TÜBİTAK

Research Article

Turk J Bot
36 (2012) 450-454

doi:10.3906/bot-1107-14

Allium shirnakiense, sect. *Melanocrommyum* (Liliaceae), a new species from South-eastern Turkey

Lütfi BEHÇET[1,*], Mustafa RÜSTEMOĞLU[2]

[1]Department of Biology, Faculty of Science and Arts, Bingöl University, Bingöl - TURKEY

[2]Health Care Profesional School, Hakkari University, Hakkari - TURKEY

Received: 21.07.2011 ● Accepted: 28.03.2012

Abstract: *Allium shirnakiense* L.Behçet & Rüstemoğlu sp. nova (sect. *Melanocrommyum* Webb & Berth.) is described as a species new to science on the basis of material collected from Şırnak Province. Morphologically, it is related to *A. rhetoreanum* Nab., which is an species endemic to South-eastern Turkey. A diagnosis, a taxonomic description, and some illustrations are given.

Key words: *Allium*, taxonomy, Şırnak, Southeast Anatolia, Turkey

Introduction

During an expedition related to the project named "The Flora of Mezra District (Beytüşebap-Şırnak) and Surroundings" carried out in May 2010, we found some interesting specimens of *Allium* L. (Figures 1 and 2). The specimens were checked in the herbaria of VANF and AEF, against *Flora of Turkey* (Kollman, 1984; Davis et al., 1988; Özhatay & Tzanoudakis, 2000; Demirelma & Uysal, 2008; Özhatay et al., 2010; Koçyiğit & Özhatay, 2010; Eker & Koyuncu, 2011; Özhatay et al., 2011), *Flora Iranica* (Wendelbo, 1971), and *Flora of Iraq* (Wendelbo, 1985). After comparison with material of morphologically similar taxa, we decided that the present specimens belong to a new species close to *Allium rhetoreanum*.

Allium, an extremely polymorphous and taxonomically complicated genus, comprises approximately 750 species widely distributed over the holarctics from dry subtropics to boreal zone (Fritsch et al., 2001; Memariani et al., 2007; Koçyiğit & Özhatay, 2010). It has a main centre of diversity in the mountainous areas of south-western and Middle Asia where widely distributed taxa as well as local endemics occur, and a second smaller one in North America (Friesen et al., 2006). Most of the species are hemicryptophytes or geophytes specially adapted to different environments by means of bulbous or rhizomatous storage organs (Cheremushkina, 1992).

Allium in Turkey was revised by Kollman (1984). Since then further floristic explorations in Turkey have increased our knowledge of the representation and distribution of the genus. According to updated knowledge, this genus is represented in Turkey by 188 taxa, 28 of which were discovered and described over the last 26 years (Özhatay et al., 2010; Eker & Koyuncu, 2011). *Melanocrommyum* Webb & Berth.

* E-mail: lbehcet2000@yahoo.com

Figure 1. *Allium shirnakiense*: A- habit (with 2 leaves), B- habit (with 4 leaves).

section is represented by 23 taxa, 7 of which are endemic to Turkey.

The main purpose of our study was to present a new species determined during the floristic research studies of the project "The Flora of Mezra District (Beytüşşebap-Şırnak) and Surroundings" carried out in 2009 and 2010.

Species description

Allium shirnakiense L.Behçet & Rüstemoğlu **sp. nova** (Figures 1-4).

Sect. *Melanocrommyum* Webb & Berth.

Type: Turkey. C9 Şırnak: Beytüşşebap town, Mezra District, rocky slopes, 2000- 2100 m, 19.05.2010, *M.Rüstemoğlu* 1341 (in flower) (holotype: VANF, isotypes: AEF & ANK)

Allium shirnakiense is closely to *A. rhetoreanum*. It mainly differs from *A. rhetoreanum* because it has a stem 16-40 cm tall (not 30-40 cm); leaves (1-) 2-4, outer 10-70(-80) mm broad, inner 10-40 mm broad (not 4-5, outer to 50 mm, inner 10-18 mm); pedicels unequal, (not equal); perigon stellate, segments brownish purple, 3-4 mm long, twisted after anthesis (not campanulate, deep rose, 6-6.5 mm, erect); anthers brownish (not yellow).

