Türkiye Tarımsal Araştırmalar Dergisi
dergipark.gov.tr/tutad
Research Article

Turk J Agric Res
2018, 5(2): 116-119
© TÜTAD
ISSN: 2148-2306
e-ISSN: 2528-858X
doi: 10.19159/tutad.368374

Muscari botryoides (L.) Mill.: A New Record for the Family Asparagaceae from Turkey

Süleyman Mesut PINAR[1*], Mehmet FİDAN[2], Hüseyin EROĞLU[3]

[1]*Van Yüzüncü Yıl University, Van Health School, Nutrition and Dietetics Program, Van, TURKEY*
[2]*Siirt University, Faculty of Arts and Sciences, Deparment of Biology, Siirt, TURKEY*
[3]*Van Yüzüncü Yıl University, Faculty of Science, Deparment of Biology, Van, TURKEY*

Received: 18.12.2017 **Accepted:** 03.05.2018

ORCID ID (By author order)
orcid.org/0000-0002-1774-7704 orcid.org/0000-0002-5041-2164 orcid.org/0000-0001-9171-5607
[*]Corresponding Author: mesutpinar@hotmail.com

Abstract: In this study, *Muscari botryoides* (L.) Mill. (Asparagaceae) is recorded for the first time from the East Anatolia region (B9 Van) of Turkey. The description of *Muscari botryoides* is given and habitus photos of related species are presented. Geographical distribution is mapped, and IUCN (International Union for Conservation of Nature) threat categories at the regional scale of the populations are discussed.

Keywords: *Muscari*, new record, taxonomy, Turkey

1. Introduction

Muscari Mill. is a genus found in Asparagaceae family, and it is distributed over the Europe from Caucasus, Africa, and North-Western and South-Western Asia (Rechinger, 1990; Jafari and Maassoumi, 2011; Yıldırım, 2015). This genus is listed in the world wide by 47 taxa (Govaerts, 2017). Davis and Stuart (1984) reported 20 species of *Muscari* from Turkey. After this flora study, 17 new species were added in the subsequent works. Today, 37 *Muscari* species (25 are endemic) have been reported in Turkey (Eker, 2012; Kaya, 2014; Yıldırım, 2015).

The general aim of this study is to record a new species, as belonging to the family Asparagaceae genus *Muscari,* according to the specified taxonomic parameters in Turkey.

2. Materials and Methods

During field trips between 2015 and 2017, the authors several interesting specimens were collected from genus *Muscari* in East Anatolia region in Turkey. The *Muscari* specimens were collected during the flowering period from natural populations in Gürpınar district from Van, Turkey. Initially, they seemed to be close to endemic *M. microstomum.* These specimens were compared with the relevant taxonomic literature (Losisnkaya, 1935; Stuart, 1966; Davis and Stuart, 1966, 1980, 1984; Townsend and Guest, 1985; Feinbrun, 1986; Rechinger, 1990; Jafari and Maassoumi, 2011). It was realized that these specimens are different from the other known *Muscari* species in Turkey.

In addition, the investigated species was compared with type specimens and materials of following herbaria: E, G, JE, K, LINN, P, and W [abbreviations as per Thiers (2017)]. The specimens have thus been identified as a new record for Turkey. We have re-described *Muscari botryoides* by making previous descriptions. Voucher specimens are deposited at the herbarium of Van Yüzüncü Yıl University (VANF) and Siirt University Flora and Fauna Center (SUFAF).

3. Results and Discussion

Muscari botryoides (L.) Mill. Gard. Dict., ed. 8. n. 1 (1768) (Figure 1, 2)
Basionym: *Hyacinthus botryoides* L. Sp. Pl. 1: 318 (1753)
Type: Linnean Society of London Herbarium (LINN), LINN-HL438-16 (lectotype photo!)

