

## *Crataegus zarrei* (Rosaceae), a new species from Iran

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A new species, *Crataegus zarrei* Dönmez (Rosaceae) is described and illustrated from Kermansah, western Iran. It is allied to *C. azarolus*, but distinct among the Eurasian species by having finely dentate leaves, a relative abundance of teeth per leaf lobe, and a small and dark-orange fruit.

Key words: *Crataegus*, new species, Rosaceae, taxonomy

The genus *Crataegus* is represented by 27 species (Pojarkova 1939, Meikle 1966, Riedl 1969, Browicz 1972, Christensen 1992) in Iran, three of which were recently described by Khatamsaz (1991). My ongoing studies in *Crataegus* include examination of extensive collections from western Asia, as well as field trips in Iran and Turkey.

During field work in Kermansah, Iran, an outstanding *Crataegus* population was observed in the Zagros Mountain range. Individuals from this population are distinct in both leaf and fruit characters. The leaves have more numerous and finer teeth per lobe, and the fruits are smaller and darker orange in colour than in any otherwise closely similar species. The region was searched for further individuals of this putatively new species, and representatives matching the characters described below were photographed. Further research was based on literature survey and the examination of material collected by the present author, and on *Crataegus* specimens in various herbaria. The results of this survey indicate that the species is distinct and it is here described as a new species.

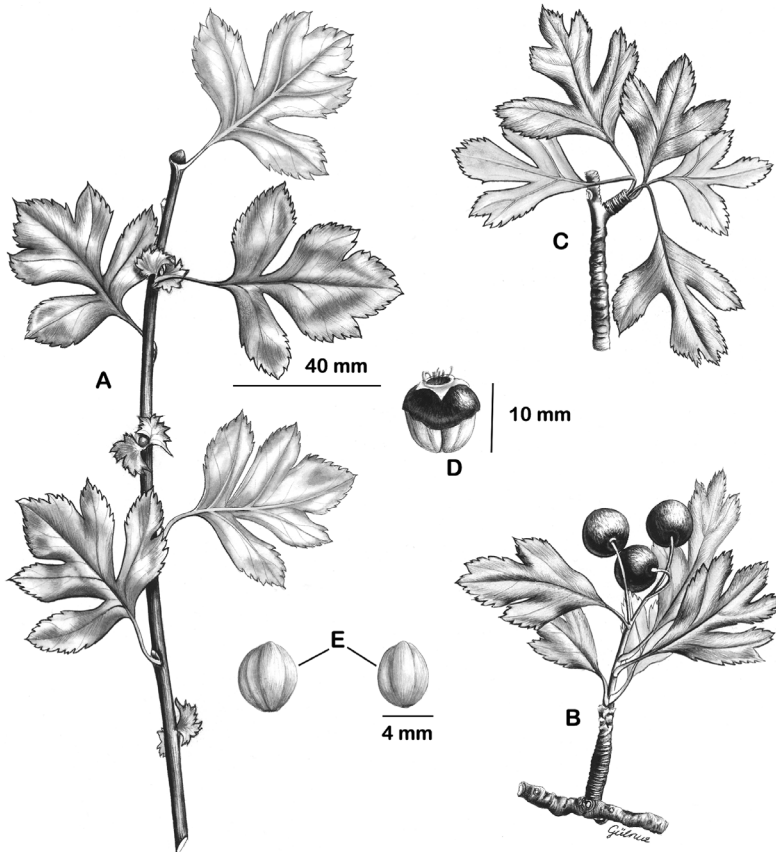
***Crataegus zarrei* Dönmez, sp. nova** (Fig. 1)

*Hic species affinis Crataego azarolii sed foliis sparse villosis, foliaceis (non coriaceis), foliorum lobis basalibus oblongis vel obovatis, dentibus, 10–20 provisis, fructu atroaurantiaco vel rubescenti parvo (7–9 × 7–9 mm), cum pulpa aurantica differt.*

HOLOTYPE: Iran. Kermansah, 2 km from Paveh to Kermansah, 1810 m, steppe, 27.IX.2005 A. A. Dönmez 12568, S. Zarre & H. Moazzini (HUB; isotypes EGE, TARI, TUH).

ETYMOLOGY: *Crataegus zarrei* honors the Iranian taxonomist Dr. Shahin Zarre from Tehran University.

