

THE GENUS *ALYSSUM* SECTION *GAMOSEPALUM* IN IRAN

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Taxonomic aspects of the genus *Alyssum* section *Gamosepalum* in Iran were studied. Based on herbarium and more field investigations in NE Iran 9 *Alyssum* species (section *Gamosepalum*) were identified, and seven of these species are reported as new records.

Key words: *Alyssum*, *Gamosepalum*, Hezar-masjed, Irano-Turanian elements, Kopet Dagh

INTRODUCTION

Genus *Alyssum* L. has been known with up to 230 species in the world with major distribution in Eastern Europe and Turkey. Most of these species, specially *Alyssum* section *Gamosepalum* (Hauskn.) T. R. Dudley have only known from Turkey and Armenia.

In recent years *A. nezaketiae* Aytaç et Duman was reported by Duman and Aytaç (2000); *A. idaeum* Boiss. et Heldr., *A. obtusifolium* Steven ex DC., *A. mughlaidi* Orcan, *A. lenense* Adams and *A. misirdalianum* Orcan et Binzet by Orcan (1999), and Orcan and Binzet (2006); *A. dudleyi* Adigüzel et R. D. Reeves by authors from Turkey; and *A. argenteum* All., *A. callichroum* Boiss., *A. condensatum* Boiss., *A. obtusifolium* Steven ex DC., *A. penjwinensis* T. R. Dudley, *A. sibiricum* Willd., *A. filiforme* Nyár., *A. singarense* Boiss., *A. anaticum* Hauskn. ex Nyár., *A. stipitatum* Kavousi et T. R. Dudley, *A. mozafricanii* Kavousi were pointed out from Iran by Kavousi.

Due to the recent studies the number of *Alyssum* species increased to 50 from the formerly listed 31 species (Dudley 1968).

Monograph of the genus *Alyssum* is going to be done by Kavousi since 1999, in this paper the results of the last field investigations in NE Iran and new information about *Alyssum* section *Gamosepalum* are presented.

Based on our recent study *Alyssum tetrastemon* Boiss., *A. harputicum* T. R. Dudley, *A. lepidoto-stellatum* (Hauskn. et Bornm.) T. R. Dudley, *A. paphlagonicum* (Hauskn.) T. R. Dudley, *A. niveum* T. R. Dudley, *A. sulphureum* T. R. Dudley et Hub.-Mor., *A. corningii* T. R. Dudley and *A. thymops* (Hub.-Mor. et Reese) T. R. Dudley are reported from Khorasan province in NE Iran.

MATERIAL AND METHODS

The following specimens have been collected from Khorasan Province in northeast of Iran together with staff members of Mashhad University Herbarium (FUMH).

Alyssum paphlagonicum (Hauskn.) T. R. Dudley (Fig. 7): Iran, Khorasan, South of Mashhad, Mt Moj, 2,300 m. Coll.: Jouharchi, 16.5.2001 (33581b FUMH).

Alyssum tetrastemon Boiss. (Fig. 9): Iran, Khorasan, Hezar-masjed, Abshar-e-Zu, 2,000 m. Coll.: Nazari, 20.5.2008 (39387 FUMH).

Alyssum sulphureum T. R. Dudley et Hub.-Mor. (Fig. 4): Iran, Khorasan, Hezar-masjed, after Shohaday-e-Ashayer Diversion Dam, 2,500 m. Coll.: Nazari, 8.5.2008 (39392 FUMH).

