

Contributions to the Bryophyte Flora of Turkey

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The bryophyte collections enumerated in this account were made by Dr P. H. Davis in the course of botanical expeditions to Turkey in 1949 and in 1952 in company with Mr J. Dodds. Relatively few bryophytes were collected on the 1949 expedition to western Turkey, but amongst them is *Mniobryum latifolium* Schiffner from Prov. Isparta, previously known only from its type locality in Kurdistan.

In 1952 collections were made from scattered localities in the south-central provinces of Adana, Niğde, Maraş and Kayseri and in the Black Sea provinces of Giresun and Rize. In these latter provinces the mixed forests of *Fagus orientalis*, *Picea orientalis* and *Alnus glutinosa* frequently with an undergrowth of *Buxus sempervirens* and *Rhododendron flavum*—referred to in the field notes as *Fagus-Picea-Alnus* forest—yielded collections especially rich in the commoner *Hypnaceae*.

Published accounts of the bryophytes of Turkey are relatively few. Bornmüller's collections, subsequently worked out by Schiffner (1897, 1901 and 1908), are almost exclusively from north-western Turkey. The few collections enumerated by Czecczott (1939) are also from the north-western provinces. Handel-Mazzetti (1907) has given a comprehensive general account of the bryophyte flora of the Pontus near Trebizond (Trabzon) which is very similar to that described by Brotherus (1893) from the Caucasus. These two latter accounts provide a fairly good general picture of the Pontic-Caucasian bryophyte flora.

The only account of bryophytes from southern Turkey seems to be a short list of a few collections made by Handel-Mazzetti (Schiffner, 1913) principally in the neighbourhood of Bitlis. Thus the south-central provinces of Adana, Niğde, Maraş and Kayseri visited in 1952 by Dr Davis were completely unknown bryologically.

The present account adds no fewer than forty-two species of mosses and ten of hepatics to the Turkish flora. These species recorded from Turkey for the first time are distinguished by an asterisk in the enumeration.

The nomenclature and systematic arrangement of the hepatics is according to Müller (1911); for the mosses it has seemed best to follow Mönkemeyer (1927), although he did not accept the 1801 (Hedwig, *Species Muscorum*) starting date for nomenclature, as laid down by the International Rules. The words Dağ and Yaylâ in field notes have been contracted to Da. and Ya. respectively in this text.

Dr Davis' name has been omitted before herbarium numbers, as all refer to his series of numbers.

Many collections were composed of several species. When material of a species has been separated from the collection it is referred to by the collection number with a letter appended [for example, *Plagiochila asplenioides* 20807, *Fissidens cristatus* 20807b (with *Plagiochila*)].

This account is based solely on the set of Davis' collection in the Herbarium of the Royal Botanic Garden, Edinburgh. Duplicate numbers

were distributed to the Royal Botanic Gardens, Kew, the British Museum (Natural History) and Ankara University.

We are indebted to Dr Davis for the opportunity to work out this collection and for help and advice on many occasions.

MOSSES

Fissidens cristatus Wils.

PROV. RIZE: Rize, 100–200 m. on ground in *Alnus glutinosa* forest, 12 Aug. 1952, 20807b (with *Plagiochila*).

Ditrichum flexicaule (Schleich.) Hampe.*

PROV. RIZE: dist. İkizdere; Vercinin Tepe, 3000 m., among stones, 29 Aug. 1952, 21134b.

var. *densum* B. & S.*

PROV. KAYSERİ: steppe near Ürgüp on north slope of bank, 21 June 1952, s.n.

Distichium inclinatum (Ehrh.) B. & S.*

PROV. RIZE: dist. İkizdere; Vercinin Tepe, 3,000 m., among stones, 29 Aug. 1952, 21134a.

Amphidium Mougeotii (B. & S.) Schp.

PROV. RIZE: dist. Hemşin; Çat-Meydan Kobaca, 1100–1300 m., on rocks, 2 Sept. 1952, 21223; İkizdere, 600 m. shady banks, granite rocks, 24 Aug. 1952, 20874.

PROV. GİRESUN: Tamdere-Yavuzkema, near Karınca, 1500 m., on rocks, 13 Aug. 1952, 20701; *ibid.* 20720.

Dichodontium pellucidum (L.) Schp. var. *flavescens* Dicks.

PROV. RIZE: Rize-Karadere, 300 m., moist bank, 23 Aug. 1952, 20849.

Dicranoweisia crispula (Hedw.) Lindb.*

PROV. RIZE: dist. İkizdere; Çarankaya Ya., 2300 m., rocks, 26 Aug. 1952, 20977.

Dicranum scoparium (L.) Hedw.

PROV. RIZE: dist. Hemşin; Ortaköy-Çat, 1700 m., 2 Sept. 1952, 21302a; *ibid.* 21316a, 21318a; Çat-Meydan Kobaca, on rocks, 1100–1300 m., 2 Sept. 1952, 21219a; Meydan Kobaca-Mollaveysi, 900–1100 m., *Alnus-Picea-Fagus* forest, 3 Sept. 1952, 21348; İkizdere, 600 m., shady banks and granite rocks, 24 Aug. 1952, 20858a; *ibid.* 20868, 20869a.

PROV. GİRESUN: Tamdere-Yavuzkema, 1500 m., damp banks, 10 Aug. 1952, 20675; *ibid.*, near Karınca, 1500 m., 13 Aug. 1952, 20758.

Dicranum fuscescens Turn.*

PROV. GİRESUN: Balaban-dağları (Kilinç Tepe) above Tamdere, 2600 m., by stream, 7 Aug. 1952, 20614.

