

Mosses (Musci) of Değirmenboğazı (Manyas District, Balıkesir)

Gökhan ABAY, Serhat URSAVAŞ
Ankara University, Faculty of Forestry, Department of Forest Engineering, 18200, Çankırı - TURKEY

Received: 02.12.2004
Accepted: 06.10.2005

Abstract: The moss specimens collected from Değirmenboğazı and its environment, which were chosen as the research area, were evaluated. A total of 74 taxa belonging to 45 genera and 19 families were identified. Of these, 16 taxa are new records for the B6 grid square in the system adopted by Henderson.

Key Words: Moss flora, Değirmenboğazı, Manyas, Turkey

Değirmenboğazı (Manyas, Balıkesir) Yöresi Karayosunları (Musci)

Özet: Araştırma alanı olarak seçilen Değirmenboğazı ve çevresinden toplanan karayosunu örnekleri değerlendirilmiştir. 19 familyaya ait 45 cins ve bunlara bağlı 74 takson tanımlanmıştır. Bunlardan 16 takson Henderson tarafından benimsenen kareleme sistemine göre B6 karesi için yeni kayıttır.

Anahtar Sözcükler: Karayosunu florası, Değirmenboğazı, Manyas, Türkiye

Introduction

For this study, Değirmenboğazı and its environment, the villages of Haciosman and Karakabaağaç within Manyas district, city of Balıkesir, in Western Turkey were selected as the research area. The study area is located in the B6 grid square according to the system adopted by Henderson (1961).

An evaluation of the phytogeography reveals that, the study area is located in the southern Marmara region and belongs to the European-Siberian flora area, but the existence of elements of Mediterranean origin as well in this area makes its floristic structure interesting.

Woody taxa that are widespread in the area are connected with the frequently seen tree and bush types. The forest vegetation consists of mainly the following taxa: *Quercus cerris* L., *Q. infectoria* Oliv., *Q. coccifera* L., *Q. frainetto* Ten., *Myrtus communis* L., *Juglans regia* L., *Sytrax officinalis* L., *Carpinus betulus* L., *C. orientalis* Mill., *Platanus orientalis* L., *Salix alba* L., *Morus alba* L., *Rosa canina* L., *Corylus avellana* L., *Populus nigra* L., *Ficus carica* L., *Paliurus spina-christi* Mill., *Alnus glutinosa* (L.) Gaertn., *Pyrus elaeagnifolia* (L.) Pall., *P. communis* L., *Fagus orientalis* Lipsky, *Ulmus glabra* Huds., *Arbutus andrachne* L., *Ceratonia siliqua* L., *Tilia tomentosa*

Moench., *Acer campestre* L., *Hedera helix* L., and *Crataegus monogyna* Jacq.

Indeed, the Mediterranean type along the Marmara coast, the Mediterranean and the Black Sea elements on southern Marmara coast, damp forests on hillsides that are facing the northern parts of the mountains, and dry forests (*Quercus* spp.) on parts that are facing south are available (Atalay, 1994).

Most of the study area is dominated by various types of oaks. The east part of the area is a coppice oak forest, and in the west hillsides are converted into high forest. In addition, the fact that the west part of the study area is threatened due to the construction of Manyas Dam means that protection is of great importance.

The study area is under the effect of a less rainy variant of the Mediterranean type of climate and it has a Central Mediterranean precipitation regime (Akman, 1999).

Değirmenboğazı and its environment are located in the Marmara region. The research area is surrounded by Pırnallık to the north, Alanbaşı Hill (462 m) to the south, Manyas Dam Lake, Yayla Hill (355 m) and Yağlıpınar Hill (335 m) to the west, Kavaklı Cemetery to the east and Manyasderbendi Hill (436 m) to the south-east (Figure 1).

