

# The Moss Flora of Ankara - Kızılcahamam Soğuksu National Park

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**Abstract:** In the Ankara-Kızılcahamam Soğuksu National Park, 116 taxa of bryophytes were identified by the authors. These belong to 20 families and 42 genera of bryophytes. Of these, 32 taxa are new for the A2 grid-square in the system adopted by Henderson.

**Key Words:** Bryophytes, Moss Flora, Soğuksu National Park, Kızılcahamam.

## Ankara - Kızılcahamam Soğuksu Milli Parkı Karayosunları Florası

**Özet:** Bu çalışmada, araştırma alanı olan Ankara - Kızılcahamam Soğuksu Milli Parkı'ndan toplanan karayosunu örnekleri değerlendirilerek 20 familya ya ait 42 cins ve bunlara bağlı 116 takson tanımlanmıştır. Bunlardan 32 tanesi Henderson tarafından benimsenen kareleme sistemine göre A2 karesi için yenidir.

**Anahtar Sözcükler:** Bryophyta, Karayosun, Flora, Milli Park, Kızılcahamam.

## Introduction

The study area is in the A2 grid-square according to the system adopted by Henderson & Prentice (1961) (Figure). No detailed study has yet been conducted on the moss flora of Ankara-Kızılcahamam Soğuksu National Park, which was chosen as the study area.

The National Park spans the transitional zone from the steppes of Central Anatolia to the lush and green forested lands of Northern Anatolia. *Pinus nigra* Arn. subsp. *pallasiana* (Lamb.) Holmboe, *P. sylvestris* L., *Abies nordmanniana* (Stev.) Spach subsp. *bornmuelleriana* (Mattf.) Coode & Cullen, *Quercus petraea* (Matt.) Lieble., *Q. pubescens* Willd., *Populus tremula* L., *Acer campestre* L., *Carpinus betulus* L. and *Crataegus tanacetifolia* (Lam.) Pers. cover the area, preserving their natural appearance.

The region has the characteristics of an oceanic as well as Mediterranean climate (Akman, 1990). In the study area, at higher altitudes, where the oceanic influence can be seen, the amount of annual rainfall is more than that at lower altitudes, where significant summer dryness,

characteristic of the Mediterranean climate, occurs. This variety makes the area interesting. In addition, 1000-1770m of the study area is next to a subalpine region.

The region is very interesting in terms of its natural structure and its climate. Its conditions encouraged us to conduct a study on the Bryophytes.

It is hoped that this study will contribute to the identification of the moss flora of Turkey and be useful as a guide for future studies.

The study area, Ankara-Kızılcahamam Soğuksu National Park, is located in the north-west part of the inner Anatolia region.

The region is surrounded by Çamlıdere in the north-west, Kızılcahamam in the north-east and Çeltikçi in the south.

The lowest part of the area is the entrance of the National Park (1000m). The highest parts of the area are Çakmaklı hill (1600m), Harmandoruk hill (1648m) and Tolubelen hill (1776m) (Figure).

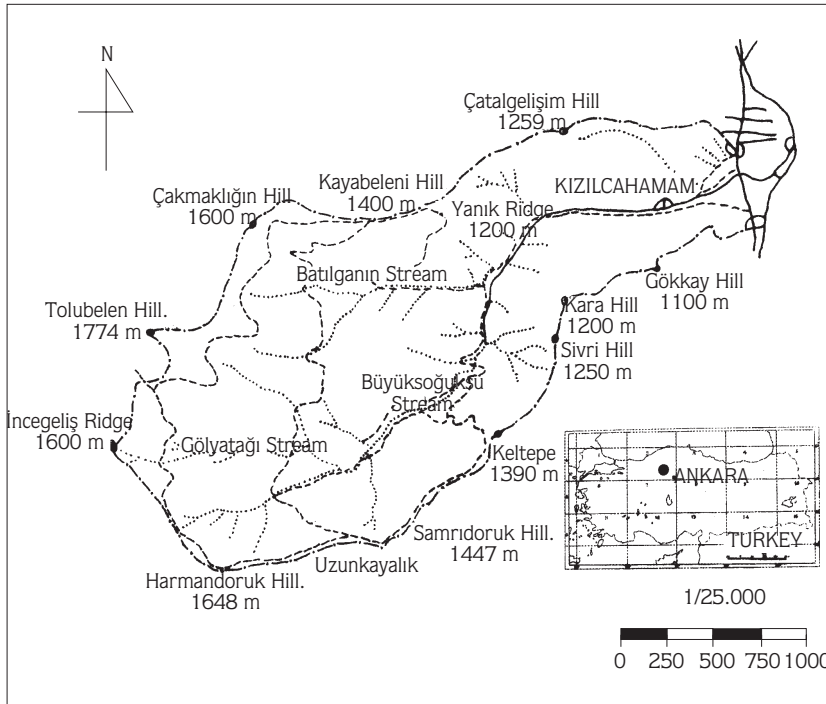


Figure. The map of study area and the grid system adopted by Henderson & Prentice for Turkey. • Study Area

## Materials and Methods

The materials for this study were collected during periodic field trips between 1996 and 1998 in different seasons.

The identification of the samples were done with various books on moss flora (Smith, 1980, Watson 1981, Nyholm 1981). In addition, the status of the species for the study area and for Turkey was determined by reviewing the related literature (Çetin, 1988). The samples were deposited in the herbarium of the University of Ankara, Faculty of Science, Department of Biology.

The plant list is arranged according to the system proposed by Corley et al. (1981). The taxa new for the A2 grid square are indicated with an asterisk (\*)

### Floristic List

#### Bryophyta

#### Musci

#### Polytrichaceae

#### Polytrichum Hedw.

#### 1. \* *P. strictum* Brid.

(= *Polytrichum alpestre* Hoppe)

A2 Ankara: Kızılcahamam Soğuksu National Park, Çakmaklı hill, *Pinus sylvestris*, *Abies nordmanniana* subsp. *bornmuelleriana* forest, on rock, 1600 m, 14.7.1996 UYAR 127

A1, Europe, Asia, N. America.

#### 2. *P. juniperinum* Hedw.

A2 Ankara: Kızılcahamam Soğuksu National Park, Çakmaklı hill, *Pinus sylvestris*, *Abies nordmanniana* subsp. *bornmuelleriana* forest, 1600 m, on soil, 14.7.1996 UYAR 129

Cosmopolitan

#### Dicranaceae

#### Dicranum Hedw.

#### 3. *Dicranum scoparium* Hedw.

A2 Ankara: Kızılcahamam Soğuksu National Park, Incegeliş ridge, *Pinus nigra* forest, on tree trunk, 1300 m, 14.7.1996 UYAR 109

Cosmopolitan

#### 4. *D. majus* Turn.

A2 Ankara: Kızılcahamam Soğuksu National Park, Çakmaklı hill, *Pinus sylvestris*, *Abies nordmanniana* subsp. *bornmuelleriana* forest, on rock, 1600 m, 14.7.1996 UYAR 108

Cosmopolitan

5. *D. tauricum* Sap.

