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RESEARCH ARTICLE

DETERMINING SOME OF THE SPECIES BELONGING TO POLYPODIOPHYTA FAMILY IN AĞRI CITY FLORA

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ABSTRACT

In the study, the places where *Asplenium trichomanes* L, *Cystopteris fragilis*, *Polystichum aculeatum* L from the Polypodiophyta family grow through the Ağrı provincial borders, how they grow and general information about pteridophyta were discussed. The determination of the species was done according to systematic literature.

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INTRODUCTION

Pteridophyta is the oldest plant group in Devon era 300 million years ago. Bituminous coal era is also called as "Pteridophyta era". The main source of the coal deposit in the world has been Pteridophyta forests. Today, most of the Pteridophyta species have become extinct although many of them have preserved their existence (Farnsworth, & Soejarto, 1991).

It is possible to come across to Pteridophyta in moist and shady places where sunburst is not observed. Pteridophyta is the plants which are herbaceous stem plants, but it can be seen in tropical regions that these plants can be of 25-meter height and their leaf blades can be bigger than 3 meters. Even if some of the Pteridophyta species can be encountered in the cold places near North Pole and on the top of the alps, Pteridophyta have been spread more in warm climate zones and humid regions. Pteridophyta creates a lush and green flora in tropical forests. Besides, even if they grow in rock fractures, rocky mountainsides, trunks of trees, bushes, and wilderness, they mostly grow in soil. Although these plants grow in the trunks of the trees, they are not parasite plants as they do not get nourishment from the trees. Homosporous ferns

(Polypodiophyta) have a reproduction cycle with the antithetical alternation of two independently living heteromorphic generations: agamic (sporophyte) and sexual (gametophyte) (Shorina, 2001).

Pteridophyta is also called vascular plant. Because they have quite developed strings which carry the water and food in the leaves, stems and roots. As the stems of many of these plants are quite short or spread stems, the leaves look as if they poked directly from the soil.

Pteridophyta is the most developed family of cryptogams which is spread in almost all over the world except Polar Regions and deserts where a complete drought dominates (Walton, 1985). Also, they are geologically the oldest vascular plants. Pteridophyta are not dominant forms nowhere in the world. However, Filicales composing the main elements of Pteridofitik flora are always present in the appropriate conditions where they can grow (Tütüncü 2006).

Pteridophyta has sporophytes differentiated as root, stem and leaf. Sporophytes are distinguished with their big and commonly pinnate, rich vascular leaves. The leaves are poked from an underground rhizome. In the soffit of the leaves, there

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are sporangium groups. Commonly the same leaf both creates both assimilation and sporangiums. Reproduction is done by sporophyll which lacks of chlorophyll, and photosynthesis is done by trophophyll whose assimilation system is developed well.

MATERIAL AND METHOD

Quadrature method was used in the study. A ri city was divided into three regions and field survey was done. Before doing field survey, literature review was done. A ri city was analyzed as Do ubeyazıt, Diyadin, Ta lıçay as 1st region, Hamur, Tutak, Patnos as 2nd region, and Central district and Ele kirt as 3rd region.

Aspleniaceae *Asplenium L*

Asplenium trichomanes L. subsp. Trichomanes
The plant looks like hard bunch and is averagely 5-30 cm height. It is immortelle in winters. Rhizome is vertical or horizontal, its young parts are lamellar, the lamellas are linear lanceolate. Its leaves are pinnate dark green and leathern. Pinna is 13-35 pair in both sides of lamina axis and they are short-stemmed or stemless. Its spores grow mature in April-August. Generally, it grows in 40-2100 m in the rock holes in sunless places. Regions where it grows: Middle Europe, Asia, Crimea and Caucasia. It was found around Sürmelikoç village of Diyadin within A ri city borders.



Figure 1 *Asplenium trichomanes L. Subs. Trichomanes*

This plant can also be grown as a decoration plant in vases and gardens. The height of the plant can be up to 40-90 cm. It is covered with oval lanceolat laminas which are ¼ height of Petiole lamina. Pinnules do not have certain stems whose bottom lobes are not long and which looks along oval pinna axis, and its corners are angled with thorny pinna axis. As the sorus gets matured as an indusium shield on the both sides of the pinnule middle string, they cover sorus. Its spores grow mature in June-September (Pangua, et al. 2003).

