



The genus *Crataegus* (Rosaceae) in Armenia (an updated review)

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The Rosaceae family plays a leading role in the dendroflora of Armenia. The *Pyrus*, *Sorbus*, *Crataegus*, *Cotoneaster*, *Rubus* and *Rosa* genera representing the family are of great importance in Armenia in the formation of various plant coexistences. With its species composition and taxonomic diversity, *Crataegus* is one of the largest genera in the Rosaceae family. Growing in Armenia in low, medium and high mountain zones, *Crataegus* has a great role in the formation of dendroflora: they are an important element of a number of forest coexistences, form a sub-forest with other representatives of dendroflora, grow in arid sparse forests, scrub, shoreline areas of mountain rivers. *Crataegus* is a valuable plant resource. Some species produce tasty and nutritious fruits that are rich in sugars, organic acids, mineral salts and vitamins. Since ancient times, the people of Armenia have used it in food and folk medicine, for example there is a decoction of hawthorn root and bark dyed threads. Currently, *Crataegus* has great economic importance. Drought-resistant and frost-resistant species are used as grafts for obtaining high-value varieties of apple, pear, and quince, decorative species are suitable for greening cities and settlements, creating living fences. Furniture and carpentry tools are made from its hard and strong natural wood. Due to their hardness, some species of *Crataegus* are promising for the creation of arid arboretums in the lower and middle mountain zones of Armenia. In Armenia the genus *Crataegus* is represented by 23 species belonging to three sections: *Crataegus*, *Pentagynae* C. K. Schneid. and *Azaroli* Loud. Species *C. ulotricha* Pojark. ex Gladkova, *C. razdanica* Pojark. ex Sargsyan, *C. gabrielianae* Pojark. ex Sargsyan, *C. susarykleinae* Gabrieljan et Sargsyan and *C. gregorianii* Gabrieljan et Sargsyan are endemic to Armenia. An updated key is provided to identify species based on new data. Altitudinal and geographical distribution of species, habitat, flowering and fruiting time are given.

Keywords: dendroflora of Armenia; biodiversity; taxonomic key; species identification; endemics.

Introduction

The flora of Armenia is very peculiar and rich. Armenia is located at the junction of the moderately humid Caucasian and arid Central Anatolian and Armeno-Iranian floristic provinces. Due to the complexity and diversity of the relief, soils and climate, about 3800 species of flowering plants grow on the territory of Armenia. Armenia is one of the centers of intensive speciation for many genera of flowering plants.

Despite the rich species composition, the hawthorns of Armenia have been relatively little studied. Therefore, we have made an attempt to clarify the species composition of the hawthorns of Armenia and to compile a key for identifying the species. Representatives of the genus *Crataegus* L. grow the temperate and subtropical regions of the Northern Hemisphere, between 30° and 60° N, that is, completely within the boundaries of the Holarctic kingdom. The genus is richly represented in the Mediterranean, Irano-Turan regions, as well as in the Eurasian part of the Circumboreal region. The genus includes 250–300 species and is one of the largest in the Rosaceae family and is considered one of the taxonomically difficult due to hybridization, apomixis and polyploidy inherent in its representatives (Christensen, 1992; Dönmez, 2004; Talent & Dickinson, 2007; Yanar et al., 2011; Vašková & Kolarčík, 2019; Kuhn et al., 2020). In addition, hawthorn species hybridize with *Mespilus* and form intergeneric hybrids *Crataegomespilus* (Phipps, 2016).

Since the 1920s, botanical research and collection of rich herbarium material by botanists in Armenia and adjacent territories have been carried out. A. I. Poyarkova described many new species from Asia, Europe, different regions of Russia, the former USSR. She was especially interested in the hawthorns of Armenia. She specially visited Armenia several times to collect material and described a number of species new to science, such as *Crataegus meyeri*, *C. atosanguinea*, *C. armena*, *C. zangezura*, *C. pseudoheterophylla*. In the "Flora of the USSR" Poyarkova (1939) 11 species of hawthorn are cited for Armenia.

