

# Synopsis of *Leopoldia*, *Muscari* and *Pseudomuscari* (Hyacinthaceae) in Iran, with *Leopoldia ghouschtchiensis* sp. nova

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Received 22 Oct. 2009, revised version received 9 June 2010, accepted 15 June 2010

Jafari, A. & Maassoumi, A. A. 2011: Synopsis of *Leopoldia*, *Muscari* and *Pseudomuscari* (Hyacinthaceae) in Iran, with *Leopoldia ghouschtchiensis* sp. nova. — *Ann. Bot. Fennici* 48: 396–400.

*Leopoldia ghoschtchiensis* Jafari & Maassoumi sp. nova (Hyacinthaceae) is described from Iran. Keys to and a brief synopsis of the eleven species here recognized in *Leopoldia*, *Muscari* and *Pseudomuscari* (or *Muscari s. lato*) in Iran is provided.

The three genera of the Hyacinthaceae, *Leopoldia*, *Muscari* and *Pseudomuscari*, alternatively recognized as subgenera within *Muscari* (e.g. Speta 1998), are distributed in Europe, the Mediterranean area and SW Asia (Losinskaya 1936, Davis & Stuart 1966, 1980, Stuart 1966, Garbari & Greuter 1970, Davis 1984, Townsend & Guest 1985, Feinbrun 1986, Rechinger 1990). The numbers of species in *Leopoldia*, *Muscari* and *Pseudomuscari* are 12, 37 and 7, respectively (Govaerts & Zona 2006).

Rechinger (1990) recognized seven species of *Muscari s. lato* in three subgenera (*M.* subg. *Leopoldia*, *Botryanthus* and *Pseudomuscari*). In addition, *M. commotatum* (Parsa 1950, confirmed by Jafari 2006), *M. armeniacum* (Assadi 1988, under *M. szovitsianum*) and *M. microstemum* (Jafari 2006) have also been recorded from Iran. Our taxonomic study of the Iranian species of *Leopoldia*, *Muscari*, and *Pseudomuscari* was based on examination of living material collected in Iran during April and May in 2001–2003, as well as on herbarium material

(including types) from B, K, E, S, P, GB, BG, G, NAP, W, WU, TARI, and IRAN (herbarium abbreviations after Index Herbariorum, <http://www.nybg.org/bsci/ih/ih.html>).

## Taxonomic treatment

Our studies revealed the presence of a hitherto undescribed species of *Leopoldia* in NW Iran. This raises the number of Iranian species in the genera *Leopoldia*, *Muscari*, and *Pseudomuscari* to eleven.

## Key to *Leopoldia*, *Muscari* and *Pseudomuscari* in Iran

1. Fertile flowers green to yellow; sterile flowers violet or blue ..... 1. *Leopoldia*
1. Fertile and sterile flowers concolourous, violet or blue .. 2
2. Fertile flowers dark violet, constricted at throat, with whitish lobes ..... 2. *Muscari*
2. Fertile flowers violet, blue or whitish, unconstricted at throat, with concolourous lobes ..... 3. *Pseudomuscari*

***Leopoldia* Parl.**

Fl. Palerm. 1: 435. 1845, *nom. cons.* — *Muscari* subg. *Leopoldia* (Parl.) Rouy, Fl. France 12: 435. 1910.

Raceme lax or dense, pedicels longer and shorter than flower. Fertile flowers oblong-urceolate or tubular, strongly constricted at throat, usually brownish, dirty yellowish or greenish, lacking a corona but often asymmetrical due to well developed shoulders below short apical lobes (teeth), which are cream-coloured, yellowish or blackish. Sterile flowers numerous, forming a blue, violet or pink coma (sometimes much reduced). Capsules dehiscent on infructescence, 3-lobed, lobes moderately or strongly compressed.

**Key to species of *Leopoldia* in Iran**

1. Tunics of bulb pinkish; lobes of fertile flowers brown-cream ..... 2
1. Tunics of bulb ivory; lobes of fertile flowers blackish .. 3
2. Pedicle of sterile flowers longer than flowers, ascending ..... *L. comosa* (L.) Parl.
2. Pedicle of sterile flowers equal and shorter than flowers, horizontal to arcuate ..... *L. caucasica* (Griseb.) Losinsk.
3. Pedicle of fertile flowers shorter than flowers or flowers sessile, fertile flowers campanulate ..... *Leopoldia ghouschtchiensis* Jafari & Maassoumi
3. Pedicle of fertile flowers longer than or equal with flowers, fertile flowers tubular or tubular-campanulate ..... 4
4. Raceme cylindrical-oblong ..... *L. tenuiflora* (Tausch.) Heldr.
4. Raceme conical-oblong .... *L. longipes* (Boiss.) Losinsk.

