

NOTES ON THE PLANT FAMILY CRUCIFERAE IN IRAN, NEW TAXA AND NEW RECORDS

K. Kavousi

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The new subsection *Alyssum* sect. *Odontarrhena* subsect. *Stipitata* is described, *Alyssum stipitatum* is designated as the type.

Alyssum mozaffarianii, *A. stipitatum* and *Farsetia assadii* are described as new species.

Alyssum argenteum, *A. callichroum*, *A. condensatum*, *A. harputicum*, *A. obtusifolium*, *A. sibiricum*, *A. singarense*, *Farsetia longisiliqua* and *F. stylosa* are reported as new records to Iran.

Kouros Kavousi, Department of Environment, Mahab Ghodss co. 17, Takharestan Alley, Shahid Vahid-e Dastgerdy Ave., P. code 19187, Tehran, Iran.

Key words: *Alyssum*, *Farsetia*, new taxa, Iran.

یادداشتی بر تیره شببو در ایران، آرایه‌ها و گزارشهای جدید

کوروش کاوسی

زیربخش *Alyssum* sect. *Odontarrhema* subsect. *Stipitata* به عنوان زیربخش جدیدی

معرفی می‌گردد و گونه *Alyssum stipitatum* به عنوان تیپ آن مشخص می‌شود.

گونه‌های زیر به عنوان گونه‌های جدیدی شرح داده می‌شوند.

Alyssum mozaffarianii, *A. stipitatum*, *Farsetia assadii*

گونه‌های زیر برای اولین بار از ایران گزارش می‌گردند.

Alyssum argenteum, *A. callichroum*, *A. condensatum*, *A. harputicum*, *A. obtusifolium*, *A. sibiricum*, *A. singarense*, *Farsetia longisiliqua*, *F. stylosa*.

INTRODUCTION

In Flora Iranica (Rechinger 1968), 31 species of *Alyssum* and two species of *Farsetia* have been mentioned from Iran. Based on much more field studies and herbarium observations 41 species of *Alyssum* and 5 species of *Farsetia* have been recognized from Iran. In this paper 3 new species are described and 9 species are reported for the first time in Iran. A new subsection is recognized for one of the *Alyssum* species. Part of the new taxa were prepared in collaboration with late Dr. T. R. Dudley, which in this case his name are used as coordinating author. The materials are preserved in TARI.

NEW TAXA

Alyssum mozaffarianii Kavousi, sp. nov.

Suffrutescens, multiramisum, 25-35 cm altum, surculi steriles basales, foliis obovato-spathulatis vel oblanceolato-spathulatis, indumento dense lepidoto. Folia caulina floriferum sparse obovato-lanceolata, acuta, attenuata. Inflorescentia racemosa. Sepala ovata vix aequilonga, elliptica, 2×0.8 mm; indumentum e pilis stellatis consistens. Petala flava, obovato-spathulata, retusa; limbi glabri, stellato-pilosi 3.5×1.5 mm. Filamenta majus 3 mm longa, alata; ala vario modo denticulata; dentes 2-4 numerus; filamenta minora 2 mm longa, basi appendiculata; appendix acuta vel 2-3 dentata, 1-5 mm longa. Pedicelli fructiferi 4 mm longi, erecto-patuli. Siliculae ellipticae, inflatae, acutae, 3×1.8 mm, pilis stellatis tenuiter multiradiatis, non contiguas, deinde evanescentibus obsitae. Stylus 2 mm longus. Semina exalata.

Typus. Tehran, Road of Chalus, Kandavan Mont. 2710 m, 21.7.1972, Foroughi 2180 (hol. TARI). *-Paratypus*. Tehran, Doab, 2055m,

Rahmanian 4475 (TARI); Kandavan, Gajereh, 2000 m, 6.7.1970, Babakhanlu 6593 (TARI); Kandavan, Khargushdareh, 2450 m, 24.6.1972, Amin & Babakhanlu 6264 (TARI); Kandavan, 2880 m, 28.2.1960, Pabot 4862 (TARI).