Since 1954, the multi-volume edition "Flora of Armenia" began to appear under the editorship of A. L. Takhtajan. The third volume (Fedorov, 1958) of the publication includes the genus *Crataegus*, represented by 11 species from three sections: section *Pentagynae* Zabel: *C. pentagyna*; section *Azaroli* Loud.: *C. orientalis*, *C. szovitsii* (with "possible occurrence on the territory of Armenia"), *C. schraderiana*; section *Oxyacanthae* Zabel.: *C. meyeri*, *C. caucasica*, *C. atosanguinea*, *C. kyrstostyla*, *C. armena*, *C. zangezura* and *C. pseudoheterophylla*. Information about hawthorns growing in Armenia is given in A. A. Dönmez (2004), A. M. Ibrahimov et al. (2020). According to Christensen (1992), the center of diversity of the section *Crataegus* (*sensu lato*) is Turkey and Iran, and the secondary center is the Crimea and the Caucasus.

Hawthorns are also of great interest as a raw material in pharmaceuticals, the fruits are rich in useful elements in people's food, are food for birds in the winter and are used for landscaping (Özcan et al., 2005; Phipps & O'Kennon, 2007; Ebrahimzadeh & Bahramian, 2009; Wang et al., 2018; Ferioli, 2020; Belabdelli et al., 2022).

Materials and methods

Type specimens and all herbarium material from the Caucasus, Turkey, Iran and neighbouring countries (ERE, ERCB, LE, WIR, WHA, MW, TBL, TGM), photographs of type specimens of some species (B) served as material for the study.

Field observations in nature and own collections in Armenia were carried out in 2006–2021 using route and stationary methods. The comparative morphological method was used in the work. When compiling the key, generally accepted features for differentiating taxa of *Crataegus* were used, such as the number of styles (or pyrenes), the length, shape and colour of the fruit, the ratio of the length and width of the leaves, sepals, serration of stipules, and so on (Dönmez, 2007; Khadivi et al., 2019; Kuhn et al., 2020).

The floristic division of Armenia and the abbreviations of the names of floristic regions are given according to A. L. Takhtajan (1954).

Results

In the course of the work, we have described and validated species new to science, identified species new to Armenia, clarified and identified new floristic areas of distribution of some species of *Crataegus* L. (Sargsyan, 2016; Gabrielyan & Sargsyan, 2020).

It has been established that the genus *Crataegus* in Armenia is represented by 23 species belonging to three sections: section *Crataegus*, section *Pentagynae* C. K. Schneid., section *Azaroli* Loud. The key also contains the species *C. artzachensis* Gabrielian et Sargsyan described by us from the NKR with a mark of possible presence, since the locus classicus is located near the border of Armenia, where representatives of the *Azaroli* section are widespread.

