

Taxonomic notes on the genus *Crataegus* (Rosaceae) in Turkey

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The Turkish *Crataegus* taxa were investigated using morphological, palynological, and anatomical characters. A new series (*Crataegus* Section *Crataegus* Series *Peshmenia*), two new species (*Crataegus peshmenii* and *Crataegus christensenii*), and one variety (*Crataegus rhipidophylla* var. *kutahyaensis*) are described. Furthermore, *Crataegus × browicziana* has been assigned to *Crataegus rhipidophylla* with a new status. Illustrations of the described taxa and their distribution map are also given. The lectotype for *Crataegus yaltirikii* is designated here. © 2007 The Linnean Society of London, *Botanical Journal of the Linnean Society*, 2007, 155, 231–240.

ADDITIONAL KEYWORDS: lectotype – morphology – palynology – taxonomy.

INTRODUCTION

The genus *Crataegus* has a northern hemisphere distribution, and some of the species are widely cultivated as ornamentals. One of the prominent monographic studies on the Eurasian *Crataegus* taxa was performed by Pojarkova (1941); she used section and series levels for her infrageneric classification. A recent monographic study of the Eurasian *Crataegus* Section *Crataegus*, covering extensive taxonomic treatments on the Turkish *Crataegus* taxa, has been carried out by Christensen (1992), but his work did not include Turkish field studies.

Phipps (1983) reorganized the infrageneric classification and proposed 39 sections for the genus worldwide. He then reclassified the genus at the infrageneric level without considering the recently published new series and the new nothosection by Christensen (1992). He finally accepted 40 series of *Crataegus* (Phipps, 2003).

Turkey has a rich floral diversity and, as might be expected, the genus *Crataegus* has many species in Turkey. Some areas and valleys in Turkey have been determined as diversity centres for *Crataegus* taxa by

Dönmez (2004). These areas contain at least four or five *Crataegus* species, their intermediate forms, and some unidentified specimens.

Hybridization and apomictic breeding are well-known phenomena in the genus *Crataegus*. Some of the specimens in the diversity centres are either hybrids or are produced apomictically. These breeding strategies have resulted in intermediate forms, which cause taxonomic confusion. Unfortunately, no investigation has been performed on the origin of the Turkish *Crataegus* taxa proposed as hybrid or apomicts. Therefore, the traditional morphological species concept (Davis & Heywood, 1963; Stuessy, 1990) has been applied for the taxa in this work.

Material collected in the pertinent literature (Pojarkova, 1941; Meikle, 1966; Franco, 1968; Riedl, 1969; Browicz, 1972; Pignatti, 1982; Khatamsaz, 1991; Christensen, 1992) and herbarium sheets of the herbaria BM, E, C, K, L, TARI, and W were used.

NEW TAXA

CRATAEGUS L. SECTION *CRATAEGUS*, *SYST. BOT. MONOGR.* 38: 18 (1992)

Type: Crataegus rhipidophylla Gand.

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This section includes around 30 species, mostly distributed in the Old World (Dönmez & Oybak Dönmez, 2004).

Thorns up to 12 cm long, stout or fine. Leaves leathery or leafy, blades lobed, rarely entire, lobes serrate or crenate, rarely entire, intercalary veins running to sinuses present; stipules deciduous or persistent, entire, denticulate or serrate. Subterminal leaf blades of flowering, sterile and short shoots with 1–3(–4) pairs of lobes, rarely unlobed. Inflorescence a terminal corymb, rarely an umbel, borne on a leafy short shoot of the current year. Sepals persistent, rarely deciduous, reflexed, spreading or erect at fruiting, margin entire or glandular to eglandular serrate; petals white, rarely pale greenish; stamens 15–23, anthers pink, claret to dark purple; styles 1–5(–6). Fruit yellow, orange, red, blackish purple, or black; flesh yellowish, orange, reddish, or dark reddish, juicy or more or less mealy; pyrenes 1–5(–6), ventrolaterally smooth or sulcate, hypostyle glabrous or pilose.

***Crataegus* Section *Crataegus* Series *Peshmenia* Dönmez, ser. nov.**

Folia integerrima vel profunde lobata; fructus aurantica et minutu, pyrenis (–4) 5.

Type: Crataegus peshmenii Dönmez.

***Crataegus peshmenii* Dönmez, sp. nov. (Fig. 1)**

Holotype: Turkey-Hakkari: 2.5 km from Şemdinli to Yüksekova, Altınsu village, among *Quercus* opening, 37°19'503"N, 044°33'583"E, 1530 m, 3.x.2001. A.A.Dönmez 10313 (holotypus: HUB, isotypus: EGE).

Diagnosis: *Crataegus peshmenii* Dönmez, sp. nov., affinis *C. pentagynae* Waldst. and Kit. ex Willd. ssp. *pentagynae* sed fructuo aurantico, foliis et inflorescentia glabra vel rare villosa, stipulis dentatis differt.