A2 Ankara: Kızılcahamam Soğuksu National Park, Çakmaklı hill, *Pinus sylvestris* forest, on decayed tree trunk, 1600 m, 26.6.1998 UYAR 219

A2, A3, B6, Europe, N. America.

6. *D. polysetum* Sw.

A2 Ankara: Kızılcahamam Soğuksu National Park, Gölündoruk hill, *Pinus sylvestris*, *Abies nordmanniana* subsp. *bornmuelleriana* forest, on soil, 1700 m, 14.7.1997 UYAR 200

A2, A4, Europe, E. Asia, N. and S. America.

*Dicranoweisia* Milde.

7. \**D. crispula* (Hedw.) Lindb.

A2 Ankara: Kızılcahamam Soğuksu National Park, Çakmaklı hill, *Pinus sylvestris*, *Abies nordmanniana* subsp. *bornmuelleriana* forest, on rock, 1600 m, 14.7.1996 UYAR 130

A4, A5, Europe, E. Asia, N. America.

*Dicranella* (C.Müll.) Schimp.

8. *D. heteromalla* (Hedw.) Schimp.

A2 Ankara: Kızılcahamam Soğuksu National Park, Göllü ridge, *Carpinus betulus*, *Pinus sylvestris* forest, on tree trunk, 1450 m, 19.10.1996 UYAR 144

A3, A4, A5, C. Europe, Asia, America.

Ditrichaceae

*Oncophorus* (Brid.) Brid.

9.\* *O. virens* (Hedw.) Brid.

A2 Ankara: Kızılcahamam Soğuksu National Park, Tolubeleni hill, *Pinus sylvestris*, *Abies nordmanniana* subsp. *bornmuelleriana* forest, on soil, 1700 m, 1.11.1997 UYAR 202

C11, A2, Europe, Asia, N. America.

*Ceratodon* Brid.

10. *C. purpureus* (Hedw.) Brid.

A2 Ankara: Kızılcahamam Soğuksu National Park, Tolubeleni hill, *Pinus sylvestris*, *Abies nordmanniana* subsp. *bornmuelleriana* forest, on tree trunk, 1700 m, 1.11.1997 UYAR 139

Cosmopolitan

Ditrichum Hampe

11. *D. flexicaule* (Schwaegr.) Hampe

A2 Ankara: Kızılcahamam Soğuksu National Park, Çakmaklı hill, *Pinus sylvestris*, *Abies nordmanniana* subsp. *bornmuelleriana* forest, on soil, 1600 m, 14.7.1997 UYAR 131

A2, A4, B7, C12, C. Europe, C. Asia, N. America.

12. \* *D. heteromallum* (Hedw.) Britt.

A2 Ankara: Kızılcahamam Soğuksu National Park, Göllü ridge, *Carpinus betulus*, *Pinus sylvestris* forest, on tree trunk, 1450 m, 14.7.1997 UYAR 207

A1, A4, Europe, N. America.

Encalyptaceae

*Encalypta* Hedw.

13. *E. raptocarpa* Schwaegr.

A2 Ankara: Kızılcahamam Soğuksu National Park, Incegeleş ridge, *Pinus nigra* forest, on tree trunk, 1300 m, 14.7.1996 UYAR 157

A2, Europe, Asia, N. America, N. Africa.

14. *E. vulgaris* Hedw.

A2 Ankara: Kızılcahamam Soğuksu National Park, Tolubeleni hill, *Pinus sylvestris*, *Abies nordmanniana* subsp. *bornmuelleriana* forest, on soil, near road, 1700 m, 26.6.1998 UYAR 215

Cosmopolitan.

Pottiaceae

*Tortula* Hedw.

15. *T. subulata* Hedw. var. *subulata*

A2 Ankara: Kızılcahamam Soğuksu National Park, Keltepe, *Pinus nigra* forest, on soil, 1300 m, 14.7.1997 UYAR 107

Cosmopolitan.

16. *T. subulata* Hedw. var. *angustata* (Schimp.) Limpr.

A2 Ankara: Kızılcahamam Soğuksu National Park, Keltepe, *Pinus nigra* forest, on soil, 1300 m, 14.7.1996 UYAR 156

A1, A2, B6, B8, Europe, Asia, N. America, N. Africa.

17. *T. subulata* Hedw. var. *subinermis* (Brid.) Wils.

A2 Ankara: Kızılcahamam Soğuksu National Park, near Batılğanın stream, *Quercus pubescens*, *Q. petraea* forest, on soil, 1250 m, 14.7.1996 UYAR 212

A2, Europe, N. Africa.

**18. T. subulata** Hedw. var. *graeffii* Warnst.

A2 Ankara: Kızılcahamam Soğuksu National Park, Kayabeleni hill, *Quercus pubescens* forest on soil, 1400 m, 1.11.1997 UYAR 173

A2, Western and Northern Britain.

**19. T. ruralis** (Hedw.) Gaertn.

A2 Ankara: Kızılcahamam Soğuksu National Park, Çakmaklı hill, *Pinus sylvestris* *Abies nordmanniana* subsp. *bornmuelleriana* forest, on rock, 1600 m, 14.7.1996 UYAR 121

Cosmopolitan.

**20. T. ruralis** (Hedw.) Gaertn. subsp. *calcicolens* W. Kramer.

A2 Ankara: Kızılcahamam Soğuksu National Park, Tolubeleni hill, *Pinus sylvestris*, *Abies nordmanniana* subsp. *bornmuelleriana* forest, on rock, 1675 m, 1.11.1997 UYAR 189

A2, N. America, S. Africa, Australia, Greenland.

**21. T. norvegica** (Web.) Wahl. & Lindb.

A2 Ankara: Kızılcahamam Soğuksu National Park, İncegeliş district, *Pinus sylvestris*, *Carpinus betulus* forest, on rock, 1450 m, 14.7.1996 UYAR 135

A1, A2, B9, Europe, N. Asia, N. America.

**22. T. ruraliformis** (Besch.) Grout.

A2 Ankara: Kızılcahamam Soğuksu National Park, Göllü ridge, *Pinus sylvestris* forest, on soil, 1500 m, 19.10.1997 UYAR 165

A1, A2, B6, B7, B8, C11, Europe, W. Asia, Algeria, N. America.

**23. \* T. laevipila** (Brid.) Schwaegr.

A2 Ankara: Kızılcahamam Soğuksu National Park, Çatalgelişim - Davutlar ridge, *Quercus pubescens*, *Pinus nigra* subsp. *pallasiana* forest, on soil, 1400 m, 19.9.1997 UYAR 211

B6, Europe, Asia, N., S. America, N. Africa, Australia.

