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Research Article

The Liverworts (*Hepaticae*) of Uludağ National Park (Bursa)

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Abstract: During the vegetation period, a total of 52 plant specimens were collected from Uludağ National Park (Bursa) between 1988 and 1989. At the end of this investigation, 23 liverwort species were identified, belonging to 15 families and 17 genera. Of these, 4 taxa are new for the AI grid-square. *Jungermannia hyalina* Lyell, *Marsupella funckii* (Web. & Mohr) Dum and *Calypogeia azurea* Stotler & Crotz, are reported for the second time from Turkey.

Key Words: *Hepaticae*, Flora, Turkey.

Uludağ (Bursa) Milli Parkı'nın Ciğerotları (*Hepaticae*)

Özet: 1988-1989 yılları arasında vejetasyon döneminde yöreden 52 bitki örneği toplanmıştır. Bu araştırma sonucunda 15 familyaya ait 17 cins ve 23 ciğerotu türü saptanmıştır. Bunlardan 4 tanesi AI karesi için yenidir. *Jungermannia hyalina* Lyell, *Marsupella funckii* (Web. & Mohr.) Dum ve *Calypogeia azurea* Stotler et Crotz, Türkiye'den ikinci kez rapor edilmiştir.

Anahtar Sözcükler: Ciğerotları, Flora, Türkiye.

Indroduction

The identification of the wild plants in Uludağ National Park will help the evaluation of the primary genetic centres and the buffer zones in the area. The biomass of liverworts and mosses is an important part of the forestal ecosystem in the region.

The present investigation was planned to fill in the gap in the hepatics flora of Uludağ National Park, and also to prepare a local herbarium of these specimens. The study area is in the AI grid-square, according to the system used by Henderson (1).

Description of the Study Area

Uludağ is the highest mountain in the Marmara region, where Europe meets Asia around the Marmara Sea. Uludağ is in the province of Bursa, which is an important centre in this region. The mountain range is about 40 km long and 15-20 km wide. There are some high plateaus on the northern side of mountain, such as Sarıalan Yaylası, Kriazlı Yayla and Kadı Yayla (Figure 1). The upper peaks of the mountain have glacial valleys and glacial lakes (Aynalı Göl, Kara Göl, Kilimli Göl), which are evidence of this glaciation.

The region has a mild climate. In general, the Mediterranean climate with very cold winters is modified by the climatic conditions of the Black Sea region, and also of the Inner Anatolian region. There are 3 meteorological stations on Uludağ: Yeşilkonak (1025 m), Sarıalan (1620 m) and Zirve (1920 m). According to the data of these stations, the mean annual temperature is 10°C, decreasing to 3-4°C at higher altituds (2000-2500 m). Mean annual rainfall is 1180 mm in Yeşilkonak, 1330 mm in Sarıalan and 1550 mm. in Zirve. Rainfall reaches a maximum in December and a minimum in August (2).

Material and Method

The specimens were collected in different parts of Uludağ National Park (abbreviated as UNP in the appendix), during the years 1988 and 1989, when a survey of localities with ecological conditions suitable for the growth of liverworts was undertaken.

They were thoroughly cleaned with water so as to remove the mud and have a clear view of their colour. The material was brought to the laboratory in small polyethylene bags and separated into groups. These were then put into special herbarium envelopes without pressing, and left in the light, in a room with no air current.