Bulb globose to ovoid, 2.5-4 × 2.5-4.5 cm, outer tunics greyish, inner membranous, white. Stem robust, longer than leaves, 16-40 cm long, erect, terete. Leaves (1-) 2-4, ligulate, 12-20 × 1-7(-8) cm. Spathe shorter than umbel, membranaceous, brownish white, 2-3 (-4) valved, valves broadly ovate, aequal, caudately acute or acuminate. Umbel globose, to 6 cm diam., many flowered. Pedicels unequal to 23

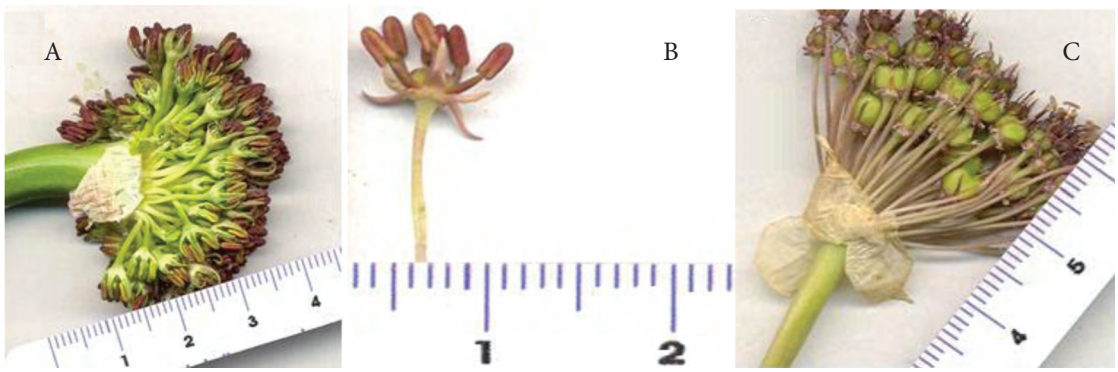

Figure 2. *Allium shirnakiense*: A- umbel (in anthesis), B- flower, C- spathe on umbel together with fruit.

mm long (elongating considerably in fruit), green, brownish green or greenish-purple. Perigon stellate (segments finally reflexed and twisted) with tepals brownish green, green or purplish, 3-4 × 0.7-1 mm, lanceolate, linear-lanceolate, acute at apex. Perigon smooth, united at base c. 1 mm. Filaments included, c. 3/4 × perigon segments, 2.5-3.5 mm long, slightly broadened at base, connate below in annulus 0.3-0.5 mm high, brown, purplish brown, linear-subulate, subulate above. Anthers slightly exserted, 2-2.5 mm long, brown, pale brown or greenish brown coloured before dehiscence. Style 1-1.5 mm long. Ovary and capsule smooth. Capsule trigonous-trilobate, green, yellowish-green, 6-7 × 6-7 mm. Seeds to 3.5 mm long, testa black, slightly shiny, densely minutely papillose-verruculose. *Fl.* 6-7.

Paratypes: Turkey. C9 Şırnak: Beytüşşebap, Mezra District, limestone rocky slopes, 2100 m, 05.06.2010, *M.Rüstemoğlu* 1467 (in fruit) (VANF, Bingöl Univ. Herb.)

Additional selected specimens examined: *A. rhetoreanum*. Turkey. C10 Hakkari: Yüksekova, Varegöz-Sat arası, dere kenarı, çayırlık, 2000 m, 1.7.1983, *M.Koyuncu* 6278 & *M.Coşkun*, (AEF), (Determined as *A. hirtofolium* Boiss. by *M.Koyuncu* in 1984 and determined as *A. rhetoreanum* by *İ.Genç* in 01.08.2010); B10 Van: Başkale, Esenyamaç Köyü üstü, Dere kenarları, nemli yerler, 2400-2500 m, 23.06.2001, *M.Koyuncu* & *M.Tampınar s.n.* (AEF no: 12452).

