

## NEW SPECIES OF SCROPHULARIA L. (SCROPHULARIACEAE) FROM IRAN

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*Scrophularia* L. has 60 species in Iran that 26 taxa are endemic to Iran. Among the collected specimens six new species are recognized as new species that named *S. alhagioides*, *S. crassipedunculata*, *S. ispahanica*, *S. khorassanica*, *S. schiraziana* and *S. tortuosissima*. These species are compared with their closest related taxa. Also *S. rosulata* is reported for the first time from Iran. The illustrations of all species are presented.

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**Keywords.** *Scrophularia*, new species, Khorassan, Iran.

گونه‌های جدی‌دی از جنس اسکروفولاریا در ایران

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جنس اسکروفولاریا در ایران دارای ۶۰ گونه است که از این تعداد ۲۶ گونه انحصاری ایران هستند. در میان نمونه‌های جمع‌آوری شده ایران شش گونه به عنوان گونه‌های جدیدی شرح داده شده و به نامهای *S. alhagioides*, *S. crassipedunculata*, *S. ispahanica*, *S. khorassanica*, *S. schiraziana*, *S. tortuosissima* نامگذاری شدند. این گونه‌ها با نزدیکترین گونه‌های خویشاوند خود مقایسه می‌گردند. گونه *S. rosulata* نیز که پراکنش آن تا کنون از افغانستان گزارش شده بود بر اساس جمع‌آوری‌های متعدد از مرزهای شمال شرقی ایران نزدیک ترکمنستان برای اولین بار گزارش می‌گردد. تصاویر همه گونه‌ها نیز ارائه می‌گردد.

### INTRODUCTION

*Scrophularia* L. is the largest genus of *Scrophulariaceae* in Iran that has 60 species in Iran (Grau, 1982; Attar & Hamzeh'ee, in press; Attar, 2006). Most species of the genus *Scrophularia* in Iran are Irano-Turanian elements and are distributed in mountainous regions. During the studies on the genus *Scrophularia* in Iran for the preparation of the Flora of Iran we found some interesting specimens that further studies showed to be new species or new to Iran. These species are introduced in this paper.

### NEW SPECIES

***Scrophularia alhagioides* Attar & Joharchi, sp. nov.** (Fig.1).

**Type.** Iran: Khorassan: northwest of Bojnurd, between Ayer-ghaye and Soukhli, ca. 1000m, 12.6.2001, Joharchi 33747 (holotypus -FUMH).

Species *S. variegata* subsp. *variegata* similis sed pedunculi et pedicelli spinosi (nec inermes); corolla 3 mm longa (nec 4-7.5 mm longa); bracteae infimae usque 13 mm longae (nec usque 6 mm longae).

Perennial, deep green, multi-stemmed, ca 47 cm tall. Stem terete, striate, branched, pruinose. Leaves opposite, pruinose; basals irregularly deeply parted, with up to 20 mm long petiole; lamina up to 2 cm long and 1 cm wide, lanceolate; stem leaves sessile, smaller. Inflorescence bracteate, thyrses; cymes alternate; lower cymes up to 5-flowered; uppers 1-2-flowered. Peduncle