Bulb globose to ovoid, 20-25 mm diameter, not producing offsets; tunics pale or greyish-brown. Leaves 2-3(-4), 5-25 × 0.5-1.5 cm, erect, linear-oblanceolate or rarely linear, abruptly contracted, hooded or shortly acuminate at apex, the upper surface paler, glaucous, often prominently ribbed. Scape 7-30 cm, almost always exceeding leaves. Raceme dense at first time, becoming laxly cylindrical and 1-7 cm long, except in some mountain plants where it does not elongate; pedicels (0.5-)2-5 mm, as long as or shorter than flowers, patent or deflexed (rarely flowers subsessile). Fertile flowers 40-55(-65); 2.5-4(-5) mm, globose, strongly constricted, bright blue; teeth white, recurved. Sterile flowers 15-20(-25), smaller and paler than fertile flowers, shortly pedicellate. Fruiting raceme lax. Capsule 4-6 × 4-6 mm, globose.

Phenology: Flowering occurs from April to June.

Habitat: Meadows, wet places, marshy land.

Conservation Status: *Muscari botryoides* is classified as "Vulnerable", VU(D2; E), based on the IUCN criteria for Turkey (Anonymous, 2017). This species grows in a very limited area (criterion D), where it is under high grazing pressure (criterion D2). Also, this species is indicating the probability of extinction in the wild to be more than 10% within the next 100 years (criterion E).

Distribution: Central and South Eastern Europe, Caucasus, new to Turkey.

Our collections: Turkey, B9 Van: Gürpınar, Van to Başkale road, 5 km before Güzelsu, 38° 15′ 45″ N, 43° 52′ 09″ E, meadows, 2140 m, 26.05.2015, *M.Pınar* 6485, *M.Fidan* & *H.Eroğlu*; *ibidem,* 28.05.2016, *M.Pınar* 7587, *H.Eroğlu; ibidem,* 20.06.2017, *M.Pınar* 8231, *H.Eroğlu* (dried samples with fruit only).

4. Conclusion

M. botryoides is closely related to endemic *M. microstomum*. However, *M. botryoides* is distinguished from *M. microstomum* by its bulb size 2-2.5 mm (not 1-1.5 mm), colour of bulb tunic pale or greyish brown (not dirty ivory), leaves number 2-3(-4) (not 3-6), lamina shape of leaves linear-oblanceolate or rarely linear (not linear-lanceolate), shape of fertile flowers globose (not obovoid to oblong-urceolate), colour of fertile flowers bright-blue (not deep china blue) and mouth of fertile flowers strongly constricted (not abruptly narrowed at the calloused shoulders to a small 0.25-0.33 mm diam.). Also it is easily distinguished from *M. armeniacum* for its tunic colour of bulb pale or

Figure 1. Distribution map of *Muscari botryoides* (●)

