Some nomenclatural adjustments and typifications for almond species in the genus *Prunus* sensu lato (Rosaceae)

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Abstract

*Prunus dulcis* (common almond) is an important horticultural nut crop with an annual production value in the billions of U.S. dollars. The genus *Prunus* is taxonomically complex, and over the centuries treatments have ranged from splitting the genus into multiple genera, with *P. dulcis* and relatives being placed in the genus *Amygdalus*, to having a single, widely circumscribed *Prunus* s. l. Recent phylogenetic studies based on molecular data support the adoption of a broadly circumscribed *Prunus*, and the widespread acceptance and usage of *Prunus* s.l. warrants nomenclatural adjustments for *Amygdalus* species. Twenty-two new combinations, one nomen novum, and one new nothospecies are proposed. In addition, two lectotypes and three neotypes are here designated.

Keywords: *Amygdalus*, breeding, comb. nov., nom. nov., nut species

Introduction

The common almond [*Prunus dulcis* (Miller 1768: without page) Webb in Heywood (1967: 24)] is one of the most important nut crops in the world, in both production yield and overall value (FAOSTAT 2014). California (USA) produces the majority of the world’s almond crop, with this portion alone having a production value of over 4 billion US dollars (USDA-NASS 2013). Other countries having a significant amount of almond production are Iran, Italy, Morocco, Syria, and Spain (FAOSTAT 2014). *Prunus dulcis* has a long history of cultivation (Candolle 1890, Kester et al. 1991, Zohary & Hopf 2000, Gradziel 2010). Through the domestication process, humans have had a significant impact on the development and distribution of this and related species (Lansari et al. 1994, Martinez-Gomez et al. 2007). In addition to the cultivation of *P. dulcis*, the use of interspecific hybridization between this species and its related ones is a potentially valuable way to gain new desirable traits such as later flowering time, cold tolerance, disease resistance, and rootstock development (Denisov 1988, Gradziel et al. 2001).

*Prunus* Linnaeus (1753: 473) is a large and complex genus, and over the centuries botanists have proposed many classifications. Tournefort (1700) recognized six genera: *Amygdalus* Linnaeus (1753: 472), *Armeniaca* Scopoli (1754: 15), *Cerasus* Miller (1754: without page), *Laurocerasus* Duhamel du Monceau (1755: 345), *Persica* Miller (1754: without page), and *Prunus*. Linnaeus (1753, 1754) considered two separate genera, *Amygdalus*, into which he merged Tournefort’s *Persica*, and *Prunus*, into which he merged Tournefort’s *Armeniaca*, *Cerasus*, *Laurocerasus*, and *Padus* (Miller 1754: without page). Münchhausen (1770) and Batsch (1801) were two early authors who adopted *Prunus* s.l., recognizing distinct subgroups as the “untergeschlecht” *Armeniaca* (Scop.) Münchhausen (1770: 237), *Cerasus* (Mill.) Münchhausen (1770: 234), and, “unterabtheilungen der gattung *Prunus*,” *Accacia* Batsch (1801: 26) [= *Prunus* s.str.], *Amygdalus* (L.) Batsch (1801: 29), *Armeniaca*, *Cerasus*, and *Padus*, respectively. There has been question as to the rank denoted by the words “untergeschlecht” and “unterabtheilung”. Brizicky (1969) made a strong case for recognition of untergeschlecht, untergattung, and unterabtheilung at the subgeneric rank, citing the specific usage of these words by Münchhausen (1770) and Du Roi (1771, 1772).