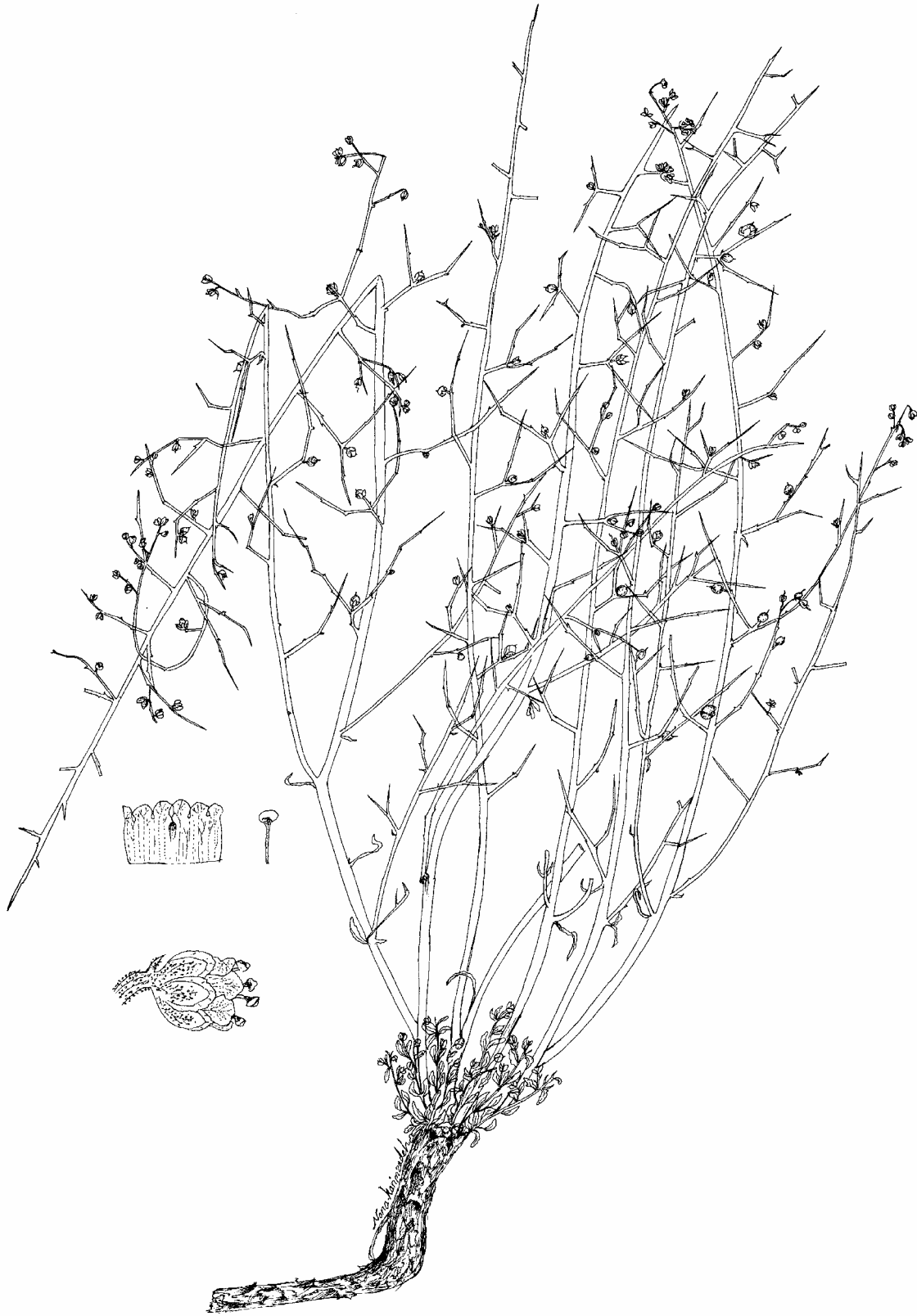


Fig. 1. *Scrophularia alhagioides* (x 0.5); corolla (x2); flower (x3).

spinose, 5-7 mm long, pruinose. Pedicel spinose, 1-2 mm long, pruinose. Lower bracts linear, 13 mm long and 1 mm wide, uppers 1.5 mm long and 0.2 mm wide, linear, lax pruinose. Calyx segments almost orbicular, 1.5 mm long and 2 mm wide, lax pruinose; margin white, 0.5 mm wide, lacerate. Corolla 3 mm long, reddish; lips unequal. Staminode linear, free, inserted in the middle of length of corolla. Filaments 3 mm long, covered by white glands; anthers pale. Capsule 2-3x2-3 mm, spherical, glabrous, apiculate.

*Affinities.* *Scrophularia alhagioides* is closely related to *S. variegata* M. B. subsp. *variegata* and *S. czapendaghii* B. Fedtsch. (distributed in Turkmenistan). It is very characteristic by its especial habit that is very similar to *Alhagi* that is very rare among species of *Scrophularia* at least in SW of Asia.

