

THREE NEW SPECIES FROM BORAGINACEAE IN IRAN

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Three new species of *Boraginaceae* are described: *Cynoglossum semnanicum* from central Iran, *Paracaryum khorassanicum* from NE. Iran and *Solenanthus bakhtiaricus* from SW. Iran. Relatives or affinities of the new species are discussed and the differences are explained.

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Key words. *Boraginaceae*, *Cynoglossum*, *Paracaryum*, *Solenanthus*, Iran, new species.

سه گونه جدید از تیره **Boraginaceae** (گاو زبان) از ایران

محبوبه خاتم ساز

سه گونه جدید از تیره گاوزبان به نامهای *Cynoglossum semnanicum* از مرکز و *Paracaryum khorassanicum* از شمال شرقی و *Solenanthus bakhtiaricus* از جنوب غربی ایران نام گذاری و معرفی می گردند. گونه های نزدیک به گونه های جدید مورد توجه قرار گرفته و اختلافات آنها مورد بررسی قرار می گیرد.

Introduction

The plant family *Boraginaceae* in Iran was revised in a project "preparation of the Flora of Iran in Farsi". My work on this family was started from about 1989. The studies more to the visiting different herbaria of Iran and world (G, W, E, KEW) were completed with field observations, partly in the type localities of some taxa. In this course some new taxa from different parts of Iran were recognized which three of them are described here.

***Cynoglossum semnanicum* Khatamsaz, sp. nov.**

Herba biennis, villosa-pubescentia, pilis basis tuberculatis. Caulis crassiusculus, 25-60 cm altus, erectus, parce ramosus, viridis. Folia basalia breviter petiolata usque ad 15 cm longa, 1-3 cm lata, oblongo-lanceolata, obtusiuscula, setis basi tuberculatis; caulina breviter petiolata vel sessilia, oblonga, acuta vel obtusa, 5-10 cm longa, 1.5-3 cm lata, glabrescentia. Inflorescentiae laxae. Calyx usque ad basin partitus, juvenilis 2-3 mm demum 4-5 mm longus, laciniis subacutis vel obtusis. Corolla coerulea, 3-5 mm longa, campanulata, limbo tubum

subaequante. Fornices oblongi, emarginati. Nuculae ovoideae, 5-6 mm longae, dense glochidiatae, inter glochidias tuberculatae, margine haud distincto.

Typus. Semnan, ca. 50 km N. of Semnan, between Sheli and Hikuh villages, 2400 m. Assadi and Mozaffarian 40638 (holotypus TARI).

Biennial herb, villous hairy, with small tubercles at base of hairs. Stem thick, 25-60 cm high, erect, with few branches, green. Basal leaves shortly petiolate, up to 15 cm long, 1-3 cm wide, oblong lanceolate, obtuse, both surfaces with sparse bristly hairs on small white tubercles. Cauline leaves sessile or with short petiole, oblong, acute or obtuse, 5-10 cm long, 1.5-3 cm wide, glabrescent. Inflorescence lax. Calyx deeply divided, 2-3 mm long in flower, to 4-5 mm in fruit; lobes subacute or obtuse. Corolla sky blue, 3-5 mm long, campanulate; lobes as long as tube. Scales oblong, emarginate. Nutlets ovoid, 5-6 mm long, densely glochidiate with tubercles between glochids, immarginate.

The new species is in general habit similar to *C. officinale* L. However their differences are compared in Table 1.



Fig. 1. *Cynoglossum semnanicum* (x0.8); corolla and nutlet (x4); style (x4.8).

Tab. 1: Comparison of the morphological characteristics of *C. semnanicum* and *C. officinale*.

Species	<i>Cynoglossum semnanicum</i>	<i>Cynoglossum officinale</i>
Indumentum	loosely villous-hairy	densely greyish hairy
Leaves beneath	subglabrous	tomentose
Flowers	sky blue	dingy dark red, sometimes nearly red-blue or dark purple
Scales	oblong, emarginate	subquadrate, slightly 2 lobed
Nutlets	immarginate, densely glochidate with tubercles between glochids	promiently marginate, disc sparsely glochidiate, ventral and lateral surfaces densely glochidiate

Paracaryum khorassanicum

Khatamsaz, **sp. nov.** (Sect. *Modestomattiastrum*).

Herba perennis, humilis, caespitosa, dense albo-pilosa, pluricaulis, 8-20 cm alta, rhizomate crasso. Folia longissime petiolata, petiolo incluso 40-50 mm longa, 10-16 mm lata, elliptico-oblonga, acuta; caulina minora, sessilia vel subpetiolata, oblonga vel lanceolata, dense pilosa. Inflorescentiae terminales, laxiflorae, 3-12 florum, bracteatae; pedicelli floriferi 1-2 mm longi, fructiferi usque ad 8 mm fere elongati. Calyces floriferi 2.5-3 mm longi, laciniis 5 oblongis, fructiferi 4-5 mm elongatis. Corolla campanulata, 4.5-8 mm longa, tubo calycem paulo superante, azurea, limbo tubum subaequante, 6-8 mm

in diam., lobis subquadratis, patentibus. Fornices in fauce inserti, subtrapeziformes, distincte bilobi, longitudine sesquialtiores. Antherae oblongae, usque ad 1.5 mm longae, apice basin fornicum non attingentes, filamentis brevissimis paulo supra medium tubum insertis. Stylus inclusus, 2.5 mm fere longus. Nuculae 4, ovoideae vel ovoideo-oblongae, 4-5 mm longae, area mediana oblongae, glabrae, laeves; alae ± 1-1.5 mm latae, planae vel rarissime paulo incurvae, integrae vel subundulatae neque autem dentatae neque glochidiatae.

