

***Linaria farsensis*, a new species of *Linaria* Miller Sect. *Linaria* (Scrophulariaceae) from Iran**

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(Received January 24, 2006; Accepted November 2, 2006)

ABSTRACT. *Linaria farsensis* is described as a new species from Fars Province of Iran. This species belong to the section *Linaria*. The new species is compared with its closest relative *Linaria michauxii* Chav. This species is similar to *Linaria michauxii* Chav. in having pedicel 1-1.5 mm long, obovate-orbicular leaves and stem height. It differs from *Linaria michauxii* in having a shorter corolla (vs. 29-43 mm long), shorter spur (vs. 17-24 mm long), shorter bracts (vs. 5-14 mm long), shorter style (vs. 11 mm long), shorter stamen (vs. 13 mm long), shorter capsule (vs. 5.5-12×6-10 long) and granular ornamentation pattern of cells (vs. flat ornamentation pattern of cells).

Keywords: Linaria; New species; Scrophulariaceae; Taxonomy; Iran.

INTRODUCTION

The genus *Linaria* Mill. is widely distributed throughout the world except the Americas. It comprises annual or perennial herbs growing in a wide variety of habitats including dry and sandy areas and rocky slopes. Sutton (1988) recognized 150 species, of which 25 occur in Iran. This study was based on materials in different herbaria in Iran (TARI, IRAN, TUH, FUMH) and also field observations. In addition to macromorphological characters, seed micromorphological characters were examined under SEM. As a result of extensive studies of herbarium material and field work throughout the mountainous area of the province Fars and mountainous area in the N.W. Fars province, a new species of the genus *Linaria* Miller (sect. *Linaria*) was found and described below.

***Linaria farsensis* S. M. M. Hamdi & M. Assadi sp. nov.—**

Holotype: Iran, Fars province, Abadeh, Soghad, Dashte Ayon, 2,100-2,270 m, 4 Jun 1975, P. Wendelbo & H. Foroughi (TARI 17870). Figures 1, 2a-c & g, 3

Planta perennis, herbacea, glauca, gabra, erecta; caules fertiles 15-20 cm longi, supra ramosi. Folia calinum fertilium 10-15×6-8 mm, alterna, linaria, acuta. Inflorescentia 1-2 cm longa, floribus 2-7, densa. Bracteae 5-5.5×1.5 mm, acutae, lanceolatae, gabra. Pediceli 1-1.5 mm longi. Calycis lobi equales, 6-6.5×1.5-1.7 mm, acutis.

lanceolati, scarious. Corolla 19-20 mm longa, flava, venis violaceis; tubus ad osem 7.5-5 mm latus; sinus labii 2 mm longi; calcar 8-8.5 mm longum, ad basem 2 mm latum, rectum, cetro corolla brevior. Capsula 4-4.5×5 mm, calyce aequales. Semina 2.2-2.4×1.2 mm, alata, alae inclusu 0.5-0.7 mm, reniformia, atro-cinerea.

Glaucous perennial herb, glabrous, erect; fertile stems 15-20 cm long, branched. Leaves of fertile stems 10-15×6-8 mm, alternate, obovate-orbicular, acute to subacute. Inflorescence 1-2 cm long with 2-7 flowers. Bracts 5-5.5×1.5 mm, margin scarious, subacute, lanceolate, glabrous. Pedicels 1-1.5 mm long. Calyx lobes equal or subequal, 6-6.5×1.5-1.7 mm, acute, lanceolate, scarious. Corolla 19-20 mm long, yellow with violet viens or tinged violet; tube 7-8 mm wide at mouth; adaxial lip sinus 2 mm, distance between lip apex 5 mm; spur 8-8.5 mm long, 2 mm wide at base, straight, shorter than the rest of corolla. Capsules 4-4.5×5 mm. Seeds 2.2-2.4×1.2 mm long, wing 0.5-0.75 mm wide, reniform, dark-grey, disc smooth.

Etymology. The specific epithet is derived from the type locality Fars province in southern Iran.

Distribution and habitat. The new species occur at 2,100-2,270 m altitude in grassland community in Abadeh, Fars province (Figure 3). Its seems to be confined to the upper alpine climatic regions (Fars subprovince, Iran-Turanian region).