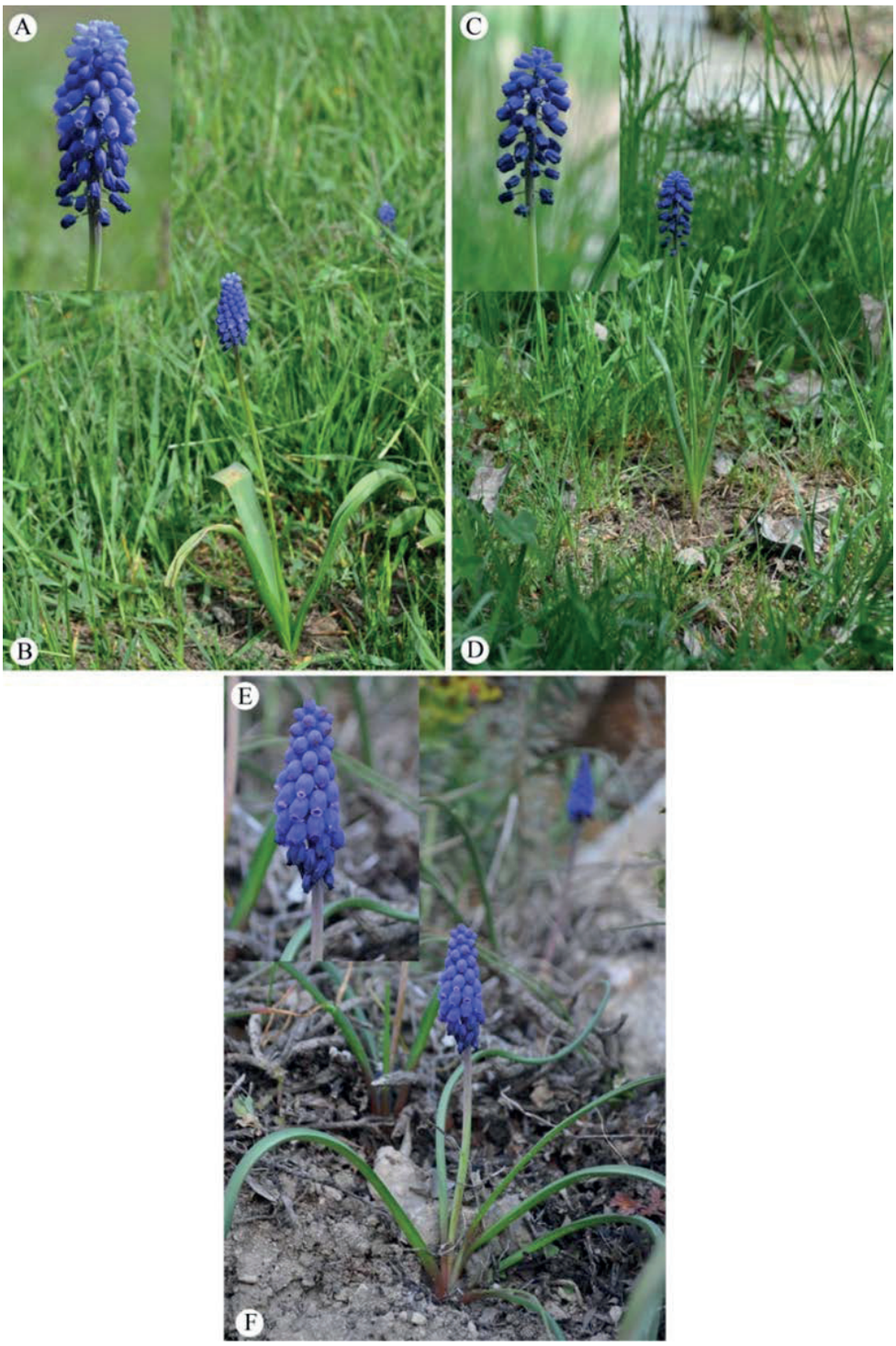

Figure 2. General habitus and inflorescence of *Muscari botryoides* (A, B), *M. microstomum* (C, D), and *M. armeniacum* (E, F)

greyish brown (not dark brown), number of leaves 2-3(-4) [not (2-)3-5(-7)], leaves shape linear-oblanceolate or rarely linear (not linear to narrowly linear-lanceolate), broad of leaves 0.5-1.5 cm (not 1-5(-10) cm), shorter and globose fertile flowers 2.5-4(-5) mm, globose (not 6-7 mm, not obovate-urceolate), raceme dense at first, becoming laxly cylindrical (not dense to very dense, ovate to cylindrical with imbricate flowers). Comparison of more detail morphological characters of the related taxa with *Muscari* are shown in Table 1. As a result of this study, with the addition of the new species records here, the number of species in the *Muscari* genus is increased to 38 in Turkey.

Table 1. Comparison morphological characters of *Muscari botryoides* and related species

Characters	*M. botryoides*	*M. microstomum*	*M. armeniacum*
Bulb			
offsets	not producing offsets	not producing offsets	with or without offsets
diameter (cm)	2-2.5	1-1.5	1-2.5
tunics	pale or greyish brown	dirty ivory	dark brown
Leaves			
number	2-3(-4)	3-6	(2-)3-5(-7)
lamina	flat, prominently ribbed	canaliculate, with a whitish median line	flat or canaliculate, without a white line
length	shorter or equal scape	longer or equal scape	longer than scape
size (cm)	5-25 × 0.5-1.5	10-30 × 4–8	10-30 × 1-5(-10)
shape	linear-oblanceolate or rarely linear	linear-lanceolate	linear to narrowly linear-lanceolate
Raceme			
shape	dense at first, becoming laxly cylindrical	dense at first, later elongating	dense to very dense, ovate to cylindrical with imbricate flowers
length (cm)	1-7	2-8	1.5-5
Fertil flowers			
shape	globose	obovoid to oblong-urceolate	obovate-urceolate
length (mm)	2.5-4(-5)	3.5-5.5	6-7
colour	bright-blue	deep china blue	sky blue or violet tinged
mouth	strongly constricted	abruptly narrowed at the calloused shoulders to a small 0.25-0.33 mm diam.	constricted distally