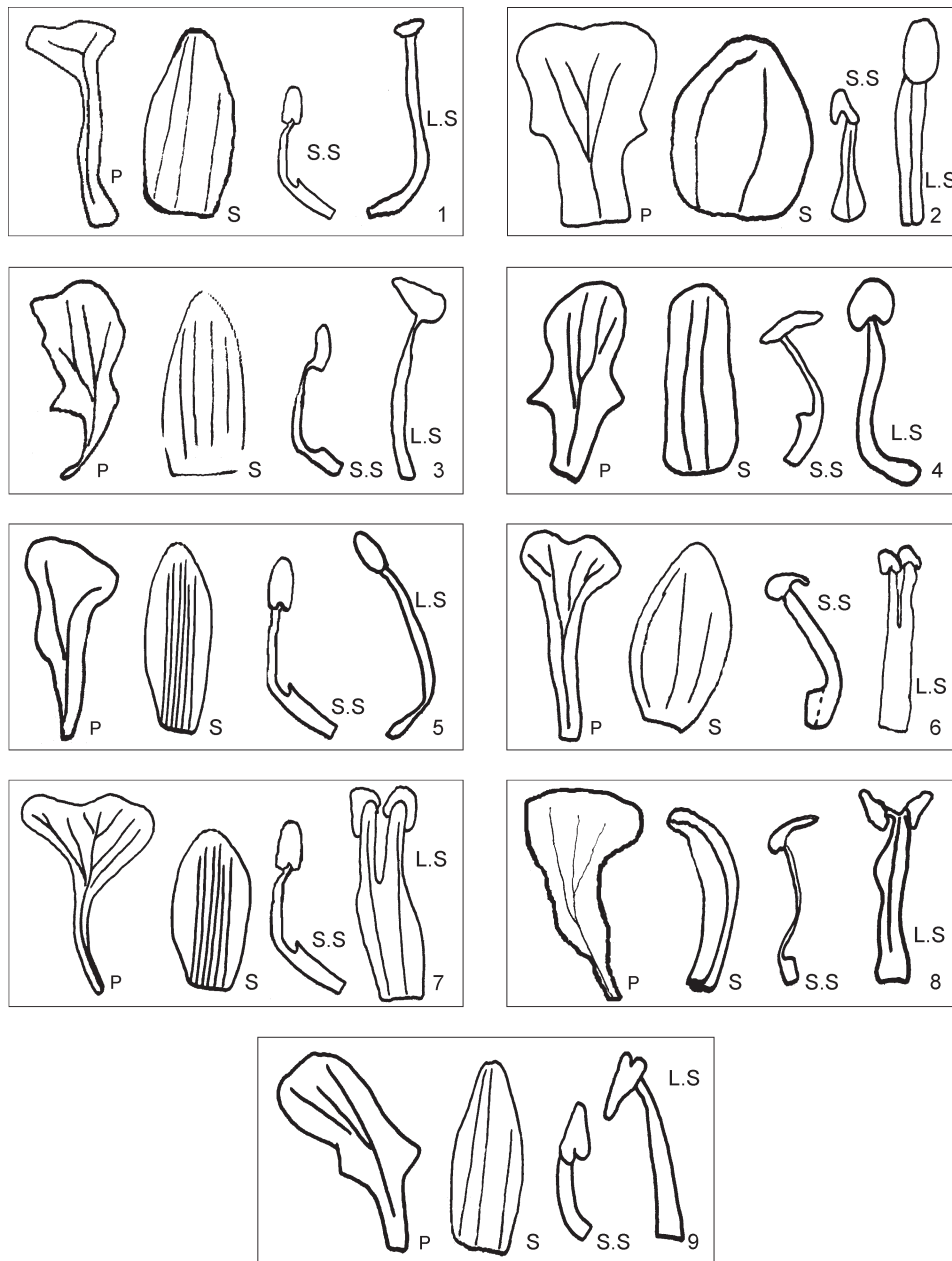
Alyssum lepidoto-stellatum (Hauskn. et Bornm.) T. R. Dudley (Fig. 6): Iran, Khorasan, Hezar-masjed, 2,000 m. Coll.: Nazari, 8.5.2008 (39388 FUMH).

Alyssum corningii T. R. Dudley (Fig. 3): Iran, Khorasan, Hezar-masjed, 98 km north of Mashhad, NW of Mareshk, 2,500 m. Coll.: Faghihnia and Zangooi, 24.6.1996 (27570 FUMH).

Alyssum niveum T. R. Dudley (Fig. 2): Iran, Khorasan, Hezar-masjed, south of Daregaz, 9 km of Garneh to Rishkhar, Alezar, 2,050 m. Coll.: Rafei and Zangooi, 9.6.1997 (24475 FUMH); NE of Birjand, between Marak and Sarchah, 2,100 m. Coll.: Faghihnia and Zangooi, 2.5.1995 (25219 FUMH); NW Kashmar, Kalat-e-Teymur, 1,800 m. Coll.: Faghihnia and Zangooi, 12.4.1993 (24743 FUMH); Hezar-masjed, 3,000 m. Coll.: Hojjat and Zangooi, 17.6.1997 (29255 FUMH); between Ghoochan and Daregaz, N. Tivan, 2,100 m. Coll.: Ajani and Zangooi, 5.6.2001 (32433 FUMH); 21 km Gonbad to Ferdows, 2,200 m. Coll.: Rafei and Zangooi, 25.4.1995 (21639 FUMH).

