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## *Arabis carduchorum* (Brassicaceae) – lectotypification and comments on the distribution area

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**Abstract:** A lectotype is designated for *Arabis carduchorum*, and the distribution area is discussed.

**Keywords:** Flora of Armenia, Azerbaijan, Iran and Turkey; Cruciferae, *Arabis*, *A. carduchorum*, lectotype.

### Introduction

During field work in Iran specimens of the genus *Arabis* had been collected, which could not be assigned to any species listed in Flora Iranica (HEDGE 1968) or GHAHREMAN A. & al. (attended 2017). In Flora of Turkey (CULLEN 1965) and Flora of Armenia (AVETISIAN 1966) the names *Arabis carduchorum* (Flora of Turkey) and *A. armena* (Flora of Armenia) have been found, fitting to the characters of the collected sample with creeping rhizomes and lanceolate leaves (Fig. 1). The two names are synonyms, and *A. carduchorum* is the earlier-published valid name. During the further investigation it was realized that *A. carduchorum* is reported for Iran in BARKER (attended 2017), based on the publication of SAJEDI & AMINI RAD (2012) and that the name needs typification.

### Material and Methods

The collected material has been compared with specimens in ERE and W. The abbreviations for Herbaria follow Index Herbariorum (THIERS, attended 2017)

**Specimens:** s. loc., s. d., C.G.T. Kotschy, Iter cilicico-kurdicum s.n., ex Herb. C. Gaillardot, “Trouvé dans les plantes de Kotschy - Iter cilicico-kurdicum sans etiquette” [JE 00003185]; – C. h. Belved. austr. e sem. Kurdistan m Kotschy lect. [Cultus (in) horto Belvedere austriaco e seminibus Kurdistanibus manu Kotschy lectis = cultivated in horto Belvedere (Austria) from seeds collected in Kurdistan by Kotschy], s.d., Wally s.n. [W 0075919]; – C. h. Belved. [cultivated in horto Belvedere (Vienna)], 1867-06-21, Wally s.n. [W 0075920 (annotated Rechner: ex seminibus typi)].

**Turkey:** B9, Bitlis, Nemrut Da., Schuttfluren am N Kraterrand, 2700–2800 m, 1983-08-18, F. Sorger 83-55-6 [W 1992-0008170]; – B9, Bitlis, Nemrut Da., NE Kraterrand, Talboden, SE Ufer des Kratersees, 2300–2700 m, 1984-06-16, F. Sorger 84-40-8 [W 1992-0008171].

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**Armenia:** Ararat Prov.: Северный макросклон Сарай-булага, окр. сел. Зинджрлу, 1960-05-26, A. Achverdov & N.V. Mirzoeva s.n. [ERE 5779 (ERE-arm 124834)]; – Северный макросклон Сарай-булага, окр. села Зинджрлу, 1960-05-26, A. Achverdov & al. s.n. [ERE 5780 (ERE-arm 124835), W 2006-0008170]; – Ararat province, mountain area 19.5 km E of Ararat, 3.3 km W Lanjar, slope above the road to St. Karapet monastery, 1995 m s.m., 39°49'41"N 44°55'56"E, 2017-05-17, E. Vitek, M. Oganessian, M. Sargsyan & A. Khachatryan 17-0699 [ERE, MO, W].

