Notes on the narrow endemic of Armenia, *Pyrus browiczii* Mulck. (Rosaceae)

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**Summary.** *Pyrus browiczii* Mulck. is a narrow endemic of the Vayots Dzor province of Armenia. It is the only pear species from the East Asian *Pyrus* section *Pashia* native to Armenian flora. Since the description by Ya. I. Mulkidzhanyan in 1969 so far *P. browiczii* was known by the type and single specimens in fruits. During the present study, *P. browiczii* was collected and observed in nature in flowering and fruiting phases. Article contains data on species taxonomy, ecology and particulars of habitat, complete description of the species, it is illustrated by original photos.

Introduction

Armenia is a center of high diversity, polymorphism and narrow endemism in the genus *Pyrus* L. (Mulkidzhanyan, 1969b; Browicz, 1993). About 32–34 species of four sections, *Pashia* Koehne, *Xeropyrenia* Fed., *Argyromalon* Fed., are recognized in the Armenian flora, of which 18 species are endemics for Armenia and Southern Transcaucasia (Akopian, 2007, 2010a).

*Pyrus browiczii* Mulck. was first described by Ya. I. Mulkidzanyan (1969a) from the Yeghegis River gorge – a remarkable habitat with concentration of numerous pear species, located in the Vayots Dzor province of Armenia (Darelegis floristic region). According to the Herbarium collections (ERE), 16 species of the genus *Pyrus* grow there: *P. browiczii* (Pashia), *P. caucasica* Fed., *P. demetrii* Kuth., *P. sosnovskyi* Fed. (*Pyrus*), *P. complexa* Rubtsov, *P. daralaghezi Mulck.*, *P. elata* Rubtsov, *P. pseudosyriaca* Gladkova, *P. syriaca* Boiss. (*Xeropyrenia*), *P. georgica* Kuth., *P. gergerana* Gladkova, *P. hajastana* Mulck., *P. medvedevii* Rubtsov, *P. oxyprion* Woronow, *P. salicifolia* Pall., *P. takhtadzhianii* Fed. (*Argyromalon*). All the groups of *Pyrus* species are represented in this
location, reflecting the main trends of formation and speciation processes in the genus: from the ancient acute-serrate or aristle-dentate, glabrous, broad-leaved mesophilic forms to xerophytic forms of pears with narrow, small, densely pubescent leaves. The ancestors of the mesophilic species were components of the ancient tertiary forest flora, the refugia of which were preserved in East Asia. In Transcaucasia, according to V. N. Gladkova (1990), they are represented by such species as *P. pyrifolia* (Burm. f.) Nakai, *P. browiczii* Mulk., *P. caucasica* Fed., *P. hyrcana* Fed., *P. zangezura* Maleev.

*Pyrus browiczii* is the only pear species from the East Asian *Pyrus* section *Pashia* that grows in Armenia. It should be noted that the section *Pashia* is represented in the Caucasian flora rarely by single taxa: by the local variety *P. pyrifolia* (Burm. F.) Nakai var. *talyshensis* Gladkova in the Talysh flora (Gladkova, 1988) and by *P. pyrifolia* (Burm. f.) Nakai var. *cula* (Makino) Nakai in the garden culture of Transcaucasia (Fedorov, 1954).

So far, *P. browiczii* has been known only from type specimens, collected by J. I. Mulkidzhanyan et al. in 1968 and the later single samples in fruit stage, stored in the Herbarium (ERE) of the Department of Plant Taxonomy and Geography of the Institute of Botany NAS RA.

During expeditions in May and October of 2019 in Vayots Dzor province, *P. browiczii* was discovered in the area of “locus classicus”, where new herbarium specimens were collected from. *P. browiczii* was described (Mulkidzhanyan, 1969a) by specimens, collected in the plant fruiting period, and the diagnosis of the species did not involve the features of inflorescences and flowers (“flowers unknown”). After the study of the existing herbarium material in ERE and comparing it with new collections of *P. browiczii*, as well as due to observations made in nature during the flowering and fruiting phase of the species, we found it necessary to supplement its description (Fig. 1).

