

## A NEW SPECIES OF THE GENUS LINARIA (SCROPHULARIACEAE) FROM IRAN

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*Linaria karajensis* is described as a new species from Tehran province. This species belongs to the section *Linaria*. The new species is compared with its closest relatives *Linaria lineolata* Boiss. and *Linaria elymatica* (Boiss.) Kuprian.

*Linaria karajensis* differs from *Linaria lineolata* in the length of style, spur and calyx, indumentum of calyx, testa cell form and length of seed. It differs from *L. elymatica* in testa cells form, the length of seed, corolla, pedicel, style, spur, and indumentum of calyx.

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**Key words.** *Linaria*, Scrophulariaceae, New species and Iran.

### یک گونه جدید از جنس *Linaria* در ایران

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گونه *Linaria karajensis* از ایران نامگذاری و معرفی می‌شود. این گونه متعلق به بخش  
*Linaria* است. گونه *L. karajensis* با گونه *L. lineolata* و *L. elymatica* قرابت زیادی  
دارد، لیکن با *L. lineolata* در طول خامه، مهمیز و کاسبرگ، پوشش کرکی کاسبرگ، شکل و  
اندازه سلول‌های پوششی دانه اختلاف دارد. از طرفی اختلاف آن با *L. elymatica* در شکل و  
اندازه سلول‌های پوششی دانه، طول دانه، جام، دمگل، خامه، مهمیز، پوشش کرکی و سطح کاسبرگ  
است.

### Introduction

One of the authors, S. M. Hamdi has been studying the genus *Linaria* in Iran for a Ph. D. thesis. The studies have been based on herbarium specimens, field studies and also seed surface ornamentation using SEM. In these studies some new species came to the light. In this paper one new species is described.

### *Linaria karajensis* S. M. M. Hamdi & M. Assadi sp. nov.

Planta perennis, herbacea, glauca, inflorescentia excepto gabra, erecta; caules fertiles 30-33 cm longi, supra ramosi. Folia 45-55 x 1-1.2 mm, alterna, linearia, acuta, densa. Inflorescentia 3-3.5 cm longa, floribus 20-24, densa. Bractea 2 x 1 mm; glanduloso - villosae, subacuta. Calycis lobi inaequales, 2.5-3 x 1.2 mm, subacuta, lanceolati, non scariosi, glanduloso-villosi. Corolla 15-16 mm longa, flava, venis violaceis; tubus ore 3.5-4 mm latus; sinus lobi 0.7-0.75 mm lati, recti, cetero corolla breviores. Capsula 3-3.5x2-2.5 mm, raro glandulosa, calyce brevior. Semina 1.57x1.05 mm, reniformia, atro-cinerea; alae 0.67-0.70 mm latae.

*Typus.* Iran, Tehran prov.; Tehran, Shahrestanak, Kuh-Touchal, 3150 m, M. Riazi 8470 (holotypus. TARI); Karaj, Gach-sar, mountain of Gach-sar, 1700-2400 m, Termeh.

Glaucous perennial herb, glabrous except for the inflorescence, erect; fertile stems 30-33 cm long, branched above. Leaves of fertile stems 45-55x1-1.2 mm, alternate, linear, acute, dense. Inflorescence 3-3.5 cm long with 20-24 flowers, dense in flowering and fruiting stages. Bracts 2x1 mm, densely glandular-villous, 0.2-0.7 mm long, lanceolate, subacute. Pedicels 0.3-0.5 mm long, villous-glandular. Calyx lobes unequal, 2.5-3x1.2 mm, subacute, lanceolate, not scarious, glandular-villous. Corolla 15-16 mm long, yellow with blue

veins or tinged with blue; tube 3.5-4 mm broad at mouth; abaxial lip sinus 0.70-0.75 mm, the distance between lip apex 2.5 mm; spur 5.5-6 mm long, 1 mm broad at base, straight, shorter than the rest of corolla. Stamens five; two tall stamens 6 mm long, villous at base; two short stamens 5 mm long, villous at base; sterile stamen 4 mm long. Style 0.2-0.5 mm long. Capsule 3-3.5x2-2.5 mm, rarely glandular-villous. Seeds 1.57-1.05 mm, reniform, dark-grey; wing 0.67-0.70 mm broad. Seed with smooth disc.

This species is a closed relative of *L. lineolata* Boiss. and *L. elymatica*. It differs from *L. lineolata* in the length of style, bracts, spur, calyx, indumentum of calyx, testa cell form and length of seed. (D. A. Sutton 1988), (tables 1, 2). It differs from *L. elymatica* in the length of seed, corolla, pedicel, style, spur, testa cell form and villous calyx. The species are compared in table 1.

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Table 1. Comparison of *Linaria karajensis*, *L. lineolata* and *L. elymatica* using macro-morphological characters.