***Leopoldia comosa* (L.) Parl.**

Giorn. Bot. Ital. 2(2): 160. 1847. — *Hyacinthus comosus* L., Sp. Pl: 318. 1753. — *Muscari comosum* (L.) Mill., Gard. Dict. ed. 8: 2. 1768. — HOLOTYPE: France, South Europe. Linn. No. 438.5. (LINN). — For a full synonymy see Govaerts and Zona (2006).

DISTRIBUTION: Azarbaijan, Guilan, Kermanshah, Lorestan.

***Leopoldia caucasica* (Griseb.) Losinsk.**

in V. L. Komarov (ed.), Fl. SSSR 4: 410. 1935. — *Bellevalia caucasica* Griseb., Spic. Fl. Rumel. 2: 387. 1846. — *Muscari caucasicum* (Griseb.) Baker, J. Linn. Soc., Bot. 11: 414.

1870. — HOLOTYPE: In montosis aridis Georgiae Caucas unio itiner. T. F. Hohenacker. (May 1831) (isotypes G!, K).

*Muscari pallens* Hohen. ex Baker, J. Linn. Soc. Bot. 11: 414. 1870 *nom. inval.*

*Muscari comosum* var. *mutilatum* Trautv., Trudy Imp. S.-Peterburgsk. Bot. Sada 7: 514. 1881. — *Muscari mutilatum* (Trautv.) Misch. ex Grossh., Fl. Kavkaza 1: 236. 1928.

DISTRIBUTION: Golestan, Azarbaijan, Kurdestan, Hamadan, Khuzestan, Kerman, Khorassan, Tehran.

***Leopoldia ghouschtchiensis* Jafari & Maassoumi, sp. nova (Fig. 1)**

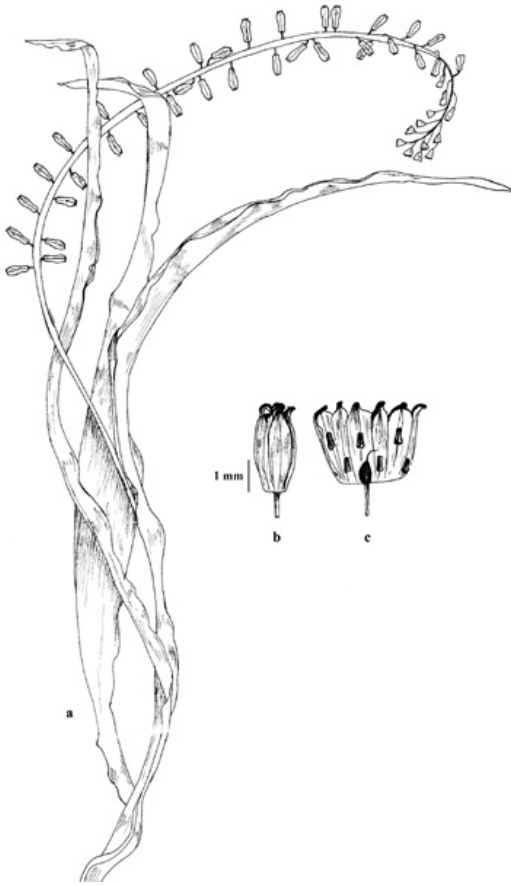
*Bulbus 2 cm longus et 1.5 cm latus, oblongo-obovoideus, tunicis brunneis. Folia 4, 24 × 1.6 cm linearibus, leviter canaliculatis, brevioris quam racemum. Scapus 27.5 cm altus, ascendens. Racemus 11.5 cm longus et 1.2 cm altus, laxus, oblongo-cylindricus; pedicellus fertilis 1 mm horizontalis; Flos fertilis 55, 4–5 × 2 mm, horizontalis, campanulato-tubularis, viridis, bruneo, luteus, in specimine sicco brunneus; lobi 0.5 mm longi, recurvati, nigri; pedicellus sterilis 5 mm ascendens vel arcuatus, violaceus, flos sterilis 20–25, 1.5 × 0.5–1 mm, ascendens, campanulatus, splendide violaceus.*

TYPE: Iran. W Azarbaijan province, Salmas to Uromieh road, Ghouschtchi, 1750 m, *Jafari 49* (holotype TARI). — PARATYPE: Same locality, *Jafari 60* (TARI).