Miller (1754) and some later works, such as Candolle (1825), Kovalyov & Kostina (1935), Linczevski & Fedorov...
1992) listed have recognized The most recent phylogenetic analyses of molecular data have shown sect. 114), and with two series: (1806: 34). Spach (1843) maintained into two subgenera: Prunus Padus Mill., Persica Mill., Prunus L. sensu stricto, and Pygeum Gaertner (1788: 218]). Others authors maintained the genus Prunus s.l., recognizing groups at sectional or subgenera levels (Batsch 1801, Bentham & Hooker 1865, Focke 1888, Koehne 1893, McVaugh 1951, Chin et al. 2010, Shi et al. 2013). Rehder (1940) considered five subgenera: P. subg. Amygdalus (L.) Batsch (1801: 29), P. subg. Cerasus (Mill.) Petermann (1846: 159), P. subg. Laurocerasus (Duhamel 1755: 345) Koehne (1893: 303), P. subg. Padas (Mill.) Petermann (1846: 159), and P. subg. Prunophora Focke (1888: 52) (= Prunus s.str.), and this general circumscription has subsequently been followed by many other authors and taxonomists (e.g. Robertson 1974). In Rehder’s treatment, P. dulcis, P. persica (L.) Batsch (1801: 30) and related species, all fall within Prunus subgen. Amygdalus. Some botanists, particularly from regions in Europe and Asia, have maintained the generic status of Amygdalus (Zhukovsky 1971, Zohary 1972, Browicz 1989, Browicz & Zohary 1996, Czepepanov 2007, Vafadar et al. 2014).

Treatments for Prunus and its associated genera vary in different regional floras. *Flora Europaea* adopted Rehder’s treatment for a broadly circumscribed Prunus with five subgenera, while other works (such as *Flora Iranica, Flora of Turkey and Flora of the USSR*) recognized Amygdalus as a distinct genus (Liniczewski & Fedorov 1941, Tutin et al. 1968, Browicz 1969, Zohary 1972, Davis 1979, Khatamsaz 1993). Even some recent floristic works, such as the *Flora of China*, have recognized Amygdalus at the generic level (in this case, with the inclusion of peach species), although the authors noted that their treatment was, “relatively traditional, with some of the generic treatments arguably out of date.” (Lu & Bartholemew 2003).

Acceptance for the placement of almond species into Prunus has become widespread, even in regions where recognition of Amygdalus as a separate genus has traditionally been maintained (MirAli & Nabusi 2007, Sorkeh et al. 2009, 2012, Rahemi et al. 2010, Gradziel & Martínez-Gómez 2013). The draft Prunus treatment that has been prepared for the Flora of North America Project does not recognize Amygdalus as a separate genus (Joseph Rohrer, personal communication), and horticultural researchers throughout much of the world have also adopted the Prunus s.l. treatment (Kester et al. 1991, Arús et al. 2009, Madam et al. 2011, Potter 2011, Gradziel & Martínez-Gómez 2013). In the *Vascular Plant Families and Genera*, Brummitt (1992) listed Amygdalus as a synonym of Prunus, and Kalkman (2004) included Amygdalus in Prunus as well. Major taxonomic databases such as the USDA Plants Database, The Integrated Taxonomic Information System (ITIS), Euro+Med Plantbase, and Catalog of Life (http://www.catalogueoflife.org/) have also adopted the use of a more broadly circumscribed Prunus (Kurtto 2009, ITIS 2014, Roskov et al. 2014, USDA-NRCS 2014).

The most recent phylogenetic analyses of molecular data have shown Prunus s.l. to be monophyletic (Bortiri et al. 2001, 2002, 2006, Lee & Wen 2001, Potter et al. 2007, Wen et al. 2008, Yazbek 2010, Shi et al. 2013, Yazbek & Oh 2013). Although these studies have all supported the recognition of Prunus s.l., they have varied somewhat in their subgeneric and sectional circumscriptions. Using sequences of the internal transcribed spacers of nuclear ribosomal DNA (ITS) from forty different species, Lee & Wen (2001) found that clades formed in the ITS phylogeny were not congruent with Rehder’s subgeneric classification of Prunus. Their data supported the recognition of two major groups, an Amygdalus-Prunus clade, and a Cerasus-Laurocerasus-Padus clade. Using a combined data set of sequences from s6pdh, ITS and trnL-trnF, Bortiri et al. (2002) found similar groupings. Most recently, Shi et al. (2013) conducted phylogenetic analyses using twelve chloroplast regions and three nuclear genes from eighty-four species representing Prunus s.l. Based on their findings, they recognized three subgenera corresponding to three main clades: Prunus subg. Padus (Mill.) Peterm., P. subg. Cerasus (Mill.) Peterm., and P. subg. Prunus, with seven sections of subg. Prunus being circumscribed. Almond species accordingly are assigned to Prunus sect. Amygdalus (L.) Bentham & Hooker (1865: 610) and peach species are placed in Prunus sect. Persica Nakai (1916: 32).