Crataegus L., Hawthorn

1. Carpels 3–5, fruits with 3–5 pyrenes 2
- Carpels 1 or 2 (3) are usual, fruits with 1–2 (3) pyrenes 11
2. Petioles of leaves are 1½–2 times shorter than leaf blades, inflorescence loose 7
- Petioles of leaves are 3–8 times shorter than leaf blades, inflorescence compact 3
3. Fruits with 3–4 pyrenes 4
- Fruits with 5, less often 4 pyrenes 5
4. Fruits almost spherical, ribbed, 10–12 mm in diameter, dark red. Leaves dense, grey, appressed-pubescent, 3–5 separate. Inflorescence 10–12 flowered, densely woolly *C. szovitsii* Pojark.
- Fruits globular, depressed from the poles, slightly ribbed, 20–22 mm in diam, yellowish-reddish. Leaves coriaceous, softly silvery hairy, glaucous-green above, lighter, densely woolly beneath, 3–5 (7)-separate. Inflorescence 18–20 flowered, densely softly whitish woolly *C. artzachensis* Gabrielian et Sargsyan
5. Fruits orange or reddish-orange, strongly flattened at the poles, pentahedral, 12–18 mm in diam. Axillary and leafy thorns are numerous *C. orientalis* Pall.
- Fruits yellow or yellow and from one side reddish 6
6. Fruits entirely yellow, the broadly-oval or pear-shaped form, slightly ribbed 15–20 mm in diam. Leaves not leathery, light green, with soft hairy pubescence from both sides *C. pojarkoviae* Kossyeh
- Fruits yellow, from one side reddish, globose, 13–15 mm in diameter, with juicy yellow pulp. Leaves leathery, almost grey, above green, thin-velvet pubescent, woolly *C. gabrielianae* Pojark. ex Sargsyan
7. Fruits black or nearly black 8
- Fruits dark red or dark cherry-red 9
8. Fruits black glaucous, globose or broadly elliptic, without sparse light roundish lenticels, 6–8 mm in diameter, with thin, reddish pulp. Sepals erect. Thorns thin, not numerous *C. pentagyna* Waldst. et Kit.
- Fruits blackish brilliant, with sparse light roundish lenticels, 15–18 mm in diameter, with juicy pulp. Sepals reflexed. Thorns absent *C. susanykleinae* Gabrieljan et Sargsyan
9. Fruits with 3–4 pyrenes, globose or ellipsoidal, 8–12 mm in diameter, dark-purple, with red pulp. Leaves above matte, light green, below greyish, with curly, soft, sometimes disappearing pubescence *C. ulotricha* Pojark. ex Gladkova
- Fruits with 4–5 pyrenes 10
10. Inflorescences and leaves from above glabrous, only from below with a bundle of hairs in corners of the main veins. Leaves glossy, above green, below light green, 3–5 lobate, not deeply incised. Fruits 8–12 mm in diameter, dark red, mature almost black, with the developed pulp *C. atrofusca* (K. Koch) Kassumova
- Inflorescences and leaves from both sides tomentose. Leaves dull above dark-olive-green, from below greyish, 5–7-lobate, deeply incised. Fruits 10–12 mm in diam, dark-cherry, with poorly developed pulp *C. tournefortii* Griseb.
11. Carpels 1, fruit with one pyrene 12
- Carpels 2 (3), fruit with 2 (3) pyrenes 18

