

NOTES ON VICIA SEPIUM AND ASTRAGALUS KIAMAKY-DAGHENSIS IN IRAN

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Abstract

Fabaceae (Leguminosae) is one of the largest and most economically important plant families worldwide. In Iran, the most species-rich genera include *Astragalus* L., *Onobrychis* Mill., *Trifolium* Tourn. ex L. and *Vicia* L. *Vicia sepium* L. is reported here as a new record for the flora of Iran. Additionally, the description of the endemic *Astragalus kiamaky-daghensis* Maassoumi & Podlech (sect. *Incani*) is completed based on newly collected material. *Vicia sepium* was found at the margins of *Quercus* woodlands of the Arasbaran area at 1600–1700 m elevation. *Astragalus kiamaky-daghensis*, previously described without fruit characters, was recollected from its type locality on the rocky slopes of Kiamaky-Daghii Mountain (2300–2500 m). Newly collected specimens include mature legumes, allowing completion of their morphological description. Fruit characters indicate a close affinity to *Astragalus siahcheshmehensis*, although the two species differ in plant height and leaflet number. A detailed description of *V. sepium* and legumes of *A. kiamaky-daghensis*, pictures, and a distribution map for both species are presented.

Keywords: Arasbaran area; *Astragalus*; biodiversity; Fabaceae; Flora of Iran; new record; *Vicia*

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یادداشتی بر *Vicia sepium* و *Astragalus kiamky-daghensis* در ایران

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چکیده: تیره ی بقولات یکی از بزرگترین و از نظر اقتصادی مهمترین تیره های گیاهی جهان می باشد.

متنوعترین جنس های این تیره در ایران *Astragalus* L., *Onobrychis* Mill., *Trifolium* Tourn.

و *Vicia* L. ex L. می باشند. در این پژوهش علاوه بر معرفی *Vicia sepium* L. به عنوان گزارشی

جدید برای فلور ایران، شرح گونه انحصاری *Astragalus kiamaky-daghensis* از بخش *Incani* بر

اساس نمونه های تازه جمع آوری شده از محل تیپ تکمیل گردیده است. *Vicia sepium* در حاشیه ی

درخت زارهای بلوط منطقه ارسباران در محدوده ی ارتفاعی ۱۶۰۰–۱۷۰۰ متر رشد می کند.

گونه *Astragalus kiamaky-daghensis* که پیش‌تر بدون صفات میوه توصیف شده بود، مجدداً نمونه‌هایی از محل تیپ در دامنه‌های سنگی کوه کیامکی‌داغی (۲۵۰۰–۲۳۰۰ متر) جمع‌آوری شد. نمونه‌های جدید دارای نیام‌های رسیده بودند که امکان تکمیل توصیف ریخت‌شناسی این گونه را فراهم ساخت. صفات میوه نشان‌دهنده‌ی خویشاوندی نزدیک آن با *Astragalus siahcheshmehensis* می‌باشد؛ با این حال، این دو گونه از نظر ارتفاع گیاه و تعداد برگچه‌ها با یکدیگر متفاوت می‌باشند. شرح کامل *V. sepium* و نیام *A. kiamaky-daghensis*، تصاویر و نقشه‌های پراکنش هر دو گونه ارائه شده است.

INTRODUCTION

The Fabaceae Lindl. (Leguminosae) Family is one of the most diverse, ecologically and economically important plant families worldwide, providing essential food, forage, and soil-enhancing species. Within this large family, species are organized into several tribes, among which Fabaceae is of particular interest for its agricultural and ecological significance (Petr & al. 2015; Smýkal & al. 2015). Phylogenetic analyses indicate that the tribe fabaeae primarily consists of two genera: *Lathyrus* L. (including *Pisum* L. and *Vavilovia* Fed.) and *Vicia* L. (including *Lens*) (Schaefer & al. 2012).

