

1-1-2004

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UYAR, GÜRAY and KEÇELİ, TAMER (2004) "A Note on *Ditrichum pusillum* (Hedw.) Hampe, (Ditrichaceae, Musci), in Turkey," *Turkish Journal of Botany*: Vol. 28: No. 4, Article 8. Available at: <https://journals.tubitak.gov.tr/botany/vol28/iss4/8>

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A Note on *Ditrichum pusillum* (Hedw.) Hampe, (*Ditrichaceae, Musci*), in Turkey

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Received: 24.04.2003

Accepted: 10.11.2003

Abstract: *Ditrichum pusillum* (Hedw.) Hampe has been collected for the first time from the Western Black Sea region of Turkey. A description of the species is given, along with notes on the ecology and a discussion of the phytogeographic significance. This note will provide better knowledge of the moss flora of Turkey.

Key Words: Moss flora, *Ditrichum*, *Ditrichaceae*, phytogeography, Turkey.

Türkiye'deki *Ditrichum pusillum* (Hedw.) Hampe, (*Ditrichaceae, Musci*) Türü Üzerine Bir Not

Özet: *Ditrichum pusillum* (Hedw.) Hampe Türkiye'nin Batı Karadeniz Bölgesinden ilk kez toplanmıştır. Türün ayrıntılı bir tanımlaması ile birlikte fitocoğrafik önemi ve ekolojisi de verilmiştir. Bu not Türkiye Karayosunları florasının daha iyi bilinmesine katkı sağlayacaktır.

Anahtar Sözcükler: Karayosunu florası, *Ditrichum*, *Ditrichaceae*, bitkicoğrafyası, Türkiye.

Introduction

Ditrichum pusillum (Hedw.) Hampe was first recorded from Muğla (C12), on low ground, on road side, on soil banks, ca. 130 m, 22.04.1992, T. 3524. (Düll, 1984; Çetin, 1988; Frey & Kürschner, 1991; Tonguç 2000). However, this species has never been collected from the Western Black Sea region of Turkey. In this study *Ditrichum pusillum* (Hedw.) Hampe is recorded for the first time from the Western Black Sea region (Çetin & Yurdakulol, 1985; Çetin & Yurdakulol, 1988; Çetin & Uyar, 1997; Keçeli & Çetin, 2000; Uyar & Çetin, 2001; Çetin et al., 2002).

Ditrichum pusillum (Hedw.) Hampe, Flora 50: 182. 1867.

Basionym: *Didymodon pusillus* Hedw., Spec. Musc. 104. 1801.

Syn.: *Ditrichum tortile* (Schrad.) Brockm., Laubm. Meckl., 1869. (Pedrotti 2001).

Plants tufted to scattered, yellow-green to dark green. Stems erect, leaves somewhat spreading and sometimes branched, 5-10 mm high, rarely higher. Leaves erect to spreading, 1-2.5 mm long, leaf apex ± flexuose, from lanceolate base narrowed into fine, channelled subula; margin plane or incurved below, recurved and bistratose above, plane and slightly obtusely denticulate at apex; costa percurrent, in cross section near the base with a narrow stereid band, in upper part of leaf with a dorsal stereid band and a small group of stereid cells above the guide cells, leaf cells near apex, cells narrow, elongate-rectangular below, at extreme base slightly widened, in upper part of leaves cells shorter; Inner perichaetial leaves from ovate base, long and narrowly subulate. Seta 1-1.5 cm long, brown. Capsule straight and erect or nearly so, brown, smooth, ovoid to cylindrical, peristome, 0.2-0.3 mm long, the teeth often twisted, divided nearly to the base, often

united at nodes below, papillose or more often obliquely striate, shorter and darker in colour bordering the mouth; operculum conical-rostrate 0.5-0.8 mm long. Spores 11-15 µm, pale smooth or almost so, mature in late autumn. Rhizoids with brownish gemmae, up to 150 x 100 µ in size (Figure 1).

