

**ORNITHOGALUM BEYAZOGLUI (HYACINTHACEAE), A NEW SPECIES
FROM WEST ANATOLIA, TURKEY**

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Abstract

Ornithogalum beyazoglui Y.Bağcı, Savran & O. D. Düşen sp. nov. (Hyacinthaceae), a new species is described and illustrated from İzmir, Ödemiş, Bozdağ (İzmir, Ödemiş province). Diagnostic morphological characters are discussed, including SEM examination of seed coat surface. Data are also presented on ecology, biogeography and conservation status of the new species.

Introduction

The genus *Ornithogalum* L. (Hyacinthaceae) consist of about 160 species (Manning *et al.*, 2009) and distributed in South Africa and around the Mediterranean basin, with many species of horticultural importance (Zahariad, 1980; Cullen, 1984; Heywood, 1993). Anatolia is an important distribution area for *Ornithogalum* in Asia.

Since *Ornithogalum* was revised by Cullen (1984) for the *Flora of Turkey*, thirty one new taxa or new records have been described from Turkey (Davis *et al.*, 1988; Özhatay, 2000; Düşen and Sümbül, 2002, 2003; Düşen and Deniz, 2005; Uysal *et al.*, 2005; Özhatay and Kültür, 2006; Bağcı *et al.*, 2009; Özhatay *et al.*, 2009; Yıldırımli, 2009; Koca and Yıldırımli, 2010). During a recent botanical expedition to İzmir in 2009, the authors collected some specimens of *Ornithogalum* which after critical examination were identified as new species *Ornithogalum beyazoglui* Y. Bağcı, Savran & O. D. Düşen.

Materials and Methods

In May of 2009, during an expedition to the Bozdağ (Ödemiş, İzmir) in the frame of the project “A Morphological, Karyological and Molecular Phylogenetic Revision of *Rorippa* Scop. (Brassicaceae) species in Turkey”, the authors collected some interesting *Ornithogalum* specimens. Further studies evidenced that they were not referable to any known taxon of the genus, and therefore a new species is here described.

A grid system was adapted for the division of the area of Turkey for the citation of specimens. This system divided Turkey into twenty-nine squares (Davis, 1965). According to this grid system, the new species growing in İzmir province falls within the A1 square.

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For scanning electron microscope (SEM) study, the seeds were transferred directly to double-sided tape affixed stubs and sputter-coated with gold plate. Photomicrographs were taken with a Jeol JSM-5600 electron microscope at the University of Erciyes (Kayseri), Faculty of Art and Education, Department of Biology.

Results

Ornithogalum beyazoglui Y. Bağcı, Savran & O. D. Düşen, *sp. nov.* (Figs 1 & 2)

Type: Turkey. A1 İzmir: Ödemiş, Bozdağ, High mountain steppe, 38°19'877" N, 28°06'956" E, 1750-1900 m, 9.6.2009, Bağcı 3936, Savran and Tutar (*Holotype:* KNYA, *Isotypes:* GAZI, PAMUH, Hb. Yıldırımılı).

Paratype: Turkey. A1 İzmir: Ödemiş, Bozdağ, High mountain steppe, damp pastureland, 1760 m, 13.5.2007, Bağcı 3604 and Savran (KNYA).

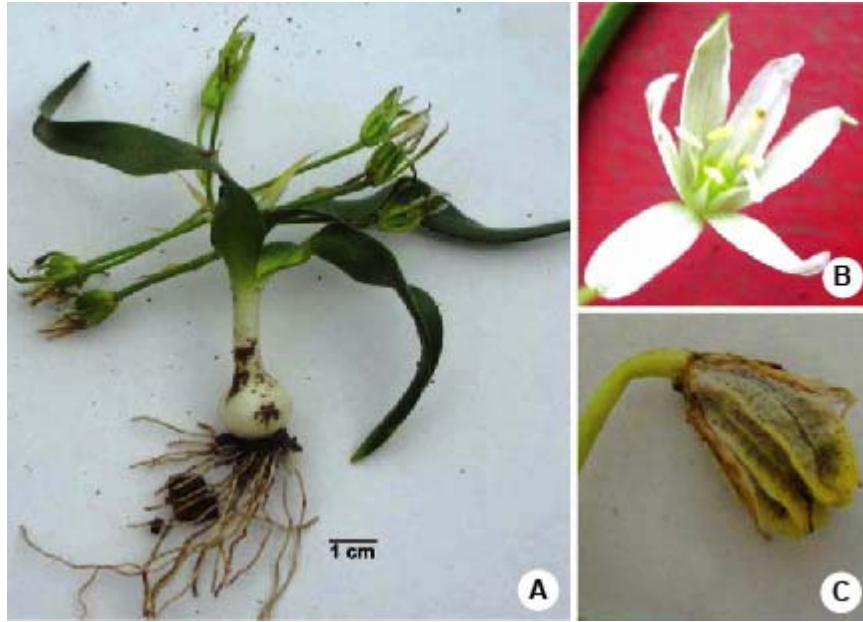


Fig. 1. *Ornithogalum beyazoglui* (A) Habit, (B) Flower, (C) Immature fruit.

