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A new species of *Onobrychis* sect. *Onobrychis* (Fabaceae) from Iran

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Abstract

Onobrychis farimanensis is described as a new species and an identification key, illustrations and distribution map provided. The new species is restricted to the north Zharf Mountains between Fariman and Torbat-e Heydarieh, in the Khorasan Razavi Province of Iran. It is a perennial herb, becoming woody at the base and has long wing petals, standard as long as the keel, and pods loosely covered by appressed hairs. The new species differs from morphologically similar taxa, *O. alamutensis* and *O. major*, in several morphological characters such as plant height, stem indumentum, leaflet length and indumentum, bract length, calyx length, corolla colour, and pod size and shape.

Introduction

The genus *Onobrychis* Miller (Gard. Dict. Abridge, ed. 4: 1754) belongs to the tribe Hedysareae (Fabaceae) and comprises nearly 170 species distributed throughout the world. Members of the genus are mainly found in the north temperate regions, with the most important diversity centers in the eastern Mediterranean and West Asia, and is especially species rich in Iran. The genus includes annual or perennial species, mostly caulescent herbs (rarely spiny shrubs) with an indumentum of simple hairs, or totally glabrous (Lock & Simpson 1991, Yakovlev *et al*. 1996, Mabberley 1997). In Flora Iranica, *Onobrychis* includes 80 species in 9 sections, of which 40 are endemic (Rechinger 1984, Ranjbar *et al*. 2004, 2006, 2007a, 2007b, 2008, 2009, Ranjbar 2009). *Onobrychis* sect. *Onobrychis,* with approximately 74 species worldwide, displays a wide range of distribution in Eurasia (Širjaev 1925, Ball 1968, Hedge 1970, Rechinger 1984). In the Flora Iranica, it is represented by 14 species, a few of them cultivated as fodder or for ornamental uses (Rechinger 1984). Recently, the number of species of this section was increased in Iran by the addition of *O. assadii* Ranjbar, Tolui & Amirab. (2007: 481); *O. chaldoranensis* Toluei, Ranjbar & Wink (2013: 253); *O. neychalanensis* Ranjbar, Hadadi & Karamian (2011: 164); *O. patula* Ranjbar, Joharchi & Karamian (2012: 52); and *O. mucronifolia* Ranjbar & Hadadi (2012: 57). In this paper a new species is described from *O.* sect. *Onobrychis* from the Khorasan Razavi Province of Iran. It is distinguished from similar species by details of its indumentum, leaflet size and indumentum, calyx length, corolla colour, proportions of standards of petals to the wings and keel, pod size, as well as the degree of dentation on the crest and disc of the pods. The new species is placed in subsect. *Macropterae* Handel-Mazzetti (1909: 374, 424) based on the wings that are longer than or equal to the calyx (9–11 mm), pods semiglobular in shape (11–14 × 6–7 mm), with 6–7 teeth on the crest and disc without bristles.

Material and methods

This study was mainly based on herbarium material and field observations made during excursions in NE Iran. Plants were collected from the Khorasan Razavi Province of Iran and vouchers were preserved in FUMH. Several other specimens were examined from the following herbaria: W, WU, TARI, FUMH and BASU.

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Key to *Onobrychis farimanensis* and similar species in Iran

The new species and similar species of sect. *Onobrychis* subsect. *Macropterae* in Iran may be distinguished through the following key:

