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Genetic Resources of Rare Fruits and Ornamentals

Volodymyr Mezhenskyj and Liudmyla Mezhenska

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Photographs on the front cover:
Exploring and conserving the genetic heritage of rare fruits and ornamentals. Courtesy of Volodymyr Mezhenkyj.

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The results of the introduction and breeding work have been given in the book, and 290 accessions belonging to 32 genera and nothogenera of the *Adoxaceae*, *Berberidaceae*, *Elaeagnaceae*, *Moraceae* and *Rosaceae* of the gene pool collection of the Educational, Research and Production Laboratory "Genetic Resources, Introduction and Breeding of Rare Fruits and Ornamentals" of the National University of Life and Environmental Sciences of Ukraine have been described. A new combination \times *Tormariosorbus liljeforsii* (T.C.G.Rich) Mezhenkyj has been proposed.

PREFACE TO THE ENGLISH EDITION

Plant genetic resources play an important role in ensuring the food, economic, environmental, and social security of humankind. They are an integral part of agricultural biodiversity. Fruit crops and some of their wild relatives with valuable traits are important sources of nutrients for people now and in the future. In many fruit-growing regions of the world, crop production is drastically affected by abiotic and biotic stresses. New cultivars of traditional crops, rare fruits, and wild relatives can help improve food resources and fruit growing is a significant driver of economic growth. The ornamental characteristics of fruit plants provide aesthetic satisfaction to people.

The translation of this book into English will make plant resources more accessible to many interested people around the world. The translation initiative belongs to Dr. Kim Hummer, a retired Research Leader, genebank curator, and well-known expert in the fields of horticulture, plant breeding, and genetic resources. We are grateful to her for donating her time, knowledge, experience, and hard work to ensure the production of what is essentially a new book.

The original book, which is the first part of the planned complete description of our collections, has been reorganized. The descriptions of the accessions are arranged in alphabetical order of the Latin names of the families and species within each crop. English species names and the etymology of cultivar names have been added to the text.

We hope that this publication will be a useful source of reference for both professional and amateur gardeners.

Volodymyr Mezhenkyj and Liudmyla Mezhenka

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INTRODUCTION

“The frustration comes from realizing how many of the named cultivars are lost for forever and the hundreds more very close to extinction. New management, private or public, rarely shares the original leader’s zeal. Collections tend to get eliminated by blade, plow, weed, neglect, or fire before they are offered to knowledgeable parties – even when they might benefit the new manager/owner to a very substantial sum of money and prestige.

If I had a dollar for every time a great cultivar selector or breeder left this earth with mostly unlabeled, unmapped, and undocumented plants as his or her legacy, I’d give away this set of books with 24K gold leaf trim and titanium bindings free of charge. If I had another dollar for every fool administrator of something who destroyed a real pioneer’s records, maps, and plowed under their priceless stock, I’d add three layers of platinum leaf to each binding with the title formed of 1 carat rubies”.

(Laurence C. Hatch, *Cultivars of Woody Plants*, 2007)

The great biodiversity of Ukrainian plants is our national treasure. The collection, comprehensive study, conservation, enhancement, and efficient, and rational use of plant resources is one of the foundations of economic and social stability and sustainable development of the country. Introduction and breeding are important tasks that enrich the diversity of plant resources, in general, and increase the cultural forms available for agricultural use. Collections of plant genetic resources are a significant source of potentially useful genes.

Trees and shrubs with edible fruits and ornamental properties are important for the national economy. The development of crop production, including horticulture, depends, in particular, on the cultivation of new plants, which gives agricultural production stability, increases its productivity, reduces material and energy consumption, improves the environment, and expands the raw material base of various branches of processing industry, and increases the variety of products. The cultivation of crops with a high content of biologically active compounds improves the quality and nutritional value of garden produce and processed products and contributes to the nation’s health.

Rare fruits have not been sufficiently studied in many respects. It is necessary to select the best varieties and forms for industrial and amateur fruit growing. The development of ornamental gardening and the growing demand for landscaping and new exotic plants also require expanding and updating the assortment. The collection facilitates diverse breeding work and further dissemination of introduced species and varieties.

First, we present the history of genetic resource collections and the result of breeding work with rare fruits and ornamentals. Then the main part of the monograph consists of an orderly description of the accessions studied in the Educational, Research and Productive Laboratory, “Genetic Resources, Introduction and Breeding of Rare Fruits and Ornamentals,” located at the Agronomic Research Station of the National University of Life and Environmental Sciences of Ukraine (Pshenychne Village, Bila Tserkva District, Kyiv Region). The description of promising accessions is made according to the following sequence: the Latin and English names of the family and genus, the name of the crop, and a brief plant description is provided. Then, the foreign

and Ukrainian literary sources, including scientific and popular science publications by the authors, are presented.

Within the family, the genera are arranged by Latin names according to the Latin alphabet. The Latin name of the family and genus is followed by the number of the National Center for Plant Genetic Resources of Ukraine (NCPGRU); collection number of the National University of Life and Environmental Sciences of Ukraine (NUBiPU) according to the specimen registration journal; Latin, English, and Ukrainian botanical names of the taxon, Ukrainian name of the crop, accession name, date of entry of the accession into the collection, donor institution or individual who provided the specimen, and geographical location from which the specimen was obtained. If available, the name of the breeders who developed the cultivar or selected the accession or name of the collector, origin of the accession, the time of both flowering and fruiting, value of the accession are provided. At the bottom of the description page is a legend for the images of the accession that appear. Specimen descriptions and images are arranged so that they are placed on the same page of the book for direct linkage to the written information.

The collections were assembled through contacts with many scientists and amateur gardeners from around the world, a list of which would take several pages. Among them, we would like to mention Jim Gilbert, owner of the One Green World Nursery in USA, Dr. Helmut Pirc, a researcher at the Federal Research Institute of Horticulture in Schönbrunn at Vienna, and Austrian amateur gardeners Julian Geyer and Johannes Rabensteiner, who helped us obtain the plants we wanted.

290 specimens of *Adoxaceae* (*Sambucus*, *Viburnum*); *Berberidaceae* (*Berberis*); *Elaeagnaceae* (*Elaeagnus*, *Hippophaë*, *Shepherdia*); *Moraceae* (*Morus*); *Rosaceae* (*Amelanchier*, *×Amelasorbus*, *Aria*, *Aronia*, *Chaenomeles*, *×Chamaearia*, *Chamaemespilus*, *×Chamariosorbus*, *Crataegus*, *×Cydolus*, *Malus*, *Prunus*, *×Pyraria*, *×Pyrulus*, *×Pyromeles*, *×Pyronia*, *Pyrus*, *Rosa*, *×Sorbaronia*, *×Sorbocotoneaster*, *Sorbus*, *×Sorbopyrus*, *Sorbus*, *×Tormaria*, *×Tormariosorbus*, *Torminalis*) have been described in the book.

HISTORY OF THE COLLECTING GERMPLASM AND BREEDING OF RARE FRUITS AND ORNAMENTALS

The development of crop production, including horticulture, depends, in particular, on the introduction of new plants. In the last century, successful efforts were made to domesticate blueberries, cranberries, kiwifruit, sea buckthorn, honeysuckle, and other fruit plants. The range of apple, currant, gooseberry, and raspberry varieties has been significantly improved based on wild species. Interspecific and interspecific hybridization has expanded new fruit crops, including rootstocks, to horticultural production (Mezhenskij and Mezhenskaya, 2002; Mezhenskyj, 2011b).

The natural flora of Ukraine includes about 250 species of fruit plants, and more than 1,000 species have been introduced from abroad. Forty-six species and interspecific hybrids are considered economically important. The nutritional value and suitability for use as the rootstock of many other species, especially introduced ones, requires close study (Mezhenskij, 1993; Mezhenskyj, 2008, 2018b).

Traditional Ukrainian industrial horticulture is a set of fruit crops that was developed by the middle of the last century: apple, pear, sour cherry, sweet cherry, apricot, plum, peach, strawberry, raspberry, black currant, red currant, gooseberry, grape, and walnut. Crops that have been added to the zoned assortment at a later date than this should be considered as rare fruits. In recent decades, the crop and varietal composition of fruits in Ukraine has changed significantly. The number of rare fruits has surpassed traditional ones and continues to grow. This improvement and expansion of the range of fruit crops ensures further development of horticulture. Due to their valuable biochemical composition, the fruits of non-traditional crops are used for fresh consumption or as raw materials for processing. Due to their greater resistance to weather extremes, pests, and pathogens, new crops are in line with organic production. The success of introducing fruit plants into culture depends on the identification of unique genotypes. This involves collecting and studying the genetic resources of fruit plants and conducting appropriate breeding work (Mezhenskij, 2007, 2009; Mezhenskyj, 2010a, 2017, 2018a, 2018b, 2019a; Mezhenskyj and Mezhenska, 2011; Mezhenskij and Mezhenskaya, 2012, 2013).

V.M. Mezhenskyj working with L.O. Mezhenska started collecting rare or non-traditional fruit crops from the first years of their work at the Bakhmut Experimental Station of Nurseries Cultivation of the Institute of Horticulture of the National Academy of Agrarian Sciences of Ukraine (former the Donetsk Experimental Horticultural Station/Artemivsk Experimental Station of Nurseries Cultivation). They were sent to this station as young specialists after graduating from Donetsk National University (former Donetsk State University). In the first decade of their work, they conducted experiments on the study of rare fruit crops (Experiment 10: 1981-1985; Section 01.12: 1991) and experiments on the breeding and varietal study of sea buckthorn (Section 05.12: 1980-1990) and Japanese quince (Section 05.13: 1982-1990). After Ukraine gained its independence, the National Center for Plant Genetic Resources of Ukraine was established at the V. Ya. Yuriev Institute of Plant Industry of the National Academy of Agrarian Sciences of Ukraine.

In 1992, the collection of rare fruits became part of the National Genetic Bank of Plant Resources of Ukraine. The Experimental Station was entrusted with the responsibility of maintaining the collection, and V.M. Mezhenskyj was appointed its

curator. During these years, the experiment "Collection of non-traditional crops" (section 01.17, then 6.17: 1991-1995) and breeding experiments with Japanese quince (section 01.14: 1992-1994), sea buckthorn (section 0.15: 1992-1995), rowan (section 01.16: 1993-1994), plum (section 01.06: 1992-1995) were carried out; in the next five years – experiments on the formation and study of the gene pool of non-traditional fruit crops (section 01.15; 01.14: 1996-2000), plum breeding (experiment 01.05: 1996), breeding of non-traditional crops – Japanese quince, sea buckthorn, and rowan (section 01.16; 0.15: 1996-2000). At the same time, experiments were conducted on technologies of reproduction and cultivation of non-traditional crops.

In 2000, the collection of 43 rare fruits included 820 accessions. The first Ukrainian variety of sea buckthorn 'Solodka Zhinka' (1999), the world's first fruit varieties of Japanese quince 'Kalif', 'Nika', 'Nikolai', 'Nina' (2000), the variety of cornelian cherry 'Bylda' (2000) and the first varieties of North American hawthorn 'Zbigniew', 'Liudmyl', and 'Shamil' (2001) were registered (Mezhenska and Mezhenskyj, 2013; Mezhenskyj, 2017, 2018a, 2021).

The success of the breeding work was largely due to the unique collection of rare fruits created by the breeder himself. Breeders must have hybrid stocks of adequate size available, which requires, among other things, significant areas under breeding plantations. This is especially true for fruit plant species with a long juvenile period and large feeding areas. In this respect, our Research Station in Donbas had significant advantages over most similar institutions in Ukraine. The Experimental Division of Research Station with a thousand-hectare profitable orchard and nursery, where millions of units of strawberries, fruits, and ornamentals were grown, provided a strong developmental base. Almost 10 hectares were allocated for planting non-traditional fruit crops, which allowed the growing and screening of tens of thousands of hybrids (Mezhenskyj, 1996, 2010b, 2011a, 2012; Mezhenskij, 2005; Mezhenskyj and Mezhenska, 2015).

In the difficult times of the structural and economic crisis of the early 2000s, ambiguous processes of reorganization of the Research Station took place, which led to the actual destruction of the scientific institution. In these conditions, it was extremely important to preserve the collections of the national gene pool, which were scattered among three legal entities, whose management was concerned with basic survival in the economic crisis and the organization of their affairs.

The gene pools were moved four times, but they were not only preserved but also significantly expanded. The composition of the gene pool of rare fruits was brought to 1259 samples of 316 species, subspecies, varieties and hybrids of 61 genera of 16 plant families. The largest number of accessions was represented by: Japanese quince (278 accessions), hawthorn (109), apple (90), rowan (60), plum (65), sea buckthorn (49), cherries (48), barberry (43), bird cherry (39), pear (38), Manchu cherry and Bessey cherry (32), apricot (30), and quince (30 samples). They consisted of breeding varieties of Ukrainian and foreign origin, local varieties and forms, hybrids, and wild relatives. Each of the accessions was certified and a catalog was published (Mezhenskyj, 2006), which contained the full composition of the collection. At this time, the scientists of the institution performed tasks 01.02.02 "Formation of a collection of genetic resources of non-traditional crops", 01.13.01 "Breeding of Japanese quince", 01.13.02 "Breeding of sea buckthorn", 01.14.10 "Variety study of non-traditional fruit crops", 05.01.01 "To continue collecting and studying the collection of ornamental forms of trees and shrubs to select the best ones", 08.02.36-017 "To form basic and characteristic collections of

rare fruit crops, ornamental trees and shrubs” of the UAAS scientific and technical programs “Horticulture and Berry Growing” and “Plant Genetic Resources.”

In 2008, the National Agrarian University of Ukraine changed its name to the National University of Life and Environmental Sciences of Ukraine (NUBiPU, or at times NULESU), which was well aligned with the direction of research on rare fruits. In 2009, V.M. Mezhenskyj with L.O. Mezhenska joined the NUBiPU. In 2010-2012, they carried out research on the topic № 110/353-pr “Breeding of non-traditional fruit and ornamental crops with phytochemical and medicinal properties and development of technologies for the natural production of horticultural products in the Forest-Steppe of Ukraine”. The research aimed to improve the existing assortment of rare fruits and ornamentals in Ukraine through introduction and breeding, taking into account the needs of modern intensive horticulture.

Meanwhile, at the Artemivsk Experimental Station of Nurseries Cultivation and its Experimental Farm, the process of destruction of the collected collections gained momentum. This required a prompt response to maximize the preservation of plant resources of national importance. Using the resources of their private nursery and a specially established nursery at the O.V. Muzychenko Scientific and Experimental Farm “Velykosnitynske” of the NUBiPU, the project executors grew the necessary planting material, which in 2011 began to lay a new gene pool garden of non-traditional crops at the Agronomic Research Station of the NUBiPU.

Thanks to intensive introduction work, 17 collections were formed in two years: hawthorn, rowan and chokeberry, service berry, ornamental apple, pear, Japanese quince, diploid plums, bird cherry, ornamental plum, Manchu cherry, Sakura, European cranberry bush, elderberry, barberry, sea buckthorn, cinnamon rose and walnut. They formed the core of the general collection of rare fruits and ornamentals at the NUBiPU. Another 14 crops were represented by a few specimens, so they did not form separate collections. In the next triennium (2013-2015), the introduction work was carried out under project No. 110/466-p “Introduction, breeding and development of microclonal propagation technologies for non-traditional fruit and ornamental crops in the Forest-Steppe of Ukraine”. The collection was expanded to 1183 accessions, including 551 varieties and selected forms. It consisted of 283 species and interspecific hybrids belonging to 52 genera of 16 families of flowering plants (Mezhenskyj, 2014; Mezhenskyj et al., 2014; Mezhenskyj and Mezhenska, 2016; Mezhenska et al., 2018).

Given the growing interest in the cultivation of rare fruits, sea buckthorn cultivars ‘Revolution’ (2019), ‘Lasunka’ and ‘Papa’ (2023), chokeberry ‘Vseslava’ (2020), Japanese quince ‘Gold Calif’, ‘Maksym’, and ‘Tamara’ (2021), service berry ‘Radoslav’ (2021), cinnamon rose ‘Volonter’ (2022), and dog rose ‘Ukrainska Bezshypna’ (2022) were included to the State Register of Plant Varieties of Ukraine. Promising candidates for cultivars have been selected (Mezhenskyj et al., 2012; Mezhenskyj, 2019b, 2021, 2022).

In 2021-2022, the theme No. BF/37-2021 “Solving the problem of ensuring food security by preserving and expanding the gene pool of grain and fruit crops” was implemented, which contributed to the further replenishment and preservation of the gene pool collection of niche fruit crops of the Educational, Research and Production Laboratory of Genetic Resources, Introduction and Breeding of Rare Fruits and Ornamentals, located at the Agronomic Research Station of the NUBiPU. Further breeding work based on the use of genetic resources of this laboratory is ongoing. In

particular, in 2022, NUBiPU became the owner of patents for varieties of elderberry 'Chorna Ruta', cinnamon rose 'Spalakh', and ornamental apple tree 'Oksana'.

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ADOXACEAE – SAMBUCUS

MOSCHATTEL FAMILY – ELDERBERRY

ELDERBERRY

The flowers and fruits of elderberry, *Sambucus nigra*, are used primarily for medicinal purposes and as food. The plant also has decorative value (Andriienko and Roman, 1991; Mezhenskyj, 2015). Flowers and fruits are a source of many compounds, including those with high biological activity (Veberic et al., 2009; Schmitzer et al., 2012; Sidor and Gramza-Michałowska, 2015; Silva et al., 2017). Due to this, elderberry has been introduced into commercial cultivation in many countries (Zeitlhöfler, 2002; Melnyk, 2004; Charlebois et al., 2010).

The growing demand for elderberry products will increase its cultivation in Ukraine and the development of varietal culture (Stadnytska et al., 2019). Surveys of natural populations have revealed promising forms (Kolisyk and Klymenko, 2006, 2007; Mezhenskyj et al., 2012; Fedko et al., 2021). The first Ukrainian black elderberry cultivar of our breeding ‘Chorna Ruta’ was registered in 2022 (Ministry of Agrarian Policy of Ukraine, 2023).

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Sambucus nigra 'Allesø'

National catalog number: UN7000012

Collection number: 03090

Botanical name in Latin: *Sambucus nigra* L.

Botanical name in English: Black elderberry

Botanical name in Ukrainian: Buzyna chorna

Crop name in Ukrainian: Buzyna

Accession name: 'Allesø' ('Alleso') (toponym in Southern Denmark)

Date of introduction: 18.09.2009

Donor: One Green World Nursery, Molalla, Oregon, USA

Breeder: Jim Gilbert (collector)

Origin: A variety of Danish breeding, selected in natural populations

Time of flowering: June

Time of fruit ripening: August

Value: The variety is listed in the Bundessortenamt (1999). Medium-sized bush; flowers in loose circles; fruits from small to medium in size; medium early ripening; ripening is uniform; fruits are sour, aromatic, and tasty



a



b



c

Figure 1. *Sambucus nigra* 'Alleso' a) branch of fruiting cymes, b) plant with fruit, c) pendulous fruit cymes

Sambucus nigra 'Chorna Ruta'

National catalog number: UN7000012

Collection number: 04761

Botanical name in Latin: *Sambucus nigra* L.

Botanical name in English: Black elderberry

Botanical name in Ukrainian: Buzyna chorna

Crop name in Ukrainian: Buzyna

Accession name: 'Chorna Ruta' (means "black ruta*")

Date of introduction: 10.09.2019

Donor: National University of Life and Environmental Sciences of Ukraine, Kyiv, Ukraine

Breeders: Volodymyr Mezhenkyj, Liudmyla Mezhenka and Artur Likhanov

Origin: Selected from local elderberry populations in Pshenychne village, Kyiv Region

Time of flowering: June

Time of fruit ripening: August

Value: In 2022, this cultivar was included in the State Register of Plant Varieties of Ukraine. It was selected for the high content of rutin in flowers

*Note: Ukrainian folklore name "ruta" refers to several species of plants, including *Ruta graveolens*, or common rue, in the rue or citrus (*Rutaceae*) family. This plant contains a high concentration of the glycoside of rutin (rutinoside)

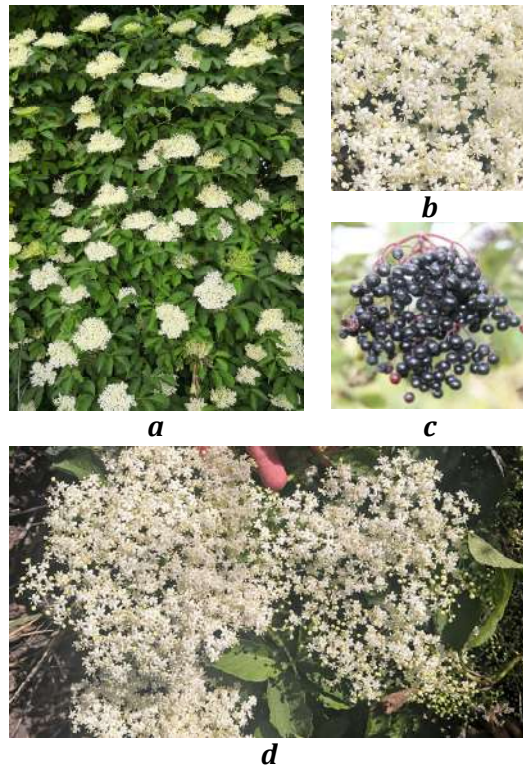


Figure 2. *Sambucus nigra* 'Chorna Ruta' a) flowering cymes, b) flowers closeup, c) fruiting cyme, d) large, showy paniced cyme

ADOXACEAE – VIBURNUM

MOSCHATEL FAMILY – CRANBERRY BUSH

EUROPEAN CRANBERRY BUSH

Viburnum opulus is one of the most popular woody species of the Ukrainian flora, widely used as an ornamental, medicinal and fruit plant (Andriienko and Roman, 1991; Mezhenkij, 2015; Demchenko, 2016; Mezhenkij and Mezhenka, 2016). Successful breeding efforts are underway in Ukraine to domesticate European cranberry bush and cultivate it commercially (Bozhkova, 1989; Kisilivskiy, 1994; Mezhenkij et al., 2012; Moskalets et al., 2018, 2019, 2020, 2021; Frantsishko et al., 2019; Postolenko and Tykhyi, 2019; Lytovchenko et al., 2021).

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Viburnum opulus 'Koralova'

National catalog number: UN9400022

Collection number: 03493

Botanical name in Latin: *Viburnum opulus* L.

Botanical name in English: Cranberry tree, European cranberry bush, Guelder rose, High Cranberry, or Water elder

Botanical name in Ukrainian: Kalyna klenova, or Kalyna zvychaina

Crop name in Ukrainian: Kalyna

Accession name: 'Koralova' (means "coral")

Date of introduction: 02.12.2011

Donor: L. P. Symyrenko Research Station of Pomology of the Institute of Horticulture of the National Academy of Sciences of Ukraine, Mliiv, Cherkasy Region, Ukraine

Breeder: Svitlana Bozhkova

Origin: Selected from local populations of European cranberry bush

Time of flowering: May to June

Time of fruit ripening: End of August

Value: The variety was included in the State Register of Plant Varieties of Ukraine in 2001, recommended for cultivation in the Forest-Steppe and Polissya. Fruit weight 1.0-1.2 g; flesh is of medium density, sweet, bitter



Figure 3. *Viburnum opulus* 'Koralova' a) fruit cymes, b) plant in the fall, c) fruit cymes and autumn leaves, d) fruit closeup

Viburnum opulus 'Krasnyj Korall'

National catalog number: UN9400059

Collection number: 03436

Botanical name in Latin: *Viburnum opulus* L.

Botanical name in English: Cranberry tree, European cranberry bush, Guelder rose, High Cranberry, or Water elder

Botanical name in Ukrainian: Kalyna klenova, or Kalyna zvychaina

Crop name in Ukrainian: Kalyna

Accession name: 'Krasnyj Korall' (means "red coral")

Date of introduction: 15.11.2011

Donor: I. V. Michurin All-Russian Research Institute of Horticulture, Michurinsk, Tambov Region, Russia

Breeder: -

Origin: Selected from natural populations of European cranberry bush

Time of flowering: May to June

Time of fruit ripening: September

Value: The variety is productive; fruits are of medium size. The flesh is bitter

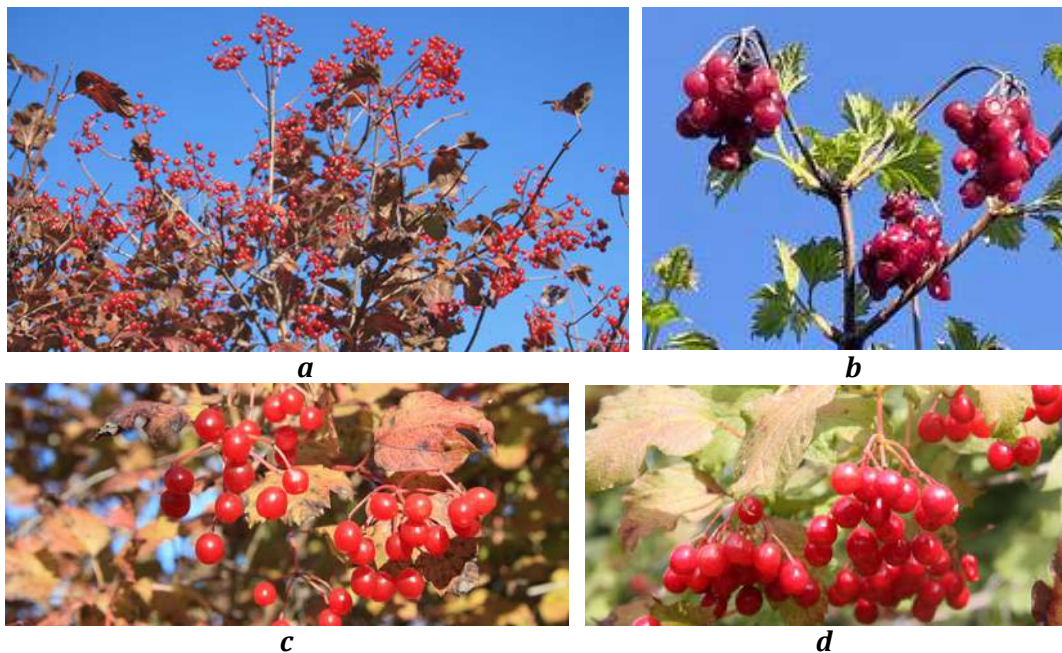


Figure 4. *Viburnum opulus* 'Krasnyj Korall' a) fruit cymes, b) last year's fruit in the spring at the beginning of the growing season, c) fruit cymes, d) fruit cymes closeup

Viburnum opulus 'Kyivska Solodka'

National catalog number: UN9400058

Collection number: 02690

Botanical name in Latin: *Viburnum opulus* L.

Botanical name in English: Cranberry tree, European cranberry bush, Guelder rose, High Cranberry, or Water elder

Botanical name in Ukrainian: Kalyna klenova, or Kalyna zvychaina

Crop name in Ukrainian: Kalyna

Accession name: 'Kyivska Solodka' (means "sweet of Kyiv")

Date of introduction: 26.03.2005

Donor: Vladimir Svechnikov, Donetsk, Rostov Region, Russia

Breeder: Vladimir Svechnikov (collector)

Origin: Selected from natural populations of European cranberry bush

Time of flowering: May to June

Time of fruit ripening: September

Value: Fruits are characterized by reduced bitterness



a



b



c

Figure 5. *Viburnum opulus* 'Kyivska Solodka' a) fruit cymes, b) fruit cyme closeup, c) fruit cymes

Viburnum opulus 'Pamjati Valentiny'

National catalog number: UN9400008

Collection number: 02856

Botanical name in Latin: *Viburnum opulus* L.

Botanical name in English: Cranberry tree, European cranberry bush, Guelder rose, High Cranberry, Water elder

Botanical name in Ukrainian: Kalyna klenova, Kalyna zvychaina

Crop name in Ukrainian: Kalyna

Accession name: 'Pamjati Valentiny' (means "in memory of Valentina")

Date of introduction: 03.09.2007

Donor: Institute of Fruit Growing of the Academy of Sciences of Belarus, Samokhvalovichi, Minsk Region, Belarus

Breeders: Anatolij Radiuk, Anna Bachylo and Tat'yana Andrushkevich

Origin: Selected from local populations of European cranberry bush

Time of flowering: May to June

Time of fruit ripening: September

Value: Including in the State Register of Varieties of Belarus in 2012

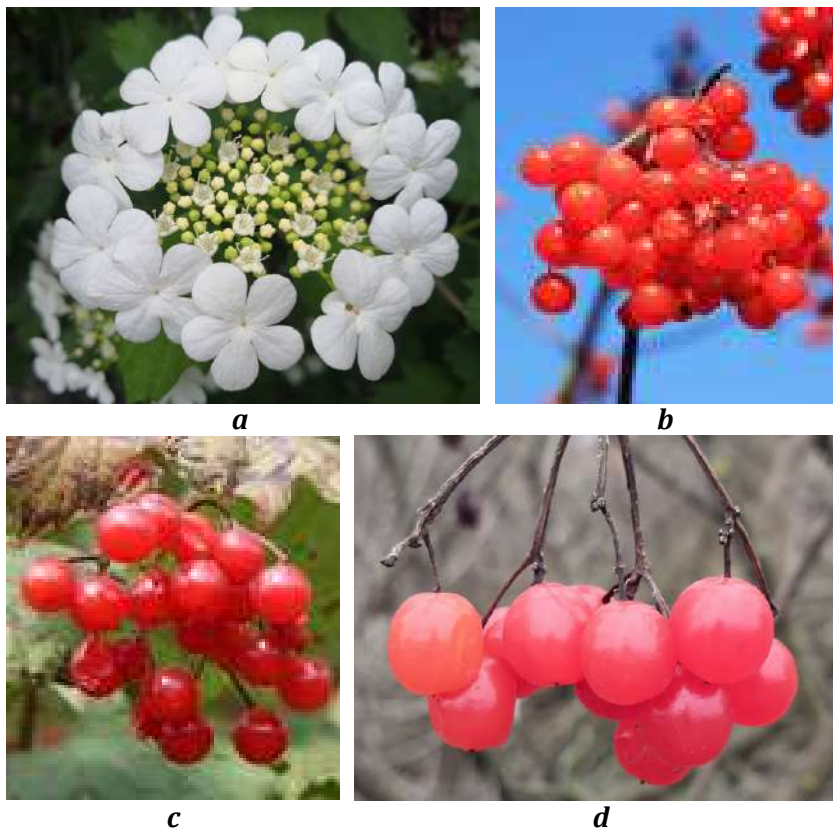


Figure 6. *Viburnum opulus* 'Pamjati Valentiny' a) compound flowering umbel, b) fruit cluster, c) fruit cluster, d) fruit closeup

Viburnum opulus 'Rubinova'

National catalog number: UN9400023

Collection number: 03494

Botanical name in Latin: *Viburnum opulus* L.

Botanical name in English: Cranberry tree, European cranberry bush, Guelder rose, High Cranberry, or Water elder

Botanical name in Ukrainian: Kalyna klenova, or Kalyna zvychaina

Crop name in Ukrainian: Kalyna

Accession name: 'Rubinova' (means "ruby")

Date of introduction: 02.12.2011

Donor: L. P. Symyrenko Research Station of Pomology of the Institute of Horticulture of the National Academy of Sciences of Ukraine, Mliiv, Cherkasy Region, Ukraine

Breeders: Svetlana Bozhkova and Taras Tykhyi

Origin: Selected from local populations of European cranberry bush

Time of flowering: May-June

Time of fruit ripening: End of August

Value: The variety was included in the State Register of Plant Varieties of Ukraine in 2001; it is recommended for cultivation in the Forest-Steppe and Polissya. Early ripening period. Fruit weight 1.2 g; the flesh is bitter



a



b



c



d

Figure 7. *Viburnum opulus* 'Rubinova' a) fall plant with fruit, b) fruit cymes, c) fall plant with fruit, d) fruit cymes closeup

Viburnum opulus 'Sladkaja Lavrinovoj'

National catalog number: UN9400060

Collection number: 02691

Botanical name in Latin: *Viburnum opulus* L.

Botanical name in English: Cranberry tree, European cranberry bush, Guelder rose, High Cranberry, or Water elder

Botanical name in Ukrainian: Kalyna klenova, or Kalyna zvychaina

Crop name in Ukrainian: Kalena

Accession name: 'Sladkaja Lavrinovoj' (means "Lavrinova's sweet")

Date of introduction: 26.03.2005

Donor: Vladimir Svechnikov, Donetsk, Rostov Region, Russia

Breeder: Vladimir Svechnikov (collector)

Origin: Selected from natural populations of European cranberry bush

Time of flowering: May to June

Time of fruit ripening: September

Value: Fruits are characterized by reduced bitterness

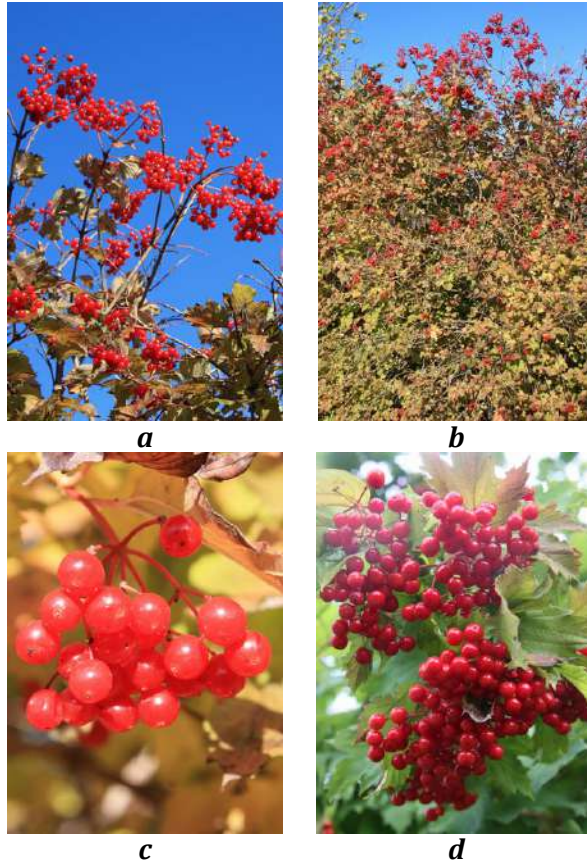


Figure 8. *Viburnum opulus* 'Sladkaja Lavrinovoj' a) fruit cymes, b) plant with fruit in the fall, c) fruit cyme closeup, d) fruit cymes

Viburnum opulus 'Sladkaja Urozhajnaja'

National catalog number: UN9400061

Collection number: 02692

Botanical name in Latin: *Viburnum opulus* L.

Botanical name in English: Cranberry tree, European cranberry bush, Guelder rose, High Cranberry, or Water elder

Botanical name in Ukrainian: Kalyna klenova, or Kalyna zvychaina

Crop name in Ukrainian: Kalyna

Accession name: 'Sladkaja Urozhajnaja' ('Sladkaya Urozhajnaya') (means "sweet high-yielding")

Date of introduction: 26.03.2005

Donor: Vladimir Svechnikov, Donetsk, Rostov Region, Russia

Breeder: Vladimir Svechnikov (collector)

Origin: Selected from natural populations of European cranberry bush

Time of flowering: May to June

Time of fruit ripening: September

Value: Fruits are characterized by reduced bitterness

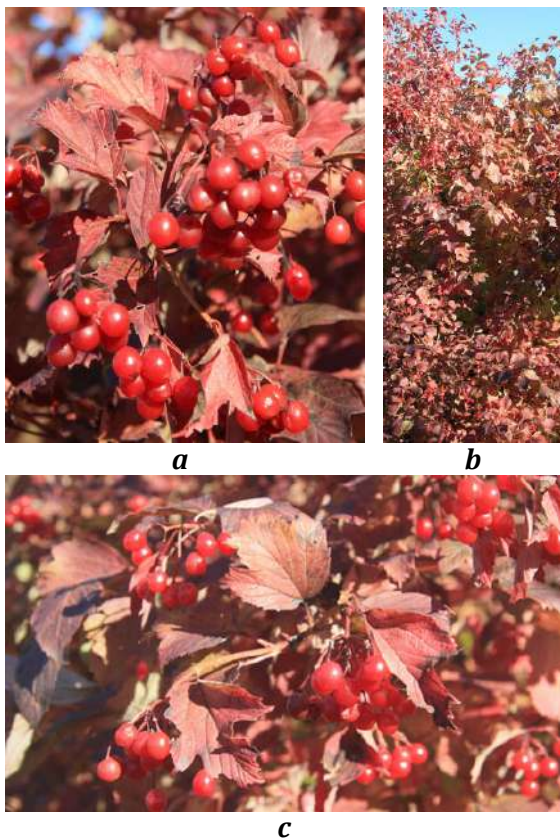


Figure 9. *Viburnum opulus* 'Sladkaja Urozhajnaja' a) fruit cymes and leaves in the fall, b) plant with fruit in the fall, c) fruit and leaves

Viburnum opulus 'Velykoplidna'

National catalog number: UN9400021

Collection number: 03492

Botanical name in Latin: *Viburnum opulus* L.

Botanical name in English: Cranberry tree, European cranberry bush, Guelder rose, High Cranberry, or Water elder

Botanical name in Ukrainian: Kalyna klenova, or Kalyna zvychaina

Crop name in Ukrainian: Kalyna

Accession name: 'Velykoplidna' (means "large-fruited")

Date of introduction: 02.12.2011

Donor: L. P. Symyrenko Research Station of Pomology of the Institute of Horticulture of the National Academy of Sciences of Ukraine, Mliiv, Cherkasy Region, Ukraine

Breeder: Svitlana Bozhkova

Origin: Selected from local populations of European cranberry bush

Time of flowering: May to June

Time of fruit ripening: September

Value: The variety was included in the State Register of Plant Varieties of Ukraine in 2001, recommended for cultivation in the Forest-Steppe and Polissya. Medium ripening period. Fruit weight 1.3 g; flesh sweet, bitter



a



b



c



d

Figure 10. *Viburnum opulus* 'Velykoplidna' *a*) fruit cymes, *b*) fruit cymes, *c*) fruit closeup, *d*) fruiting plant in the fall

Viburnum opulus 'Zarnitsa'

National catalog number: UN9400057

Collection number: 03435

Botanical name in Latin: *Viburnum opulus* L.

