

***Isothecium holtii* Kindb. (Brachytheciaceae, Bryopsida), new to the moss flora of Turkey**

Güray UYAR* & Muhammet ÖREN

Zonguldak Karaelmas University, Faculty of Science & Arts,
Department of Biology, 67100, Zonguldak-Turkey

Abstract – *Isothecium holtii* Kindb. (Brachytheciaceae) is recorded for the first time in Turkey. A site description, illustrations and diagnostic characters of the species are presented.

Bryophyta / Mosses / Brachytheciaceae / *Isothecium holtii* / Turkey / distribution / ecology

Résumé – *Isothecium holtii* est signalé pour la première fois en Turquie. La description du site et les illustrations des caractères diagnostiques de l'espèce sont présentées.

Bryophyta / Mousses / Brachytheciaceae / *Isothecium holtii* / Turquie / distribution / écologie

INTRODUCTION

Despite the great deal of research recently conducted on the bryophyte flora of Turkey, there is still much work to be done in all regions of this country. In this study, *Isothecium holtii* Kindb. is recorded for the first time in Turkey. Besides contributing to a better knowledge of the Turkish bryoflora, this new record makes a remarkable range extension of this species towards western Asia (Düll, 1984, 1985; Ignatov & Afonina, 1992; Frey *et al.*, 1995).

Brachytheciaceae Schimp. is a dominant family in northern and north-western side of Turkey (Çetin & Yurdakulol, 1988; Çetin & Uyar, 1997; Uyar & Çetin, 2001; Özdemir, 2001; Abay & Çetin, 2003) because of their oceanic climate with high annual rainfall (925-2700 mm) and strongly humid conditions. The number of species of *Brachytheciaceae* and *Pottiaceae* in this region is higher than that of other families (Erdağ & Yayıntaş, 1999; Yayıntaş, Higuchi & Tonguç, 1996; Çetin, 1999).

Five species of *Isothecium* occur in Europe: *Isothecium algarvicum* Nich. & Dix., *I. alopecuroides* (Dubois) Isov., *I. holtii* Kindb., *I. myosuroides* Brid. and *I. striatulum* (Spruce) Kindb. (Corley *et al.*, 1981; Corley & Crundwell, 1991). Until now, *Isothecium alopecuroides* and *I. myosuroides* have been recorded in Turkey

* Correspondence and reprints: guray7@hotmail.com

(Uyar & Çetin, 2004), while *Isothecium holtii* was found in Balıkesir province (Erdek county; Kapıdağ peninsula), and is here reported for the first time in Turkey (Fig. 1). The specimens are kept at the UYAR herbarium (Zonguldak).

Illustrations of diagnostic characters of *I. holtii* and comparisons with other similar specimens are given in this study. In addition, its distribution in Turkey is mapped.

