PARASITIC FUNGI DETERMINED ON THE FLORA OF AKDAĞ (OLUR-ERZURUM)

AKDAĞ (OLUR-ERZURUM) FLORASINDA BELIRLENEN PARAZITIK FUNGUSLAR

Arş. Gör. Feyzi Osman PEKEL*
Atatürk Üniversitesi, K. Karabekir Eğitim Fakültesi, Biyoloji Bölümü, Erzurum

Yrd. Doç. Dr. Ayşe Dilek AZAZ
Balıkesir Üniversitesi, Fen-Edebiyat Fakültesi, Biyoloji Bölümü, Balıkesir

ABSTRACT

This study examines the parasitic fungi collected from the flora of Akdağ. Seventeen microfungi species were determined on the leaves and stems of the plants of Akdağ (Olur-Erzurum, Turkey). Four species of 17 microfungi determined as new records for Turkish Mycoflora and 1 host plant is reported for the first time from Turkey.

Key Words: Parasitic Fungi, Turkish Mycoflora, Akdag, Olur

ÖZET

Bu çalışmada Akdağ florasından toplanan parazitik funguslar incelenmektedir. Akdağ (Olur-Erzurum, Türkiye) bitkilerinin yaprak ve gövdeleri üzerinde 17 mikrofungus türü belirlenmiştir. Belirlenen 17 mikrofungustan 4'ü Türkiye Mikoflorası için yeni kayıttır ve 1 yeni konukçu bitki ilk kez bildirilmektedir.

Anahtar Sözcükler: Parazitik Funguslar, Türkiye Mikoflorası, Akdağ, Olur

INTRODUCTION

Microfungi grow in most habitats; in the soil, in fresh and salt water, on dung, on insects and other animals, on food and on textiles. By far the greatest number are found on living plants (Ellis & Ellis, 1985).

Causing different damages on plants, parasitic fungi destroy the whole product besides leading qualitative and quantitative loses. For control of the parasitic fungi seen on the plants, it is essential to known fungus species and biology. Therefore determining the mycoflora has great importance (Bahçecioğlu & Yıldız, 1996; Baydar, 1975; Demirci et al.,1997; Tamer, 1978; Tamer et al., 1989; Tamer et al.,1990; Tamer & Altan, 1995;

* haberleşme: osmanpekel@yahoo.com

Tepe & Özrenk 1999). The aim of this study is to determine the parasitic fungi of Akdağ (Olur) which has not been investigated in detailed, and to contribute to knowledge of Turkish Mycoflora.

Description of the research area

Our research area (Akdağ district) is located in the east part of the Blacksea region of Turkey. It is 172 km away from the Erzurum by highway. It has 836.000 meters square. Altitude of the research area ranges from 2248 meters in the east to 2342 meters in the middle and 2466 meters in the west. There are mountains surrounding the research area; in the North-east Zamp Mountain (2745 m), the North Mount Halila (2169 m) and Mount Kılıç (2951m), the South Mount Kotek (2115m), from the East Mount Ziyaret (2438m). Alike to a plateau the research area has higher inclination in the South than the North. The area has 397.7 mm annual average rainfall. Extreme temperature degrees of the area are 49 ^{o}C below the zero in winter and 38 ^{o}C in July. Having 4 ^{o}C annual average temperature, the area is very cold in winter which continues from mid of October till May and warm in the summer. It snows in October and snow cover of the ground stays on the land until mid of the May. Having higher altitudes, and variable extreme cold climate, staying snow cover of the land too long, different composition of the flora makes our research area specific.

In the area, woodland begins from 1500 meters and continues till 2500 meters. The most abundant trees of the woodland are *Pinus sylvestris* L.*, Cotoneaster nummularia* Fisch et Mey. and *Sorbus umbellata*.(Desf.) Fritsch. But there are natural steppe areas also between the trees of the woodland formed because of devastating. Under 1500 meters, grasslands are damaged because of excessive grazing. There are sub alpine grasses above the forest (Kaya, 1997).

MATERIALS AND METHODS

The material, consisting of plant samples was collected frequently from the Akdağ (Olur) flora in May-November 1999 and 2000 when fungi have their fructification organs in spring and autumn and their symptoms' seen in summer months. This period was regulated according to the area and samples were collected once in a month by the botanic excursions. Sample collection team was consisting of a botanist and a mycologist. All samples were enumerated one by one during the excursions and sample locations, and altitudes were registered. All material studied were examined

using hand loupe and stereomicroscope and samples carrying parasitic fungi were separated. Preparations were made by scraping, cutting and squashing, and examined under the light microscope (Olympus Vanox AHB-LB-2) . For each species, at least10 measurement were calculated in order to determine the ideal spore size. The identification of fungi species was made according to their microscopic and macroscopic features using the literature (Cummins, 1971; Ellis & Elllis, 1985; Tamer et al., 1987; 1989; 1990a; 1990b; 1992; 1998; Tamer & Altan 1995). Voucher fungi specimens and infectious host plants are kept in Ata Herbarium of Atatürk University. Host plants' identification were made comparatively using Ata Herbarium and also according to Flora of Turkey and East Aegean Islands (Davis, 1965-1985). Citations of the authors' names presented are standardized according to Authors of Fungal Names (Kirk & Ansell, 1992).

RESULTS

In order to determine the parasitic microfungi on the flora of Akdağ (Olur) district, 221 different plants have been collected on 1- May; 1-November 1999-2000. By identification of microfungi isolates on all plants 17 species of 6 genera have been determined (Table 1).