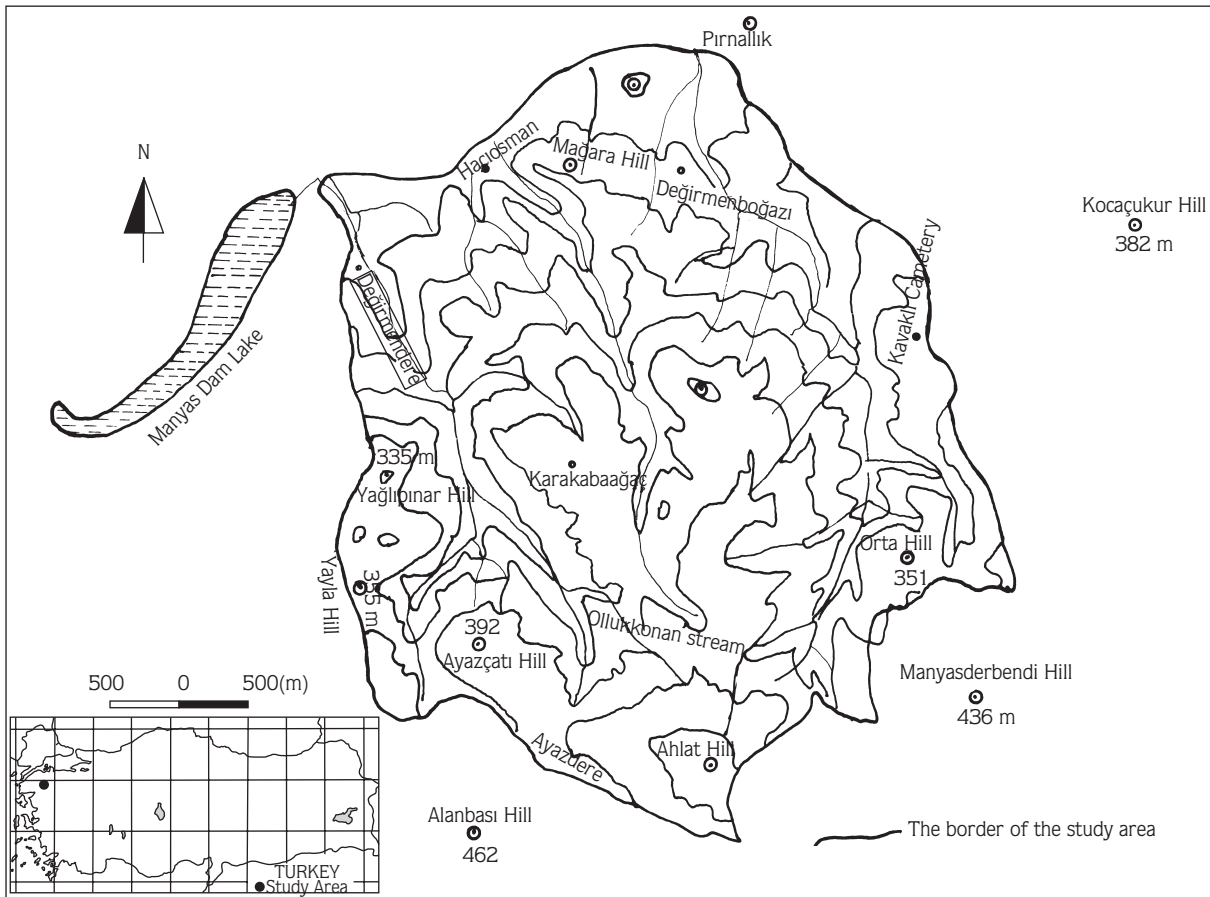


Figure 1. Map of the study area and the grid system adopted by Henderson for Turkey.

Materials and Methods

The materials for the study include 400 moss specimens collected during periodic field trips to the research area in different seasons in 2002 and 2004.

The moss samples were identified according to various books on moss flora (Savicz-Ljubitzkaja et al., 1970; Lawton, 1971; Smith, 1980; Nyholm, 1981; Watson, 1981; Frey et al., 1995; Greven, 1995-2003). The status of the taxa for Turkey was determined by reviewing the related literature (Çetin, 1988; Frey & Kürschner, 1991; Uyar & Çetin, 2004; Kürschner & Erdağ, 2005). Information about new taxa for the B6 grid square was obtained from the literature (Henderson, 1961; Walther, 1967; Yayıntaş & Iwatsuki, 1988; Yayıntaş et al., 1994; Tonguç & Yayıntaş, 1996; Erdağ & Yayıntaş, 1999; Savaroğlu et al., 2001). New records for the B6 grid square are indicated with an asterisk. The

moss samples were deposited in the private collection of ABAY, Forest Botany Laboratory, Çankırı Forestry Faculty, Ankara University. The floristic list is arranged according to the system proposed by Corley et al. (1981) and Corley & Crundwell (1991). Manyas and the B6 grid square are not indicated in the localities for taxa to avoid repetition. In addition, collecting dates, collector number, altitude and coordinates, vegetation and habitat are mentioned for taxa in the floristic list.

Floristic List

Polytrichaceae Schwägr.

1. *Pogonatum urnigerum* (Hedw.) P.Beauv.

Karakabağaç village, Ahırtaşlı Hill, *Fagus orientalis*, 490 m, N 39° 57' 391", E 27° 49' 787", 31 iii 2004, on tree, ABAY 541.

2. Polytrichum juniperinum Hedw.

Haciosman village, Mağara Hill, *Quercus infectoria*, *Ulmus glabra*, *Arbutus andrachne*, 225 m, N 39° 59' 693", E 27° 49' 008", 30 iii 2004, on soil, ABAY 537.

Fissidentaceae Schimp.

***3. Fissidens crassipes Wilson ex Bruch & Schimp.**

Değirmenboğazı village, Başdeğirmendere, *Quercus infectoria*, *Juglans regia*, *Corylus avellana*, 130 m, N 39° 59' 795", E 27° 50' 474", 01 i 2004, on rock in water, ABAY 520.

Dicranaceae Schimp.

4. Dicranum scoparium Hedw.

Karakabaağaç village, Kayakbaşı Hill, *Fagus orientalis*, *Quercus infectoria*, 410 m, N 39° 57' 777", E 27° 49' 826", 31 iii 2004, on soil, ABAY 542.

Pottiaceae Schimp.

5. Syntrichia intermedia Brid.

Değirmenboğazı village, Suçıktı Stream, *Ficus carica*, *Populus nigra*, *Quercus infectoria*, 110 m, N 39° 59' 908", E 27° 49' 952", 01 i 2004, on rock, ABAY 521.

6. S. laevipila Brid.

On the road to Haciosman village, *Salix alba*, *Quercus infectoria*, *Paliurus spina-christi*, 55 m, N 39° 59' 978", E 27° 49' 635", 30 iii 2004, on tree, ABAY 562.

