

## THE GENUS CRATAEGUS L. (ROSACEAE) IN IRAN

M. Khatamsaz

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The genus *Crataegus* L. in Iran is revised. Altogether 22 species and 5 hybrids are recognized from Iran. Three new species including *C. aminii*, *C. assadii* and *C. babakhanloui* are described. A key for the species occurring in Iran is presented. Parents of hybrids are indicated and the differences of the hybrids are compared with them.

Mahboubeh Khatamsaz, Research Institute of Forests and Rangelands, P.O.Box 13185-116, Tehran.Iran.

جنس ولیک (*Crataegus* L.) از خانواده گل سرخ در ایران

از: محبوبه خاتم‌ساز

جنس ولیک (*Crataegus* L.) در ایران مورد مطالعه قرار گرفته است. از این جنس جمعاً ۲۲ گونه و ۵ هیبرید از ایران تشخیص داده می‌شود که ۳ گونه زیر بعنوان گونه‌های جدید معرفی و شرح داده می‌شوند.

*Crataegus aminii*, *C. assadii*, *C. babakhanloui*

کلید شناسائی گونه‌های شناخته شده برای ایران ارائه می‌گردد. والدین هیبریدها مشخص و تفاوت آنها با هیبریدهای شناخته شده مقایسه می‌شود.

## Introduction

This work is a revision of the genus *Crataegus* L. in Iran. The work was started about 1984 and is based on the study of numerous herbarium specimens including all big herbaria of Iran. The study was completed in the field in various parts of Iran. Many of the species were studied in the field at the type localities or specimens from the locus classicus or even the types.

Riedl (1969) in K.H. Rechinger Flora Iranica recognized 17 species from Iran. In this work altogether with previous new records of the author to Iran (Khatamsaz 1988), 22 species are recognized from Iran. This article contains 3 new species, a new key for the Iranian species of the genus and 5 hybrids.

## New species

### *Crataegus aminii* Khatamsaz, sp. nov.

Arborescens vel frutex. Rami juveniles pubescentes, vetustiores + opace brunnescenti-in-cani, spinis carentes. Folia opace glaucescentia, usque ad 6 cm longa et lata, ambitu late ovata, basi truncata, lobis 3-5 acutis, irregulariter dentatis, supra glabra vel laxissime pilulosa, subtus pubescentia, petiolo piloso. Inflorescentiae multiflorae, laxae, pedicelli et pedunculi villosi. Flores ignoti; sepala late triangularia, fructu reflexa. Fructus subglobosus, 10-12 mm in diam., nigricans vel atropurpureus. Pyrenis 3-4, in ventre plains, obsolete sulcatis.

*Typus.* Iran, Esfahan, Shahr-e Kord pass, 15 km

after Zob-Ahan, 1500 m, Amin 35157 (holotypus TARI).

Small tree or shrub. Young shoots pubescent, older shoots brownish-yellow, unarmed. Leaves light glaucescent-green, dull, to 6 cm long and broad, broad ovate, truncate at the base, rather shallowly dissected into 3-5 acute lobes, irregularly dentate, glabrous or less often sparsely puberulent above, pubescent beneath; petiole pilose. Inflorescence many flowered, loose, pedicels and peduncles villous. Flowers unknown; sepals reflexed in fruit. Fruits subglobose, 10-12 mm in diam., dark purple or black, rather fleshy and succulent; nutlets 3(-4) with 2 or 3 furrows in dorsal side.

This species by having yellowish fleshy fruits and furrows of the dorsal side of the nutlets fits to the sect. *Oxyacantha* Zbl. However it differs from this section by having rarely 4 nutlets. The closest species is *C. atosanguinea* Pojark. which differs from the new species by having glabrous inflorescence, glabrous shoots, dark bloody red fruits and 2 nutlets.

The new species named in honour of its discoverer Gh.R. Amin.