Characters	<i>L. karajensis</i>	<i>L. elymatica</i>	<i>L. lineolata</i>
Corolla (mm)	15-16 x 3.5-4	17 – 18	15-17 x 3.5-5
The length & breadth of spur (mm)	5.5-6 x 1	6 x 1	4-6.5 x 0.8-1.2
Pedicle (mm)	0.3-0.5	2	0.5-1.5
Bracts (mm)	2 x 0.8-1	1 x 0.2 – 0.4	1.5-3
The length & breadth of calyx lobes (mm)	2.5-3 x 1.2	4 x 1 – 2	(3-)3.5-5 x (0.8-) 1.2-2
leaf size (mm)	45-55 x 1-1.2	35 – 40 x 2.5 – 3	15-45 (-60) x 0.5-1.5 (-2)
Stem length (cm)	30-33	30 – 35	25-60
Capsule size (mm)	3-3.5 x 2-2.5	2.5 -4.5	3.5-6
Seed size (mm)	1.57 x 1.05	1 – 1.2 x 0.75 – 0.8	2.7-3
Wing (mm)	0.67-0.7	0.27 – 0.4	0.5-0.8
Abaxial lip sinus of corolla (mm)	0.70-0.75	1.1	0.5-1.4
Distance between apex of abaxial lips (mm)	2.3-2.5	1	3-3.25
Seed form	Reniform	Reniform	Reniform , orbicular
Style length (mm)	0.2- 0.5	6.5 – 7.0	4.5
Tall stamens (mm)	6	8	8
Short stamens (mm)	5	6	6.5
Sterile stamen (mm)	4	0.3	0.1

Table 2. Comparison of the new species with *L. lineolata* & *L. elymatica* using SEM seed surface characters.

Characters	<i>L. karajensis</i>	<i>L. elymatica</i>	<i>L. lineolata</i>
Testa cell form	Hexagonal	Hexagonal	Hexagonal
Cell form of wing	Polygonal	Hexagonal	Polygonal
The length of test cell (µm )	12-15	27-30	30-35
The breadth of test cell (µm )	7-8	15-24	20-25
The length of wing cell (µm)	55-75	30-40	75-90
The breadth of wing cell (µm )	27-47	20-30	25-40
Tuberculate form of tubercle	Ramose	Pitted	Rosette form
Partition of testa cells	Clear	Clear	Clear
Partition of testa cell of wing	Clear	Clear	Clear
Cell wall thickness	Thick	Very thick	Thick