Acknowledgements

The authors would like to thanks to Assoc. Prof. Hasan Yıldırım (Ege University) and Assoc. Prof. İsmail Eker (Bolu Abant İzzet Baysal University) for checking the samples and valuable comments. We also thank Research Fund of the Van Yüzüncü Yıl University (Project Number: FDK-2017-5960) for its financial support.

References

Anonymous, 2017. IUCN Standards and Petitions Subcommittee. Guidelines for Using the IUCN Red List Categories and Criteria, Version 13, Gland, Switzerland.

Davis, P.H., Stuart, D.C., 1966. Three new species of *Muscari*. *Lily Year-Book*, 30: 123-126.

Davis, P.H., Stuart, D.C., 1980. *Muscari* Mill. In: T.G. Tutin, V.H. Heywood, D.H. Valentine (Eds.), *Flora Europaea*, Cambridge University Press, London, UK, Vol. 5., pp. 46-49.

Davis, P.H., Stuart, D.C., 1984. *Muscari* Mill. In: P.H. Davis, R.R. Mill, K. Tan (Eds.), *Flora of Turkey and the East Aegean Islands*, Edinburgh University Press, Edinburgh, UK, Vol. 8., pp. 245-265.

Eker, İ., 2012. *Muscari* Mill. In: A. Güner, S. Aslan, T. Ekim, M. Vural, M.T. Babaç (Eds.), *Türkiye Bitkileri Listesi (Damarlı Bitkiler)*, Nezahat Gökyiğit Botanik Bahçesi ve Flora Araştırmaları Derneği Yayını, İstanbul, pp. 95-96.

Feinbrun, N., 1986. *Muscari* Mill. In: M. Zohary, N. Feinburn-Dothan (Eds.), *Flora of Palestine*, The Israel Academy of Science & Humanity, Jarusalem, Vol. 4., pp. 84-104.

Govaerts, R., 2017. World Checklist of Asparagaceae. Royal Botanic Gardens, Kew. (http://apps.kew.org/wcsp/) (Accessed: 23.11.2017).

Jafari, A., Maassoumi, A.A., 2011. Synopsis of *Leopoldia*, *Muscari* and *Pseudomuscari* (Hyacithaceae) in Iran, with *Leopoldia ghouschtchiensis* sp. nova. *Annales Botanici Fennici*, 48: 396-400.

Kaya, E., 2014. *Muscari* Mill. In: *Türkiye Geofitleri*, Atatürk Bahçe Kültürleri Merkez Araştırma Enstitüsü, Yayın No: 96, Yalova, Türkiye, Vol. 2, pp. 350-411.

Losinskaya, L.A.S., 1935. *Muscari* Mill. In: V.L. Komarov (Ed.), *Flora URSS*, Nauka Press, Russia, Vol. 4, pp. 412-422.

Rechinger, K., 1990. Liliaceae II. In: K.H. Browicz, K. Persson, P. Wendelbo (Eds.), *Flora Iranica*, Akademic Druck., Verlagsanstatt, Graz, Austria, Vol. 165, pp. 140-148.

Stuart, D.C., 1966. *Muscari* and allied genera. A lily group discussion. *Lily Year-Book*, 29: 123-128.

Thiers, B., 2017. Index Herbariorum: A global directory of public herbaria and associated staff. New York Botanical Garden's Virtual Herbarium. (http://sweetgum.nybg.org/science/ih/) (Accessed: 01.11.2017).

Townsend, C., Guest, G., 1985. *Flora of Iraq*. Ministry of Agriculture & Agrarian Reform, Vol. 8, p. 128.

Yıldırım, H., 2015. *Muscari atillae* sp. nova (Asparagaceae): a new species from Eastern Anatolia, Turkey. *Phytotaxa*, 213(3): 291-295.