*Habit.* Sandy slopes, very rare.

***Scrophularia crassipedunculata* Attar & Joharchi, sp. nova** (Fig. 2).

*Type.* Iran: Khorassan: Mashhad, Cheshmeh Sabz, 31.10.1985, Ayatollahi & Joharchi. 13630- (Holotype FUMH).

Differt ab *Scrophularia variegata* M. B. subsp. *variegata* pedunculi crassi, stricti; cymae infimae 1-2 florum (nec usque ad 8 florum); stamina non exserta, 6 mm longa (nec 7 mm longa); lobis superioribus 2 mm longis (nec usque ad 1 mm longis).

Suffruticose, all glabrous, up to 30 cm long. Stems numerous, almost simple, striate. Leaves opposite, sessile, subamplexicaule, ovate-cordate, acute, obtuse or sometimes apiculate; lower leaves dentate to entire at margin; middle and upper leaves entire. Inflorescence bracteose, few-flowered; cymes alternate; lower cymes with up to 1 cm long peduncle, in upper cyme 4 mm long; pedicel 1-6 mm long; peduncle and pedicel thickened, strict. Bracts in lower cyme lanceolate-triangular, 4x2 mm; bracteoles linear or triangular, smaller. Calyx segments subequal, 3x2 mm, oblong to elliptic, with white or reddish flat margin. Corolla 6 mm long; upper lip 2 mm long, green, reddish at margin. Stamens included, 5 mm long. Staminode free above, flabellate, subequal with lateral lobes. Style ad 4 mm long. Capsule glabrous, 4x4 mm, apiculate. Seeds immatured.

*Other specimens. Paratypes:* Khorassan: Chenaran, Farizi region, Dermeh village, beside river, 36°, 29', 58°, 53', 1973 m, 11.6.2005, Emadzadeh, Memariani & Zangooei, 26644; mt. Binalud, mt. Pivehzen, 1900 m, 29.7.1992, Faghinia & Zangooei 22333-FUMH;

Southeast of Neyshabour, Dizbad-e Olya, slope of mt. Ghoujgher, 2200-2300 m, 10.8.2003, Joharchi 35134-FUMH; Neyshabour, Baghshan, East of Neyshabour, mt. Garineh, 1900 m, 3.7.1996, Faghinia & Zangooei 27771-FUMH.

*Affinities.* *Scrophularia crassipedunculata* is related to *S. variegata* subsp. *variegata* but easily distinguished from it by hardly thickened peduncles and pedicels and few flowered cymes.

***Scrophularia ispanica* Attar & Nowrouzi, sp. nov.** (Fig. 3).

*Type.* Esfahan: Fereydunshahr, Cheshmeh Langan, 2550 m, 11.6.1998, Nowrouzi & Shams 11741 (Holotype, Esfahan, Research Centre of Agricultural and Natural Resources Herbarium).

*S. flava* Grau similis sed foliis pinnatisectis (non late serratis), inflorescentiis 18 cm longis (non 6 cm longis), bracteis glabris (non glandulosis), staminibus 7 mm longis (non 4.5 mm longis), staminodium flabellatum (non ellipticum).

Plant herbaceous, up to 70 cm tall, glabrous. Stem branched, striate. Leaves 6x4 cm, opposite, sessile, lanceolate, pinnatifid or irregularly parted. Inflorescence thyrsoid, bracteate, nearly 18 cm long. Cymes alternate; lower cymes 3-flowered, uppers 1-flowered. Peduncle up to 10 mm long, covered by stipitate black glands. Pedicel up to 6 mm long, covered by stipitate black glands. Bracts 3x1 mm, linear or lanceolate, glabrous. Calyx 3.5x3 mm, suborbicular, glabrous, membranous at the margin. Corolla 7 mm long, yellow or greenish, with unequal lips. Staminode flabellate, covered by white glands, greenish-yellow. Stamens 4.5 mm long, included; anthers yellow; filaments glandular. Capsule not seen.