***7. S. latifolia (Hartm.) Huebener**

Değirmenboğazı village, Başdeğirmendere, *Platanus orientalis*, *Ulmus glabra*, *Populus nigra*, *Ficus carica*, 46 m, N 39° 59' 999", E 27° 49' 633", 14 vii 2004, on tree, ABAY 555.

8. S. subulata (Hedw.) F.Weber & D.Mohr var. subulata

Değirmenboğazı village, Başdeğirmendere, *Salix alba*, *Populus nigra*, *Alnus glutinosa*, 30 m, N 39° 59' 696", E 27° 49' 805", 15 ix 2002, on soil, ABAY 490.

9. S. subulata (Hedw.) F.Weber & D.Mohr var. angustata (Schimp.) J.J.Amann

Karakabaağaç village, Ayazçatı Hill, *Quercus infectoria*, 305 m, N 39° 58' 503", E 27° 48' 751", 31 iii 2004, on soil, ABAY 543.

10. Tortula muralis L. ex Hedw. var. muralis

Değirmenboğazı village, between Başdeğirmendere

and the Trout Production Pond, *Quercus infectoria*, *Salix alba*, *Populus nigra*, *Alnus glutinosa*, 35 m, N 39° 59' 757", E 27° 49' 806", 15 ix 2002, by streams, on rock, ABAY 489.

***11. T. muralis L. ex Hedw. var. aestiva Brid. ex Hedw.**

Değirmenboğazı village, between Başdeğirmendere and the Trout Production Pond, *Platanus orientalis*, *Salix alba*, *Sytrax officinalis*, *Myrtus communis*, 35 m, N 39° 59' 621", E 27° 49' 824", 30 x 2002, on rock, ABAY 506.

***12. Desmatodon leucostoma (R.Br.) Berggr.**

Değirmenboğazı, Başdeğirmendere, the Trout Production Pond, *Platanus orientalis*, *Salix alba*, *Ficus carica*, *Alnus glutinosa*, *Sytrax officinalis*, 78 m, N 39° 59' 848", E 27° 49' 647", 14 vii 2004, on rock, ABAY 558.

13. Barbula unguiculata Hedw.

Değirmenboğazı village, between Başdeğirmendere and the Trout Production Pond, *Platanus orientalis*, *Salix alba*, *Sytrax officinalis*, *Myrtus communis*, 35 m, N 39° 59' 621", E 27° 49' 822", 30 x 2002, on rock in water, ABAY 507.

14. Didymodon fallax (Hedw.) R.H.Zander.

Değirmenboğazı village, Suçıktı Stream, *Quercus infectoria*, *Pyrus elaeagnifolia*, *P. communis*, *Rosa canina*, 200 m, N 39° 59' 757", E 27° 50' 440", 01 i 2004, on soil, ABAY 522.

15. D. sinuosus (Mitt.) Delogne

Değirmenboğazı village, Suçıktı Stream, *Ficus carica*, *Hedera helix*, *Crataegus monogyna*, 52 m, N 40° 00' 050", E 27° 49' 751", 15 vii 2004, on rock, ABAY 559.

16. D. tophaceus (Brid.) Lisa var. tophaceus

Değirmenboğazı village, Başdeğirmendere, *Quercus infectoria*, *Platanus orientalis*, *Corylus avellana*, *Rosa canina*, 140 m, N 39° 59' 795", E 27° 50' 474", 01 i 2004, near water, on rock, ABAY 523, Y 559.

17. D. vinealis (Brid.) R.H.Zander.

Değirmenboğazı village, Suçıktı Stream, *Quercus infectoria*, *Platanus orientalis*, 160 m, N 39° 59' 847", E 27° 50' 393", 01 i 2004, on soil, ABAY 524.

18. Bryoerythrophyllum recurvirostrum (Hedw.) P.C.Chen.

Değirmenboğazı village, Suçıkçı Stream, *Platanus orientalis*, *Quercus infectoria*, *Paliurus spina-christi*, 130 m, N 39° 59' 795", E 27° 50' 474", 01 i 2004, on soil, ABAY 525.

19. Eucladium verticillatum (Brid.) Bruch & Schimp.

Değirmenboğazı, Başdeğirmendere, *Ficus carica*, *Sytrax officinalis*, *Populus nigra*, *Quercus infectoria*, *Paliurus spina-christi*, 127 m, N 39° 59' 488", E 27° 49' 568", 19 vi 2004, on rock, ABAY 552.

20. Weissia controversa Hedw.

Değirmenboğazı village, *Ficus carica*, *Sytrax officinalis*, *Populus nigra*, *Quercus infectoria*, *Paliurus spina-christi*, 127 m, N 39° 59' 488", E 27° 49' 568", 19 vi 2004, on rock, ABAY 551.

***21. Tortella inflexa** (Bruch.) Broth.

Değirmenboğazı village, Suçıkçı Stream, *Ficus carica*, *Quercus infectoria*, *Rosa canina*, 185 m, N 39° 59' 909", E 27° 49' 956", 01 i 2004, on rock, ABAY 526.

22. T. nitida (Lindb.) Broth.

Değirmenboğazı village, Başdeğirmendere, *Quercus infectoria*, *Pyrus elaeagnifolia*, *P. communis*, *Rosa canina*, 200 m, N 39° 59' 768", E 27° 50' 440", 01 i 2004, on rock, ABAY 527.