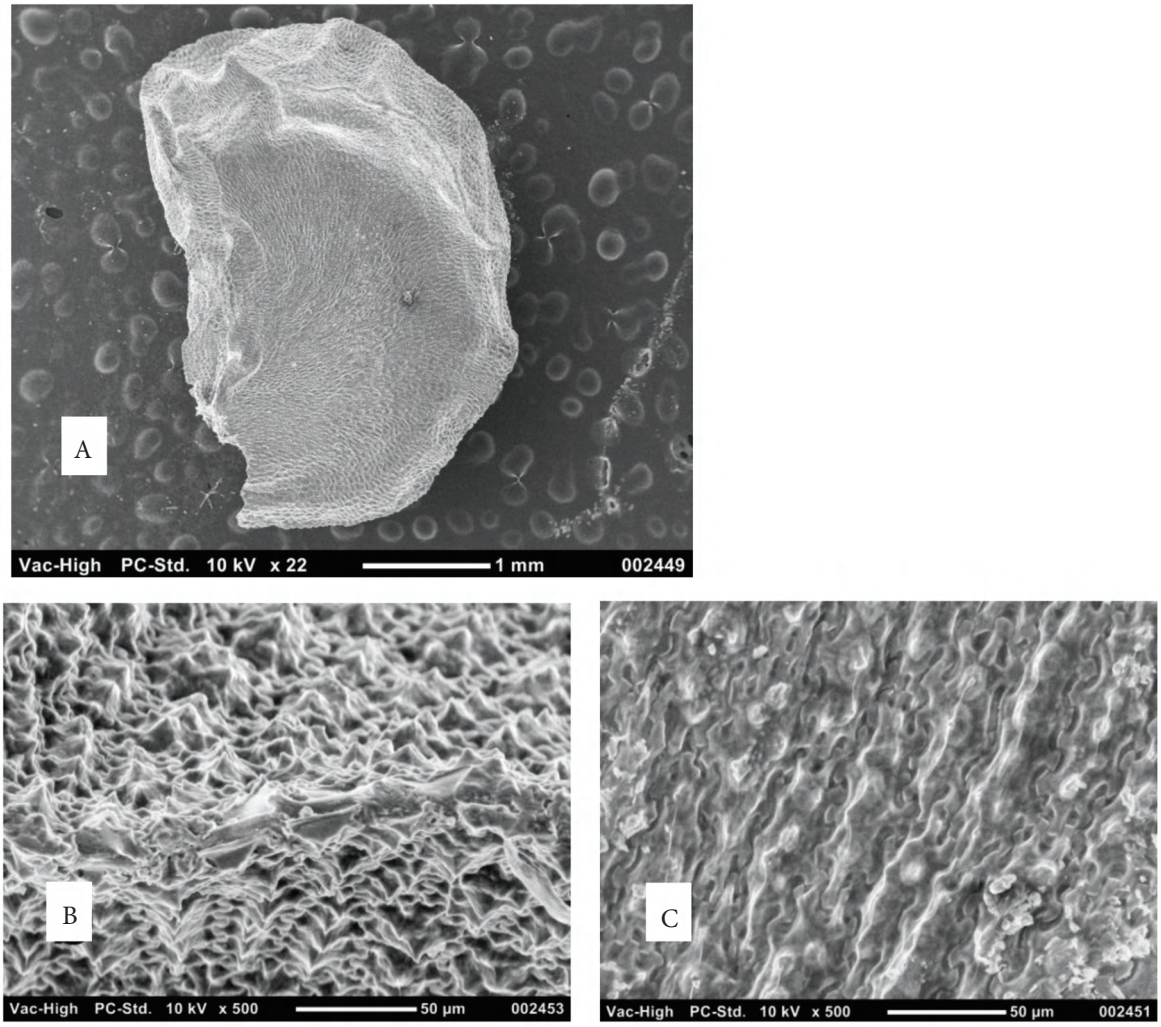

Figure 3. SEM images of *Allium shirnakiense* seed: A- general view, B- testa cells, C- anticlinal wall cells.

Table. Morphological comparison of *Allium shirnakiense* and *A. rhetoreanum*.

	A. shirnakiense	*A. rhetoreanum*
Stem	16-40 cm, at base 3-7 mm thick	30-40 cm, at base 10 mm thick
Leaves	(1-) 2-4, ligulate, oblong- lanceolate, outer ones 10-70 (-80) mm broad, inner 10-40 mm broad	4-5, oblong-lanceolate, outer to 50 mm broad, inner 10-18 mm broad
Spathe	2-3 (-4) lobed, shorter than pedicels, white	2-3 lobed, white at base, rose towards apex
Umbel	globose, to 6 cm diam.; pedicels unequal, 7-25 mm long	globose, to 7 cm diam., pedicels equal to 30 mm long
Perigon	stellate, segments brownish purple, purplish, green or greenish brown, linear, linear-lanceolate, 3-4 mm long, acute at apex, reflexed and twisted after anthesis	campanulate, segment deep rose, oblong-lanceolate, 6-6.5 mm long, acute, slightly wavy at apex, erect even after anthesis
Filaments length	c. 3/4 (-4/4) × perigon segments	c. 2/3 × perigon
Anthers	brown, purplish-brown, brownish, 2-2.2 mm long	yellow, 2.5 mm long

Etymology: The name refers to the province of Şırnak in SE Anatolia, where the new species was first collected.

