*Cryptogamie, Bryologie, 2012, 33 (3): 267-270*


# New and noteworthy records to the bryophyte flora of Turkey and Southwest Asia

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*(Received 7 September 2011, accepted 11 January 2012)*

**Abstract** – *Anthoceros caucasicus*, *Conardia compacta, Didymodon icmadophilus*, *Pohlia obtusifolia* and *Zygodon gracilis* are reported for the first time from Turkey, and two of them from Southwest Asia (*C. compacta*, *P. obtusifolia*). Additionally, *Diphyscium foliosum* and *Oligotrichum hercynicum* are re-discovered in the eastern Black Sea area after long time from their first collections.

***Anthoceros* / Bryophyta / *Conardia* / *Didymodon* / *Diphyscium* / Flora / *Oligotrichum* / Southwest Asia / Turkey**

## INTRODUCTION

Turkey is characterized by a high variety of different ecological landscapes which provide excellent niches for plant life, including bryophytes. Since the first floristic inventory 20 years ago (Frey & Kürschner, 1991), more than 100 taxa have been added to the country's bryoflora, increasing the total number of known species to 934 (171 liverworts, 760 mosses, three hornworts (Kürschner & Frey, 2011). Thus, Turkey has the highest bryophyte diversity of all countries of Southwest Asia (Near and Middle East).

Ongoing field studies of the inner west Anatolian volcanic areas in 2008 and the eastern Black Sea area in 2004 and 2011 resulted in further new saxicolous bryophyte communities, the discovery of *Anacolia menziesii* (Turner) Paris (Kürschner & Erdağ, 2009), as well as some additional species new to the bryophyte flora of Turkey, which are presented in the following.

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## NEW RECORDS

### Anthocerotophyta

***Anthoceros caucasicus*** Steph.

TURKEY: Rize, Çayeli to Kaptanpaşa, near Yesiltepe, c. 20 km S of Çayeli, 40°58'01"N, 40°47'44.9"E, 430 m; on wet soil bank in *Fagus orientalis-Picea orientalis* montane forest, 23/06/2011, M. Kirmaci & H. Kürschner 11-144 (hb. Kürschner and AYDN 2977).

The next locality of this species is in Georgia (Adjara area; Chikovani & Svanidze, 2004), close to the Turkish site. At present, the species is known from Southwest Asia only by a single record from Iran [in the Mazandaran area (Kürschner, 1996)]

### Bryophyta

***Conardia compacta*** (Drumm. *ex* Müll.Hal.) H. Rob.

TURKEY:Niğde, 10 km north of Niğde, Izanlidere, Uzandı streem, 38°01'53"N, 34°39'48"E, 1470 m; on rock near stream, 12/06/2010, coll. M. Kırmacı, H. Kürschner & A. Erdag (hb. AYDN 2895). **New to Southwest Asia.**

*Conardia compacta* has the small size and appearance of an *Amblystegium* species. It is, however, easily distinguished from members of this genus by the strongly denticulate leaves and a costa extending to the apex or percurrent. It was recorded for Southwest Asia before from Israel (Upper Galilee: Nahal Keziv, S. Nachmony 19 March 1955; Golan Heights: Tell-el Qadi, T. Kushnir 8 April 1942), but a re-examination of these collections has shown that the sample from the Upper Galilee was a misidentified *Rhynchostegiella letourneuxii* (Besch.) Broth., and the single collection from the Golan Heights seems rather scanty (Heyn & Herrnstadt, 2004).

***Didymodon icmadophilus*** (Schimp. *ex* Müll.Hal.) K.Saito

TURKEY: Konya, Between Karadağ and Kılbasan, 37°20'47,8"N, 33°10'58"E, 1130 m; on soil covered lava rock in *Stipa-Artemisia santonicum* steppe, 11/06/2010, coll. M. Kırmacı, H. Kürschner & A. Erdağ (hb. AYDN 2894). **New to Turkey**. Known in Southwest Asia from Afghanistan, Iraq, Iran and the Lebanon (Kürschner & Frey, 2011).

*D. icmadophilus* differs from the closely related *D. acutus* by the long excurrent costa and the abaxial papillose upper laminal cells, which are quadrate to roundish-quadrate with weakly thickened cell walls. By contrast, the upper laminal cells are ± rounded and smooth in *D. acutus*, and the cell walls are thick. Despite these differentiating characters and the much more slender appearance of *D. icmadophilus*, it is treated often only as a variety of *D. acutus* (cf. Kucera, 2000).

***Pohlia obtusifolia*** (Vill. ex Brid.) L.F.Koch

TURKEY:Rize, Ikizdere, Ovit Da, Aksu Göller, 40°39'08.1"N, 40°50'33.9"E, 3060 m; on rock near lake side, 15/10/2004, coll. H. Kürschner & G. Parolly 04-949 (hb. Kürschner). **New to Turkey**. Known in Southwest Asia from Afghanistan (Kürschner & Frey, 2011).