**24. T. virescens** (De Not.) De Not.

[=*T. pulvinata* (Jur.) Limpr.]

A2 Ankara: Kızılcahamam Soğuksu National Park, Keltepe *Quercus pubescens*, *Q. petraea* forest, on rock, 1200 m, 26.6.1998 UYAR 220

B6, A2, Europe, N. Africa.

**Barbula** Hedw.

**25. B. convoluta** Hedw.

A2 Ankara: Kızılcahamam Soğuksu National Park, Harmandoruk hill *Pinus sylvestris*, *P. nigra* forest, on soil, 1400 m, 19.9.1997 UYAR 172.

A1, A2, B6, C11, C12, C13, Europe, Asia, N. Africa, N. America, Mexico, Australia.

**26. B. unguiculata** Hedw.

A2 Ankara: Kızılcahamam Soğuksu National Park, Tolubeleni hill, *Pinus sylvestris*, *Abies nordmanniana* subsp. *bornmuelleriana* forest, on rock, 1600 m, 1.11.1997 UYAR 177

A1, A2, A3, B6, B7, C11, Europe, Asia.

**27. B. fallax** Hedw.

A2 Ankara: Kızılcahamam Soğuksu National Park, *Pinus sylvestris*, *Abies nordmanniana* subsp. *bornmuelleriana* forest, on rock, 1600 m, 1.11.1997 UYAR 177.

A2, B6, B9, C11, C13, Europe, N. America, Asia.

**28. \* B. cylindrica** (Tayl.) Schimp.

A2 Ankara: Kızılcahamam Soğuksu National Park, Batılğanın stream, near stream on rock

1200 m, 16.10.1998 UYAR 227.

A1, A3, A4, B6, C11, Europe, Asia, N. Africa, N., C. America.

**29. B. vinealis** Brid.

A2 Ankara: Kızılcahamam Soğuksu National Park, Tolubeleni hill, *Pinus sylvestris*, *Abies nordmanniana* subsp. *bornmuelleriana* forest, on rock, 1700 m., 1.11.1997 UYAR 210

Cosmopolitan.

**Bryoerythrophyllum**

**30. B. recurvirostrum** (Hedw.) Chen

A2 Ankara: Kızılcahamam Soğuksu National Park, İncegeliş ridge, *Pinus nigra* subsp. *pallasiana* forest, on soil, 1300 m, 14.7.1996 UYAR 113

Cosmopolitan.

**Weissia** Hedw.

**31. W. controversa** Hedw. var. *crispata* (Nees & Horansch.) Nyh.

A2 Ankara: Kızılcahamam Soğuksu National Park, Çakmaklı hill, *Pinus sylvestris*, *Abies nordmanniana* subsp. *bornmuelleriana* forest, on rock, 1600 m, 14.7.1996 UYAR 123

A2, A3, A4, B6, B9, C12, Europe, N. Africa, N. America.

**Tortella** Limpr.

**32. T. tortuosa** (Hedw.) Limpr.

A2 Ankara: Kızılcahamam Soğuksu National Park, Göllü ridge, *Carpinus betulus* forest, on soil, 1450 m, 14.7.1996 UYAR 118

Cosmopolitan.

**33. \* T. inclinata** (Hedw.) Limpr.

A2 Ankara: Kızılcahamam Soğuksu National Park, Gölümdoruk hill, *Pinus sylvestris*, *Abies nordmanniana* subsp. *bornmuelleriana* forest, on rock, 1700 m, 11.7.1997 UYAR 199

B6, C11, Europe, N. America.

**GRIMMIALES**

**Grimmiaceae**

**Coscinodon** Spreng.

**34.\* C. cribrosus** (Hedw.) Spruce

A2 Ankara: Kızılcahamam Soğuksu National Park, between Tolubeleni and Çakmaklı hills, *Pinus sylvestris*, *Juniperus communis* subsp. *nana* forest, on rock, 1500 m, 14.7.1996 UYAR 175

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

**Schistidium** Brid.

**35. S. confertum** (Funck) B., S. & G.

A2 Ankara: Kızılcahamam Soğuksu National Park, Tolubeleni hill, *Pinus sylvestris*, forest, on rock, 1675 m, 26.6.1998 UYAR 226

A2, A4, B6, B8, B9, C13, C14, Europe, Asia, Africa, N. America.

**36. S. apocarpum** (Hedw.) B., S. & G.

A2 Ankara: Kızılcahamam Soğuksu National Park, Tolubeleni hill, *Pinus sylvestris* forest, on tree trunk, 1650 m, 1.11.1997 UYAR 124

Cosmopolitan.

**37. S. pulvinatum** (Hedw.) Brid.

A2 Ankara: Kızılcahamam Soğuksu National Park, Tolubeleni hill, *Pinus sylvestris*, *Abies nordmanniana* subsp. *bornmuelleriana*, *Juniperus communis* subsp. *nana* forest, on rock, 1650 m, 1.11.1997 UYAR 187

Cosmopolitan.

**Grimmia** Hedw.

**38. G. pulvinata** (Hedw.) Sm.

A2 Ankara: Kızılcahamam Soğuksu National Park, Çakmaklı hill, *Pinus sylvestris*, *Abies nordmanniana* subsp. *bornmuelleriana* forest, on rock, 1600 m, 14.7.1996 UYAR 206

Cosmopolitan.

**39.\* G. alpestris** (Web. & Mohr.) Schleich.

A2 Ankara: Kızılcahamam Soğuksu National Park, Harmandoruk hill, *Pinus sylvestris*, *Carpinus betulus* forest, on rock, 1450 m, 11.7.1997 UYAR 136

A4, B8, Europe, N. America, Asia.

**40. G. ovalis** (Hedw.) Lindb.

A2 Ankara: Kızılcahamam Soğuksu National Park, Karatepe ridge, *Quercus pubescens* forest, on rock, 1200 m, 14.7.1997 UYAR 152

Cosmopolitan.

**41. G. donniana** Sm.

A2 Ankara: Kızılcahamam Soğuksu National Park, Karatepe and Yanık ridge, *Quercus pubescens*, *Q. petraea* forest, on rock, 1200 m, 19.10.1996 UYAR 149

A2, B6, Europe, E. Asia, N. Africa, N., S. America, Antarctica.