Diagnosis: *Foliaris* 3-10 mm latitudo; *scapis* usque ad 6.5 cm longis; *perigonio segmentis* 9-12 mm longis; *pedicellis fructiferis valde recurvis*; *filamentis* 4-5 mm longis; *capsulis alatis*.

Plant 3.5-17.0 cm long. Bulb ovoid, 10-17 x 07-15 mm, without bulbils; outer tunics brown, inner whitish, membranous. Scape usually erect, 0.5-6.5 cm long, glabrous. Leaves 2-3 (-4), spreading or erect, usually lanceolate, sometimes linear-lanceolate, glabrous; 4-15 (-17) x 0.3-1.0 cm, much longer than scape, usually flat or slightly

canaliculate, or canaliculated only at the apex, gradually tapering to acute apex, without white median line, margin entire. Raceme corymbose; 2-12 flowered, pedicels up to 3 cm in flower and up to 4 cm in fruit, ascending at anthesis but some of them strongly recurved in fruit, longer than perianth segments. Bracts 0.5-2.0 cm long, lanceolate or linear to lanceolate, acuminate, equalling or shorter than pedicels. Perianth segments 9-12 mm long, white inside, green with narrow white margins outside. Filaments 4-5 x 1.0-1.5 mm, acuminate; anthers 2.0-2.5 mm long, whitish to dirty white, neither winged nor toothed. Ovary 2-3 x 1.5-2.0 (-3) mm wide, ovoid, longer than style; style c. 1.0-1.8 (-2) mm long. Capsule 0.6-1.0 x 0.5-1.0 cm, ovoid, winged. Seed numerous, black, 1.5-2.0 x 1.0-1.2 mm, rough, subglobose to globose. Flowering and fruiting time: May to June.

Etymology: This species is named in honour of the Turkish Botanist, Professor Dr. Osman Beyazoğlu (Department of Biology, Karadeniz Technical University).

Distribution and Ecology: *Ornithogalum beyazoglui* is a Turkish endemic species, restricted to the Bozdağ, Ödemiş-İzmir, West Anatolia, and an Irano-Turanian element. It grows on high mountain steppe and damp pastureland. Its altitudinal range is 1750-1900 m. The new species is associated with *Ornithogalum nutans*, *Centaurea* sp., *Rumex* sp., and *Euphorbia* sp.

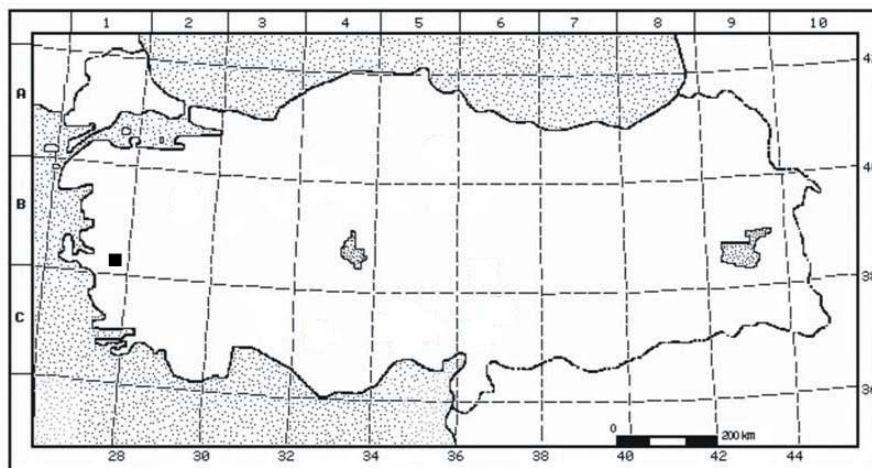


Fig. 2. Distribution map of *Ornithogalum beyazoglui* (■)

Conservational status: The specimens were collected in A1 İzmir (Ödemiş) where the species seems to be very rare and local (Fig 2). It is known only from the type locality. The range of this local endemic species is restricted to a single location (IUCN criterion B1a). The populations seem to be small and scattered on the mountain slopes where excessive grazing, erosion and human effects are threatening the species. Populations are pure, with an area of occupancy smaller than 10 km², and according to

field observations, it is estimated that the total number of individuals of these endemic species does not exceed 70-80 in its single locality (criteria B2a and C). Therefore we suggest that *Ornithogalum beyazoglui* should be labelled as Critically Endangered (CR), according to the IUCN (2001) red list categories.