sect. Spartioides, and A. sect. Leptopus), while Browicz and Zohary maintained three sections (A. sect. Amygdalus, A. sect. Chamaeamygdalus, and A. sect. Spartioides). All these treatments excluded Prunus persica and its related species from the genus Amygdalus. Classifications that recognized Prunus subg. Amygdalus (L.) Focke (1888: 51) have also been based on Spach’s treatment. Grasselly (1976) listed six sections within Prunus subg. Amygdalus [the invalid name Euamygdalus (Spach) Dippel (1893: 603), and Spartioides (Spach) Schneider (1906: 599), Emplectocladus (Torr.) Gray (1874: 70), Chamaeamygdalus (Spach) Dippel (1893: 604), and Amygdalopsis (Carr.) Bentham & Hooker (1865: 610)], while Kester et al. (1991) recognized five taxonomic sections [the invalid name Euamygdalus (Spach) Dippel, and Spartioides (Spach) Schneider, Lycioides (Spach) Schneider, Chamaeamygdalus (Spach) Dippel, and Leptopus Spach]. More recently, Gradziel & Martínez-Gómez (2013) divided Prunus subg. Amygdalus into an “Almond group” with four sections [the invalid name Euamygdalus (Spach) Dippel, and Spartioides (Spach) Schneider, Lycioides (Spach) Schneider, Chamaeamygdalus (Spach) Dippel and a “Peach group.”].

Roemer (1847) proposed Amygdalopsis Roemer (1847: 4, 15) assigning two sections to the genus, sect. Lycioides (Spach) Roemer (i.e., 4, 15) and sect. Scorpius (Spach) Roemer (i.e., 4, 15). Later, Carrière (1862: 91) published a homonym, Amygdalopsis, with A. lindleyi Carrière (1862: 91) as a superfluous name for name for Prunus triloba Lindley (1857: 268). This illegitimate generic name is the basionym for Prunus sect. Amygdalopsis Bentham & Hooker (1865: 610), Amygdalus subg. Amygdalopsis (Benth. & Hook.f.) Popov (1929: 359) and Amygdalus sect. Amygdalopsis (Benth. & Hook.f.) Linczevski in Linczevski & Fedorov (1941: 545). Subsequently, Carrière (1872: 34) proposed the name Louiseania, stating that Roemer’s Amygdalopsis had priority.

Depending on the treatment used, there are 24 to 45 accepted almond species (Browicz 1969, Yazbek & Oh 2013, Vafadar et al. 2014). The highest diversity of species occurs in southwestern and central Asia, in the Irano-Turanian phytogeographic region (Zhukovsky 1971, Browicz & Zohary 1996, Gradziel 2010, Vafadar et al. 2010). The taxonomy of species within this group is complicated because many species have the capability to hybridize and many nothospecies have been described (Browicz & Zohary 1996). Based on recently conducted molecular analyses, Yazbek & Oh (2013) and Yazbek & Al-Zein (2014) put forth a simplified classification for Prunus subg. Amygdalus, as their data did not support the more complex sectional classifications. Their circumscription has two sections, Prunus sect. Persica, the peach-type species, and Prunus sect. Amygdalus, the almond-type species. They also removed a number of species from P. subg. Amygdalus. Two of the species, P. tenella Batsch (1801: 29) and P. petunniikowii (Litvinov 1902: 16) Rehder (1926: 29), which have been traditionally assigned to Prunus sect. Chamaeamygdalus, were determined to fall outside the monophyletic clade representing species belonging to P. subg. Amygdalus.