23. T. tortuosa (Hedw.) Limpr.

Değirmenboğazı village, Suçıkçı Stream, *Ficus carica*, *Populus nigra*, *Quercus infectoria*, 110 m, N 39° 59' 909", E 27° 49' 956", 01 i 2004, on rock, ABAY 528.

***24. Diallytrichia mucronata** (Brid.) Broth.

Değirmenboğazı village, Başdeğirmendere, *Platanus orientalis*, *Juglans regia*, *Tilia tomentosa*, *Alnus glutinosa*, 30 m, N 39° 59' 864", E 27° 49' 792", 15 ix 2002, on *Platanus* bark, ABAY 491.

Grimmiaceae Arnott.

25. Schistidium apocarpum (Hedw.) Bruch & Schimp.

Değirmenboğazı village, between Başdeğirmendere and the Trout Production Pond, by streams, *Quercus infectoria*, *Salix alba*, *Populus nigra*, *Alnus glutinosa*, 35 m, N 39° 59' 727", E 27° 49' 817", 15 ix 2002, on rock, ABAY 492.

26. Grimmia laevigata (Brid.) Brid.

Değirmenboğazı village, between Başdeğirmendere

and the Trout Production Pond, *Platanus orientalis*, *Populus nigra*, *Myrtus communis*, *Paliurus spina-christi*, *Sytrax officinalis*, 40 m, N 39° 59' 655", E 27° 49' 802", 15 x 2002, on rock, ABAY 502.

27. G. pulvinata (Hedw.) Sm.

Değirmenboğazı village, Başdeğirmendere, *Acer campestre*, *Quercus infectoria*, *Platanus orientalis*, 40 m, N 39° 59' 725", E 27° 49' 788", 15 ix 2002, on rock, ABAY 493.

28. G. trichophylla Grev.

Değirmenboğazı village, between Başdeğirmendere and the Trout Production Pond, *Quercus infectoria*, *Salix alba*, *Populus nigra*, *Alnus glutinosa*, 35 m, N 39° 59' 727", E 27° 49' 817", 15 ix 2002, on rock, ABAY 494.

Funariaceae Schwaegr.

29. Funaria hygrometrica Hedw.

Değirmenboğazı village, Başdeğirmendere, *Platanus orientalis*, *Alnus glutinosa*, *Paliurus spina-christi*, *Sytrax officinalis*, 30 m, N 39° 59' 700", E 27° 49' 833", 15 ix 2002, by streams, on rock, ABAY 495.

Bryaceae Schwaegr.

30. Pohlia nutans (Hedw.) Lindb.

Değirmenboğazı village, between Başdeğirmendere and the Trout Production Pond, *Platanus orientalis*, *Salix alba*, *Sytrax officinalis*, 35 m, N 39° 59' 622", E 27° 49' 825", 30 x 2002, on rock, ABAY 508.

***31. P. wahlenbergii** (F.Weber & D.Mohr) A.L.Andrews var. *calcareae* (Warnst) E.F.Warb.

Değirmenboğazı village, between Başdeğirmendere and the Trout Production Pond, *Platanus orientalis*, *Salix alba*, *Sytrax officinalis*, 35 m, N 39° 59' 727", E 27° 49' 817", 30 x 2002, on rock, ABAY 509.

32. Bryum caespiticium Hedw.

Değirmenboğazı village, Başdeğirmendere, *Quercus cerris*, *Q. infectoria*, *Platanus orientalis*, *Acer campestre*, 50 m, N 39° 59' 433", E 27° 50' 002", 30 x 2002, on soil, ABAY 510.

33. B. capillare Hedw.

Değirmenboğazı village, between Başdeğirmendere and the Trout Production Pond, *Platanus orientalis*, *Salix alba*, *Sytrax officinalis*, *Myrtus communis*, 35 m, N 39° 59' 618", E 27° 49' 822", 30 x 2002, on rock, ABAY 511.

Mniaceae Schwägr.

34. *Mnium stellare* Hedw.

Karakabaağaç village, Kavakbaşı Hill, *Fagus orientalis*, *Carpinus betulus*, *Quercus frainetto*, 417 m, N 39° 57' 542", E 27° 49' 248", 16 vii 2004, on soil, ABAY 563.

35. *Plagiomnium affine* (Blandow) T.Kop.

Değirmenboğazı village, between Başdeğirmendere and the Trout Production Pond, *Quercus cerris*, *Myrtus communis*, *Juglans regia*, 35 m, N 39° 59' 726", E 27° 49' 937", near the water reservoir, 30 x 2002, on rock, ABAY 512.

36. *P. elatum* (Bruch & Schimp.) T.Kop.

Değirmenboğazı village, between Başdeğirmendere and the Trout Production Pond, *Quercus cerris*, *Myrtus communis*, *Juglans regia*, 35 m, N 39° 59' 727", E 27° 49' 817", 30 x 2002, on rock in water, ABAY 513.

37. *P. undulatum* (Hedw.) T.Kop

Between Haciosman and Karakabaağaç villages, in the vicinity of Değirmendere, *Quercus infectoria*, *Fagus orientalis*, *Corylus avellana*, *Ulmus glabra*, *Tilia tomentosa*, 180 m, N 39° 58' 590", E 27° 48' 635", 11 iv 2004, by streams, on soil, ABAY 549.

Orthotrichaceae Arnott.

38. *Orthotrichum affine* Schrad. ex Brid.