***Scrophularia khorassanica* Attar & Joharchi, sp. nov.** (Fig. 4).

*Type.* Khorassan: Mashhad, southwest of Sarakhs, between division of Salehabad and Baghbaghu, south of Rahmatabad, 690-700m, 2.6.2003, Joharchi & Zangooei. 34573- (holotype FUMH).

Differt ab *Scrophularia rosulata* Stiefel. Cymae infimae usque 5-florum (nec (7-) 25 florum); pedunculi usque 1 cm longi (nec usque 3.3 cm longi); staminodium nullum (nec lineare); antherae rubrae (nec albae).

Perennial or biennial, totally pruinose, up to 40 cm tall. Stem indistinctly striate, simple or branched. Basal



Fig. 2. *Scrophularia crassipedunculata* (x 0.5); details (x2).



Fig. 3. *Scrophularia ispanhanica* (x 0.7); details (x 3.5).

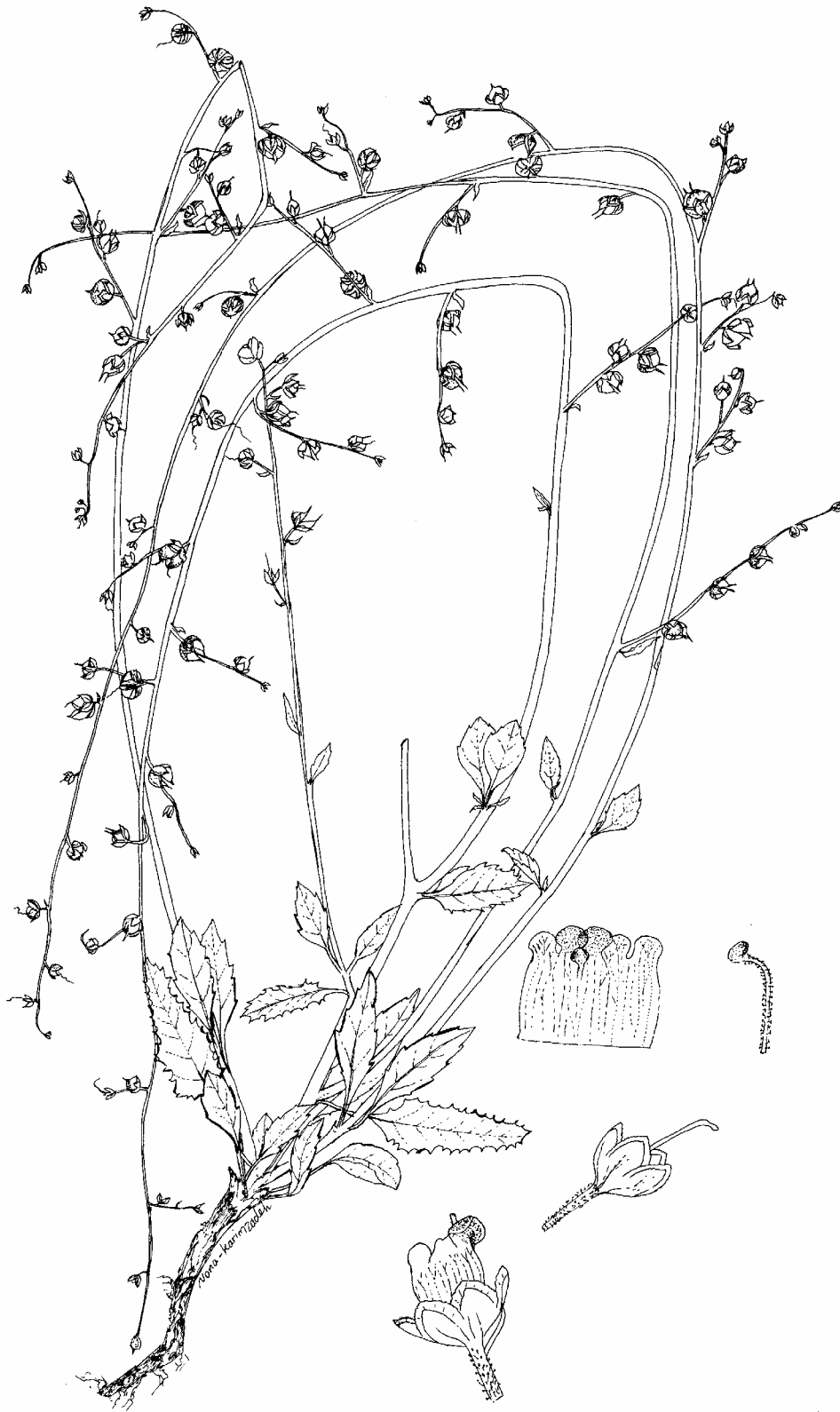


Fig. 4. *Scrophularia khorassanica* (x 0.65); details (x 3.2).

leaves in rosette, with up to 2 cm long petiole; lamina elliptic, irregularly dentate or parted; lower leaves opposite, shortly petiolate similar to basals; median leaves alternate, reduced, sessile. Inflorescence bracteate; cymes alternate; lower cymes up to 5-flowered, with up to 1 cm long peduncle; uppers 1-flowered, with 3 mm long peduncle; pedicel 1-2 mm long or absent. Bracts in lower cymes lanceolate, leaf-like, 8-12x5 mm; bracteoles linear, 2x0.5 mm. Calyx segments pruinose, 4x3 mm, oblong to elliptic, broadly flat white-margined. Corolla 4mm long, pink, lips subequal. Stamens exerted, 5mm long; anthers red; filaments glandular. Staminode absent. Capsule glabrous, 3 mm long and 4 mm wide, apiculate. Seeds 3x2 mm, black, prismatic, slightly curved, deeply transversely scrobiculate.

*Other specimen. Paratype:* Iran: Khorassan: Mozduran, 14 km to Sarakhs, 850m, 21.5.1985, Ayatollahi & Joharchi 13215-FUMH.