**42. \* G. affinis** Hornsch.

A2 Ankara: Kızılcahamam Soğuksu National Park, Yanık ridge, *Quercus pubescens* forest, on rock, 1200 m, 19.10.1996 UYAR 153

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

**43. \* G. elongata** Kaulf.

A2 Ankara: Kızılcahamam Soğuksu National Park, Karatepe and Yanık ridge, *Quercus pubescens*, *Q. petraea* forest, on rock, 1200 m, 19.10.1996 UYAR 154

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

**44. G. trichophylla** Grev. var. *trichophylla*

A2 Ankara: Kızılcahamam Soğuksu National Park, Göluyağı ridge, *Pinus sylvestris* forest, on rock, 1625 m, 11.7.1997 UYAR 186

Cosmopolitan.

**45. \* G. montana** B., S. & G.

A2 Ankara: Kızılcahamam Soğuksu National Park, Göluyağı ridge, *Pinus sylvestris* forest, on rock, 1625 m, 19.10.1996 UYAR 226

B6, Europe, N. America.

**46. G. decipiens** (Schultz) Lindb.

A2 Ankara: Kızılcahamam Soğuksu National Park, Tolubeleni hill, *Pinus sylvestris* forest, on rock, 1650 m, 1.11.1997 UYAR 185

A1, A2, A4, B6, C13, Europe, N. Africa, N. America.

**BRYALES**

**Bryaceae**

*Pohlia* Hedw.

**47. P. nutans** (Hedw.) Lindb.

A2 Ankara: Kızılcahamam Soğuksu National Park, Tolubeleni hill, *Abies nordmanniana* subsp. *bornmuelleriana* forest, on rock, 1700 m, 26.6.1998 UYAR 218

A2, C. Europe, N. America S. Africa, Australia, New Zealand, Antarctica.

**48. P. cruda** (Hedw.) Lindb.

A2 Ankara: Kızılcahamam Soğuksu National Park, Çakmaklı hill, *Pinus sylvestris*, *Abies nordmanniana* subsp. *bornmuelleriana* forest, on soil, 1600 m, 14.7.1997 UYAR 117

Cosmopolitan.

*Bryum* Hedw.

**49. B. alpinum** With. var. *alpinum*

A2 Ankara: Kızılcahamam Soğuksu National Park, İncegeliş ridge, *Pinus nigra* forest, on soil, 1300 m, 14.7.1996 UYAR 113

A2, B6, B7, B8, C11, Europe, Asia, Africa, America.

**50. B. alpinum** With. var. *viride* Husn.

A2 Ankara: Kızılcahamam Soğuksu National Park, Çakmaklı hill, *Pinus sylvestris*, *Abies nordmanniana* subsp.

*bornmuelleriana* forest, on tree roots 1600 m, 1.11.1997 UYAR 184

A1, A2, Europe, Asia, C., S. Africa, America.

**51. B. capillare** Hedw.

A2 Ankara: Kızılcahamam Soğuksu National Park, Çakmaklı hill, *Pinus sylvestris*, *Abies nordmanniana* subsp. *bornmuelleriana* forest, on rock 1600 m, 14.7.1996 UYAR 126

Cosmopolitan.

**52. B. flaccidum** Brid.

A2 Ankara: Kızılcahamam Soğuksu National Park, İncegeliş ridge, *Pinus nigra*, *Pinus sylvestris* forest, on rock – soil, 1600 m, 11.7.1997 UYAR 137

A1, A2, Europe, N. America.

**53. B. torquescens** Bruch ex De Not.

A2 Ankara: Kızılcahamam Soğuksu National Park, Çakmaklı hill, *Pinus sylvestris*, *Abies nordmanniana* subsp. *bornmuelleriana* forest, on soil, 1600 m, 14.7.1996 UYAR 141

A1, A2, B6, B8, C11, C12, Cosmopolitan.

**54. B. inclinatum** (Brid.) Bland.

A2 Ankara: Kızılcahamam Soğuksu National Park, *Pinus nigra* forest, near water, on wet rock 1000 m, 19.10.1997 UYAR 148

A4, A2, Europe, Asia, N. Africa, N. America, Australia, Antarctica.

**55. B. pallescens** Schleich. ex Schwaegr.

A2 Ankara: Kızılcahamam Soğuksu National Park, between Uzunkayalık and Harmandoruk hills, *Pinus sylvestris*, *Juniperus communis* subsp. *nana* forest, on soil, 1500 m, 19.10.1996

UYAR 167

A1, A2, B6, B8, C. Europe, Asia, America, Africa.

**56. B. argenteum** Hedw.

A2 Ankara: Kızılcahamam Soğuksu National Park, between Çakmaklı hill and Kayabeleni *Pinus sylvestris* forest, on soil, 1600 m, 1.11.1997 UYAR 181

Cosmopolitan .

**57. B. caespiticum** Hedw.

A2 Ankara: Kızılcahamam Soğuksu National Park, Çakmaklı hill, *Pinus sylvestris* forest, on rock, 1600 m, 1.11.1997 UYAR 182



Cosmopolitan.

58. \* *B. klinggraeffii* Schimp. ex Klinggr.

A2 Ankara: Kızılcahamam Soğuksu National Park, between İncegeliş and Harmandoruk hill, *Pinus sylvestris* forest, on soil, 1550 m, 1.11.1997 UYAR 176

B6, Europe, Asia, N. America.

59. *B. uliginosum* (Brid.) B., S. & G.

A2 Ankara: Kızılcahamam Soğuksu National Park, İncegeliş ridge, *Pinus sylvestris*, *P. nigra* forest, on rock, 1600 m, 11.7.1997 UYAR 178

A2, Europe, N., C. Asia, N. America.

60.\* *B. mildeanum* Jur.

A2 Ankara: Kızılcahamam Soğuksu National Park, Keltepe ridge, *Quercus pubescens* forest, on rock, 1200 m, 26.6.1998 UYAR 222

A1, C11, C13, C14, Europe, Asia, N. Africa.

#### Mniaceae

Plagiomnium Kop.

61. *P. affine* (Bland. ex Funck) T. Kop.

A2 Ankara: Kızılcahamam Soğuksu National Park, Harmandoruk hill, *Pinus sylvestris*, *Juniperus communis* subsp. *nana* forest, on soil, 1500 m, 19.10.1996 UYAR 166

A1, A2, A4, B6, B8, Europe, Asia.

#### Aulacomniaceae

Aulacomnium Schwaegr.

62.\* *A. androgynum* (Hedw.) Schwaegr.

A2 Ankara: Kızılcahamam Soğuksu National Park, Tolubeleni hill, *Pinus sylvestris*, forest, on soil, 1750 m, 14.7.1996 UYAR 101

A1, B6, B8, Europe, Asia, N. America.

#### Bartramiaceae

Bartramia Hedw.

63. *B. ithyphylla* Brid.

A2 Ankara: Kızılcahamam Soğuksu National Park, Tolubeleni hill, *Pinus sylvestris*, *Abies nordmanniana* subsp. *bornmuelleriana* forest, near road on soil, 1700 m, 26.6.1998

UYAR 214

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

#### ORTHOTRICHALES

Orthotrichaceae

Orthotrichum Hedw.