12. Inflorescences pedicels shaggy-haired, leaves from both sides shortly pubescent, with 3–5 acute lobes. Axillary and leafy thorns not numerous. Fruits ellipsoidal, 8–12 mm long, 6–8 mm in diameter, dark-red *C. armena* Pojark.
- Inflorescences pedicels and leaves glabrous, or slightly pubescent 13
13. Leaves deeply (¾) serrate 14
- Leaves not so deeply (до 1/3–2/3) serrate 15
14. Leaves not deeply 5–7 incised, lobes serrate. Inflorescences with 8–10 flowers. Fruits 6–8 mm in diameter, purple-black *C. pallasii* Griseb.
- Leaves deeply 5–11 incised almost till middle vein, lobes with a few large teeth. Inflorescences with 10–15 flowers. Fruits 10–12 mm long, 6–8 mm in diameter, red *C. stevenii* Pojark.
15. Flowers in simple umbellate inflorescences. Leaves 1–3 cm long, 0.5–1.5 cm wide, with 5–7 oval lobes. Thorns are numerous. Fruits 8–12 mm long, 6–8 mm in diameter, reddish almost black .. *C. microphylla* K. Koch
- Flowers in complex corymbose inflorescences 16
16. The leaves are mostly 3-lobed, the plant is completely thornless. Fruits are barrel-shaped to ellipsoidal with a pear-shaped base, 13–15 x 10–12 mm, red *C. gregorianii* Gabrielian et Sargsyan
- Leaves 5–7-lobed, plant with thorns 17
17. Leaves below not waxy, 7-lobate, serrate on margin. Fruits 8–15 mm long, 6–12 mm in diam, red *C. rhipidophylla* Gand.
- Leaves below waxy, 3–5-lobate, entire, denticulate only in upper part. Fruits 8–12 mm long, 5–9 mm in diameter, brown-red *C. pseudoheterophylla* Pojark.
18. Inflorescence and leaves densely pubescent 19
- Inflorescence glabrous, leaves glabrous or with rare hairs on veins 21
19. Fruits yellowish with thick juicy pulp, strongly flattened, 15–22 (25) mm in diameter. Leaves appressed-pubescent, 7 incised *C. pontica* K. Koch
- Fruits red, dark red, almost up to black 20
20. Leaves pubescent on both sides, below woolly. Fruits cylindrical 12–15 mm long, 8–10 mm in diameter, dark-cherry, juicy *C. meyeri* Pojark.
- Leaves with sparse appressed bristly hairs, below almost glabrous. Fruits globose, 6–8 mm in diameter, dark red *C. eriantha* Pojark.
21. Fruits 6–10 mm in diameter, flowers 10–12 mm in diameter 22
- Fruits 12–18 mm in diameter, flowers 14–20 mm in diameter 23
22. Leaves above dark green, below dull 5–7-lobate. Inflorescences 10–14-flowered. Fruits oblong, elliptic, 6–8 mm in diameter, cherry red to blackish purple, with red-orange pulp *C. zangezura* Pojark.
- Leaves above light green, from below glaucous, 3–5-lobate. Inflorescences 5–15 flowered. Fruits elliptic-globose, 10–12 mm long, 8–10 mm in diameter, red with a crimson shade, with rare, light lenticels *C. caucasica* K. Koch
23. Lobes of leaves entire, only at a top with 1–3 teeth, from both sides glaucous-green, dim, almost naked, 3–5–7-lobate. Fruits spherical, 15–18 mm in diameter, blood-red, juicy *C. atrosanguinea* Pojark.
- Lobes of leaves from the middle or from the basis on edge with large, sharp, unequal teeth, from above is sated green, from below light, with beards in corners of the main veins, 3–5-lobate. Fruits ovoid-globose, 12–15 mm in diameter, is dark-purple or black-violet with light points *C. razdanica* Pojark. ex Sargsyan

Discussion

Genus *Crataegus* L., 1753, Sp. Pl. 1: 475 pp.

Typus: *Crataegus rhipidophylla* Gandoger (= *Crataegus oxyacantha* L., nom. rejic.)

Sect. 1. *Crataegus*

Small trees or shrubs. Spines are short or absent. Leaves obovate, broadly ovate, ovate, narrowly ovate, cuneate or rhombic, lobed or separate, rarely dissected. Petioles 1.5–2.0 (4) times shorter than blades. Inflorescences many-flowered, compound, corymbose, rarely simple, friable, with well-developed axes and pedicels, pedicels glabrous or hairy, rarely densely hairy. Anthers pink or purple. The fruits are small, ellipsoidal or almost spherical, sometimes cylindrical, from light red to purple-black,

with 1–2 (3) stones. The ossicles on the ventral side are slightly pitted or almost smooth, on the dorsal side with 1–3 longitudinal shallow grooves. The pulp of the fruit is yellowish, juicy or mealy.

Type: *C. rhipidophylla* Gand.

1. *C. atrosanguinea* Pojark., Fl. USSR 9, Addenda 8: 504.

Tree up to ca. 10–12 m. Fl. VI, fr. from IX–X. 800–1200 m. On slopes of gorges of the mountain rivers, among bushes. It is cultivated in gardens. – Armenia (Lori., Apar., Yerev., Dar., Zang.), Caucasus (E Caucasus, S Transcaucasia, Nakhichevan, Karabach), Anatolia, C and N Iran.

2. *C. caucasica* K. Koch, 1853, Verh. Ver. Beförd. Gartenb. Königl. Preuss. Staaten, N. R. 1: 286.

