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## *Ornithogalum nurdaniae* (Liliaceae), a New Species from North-West Anatolia, Turkey

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**Abstract:** *Ornithogalum nurdaniae* Y.Bağcı & Savran sp. nov. (Liliaceae), a new species related to *O. oligophyllum* E.D.Clarke, is described and illustrated from Uludağ (the Bithynian Olympus), a mountain in NW Anatolia well known for its rich flora and many local endemics (A2 Bursa province). Diagnostic morphological characters are discussed. Notes are also presented on the ecology, biogeography, and conservation status of the new species.

**Key Words:** Liliaceae, Uludağ, endemic, taxonomy

### *Ornithogalum nurdaniae* (Liliaceae), Türkiye'nin Kuzey-Batı Anadolu Bölgesinden Yeni Bir Tür

**Özet:** Bursa bölgesinde zengin flora ve pek çok lokal endemiğe sahip olmasıyla bilinen Kuzey-Batı Anadolu'da bir dağ olan Uludağ'dan toplanan ve *Ornithogalum oligophyllum* E.D.Clarke ile yakın benzerlik gösteren *Ornithogalum nurdaniae* Y.Bağcı ve Savran yeni türü tanımlandı ve resimlendi. Ayırt edici morfolojik özellikleri tartışıldı. Ayrıca yeni türün ekolojisi, biyocoğrafyası ve koruma statüsü sunuldu.

**Anahtar Sözcükler:** Liliaceae, Uludağ, endemik, taksonomi

#### Introduction

The genus *Ornithogalum* L. (Liliaceae) has over 140 species throughout the world. It is a large genus centred in southern Africa and around the Mediterranean, with numerous species of horticultural note (Zahariadi, 1980; Cullen, 1984; Heywood, 1993). Anatolia is an important area for *Ornithogalum* in Asia: in recent years, 19 taxa have been added to the known species of *Ornithogalum* in Turkey, bringing the total to 43 taxa;

16 of these are endemic to Turkey (Davis et al., 1988; Özhatay, 2000; Düşen & Sümbül 2002, 2003; Uysal et al., 2005).

In June 2008, during an expedition to Uludağ (Bursa), as a part of the project on "Revision of the genus *Barbarea* R.Br. (Brassicaceae) in Turkey", the authors collected some interesting *Ornithogalum* specimens. The specimens were not referable to any known *Ornithogalum* species.

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The genus *Ornithogalum* was previously revised by Cullen (1984) for the flora of Turkey and was represented by 23 species in Turkey. In total, 17 new taxa or new records were added (Davis et al., 1988; Özhatay, 2000), *Ornithogalum pamphylicum* O.D.Düşen & Sümbül, *Ornithogalum isauricum* O.D.Düşen & Sümbül, and *Ornithogalum chetikianum* Uysal, Ertuğrul and Dural were described (Düşen & Sümbül 2002, 2003; Uysal et al., 2005). Including the new species described here, the

total number of *Ornithogalum* species in Turkey is increased to 44. The authors of plant names are given according to Brummitt and Powell (1992).

In addition, scanning electron microscopy was used to examine the seed surface of the *Ornithogalum* species distributed in the Black Sea region of Turkey and *Ornithogalum* populations were investigated in terms of numerical taxonomy in the subgen. *Ornithogalum*, Syn: Subgen. *Heliocharmos* Baker. (*O. sigmoideum* Freyn &



Figure 1. *Ornithogalum nurdaniae* sp. nov. (A), in the wild when flowering (B) and in the wild when in fruit (C).