Dicranum undulatum Ehrh.*

PROV. RIZE : İkizdere, 600 m., shady banks, granite rocks, 24 Aug. 1952, 20864a.

PROV. GİRESUN : Tamdere-Yavuzkema1, 1500 m., damp banks, 10 Aug. 1952, 20672a.

Dicranum fulvum Hook.*

PROV. RIZE : dist. Hemşin ; Meydan Kobaca-Mollaveysi, 900-1100 m., in *Fagus-Picea-Alnus* forest with *Buxus* undergrowth, 3 Sept. 1952, 21324a.

Dicranum longifolium Ehrh.*

PROV. RIZE : dist. Hemşin ; Meydan Kobaca-Mollaveysi, 900-1100 m., *Alnus-Picea-Fagus* forest, 3 Sept. 1952, 21331.

Dicranum albicans B. & S.*

PROV. RIZE : dist. İkizdere ; Çarankaya Ya.-Başköy, 3000 m., granite rocks, 26 Aug. 1952, 20940 ; Çarankaya Ya.-Başköy, 2300 m. in wet Nardetum, 26 Aug. 1952, 20950.

Campylopus atrovirens De Not.

PROV. RIZE : dist. Hemşin ; Üsküt Da., between Mollaveysi and Hemşin, 1000 m., 4 Sept. 1952, 21270.

Dicranodontium denudatum (Brid.) Hagen

PROV. RIZE : dist. Hemşin ; Üsküt Da., between Mollaveysi and Hemşin, 1000 m., 4 Sept. 1952, 21269 ; Meydan Kobaca-Mollaveysi, 900-1100 m., *Alnus-Picea-Fagus* forest, 3 Sept. 1952, 21367 ; *ibid.* 21368.

Leucobryum glaucum (L.) Schp.

PROV. RIZE : dist. Hemşin ; Üsküt Da., between Mollaveysi and Hemşin, 1000 m., shady banks, 4 Sept. 1952, 21278 ; *ibid.* 21280 ; Meydan Kobaca-Mollaveysi, 900-1100 m., *Alnus-Fagus-Picea* forest, 3 Sept. 1952, 21330b ; Rize, 100-200 m. on rather dry ground in *Alnus glutinosa* forest, 21 Aug. 1952.

Tortella tortuosa (L.) Limpr.*

PROV. ADANA : dist. Feke ; Sencan dere, near Gürümze, 1300 m., 30 June 1952, 19663.

PROV. RIZE : dist. Hemşin ; Meydan Kobaca-Mollaveysi, 900-1100 m., *Alnus-Picea-Fagus* forest, 3 Sept. 1952, 21350 ; Çat, 1300 m., forest, 2 Sept. 1952, 21239 ; *ibid.* 21240.

PROV. KAYSERİ : Bakir Da., between Kisge and Bakir Oluğu Ya., 1700 m., shady rocks in Abietum, 28 June 1952, 19488 (with *Camptothecium philippeanum*).

Erythrophyllum rubellum (Hoffm.) Loeske *

PROV. NIĞDE : Hasan Da., above Taşpınar Ya., 2900 m., shady rocks, 16 June 1952, 18970.

Barbula unguiculata Hedw.

PROV. RIZE: Rize-Karadere, 300 m., on rather dry banks, 23 Aug. 1952, 20854; *ibid.* 20855.

Barbula vinealis Brid.

PROV. ADANA: Saimbeyli, 1100 m., by spring, 11 July 1952, 19889.

Barbula lurida (Hornsch.) Lindb.*

PROV. RIZE: dist. Hemşin; Ortaköy-Çat, 2000 m., on volcanic rocks, 2 Sept. 1952, 21197a.

Syntrichia montana Nees

PROV. ADANA: dist. Feke; Göksu gorge below Himmetli, 700-800 m., 9 July 1952, 19834.

PROV. MARAS: dist. Göksun; Binboğa Da. in ravine on N.E. side of Isik Da., 1900 m., 16 July 1952, 20051a.

Syntrichia ruralis Brid.

PROV. ADANA: dist. Feke; Sencan Dere, 2 July 1952, 19786.

PROV. GİRESUN: Tamdere-Yavuzkema1, near Karınca, 1500 m., 13 Aug. 1952, 20770.

PROV. MARAS: dist. Göksun; Binboğa Da., in ravine on N.E. side of Isik Da., 1900 m., 16 July 1952, 20052.

PROV. NIĞDE: Hasan Da., above Taşpınar Ya., 2800 m., on rocks, 18957; *ibid.* 18971.

Coscinodon cribrus (Hedw.) Spruce

PROV. RIZE: dist. Hemşin, Ortaköy-Çat, 2000 m., on volcanic rocks, 2 Sept. 1952, 21197d with *Grimmia campestris*.

Grimmia apocarpa (L.) Hedw.

PROV. GİRESUN: near Yavuzkema1, 1600 m., 14 Aug. 1952, 20741b.

PROV. RIZE: dist. Hemşin; Çat-Meydan Kobaca, 1100-1300 m., on rocks, 2 Sept. 1952, 21224a.

var. *gracilis* (Schwaegr.) W. & M.

PROV. RIZE: dist. Hemşin: Meydan Kobaca-Mollaveysi, 900-1000 m., in *Fagus-Alnus-Picea* forest, 3 Sept. 1952, 21325.

Grimmia campestris Burch.

PROV. RIZE: dist. Hemşin; Ortaköy-Çat, 2000 m., on volcanic rocks, 2 Sept. 1952, 21197a.