1	Plants with wing petals 3–5 mm long	rest of *Onobrychis*
-	Plants with wing petals 5.5–11 mm long	2 (subsect. *Macropterae*)
2	Pod > 9–10 mm long; standard 12–14 mm long; wing 9–11 mm long	3
-	Pod < 9–10 mm long; standard 7.5–10.4 mm long; wing 5.5–8.0 mm long	4
3	Corolla milky yellow; number of pod teeth 7–10; teeth 0.2–0.5 mm long	*O. alamutensis*
-	Corolla pale pink-violet; number of pod teeth 6–7; teeth 15–20 mm long	*O. farimanensis*
4	Plants densely covered by spreading hairs 0.3–0.7 mm long; leaflets 5–8 mm long	*O. patula*
-	Plants loosely to densely covered by appressed hairs 0.2–0.3 mm long; leaflets 15–25 mm long	5
5	Pods glabrous	*O. assadii*
-	Pods densely covered by appressed hairs	6
6	Leaflets with upper surface glabrous and bracts ≥ 3.2 mm long	*O. mucronifolia*
-	Leaflets upper surface with loosely to densely appressed hairs, bracts ca. 3 mm long	7
7	Plants suffrutescent; calyx 4.5–5.6 mm long; teeth subulate, as long as tube	*O. ptychophylla*
-	Plants herbaceous; calyx 6–7 mm long; teeth linear-subulate, two to four times as long as tube	8
8	Pods with 6–7 teeth, leaflets ovate to elliptic, distinctly mucronate at the apex, standard 10.8–11 mm long	*O. gontscharovii*
-	Pods with 4–6 teeth, leaflets elliptic, acute or obtuse, slightly mucronate at the apex; standard 7.5–9.0 mm long	*O. verae*

Onobrychis farimanensis Ranjbar & Askari, *sp. nov*. (Figs. 1–2)

Type:—IRAN. Prov. Khorasan Razavi: between Torbat-e Heydarieh and Fariman, Zharf Mtns., 1950 m, 25 June 1993, *Joharchi & Zangooei 23506* (Holotype FUMH!, BASU fragm.).

Ascending to erect perennial with thick woody rootstock, up to 0.46 m tall, branched at the base. Stipules of lower leaves connate, ovate-triangular, acute-acuminate, those of upper leaves free, papery with brownish base; 4–9 mm long and 2.1–3.5 mm wide, loosely covered by appressed hairs, ciliate at margins with 0.4–0.8 mm long. Upper leaves 23–36 mm long and lower leaves 100–125 mm long; rachis slender, straight or curved-ascending, loosely covered by appressed hairs, ciliate hairs at the margins 0.5–1.2 mm long; upper petiole up to ca. 15 mm long, lower petiole up to 30 mm long. Upper leaflets in 5–7 pairs, lower leaflets in 3–6 pairs, elliptic to oblong-elliptic, rounded to cuneate at the base, obtuse or slightly mucronate at the apex, 15–20 × 4–5 mm, upper surface loosely covered by subappressed or appressed hairs, 0.2–0.4 mm long, lower surface densely covered by subappressed or appressed hairs, 2–3 mm long. Inflorescence a raceme, 4–9 cm long, rather dense before anthesis, 16–24-flowered, elongating in fruit to 8–13 cm long. Bracts papery, 1.8–4.0 mm long and 0.5–1.3 mm wide, linear-lanceolate, acuminate, loosely appressed hairs, at the margins with ciliate hairs, 0.3–0.5 mm long. Pedicel 1–3 mm long. Bracteoles narrowly linear to subulate, minutely hairy. Calyx greenish-brown, 5–7 mm long, loosely covered by appressed hairs; teeth 3–4 mm long, narrowly linear or subulate. Corolla pale pink-violet or brownish to yellowish when dry. Standard 11–13 × 7.5–8.0 mm, ovate-elliptic, emarginate at the apex, abruptly cuneatly narrowed at the base. Wings 9–11 mm long; blades narrowly oblong, rounded at the apex, 7.5–8.0 × 2.0–2.4 mm; auricle 1.3–1.5 mm; claw 2.1–2.3 mm long. Keel 10–11 mm long; blades obliquely obovate, with curved lower edge and nearly straight upper edge, obtuse to subacute at the apex, 7.5–8.0 × 4.0–4.5 mm; auricle indistinct; claw 2.0–2.3 mm long. Stamens diadelphous, 9 + 1, anthers uniform, staminal tube truncate at the mouth. Ovary sessile, semiglobular. Pods sessile, semiorbicular, erect to ascending, 11–14 mm long and 6–7 mm wide, loosely covered by appressed hairs 0.3–0.4 mm long, without prickles on disc, crest 6–7-toothed, serrate; teeth 1.0–2.2 mm long and 1.0–1.8 mm wide.

