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Research article/Araştırma makalesi

Two new records (*Sorbus persica*, *Cotoneaster morulus*) for the Lebanon flora

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Abstract

Two taxa of Rosaceae, *Sorbus persica* and *Cotoneaster morulus*, are reported as new records for Lebanon flora. A detailed description, geographical distrubitions and illustrations of the new records are provided in this study.

Key words: *Cotoneaster*, flora, new record, Lebanon, *Sorbus*

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Lübnan florası için iki yeni kayıt (*Sorbus persica*, *Cotoneaster morulus*)

Özet

Bu çalışmada, Rosaceae familyasına ait olan *Sorbus persica* ve *Cotoneaster morulus* türleri Lübnan Florası için yeni kayıt olarak tespit edilmiştir. Bu yeni kayıtların ayrıntılı betimleri, yayılışları ve fotoğrafları da çalışma içerisinde yer almaktadır.

Anahtar kelimeler: *Cotoneaster*, Flora, Lübnan, *Sorbus*, yeni kayıt

1. Introduction

Lebanon is a relatively small country of 10,450 km^2 considered as a regional hotspot for biodiversity (Médail & Quézel, 1997; Myers et al., 2000). Its floristic richness is estimated at 2612 vascular plant taxa, of which 108 are endemic to Lebanon and 336 are endemic to neighbor area including to Turkey (Tohme and Tohme, 2007).

Sorbus and *Cotoneaster* were threated under subfamily Maloideae C. Weber for a long time. After the phylogenetic and nomenclature changes (Potter et al., 2007; Reveal, 2012a; 2012b), these genera are accepted under subfamily Maloideae C.Weber, tribe Maleae Small, subtribe Malinae Reveal. In Lebanon, the genus *Sorbus* is represented by only two species, *S. graeca*, Lodd. ex Schauer and *S. torminalis* (L.) Crantzas, and these taxa are reported on Lebanon Flora (2017) online database featuring an update of the "Flore du Liban et de la Syrie" by Mouterde (1984). The new record, *S. persica*, was collected from Ehden Nature Reserve (North Lebanon) and from Bekaa valley in Lebanon. The first place is common habitat for *S. torminalis* and the new record. The genus *Cotoneaster* is represented by one species in Lebanon according to Mouterde (1984). A second new record, *Cotoneaster morulus*, was also founded in Ehden Nature reserve.

2. Materials and methods

Specimens of the new records were collected from different localities during the field trip in Lebanon by first two authors. Samples are identified using the Turkish flora (Gabrielian, 1972) and using the relevant literature (Gabrielian, 1978). All collected specimens are deposited in HUB.

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3. Results

Sorbus persica Hedl.; Monogr. Gatt. Sorbus 70, f. 18: 1901. Figure 1.

Lectotype: Iran. Persia borealis, in M. Elburs, pr. pagum Passgala, 21.5.1843, *Kotschy* 187 (lectotype designed by Schönbeck-Temesy, 1969: W!; isolectotypes: G! BM! LE!).

Shrub with branched at base, 3–4(–7) m; crown oblong. Stem bark grey; young branches brown, villose, with numerous lenticels. Buds ovate, oblong, 5–7 × 3–4 mm, ovate with small mucro, sticky. Leaves obovate, deltoid or widely elliptic, (4–)5–7(–10) × 4–6(–9) cm, 4-6-lobed at margin, dull or dark green, glabrous or sparsely hairy at above, grey, densely lanate at below, shortly cuneate truncate or rounded at base, entire or serrate at margin, rounded or obtuse at apex, mid-vein 5-7 pairs; petioles 10–15(–22) mm long, lanate; stipules triangular or subulate, 3–5 mm, sparsely lanate, decidious. Inflorescence a corymb with (15–)25–40(–70)-flowered, (4–)6–8(–12) cm in diameter; inflorescence axis lanate; bracts subulate, 8–12 mm, long or sparsely lanate, deciduous; bracteoles similar to bracts, smaller. Flowers 10–15 mm in diameter, epigyn. Hypanthium cupular, lanate at outside, partly deciduous at fruit. Sepals narrowly triangular, erect, 2–2.5 × 1.5–2 mm, densely lanate at outside, sparsely lanate, acute at apex, persistent in fruit. Petals white, elliptic or rounded, 4–6 × 4–6 mm, concave with claw, sparsely lanate at base. Stamens 20, unequal; ovary lanate at outside, styles 2, lanate at base. Fruits 10–14 × 8–10 mm, red, orange, short oblong, elliptic or ellipsoid with typical numerous lenticels, 10–20 in frutescence. Seeds 5–8 × 3–4 mm, brown, 4(–6), long triangular.