Alyssum thymops (Hub.-Mor. et Reese) T. R. Dudley (Fig. 8): Iran, Khorasan, Hezar-masjed, 2,200 m. Coll.: Nazari, 10.5.2008 (39402 FUMH).

Alyssum harputicum T. R. Dudley (Fig. 1): Iran, Khorasan, south of Mashhad, Mt Moj, 2,399 m. Coll.: Jouharchi, 17.5.2001 (33581a FUMH); SW of



Figs 1–9. 1 = *Alyssum harputicum*, 2 = *A. niveum*, 3 = *A. corningii*, 4 = *A. sulphureum*, 5 = *A. baumgartnerianum*, 6 = *A. lepidoto-stellatum*, 7 = *A. paphlagonicum*, 8 = *A. thymops*, 9 = *A. tetrastemon*.
Legends: p = petal, s = sepal, l.s = long stamen, s.s = short stamen ($\times 25$)

Bodjnourd, between Kachranlou and top of Mt Biv, 1,600 m. Coll.: Jouharchi and Zangooi, 14.5.1998 (16565 FUMH); North of Ghoochan, Ali-bolagh forest, 800 m. Coll.: Faghihnia and Zangooi, 15.5.2003 (32812 FUMH).

Determination of plant species has been done by Flora of Turkey (Dudley 1965) and all of the recorded specimens have been compared with the type materials in Turkish herbaria and the Natural History Museum of Vienna (Austria).

RESULTS AND DISCUSSION

According to the records of 9 species of *Alyssum* (section *Gamosepalum*) from NE Iran, it seems that Khorasan Province might be known as the second centre of the *Alyssum* section *Gamosepalum*, such as the Anatolian region in Turkey.

Based on Dudley (1964) all of the species of the genus *Gamosepalum* Hausskn. were combined with *Alyssum*. Dudley (1964) as *Alyssum* section *Gamosepalum* Dudl. with 10 species, some of the species, such as *A. baumgartnerianum* (Fig. 5), *A. niveum*, *A. harputicum*, *A. sulphureum*, *A. tetrastemon* and *A. corningii* were added to this section by Dudley in 1964, *A. nezaketiae* by Duman and Aytac in 2000, and *A. misirdalianum* by Orcan and Binzet (2006) from Turkey.

Based on the synopsis of Dudley (1964) species in the genus *Alyssum* section *Gamosepalum* are distinguishable from other species by dimorph sepals with simple, furcate, stellate or lepidoto-stellate hairs on the inner surface.

Our investigations show that *A. baumgartnerianum* and *A. sulphureum* are distributed in other countries besides Turkey, and other species have only been known from the type locality in Turkey.

Our recent work in Iran and comparative study between Iranian specimens and type material in Turkish herbarium come to this result that a lot of species from section *Gamosepalum* are distributing in Iran.

Our previous studies have only confirmed the occurrence of *A. niveum* and *A. baumgartnerianum* in Iran. Surely, more field investigations can find the lack of information about redistribution of the recorded species between Iran and the Anatolian mountains in Turkey and make more understanding about the reason of disjunction of new species from NE Iran with the type locality in Turkey.

It is necessary to present that all species in section *Gamosepalum* differ from the others by specific characters in flowers, sepals, petals, long and short stamens, as presented here.

REFERENCES

- Dudley, T. R. (1964): Synopsis of the genus *Alyssum*. – *J. Arnold Arbor.* **45**(3): 358–372.
- Dudley, T. R. (1965): *Alyssum* L. – In: Davis, P. H. (ed.): Flora of Turkey and the East Aegean Island. 1. Edinburgh University Press, Edinburgh, pp. 362–406.
- Dudley, T. R. (1968): *Alyssum* L. – In: Rechinger, K. H. (ed.): Flora Iranica, Cruciferae. 58/28. Akademische Druck- u. Verlagsanstalt, Graz (Austria), pp. 146–170.
- Duman, H. and Aytaç, Z. (2000): *Alyssum nezaketiae* new species from central Anatolica. – *Israel J. Plant Sci.* **48**(4): 317–319.
- Kavousi, K. (2001): Notes on the plant family Cruciferae in Iran, new taxa and new records. – *Iranian J. Bot.* **9**(1): 47–57.
- Orcan, N. (1999): A new *Alyssum* record for the flora of Turkey. – *Israel J. Plant Sci.* **47**(4): 291–294.
- Orcan, N. and Binzet, R. (2006): A new record for the Flora of Turkey, *Alyssum idaeum* Boiss. & Heldr. – *Pakistan J. Bot.* **38**(4): 931–933.