Vayots' Dzor Prov.: Ехегнадзорский район, юго-восточный макросклон Селимского перевала, сухой восточный склон, 2200 м н. у. м., 1955-08-02, E. Gabrielian s.n. [ERE 5771 (ERE-arm 67280)]; – Ехегнадзорский район, с. с. Хачик х Гнишик, ближе к с. Хачик, Горная трагакантовая степь, 2300 м н. у. м., восточный скалистый склон, 1955-08-04, Y.I. Mulkidjanian s.n. [ERE 5772 (ERE-arm 67282)]; – Ехегнадзорский район, с. с. Хачик х Гнишик, 2600 м н. у. м., яйлаг с. Яйджи, на скалах, 1955-08-05, E. Gabrielian s.n. [ERE 5773 (ERE-arm 67277)]; – Ехегнадзорский район, с. с. Хачик х Гнишик, 2600 м н. у. м., яйлаг с. Яйджи, на скалах, 1955-08-05, E. Gabrielian s.n. [ERE 5774 (ERE-arm 67278)]; – Ехегнадзорский район, с. Гнишик х Гандзак, северо-восточный скалистый склон, 1955-08-05, Y.I. Mulkidjanian s.n. [ERE 5776 (ERE-arm 67281)]; – Ехегнадзорский район, с. с. Хачик х Гнишик, 1963-08-05, M. Galstian s.n. [ERE 5782 (ERE-arm 78045)]; – Ехегнадзорский район, окр. с. Хачик, г. Кармир Сахал, 2100–2400 м н. у. м., 1972-07-12, V.A. Manakyan s.n. [ERE 5783 (ERE-arm 105926)]; – Ехегнадзорский район, с. с. Хачик х Гнишик, скалистые склоны г. Аренасар, 2600 м н. у. м., 1976-07-09, V.E. Avetisian et al. s.n. [ERE 5784 (ERE-arm 114489)]; – Микоянский район, Гнишик х Аяр, Северо-восточный каменистый склон, 1955-08-05, Y.I. Mulkidjanian s.n. [ERE 5775 (ERE-arm 67279)].

Syunik' Prov.: Зангезур, Кафанский район, известковые скалы близ гребня г. Хуступ, 2800 м., 1957-07-30, A. Elenevski & A. Vylova s.n. [ERE 5777 (ERE-arm 64320)]; – Зангезур, Кафанский район, известковые скалы близ гребня г. Хуступ, 2800 м., 1957-07-30, A. Elenevski & A. Vylova s.n. [ERE 5778 (ERE-arm 78044)]; – Кафанский район, вершина г. Хуступ, 3100–3150 м, 1979-07-05, V. Avetisian [W 1983-0002183]; – Юго-западный Зангезур. Бассейн реки Меграрет, Восточный отрог г. Союх, 2500–2600 м., 1947-05-28, A. Doluchanov s.n. [ERE 5770 (ERE-arm 37828)]; – Мегринский район, с. Личк, уроч. Джиндара (Арпалых х Елиурд), травянистые северные склоны, выше леса, 2200–2500 м н. у. м., 1963-07-20, Y.I. Mulkidjanian & V.A. Manakian s.n. [ERE 5781 (ERE-arm 105927)].

**Azerbaijan:** Distr. Nachitshevan, in monte Sojuch supra Ordubad, 5–8000' [1524–2438 m], 1923-05-27, A. Grossheim s.n., [ERE 0004977 (ERE-arm 265)]; – Distr. Nachitshevan, in monte Sojuch supra Ordubad, 5–8000' [1524–2438 m], 1923-05-27, A. Grossheim s.n. [ERE 0004978 (ERE-arm 266)]; – [Нахçиван,] Зангезурский хребет, привершинная зона горы Гохтан (г. Союх) со стороны Ордубадского района Нах. АССР, 3045 м. над ур. м., 1987-06-25, V.E. Avetisian s.n. [ERE 0004966 (ERE-arm 267)].

**Iran:** West Azerbaijan, Orumiya, Darband village, Kuhe Shahidan, 3000–3250 m, 37°27'49"N 44°42'08" E, 2016-06-30, J. Noroozi, 3653 [W 2017-0012259, G, MO, TARI]; – West Azerbaijan, Orumiya, Darband village, Kuhe Shahidan, 2500–2800 m, 37°27'31" N 44°43'42" E, 2016-07-01, J. Noroozi 3742 [W 2017-0012260]; – W Azarbaijan, Oroumieh, Movana, Marmisho, 2902 m, 2012-07-02, Amini Rad & Torabi [IRAN 58054 n.v.].

## Results and Discussion

*Arabis carduchorum* BOISS, Fl. Orient. 1: 173 (1867). Described from: “Hab. in summo jugo Agerowdagh Armeniae Kurdicae inter Van et Müküs alt. 12000' (Ky!).”