Small trees up to 5 m; unarmed or rarely thorny, thorns with two types; the short without leafy branches, up to 15 mm, slightly recurved, the long with leafy branches, up to 100 mm. Twigs glabrous to sparsely villous. Buds 1.5–2 mm in diameter. Leaves slightly coriaceous, slightly lustrous upper, glabrous, rarely long villous on margin and petiole, cuneate to widely cuneate at base, simple or 2–3-lobed. Leaves of flowering shoots 30–55 × 25–55 mm, slightly lobed to 2–3-lobed, simple leaves toothed nearly to upper two-thirds, basal lobes with 7–10 serrate or finely biserrate teeth in distal half, basal sinuses at below half of the lamina length, basal lobe 2–3× as long as wide, angles of basal vein more than 45°; petiole 10–25 mm; stipules deciduous 4–6 × 2–3 mm, lanceolate, entire or dentate. Subterminal leaf blades of short shoots similar to leaves of flowering shoots, petiole up to 32 mm. Leaves of elongate shoots with 2–3(–4) pairs

of lobes, basal lobes divergent, petiole 15–25 mm, stipules 13–17 × 6–9 mm, dentate. Inflorescence 30–45 × 35–50 mm, lax, corymbose, 10–15-flowered, glabrous, rarely sparsely villous; pedicels (3–)5–7(–10) mm; flowers 15–18 mm in diameter; hypanthium 3–4 × 4–5 mm; sepals 2–3 × 2–4 mm, widely triangular at base, shortly cuspidate, reflexed, entire; petals 6–8 × 6–7 mm; stamens 18–20; styles (2–)3–4(–5). Fruit 6–8 × 6–8 mm, globose, pale orange to slightly reddish, glabrous, flesh pale orange, juicy; pyrenes 5–6 × 4–5 mm, (2–)3–4(–5), dorsally 1–3 sulcate, hypostyle glabrous.

Eponymy: The epithet is chosen to honour the late taxonomist Hasan Peşmen, who was pioneer of plant taxonomy in Turkey and founder of the HUB herbarium.

The new species grows in *Quercus* scrub at 1500–1700 m in south-eastern Turkey (Fig. 2).

The serial classification of Section *Crataegus* was revised, and four series were accepted by Christensen (1992). *C. peshmenii* is a very distinct species amongst the taxa of *Crataegus* Section *Crataegus* in terms of both fruit and leaf characters. A comparison of the new species with the allied taxa is given in Table 1. Owing to the fact that the character combination of the fruit is confined to this species, it is placed into a new series named *Peshmenia*. This new series is closest to the series *Pentagynae* (Schneid.) Russanov, which is characterized by a black or purple fruit colour, as defined by Christensen (1992).

The fruit size and shape of *C. peshmenii* are closest to those of *C. pentagyna*. It is closest to *C. azarolus* L. in the orange colour of the fruit. The other characters of the new species, such as the indumentum and leaf shape, are similar to those of *C. aronia* and *C. rhipidophylla*.

The type locality of *C. peshmenii* was revisited to collect flowering material and observe its population structure. There were several shrubs and trees with plenty of blossom and mature fruits. Because of the harsh environmental conditions, the area could not be surveyed extensively. However, the total distribution area of the species is estimated to be approximately 30 km². In addition, it seems likely that new locations would be found in *Quercus* openings in the region. According to my observations in the area, there is no special threat to this species. In consideration of the occupancy area of the species, the 'Least Concern' (LC) status is proposed according to the World Conservation Union (IUCN) categories (IUCN, 2001).

Paratypes: Turkey: Hakkari; Şemdinli, around city, *Quercus* opening, 37°18'418"N, 044°34'620"E, 1435 m, 3.x.2001, A.A.Dönmez 10306 (HUB);