Small tree up to 5 m, unarmed, rarely thorny. Young shoots tomentose to pubescent, soon subglabrous. Leaves non-coriaceous, broadly deltoid to orbicular in outline, mostly trilobed, pubescent on veins. Leaves of flowering shoots 25–35 × 20–33 mm, deeply trilobed, basal lobes oblong to obovate with 10–20 fine dentate teeth in distal 1/2, terminal lobe obovate to cuneate, ± slightly trilobed with 10–15 teeth, basal pair of sinuses in lower 1/2 of lamina, basal lobe



**Fig. 1.** *Crataegus zarrei* (from the holotype). — **A:** Leaves and stipules of elongate shoot. — **B:** Fruiting shoot. — **C:** Leaves of short shoot. — **D:** Fruit (flesh partly removed). — **E:** Pyrenes (dorsal view).

1.5–2 times as long as wide, angle of each of basal lateral veins to midrib approximately 45°; petiole 8–15 mm; stipules deciduous, 1–1.5 mm long, filiform. Subterminal leaf blades of short shoots similar to leaves of flowering shoots, blades deeply trilobed, rarely 5-lobed, petiole 10–15 mm. Leaves of elongate shoots 30–50 × 35–55 mm, mostly 5-lobed, basal pair of sinuses extending almost to midrib, pubescent or villous, petiole 10–20 mm, stipules D-shaped, 12–14 × 9–12 mm, 15–25 dentate. Inflorescence 20–30 × 20–35 mm, compact, corymbose, 20–30 flowered, pubescent to tomentose; pedicels 3–4 mm; flowers unknown; stamens 18–20; styles 2–3. Fruit 8–11 × 8–12 mm, globose, orange, glabrous, flesh pale orange, juicy; sepals 2–2.5 × 2.5–3 mm, persistent at fruit, recurved at maturity, apex acute; pyrenes 5–6 × 4–5 mm, 2–3, dorsally 2(–3) sulcate, ventro-laterally smooth hypostyle hairy.

**PHENOLOGY AND HABITAT:** Flowering in May–June, fruiting in September–December. Steppe and open *Quercus* scrub, 1700–1900 m.

**DISTRIBUTION:** Endemic. Irano-Turanian element. Only known from the type locality (Fig. 2).

In respect to pyrene number, leaf architecture and a few other characters *C. zarrei* is fairly similar to *C. azarolus s. lato*. However, examination of numerous herbarium specimens of the latter species at various herbaria (*see below*) and extensive field collections from both Turkey and Iran indicate that *C. zarrei* is not conspecific with *C. azarolus* (Table 1).

Leaves in *Crataegus* are coriaceous or non-coriaceous, with leathery leaves being a likely adaptation to dry habitats. *Crataegus azarolus* grows mainly in dry areas of the Irano-Turanian and Mediterranean regions (Franco 1968, Meikle 1977, Dönmez 2004). In that species, the

leaves at early stages of development are papery and they become increasingly leathery as they mature. Leaves of *C. zarrei* are non-coriaceous.

Several other distinctions in leaf morphology characterize *C. zarrei*. The most common tooth types within *Crataegus* are dentate or serrate, although intermediate forms also exist. The leaf margin of *C. azarolus* is mostly dentate, but other forms varying from coarsely to minutely dentate also occur. *Crataegus zarrei* differs from *C. azarolus* in having more and finer teeth per leaf lobe. Regarding the number and shape of teeth, *C. zarrei* is more similar to *C. rhipidophylla* than to *C. azarolus*. Other morphological characters of *C. zarrei* are, however clearly different from *C. rhipidophylla*. *Crataegus zarrei* has hairs on both leaf surfaces, and they are longer and more numerous than in *C. azarolus*. In addition to dentation and indumentum differences, *C. zarrei* differs from the other species in having more deeply lobed leaf blades.

*Crataegus zarrei* has small fruits with triangular sepals and 7–12 fruits per in frutescence, like the allied species of series *Crataegus*. The majority of species in the series have mostly a single pyrene and red fruits, while *C. zarrei* has 2–3 pyrenes and dark-orange fruits. Among the west Asian *Crataegus* taxa, *C. azarolus*, *C. pontica*, *C. tanacetifolia*, *C. × bornmuelleri*, *C. pseudoazarolus*, and a few other species also have orange fruits. However, *C. zarrei* differs from these species in the different type of indumentum, pyrene number, leaf shape and type of glands. According to field and herbarium observations of the fruits, their colour changes from greenish yellow to pale orange. The flesh of *C. azarolus* is still hard and unsuitable to eat in September but becomes juicier in October to