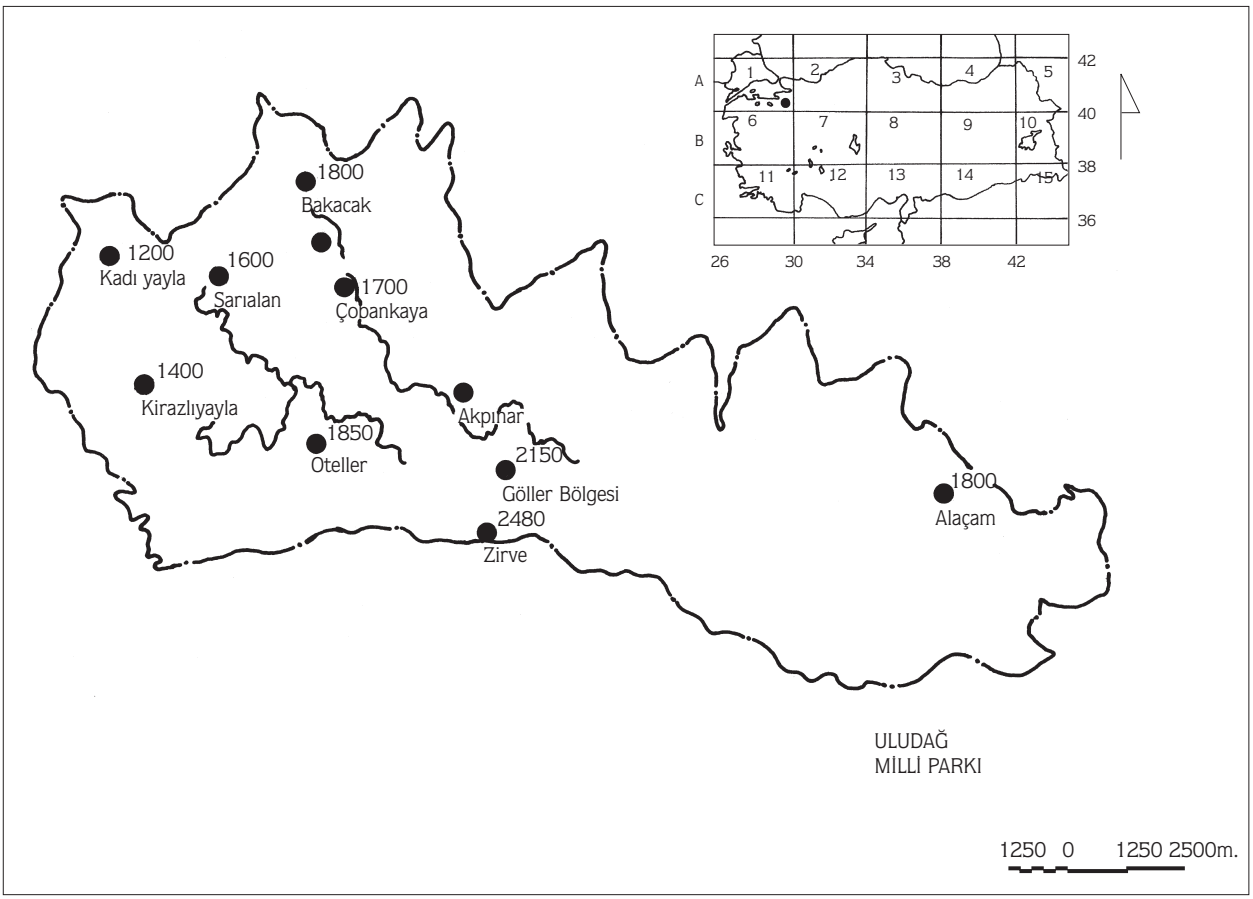

Figure 1. Map of the study area.

The species new for the gird-square is indicated with an asteriks (*). All the specimens are kept at the herbarium of the Biology Department, Faculty of Science, University of Ankara (ANK). The samples were identified with the appropriate literature (3, 4). All species are compiled in the appendix. The taxonomic arrangement, numbering and nomenclature follow Grolle (5).

Results

In this study, 17 genera belonging to 15 families and 23 taxa were identified from the liverworts samples collected from Uludağ National Park (see appendix). Of these, *Jungermannia hyalina* Lyell, *Marsupella funckii* (Web. & Mohr). Dum., *Chiloscyphus pallescens* (Ehrh. ex Hoffm.) Dum. and *Calypogeia azurea* Stotler & Crotz are new records for grid-square Al (1, 6, 7).

Marsupella funckii, Jungermannia hyalina and *Calypogeia azurea,* are reported for the second time from Turkey (7-9).

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APPENDIX

The Floristic List

BRYOPHYTA

MARCHANTIOPSIDA

Conocephalaceae

1- Conocephalum conicum (L.) Underw.

AI-Bursa-Uludağ National Park; Akpınar, near bridge, on wet soil, 1400m., 26.8.1988, Çetin 792. Distrubition; Common, Europe, Asia, N. Africa, N. America.

Marchantiaceae

2- Marchantia alpestris (Ness) Burgeff

AI-Bursa-Uludağ National Park; Kirazlı Yayla, on wet soil, 1400 m., 4.9.89, Çetin 807. A1, B6, B9, Europe, Asia, N. America.

3- M. polymorpha L.

AI-Bursa-U.N.P., Akpınar, stream side, on wet soil, 1400 m., 26.8.88, Çetin 791. Common, Europe, Asia, Africa, America, Australia.

Metzgeriaceae

4- Metzgeria furcata (L.) Dum

AI-Bursa; Bakacak Hill, on bark, 1700 m., 26.8.88, Çetin 789.