64. *O. pallens* Bruch. ex Brid.

A2 Ankara: Kızılcahamam Soğuksu National Park, Çakmaklı hill, *Pinus sylvestris* forest, on tree trunk, 1600 m, 26.6.1998 UYAR 224

A2, A3, Europe, Asia, N. Africa, N. America.

65. *O. affine* Brid. var. *affine*

A2 Ankara: Kızılcahamam Soğuksu National Park, Uzunkayalık ridge, *Pinus sylvestris* forest, on tree trunk, 1250 m, 14.7.1996 UYAR 103

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

66. \* *O. affine* Brid. var. *fastigatum* Brid.

A2 Ankara: Kızılcahamam Soğuksu National Park, Göllü ridge, *Carpinus betulus* forest, on tree trunk, 1450 m, 14.7.1996 UYAR 164

B6, C11, Europe, Asia, N. Africa, N. America.

67. \* *O. laevigatum* Zett.

A2 Ankara: Kızılcahamam Soğuksu National Park, Çakmaklı hill, *Pinus sylvestris*, *Abies nordmanniana* subsp. *bornmuelleriana* forest, on rock, 1600 m, 14.7.1996 UYAR 168

A4, Europe, N. America.

68. *O. rupestre* Schleich. ex Schwaegr.

A2 Ankara: Kızılcahamam Soğuksu National Park, Karatepe ridge, *Quercus pubescens*, *Q. petraea* forest, on rock, 1200 m, 19.10.1997 UYAR 151

Cosmopolitan.

69. \* *O. urnigerum* Myr.

A2 Ankara: Kızılcahamam Soğuksu National Park, Gölünderuk hill, *Pinus sylvestris*, *Abies nordmanniana* subsp. *bornmuelleriana* forest, on rock, 1725 m, 11.7.1997 UYAR 191

C13, A3, N., C. Europe, Asia, N. America.

70. *O. striatum* Hedw.

A2 Ankara: Kızılcahamam Soğuksu National Park, Tolubeleni hill, *Populus tremula* forest, on tree trunk, 1675 m, 1.11.1997 UYAR 119

A1, A2, A4, B6, C13, Europe, Asia, N. Africa, N. America.

71. *O. Iyellii* Hook. & Tayl.

A2 Ankara: Kızılcahamam Soğuksu National Park, between Karatepe and Çatalgelişim district, *Quercus petraea*, *Pinus nigra* forest, on tree trunk, 1300 m, 14.7.1997 UYAR 158

A2, A4, Europe, Asia, N. Africa, N., S. America.

72. *O. speciosum* Nees

A2 Ankara: Kızılcahamam Soğuksu National Park, İncegeliş ridge, on elm trunk (= *Ulmus* sp.), 1600 m, 11.7.1997 UYAR 179

A1, A2, Europe, N., C. Asia, N. Africa, N. America.

*Ulota* Mohr

73. \* *U. hutchinsiae* (Sm.) Hammar.

A2 Ankara: Kızılcahamam Soğuksu National Park, Tolubeleni hill, *Pinus sylvestris*, *Abies nordmanniana* subsp. *bornmuelleriana* on rock, 1675 m, 1.11.1997 UYAR 192

B6, Europe, E. Asia, N. America.

Hedwigiaceae

*Hedwigia* P. Beauv.

74. *H. ciliata* (Hedw.) P. Beauv.

A2 Ankara: Kızılcahamam Soğuksu National Park, between Karatepe and Samrıdoruk hill, *Quercus pubescens*, *Q. petraea* forest, on soil, 1200 m, 19.10.1996 UYAR 146

Cosmopolitan.

ISOBRYALES

Fontinalaceae

*Fontinalis* Hedw.

75. *F. antipyretica* Hedw. var. *antipyretica*

A2 Ankara: Kızılcahamam Soğuksu National Park, Batılğanın stream on rock in water,

1200 m, 26.6.1998 UYAR 217

Cosmopolitan.

Leucodontaceae

*Leucodon* Schwaegr

76. *L. immersus* Lindb.

A2 Ankara: Kızılcahamam Soğuksu National Park, Karatepe ridge, *Quercus pubescens*, forest, on tree trunk, 1200 m, 19.10.1996 UYAR 147

A2, A3, Europe, S., W. Asia.

77. *L. sciuroides* (Hedw.) Schwaegr.

A2 Ankara: Kızılcahamam Soğuksu National Park, between Sivritepe and Karatepe, *Quercus pubescens*, forest, on tree trunk, 1200 m, 19.10.1996 UYAR 150

Cosmopolitan.

*Antitrichia* Brid.

78. *A. curtispindula* (Hedw.) Brid.

A2 Ankara: Kızılcahamam Soğuksu National Park, Harmandoruk hill, *Pinus sylvestris*, *Carpinus betulus*, forest, on soil, 1450 m, 19.10.1996 UYAR 162

A2, A3, A4, B6, Europe, Africa, N. America.

THUIDIALES

Leskeaceae

*Lescurea* B., S., & G.

79. \* *L. patens* (Lindb.) Arn. & C. Jens.

A2 Ankara: Kızılcahamam Soğuksu National Park, Göllü ridge, *Pinus sylvestris*, *Carpinus betulus*, forest, on tree root, 1450 m, 14.7.1996 UYAR 120

A4, Europe, N. America.

80. \* *L. incurvata* (Hedw.) Lawt.

A2 Ankara: Kızılcahamam Soğuksu National Park, Gölündoruk hill, *Abies nordmanniana* subsp. *bornmuelleriana*, *Pinus sylvestris*, on rock, 1725 m, 11.7.1997 UYAR 128

A1, A4, B10, C13, Europe, Asia, N. America.

81. \* *L. saxicola* (B., S. & G.) Milde.

A2 Ankara: Kızılcahamam Soğuksu National Park, Yanık ridge, *Carpinus betulus*, *Pinus nigra* forest, on rock, 1300 m, 14.7.1996 UYAR 110

A4, A5, C13, Europe, Asia, N. America.

*Pterigynandrum* Hedw.

82. *P. filiforme* Hedw.

A2 Ankara: Kızılcahamam Soğuksu National Park, Yanık ridge, *Pinus sylvestris*, *Pinus nigra* subsp.



pallasiana, *Carpinus betulus*, forest on tree roots, 1450 m, 14.7.1996 UYAR 111

A2, A3, B6, C11, Europe, Asia, N. America.

#### Thuidiaceae

*Anomodon* Hook. & Tayl.

83. *A. viticulosus* (Hedw.) Hook. & Tayl

A2 Ankara: Kızılcahamam Soğuksu National Park, Çakmaklı hill, *Pinus sylvestris*, *Populus tremula*, forest on tree trunk, 1600 m, 19.9.1997 UYAR 180

A2, A3, A4, B6, C13, C. Europe, C. Asia, N. America.