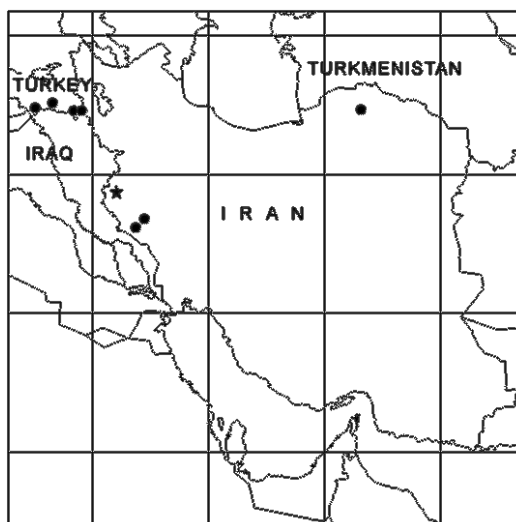


Fig. 2. Distribution of *Crataegus zarrei* (★) and *C. azarolus* (●).

December. In contrast, the fruits of *C. zarrei* are already mature with juicy flesh in September. To conclude, *C. zarrei* has a distinctive and unique combination of characters.

SELECTED SPECIMENS EXAMINED: — *Crataegus azarolus* var. *azarolus*: **France**. Prope Narbonem et au Pech de l'agniel (Dep. De l'Aude), Majo 1830, *Enderfs s.n.* (E!, JE!, W!). Hort. Reg. Parisiensis, Ex herbario Reichenbachiano, *s.n.* (JE!). Sardaigne, *s.n.* & collector unknown (JE!). Vereinigte Herbarien T: Ph. Ekart u. Th. Irmisch, *Sondershausen s.n.* (JE!). Montpellier, Hrb. W. Gerhard, Lipsia 1820 (JE!). Herault, Beziers, *Sennen s.n.* (JE!, W!). Aude, La Clappe, a Combe-malle, mai 1887, *R. Neyra s.n.* (E!, JE!, W!). Herb. Musei Palat Vindob. Cult, im Borden, Borden 1893, *Leichthin s.n.* (W!). **Italy**. H. Pro Herbarium Siculum, in collibus calcareis reg inferioris et subinat Polermo, *R. Coll 231* (E!). Sicily, Trapani, ca. 35 km NE of Trapani Timpone, *Davis & Sutton 63648* (E!). **Malta**. Mellicha, 200 m, *Davis & Sutton 50624* (E!). — *C. azarolus* var. *aronia*: **Turkey**. Çanakkale: 25 km N of Gelibolu, *F. Sorger 68.2. 81*(W!). B7 Erzincan:

Table 1. Comparison of *Crataegus zarrei* with *C. azarolus*.

Characters	<i>Crataegus zarrei</i>	<i>Crataegus azarolus</i>
Leaf indumentum	pubescent to villose at both side	pubescent to subglabrous at above, pubescent to glabrous at below
Leaf texture	non-coriaceous	± coriaceous
Basal lobes	oblong to obovate	widely to narrowly oblong
Leaf teeth	10–20	entire to 6
Fruit colour	dark orange to reddish	pale yellow to orange
Fruit size (mm)	8–11 × 8–12	8–35 × 8–27
Flesh	juicy	not juicy

Eğin, *P. Sintenis* 1890: 2342(W!). Bitlis: Sason, *Handel-Mazzetti* 2678 (W!). Muğla: Datça, Taşlıca village, Karayurt district, limestone, A. A. Dönmez 10309 (HUB). Isparta: Kurutepe, Steppenbügel, *F. Sorger* 66.44.48 (W!). İçel: 18 km SW Mut, Steppenbügel, *F. Sorger* 66.21.4 (W!). Urfa: Halfeti, *F. Sorger* 80.14.29 (W!). Adıyaman: W of Eskikahta, römisce Brücke, *F. Sorger* 80.22.3 (W!). Hakkari: Şemdinli, among *Quercus* scrub, A. A. Dönmez 10111 (HUB). **Iran.** Horasan, Bojnurd, Sarivan Pass, steppe, A. A. Dönmez 14069, *G. Zare & A. A. Arjmandy* (HUB). Kermaşah, from Kermaşah to Keren, A. A. Dönmez 14118, *G. Zare & H. Moazzini*. Kermaşah, from Kermaşah to Gilanag, A. A. Dönmez 14120, *G. Zare & H. Moazzini* (HUB).

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