Cryptogamie, Bryologie, 2008, 29 (1): 103-106

Dicranum flexicaule Brid. (Dicranaceae, Bryopsida), new to the moss flora of southwest Asia

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(Received 27 December 2007, accepted 9 June 2007)

Abstract – *Dicranum flexicaule* Brid. is recorded for the first time in southwest-Asia, from specimens collected in northeastern Turkey. A site description, illustrations and a few characters of the Turkish specimens different from the European ones are given, together with notes on its distribution and ecology in the studied area.

Bryophyta / Mosses / Kaçkar Mountains / Turkey

INTRODUCTION

D. flexicaule Brid. has long been considered to be a variety of *Dicranum congestum* Brid. (Bruch *et al.,* 1847) and *D. fuscescens* Sm. (Wilson, 1855), until Nyholm raised it at specific rank (Nyholm, 1986). In fact, most the North American bryologists have considered it a variety of *Dicranum fuscescens* Sm. (Anderson *et al.,* 1990). Although *D. flexicaule* can easily be confused with *D. fuscescens*, the former taxon differs from *D. fuscescens* and *D. congestum* by 1) its irregularly and non mamillose upper lamina cells, 2) its less regularly serrate leaf margins, 3) its costa in upper third of the leaf not regularly toothed on the abaxial side and (4) its smooth, curved capsule with large annulus cells (Nyholm, 1986; Smith, 2004; Hedenäs & Bisang, 2004; Hallingbäck *et al.*, 2006). Based on these differences, the European bryologists have considered it to be a separate species, as it is has been recently recorded in Hill *et al.* (2006).

Dicranum flexicaule is a typical arctic-mountainous species. Up to now, it has been frequently reported from northern Europe as well as from alpine and

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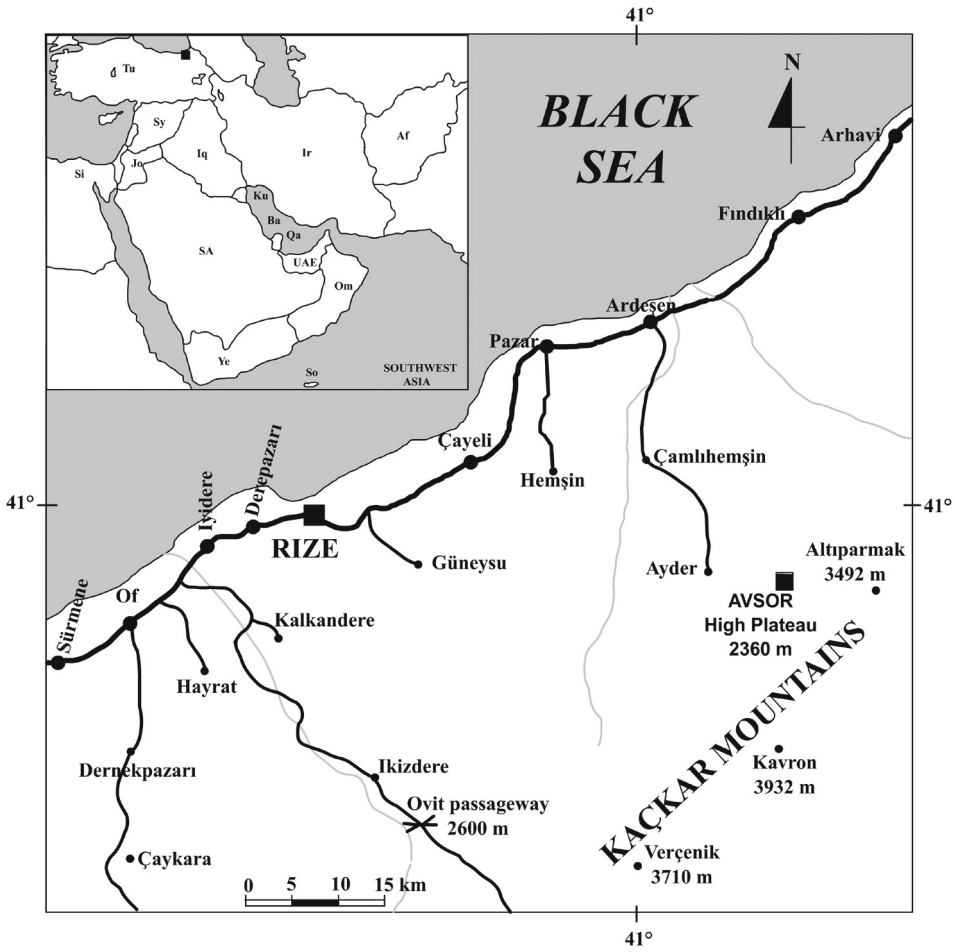


Fig. 1. The position of Turkey in SW Asia and the distribution of *Dicranum flexicaule* Brid. The square represents the new locality in Turkey. Abbreviations: Af: Afghanistan; Ba: Bahrain; Ir: Iran; Iq: Iraq; Is: Israel; Jo: Jordan; Ku: Kuwait; Le: Lebanon; Om: Oman; Qa: Qatar; SA: Saudi Arabia; Si: Sinai Peninsula/Egypt; So: Socotra/Yemen; Sy: Syria; Tu: Turkey; UAE: United Arab Emirates; Ye: Yemen.

sub-alpine zones in central and southern Europe. In Asia it has been reported from the Caucasus, Middle Asia, Far East and Siberia. Finally, it has been recorded in Greenland and N. America. Nevertheless, until now, *D. flexicaule* was unknown in SW Asia.

