



A note on *Pohlia ludwigii* (Spreng. ex Schwägr.) Broth., (Bryaceae, Musci) in Turkey

Mevlüt ALATAŞ^{*1}, Güray UYAR¹

¹Zonguldak Karaelmas University, Faculty of Sciences and Letters, Department of Biology, Zonguldak, Turkey

Abstract

Pohlia ludwigii (Sprengl. ex Schwägr.) Broth. is recorded for the second time in Turkey after more than half a century from the first recording time. And also with this record, this species is reported for the first time from Western Black Sea region of Turkey. A description of the species is given along with its ecology and a discussion of its phytogeographical significance.

Key words: Bryophyte flora, *Pohlia*, Bryaceae, Phytogeography, Turkey

----- * -----

Türkiye'deki *Pohlia ludwigii* (Spreng. ex Schwägr.) Broth., (Bryaceae, Musci) türü üzerine bir not

Özet

Pohlia ludwigii (Sprengl. ex Schwägr.) Broth. Türkiye'den ilk kaydının verildiği tarihten yarım yüzyıldan fazla bir zaman sonra ikinci kez kayıt edildi. Dahası bu kayıtla bu tür Türkiye'nin Batı Karadeniz bölgesinden ilk kez rapor edilmiş oldu. Türün ayrıntılı bir tanımlaması ile birlikte onun ekolojisi ve fitocoğrafik öneminin bir tartışması da sunuldu.

Anahtar kelimeler: Bryofit flora, *Pohlia*, Bryaceae, Bitkicoğrafyası, Türkiye

1. Introduction

During floristic investigations, authors collected some interesting Bryaceae specimens from Abant district in A2 grid-square adopted by Henderson (1961). One of these is *Pohlia ludwigii* (Sprengl. ex Schwägr.) Broth. This species was first recorded by Henderson in 1952 from Rize province, İkizdere district, Baltas peak, over wet soil, ca. 3200 m in A4 grid-square (Henderson, 1955) (Figure 1). Since then, it has not been recorded in Turkey. In this study, *Pohlia ludwigii* (Sprengl. ex Schwägr.) Broth. is recorded for the second time from Turkey and also the first time reported from the Western Black Sea region (Çetin and Yurdakulol, 1985, 1988; Çetin and Uyar, 1997; Uyar and Çetin, 2001; Çetin et al., 2002; Abay and Çetin, 2003; Uyar, 2003; Uyar and Çetin, 2004; Erdağ and Kürschner, 2005; Uyar and Çetin, 2006; Keçeli and Çetin 2006; Uyar et al., 2007; Ursavaş and Abay, 2009; Cangül and Ezer, 2010).

The Abant district is about 22 km south-west of Bolu (Western Anatolia, Turkey). It is lies approximately at the latitude 40°, 04' N and longitude 31°, 12' E. Phytogeographically, Abant Mountains, take part in transition zone between Euro-Siberian concerning seashore of black sea and Irano-Turanian floristic region concerning middle Anatolia. The heights of the region are approximately between 1000 and 1784 meters. In terms of climatic conditions Abant region shows a transitory character between the Mediterranean climate with a very cold and less rainy winter and oceanic climate (Akman, 1999). These geographical and climatically conditions of the region provide rich floristic diversity for this region (Özhatay et al., 2005).

* Corresponding author / Haberleşmeden sorumlu yazar: Tel.: +903722574010/1349; Fax.: +903722574010; E-mail: mevlutalatas@hotmail.com