Grimmia decipiens (Schultz) Lindb.*

PROV. RIZE: dist. Hemşin; Meydan Kobaca-Mollaveysi, 900-1100 m., *Alnus-Picea-Fagus* forest, 3 Sept. 1952, 21357.

Grimmia elatior Bruch

PROV. RIZE: dist. Hemşin; Ortaköy-Çat, 1700 m., on volcanic rocks, 2 Sept. 1952, 21307.

Grimmia Hartmanii Schp.

PROV. RIZE : İkizdere, 600 m., shady banks, granite rocks, 24 Aug. 1952, 20866a ; dist. Hemşin ; Meydan Kobaca-Mollaveysi, 900-1100 m., *Alnus-Picea-Fagus* forest, 3 Sept. 1952, 21365a.

Grimmia flaccida (De Not.) Lindb.*

PROV. RIZE : dist. Hemşin ; Ortaköy-Çat, 2000 m., on volcanic rocks, 2 Sept. 1952, 21197b (with *Grimmia campestris*).

Rhacomitrium heterostichum Brid.*

PROV. RIZE : dist. İkizdere ; Çarankaya Ya., 2300 m., on rocks, 26 Aug. 1952, 20981.

var. *affine* (Schleich.) Amann.*

PROV. RIZE : dist. İkizdere ; Çarankaya Ya. 2300 m., 26 Aug. 1952, 20985 ; *ibid.* 20978, 20979.

Rhacomitrium canescens (Timm.) Brid.

PROV. RIZE : dist. Hemşin ; Meydan Kobaca-Mollaveysi, 900-1100 m., *Alnus-Picea-Fagus* forest, 3 Sept. 1952, 21355 ; Ortaköy-Çat, 1700 m., forest, 2 Sept. 1952, 21312.

var. *ericoides* B. & S.

PROV. RIZE : dist. Hemşin ; Üsküt Da., 700 m., in forest, 4 Sept. 1952, 21298.

Plagiobryum Zieri (Dicks.) Lindb.

PROV. ADANA : dist. Feke ; between Süphandere and Feke, 2 July 1952, 19788.

PROV. RIZE : İkizdere, 600 m., shady banks, granite rocks, 24 Aug. 1952, 20859a (with *Plagiochila asplenioides*).

Mniobryum latifolium Schiffn.

PROV. ISPARTA : dist. Sütçüler ; Dedegöl Da. by Dedegöl lake, 2300 m., 8 Aug. 1949, 16035.

This collection agrees with Schiffner's description (Schiffner, 1913) and figures of *M. latifolium*, which hitherto has been known only from the type locality in Eastern Turkey "Meleto Dagh, prov. Bitlis between 2900 and 3100 m." whence it was collected by Handel-Mazzetti.

Pohlia Ludwigii (Spreng.) Broth.

PROV. RIZE : dist. İkizdere ; Baltaş Tepe, 3200 m., in flush, 3 Aug. 1952, 21104.

Bryum Schleicheri Schwaegr., var. *latifolium* (Schleich.) Schp.*

PROV. GİRESUN : Balaban-dağları (Kilinç Tepe) above Tamdere, 2600 m., by stream, 7 Aug. 1952, 20612.

PROV. MARAS : dist. Çardak ; Berit Da., 2300 m., near Arpa Çukuru Ya., by stream, 25 July 1952, 20269.

PROV. RIZE : dist. İkizdere ; Yetimhoca (Cimil), 2100 m., in flush at top of forest, 27 Aug. 1952, 20987 ; Başköy (Cimil)-Cermanin Ya., 2400 m., 28 Aug. 1952, 21045.

Bryum pallens Schwartz

PROV. RIZE: dist. İkizdere; Haros Da.-Baltas Tepe, 2700 m., by stream on granite, 26 Aug. 1952, 20969.

Bryum neodamense Itz. var.*

PROV. RIZE: dist. İkizdere; Çarankaya Ya.-Başköy, 3000 m., granite rocks, 26 Aug. 1952, 20942.

Bryum ventricosum Dicks.

PROV. KAYSERİ: Bakir Da., between Kısge and Bakir Oluğu Ya., 1700 m., shady rocks in Abietum, 28 June 1952, 19488.

Bryum argenteum L.

PROV. RIZE: dist. Hemşin; Ortaköy-Çat, 2000 m., on volcanic rocks, 2 Sept. 1952, 21197.

Rhodobryum roseum Limpr.*

PROV. RIZE: dist. Hemşin; Meydan Kobaca-Mollaveysi, 900-1100 m., in *Alnus-Picea-Fagus* forest, 3 Sept. 1952, 21358; *ibid.*, 21335.

Mnium stellare Reich.*

PROV. RIZE: dist. Hemşin; Meydan Kobaca-Mollaveysi, 900-1100 m., *Alnus-Picea-Fagus* forest, 3 Sept. 1952, 21342.

Mnium undulatum Weis.

PROV. RIZE: dist. Hemşin; Meydan Kobaca-Mollaveysi, 900-1100 m., *Alnus-Picea-Fagus* forest, 3 Sept. 1952, 21352; *ibid.*, 21343a, 21338, 21364; Rize-Karadere, 300 m., moist bank, 23 Aug. 1952, 20848.

Mnium rostratum Schrad.

PROV. RIZE: dist. Hemşin; Meydan Kobaca-Mollaveysi, 900-1100 m., *Alnus-Picea-Fagus* forest, 3 Sept. 1952, 21327; *ibid.*, 21332a, 21344a.

Mnium affine Bland.