A bush up to ca. 2–3 (4) m. Fl. V, fr. X. 800–1200 m. In arid light forests, on stony slopes, in gorges of the mountain rivers. – Armenia (Lori., Ijev., Apar., Gegh., Yerev., Dar., Zang.), Caucasus (C, SW, S Transcaucasia, Nakhichevan, Karabagh, Talysh), Anatolia, Iran.

3. *C. meyeri* Pojark. Flora of the USSR 9, Addenda 8: 500.

Tree or shrub up to ca. 1.5–3.0 (5) m. Fl. V, fr. IX–X. 800–1200 m. In thickets, rocky slopes. – Lori., Arag., Ijev., Gegh., Sevan, Yerev., Dar., Zang., Meghri. – Caucasus (C, E, S Transcaucasia, Nakhichevan, Talish), Anatolia, Iran.

4. *C. eriantha* Pojark. Flora of the USSR 9, Addenda 8: 500.

Tree or shrub up to ca. 3–5 m. Fl. V–VI, fr. IX–X. 800–1200 m. Rocky mountain slopes, among shrubs. – Armenia (Yerev., Zang., Meghri.), Caucasus (E, S Transcaucasia, Nakhichevan).

5. *C. rhipidophylla* Gand., 1871, Bull. Soc. Bot. France 18: 447.

Small tree or shrub up to 2–8 m. Fl. V–VI, fr. IX. 1200–2000 m. Arid open forest. – Armenia (all regions except Up. Akhur.), Caucasus (all), C & E Europe, Crimea, Anatolia.

6. *C. pseudoheterophylla* Pojark. Flora of the USSR 9, Addenda 8: 506.

Small tree or shrub up to 3–6 m. Fl. V–VI, Fr. IX. 1200–2000 m. On stony slopes of mountains in thickets of bushes. – Armenia (Lori., Ijev., Gegh., Yerev., Dar., Zang., Meghri.), Caucasus (E Ciscaucasia, C Caucasia, W, C, E, S Transcaucasia Nakhichevan), Anatolia, N Iran, Afghanistan.

7. *C. microphylla* K. Koch, 1853, Verh. Ver. Beförd. Gartenb. Königl. Preuss. n. s. 1: 288.

Shrub up to ca. 2.0–2.5 m. Fl. VI, fr. IX–X. 800–1200 m. Forest edges – Armenia (Ijev., Zang.), Caucasus (W, C, E, S Transcaucasia, Talysh), E Europe, Crimea, Anatolia, Iran, Iraq.

8. *C. stevenii* Pojark., 1939, Flora of the USSR 9, Addenda 8: 505.

Shrub up to ca. 1.5–2.5 m. Fl. V, fr. IX–X. 800–1200 m. Rocky slopes. – Armenia (Ijev., Zang.), Caucasus (S Transcaucasia), Crimea, Anatolia.

9. *C. pallasii* Griseb., 1843, Spicil. Fl. Rumel. et Bithyn. 1: 89.

Shrub up to ca. 1.5–3.0 m. Fl. V, fr. IX–X. 1200–1800 m. Rocky slopes, in thickets. – Armenia (Ijev., Yerev., Gegh., Dar., Zang.), Caucasus (W, E Ciscaucasia, E Caucasus, S Transcaucasia), E Europe, Crimea, Anatolia.

10. *C. × zangezura* Pojark., 1939, Flora of the USSR 9 Addenda 8: 508.

Shrub up to ca. 1.5–2.0 m. Fl. VI, fr. IX–X, 1200–1800 m. Open forests, in shibliak, rocky slopes. – Armenia (Zang.), Caucasus (S Transcaucasia, Nakhichevan).

11. *C. × armena* Pojark., 1939, Flora of the USSR, 9, Addenda 8: 509.

Shrub up to ca. 2.0–2.5 m. Fl. VI, fr. IX–X. 1300–2500 m. Arid and open forest, shibliak, in thickets. – Armenia (Yerev., Gegh., Dar., Zang., Meghri.), Caucasus (S Transcaucasia, Nakhichevan), N Iran.