Botanical name in English: Cranberry tree, European cranberry bush, Guelder rose, High Cranberry, or Water elder

Botanical name in Ukrainian: Kalyna klenova, or Kalyna zvychaina

Crop name in Ukrainian: Kayina

Accession name: 'Zarnitsa' (means "distant lightning, distant thunderstorm")

Date of introduction: 15.11.2011

Donor: I. V. Michurin All-Russian Research Institute of Horticulture, Michurinsk, Tambov Region, Russia

Breeders: Ida Kalinina, Olga Nikonova and Zarya Zholobova

Origin: Selected from natural populations of European cranberry bush in Siberia at M. A. Lisavenko Research Institute of Horticulture of Siberia

Time of flowering: May to June

Time of fruit ripening: September

Value: The variety was included in the State Register of Breeding Achievements of the Russian Federation in 2000



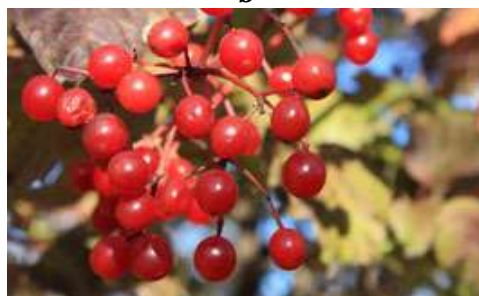
a



b



c



d

Figure 11. *Viburnum opulus* 'Zarnitsa' a) fruit cymes, b) fruit cymes, c) fruit cymes closeup, d) fruit cymes

BERBERIDACEAE – BERBERIS

BARBERRY FAMILY– BARBERRY

BARBERRY

The genus *Berberis*, interpreted in a narrow or broad sense, contains ~500 species together with hybrids (*sensu stricto*) or more than 600 ones (*sensu lato*) (Ahrendt, 1961). Barberrry is known for its medicinal and decorative properties and has long been cultivated as a fruit plant (Arifkhanov and Slavkina, 1981; Mezhenskij, 2005; Mezhenskij et al., 2014). We have developed a number of promising genotypes with large fruits of improved taste (Mezhenskij, 2006; Mezhenskij, 2006, 2007, 2019). Seedless forms are especially valued (Tehranifar, 2003; Mezhenskij, 2010; Mezhenskij, 2014). Since common barberry is an intermediate host of cereal linear rust, its cultivation is limited, and in some countries natural stands have been destroyed. However, the most effective protective measures are the cultivation of resistant cereal varieties and protective fungicide treatments. In addition, the absence of an intermediate host does not affect the spread of the disease (Ishkova et al., 2002). Yellow rust on bread, which is an equally dangerous disease, is not related to barberry (Sokolov, 1952). Introduced barberry species are more resistant to rust.

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Berberis nummularia 'Tsukerka'

National catalog number: UT4800046

Collection number: 01569

Botanical name in Latin: *Berberis nummularia* Bunge

Botanical name in English: Moneyleaf barberry

Botanical name in Ukrainian: Barbarys monetnyi

Crop name in Ukrainian: Barbarys

Accession name: 'Tsukerka' (means "candy")

Date of introduction: 23.12.1994

Donor: Volodymyr Mezhenkyj, Bakhmut, Donetsk Region, Ukraine

Breeder: Volodymyr Mezhenkyj

Origin: Selected from seedlings grown from seeds obtained from Botanical Garden of Rostov State University

Time of flowering: May

Time of fruit ripening: September

Value: The accession was registered in the National Center for Plant Genetic Resources of Ukraine for late flowering and spherical fruits of good taste in 2005. The fruits are almost spherical, yellowish-red to red, weighing 0.2 g, with 2-3 seeds, 30 in racemes, sweetish, with a pleasant taste. Fruits contain 8.0% sugars, 4.0% organic acids, 20.0 mg/100 g ascorbic acid. Ripe fruits stay on the branches for a long time. A source of good taste. Ornamental, especially during the flowering and fruiting seasons



a



b



c



d

Figure 12. *Berberis nummularia* 'Tsukerka' *a*) branch with fruit, *b*) branch with fruit, *c*) branch with fruit, *d*) branch with fruit

Berberis nummularia 'Tsukerka 2'

National catalog number: UT4800080

Collection number: 04395

Botanical name in Latin: *Berberis nummularia* Bunge

Botanical name in English: Moneyleaf barberry

Botanical name in Ukrainian: Barbarys monetnyi

Crop name in Ukrainian: Barbarys

Accession name: 'Tsukerka 2' (means "candy")

Date of introduction: 23.12.1994

Donor: Volodymyr Mezhenkyj, Bakhmut, Donetsk Region, Ukraine

Breeder: Volodymyr Mezhenkyj

Origin: Selected from seedlings grown from seeds obtained from Botanical Garden of Rostov State University

Time of flowering: May

Time of fruit ripening: September

Value: Fruits are almost spherical, yellowish-red to red, weighing 0.2 g, with 2-3 seeds, sweetish, pleasant taste. Fruits contain 8.0% sugars, 3.0% organic acids, 15.0 mg/100 g ascorbic acid. Ripe fruits stay on the branches for a long time. Like 'Tsukerka', it blooms later than other cultivars and most barberry species, so it is the best pollinator for 'Tsukerka'. A source of good flavor. Ornamental, especially during the flowering and fruiting seasons

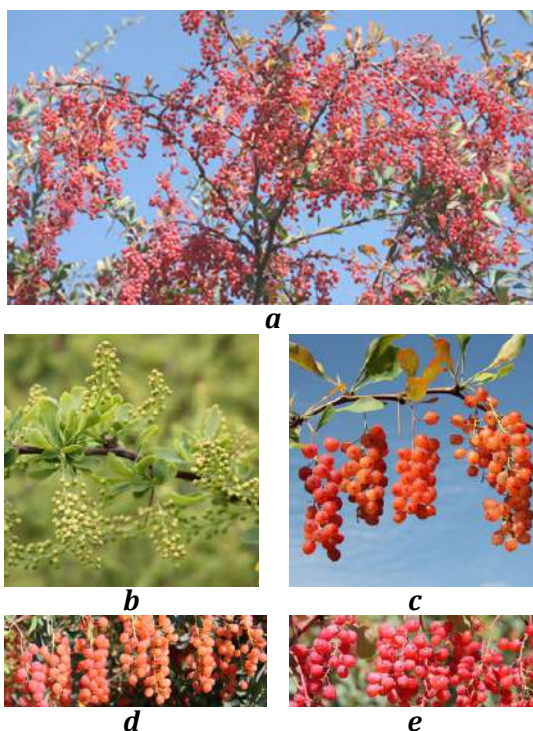


Figure 13. *Berberis nummularia* 'Tsukerka 2' a) tree with fruiting branches, b) branch with flower buds, c) branch with fruit, d) branch with fruit, e) infructescences

Berberis sp. 'Beznasinni Chervonyi'

National catalog number: UT4800029

Collection number: 01461

Botanical name in Latin: *Berberis* sp.

Botanical name in English: Barberry

Botanical name in Ukrainian: Barbarys

Crop name in Ukrainian: Barbarys

Accession name: 'Beznasinni Chervonyi' ('Beznasinnievyi Chervonyi') (means "red seedless")

Date of introduction: 12.03.1993

Donor: Volodymyr Mezhenkyj, Bakhmut, Donetsk Region, Ukraine

Breeder: Volodymyr Mezhenkyj

Origin: Selected from seedlings grown from seeds obtained from the Forest-Steppe Experimental Station as *B. nummularia* Bunge. A putative interspecific hybrid

Time of flowering: May

Time of fruit ripening: September

Value: Fruits are oblong-ovoid, red, weighing 0.05 g, without seeds, in racemes of 10-66. The fruits contain 7.7 mg/100 g ascorbic acid. Seedless forms of barberry are valued in processing, as there is no need to remove the seeds, which contain the alkaloid berberine, which gets into processed products, making them indicated for consumption by certain groups of the population, for example, pregnant women. Ornamental, especially during the flowering and fruiting seasons

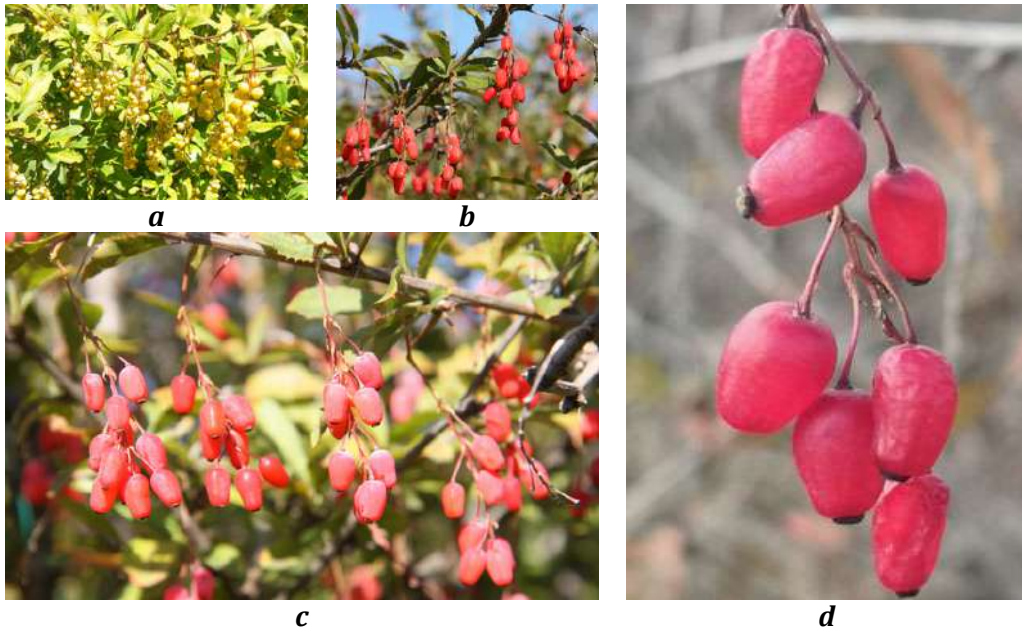


Figure 14. *Berberis* sp. 'Beznasinni Chervonyi' a) flowers, b) branch with flowers, c) branch with fruit, d) branch with fruit

Berberis sp. 'Chervonyi Veleten'

National catalog number: UT4800051

Collection number: 04393

Botanical name in Latin: *Berberis* sp.

Botanical name in English: Barberry

Botanical name in Ukrainian: Barbarys

Crop name in Ukrainian: Barbarys

Accession name: 'Chervonyi Veleten' (means "red giant")

Date of introduction: 02.01.2009

Donor: Volodymyr Mezhenkyj, Bakhmut, Donetsk Region, Ukraine

Breeder: Volodymyr Mezhenkyj

Origin: Originated from seeds obtained from Botanical Garden of Rostov State University under the name *B. iliensis* Popov. A putative interspecific hybrid.

Time of flowering: May

Time of fruit ripening: September

Value: The accession was registered in the National Center for Plant Genetic Resources of Ukraine for large red fruits in large racemes in 2005. Fruits are oblong, dark red, weighing 0.6 (0.7) g, with 4 seeds, 20-25 in racemes, sour. Fruits contain 6.0% sugars, 4.5% organic acids, 20.0 mg/100 g ascorbic acid. Ripe fruits remain on the branches for a long time. A source of large-sized fruits. Ornamental, especially during flowering and fruiting

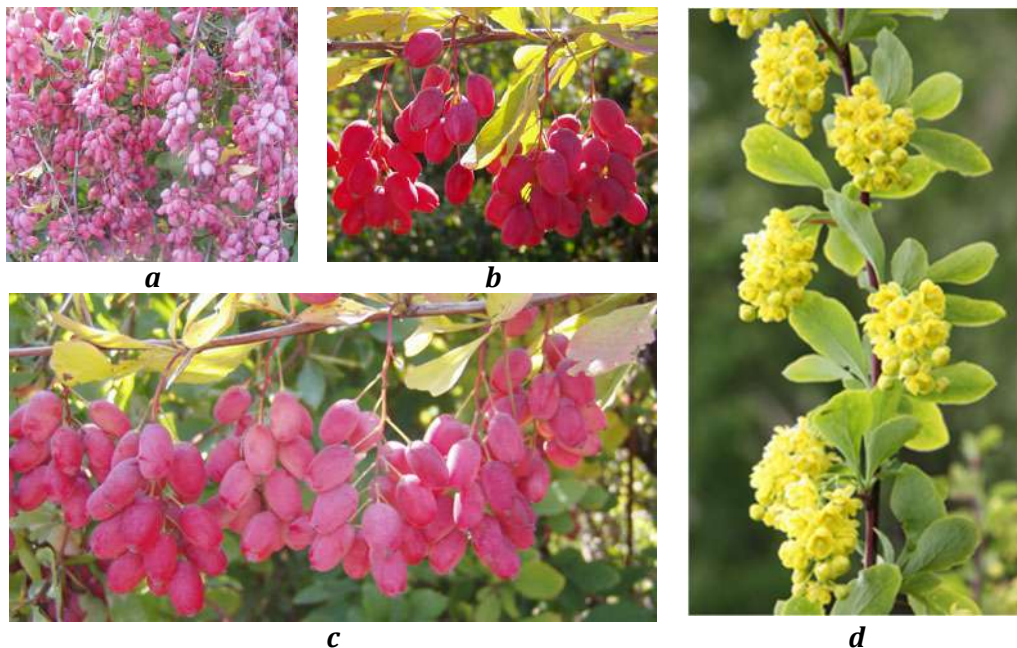


Figure 15. *Berberis* sp. 'Chervonyi Veleten' a) branch with fruit, b) branch with fruit, c) branch with fruit, d) branch with flowers

Berberis sp. 'Likhtaryk'

National catalog number: UT4800059

Collection number: 04392

Botanical name in Latin: *Berberis* sp.

Botanical name in English: Barberry

Botanical name in Ukrainian: Barbarys

Crop name in Ukrainian: Barbarys

Accession name: 'Likhtaryk' (means "lantern")

Date of introduction: 02.01.2009

Donor: Volodymyr Mezhenkyj, Bakhmut, Donetsk Region, Ukraine

Breeder: Volodymyr Mezhenkyj

Origin: Originated from seeds obtained from Botanical Garden of Rostov State University under the name *B. iliensis* Popov. A putative interspecific hybrid.

Time of flowering: May

Time of fruit ripening: September

Value: The accession was registered in the National Center for Plant Genetic Resources of Ukraine for large fruits with good taste in 2005. Fruits are flattened, red, weighing 0.5 (0.8) g, with 2 seeds, 10-14 in racemes, sweetish, pleasant taste. Fruits contain 7.2% sugars, 4.2% organic acids, 27.0 mg/100 g ascorbic acid. Ripe fruits stay on the branches for a long time. A source of large fruits with good taste. Ornamental, especially during flowering and fruiting

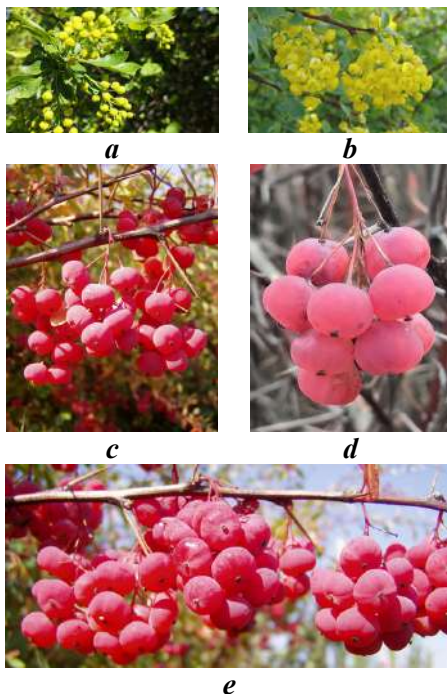


Figure 16. *Berberis* sp. 'Likhtaryk' a) branch with flower buds, b) flowers, c) branch with fruit, d) closeup branch with fruit, e) branch with fruit

Berberis sp. 'Mashkov'

National catalog number: UT4800076

Collection number: 03024

Botanical name in Latin: *Berberis* sp.

Botanical name in English: Barberry

Botanical name in Ukrainian: Barbarys

Crop name in Ukrainian: Barbarys

Accession name: 'Mashkov' (surname)

Date of introduction: 01.04.2009

Donor: Yakiv Kovalov, Sievernyi, Luhansk Region, Ukraine

Breeder: Yakiv Kovalov (collector)

Origin: -

Time of flowering: May

Time of fruit ripening: September

Value: It is characterized by black with a bluish bloom, and large, sour fruits suitable for processing. Ripe fruits stay on the branches for a long time. A source of large fruits. Ornamental, especially during the flowering and fruiting seasons



a



b



c



d

Figure 17. *Berberis* sp. 'Mashkov' *a*) flowering branches, *b*) flowers, *c*) branch with young fruit, *d*) branch with ripe fruit

Berberis sp. '14-123'

National catalog number: UT4800081

Collection number: 04397

Botanical name in Latin: *Berberis* sp.

Botanical name in English: Barberry

Botanical name in Ukrainian: Barbarys

Crop name in Ukrainian: Barbarys

Accession name: '14-123'

Date of introduction: 18.10. 2012

Donor: Volodymyr Mezhenkyj, Bakhmut, Donetsk Region, Ukraine

Breeder: Volodymyr Mezhenkyj

Origin: Seedling of 'Mashkov' from free pollination

Time of flowering: May

Time of fruit ripening: September

Value: It is characterized by black with a bluish bloom, and large, sour fruits suitable for processing. Ripe fruits stay on the branches for a long time. A source of large fruits. Ornamental, especially during flowering and fruiting

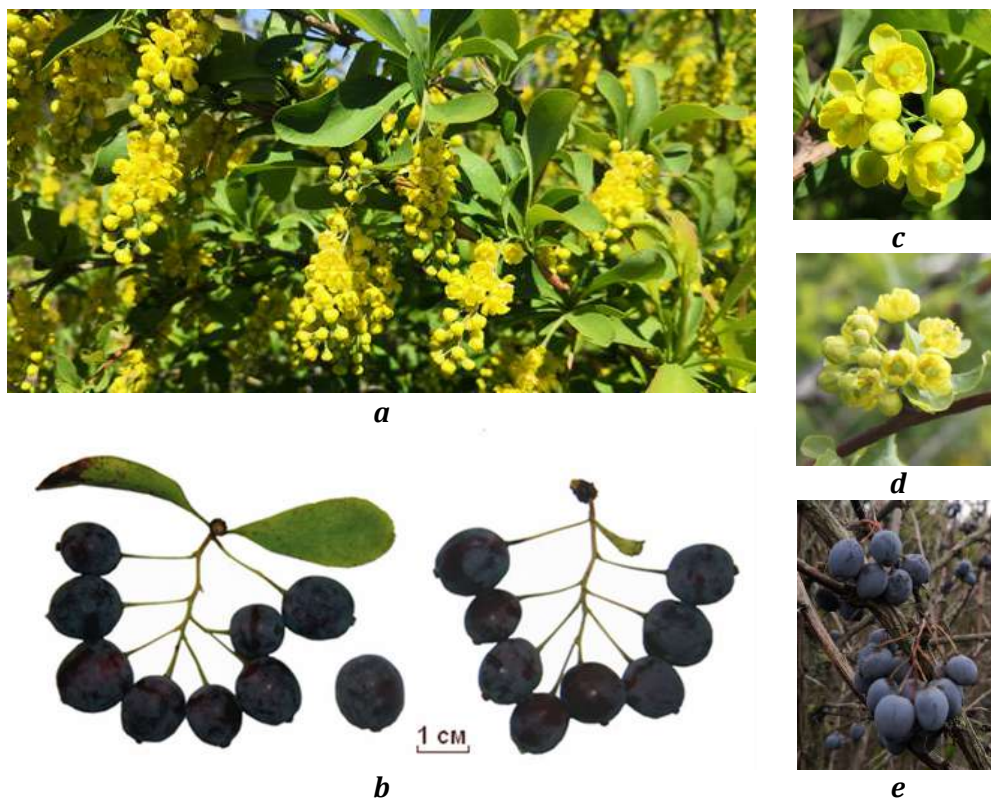


Figure 18. *Berberis* sp. '14-123' a) flowering branches, b) branches with ripe fruit, c) flowers, d) flowers, e) ripe fruit

Berberis sp. '14-133'

National catalog number: UT4800079

Collection number: 03779

Botanical name in Latin: *Berberis* sp.

Botanical name in English: Barberry

Botanical name in Ukrainian: Barbarys

Crop name in Ukrainian: Barbarys

Accession name: '14-133'

Date of introduction: 18.10.2012

Donor: Volodymyr Mezhenkyj, Bakhmut, Donetsk Region, Ukraine

Breeder: Volodymyr Mezhenkyj

Origin: Seedling of form '31-59', originating from seeds obtained from Botanical Garden of Rostov State University under the name *B. iliensis* Popov

Time of flowering: May

Time of fruit ripening: September

Value: It differs in abundant fruiting. Fruits are ellipsoidal, violet-blue, with a plague, sour. Ripe fruits remain on the branches for a long time. Ornamental, especially during flowering and fruiting

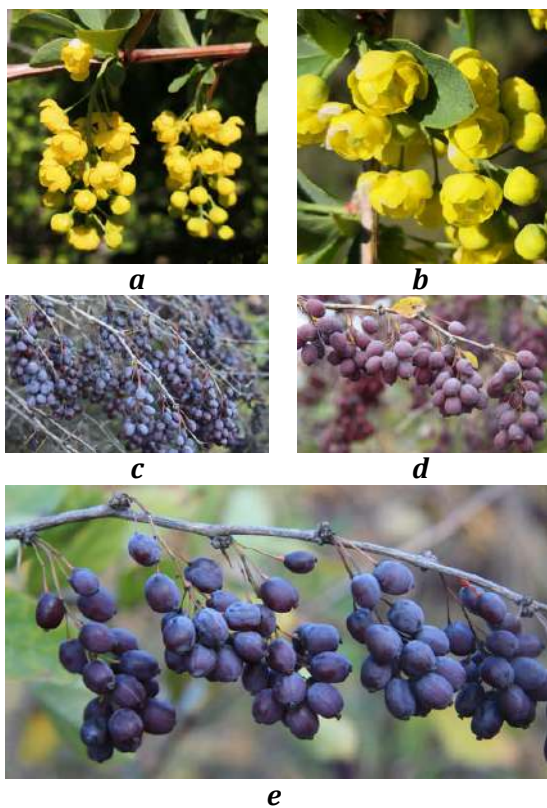


Figure 19. *Berberis* sp. '14-133' a) branch with flowers, b) flowers, c) ripe fruit, d) unripe fruit, e) branch with ripe fruit

Berberis sp. '31-62'

National catalog number: UT4800077

Collection number: 03775

Botanical name in Latin: *Berberis* sp.

Botanical name in English: Barberry

Botanical name in Ukrainian: Barbarys

Crop name in Ukrainian: Barbarys

Accession name: '31-62' ('Bilyi' – means “white”)

Date of introduction: 18.10.2012

Donor: Volodymyr Mezhenkyj, Bakhmut, Donetsk Region, Ukraine

Breeder: Volodymyr Mezhenkyj

Origin: Originated from seeds obtained from Botanical Garden of Rostov State University under the name *B. iliensis* Popov. A reliable interspecific hybrid

Time of flowering: May

Time of fruit ripening: September

Value: It is characterized by ovoid-globular sour Fruit weight 0.2 g with 3 seeds, white in shade, yellowish-pink to reddish in autumn. Ripe fruits stay on branches for a long time. Ornamental, especially during the flowering and fruiting seasons

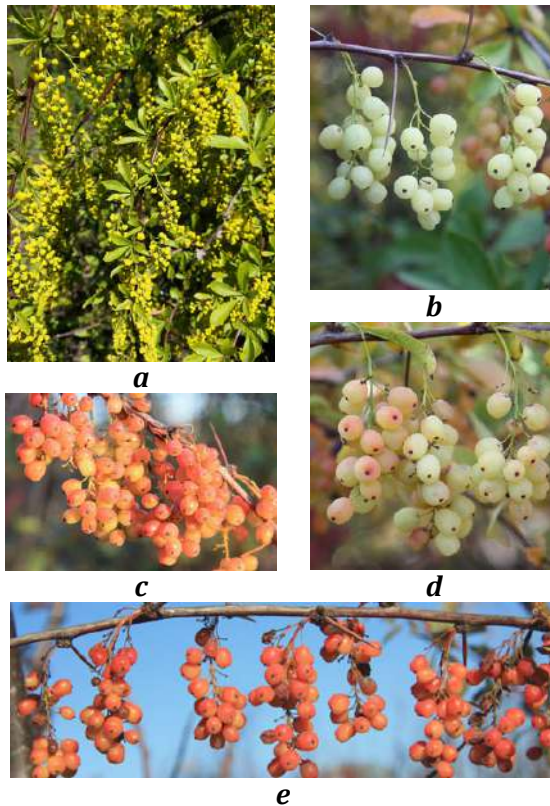


Figure 20. *Berberis* sp. '31-62' a) branch with flowers, b) branch with fruit, c) fruiting branch, d) branch with fruit, e) branch with fruit

Berberis vulgaris 'Beznasinni Zhovtyi'

National catalog number: UT4800061

Collection number: 01138

Botanical name in Latin: *Berberis vulgaris* L.

Botanical name in English: Common barberry, or European barberry

Botanical name in Ukrainian: Barbarys zvychainyi

Crop name in Ukrainian: Barbarys

Accession name: 'Beznasinni Zhovtyi' ('Beznasinnievi Zhovtyi') (means "seedless yellow")

Date of introduction: 30.02.1991

Donor: Volodymyr Mezhenkyj, Bakhmut, Donetsk Region, Ukraine

Breeder: Volodymyr Mezhenkyj

Origin: The seedless mutation found in a natural population

Time of flowering: May

Time of fruit ripening: September

Value: The accession was registered in the National Center for Plant Genetic Resources of Ukraine for seedless yellow fruits in 2005. Fruits are oblong, yellow, weighing 0.1 (0.2) g, seedless, 12-20 in racemes, and sour. Fruits contain 6.0% sugars, 5.0% organic acids, 23.0 mg/100 g ascorbic acid. Ripe fruits stay on the branches for a long time. Ornamental, especially during the flowering and fruiting seasons

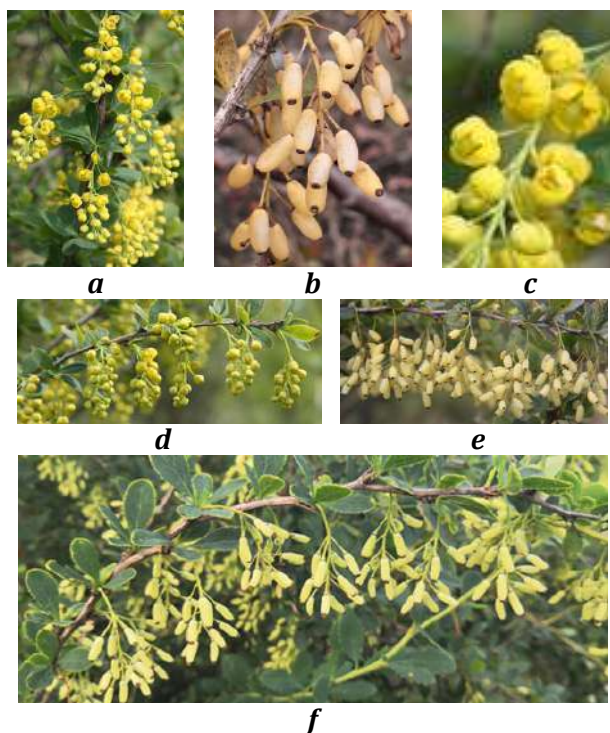


Figure 21. *Berberis vulgaris* 'Beznasinni Zhovtyi' a) branch with flowers, b) branch with fruit, c) flowers, d) flowers, e) fruit, f) fruit

ELAEAGNACEAE – ELAEAGNUS

OLEASTER FAMILY – OLEASTER

TREBIZOND DATE, CHERRY SILVERBERRY, AND AUTUMN OLIVE

Three species of silverberry are introduced in Ukraine as fruit plants. It is Trebizond date – *Elaeagnus augustifolia* var. *orientalis* (Arendt and Richter, 1960; Mezhenskyj, 1997; Mezhenskyj et al., 2012), cherry silverberry – *E. multiflora* (Mezhenskyj, 1996, 1997, 2005; Zarakhovych, 2001; Mezhenskyj, 2004; Vasiuk, 2004; Klimenko et al., 2017; Mezhenskyj et al., 2014; Grygorieva et al., 2018), and autumn olive – *E. umbellata*. Breeding work with them was initiated by Mykola Kashchenko (1925).

The juicy fruits of cherry silverberry and autumn olive are nutritious and biologically active substances that give them therapeutic and prophylactic properties. Ripe Trebizond date fruits are characterized by a high dry matter content, sugar content, and high sugar-acid index (Moroz et al., 2000; Mezhenskyj et al., 2007a, 2007b, 2008).

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Elaeagnus angustifolia 'Amu-Dar'inskij Rannij'

National catalog number: UR310003

Collection number: 01070

Botanical name in Latin: *Elaeagnus angustifolia* L. var. *orientalis* (L.) Kuntze

Botanical name in English: Djida, Dzhida, Pshat, Russian olive, or Trebizond date.

Botanical name in Ukrainian: Maslynka vyzkolystkova skhidna

Crop name in Ukrainian: Dzhyda

Accession name: 'Amu-Dar'inskij Rannij' (means "Amu Darya early")

Date of introduction: 25.12.1989

Donor: Kara-Kala Research Station of VIR - N. I. Vavilov Research Institute of Plant Industry, Makhtumkuli (Gayygala, Kara-Kala), Turkmenistan.

Breeder: -

Origin: Originally from Turkmenistan, selected among local varieties.

Time of flowering: June

Time of fruit ripening: September

Value: Fruit weight 5.7 (7.0) g are characterized by a high dry matter content, contain 10.6% sugars, have an extremely high sugar- acid index of 35.3, contain 5.3 mg/100 g ascorbic acid



a



b

c

Figure 22. *Elaeagnus angustifolia* var. *orientalis* 'Amu-Dar'inskij Rannij' a) fruits: 'Amu-Dar'inskij Rannij' (bottom row); accession No. 01583 (middle row); accession No. 01540 (top row); wild Russian olive on a branch, b) fruits of 'Anatolia' in a 10 cm Petri dish, c) stones

Elaeagnus angustifolia var. *orientalis* 'Matna-pshat'

National catalog number: UR310004

Collection number: 01530

Botanical name in Latin: *Elaeagnus angustifolia* L. var. *orientalis* (L.) Kuntze

Botanical name in English: Djida, Dzhida, Pshat, Russian olive, or Trebizond date

Botanical name in Ukrainian: Maslynka vyzkolystkova skhidna

Crop name in Ukrainian: Dzhyda

Accession name: 'Matna-pshat'

Date of introduction: 13.10.1993

Donor: Crimean Agricultural Institute, Simferopol, Crimea, Ukraine

Breeder: -

Origin: Originated in Armenia, selected among local varieties

Time of flowering: June

Time of fruit ripening: September

Value: Fruit weight 7.0 (8.5) g are characterized by a high dry matter content, contain 7.0% sugars, have an extremely high sugar-acid index of 23.3, contain 7.9 mg/100 g ascorbic acid



a



b



c

Figure 23. *Elaeagnus angustifolia* var. *orientalis* 'Matna-pshat' a) inflorescences, b) flowers, c) fruits

Elaeagnus multiflora 'Chorus'

National catalog number: UN9800001

Collection number: 04601

Botanical name in Latin: *Elaeagnus multiflora* Thunb. var. *gigantea* Araki

Botanical name in English: Cherry elaeagnus, Cherry silverberry, or Goumi

Botanical name in Ukrainian: Maslynka bahatokvitkova veletenska

Crop name in Ukrainian: Gumi

Accession name: 'Chorus' ('Daigoumi', means "giant goumi")

Date of introduction: 18.01.2018

Donor: Sven Maksymiuk, Milanówek, Poland

Breeder: Sven Maksymiuk (collector)

Origin: Imported from Korea

Time of flowering: May

Time of fruit ripening: June

Value: Accession characterized by extremely large fruits, 3 cm long, weighing 3.5-5.0 g, larger than typical forms of goumi, but inferior to them in terms of soluble solids content, having 12 °Bx. The source of large fruit

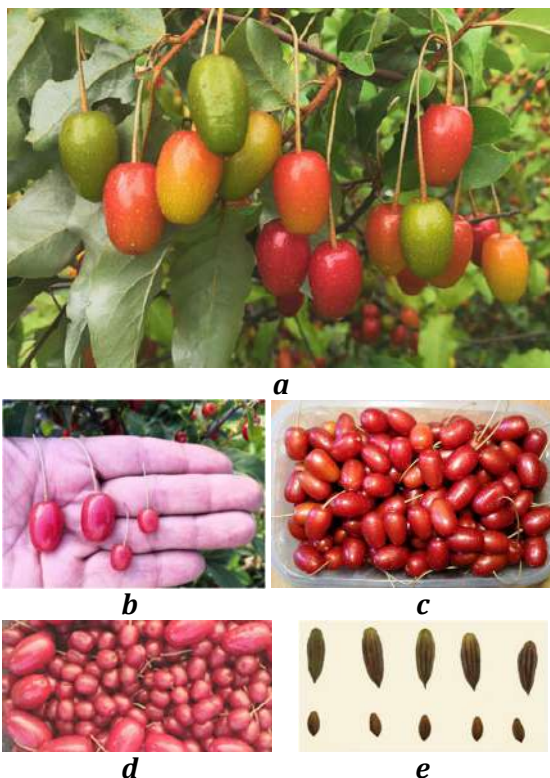


Figure 24. *Elaeagnus multiflora* var. *gigantea* 'Chorus', a) ripening fruits, b) comparison of 'Chorus' (left) and 'Yahidka' (right), c) harvested fruits, d) comparison of 'Chorus' (left) and 'Yahidka' (right), e) comparison of 'Chorus' (top row) and 'Yahidka' (bottom row) seeds

Elaeagnus multiflora 'Gumi No. 4'

National catalog number: UR3100008

Collection number: 00888/14

Botanical name in Latin: *Elaeagnus multiflora* Thunb.

Botanical name in English: Cherry elaeagnus, Cherry silverberry, or Gumi

Botanical name in Ukrainian: Maslynka bahatokvitkova

Crop name in Ukrainian: Gumi

Accession name: 'No. 4'

Date of introduction: 12.04.1988

Donor: Volodymyr Mezhenkyj Bakhmut, Donetsk Region, Ukraine

Breeder: Volodymyr Mezhenkyj

Origin: Seedling of accession No. 00888 *E. multiflora*, received from Viktor Zarakhovych (Lviv, Ukraine)

Time of flowering: May

Time of fruit ripening: June to July

Value: The form was selected for adaptability, high yield, large high-quality. Fruit weight 1.0-1.4 g. Fruits contain 21-23 °Bx soluble solids, 12.8% sugars, 1.9% organic acids, 0.9% pectin substances, 3.9-10.6 mg/100 g ascorbic acid

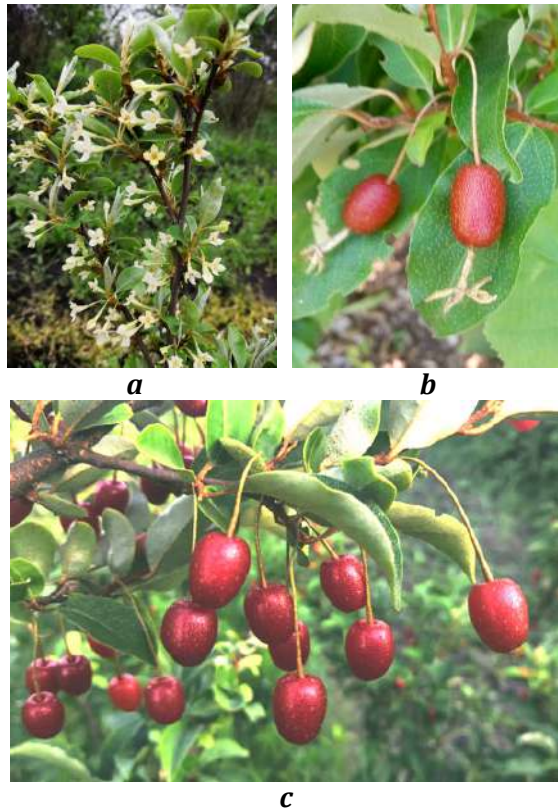


Figure 25. *Elaeagnus multiflora* 'No. 4' a) flowering branch, b) fruits with persistent flowers, c) ripe fruit

Elaeagnus multiflora 'Yahidka'

National catalog number: UR3100010

Collection number: 00888/7

Botanical name in Latin: *Elaeagnus multiflora* Thunb.

Botanical name in English: Cherry elaeagnus, Cherry silverberry, or Gumi

Botanical name in Ukrainian: Maslynka bahatokvitkova

Crop name in Ukrainian: Gumi

Accession name: 'Yahidka' (means "small berry")

Date of introduction: 12.04.1988

Donor: Volodymyr Mezhenkyj Bakhmut, Donetsk Region, Ukraine

Breeder: Volodymyr Mezhenkyj

Origin: Seedling of accession No. 00888 *E. multiflora*, received from Viktor Zarakhovych (Lviv, Ukraine)

Time of flowering: May

Time of fruit ripening: June to July

Value: The variety was selected for adaptability, high yield, and large, high-quality fruits. Fruits weigh 1.0-1.6 g, 16-18 °Bx soluble solids, 11.1% sugars, 1.7% organic acids, 5.3 mg/100 g ascorbic acid. Tastes pleasant, with some astringency



a



b



c



d

Figure 26. *Elaeagnus multiflora* 'Yahidka' a) flowers, b) young fruit, c) ripe fruit, d) ripe fruit closeup

Elaeagnus umbellata 'Amber'

National catalog number: UR3100015

Collection number: 04648

Botanical name in Latin: *Elaeagnus umbellata* Thunb.