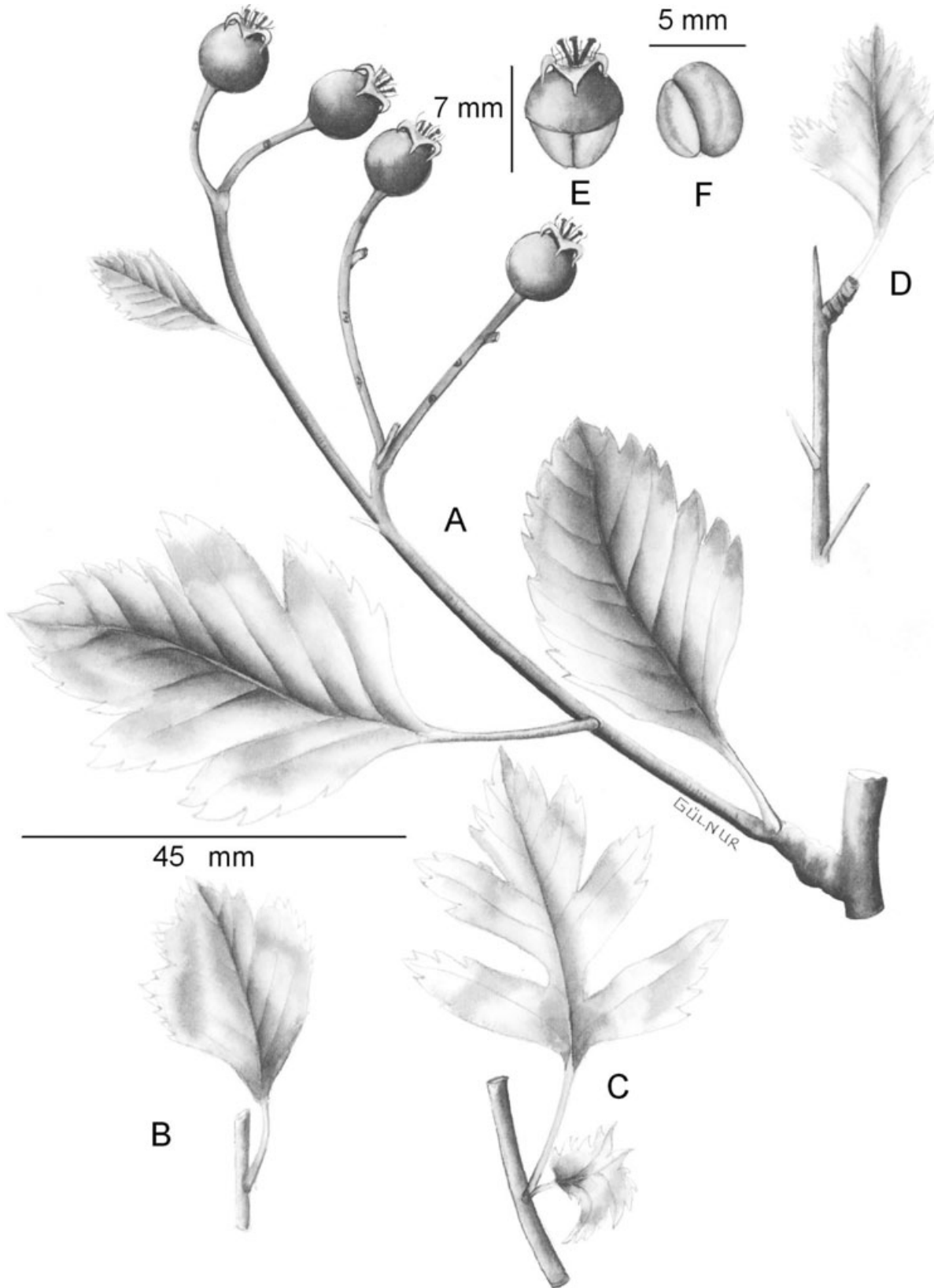


Figure 1. *Crataegus peshmenii*: A, habit; B, leaf of flowering shoot; C, leaf of sterile shoot; D, leaf of short shoot; E, fruit (flesh partly removed); F, pyrene (dorsal view) (from holotype).

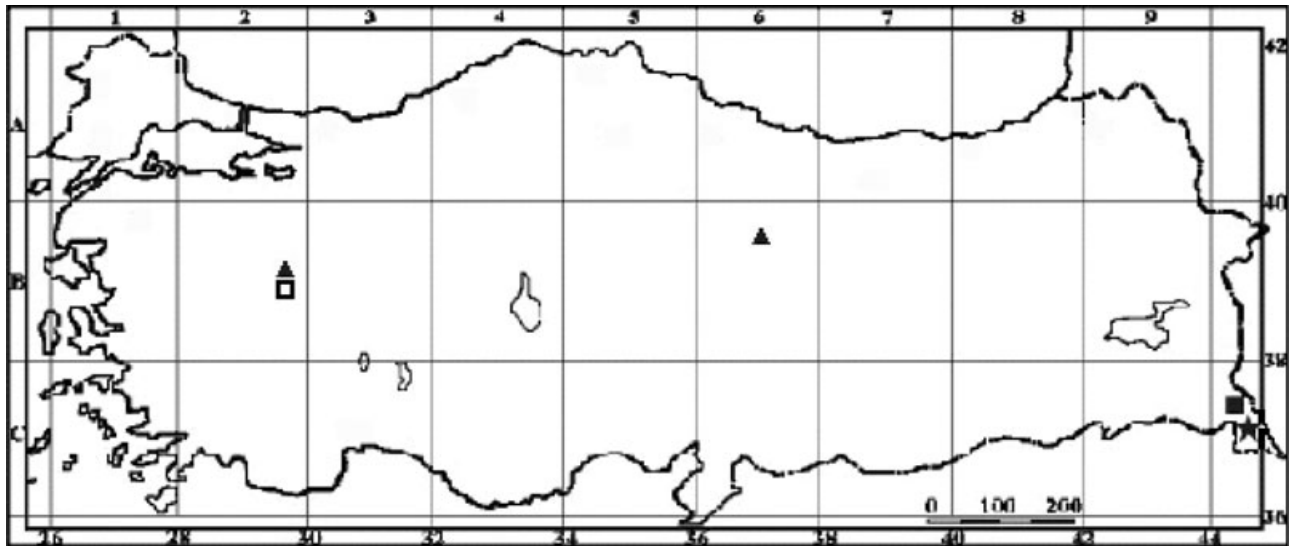


Figure 2. Locations of *Crataegus peshmenii* (★), *C. christensenii* (■), *C. rhipidophylla* var. *kutahyaensis* (▲), and *C. rhipidophylla* var. *browicziana* (□).

Table 1. Morphological comparison of *Crataegus peshmenii* with *C. pentagyna* and *C. azarolus*

Character	<i>C. pentagyna</i>	<i>C. peshmenii</i>	<i>C. azarolus</i>
Leaf lobes	Lobed	Unlobed or lobed	Lobed
Nature of leaves	Leafy	Leafy	More or less leathery
Indumentum	Sparsely to densely lanate	Glabrous to sparsely villous	Tomentose to sparsely pubescent
Corolla colour	White to greenish	White	White
Fruit colour	Dark purple to black	Orange to reddish	Orange to reddish
Flesh colour	Dark reddish	Pale yellowish	Pale yellowish
Fruit size (mm)	5–9 × 5–9	6–8 × 6–8	(6–)8–12(–35) × 8–10
Indumentum of inflorescence and young shoots	Sparsely to densely lanate	Glabrous to sparsely villous	Tomentose to sparsely pubescent

Hakkari: 2.5 km from Şemdinli to Şapatan Pass, *Quercus* opening, 37°21'733"N, 044°32'404"E, 1660 m, 30.v.2002, A.A.Dönmez 10791 & B. Mutlu (HUB).