12. *C. × ulotricha* Pojark. ex Gladkova, 1996, Novitates Syst. Pl. Vascular., 30: 96.

Small tree or shrub up to ca. 2–5 m. Fl. V–VI, fr. IX. 1400–1500 m. On slopes of gorges, in broad-leaves and open forest. – Armenia (Zang.). Endemic to Armenia.

13. *C. × razdanica* Pojark ex Sargsyan, 2009, Fl., vegetat., plant res. of Armenia 17: 12.

The bush or small tree up to ca. 3–5 m. Fl. V–VI, fr. IX–X. 1000–1300 m. In tree-scrub, near shores of rivers. – Armenia (Yerev.). Endemic to Armenia.

14. *C. gregorianii* Gabrielian et Sargsyan, 2020, Novitates Syst. Pl. Vascular., 51: 22.

Shrub or tree 3–4 m. Fl. V–VI, fr. VIII–IX. 1600–1700 m. In arid woodlands. – Armenia (Apar.). Endemic to Armenia.

Sect. 2. *Pentagynae* C. K. Schneid., 1906, Ill. Handb. Laubh. 1: 768.

Trees with few short spines. Leaves ovate, broadly ovate or ovate-rhombic, deeply lobed or separate, glabrous or pubescent below; inflorescences glabrous or pubescent, many-flowered. The fruits are black, with underdeveloped, thin, reddish flesh, with 3–5 trihedral stones – smooth on the sides, along the back with slightly pronounced longitudinal grooves, keeled on the ventral side. Sepals in fruit are erect or raised-bent.

Type: *C. pentagyna* Waldst. et Kit. ex Willd.

15. *C. atrofusca* (K. Koch) Kassumova, 1991, Bot. Journ. 76, 7: 986.

Small tree or shrub up to ca. 3–10 m. Fl. V–VI, fr. IX. 800–1200 m. In oak and beech forest glades. – Armenia (Lori., Ijev., Sevan, Dar., Zang.), Caucasus (E Caucasus, E, S Transcaucasia), Crimea.

16. *C. pentagyna* Waldst. et Kit. ex Willd., 1800, Sp. Pl. 2, 2: 1006.

Tree or shrub, 3–8 (12) m. Fl. V–VI, fr. VIII–IX. 800–1200 m. Forest edges, in thickets of shrubs. – Armenia (All regions except Dar.), Caucasus (all), Crimea, C & E Europe, Anatolia, N Iran.

17. *C. susanykleinae* Gabrielian et Sargsyan, 2009, Fl., vegetat., plant res. of Armenia 17: 10.

Tree or shrub up to ca. 3–10 m. Fl. V–VI, fr. IX–X. 1200–2000 m. Forest edges, often forms groves with other species of hawthorn. – Armenia (Apar., Yerev., Gegh.). Endemic to Armenia.

Sect. 3. *Azaroli* Loud., 1838, Arbor. frutic. Brit. 2: 826.

Shrubs or small trees. Leaves oblong-ovate, rhombic, ovate or cuneate, separate, pubescent; petioles 3–8 (10) times shorter than blades; spines numerous, short or absent. Inflorescences are felt-pubescent, compact, with short axes and pedicels. Anthers are white. The fruits are yellow, orange, reddish-orange, red, large, round, usually flattened at the poles, sometimes ribbed, with 2–5 seeds, convex and shallowly ribbed on the dorsal side, smooth on the sides, keeled on the ventral side.

Type: *C. azarolus* L.

18. *C. orientalis* Pall. ex M. Bieb., 1808, Fl. Taur. – Cauc. 1: 387.

Shrub or small tree up to ca. 1–3 m. Fl. VI–VII, fr. IX. 800–1200 m. Arid stony slopes, among bushes, in open juniper forests. – Armenia (Up. Achur., Shir., Arag., Sevan, Yerev., Dar., Zang., Meghri.), Caucasus (W & E Caucasus, S & E Transcaucasia, Nakhichevan, Talysh); S Europe, Crimea, Anatolia, Iran.