Perennial, suffruticose, multibranched, up to 25-35 cm high. sterile shoots few, arising from the base. Leaves obovate-lanceolate or oblanceolate-spathulate. Indumentum of grey canescens stellate hairs. Flowering stem leaves obovate-lanceolate, acute, attenuate at the base. Inflorescence terminal racemes, 4-6 (-10) cm long. Sepals elliptic, equal, obtuse, covered by stellate hairs. Petals yellowish, obovate-spathulate, retuse, glabrous or with few stellate hairs, 3-5×1.5 mm. Long filaments 3 mm long, winged; wing 2-4 toothed; short filaments 2 mm long, appendiculate; appendix acute or 2-3 dentate. Wing 1.5 mm long. Pedicel 4 mm long, erect. Fruits 3×1.8 mm, elliptic, inflated, acute at the apex, covered with deciduous stellate hairs. Style 2 mm long. Seeds wingless.

The new species is related to *A. longistylum*. The differences are shown in table 1.

Alyssum stipitatum K. Kavousi & T. R. Dudley, sp. nov.

Plantae perennae, suffruticosae, a. basi interdum ramosissimae, 9-10 cm altae, 19 cm diametro. Caules floriferi multi, arcuato-ascendentes, 12 cm alti, indumento e pilis punctato-stellatis, 0.55 mm diametro, 8-12 radiatis, foliis persistentibus, spathulatis vel obovato-spathulatis, 5-12×2-3 mm, apice subacutis, indumento e pilis stellatis 0.55 mm longis, 18 radiatis. Surculi steriles basales pauci, decumbentes, 1-2 cm longi, densiuscule foliati, indumento e pilis punctato-stellatis, 0.55 mm longis, 8-12 radiatis. Folia obovata vel obovato-spathulata. Inflorescentia corymbosa, ramosa, 1.5-3.5 cm longa, 6 mm



Fig. 1. *Alyssum mozaffarianii* ($\times 0.6$); fruit ($\times 11$)

Table 1. Comparison of *Allysum mozaffarianii* and *A. longistylum*.

Characters	<i>A. mozaffarianii</i>	<i>A. longistylum</i>
Short stamen wing	2-3 teeth	1 (2) teeth
Fruit cross section	Inflated	Non inflated
Fruit size	3×1.8 mm	4-6×2.5-3 mm
Fruit hairs	Deciduous	Persistent

diametro. Pedicellii fructiferi 2-3 mm longi subdivergentes vel subflexuosi. Sepala ovata, rotundata vel obtusa, 1.5-1.8×1 mm, decidua, marginibus coriacea. Petala spathulata, apice emarginata, basi cuneata, 2.5-2.7 mm longa; limbi 0.7-0.8 diametro, glabri vel sparse stellati. Filamenta majus 2-2.5 mm longa, unilateraliter alata; ala 0.8-0.9 mm, connata, apice acuta, 0.1 mm longa. Filamenta minora 2 mm longa, appendiculata, appendice 0.1-0.2 mm diametro, apice acuto 1-2 dentato. Anthera flava, longitudinaliter dehiscens, pubescens, obtusa, 2 mm longa, 0.8-1 mm lata. Stylus glabrus, 1 mm longus. Silicula stipitata, stipite 1.5 mm longi, apice obtusa, oblongo-obovata, erecta vel subdivergens, 2.5-3.5×1 mm, margine crenulata, inflata, indumento e pilis punctato-stellatis, 6-10 radiatis. Pedicelli fructiferi 2-3 mm longi. Stylus glabrus, 0.8-1 mm longus, stigmatum capitato, 0.1 mm diametro. Semina exalata, orbiculata, 0.1×0.4 mm.

Typus. Tehran, 12 km after Tehran, on road of Karaj, near the road, 1320 m, 22.5.1972, Malekpour & Fourghian 6051 (hol. TARI).