Botanical name in English: Autumn berry, Autumn elaeagnus, Autumn olive, Japanese silverberry, or Umbellata oleaster

Botanical name in Ukrainian: Maslynka parasolkova

Crop name in Ukrainian: Akigumi

Accession name: 'Amber'

Date of introduction: 27.01.2019

Donor: Ömer Selim, Trabzon, Turkey

Breeder: Markus Kobelt, Lubera nursery, Switzerland

Origin: Originated from plants introduced to Europe from the USA

Time of flowering: May to June

Time of fruit ripening: September

Value: It differs in enlarged yellow fruits of improved flavor

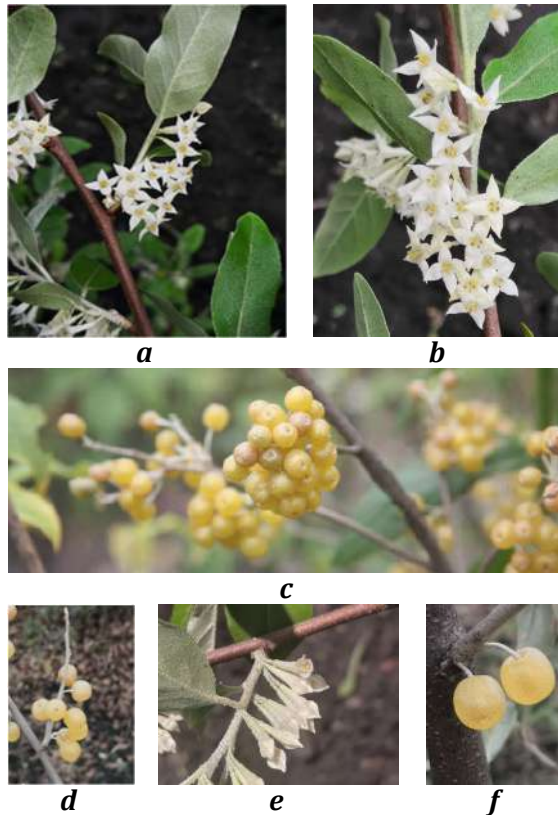


Figure 27. *Elaeagnus umbellata* 'Amber' a) flowers, b) flowers, c) fruiting branch, d) fruiting branch, e) flowering branch, f) closeup of two fruit

Elaeagnus umbellata 'Charlies Golden'

National catalog number: UR3100016

Collection number: 04650

Botanical name in Latin: *Elaeagnus umbellata* Thunb.

Botanical name in English: Autumn berry, Autumn elaeagnus, Autumn olive, Japanese silverberry, or Umbellata oleaster

Botanical name in Ukrainian: Maslynka parasolkova

Crop name in Ukrainian: Akigumi

Accession name: 'Charlies Golden'

Date of introduction: 27.01.2019

Donor: Ömer Selim, Trabzon, Turkey

Breeder: Hector Black, Hidden Springs Nursery, Tennessee, USA

Origin: Selected from local populations of this introduction in Tennessee.

Time of flowering: May to June

Time of fruit ripening: September

Value: It is distinguished by yellow fruits with improved flavor

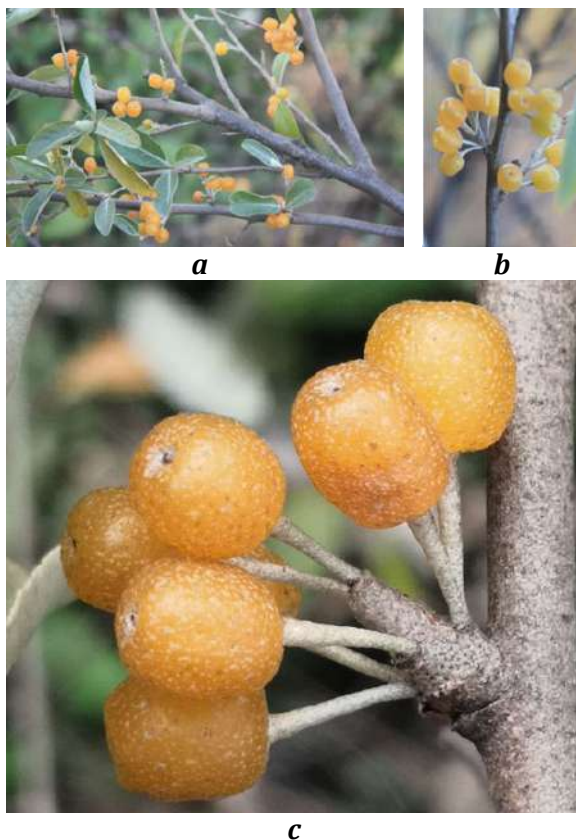


Figure 28. *Elaeagnus umbellata* 'Charlies Golden' a) fruiting branches, b) fruiting branches, c) fruit closeup

Elaeagnus umbellata No. 04645

National catalog number: UR3100017

Collection number: 04645

Botanical name in Latin: *Elaeagnus umbellata* Thunb.

Botanical name in English: Autumn berry, Autumn elaeagnus, Autumn olive, Japanese silverberry, or Umbellata oleaster

Botanical name in Ukrainian: Maslynka parasolkova

Crop name in Ukrainian: Akigumi

Accession name: -

Date of introduction: 27.01.2019

Donor: Ömer Selim Trabzon, Turkey

Breeder: -

Origin: -

Time of flowering: May to June

Time of fruit ripening: September

Value: The genotype with red fruits



a



b



c

Figure 29. *Elaeagnus umbellata* No. 04645 a) fruiting branches, b) fruiting branches, c) fruiting branches

ELAEAGNACEAE – HIPPOPHAË

OLEASTER FAMILY – SEABUCKTHORN

SEABUCKTHORN

The Eurasian *Hippophae rhamnoides* has a wide disjunctive range from the Atlantic to almost the Pacific coast. Its subsp. *carpatica* distributes the territory of Ukraine at the mouth of the Danube (Rousi, 1971; Hyvonen, 1996). Valuable genotypes from natural populations of this subspecies were selected by the staff of the M.M. Hryshko National Botanical Garden, but not developed into varieties (Lebeda and Dzhurenko, 1990). Instead, cultivars of Russian breeding belonging to subsp. *mongolica* were introduced and zoned in Ukraine since 1988. Sea buckthorn fruits are widely used in the pharmaceutical, food, and cosmetic industries (Lebeda and Dzhurenko, 1990; Li and Schroeder, 1996; Koskovac et al., 2017; Hrynyk et al., 2020). The first varieties of Ukrainian breeding, including ‘Solodka Zhynka’ of our breeding, were included in the State Register of Plant Varieties of Ukraine in 2000 (Mezhenskij, 2003). Intensive breeding work with sea buckthorn is currently underway in many countries around the world (Singh and Zubarev, 2014; Bartish, 2016). Successful work continues in Ukraine (Mezhenskyj and Mezhenska, 2011; Mezhenskyj, 2018; Moskalets et al., 2019, 2021; Hrynyk et al., 2020).

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Hippophaë rhamnoides subsp. *mongolica* × subsp. *rhamnoides* 'Orange Revolution'

National catalog number: UN3700068

Collection number: 03789

Botanical name: *Hippophaë rhamnoides* L. subsp. *mongolica* Rousi × subsp. *rhamnoides*

Botanical name in English: Sallowthorn, Sandthorn, Sea-buckthorn, Seaberry

Botanical name in Ukrainian: Shchets monholskyi × shchetz zhosteropodibnyi

Crop name in Ukrainian: Oblipykha

Accession name: 'Orange Revolution' ('1-1-40'; 'Pomarancheva' = "orange")

Date of introduction: 18.10.2012

Donor: Volodymyr Mezhen'skyj, Bakhmut, Donetsk Region, Ukraine

Breeder: Volodymyr Mezhen'skyj

Origin: The hybrid between accession No 00881 'Volna' (UN3700005) and free pollinated seedlings of accession No 00008/6 'Chujskaja' (UN3700019)

Time of flowering: April

Time of fruit ripening: July to August

Value: The variety was included in the State Register of Plant Varieties of Ukraine in 2019, and registered in Poland in 2021. It has extremely large, elongated, orange fruits with red spots on the ends, weighing 1.2 (1.9) g, high productivity of 20 t/ha, and resistance to mycotic wilt. Fruits contain 5.2% sugars, 2.1% organic acids, 40.8 mg/100 g ascorbic acid, 14.1 mg/100 g carotene



Figure 30. *Hippophaë rhamnoides* subsp. *mongolica* × subsp. *rhamnoides* 'Orange Revolution' a) fruiting branches, b) fruits in a 10 cm Petri dish, c) fruiting clusters, d) 'Orange Revolution' fruit (bottom) and wild type fruit (top)

Hippophaë rhamnoides subsp. *mongolica* × subsp. *rhamnoides*
'1-1-18'

National catalog number: UN3700067

Collection number: 03790

Botanical name: *Hippophaë rhamnoides* L. subsp. *mongolica* Rousi × subsp. *rhamnoides*

Botanical name in English: Sallowthorn, Sandthorn, Sea-buckthorn, or Seaberry

Botanical name in Ukrainian: Shchets monholskyi × shchetz zhostero-podibnyi

Crop name in Ukrainian: Oblipykha

Accession name: '1-1-18'

Date of introduction: 18.10.2012

Donor: Volodymyr Mezhenkyj, Bakhmut, Donetsk Region, Ukraine

Breeder: Volodymyr Mezhenkyj

Origin: The hybrid between accession No 00881 'Volna' (UN3700005) and free pollinated seedlings of accession No 00008/6 'Chujskaja' (UN3700019)

Time of flowering: April

Time of fruit ripening: September

Value: Ellipsoidal reddish fruit weight 0.6 g contains 4.2% sugars, 1.9% organic acids, 58.1 mg/100 g ascorbic acid

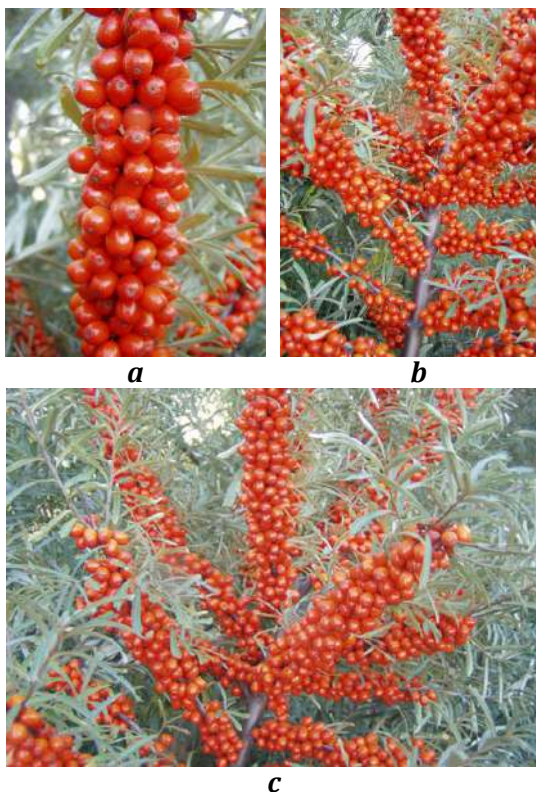


Figure 31. *Hippophaë rhamnoides* subsp. *mongolica* × subsp. *rhamnoides* '1-1-18' a) fruiting branch, b) fruiting branches, c) fruiting branches

Hippophaë rhamnoides subsp. *mongolica* 'Lasunka'

National catalog number: UN3700050

Collection number: 04435

Botanical name: *Hippophaë rhamnoides* L. subsp. *mongolica* Rousi

Botanical name in English: Sallowthorn, Sandthorn, Sea-buckthorn, or Seaberry

Botanical name in Ukrainian: Shchets monholskyi

Crop name in Ukrainian: Sea buckthorn

Accession name: 'Lasunka' ('25-109') (means "gourmand")

Date of introduction: 18.10.2012

Donor: Volodymyr Mezhenkyj, Bakhmut, Donetsk Region, Ukraine

Breeder: Volodymyr Mezhenkyj

Origin: Seedling of accession No. 00008/6 'Chujskaja' (UN3700019) from free pollination

Time of flowering: April

Time of fruit ripening: July

Value: The variety was included in the State Register of Plant Varieties of Ukraine in 2023. It has a large, elongated, orange fruit weight 0.8 (1.3) g, a productivity 10 t/ha. The fruits contain 40 mg/100 g ascorbic acid, 14 mg/100 g carotene



Figure 32. *Hippophaë rhamnoides* subsp. *mongolica* 'Lasunka' a) fruiting branches, b) plant with fruiting branches, c) fruiting branches

Hippophaë rhamnoides subsp. *mongolica* 'Solodka Zhinka'

National catalog number: UN3700017

Collection number: 04437

Botanical name: *Hippophaë rhamnoides* L. subsp. *mongolica* Rousi

Botanical name: Sallowthorn, Sandthorn, Sea-buckthorn, or Seaberry

Botanical name in Ukrainian: Shchets monholskyi

Crop name in Ukrainian: Oblipykha

Accession name: 'Solodka Zhinka' ('57-1-157') (means "sweet woman", "sweet lady")

Date of introduction: 18.10.2012

Donor: Bakhmut Experimental Station of Nurseries Cultivation, Bakhmut, Donetsk Region, Ukraine

Breeder: Volodymyr Mezhen'skyj

Origin: Seedling of accession No. 00008/6 'Chyuj'skaja' (UN3700019) from free pollination

Time of flowering: April

Time of fruit ripening: July

Value: The first Ukrainian variety was included in the State Register of Plant Varieties of Ukraine in 1999. The accession was registered in the National Center for Plant Genetic Resources of Ukraine for its low habitus, large dessert fruits of early ripening in 2005. Fruits are ellipsoidal-cylindrical, orange, weighing 0.7 g, sour-salty, and dessert flavor. The fruits accumulate 7.0% of sugars and the sugar-acid index (4.5) is one and a half times higher than 'Chyuj'skaja', containing 27.9-32.0 mg/100 g ascorbic acid, 12.8-24.2 mg/100 g carotene

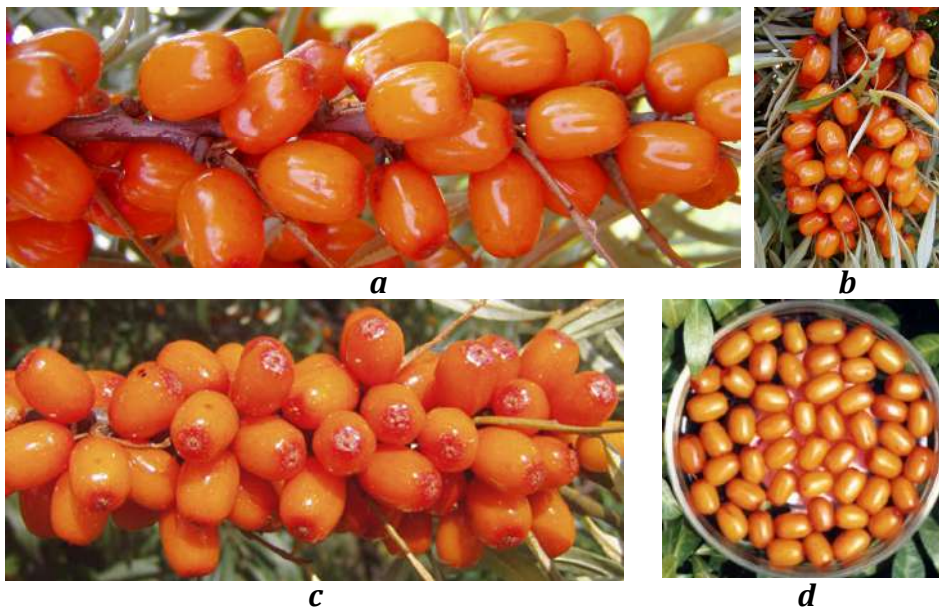


Figure 33. *Hippophaë rhamnoides* subsp. *mongolica* 'Solodka Zhinka' a) fruiting branch, b) fruiting branch, c) dense fruiting branch, d) fruits in a 10 cm Petri dish

ELAEAGNACEAE – SHEPHERDIA
OLEASTER FAMILY – BUFFALOBERRY

BUFFALOBERRY

Silver buffaloberry (*Shepherdia argentea*) is the most promising fruit plant among two species of *Shepherdia* introduced in Ukraine (Vasyuta et al., 1990; Mezhenkij, 1998a, 1998b; Klymenko, 2005, 2008; Mezhenkij, 2007b; Mezhenkij and Mezhenka, 2015).

It is characterized by high winter hardiness (Kashchenko, 1930; Mezhenkij, 2007a). Its fruits contain carotenoids, ascorbic acid, P-active substances, and other compounds (Boboreko et al., 1978; Becker and Glushenkova, 2001; Mezhenkij et al., 2007a, 2007b, 2008). *Shepherdia* is used for phytomelioration, which is facilitated by the presence of symbiotic nitrogen fixation (Mezhenkij, 1998a, 1998b, 1999a, 1999b).

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Shepherdia argentea 'Namystynka'

National catalog number: UR97000012

Collection number: 00922

Botanical name in Latin: *Shepherdia argentea* (Pursh) Nutt.

Botanical name in English: Silver buffaloberry, or Silver bullberry

Botanical name in Ukrainian: Sheferdiia sribliasta

Crop name: Sheferdiia

Accession name: 'Namystynka' (means "beat")

Date of introduction: 26.07.1988

Donor: Donetsk Botanical Garden, Donetsk, Ukraine

Breeder: Volodymyr Mezhenkyj

Origin: The genotype was selected among seedlings grown from seeds collected from plants of the dendrological collection of the Donetsk Botanical Garden, which originated from the plants of the Mariupol Forest Research Station

Time of flowering: March to April

Time of fruit ripening: August to September

Value: Drought tolerance, undemanding to soil conditions, high winter hardiness (fruiting after the harshest winter of 2005/2006, when the air temperature reached -34.3 °C and the snow level -39.4 °C), high resistance to frost (fruiting after the temperature dropped to -3.1 and -3.0 °C on May 6-7, 1999). The fruits have a pleasant taste, and are easy to harvest; they contain 10.8-13.4% sugars, 1.3-2.6% organic acids, 66.9-169.0 mg/100 g ascorbic acid. Ripe fruits stay on the branches for a long time

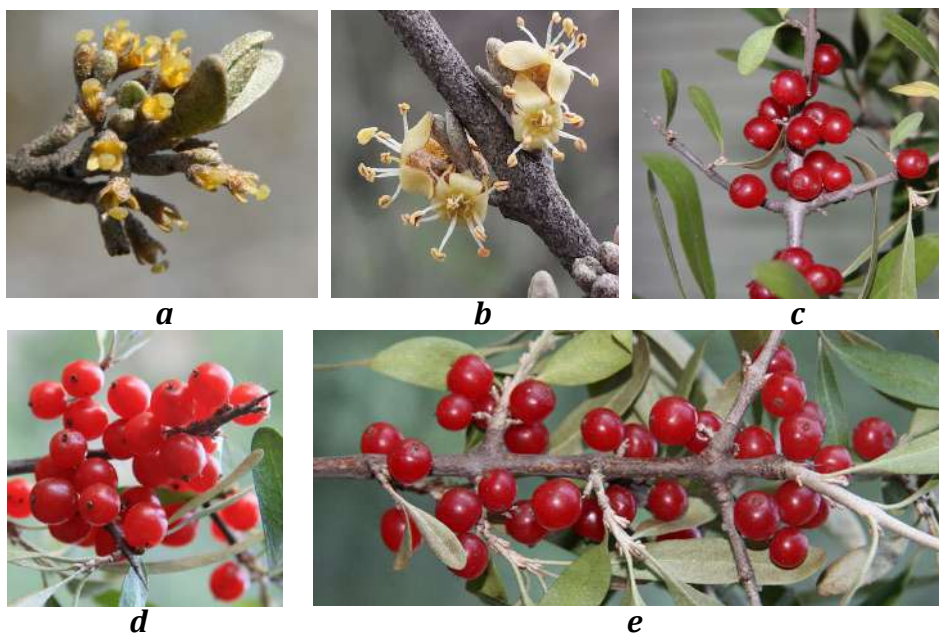


Figure 34. *Shepherdia argentea* 'Namystynka' a) female flowers, b) male flowers, c) fruiting branch, d) fruiting branch, e) fruiting branch

MORACEAE – MORUS

MULBERRY FAMILY – MULBERRY

MULBERRY

The genus *Morus* is one of the most interesting taxonomic groups. In the course of its study, the number of mulberry taxa was expanded to 120 species and then reduced to 2-3 species. Currently, it includes 16 to 68 species (Mezhenskyj and Mezhenska, 2016). In Ukraine, 3-4 (6) species have been introduced, of which *Morus alba* is the most widespread (Kohno and Kurdyuk, 1994). Names based on the different coloration of *Morus alba* fruits and their similar to the species epithets of three different species *Morus alba*, *Morus nigra*, *Morus rubra* are widespread, which leads to confusion and misunderstanding (Mezhenskyj and Mezhenska, 2016).

White mulberry was introduced and spread due to the need for a fodder base for silkworms. At the same time, it has gained importance as a reclamation, ornamental and fruit plant (Marchenko, 1960; Ivanchenko, 1970; Ananiiev and Bogach, 2002; Mitina, 2002; Hlukhov et al., 2003; Oleksiichenko, 2005; Vitenko, 2008, 2010, 2021; Mezhenskij, 2010; Mezhenskyj and Mezhenska, 2016). In Ukraine a large scale of fodder and fruit mulberries cultivars was developed (Mitina, 2002; Hlukhov et al., 2003; Oleksiichenko, 2005, 2007; Babaieva, 2002; Babaieva et al., 2011; Mezhenskyj and Mezhenska, 2016).

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Morus alba 'Chornobrova'

National catalog number: UN8800005

Collection number: 01534

Botanical name in Latin: *Morus alba* L.

Botanical name in English: White mulberry

Botanical name in Ukrainian: Shovkovytsia bila

Crop name in Ukrainian: Shovkovytsia

Accession name: 'Chornobrova' (means "black eyebrows")

Date of introduction: 19.04.1994

Donor: Volodymyr Mezhenkyj, Bakhmut, Donetsk Region, Ukraine

Breeder: Volodymyr Mezhenkyj

Origin: Seedling of 'Har-tut' from free pollination, grown from seeds collected in the Donetsk Botanical Garden

Time of flowering: May

Time of fruit ripening: June to July

Value: Fruits are large, weighing 3.5 g, black, tasty, and contain 10.4% sugars, 0.67% organic acids, 33.4 mg/100 g ascorbic acid. The image of Figure 35e has been used in the Internet on many websites to illustrate any mulberry tree

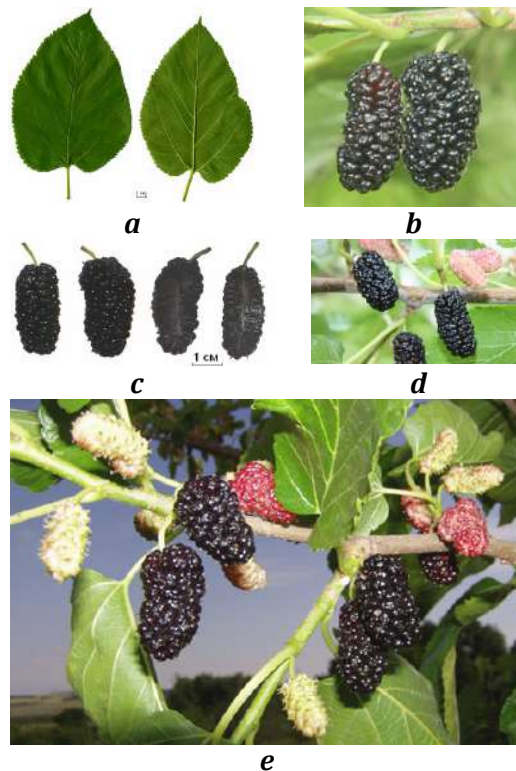


Figure 35. *Morus alba* 'Chornobrova' a) leaves, b) fruit, c) shape, size, and longitudinal section of the fruit, d) fruit, e) fruiting branch* *Note: This popular image has been used on the internet by many web sites as an illustration of any mulberry tree

Morus alba 'Heze'

National catalog number: UN8800128

Collection number: 04734

Botanical name in Latin: *Morus alba* L.

Botanical name in English: White mulberry

Botanical name in Ukrainian: Shovkovytsia bila

Crop name in Ukrainian: Shovkovytsia

Accession name: 'Heze'

Date of introduction: 16.03.2019

Donor: Viacheslav Frantsishko, Kamianets-Podilskyi, Khmelnytskyi Region, Ukraine

Breeder: Vyacheslav Frantsishko (Collector)

Origin: A variety of Chinese origin

Time of flowering: May

Time of fruit ripening: June to July

Value: Fruits are large, weighing 5.0 (6.8) g, black, seedless, tasty

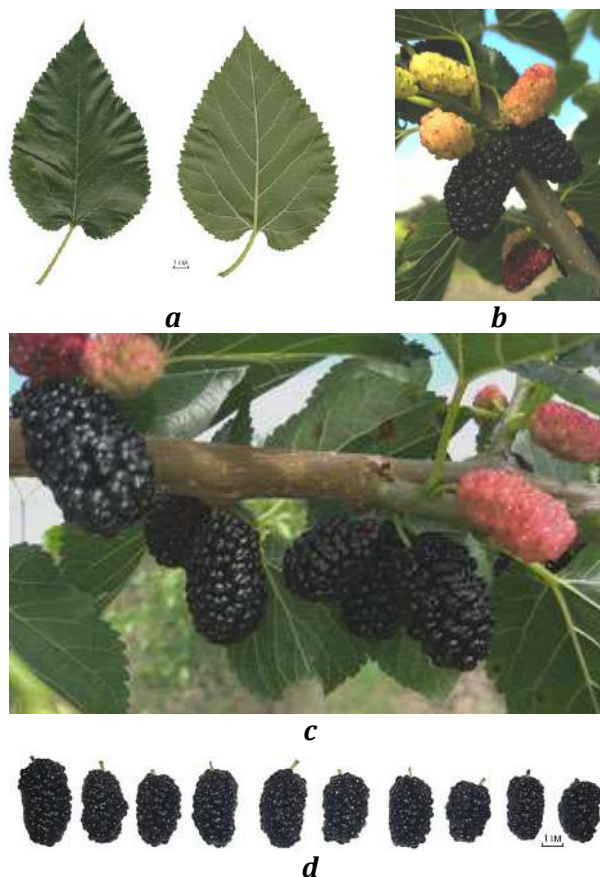


Figure 36. *Morus alba* 'Heze' a) leaves, b) infructescence, c) fruiting stages, d) the shape and size of the fruit

Morus alba 'Muzatari'

National catalog number: UN8800126

Collection number: 04556

Botanical name in Latin: *Morus alba* L.

Botanical name in English: White mulberry

Botanical name in Ukrainian: Shovkovytsia bila

Crop name in Ukrainian: Shovkovytsia

Accession name: 'Muzatari'

Date of introduction: 18.02.2018

Donor: Leonid Prokazin, Myrhorod, Poltava Region, Ukraine

Breeder: Leonid Prokazin (collector)

Origin: Origin unknown

Time of flowering: May

Time of fruit ripening: June to July

Value: Fruits are large, weighing 3.0 g, purple-black to black, tasty

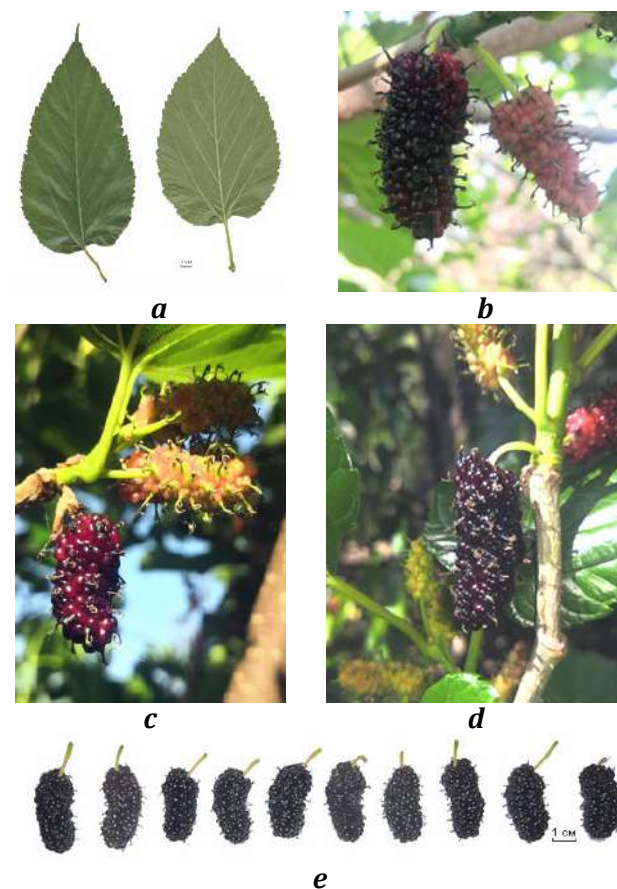


Figure 37. *Morus alba* 'Muzatari' a) leaves, b) infructescence, c) infructescence, d) infructescence, e) shape and size of the fruit

Morus alba 'Shelli'

National catalog number: UN8800125

Collection number: 04555

Botanical name in Latin: *Morus alba* L.

Botanical name in English: White mulberry

Botanical name in Ukrainian: Shovkovytsia bila

Crop name in Ukrainian: Shovkovytsia

Accession name: 'Shelli' ('Shelly') (Russian abbreviation means "Shelko-vytsa (mulberry) of Leonid Illich Prokazin")

Date of introduction: 18.02.2018

Donor: Leonid Prokazin Myrhorod, Poltava Region, Ukraine

Breeder: Leonid Prokazin (collector)

Origin: Origin unknown

Time of flowering: May

Time of fruit ripening: June to July

Value: Fruits are large, weighing 3.5 g, purple-black to black, tasty

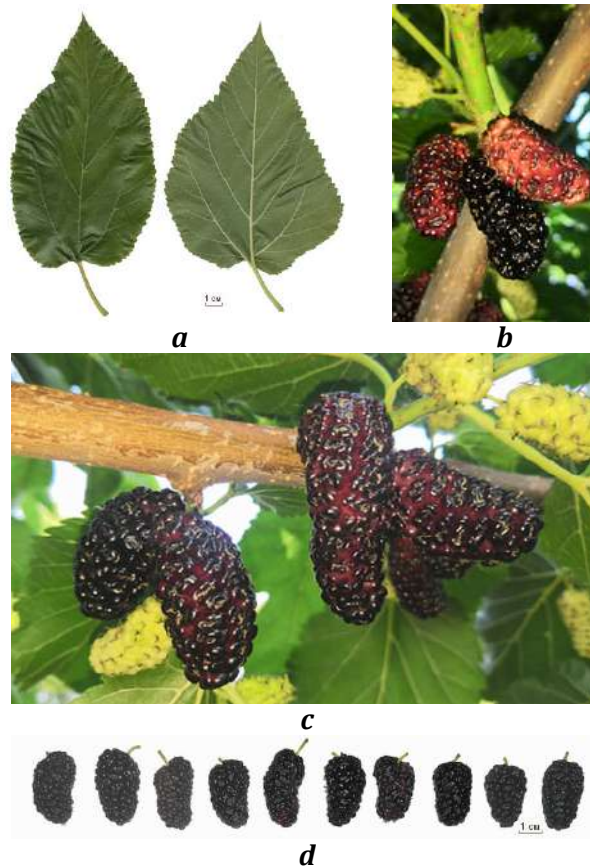


Figure 38. *Morus alba* 'Shelli' a) leaves, b) infructescence, c) fruit, d) shape and size of the fruit

Morus alba × *M. rubra* 'Illinois Everbearing'

National catalog number: UN8800124

Collection no: 3932

Botanical name in Latin: *Morus alba* L. × *M. rubra* L.

Botanical name in English: White mulberry × red mulberry

Botanical name in Ukrainian: Shovkovytsia bila × shovkovytsia chervona

Crop name in Ukrainian: Shovkovytsia

Accession name: 'Illinois Everbearing'

Date of introduction: 25.02.2014

Donor: Vladimiro Rocco, Stanghella, Italy

Breeder: -

Origin: American variety, putative interspecies hybrid

Time of flowering: May

Time of fruit ripening: June to August

Value: Long ripening period. Fruits are elongated, weighing 2.0 g, purple-black to black, tasty, with a pleasant acidity

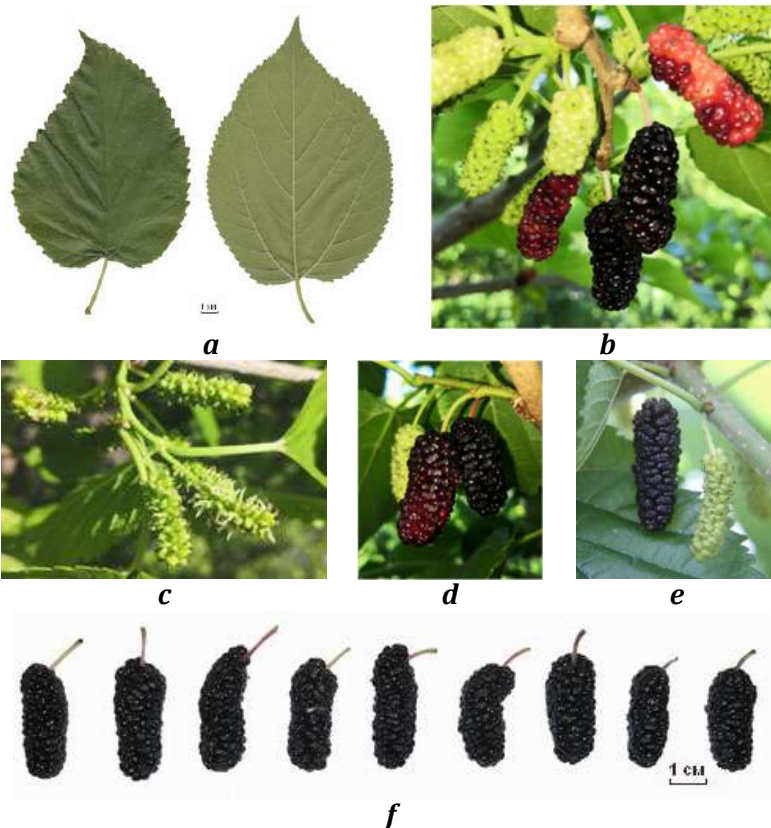


Figure 39. *Morus alba* × *M. rubra* 'Illinois Everbearing' a) leaves, b) fruit, c) flowering and the beginning of fruit development, d) infructescence, e) unripe and ripe fruit, f) shape and size of the fruit

ROSACEAE – AMELANCHIER

ROSE FAMILY – SERVICEBERRY

SERVICEBERRY OR SASKATOON

Most species of the genus *Amelanchier* are distributed in North America. Here they were introduced into commercial culture (Harris, 1966; Stushnoff, 1991; Mazza and Davidson, 1993; St-Pierre, 1997; Finn, 1999).

In Ukraine, introduced species of *Amelanchier* are cultivated as forest, phytomeliorative, ornamental, and fruit plants, the fruits of which are characterized by a high content of sugars and bioflavonoids (Ivchenko et al., 1966; Strela, 1970; Mezhenskyj, 2002, 2007, 2016; Osipova and Vasyuk, 2006; Mezhenskyj, 2007; Mezhenskyj et al., 2012; Andriienko, 2016). In 2021, the first Ukrainian cultivar 'Radoslav' was registered.

In the Ukrainian language the name "irha" refers to *Cotoneaster*, but as a result of Russification, it was transferred to designate *Amelanchier* like in the Russian language, therefore the generic name "garden irha" is proposed for *Amelanchier* to avoid confusion (Kobiv, 2004; Mezhenskyj and Mezhenska, 2019).

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Amelanchier alnifolia 'Altaglow'

National catalog number: UN6800030

Collection number: 04054

Botanical name in Latin: *Amelanchier alnifolia* Nutt.

Botanical name in English: Pacific serviceberry, Saskatoon, Western juneberry, Western serviceberry, or Western shadbush

Botanical name in Ukrainian: Sadova irha vilkholystkova

Crop name in Ukrainian: Sadova irha

Accession name: 'Altaglow' ('Brooks White') ('Alta' comes from the first and last letters of the province Alberta name)

Date of introduction: 24.02.2015

Donor: Johannes Rabensteiner, Graz, Austria

Breeders: Augustus Griffin; Alberta Horticultural Experiment Station (introducer). Later, John Alexander Wallace selected this variety for its ornamental qualities

Origin: Variety selected from local populations of *A. alnifolia* in the province of Alberta, Canada

Time of flowering: April to May

Time of fruit ripening: June to July

Value: Fruits are white, weighing 1.1 g, sweet, juicy, tasty, usually 8-13 in racemes. Probably self-fertile

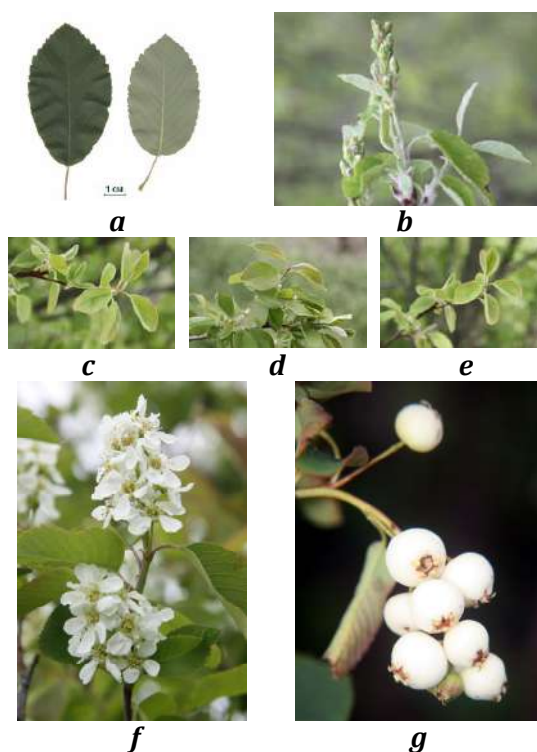


Figure 40. *Amelanchier alnifolia* 'Altaglow' a) leaves, b) inflorescence in the bud, c) young leaves, d) young leaves, e) young leaves, f) inflorescences, g) infructescence

Amelanchier alnifolia 'Bluesun'

National catalog number: UN68000023

Collection number: 01130/31

Botanical name in Latin: *Amelanchier alnifolia* Nutt.