A1, A2, A3, A4, B6, B7, C11, C12, C13, Europe, N. Africa, Asia, America, Australia.

Pelliaceae

5- Pellia epiphylla (L.) Corda

AI-Bursa; U.N.P., lake district, on wet soil, 2100 m., 2.9.89, Çetin 800.

A1, A4, C11, Europe, Asia, N. America.

6- P. neesiana (Gott.) Limpr.

AI-U.N.P., Akpınar, near bridge, stream side, 1400 m., 26.8.88, Çetin 799.

A1, A4, A6, Europe, Asia, America.

Lophoziaceae

7- Barbilophozia hatcheri (Evans) Loeske

AI-U.N.P., Bakacak Hill, on wet rock, 1700 m., 26.8.88, Çetin 795.

A1, A2, B6, Europe, Asia, N. America.

8- Lophozia ventricosa (Dicks.) Dum.

AI-U.N.P., around the hotels, on wet soil, 1700 m., 25.8.88, Çetin 790.

A1, A4, Europe, C.Asia, N. America.

Jungermanniaceae

***9- Jungermannia hyalina** Lyell

A1-U.N.P., Lakes district, shore of lake, 2100 m., 2.9.89, Çetin 803.

A4, Europe, Asia, N. America.

Gymnomitriaceae

***10- Marsupella funckii** (Web. & Mohr) Dum.

A1-U.N.P., Bakacak Hill, on wet rock, 1700 m., 27.8.88, Çetin 788.

A4, Europe, N. Africa, Asia, N. America.

Plagiochilaceae

11- Plagiochila asplenioides (L. emend. Tayl.) Dum.

A1-U.N.P., Lakes district, on wet rock, 2100 m., 2.9.89, Çetin 805.

A1, A2, A4, A5, Europe, Asia, N. America, Scandinavia.

Geocalycaceae

12- Lophocolea bidentata (L.) Dum.

A1-U.N.P., around hotels, on wet soil, 1500 m., 28.8.88, Çetin 798.

A1, A2, A3, A4, B6, Europe, Asia, N. America.

13- L. cuspidata Limpr.

A1-U.N.P., Kirazlı Yayla on wet soil 1380 m., 4.9.89, Çetin 808.

A1, Europe, Asia, N. America.

14- L. minor Nees.

A1-U.N.P., Alaçam on wet soil, 25.8.88, Çetin 809.

A1, A2, A3, A4, Europe, Asia, N. America.

***15- Chiloscyphus pallescens** (Ehrh. ex Hoffm.) Dum.

A1-U.N.P., around hotels, on wet soil, 1500 m., 27.8.88, Çetin 787.

A4, B6, Europe, Asia, N. America.

Scapaniaceae

16- Scapania irrigua (Ness) Nees

A1-U.N.P., lakes district, shore of lake, 2100 m., 21.8.89, Çetin 797.

A1, A4, Europe, Asia, N. Africa, N. America.

17- S. undulata (L.) Dum.

A1-U.N.P., 5 km down of hotels, on wet soil, 1600 m., 26.8.88, Çetin 796.

A1, A4, B6, C11, Europe, Asia. N. America.

Cephaloziaceae

18- Cephalozia bicuspidata (L.) Dum.

A1-U.N.P., around hotels, on wet soil, 13.7.89, Çetin 804.

A1, A2, A4, Europe, Asia, N. America.

Calypogeiaceae

***19- Calypogeia azurea** Stotler & Crotz

A1-U.N.P., lakes district, shore of lake, 2100 m., 2.9.89, Çetin 802.

A4, Europe, N. America.

Radulaceae

20- Radula complanata (L.) Dum.

A1-U.N.P., Bakacak Hill, on tree trunk, 1700 m., 26.8.88, Çetin 794.

A1, A2, A4, B6, C11, Europe, Asia, N. America.

Porellaceae

21- Porella cordeana (Hüb.) Moore

A1-U.N.P., Kadı Yayla on bark, 1000 m., 3.9.89, Çetin 810.

A1, A2, B6, B7, C13, Europe, Asia, N. America.

22- Porella platyphylla (L.) Pfeiff.

A1-U.N.P., Alaçam, on wet rock, 1750 m., 25.8.88, Çetin 793.

Common, Europe, Asia, N. Africa, N. America.

Frullaniaceae

23- Frullania dilatata (L.) Dum.

A1-U.N.P., Çobankaya on tree trunk, 1700 m., 3.9.89, Çetin 806.

Common, Europe, Asia.