The genus *Vicia* comprises approximately 230–250 species, predominantly distributed across temperate regions of the Northern Hemisphere (POWO 2024; Hasler 2016). In Iran, *Vicia* with 44 (including *Vicia sepium* L. as a new record) recorded species represents the fourth-largest genus of Fabaceae after *Astragalus* L. (~900 species), *Onobrychis* Mill. (73 species), and *Trifolium* Tourn. ex L. (51 species). Similar to *Trifolium*, the endemic rate in *Vicia* is low, with only three endemic species (*V. kotschyana* Boiss, *V. kurdica* Jalilian, and *V. garinensis* Dehshiri) reported in the region (Jalilian & al. 2010; Dehshiri & al. 2011; Jalilian & al. 2014; Jarchi & al. 2024).

Fruit characters are particularly important in genera with numerous species, such as *Astragalus*, where they provide key diagnostic traits for species identification and resolving taxonomic ambiguities. Descriptions of approximately twelve species of *Astragalus* in section *Incani* remain incomplete due to the absence of fruit in the available material (Maassoumi 2018). These species are often known from a single collection, and re-collection—ideally including standard specimens—is required to provide complete and reliable descriptions. Complete morphological descriptions, particularly of fruits, are therefore essential for understanding the diversity and systematics of this genus (or sections).

In addition, we report *Vicia sepium* as a new record for the flora of Iran. This study aims to amend the description of *Astragalus kiamaky-daghensis* Maassoumi & Podlech (section *Incani*) by explaining

its fruit characters, which were missing from the type specimen.

MATERIALS AND METHODS

Over several years of conducting floristic surveys in northwestern Iran, we have documented several species. In continuation of these efforts, a standard specimen of *Astragalus kiamaky-daghensis* and an unidentified *Vicia* species were collected from northwestern Iran. *Astragalus kiamaky-daghensis* was identified using the original description (Podlech & Maassoumi 2003) and examining the type specimen. Specimens of *Vicia* were studied, compared, and identified with relevant references (Boissier, 1872; Fedchenko 1948; Ball 1968; Davis & Plitmann 1970; Chrtkova-Zertova 1979; Pakravan 2000; Jalilian & al. 2014). The voucher specimens are preserved at the Herbarium of the Research Institute of Forests and Rangelands (TARI).

RESULT AND DISCUSSION

Based on Taxonomic history, the genus *Vicia* is classified into different infrageneric units (Boissier 1872; Ball 1968; Davis & Plitmann 1970; Chrtkova-Zertova 1979). However, according to the most recent taxonomic study based on morphological traits, it is divided into two subgenera and 22 sections. *V. sepium* by having an inflorescence much shorter than the subtending leaf and 1-few-flowered, categorized in subgenus *Vicia*. Within subgenus *Vicia*, this species, with an oblique-mouthed calyx, oblong glabrous standards, few to several paired leaflets, and a perennial growth habit, belongs to the section *Atossa* (Alef.) Aschers. & Graebner (Kupicha 1983).

Vicia sepium L., Sp. pl. 1: 373 (1753). (Hb. Linn. 906/31). Fig.1 (A-F)

Perennial; 30-80 cm high, with long stolon; stems erect to ascending, simple or more or less branching at base, ribbed; usually glabrous or sparsely pubescent; leaves paripinnate, petiolate, petiole 7-11 mm, in upper surface glabrous, rarely in lower surface soft-hairy, the hairs are more distinct on the leaf margins; rachis ending in a strongly branched tendril; leaflets 4-8 paired, distance between leaflets 1-3 cm, subsessile, oblong- elliptic or oblong-lanceolate, rarely narrowly