Crataegus L. Section *Crataegus* Series *Crataegus*, Subseries *Erianthae* (Pojark.) K.I.Chr., *Syst. Bot. Monogr.* 38: 58 (1992)

***Crataegus christensenii* Dönmez, sp. nov.** (Fig. 3)
Holotype: Turkey-Hakkari: Şemdinli, Altınsu village, 4.4 km from Şemdinli to Yüksekova, among *Quercus* forest in the valley, 37°20'316"N, 044°30'597"E, 1640 m, 3.x.2001, A.A.Dönmez 10314 (fruiting material) (HUB).

Diagnosis: *Crataegus christensenii* Dönmez sp. nov., affinis *Crataego ambiguae* sed surculorum florentium

fertilim foliorum stipulis omnino integris, foliis basalibus lobis symmetrici et pyreni 2–3 differt.

Trees up to 7 m. Twigs moderately to sparsely villous. Unarmed or rarely thorny. Buds 2–3 mm × 2–3 mm. Leaves slightly coriaceous, dull green upper and greyish green below, slightly lustrous upper, sparsely appresent-pubescent above and beneath, widely cuneate at base, lobes mostly with small apical point. Leaves of flowering shoots 35–50 × 40–65 mm, lobes 2–3 pairs with 6–10 coarsely serrate teeth in upper half, terminal lobe oblong to shortly ovate with 6–10 teeth; basal sinuses at lower of lamina length, basal lobe 2–3× as long as wide, angles of basal vein more than 45°; petiole 15–22 mm; stipules 4–8 × 2–5 mm, D-shaped in cross-section, entire or with 1–3 teeth, deciduous. Subterminal leaf blades of short shoots similar to leaves of flowering shoots; petiole

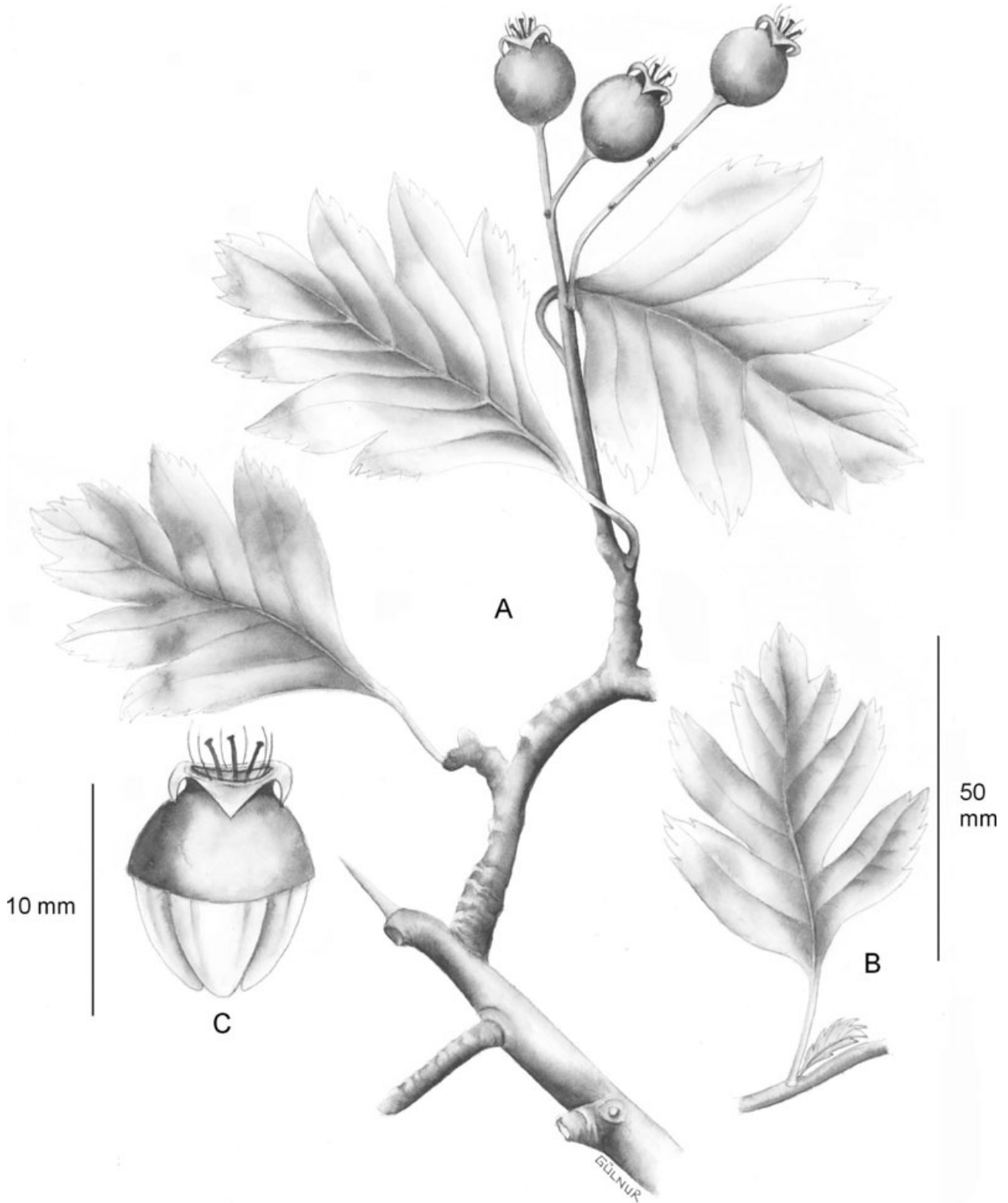


Figure 3. *Crataegus christensenii*: A, habit; B, leaves of sterile shoot; C, fruit (flesh partly removed) (from holotype).