Değirmenboğazı village, Suçıktı Stream, *Ficus carica*, *Populus nigra*, *Quercus infectoria*, 110 m, N 39° 59' 908", E 27° 49' 952", 01 i 2004, on rock, ABAY 529.

39. *O. lyellii* Hook. & Taylor

Karakabaağaç village, Kavakbaşı Hill, *Fagus orientalis*, *Carpinus betulus*, *Quercus frainetto*, 417 m, N 39° 57' 542", E 27° 49' 248", 16 vii 2004, on tree, ABAY 560.

*40. *O. urnigerum* Myrin

Değirmenboğazı village, Başdeğirmendere, *Sytrax officinalis*, *Carpinus betulus*, *Quercus cerris*, *Paliurus spina-christi*, 40 m, N 39° 59' 605", E 27° 49' 949", 30 x 2002, on rock, ABAY 514.

41. *Ulota hutchinsiae* (Sm.) Hammar

Değirmenboğazı village, between Başdeğirmendere and the Trout Production Pond, *Platanus orientalis*, *Populus nigra*, *Myrtus communis*, *Paliurus spina-christi*, *Sytrax officinalis*, 40 m, N 39° 59' 657", E 27° 43' 807", 15 x 2002, on rock, ABAY 503.

Hedwigiaceae Schimp.

42. *Hedwigia ciliata* (Hedw.) Ehrh. ex P.Beauv.

Karakabaağaç village, Kayakbaşı Hill, *Fagus orientalis*, *Quercus infectoria*, 400 m, N 39° 57' 728", E 27° 49' 933", 31 iii 2004, on rock, ABAY 544.

Climaciaceae Kindb.

*43. *Climacium dendroides* (Hedw.) F.Weber & D.Mohr.

Değirmenboğazı village, Suçıktı Stream, *Quercus infectoria*, *Platanus orientalis*, *Corylus avellana*, *Rosa canina*, 140 m, N 39° 59' 864", E 27° 50' 067", 01 i 2004, on rock, ABAY 530.

Leucodontaceae Schimp.

44. *Leucodon sciuroides* (Hedw.) Schwägr.

Değirmenboğazı village, Başdeğirmendere, *Quercus infectoria*, *Paliurus spina-christi*, *Myrtus communis*, 160 m, N 39° 59' 904", E 27° 50' 067", 01 i 2004, on tree, ABAY 531.

45. *Antitrichia curtispindula* (Hedw.) Brid.

Karakabaağaç village, Ayazçatı Hill, *Fagus orientalis*, 430 m, N 39° 57' 380", E 27° 49' 653", 31 iii 2004, on soil, ABAY 545.

Neckeraceae Schimp.

46. *Leptodon smithii* (Hedw.) F.Weber & D.Mohr.

Değirmenboğazı village, the Fish Farm, *Platanus orientalis*, *Sytrax officinalis*, *Alnus glutinosa*, *Sambucus nigra*, 78 m, N 39° 59' 751", E 27° 49' 659", 14 vii 2004, on tree, ABAY 557.

47. *Neckera complanata* (Hedw.) Huebener

Değirmenboğazı village, Suçıktı Stream, *Quercus infectoria*, *Platanus orientalis*, *Corylus avellana*, *Rosa canina*, 130 m, N 39° 59' 866", E 27° 50' 371", 01 i 2004, on rock, ABAY 532.

Thamniaceae Mönk.

48. *Thamnobryum alopecurum* (Hedw.) Nieuwl. ex Gangulee

Değirmenboğazı village, Suçıktı Stream, *Quercus infectoria*, *Platanus orientalis*, *Morus alba*, *Myrtus communis*, 120 m, N 39° 59' 905", E 27° 50' 069", 01 i 2004, on rock, ABAY 533.

Thuidiaceae Schimp.

*49. *Heterocladium dimorphum* (Brid.) Schimp.

Değirmenboğazi village, Başdeğirmendere, the Trout Production Pond, *Platanus orientalis*, *Sytrax officinalis*, *Alnus glutinosa*, *Sambucus nigra*, *Acer campestre*, *Carpinus orientalis*, 80 m, N 39° 59' 751", E 27° 49' 659", 14 vii 2004, on rock, ABAY 556.

*50. *Anomodon attenuatus* (Hedw.) Huebener

Değirmenboğazi village, Suçıktı Stream, *Quercus infectoria*, *Platanus orientalis*, *Corylus avellana*, *Populus nigra*, 140 m, N 39° 59' 905", E 27° 50' 322", 01 i 2004, on tree, ABAY 534.

51. *A. viticulosus* (Hedw.) Hook. & Taylor

Değirmenboğazi village, Başdeğirmendere, *Corylus avellana*, *Platanus orientalis*, *Acer campestre*, 45 m, N 39° 59' 469", E 27° 49' 994", 30 x 2002, on tree, ABAY 535.

*52. *Thuidium abietinum* (Hedw.) Schimp. var. *hystricosum* (Mitt.) Loeske & Lande ex Loeske

Değirmenboğazi village, between Başdeğirmendere and the Trout Production Pond, *Platanus orientalis*, *Populus nigra*, 40 m, N 39° 59' 620", E 27° 49' 824", 15 x 2002, on rock, ABAY 504.

Amblystegiaceae (Broth.) Fleisch.