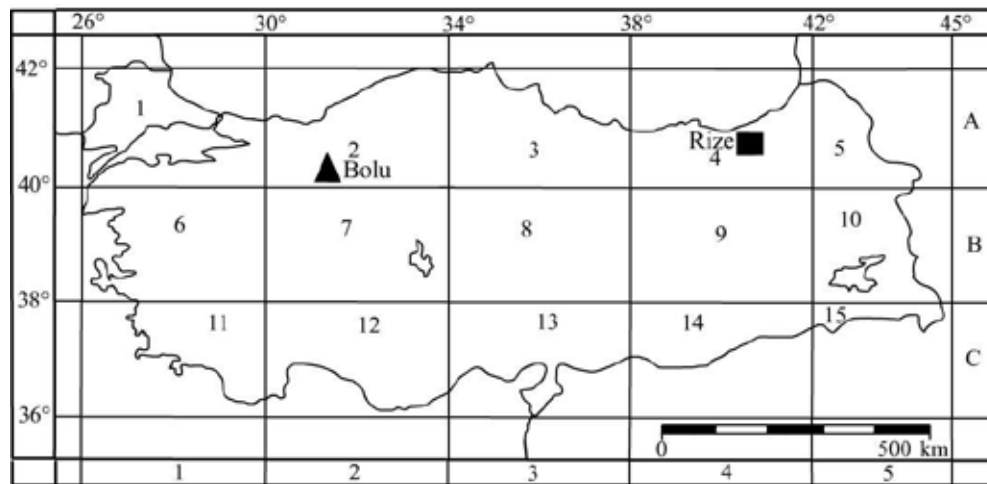


Figure 1. Distribution of *Pohlia ludwigii* in Turkey and grid system adopted by Henderson (1961).

- ▲ Geographic location of the study area
- The first record location of *Pohlia ludwigii* (Henderson, 1955)

The main vegetation types of this mountain chain are meadows near the lake and, beyond the meadows, there are forests. To the south, there is a mixed forest (*Fagus* L., *Carpinus* L., *Quercus* L., *Acer* L., *Crataegus* L., *Pyracantha* M.J.Roemer and *Juniperus* L.). In the other regions, *Pinus* L. and *Abies* Miller make up mixed and pure stands. On the tops of the hills, alpine zones are present (Uçar Türker & Güner, 2003).

Pohlia ludwigii (Spreng. ex Schwägr.) Broth., Acta Soc. Sci. Fenn., 19 (12): 27. 1892. Synonyms: *Mniobryum ludwigii* (Spreng. ex Schwägr.) Loesk., Stud. Morp. Syst. Laubm. 124. 1910. *Bryum ludwigii* Schwägr. Sp. Musc. Frond., Suppl. 1(2): 95. Pl. 68. 1816. Type: Europe. In addition, this plant "Pembevida Yosunu" is known by the Turkish name.

Plants medium-sized, (1–) 2–10 (–15) cm high, green above and reddish brown below in lax or dense tufts. Stems erect, simple and seldom foliate, with a few rhizoids at base. Leaves shrunken when dry, patent when moist, lax and distant arranged, oblong ovate to narrowly ovate-lanceolate, broadly decurrent at base, margins plane, sinuose or faintly serrulate near apex; costae brownish ending below the apex; leaf cells elongate-rhomboidal, 60–100 μm x 16–24 μm ; lower marginal and basal cells narrower and thin-walled, Sporophytes not seen (Figure 2).

1.1 Specimen examined

Turkey, Bolu province, Abant district, Erelti plateau (N 40° 38', E 031° 19'), in *Abies nordmannia* (Stev.) Spach subsp. *bornmuelleriana* (Matff.) Coode & Cullen and *Pinus sylvestris* L. mixed forest, on wet soil, alt. 1410 m, 15. 06. 2011, (Herb. UYAR), ALATAŞ 789.

1.2 World Distribution

Scattered higher altitudes in northern Europe north to Svalbard, Faeroes, Iceland, Greenland, West, Central, East Europe and Pyrenees in southwest Europe, China, Japan, Northern Part of Ural Mountains in Russia, Caucasus, Turkey, Iran, Kenya and North America (Ignatov & Afonina, 1992; Nyholm, 1993; Smith, 2004; Frey et al., 2006; Xing-Jiang & Crosby, 2007; Kürschner, 2008).