A subalpine to alpine species which in Europe frequently grows along streams with melt-water from glaciers, especially on glacial alluvium. The new record close the distributional gap between the European Alps and the Central Hindukush (Paghman Mts.). The sample from Aksu Göller fits well in this site

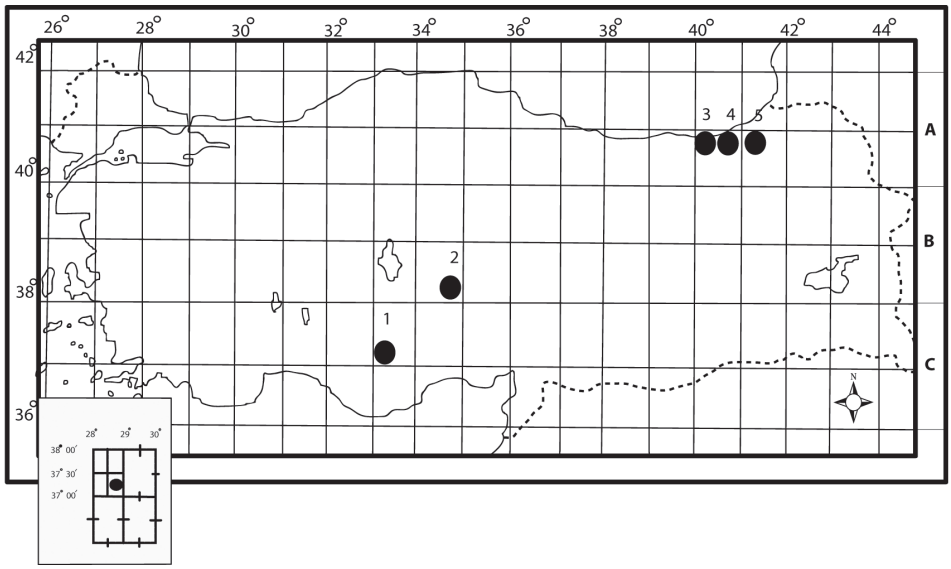


Fig. 1. Map of collection sites of reported taxa. **1.** *Didymodon icmadophilus;* **2.** *Conardia compacta;* **3.** *Zygodon gracilis;* **4.** *Anthoceros caucasicus, Diphyscium foliosum, Pohlia obtusifolia;* **5**. *Oligotrichum hercynicum.*

ecology. It has very concave, whitish-green, shiny leaves which are distinctly carinate. On a first look these characters resemble *P. pentasticha* Schiffn. from Iran, a distinctly 5-serriate taxon known only from the type locality (Silachor, June 1902, leg. Th. Strauß; cf. Schiffner, 1908). According to Schiffner (1908), *P. pentasticha* is closely related to *P. obtusifolia* [syn. *Webera cucullata* (Schwägr.) Schimp.] which also is known with some carinate forms from the European Alps.

***Zygodon gracilis*** Wilson

TURKEY: Trabzon, Of towards Uzungöl, near Çaykara, 40°46'18.3"N, 40°15'36.7"E, 340 m; on rock in *Castanea sativa-Carpinus orientalis* lowland forest, 22/06/2011, coll. M. Kirmaci & H. Kürschner 11-134 (hb. Kürschner). **New to Southwest Asia.**

Differs from *Z. dentatus* (Limpr.) Kartt. by its site ecology (mainly calcareous rocks), the recurved leaves when moist, and the absence of axillary gemmae. By contrast, *Z. dentatus*, which was recorded most recently by Lara et al. (2010) in the neighbouring Altndere valley, occurs on bark and has axillary gemmae.

## OLD RECORDS REDISCOVERED

***Diphyscium foliosum*** (Hedw.) D.Mohr

TURKEY: Rize, Çayeli to Kaptanpaşa, near Yesiltepe, c. 20 km S of Çayeli, 40°58'01"N, 40°47'44.9"E, 430 m, on acidic, wet soil bank beneath *Rhododendron ponticum* in *Fagus orientalis-Picea orientalis* montane forest, 23/06/2011, coll. M. Kirmaci & H. Kürschner 11-142b (hb. Kürschner and AYDN 2978).

First record since more then 100 years, when Freiherr H. v. Handel-Mazzetti collected this interesting species for the first time from northeast Anatolia (Giresun vilayet) [An Felsen und feuchter Erde am Steilhang Imbaschi unter der Kisyl Ali Jaila, 1300-1600 m, Juli 1907 Fr. H. v. Handel-Mazzetti Nr. 301 (Handel-Mazzetti,1909)]. Easily recognized, when fertile, by the short shoots, lanceolate, setaceous perichaetial leaves with a long excurrent costa, and the large, sessile, oblique capsules.

***Oligotrichum hercynicum*** (Hedw.) Lam *et* DC.

TURKEY: Rize, Kaçkar Dağları Milli Parkı, Ayder Yayla, near Galekuzu, 40°55'54.4''N, 41°08'34.5''E, 1650 m; on wet soil bank beneath *Rhododendron ponticum* scrub, 24/06/2011, coll. M. Kirmaci & H. Kürschner 11-161 (hb. Kürschner and AYDN 2979).

First record since 1960, when J. D. A. Stainton & D. M. Henderson (21 July 1960, no. 6308) collected it near Ilica (Rize province), 1000 m, on sandy soil (cf. Henderson, 1963). A typical montane to subalpine species, growing especially on sites with prolonged snow cover. Occasionally growing in the lowland.

**Acknowledgements -** We greatfully acknowledge the financial support of the field 2004, 2008 and 2011trips by the Adnan Menderes Üniversitesi and the Freie Universität Berlin. Special thanks are addressed to Gerald Parolly (Berlin), who joined the 2004 field trip.

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