PROV. GİRESUN: Tamdere-Yavuzkema1, 1500 m., damp banks, 10 Aug. 1952, 20673.

PROV. RIZE: Rize, 100-200 m., on ground in *Alnus glutinosa* forest, 21 Aug. 1952, 20805; *ibid.*, 20806a; Meydan Kobaca-Mollaveysi, 900-1100 m., 21365; *ibid.*, 21343a.

Mnium marginatum (Dicks.) P. de B.*

PROV. RIZE: dist. Hemşin; Meydan Kobaca-Mollaveysi, 900-1100 m., *Alnus-Picea-Fagus* forest, 3 Sept. 1952, 21356; *ibid.*, 21353.

Bartramia oederi (Gunn.) Sw.*

PROV. RIZE: dist. Hemşin; Ortaköy-Çat, 1800 m., 2 Sept. 1952, 21253.

Bartramia norvegica (Gunn.) Lindb.*

PROV. RIZE: dist. Hemşin; Çat-Meydan Kobaca, 1100-1300 m., on rocks,

2 Sept. 1952, 21219a; Meydan Kobaca-Mollaveysi, 900-1100 m., *Picea-Alnus-Fagus* forest, 3 Sept. 1952, 21345; İkizdere, 600 m., shady banks, granite rocks, 24 Aug. 1952, 20863.

Philonotis calcarea Schp.

PROV. ADANA: Saimbeyli, 1100 m., by spring, 11 July 1952, 19891.

PROV. GİRESUN: Balaban-dağları (Kilinç Tepe) above Tamdere, 2000 m., 7 Aug. 1952, 20586.

PROV. MARAS: dist. Çardak; Berit Da., 2300 m., near Arpa Çukuru Ya., by stream, 25 July 1952, 20268.

PROV. RİZE: dist. Hemşin; Ortaköy-Çat, 2000 m., 2 Sept. 1952, 21196; dist. İkizdere; Başköy (Cimil)-Cermanin Ya., Cermanin Tepe, 3100 m., by stream, 29 Aug. 1952, 21048.

Philonotis fontana (L.) Brid.

PROV. RİZE: dist. İkizdere; Başköy (Cimil)-Cermanin Ya., 2400 m., 28 Aug. 1952, 21046a.

Philonotis seriata (Mitt.) Lindb.

PROV. RİZE: dist. İkizdere; Başköy (Cimil)-Cermanin Ya., 2400 m., 28 Aug. 1952, 21046b.

Timmia bavarica Hessel.*

PROV. NİĞDE: Hasan Da. above Taşpınar Ya., 2900 m., shady rocks, 16 June 1952, 18971a.

Orthotrichum sp.

PROV. GİRESUN: Balaban-dağları (Kilinç Tepe) above Tamdere, 2000 m., on exposed rocks, 7 Aug. 1952, 20587b. Sterile.

Hedwigia albicans (Web.) Lindb.

PROV. GİRESUN: Balaban-dağları (Kilinç Tepe) above Tamdere, 2000 m., on exposed rocks, 7 Aug. 1952, 20587a.

PROV. RİZE: dist. Hemşin; Çat-Meydan Kobaca, 1100-1300 m., 2 Sept. 1952, 21218a.

Leucodon sciuroides (L.) Schwaegr.

PROV. GİRESUN: Tamdere-Yavuzkema, near Karınca, 1500 m., rocks, 13 Aug. 1952, 20716.

PROV. RİZE: dist. Hemşin; Meydan Kobaca-Mollaveysi, 900-1100 m., *Alnus-Picea-Fagus* forest, 3 Sept. 1952, 21360.

var. *morensis* (Sch.) De Not.*

PROV. ADANA: dist. Feke; between Süphandere and Feke, 2 July 1952, 19789.

PROV. ANTALYA: dist. Kemer (Lycia); Teke Da. near Ovacık, 12 July 1949, 15170.

Antitrichia curtispindula (Hedw.) Brid.*

PROV. RİZE: dist. Hemşin; Çat, 1300 m., forest, 2 Sept. 1952, 21238.

Antitrichia californica Sull.*

PROV. ADANA: dist. Feke; Sencan Dere, between Süphandere and Feke, 2 July 1952, 19787.

Neckera crispa (L.) Hedw.

PROV. RIZE: dist. Hemşin; Meydan Kobaca-Mollaveysi, 900-1100 m., *Alnus-Picea-Fagus*, 3 Sept. 1952, 21359; *ibid.*, 21330a, 21349; Ortaköy-Çat, 1700 m., forest, 2 Sept. 1952, 21321; *ibid.*, 21315; İkizdere, 600 m., shady banks, granite rocks, 24 Aug. 1952, 20870, 20871.

Neckera complanata (L.) Huebn.

PROV. RIZE: dist. Hemşin; Çat-Meydan Kobaca, 1100-1300 m., on decaying branches of *Buxus* and *Rhododendron flavum*, 2 Sept. 1952, 21226; Meydan Kobaca-Mollaveysi, 900-1100 m., *Alnus-Picea-Fagus* forest, 3 Sept. 1952, 21354 (with *Eurhynchium zetterstedtii*).

Thamnum alopecurum (L.) B. & S.

PROV. RIZE: dist. Hemşin; Meydan Kobaca-Mollaveysi, 900-1100 m., *Alnus-Picea-Fagus* forest, 3 Sept. 1952, 21341; İkizdere-Çarankaya Ya., 1200 m., shady banks, 25 Aug. 1952, 20890.

Isothecium viviparum (Neck.) Lindb. var. **robustum** B. & S.