1.3 Ecology

This circumpolar species prefers on wet or moist sandy or gritty soils on streams-banks, flushes high in the mountain and late snow fields. It also grows on wet soil overlying outcrops rock, rock ledges and in scree (Dierßen, 2001; Atherton et al., 2010). The specimens collected in Turkey come from 2 different localities on brown forest soils where on the granite and granodiorite main rock. Accompanying moss species in new collecting locality of the species in Bolu province are such as; *Marchantia polymorpha* L., *Mnium spinosum* (Voit) Schwägr., *Philonotis calcarea* (Bruch & Schimp.) Schimp., *Hygroamblystegium fluviatile* (Hedw.) Loeske., *Dicranella heteromalla* (Hedw.) Schimp., *Pohlia wahlenbergii* (F.Weber & D.Mohr) A.L.Andrews., *Weissia brachycarpa* (Nees & Hornsch.) Jur, *Rhizomnium punctatum* (Hedw.) T.J.Kop., *Oxyrrhynchium hians* (Hedw.) Loeske and also *Pleurozium acuminatum* Lindb.

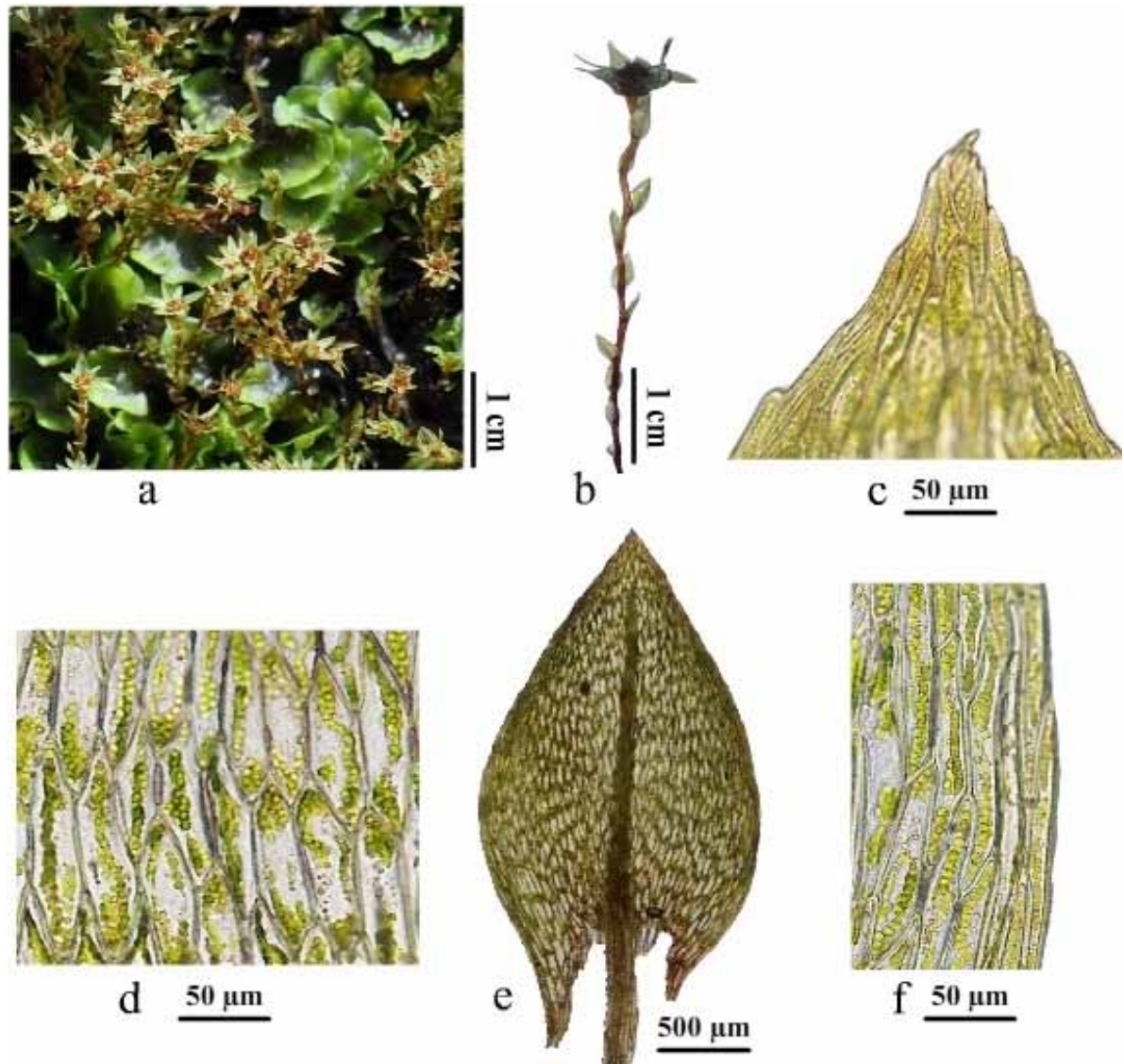


Figure 2. *Pohlia ludwigii*: a- Habit, b- Shoot, c- Apex, d- Mid-leaf cells, e- Leaf, f- Leaf edge.

2. Discussion

Pohlia ludwigii dissimilar other *Pohlia* species with its leaf base that widely runs down onto the stem. In addition, at first sight this species resembles to *Bryum weigelii* Spreng. but *B. weigelii* differs from *P. ludwigii* in its upper leaves usually being pink rather than green and its leaves more widely spaced down the stem.

Although *P. ludwigii* almost occurs in the whole Europe, until now it has not been recorded in Bulgaria (Natcheva & Ganeva, 2005). The nearest localities of this species are situated in Greece and Romania at the Balkan countries (Sabovljević et al., 2008). Nevertheless, it was recorded only one locality where; Golestan Province is one of the 31 provinces of Iran, located in the north-east of the country, south of the Caspian Sea from South-west Asia (Akhani & Kürschner, 2004). The first report of this rare circumpolar-mountain species in Turkey corresponded to Rize province at high altitude (ca 3200 m a.s.l.) (Henderson, 1955), whereas in this study it was collected from a rather low locality (ca 1400 a.s.l.) than it had been in Turkey. Thus this new finding extends its distribution range to the Western Black Sea region in Turkey. In addition, this record filled distributional gap of this species between southwest Asia and Balkan countries. Consequently, the new record is not surprising because of its distribution line. In our opinion, with the increasing floristic studies on bryophyte flora of Turkey especially in less studied regions can be added significant new records to Turkish bryophyte flora.

Acknowledgements

We would like to thank the Research Fund of Zonguldak Karaelmas University (Project number: 2011-10-06-06) for its financial support.