Botanical name in English: Pacific serviceberry, Saskatoon, Western juneberry, Western serviceberry, or Western shadbush

Botanical name in Ukrainian: Sadova irha vilkholystkova

Crop name in Ukrainian: Sadova irha

Accession name: 'Bluesun'

Date of introduction: 30.02.1991

Donor: Volodymyr Mezhenkyj, Bakhmut, Donetsk Region, Ukraine

Breeder: Volodymyr Mezhenkyj

Origin: Seedling of accession No. 01130 *A. alnifolia*, obtained from the Central Botanical Garden of the Academy of Sciences of Belarus (Minsk, Belarus)

Time of flowering: April to May

Fruit ripening time: June to July

Value: The accession was registered in the National Center for Plant Genetic Resources of Ukraine for its good taste of large fruits and tallness in 2002. Fruit weight 1.0 g, dark blue to violet-black with a plaque, sweet, juicy, tasty. Contains 8.6% sugars, 0.5% organic acids, 20.8 mg/100 g ascorbic acid

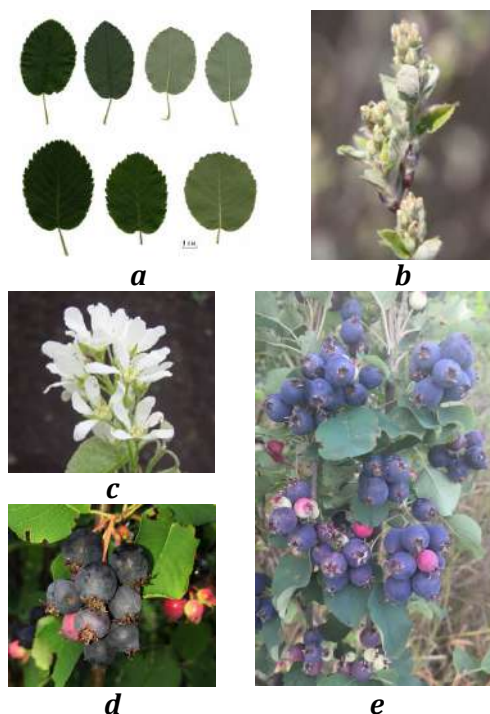


Figure 41. *Amelanchier alnifolia* 'Bluesun' a) leaves: the upper row from fruiting shoots, the lower row from non-fruiting shoots, b) shoot with inflorescences in the budding phase, c) inflorescence, d) ripe fruit, e) infructescence

Amelanchier alnifolia 'Julian'

National catalog number: UN6800033

Collection number: 04529

Botanical name in Latin: *Amelanchier alnifolia* Nutt.

Botanical name in English: Pacific serviceberry, Saskatoon, Western juneberry, Western serviceberry, or Western shadbush

Botanical name in Ukrainian: Sadova irha vilkholystkova

Crop name in Ukrainian: Sadova irha

Accession name: 'Julian' (named after Julian Geyer)

Date of introduction: 08.04.2017

Donor: Julian Geyer, Graz, Austria

Breeder: Julian Geyer

Origin: Seedling 'Martin' or 'Pembina'

Time of flowering: April to May

Time of fruit ripening: June to July

Value: Fruits are large, dark blue to purple-black with a plague, weighing 1.6 g, sweet, juicy, tasty, 14-21 in racemes

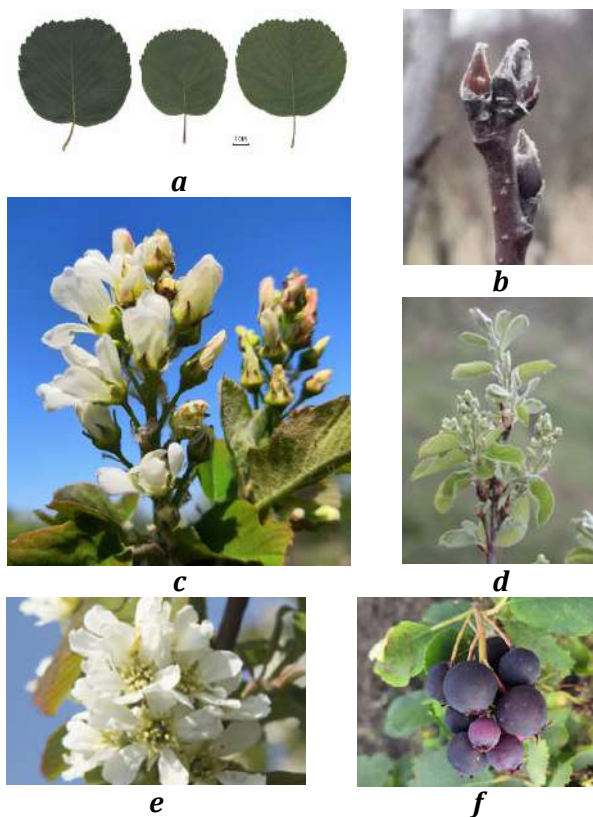


Figure 42. *Amelanchier alnifolia* 'Julian' a) leaves of growth shoots, b) buds, c) inflorescence, d) young shoots and inflorescences in the bud, e) flowers, f) infructescence

Amelanchier alnifolia 'Lee 3'

National catalog number: UN6800034

Collection number: 04039

Botanical name in Latin: *Amelanchier alnifolia* Nutt.

Botanical name in English: Pacific serviceberry, Saskatoon, Western juneberry, Western serviceberry, or Western shadbush

Botanical name in Ukrainian: Sadova irha vilkholystkova

Crop name in Ukrainian: Sadova irha

Accession name: 'Lee 3'

Date of introduction: 28.03.2015

Donor: Julian Geyer, Graz, Austria

Breeder: Kris Pruski; Alberta Agriculture, Crop Diversification Centre - North, Edmonton (introducer)

Origin: Hybrid 'Pembina' × ?'Northline'

Time of flowering: April to May

Fruit ripening time: June to July

Value: Fruits are dark blue to purple-black with a waxy coating, sweet, juicy, tasty

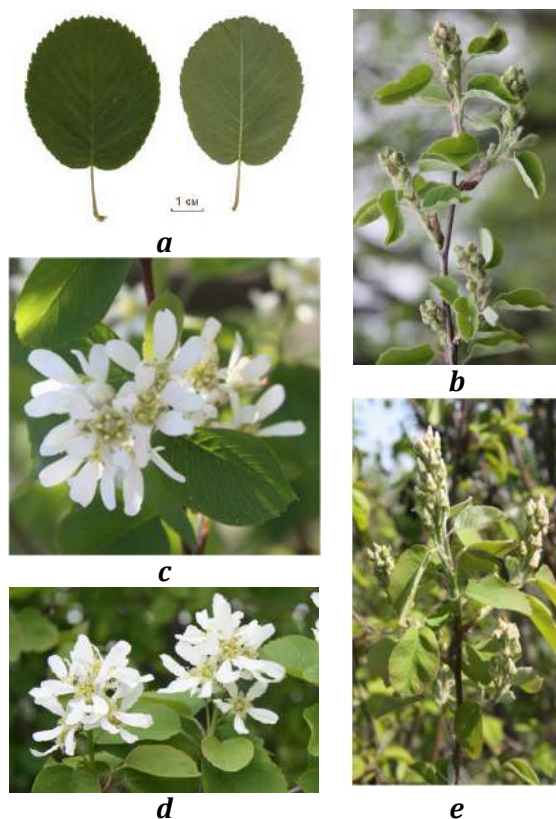


Figure 43. *Amelanchier alnifolia* 'Lee 3' a) leaves, b) inflorescence in the bud, c) inflorescence, d) inflorescence in the bud, e) inflorescence

Amelanchier alnifolia 'Mandan'

National catalog number: UN6800019

Collection number: 01892

Botanical name in Latin: *Amelanchier alnifolia* Nutt.

Botanical name in English: Pacific serviceberry, Saskatoon, Western juneberry, Western serviceberry, or Western shadbush

Botanical name in Ukrainian: Sadova irha vilkholystkova

Crop name in Ukrainian: Sadova irha

Accession name: 'Mandan' (a North Dakota Indian tribe and city)

Date of introduction: 07.03.1999

Donor: Oleksandr Sychoy, Rossosh, Voronezh Region, Russia

Breeder: -

Origin: The accession was imported to Russia from Canada. Originally released from the Mandan, North Dakota Experiment Station, USA

Value: Fruits are dark blue to purple-black with a waxy coating, sweet, juicy, tasty

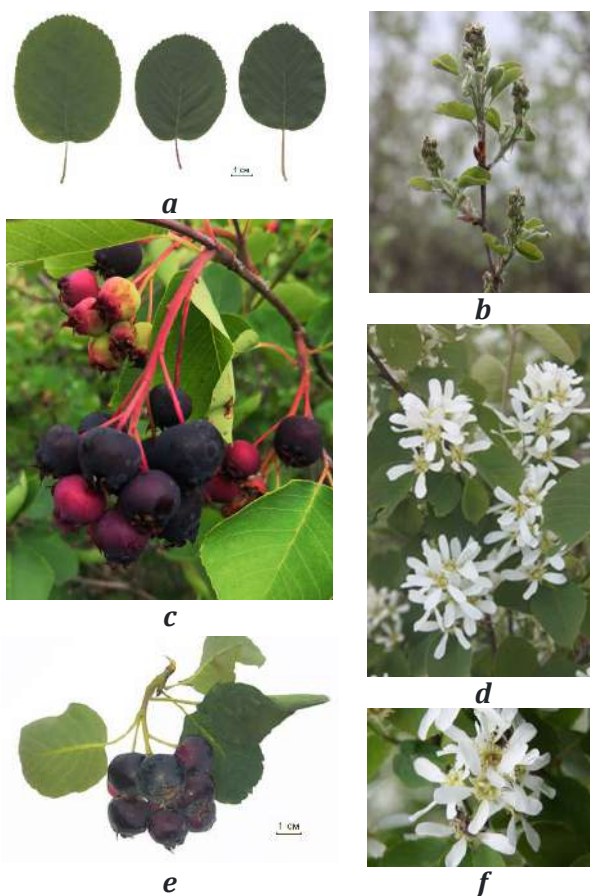


Figure 44. *Amelanchier alnifolia* 'Mandan' a) leaves, b) inflorescence in the budding phase, c) fruit, d) flowers, e) infructescence, f) flowers

Amelanchier alnifolia 'Northline'

National catalog number: UN6800036

Collection number: 03959

Botanical name in Latin: *Amelanchier alnifolia* Nutt.

Botanical name in English: Pacific serviceberry, Saskatoon, Western juneberry, Western serviceberry, or Western shadbush

Botanical name in Ukrainian: Sadova irha vilkholystkova

Crop name in Ukrainian: Sadova irha

Accession name: 'Northline'

Date of introduction: 14.03.2014

Donor: Julian Geyer, Graz, Austria

Breeder: John Alexander Wallace; Beaverlodge Nursery, Alberta, Canada

Origin: A variety of Canadian breeding, selected among local populations *A. alnifolia*

Time of flowering: April to May

Time of fruit ripening: June to July

Value: One of the most common commercial varieties in Canada. Fruits are dark blue to purple-black with a veil, sweet, juicy, and tasty. High yield and fruit quality

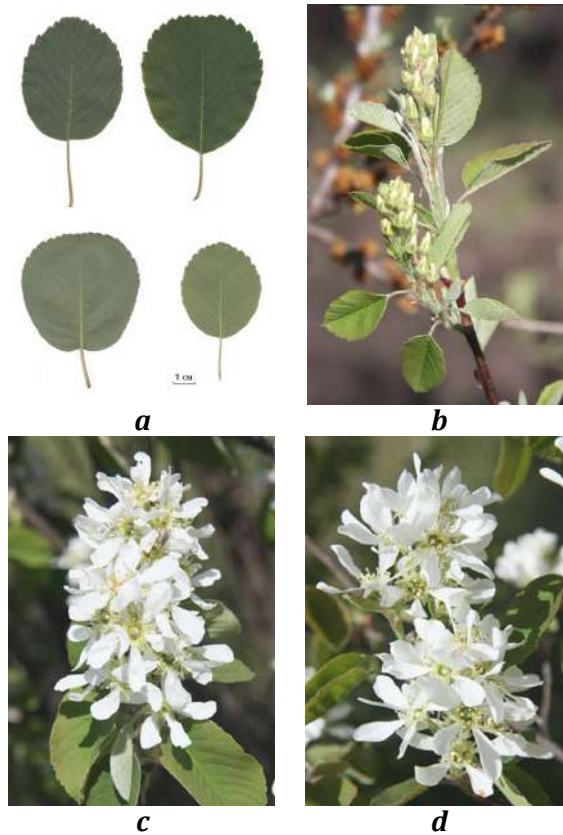


Figure 45. *Amelanchier alnifolia* 'Northline' a) leaves, b) shoot with inflorescences in the budding phase, c) inflorescence, d) flowers

Amelanchier alnifolia 'Pembina'

National catalog number: UN6800037

Collection number: 04037

Botanical name in Latin: *Amelanchier alnifolia* Nutt.

Botanical name in English: Pacific serviceberry, Saskatoon, Western juneberry, Western serviceberry, or Western shadbush

Botanical name in Ukrainian: Sadova irha vilkholystkova

Crop name in Ukrainian: Sadova irha

Accession name: 'Pembina' ('Barrhead 1', 'B.E.F.3501')

Date of introduction: 28.03.2015

Donor: Julian Geyer, Graz, Austria

Breeder: John Alexander Wallace; Beaverlodge Nursery, Alberta, Canada

Origin: A variety of Canadian breeding, selected among local populations *A. alnifolia*

Time of flowering: April to May

Time of fruit ripening: June to July

Value: Fruits are large, dark blue to purple-black with a papery surface, weighing 1.6 g, sweet, juicy, tasty, 8-13 in racemes. High yield and quality of fruit

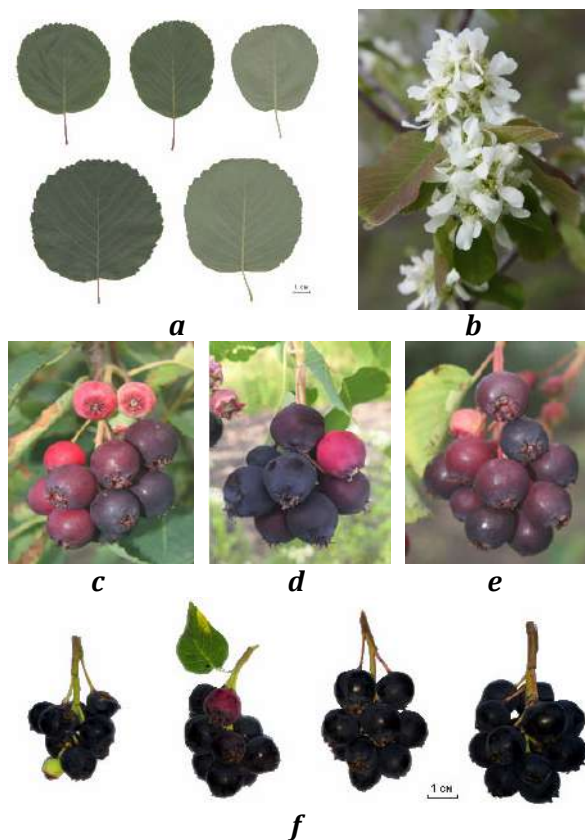


Figure 46. *Amelanchier alnifolia* 'Pembina' a) leaves: the upper row of fruiting shoots, the lower row of shoots, b) inflorescence, c) fruit, d) fruit, e) fruit, f) fruit size

Amelanchier alnifolia 'Radoslav'

National catalog number: UN6800039

Collection number: 04451

Botanical name in Latin: *Amelanchier alnifolia* Nutt.

Botanical name in English: Pacific serviceberry, Saskatoon, Western juneberry, Western serviceberry, or Western shadbush

Botanical name in Ukrainian: Sadova irha vilkholystkova

Crop name in Ukrainian: Sadova irha

Accession name: 'Radoslav'

Date of introduction: 22.07.2017

Donor: Volodymyr Mezhenkyj, Bakhmut, Donetsk Region, Ukraine

Breeder: Volodymyr Mezhenkyj

Origin: Second generation of accession No. 03298 *A. alnifolia* 'Mandan' obtained from the I. V. Michurin All-Russian Research Institute of Horticulture

Time of flowering: April to May

Time of fruit ripening: June to July

Value: The first Ukrainian cultivar included in the State Register of Plant Varieties of Ukraine in 2022. The fruits contain 8.2% sugar, 0.2% pectin, 0.5% organic acids, 20.8 mg/100 g ascorbic acid, 830.5 mg/100 g phenolic compounds. Fruits are dark blue to purple-black with a plague, weighing 1.5 g, sweet, juicy, tasty, 14-18 in racemes

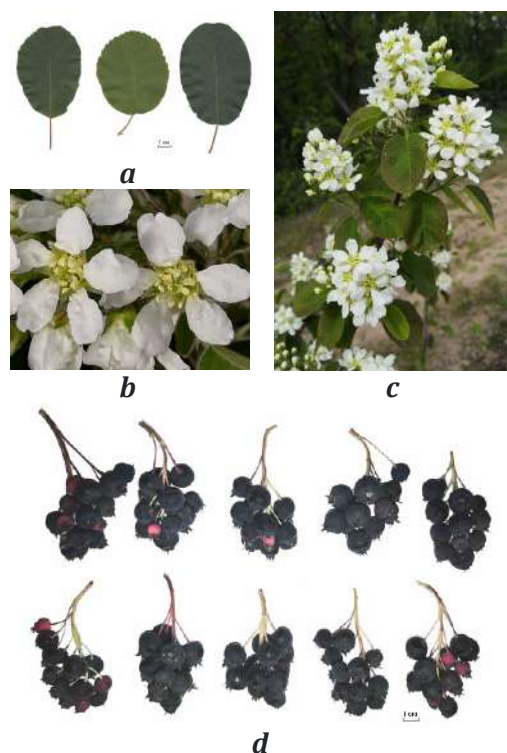


Figure 47. *Amelanchier alnifolia* 'Radoslav' a) leaves of vegetative shoots, b) flowers, c) flowers, d) variety of infructescences

Amelanchier alnifolia 'Martin'

National catalog number: UN6800035

Collection number: 04208

Botanical name in Latin: *Amelanchier alnifolia* Nutt.

Botanical name in English: Pacific serviceberry, Saskatoon, Western juneberry, Western serviceberry, or Western shadbush

Botanical name in Ukrainian: Sadova irha vilkholystkova

Crop name in Ukrainian: Sadova irha

Accession name: 'Martin' (the breeder's surname)

Date of introduction: 27.08.2015

Donor: Julian Geyer, Graz, Austria

Breeder: Dieter Martin, Saskatchewan, Canada

Origin: Seedling of 'Thiessen'

Time of flowering: April to May

Time of fruit ripening: June to July

Value: Fruits are large, dark blue to violet-black with a plague, weighing 1.6 g, sweet, juicy, tasty, in clusters of 10-13

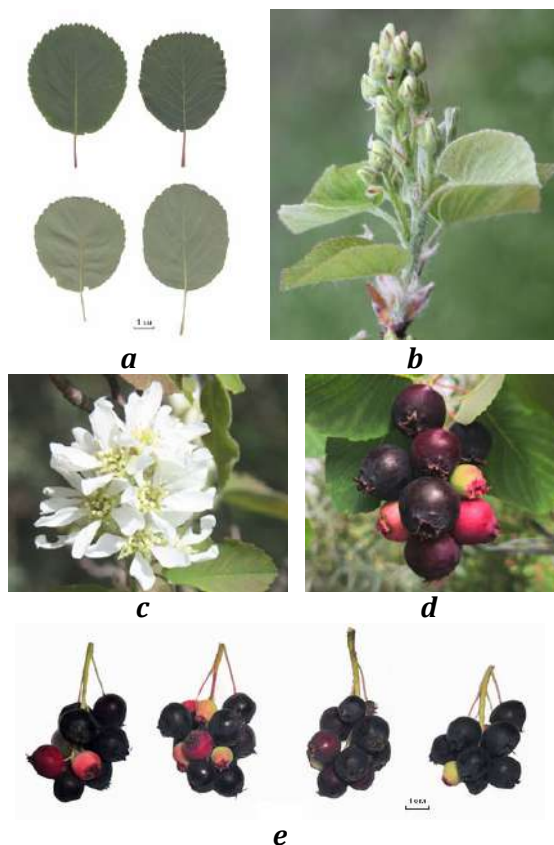


Figure 48. *Amelanchier alnifolia* 'Martin' a) leaves, b) inflorescence in the bud, c) inflorescence, d) infructescence, e) diversity of infructescences

Amelanchier canadensis 'Glenn Form'

National catalog number: UN6800038

Collection number: 04361

Botanical name in Latin: *Amelanchier canadensis* (L.) Medik.

Botanical name in English: Canadian serviceberry, Juneberry, Shadblow serviceberry, or Shadbush serviceberry

Botanical name in Ukrainian: Sadova irha kanadska

Crop name in Ukrainian: Sadova irha

Accession name: 'Glenn Form' (Rainbow Pillar®)

Date of introduction: 14.03.2017

Donor: Ömer Selim, Trabzon, Turkey

Breeder: Edward Losely; Losely Nursery, Perry, Ohio, USA

Origin: Selected from *A. canadensis* seedlings for their dense, upright, and symmetrical habit

Time of flowering: April to May

Time of fruit ripening: June to July

Value: Restrained growth, ornamental during the flowering season

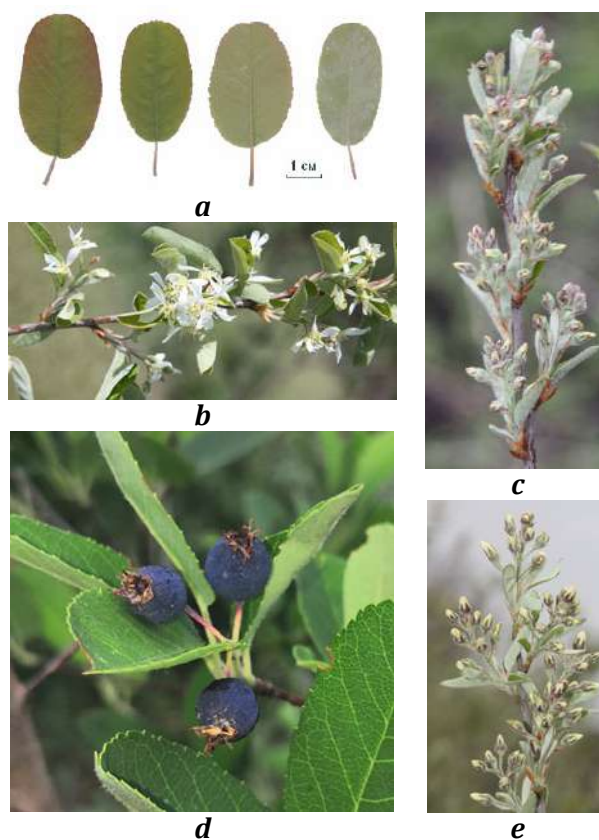


Figure 49. *Amelanchier canadensis* 'Glenn Form' a) leaves, b) inflorescence in the budding phase, c) flowering, d) infructescence, e) inflorescence in the bud

Amelanchier ×*grandiflora* 'Ballerina NL'

National catalog number: UN6800031

Collection number: 04033

Botanical name in Latin: *Amelanchier* ×*grandiflora* Rehder

Botanical name in English: Apple serviceberry

Botanical name in Ukrainian: Sadova irha velykokvitkova

Crop name in Ukrainian: Sadova irha

Accession name: 'Ballerina NL'

Date of introduction: 10.03.2015

Donor: Julian Geyer, Graz, Austria

Breeder: Julian Geyer

Origin: Seedling of *A.* ×*grandiflora* 'Ballerina'. The 'Ballerina' was developed in the Netherlands from seeds obtained from Hillier Nurseries (UK). *A.* ×*grandiflora* is a spontaneous hybrid of garden origin between two species from eastern North America *A. arborea* (F.Michx.) Fernald × *A. laevis* Wiegand.

Time of flowering: April to May

Time of fruit ripening: June to July

Value: High decorativeness during flowering. Weigh of fruits 0.9 g; sweet, juicy, tasty, 5-9 in racemes

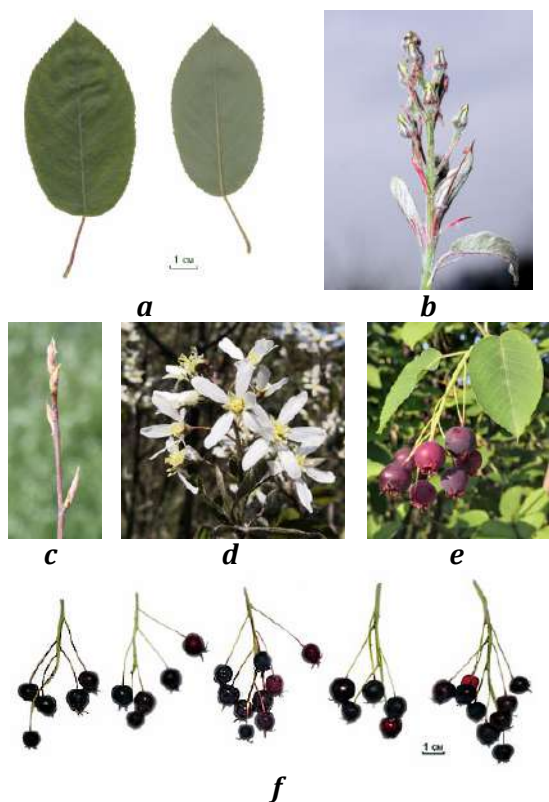


Figure 50. *Amelanchier* ×*grandiflora* 'Ballerina NL' a) leaves, b) inflorescence in the bud, c) shoot with buds, d) flowers, e) infructescence, f) diversity of infructescences

Amelanchier sp. 'Blue Ray'

National catalog number: UN6800032

Collection number: 04038

National catalog number: UN6800031

Collection number: 04033

Botanical name in Latin: *Amelanchier* sp.

Botanical name in English: Serviceberry

Botanical name in Ukrainian: Sadova irha

Crop name in Ukrainian: Sadova irha

Accession name: 'Blue Ray'

Date of introduction: 10.03.2015

Donor: Julian Geyer, Graz, Austria

Breeder: Clifford D. England, Sandgap, Kentucky, USA

Origin: Hybrid of *A. afnifolia* × *A. canadensis*

Time of flowering: April to May

Time of fruit ripening: June to July

Value: High decorative effect during flowering

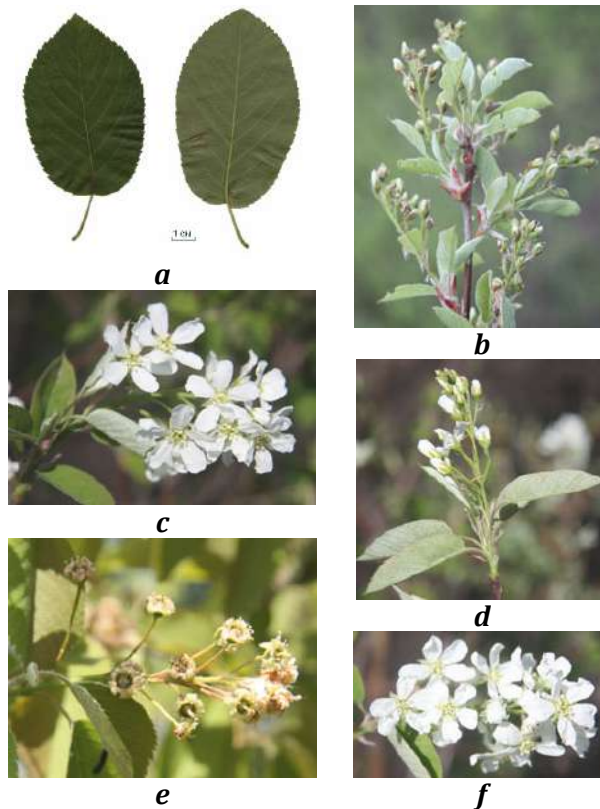


Figure 51. *Amelanchier* sp. 'Blue Ray' a) leaves, b) inflorescence in the bud, c) flowering inflorescence, d) inflorescence at the beginning of flowering, e) inflorescence after flowering, f) inflorescence

Amelanchier spicata 'Bluemoon'

National catalog number: UN6800024

Collection number: 01082/87

Botanical name in Latin: *Amelanchier spicata* (Lam.) K.Koch

Botanical name in English: Low serviceberry, or Low juneberry

Botanical name in Ukrainian: Sadova irha kolosysta

Crop name in Ukrainian: Sadova irha

Accession name: 'Bluemoon'

Date of introduction: 28.05.1990

Donor: Volodymyr Mezhenkyj, Bakhmut, Donetsk Region, Ukraine

Breeder: Volodymyr Mezhenkyj

Origin: Seedling of accession No. 01082, obtained as *A. canadensis* (L.) Medik. from Kudymkar, Perm Kraj, Russia

Time of flowering: April to May

Time of fruit ripening: June to July

Value: The variety was registered in Poland in 2016. The accession was registered in the National Center for Plant Genetic Resources of Ukraine for the traits of good taste of large fruits and low habitus in 2005. Fruits are dark blue to purple-black with a plague, weighing 1.0 g, sweet, juicy, and tasty. Contains 8.0% sugars, 0.5% organic acids, 21.1 mg/100 g ascorbic acid

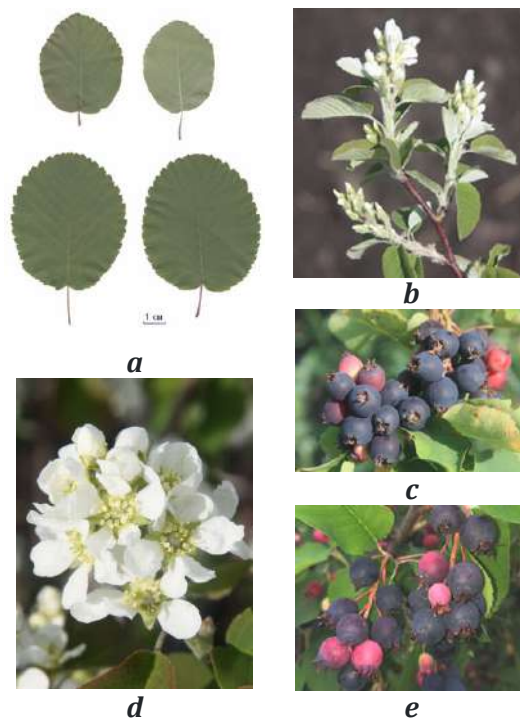


Figure 52. *Amelanchier spicata* 'Bluemoon' a) leaves: top row - flowering shoots, bottom row - shoots of growth, b) inflorescence in the phase of the beginning of flower development, c) infructescence, d) flowers, e) infructescence

ROSACEAE – ×AMELASORBUS
ROSE FAMILY – AMELANCHIER × SORBUS

AMELASORBUS AND SORBERRY

In 1918, dendrologist John Jack found a plant in the mountains of Idaho that Alfred Rehder (1925) identified as an intergeneric hybrid between *Amelanchier* × *Sorbus*, establishing a new nothogenus ×*Amelasorbus*. The nothospecies was named ×*A. jackii* in honor of the discoverer. According to Reder, the probable parental species were *A. florida* and *S. sitchensis*. According to George Jones (1939), the most likely parental component of Jack's plant is *S. scopulina*. Plants growing in the Arnold Arboretum were grown from seeds collected by Jack. They are characterized by entire coarsely serrate leaves, sometimes partially serrate or lobed in the lower part of the leaf blade, and red fruits (Rehder, 1925, 1949b). Per Axel Rydberg (1927) was obviously not familiar with Rehder's earlier description. Based on the study of a herbarium specimen collected by William Kuzik in Oregon, he described an intergeneric hybrid involving probably *A. florida* and *S. occidentalis*. The herbarium specimen collected by Kuzik in the 1880s have pinnate leaves at the base. In the article by Rhoda Love (1998), ×*A. jackii* mistakenly illustrated by the species ×*Sorbaronia arsenii* (Britt. ex L.Arsène) G. N. Jones.

In the Polish Kórnik Arboretum, Antoni Wróblewski discovered hybrid plants among the introduced material in the 1930s, which he named ×*A. raciborskiana* and ×*A. hoseri*. The first hybrid was grown from seeds of *A. asiatica*, obtained from Gothenburg (Sweden), which apparently originated from pollination by some species of *Sorbus* with pinnate leaves. Seeds of another plant were obtained from Le Barre (France) under the name *S. aristata*. Its origin was assumed to be due to hybridization of *Amelanchier* sp. with *Sorbopyrus auricularis* or *S. hybrida* (Rehder, 1949a; Browicz and Bugala, 1958; Eder, 1970; Krüssmann, 1976; Seneta, 1991).

In this case, according to the concept of *Sorbus* s. str., this plant would have a trigenic origin. There are two accessions of ×*Amelasorbus* in our collection (Mezhenskyj, 2005; Mezhenskij, 2006; Mezhenskyj and Mezhenska, 2015).

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×Amelasorbus jackii No. 00225 F₁

National catalog number: UN6800018

Collection number: 00225 F₁

Botanical name in Latin: *×Amelasorbus jackii* Rehder

Botanical name in English: Jack's amelasorbus, or Sorberry

Botanical name in Ukrainian: Irhohorobyna Dzheka

Crop name in Ukrainian: Irhohorobyna

Accession name: -

Date of introduction: 17.03.1993

Donor: Bakhmut Experimental Station Nurseries Cultivation, Bakhmut, Donetsk Region, Ukraine

Breeder: Volodymyr Mezhen'skyj (introducer)

Origin: The natural range of *×A. jackii* (= *Amelanchier alnifolia* × *Sorbus scopulina* Greene) is Idaho and Oregon. It is a seedling of accession No. 00225 *×A. jackii*, obtained from the former Main Botanical Garden of the Academy of Sciences of USSR, which was brought in as seedlings from the Netherlands

Time of flowering: April to May

Time of fruit ripening: June to July

Value: Interesting as an intergeneric hybrid. Could be tested as an intermediate insert for cereal crops

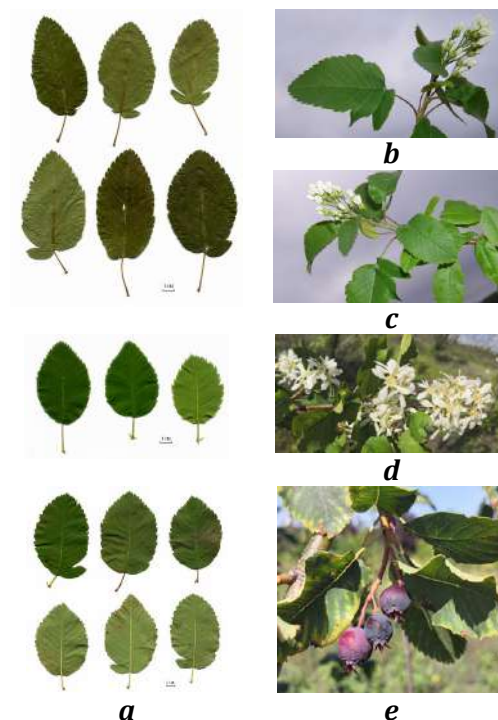


Figure 53. *×Amelasorbus jackii* No. 00225 F₁ a) leaves of different years, b) young shoot with leaves and inflorescence in the bud, c) young shoot with leaves and inflorescence in the bud, d) flowering, e) infructescence

×Amelasorbus raciborskiana 'Raciborskiana'

National catalog number: U00100044

Collection number: 04298

Botanical name in Latin: *×Amelasorbus raciborskiana* Browicz & Bugala

Botanical name in English: Raciborski's amelasorbus

Botanical name in Ukrainian: Irhohorobyna ratsiborskova

Crop name: Irhohorobyna

Accession name: 'Raciborskiana' (named after Marjan Raciborski, a Polish botanist)

Date of introduction: 11.03.2017

Donor: Sven Maksymiuk, Milanówówek, Poland

Breeder: Antoni Wróblewski (introducer)

Origin: Spontaneous hybrid of *Amelanchier asiatica* (Siebold & Zucc.) Endl. × *Sorbus* sp., grown in the Kórnik Arboretum (Poland) from seeds obtained from Gothenburg (Sweden)

Time of flowering: April to May

Time of fruit ripening: Has not yet borne fruit under collection conditions

Value: Interesting as an intergeneric hybrid. Should be used in the breeding of Sorboid plants and for dwarf rootstock

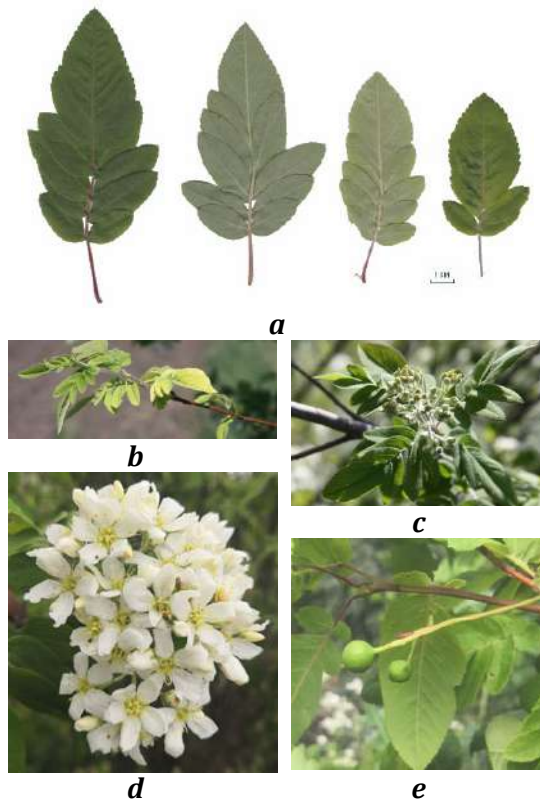


Figure 54. *×Amelasorbus raciborskiana* 'Raciborskiana' a) leaves, b) young shoot with leaves, c) inflorescence in the bud, d) inflorescence, e) young fruits

ROSACEAE – ARIA

ROSE FAMILY – WHITEBEAM

WHITEBEAM

Christian Persoon (1807) established the subgenus *Aria* in the genus *Sorbus*, and Nikolaus Host (1831) raised the rank of the taxon to a separate genus. However, most taxonomists included *Aria* in *Sorbus* s.l. as a subgenus (Koch, 1869; Aldasoro et al., 2004) or section (Dumortier, 1827). Phylogenetic studies have established the polyphyletic nature of *Sorbus* s.l., so it was divided into separate genera, with the restoration of the genus status of *Aria* in particular (Campbell et al., 2007; Li et al., 2012; Lo and Donoghue, 2012; Sun et al., 2018). Due to the large number of related taxa in the subfamily *Malinae*, it has been proposed to expand the genus *Aria* to include *Chamaespilus* and *Torminalis* (Mosyakin et al., 2022) or even to establish *Pyrus* s.l., which, in addition to *Pyrus* s.str., *Malus*, *Cydonia*, and other closely related genera, also include all sorboid genera and nothogenera together with *Aria* (Christenhusz et al., 2018).