19. *C. pontica* K. Koch, 1853, Verh. Ver. Beförd. Gartend. Königl. Preuss. N. R. 1: 269.

Small tree or shrub up to ca. 6–10 m. Fl. VI–VII, fr. IX–X. 1000–1200 m. Arid places, seldom trees, rarely form groves. – Armenia (Yerev., Gegh., Dar., Meghri.), Caucasus (C, E, S Transcaucasia, Nakhichevan), W, C Asia, Anatolia, Iran.

20. *C. szovitsii* Pojark., 1939, Flora of the USSR, 9, Addenda 8: 499.

Shrub or a small tree up to ca. 1–3 m. Fl. VI, fr. X. 1200–1800 m. In arid open forest. – Armenia (Dar., Zang.), Caucasus (E, S Transcaucasia, Nakhichevan), Anatolia, Iran.

21. *C. tournefortii* Griseb., 1843, Spicil. Fl. Rumel. Et Bithyn. 1: 90.

Small tree or shrub up to ca. 1.5–2.5 m. VI, IX. 1200–1800 m. Rocky slopes, edges of broad-leaved forest. – Armenia (Ijev., Zang.), Caucasus (S Transcaucasia, Nakhichevan), Europe, N Greece, Crimea.

22. *C. pojarkoviae* Kossyich, 1964, Novitates systematicae plantarum non vascularium: 147.

Shrub, less often tree up to ca. 3–6 m. Fl. V–VI, fr. IX. 1500–1700 m. – Armenia (Yerev., Dar., Meghri.), Caucasus (S. Transcaucasia, Nakhichevan), Crimea.

23. *C. gabrielianae* Pojark. ex Sargsyan, 2009, Fl., vegetat., plant res. of Armenia 17: 11.

Shrub up to ca. 2–3 m. Fl. V–VI, fr. IX–X. 1200–1600 m. On dry stony slopes. – Armenia (Yerev., Dar.). Endemic to Armenia.

24. *C. artachensis* Gabrielian et Sargsyan, 2018, Takhtajania 4: 4.

Shrub or small tree to 4–5 m tall. Fl. VI–VII, fr. IX–X. 1100–1400 m. Dry stony slopes, bush thickets, arid woodland. – Possibly grows in Armenia (Zang.), Caucasus (Nagorno-Karabagh).

Conclusions

In Armenia, the hawthorn genus is represented by 23 species. Representatives of the genus participate in the formation of broad-leaved forests, arid light forests, are found in riverside forest stands, along roads.

New floristic areas of distribution of some species of *Crataegus* L. in Armenia have been clarified and identified. The species *C. ulotricha* Pojark. ex Gladkova, *C. razdanica* Pojark. ex Sargsyan, *C. gabrielianae* Pojark. ex Sargsyan, *C. susanykleinae* Gabrielian et Sargsyan and *C. gregorianii* Gabrielian et Sargsyan are endemic to Armenia. The species *C. caucasica* Willd. and *C. armena* Pojark. are Caucasus endemics.

The species *C. ulotricha*, *C. microphylla*, *C. pontica*, *C. szovitsii*, *C. tournefortii* and *C. zangezura* are included in the “Red Book” of Armenia.

The species *C. pontica*, *C. orientalis*, *C. susanykleinae* and *C. atrosanguinea* are recommended for use as food.

The species *C. armena*, *C. meyeri*, *C. stevenii*, *C. pallasii*, *C. atrosanguinea*, *C. pseudoheterophylla*, *C. microphylla*, *C. pontica*, *C. tournefortii*, *C. orientalis* and *C. zangezura* are highly decorative and are recommended for introduction to culture in city parks. To create hedges, it is recommended to use the species *C. orientalis*, *C. meyeri*, *C. pallasii* and *C. microphylla*.

The species *C. tournefortii*, *C. armena*, *C. orientalis*, *C. meyeri*, *C. pontica*, *C. pojarkoviae*, *C. szovitsii* are recommended for creating arid arboretums.

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