The genus Emplectocladus Torrey (1851: 92) has been merged into Prunus at varying ranks. Its placement in Prunus is sometimes attributed to Sargent (1892: 7) at the sectional level, and Mason (1913: 153) for subgeneric placement, but Prunus sect. Emplectocladus (Torr.) Gray (1874: 70) and Prunus subg. Emplectocladus (Torr.) Focke (1888: 53) have priority (Bortiri 2002, Chin et al. 2010; Potter 2012; Shi et al. 2013). The individual species associated with Emplectocladus have also been included in Amygdalus as A. andersonii (Gray 1868: 337) Greene (1891: 49), A. fasciculata (Torrey 1851: 92) Greene (1891: 49), A. fremontii (Watson 1880: 442) Abrams (1910: 385), A. glandulosa Hooker (1840: 288), A. harvardii Wight (1913: 133), and A. minutiflora (Engelmann ex Gray 1850: 185) Wight (1913: 132)]. Some authors, such as Schneider (1906), placed section Emplectocladus in Prunus subg. Amygdalus. Rehder (1940) did not recognize Emplectocladus but merely placed P. fasciculata (Torr.) Gray (1874: 70) in Prunus subg. Amygdalus. Alternatively, Mason (1913: 153–154) excluded these species from P. subg. Amygdalus and assigned them to P. subg. Emplectocladus and P. subg. Prunus which was subdivided into P. sect. Piloprunus Mason [1913: 153, typified by P. texana Dietrich (1842: 45)] and P. sect. Penarmeniaca Mason (1913: 154, untypified but included P. andersonii). Jepson (1936) placed P. fasciculata in subg. Emplectocladus, and placed P. fremontii and P. andersonii in subg. Armeniaca. Turczaninow was the first to propose Prunus sect. Armeniaca (Scop.) Turczaninow (1843: 587), while Prunus subg. Armeniaca is properly attributed to Koch (1869: 87). Although both Endlicher (1840) and Koch (1869) listed Armeniaca as a subdivision of the genus Prunus, they did so without designating a rank (Brizicky 1969). According to Article 37.3 (McNeill et al. 2012), these names are validly published, but non-operative in questions of priority except for homonymy. Therefore, rank was established by Jepson (1936), and as such, should be cited as Prunus subg. Armeniaca (Scop.) Jepson. Current molecular data supports the exclusion of Emplectocladus-associated species from Prunus subg. Amygdalus, but with varying placements. Most recent authors have recognized Prunus subg. Emplectocladus while Shi et al. (2013) adopted Prunus sect. Emplectocladus (Torr.) A. Gray (Bortiri et al. 2001, Shaw & Small 2004, Chin et al. 2013, Shi et al. 2013, Yazbek & Al-Zein 2014).

Although there is more work necessary to resolve the infrageneric classification of Prunus s.l., molecular evidence strongly supports a broad generic circumscription, and the adoption of Prunus s.l. has become widespread. While
Preparing a manuscript reviewing wild and cultivated almond germplasm available in the former USSR, it became evident that a number of new combinations were in need of valid publication (Zaurov et al. 2015).

Materials and Methods

Species of *Amygdalus* were queried in multiple databases: Euro+Med PlantBase (http://www.emplantbase.org/home.html), International Organization for Plant Information Provisional Global Plant Checklist Rosaceae taxonomic database (http://www.bgbm.fu-berlin.de/IOPI/GPC/query.asp), The International Plants Name Index (www.ipni.org/), The Plant list (www.theplantlist.org/), Tropicos (http://www.tropicos.org/), Species 2000 & ITIS Catalogue of Life (www.catalogueoflife.org/col), the USDA, ARS Germplasm Resources Information Network—(GRIN) Online Database (http://www.ars-grin.gov/cgi-bin/npgs/html/tax_search.pl). Each species was assessed as to whether it had been transferred to *Prunus*. Standard floras, revisions, monographs and checklists were consulted to assess whether each species is currently accepted. This included the following references, Fedorov (1942), Browicz & Zohary (1996), Czerepanov (2007), Flora of Israel Online (http://flora.org.il/plants/) and Flora of Iran website (http://flora-iran.com/), as well as others detailed below. The literature citation and protologue for each basionym was verified in the original reference, and when available, digital images of type specimens were observed via online herbarium databases or by requesting images directly from herbaria.

Results

Nomenclatural adjustments are required resulting in twenty-two new combinations, one nomen novum, and one new nothospecies. In addition, two lectotypes and three neotypes are here designated.

*Prunus × andarobi* Serafimov, nothosp. nov.


*Description:*—Serafimov (1971a: 350).