Etymology:—The new species is named after the type locality, Fariman city.

Distribution:—*Onobrychis farimanensis* is a narrowly endemic species known only from the dry-steppe zone of the mountainous regions near north Zharf, Torbat-e Heydarieh in the Razavi Khorasan Province (Fig. 3). It is only known from the type collection.

Diagnostic characters:—The new species displays a remarkable similarity to *O. alamutensis* Amirah., Kaz. Osaloo & Charkhch. (2014: 659) in the elliptic to oblong or obovate-oblong leaflets, triangular membranous stipules that connate at the base with brownish stripes, large wing petal (12–14) mm long, and large pod (9–14) mm long. However, it can be recognized by its plant height of up to 46 cm (vs. up to 70 cm) tall, leaflets 15–20 mm (vs. 10–28 mm) long, corolla pale pink-violet (vs. milky yellowish), keel 10–11 mm (vs. ca. 14 mm) long, pod 11−14 mm (vs. 9–12 mm) long and number of teeth 6−7 (vs. 7–10). Also, it is similar to *O. major* (Boiss. & Kotschy 1872: 533) ex Hand.-Mazz. (1910: 6) in the elliptic to oblong or obovate-oblong shape of the leaflets, stipules connate at the base,

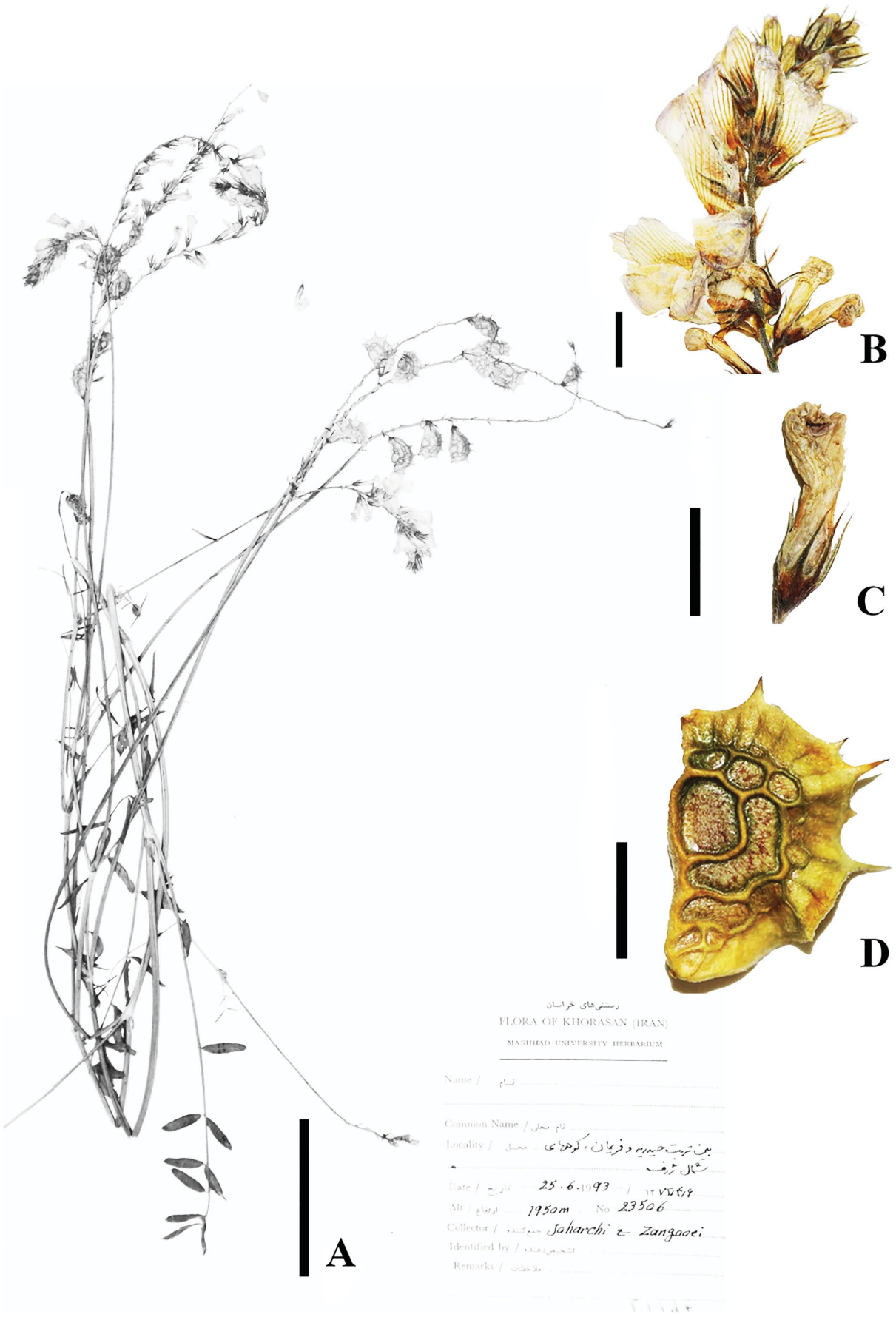

FIGURE 1. *Onobrychis farimanensis* (from holotype). **A.** habit. **B.** inflorescence with flowers. **C.** flower. **D.** pod. Scale **A** = 5 cm, **B**–**D** = 5 mm (*Joharchi & Zangooei 23506,* FUMH!).