Table 2. Morphological comparison of *Crataegus christensenii* with *C. ambigua* and *C. pentagyna*

Character	<i>C. ambigua</i>	<i>C. christensenii</i>	<i>C. pentagyna</i>
Basal leaf lobes	Asymmetric	Symmetric	Symmetric
Nature of leaves	Leafy	Leafy	More or less leathery
Indumentum	Glabrous to sparsely villose	Glabrous to sparsely villose	Sparsely to densely lanate
Corolla colour	White to greenish	White	White
Fruit colour	Red to dark reddish	Dark reddish	Dark purple to black
Flesh colour	Orange to reddish	Dark reddish	Dark reddish to purple
Fruit size (mm)	8–10(–14) × 7–12	10–11 × 10–11	5–9 × 5–9
Indumentum of inflorescence and young shoots	Glabrous to sparsely villose	Glabrous to moderately villose	Sparsely to densely lanate
Stipules of flowering shoots	Irregularly serrated with many teeth	Entire to 1–3 teeth	Entire

20–25 mm. Leaves of elongate shoots 35–60 × 45–60(–70) mm, 2–3(–4)-lobed, sometimes pinnatisect, basal lobes widely divergent; petiole 15–25 mm, stipules 10–20 × 5–10 mm, D-shaped in cross-section with 8–10 dentate teeth. Inflorescence 30–40 × 30–40 mm, densely corymbose, (10–)15–20-flowered, moderately to sparsely villous; pedicels 2–4 mm; flowers 12–16 mm in diameter; bracts 3–4 × 0.2–0.3 mm, entire to 3–5-teethed, deciduous; hypanthium 3–5 × 4–6 mm; sepals 2–3 × 3–4 mm, widely triangular, acute, entire; petals 5–7 × 5–7 mm; stamens 17–20; styles 2–3, stigma wide. Fruit 10–11 × 10–11 mm, globose to slightly obovate, dark reddish, glabrous, flesh orange, juicy; sepals reflexed at maturity; pyrenes 7–8 × 3–5 mm, 2–3, dorsally 1–2, widely sulcate, hypostyle glabrous.

The new species grows in *Quercus* scrub at 1600–1700 m in south-eastern Turkey (Fig. 2).

Eponymy: The epithet is chosen to honour K. I. Christensen, who is the recent monographer of the Old World *Crataegus*.

Crataegus christensenii is closely related to *C. ambigua*. Its fruiting specimens were proposed as a new hybrid species of *C. ambigua* ssp. *ambigua* and *C. pentagyna* by K. I. Christensen (University of Copenhagen, pers. comm.). Because of the abundant flowering and mature fruits, it is difficult to justify a hybrid origin. Furthermore, the pollen morphology does not support the hybrid origin theory, as the pollen is well developed and there are only small-scale variations and abnormalities in size and shape. Hence, it is described as a new natural species here. However, many of the *Crataegus* taxa require experimental investigation in order to obtain a better understanding of their breeding strategies. A comparison of the new species with closely allied taxa is given in Table 2.

Paratypes: Turkey: Hakkari; 11.5 km from Şemdinli to Yüksekova, among *Quercus* scrub, 37°21'733"N,

044°32'404"E, 1660 m, 3.x.2001, A.A.Dönmez 10327 (fruiting material) (HUB); same location, 30.v.2002, B. Mutlu, A.A.Dönmez 10795 (flowering material) (HUB); A.A.Dönmez 10797 (flowering material) (HUB).

Crataegus L. Section *Crataegus* Series *Crataegus*
Subseries *Crataegus*

Crataegus rhipidophylla Gand., *Bull. Soc. Bot. Fr*
18: 447 (1871)

Type: France: Rhone, Liergues, a la Combe, 2.x.1870,
Gandoger 3 (holotype: LY).

Shrub or small trees up to 7 m; thorny (two types: the short without leafy branches, up to 15 mm, the long with leafy branches, up to 100 mm) or rarely unarmed. Twigs glabrous to sparsely villous. Buds 1.4–2(–3.5) × 1.4–2(–3.2) mm. Leaves more or less lustrous, dark green and subglabrous or rarely more or less villous above, pale green or rarely more or less greyish green and villous in vein axils beneath, narrowly to widely cuneate at base, lobes acute or sub-acuminate, margin serrate with more or less fine teeth; basal pair of veins divergent, rarely straight. Leaves of flowering shoots 20–65 × 12–69 mm, lobes 2–4 pairs, basal pair 1.6–3.3 × as long as wide, extending (0.4–)0.6–0.8(–0.9) × the width of the lamina to the midrib, each lobe with 6–25 teeth in the distal 15/16–1/8, basal pair of sinuses in the apical two-fifths to basal one-fifth of the lamina; petiole (3–)9–26 mm long, 0.2–0.7 × as long as lamina; stipules 5–22 mm, serrate or serrate-denticulate with 8–29 teeth, lanceolate, deciduous. Subterminal leaf blades of short shoots 18–50 × 18–50 mm, lobes 2–3 pairs, basal pair 1.7–3.2 × as long as wide, extending 0.6–0.9 × the width of the lamina to the midrib, with 8–29 teeth in the distal 7/8–2/7, basal pair of sinuses in the basal two-fifths to one-fifth of the lamina; petiole 10–47 mm long, 0.2–0.7 × as long as lamina; stipules 5–25 mm, serrate with 13–46 teeth. Inflorescence (20–)30–40(–50) × 20–30(–50) mm, lax, corymbose, 5–15(–20)-