Perennial, multistemmed and multibranched, covered by grey-canescens stellate hairs, 9-10 cm high. Flowering stems numerous, arcuately ascending, sparsely foliate. Sterile shoots few, arising from the base, 1-2 cm long, decumbent and spreading, densely foliate, with grey canescens hairs. Leaves of sterile shoots obovate to obovate-spathulate. Inflorescence terminal, corymbose-racemose, 2-2.5 cm long. Flowers white. Pedicels 2-3 mm long. Sepals

ovate, 1.5-1.8×1 mm, covered by stellate hairs, narrowly membranaceous at the margin. Petals spathulate, emarginate, 2-2.5×0.7-0.8 mm, glabrous or with sparse stellate hairs. Long filaments 2-2.5 mm long, with a narrow unilateral wing; wing 0.8-0.9×0.13 mm; free portion unidentate, 0.1 mm long. Short filaments 2 mm long; free wing 1×0.1-0.2 mm, with 1-2 teeth at the apex. Style glabrous, 1 mm long. Silicule two seeded, strongly stipitate, erect or subdivergent, oblong-obovate, 2.5-3.5×1 mm, at the margin semicrenulate; valves herbaceous, equal, inflated, covered by 6-10 rayed stellate hairs. Seeds brown, wingless 1×0.4 mm.

Alyssum stipitatum belongs to the sect. *Odontarrhena* (Meyer) Hooker. But it needs a new subsection, based on the stipitate fruit.

Alyssum section **odontarrhema** (Meyer) Hooker subsection **stipitata** K. Kavousi & T. R. Dudley, **subsect. nov.**

Seccio nova a siliquis 1.5 mm longo stipite, margine crenulata, subdivergenti distincta.

Typus. *Alyssum stipitatum* K. Kavousi & T. R. Dudley.

Farsetia assadii K. Kavousi, **sp. nov.**

Suffrutescens, ramosissimus, 25 cm altus. Caules tenues, ramosi. Indumentum totus plantae e pilis bipartis appressis. Folia sparsa, linearia vel oblanceolata, 2-3×1-1.2 mm, apice acuta, basi attenuata. Racemi multiflori, 6 cm longi, fructiferi elongati. Pedicelli 1 mm longi, fructiferi 3-3.5 mm longi. Sepala 8 mm longa, interiora 1.5 mm lata, exteriora 1.2 mm diametro. Petala pallide flava, obovato-



Fig. 2. *Alyssum stipitatum* ($\times 0.7$); flower ($\times 28$); fruit ($\times 7$).

Table 2. Comparison of *Alyssum argenteum* and *A. murale*.

Characters	<i>A. murale</i>	<i>A. argenteum</i>
Petal apex	Obtuse	Retuse
Petal base	Attenuate	Distinctly narrowed
Petal shape	Obcordate	Obovate-spathulate

spathulata, 12×2.5 mm. Filamenta media 5 mm, lateralia 2.7 mm longa. Antherae 3 mm longae. Ovarium 8-14 ovulatum. Stylus brevis, 0.25 mm longus. Stigma bilobum, lobis decurrentibus, 0.75 mm longis. Siliqua plana, linearia, 22×3 mm, apice acuta, valvis tenuibus. Semina angusta, 1.5 mm lata; ala 1 mm lata.

Holotypus. Kerman, Hamun Jazmurian, Zehkalat, Hossein abad village, 300 m, 24.10.1983 Mozaffarian 45634 (TARI).

Suffruticase, branched, 25 cm high. Stems thin, branched. Indumentum of total plant consist of two branched, appressed hairs. Leaves scattered, linear or oblanceolate, 2-3×1-1.2 mm, acute, attenuate at base. Racemes many flowered, 6 cm long, elongated at fruiting stage. Pedicells 1 mm long, 3-3.5 mm at fruiting stage. Sepals 8 mm long, 1.5 mm wide. Petals pale yellow, obovate-spathulate, 12×2.5 mm. Inner filaments 5 mm long; outer filaments 2.7 mm long. Anthers 3 mm long. Ovary 8-14 ovuled. Style short, 0.25 mm long. Stigma bilobed; lobes decurrent, 0.75 mm long. Siliqua flat, linear, 22×3 mm, acute, with thin valves. Seeds narrow, 1.5 mm wide; wing 1 mm wide.

The species with acute silicua and attenuate, obovate-spathulate petals is distinguishable from *Farsetia jaquemontii*, named in the honour of Dr. Mostafa Assadi, A botanist in National Botanic Garden of Iran.