Distribution and habitat: Turkey, Georgia, Azerbaijan, Armenia, Iran, Lebanon and Middle Asia, occurring in deciduous scrub and junipers, 700−2500 m.

Specimen examined: LEBANON. Bekaa: Yammounek, 34°08'38"N, 36°03'09"E, 1393 m, on rock crack, 10 June 2010, *AAD* 17065-*M.Bou Dagher-Kharrat*; North Ehden: before entry of the Nature reserve, limestone, mixed forest opening, 9 December 2014, *AAD* 18977-*M. Bou Dagher-Kharrat*.

Figure. 1. *Sorbus persica* in Lebanon (from *AAD* 18977)

Cotoneaster morulus Pojark.; Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk S.S.S.R. 21: 177. 1961. Figure 2.

= *C. armenus* Pojark.; Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk S.S.S.R. 17: 202. 1955.

Holotype: [Soviet Azerbaijan] 8 km boream versus ad oppidulo Nucha, 12 ix 1949, *Pojarkova* 1156 (LE!).

Deciduous, (0.5–)1–1.5 m varying from ground-hugging prostrate to erect shrubs; branches intricate or symmetric. Young branches greyish-brown or reddish, initially pilose, later sparsely pilose or glabrous. Leaves elliptic, rounded or lanceolate, rarely oblong, (0.5)1–2(–2.5) × 0.4–1.5(–2) cm, initially sparsely pilose later glabrous at below, sparsely pilose or glabrous at above, widely truncate or rounded at base, obtuse or rounded rarely emarginate at apex, margin entire; petiole 2–3(–4) mm long; stipules lanceolate, 1–1.5 mm, usually red, sparsely tomentose, deciduous. Inflorescence corymbose, 3–5(–8)-flowered; bracts linear, 0.6–1 mm, glabrous or sparsely long hairy; bracteoles small; pedicels short, 1-2 mm, pilose. Flowers 7–9 mm in diameter. Hypanthium widely campanulate, sparsely pubescent. Sepals triangular, 1–1.6 × 0.8–1.2 mm, acute at apex, incurved. Petals rounded, spreading, slightly concave with claw, pilose at inner base, white, 4–5 mm in diameter, entire or slightly dentate at margin, emarginate at apex. Stamens (18–)20(–21), filaments in single row, enlarged at base. Ovary pubescent apically in flower; styles mainly 2(–3), free. Fruit elliptic or ovate, 5–7 × 4–6 mm, purple-black, glabrous or sparsely lanate at apex; pyrenes 2(–3), hairy at apex.

Distribution and habitat: Turkey, Lebanon, Caucasia occurring in forests and shrubs at 450-1500 m.

Specimen examined: LEBANON. North Ehden: before entry of the Nature reserve, limestone, mixed forest opening, 34°19'23"N, 035°57'42"E, 1400 m, 17 May 2014, *AAD* 18970-*M.Bou Dagher-Kharrat*, ibid. *AAD* 18987.

Figure. 2. *Cotoneaster morulus* in Lebanon (from *AAD* 18977)

4. Conclusions and discussion

Sorbus is taxonomically difficult genus like most genera of *Rosaceae* because of hybridization and apomixes (Sennikov & Kurtto, 2017). It occurs wide range of western, central and southern Europe, in North-western part of Africa. The distribution of the genus is expanded to Turkey, Lebanon, Caucasus and the Middle East. *Sorbus persica* can be found in Transcaucasia, east and north part of Iran with east part of Turkey (Kurtto, 2009). Therefore, Lebanon has potential to be habitat for *Sorbus persica* and it was collected from northern of Lebanon.

Leaf shape is important taxonomic character to distinguish species of the genus. Among *Sorbus* in Lebanon, the new record has obovate or elliptic leaves with crenate or entire margin, while *Sorbus torminalis* is characterized lobed and ovate leaves and *S. graeca* is well distinguished by ovate and glabrous leaves.