*Note:*—According to Article 40.1 of the ICN (McNeill et al. 2012) the name *Amygdalus × andarobi* was not validly published because two gatherings were indicated as types. Accordingly, the new nothospecies *Prunus × andarobi* is here described. The original epithet “*andarobii*” used by Serafimov (1971a), is corrected here because it is referable to a geographical name and not a personal name (Arts. 60.7, 60.12 of the ICN, McNeill et al. 2012).

*Prunus browiczii* (Freitag) Eisenman, *comb. nov.*


*Type:*—AFGHANISTAN. Dilaram, 56 km NW, N-exposed slopes, Syah Band mountains, 1350 m, 20 April 1968, H. Freitag 2530 (holotype GOET! [digital image], isotype W 1978-0004275! [digital image]; image of the holotype is available at https://plants.jstor. org/stable/10.5555/al.ap.specimen.goet010005).

*Prunus georgica* (Desf.) Eisenman, *comb. nov.*

Basionym:—*Amygdalus georgica* Desfontaines (1809: 221)

*Type* (neotype, designated here):—Cultivated garden specimen, s.d., *without collector s.n.* [”*Amygdalus georgica* Desf. H[ort] Pari[s]. Herbarium Webbianum, ex Herb. Desfontaines”] (FI-W 055869! [digital image], specimen on right side of the sheet).
Prunus graeca (Lindl.) Eisenman, _comb. nov._

_Basionym:_ — _Amygdalus graeca_ Lindley in Sibthorp & Lindley (1840: 71).


_Note:_ — The species is accepted by Browicz & Zohary (1996), and also included in the _Flora of Turkey_, wherein Browicz (1972) stated that it is closely related to _Amygdalus orientalis_ Miller (1768: without page), but sufficiently distinct to merit specific recognition. The distribution is given as, “southwest Anatolia and in some of the adjacent Greek Islands, particularly Rhodos…Aleppo district, Syria and near Ankara, Turkey.” Kurtto (2009) synonymized _A. graeca_ with _Prunus discolor_ (Spach 1843: 119) Schneider (1905: 591), but _Prunus graeca_ has priority under Art. 11.4 of the ICN (McNeill et al. 2012). Lindley in Sibthorp & Lindley (1840: 71) described _A. graeca_ as a new species in a list of emendations to replace the misidentified _A. incana_ (Sibthorp & Smith 1809: 337, Sibthorp & Smith 1825: 61). No type was designated for _A. graeca_. In the Herbarium Sibthropianum (OXF) two specimens are conserved under the name _Prunus graeca_. The first was identified as, “Amygdalus incana,“ and labeled, “J. Sibthorp, M.D.” with additional annotations listing the _A. incana_ citation of _Flora Graeca_. A second specimen with a “J. Sibthorp, M.D.” tag is annotated with “1136?”, the species number in _Flora Graeca_. The first one is here designated as neotype. No specimens of _Amygdalus graeca_ were found at CGE, where Lindley’s general collection is housed.

Prunus × insuenta (Seraf.) Eisenman, _comb. nov._

_Basionym:_ — _Amygdalus × insuenta_ Serafimov (1977: 134).


Prunus × iranshahrii (Khat.) Eisenman, _comb. nov._


_Type:_ — _IRAN. Fars: 36 km from Khonj to Lar, 700 m, s.d., Assadi and Sardabi 41672 (holotype TARI).
Prunus × kalmykii (O.A.Lincz.) Eisenman, comb. nov.
Basionym:—Amygdalus × kalmykii Linczevski (1951: 202).

Type:—UZBEKISTAN [formerly Kazakhstan]. Bostandyk region [Tashkent Province]: Chatkal River basin, Koksu River gorge, 5 km above Brich-Mulla village, 29 July 1950, Linczevski & Roshkova 142 (holotype LE).

Prunus × kamiaranensis (Khat. & Assadi) Eisenman, comb. nov.

Type:—IRAN. Kordestan: 28 km from Sanandaj to Kamiaran, 1400 m, 15 June 1977, Assadi 60582 (holotype TARI).

Prunus kurdistanica (Attar, Maroofi & Vafadar) Eisenman, comb. nov.
Basionym:—Amygdalus kurdistanica Attar, Maroofi & Vafadar (2009: 324).