The seeds of the investigated new species are black and slightly shiny. The seeds are generally reniform. The testa cells are polygonal and irregular. The anticlinal walls are usually raised with several verrucae, combined with depressed, S- to omega-like, undulated anticlinal walls (Figure 3). A similar structure was reported by Fritsch et al. (2006) and Kreuse (1994) in some *Allium* species.

Discussion and conclusion

Allium shirnakiense is included in the section *Melanocrommyum* because it has a subglobose bulb, its basal leaves are flat with no above-ground sheaths, and its stem is longer than leaves. It contains a persistent, 2-3 (-4) valved spathe. Its perianth segments are reflexed and twisted after flowering. Thus, it is closely related to *Allium rhetoreanum*, the distribution area of which is close to the type place. Differentiating characters are given in the Table.

Distribution and habitat ecology: *A. shirnakiense* is endemic to Şırnak Province, SE Anatolia, and is an Irano-Turanian element (Figure 4). The distribution area has high erosion pressure because of the steep, unforested slopes, and overgrazing. It grows on rocky limestone slopes with other characteristic plants such as *Acanthus dianthifolium* Bokhari, *Achillea vermicularis* Trin., *Alcea dissecta* (Baker) Zohary, *Astragalus brachyclyx* Fischer., *A. eriocephalus* Willd. subsp. *eriocephalus*, *A. gummifer* Lab., *A. halicacabus* Lam., *A. longifolius* Lam., *A. oocephalus* Boiss. subsp.

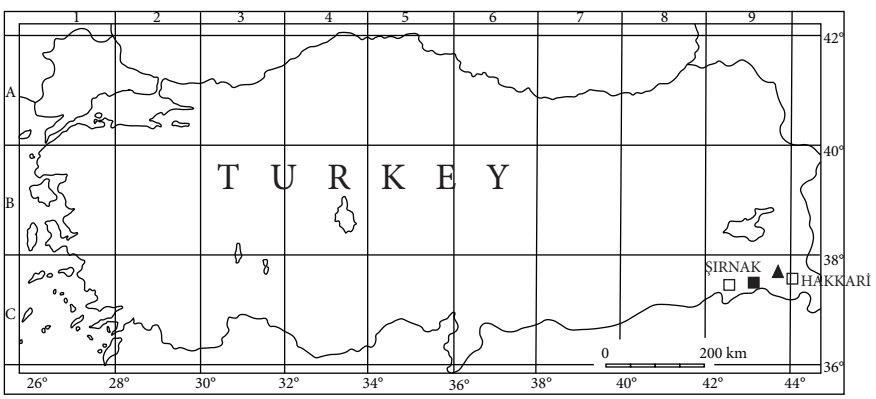

Figure 4. Distribution map of *Allium shirnakiense* (▪) and *A. rhetoreanum* (▲).

oocephalus, *A. rechingeri* Sirj, *A. xerophilus* Ledeb., *A. yueksekovae* Matthews, *Bellevalia kurdistanica* Feinbrun, *B. modesta* Wendelbo, *Bromus tomentellus* Boiss., *Chaerophyllum macropodum* Boiss., *Centaurea solstitialis* L. subsp. *solstitialis*, *Crepis hakkarica* Lamond, *C. sancta* (L.) Babcock., *Dactylis glomerata* L. subsp. *glomerata*, *Galium nabelekii* Ehrenol. & Schönb-Tem, *Hypericum scabrum* L., *Nepeta macrosiphon* Boiss., *Pimpinella anthriscoides* Boiss. var. *anthriscoides*, *P. corymbosa* Boiss., *Potentilla pannosa* Boiss. & Hausskn., *Rhynchocorys kurdica* Nab., *Salvia frigida* Boiss., *Scorzonera latifolia* (Fisch. & C.A.Mey.) DC. var. *latifolia*, *Stachys iberica* M.Bieb. subsp. *stenostachya* (Boiss.) Rech. f., *Tanacetum chilliophyllum* (Fisch. & C.A.Mey.) Schultz Bip. var. *chilliophyllum*. *Thlaspi arvense* L., *Trigonosciadium viscidulum* Boiss. & Hausskn., and *Verbascum oreophilum* C.Koch var. *joannis* (Bordz.) Hub.- Mor.

Recommended IUCN threat category: We recommend placing *Allium shirnakiense* in the IUCN category "Critically Endangered (CR)", because the estimated whole range is less than 10 km^2 and the distribution area of the species has high erosion pressure. Moreover, the area is heavily grazed by animals (criteria B2 a b (i, iii) of IUCN 2001).