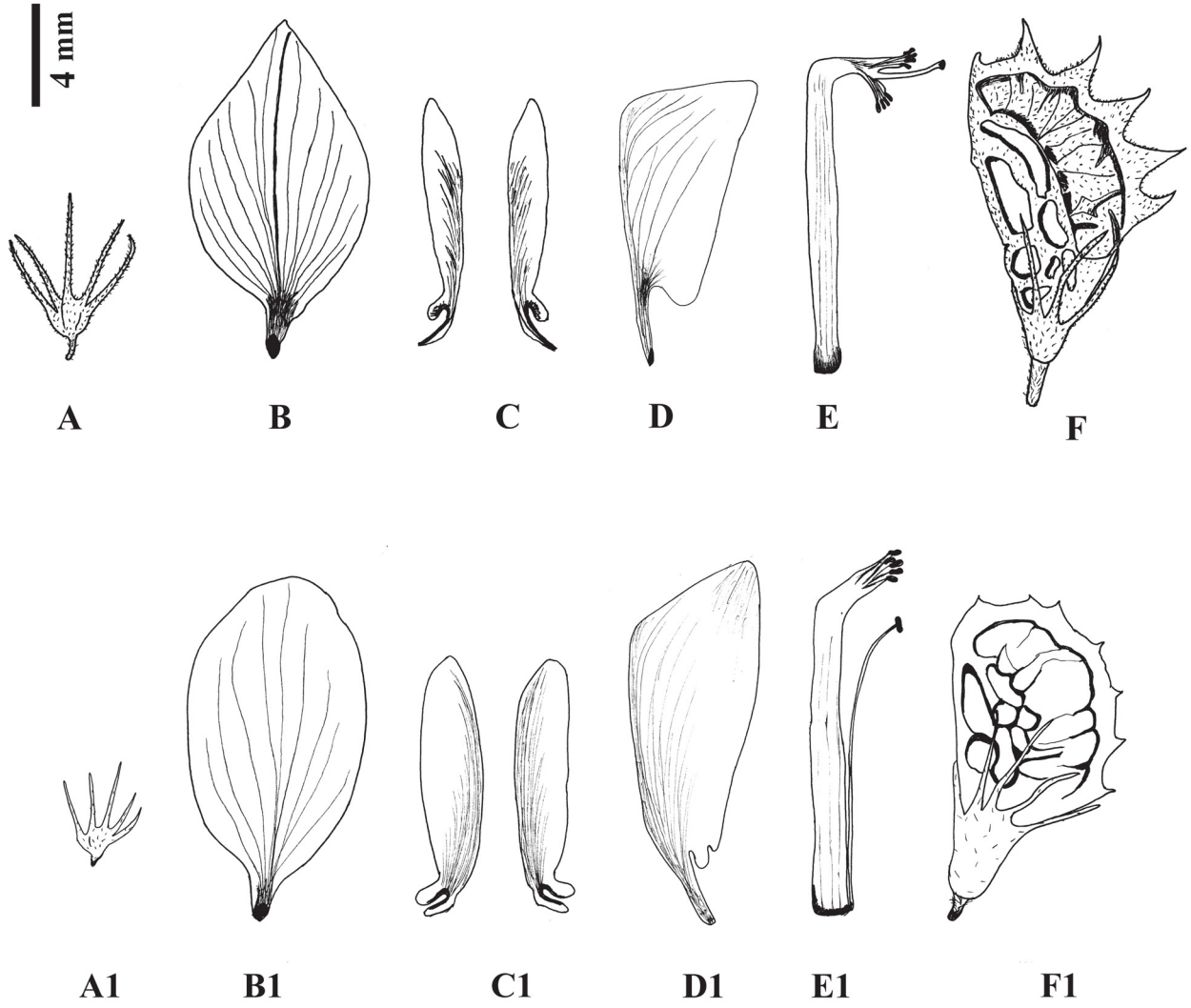

FIGURE 2. *Onobrychis farimanensis* (from holotype). **A**. calyx. **B**. standard. **C**. wings. **D**. keel. **E**. androecium. **F**. pod and *O. alamutensis* (from holotype). **A1**. calyx. **B1**. standard. **C1**. wings. **D1**. keel. **E1**. androecium. **F1**. pod (*Joharchi & Zangooei 23506,* FUMH!). Drawn by A. Askari

inflorescences to 90 mm long, papery bracts, number of pod teeth (5–7), and large standard petal (12–14) mm long, but differs from this species by its plant height of up to 46 cm (vs. up to 100 cm) tall, stems loosely covered by appressed hairs (vs. sparsely appressed pilose), stipules 4−9 mm (vs. 10–12 mm) long, leaflets 15−20 mm (vs. 15–35 mm) long and loosely covered by appressed to subappressed hairs (vs. appressed pilose hairs at lower surface and glabrous at upper surface), calyx 5–7 mm (vs. 8–10 mm) long, corolla pale pink-violet (vs. pink to rose), wing 9−11 mm (vs. (4)5–6 mm) long, keel 10–11 mm (vs. to 14 mm) long and pod 11−14 mm (vs. 8–9(11) mm) long (Table 1).

TABLE 1. Diagnostic morphological characters of *Onobrychis farimanensis, O. alamutensis* and *O. major*.

	O. alamutensis	***O. major***	***O. farimanensis***
Plant height (m)	Up to 0.70	Up to 1.0	Up to 0.46