**Material and methods**

The study was based on *P. browiczii* ERE Herbarium material and on the new materials collected from species area in the Vayots Dzor province of Armenia during expeditions in 23 V 2019 and 11 X 2019. Materials represent both flowering and fruiting phases. Morphological characteristics of *P. browiczii* specimens were studied using Stereo Microscope MBC-9. Photos of the plant and their

Fig. 1. View on *Pyrus browiczii* tree in the natural habitat.
details were done with digital camera NIKON D3400.

Results

Taxonomy and Description

Pyrus L.

Section Pashia Koehne 1893, Deutsch. Dendrol: 244; emend. Terpó 1960, Ann. Acad. Horti–Viticult. 22, 6, 2: 30–32.

Calyx deciduous in fruits. Leaves ovate or orbicular, serrate or crenate, rarely entire, abruptly angustate into long, thin petioles; pubescence absent or sparse. Fruits covered with white or brownish lenticels or without them.

Type: Pyrus pashia Hamilt.

P. browiczii Mulk. 1969, Dokl. Akademii Nauk ArmSSR, 1969, 48, 4: 233.

Described from Armenia: “Armenia. Daralagez, systema fl. Elegis, inter pagos Kavuschuk et Gulliduz, 1700 m s. m. 12 VII 1968, Ja. I. Mulkidzahan, K. K. Browicz, T. N. Popova, B. G. Arevschatjan legunt” (Fig. 2).

Distribution. Darelegis floristic region of Armenia. Gorge of the river Yeghegis, in the vicinity of villages Hermon (Kavuschuk) and Varadaovit (Gulliduz). Seldom. Narrow endemic of the Vayots Dzor province of Armenia (Fig. 3).

Ecology and Habitat. In the middle mountain belt, 1700–1950 m a. s. l., at the edges of broad-leaved forests and fields, on the open hills, meadows; mostly solitary. The habitat of P. browiczii occurrence is rich in other woody fruit plants, e. g. Rosa corymbifera Borkh., R. spinossissima L., Malus orientalis Uglitzk., Sorbus aucuparia L., Crataegus sp., × Pyrus hycana Fed., P. pseosyriaca Gladkova, P. syriaca Boiss., P. fedorovii Kuth., P. takhtadhzianii Fed. and some others.

Flowering observed in April – May, fruiting in September – October.

Protection Category. Critically endangered species, included in the Red Book of Plants of RA (Akopian, 2010b). The area of occupancy is less than 10 km². The limiting factors are restricted extent of occurrence and area of occupancy as well as anthropogenic factors influence. The population is represented by single individuals far apart from each other. Seed productivity is low, vegetative weak propagation is noted. There are currently no measures to protect the species in the habitat. Within the present study, some seedlings of P. browiczii were transplanted from nature into the living collection “Flora and Vegetation of Armenia” of the Yerevan Botanical Garden NAS RA for conservation ex situ.