1. Sepals erect or suberect on fruit	2. var. <i>lindmanii</i>
1. Sepals reflexed on fruit	2
2. Basal leaf sinuses nearly reaching midvein; serration more than half of basal lobes	3. var. <i>browicziana</i>
2. Leaves not deeply sinused; serration not more than half of basal lobes	3
3. Leaf base narrowly cuneate; blade with irregular sinuses	4. var. <i>kutahyaensis</i>
3. Leaf base truncate to shortly cuneate; blade with regular sinuses	1. var. <i>rhipidophylla</i>

flowered, glabrous, rarely more or less villous; pedicels 3–10(–32) mm, glabrous or more or less villous; bracts 2.1–3.7 × 0.2–0.5 mm, 6.5–13.0 × as long as wide, deciduous, margin denticulate with 4–9 teeth. Flowers (6–)10–15(–18) mm in diameter. Hypanthium 3–5 mm, glabrous or more or less villous; sepals 1.8–5.5 × 1.2–2.6 mm, more or less narrowly triangular, 1.1–2.6 × as long as wide, margin entire, apex more or less acuminate; petals 5–7(–10) × 5–7(–9) mm; stamens 14–20, anthers claret to pink; styles (1–)2. Fruit 6–8(–15) × 4–6(–9), 5–11 mm in diam., subglobose, ellipsoidal, or cylindrical, bright or dark red, rarely angular at base, crowned by rarely deciduous reflexed, spreading, or erect sepals; flesh yellowish, juicy; pyrenes 1(–2), (4–)5–7(–10) × (2–)3–5(–7) mm, dorsally and ventro-laterally sulcate, 1–3-sulcate, hypostyle pilose or glabrous.

- Crataegus rhipidophylla* Gand. var. *rhipidophylla*
This variety is very common in nearly every part of Turkey (Dönmez & Oybak Dönmez, 2004).
- Crataegus rhipidophylla* Gand. var. *lindmanii* (Hrabetová) K.I.Chr. Syst. Bot. Monogr. 38: 92–93 (1992)

Type: Czechoslovakia: Slovakia, Tatra minor, infimo monto Kamenicna in convalle Svotojanska dolina supra vicum Lipt. Jan, supra rivum Stiavnica, 690 m, 25.viii.1960, *Hrabetova s.n.* (Holotype: BRNU 430242).

No representative specimen of this variety has yet been found in Turkey. The taxonomic relationship of this variety to *C. microphylla* is not clear.

3. *Crataegus rhipidophylla* Gand. var. *browicziana* (K.I.Chr.) Dönmez, **comb. et stat. nov.** (pro *hyb.*)

Holotype: Turkey-Kütahya: Kütahya to Eskişehir, 900 m, in calcareous gorge, 10–15 km north of Kütahya, 7.vii.1962, *Davis & Coode 37006* (E!).

= *Crataegus × browicziana* K.I.Christ, Syst. Bot. Monogr. 38: 153–154 (1992).

Paratypes: Kütahya: Eskişehir road, 9.4 km, Ahmetoluk village, hedge, 39°33'151"N, 030°03'883"E, 893 m, 20.v.2002, A.A.Dönmez 10646 & 10648; same

locality from Seyitömer to Elmacık village, 1 km, 39°36'983"N, 029°54'043"E, 1222 m, 23.viii.2001, A.A.Dönmez 9977. Sivas: from Sincan to Divriği, 4 km, hedge, 39°29'0219"N, 037°55'728"E, 1323 m, 1.vi.2002, A.A.Dönmez 10877 & B.Mutlu.

Crataegus rhipidophylla was treated as two varieties [*C. rhipidophylla* var. *rhipidophylla* and *C. rhipidophylla* var. *lindmanii* (Hrabetová) K.I.Chr.] by Christensen (1992). *Crataegus × browicziana* K.I.Chr. (*C. microphylla* × *C. rhipidophylla*) has also been described as a new hybrid species in the same publication, based on a collection of P. H. Davis & M. J. E. Coode. This specimen is at the fruiting stage and was proposed to be of hybrid origin by K. Browicz in his determination label on the type sheet, but this has not been published.

The type locality and its surroundings environs were searched for flowering and fruiting material of *Crataegus × browicziana*, and to examine its population during the project. Unfortunately, there were not many specimens, and I have found only two specimens from different areas at the type locality. Both of the specimens were small bushes and were growing under trees of *Elaeagnus angustifolia* L. and *C. rhipidophylla* var. *rhipidophylla*. Another specimen of *Crataegus × browicziana* was collected from Sivas, nearly 700 km from the type locality, and was found growing under a canopy of *Salix alba* L.

The species was proposed as a hybrid by both Browicz and Christensen. However, in this study, it has been treated as a non-hybrid variety of *C. rhipidophylla*. According to my field observations, there were no *C. microphylla* (second parent species) specimens, and it is much closer to *C. rhipidophylla* than the intermediate form of the parent species with regard to morphological features. Therefore, *Crataegus × browicziana* is assigned to *C. rhipidophylla* as a variety. An identification key is supplied for all varieties of *C. rhipidophylla*.

4. *Crataegus rhipidophylla* Gand. var. *kutahyaensis* Dönmez, **var. nov.** (Fig. 4)

Holotype: Turkey-Kütahya: Eskişehir road, 9.4 km, Ahmetoluk village, hedge, 39°33'151"N, 030°03'883"E, 898 m, 23.viii.2001, A.A.Dönmez 9972 (HUB).