Stem indumentum	White, densely covered by soft appressed hairs	White, sparsely covered by appressed pilose hairs	White, loosely covered by appressed hairs
Stipules	Membranous with brownish stripes	Membranous	Membranous with brownish base
Stipule length (mm)	3–7	10–12	4–9
Stipule shape	Triangular-subulate	Ovate	Ovate-triangular
Leaflet pairs in lower leaves	4–7	5−7	3−6

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TABLE 1. (Continued)

	O. alamutensis	*O. major*	*O. farimanensis*
Leaflet length (mm)	10–28	15–35	15−20
Leaflet indumentum	Densely covered by appressed hairs on lower surface, more or less glabrous or sparsely covered by appressed hairs on upper surface	Covered by appressed pilose hairs on lower surface, glabrous on upper surface	Loosely covered by appressed to subappressed hairs on both surfaces
Bract length (mm)	4−8	3	1.8−4.0
Calyx indumentum	Loosely covered by appressed hairs	Loosely covered by appressed to subappressed hairs	Loosely covered by appressed hairs
Calyx length (mm)	3–4 (5)	8–10	5–7
Corolla color	Milky yellowish	Pink to rose	Pale pink-violet
Standard length (mm)	12–14	11.0–14.5	12−14
Wing length (mm)	10–11	(4)5–6	9−11
Keel length (mm)	Ca. 14	To 14	10−11
Pod length (mm)	9–12	8–9(11)	11−14
Number of pod teeth	7–10	5–6	6−7
Teeth length (mm)	0.2–0.5	2	1.0−2.2