The genus *Aria* includes 53 species in Europe (Sennikov and Kurtto, 2017). In Ukraine, *Aria* species are found in Crimea (Fedoronchuk, 2017). Indications of their occurrence in the Carpathians need to be verified (Chopyk and Fedoronchuk, 2015). *Aria* species have value as fruit plants (Mezhenskyj, 2019).

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Aria albovii No. 03606

National catalog number: U00300003

Collection number: 03606

Botanical name in Latin: *Aria albovii* (Zinserl.) Mezhen'skyj

Botanical name in English: Albov's whitebeam

Botanical name in Ukrainian: Ariia Albova

Crop name in Ukrainian: Mukynia, or Ariia

Accession name: -

Date of introduction: 07.08.2012

Donor: Otradnoe Research Station of V. L. Komarov Botanical Institute of the Russian Academy of Sciences, Otradnoe, Leningrad Region, Russia

Breeder: Tamara Zaikonnikova (introducer)

Origin: Collected in natural populations of *Aria* on Mount Jermuk, Armenia

Time of flowering: May

Time of fruit ripening: September

Value: Promising for the breeding of the Sorboid plant group

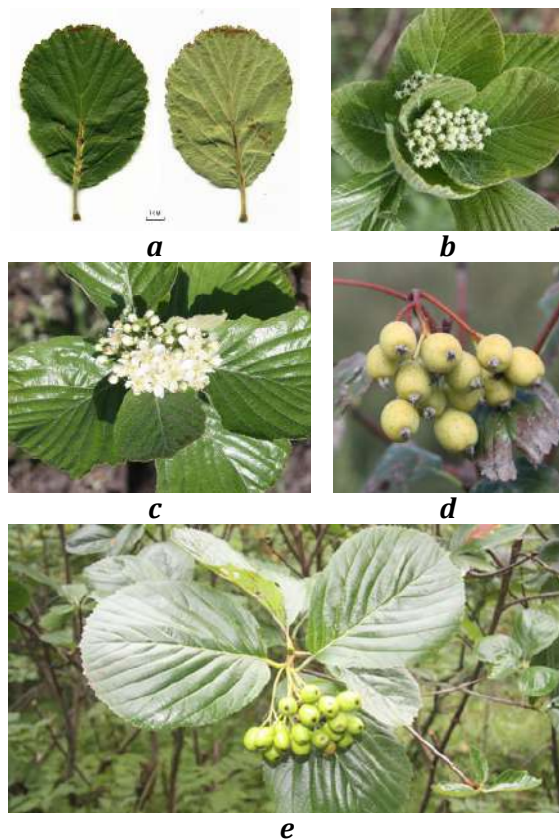


Figure 55. *Aria albovii* No. 03606 a) leaves, b) flower buds, c) first open flowers, d) fruit, e) leaves and unripe fruit

Aria buschiana No. 03608

National catalog number: U00300004

Collection number: 03608

Botanical name in Latin: *Aria buschiana* (Zinserl.) Mezhenkyj

Botanical name in English: Busch's whitebeam

Botanical name in Ukrainian: Ariia Busheva

Crop name in Ukrainian: Mukynia, or Ariia

Accession name: -

Date of introduction: 07.08.2012

Donor: Otradnoe Research Station of V. L. Komarov Botanical Institute of the Russian Academy of Sciences, Otradnoe, Leningrad Region, Russia

Breeder: Tamara Zaikonnikova (introducer)

Origin: Seeds collected in natural populations of *Aria* in the Caucasus, Mount Aczishcho

Time of flowering: May

Time of fruit ripening: September

Value: Promising in plant breeding of the Sorboid group

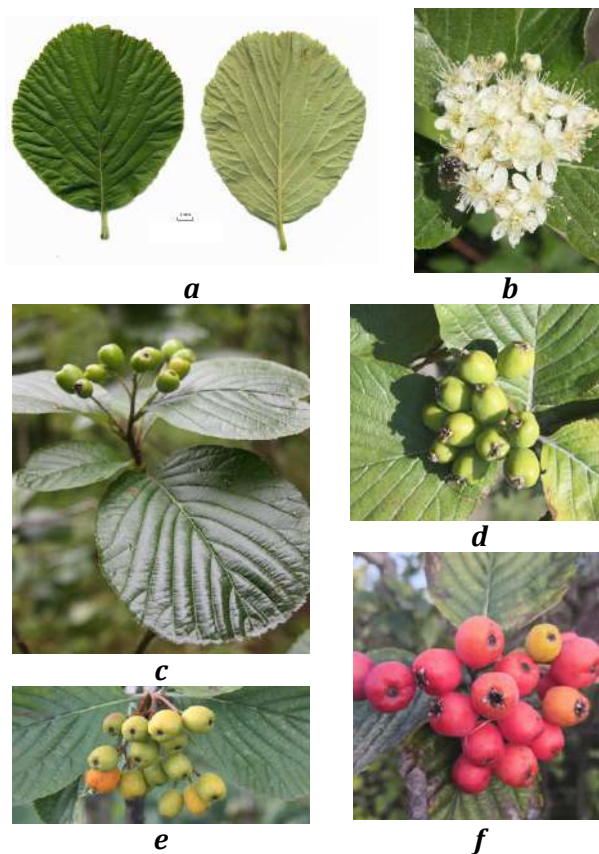


Figure 56. *Aria buschiana* No. 03608 a) leaves, b) inflorescences, c) fruits, d) leaves and fruits, e) infructescence, f) ripe fruit

Aria edulis No. 03675

National catalog number: U00300010

Collection number: 03675

Botanical name in Latin: *Aria edulis* (Willd.) M.J.Roemer

Botanical name in English: Common whitebeam, or Whitebeam

Botanical name in Ukrainian: Aria edible

Crop name in Ukrainian: Mukynia, or Ariia

Accession name: -

Date of introduction: 09.08.2012

Donor: Pavlovsk Research Station VIR - N.I.Vavilov Research Institute of Plant Industry, Pavlovsk, Leningrad Region, Russia

Breeder: -

Origin: Originates from Botanical Garden in Nancy, France (no. 42651). The native range of the species covers Western, Central, Southern, and South-Eastern Europe and North-Western Africa

Time of flowering: May

Time of fruit ripening: October

Value: Diploid. Can be used in breeding plants of the Sorboid group

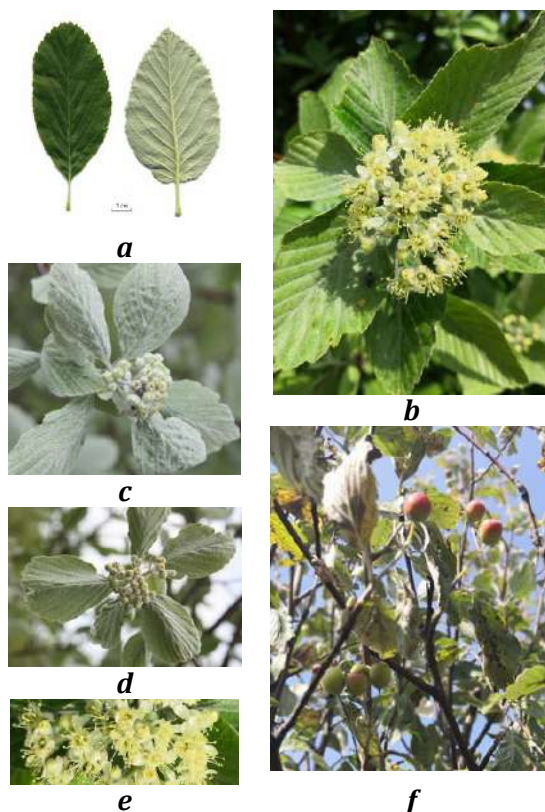


Figure 57. *Aria edulis* No. 03675 a) leaves, b) inflorescence, c) leaves and inflorescences in the bud, d) inflorescence in the budding stage, e) flowers, f) fruiting

Aria fedorovii No. 03614

National catalog number: U00300005

Collection number: 03614

Botanical name in Latin: *Aria fedorovii* (Zaikonn.) Mezhen'skyj

Botanical name in English: Fedorov's whitebeam

Botanical name in Ukrainian: Ariia Fedorova

Crop name in Ukrainian: Mukynia, or Ariia

Accession name: -

Date of introduction: 07.08.2012

Donor: Otradnoe Research Station of V. L. Komarov Botanical Institute of the Russian Academy of Sciences, Otradnoe, Leningrad Region, Russia

Breeder: Tamara Zaikonnikova (introducer)

Origin: Seeds collected in natural populations in the Caucasus, Mount Aczishcho

Time of flowering: May

Time of fruit ripening: September

Value: Promising in the breeding of plants of the Sorboid group

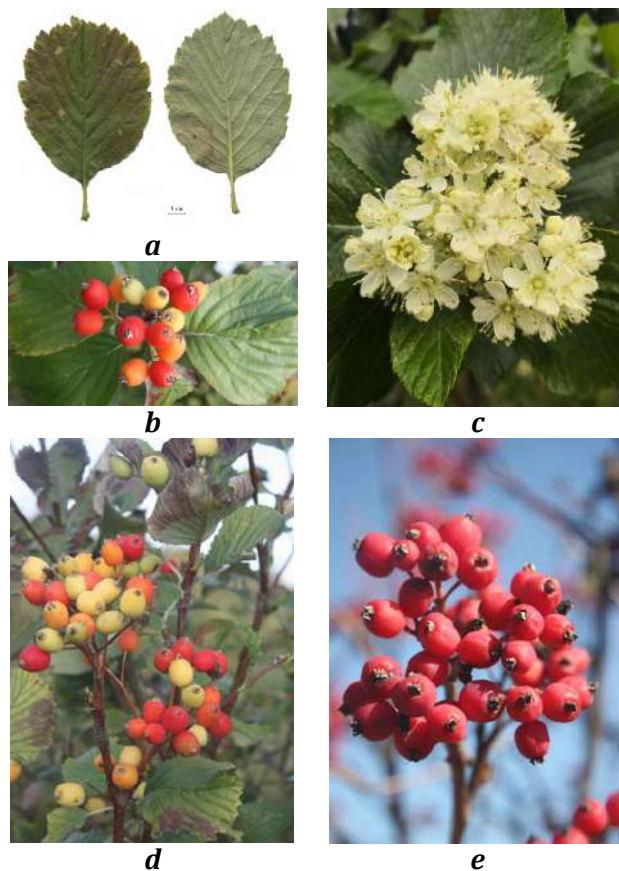


Figure 58. *Aria fedorovii* No. 03614 a) leaves, b) fruits, c) inflorescences, d) fruiting, e) infructescence

Aria pannonica 'Pannonia'

National catalog number: U00300011

Collection number: 04819

Botanical name in Latin: *Aria pannonica* (Kárpáti) Sennikov & Kurtto

Botanical name in English: Pannonia whitebeam

Botanical name in Ukrainian: Ariia pannonska

Crop name in Ukrainian: Mukynia, or Ariia

Accession name: 'Pannonia' (Pannonia is a region in Central Europe)

Date of introduction: 22.02.2021

Donor: Johannes Rabensteiner, Graz, Austria

Breeder: Fritz Kummert (introducer)

Origin: Endemic to western Hungary. A putative hybrid of *A. edulis* (Willd.) M. J. Roemer × *A. graeca* (Spach) M. J. Roemer. Triploid. Seeds collected in natural populations in Hungary

Time of flowering: May

Time of fruit ripening: September

Value: Promising in the breeding of plants of the Sorboid group

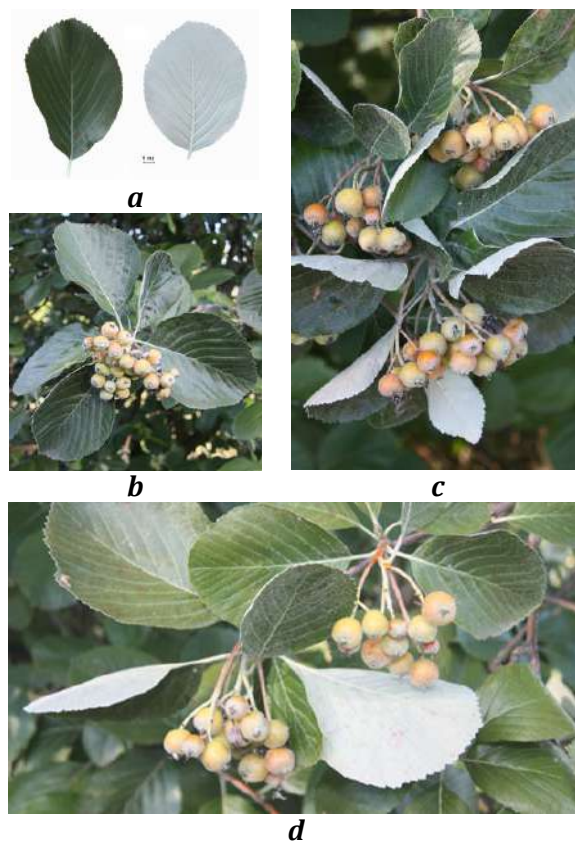


Figure 59. *Aria pannonica* 'Pannonia' a) leaves, b) fruiting, c) leaves and unripe fruits, d) leaves and unripe fruits

Aria sp. 'Kyivska Dovhasta'

National catalog number: U00300002

Collection number: 03398

Botanical name in Latin: *Aria* sp.

Botanical name in English: Whitebeam

Botanical name in Ukrainian: Ariia

Crop name in Ukrainian: Mukynia, or Ariia

Accession name: 'Kyivska Dovhasta' (means "oblong of Kyiv")

Date of introduction: 26.09.2011

Donor: M. M. Hryshko National Botanical Garden of the National Academy of Sciences of Ukraine, Kyiv, Ukraine

Breeder: Volodymyr Mezhenkyj

Origin: The variety was grown from seeds collected in the M. M. Hryshko National Botanical Garden

Time of flowering: May

Time of fruit ripening: September

Value: Fruits are large, elongated-ovoid, and sweetish. Promising in the breeding of plants of the Sorboid group

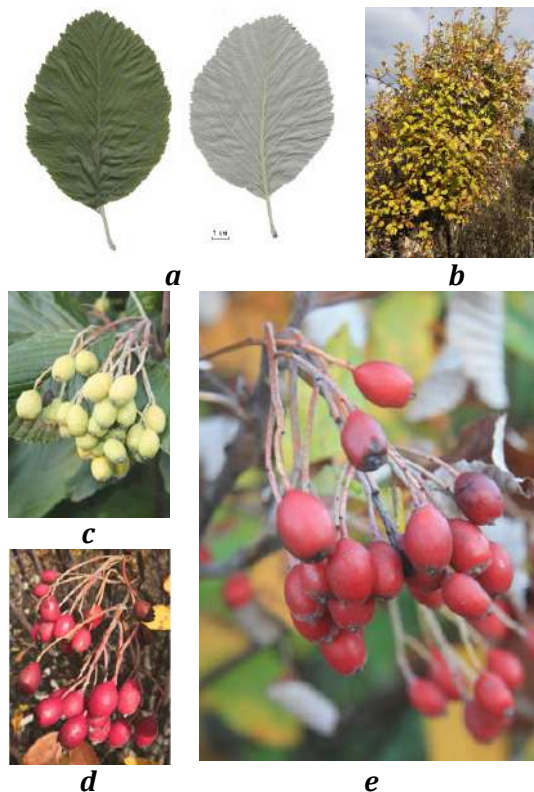


Figure 60. *Aria* sp. 'Kyivska Dovhasta' a) leaves, b) tree, c) infructescence, d) infructescence, e) infructescence

Aria sp. No. 03629

National catalog number: U00300009

Collection number: 03629

Botanical name in Latin: *Aria* sp.

Botanical name in English: *Aria*

Botanical name in Ukrainian: Aria

Crop name in Ukrainian: Mukynia, or aria

Accession name: -

Date of introduction: 07.08.2012

Donor: Otradnoe Research Station of V. L. Komarov Botanical Institute of the Russian Academy of Sciences, Otradnoe, Leningrad Region, Russia

Breeder: Tamara Zaikonnikova (introducer)

Origin: Seeds collected in natural populations in the Caucasus

Time of flowering: May

Time of fruit ripening: September

Value: Promising in the breeding of plants of the Sorboid group

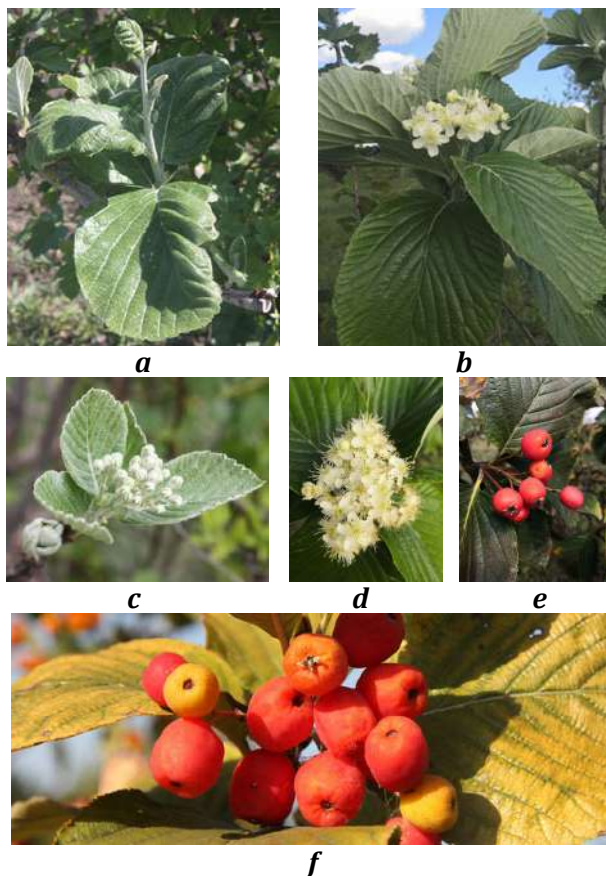


Figure 61. *Aria* sp. No. 03629 a) a young shoot, b) leaves and inflorescences, c) inflorescence in the budding phase, d) inflorescence, e) fruit, f) fruit

Aria szovitsii 'Samlia'

National catalog number: U00300007

Collection number: 03624

Botanical name in Latin: *Aria szovitsii* Decne

Botanical name in English: Szovits's whitebeam

Botanical name in Ukrainian: Ariia Shovitsa

Culture name: Mukynia, or Ariia

Accession name: 'Samlia' (from Mount Samlia in the Caucasus)

Date of introduction: 07.08.2012

Donor: Otradnoe Research Station of V. L. Komarov Botanical Institute of the Russian Academy of Sciences, Otradnoe, Leningrad Region, Russia

Breeder: Tamara Zaikonnikova (introducer)

Origin: Seeds collected in natural populations on Mount Samlia, Georgia

Time of flowering: May

Time of fruit ripening: September

Value: Promising in breeding plants of the sorboid group. Fruits contain 4.8 mg/100 g carotene

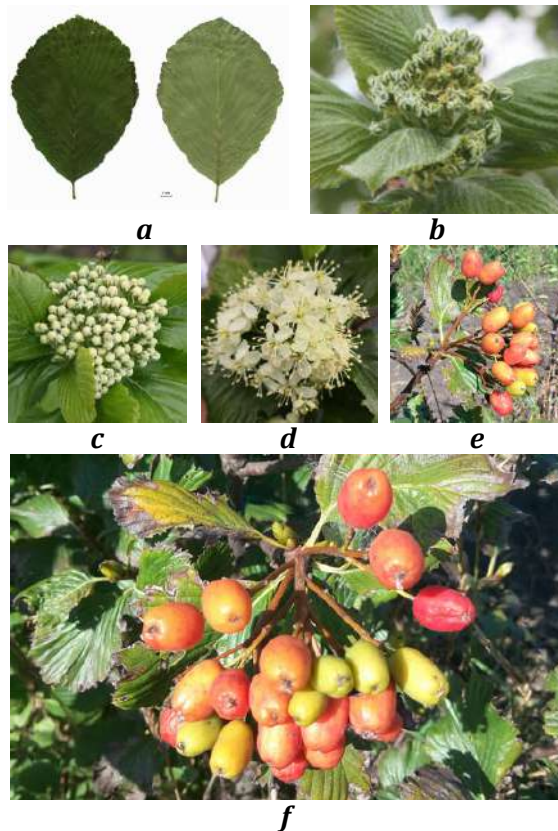


Figure 62. *Aria szovitsii* 'Samlia' a) leaves, b) inflorescence in the budding phase, c) inflorescence in the budding phase, d) flowering inflorescence, e) infructescence, f) infructescence

Aria taurica No. 01389

National catalog number: U00300001

Collection number: 01389

Botanical name in Latin: *Aria taurica* (Zinserl.) Sennikov & Kurtto

Botanical name in English: Crimean whitebeam

Botanical name in Ukrainian: Ariia tavrivska

Crop name in Ukrainian: Mukynia, Ariia

Accession name: -

Date of introduction: 22.08.1992

Donor: Lubny Forestry Technical Lyceum, Lubny, Poltava Region, Ukraine

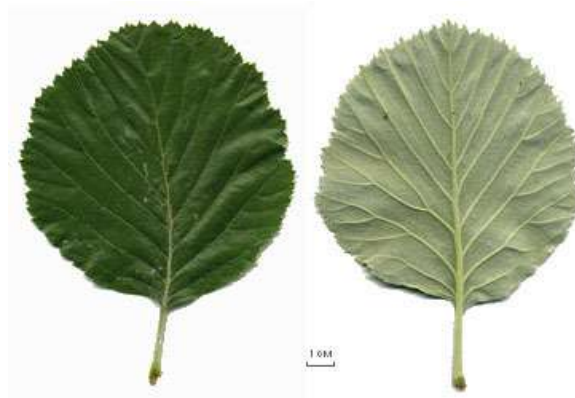
Breeder: -

Origin: Tetraploid species related to *A. umbellata* (Desf.) Sennikov & Kurtto. Endemic to Crimea

Time of flowering: May

Time of fruit ripening: September

Value: Promising in the breeding of plants of the Sorboid group



a



b

Figure 63. *Aria taurica* No. 01389, a) leaves, b) inflorescence

ROSACEAE – ARONIA

ROSE FAMILY – CHOKEBERRY

CHOKEBERRY

The genus *Aronia* was established by Friedrich Medikus (1789). It originally included a single species previously described as *Mespilus arbutifolia* (Linnaeus, 1753). Now it includes North American *A. arbutifolia*, *A. melanocarpa*, and a natural hybrid between them *A. ×prunifolia* (Hardin, 1973; Phipps et al., 1990; Mezhenskij, 2005; Connolly, 2014). Due to the morphological similarity of flowers and fruits, *Aronia* was included in *Photinia* (Robertson et al., 1991), but phylogenetic studies have proved the separation of these genera (Guo et al., 2011; Sun et al., 2018). Alexei Skvortsov and Yulia Maitulina (Skvortsov and Maitulina, 1982) proposed the name *A. mitschurinii* for garden chokeberry against *A. melanocarpa* because it is morphologically distinct from the true North American *A. melanocarpa*. Since the garden chokeberry arose as a result of hybridization of *Aronia* × *Sorbus*, it is advisable to transfer it to ×*Sorbaronia* (Sennikov and Phipps, 2013). The commercial culture of garden chokeberry is based on ×*Sorbaronia mitschurinii* (= *A. melanocarpa* hort.), while small-fruited *Aronia* ssp. are grown as ornamental plants. However, biochemical analysis has proven its superiority in the accumulation of substances that determine the antioxidant properties of fruits. Therefore, *Aronia* species are useful in garden chokeberry breeding programs (Brand, 2010; Connolly, 2014; Brand et al., 2017, 2022; Mahoney, 2020).

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Aronia arbutifolia 'Brilliant'

National catalog number: UR5200012

Collection number: 04565

Botanical name in Latin: *Aronia arbutifolia* (L.) Pers.

Botanical name in English: Red chokeberry

Botanical name in Ukrainian: Aronisa synychnykolystkova

Crop name in Ukrainian: Aroniia

Accession name: 'Brilliant' ('Brilliant Red Chokeberry', 'Brilliantissima')

Date of introduction: 14.03.2017

Donor: Ömer Selim, Trabzon, Turkey

Breeder: -

Origin: Cultivated in American nurseries since the beginning of the 20th century

Time of flowering: May

Time of fruit ripening: August to September

Value: The variety is ornamental primarily for its red abundant fruits and autumn leaf color. Fruits are spherical, small, and edible

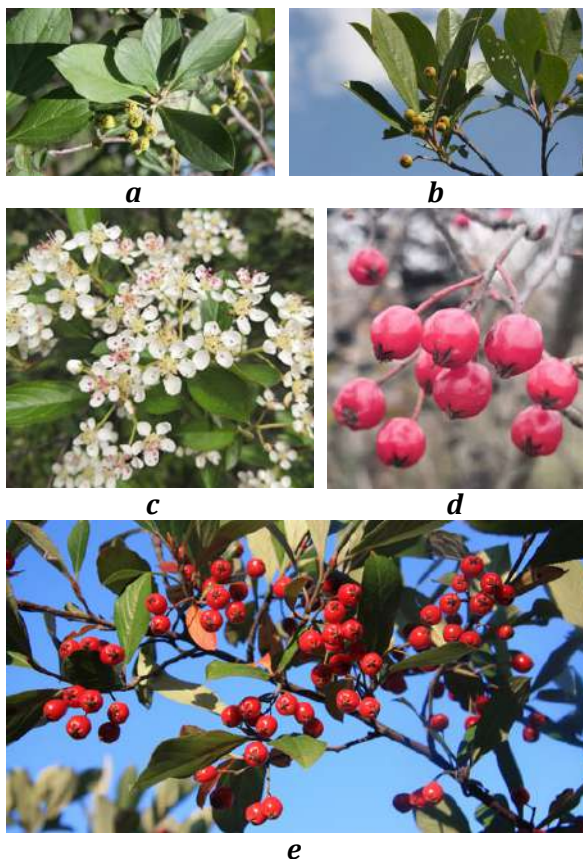


Figure 64. *Aronia arbutifolia* 'Brilliant' a) leaves and young fruit, b) leaves and young fruit, c) flowers, d) infructescence, e) fruit

Aronia melanocarpa 'Dwarf'

National catalog number: UR2500009

Collection number: 03207

Botanical name in Latin: *Aronia melanocarpa* (Michx.) Elliott

Botanical name in English: Black chokecherry

Botanical name in Ukrainian: Aroniia chornoploda

Crop name: Aroniia

Accession name: 'Dwarf'

Date of introduction: 08.01.2011

Donor: One Green World Nursery Molalla, Oregon, USA

Breeder: Jim Gilbert (collector)

Origin: -

Time of flowering: May

Time of fruit ripening: August to September

Value: Fruits are spherical, small, black, glossy, edible, weighing 0.5 (1.0) g, 5-20 in corymb. Fruits contain 6.0-8.6% sugars, 0.7 (1.0)% pectin substances, 0.8-1.5% organic acids, 2.6-4.8% polyphenols, 27.1-42.9 mg/100 g ascorbic acid

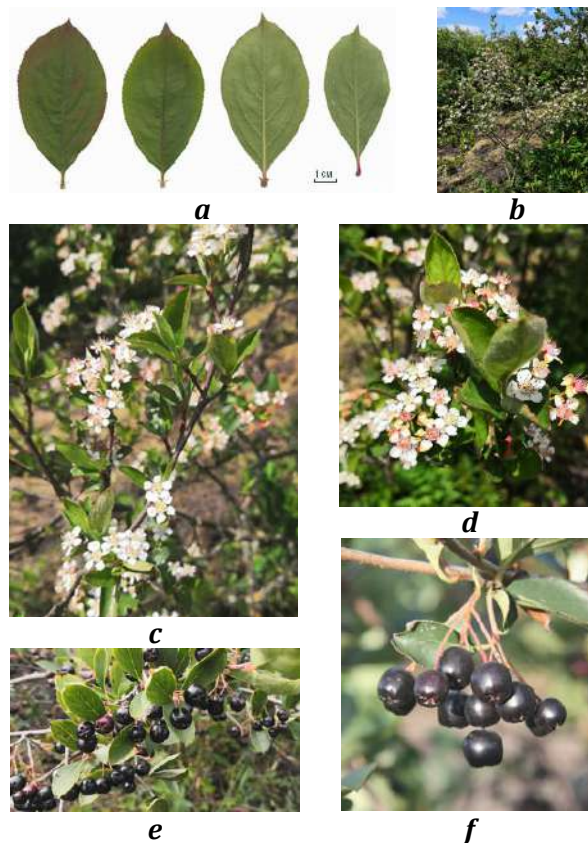


Figure 65. *Aronia melanocarpa* 'Dwarf' a) leaves, b) flowering bush, c) flowering, d) flowering, e) fruiting, f) infructescence

Aronia melanocarpa 'Hugin'

National catalog number: UR5200011

Collection number: 04212

Botanical name in Latin: *Aronia melanocarpa* (Michx.) Elliott

Botanical name in English: Black chokeberry

Botanical name in Ukrainian: Aroniia chornoploda

Crop name: Aroniia

Accession name: 'Hugin' (in Norse mythology, Huginn is a black raven)

Date of introduction: 28.08.2015

Donor: Federal Research Institute of Horticulture Schönbrunn, Vienna, Austria

Breeder: Alnarp Institute, Sweden

Origin: Swedish variety originating from natural populations on Walpole Island, Canada

Time of flowering: May

Time of fruit ripening: August to September

Value: Tetraploid. Fruits are spherical, small, black, glossy, edible, weighing 0.5 g, 4 to 6 fruit per corymb

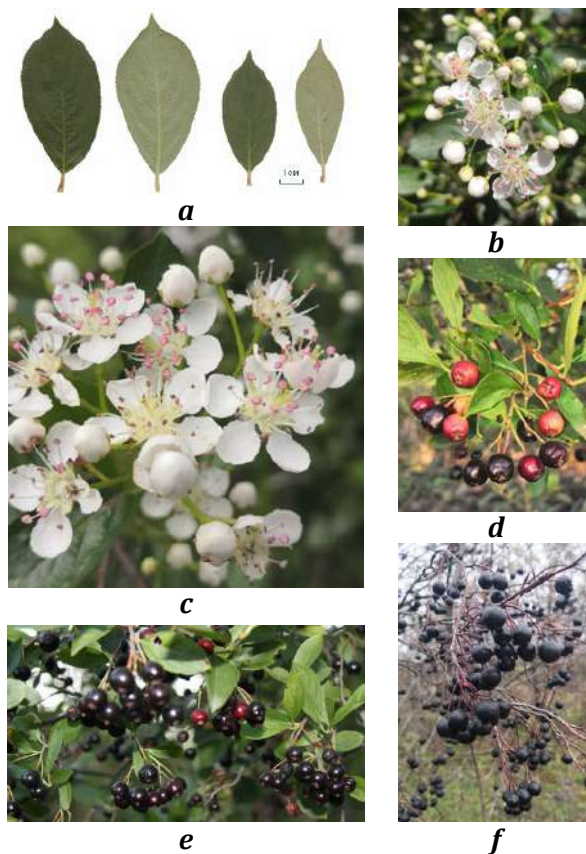


Figure 66. *Aronia melanocarpa* 'Hugin' a) leaves, b) inflorescences, c) flowers, d) ripening fruits, e) fruit, f) fruit on branches after leaf fall

Aronia sp. No. 03597

National catalog number: UR5200010

Collection number: 03597

Botanical name in Latin: *Aronia* sp.

Botanical name in English: Chokeberry

Botanical name in Ukrainian: Aroniia

Crop name in Ukrainian: Aroniia

Accession name: -

Date of introduction: 07.08.2012

Donor: Otradnoe Research Station of V. L. Komarov Botanical Institute of the Russian Academy of Sciences, Otradnoe, Leningrad Region, Russia

Breeder: -

Origin: The accession was obtained as *A. arbutifolia* (L.) Pers. but it may be *A. ×prunifolia* (Marsh.) Rehder, which is a natural hybrid *A. arbutifolia* × *A. melanocarpa* (Michx.) Elliott, which occurs in northeastern North America, or it is a putative hybrid *A. arbutifolia* × *Sorbaronia mitschurinii* (A.K.Skvortsov & Maitul.) Sennikov.

Time of flowering: May

Time of fruit ripening: August to September

Value: Fruits are spherical, small, purple-black to black, edible

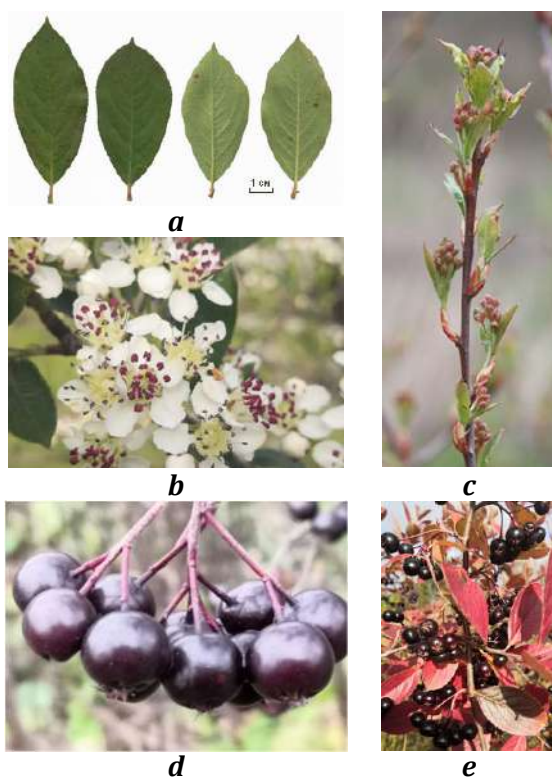


Figure 67. *Aronia* sp. No. 03597 a) leaves, b) a branch with inflorescences in the budding stage, c) flowers, d) fruits, e) fruiting and autumn color of leaves

ROSACEAE – CHAENOMELES

ROSE FAMILY – JAPANESE QUINCE

JAPANESE QUINCES

The genus *Chaenomeles* includes the plants commonly known as Japanese quinces and comprises 3 natural species in East Asia and 4 hybrid groups developed in Europe and North America (Weber, 1963, 1964; Mezhenskij, 1989a, 2004). There are above 500 ornamental cultivars of Japanese quinces (Weber, 1963). Japanese quince has been cultivated in Ukraine since the early 19th century. Ukraine has priority in introducing it to commercial growing as a fruit plant since 1937 and registering the first fruit varieties in 2001 (Mezhenskij, 1996; Klymenko and Mezhenskyj, 2013). The fruits of Japanese quince are more similar to lemons than to the fruits of related pome crops, such as apples and pears, in terms of their high organic acid content. They accumulate a significant amount of ascorbic acid, bioflavonoids, pectin, and aromatic substances and have significant potential as raw materials for the food, pharmaceutical, and perfume industries. Japanese quince is valuable for its early maturity, high yield, annual fruiting, and resistance to pathogens and pests, which makes it a promising organic gardening crop (Mezhenskij, 1989a, 1989b, 2004, 2010; Rumpunen, 2003; Mezhenskyj, 2009, 2015). Ecological plasticity, ease of reproduction, and high economic efficiency confirm the prospects of this new fruit crop. The genetic variability of many characters allows superior genotypes and new fruit cultivars have been developed in Ukraine and other countries (Mezhenskij, 1989b, 1999; Rumpunen, 2003; Mezhenskyj, 2009, 2021; Klymenko and Mezhenskyj, 2013; Mezhenskyj et al., 2019).