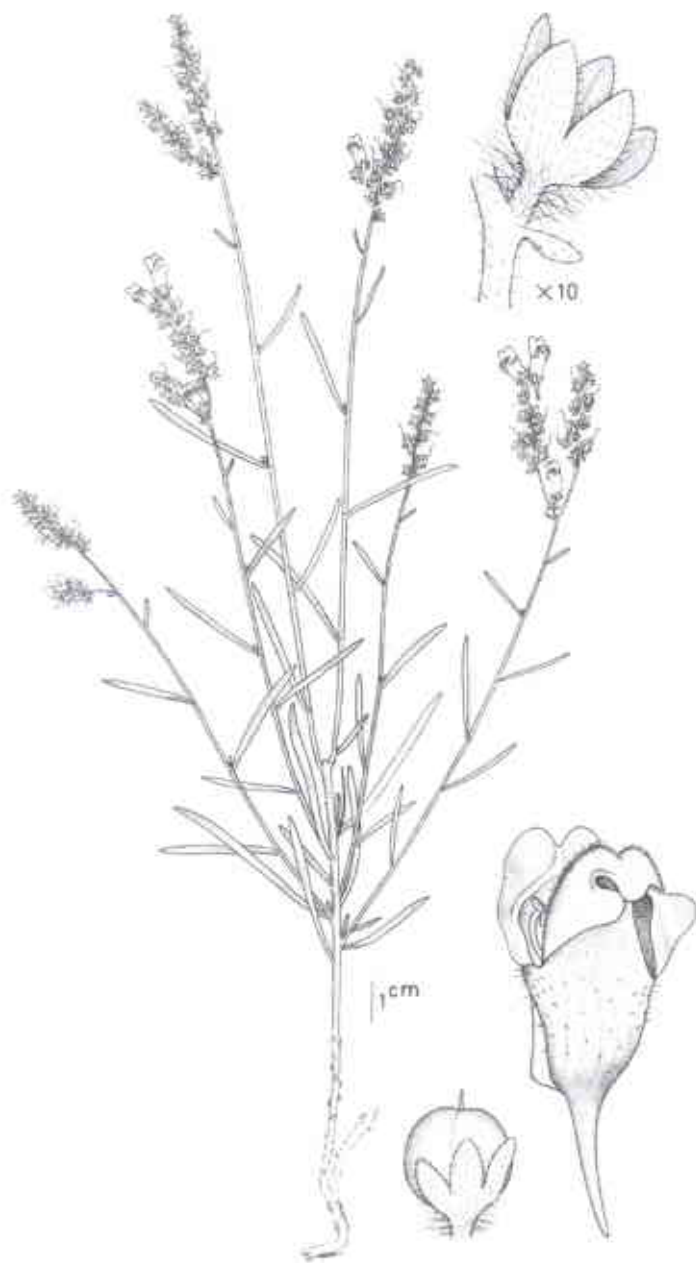


Fig. 1. *Linaria karajensis*. (a) habit; (b) flower,  $\times 3.4$ ; (c) calyx  $\times 6$ ; (d) capsule,  $\times 3.4$ . M. Riazi 8470 (TARI).

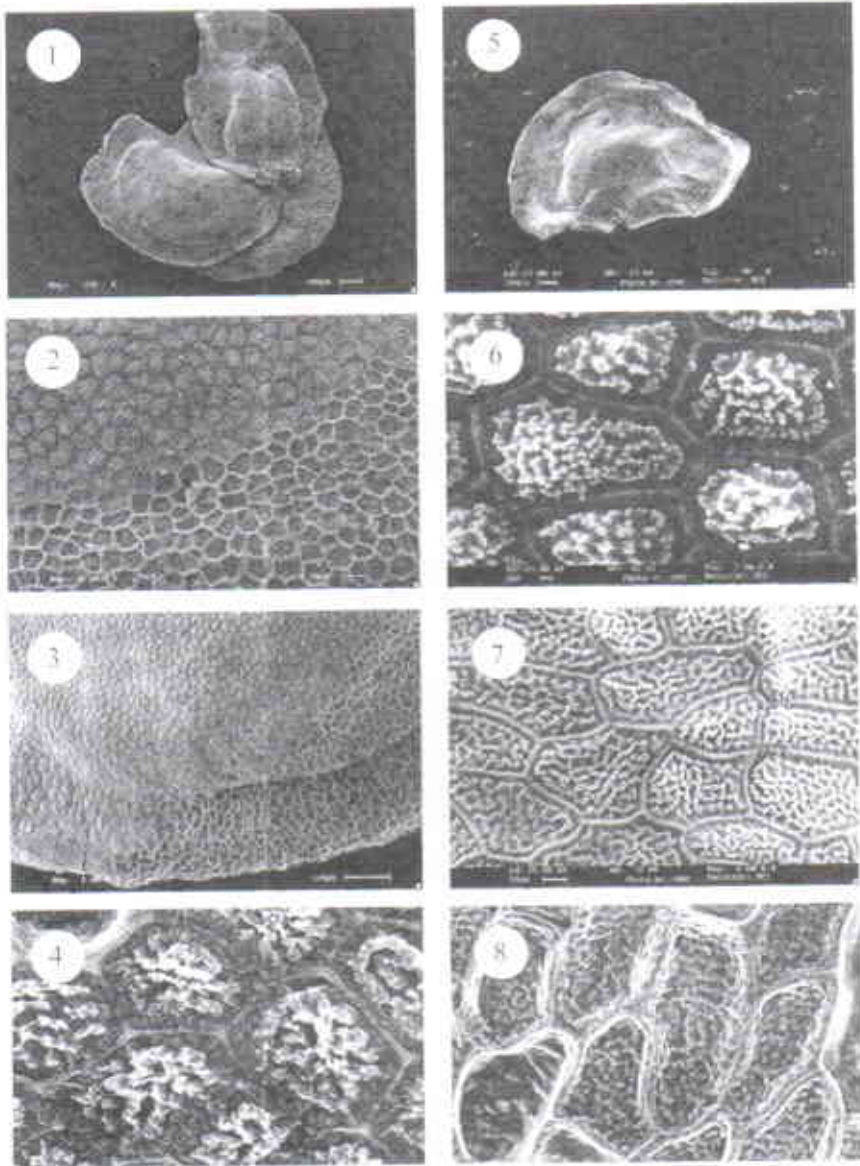


Fig. 2. Scanning electron micrographs of seed of *Linaria*. (2.1) *L. elymatica*: concave face of seed. Scale=200  $\mu$ m. (2.2) *L. elymatica* testa cells from disc. Scale=20  $\mu$ m. (2.3) *L. elymatica* testa cells from edge of wing. Scale=100  $\mu$ m (2.4) *L. lineolata* testa cells from disc. Scale = 2  $\mu$ m. (2.5) *L. karajensis*: concave face of seed. Scale=200  $\mu$ m (2.6) *L. karajensis* testa cells from disc. Scale=2  $\mu$ m (2.7) *L. karajensis* testa cells from edge of wing. Scale=10  $\mu$ m. (2.8) *L. lineolata*: testa cells from edge of wing. Scale= 10  $\mu$ m.