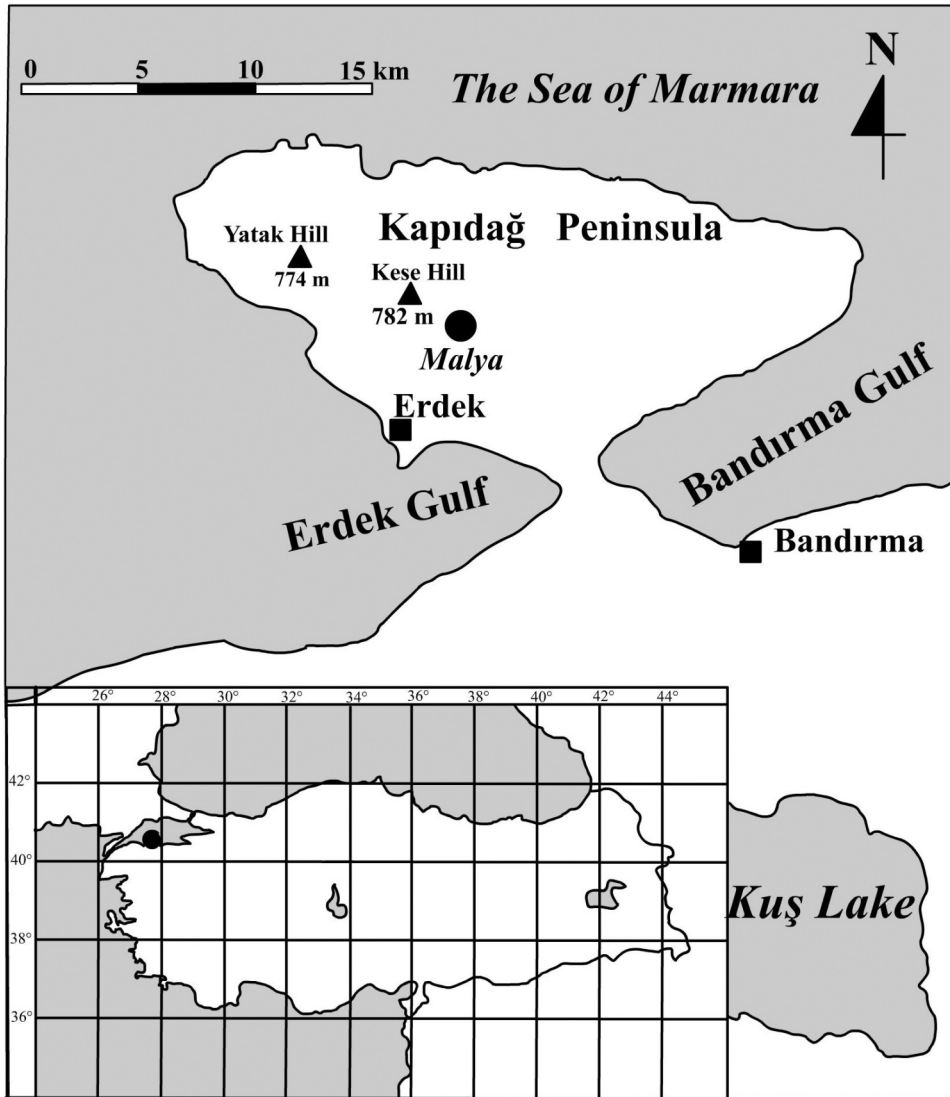


Fig. 1. Geographic location of the study area. The species locality.