53. *Crataneuron filicinum* (Hedw.) Spruce var. *filicinum*

Değirmenboğazi village, between Başdeğirmendere and the Trout Production Pond, *Quercus infectoria*, *Salix alba*, *Populus nigra*, *Alnus glutinosa*, 35 m, N 39° 59' 758", E 27° 49' 806", 15 ix 2002, by streams, on rock, ABAY 496.

54. *Amblystegium varium* (Hedw.) Lindb.

Değirmenboğazi köyü, Suçıktı Stream, *Quercus infectoria*, *Platanus orientalis*, *Corylus avellana*, *Rosa canina*, 130 m, N 39° 59' 908", E 27° 50' 320", 01 i 2004, on rock, ABAY 535.

Brachytheciaceae Schimp.

55. *Isoetecium alopecuroides* (Dubois) Isov.

Karakabaağaç village, Ayazdere, *Fagus orientalis*, 350 m, N 39° 57' 337", E 27° 49' 588", 20 vi 2004, on tree, ABAY 553.

56. *Homalothecium lutescens* (Hedw.) H. Rob.

Değirmenboğazi village, Başdeğirmendere, *Platanus orientalis*, *Juglans regia*, *Ceratonia siliqua*, *Populus nigra*, 30 m, N 39° 59' 931", E 27° 49' 804", 15 ix 2002, on tree, ABAY 497.

57. *H. sericeum* (Hedw.) Schimp.

Değirmenboğazi village, between Başdeğirmendere and the Trout Production Pond, *Quercus infectoria*, *Salix alba*, *Populus nigra*, *Alnus glutinosa*, 35 m, N 39° 59' 727", E 27° 49' 817", 15 ix 2002, by streams, on rock, ABAY 498.

*58. *Brachythecium erythrorrhizon* Schimp.

Between Karakabaağaç and Hacıosman villages, in the vicinity of Değirmendere, *Quercus infectoria*, *Fagus orientalis*, *Ulmus glabra*, 185 m, N 39° 58' 580", E 27° 48' 638", 11 iv 2004, by streams, on soil, ABAY 550.

*59. *B. plumosum* (Hedw.) Schimp.

Değirmenboğazi village, Başdeğirmendere, *Quercus infectoria*, *Sytrax officinalis*, *Paliurus spina-christi*, *Populus nigra*, 30 m, N 39° 59' 726", E 27° 49' 818", 15 ix 2002, on rock, ABAY 499.

60. *B. rivulare* Schimp.

Değirmenboğazi village, Başdeğirmendere, *Quercus cerris*, *Q. infectoria*, *Platanus orientalis*, *Acer campestre*, 50 m, N 39° 59' 580", E 27° 49' 968", 30 ix 2002, on soil, ABAY 516.

61. *B. rutabulum* (Hedw.) Schimp.

Karakabaağaç village, Ayazçatı Hill, *Fagus orientalis*, 490 m, N 39° 57' 381", E 27° 49' 711", 31 iii 2004, on tree, ABAY 546.

62. *Scleropodium cespitans* (Müll.Hal.) L.F.Koch

Değirmenboğazi village, Suçıktı Stream, *Quercus infectoria*, *Platanus orientalis*, 160 m, N 39° 59' 912, E 27° 49' 971", 01 i 2004, on soil, ABAY 536.

63. *S. purum* (Hedw.) Limpr.

Değirmenboğazi village, Başdeğirmendere, *Quercus infectoria*, *Q. cerris*, *Carpinus betulus*, *Sytrax officinalis*, *Myrtus communis*, 30 m, N 39° 59' 469", E 27° 49' 971", 15 ix 2002, on rock, ABAY 500.

64. *Rhynchostegium megapolitanum* (F.Weber & D.Mohr) Schimp.

Değirmenboğazi village, Başdeğirmendere, near the

water reservoir, *Sytrax officinalis*, *Carpinus betulus*, *Quercus cerris*, *Paliurus spina-christi*, 40 m, N 39° 59' 580", E 27° 49' 968", 30 x 2002, on rock, ABAY 517.

65. *Platyhypnidium riparioides* (Hedw.) Dixon

Karakabaağaç village, Suçıktı Stream, *Quercus infectoria*, *Ulmus glabra*, 135 m, N 39° 59' 768", E 27° 50' 440", 30 iii 2004, on rock, ABAY 538.

66. *Eurhynchium hians* (Hedw.) Sande Lac.

On the road to Haciosman village, *Salix alba*, *Quercus infectoria*, *Hedera helix*, 55 m, N 39° 59' 978", E 27° 49' 635", 30 iii 2004, on soil, ABAY 539.

67. *E. praelongum* (Hedw.) Schimp.

On the road to Karakabaağaç village, *Ulmus glabra*, *Quercus infectoria*, 135 m, N 39° 59' 395", E 27° 49' 474", 30 iii 2004, on soil, ABAY 540.

68. *E. speciosum* (Brid.) Jur.

Değirmenboğazı village, Başdeğirmendere, *Populus nigra*, *Platanus orientalis*, *Sytrax officinalis*, *Paliurus spina-christi*, 30 m, N 39° 59' 727", E 27° 49' 817", 15 ix 2002, by streams, on tree roots, ABAY 501.

69. *E. striatum* (Hedw.) Schimp.

Karakabaağaç village, *Fagus orientalis*, *Carpinus betulus*, *Quercus infectoria*, *Hedera helix*, 181 m, N 39° 58' 586", E 27° 48' 630", 20 vi 2004, on soil, ABAY 554.