***Scrophularia schiraziana* Attar & Hatami, sp. nov.** (Fig. 5).

*Type.* Fars: Shiraz, Deh Bid, Qasr-e Yaghoub, 2040m, Hatami 105853 (Holotype Shiraz, Research Centre of Agricultural and Natural Resources Herbarium).

Perennis, ad 32 cm alta, e rhizomate. Caules singuli, erecti, quadrangulare. Folia 10-50x5-30 mm, opposita, ovata, indivisa, dentata, acuta, cordata vel subcordata, petiolo 5-15 mm longo suffulta. Inflorescentia thyrsoida, bracteolata. Cymae inferiorae alternatae. Pedunculi usque 15 mm longi. Pediceli usque 5 mm longi. Bracteae inferiorae foliaceae, usque 8x3 mm, lanceolatae, triangulares. Calycis lacinae 3x2 mm, suborbiculariae vel ellipticae, albo-marginatae. Corolla 5 mm longa, tubo pallidi, lobis rufescentibus. Stamina 5 mm longa. Staminodium suborbiculare. Capsula glabra, 5x4 mm, apiculata. Semina immatura.

Perennial herb, rhizomatous, all hirsute-glandulose, 32 cm. tall. Stem solitary, erect, quadrangular. Leaves 10-50x5-30 mm, opposite, broadly ovate, undivided, dentate or double-dentate at margin, acute, cordate or subcordate at base, with up to 5-15 mm long petiole. Inflorescence thyrses, bracteate. Lower cymes alternate, with up to 15mm long peduncle, in upper cyme 5mm long; pedicel up to 5mm long. Bracts in lower cyme leaf-like, up to 8x3 mm lanceolate-triangular. Bracteoles in upper cymes smaller, linear. Calyx segments subequal, 3x2 mm, suborbicular to elliptic, with flat white margin. Corolla 5 mm long; tube pallid;

lips rufescence. Stamens included, 4mm long. Staminode semiorbicular. Capsule glabrous, 5x4mm, apiculate. Seeds immature.

*Paratype.* Fars: Sepidan, 2200m, 15.5.1972, Zandi 6678; Kermanshah, Paveh, Hajj, Zeltah valley, 650-700m, Tavakoli 3083 TARI.