Notes. The new species occurs sympartically with and appears to be releted to *Linaria michauxii* Chav. that is widely distributed in east, central to southern Iran

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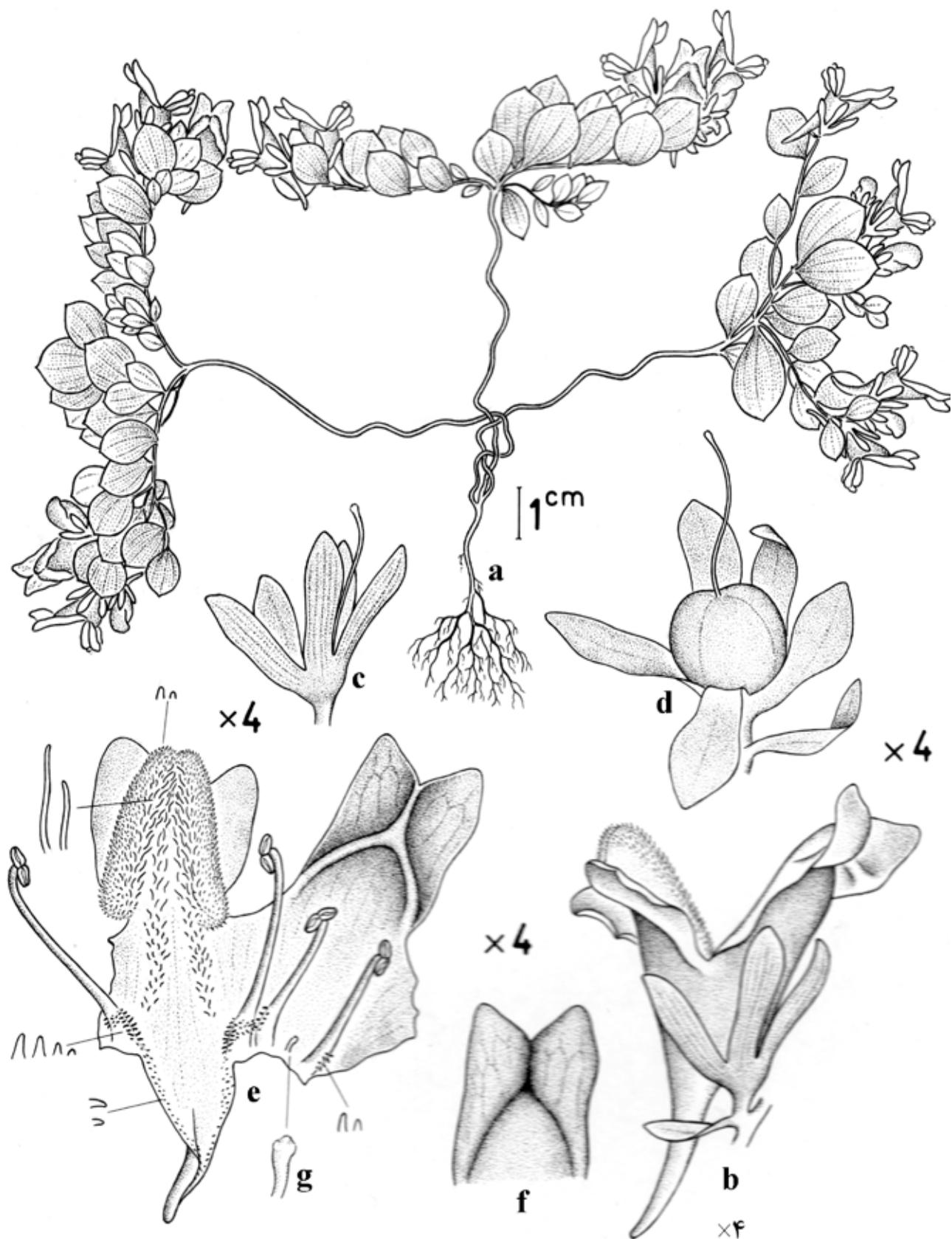


Figure 1. *Linaria farsensis*. a, habit; b, flower; c, calyx; d, capsule; e, opened corolla; f, adaxial lip sinus; g, sterile stamen. Drawn from the type collection, P. Wendelbo & H. Foroughi (TARI 17870), by M. Mehranfarid.