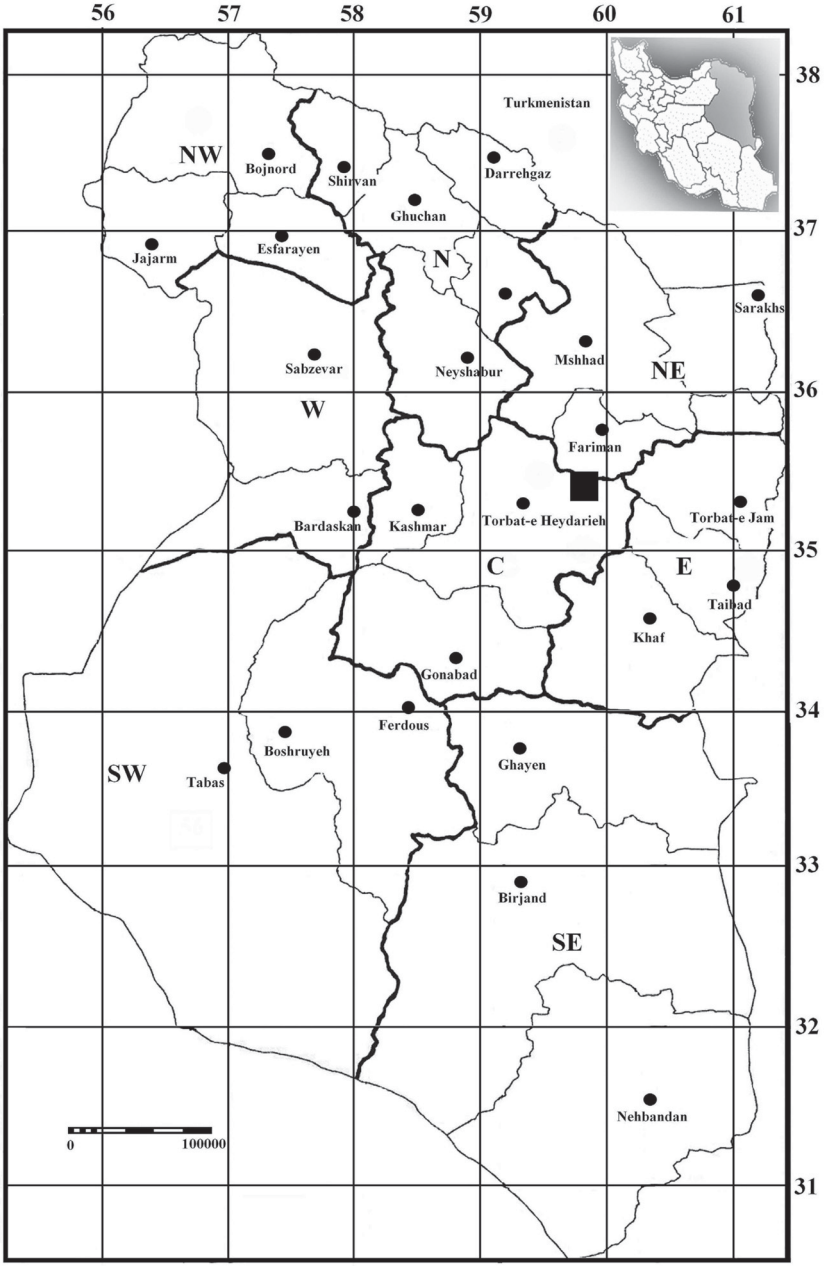

FIGURE 3. Distribution of *Onobrychis farimanensis* in Iran indicated by the square.

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