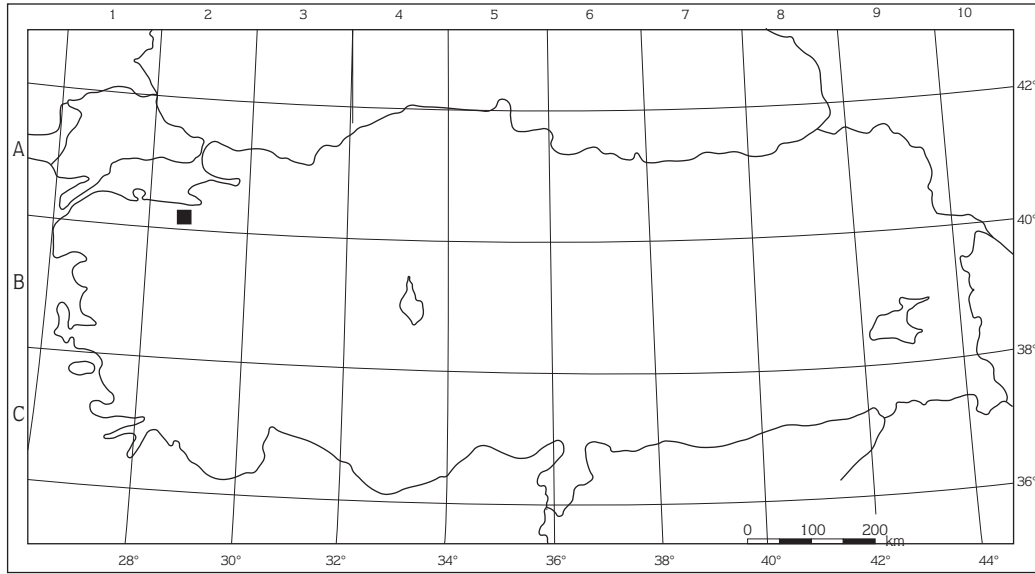


Figure 2. Distribution map of *Ornithogalum nurdaniae* (■).

Sint., *O. armeniacum* Baker, *O. umbellatum* L., *O. oligophyllum* E.D.Clarke, *O. wiedemannii* Boiss., and *O. orthophyllum* Ten. (Çoşkunçelebi et al., 2000, 2002).

#### Taxonomical Treatment

*Ornithogalum nurdaniae* Y.Bağcı & Savran, sp. nov. (Figures 1 and 2).

(Subgen. *Ornithogalum*, Syn: Subgen. *Heliocharmos* Baker).

**Type:** Turkey. A2 Bursa: Uludağ (Bithynian Olympus); Uludağ, openings in *Juniperus communis* communities, 1750-1900 m, 09.06.2008, Bağcı 3782 & Savran (holotype: KNYA, Isotypes: GAZI, Hb. Yıldırımli).

**Diagnosis:** Affinis *O. oligophyllum*, sed scapis 2-7 cm (non 4-15 cm); racemis 5-12(-13) floribus et valde flexuosis (nec 2-5 floribus et nec flexuosis); perigonio segmentia 9-14 mm longa (non 11-16 mm); pedicellis fructiferis 30-60 mm (non 10-30 mm) differt.

#### Description

Plant 8-20 cm. Bulb ovoid, 10-20 mm × 15-20 mm, without bulblets; outer tunics brown, inner whitish, membranous. Scape usually erect, 2-7 (-7.5) cm, glabrous. Leaves 2-3, spreading, lanceolate, glabrous; 10-18 cm × 0.4-1.2 cm, much longer than scape, flat or slightly canalicate, gradually tapering to acute apex, without white median line, margin entire.

Raceme corymbose, distinctly zigzag; 5-12 (-13) flowered, pedicels up to 3 cm in flower, ascending at anthesis, 3-6 cm and strongly curved in fruit, longer than perianth segments. Bracts 0.5-3.0 cm, lanceolate or lanceolate to linear, acuminate, equal or shorter than pedicels. Perianth segments 9-15 mm; white inside, green with narrowly white margins outside. Filaments 5-7 mm × 1-1.8 mm, acuminate; Anthers 1.5-2 mm long, yellow. Ovary 3-3.5 mm × c. 2 mm wide, ovoid, longer than style; style 1.5-2 mm long. Capsule 1-1.5 cm × 0.4-1.0 cm, ovoid, winged. Seed numerous, black, 1.5-2 mm × 0.9-1.5 mm in diameter, rough, tip of seed hairy.