PROV. GİRESUN: Yavuzkema1, 1600 m., 14 Aug. 1952, 20740a; Tamdere-Yavuzkema1, 1500 m., damp banks, 1 Aug. 1952, 20672.

PROV. RIZE: dist. Hemşin; Uskut Da., 700 m., 4 Sept. 1952, 21299; Çat, 1300 m., forest, 2 Sept. 1952, 21242; Ortaköy-Çat, 1700 m., 2 Sept. 1952, 21301; *ibid.*, 21319; Çat-Meydan Kobaca, 1100-1300 m., 2 Sept. 1952, 21217a; Meydan Kobaca-Mollaveysi, 900-1100 m., *Alnus-Picea-Fagus* forest, 3 Sept. 1952, 21366; İkizdere-Çarankaya Ya., 1200 m., shady banks, 25 Aug. 1952, 20890b.

Isothecium filescens (Brid.) Moenk.*

PROV. RIZE: İkizdere-Çarankaya Ya., 1800 m., on dead tree branch, 27 Aug. 1952, 20914.

Fontinalis antipyretica Linn.

PROV. ANTALYA: Kara Göl near Yuva, 100 m., on rocks in water by a spring, 7 Aug. 1949, 13904.

Anomodon apiculatus B. & S.

PROV. RIZE: İkizdere, 600 m., on shady banks on granite rocks, 24 Aug. 1952, 20857c.

Anomodon viticulosus (L.) Hook. & Tayl.

PROV. GİRESUN: Tamdere-Yavuzkema1, near Karınca, 1500 m., damp rocks, 13 Aug. 1952, 20719.

Lescuraea mutabilis (Brid.) Lindb. var. **saxicola** (Mol.) B. & S.

PROV. RIZE: dist. İkizdere; Vercinin Tepe, 3000 m., among stones, 29 Aug. 1952, 21133; *ibid.*, 21134b; Çarankaya Ya., 2300 m., 26 Aug. 1952, 20977a.

Pseudoleskea atrovirens (Dicks.) B. & S. var. *brachyclados* B. & S.
 PROV. RIZE: dist. İkizdere; Çarankaya Ya.-Başköy, 3000 m., granite rocks,
 26 Aug. 1952, 20941.

This variety is not mentioned by Mönkemeyer (1927) but is clearly distinguished by Roth (1904) and seems to be quite distinct. Our material closely matches Schimper's *exsiccati* "in rupestribus humidis summi Vogesi" and Brotherus' collection from the Caucasus "Imeretia, in alpe Bereleti, 1877."

Thuidium tamariscifolium (Neck.) Lindb.

PROV. RIZE: dist. Hemşin; Meydan Kobaca-Mollaveysi, 900-1100 m., *Alnus-Picea-Fagus* forest, 3 Sept. 1952, 21343a; İkizdere, 600 m., shady banks and granite rocks, 24 Aug. 1952, 20858b.

Thuidium delicatulum (L.) Mitt.

PROV. GİRESUN: Tamdere-Yavuzkema, near Karınca, 1500 m., damp rocks, 13 Aug. 1952, 20717.

PROV. RIZE: dist. Hemşin; Meydan Kobaca-Mollaveysi, 900-1100 m., *Alnus-Picea-Fagus* forest, 3 Sept. 1952, 21332; İkizdere, 600 m., shady banks, granite rocks, 24 Aug. 1952, 20863a; Rize, 100-200 m., on ground in *Alnus glutinosa* forest, 21 Aug. 1952, 20805a.

Cratoneurum commutatum (Hedw.) Roth

PROV. MARAS: dist. Çardak; Berit Da., 2300 m., near Arpa Çukuru Ya., by stream, 25 July 1952, 20267.

var. *falcatum* (Brid.) Moenk.

PROV. MARAS: dist. Göksun; Binboğa Da., on Işık Da., above Karlı Ya., 2200 m., by spring, 15 July 1952, 20024b.

PROV. RIZE: dist. Hemşin; Çat, 1300 m., forest, 2 Sept. 1952, 21237.

Cratoneurum filicinum (L.) Moenk.

PROV. ADANA: dist. Saimbeyli; between Süphandere and Feke, 2 July 1952, Davis 19791.

Hygrohypnum palustre (Huds.) Loeske var. *subsphaericarpum* (Schl.)

B. & S.

PROV. RIZE: dist. Hemşin; Ortaköy-Çat, 1700 m., 2 Sept. 1952, 21311.

Drepanocladus uncinatus (Hedw.) Warnst.

PROV. RIZE: dist. İkizdere; Cermanin Tepe above Cimil, 3200 m., 29 Aug. 1952, 21102.

Camptothecium philippeanum (Spruce) Kindb., near var. *gïrodi* Thér.

PROV. KAYSERİ: Bakir Da., between Kisge and Bakir Oluğu Ya., 1700 m., shady rocks in *Abietum*, 28 June 1952, 19488.

Camptothecium sericeum (L.) Kindb.

PROV. ADANA: dist. Feke; between Süphandere and Feke, 2 July 1952, 19790; Göksu gorge below Himmetli, 700-800 m., 9 July 1952, 19833.

PROV. KAYSERI: Bakir Da., between Kışge and Bakir Oluğu Ya., 1700 m., in Abietum, 28 June 1952, 19493, 19488.

PROV. MARAS: dist. Göksun; Binboğa Da., above Yalak, 2300-2400 m., 17 July 1952, 20113; Binboğa Da., in ravine on N.E. side of Işık Da., 1900 m., rocks, 16 July 1952, 20050, 20051.