This species is distinguished from related species by dioecious conditions, leaves gradually tapering, in the upper part subulate, not squarrose and not crisped; margins narrowly recurved denticulate above; seta brown; operculum 0.5-0.8 mm long, peristome teeth 0.2-0.4 mm long, papillose often united at base; spores smooth 11-15 µm and the presence of rhizoidal gemmae (Smith, 1978; Watson, 1981; Nyholm, 1986; Lawton, 1971; Frey, et al., 1995)

World distribution: Europe: Austria, Belgium, Great Britain, Czechoslovakia, Denmark, Finland, France, Germany, Ireland, Switzerland, Netherlands, Hungary, Iceland, Italy, Yugoslavia, Norway, Poland, Romania.

Russia and the former USSR: Northern region, Baltic region, Central region, South-western region, Caucasus.

Asia: North-east Asia, Central Asia, South-west Asia (Jordan).

Africa: North Africa, Macaronesia with Azores.

America: North America including Greenland, Central America.

Specimen examined: Düzce; Akçakoca mountains; Bacaklı plateau hill, near stream, in *Fagus orientalis* Lipsky forest, mixed with *Carpinus betulus* L., *Castanea sativa* Miller., *Abies bornmuelleriana* Mattf., *Pinus sylvestris* L., *Pinus nigra* Arn., *Taxus baccata* L., *Laurocerasus officinalis* Roemer. on wet soil, alt. 800 m, 6. ix. 2001, (herb. Uyar) UYAR 441.

Ecology: Plants on damp sandy soil, schistose craggy rocks, slopes, paths and road sides and fallow fields in sand pits below the subalpine belt.

Associated bryophyte species in the same habitat: *Pogonatum aloides* (Hedw.) P. Beauv. var. *minimum* (Crome.) Mol., *Dicranella heteromalla* (Hedw.) Schimp., *Ditrichum heteromallum* (Hedw.) Britt., *Pohlia elongata* var. *elongata* Hedw., *Philonotis tomentella* Mol.,

Drepanocladus revolvens (Sm.) Warnst., *Lunularia cruciata* (L.) Dumort. ex Lindb., *Metzgeria conjugata* Lindb. and also *Diplophyllum albicans* (L.) Dumort.

The study area is the A2 grid-square in the system adopted by Henderson (1961) (Figure 2). This region has a typical oceanic climate. The precipitation regime in the study area is oceanic climate type 2. There is no drought season in this climate type (Akman, 1990).

Forest vegetation consists of mainly *Fagus orientalis* Lipsky, *Carpinus betulus* L., *Coryllus avellana* L., *Castanea sativa* Miller., *Abies nordmanniana* (Steven) Spach., *Pinus sylvestris* L., *Pinus nigra* L., *Taxus baccata* L., *Prunus laurocerasus* L. and *Rhododendron ponticum* L. in the study area.

Discussion

Although this species was found almost all over Europe, in south-west Asia it was only found in Jordan by El-Oqlah et al. (1988). As is known, Turkey is a transition zone between Europe and the Middle East for many plants and animals. It is therefore expected to find this species in Turkey. It was firstly recorded in Muğla, which is ca. 800 km away from the recent study area. In our opinion, the reason for there being no record for *Ditrichum pusillum* between these localities could be that floristic studies on moss flora of Turkey are disorganised and localised. We hope that regional studies will be undertaken to complete the moss flora of Turkey in the near future. The distance between the old locality, Muğla, and the new locality (Düzce; Akçakoca mountains) and different extreme habitats indicate a high probability of its being found in the other fields not studied previously.

Acknowledgements

We would like to thank the curator of the herbarium of (S) L. Hedenäs, for his helpful support in the identification and checking with herbarium specimens and we also thank the Research Fund of Zonguldak Karaelmas University (Project number: 2000-13-03-10) for its financial support.