### *Crataegus assadii* Khatamsaz, sp. nov.

(Sect. *Azaroli* Loudon)

Arborescens 5-6 m alta, spinis carentes. Rami juveniles pubescentes, vetustiores crassi, cortice purpureo-grisei. Folia herbacea, viridia, ambitu late ovata, 3-6 cm longa, 2-6 cm lata,

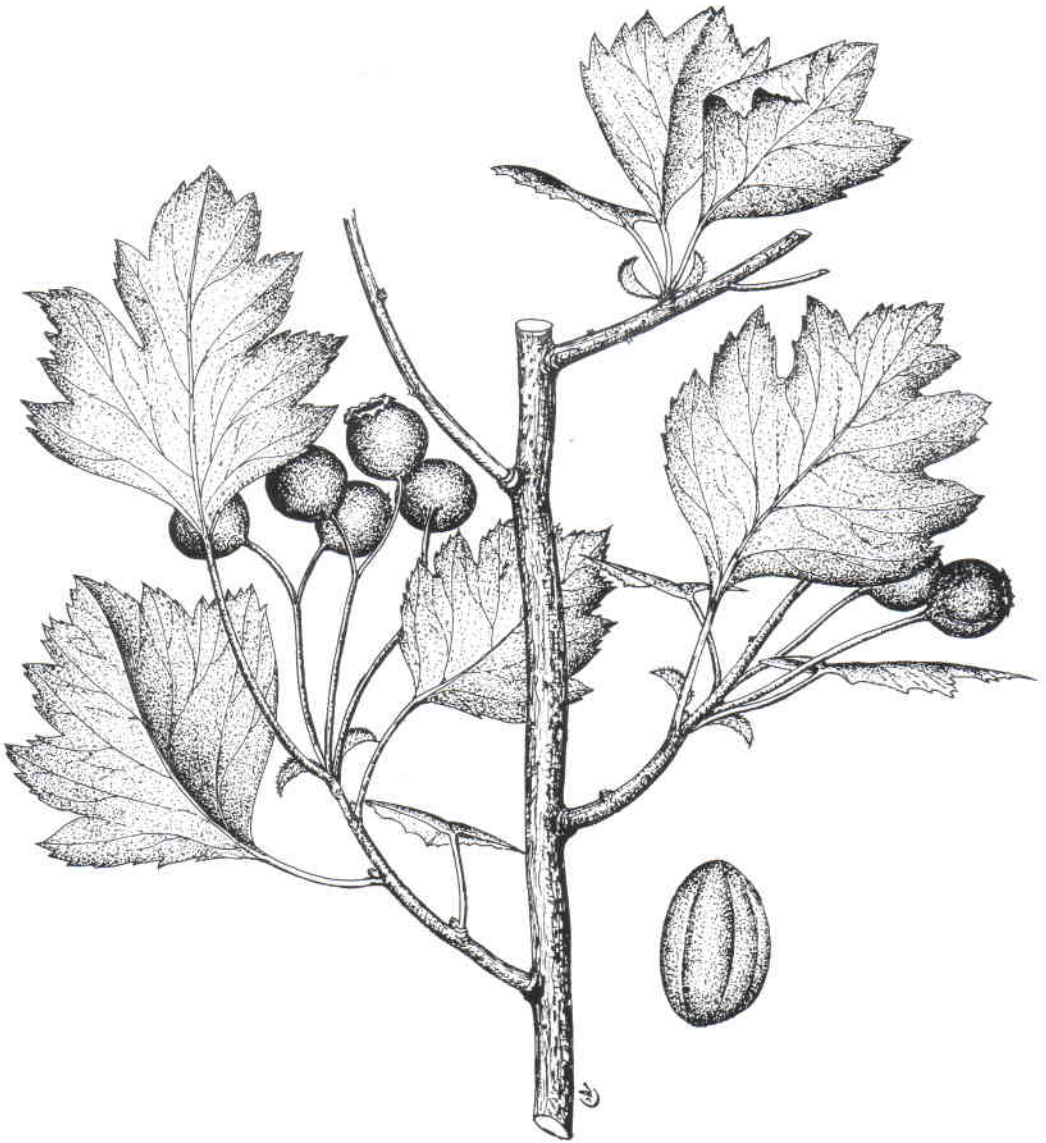


Fig.1. *Crataegus aminii* (nat. size; nutlet x 2)



Fig.2. *Crataegus assadii* (x 0.7; fruit and nutlet x 1.5).