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Chaenomeles ×californica 'Gold Kalif'

National catalog number: UN9100307

Collection number: 04432

Botanical name in Latin: *Chaenomeles ×californica* W.Clarke ex C.Weber

Botanical name in English: Californian quince

Botanical name in Ukrainian: Yaпonska aiva kaliforniiska

Crop name in Ukrainian: Khenomeles, or Yaпonska aiva

Accession name: 'Gold Kalif'

Date of introduction: 08.07.2017

Donor: Bakhmut Experimental Station of Nurseries Cultivation, Bakhmut, Donetsk Region, Ukraine

Breeder: Volodymyr Mezhen'skyi

Origin: Bud mutation of 'Kalif'

Time of flowering: April to May

Time of fruit ripening: September

Value: The variety was included in the State Register of Plant Varieties of Ukraine in 2021. Flowers white with pink spots. Fruits are spherical to spherical-ovoid, smooth, yellow, fragrant, weighing 80-120 (180) g. Pulp content 92-95%, the thickness of the pulp layer 14-16 mm, domesticated index 2.0-2.3. Fruits contain 3.7% of sugars, 4.5% of organic acids, and 145.0 mg/100 g ascorbic acid



Figure 68. *Chaenomeles ×californica* 'Gold Kalif' a) flowers, b) flower, c) flower buds opening, d) fruit on the branch, e) flowers, f) fruit shape and cross-section, g) fruit on the branch

Chaenomeles ×californica 'Kalif'

National catalog number: UN910003

Collection number: 04431

Botanical name in Latin: *Chaenomeles ×californica* W.Clarke ex C.Weber

Botanical name in English: Californian quince

Botanical name in Ukrainian: Yaponska aiva kaliforniiska

Crop name in Ukrainian: Khenomeles, or Yaponska aiva

Accession name: 'Kalif' ('60-11-100')

Date of introduction: 08.07.2017

Donor: Bakhmut Experimental Station of Nurseries Cultivation, Bakhmut, Donetsk Region, Ukraine

Breeder: Volodymyr Mezhenyskyi

Origin: Seedling of accession No. 595/1, obtained by seeds from the Tashkent Botanical Garden, Uzbekistan

Time of flowering: April to May

Time of fruit ripening: September

Value: The variety was included in the State Register of Plant Varieties of Ukraine in 2001. The accession was registered in the National Center for Plant Genetic Resources of Ukraine for its large fruits with a thickened layer of flesh, tall growth, upright habit, few thorns, and white flowers with pink spots registered in 2005. Fruits are spherical to ellipsoidal, smooth, yellow, fragrant, weighing 80-100 (140) g. Pulp content 92-94%, the thickness of the pulp layer 14-15 mm, domesticated index 2.0-2.1. Fruits contain 3.7% of sugars, 4.5% of organic acids, and 111.8 mg/100 g ascorbic acid

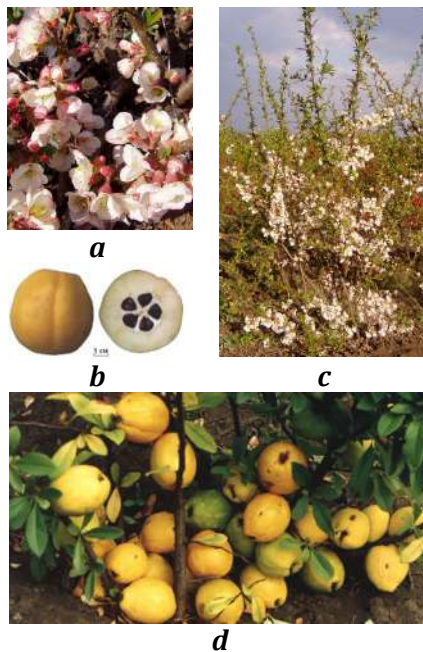


Figure 69. *Chaenomeles ×californica* 'Kalif' a) flowers, b) flowering bush, c) fruit shape and cross section, d) fruiting bush

Chaenomeles ×californica 'Maksym'

National catalog number: UN9100305

Collection number: 03734

Botanical name in Latin: *Chaenomeles ×californica* W.Clarke ex C.Weber

Botanical name in English: Californian quince

Botanical name in Ukrainian: Yaпoнcka aивa kalifornиicka

Crop name in Ukrainian: Khenomeles, or Yaпoнcka aивa

Accession name: 'Maksym' ('11-39-89') (the Latin word "maximus" indicates the large fruits of this cultivar, as well as Maksym Melnychuk, vice-rector of the NUBiPU, and Sven Maksymiuk, a Polish nurseryman)

Date of introduction: 23.08.2012

Donor: Volodymyr Mezhenkyj, Bakhmut, Donetsk Region, Ukraine

Breeder: Volodymyr Mezhenkyj

Origin: Seedling of 'Kalif' from free pollination

Time of flowering: April to May

Time of fruit ripening: September

Value: The variety was registered in Poland in 2016; it was included in the State Register of Plant Varieties of Ukraine in 2021. The flowers are white with pink spots. Fruits are spherical, smooth, yellow, and fragrant, weighing 80-100 (150) g. Pulp content 92-95%, pulp layer thickness 13-16 mm, domesticated index (calculated as the fruit diameter/core diameter ratio) = 2.1-2.3. Ripe fruits are easily separated from the branches and fall off. Fruits contain 4.0-6.1% of sugars, 4.9-5.7% of organic acids, and 122.0-134.8 mg/100 g ascorbic acid

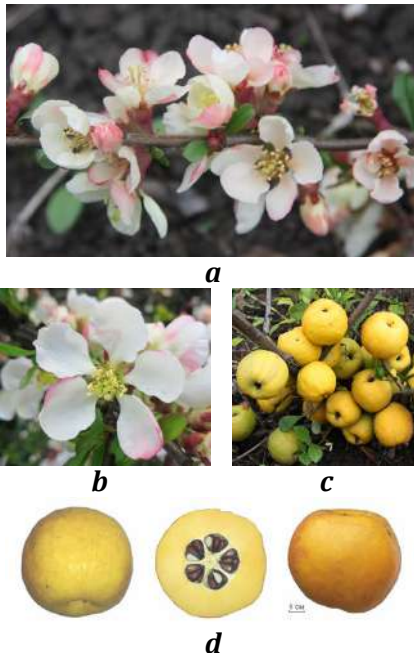


Figure 70. *Chaenomeles ×californica* 'Maksym' a) flowering, b) a flower, c) fruiting, d) shape of the fruit and cross-section

Chaenomeles ×californica 'Tamara'

National catalog number: UN9100306

Collection number: 04420

Botanical name in Latin: *Chaenomeles ×californica* W. Clarke ex C. Weber

Botanical name in English: Californian quince

Botanical name in Ukrainian: Yaпonska aiva kaliforniiska

Crop name in Ukrainian: Khenomeles, or Yaпonska aiva

Accession name: 'Tamara' ('20-73') (name of the sister of the breeder)

Date of introduction: 08.07.2017

Donor: Volodymyr Mezhenkyj, Bakhmut, Donetsk Region, Ukraine

Breeder: Volodymyr Mezhenkyj

Origin: Seedling of 'Kalif' from free pollination

Time of flowering: April to May

Time of fruit ripening: September

Value: The variety was included in the State Register of Plant Varieties of Ukraine in 2021; and registered in Poland in 2022. The bush is upright, 1.5 m tall. The flowers are red. Fruits are ovoid, smooth, yellow, attractive, and fragrant, weighing 110 (140) g. Pulp content 92-94%, pulp layer thickness 13-15 mm, domesticated index 2.0-2.2. Fruits contain 4.4% sugars, 6.0% organic acids, and 134.0 mg/100 g ascorbic acid

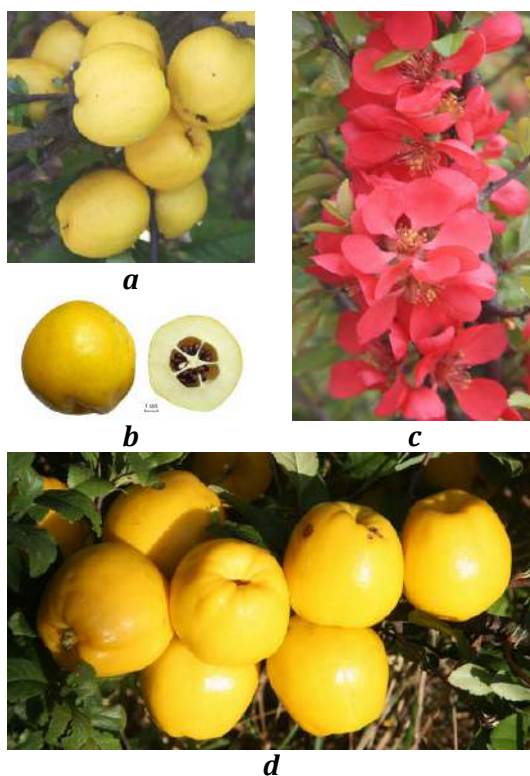


Figure 71. *Chaenomeles ×californica* 'Tamara' a) fruiting, b) flowering, c) fruit shape and cross-section, d) fruiting

Chaenomeles ×californica '19-432'

National catalog number: UN9100309

Collection no: 19-432

Botanical name in Latin: *Chaenomeles ×californica* W.Clarke ex C.Weber

Botanical name in English: Californian quince

Botanical name in Ukrainian: Yaпonska aiva kaliforniiska

Crop name in Ukrainian: Khenomeles, or Yaпonska aiva

Accession name: '19-432'

Date of introduction: 05.11.2012

Donor: National University of Life and Environmental Sciences of Ukraine, Pshenychne, Kyiv Region, Ukraine

Breeder: Volodymyr Mezhen'skyj

Origin: Seedling of 'Maxim' from free pollination; F₂ 'Kalif'

Time of flowering: April to May

Time of fruit ripening: September

Value: Spreading bush, 1.6 m tall. Flowers are white with small pink spots. Fruits are ellipsoidal to ovoid, slightly tuberous, yellow, with yellow flesh, weighing 80 (130) g. The pulp content 96%, the thickness of the pulp layer 17-20 mm, and the domesticated index 2.7. Source for increasing the domesticated index

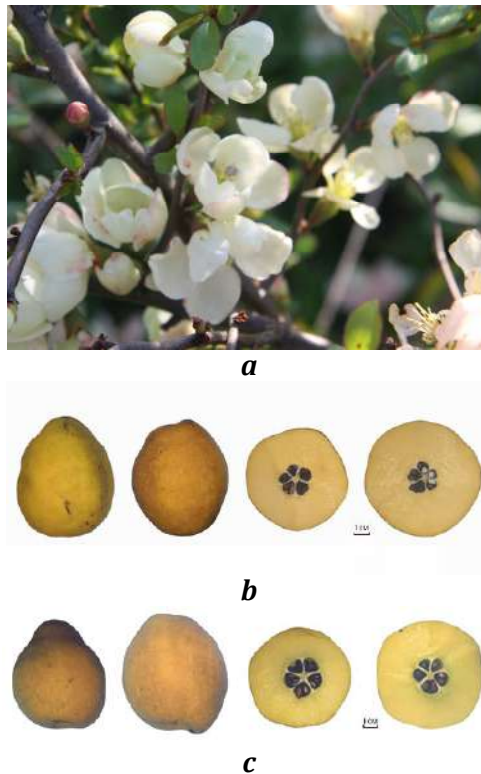


Figure 72. *Chaenomeles ×californica* '19-432' a) flowers, b) fruit shape and cross-section, c) fruit shape and cross-section

Chaenomeles ×superba 'Nina'

National catalog number: UN9100217

Collection number: 04411

Botanical name in Latin: *Chaenomeles ×superba* (Frahm) Rehder

Botanical name in English: Superb quince

Botanical name in Ukrainian: Yaponska aiva chudova

Crop name in Ukrainian: Khenomeles, or Yaponska aiva

Accession name: 'Nina' ('2-025') (name of the mother of the breeder)

Date of introduction: 08.07.2017

Donor: Bakhmut Experimental Station of Nurseries Cultivation, Bakhmut, Donetsk Region, Ukraine

Breeder: Volodymyr Mezhenyskyj

Origin: Seedling of the select '4-1-11', which is F₁ of the accession No 00095, obtained by seeds from the Donetsk Botanical Garden and treated with 0.05% 1,4-bisdiazoacetylbutane solution

Time of flowering: April to May

Time of fruit ripening: September

Value: The variety was included in the State Register of Plant Varieties of Ukraine in 2001. The accession was registered in the National Center for Plant Genetic Resources of Ukraine for its large fruits with a thickened layer of flesh and absence of thorns on the branches in 2005. The flowers are orange-red. Fruits are spherical to ellipsoidal, with a lumpy surface, weighing 60-90 (110) g. The pulp content 92-94%, the thickness of the pulp layer 11-13 mm, and the domesticated index 1.9-2.0. Fruits contain 3.2% of sugars, 5.3% of organic acids, and 92.9 mg/100 g ascorbic acid

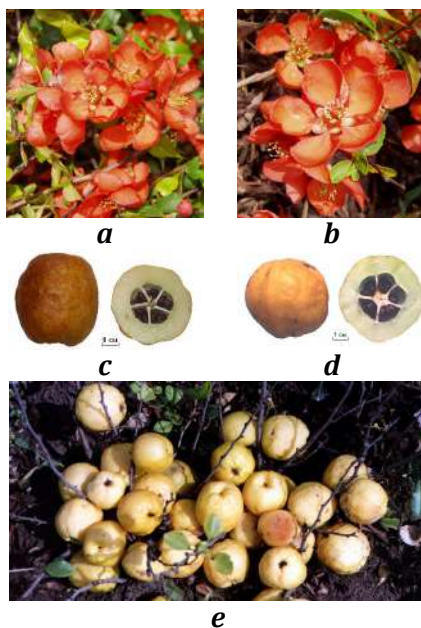


Figure 73. *Chaenomeles ×superba* 'Nina' a) flower cluster, b) fully open flower cluster, c) fruit shape and cross-section, d) fruit shape and cross-section, e) fruit

Chaenomeles ×superba '11-21-149'

National catalog number: UN9100308

Collection number: 03745

Botanical name in Latin: *Chaenomeles ×superba* (Frahm) Rehder

Botanical name in English: Superb quince

Botanical name in Ukrainian: Yaпonska aiva chudova

Crop name in Ukrainian: Khenomeles, or Yaпonska aiva

Accession name: '11-21-149'

Date of introduction: 23.08.2012

Donor: Bakhmut Experimental Station of Nurseries Cultivation, Bakhmut, Donetsk Region, Ukraine

Breeder: Volodymyr Mezhen'skyj

Origin: The hybrid seedling was obtained by crossing '59-2-102' (= 'clone 49' × No. 00587) × '60-19-160' (= 'clone 26' F₁ from free pollination). 'Clone 26' (accession number 00632) and 'clone 49' (accession number 00637) were obtained as seedlings from the Stavropol Botanical Garden. They are descendants of Mylola Kashchenko's plant material, the breeding work which was later continued in the Stavropol Botanical Garden

Time of flowering: April to May

Time of fruit ripening: September

Value: The bush is low-growing, 0.5 m tall. Flowers are white, with pinkish spots. Fruits are ellipsoidal, yellow, weighing 50 (100) g. Pulp content 95%, pulp layer thickness 15-17 mm, domesticated index 2.5-2.9. Source for increasing the cultivability index

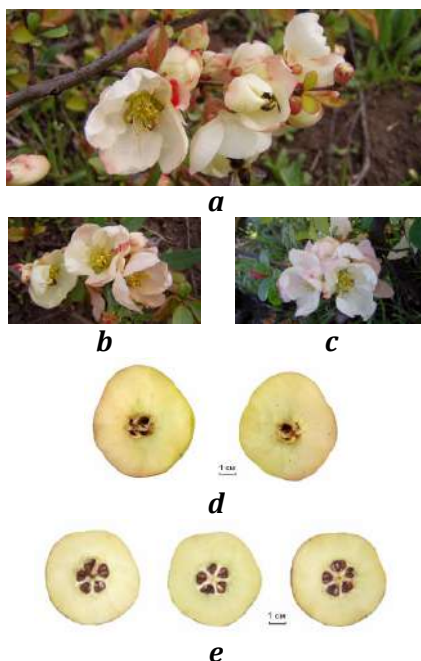


Figure 74. *Chaenomeles ×superba* '11-21-149' a) flowering, b) flowering, c) flowering, d) fruit cross-sections, e) fruit cross-sections

ROSACEAE – ×CHAMAERIA
ROSE FAMILY – ARIA × CHAMAEMESPILUS

SUDETEN WHITEBEAM

Ignaz Tausch (1834) found a plant in the Krkonoše Mountains (Riesengebirge) in the Sudetenland that he identified as a new species of *Pyrus sudetica*. Later botanists classified it as *Sorbus sudetica*, a variety or subspecies *S. aria* or *S. chamaemespilus*. In addition to the Sudetenland, it occurs in the Carpathians, Alps, and Pyrenees (Focke, 1881; Kárpáti, 1960; Kovanda, 1961, 1965; Aldasoro et al., 2004). *S. chamaemespilus* is one of the parents, as evidenced by the presence of the flavonoid glycoside vitexin in the leaves (Challice and Kovanda, 1978). The tetraploid nature of this taxon also indicates its hybridity (Jankun and Kovanda, 1986). The origin of the taxon is from the cross of *S. aria* aggr. × *S. chamaemespilus* was confirmed by the analysis of molecular data (Nelson-Jones et al., 2002). It was proposed to establish a special subgenus *Chamaemespilaria* for such hybrids (Májovský and Bernátová, 2001). Taking into account the isolation of the genera *Aria* and *Chamaemespilus* from *Sorbus* s.l. (Potter et al., 2007), the nothogenus ×*Chamaearia* should be established for hybrids between them (Mezhenskyj et al., 2012; Mosyakin and McNeill, 2023) or the new genus *Majovskya* (Sennikov and Kurtto, 2017). They are valuable in the breeding of plants of the sorboid group (Mezhenskyj, 2019).

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×*Chamaearia sudetica* 'Erubescens'

National catalog number: U00100061

Collection number: 03611

Botanical name in Latin: ×*Chamaearia sudetica* (Tausch) Mezhen'skyj (= *Majovskya sudetica* (Tausch) Sennikov & Kurtto)

Botanical name in English: Sudeten whitebeam

Botanical name in Ukrainian: Nyzka ariia sudetska

Crop name: Nyzka ariia

Accession name: 'Erubescens' (in Latin "reddening, blushing")

Date of introduction: 07.08.2012

Donor: Otradnoe Research Station of V. L. Komarov Botanical Institute of the Russian Academy of Sciences, Otradnoe, Leningrad Region, Russia

Breeder: Anton Kerner von Marilaun (introducer)

Origin: Originally from southern Tyrol. A spontaneous hybrid of *Aria edulis* (Willd.) M.J.Roemer × *Chamaemespilus alpina* (Mill.) K.P.Robertson & J.B.Phipps

Time of flowering: May

Time of fruit ripening: August

Value: Low tree. Flowers with pink petals. Fruits are ellipsoidal, not bitter, and contain 13.4 mg/100 g carotene. Promising for breeding plants of the Sorboid group for ornamental and fruit traits

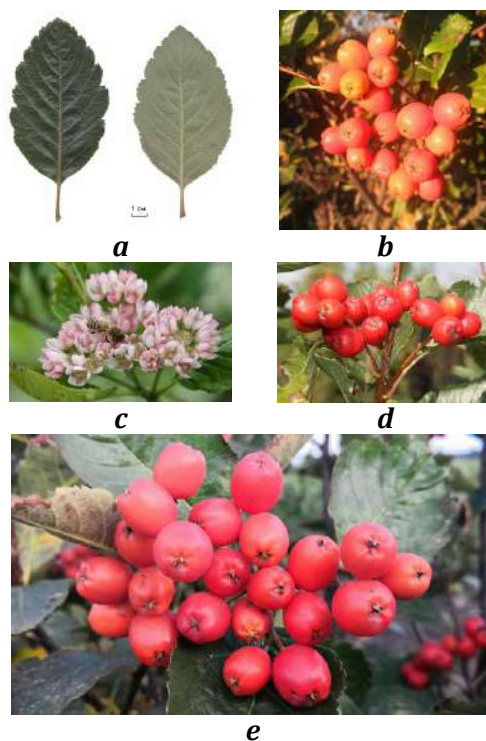


Figure 75. ×*Chamaearia sudetica* 'Erubescens' a) leaves, b) fruit, c) inflorescence, d) fruit, e) fruit closeup

ROSACEAE – CHAMAEMESPILUS

ROSE FAMILY – DWARF WHITEBEAM

DWARF WHITEBEAM

Initially, Carl Linnaeus (Linnaeus, 1753) included dwarf whitebeam in the genus *Mespilus*. A separate genus *Chamaemespilus* was proposed by Friedrich Medikus (1789). Subsequent botanists of the XVIII-XIX centuries referred it to *Aria*, *Aronia*, *Azarolus*, *Chamaemespilus*, *Crataegus*, *Hahnia*, *Lazarolus*, *Prunus*, *Pyrenia*, *Pyrus*, and *Sorbus* (POWO, 2023). During the twentieth century, the system of the genus *Sorbus* s.l. was recognized, according to which the dwarf whitebeam placed in *Sorbus* (Crantz, 1763; Hedlund, 1901; Aldasoro et al., 2004; Kalkman, 2004). The analysis of molecular data proved the expediency of dividing *Sorbus* s.l. into separate genera, including the monotypic *Chamaemespilus* (Campbell et al., 2007; Lo and Donoghue, 2012; Sun et al., 2018), which was supported by morphologists (Sennikov and Kurtto, 2017). However, there are proposals to consolidate the genera with the inclusion of *Chamaemespilus* in *Pyrus* (Christenhusz et al., 2018) or *Aria* (Mosyakin et al., 2022). Dwarf whitebeam itself is derived from the ancient hybridization of *Aria* with *Torminalis* (Campbell et al., 2007). Dwarf whitebeam is valuable in the breeding of fruit and ornamental plants of the sorboid group as a source of low habitat, non-bitter fruits, and pink-colored flowers (Mezhenskyj, 2019a, 2019b).

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Chamaespilus alpina No. 00910

National catalog number: UN0700039

Collection number: 00910

Botanical name in Latin: *Chamaespilus alpina* (Mill.) K.P.Robertson & J.B.Phipps

Botanical name in English: Dwarf whitebeam, or False medlar

Botanical name in Ukrainian: Alpiiska ariia spravzhnia

Crop name in Ukrainian: Alpiiska aria

Name of the sample: -

Date of introduction: 26.07.1988

Donor: Botanical Garden of Geneva, Geneva, Switzerland

Breeder: -

Distribution: The natural range of the species is the mountains of Western, Central, Southern and Southeastern Europe. Diploid and tetraploid; at least some triploid and tetraploid forms may be of hybrid origin. Accession probably comes from natural populations in the Swiss Alps

Time of flowering: April to May

Time of fruit ripening: August

Value: Low bush. Flowers with pink petals. Fruits without bitterness. Promising in the breeding of plants of the Sorboid group for ornamental and fruit traits

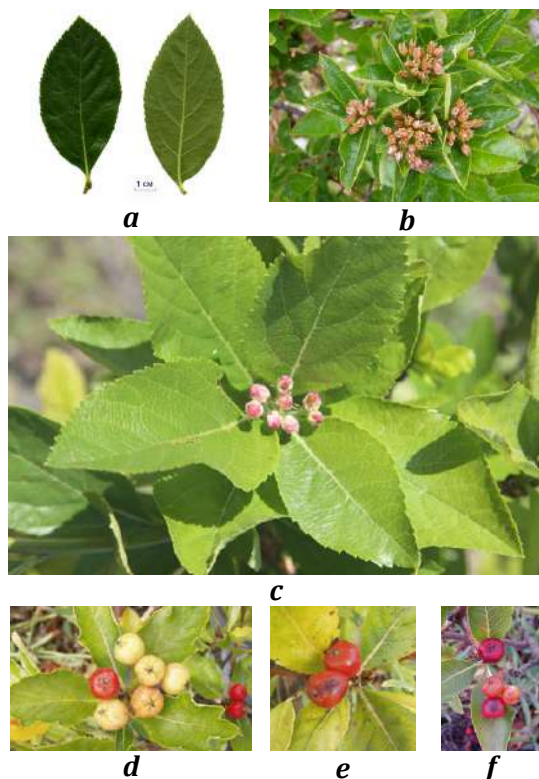


Figure 76. *Chamaespilus alpina* No. 00910 a) leaves, b) flower clusters, c) flower clusters in the bud, d) fruit, e) ripe fruit, f) ripe fruit

Chamaemespilus alpina No. 03677

National catalog number: U00200001

Collection number: 03677

Botanical name in Latin: *Chamaemespilus alpina* (Mill.) K. P. Robertson & J. B. Phipps

Botanical name in English: Dwarf whitebeam, or False medlar

Botanical name in Ukrainian: Alpiiska ariia spravzhnia

Crop name in Ukrainian: Alpiiska ariia

Accession name: -

Date of introduction: 09.08.2012

Donor: Pavlovsk Research Station VIR - N.I.Vavilov Research Institute of Plant Industry, Pavlovsk, Leningrad Region, Russia

Breeder: -

Origin: The natural range of the species is the mountains of Western, Central, Southern and Southeastern Europe. Diploid and tetraploid; at least some triploid and tetraploid forms may be of hybrid origin. The accession comes from Botanical Garden in Nancy, France

Time of flowering: April to May

Time of fruit ripening: August

Value: Low bush. Flowers with pink petals. Fruits without bitterness. Promising in the breeding of plants of the Sorboid group for ornamental and fruit traits



a



b



c

Figure 77. *Chamaemespilus alpina* No. 03677 *a*) leaves and inflorescences at the beginning of flowering, *b*) inflorescence, *c*) inflorescence

Chamaespilus alpina No. 03988

National catalog number: U00200002

Collection number: 03988

Botanical name in Latin: *Chamaespilus alpina* (Mill.) K.P.Robertson & J.B.Phipps

Botanical name in English: Dwarf whitebeam, or False medlar

Botanical name in Ukrainian: Alpiiska ariia spravzhnia

Crop name in Ukrainian: Alpiiska aria

Accession name: -

Date of introduction: 05.05.2014

Donor: Julian Geyer, Graz, Austria

Breeder: Julian Gaier (introducer)

Origin: The natural range of the species is the mountains of Western, Central, Southern and Southeastern Europe. Diploid and tetraploid; at least some triploid and tetraploid forms may be of hybrid origin. Accession collected in the Austrian Alps, Flattnitz Pass

Time of flowering: April to May

Time of fruit ripening: August

Value: Low bush. Flowers with intensely colored purple petals. Fruits without bitterness. Promising in the breeding of plants of the Sorboid group for decorative and fruit traits



a



b



c

Figure 78. *Chamaespilus alpina* No. 03988 a) flowering, b) inflorescence, c) fruiting

Chamaespilus alpina No. 04184

National catalog number: U00200003

Collection number: 04184

Botanical name in Latin: *Chamaespilus alpina* (Mill.) K.P.Robertson & J.B.Phipps

Botanical name in English: Dwarf whitebeam, or False medlar

Botanical name in Ukrainian: Alpiiska ariia spravzhnia

Crop name in Ukrainian: Alpiiska aria

Accession name: -

Date of introduction: 26.08.2015

Donor: Volodymyr Mezhenky

Breeder: Volodymyr Mezhenkyj (introducer)

Distribution: The natural range of the species is the mountains of Western, Central, Southern and Southeastern Europe. Diploid and tetraploid; at least some triploid and tetraploid forms may be of hybrid origin. Accession collected in Mount Hirnkopf, Carinthia, Austria

Time of flowering: April to May

Time of fruit ripening: August

Value: Low bush. flowers with pink petals. Fruits without bitterness. Promising in the breeding of plants of the Sorboid group for ornamental and fruit traits



a



b



c

Figure 79. *Chamaespilus alpina* No. 04184 *a*) leaves and buds, *b*) fruit clusters, *c*) ripe fruit

ROSACEAE – ×CHAMARIOSORBUS
ROSE FAMILY – ARIA × CHAMAEMESPILUS × SORBUS

HOST'S WHITEBEAM

The type species of Host's whitebeam was given a species epithet in honor of the Austrian botanist Nikolaus Host (1831), who assigned it to the genus *Aria*. For a long time, the species was included of *Sorbus* s.l. (Hedlund, 1901; Májovský and Bernátová, 2001). Now it is known Host's whitebeam is a three-genus hybrid combining *Aria*, *Chamaemespilus*, and *Sorbus* (Májovský and Bernátová, 2001; Meyer et al., 2005). Considering the proven separation of these genera from their hybrids by the analysis of molecular data, it is possible to establish new nothogenera (Stace, 2010). However, we do not want to complicate the nomenclature for intergeneric hybrids, particularly those that have the same parents. In some genera, hybridogenic species have long been stabilized. We see that the best solution is to include the entire group in the nothogenus. In particular, for the hybrids *Aria* × *Chamaemespilus* × *Sorbus*, the name ×*Chamariosorbus* was proposed (Mezhenskyj et al., 2012). Another solution would be to establish a new hybridogenic genus *Normeyera* with the inclusion of both species and nothospecies (Sennikov and Kurtto, 2017).

Representatives of this nothogenus/genus have a limited range. They are found in the mountains of Slovakia, as well as in the extreme south of Germany and the extreme west of Austria (Kârpâti, 1960; Bernátová and Májovský, 2003; Aldasoro et al., 2004; Meyer et al., 2005; Sennikov and Kurtto, 2017; Kurtto et al., 2018). Although plants of this taxon are inferior in fruit quality to the best selections and varieties of the original parental species, they can be included in the breeding of fruit plants of the Sorboid group (Mezhenskyj, 2005, 2019).

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×*Chamariosorbus hostii* No. 03553

National catalog number: U00100060

Collection number: 03553

Botanical name in Latin: ×*Chamariosorbus hostii* (J.Jacq. ex Host) Mezhen'skyj = *Normeyera hostii* (J.Jacq. ex Host) Sennikov & Kurtto)

Botanical name in English: Host's whitebeam

Botanical name in Ukrainian: Alpiiska horobynoariiia Hosta

Crop name in Ukrainian: Alpiiska horobynoariiia

Accession name: -

Date of introduction: 24.06.2012

Donor: Central Botanical Garden of the Academy of Sciences of Belarus, Minsk, Belarus

Breeder: -

Distribution: The natural range of the species is the mountains of Western and Central Europe. Diploid. A natural putative hybrid of *Chamaemespilus alpina* (Mill.) K.P.Robertson & J.B.Phipps × *Hedlundia austriaca* (G.Beck) Sennikov & Kurtto. Accession is a specimen No. 2438 in the collections of the Central Botanical Garden of the Academy of Sciences of Belarus

Time of flowering: May

Time of fruit ripening: August

Value: Low shrub. Flowers with pinkish-white petals. Fruits are without bitterness. Promising in the breeding of plants of the Sorboid group for ornamental and fruit traits

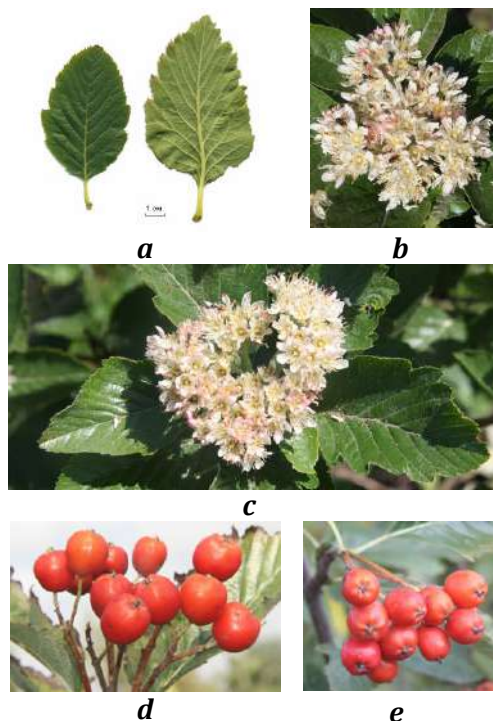


Figure 80. ×*Chamariosorbus hostii* No. 03553 a) leaves, b) inflorescence, c) leaves and inflorescences, d) infructescence, e) infructescence

×*Chamariosorbus hostii* No. 03883

National catalog number: U00100043

Collection number: 03883

Botanical name in Latin: ×*Chamariosorbus hostii* (J.Jacq. ex Host) Mezhen'skyj (syn. *Normeyera hostii* (J.Jacq. ex Host) Sennikov & Kurtto)

Botanical name in English: Host's whitebeam

Botanical name in Ukrainian: Alpiiska horobynoariia Hosta

Crop name in Ukrainian: Alpiiska horobynoariia

Accession name: -

Date of introduction: 30.07.2013

Donor: Academician O. V. Fomin Botanical Garden of Taras Shevchenko National University, Kyiv, Ukraine

Breeder: -

Distribution: The natural range of the species is in the mountains of Western and Central Europe. Diploid. A natural putative hybrid of *Chamaemespilus alpina* (Mill.) K.P.Robertson & J.B.Phipps × *Hedlundia austriaca* (G.Beck) Sennikov & Kurtto. In the Academician O. V. Fomin Botanical Garden, it is cultivated under the name *Sorbus* ×*intermedia* (Ehrh.) Pers.

Time of flowering: May

Time of fruit ripening: August

Value: Low shrub. Flowers with pinkish-white petals. Fruits are without bitterness. Promising in the breeding of plants of the Sorboid group for decorative and fruit traits

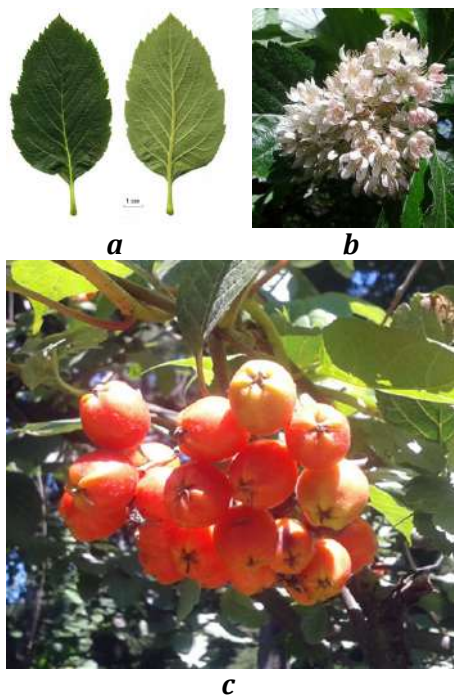


Figure 81. ×*Chamariosorbus hostii* No. 03883 a) leaves, b) inflorescences, c) fruits

ROSACEAE – CRATAEGUS

ROSE FAMILY – HAWTHORN

FRUIT AND ORNAMENTAL HAWTHORN

Crataegus is a genus with about 230 species, most of which occur in North America (Christensen, 1992; Phipps, 2014). There are 27 taxa in the natural flora of Ukraine, and several dozen species are introduced (Mezhenska, 2007; Mezhenska and Mezhenskyj, 2013). Hawthorn species are important as ornamental, fruit, medicinal, and technical plants. European hawthorns are widely used for landscaping and hedges. Red flower and double-flowered varieties are especially popular in gardening. The medicinal properties of hawthorn both flowers and fruits are determined by the accumulation of a large number of bioflavonoids. Large-fruited species are important for fruit growing, among which are the Mediterranean-Central Asian azarole (*Crataegus azarolus*), Chinese hawthorn (*C. pinnatifida* var. *major*), North American species of the sections *Aestivalis*, *Coccineae*, and *Crus-galli*, and Mexican hawthorn (*C. mexicana*). In Ukraine, there are large-fruited *C. ×pojarkovae*, *C. orientalis*, and *C. tournefortii* species with high-quality fruits for fresh consumption and processing (Mezhenska and Mezhenskyj, 2013; Mezhenskyj and Mezhenskaya, 2009; Mezhenskyj and Mezhenska, 2013; Yevchuk et al., 2019). Now most large-fruited medlar (*C. germanica*) including to *Crataegus* too (Ufimov and Dickinson, 2020).

In Ukraine, many fruit cultivars and promising genotypes for orchards and gardens have been developed (Mezhenska and Mezhenskyj, 2013, 2015; Mezhenskyj and Mezhenska, 2013; Mezhenskyj and Mezhenskaya, 2014).