ETYMOLOGY: The epithet is derived from the collecting locality, Ghouschtchi.

Bulbs 2 × 1.5 cm, oblong-ovoid, tunics brownish. Leaves 4, 24 × 1.6 cm, linear, weakly canaliculate, shorter than raceme. Scape 27.5 cm, erect. Raceme 11.5 × 1.2 cm, lax, cylindrical-oblong; pedicels of fertile flowers 1 mm, horizontal, pedicle of sterile flowers 5 mm, ascending or arcuate, violet. Fertile flowers 55, 4–5 × 2 mm, horizontal, campanulate-tubular, green, brown-yellow; lobes 0.5 mm, recurved, black; sterile flowers 20–25, 1.5 × 0.5–1 mm, ascending, campanulate, bright violet.

*Leopoldia cycladica* subsp. *subsessilis* appears the closest taxon to *L. ghouschtchiensis*, as it has 2–5 linear, usually recurved leaves. Its racemes are 2.5–11 cm long, the fertile flowers being tubular to suburceolate, contracted near



**Fig. 1.** *Leopoldia ghoushtchiensis* (from the holotype). — **a:** Habit. — **b:** Fertile flower. — **c:** Flower with stamens and ovary.

the apex, and during anthesis greenish–yellow. The pedicel of fertile flowers is 0–3 mm, horizontal, and that of sterile flowers is 0–5 mm; the sterile flowers are obovoidal to obconical. *Leopoldia cycladica* subsp. *subsessilis* grows on limestone cliffs and is distributed in Crete, Paros, Andiparos Strongilo area, Ios, Iraklia and Kardiotissa.

### *Leopoldia tenuiflora* (Tausch.) Heldr.

Bull. Soc. Imp. Naturalistes. Moscou 53(1): 70. 1878. — *Muscari tenuiflorum* Tausch, Flora 24: 324. 1841. — SYNTYPES: Austria et Bohemia.

*Muscari bushiricum* Parsa, Kew Bull. 4: 35. 1949.

*Muscari iranicum* Parsa, Kew Bull. 4: 35. 1949.

*Muscari wallii* Rech.f., Ark. Bot., n.s., 1: 506. 1952.

*Muscari haradjianii* Briq. ex Rech. f., Ark. Bot. 5: 88. 1960.

DISTRIBUTION: Mazandaran, Azarbaijan, Kurdistan, Hamadan, Kermanshah, Lorestan, Isfahan, Kohglouyeh and Boyer ahmad, Chahar mahal and Bakhtiari, Fars, Bushehr, Khuzestan, Kerman, Tehran.

### *Leopoldia longipes* (Boiss.) Losinsk.

in V. L. Komarov (ed.), Fl. SSSR 4: 410. 1935. — *Muscari longipes* Boiss., Dign. Pl. Orient. 13: 36. 1854. — HOLOTYPE: Palaestina, (Apr. Mai 1846), Boissier (G-Boiss!).

*Muscari bushiricum* var. *pumilum* Parsa, Kew Bull. 4: 35. 1949.

DISTRIBUTION: Azarbaijan, Kurdistan, Hamadan, Kermanshah, Isfahan, Bushehr, Markazy, Gazvin.

### *Muscari* Mill.

Gard. Dict. Abr. ed. 4. 1754.

Raceme usually fairly dense, often becoming lax in fruit; pedicels usually deflexed or recurved at anthesis, sometimes horizontal or ascending, fertile flowers blue, violet or blackish (rarely white), concolorous or with whitish lobes (teeth), with or without slender bluish fascia on perianth tube and lobes, constricted at throat or unconstricted, sometimes campanulate or appearing obconical, sterile flowers smaller than fertile flowers, fewer than 10 or none. Capsule trigonous, membranous, dehiscent.