Camptothecium lutescens (Huds.) B. & S.*

PROV. RIZE: dist. Hemşin; Çat-Meydan Kobaca, 1100-1300 m., 2 Sept. 1952, 21221.

var. *fallax* (Phil.) Breidl.

PROV. KAYSERI: Kışge at W. foot of Bakir Da., 1300 m., limestone rocks, 27 June 1952, 19215.

PROV. RIZE: dist. Hemşin: Ortaköy-Çat, 1700 m., 2 Sept. 1952, 21310; *ibid.*, 21313, 21245.

Brachythecium glareosum (Bruch) B. & S.*

PROV. RIZE: dist. Hemşin; Meydan Kobaca-Mollaveysi, 900-1100 m., *Alnus-Picea-Fagus* forest, 3 Sept. 1952, 21363; dist. İkizdere; Çarankaya Ya.-Başköy, 3000 m., granite rocks, 26 Aug. 1952, 20941a.

Brachythecium rivulare (Bruch) B. & S.

PROV. RIZE: dist. Hemşin; Meydan Kobaca-Mollaveysi, 900-1100 m., *Alnus-Picea-Fagus* forest, 3 Sept. 1952, 21344; Rize-Karadere, 300 m., on rather dry banks, 23 Aug. 1952, 20854a.

Brachythecium collinum (Schleich.) B. & S.

PROV. NIĞDE: Hasan Da. near Taşpınar Ya., 2500 m., on rocks, 16 June 1952, 18950.

Brachythecium populeum (Hedw.) B. & S. var. *rufescens* B. & S.

PROV. RIZE: İkizdere-Çarankaya Ya., 1200 m., shady banks, 25 Aug. 1952, 20891.

Cirriphyllum crassinervium (Tayl.) Loesk. & Fleisch.

PROV. RIZE: dist. Hemşin; Meydan Kobaca-Mollaveysi, 900-1100 m., *Alnus-Picea-Fagus* forest, 3 Sept. 1952, 21365a.

Eurhynchium striatum (Hedw.) Schp.

PROV. RIZE: İkizdere, 600 m., shady banks and granite rocks, 24 Aug. 1952, 20858c (with *Rhytidiadelphus triquetrus*); *ibid.*, 20868a (with *Dicranum scoparium*); *ibid.*, 20869; 20873a (with *R. triquetrus*); Rize, 100-200 m., shady banks, 21 Aug. 1952, 20788; *ibid.*, 20789a (with *Pogonatum aloides*).

Eurhynchium zetterstedtii Størm.*

PROV. GİRESUN: Tamdere-Yavuzkema1, 1500 m., damp banks, 10 Aug. 1952, 20674; *ibid.*, 20675; Tamdere-Yavuzkema1, near Karınca, 1500 m., damp rocks, 13 Aug. 1952, 20717 (with *Thuidium delicatulum*).

PROV. RIZE: dist. Hemşin; Meydan Kobaca-Mollaveysi, 900-1100 m., *Alnus-Picea-Fagus* forest, 3 Sept. 1952, 21354; *ibid.*, 21351; 21343b (with *Hylocomium brevirostre*); 21364a (with *Mnium undulatum*); İkizdere,

600 m., shady banks and granite rocks, 24 Aug. 1952, 20867a (with *Hylocomium proliferum*).

This species was recently described by Størmer (1943) who showed that the European "*Eurhynchium striatum*" was composed of two distinct types which he considered specifically distinct. *E. striatum*, *sensu stricto*, has narrow, acute leaves with an apical angle between 15° and 45°; *E. zetterstedtii* has broader more cordate leaves with an apical angle between 45° and 85°. From his study of herbarium material Størmer suggests that *E. striatum* tends to be more westerly in its distribution than *E. zetterstedtii*, the latter occurring chiefly to the east of a line between Oslo and Zurich. In the Pontic collections both species occur and match Størmer's Norwegian material [*E. striatum*, Rosendal in the Hardanger fjord, 11 Aug. 1943, and *E. zetterstedtii*, Nesøya in Askir, near Oslo]. They apparently occur frequently in the same locality in the Pontus but have not been found intermixed.

Entodon schreberi (Willd.) Moenkem.

PROV. RIZE: dist. Hemşin; Üsküt Da., 1000 m., 4 Sept. 1952, in forest, 21296; dist. İkizdere; Çarankaya Ya. 2300 m., 26 Aug. 1952, 20973a (with *Hylocomium proliferum*).

Plagiothecium muellerianum Schp.*

PROV. RIZE: dist. Hemşin; Meydan Kobaca-Mollaveysi, 900-1100 m., *Alnus-Picea-Fagus* forest, 3 Sept. 1952, 21342a (with *Mnium stellare*).

Plagiothecium latebricola (Wils.) B. & S.*

PROV. RIZE: dist. Hemşin; Meydan Kobaca-Mollaveysi, 900-1100 m., *Alnus-Picea-Fagus* forest, 3 Sept. 1952, 21368a.

Hypnum cupressiforme L.

PROV. ADANA: dist. Feke; Göksu gorge below Himmetli, 700-800 m., 9 July 1952, 19839.

PROV. RIZE: dist. Hemşin; Meydan Kobaca-Mollaveysi, 900-1100 m., *Fagus-Picea-Alnus* forest with *Buxus* undergrowth, 3 Sept. 1952, 21324; *ibid.*, 21362; Ortaköy-Çat, 1700 m., forest, 2 Sept. 1952, 21314; *ibid.*, 21317, 21320; Üsküt Da., between Mollaveysi and Hemşin, 1000 m., shady banks, 4 Sept. 1952, 21279; İkizdere, 600 m., shady banks, granite rocks, 24 Aug. 1952, 20859, 20860, 20861, 20872.

var. **tectorum** B. & S.