lanceolate, elongate at apex, up to 35 mm long and 15 mm wide, rounded at both ends or slightly emarginated and mucronate at apex; stipules 3-6 mm long, ovate or semi sagittate, more or less dentate, the upper entire, with purple-brown spot below; flowers 12-15 mm long, subsessile, pedicel 3 mm, tomentose, with very minute bracts, drooping, racemes axillary, shorter than leaves, short-peduncled (3-6 mm), much shorter than flowers, 2-5-flowered; Calyx zygomorphic, pubescent, purplish, short-tubular, 7-9 mm, 5-10-nerved or without nerve, lower teeth subulate, shorter than tube, \pm unequal the upper much shorter than the lower, mouth somewhat oblique; petals red-violet or dull blue, 12-15 mm; standard obovate, slightly emarginated, 12-14 mm; wing completely attached to the keel, 11-12 mm, keel 10-11 mm; stamens monadelphous, all the filaments attached together, forming a filament tube, 10-11 mm, anthers brown, 1 \times 0.5 mm; style 10-13 mm, pubescent on the abaxial surface near the apex; pods not stipitate, oblong or broadly linear, up to 3.5 cm long and 5-8 mm wide, at first pubescent, later glabrous, shiny, black, shortly beaked; seeds 4-7 per pod, brownish or black, hilum two-thirds to three-fourths the circumference of seed.

Specimen examined: Iran, East Azerbaijan, Varzeghan, Kerenkan village, 38°45'54" N, 46°31'44" E, 1600-1700 m, 10 Jun 2025, Ramezani and Jarchi (TARI-4325).

Phenology: Flowering May-June, fruiting June-July

Habitat and ecology: *Vicia sepium* grows in shrubby formations and meadows, mainly within or along the edges of forests. It occurs in *Picea* A. Dietr. forest margins, *Rhododendron luteum* Sweet scrub, and along riverbanks, and is occasionally found as a weed at elevations between 1450 and 2550 m a.s.l. (Fedchenko 1948; Davis 1970). In Iran, it has been observed at the edge of *Quercus* L. woodlands (same as *Polygonatum verticillatum* (L.) All., which was newly recorded for Iran (Jarchi & Ramezani 2025)), in shady, relatively moist habitats, at an altitude of about 1642 m.

Members of the subgenus *Vicia* possess stipular nectaries that likely attract insects. These visitors may aid in pollination (Plitmann 1967) or act as decoys, diverting unwanted ones (Proctor & Yeo 1973). Ants have been reported on the stipules of *V. sativa*, *V. faba*, and *V. sepium* (Gams 1924). As noted by Knuth (1908), these ants may help protect the plant from caterpillar herbivores. In the present study, ants were also frequently observed on the stipules of *V. sepium*, confirming the activity of the stipular nectaries, supporting earlier observations.

Distribution: Europe, Caucasus, Northern Iran, Central Asia to western Siberia; widespread in temperate Eurasia.

Note: *Vicia sepium* can be identified by its red-violet or

dull blue petals, which set it apart from *V. balansae* Boiss., *V. truncatula* Fisch, and *V. grandiflora*, all of which feature yellow or orange-yellow petals. Conversely, *V. sepium* is distinguished from *V. narbonensis*, *V. qatemensis*, and *V. barbazitae* by its perennial habit, whereas the latter three are annuals.

Astragalus kiamaky-daghensis Maassoumi & Podlech. Fig. 2 (A-F)

(Description amended)

Legumes meaty-mottled (in live state) and dark green-mottled (in dry state), with symmetric medifixed white hairs (0.2-0.4 mm), straight, oblong, slightly up curved, 22-25 mm, terete 3.5-4 mm in diameter, rounded to slightly carinate in ventral side, rounded dorsally, with a curved beak, up to 2-3 mm long, stipe glabrescent, 2.5-3 mm long, valve green, loosely covered with medifixed hairs to glabrescent.

Taxonomic note: *Astragalus kiamaky-daghensis* is an endemic species of Iran and belongs to the sect. *Incani*. It was first collected by Talebi and Kasempour in 1994, near Daran village (Podlech & Maassoumi 2003). Later, in 2011, this species was found in the Munjughlu sanctuary zone in the Marakan protected area (Ghahermaninejad & Nafisi 2011). We collected it again from the type locality on the rocky slopes of Kiamaky-daghii Mountain. The holotype specimens lack legume. Since no description of the legume of this species is available, we have provided an enhanced description.

