Two new records to the bryophyte flora of Turkey: 
**Crossidium crassinerve** (De Not.) 
**Jur. and C. laxefilamentosum** Frey et Kürschner 
(Pottiaceae, Bryophyta) 

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(Received 9 January 2009, accepted 20 May 2009) 

**Abstract** – *Crossidium crassinerve* and *C. laxefilamentosum* are recorded for the first time to the bryophyte flora of Turkey. Illustrations of these records with ecological and phytogeographical remarks including maps are presented. 

Bryophyta / Mosses / Turkey / Crossidium / Pottiaceae / Flora / Phytogeography 

INTRODUCTION 

The genus *Crossidium* Jur. can be distinguished from related xeropottioid taxa by its piliferous leaves (except *C. davidai* Catcheside, *C. laevisulcum* Thér. et Trab. and *C. woodii* (Delgard.) R. H. Zander) bearing assimilatory filaments on the adaxial surface of the costa. This character clearly differentiates the genus of similar *Alonia* Kindb. species, where filaments can be found on the costa, as well as on the most part of the leaf lamina. The closely related genus *Microcrossidium* Guerra & Cano is separated from *Crossidium* by the presence of a central strand (Cano *et al.*, 1993). 

*Crossidium* is a genus of arid zones, showing a xerothermic Pangaeanean distribution pattern related to a former Permo-Triassic continental Pangaeanean range (Frey & Kürschner, 1988). It consists of 11 species world wide (Cano *et al.*, 1993; Zander, 1993; Pócs *et al.*, 2004). 

In Turkey, at present only one species, *Crossidium squamiferum* (Viv.) Jur. with two varieties, *C. squamiferum* var. *squamiferum* and *C. squamiferum* var. *pottioides* (De Not.) Mönk. has been recorded (cf. Kürschner & Erdağ, 2005). The new records raise the number of *Crossidium* species in Turkey to three (Fig. 1). 

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Fig. 1. Distribution map of the *Crossidium* species in Turkey.

**Specimen examined:**

*C. crassinerve* (De Not.) Jur.  

**Turkey:** Aydın, Bozdoğan, Amasya locality, on soil, c. 500 m, N 37° 38' 20'', E 28° 29' 18'', 04.08. 2005, M.Cet. 569, AYDN!. – Province Aydın, between Yamalak and Aksaz, on soil, c. 340 m, N 37° 52' 09'', E 28° 38' 41'', 08.07, 2005, M.Kır. 3741, AYDN!. – Province Denizli, Denizli – Babadag cross road, on soil, c. 180 m, N 37° 54' 50.5'', E 28° 56' 04.3'', 23.03. 2006, M.Kır. 3741, AYDN!. – Province Aydn, on soil, c. 120 m, N 37° 52' 05.52'' E 027° 46' 26.39'', 14.03.2008, EMA 182, AYDN!
Crossidium crassinerve
and *C. laxefilamentosum* newly reported from Turkey

C. laxefilamentosum Frey & Kürschner

**Turkey:** Province Aydın, Kepez, Adnan Menderes University main campus area, on soil, c. 160 m, N 37° 51'E 027° 51', 13.10. 2004, MĆet. 500, AYDN! – Province Aydın, Kızılcaköy, on soil, c. 120 m, N 37° 52'E 027° 46', 14.03. 2008, EMA 187, AYDN!

C. squamiferum (Viv.) Jur. var. squamiferum  

**Distribution in Turkey:** (from the relevant literature and our own collection):  
Adıyaman (Papp, 2007), Amasya (Schifflner, 1897; Bornmüller, 1931), Ankara, Aydin (Walther, 1967; AYDN 21271), Bartın (Üyar & Çetin, 2005), Bilecik (Bornmüller, 1931), Denizli (AYDN 2262!), Elazığ, İskenderun (Bornmüller, 1931), İzmir, Kütahya (Walther, 1967), Malatya (Henderson, 1958), Manisa (Walther, 1967), Trabzon (Papp, 2004), Zonguldak (Üyar & Çetin, 2006) [see Fig. 1].

C. squamiferum (Viv.) Jur. var. pottioides (De Not.) Mönk.  

**Distribution in Turkey:** (from the relevant literature and our own collection):  
Ankara, Antalya (Bornmüller, 1931), Aydin (MCET 294, AYDN!), Bitlis – incl. Kahta and Sason ( Schifflner, 1913), Denizli (Walther, 1967; AYDN 22331), İskenderun (Juratzka & Milde, 1870; Schifflner, 1913), İzmir (Walther, 1970), Nigde (Walther, 1967) [see Fig. 1].

C. crassinerve (Figs 2-6) is widely distributed in the Northern hemisphere, including North America, North Africa, Europe and Asia (cf. Cano et al., 1993). By contrast, C. laxefilamentosum (Figs 7-10), a circum Tethyan floral element, was described and for a long time only known from the Arabian Peninsula (Frey & Kürschner, 1991). Meanwhile it was reported from various areas like the Balkan Peninsula, Spain, North Africa, and China (Pocs et al., 2004; Kürschner & Wagner, 2005).

Taxonomically, C. crassinerve and C. laxefilamentosum are closely related species sharing some common features such as pilose leaves, more or less isodiametric upper laminal cells and a long, twisted peristome. The papillosity and shape of the terminal cells of the supracostal assimilatory filaments is the main distinguishing character between the two species. These two new records can be easily distinguished from C. squamiferum by more or less isodiametric upper laminal cells which are oblique in C. squamiferum (Fig. 16).

The specimens collected in Turkey come from three different localities of the Menderes massif. Both species typically occur in the understorey of the common Mediterranean shrub vegetation, dominated by Quercus cocciifera L., Cistus creticus L., C. salviifolius L., Asphodelus aestivus Broit. and Pinus brutia Ten.

The soils here are slightly basic or neutral terra rosa type soil (Babadağ) or acidic soils including weathering products from metamorphic rocks (Aydın Mt., Karıncali Ms). Main annual precipitation during the summer period in the area is 58 mm/y, with a mean maximum temperature of 34,8 °C (in July). (Arslan et al., 2006).

Accompanying moss species in these localities are Aloina ambigu (Bruch et Schimp.) Limpr., Crossidium squamiferum, Didymodon acutus (Br.) K. Saito, D. luridus Hornsch., D. topheceus (Br.) Lisa, D. vinealis (Br.) R. H. Zander, Tortula muralis Hedw., Trichostomum crispulum Bruch and some weedy and ruderal species such as Bryum caespiticium Hedw. and Ceratodon purpureus (Hedw.) Brd. mostly on South faced soils, fully exposed to sun and irradiation resulting strong desiccation during the dry period lasting nearly 7 months in a year.

**Acknowledgements.** We are indebted to A. Menderes University for the Research Fund supporting the Doctoral Project of M. Kirmaci (FEP 05-003). Special thanks are addressed to Harald Kürschner (Freie University, Berlin) for his valuable comments on an early version of the manuscript and to Emre Agcagil (A. Menderes University) for collecting additional specimens of both taxa.
Crossidium crassinerve
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