The places where it grows are generally in rock holes deeps of the forests which is moist and shady in 500-2000 m. It was found around Ele kirt and Kılıçgedi i plateau within A ri city borders.

Cystopteris Bernh

Cystopteris fragilis (L.) Bernh

Syn: *Polypodium fragile L. (1753)*

The plant is about 10-40 cm height, the leaves are sparse bunch. Rhizome is short and horizontal. The length of petiole is as lamina and thin. It is naked apart from lanceolate laminas (Gämperle, 2002). It is light green or straw-colored, bright towards bottom, light brown, and black in bottom. Lamina lanceolate is 2-pinnat and pinnules are ovat and half of them are pinnatifid. Sorus are round, indusium is like wing, and its edges are backward bent. Spores grow mature in June-September. The spores of the plant are in a thorny sac.

The places it grows: 400-2300 m heights, generally moist and forested places, shady and moist holes of the rocks. It is very common in both the north and south hemisphere. It can be grown all over Turkey locally.

It was found in all of 2200 m altitude hills of all the districts in A ri city borders.



Figure 2 An example of *Cystopteris fragilis*

Table 1 *Asplenium trichomanes L. subsp. Trichomanes*

Name of the Plant	The Plant's				
	Coordinates		Altitude	Date	Place
	North	East			
<i>Asplenium trichomanes L.</i>	39 30 04	43 30 15	2251 m	19.06.2013	The area of Diyadin
<i>Asplenium trichomanes L.</i>	39 30 18	43 30 18	2251 m	19.06.2013	The area of Diyadin
<i>Asplenium trichomanes L.</i>	39 30 24	43 30 32	2217 m	19.06.2013	The area of Diyadin

Polystichum aculeatum (L.) Roth

Table 2 *Polystichum aculeatum (L.) Roth*

Name of the plant	Plant's				
	Coordinates		Altitude	Date	Place
	North	East			
<i>Polystichum aculeatum L.</i>	39 40 45	42 47 37	1968 m	05.08.2012	Kılıçgedi i
<i>Polystichum aculeatum L.</i>	39 40 45	42 47 37	1966 m	05.08.2012	Kılıçgedi i

Tablo 3 Cystopteris fragilis (L.)

Name of the Plant	The plant's				Place
	Coordinates North	Coordinates East	Altitude	Date	
Cystopteris fragilis	39 33 44	43 14 43	2234 m	04.06.2013	Around Ta lıçay
Cystopteris fragilis	39 30 52	43 21 30	2223 m	07.06.2013	Around Bahkılıgöl
Cystopteris fragilis	39 30 52	43 21 34	2324 m	08.06.2013	Tanrıverdi Village
"	39 30 48	43 21 39	2346 m	08.06.2013	"
"	39 30 59	43 21 46	2014 m	08.06.2013	"
"	39 31 01	43 21 32	2186 m	08.06.2013	"
Cystopteris fragilis	39 43 54	43 28 42	2400 m	10.07.2013	Yukarı Toklu
"	39 43 54	43 28 37	2409 m	10.07.2013	"
"	39 43 55	43 28 36	2408 m	10.07.2013	"
"	39 43 50	43 28 39	2416 m	10.07.2013	"
Cystopteris fragilis	39 31 04	43 29 33	2100 m	12.07.2013	Around Diyardin
"	39 33 10	43 16 56	2013 m	12.07.2013	"
"	39 33 30	43 17 27	2014 m	12.07.2013	"

RESULT

As a result of the field survey, examples of splegium trichomanes L, Cystopteris fragilis, Polystichum aculeatum L. from Polypodiophyta family was found within A rı city borders. Particularly, it is thought that the number of the species found in A rı is low as there is no forestland in A rı, its climate is continental and because of its soil structure.

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However, as there can be more species of Polypodiophyta in the world, the studies will continue more comprehensively. Particularly, Cystopteris fragilis species were found most commonly.

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