Type:—IRAN. Kurdistan: ca 34 km from Saqqez to Baneh, Nakarouz Mountain, 1675 m, 8 May 2007, Attar, Maroofi and Vafadar 3725 (holotype TUH).

Prunus kurdistanica (Attar, Maroofi & Vafadar) Eisenman, comb. nov.
Basionym:—Amygdalus kurdistanica Attar, Maroofi & Vafadar (2009: 324).

Type:—IRAN. Kurdistan: ca 34 km from Saqqez to Baneh, Nakarouz Mountain, 1675 m, 8 May 2007, Attar, Maroofi and Vafadar 3725 (holotype TUH).

Prunus kurdistanica (Attar, Maroofi & Vafadar) Eisenman, comb. nov.
Basionym:—Amygdalus kurdistanica Attar, Maroofi & Vafadar (2009: 324).

Type:—IRAN. Kurdistan: ca 34 km from Saqqez to Baneh, Nakarouz Mountain, 1675 m, 8 May 2007, Attar, Maroofi and Vafadar 3725 (holotype TUH).

Prunus mozaffarianii (Khat.) Eisenman, comb. nov.

Type:—IRAN. Baluchestan: east slope of Kuh-e Taftan from Sangan, 2300-2900 m, s.d., Mozaffarian 53243 (holotype TARI).

Prunus nairica (Fed. & Takht.) Eisenman, comb. nov.
Basionym:—Amygdalus nairica Fedorov & Takhtajan in Fiodorov & Tachtadzhian (1936: 288).

Type (lectotype, designated here):—ARMENIA. On the road between Meghri and Shvanidzor, 18 May 1935, Fedorov, s.n. (ERE 26331!).

Note:—Avetisian et al. (1999) stated that the syntypes (ERE 20775!, ERE 20776!, ERE 20792!, all Takhtajan s.n., 20.IX.1934; ERE 26331! and ERE 26327!, both Fedorov s.n. 18.V.1935), toposyntypes and specimena authentica are held at ERE. These syntypes were later described as representing a number of different forms (Fedorov 1942). The specimen that fits with the original description is ERE 26331, which was later described as Amygdalus nairica f. normalis Fedorov (1942: 138). This specimen is here selected as lectotype.

Prunus orazii (Maroofi, Attar & Vafadar) Eisenman, comb. nov.

Type:—IRAN. Kurdistan: Baneh, Nenor to Siranband village, 1656 m, 10 May 2007, Maroofi, Attar and Vafadar 37225 (holotype TUH).

Prunus pabotii (Browicz) Eisenman, comb. nov.


Prunus ramonensis (Danin) Eisenman, comb. nov.

Type:—ISRAEL. Central Negev Highlands, Nahal Eliav, 4 km SW of Har Ramon, 34° 39’E/30° 38’N, banks of wadi with loessial alluvium. 16 April 1979, Avinoam Danin s.n. (holotype HUJ).

Note:—The collection date in the original basionym description does not match the date on the labels of specimens.
hold at E and K (15 June 1979). According to Arts. 9.4 and 9.6 of the ICN (McNeill et al. 2012), these specimens should be considered paratypes, rather than isotypes.


Additional specimens examined:—ISRAEL. Central Negev Highlands, Nahal Eliav, 4 km SW of Har Ramon, 34° 39'E/30° 38'N, banks of large wadi with loessial alluvium. 15 April 1979, Avinoam Danin s.n. (paratypes E!, K! [digital images])

Prunus × rhodia (Browicz) Eisenman, comb. nov.
Basionym:—Amygdalus × rhodia Browicz (1985: 34).


Note:—The isotype specimen, Boratynska et al. 138 (K000395333), has a different collection date (14 May 1959), which is a typographical error.

Prunus runemarkii Eisenman, nom. nov.
Basionym:—Amygdalus reticulata Runemark in Khatamsaz (1985: 78).

Type:—IRAN. Fars Province, Bamu Protected Region, Darreh-chap, 1650–1900 m, 3 May 1975, Wendelbo & Foroughi 17577 (holotype TARI).

Blocking name:—Prunus reticulata Sargent (1911: 151). Type:—UNITED STATES OF AMERICA. Texas, 23 June 1910, Munson 4 (holotype GH).

Prunus × saviczii (Pachom.) Eisenman, comb. nov.