NEW RECORDS

Alyssum argenteum All.

Mazandaran: 50 km SW of Chalus, Delir village, 2800 m 18.7.1984, Assadi & Maassoumi 6437 (TARI). -Azarbaijan: Arasbaran protected area, South of Vaighan, 1200-1500 m, 10.6.1976, Assadi

& Maassoumi 20354 (TARI). -Lorestan: Aligudarz, Chagha Gorg, 2200 m, 7.5 1973, Riazi 9728 (TARI).

This species belongs to subsection *Compressa* and similar to *Alyssum murale* Waldst. & Kit., differences between the two species are shown in table 2. (Nyaradi 1927).

Alyssum callichroum Boiss.

Hamadan: Alvand mountain, 3000 m, 11.7.1977, Zehzad & Rafii 490, Shahid Behesti University herbarium.

A new record for Iran, it was previously known only from Turkey (Orcan 1997).

Alyssum condensatum Boiss.

Ardabil: Khalkhal (Herowabad), Almus mount; 1950 m, 23.6.1950, Makui 9939 (TARI).

This species has only been known from Iraq, Syria, Libanon and Turkey previously (Rechinger 1968).

Alyssum harputicum Dudley

Tehran: Road of Firuzkuh, Kalar-Khan, 59 km. SE. of Firuzkuh, 2500 m, 19.6.1973, Bazargan & Arazm 6663 (TARI).

Alyssum harputicum and *A. baumgartnerianum* Bornm. belong to sect. *Gamosepalum*. Petals in *Alyssum harputicum* are denticulate in the margin, 2.5 mm wide, but edentate and 1 mm wide in *A. baumgartnerianum* (Dudley 1965).

Alyssum obtusifolium Stev.

Tehran: Abe-ali, 2750 m, 15.6.1975, Amin 1412 (TARI).