Description. Tree up to 15 m tall with trunk 25–40 cm in diameter, crown broadly pyramidal, branches upright directed; bark grayish-brown, almost smooth on young branches and deeply scaly-furrowed on old ones. Spines dark brown, short, 0.8–1.5 cm long. Buds 0.5–0.8 cm, ovate, conical at the top, glabrous, scales broadly ovate, shortly pointed at the top. Leaves 6–8 × 3–5 cm, lustrous green above, paler below, thin, elliptic, at base from obtuse to broadly-cuneate, at apex broadly acute to acute, weakly mucronate, at margin unequal minute crenate-dentate; young leaf blades below along the main vein and petioles sparsely hairy, later glabrous; petioles up to 4 cm long; stipules 1.5–2.5 mm long, narrowly subulate, deciduous. Inflorescence corymb, up to 8 cm broad, usually 10-flowered. Bracts 6–8 mm long, filiform, brownish. Flowers 2.8–3 cm in diameter, pedicels 4–5 cm long. Hypanthium (2.5)2.8 × (1.8)2.3 mm, hairy, sepals 4.5–4.8 mm long, reflexed, triangular acuminate, on both sides densely tomentose. Receptacle 4.2 mm in diameter, saucer-shaped, densely covered by whitish glands. Petals 5, white, from 13(15) × 13 to 12 × 8 mm, orbicular or obovate, slightly clawed at the base, free, in flowering directed apart. Stamens 20–22, in two rows, ones of the outer row longer then inner ones, anthers (0.8)1.0 mm long, dark pink, filaments white, in outer row 5.5–6.3 mm, in inner row 2.5–3.5 mm long. Styles 5, 5.5 mm long, slightly pubescent at base; ovary 5-loculed. Fruit pome, shortly pyriform, (1.5)–4 cm long, with 5 unequal locules, brown, smooth, without lenticels; fruit pedicels up to 5–6 cm long. Calyx in fruits deciduous, leaving only a scar ring. Seeds (6) × (4) mm, dark brown, ovate, at apex acute, flat at one side, convex at other side (Fig. 4).

Examined specimens (Armenia, Darelegis floristic region): «АрмССР, Даралагез, ущ. Элегис, сел. Кавушуг × Гюллидуз. Ближе к Гюллидузу на краю поля. 1700 м над ур. м. Южн. Я. И. Мулкиджанян, К. К. Брович, Т. Н. Попова, Б. Г. Аревшатян. Det. J. I. Мулкиджанян, К. К. Брович, Т. Н. Попова, Б. Г. Аревшатян» (Holo – ERE 144574, barcode ERE 0000832); «АрмССР, Даралагез, ущ. Элегис, сел. Кавушуг × Гюллидуз. На краю ущелья. 1700 м над ур. м. Южн. скл. 12 VII 1968. Я. И. Мулкиджанян, К. К. Брович, Т. Н. Попова, Б. Г. Аревшатян. Det. Ja. I. Mulkijanian, K. K. Browicz, T. N. Popova, B. Arevschatjan. Det. Ja. I. Mulkijianian» (Iso – ERE 144612, barcode ERE 0000832); «АрмССР, Даралагез, ущ. Элегис, сел. Кавушуг × Гюллидуз. На краю ущелья. 1700 м над ур. м. Южн. скл. 12 VII 1968. Я. И. Мулкиджанян, К. К. Брович, Т. Н. Попова, Б. Г. Аревшатян. Det. Ja. I. Mulkijianian» (Iso – ERE 144574, barcode ERE 0000832); «АрмССР, Даралагез, ущ. р. Элегис, сел. Кавушуг × Гюллидуз. Сел. Гюллидуз. Ближе к Гюллидузу на краю поля. 1700 м над ур. м. Южн. Я. И. Мулкиджанян, К. К. Брович, Т. Н. Попова, Б. Г. Аревшатян. Det. J. I. Мулкиджанян, К. К. Брович, Т. Н. Попова, Б. Г. Аревшатян» (Holo – ERE 144612, barcode ERE 0000832); «АрмССР, Даралагез, ущ. р. Элегис, сел. Кавушуг × Гюллидуз. На краю ущелья. 1700 м над ур. м. Южн. скл. 12 VII 1968. Я. И. Мулкиджанян, К. К. Брович, Т. Н. Попова, Б. Г. Аревшатян. Det. Ja. I. Mulkijianian, K. K. Browicz, T. N. Popova, B. Arevschatjan. Det. Ja. I. Mulkijianian» (Iso – ERE 144574, barcode ERE 0000832);
Fig. 2. Holotype of *Pyrus browiczii* Mulik.
Fig. 3. *Pyrus browiczii* Mulk. location in the Vayots Dzor province of Armenia.
References / Литература

Akopian J. A. 2007. On the Pyrus L. (Rosaceae) species in Armenia. Flora, vegetation and plant resources of Armenia 16: 15–26. [In Russian] (Акопян Ж. А. О видах рода Pyrus L. (Rosaceae) в Армении // Флора, растительность и растительные ресурсы Армении, 2007. Т. 16. С. 15–26).