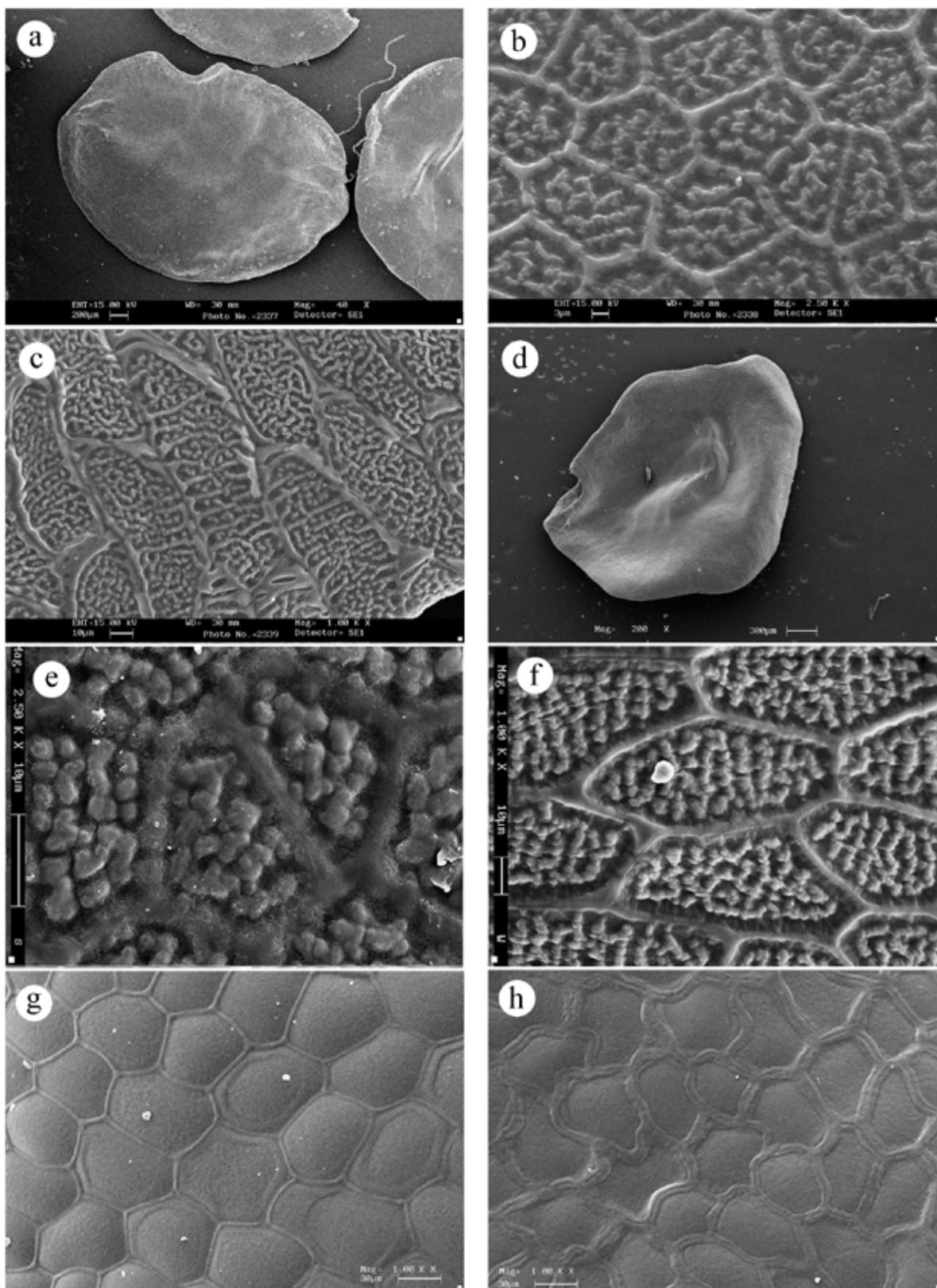


Figure 2. Scanning electron micrographs of seeds of *Linaria*. a-c, g, *L. farsensis* (TARI 17870); d-f, h, *L. michauxii* (TARI 1146-1, Esfahan, ghameshloo, Arya protected area, Bahgaki, 2,000-2,200 m, 20 May 1996, Yousefi); a, seed overview; b, testa cells of seed corpus; c, wing edge; d, overview; e, testa cells of seed corpus; f, wing edge; g-h, surface of inside wall at the base of valve of dehisced capsules of *Linaria*. Scale bars: a=200 µm, b=3 µm, c=10 µm, d=300 µm, e=10 µm, f=10 µm, g=30 µm, h=30 µm.

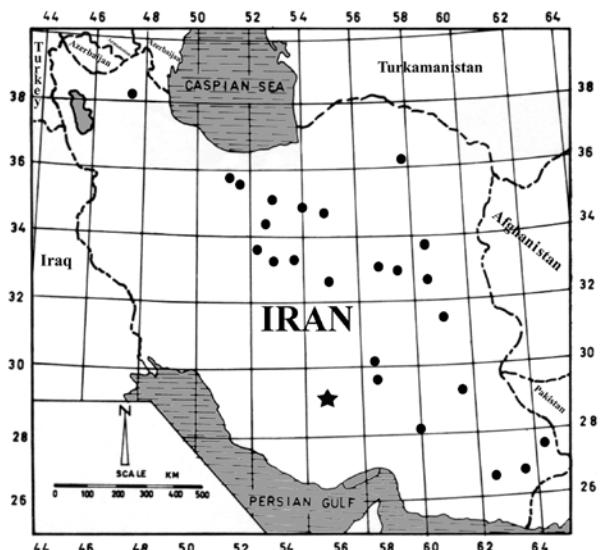


Figure 3. Distribution map of (●) *Linaria michauxii* and (★) *Linaria farsensis* in Iran.