### Key to species of *Muscari* in Iran

1. Fertile flowers obovate; lobes concolorous with the tube ..... *M. commutatum* Guss.
1. Fertile flowers campanulate- ovoid or tubular; lobes whitish ..... 2
2. Fertile flowers blue-bright violet; sterile flowers tubular ..... *M. armeniacum* Leichtlin ex Baker
2. Fertile flowers black-violet; sterile flowers obovate .... 3
3. Fertile flowers tubular- ovate; sterile flowers obovate-tubular ..... *M. microstomum* Davis & Stuart
3. Fertile flowers ovate; sterile flowers obovate ..... *M. neglectum* Guss.

***Muscari commutatum* Guss.,**

Pl. Rar.: 145. 1826. — HOLOTYPE: (has been reported nowhere).

DISTRIBUTION: Lorestan, Fars.

***Muscari armeniacum* Leichtlin ex Baker,**

Gard. Chron. 9: 798. 1878. — HOLOTYPE: Hort. K!, May. 12.1879. — For a synonymy see Govaerts and Zona (2006).

*Muscari szovitsianum* Baker, Gard. Chron., n.s., 9: 799. 1878.

DISTRIBUTION: Azarbaijan.

***Muscari microstomum* P.H. Davis & D.C. Stuart**

Lily Year Book. 30: 124. 1966. — HOLOTYPE: Turkey. Prov. Sivas. Pinarbasi, 1300 m, 25 May 1960, *Stainton & Henderson* (E!; isotype K).

This species was described as endemic to Turkey by Davis and Stuart (1966) but it was found on Mt. Mahneshan in the province of Zanjan (Jafari 2006).

DISTRIBUTION: Azarbaijan, Zanjan.

***Muscari neglectum* Guss.**

in Ten., Syll. Pi. Fl. Neap., App. 5: 13. 1842. — TYPE: Calabria, Castel di sangro a Reggio, G. Gussone, NAP. — For a synonymy see Govaerts and Zona (2006).

DISTRIBUTION: Golestan, Guilan, Azarbaijan, Kurdistan, Hamadan, Kermanshah, Lorestan, Isfahan, Kohgelouyeh and Boyer ahmad, Chaharmahal and Bakhtiary, Fars, Kerman, Khorassan, Semnan, Markazy, Gazvin, Tehran.

***Pseudomuscari* Garbari & Greuter**

Taxon 19: 334. 1970.

Raceme dense, pedicle recurved; fertile flowers without contracted above, campanulate, blue-violet, lobes concolorous with tube, sterile flow-

ers smaller and fewer than fertile ones. Capsules triangular, dehiscent.

**Key to species of *Pseudomuscari* in Iran**

1. Raceme lax, cylindrical; fertile flowers tubular, black-violet ..... *P. inconstriatum* (Rech. f.) Garbari
1. Raceme dense, ovate; fertile flowers campanulate, blue or bright violet ..... *P. chalusicum* (D.C. Stuart) Garbari

***Pseudomuscari inconstriatum* (Rech. f.) Garbari**

Atti Soc. Tosc. Sci. Nat. Pisa, Mem. 77: 112. 1970, publ. 1971. — *Muscari inconstriatum* Rech. f., Ark. Bot. 2: 314. 1952. — HOLOTYPE: Jordania. Petra, on rocks, 1000 m, *K. H. Rechinger* *Fi.* & *J. E. Dinsmore* (S!).

DISTRIBUTION: Guilan, Azarbaijan, Kohglouyeh and Boyer ahmad, Chaharmahal and Bakhtiary, Fars.

***Pseudomuscari chalusicum* (D.C. Stuart) Garbari**

Atti Soc. Tosc. Sci. Nat. Pisa, Mem. 77: 112. 1971. — *Muscari chalusicum* D.C. Stuart, Lily Year Book 30: 125. 1966. — HOLOTYPE: Iran. Gorgan, (Asterabad), prope Ketul, *Buhse* (G!).

DISTRIBUTION: Gorgan, Mazandaran, Guilan.

**Acknowledgements**

We thank Prof. Dr. Thomas V. Jacob from the University of South Africa, Pretoria, for translating the description into Latin and all other colleagues who have helped us to collect materials. We would also like to thank Prof. Dr. W. Greuter, Dr. R. Vogt, Dr. Ch. Oberprieler (B), Prof. Dr. R. Spichiger, M. Hecquet (G), Dr. J. Simons (K) and Dr. B. Wallnöfer (W) who gave me the opportunity to examine type specimens.

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