Table 1: Differences of *Crataegus pontica* and *C. assadii*

<i>C. pontica</i>	<i>C. assadii</i>
Leaves firm, coriaceous, glaucous green, cuneate at the base, glabrous above.	leaves herbaceous, green, truncate at the base, pubescence above.
Lobes, with few teeth only at the apex.	Lobes irregularly dentate.
Inflorescence 8-14 flowered.	Inflorescence 12-25 flowered.
Fruit yellow to orange, 15-25 mm diam., with mealy flesh.	Fruit red, 12-18 mm diam., with compact (not mealy) flesh.

*basi truncata, profunde incisa, lobis 3-5 lineari-oblongis acutissime irregulariter dentatis, supra subtusque pubescentia, petiolo piloso brevi suffulta. Inflorescentiae multiflorae, 3-7 cm in diam., 14-25 florum, densiusculae, in omnibus partibus maxime tomentosae, pedicellis brevibus, pedicelli fructus et calyces dense tomentoso-pubescentes. Sepala late triangularia, revoluta. Petala suborbicularia, alba, styli 2-3. Fructus globosus, 12-15 mm in diam., rubri. Pyrenis 2-3.*

Typus. Iran, Khorassan, Bojnoord, Badranloopass, Assadi & Maassoumi 50895 (holotypus TARI).

Tree to 5-6 m high, with broad crown, shoots unarmed, young and anntinous shoots pubescent-tomentose. The older ones thick with the

purplish-grey bark. Leaves herbaceous, green, broad ovate, 3-6 cm long, 2-6 cm broad, truncate at the base, deeply incised, 3-5 fid, often very deeply so, nearly to midrib, lobes usually narrow, with acute irregular teeth, pubescent on both sides. Petiole pilose, much shorter than the blade. Inflorescence many flowered, 3-7 cm in diam., 14-25 flowered, compact, densely whitish-tomentose, with very short pedicels. Sepals broadly triangular, acute, recurved in fruit. Petals suborbicular, white. Styles 2-3. Fruit globular, 12-15 mm in diam., red, nutlets 2-3.

*Diagnose.* The closest species to the new species is *C. pontica*, which differences between the two species are presented in table 1. The new species named in honour of its discoverer M. Assadi.

***Crataegus babakhanloui* Khatamsaz, sp. nov.**(Sect. *Sanguineae* Zabel ex Schneider).

Frutex vel arbuscula, 2-3 m altus, ramuli hor-notini pilosi, annotini glabri, vetustiore crassi cortice rubiginose fisso, spinae raras. Folia ambitu late ovata, 3-6 cm longa, usque ad 5 cm lata, profunde incisa vel incisione infima rarissime fere ad nervum medianum pertinente, laciniis utrinque 4-6 grosse dentatis, dentibus acutis, folia ramorum sterilius profundius pinnatifida, supra glabra vel laxissime pilulosa, subtus pubescentia, petiolus  $\pm$  2 cm longus, pilosus. Stipulae latae, falcatae, glandulosae serratae. Inflorescentiae 3-5 cm in diam., 9-15 florum, laxae; pedicelli et pedunculi et hypanthium villosi. Corolla 12-15 mm in diam., alba; sepala oblonga vel lanceolata, triangularia, stamina 20, styli (2)3-4. Fructus subglobosus, 10-12 mm in diam., atropurpureus, pruinosis. Pyrenae (2)3-4, in apice liberae, in ventre minus compressae et foveolatae.

Typus. Iran, Markazi, Karaj-Chalous road, Aderan, Arangeh, 1700 m, Khatamsaz 47505 (holotypus TARI). Paratypus. idem 52100 (flowering stage); Aderan, Haftcheshmeh, Babakhanlou & Amin 20588.

Shrub or small tree, 2-3 m high, branchlets of this year's growth pilose, of last year's growth glabrous, the older ones thick with the ruby-red bark fissured, spines rare. Leaves broad ovate, 3-6 cm long, up to 5 cm broad, deeply lobed with 4-6 acute large teeth on each side, leaves on sterile shoots sometimes more deeply lobed or pinnatifid, glabrous less often sparsely

puberulent above, pubescent beneath. Petiole  $\pm$  2 cm long, pilose. Stipules large, falcate, with large teeth terminating in a gland. Inflorescence 3-5 cm in diam., 9-15 flowered, loose. Pedicels and peduncles and outside of hypanthium villous. Flowers 12-15 mm in diam., with white petals; sepals oblong-triangular; stamens 20; styles (2)3-4. Fruit subglobose, 10-12 mm in diam., dark purple, pruinose, with yellow mealy flesh. Nutlets (2)3-4, free in the apex, compressed and minutely pitted ventrally.