*Habit.* Riverside.

The relationships of *S. schiraziana* is not clear, but it probably belongs to the group *S. catarifolia* based on their undivided leaves and *S. variegata*. based on length and color of corolla.

***Scrophularia tortuosissima* Attar & Joharchi, sp. nov.** (Fig. 6)

*Type.* Iran: Khorassan. Mashhad, road of Sarakhs, between division of Bezangan and Shurlogh, 650 m, 16.8.1994, (holotype Akhani & Zangooei 24521-FUMH).

Differt ab *Scrophularia frigida* subsp. *haussknechti* ramis tortuosissimis (nec divaricatis), cyma infima usque 1-2 florum (nec usque 9 florum), pedunculo usque 5.5 mm longo (nec usque 30 mm longo), corolla 8.5 mm longa, (nec 3.5-5 mm longa), staminibus  $\pm$  10 mm longis (nec  $\pm$  5 mm longis), staminodiis linearibus (nec spathulatis, reniformibus vel triangularibus).

Perennial, up to 60 cm tall, glabrous. Stem hardly dichotomously branched, intricate, terete, striate. Leaves opposite, few, remote, basals spatulate, parted, up to 13 mm long and 3 mm wide, with 2 mm long petiole; cauline leaves similar to basals but smaller. Inflorescence bracteate, thyrses; lower cymes 1-2-flowered, uppers 1-flowered. Peduncle in lower cymes 5.5 mm long, in uppers up to 3 mm long; pedicel up to 6 mm long, with long dense white spreading glandular hairs. Bracteoles linear, binate, covered by dense long hairs, 2.5x0.5 mm. Calyx segments subequal, at first triangular, 3x1 mm, then accrescent in fruit, linear, 6x1 mm, indistinctly membranose-margined, covered by dense long multicellular hairs, glands with brown tip. Corolla 8.5 mm long, pink, slightly constricted at base, lips subequal or upper lip slightly longer, all lobes with rounded tip. Staminode reduced into linear appendage, indistinctly broad at tip, free. Stamens more or less 10 mm long, exerted; dried anthers brownish; filaments glandulose. Capsule subspherical, apiculate, 4x4 mm, yellow, covered by glandular hairs, sometimes mixed with shortly stipitate glands, with persistent 8 mm long style. Seeds light or dark brown. elliptic to subovate, curved, indistinctly pustulate.



Fig. 5. *Scrophularia schiraziana* (x0.86); fruit (x7).