Fl. & Fr. 6-7, openings in *Juniperus communis* communities, 1750-1900 m a.s.l.

Key to closely related *Ornithogalum* species in Turkey (Subgen. *Ornithogalum*, Syn: Subgen. *Heliocharmos* Baker), (Adapted from Cullen, 1984).

1. Raceme 5-12 (-13) flowered, distinctly zigzag shape, fruiting pedicels 30-60 mm and strongly recurved.....*O. nurdaniae*
1. Raceme 2-5 or rarely more flowered, not zigzag, fruiting pedicels 10-30 mm and erect-spreading..... *O. oligophyllum*

### Conservation status

*Ornithogalum nurdaniae* is endemic to North-West Anatolia and is an Irano-Turanian element. The new species is distributed only in a single locality. It appears to be known only from the present locality and its estimated area of occupancy is less than 10 km<sup>2</sup> (criterion B). The population is unhealthy with less than 100 mature individuals (criterion C). Therefore, it should be classified as Critically Endangered (CR) based on the criteria of the IUCN Red List Categories (IUCN, 2001).

### Ecology

Flowering time is June. *Ornithogalum nurdaniae* grows in *Juniperus communis* communities at 1750-1950 m with *Geum coccineum* Sm., *Juniperus communis* L., *Muscari bourgaei* Baker, *Viola altaica* Ker-Gawl., *Plantago* sp., *Senecio olympicus* Boiss., *Festuca* sp., *Astragalus* sp., *Vaccinium myrtillus* L., *Veronica gentianoides* Vahl., *Gagea chrysantha* (Jan) Schultes & Schultes fil., and *Gagea bithynica* Pascher.

**Etymology:** This species is named in honour of the first author's wife Nurdan Bağcı.

### Discussion and Conclusion

*Ornithogalum nurdaniae*, endemic to Turkey, is related to *O. oligophyllum*. It differs from *O.*

*oligophyllum* because of its scape length 2-7 cm (not 4-15 cm), raceme distinctly zigzag shape (not zigzag), fruiting pedicels 30-60 mm and strongly recurved (not 10-30 mm and erect-spreading) (Table).

Moreover, this new species has similarities to *O. alpigenum* Stapf. because only the pedicels are usually longer than flowers at anthesis, but it differs from *O. alpigenum* because of its scape 2-7 cm (not 7-12 cm), raceme distinctly zigzag shape (not zigzag), fruiting pedicels 30-60 mm and strongly recurved (not 20-40 mm and arcuate-spreading), capsule winged (not winged), leaves 2-3 (not 3-7), raceme 5-12 (-13) flowered (not 4-7 flowered), and perianth segments 9-14 mm (not 7-10 (-11) mm) (Table).

The new species is relatively close to *Ornithogalum oligophyllum*, but differs from it by the characters given in the Table.

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Table. Comparison between the diagnostic characters of *Ornithogalum nurdaniae* and those of the related species *O. oligophyllum* and *O. alpigenum*.

Characters	<i>Ornithogalum nurdaniae</i>	<i>Ornithogalum oligophyllum</i>	<i>Ornithogalum alpigenum</i>
Scape	2-7 cm	4-15 cm	7-12 cm
Leaves	2-3	2-3 (rarely more)	3-7
Raceme	distinctly zigzag; 5-12(-13) flowered	2-5 or rarely more flowers	4-7 flowered
Perianth segments	9-15 mm	11-16 mm	7-10 (-11) mm
Fruiting pedicels	30-60 mm and strongly recurved	10-30 mm and erect-spreading	20-40 mm and arcuate-
Capsule	winged	winged	spreading unwinged

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