In this study, with the addition of this new species, the number of species in the section *Melanocrommyum* is increased to 24 and the number of Turkish *Allium* taxa to 188.

Acknowledgements

The authors would like to thank Prof Dr Mehmet Koyuncu (Ankara Univ.) for checking the specimens and his critical discussion and they also wish to thank Yüzüncü Yıl University (Project no: 2010-FBE-YL030) for its financial support. Thanks are also due to AEF for letting the authors study their *Allium* specimens.

References

Cheremushkina VA (1992). Evolution of life forms of species in subgenus *Rhizirideum* (Koch) Wendelbo, genus *Allium* L. In: Hanelt P et al. (eds.), *The Genus Allium-Taxonomic Problems and Genetic Resources*. Gatersleben, pp. 27-34. Germany.

Davis PH, Mill RR & Tan K (eds.) (1988). *Flora of Turkey and the East Aegean Islands*. (suppl. 1) Vol. 10, pp. 221-223. Edinburgh: Edinburgh Univ. Press.

Demirelma H & Uysal T (2007). *Allium ertugrulii* sp. nov. (*Alliaceae*) from southern Turkey. *Nordic Journal of Botany* 25: 315-317.

Eker İ & Koyuncu M (2011). *Allium olivieri* Boiss. (Alliaceae), a new taxon to Turkey, with contributions to its taxonomy. *Acta Societatis Botanicorum Poloniae* 80: 275-277.

Friesen N, Fritsch RM & Blattner FR (2006). Phylogeny and new intrageneric classification of *Allium* L. (Alliaceae) based on nuclear rDNA ITS sequences. *Aliso* 22: 372-395.

Fritsch RM, Matin F & Klaas M (2001). *Allium vavilovii* M. Pop. et Vved. and a new Iranian species are the closest among the known relatives of the common onion, *A. cepa* L. (Alliaceae). *Genetic Resources and Crop Evolution* 48: 401-408.

Fritsch RM, Kreuse J, Adler K & Rutten T (2006). Testa sculptures in *Allium* L. subg. *Melanocrommyum* (Webb & Berth.) Rouy (Alliaceae). *Feddes Repertorium. Zeitschrift für Botanische Taxonomie und Geobotanik* 117: 250-263.

IUCN (2001). *IUCN Red List Categories and Criteria. Version 3.1*. IUCN Species Survival Commission. Gland & Cambridge UK.

Koçyiğit M & Özhatay N (2010). A Contribution to the Genus *Allium* L. (sect. *Codonoprasum*) in Turkey. *Turkish Journal of Botany* 34: 391-395

Kollman F (1984). *Allium* L. In: Davis PH (ed.), *Flora of Turkey and the East Aegean Islands*. Vol. 8, pp. 98-211. Edinburgh: Edinburgh Univ. Press.

Kreuse J (1994). Rasterelektronenmikroskopische Untersuchungen an Samen der Gattung *Allium* L. IV. *Feddes Repertorium. Zeitschrift für Botanische Taxonomie und Geobotanik* 105: 457-471.

Memariani F, Joharchi MR & Khassanov FO (2007). *Allium* L. subgen. *Rhizirideum* sensu lato in Iran, two new records and a synopsis of taxonomy and phytogeography. *Iranian Journal of Botany* 13: 12-20.

Özhatay N, Koçyiğit M & Akalın E (2010). *Allium rumelicum*, sect. *Codonoprasum*, a new species from European Turkey. *Phytologia Balcanica* 16: 355-359.

Özhatay FN, Kültür Ş & Gürdal MB (2011). Check-list of additional taxa to the supplement Flora of Turkey V. *Turkish Journal of Botany* 35: 589-624

Özhatay N & Tzanoudakis D (2000). *Allium* L. In: Güner A, Özhatay N, Ekim T & Başer KHC (eds.), *Flora of Turkey and the East Aegean Islands*, (Suppl. 2), Vol. 11, pp. 224-232. Edinburgh: Edinburgh Univ. Press.

Wendelbo P (1971). *Allium* L. In: Rechinger KH (ed.). *Flora Iranica*, Vol. 76: pp. 1-100. Graz: Akademische Druck und Verlagsanstalt.

Wendelbo P (1985). *Allium* L. In: Townsend CC & Guest E (eds.), *Flora of Iraq*. Vol. 8, pp. 137-177. Ministry of Agriculture Republic of Iraq, Baghdad.