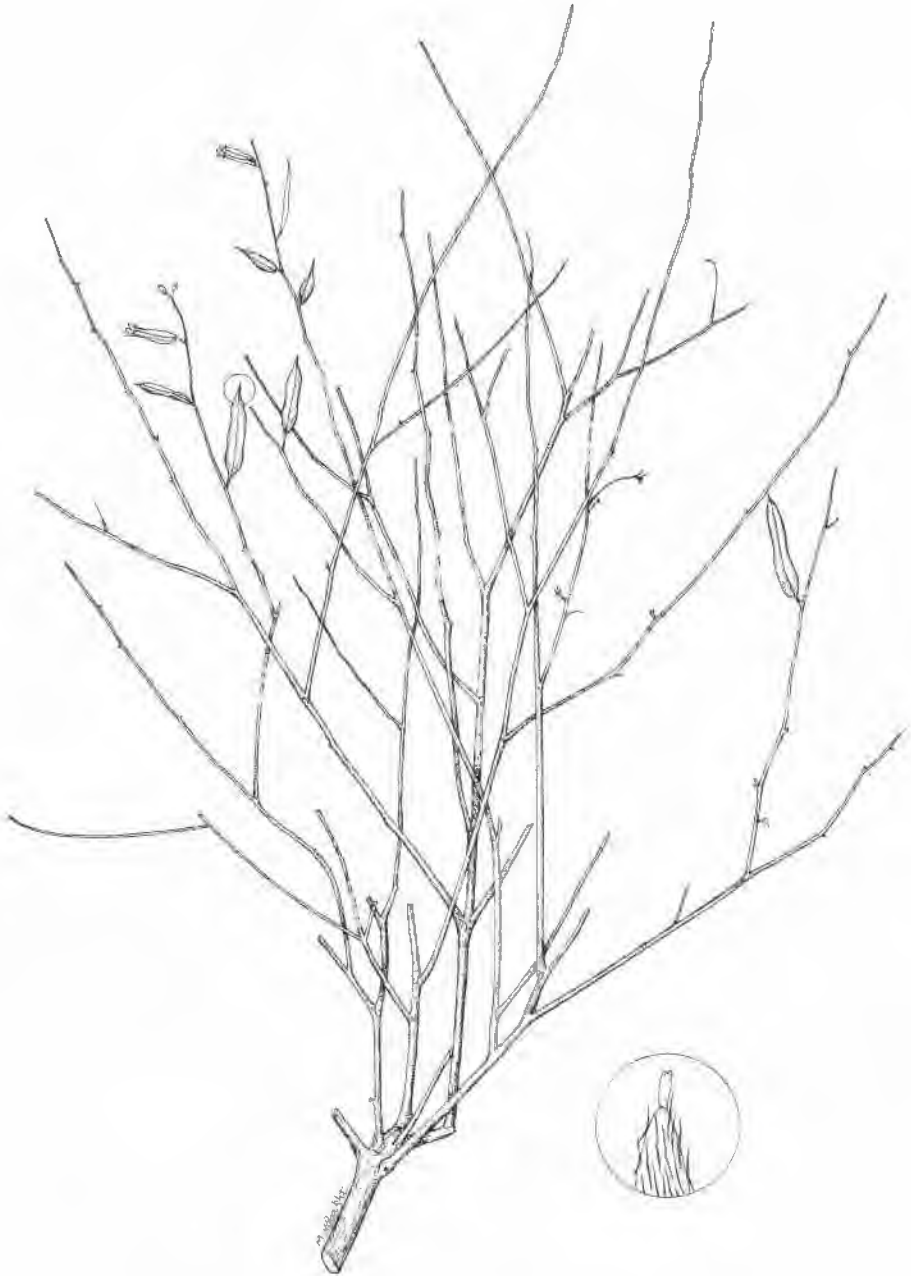


Fig. 3. *Farsetia assadii* ($\times 0.6$)

This species has been previously known from former USSR and Turkey (Orcan 1997).

***Alyssum penjwinensis* Dudley**

Kurdistan: 42 km S. of Sanandaj, Marivan mountain, 1800-1970 m, 17.6.1978, Hamzee 1179 (TARI); Mahabad, Bovana village, 1700 m, 25.8.1987, Fatahi & Boluki 49 (TARI). – Kermanshah: NW. of Kermanshah, Shamsir village, Shahu mont, 1700-1960 m, 18.6.1987, Hamzee & Hatami 1255 (TARI); Kuhe-Paveh, 1700 m, 18.6.1987, Assadi 50726 (TARI).

This species has only been known from Iraq. All of plant is green-yellowish, hairs of silicule is dispersal and with 4-8 rays, a close species to *A. condensatum* Boiss. & Hausskn. in flower characters (Orcan 1997).

***Alyssum sibiricum* Willd.**

Azarbaijan: Salavat, Goli-Daragh, mont. Goli-Daragh, 24.2.1980, 1980-1990 m, Mozaffarian & Nouruzi 35041 (TARI).

The nearest locality to the Iranian gathering is in Turkey. Silicule in *A. sibiricum* is strongly S-shaped in cross section. Teeth wing of the long stamens are characteristic comparing to the related species in Iran (Dudley 1965).

***Alyssum singarense* Boiss. & Hausskn.**

Azarbaijan: Urmiyeh, Shahr-chay river, 1340 m, 12.5.1972, Zehzad 72353 (Shahid Beheshti University herbarium).

This new record have previously been known only from the type locality in Iraq (Dudley 1965).

***Farsetia longisiliqua* Decaisne**

Yazd: 63 km from Yazd to Bafgh, 1400 m, 25.5.1986, Assadi & Bazgoshah 55991 (TARI).

This species has been reported previously from Egypt, Africa, Yemen, Saudi Arabia and it is new record to the flora of Iran (Johnsell 1986).

***Farsetia stylosa* R. Brown**

Baluchestan: 80 km from Chahbahar to Rask, Kahir, 80 m, 16.4.1973, Mozaffarian 43792, 43791 (TARI); Gat, Road of Chahbahar, 40 m, 7.4.1974, Foroughi 10680 (TARI); 71 km Rask, on road of Chahbahar, 100 m, 8.3.1977, Runemark, Assadi & Sardabi 22442 (TARI); Chahbahar, 5 km from Negur to Beris, 30 m, 13.11.1984, Mozaffarian 52807 (TARI).

This species has only been known previously from Pakistan and India (Johnsell 1986).

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