This paper reports on a recent find of *Dicranum flexicaule* in the vicinity of the Kaçkar mountains (Fig. 1) which constitutes the first record of the species in Turkey and southwestern Asia. The nearest localities of *D. flexicaule* are located at the central part of the Balkan range, in Bulgaria, and the Caucasus: Georgia, Armenia, Azerbaijan, and Stavropol and Krasnodar Provinces (Natcheva & Ganeva, 2005; Ignatov & Afonina, 1992).

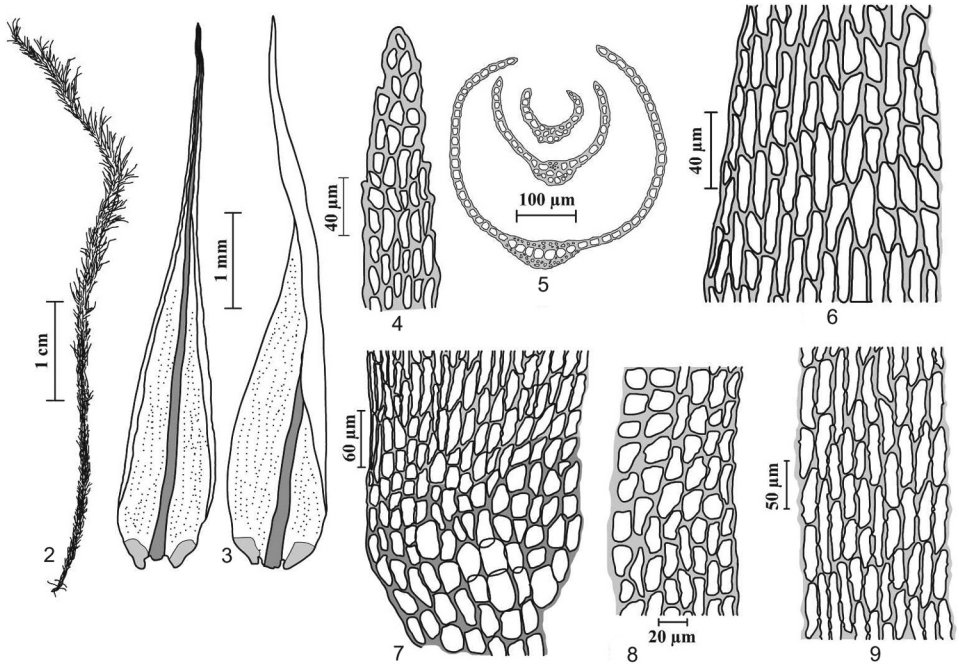
THE NEW LOCALITY

Turkey, Rize: Kaçkar Mountains, Avsor high-plateau, 40°56' 18.3'' N and 41°12' 10.5'' E, 2360 m, on soil at the bottom of rock slopes, 15.06.2005, UYAR 860.

The Kaçkar Mountains form an important range in eastern Karadeniz Mountains of Turkey. This range is the third most important glacial region in Turkey, after the Ağrı (Ararat) and Cilo-Sat Mountains (Fındık, 2001).

The specimens were gathered at 2400 m above sea level in cliff ledges in a rocky place nearby a glacial lake. It is an acidophytic species forming tall turfs on a variety of non-calcareous rocks such us granite, gneiss, basalt or sandstone. This species was found in only one sub-alpine locality in course of our trip throughout the Kaçkar mountains, between 2004 and 2006. So, it can be considered a rare species in the studied area.

Although the general characters of Turkish plants lie within the variability range of *Dicranum flexicaule*, a few different characters such as its tomentose reddish brown rhizoids and conspicuously pitted laminal cells between the alar and median cells, have been observed in this study (Figs 2-9). The gathering was abundant and contained well preserved material that grew together with *Dicranoweisia cirrata* (Hedw.) Lindb., *Dichodontium palustre* (Dicks.) M.Stech, *Ditrichum pusillum* (Hedw.) Hampe, *Grimmia decipiens* (Schultz) Lindb., *G. elatior* Bruch. *ex* Bals.-Criv. & De Not., *G. pulvinata* (Hedw.) Sm., *G. trichophylla* Grev., *Racomitrium heterostichum* (Hedw.) Brid., *R. macounii*



Figs 2-9. *Dicranum flexicaule* Brid. – **2.** Habit. **3.** Leaves. **4.** Leaf apex. **5.** Cross-sections of leaf cells from middle of leaf to near apex. **6.** Median leaf cells. **7.** Alar region. **8.** Upper marginal leaf cells. **9.** Leaf cells above the alar region.

Kindb., *R. macounii* Kindb. *ex* Kindb. subsp. *alpinum* (E. Lawton) Frisvoll and *R. microcarpon* (Hedw.) Brid.

Acknowledgements. We gratefully acknowledge financial support of the Turkish Scientific and Technical Research Council (TBAG – 2404). GU thanks the Swedish Museum of Natural History and the financial support through SYNTHESYS funding (SE-TAF-1934), which was made available by the European Community-Research Infrastructure Action under the FP6 "Strutting the European Research Area" Programme. Special thanks are due to Lars Hedenäs, who confirmed *Dicranum flexicaule* and supplied literature. Lastly, we also thank M. Ören for drawing the figures.

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