70. *Rhynchostegiella tenella* (Dicks.) Limpr.

Değirmenboğazı village, Başdeğirmendere, *Ficus carica*, *Populus nigra*, *Morus alba*, *Alnus glutinosa*, 30 m, N 39° 59' 884, E 27° 49' 801, 15 ix 2002, near water, on rock, ABAY 505.

Plagiotheciaceae (Broth.) M.Fleisch.

***71. *Plagiothecium platyphyllum* Mönk.**

Karakabaağaç village, Olukkonan Stream, *Fagus orientalis*, *Quercus infectoria*, 390 m, N 39° 57' 785", E 27° 49' 819", 31 iii 2004, on soil, ABAY 547.

Hypnaceae Schimp.

72. *Hypnum cupressiforme* Hedw. var. *cupressiforme*

Değirmenboğazı village, Başdeğirmendere, *Myrtus communis*, *Sytrax officinalis*, *Quercus cerris*, *Q. infectoria*, *Carpinus betulus*, 45 m, N 39° 59' 726", E 27° 49' 937", 30 ix 2002, on soil, ABAY 518.

73. *H. cupressiforme* Hedw. var. *lacunosum* Brid.

Karakabaağaç village, Olukkonan Stream, *Fagus orientalis*, *Quercus infectoria*, 400 m, N 39° 57' 729", E 27° 49' 931", 31 iii 2004, on rock, ABAY 548.

***74. *H. cupressiforme* Hedw. *resupinatum* (Taylor) Schimp.**

Değirmenboğazı village, Başdeğirmendere, *Quercus infectoria*, *Sytrax officinalis*, *Carpinus betulus*, *Myrtus communis*, 50 m, N 39° 59' 605", E 27° 49' 949", 30 x 2002, on tree, ABAY 519.

Results and Discussion

In this study, 45 genera belonging to 19 families and 74 taxa were determined from moss samples collected from Değirmenboğazı village and its environment in 2002 and 2004.

The study area stands between 30 and 490 m in altitude. If compared in terms of the surface measurement, these 74 mosses, which were determined between these elevations, are a considerable number. The variety of mosses seen in the area may depend on the features below.

The study area being close to the intersection point of the Marmara and Aegean regions.

The research area varying in terms of the main rock kinds (granite, gneiss, mica-schist, limestone etc.).

The area being rich in underground waters and the presence of running streams in the area.

The Manyas Dam, located close to the study area, creating a microclimate effect around itself.

Because of the small variations among the elevations in the area, the humidity being able to move towards the inner zones.

In the study area, the availability of both woody taxa (like *Quercus coccifera*) that represents a Mediterranean origin arid climate, and the euxine elements such as *Fagus orientalis*, *Acer campestre*, *Alnus glutinosa*, *Carpinus betulus*, *C. orientalis*, indicate that various vegetation types are dominant in the area.

According to the grid system described by Henderson (1961), the number of new records in the study area in the B6 square is 16. These specimens are *Fissidens crassipes*, *Syntrichia latifolia*, *Tortula muralis* var. *aestiva*,

Desmatodon leucostoma, *Tortella inflexa*, *Dialytrichia mucronata*, *Pohlia wahlenbergii* var. *calcareo*, *Orthotrichum urnigerum*, *Climacium dendroides*, *Heterocladium dimorphum*, *Anomodon attenuatus*, *Thuidium abietinum* var. *hystricosum*, *Brachythecium erythrorrhizon*, *B. plumosum*, *Plagiothecium platyphyllum*, and *Hypnum cupressiforme* var. *resupinatum*.

The richness of families in terms of species in the research area is given in Table 1.

The first 7 families make up 75.70% of the total taxa in the study area. The other 12 families constitute 24.30% of the total taxa.

The families which contain xerophytic taxa in the area are as follows: Pottiaceae, Grimmiaceae, and Orthotrichaceae. The aforementioned families contain taxa which can endure long periods of heat and dryness. Pottiaceae is the richest family with regard to number of taxa, as seen in Table 1. We can understand that the Mediterranean climate is efficient owing to the Mediterranean elements, such as *Myrtus communis*, *Sytrax officinalis*, *Arbutus andrachne*, and *Ceratonia siliqua*, spreading in the study area. Thus, the richness in terms of members of Pottiaceae is the result of Mediterranean climate effects in the area. The family Brachytheciaceae of pleurocarpous mosses, growing best in humid areas, is the second in Table 1. The families

Table 1. The distributions of the taxa according to the families.

Families	Number of taxa	Percentage of taxa according to total number of taxa (%)
Pottiaceae	20	27.03
Brachytheciaceae	16	21.62
Grimmiaceae	4	5.41
Bryaceae	4	5.41
Orthotrichaceae	4	5.41
Thuidiaceae	4	5.41
Mniaceae	4	5.41
Hypnaceae	3	4.05
Polytrichaceae	2	2.70
Leucodontaceae	2	2.70
Amblystegiaceae	2	2.70
Neckeraceae	2	2.70
Fissidentaceae	1	1.35
Dicranaceae	1	1.35
Funariaceae	1	1.35
Hedwigiaceae	1	1.35
Climaciaceae	1	1.35
Thamniaceae	1	1.35
Plagiotheciaceae	1	1.35
Total: 19	74	100

Grimmiaceae, Bryaceae, Orthotrichaceae and Thuidiaceae follow the aforementioned families, with 4 taxa.