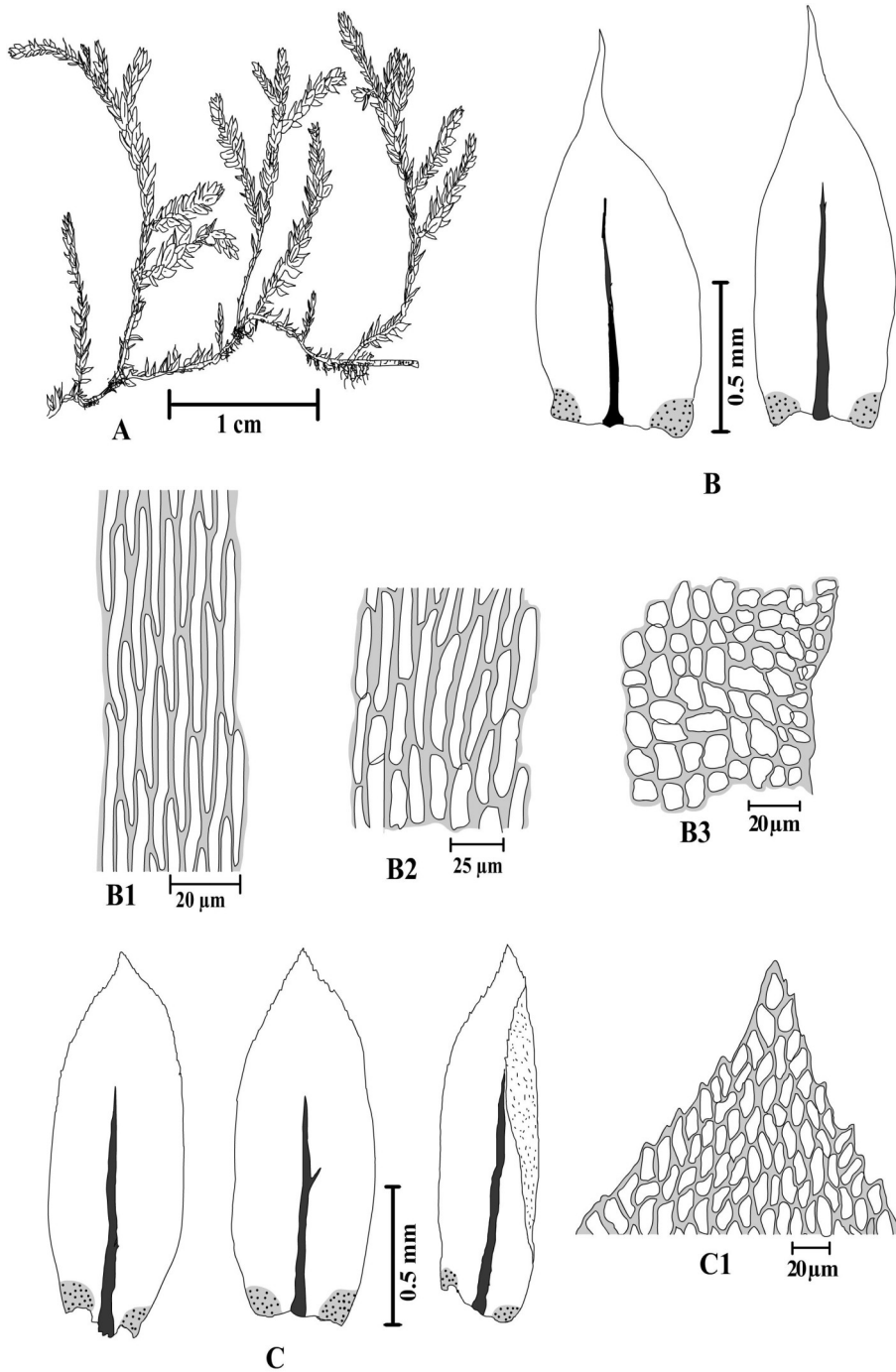


Fig. 2. *Isoetecium holtii* Kindb. – **A.** General view of plant. **B.** Stem leaves. **B1.** Mid-leaf cells. **B2.** Basal cells. **B3.** Alar cells. **C.** Branch leaves. **C1.** Leaf apex.

SITE DESCRIPTION

Kapıdağ peninsula is situated in the southwest of the Marmara sea. The study area is located between N40°22' - N40°30' and E027°42' - E028°00'. Granodioritic, granitic and volcanic rocks that belong to Paleozoic age constitute the main substratum type in the area (Ercan *et al.*, 1990). The common soil types in the region are inceptisols (Efe, 1999).

The study area has a typical humid Mediterranean climate. The annual rainfall in the region is 550 – 1500 mm. The annual rain average is 580 mm in Erdek town, but hills are above 782 m (i.e. Kese Hill), and take up to 1300 mm. The annual average temperature is between 8-15°C. The seasonal precipitation regime for a year is as follows: winter (W), autumn (A), spring (S) and summer (S) – (WASS) (Akman, 1999). Three main vegetation types are found there: humid forest, dry forest, maquis and pseudomaquis.

Isothecium holtii Kindb. (Fig. 2)

Specimen examined – Turkey, Balıkesir: Erdek, Kapıdağ peninsula, (40°27'16.0"N and 27°50'10.8"E) Malya place, in *Fagus orientalis* Lipsky, *Quercus petraea* (Matt.) Liebl. and *Q. frainetto* Ten. forest, on rock near a stream bed, 545 m, 17.09.2003, ÖREN 77.

At first sight, *Isothecium holtii* recalls small forms of *Thamnobryum alopecurum* and *Echinodium prolixum*. However *Thamnobryum alopecurum* has a stronger nerve and short papillose cells; phenotypes of *E. prolixum* which are similar to *I. holtii* occur. In addition the alar cells are also similar in *E. prolixum* and *I. holtii*. Nevertheless the two are separated by the more strongly denticulate stem leaf margin, the more longly acuminate stem leaf apex, the wider nerve, shorter basal cells and mid-leaf cells which are much less incrassate in *E. prolixum* than in *I. holtii*. Finally, *I. holtii* is separated from *I. myosuroides* and other species of the genus by its frequent orange tint, the longer and stronger branches, the more shortly pointed stem leaves and indistinct serrate leaves in branch leaf apex (Nyholm, 1979; Smith, 1980, Hedenäs, 1992).

Ecology – The plant is perennial, hygrophytic and mesothermophytic. It grows on acidic, limeless brown forest soils in the southern Mediterranean zone, where deciduous hardwood forests and coniferous and maquis forests belt are common. In general, European populations of *I. holtii* are known to occur in mountains of euoceanic areas. Our specimens were gathered at 500 m above sea level in a suboceanic-Mediterranean area. In all cases, this species prefers sites located near waterfall or near mountain stream beds on rocks, tree-roots and tree-boles in the inundation zone of fast flowing rivers, near waterfalls and deep ravines (Dierßen, 2001).

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