Lectotype (hic designatus): Plantae in Karduchia ad Agerow Dagh lectae, crescit in summo jugo inter Wan [= Van] et Müküs [= Bahçesaray], alt. 12000 ped. [3658 m], 1859-09, Kotschy, Iter cilicico-kurdicum 747 [W 0050692 (excl. plant in the middle – *Erysimum* sp.)], <http://herbarium.univie.ac.at/database/detail.php?ID=461306>, isolecotype G-BOIS-00332071].

The labels on both specimens in W and G are identical except the original naming of the plant as “*Draba gigas* Stur msc.” in W. At the end of the protologue, BOISSIER (1867: 173) wrote “*Drabo gigas* Stur mss. in herb. Imp. Vindob!”. Therefore the sheet in W is designated as the lectotype. The sheet is a mixed collection involving a tiny fruiting plant of *Erysimum* sp., a sterile portion of cushion and much larger one with



Fig. 1: *Arabis carduchorum*, locality, habitus and detail.

fruits that clearly confirms the generic identity. Boissier did not annotate the W sheet though based on the mentioned phrase he examined it and took fragments for his collection. There is one more possible fragment in the herbarium in Jena [JE 3185, <http://herbarium.univie.ac.at/database/detail.php?ID=118477>] – the assumption (MÜLLER in Virtual Herbaria) is supported by the fact that Kotschy collected the species only once, but cannot be confirmed as there is no information on the sheet.

“Agerow Dagh” could not be identified. Between Van and Bahçesaray is no mountain with an altitude over 3600 m. Following the narration of KOTSCHY (1860) the mountain should be within some kilometers



Fig. 2: *Arabis carduchorum*, distribution based on the cited specimens and the information in Flora of Turkey (CULLEN 1965). Basis map OpenStreetMap®.

distance of “Müküş” [= Bahçesaray] (“... we went down 3000 feet to Chana Putkie ... here resides no priest, but every Sunday one comes up from Müküs. ...”). High mountains with 3400–3500 m altitude are c. 7.5 km ENE or 10.3 km N of Bahçesaray. It is supposed that *Arabis carduchorum* was collected there.

Two other specimens in W show cultivated material, following the annotations originating from seeds of the type collection.

= *Draba gigas* STUR ex BOISS., Fl. Orient. 1: 173 (1867), nom. nud. in syn..

= *Arabis armena* N. BUSCH, Vestn. Tiflissk. Bot. Sada, n.s., 3–4: 4 (1927).

Type: Transcaucasia, distr. Nachitshevan, in monte Sojuch supra Ordubad, 7000'–8000', 23. 5. 1923, A. Grossheim [LE n.v.].

Three specimens in ERE are from the type locality, have been determined by Grossheim and annotated as topotypes by Avetisian (in sched.).

Although DOROFYEV (2012: 425) maintained both *Arabis armena* and *A. carduchorum* and gave the exact distribution pattern for both of them in the Caucasus, we strongly believe that the two species are conspecific, and the former name is synonymized under the earlier-published *A. carduchorum*, as was done by CZEREPANOV (1995) and on the Brassicaceae database (BRASSIBASE, attended 2017).

Ecology: the species grows in the alpine and subalpine vegetation belt, in meadows, scree, and on rocks (Fig. 1).

General Distribution (Fig. 2): The species is endemic in Nakhichevan and surrounding areas. In Iran in West-Azerbaijan, on the mountains between Urmia lake and the Turkish border; in Turkey in the provinces Bitlis and Van, in Armenia in the provinces Ararat, Vayots' Dzor and Syunik'.

The species had not been collected in Armenia for at least 35 years. The published chromosome count ( $2n = 16$ , GUKASIAN & SAFARIAN 1990) is based on material cultivated in

the Botanic Garden of Yerevan. The material was replanted by Achverdov & Mirzoeva, 1960, from Saray Bulag, probably corresponding with the specimens ERE 0005779, 0005780; seeds collected by Arevshatian, 1988, number of preparation is 1810.

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