#### HYPNOBRYALES

##### Amblystegiaceae

*Cratoneuron* (Sull.) Spruce

84. *C. commutatum* (Hedw.) G. Roth var. *commutatum*

A2 Ankara: Kızılcahamam Soğuksu National Park, Çakmaklı hill, *Pinus sylvestris*, forest on rock, 1600 m, 19.10.1996 UYAR 171

A2, B7, B8, B9, C13, C15, C. Europe, N. Africa, C. Asia, N. America.

85. \* *C. commutatum* (Hedw.) G. Roth var. *fluctuans* (B., S. & G.) Wijk & Marg.

A2 Ankara: Kızılcahamam Soğuksu National Park, between Karatepe and Çatalgelişim, *Astragalus*, forest on soil, 1300 m, 19.10.1996 UYAR 161

A4, Europe, Asia.

*Amblystegium* B., S. & G.

86. *A. riparium* (Hedw.) B., S. & G.

A2 Ankara: Kızılcahamam Soğuksu National Park, Batılğanın stream on rock in water, 1200 m, 26.6.1998 UYAR 216

A2, B6, Cosmopolitan.

87. *A. serpens* (Hedw.) B., S. & G.

A2 Ankara: Kızılcahamam Soğuksu National Park, Çakmaklı hill, *Pinus sylvestris*, *Abies nordmanniana* subsp. *bornmuelleriana* forest, 1600m, on tree trunk 14.7.1996 UYAR 122

A2, A4, B7, B8, C11, C. Europe, N. America, C. Asia.

*Drepanocladus* (C. Müll.) G. Roth.

88. \* *D. fluitans* (Hedw.) Warnst.

A2 Ankara: Kızılcahamam Soğuksu National Park, Çakmaklı hill, *Pinus sylvestris*, *Abies nordmanniana* subsp. *bornmuelleriana* forest, on soil, 1600m, 19.10.1996 UYAR 169

A1, Cosmopolitan.

89. *D. revolvens* (Broth.) Fleisch.

A2 Ankara: Kızılcahamam Soğuksu National Park, Tolubeleni hill, *Abies nordmanniana* subsp. *bornmuelleriana* forest, on wet rock, 1700m, 26.6.1998 UYAR 221

A2, A4, Cosmopolitan.

*Calliergon* (Sull.) Kindb.

90. \* *C. stramineum* (Brid.) Kindb.

A2 Ankara: Kızılcahamam Soğuksu National Park, Yanık ridge, *Pinus nigra* forest, on tree trunk, 1300m, 14.7.1996 UYAR 114

A1, Europe, Asia, N. America, Australia.

##### Brachytheciaceae

*Isoetecium* Brid.

91. *I. myosuroides* Brid.

A2 Ankara: Kızılcahamam Soğuksu National Park, İncegeliş ridge, *Pinus sylvestris*, *Pinus nigra* forest, on rock, 1600m, 11.7.1997 UYAR 206

A2, A3, A4, B6, C. Europe, N. Africa.

92. \* *I. striatulum* (Spruce) Kindb.

A2 Ankara: Kızılcahamam Soğuksu National Park, Karatepe district, *Pinus nigra* subsp. *pallasiana* forest, on soil, 1300m, 14.7.1996 UYAR 159

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

*Homalothecium* B., S. & G.

93. *H. sericeum* (Hedw.) B., S. & G.

A2 Ankara: Kızılcahamam Soğuksu National Park, between Çatalgelişim and Davutlar ridge, *Quercus pubescens*, *Pinus nigra* forest, on soil, 1450m, 19.9.1997 UYAR 102

Cosmopolitan.

94. *H. lutescens* (Hedw.) Robins.

A2 Ankara: Kızılcahamam Soğuksu National Park, Arkut hill, *Pinus sylvestris*, *Juniperus communis* subsp.

*nana* forest, on soil and rock, 1700m, 19.9.1997 UYAR 198

A1, A2, A3, B6, B7, C11, C12, C13, Europe, Asia.

*Brachythecium* B., S. & G.

95. \* *B. velutinum* (Hedw.) B., S. & G. var. *velutinum*

A2 Ankara: Kızılcahamam Soğuksu National Park, Gölündoruk hill, *Pinus sylvestris*, *Abies nordmanniana* subsp. *bornmuelleriana* forest, on decayed tree root, 1675m, 11.7.1997

UYAR 196

A1, B6, C12, Europe, Asia, N. America.

96. \* *B. velutinum* (Hedw.) B., S. & G. var. *salicinum* (B., S. & G.) Moenk.

A2 Ankara: Kızılcahamam Soğuksu National Park, Çakmaklı hill, *Pinus sylvestris*, *Abies nordmanniana* subsp. *bornmuelleriana* forest, on tree root, 1600m. 14.7.1996 UYAR 132

A1, A3, B6, C12 Europe, Asia, N. Africa.

97. *B. salebrosum* (Web. & Mohr.) B., S. & G.

A2 Ankara: Kızılcahamam Soğuksu National Park, Çakmaklı hill, *Pinus nigra* forest, on soil, 1300m, 14.7.1996 UYAR 160

A2, A4, B6, C13, Europe, Asia, N. America.

98. *B. populeum* (Hedw.) B., S. & G.

A2 Ankara: Kızılcahamam Soğuksu National Park, Batılğanın stream, *Pinus nigra* forest, on rock, 1300m, 14.7.1996 UYAR 106

A1, A2, A4, B6, Cosmopolitan.

99. *B. mildeanum* (Schimp.) Schimp. ex Milde.

A2 Ankara: Kızılcahamam Soğuksu National Park, Batılğanın stream, *Pinus nigra* forest, on soil, 1300m, 14.7.1996 UYAR 104

A2, C. Europe, N. Asia, N. America.

100. *B. glareosum* (Spruce) B., S. & G.

A2 Ankara: Kızılcahamam Soğuksu National Park, Çakmaklı hill, *Pinus sylvestris*, *Abies nordmanniana* subsp. *bornmuelleriana* forest, on tree trunk, 1600m, 14.7.1996 UYAR 140

A2, A4, B6, B8, Europe, E. Asia, N. America.

101. *B. erythrorrhizon* B., S. & G.

A2 Ankara: Kızılcahamam Soğuksu National Park, Çakmaklı hill, *Pinus nigra* forest, on soil, 1300m, 14.7.1996 UYAR 138

A2, A4, Europe, N. America.

102. *B. plumosum* (Hedw.) B., S. & G.

A2 Ankara: Kızılcahamam Soğuksu National Park, Harmandoruk hill, *Pinus sylvestris*, *Carpinus betulus*, forest, on soil, 1450m, 14.7.1996 UYAR 163

Cosmopolitan.