Type:—UZBEKISTAN. Zapadnyi Pamiro-Alai, goryi Kara-Tyube, po kamenistyim sklonam na trakte Takhta-Karacha [Western Pamiro Alai, Kara-Tyube Mountains, on rocky slopes of Takhta-Karacha Pass], 1800 m, 9 May 1951 (flowering); 18–30 May 1951, Pachomova 8 (holotype LE).

Prunus susakensis (Vassilcz.) Eisenman, comb. nov.

Type:—KYRGYZSTAN. Na krasnyikh glinisto-kamenistyikh yugo-vostochnyikh sklonakh suzakskoy gryady dites, na kamenistykh gorykh slosheskakh suzakskoj gryady dites, [Yuzhnaya Kirgiziya] [On the red-clay, stony south-eastern slopes of the Suzak ridge near the town of Jalalabad (South Kyrgyzstan)], 950 m, 10 September 1954, Vassilchenko s.n. (holotype LE).

Prunus urartu (Tamamsch.) Eisenman, comb. nov.
Basionym:—Amygdalus urartu Tamamschjan (1935: 166).

Type (lectotype, designated here):—Erivan, 3 July 1933, Tamamschian s.n. [“Erivan. In faucib. m. Eranos.”]; (ERE 20787! [digital image]).
Note:—A holotype was not indicated by Tamamschjan. The following locality and dates are cited in the original protologue: “Habitat in Armenia, prope Erivan, in faucibus Gjarny—cai m. Eranos, 31. V. 31!!, 3. VII. 33!!, 13. V. 34!!.” Avetisian et al. (1999) noted that the following material is held in the herbarium of the Institute of Botany of the National Academy of Sciences of Armenia (ERE): a syntype (ERE 20787! Tamamschjan s.n., 3.VII.1933), toposyntypes (ERE 20786!, ERE 20788!), and specimen authentica (ERE 496!, ERE 35023!, ERE 35024!). Among the original material traced in ERE, the specimen ERE 20787 is the only original material with both the correct collection locality and date, and is therefore designated as lectotype.

**Prunus urartu** Tamamsch. subsp. **pseudopersica** (Tamamsch.) Eisenman, **comb. nov.**
Basionym:—**Amygdalus urartu** Tamamsch. subsp. **pseudopersica** Tamamschjan (1935: 166).

Type (neotype, designated here)—Erivan, 11 May 1934, **Tamamschian s.n.** [“Erivan, in faucibus. m. Eranos.”] (ERE 20786! [digital image]).

Note:—A holotype was not designated by Tamamschjan. Following the original description of this subspecies, Tamamschjan stated, “[ibidem!!,” referring to the locality and dates provided for specimens of *A. urartu*, which was published on the same page. Avetisian (1999) noted that no original material, but only a toposyntype (specimen authenticum) (ERE20786! Tamamschjan, s.n., 11.V.1933), is housed at ERE. The collection date of this specimen does not match those cited in the protologue. Because the specimen is from the type locality, and was labeled as *Amygdalus urartu* mihi subsp. **pseudopersica** m[ihi] by Tamamschjan, this specimen is selected as neotype.

**Prunus × uzbekistanica** (Sabirov) Eisenman, **comb. nov.**
Basionym:—**Amygdalus × uzbekistanica** Sabirov (1959: 230).

Type:—UZBEKISTAN. Zapadnyii Gissar (bassein p. Sangardaka) na skalakh, v srednem techenii r. Obi-Naurus [Western Gissar (Sangardak River basin) on rocks, in middle reaches of the Obi-Naurus River], 1600–1700 m, 30 July 1956, *Sabirov 420* (holotype LE).

**Prunus wendelboi** (Freitag) Eisenman, **comb. nov.**
Basionym:—**Amygdalus wendelboi** Freitag (1977: 118).


**Prunus × yasujensis** (Khat.) Eisenman, **comb. nov.**

Type:—IRAN. Prov. Kohgiluyeh and Boyer-Ahmad, Yasuj, Sisakht, 2000 m, *s.d.*, *Foroughi 8114* (holotype TARI).

**Prunus zabulica** (Seraf.) Eisenman, **comb. nov.**


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