Table 1. Comparison of the new species *Linaria farsensis* with *L. michauxii*.

Characters	<i>L. farsensis</i>	<i>L. michauxii</i>
Flower		
Corolla length	19-20	(29-)32-43
Spur (mm)	8-8.5	17-24
Ratio spur/rest of corolla	<0.5	≥0.5
Pedicel (mm)	1-1.5	1-3.5
Bracts (mm)	5-5.5	5-14
Calyx lobes (mm)	6-6.5×1.5-1.7	6-8.5×2-2.7
Adaxial lip sinus of corolla (mm)	2	2.3-4
Distance between apex of adaxial lips (mm)	5	6-7
Style length (mm)	7	11
Long stamen (mm)	9	13
Short stamen (mm)	6	10
Staminodes (mm)	1	2
Leaf size (mm)	10-15×6-8	(3-) 8-27×(2.5-)7-24
Stem height (cm)	15-20	4.5-22
Capsule size (mm)	4-4.5×5	5.5-12×6-10
Seed length (mm)	2.2-2.4	2.6-3
Wing (mm)	0.5-0.7	0.4-0.7
Seed form	Reniform	Reniform
Cells shape of testa	Irregular pentagonal & hexagonal	Irregular hexagonal
Cell shape of wing	Irregular pentagonal	Irregular pentagonal & hexagonal
Length of test cell (μm)	27-30	18-30
Width of test cell (μm)	15-23	12-18
Length of wing cells (μm)	80-120	70-100
Width of wing cells (μm)	30-35	21-35
Cells surface	Granular	Flat

(Sutton, 1988). This new species is similar to *Linaria michauxii* Chav. in having pedicels 1-1.5 mm long, leaves obovate-orbicular and stem height. It differs from *Linaria michauxii* in having a shorter corolla (vs. 29-43 mm long), shorter spur (vs. 17-24 mm long), shorter bracts (vs. 5-14 mm long), shorter style (vs. 11 mm long), shorter stamen (vs. 13 mm long), shorter capsule (vs. 5.5-12×6-10 long) and granular ornamentation pattern of cells (vs. flat ornamentation pattern of cells) (Table 1). Seed coat micromorphology (Elisens, 1985) provides further evidence of distinction: seed surface cells are irregularly pentagonal and hexagonal in *L. farsensis* and irregularly hexagonal in *L. michauxii*. Ornamentation pattern on testa cell is also different. It is more granular in the new taxon and flat in *L. michauxii*. Capsule, style, corolla, spur, stamen and seed are smaller than those of *L. michauxii* (Davise, 1982; Kuperanova, 1950; Sutton, 1988). The inside surface cells of capsules of *L. farsensis* are distinctly larger than those in *L. michauxii* and with a different shape (Figure 2).

Key to distinguishing *L. farsensis* from *L. michauxii*

1. Corolla 19-20 mm, spur 8-8.5 mm, shorter than the rest of corolla *L. farsensis*
1. Corolla 29-43 mm, spur subequal to or longer than the rest of corolla *L. michauxii*

Acknowledgment. The authors thank Mrs. N. Sadeghi and Mrs. A. Eshghi for technical assistance with seeds coat SEM studies and Mr. Mahrnfard from IRAN herbarium for the illustrations.

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伊朗產玄參科柳穿魚屬 (*Linaria*) 一新種：*Linaria farsensis*

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本文報導產於伊朗 Fars 省的玄參科柳穿魚屬 (*Linaria*) 植物一新種 *Linaria farsensis*，並與近似種 *Linaria michauxii* 做一比較。*Linaria farsensis* 與 *Linaria michauxii* 之主要不同在於本新種之距較短 (8-8.5 mm)、苞片較短 (5-5.5 mm)、柱頭較短 (7 mm)、較長的一對雄蕊長僅 9 mm、較短的一對雄蕊長僅 6 mm、蒴果較小 (4-4.5×5 mm)，種子表皮細胞具顆粒狀的紋飾。

關鍵詞：柳穿魚屬；*Linaria farsensis*；*Linaria michauxii*；新種；玄參科；分類學；伊朗。