Cotoneaster is another woody genus of Rosaceae, which has complicated taxonomy by interspecific hybridization and apomixis. It occurs northwestern Africa, southern India and Taiwan, Europe and North Africa (Dickoré & Kasperek 2010). It is also known various parts of Turkey (Browicz, 1972; Bağcı et al. 2012). Fryer and Hylmö (2009) are included about 400 species with 70 new species in latest monograph of the genus. Both native and alien species of *Cotoneaster* are also attractive as ornamental plants in Europe (Dickoré & Kasperek 2010). Despite it has species richness in the family, only *C. nummularius* are recorded in Lebanon flora until now. The new record, *C. morulus* is distinguished having by smaller flower (7–9 mm in diam.) and smaller oblong leaves from *C. nummularius*.

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Additional specimen examined

Sorbus persica

Turkey. Karabük: Keltepe, 1579 m, 41°03'13"N, 032°34'35"E, 18 Oct. 2012, *AAD* 18253-*Z.Uğurlu*; Çankırı: Kurşunlu, 1299 m, 40°56'26"N, 033°16'14"E, 13 Oct. 2013, *AAD* 18845; Zonguldak: KeItepe, above Karabük, 1700 m, *Davis* 38875 (E!); Tokat: from Reşadiye to Aybastı, steppe, 1369 m, 40°29'36"N, 037°16'48"E, 15 Oct. 2013, *AAD* 18868; Bitlis: Tatvan, Nohutlu village, 1760 m, 38°21'63.6"N, 042°40'04"E, 2 Oct. 2013, *AAD* 18748-*K.Özgişi*; Tatvan, Nemrut Mountain, 2300 m, 30 July 1972, *H. Peşmen* 3139 (HUB!); Bingöl: ad Boglan, 1060 m, *Kotschy* 802 (G!-another syntypes). Kars: from Kağızman to Horosan, 1326 m, 40°04'23.5"N, 042°53'45"E, 6 Oct. 2013, *AAD* 18828-*K.Özgişi*; Artvin: Ardanuç, 700 m, *Aydin* (ISTO 4316!); Van: 15 km N. of Çatak, *Davis* 23153(E!); İçel: Bolkar Mountain, Jau Schaula (summit of Armadschek), 2100 m, *Eig* & *M.Zohary* 276 (HUJ!); Hakkari: Şapatan, 1864 m, 37°21'33.7"N, 44°31'48.8"E, 4 Oct. 2013, *AAD* 18802-*K. Özgişi*; 12-16 km from ŞemdinIi to Yüksekova, 1600-1650 m, *Davis* 45007(E!); Samdi Da., 1800 m, *Rix* 41(E!).

Azerbaijan. İsmailli, Taglobion village, 5 June 1979, *Zaykovnikova* s.n (LE!)

Armenia. Mikayan, Cermuh, 17 Sept. 1952, *Gabriellien* s.n (LE!); Azizbeyov, S. of Cermuk, *Zaykovnikova* s.n (LE!); Vedi, Kaladivi village, 22 July 1952, *Gabriellien* s.n (LE!); Begun, 17 Sept. 1967, Zaykovnikova (LE!).

Cotoneaster morulus

Turkey. Artvin: Yusufeli, around Morkaya village, 1541 m, 41°32'17.3"N, 042°47'50"E, 5 June 2013, *AAD* 18501; Çoruh: Ardanuç, 450 m, *Aydin* (ISTO 4309)! d. Yusufeli, 900-950 m, *Davis* 47668!; Sarıgöl, 848 m, 40°58'59"N, 041°30'01.1"E, 15 March 2015, *AAD* 19347; Ardanuç, Ovacık village, 394 m, 18 August 2013, *AAD* 18642; Şavşat-Yusufeli, 250 m, 25 August 1995, *AAD* 5026.

Georgia. Sagarejo: Gaze Kakheti, Khasmi village, David Gazeji area, *Paliurus- Pyrus* scrub slopes, 844 m, 41°44'82.5"N, 045°12'65.7"E, 9 August 2012, *AAD* 18156-*Z.Uğurlu* & *N.Lachashvili*; Garici area, Udabno village, 931 m, 41°33'50.3"N, 045°20'55.5"E, 10 August 2012, *AAD* 18163-*Z.Uğurlu & N.Lachashvili*.

Azerbaijan. Cıngıllı, 12 September 1949, *A. Pojarkova* 1156 (LE!).

Armenia. Megri region, 17 October 1937, *Pojarkova* 385 (LE!); Erivan, near the Gehart Church, 17 October 1937, *Pojarkova* 385 (LE!).

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