Akopian J. A. 2010a. Endemic pears (Pyrus L., Rosaceae) of Armenia and Southern Transcaucasia. In: Izuchenye flory Kavkaza [Study of the flora of the Caucasus. Abstracts of the International Conference]. Pyatigorsk. Pp. 9–10. [In Russian] (Акопян Ж. А. Эндемичные груши (Pyrus L., Rosaceae) Армении и Южного Закавказья // Изучение флоры Кавказа: Тезисы докладов междунар. науч. конф. Пятигорск, 2010. С. 9–10).

Akopian J. A. 2010b. Pyrus L. In: The Red Book of Plants of the Republic of Armenia. Higher plants and Fungi. Eds. K. Tamanyan, G. Fayvush, L. Nanagyulyan, T. Danielyan. Second edition. Yerevan. Pp. 435–444.
Browicz K. 1993. Conspect and chorology of the genus *Pyrus* L. *Arboretum Korickie* 38: 17–33.

Gladkova V. N. 1988. *Pyrus* L. (Rosaceae) genus species of Talish flora. *Novosti sistematiki vysshikh rasteniy* [Novit. Syst. Pl. Vasc.] 25: 96–102. [In Russian] (Гладкова В. Н. Виды рода *Pyrus* L. (Розоцветные) флоры Талыша // Новости систематики высших раст., 1988. Т. 25. С. 96–102).

Gladkova V. N. 1990. The synopsis of the species of the genus *Pyrus* (Rosaceae) for the flora of the Caucasus. *Bot. Zhurn. (Moscow & St. Petersburg)* 75(6): 874–883. [In Russian] (Гладкова В. Н. Обзор видов рода *Pyrus* (Розоцветные) флоры Кавказа // Бот. журн., 1990. Т. 75. № 6. С. 874–883).

Fedorov An. A. 1954. *Pyrus* L. In: *Derevyia i kustarniki SSSR* [Trees and shrubs of USSR]. Vol. 3. Ed. S. Ya. Sokolov. Moscow–Leningrad. Pp. 378–414. [In Russian] (Федоров Ан. А. *Pyrus* L. // Деревья и кустарники СССР. Т. 3. Под ред. С. Я. Соколова. М.–Л., 1954. С. 378–414).

Koehne B. A. E. 1893. *Deutsche Dendrologie*. Stuttgart: Verlag von Ferdinand Enke. 601 pp.

Mulkidzhanyan Ya. I. 1969a. New for science species of pears from Southern Transcaucasia. *Doklady Akademii Nauk Armyskoy SSR* [Reports of Academy of Sciences of Armenian SSR] 48, 4: 234–236. [In Russian] (Мулкиджанян Я. И. Новые для науки виды груши из Южного Закавказья // Доклady Академии Наук Армянской ССР, 1969a. Т. 48, № 4. С. 234–236).

Mulkidzhanyan Ya. I. 1969b. Armenian SSR – one of the centers of speciation in the genus *Pyrus*. *Doklady Akademii Nauk Armyskoy SSR* [Reports of Academy of Sciences of Armenian SSR] 48, 5: 288–291. [In Russian] (Мулкиджанян Я. И. Армянская ССР – один из очагов видообразования в роде *Pyrus* // Доклады Академии Наук Армянской ССР, 1969b. Т. 48, № 5. С. 288–291).

Terpó A. 1960. Magyarország Vadvöröse (Pyri Hungariae). *Annal. Acad. Hort. Viticult.* 6: 1–258.