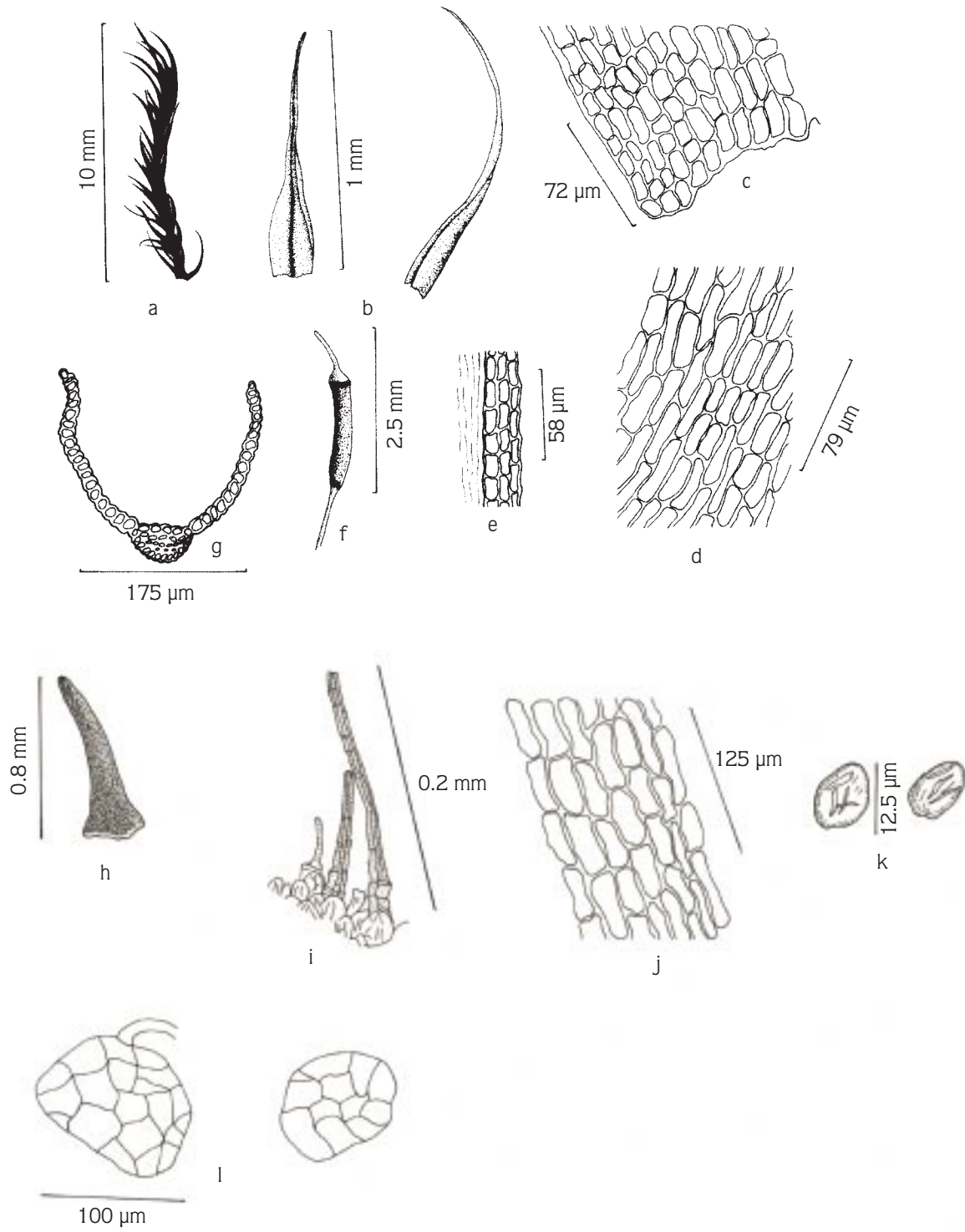


Figure 1. *Ditrichum pusillum*.