References

- Abay, G., Çetin, B. 2003. The Moss Flora (Musci) of Ilgaz Mountain National Park. *Turkish Journal of Botany*. 27: 321-332.
- Akhani, H., Kürschner, H. 2004. An annotated and updated checklist of the Iranian bryoflora. *Cryptogamie, Bryologie*. 25: 315-347.
- Akman, Y. 1999. İklim ve Biyoiklim (Biyoiklim metodları ve Türkiye İklimleri). Kariyer Matbaacılık, Ankara.
- Atherton, L., Bosanguet, S., Lawley, M. 2010. British mosses and liverworts a field guide. British Bryological Society, London.
- Cangül, C., Ezer, T. 2010. The Bryophyte Flora of Kaplandede Mountain (Düzce, Turkey). *Flora Cryptog. Estonica*. 47: 3-12.
- Çetin, B., Yurdakulol, E. 1985. Gerede-Aktaş (Bolu) Ormanlarının Karayosunları (Musci) Florası. *Doğa Bilim Dergisi*. 9 (1): 29-38.
- Çetin, B., Yurdakulol, E. 1988. Yedi Göller Milli Parkı'nın Karayosunu (Musci) Florası. *Doğa Türk Botanik Dergisi*. 12 (2): 128-146.
- Çetin, B., Uyar, G. 1997. The Moss Flora of Sinop and its Environs (Ayancık, Boyabat and Gerze). *Turkish Journal of Botany*. 21: 231-244.
- Çetin, B., Unç, E., Uyar, G. 2002. The Moss Flora of Ankara - Kızılcahamam - Çamkoru and Çamlıdere Districts. *Turkish Journal of Botany*. 26: 91-101.
- Dierßen, K. 2001. Distribution, ecological amplitude and phytosociological characterization of European bryophytes. *Bryophytorum bibliotheca*. 56: 1-289.
- Erdağ, A., Kürschner, H. 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. *Turkish Journal of Botany*. 29: 95-154.
- Frey, W., Frahm, J.P., Lobin, W. 2006. The Liverworts, Mosses and Ferns of Europe. Harley Books. Essex.
- Henderson, D.M., Murhead, C.W. 1955. Contributions to the bryophyte flora of Turkey. Notes from the Royal Botanic Garden Edinburgh. 22: 29-43.
- Henderson, D.M. 1961. Contribution to the Bryophyte Flora of Turkey: IV. Notes from Royal Botanic Garden Edinburgh. 23: 263-278.
- Ignatov, M.S., Afonia, O.M. 1992. Check-list of mosses of former USSR. *Arctoa*. 1: 1-85.
- Keçeli, T., Çetin, B. 2006. A Contribution to the Liverwort Flora of Western Black Sea Region, Northern Turkey, and a new record (*Cephaloziella dentata*, Cephaloziellaceae) to Southwest Asia. *Cryptogamie, Bryologie*. 27 (4): 459-470.
- Kürschner, H. 2008. A key to the acrocarpous mosses (Bryophytina p. p., excl. Pottiaceae) of the Near and Middle East. Towards a bryophyte flora of the Near and Middle East, 7. *Nova Hedwigia*. 86: 43-103.
- Natcheva, R., Ganeva, A. 2005. Check-list of the bryophytes of Bulgaria. II. Musci. *Cryptogamie, Bryologie*. 26: 209-232.
- Nyholm, E. 1993. Illustrated Flora of Nordic Mosses. Fasc 3: Bryaceae - Rhodobryaceae - Mniaceae - Cinclidiaceae - Plagiomniaceae. Nordic Bryological Society. Lund.
- Özhatay, N., Byfield, A., Atay, S. 2005. Türkiye'nin 122 Önemli Bitki Alanı. Mas Matbaacılık, İstanbul.
- Sabovljević, M., Natcheva, R., Dihoru, G., Tsakiri, E., Dragičević, S., Erdağ, A., Papp, B. 2008. Check -list of the mosses of SE Europe. *Phytologia Balcanica*. 14 (2): 207-244.
- Smith, A.J.E. 2004. The Moss Flora of Britain and Ireland (Second Edition). Cambridge University Press, Newyork.
- Uçar Türker, A., Güner, A. 2003. Plant Diversity in Abant Nature Park (Bolu), Turkey. *Turkish Journal of Botany*. 27: 185-221
- Ursavaş, S., Abay, G. 2009. Contributions to the bryoflora of Ilgaz Mountains, Yenice Forests, Turkey. *Biological Diversity and Conservation* 2 (3): 112-121.
- Uyar, G., Çetin, B. 2001. The Moss Flora of Ankara - Kızılcahamam Soğuksu Nationalpark. *Turkish Journal of Botany*. 25: 261-273.
- Uyar, G. 2003. The Moss Flora of Düzce-Akçakoca Mountains. *Ot Sistematik Botanik Dergisi*. 10: 77-95.
- Uyar, G., Çetin, B. 2004. A new check-list of the mosses of Turkey. *Journal of Bryology*. 26: 203-220.
- Uyar, G., Çetin, B. 2006. Contribution to the Moss Flora of Turkey: Western Black Sea Region (Bolu, Kastamonu, Karabük, Bartın and Zonguldak). *International Journal of Botany*. 3: 229-241.
- Uyar, G., Alataş, M., Ören, M., Keçeli, T. 2007. The Bryophyte Flora of Yenice Forests (Karabük, Turkey). *International Journal of Botany*. 2: 129-146.
- Xing-Jiang, L., Crosby, M.R., He, S. 2007. Moss Flora of China, Volume 4: Bryaceae to Timmiaceae. Missouri Botanical Garden Press, St. Louis.

(Received for publication 05 October, 2011; The date of publication 15 December 2011)