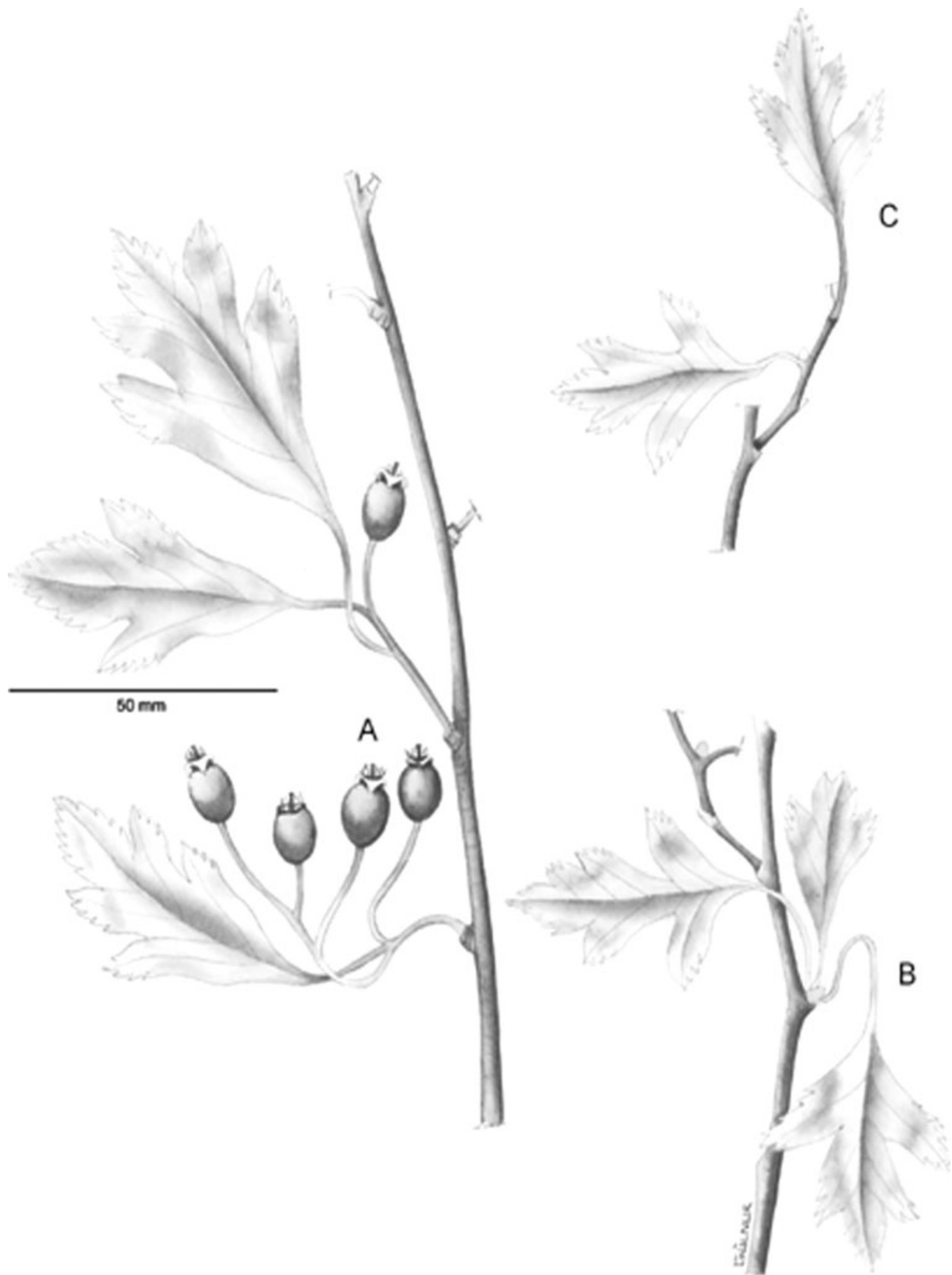


Figure 4. *Crataegus rhipidophylla* var. *kutahyaensis*: A, habit; B, leaves of short shoot; C, leaves of sterile shoot (from holotype).

Diagnosis: Folia basi anguste cuneata et lobis irregulariter sinuata

During the search for *Crataegus* × *browicziana*, another interesting specimen of *Crataegus* was collected from the type locality. This specimen has a very distinct leaf shape and lobes. With the exception of leaf characters, all other features of the specimen were the same as those of *C. rhipidophylla* and it is described as a new variety of this species.

Eponymy: The epithet denotes the name of the collection vilayet.

Paratypes: Turkey: Eskişehir; Sarıcakaya, Yarımca village, around Eldem fountain, *Quercus cerris* opening, 39°54'170"N, 030°37'976"E, 1210 m, 24.viii.2001, A.A.Dönmez 9995 (HUB); B3 Kütahya: Eskişehir road, 9.4 km, Ahmetoluk village, hedge, 39°33'151"N, 030°03'883"E, 893 m, 20.v.2002, A.A.Dönmez 10647 (HUB) & A.A.Dönmez 10649 (HUB); Kütahya: Eskişehir road, 10.4 km, hedge, 900 m, 20.v.2002, A.A.Dönmez 10652 (HUB).

DISCUSSION

Two new species have been described in previous papers, several other new taxa are under preparation for publication as new to science, and other species are available as new records for the flora of Turkey (Dönmez & Oybak Dönmez, 2004).

Section *Crataegus* Series *Pentagynae* has one species, and was divided into two subspecies by Christensen (1992). Intraspecific variation of the species is highly variable by fruit size and leaf shape. A new species, namely *C. turcicus* Dönmez, was described from Turkey, and has been preliminarily assigned to Series *Pentagynae* (Dönmez, 2005; Dönmez & Oybak Dönmez, 2005). Herbarium and field studies show that this series requires further experimental investigation.