Seed characteristics

In this study, the dorsal seed coat surface of *Ornithogalum beyazoglui* and *Ornithogalum lanceolatum* were examined in detail using scanning electron microscopy. Seeds of *O. beyazoglui* are blackish, subglobose to globose, 1.5-2.0 x 1.0-1.2 mm. The surface ornamentation is reticulate-rugulate. The seeds of *O. lanceolatum* are blackish, ovoid to oblong, 1.8-2.2x1.8-2.0 mm. The surface ornamentation is reticulate-striate (Fig. 3).

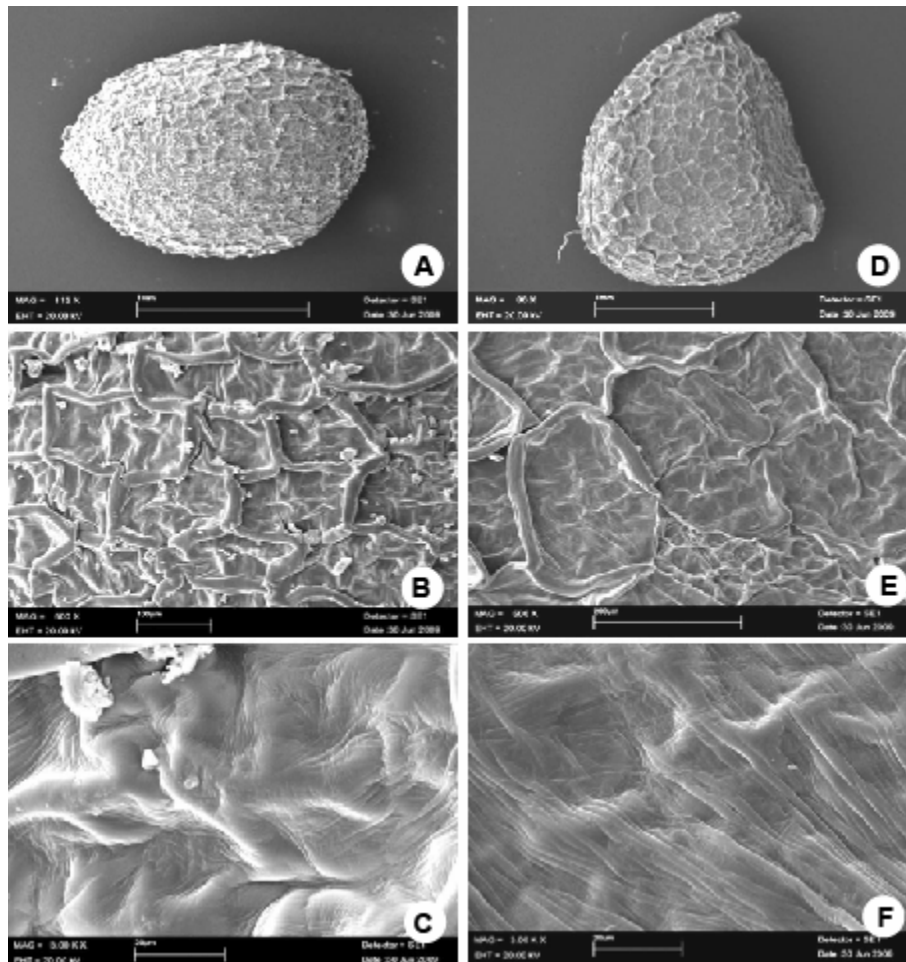


Fig. 3. SEM photographs of the seed coat. A, B & C: *Ornithogalum beyazoglui*; A) General view, B & C, Seed coat surface. D, E & F: *O. lanceolatum*; D) General view, E & F: Seed coat surface.

The Turkish endemic *Ornithogalum beyazoglui* is closely related to *O. lanceolatum*, however, the former differs from the later by having the following characters: fruiting pedicels usually strongly recurved (not erect-spreading); leaves width 3-10 mm (not 15-20 mm); filaments 4-5 mm long (not 6-7 mm) and capsule winged (not unwinged).

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