103. *B. rivulare* B., S. & G.

A2 Ankara: Kızılcahamam Soğuksu National Park, Arkut hill, *Pinus sylvestris* forest, on rock, 1700m, 19.9.1997 UYAR 201

A1, A2, A4, B8, B9, C11, C12, Europe, Asia, N. America.

104. *B. albicans* (Hedw.) B., S. & G.

A2 Ankara: Kızılcahamam Soğuksu National Park, Gölündoruk hill, *Pinus sylvestris*, *Abies nordmanniana* subsp. *bornmuelleriana* forest, on tree roots, 1700m, 19.9.1997 UYAR 143

A2, A4, Cosmopolitan.

105. \* *B. curtum* (Lindb.) J. Lange & C. Jens

A2 Ankara: Kızılcahamam Soğuksu National Park, Gölündoruk hill, *Pinus sylvestris*, *Abies nordmanniana* subsp. *bornmuelleriana*, *Populus tremula* forest, on tree roots, 1675m, 11.7.1997 UYAR 195

A4, Europe, Asia, N. America.

106.\* *B. starkei* (Brid.) B., S. & G.

A2 Ankara: Kızılcahamam Soğuksu National Park, Çakmaklı hill, *Pinus sylvestris*, *Abies nordmanniana* subsp. *bornmuelleriana*, forest, on soil, 1600m, 19.10.1996 UYAR 170

A1, Europe, Asia, N. America.

*Eurhynchium* B., S. & G.

107. *E. praelongum* (Hedw.) B., S. & G.

A2 Ankara: Kızılcahamam Soğuksu National Park, Arkut hill, *Pinus sylvestris*, *Abies nordmanniana* subsp. *bornmuelleriana*, forest, on soil, 1700m, 17.9.1997 UYAR 134

A1, A2, A3, B6, B8, Europe, Asia, N. Africa, N. America.

**108. E. pulchellum** (Hedw.) Jenn. var. *pulchellum*

A2 Ankara: Kızılcahamam Soğuksu National Park, İncegeliş district, *Pinus nigra* subsp. *pallasiana*, forest, on soil, 1300m, 14.7.1996 UYAR 116

A1, A2, A4, B6, B8, B10, Europe, N., S. America.

**109. E. pulchellum** (Hedw.) Jenn. var. *diversifolium*

(B., S. & G.) C. Jens.

A2 Ankara: Kızılcahamam Soğuksu National Park, İncegeliş district, *Pinus nigra* subsp. *pallasiana*, *Pinus sylvestris* forest, on soil, 1300m, 14.7.1996 UYAR 142

A2, Europe, N. Africa, N. America.

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

A2 Ankara: Kızılcahamam Soğuksu National Park, İncegeliş district, *Pinus nigra* subsp. *pallasiana*, *Pinus sylvestris* forest, on tree trunk, 1300m, 14.7.1996 UYAR 115

A1, A2, A4, B6, Europe, N. Africa, E. Asia.

**Plagiotheciaceae****Plagiothecium** B., S. & G.**111. \* P. platyphyllum** Moenk.

A2 Ankara: Kızılcahamam Soğuksu National Park, Arkut hill, *Pinus sylvestris*, *Abies nordmanniana* subsp. *bornmuelleriana* forest, on wet rock, 1700m, 19.9.1997 UYAR 203

A1, A3, Europe.

**112. P. denticulatum** (Hedw.) B., S. & G.

A2 Ankara: Kızılcahamam Soğuksu National Park, Batılğanın stream, on wet rock, 1100m, 16.10.1998 UYAR 226

A1, A3, Europe, Asia, N., S. America, Australia.

**Herzogiella** Broth.**113. H. seligeri** (Brid.) Iwats.

A2 Ankara: Kızılcahamam Soğuksu National Park, Tolubeleni hill, *Pinus sylvestris*, *Abies nordmanniana* subsp. *bornmuelleriana* forest, on decaying tree trunk, 1675m, 1.11.1997

UYAR 197

A2, Europe, Asia, N. America.

**Hypnaceae****Hypnum** Hedw.**114. H. cupressiforme** Hedw. var. *lacunosum* Brid.

A2 Ankara: Kızılcahamam Soğuksu National Park, between Çatalgelişim and Davutlar ridge, *Quercus pubescens*, *Pinus nigra* subsp. *pallasiana* forest, on soil, 1400m, 19.9.1997

UYAR 174

A1, A2, B6, Europe, C. America.

**115. H. andoi** A.J.E.Sm.

(*H. mamillatum* (Brid.) Loeske)

A2 Ankara: Kızılcahamam Soğuksu National Park, Karatepe district, *Pinus nigra* subsp. *pallasiana*, *Quercus pubescens* forest, on soil, 1500m, 19.9.1997 UYAR 228

A1, A2, A3, A4, B6, N., C. Europe.

**Ptilium** De Not.**116. \* P. crista-castrensis** (Hedw.) De Not.

A2 Ankara: Kızılcahamam Soğuksu National Park, between Tolubeleni and Çakmaklı hill, *Pinus sylvestris* forest, on soil, 1500m, 17.9.1997 UYAR 145

A3, Europe, Asia, N. America.

**Results and Discussion**

In this study, 42 genera belonging to 20 families and 116 taxa were identified from the moss specimens collected from Ankara-Kızılcahamam Soğuksu National Park between 1996 and 1998.

According to Henderson's grid system, the number of new records in the study area in the A2 square is 32.

The families richest in species are shown in order below (Table 1). The first 8 families make up 80.1% of the total taxa in the study area and the other 12 families constitute 19.9%. (Table 2).

In Table 2, a comparison between studies carried out in the Black Sea (Çetin & Yurdakulol, 1985, 1988.; Özdemir, 1994, Çetin & Uyar, 1997) and the Mediterranean (Çetin, 1989) shows that the number of taxa of *Pottiaceae* family members, which display acrocarpous mosses in the Mediterranean, is higher than in the Black Sea region. Since acrocarpous species have quill-edged leaves and grow in cushion form, they can endure long periods of heat and dryness better than pleurocarpous species in the Black Sea region.