It represents a unique saxicolous species of the genus *Astragalus* in Iran, typically found on rocky substrates. Its habitat is located away from livestock grazing areas and hiking trails, thereby minimizing the risk of trampling and other anthropogenic disturbances. Consequently, individual plants and entire populations display vigorous growth, high survival rates, and fully developed reproductive structures, reflecting a well-established community.

Based on fruit characteristics (Maassoumi 2018), *Astragalus kiamaky-daghensis*, with its elongated rectangular fruits that are upright or horizontal, leaflets adaxially glabrous, leaflets less than 7 mm long, and plant height under 20 cm, is closely related to *A. siahcheshmehensis* Maassoumi & Podlech. However, the two species differ primarily in plant height and leaflet number. *Astragalus kiamaky-daghensis* reaches 10-13 cm in height, whereas *A. siahcheshmehensis* has been reported at 4-7 cm. Furthermore, *A. kiamaky-daghensis* has 6-11 pairs of leaflets, compared to 2-6 pairs in *A. siahcheshmehensis*.

Specimens examined: Iran, East Azerbaijan, Jolfa, Daran village, Kimaki-Daghii Mountain, 38°46'35" N, 45°50'19" E, 2300-2500 m, 19 Jun 2023, Mokhtari and Jarchi (TARI-4010).