Typus. Khorassan: ca 50 km NNE Kashmar, Kuh-e Bezgh (FE4), 1900-2500 m, Assadi & Mozaffarian 35755 (holotypus TARI).



Fig. 2. *Paracaryum khorassanicum* (nat. size); corolla and fruit (x9); nutlet (x8).

Perennial, low, nearly caespitose, densely white-pilose, many-stemmed, 8-20 cm high, rhizome thick. Radical leaves oblong-elliptic, tapering to long petiole, 40-50 mm long, 10-16 mm wide, acute; cauline leaves smaller, sessile or with short petiole, oblong or lanceolate, densely pilose. Inflorescence of 1 or few terminal scorpioid cymes, lax, 3-12 flowered. Pedicels 1-2 mm in flower, becoming long to 8 mm in fruit. Calyx 2.5-3 mm long in flower, with 5 oblong teeth, exceeding in fruit to 4-5 mm long. Corolla campanulate, 4.5-8 mm long; tube longer than the calyx, azure (pure deep blue); limb as long as the tube, 6-8 mm in diam., with $5 \pm$ squared shape lobes, spreading; scales trapeziform, distinctly 2-lobed, slightly protruding from throat. Anthers oblong, 1.5 mm long, base of anther at below scale base; filaments short, attached to the middle of corolla tube. Style not exerted from the throat of corolla, 2.5 mm long. Nutlets 4, ovoid or oblong-ovoid, 4-5 mm long, glabrous, smooth; wings \pm 1-1.5 mm wide, flat, sometimes slightly curved inward, entire or subundulate, not dentate.

Solenanthus bakhtiarius Khatamsaz, **sp. nov.** (sect. *Apennini* M. Pop.)

Perennis, pubescens. Caulis elatus,

fistulosus, crassiusculus, 50-100 cm altus, dense foliosus. Folia basalia ignota, superiora oblonga vel elliptica, obtusa, substrigosa, 8-20 cm longa, 3-8 cm lata, in petiolo attenuata. Inflorescentiae terminales vel in axillis foliorum superiorum insertae, cylindricae, congestae, demum elongatae, laxiuscule paniculatae. Pedicelli fructiferi brevissimi. Calyx \pm 5 mm longus, laciniis oblongo-lanceolatis, obtusis, ciliatis. Corolla cylindrica, 4-5 mm longa, coerulea, lobis brevibus, ovato acutiusculis; fornice oblongi, infra medium tubum dispositi. Filamenta ad medium corollam insertae; antherae ovoideae lobos corollae paulo excedentes. Stylus calyce duplo longiora. Nuculae ovoideae, 6-8 mm longae, in margine dense sed in area mediana sparse glochidiatae.

Typus. Iran, Chaharmahal-e Bakhtiari: Shahre Kurd, Ben, Harchegan, 2650 m, Mozaffarian 62064 (holotypus TARI).

Perennial, hairy. Stem thick, erect, fistular, 50-100 cm high. Cauline leaves rather numerous. Radical leaves unknown; upper leaves oblong or elliptic, obtuse, nearly strigose, 8-20 cm long; 3-8 cm wide, attenuate to petiole. Inflorescence paniculate, racemiform-paniculate from short and dense, terminal or lateral,



Fig. 3. *Solenanthus bakhtiaricus* (x0.5); corolla and fruit (x3).

few-flowered scorpioid cymes, in fruit loosely paniculate owing to elongating cymes. Pedicels short even in fruit. Calyx \pm 5 mm long; lobes lanceolate-oblong, obtuse, ciliate. Corolla cylindrical, 4-5 mm long, deep blue, lobes short, ovate, acute; scales oblong, below the middle of corolla. Filaments attached to middle of corolla, above scales; anthers ovate, hardly protruding from corolla teeth. Style twice as long as calyx. Nutlets ovoid, 6-8 mm long, their disk is smooth and bears a few, long spinules, the margin of the disk and sides of the nutlet are very densely covered with shorter spinules.

Solenanthus bakhtiaricus is in general

habit similar to *S. brachystemon* Fish. & Mey. In *S. brachystemon* all parts of plant covered with villous greyish hairs, leaves narrowly elliptic to nearly lanceolate, pedicels long, style shorter than calyx, filaments below the middle of tube. In the new species the plant is less hairy, leaves oblong or elliptic, pedicels short or absent, style longer than the calyx, filaments attached to the middle of the tube.

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