PROV. RIZE: Karadere-Guneyce, 500 m., 23 Aug. 1952, 20827.

var. **filiforme** Brid.

PROV. RIZE: dist. Hemşin; Meydan Kobaca-Mollaveysi, 900-1100 m., 3 Sept. 1952, 21337.

var. **minus** Wils.

PROV. RIZE: İkizdere, 600 m., shady rocks, banks, 24 Aug. 1952, 20865.

var. **mamillatum** Brid.

PROV. RIZE: dist. Hemşin; Meydan Kobaca-Mollaveysi, 900-1100 m., *Alnus-Picea-Fagus* forest, 3 Sept. 1952, 21326; Çat, 1300 m., forest, 2 Sept. 1952, 21241.

Hypnum revolutum (Mitt) Lindb.*

PROV. GİRESUN: Balaban-dağları (Kilinç Tepe) above Tamdere, 2600 m., by stream, 7 Aug. 1952, 20613.

PROV. NIĞDE: Hasan Da., 2900 m., with *Festuca*, on shady volcanic rocks, 16 Sept. 1952, 18967; *ibid.*, 16 June 1952, 18972.

Ctenidium molluscum (Hedw.) Mitt.

PROV. RİZE: dist. Hemşin; Üsküt Da., between Mollaveysi and Hemşin, 1000 m., 4 Sept. 1952, 21268; dist. İkizdere; Çarankaya Ya., 2300 m., shady volcanic rocks, 26 Aug. 1952, 20974.

PROV. RİZE: Rize, 100-200 m., on ground in *Alnus glutinosa* forest, 21 Aug. 1952, 20806.

Rhytidium rugosum (Hedw.) Kindb.*

PROV. RİZE: dist. Hemşin; Ortaköy-Çat, 1700 m., forest, 2 Sept. 1952, 21318b (with *Hylocomium proliferum*); *ibid.*, 21312.

Rhytidiadelphus triquetrus Warnst.

PROV. GİRESUN: Tamdere-Yavuzkema1, near Karınca, 1500 m., rocks, 13 Aug. 1952, 20721.

PROV. RİZE: dist. Hemşin; Ortaköy-Çat, 1700 m., 2 Sept. 1952, 21302; dist. İkizdere; Çarankaya Ya., 2300 m., shady volcanic rocks, 26 Aug. 1952, 20975; İkizdere, 600 m., shady banks, granite rocks, 24 Aug. 1952, 20873; *ibid.*, 20858.

Hylocomium proliferum (L.) Lindb.*

PROV. GİRESUN: Tamdere-Yavuzkema1, near Karınca, 1500 m., damp rocks, 13 Aug. 1952, 20718.

PROV. RİZE: dist. Hemşin; Ortaköy-Çat, 1700 m., forest, 2 Sept. 1952, 21316; *ibid.*, 21318; Çat-Meydan Kobaca, 1100-1300 m., 2 Sept. 1952, 21220; *ibid.*, 21222; İkizdere, 600 m., shady banks, granite rocks, 24 Aug. 1952, 20867; Çarankaya Ya.-Başköy, 3000 m., granite rocks, 26 Aug. 1952, 20939; Çarankaya Ya., 2300 m., 26 Aug. 1952, 20973.

Hylocomium brevirostre (Ehrh.) B. & S.*

PROV. RİZE: dist. Hemşin; Meydan Kobaca-Mollaveysi, 900-1100 m., *Alnus-Picea-Fagus* forest, 3 Sept. 1952, 21343d; *ibid.*, 21329, 21336.

Catharinea undulata (L.) Web. & Mohr

PROV. RİZE: Rize, 100-200 m., shady banks, 21 Aug. 1952, 20789b (with *Pogonatum aloides*).

Catharinea angustata Brid.

PROV. RİZE: dist. Hemşin; Üsküt Da., between Mollaveysi and Hemşin 1000 m., 4 Sept. 1952, 21266.

Pogonatum aloides (Hedw.) P. de B.

PROV. RİZE: Rize, 100-200 m., shady banks, 21 Aug. 1952, 20789; *ibid.*, 20819.

Pogonatum urnigerum (L.) P. de B.*

PROV. RIZE : Rize-Karadere, 300 m., moist banks, 23 Aug. 1952, 20847 ; dist. İkizdere ; Çarankaya Ya., 2300 m., 26 Aug. 1952, 20985a ; Çarankaya Ya.-Başköy, 3000 m., granite rocks, 26 Aug. 1952, 20940c.

Polytrichum alpinum L.

PROV. RIZE : dist. İkizdere ; Çarankaya Ya., 2300 m., shady volcanic rocks, 26 Aug. 1952, 20975 ; Cermanin Tepe above Cimil, 3200 m., 29 Aug. 1952, 21102 ; Rize-Karadere, 300 m., moist banks, 23 Aug. 1952, 20845.

var. **septentrionale** (Sw.) Lindb.*

PROV. RIZE : dist. İkizdere ; Çarankaya Ya.-Başköy, 3000 m., granite rocks, 26 Aug. 1953, 20940c.

Polytrichum attenuatum Menz.

PROV. RIZE : dist. Hemşin ; Üsküt Da., 700 m., in forest, 4 Sept. 1952, 21297 ; Meydan Kobaca-Mollaveysi, 900-1100 m., *Alnus-Picea-Fagus* forest, 3 Sept. 1952, 21339 ; *ibid.*, 21336a (with *Hylocomium brevirostre*) ; Ortaköy-Çat, 1700 m., 2 Sept. 1952, 21302b (with *Rhytidiadelphus triquetrus*) ; *ibid.*, 21321.