This study is compared to previous ones performed in the B6 grid square (Yayıntaş et al., 1994; Tonguç & Yayıntaş, 1996; Erdağ & Yayıntaş, 1999) in Table 2. We also determined that the family Pottiaceae has the largest number of taxa according to this study, Bozcaada

(Yayıntaş et al., 1994) and Çal Mountain (Tonguç & Yayıntaş, 1996). Most of the Brachytheciaceae are found in Kaz Mountain (Erdağ & Yayıntaş, 1999), whereas they ranked second in our area and Bozcaada (Yayıntaş et al., 1994). The fact that these families include different genera and species is the result of the distinctive climate and topography.

Table 2. The comparison of the taxa distribution according to the families.

Number of Total Taxa	Değirmenboğazı		Bozcaada (1994)		Çal Mountain (1996)		Kaz Mountain (1999)	
	74		36		47		139	
Families	Numbe of taxa	Rate (%)	Numbe of taxa	Rate (%)	Numbe of taxa	Rate (%)	Numbe of taxa	Rate (%)
Pottiaceae	20	27.03	11	30.56	18	38.29	25	17.98
Brachytheciaceae	16	21.62	7	19.44	4	8.51	27	19.42
Grimmiaceae	4	5.41	3	8.33	3	6.38	15	10.78
Bryaceae	4	5.41	4	11.11	3	6.38	9	6.47
Orthotrichaceae	4	5.41	4	11.11	6	12.76	6	4.32
Thuidiaceae	4	5.41	-	-	-	-	-	-
Mniaceae	4	5.41	-	-	-	-	7	5.04
Hypnaceae	3	4.05	3	8.33	3	6.38	6	4.32

References

- Atalay İ (1994). *Türkiye Vegetasyon Coğrafyası*. İzmir: Ege Üniversitesi Basımevi.
- Akman Y (1999). *İklim ve Biyoiklim*. Ankara: Kariyer Matbaacılık.
- Corley MFV, Crundwell AC, Düll R, Hill MO & Smith AJE (1981). Mosses of Europe and Azores: an annotated list of species with synonyms from recent list of species, with synonyms from recent literature. *Journal of Bryology* 11: 609-689.
- Corley MFV & Crundwell AC (1991). Additions and amendments to the mosses of Europe and the Azores. *Journal of Bryology* 16: 337-356.
- Çetin B (1988). Checklist of the Mosses of Turkey. *Lindbergia* 14: 15-23.
- Erdağ A & Yayıntaş A (1999). A Contribution to the Moss Flora of Western Turkey: Moss Flora of the Kaz Mountain (Balıkesir, Turkey). *Turk J Bot* 23: 117-125.
- Frey W, Frahm JP, Fischer E & Lobin W (1995). *Kleine Kryptogamenflora*. Stuttgart: Gustav Fischer Verlag.
- Frey W & Kürschner H (1991). *Conspectus Bryophytorum Orientalum et Arabicorum. An Annotated Catalogue of the Bryophytes of Southwest Asia*. Bryoph Bibl 39: 1-181.
- Greven HC (1995). *Grimmia Hedw. (Grimmiaceae, Musci) in Europe*. Leiden: Backhuys Publishers.
- Greven HC (2003). *Grimmias of The World*. Leiden: Backhuys Publishers.
- Henderson DM (1961). Contributions to the Bryophyte Flora of Turkey IV. *Notes Roy Bot Gard Edinburg* 23: 263-301.
- Kürschner H & Erdağ A (2005). Bryophytes of Turkey: An Annotated Reference List of the Species with Synonyms from the Recent Literature and an Annotated List of Turkish Bryological Literature. *Turk J Bot* 29: 95-154.
- Lawton E (1971). *Moss Flora of the Pacific Northwest*. Suppl. No: 1 Nichinan: Hattori Botanical Laboratory.
- Nyholm E (1981). *Illustrated Moss Flora of Fennoscandia*. Fasc. 1-6 Lund: Swedish Natural Science Research Council.
- Savaroğlu F, Tokur S & Yücel E (2001). Kütahya Yöresinde Yayılış Gösteren Bazı Karayosunu (Musci) Taksonları. *Anadolu Üniversitesi Bilim ve Teknoloji Dergisi* 2: 393-399.
- Savicz-Ljubitzkaja LI & Smirnova ZN (1970). *The Handbook of the Mosses of the U.S.S.R.*: The Komarov Botanical Institute.

- Smith AJE (1980). *The Moss Flora of Britain And Ireland*. Cambridge: Cambridge University Press.
- Tonguç Ö & Yayıntaş A (1996). Çal Dağı (Manisa) Karayosunları. *Turk J Bot* 20: 59-63.
- Uyar G & Çetin B (2004). A New Check-List of the Mosses of Turkey. *Journal of Bryology* 26: 203-220.
- Watson EV (1981). *British Mosses and Liverworts*. Cambridge: Cambridge University Press.
- Walther K (1967). Beitrage zur Moosflora Westanatoliens I. *Mitt Staatsinst Allg Bot* 12: 129-186.
- Yayıntaş A & Iwatsuki Z (1988). Some Moss Records from Western Turkey. *Hikobia* 10: 209-213.
- Yayıntaş A, Aysel V, Güner H & Tonguç Ö (1994). Bozcaada'nın Karayosunu Florası. *Turk J Bot* 18: 29-32.