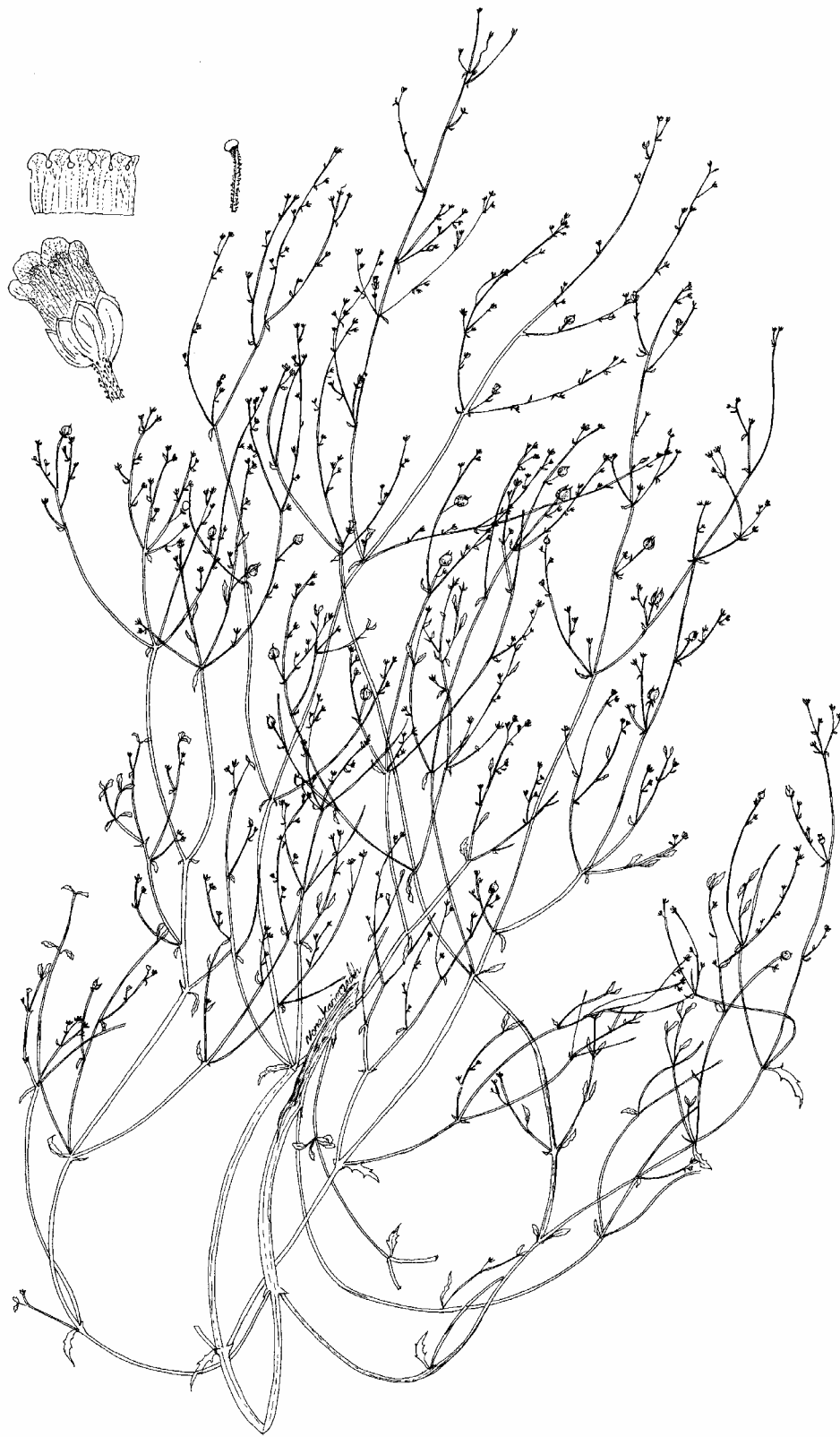


Fig. 6. *Scrophularia tortuosissima* (x 0.6); flower (x6); corolla (x3).

## NEW REPORT

**Scrophularia rosulata** Stiefelh., Bot. Jahrb. 44: 475 (1910).

*Scrophularia rosulata* is reported for the first time from northeast and east of Iran. It is distributed in Afghanistan (Harat) and Turkmenistan (Ashkhabad) near borders of Iran. This species is easily distinguished by pruinose-canescens habit, large rosette leaves and long petiole.

*Specimens seen.* Khorassan: Shirvan, North Bajgiran, Baba Haselmeh, 1600m, 15.7.1992, Faghinihnia & Zangooei 22244-FUMH; Mashhad, Southwest of Sarakhs, between division of Salehabad and Baghbaghu, South of Rahmatabad, ca. 700 m, 2.6.2003, Joharchi & Zangooei 34573; northwest of Bojnurd, between Atabai & Guinik, 1150 m, 22.4.2001, Joharchi & Zangooei 33456-FUMH; Northeast of Bojnurd, between Surak and Ghezalghan, 1.7.1986, Joharchi & Zangooei 13669-FUMH; Northeast of Bojnurd, Gifan, 1400 m, 16.6.1981, Joharchi & Zangooei, 20778-FUMH; northeast of Bojnurd, Gifan, 1400 m, 16.6.1991, Joharchi & Zangooei 20772-FUMH;

Mashhad: Kalat-e Naderi, 10 km to Archangan, 1100 m, 1.6.1997, Faghinihnia & Zangooei 28949-FUMH; Northeast of Bojnurd, Emam-Darreh, 17.4.2001, Faghinihnia & Zangooei, 33278-FUMH.

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