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Crataegus azarolus var. *pontica* 'Pontii'

National catalog number: UN9300057

Collection number: 01424

Botanical name in Latin: *Crataegus azarolus* L. var. *pontica* (K.Koch) K.I.Chr. (= *C. pontica* K.Koch)

Botanical name in English: Azarole

Botanical name in Ukrainian: Hlid azarol pontiiskyi

Crop name: Hlid

Accession name: 'Pontii' (male name "Pontius"; and an allusion to species epithet)

Date of introduction: 24.11.1992

Donor: Aşgabat Botanical Garden, Aşgabat, Turkmenistan

Breeders: Volodymyr Mezhenkyj and Liudmyla Mezhenka

Origin: Originated from plants of Turkmenistan's natural hawthorn populations

Time of flowering: May to June

Time of fruit ripening: September

Value: Large yellow fruits, weighing 4.5 (9.0) g; pulp content 85%; stones 2-3. Attractiveness 7 points, taste 8 points

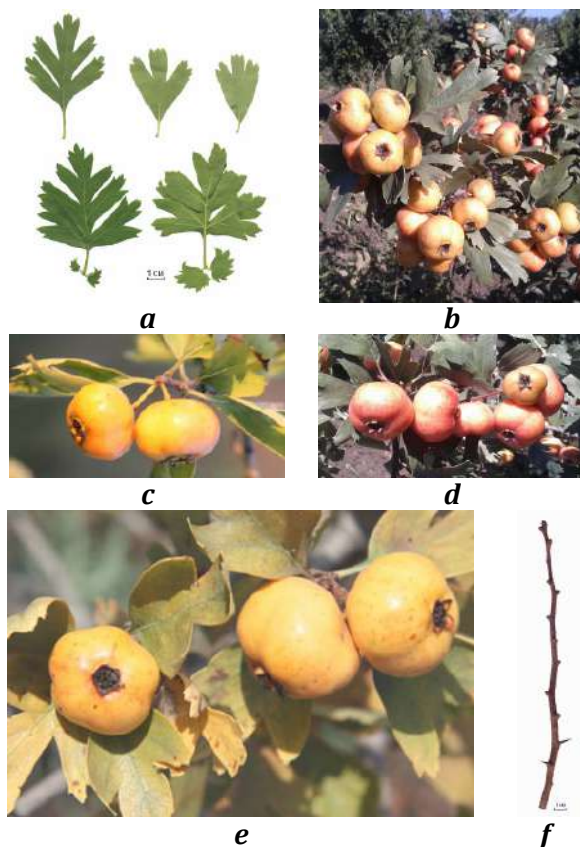


Figure 82. *Crataegus azarolus* var. *pontica* 'Pontii' a) leaves of long shoots (bottom), short shoots (top), b) fruit, c) fruit, d) fruiting bunch, e) fruit, f) annual shoot

Crataegus azarolus var. *pontica* 'Pontida'

National catalog number: UN9300127

Collection number: 01590

Botanical name in Latin: *Crataegus azarolus* L. var. *pontica* (K.Koch) K.I.Chr. (= *C. pontica* K.Koch)

Botanical name in English: Azarole

Botanical name in Ukrainian: Hlid azarol pontiiskyi

Crop name: Hlid

Accession name: 'Pontida' ("Pontida" is a hypothetical land; and an allusion to species epithet)

Date of introduction: 13.04.1996

Donor: Nikita Botanical Garden, Nikita, Crimea, Ukraine

Breeders: Volodymyr Mezhenskyj and Liudmyla Mezhenska

Origin: Originated from plants of Turkmenistan's natural hawthorn populations

Time of flowering: May to June

Time of fruit ripening: September

Value: Large yellow fruits with a blush, weighing 5.5 g. Attractiveness 7 points, taste 8 points

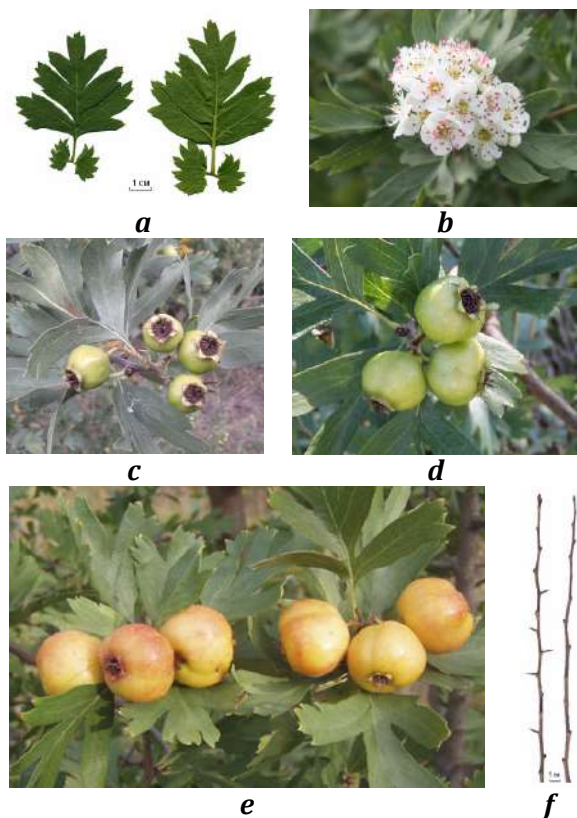


Figure 83. *Crataegus azarolus* var. *pontica* 'Pontida' a) leaves of long shoots, b) inflorescence, c) young fruit, d) young fruit, e) ripe fruit, f) annual shoot

Crataegus chlorocarpa 'Marmeladnyi'

National catalog number: UN9300164

Collection number: 04285

Botanical name in Latin: *Crataegus chlorocarpa* Lenné & K.Koch

Botanical name in English: Altai hawthorn

Botanical name in Ukrainian: Hlid zelenoplodyi

Crop name in Ukrainian: Hlid

Accession name: 'Marmeladnyi' (means "marmalade")

Date of introduction: 23.08.2012

Donor: Volodymyr Mezhenkyj, Bakhmut, Donetsk Region, Ukraine

Breeders: Volodymyr Mezhenkyj and Liudmyla Mezhenka

Origin: Developed from plants of the Donetsk Botanical Garden

Time of flowering: May

Time of fruit ripening: August

Value: The accession was registered in the National Center for Plant Genetic Resources of Ukraine for short seed dormancy, abundant fruiting, and early ripening of fruits with marmalade-like pulp in 2022. Fruits are flattened, yellow-orange, weight 1 g; pulp content 78%; yellow, filling, sweet; stones 4-5. Fruits contain 5.1% sugars, 0.5% organic acids, 4.6 mg/100 g ascorbic acid, 9.2 mg/100 g carotene. Attractiveness 9 points, taste 5 points

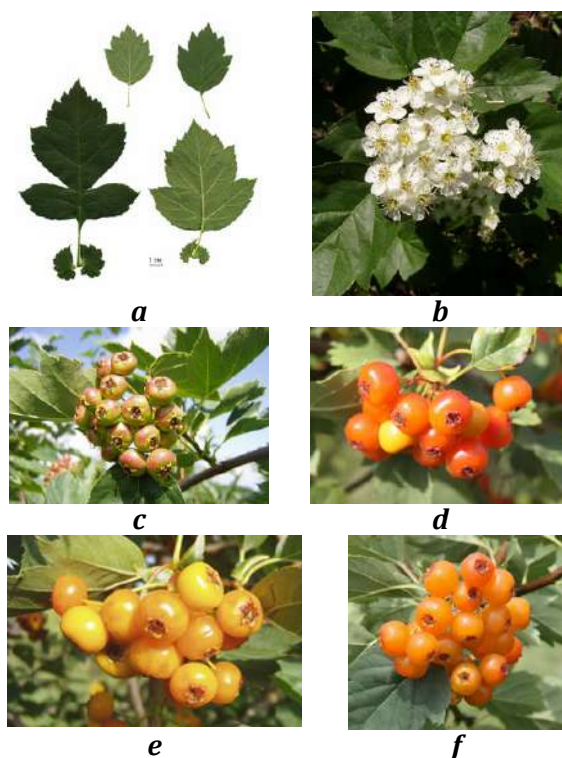


Figure 84. *Crataegus chlorocarpa* 'Marmeladnyi' a) leaves of long shoots (bottom) and short shoots (top), b) inflorescence, c) young fruit, d) ripe fruit, e) ripe fruit, f) ripe fruit

Crataegus ×lavalleeii 'Carrièrei'

National catalog number: UN9300174

Collection number: 03035

Botanical name in Latin: *Crataegus ×lavalleeii* Hèrincq ex Lavallée

Botanical name in English: Lavallée's hawthorn

Botanical name in Ukrainian: Hlid Lavalie

Crop name in Ukrainian: Hlid

Accession name: 'Carrièrei' ('Pozdnij MSHA' – means “late of the Moscow Agricultural Academy”) (named after Élie-Abel Carrière, a French botanist)

Date of introduction: 05.04.2009

Donor: K. A. Timiryazev Moscow Agricultural Academy, Moscow, Russia

Breeder: Élie-Abel Carrière, Paris, France

Origin: Grown from seeds of *C. mexicana* Moc. & Sessé ex DC. Most likely, it was pollinated with pollen of *C. calpodendron* (Ehr.) Medik. The accession was obtained under the name 'Pozdnij MSHA'

Time of flowering: June

Time of fruit ripening: October

Value: Late flowering and fruit ripening. decorative quality. The fruits are orange-red, weighing 2.2 g; 2-3 seeds per fruit. Persistent ripe fruit remains on the branches throughout winter

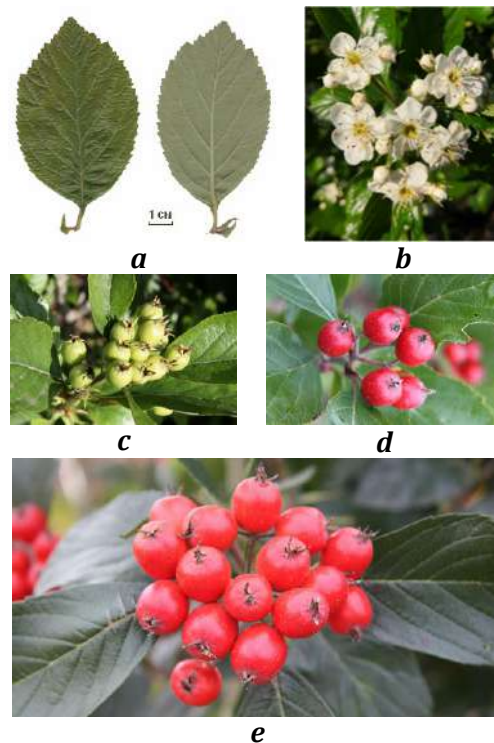


Figure 85. *Crataegus ×lavalleeii* 'Carrièrei' a) leaves, b) flowers, c) young fruit, d) ripe fruit, e) fruit

Crataegus ×lavalleei No. 03753

National catalog number: UN9300168

Collection number: 03753

Botanical name in Latin: *Crataegus ×lavalleei* Hèrincq ex Lavallée

Botanical name in English: Lavallée's hawthorn

Botanical name in Ukrainian: Hlid Lavalie

Crop name in Ukrainian: Hlid

Accession name: -

Date of introduction: 31.08.2012

Donor: Academician O. V. Fomin Botanical Garden of Taras Shevchenko National University, Kyiv, Ukraine

Breeder: -

Origin: The nothospecies is derived from the pollination of *C. mexicana* Moc. & Sessé ex DC. with pollen probably of *C. calpodendron* (Ehrh.) Medik. The accession was obtained under the name *C. pubescens* Steud. f. *stipulacea* (Loud.) Stapf.

Time of flowering: June

Time of fruit ripening: October

Value: Late flowering and fruit ripening. Ornamental quality. Fruits are orange-red, weighing 1.2 g; stones 2-3. Ripe fruits stay on branches for a long time



a



b



c



d



e



f

Figure 86. *Crataegus ×lavalleei* No. 03753 *a*) flowers, *b*) inflorescence, *c*) inflorescence, *d*) young fruit, *e*) ripe fruit, *f*) ripe fruit

Crataegus maximowiczii 'Pendula'

National catalog number: UN9300102

Collection number: 01717

Botanical name in Latin: *Crataegus maximowiczii* Pojark.

Botanical name in English: Maximowicz's hawthorn

Botanical name in Ukrainian: Hlid Maksymovicha

Crop name: Hlid

Accession name: 'Pendula' (in Latin means "hanging, hanging down")

Date of introduction: 27.03.1999

Donor: Yakiv Kovalev, Sievernyi, Luhansk Region, Ukraine

Breeder: -

Origin: Variety of unknown origin

Time of flowering: May

Time of fruit ripening: July to August

Value: Weeping habit, early fruit ripening

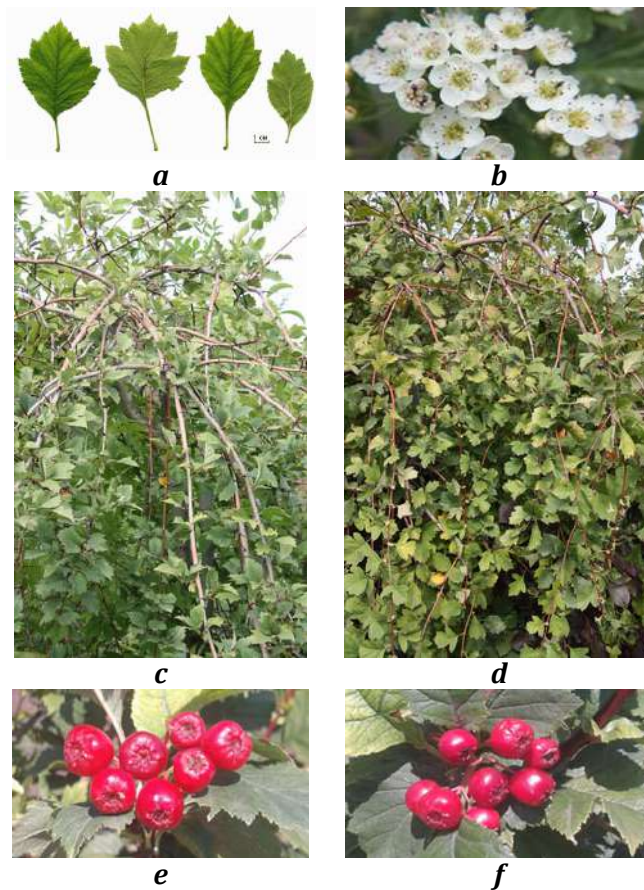


Figure 87. *Crataegus maximowiczii* 'Pendula' a) leaves of long shoots (left), short shoots (right), b) flowers, c) habit with a high stem, d) habit with a high stem, e) fruit, f) fruit

Crataegus ×media 'Rosea' No. 01121

National catalog number: UN9300098

Collection number: 01121

Botanical name in Latin: *Crataegus ×media* Bechst.

Botanical name in English: Intermediate hawthorn

Botanical name in Ukrainian: Hlid serednii

Crop name: Dekoratyvnyi hlid, or Hlid

Accession name: 'Rosea' (in Latin means "rose-colored")

Date of introduction: 30.02.1991

Donor: Central Botanical Garden of the Academy of Sciences of Belarus Minsk, Belarus

Breeder: -

Origin: Probably a seedling of this old European variety, because seed exchange is common in botanical gardens

Time of flowering: May to June

Time of fruit ripening: September

Value: Differs in simple white-pink flowers; petals are colored in the upper half, and white in the lower half



a



b



c



d



e

Figure 88. *Crataegus ×media* 'Rosea' No. 01121 *a*) inflorescence in the budding phase, *b*) leaves of long shoots (bottom), short shoots (top), *c*) flowers, *d*) fruit, *e*) flowers

Crataegus ×media 'Rosea' No. 01982

National catalog number: UN9300100

Collection number: 01982

Botanical name in Latin: *Crataegus ×media* Bechst.

Botanical name in English: Intermediate hawthorn

Botanical name in Ukrainian: Hlid serednii

Crop name: Dekoratyvnyi hlid, or Hlid

Accession name: 'Rosea' (in Latin means "rose-colored")

Date of introduction: 04.08.2000

Donor: M. M. Hryshko National Botanical Garden of the National Academy of Sciences of Ukraine, Kyiv, Ukraine

Breeder: -

Origin: Probably a seedling of an old European variety, as seed exchange is common in botanical gardens

Time of flowering: May to June

Time of fruit ripening: September

Value: Differs in simple bright dark pink flowers with a white center; petals are almost completely colored, except for the lower part near the base

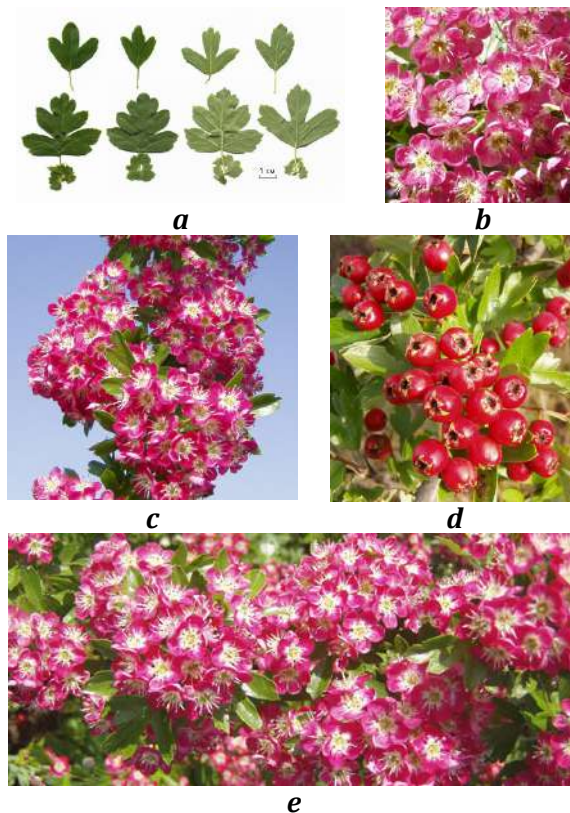


Figure 89. *Crataegus ×media* 'Rosea' No. 01982 a) leaves of long shoots (bottom), short shoots (top), b) flowers, c) flowers, d) fruit, e) flowers

Crataegus ×media 'Rubra Plena'

National catalog number: UN9300022

Collection number: 01119

Botanical name in Latin: *Crataegus ×media* Bechst.

Botanical name in English: Intermediate hawthorn

Botanical name in Ukrainian: Hlid serednii

Crop name: Dekoratyvnyi hlid, or Hlid

Accession name: 'Rubra Plena' (in Latin means "red full")

Date of introduction: 30.02.1991

Donor: Central Botanical Garden of the Academy of Sciences of Belarus, Minsk, Belarus

Breeder: -

Origin: An old European cultivar that is a hybrid of *C. monogyna* Jacq. × *C. laevigata* (Poir.) DC.; often referred to as belonging to *C. laevigata*. Its seedlings are often grown under the cultivar name

Time of flowering: May to June

Time of fruit ripening: September

Value: Differs by double pink flowers

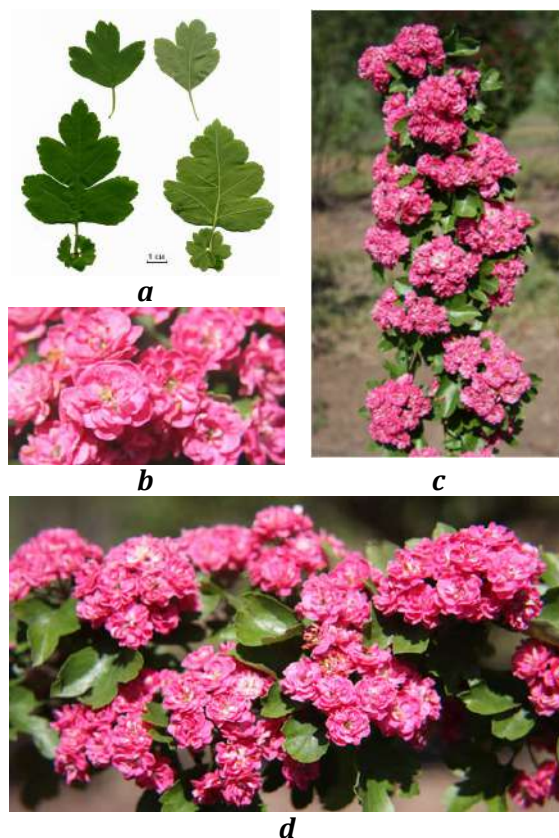


Figure 90. *Crataegus ×media* 'Rubra Plena' a) leaves of long shoots (bottom), short shoots (top), b) flowers, c) flowers, d) flowers

Crataegus meyeri 'Vsevolod'

National catalog number: UN9300161

Collection number: 04279

Botanical name in Latin: *Crataegus meyeri* Pojark.

Botanical name in English: Meyer's hawthorn

Botanical name in Ukrainian: Hlid Meiera

Crop name: Hlid

Accession name: 'Vsevolod' (name of the grandson or the breeder)

Date of introduction: 23.08.2012

Donor: Volodymyr Mezhenkyj, Bakhmut, Donetsk Region, Ukraine

Breeders: Volodymyr Mezhenkyj and Liudmyla Mezhenka

Origin: Originated from plants of M. M. Hryshko National Botanical Garden of the National Academy of Sciences of Ukraine

Time of flowering: May

Time of fruit ripening: September

Value: The accession was registered in the National Center for Plant Genetic Resources of Ukraine in 2017 for its late flowering, resistance to adverse environmental factors, and original fruit shape. Fruits are bell-shaped, bluntly pentagonal, ribbed, expanded at the base, with large horn-shaped outgrowths, red, weighing 2 g; flesh content 78-80%; stones 2. Fruits contain 6.3% sugars, 0.5% organic acids, 5.3 mg/100 g ascorbic acid, 1.6 mg/100 g carotene. Attractiveness 9 points, taste 5 points

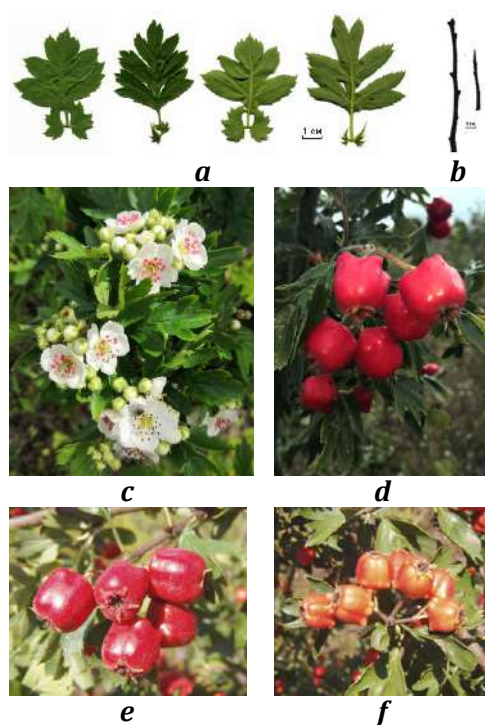


Figure 91. *Crataegus meyeri* 'Vsevolod' a) leaves, b) annual growth and spurge, c) flowers, d) fruit, e) fruit, f) fruit

Crataegus ×mordenensis 'Toba'

National catalog number: UN93000122

Collection number: 01785

Botanical name in Latin: *Crataegus ×mordenensis* Boom

Botanical name in English: Morden hawthorn

Botanical name in Ukrainian: Hlid mordenskyi

Crop name in Ukrainian: Dekoratyvnyi hlid, or Hlid

Accession name: 'Toba' (short for Manitoba)

Date of introduction: 06.08.1999

Donor: M. V. Tsitsin Main Botanical Garden of the Russian Academy of Sciences, Moscow, Russia

Breeder: Agriculture Canada Plant Breeding Station in Morden, Manitoba, Canada

Origin: Raised from a cross of *C. laevigata* (Poir.) DC. 'Paul's Scarlet', or 'Rubra Plena' × *C. succulenta* Schrad. ex Link. It has not been determined that the accession is probably a seedling of 'Toba' from free pollination

Time of flowering: May to June

Time of fruit ripening: September

Value: Ornamental, double flowers, glossy leaves



a



b



c



d



e

Figure 92. *Crataegus ×mordenensis* 'Toba' *a*) flowers, *b*) inflorescences at the beginning of flowering, *c*) inflorescence, *d*) young fruit, *e*) ripe fruit

Crataegus opaca 'Texas Star'

National catalog number: UN9300172

Collection number: 02990

Botanical name in Latin: *Crataegus opaca* Hook. & Arn.

Botanical name in English: Mayhaw

Botanical name in Ukrainian: Hlis tinisty

Crop name: Hlid, or meikho

Accession name: 'Texas Star'

Date of introduction: 02.01.2009

Donor: One Green World Nursery, Molalla, Oregon, USA

Breeder: Bobby M. Talbert, Vidor, Texas, USA

Origin: American variety selected from local natural populations in Texas

Time of flowering: May

Time of fruit ripening: July

Value: Fruits are spherical and red. Attractiveness 8 points, taste 8 points

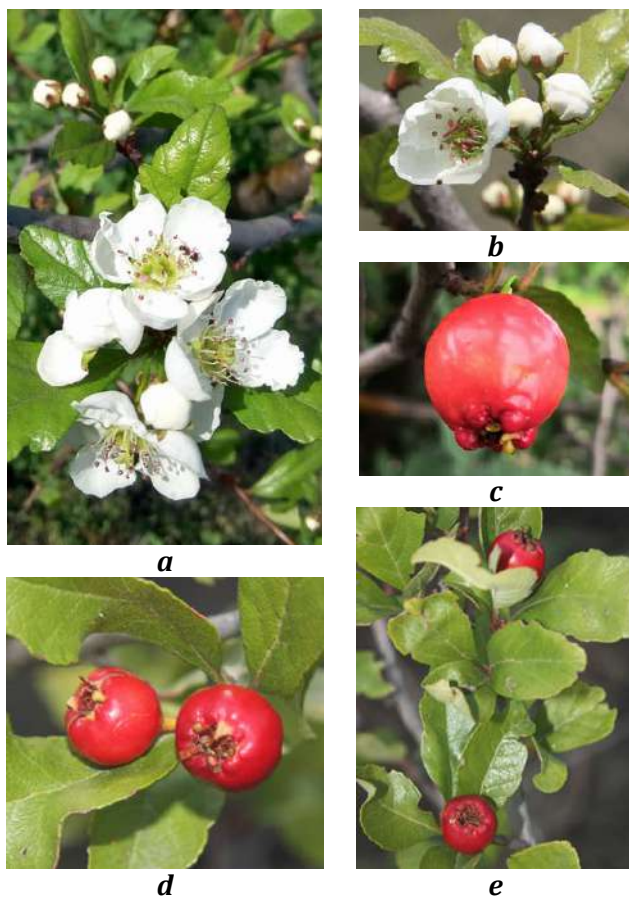


Figure 93. *Crataegus opaca* 'Texas Star' a) flowers, b) inflorescence, c) fruit, d) fruit, e) fruit

Crataegus orientalis 'Mark'

National catalog number: UN9300119

Collection number: 01784

Botanical name in Latin: *Crataegus orientalis* Pall. ex M.Bieb.

Botanical name in English: Oriental hawthorn

Botanical name in Ukrainian: Hlid skhidnyi

Crop name: Hlid

Accession name: 'Mark' (patronymic of Elena Markovna Nemova, a botanist at the M. V. Tsitsin Main Botanical Garden)

Date of introduction: 06.08.1999

Donor: M. V. Tsitsin Main Botanical Garden of the Russian Academy of Sciences, Moscow, Russia

Breeders: Volodymyr Mezhenkyj and Liudmyla Mezhenka

Origin: Obtained under the name *C. tanacetifolia* (Lam.) Pers

Time of flowering: June

Time of fruit ripening: September

Value: Fruits are flattened, spherical, ribbed, red-orange, weighing 3 (5.5 g); pulp content 88%; stone 4-5. Fruits contain 8.8% sugars, 0.7% organic acids, 9.5 mg/100 g ascorbic acid. Attractiveness 8 points, taste 8 points

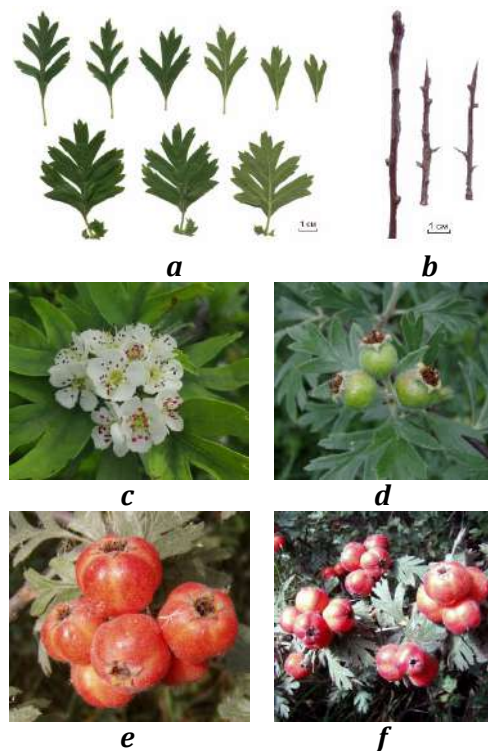


Figure 94. *Crataegus orientalis* 'Mark' a) leaves of long shoots (bottom) and short shoots (top), b) annual growth and spur spines, c) inflorescence, d) young fruit, e) ripe fruit, f) fruit

Crataegus orientalis 'Victor'

National catalog number: UN9300176

Collection number: 04281

Botanical name in Latin: *Crataegus orientalis* Pall. ex M.Bieb.

Botanical name in English: Oriental hawthorn

Botanical name in Ukrainian: Hlid skhidnyi

Crop name: Hlid

Accession name: 'Victor' (male derivative of female name Victoriia; named after Victoriia Letukhova, a botanist at Karadag Nature Reserve)

Date of introduction: 02.02.2006

Donor: Victoriia Letukhova, Crimea, Ukraine

Breeders: Volodymyr Mezhenkyj, Liudmyla Mezhenka, and Victoriia Letukhova.

Origin: Selected in natural populations of hawthorn near Staryi Krym in Crimea

Time of flowering: June

Time of fruit ripening: September

Value: Fruits are flattened, spherical, ribbed, orange-black, weighing 3 (5.5 g); pulp content 88%; stone 4-5. Attractiveness 8 points, taste 8 points

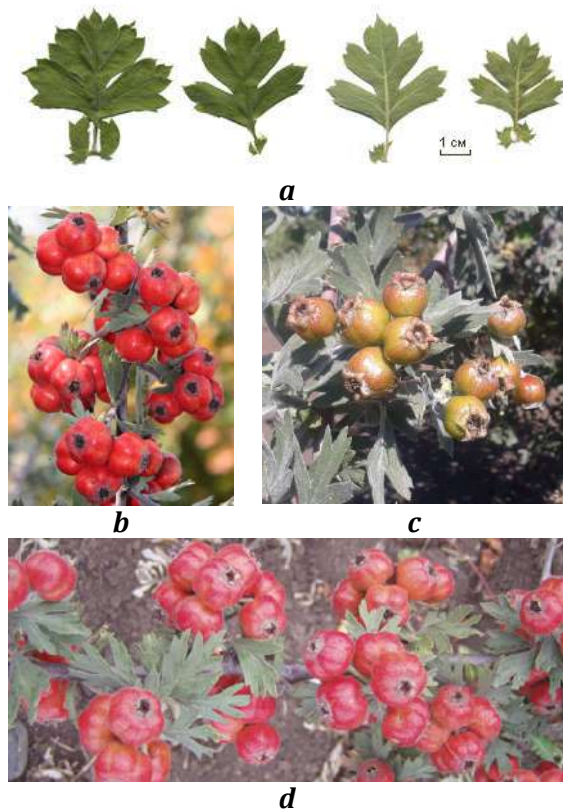


Figure 95. *Crataegus orientalis* 'Victor' a) leaves, b) fruit, c) unripe fruit, d) fruit

Crataegus pennsylvanica 'Shamil'

National catalog number: UN9300008

Collection number: 04017

Botanical name in Latin: *Crataegus pennsylvanica* Ashe

Botanical name in English: Pennsylvania hawthorn

Botanical name in Ukrainian: Hlid pennsilvanskyi

Crop name in Ukrainian: Amerykanskyi hlid, or Hlid

Accession name: 'Shamil' (named after Shamil Basayev, a leader of the struggle for independence of Ichkeria from Russia)

Date of introduction: 23.08.2012

Donor: Volodymyr Mezhenkyj, Bakhmut, Donetsk Region, Ukraine

Breeders: Volodymyr Mezhenkyj and Liudmyla Mezhenka

Origin: Originated from plants of the Central Botanical Garden of the Academy of Sciences of Belarus, Minsk, Belarus

Time of flowering: May

Time of fruit ripening: September

Value: The variety was included in the State Register of Plant Varieties of Ukraine in 2001. The accession was registered in the National Center for Plant Genetic Resources of Ukraine for high-yield, large fruits of excellent taste with high pulp yield and ascorbic acid content in 2005. Fruits are spherical, red, weighing 4.0 (7.0) g; flesh content 88%; stones 3-6. Fruits contain 7.8% sugars, 1.4% organic acids, 21.2 mg/100 g ascorbic acid, 1.8 mg/100 g carotene. Attractiveness 9 points, taste 9 points

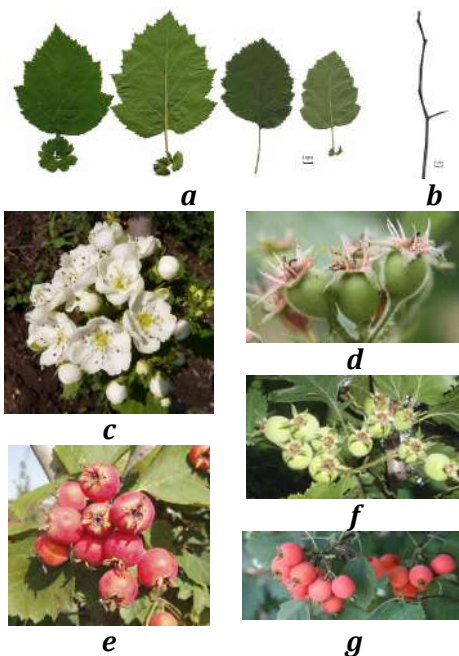


Figure 96. *Crataegus pennsylvanica* 'Shamil' a) leaves of long shoots (left) and short shoots (right), b) one-year shoot, c) inflorescence, d) young fruit, e) ripe fruit, f) young fruit, g) fruit

Crataegus phaenopyrum No. 03844

National catalog number: UN9300169

Collection number: 03844

Botanical name in Latin: *Crataegus phaenopyrum* (L.f.) Medik.

Botanical name in English: Washington hawthorn

Botanical name in Ukrainian: Hlid hrushevyi

Crop name in Ukrainian: Hlid

Accession name: -

Date of introduction: 11.04.2013

Donor: M. M. Hryshko National Botanical Garden of the National Academy of Sciences of Ukraine, Kyiv, Ukraine

Breeder: -

Origin: Natural range of the species in eastern North America

Time of flowering: May

Time of fruit ripening: September to October

Value: Ornamental, especially during flowering and fruiting. Fruits are small, red, and glossy, after ripening they remain on the branches for a long time

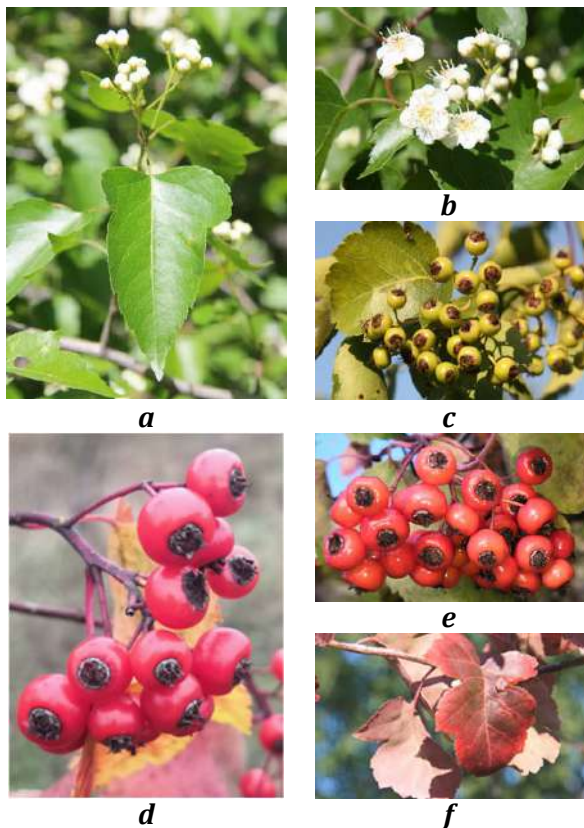


Figure 97. *Crataegus phaenopyrum* No. 03844 a) leaf and inflorescence in the budding phase, b) flowers, c) young fruit, d) ripe fruit, e) ripe fruit, f) autumn leaves

Crataegus pinnatifida 'Donetski Zirochky'

National catalog number: UN9300160

Collection number: 04278

Botanical name in Latin: *Crataegus pinnatifida* Bunge

Botanical name in English: Mountain hawthorn

Botanical name in Ukrainian: Hlid pirschastyi

Crop name: Hlid

Accession name: 'Donetski Zirochky' (means "Donetsk small stars")

Date of introduction: 23.08.2012

Donor: Volodymyr Mezhenkyj, Bakhmut, Donetsk Region, Ukraine

Breeders: Volodymyr Mezhenkyj and Liudmyla Mezhenka

Origin: Originated from plants of the Donetsk Botanical Garden

Time of flowering: May

Time of fruit ripening: September

Value: Fruits are spherical to ovoid, with a large star-shaped calyx, red, weighing 1.5-2.5 g; stones 3-5. Attractiveness 9 points, taste 5 points

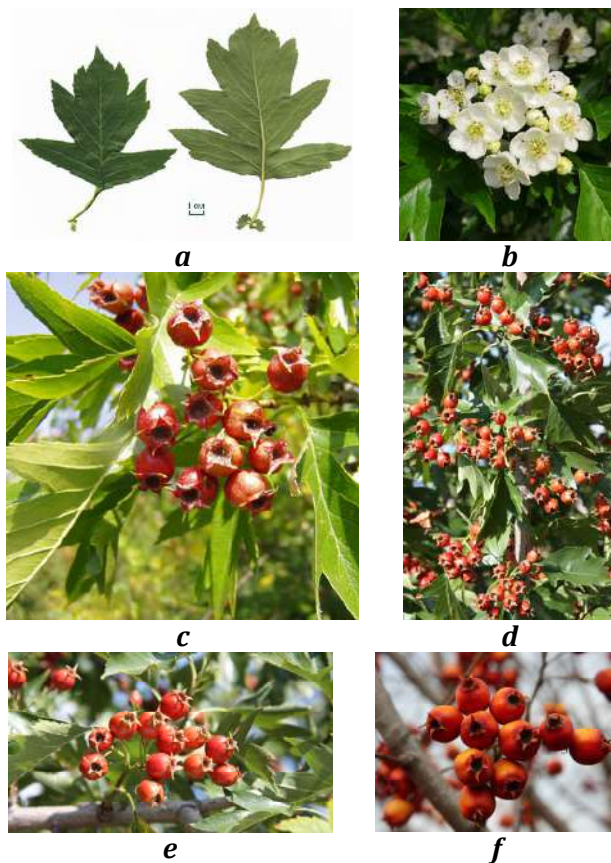


Figure 98. *Crataegus pinnatifida* 'Donetski Zirochky' a) leaves, b) inflorescence, c) fruit, d) fruit, e) fruit, f) fruit

Crataegus pinnatifida 'Novosibirskij No. 2'

National catalog number: UN9300173

Collection number: 03447

Botanical name in Latin: *Crataegus pinnatifida* Bunge

Botanical name in English: Mountain hawthorn

Botanical name in Ukrainian: Hlid pirschastyi

Crop name: Hlid

Accession name: 'Novosibirskij No. 2' (means "from Novosibirsk")

Date of introduction: 15.11.2011

Donor: The I. V. Michurin All-Russian Research Institute of Horticulture, Michurinsk, Tambov Region, Russia

Breeder: -

Origin: Developed in the Central Siberian Botanical Garden of the Siberian Branch of the Russian Academy of Sciences

Value: Fruits are spherical, red, with a large calyx, weighing 2 g. Carotene content 3.5 mg/100 g. Attractiveness 8 points, taste 5 points

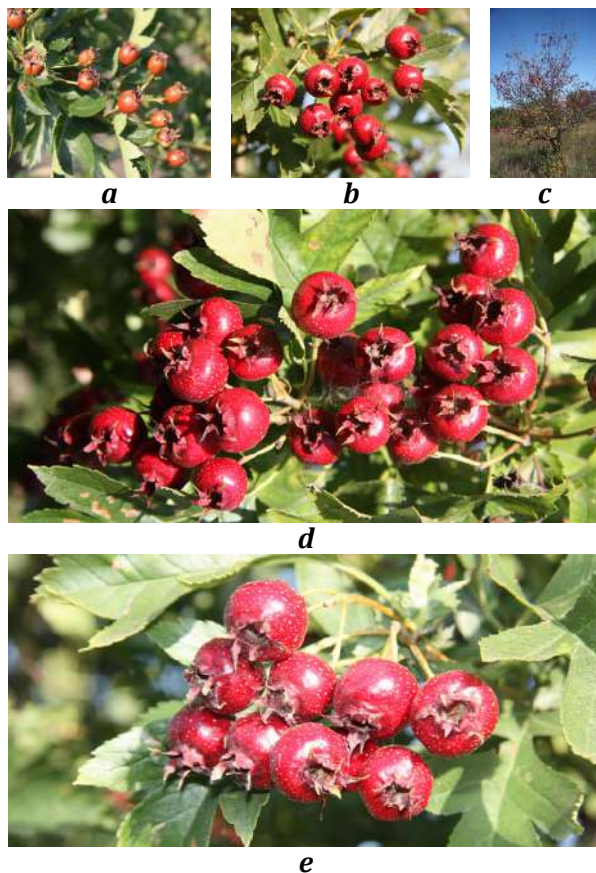


Figure 99. *Crataegus pinnatifida* 'Novosibirskij No. 2' a) young fruit, b) fruit, c) fruiting tree, d) fruit, e) fruit

Crataegus pinnatifida 'Shadrikha'

National catalog number: UN9300175

Collection number: 03266

Botanical name in Latin: *Crataegus pinnatifida* Bunge

Botanical name in English: Mountain hawthorn

Botanical name in Ukrainian: Hlid pirschastyi

Crop name: Hlid

Accession name: 'Shadrikha' (toponym in the Novosibirsk Region, Russia)

Date of introduction: 15.07.2011

Donor: The I. V. Michurin All-Russian Research Institute of Horticulture, Michurinsk, Tambov Region, Russia

Breeder: -

Origin: Developed in the Central Siberian Botanical Garden of the Siberian Branch of the Russian Academy of Sciences

Time of flowering: May to June

Time of fruit ripening: September

Value: Fruits are large, spherical, red, with a large calyx, weighing 2 (3) g. Attractiveness 8 points, taste 5 points

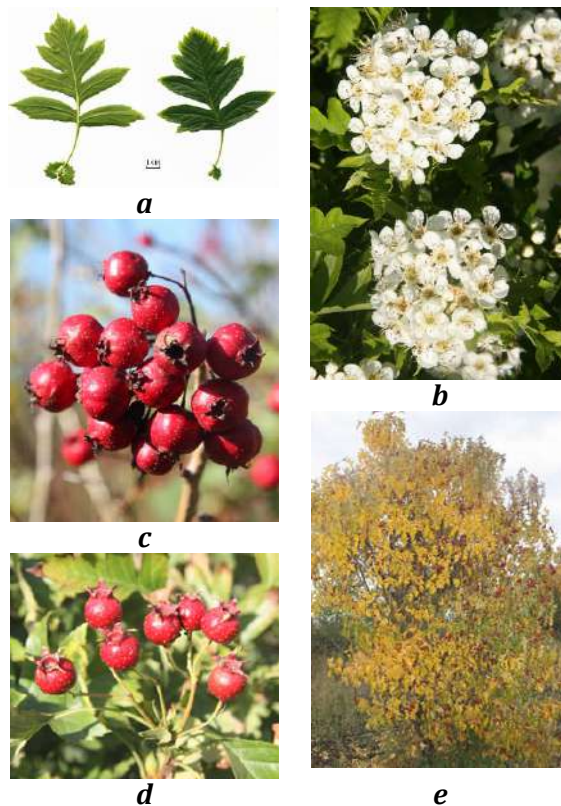


Figure 100. *Crataegus pinnatifida* 'Shadrikha' a) leaves, b) flowers, c) fruit, d) fruit, e) tree in the fall

Crataegus pinnatifida var. *major* 'Kytayskiy 1'

National catalog number: UN9300112

Collection number: 01776

Botanical name in Latin: *Crataegus pinnatifida* Bunge var. *major* N.E.Br.