- a) Habit wet
- d) Between basal and upper laminal cells)
- g) Cross section of leaf
- j) Exothecial cells

- b) Leaves
- e) Upper cells
- f) Capsule
- k) Spores

- c) Basal laminal cells
- i) Peristome
- l) Rhizoidal gemmae

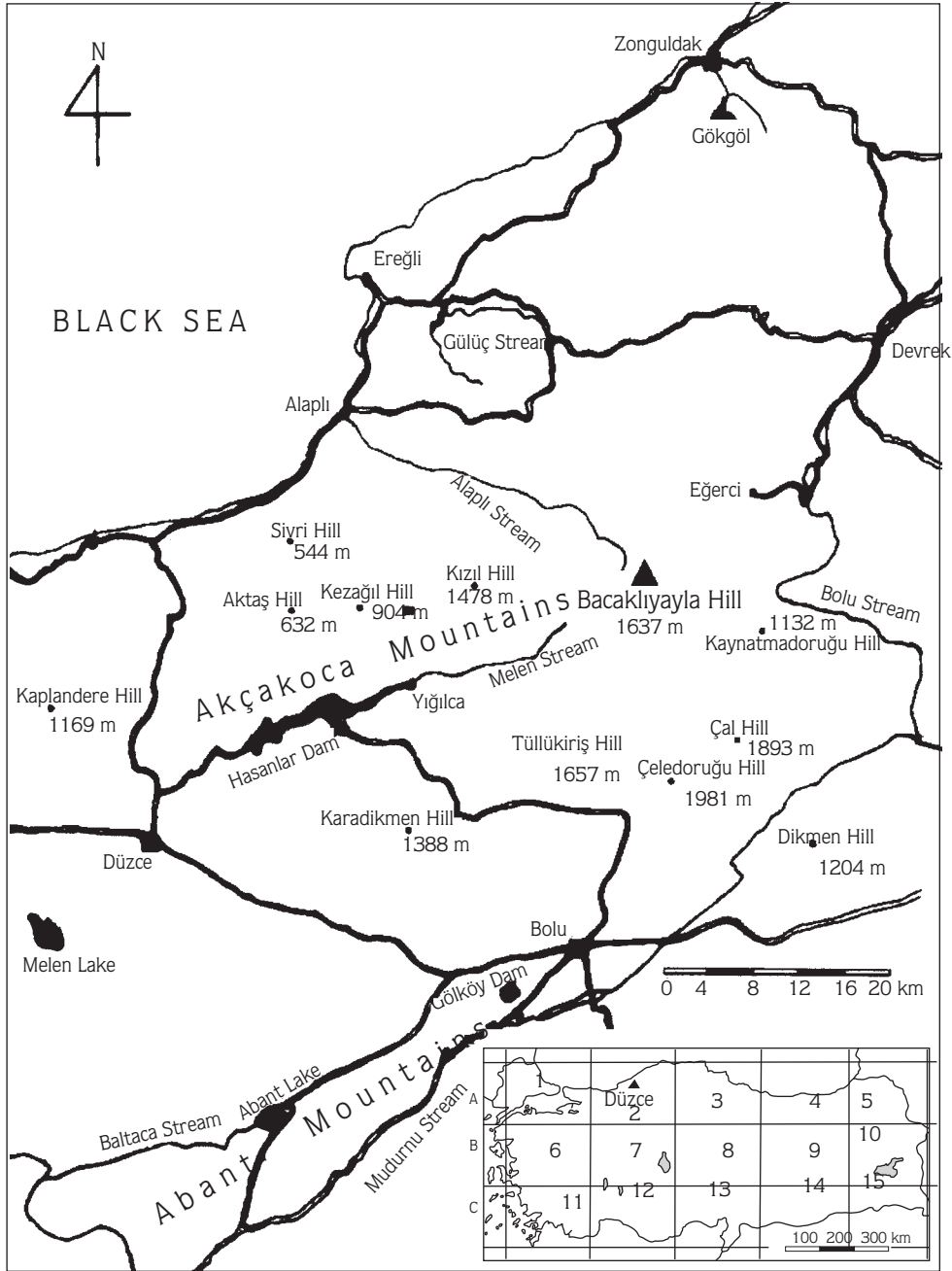


Figure 2. Distribution of *Ditrichum pusillum*(▲) in Turkey and grid system adopted by Henderson (1961).

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