	Bar kas
21.	805	*Adiantum venustum* D.Don		Bamboozle	Koza ada
22.	804	*Adiantum capillus -veneris* L.		Bar sumbel	Proper Jelar

23.	852	*Selaginella sanguinolenta* (L.) Spring	Selaginellaceae	Kamar Drub	Suri pao
24.	740	*Equisetum arvenses* L.	Equisetaceae	Bandakay	Manza
25.	809	*Equisetum ramosissimum* Desf.		Bandakay	Manjale
26.	691	*Equisetum hyemale* Roxb.		Bandakay	Danda
27.	127	*Equisetum debile* Roxb.		Bandakay	Danda
28.	882	*Marsila minuta* L.	Marsileaceae	Shawtal panray	Gongatay

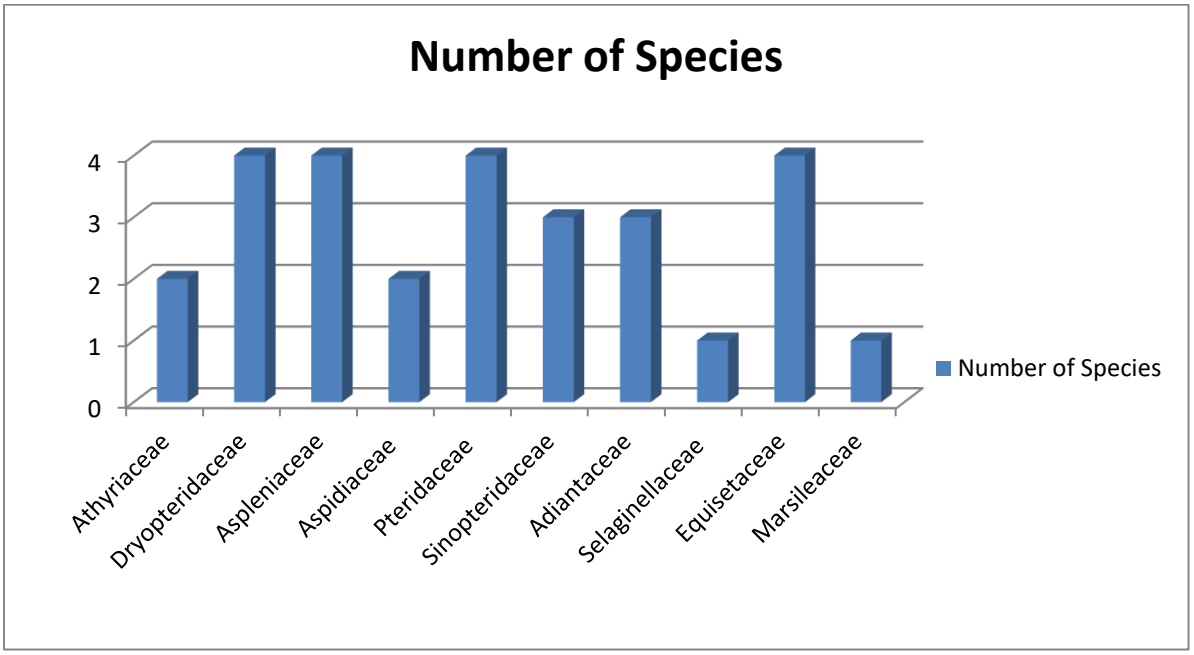

Figure-1: Family wise distribution of pteridophytes in the study area.

Athyrium filix-foemina

Dryopteris sieboldii

Figure: 2

Polystichum willsonii

Asplenium trichomanes

Figure: 3

Cystopteris fragilis

Cyrtomium caryotideum

Figure: 4

Onychium contiguum

Petridum aquilinum

Figure: 5

Pteris critica

Cheilanthes albomarginata

Figure: 6

Adiantum incisum

Selaginella sanguinolenta

Figure: 7

Equisetum arvenses

Marsila minuta

Figure: 8

CONCLUSION

From this research work we conclude that total fern allies and ferns recorded from the Jelar valley of Khyber Pakhtun Khwa Pakistan, a significant proportion is medicinally important. Amongst these 28 species belonging 15 genera and 10 families were collected in the study area. The traditional healers many of these medicinally active ferns have been used ethno botanically and the local people used these species against various disorders, and these still constitute a significant bulk of medicine in the Ayurvedic and Yunnani systems of medicine. Particularly due to over-exploitation and destruction, hence there is an urgent need to conserve various Pteridophytes habitats, and also to make the local public aware about their potential medicinal applications.

CONFLICT OF INTEREST

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

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AUTHOR CONTRIBUTIONS

AH and KS designed and performed the experiments and also wrote the manuscript. TJ, GR and ZA data analysis, ZF, MM, SB and TN identification and collection, JZ, SU and AU proof reading and MN reviewed the manuscript. All authors read and approved the final version.

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