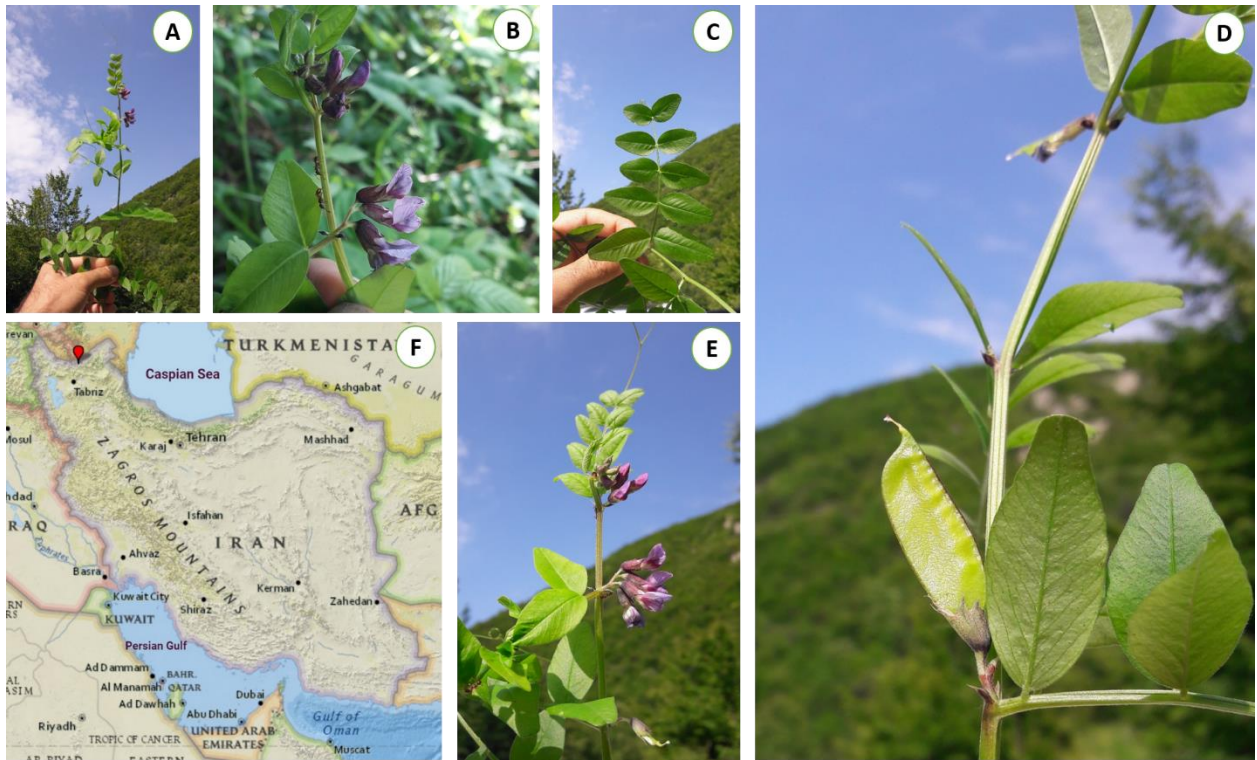


Fig. 1. *Vicia sepium*: A, Habit; B, symbiosis with ants; C, leaf and leaflets; D, legume; E, inflorescence; F, distribution map.

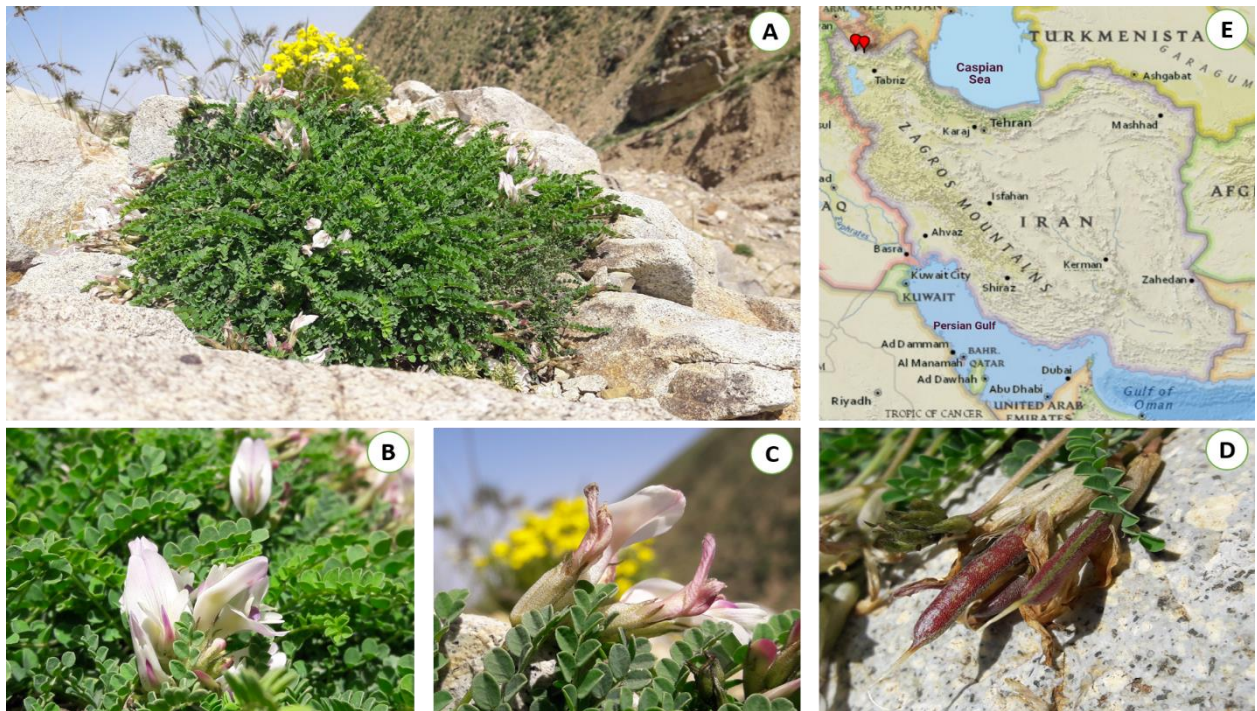


Fig. 2. *Astragalus kiamaky-daghensis*: A, habit; B, flowers; C, calyx with modified black hairs; D, legumes; E, distribution map.

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