Fourteen species of the determined microfungi belong to Uredinales. Of these species *Puccinia calcipetra* D.C., *P. cerienthes*-agropryna Tranz., *P.cnici-oleracei* Pers., *P. coronata* Corda, *P. dispersa* Eriks, *P. gentianae* Röhl., *P. iridis* Robenhast , *P. menthae* Pers , *P. paorum* Niels , *Puccinia* sp., *Phragmidium mucronatum* (Pers.) Schlecha, *Uromyces polygoni-aviculare* (Pers) and *Uromyces tenuicutis* Mc Alp. are in the Puccinaceae. *Melamspora euphorbia* Cast. belongs to Melamsporaceae in Uredinales. One of the two species of Deuteromycetes is *Drechslera iridis* (Oud.) M.B. Ellis which belongs to Dematiaceae and *Ramularia picridis* Foutr.&Roum. belongs to Mucedinaceae. Distributions of the determined fungi according to their families; Pucciniaceae is 82.35%, Dematiaceae is 5.88%, Melamsporaceae is 5.88%, and Mucedinaceae is 5.88%. Distributions of the determined fungi according to their host plant families: Compositae 23.52%; Boraginaceae is 17.64; Gentianaceae and Iridaceae are 11.76; Euphorbiaceae, Labiatae, Polygonaceae, Rhamnaceae, Rosaceae, and Urticaceae are 5.88%.

Table 1. Parasitic fungi determined on the different host plants of investigation area.

(***L:** Leaf, **S:** Stem; ****NR:** New Record For Turkey, **NH:** New Host For Turkey)

Fungi	Host Plant	Part of Plant*	Date	Location	Re-marks **
Melamspora euphorbiae Cast.	*Euphorbia virgata* Walds. & Kit.	L, S	02.06.1999 07.06.2000	Cevizdere	-
Phragmidium mucro-natum (Pers.) Schlect.	*Rosa canina* L.	L	02.10.1999 06.09.2000	Tinitap	-
Puccinia calcitrapae DC.	*Carduus lanuginosus* Willd.	L	02.05.1999 08.05.2000	Cevizdere	-
P. cerinthes -agropryna Tranz.	*Cerinthae minor* L.	L, S	02.05.1999 08.05.2000	Çankamat	NR
Puccinia cnici-oleracei Pers. ex Desm.	*Aster amellus* L. ssp. *ibericus.(*Stev) Avetian	L	04.11.1999 07.10.2000	Uzun tarla	NH
Puccinia coronata Corda	*Rhamnus pallasii* Fisch. & Mey.	L	03.05.1999 08.06.2000	Cevizdere	-
Puccinia dispersa Eriks. & Henn.	*Leontodon crispus* Vill.	L	02.07.1999 04.08.2000	Dağ tarla.	-
Puccinia gentianae Röhl.	*Gentiana cruciata* L.	L	02.09.1999 06.09.2000	Akbayır	-
Puccinia gentianae Röhl.	*Gentiana lutea* L.	L, S	02.09.1999 07.09.2000	Akbayır	-
Puccinia iridis Rabenhost.	*İris taochia* Woronow ex Grossh.	L	03.10.1999 06.09.2000	Tinitap Kızamıkt	-
Puccinia menthae Pers.	*Origanum vulgare* L.	L	03.09.1999 07.09.2000	Akbayır	-
Puccinia poarum Niels.	*Tussilago farfara* L.	L	03.10.1999 05.10.2000	Tinitap	-
Puccinia Pers *sp.*	*Anchusa arvensis* L.	L	02.10.1999 05.10.2000	Dağ tarla Hastane	-
Uromyces polygoni-aviculare (Pers) Karst.	*Polygonum cognatum* Meissn.	L, S	02.07.1999 04.08.2000	Öküz Yat	-
Uromyces tenuicutis Mc Alp.	*Parietaria judaica* L.	L, S	02.06.1999 07.06.2000	Tinitap	NR
Drechslera iridis (Oud.) MB.Ellis	*Iris taochia* Woronow ex Grossh.	L	02.07.1999 04.08.2000	Kızamıkt Tinitap	NR
Ramularia picridis Fautr. & Roum.	*Picris strigiosa* Bieb.	L, S	02.09.1999 07.09.2000	Tinitap	NR

Consequently, as it can be seen on Table 1, four new species of parasitic fungi were added to Mycoflora of Turkey. Those are *Puccinia cerienthes- agropryna* Tranz., *Uromyces tenuicutis* Mc Alp., *Drechslera iridis* (Oud.) M.B. Ellis, *Ramularia picridis* Foutr.& Roum. In addition, one new host plant species, *Aster amellus* L. ssp. *ibericus* (Stev.) Avetian., was added to host plants of Turkey by this investigation.

Discussion

After examining two hundred and twenty one infected plants, we determined 17 parasitic fungi species on 17 host plants. All fungi species, which we obtained, belong to rusts, and of these; 11 to *Puccinia*, 2 to *Uromyces*, 1 to *Phragmidium*, 1 to *Melamspora*, 1 to *Ramularia* and 1 belong to *Drechslera* genus. Puccinaceae was predominant family including much of the parasitic fungi species investigated in this study.

Little is known about the distribution of even the very common species, and valuable contributions to our knowledge in this field can be made (Ellis & Ellis, 1985). Although the results of this study are similar to the previous researches from Turkey (Baydar, 1975; Tamer, 1978; Tamer et al., 1987; 1989; 1990a; 1990b; 1998; Tamer & Altan, 1995; Bahçecioğlu & Yıldız, 1996, Işık & Tepe, 1999), by this study, it is thought that parasitic fungi on the vascular plants of the Akdağ (Olur) flora were determined, at the same time four new species of parasitic fungi plus a new species of host plant of Turkey were added to mycoflora of Turkey.

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