*Diagnose.* The closest species to the new species is *C. sanguinea* Pall. which differs from the new species by having glabrous inflorescence and blood-red or orange-yellow fruit. Probably the species that Reidel (1969 p.51) mentioned *C. pinnatifida* Bge. is this species, but because that specimen does not have flower and fruit, I can not take a clear decision.

The new species, named in honour of its discoverer P. Babakhanlou.

**Key to the species**

1. Styles 3 to 5; fruit with 3-5 nutlets. 2
- + Styles 1-3; fruit with 1-3 nutlets. 9
2. Inflorescence lax; peduncles and pedicels long; petioles longer than 1/8 - 1/6 blade; leaves not flabellate. 3
- + Inflorescence dense and compact; peduncles and pedicels very short; petioles 1/8 - 1/6 as long as blade; leaves flabellate. 8
3. Nutlets strongly compressed and pitted laterally; leaves on sterile shoots sometimes more deeply lobed or parted to the midrib. 4





Fig.3. *Crataegus babakhanloui*, leaf of sterile shoot (x 0.7; nutlet x 1.5).

- + Nutlets triangular and not compressed and pitted laterally; leaves on sterile shoots not parted to the midrib. 5
4. Shoots glabrous and lustrous, usually with thick spines; inflorescence glabrous; fruit blood red or orange-yellow, 5-10 mm diam.
1. *C. sanguinea* Pall.
- + Shoots hairy, unarmed or spines rare; in florescence villous; fruit dark purple, 10-12 mm diam. 2. *C. babakhanloui* Khatamsaz
5. Inflorescence glabrous, less often axes and pedicels slightly hairy, sometimes lower part of hypanthium rather pubescent; leaves glabrous or rather sparsely puberulent; petioles 1/2 as long as blade
4. *C. psuedomelanocarpa* Pop. ex Pojark.
- + Inflorescence axes, pedicels, hypanthium, and outer side of sepals tomentose-pubescent; shoots and leaves (at least below) densely pubescent, petioles longer than 1/2 blade. 6
6. Fruit  $\pm$  large, more than 10 mm diam., with yellowish mealy flesh; nutlets with 1-4 longitudinal furrows on the back; leaves shallowly lobed; sepals broad triangular.
11. *C. aminii* Khatamsaz
- + Fruit small, up to 10 mm diam., with little-developed reddish flesh; nutlets smooth on the sides and with inconspicuous longitudinal furrows on the back; leaves partite; sepals ovate-triangular, mostly with a short sharp point. 7
7. Leaves broadly cuneate or truncate at base; lobes spreading horizontally. Euro-Sib. element. 3. *C. pentagyna* Weldst. & Kit.
- + Leaves cuneate or narrowly cuneate at base; lobes diverging at an acute angle. Ir-Tur. element. 5. *C. davisii* Browicz
8. Fruits with 5, rarely 4 nutlets, red-orange; sepals reflexed, lanceolate-triangular, long-acuminate; leaf lobes narrow.
6. *C. orientalis* Pall. ex M.B.
- + Fruits with 3 or 4 nutlets, red; sepals erect-spreading, broadly triangular, mucronulate; leaf lobes broader.
7. *C. szovitsii* Pojark.
9. Inflorescence very compact, pedicels short, petioles 1/8 - 1/6 as long as blade. 10
- + Inflorescence loose, pedicels long; petioles longer than 1/8 - 1/6 blade. 12
10. Branches thorny, fruit little hairy, especially toward the apex.
8. *C. aronia* (L.) Bosc ex DC.
- + Branches thorny, fruit not hairy. 11
11. Fruit large, 15-28 mm diam., yellow, less often reddish laterally, strongly flattened at the poles; leaves coriaceous and glabrous above; sepals broad triangular.
9. *C. pontica* Koch
- + Fruit smaller, less than 15 mm diam., dark red, not flattened at the poles; leaves herbaceous and densely pubescent above; sepals lanceolate-triangular.
10. *C. assadii* Khatamsaz
12. Nutlets 2-3 rarely 1. 13
- + Nutlet 1. 17
13. Young shoots densely hairy; inflorescence and leaves (especially beneath) pubescent; styles 2 rarely 1; petioles pubescent. 14
- + Young shoots glabrous or with scattered hairs; inflorescence glabrous; leaves glabrous or with a few hairs on the underside of the midrib; styles 2-3; petioles