Three new species of Sections *Oxyacantha* Zabel (*C. aminii* Khat.), *Azaroli* Loud (*C. assadii* Khat.), and *Sanguineae* Zabel ex Schneid. (*C. babakhanloui* Khat.) have been described from Iran by Khatamsaz (1991). There is no discussion about the sectional affiliation, but it is difficult to assign *C. babakhanloui* Khat. to Section *Sanguineae*. The leaves of the sterile shoots of most *Crataegus* taxa are deeply lobed, and the illustration of *C. babakhanloui* does not fit into this section. It should be assigned to Series *Peshmenia*, but there is insufficient material available at present to make a clear decision.

Crataegus yaltirikii Dönmez in *Bot. J. Linn. Soc.* 2005, 148: 245–249 is not validly published, because more than one specimen (fruiting and flowering) was designated as type specimen in the original publica-

tion [under Art. 37.1 and Art. 37.2 of the Code (McNeill *et al.*, 2006)]. To validate the name, the first mentioned specimen is selected as lectotype (A.A.Dönmez 11143) here.

CRATAEGUS YALTIRIKII DÖNMEZ

Lectotype: Turkey: C9 Şırnak, Beytüşşebap, above Günyüzü village, opening of deciduous forest, 37°27'N, 043°09'E, 1495 m, 28.ix.2002; A.A.Dönmez 11143-B.Mutlu (designated here) (lectotypus: HUB, isolectotypus: E and ISTO).

Isoparatypus: C9 Şırnak, Beytüşşebap, above Günyüzü village, opening of deciduous forest, 37°27'N, 043°09'E, 1495 m, 18.vi.2003, A.A.Dönmez 11261; 26.v.2004, A.A.Dönmez 11922. C9 Şırnak, Beytüşşebap, from Dağdibi village to main road, alongside the road, 37°22'N, 043°07'E, 1124 m, 26.v.2004, A.A.Dönmez 11912.

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REFERENCES

- Browicz K. 1972.** *Crataegus* (Rosaceae). In: Davis PH, ed. *Flora of Turkey and the East Aegean Islands*, Vol. 4. Edinburgh: Edinburgh University Press, 133–147.
- Christensen KI. 1992.** Revision of *Crataegus* Sect. *Crataegus* and *Nothosect.* *Crataeguineae* (Rosaceae-Maloideae) in the old world. *Systematic Botany Monographs* 35. American Society of Plant Taxonomists.
- Davis PH, Heywood VH. 1963.** *Principles of angiosperm taxonomy*. Edinburgh/London: Oliver and Boyd.
- Dönmez AA. 2004.** The genus *Crataegus* L. (Rosaceae) with special reference to hybridisation and biodiversity in Turkey. *Turkish Journal of Botany* 28: 29–37.
- Dönmez AA. 2005.** A new species of *Crataegus* (Rosaceae) from Turkey. *Botanical Journal of the Linnean Society* 148: 245–249.
- Dönmez AA, Oybak Dönmez E. 2004.** *Taxonomy of the genus Crataegus L. (Rosaceae) in Turkey*. Ankara: TÜBİTAK-TBAG (100T125).

- Dönmez AA, Oybak Dönmez E. 2005.** *Crataegus turcicus* (Rosaceae), a new species from NE Turkey. *Annales Botanici Fennici* **42**: 61–65.
- Franco JDA. 1968.** *Crataegus* (Rosaceae). In: Tutin TG, Heywood VH, Burges NA, Moore DM, Valentine DH, Walters SM, Webb DA, eds. *Flora Europaea*, Vol. 2. Cambridge: Cambridge University Press, 73–77.
- IUCN. 2001.** *IUCN red list categories*, Version 3.1. Cambridge/Gland: IUCN Species Survival Commission.
- Khatamsaz M. 1991.** The genus *Crataegus* L. (Rosaceae) in Iran. *Iranian Journal of Botany* **5** (1): 47–56.
- McNeill J, Barrie FR, Burdet H-M, Demoulin V, Hawksworth DL, Marhold K, Nicolson DH, Prado J, Silva PC, Skog JE, Wiersema JH, Turland NJ, eds. 2006.** *International code of botanical nomenclature (Vienna code)*. Liechtenstein: Gantner Verlag Ruggell.
- Meikle RD. 1966.** *Crataegus* (Rosaceae). In: Townsend CC, Guest E, eds. *Flora of Iraq*, Vol. 2. Baghdad: Ministry of Agriculture, 115–118.
- Phipps JB. 1983.** *Crataegus* – A nomenclator for sectional and serial names. *Taxon* **32**: 598–604.
- Phipps JB. 2003.** *Hawthorns and medlars*. Portland/Cambridge: Timber Press.
- Pignatti S. 1982.** *Crataegus* (Rosaceae). In: Pignatti S, ed. *Flora d'Italia*, Vol. 1. Bologna, Rome, Milan: Edagricole, 611–613.
- Pojarkova AI. 1941.** *Crataegus* (Rosaceae). In: Komarov VL, Yuzepchuk SV, eds. *Flora USSR*, Vol. 9. Moscow/Leningrad: Botanicheskii Institut Akademii Nauk SSSR (translated from Russian by Israel Program for Scientific Translations, Jerusalem 1971), 317–356.
- Riedl H. 1969.** *Crataegus* (Rosaceae). In: Rechinger KH, ed. *Flora Iranica*, Vol. 66. Graz: Akademische Druck und Verlagsanstalt, 49–65.
- Stuessy TF. 1990.** *Plant taxonomy, the systematic evaluation of comparative data*. New York: Columbia University Press.