Table 1. The Distributions of the Taxa According to the Families

Families	Taxa	Percentage of taxa according to total number of taxa
<i>Brachytheciaceae</i>	20	17.2
<i>Pottiaceae</i>	19	16.4
<i>Bryaceae</i>	14	12.1
<i>Grimmiaceae</i>	13	11.2
<i>Orthotrichaceae</i>	10	8.6
<i>Amblystegiaceae</i>	7	6.0
<i>Dicranaceae</i>	6	5.2
<i>Leskeaceae</i>	4	3.4
<i>Ditrichaceae</i>	4	3.4
<i>Hypnaceae</i>	3	2.6
<i>Leucodontaceae</i>	3	2.6
<i>Plagiotheciaceae</i>	3	2.6
<i>Polytrichaceae</i>	2	1.8
<i>Encalyptaceae</i>	2	1.8
<i>Mniaceae</i>	1	0.9
<i>Fontinalaceae</i>	1	0.9
<i>Aulacomniaceae</i>	1	0.9
<i>Bartramiaceae</i>	1	0.9
<i>Hedwigiaceae</i>	1	0.9
<i>Thuidiaceae</i>	1	0.9

As a result of our efforts to determine the ecological habitat of mosses, the following moss species were found to be abundant in the sublayers of *Quercus pubescens* (Willd.), *Q. petraea* (Matt.) Lieb. and *P. nigra* Arn, which appear on wet soil at an elevation of 1200-1400m: *Tortula laevipila*, *T. subulata* var. *subinermis*, *T. subulata*

var. *graeffii*, *Hedwigia ciliata*, *Cratoneuron commutatum* var. *fluctuans*, *Homalothecium sericeum*, *Hypnum cupressiforme* var. *lacunosum* and *H. andoi*; the following species on rocks under the same formation: *Grimmia ovalis*, *G. donniana*, *G. affinis*, *G. elongata*, *Bryum mildeanum*, *Orthotrichum rupestre* and *Tortula virescens*; and the following on tree trunks and roots: *Orthotrichum lyelii*, *Leucodon immersus* and *Calliergon stramineum*.

The following species are abundant below the layer of *Pinus nigra* Arn. subsp. *pallasiana* (Lamb.), which grow in acidic soil at an elevation of 1300m: *Tortula subulata* var. *subulata*, *T. subulata* var. *angustata*, *Bryoerythrophyllum recurvirostrum*, *Bryum alpinum*, *Isothecium striatulum*, *Brachythecium salebrosum*, *B. mildeanum*, *B. erythrorrhizon*, *Eurhynchium pulchellum* var. *pulchellum* and *E. pulchellum* var. *diversifolium*; the species on rocks under the same formation are: *Barbula cylindrica* and *Brachythecium populeum*, and also on tree trunks are *Dicranum scoparium*, *Encalypta rhapsocarpa* and *Eurhynchium striatum*.

The following moss species are common below *Pinus sylvestris* L., *Juniperus communis* L. subsp. *nana* and *Pinus nigra* Arn., which grows in acidic soil at 1250-1500m: *Bryum pallescens*, *Ptilium crista-castrensis* and *Plagiomnium affine* on rocks, *Coscinodon cribrosus*, and, also on tree trunks, *Orthotrichum affine*. The following taxa are abundant below the layer of *Pinus sylvestris* L., *Abies nordmanniana* (Stev.) Sparch. subsp. *bornmuelleriana* (Mattf.) Coode & Cullen., and *Populus tremula* L., which grow in acidic soil at an elevation of 1400-1700m: *Polytrichum juniperinum*, *Dicranum polysetum*, *Oncophorus virens*, *Ditrichum flexicaule*, *Encalypta vulgaris*, *Tortula ruraliformis*, *Barbula*

Table 2. The Comparison of the Taxa Distribution According to the Families

Families	Ankara-K.hamam Soğuksu National Park		Gerede-Aktaş		Yedigöller National Park		Sinop and Environs		Sürmene		Antalya and Environs	
	The number of taxa	%	The number of taxa	%	The number of taxa	%	The number of taxa	%	The number of taxa	%	The number of taxa	%
<i>Brachytheciaceae</i>	20	17.2	19	15	15	17.4	23	20.5	9	30	14	15.5
<i>Pottiaceae</i>	19	16.4	16	12	12	13.6	12	10.7	3	10	32	35.5
<i>Bryaceae</i>	14	12.1	17	12.6	2	2.2	6	5.3	1	3.3	4	4.4
<i>Hypnaceae</i>	3	2.6	11	8	8	9.9	10	8.9	4	13.3	3	3.3
<i>Polytrichaceae</i>	2	1.8	4	3	5	5.7	3	2.6	5	16.6	-	-
<i>Mniaceae</i>	1	0.9	9	6.7	8	9	6	5.3	2	6.6	-	-

*convoluta*, *Pohlia cruda*, *Bryum flaccidum*, *B. torquescens*, *B. argenteum*, *B. kliggraeffii*, *Aulacomnium androgynum*, *Bartramia ithyphylla*, *Drepanocladus fluitans*, *Brachythecium starkei* and *Eurhynchium praelongum*.

The following taxa are seen especially on rocks in places where the aforementioned community grows: *Polytrichum strictum*, *Dicranum majus*, *Dicranoweissia crispula*, *Tortula ruralis*, *T. ruralis* subsp. *calicolens*, *Barbula unguiculata*, *B. fallax*, *B. vinealis*, *Weissia controversa* var. *crispata*, *Tortella inclinata*, *Schistidium confertum*, *S. pulvinatum*, *Grimmia pulvinata*, *G. trichophylla* var. *trichophylla*, *G. montana*, *G. decipiens*, *Pohlia nutans*, *Bryum capillare*, *B. caespiticum*, *B. cernuum*, *Orthotrichum leavigatum*, *O. urnigerum*, *Ulota hutchinsinaea*, *Lescurea incurvata*, *Drepanocladus revolvens*, *Isothecium myosurroides*, *Homalothecium lutescens*, *Cratoneuron commutatum* var. *commutatum*, and, also on tree trunks, *Dicranum tauricum*, *Cratoneuron purpureus*, *Schistidium apocarpum*, *Bryum alpinum* var. *viride*, *Orthotrichum pallens*, *O. striatulum*, *O. speciosum*, *Anomodon viticulosus*, *Amblystegium serpens*, *Brachythecium velutinum* var. *velutinum*, *B.*

*velutinum* var. *salicinum*, *B. glaerosum*, *B. albicans*, *B. curtum* and *Herzogiella seligeri*.

The following taxa are abundant below the layer of *Pinus sylvestris* L., *Carpinus betulus* L, which grows on tree trunks at an elevation of 1450m: *Dicranella heteromalla*, *Ditrichum heteromallum*, *Orthotrichum affine* var. *fastigatum*, *Lescurea patens*, *L. saxicola*, *Pterigynandrum filiforme* and *Brachythecium plumosum*, and, on rocks, *Tortula norvegica* and *Grimmia alpestris*, and also, on soil, *Tortella tortuosa* and *Antitrichia curtipendula*.

The following species were found in wetlands and near water in places where the aforementioned community grows: *Barbula cylindrica*, *Bryum inclinatum*, *Brachythecium rivulare*, *Plagiothecium platyphyllum* and *P. denticulatum*, and, in water, *Fontinalis antipyretica* and *Amblystegium riparium*.

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