- glabrous 15
14. Fruit dark red; large, 12-18 mm diam., hairy towards apex and base, especially when young; inflorescence densely villous. 12. *C. meyeri* Pojark.
- + Fruit dark purple, smaller, 12-13 mm diam., not hairy inflorescence puberulent. 15. *C. persica* Pojark.
15. Inflorescence few-flowered; fruit ovoid-ellipsoid, small, to 6 mm dim. 16. *C. sakranensis* Hadac & Chrtek
- + Inflorescence many-flowered; fruit globose; large, 12-16 mm diam. 16
16. Leaf lobes with few large teeth only near the apex; sepals ovate, mucronulate, ciliate; fruit dark blood red. 13. *C. atosanguinea* Pojark.
- + Leaf lobes unequally serrate from the middle or nearly from the base; sepals broadly triangular, entire; fruit purple-black with sparse light dots. 14. *C. songarica* Koch
17. Leaves thin; fruit with erect sepals; inflorescence usually an umbel. 22. *C. microphylla* Koch
- + Leaves firm; fruit with spreading sepals; inflorescence a compound corymb. 18
18. Leaves green beneath; sepals lanceolate-triangular; fruit red. 19
- + Leaves glaucous beneath; sepals triangular; fruit dark purple. 21
19. Inflorescence with scattered hairs; fruit elongate at the base; leaves slightly hairy on the midrib; lower part of hypanthium usually hairy. 17. *C. turkestanica* Pojark.
- + Inflorescence glabrous; fruit different; leaves glabrous beneath; hypanthium glabrous. 20
20. Leaves coriaceous; fruit light red. 18. *C. sinaica* Boiss.
- + Leaves not coriaceous; fruit dark red crowned by deflexed or patent sepals; style long and recurved. 19. *C. curvisepala* Lindman.
21. Fruit 9-11 mm long, not pruinose; leaves on sterile shoots up to 3.5 cm long. 20. *C. pseudoheterophylla* Pojark.
- + Fruit 12-13 mm long, pruinose; leaves on sterile shoots to 5 cm long. 21. *C. turcomanica* Pojark.

### Hybrid specimens

1. *C. curvisepala* Kindman. x *C. meyeri* Pojark.;

*C. x armena* Pojark.

This hybrid has 1 rarely 2 nutlets, while *C. meyeri* has 2 nutlets.

2. *C. pontica* Koch x *C. atosanguinea* Pojark. Lorestan, 15 km from Shoulabad to Aligoodarz, 1850-2200 m, Mozaffarian & Sardabi 4277.

This hybrid has hairy shoots, flabellate leaves which are pubescence above, lax inflorescence and yellow fruits.

3. *C. meyeri* Pojark. x *C. pseudoheterophylla* Pojark.

Azarbaiejan, 50 km from Varzeghan to Jolfa, 1300 m, Mozaffarian 43596.

The leaves of this hybrid are very similar to the leaves of *C. pseudoheterophylla* and fruits are similar to *C. meyeri*.

Both two parents are found together with the hybrid.

4. *C. pentagyna* Waldst. & Kit. ex Willd. x *C. songarica* Koch, Mazandaran, Veresk, 2700 m, Khatamsaz & Abouhamzeh 47510.

The leaves, spines and reddish flesh of fruit are similar to *C. pentagyna* and inflorescence, shape and colour of fruit are similar to *C. songarica*. This hybrid is found among two parents.

5. *C. pseudomelanocarpa* M. Pop. x *C. turkestanica* Pojark.; *C. x pseudoambigua* Pojark., Fl. URSS. 9:509 (1939).

This species is mentioned in Flora Iranica (cf. H. Riedle 1969) from Iran, but I have not seen any specimen.

### Acknowledgments

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