Polytrichum piliferum Schreb.*

PROV. GİRESUN : Balaban-dağları (Kilinc Tepe) above Tamdere, 2000 m., 7 Aug. 1952, 20586.

Polytrichum commune L.

PROV. RIZE : Rize-Karadere, 300 m., moist bank, 23 Aug. 1952, 20846.

HEPATICIS

Fegatella conica Corda

PROV. RIZE : Rize, 100-200 m., in *Alnus glutinosa* forest, 21 Aug. 1952, 20797 ; Rize-Karadere, 300 m., moist bank, 23 Aug. 1952, 20848b (with *Mnium undulatum*).

Metzgeria furcata (L.) Lindb.

PROV. RIZE : dist. Hemşin, Meydan Kobaca-Mollaveysi, 900-1100 m., *Alnus-Fagus-Picea* forest, 3 Sept. 1952, 21328a.

Metzgeria conjugata Lindb.

PROV. RIZE : dist. Hemşin ; Üsküt Da., between Mollaveysi and Hemşin, 1000 m., 4 Sept. 1952, 21267.

Metzgeria pubescens (Schrank) Raddi

PROV. RIZE : İkizdere-Çarankaya Ya., 1200 m., shady banks, 25 Aug. 1952, 20890.

Pellia epiphylla (L.) Lindb.

PROV. RIZE : Rize, 10 m., on banks, 22 Aug. 1952, 20820a.

Pellia fabbroniana Raddi.*

PROV. RIZE : Rize, on bank, 10 m., 22 Aug. 1952, 20815a.

Blasia pusilla L.*

PROV. RIZE : Rize-Karadere, 300 m., moist banks, 23 Aug. 1952, 20844.

Eucalyx obovatus (Nees) Breidl.*

PROV. RIZE : Rize-Karadere, 300 m., damp bank, 23 Aug. 1952, 20850.

Eucalyx hyalinus (Lyell) Breidl.*

PROV. RIZE : Rize-Karadere, 300 m., 23 Aug. 1952, 20845.

Haplozia riparia (Tayl.) Dum.*

PROV. RIZE : dist. Hemşin ; Meydan Kobaca-Mollaveysi, 900-1100 m., in *Fagus-Picea-Alnus* forest with *Buxus* undergrowth, 3 Sept. 1952, 21324.

Lophozia quinquedentata (Huds.) Cogn.*

PROV. RIZE : dist. İkizdere ; Çarankaya Ya.-Başköy, 3000 m., granite rocks, 26 Aug. 1952, 20940d ; dist. Hemşin ; Çat-Meydan Kobaca, 1100-1300 m., 2 Sept. 1952, 21217c.

Plagiochila asplenioides (L.) Dum.

PROV. GİRESUN : Tamdere-Yavuzkema1, 1500 m., damp banks, 10 Aug. 1952, 20672 ; *ibid.*, 20674.

PROV. RIZE : dist. Hemşin ; Meydan Kobaca-Mollaveysi, 900-1100 m., *Alnus-Picea-Fagus* forest, 3 Sept. 1952, 21342 ; *ibid.*, 21364, 21337, 21217, 21332, 21336, 21328, 21329 ; dist. İkizdere ; shady banks, granite rocks, 600 m., 24 Aug. 1952, 20859.

Calyptogeia trichomanis (L.) Corda

PROV. RIZE : Rize, on banks, 10 m., 22 Aug. 1952, 20820b (with *Pellia epiphylla*).

Anthelia julacea (L.) Dum.*

PROV. RIZE : dist. İkizdere ; Başköy (Cimil)-Cermanin Ya., Cermanin Tepe, 3100 m., by tarn, on damp soil, 29 Aug. 1952, 21047.

Diplophyllum albicans (L.) Dum.

PROV. RIZE : dist. Hemşin ; Üsküt Da., between Mollaveysi and Hemşin, 1000 m., 4 Sept. 1952, 21273.

Scapania verrucosa Heeg.

PROV. RIZE : İkizdere-Çarankaya Ya., 1200 m., shady banks, 25 Aug. 1952, 20891.

Scapania aspera Bern.*

PROV. RIZE : dist. Hemşin ; Çat-Meydan Kobaca, 1100-1300 m., 2 Sept. 1952, 21217d (with *Plagiochila asplenioides*).

Radula complanata (L.) Dum.*

PROV. RIZE: dist. Hemşin; Çat-Meydan Kobaca, 1100-1300 m., on rocks, 2 Sept. 1952, 21224; Meydan Kobaca-Mollaveysi, 900-1100 m., *Alnus-Fagus-Picea* forest, 3 Sept. 1952, 21338b (with *Mnium undulatum*).

Frullania tamarisci (L.) Dum.

PROV. RIZE: dist. Hemşin; Çat-Meydan Kobaca, 1100-1300 m., rocks, 2 Sept. 1952, 21218b; İkizdere, 600 m., shady banks, granite rocks, 24 Aug. 1952, 20862.

Frullania jackii Gottsche *

PROV. RIZE: İkizdere, 600 m., on shady banks or granite rocks, 24 Aug. 1952, 20857; *ibid.*, 20866b (with *Frullania tamarisci*); dist. Hemşin; Meydan Kobaca-Mollaveysi, 900-1100 m., *Alnus-Picea-Fagus* forest, 3 Sept. 1952, 21331b.

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