Botanical name in English: Chinese hawthorn

Botanical name in Ukrainian: Hlid pirschastyi velykyi

Crop name in Ukrainian: Hlid, or Kytayskiy hlid

Accession name: 'Kytayskiy 1' (means "Chinese")

Date of introduction: 31.07.1999

Donor: Yakiv Kovalev, Sievernyi, Luhansk Region, Ukraine

Breeder: Ivan Yaremchuk (introducer)

Origin: An unknown Chinese variety introduced in Ukraine by Ivan Yaremchuk

Time of flowering: May

Time of fruit ripening: October

Value: Fruits are large, spherical to ovoid, red, with large gray warts, weighing 10 (20) g; pulp content 90%; stones 4-5. Attractiveness 8 points, taste 5 points

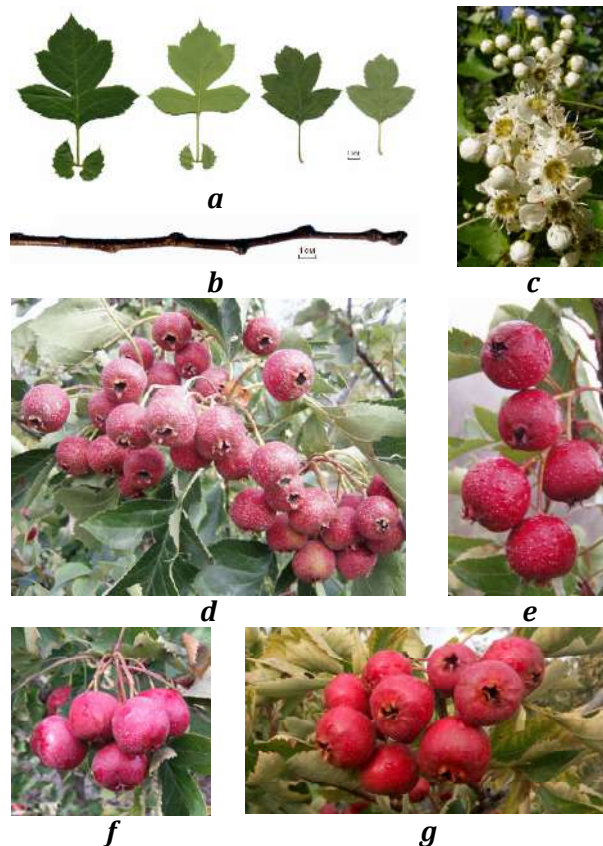


Figure 101. *Crataegus pinnatifida* var. *major* Kytayskiy 1' a) leaves of long shoots (left) and short shoots (right), b) one-year shoot, c) flowers, d) fruit, e) fruit, f) fruit, g) fruit

Crataegus pinnatifida var. *major* 'Mao Mao'

National catalog number: UN9300159

Collection number: 04276

Botanical name in Latin: *Crataegus pinnatifida* Bunge var. *major* N.E.Br.

Botanical name in English: Chinese hawthorn

Botanical name in Ukrainian: Hlid pirschastyi velykyi

Crop name in Ukrainian: Hlid, or Kytayskyi hlid

Accession name: 'Mao Mao' (name of a Chinese woman artist, a professor at Taras Shevchenko National University, Kyiv, Ukraine)

Date of introduction: 23.08.2012

Donor: Oleksandr Sychov, Rossosh, Voronezh Region, Russia

Breeders: Volodymyr Mezhenskyj, Liudmyla Mezhenska, and Oleksandr Sychov

Origin: Grown from seeds of Chinese origin

Time of flowering: May

Time of fruit ripening: October

Value: The accession was registered in the National Center for Plant Genetic Resources of Ukraine for large fruits and late ripening in 2016. Fruits are spherical to ovoid, bright red, with large white warts, weighing 10 (12) g; pulp content 90%; stone 4-5. Fruits contain 7.2% sugars, 3.0% organic acids, 22.9 mg/100 g ascorbic acid. Attractiveness 8 points, taste 5 points

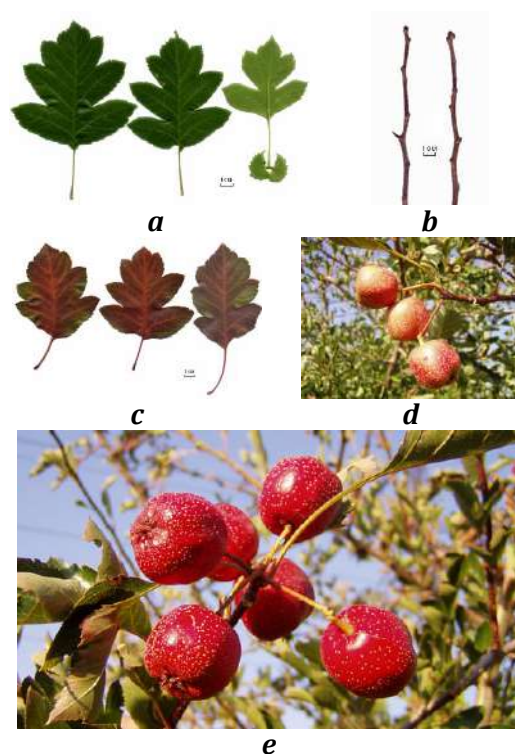


Figure 102. *Crataegus pinnatifida* var. *major* 'Mao Mao' a) leaves, b) annual growth, c) autumn leaves, d) fruit, e) fruit

Crataegus pinnatifida var. *major* 'Redflesh Mao'

National catalog number: UN9300158

Collection number: 04277

Botanical name in Latin: *Crataegus pinnatifida* Bunge var. *major* N.E.Br.

Botanical name in English: Chinese hawthorn

Botanical name in Ukrainian: Hlid pirschastyi velykyi

Crop name in Ukrainian: Hlid, or Kytayskyi hlid

Accession name: 'Redflesh Mao' (an allusion to related 'Mao Mao')

Date of introduction: 23.08.2012

Donor: Oleksandr Sychoy, Rossosh, Voronezh Region, Russia

Breeders: Volodymyr Mezhenkyj, Liudmyla Mezhenka, and Oleksandr Sychoy

Origin: Grown from seeds of Chinese origin

Time of flowering: May

Time of fruit ripening: October

Value: The accession was registered in the National Center for Plant Genetic Resources of Ukraine for its large fruits, late ripening, and resistance to unfavorable environmental factors in 2016. Fruits are spherical to ovoid, bright red, with large gray warts, weighing 10 g; pulp content 90%; stones 4-5. Attractiveness 8 points, taste 5 points. The flesh is red colored

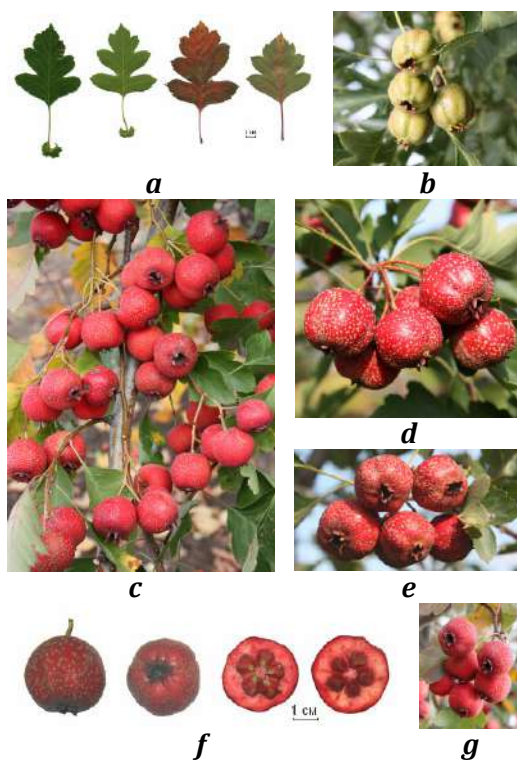


Figure 103. *Crataegus pinnatifida* var. *major* 'Redflesh Mao' a) summer (left) and in autumn leaves (right), b) young fruits, c) fruit, d) fruit, e) fruit, f) fruit shape, top view and cross-sections, g) fruit

Crataegus pinnatifida var. *major* 'Red Sun'

National catalog number: UN9300171

Collection number: 04527

Botanical name in Latin: *Crataegus pinnatifida* Bunge var. *major* N.E.Br.

Botanical name in English: Chinese hawthorn

Botanical name in Ukrainian: Hlid pirschastyi velykyi

Crop name in Ukrainian: Hlid, or Kytayskyi hlid

Accession name: 'Red Sun' ('Da Mian Qui')

Date of introduction: 08.04.2017

Donor: Julian Geyer, Graz, Austria

Breeder: -

Origin: Chinese variety

Time of flowering: May

Time of fruit ripening: October

Value: Fruits are large, spherical, red, with large gray warts, weighing 9 g; stones 5. Attractiveness 7 points, taste 5 points

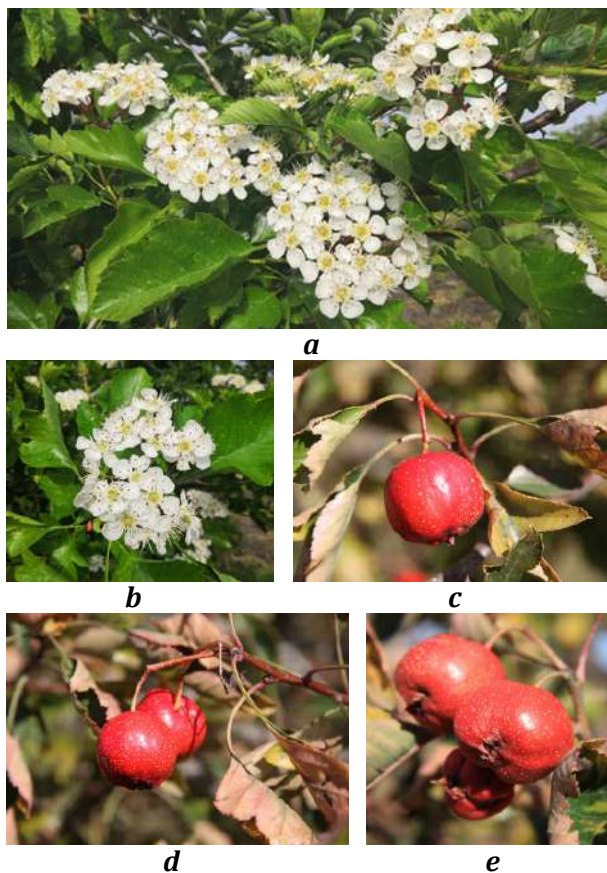


Figure 104. *Crataegus pinnatifida* var. *major* 'Red Sun' a) flowers, b) inflorescence, c) fruit, d) fruit, e) fruit

Crataegus pinnatifida var. *major* No. 03121

National catalog number: UN9300165

Collection number: 03121

Botanical name in Latin: *Crataegus pinnatifida* Bunge var. *major* N.E.Br.

Botanical name in English: Chinese hawthorn

Botanical name in Ukrainian: Hlid pirschastyi velykyi

Crop name in Ukrainian: Hlid, or Kytaiskyi hlid

Accession name: -

Date of introduction: 25.01.2010

Donor: Faculty of Horticulture, Mendel University in Brno, Lednice, Czech Republic

Breeder: -

Origin: Unknown Chinese variety

Time of flowering: May

Time of fruit ripening: October

Value: Fruits are ellipsoidal, red, weighing 2.5 g; stones 5. Attractiveness 7 points, taste 5 points

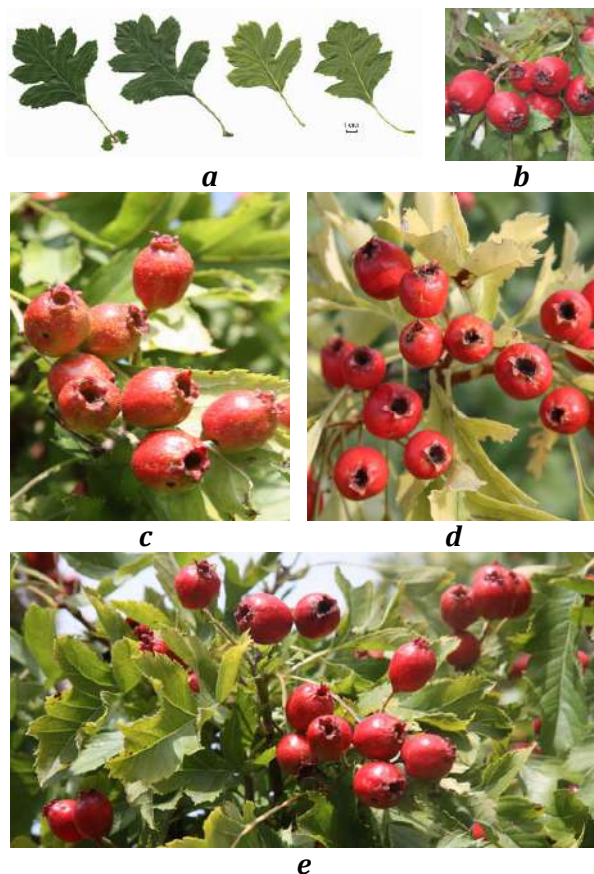


Figure 105. *Crataegus pinnatifida* var. *major* No. 03121 a) leaves, b) fruit, c) fruit, d) fruit, e) fruit

Crataegus pinnatifida var. *major* No. 03122

National catalog number: UN9300166

Collection number: 03122

Botanical name in Latin: *Crataegus pinnatifida* Bunge var. *major* N.E.Br.

Botanical name in English: Chinese hawthorn

Botanical name in Ukrainian: Hlid pirschastyi velykyi

Crop name in Ukrainian: Hlid, or Kytayskyi hlid

Accession name: -

Date of introduction: 25.01.2010

Donor: Faculty of Horticulture, Mendel University in Brno, Lednice, Czech Republic

Breeder: -

Origin: Unknown Chinese variety

Time of flowering: May

Time of fruit ripening: October

Value: Fruits are large, spherical, red, with large gray warts, weighing 7-8 g; stones 5. Attractiveness 8 points, taste 5 points

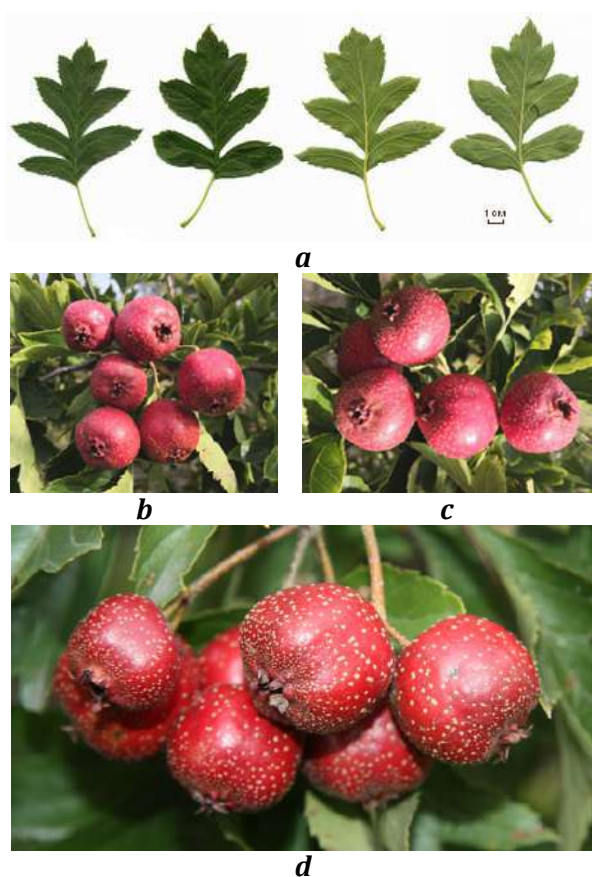


Figure 106. *Crataegus pinnatifida* var. *major* No. 03122 a) leaves, b) fruit, c) fruit, d) fruit

Crataegus pojarkovae 'Zlat'

National catalog number: UN9300150

Collection number: 01402

Botanical name in Latin: *Crataegus pojarkovae* Kossyeh

Botanical name in English: Poyarkova' hawthorn

Botanical name in Ukrainian: Hlid Poiarkovoi

Crop name in Ukrainian: Hlid

Accession name: 'Zlat' (means "golden"; masculine derivative of the femonine name Zlata, the granddaughter of the breeders)

Date of introduction: 11.09.1992

Donor: Karadag Nature Reserve, Karadag, Crimea, Ukraine

Breeders: Volodymyr Mezhenkyj and Liudmyla Mezhenka

Origin: Originated from plants of the natural hawthorn population in Crimea

Time of flowering: June

Time of fruit ripening: September

Value: The accession was registered in the National Center for Plant Genetic Resources of Ukraine for thornless branches, and large, yellow, and tasty fruits in 2022. Fruits are spherical to conical, ribbed, golden yellow, weighing 3.5 (7.5 g); pulp content 88%; stone 3-5. Fruits contain 7.1% sugars, 0.9% organic acids, 4.1 mg/100 g ascorbic acid. Attractiveness 9 points, taste 8 points

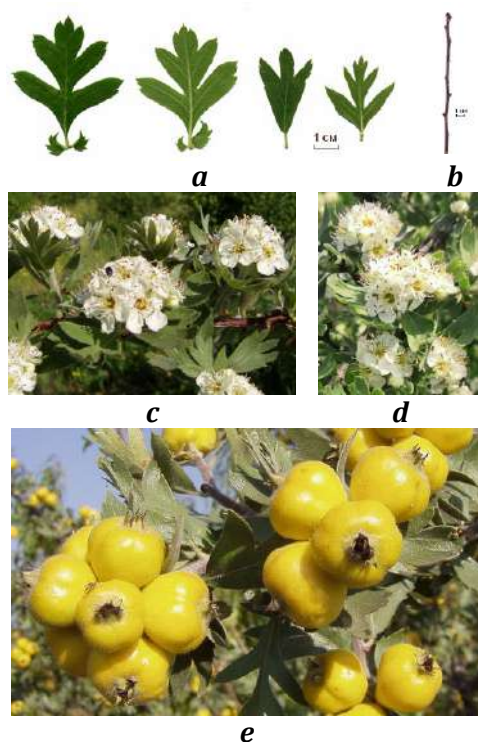


Figure 107. *Crataegus pojarkovae* 'Zlat' a) leaves of long shoots (left) and short shoots (right), b) one-year shoot, c) flowers, d) flowers, e) fruit

Crataegus × *pseudoazarolus* 'Nikita'

National catalog number: UN9300163

Collection number: 04283

Botanical name in Latin: *Crataegus* × *pseudoazarolus* Popov (= *C.* × *nikitinii* Essenova)

Botanical name in English: False azarole

Botanical name in Ukrainian: Hlid nespravzhnii azarol

Crop name: Hlid

Accession name: 'Nikita' (Nikita is a village in Crimea, a place of Botanical Garden; and an allusion to the species epithet "nikitinii")

Date of introduction: 11.09.1992

Donor: Nikita Botanical Garden, Nikita, Crimea, Ukraine

Breeders: Volodymyr Mezhenkyj and Liudmyla Mezhenka

Origin: Derived from plants of Turkmenistan's natural hawthorn populations. It is a natural hybrid *C. pontica* K. Koch × *C. pentagyna* Kit. ex Willd.

Time of flowering: June

Time of fruit ripening: September

Value: Red Fruit weight 2.5 g; pulp content 81%; stones 3-5. The fruits contain 6.4% sugars, 1.7 organic acids, 4.9 mg/100 g ascorbic acid. Attractiveness 9 points, taste 9 points

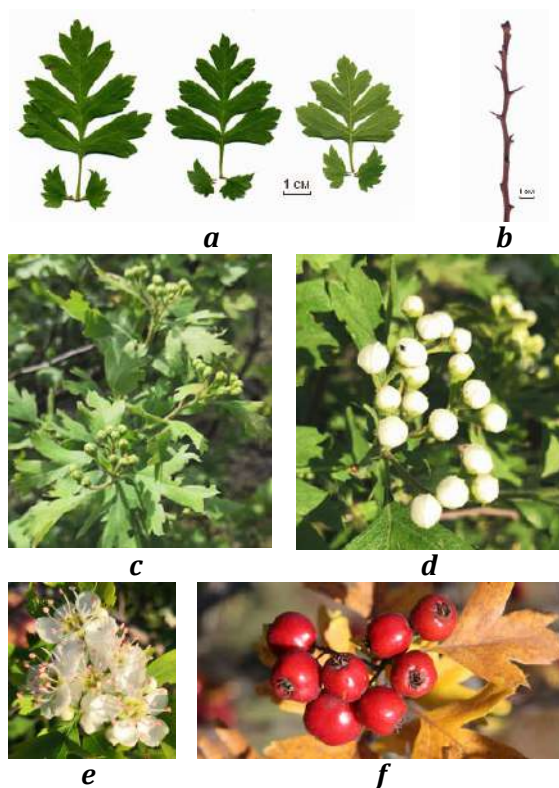


Figure 108. *Crataegus* × *pseudoazarolus* 'Nikita' a) leaves, b) one-year growth, c) the beginning of budding, d) inflorescence in the bud, e) flowers, f) fruit

Crataegus punctata 'Liudmyl'

National catalog number: UN9300068

Collection number: 04016

Botanical name in Latin: *Crataegus punctata* Jacq.

Botanical name in English: Dotted hawthorn

Botanical name in Ukrainian: Hlid tsiatkovyj

Crop name in Ukrainian: Amerykanskyj hlid, or Hlid

Accession name: 'Liudmyl' (masculine derivative of the feminine name Liudmyla; named after the wife of the breeder and coauthor of the cultivar)

Date of introduction: 23.08.2012

Donor: Volodymyr Mezhenkyj, Bakhmut, Donetsk Region, Ukraine

Breeders: Volodymyr Mezhenkyj and Liudmyla Mezhenka

Origin: Originated from plants of the M. V. Tsitsin Main Botanical Garden of the Russian Academy of Sciences

Time of flowering: May

Time of fruit ripening: September

Value: The variety was included in the State Register of Plant Varieties of Ukraine in 2001. The accession was registered in the National Center for Plant Genetic Resources of Ukraine due to high yield, thornless branches, and large fruits of medium-late ripening with long-keeping quality in 2005. Fruits are spherical to conical-globular, orange-red, weighing 4.5 (10.0) g; stones 2-4. Fruits contain 7.2% sugars, 1.7% organic acids, 21.2 mg/100 g ascorbic acid, 0.12 mg/100 g carotene. Attractiveness 7 points, taste 5 points

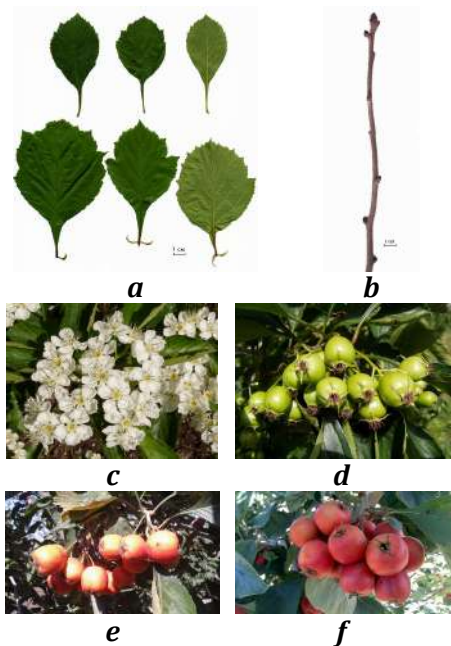


Figure 109. *Crataegus punctata* 'Ludmyl' a) leaves of long shoots (bottom) and short shoots (top), b) one-year growth, c) flowers, d) young fruit, e) fruit, f) ripe fruit

Crataegus rusanovii No. 03488

National catalog number: UN9300167

Collection number: 03488

Botanical name in Latin: *Crataegus rusanovii* Cinovskis

Botanical name in English: Rusanov's hawthorn

Botanical name in Ukrainian: Hlid Rusanova

Crop name in Ukrainian: Hlidn

Accession name: -

Date of introduction: 01.12.2011

Donor: Kryvyi Rih Botanical Garden, Kryvyi Rih, Dnipro Region, Ukraine

Breeder: -

Origin: Natural range of the species in Central Asia

Time of flowering: May

Time of fruit ripening: August

Value: Thornless branches, early fruit ripening. The greatest decorativeness during flowering and fruiting seasons

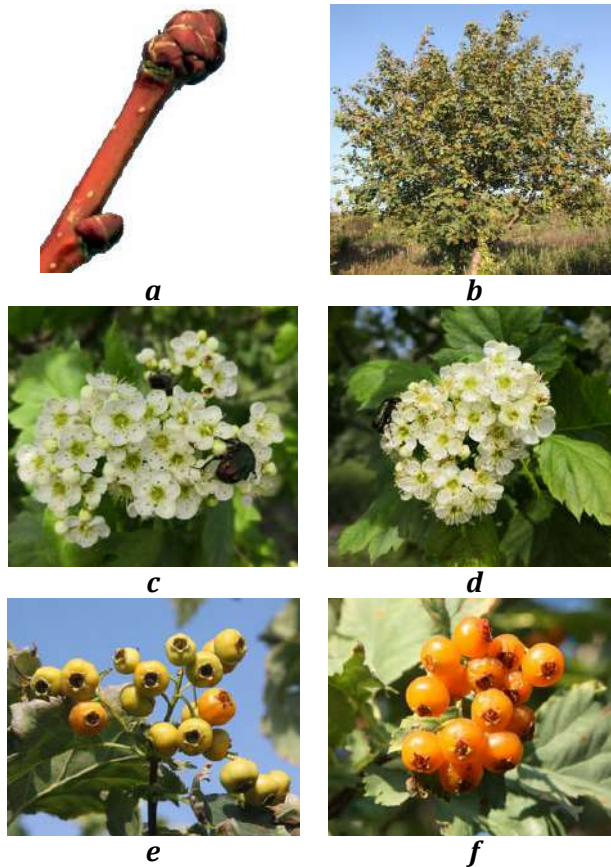


Figure 110. *Crataegus rusanovii* No. 03488 a) shoot with buds, b) fruiting tree, c) flowers, d) inflorescence, e) ripening fruit, f) ripe fruit

Crataegus sp. No. 01419

National catalog number: UN9300053

Collection number: 01419

Botanical name in Latin: *Crataegus* sp.

Botanical name in English: Hawthorn

Botanical name in Ukrainian: Hlid

Crop name in Ukrainian: Hlid

Accession name: -

Date of introduction: 24.11.1992

Donor: Aşgabat Botanical Garden, Aşgabat, Turkmenistan

Breeder: -

Origin: Originated from a seed obtained under the name *C. azarolus* L.

Time of flowering: May

Time of fruit ripening: September

Value: Fruits are dark red, weighing 2.0-3.5 g; stones 1-2. Attractiveness 7 points, taste 7 points

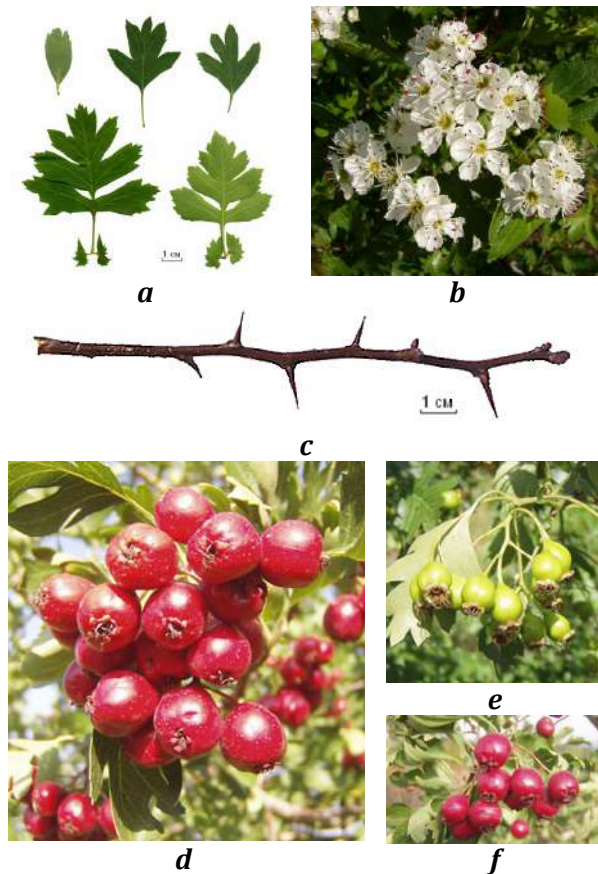


Figure 111. *Crataegus* sp. No. 01419 a) leaves of long shoots (bottom) and short shoots (top), b) flowers, c) one-year growth, d) fruit, e) unripe fruit, f) ripe fruit

Crataegus submollis var. *arnoldiana* 'Zbigniew'

National catalog number: UN9300001

Collection number: 04015

Botanical name in Latin: *Crataegus submollis* Sarg. var. *arnoldiana* (Sarg.) Mezhen'skyj

Botanical name in English: Arnold's hawthorn, Northern downy hawthorn, Northern red haw, or Quebec hawthorn

Botanical name in Ukrainian: Hlid miakuvatyi Arnoldiv

Crop name in Ukrainian: Amerykanskyi hlid, or Hlid

Accession name: 'Zbigniew' (named after Zbigniew Brzeziński, a Polish-American diplomat and political scientist)

Date of introduction: 23.08.2012

Donor: Volodymyr Mezhen'skyj, Bakhmut, Donetsk Region, Ukraine

Breeders: Volodymyr Mezhen'skyj and Lyudmyla Mezhen'ska

Origin: Originated from plants obtained from the M. M. Hryshko National Botanical Garden, Kyiv, Ukraine

Time of flowering: May

Time of fruit ripening: August

Value: The variety was included in the State Register of Plant Varieties of Ukraine in 2001, and registered in Poland in 2014. The accession was registered in the National Center for Plant Genetic Resources of Ukraine for its high yield, large and tasty fruits, and early ripening in 2005. Fruits are spherical, bright red, weighing 3.5 (5) g; 2-6 in corymb. Fruits contain 6.1% of sugars, 2.3% of pectin substances, 1.0% of organic acids, 12.6 mg/100 g ascorbic acid. Attractiveness 9 points, taste 9 points

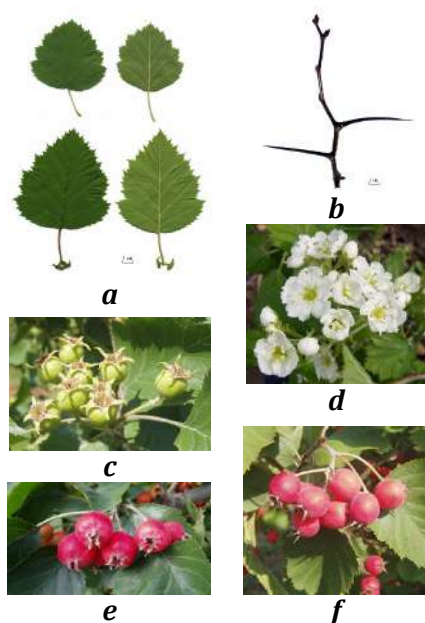


Figure 112. *Crataegus submollis* var. *arnoldiana* 'Zbigniew' a) leaves of long shoots (bottom) and short shoots (top), b) one-year growth, c) young fruit, d) inflorescence, e) ripe fruit, f) fruit

Crataegus tanacetifolia 'Pirc'

National catalog number: UN9300164

Collection number: 04220

Botanical name in Latin: *Crataegus tanacetifolia* (Poir.) Pers.

Botanical name in English: Tansy-leaved hawthorn

Botanical name in Ukrainian: Hlid pyzhmolystkovyi

Crop name in Ukrainian: Hlid

Accession name: 'Pirc' (named after Helmut Pirc, a botanist at the Federal Research Institute of Horticulture Schönbrunn, Vienna)

Date of introduction: 28.08.2018

Donor: Federal Research Institute of Horticulture Schönbrunn, Vienna, Austria

Breeders: Volodymyr Mezhenskyj and Liudmyla Mezhenska (introducers)

Origin: Natural range of the species in Asia Minor

Time of flowering: June

Time of fruit ripening: September

Value: The accession was registered in the National Center for Plant Genetic Resources of Ukraine for late flowering period and large tasty fruits in 2022. Fruits are flattened, spherical, faceted, orange-red, weighing 4.0-5.0 g; pulp content 86%; stones 3-5. The fruits contain 2.6 mg/100 g carotene. Attractiveness 9 points, taste 9 points

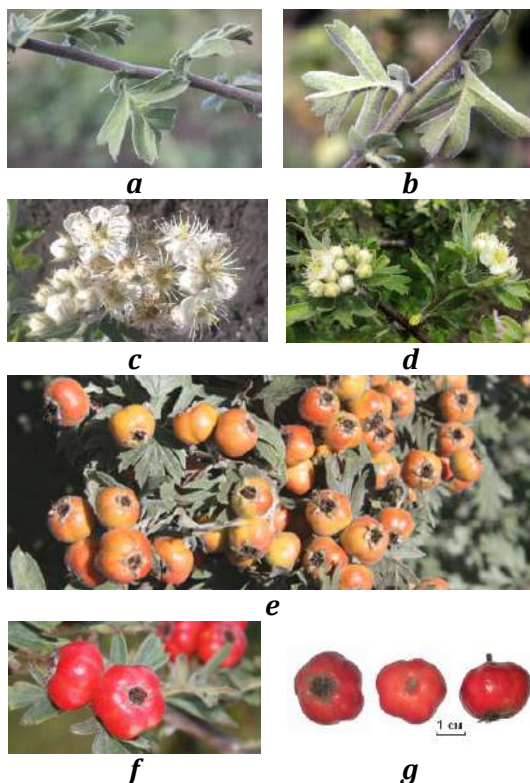


Figure 113. *Crataegus tanacetifolia* 'Pirc' a) leafy shoot, b) leafy shoot, c) flowers, d) flowers, e) fruit, f) fruit, g) fruit shape

Crataegus ×tournefortii 'Eski Qirim'

National catalog number: UN9300162

Collection number: 02725

Botanical name in Latin: *Crataegus ×tournefortii* Griseb.

Botanical name in English: Tournefort's hawthorn

Botanical name in Ukrainian: Hlid Turnefora

Crop name in Ukrainian: Hlid

Name of the sample: 'Eski Qirim' (means "Old Crimea")

Date of introduction: 02.02.2006

Donor: Victoriia Letukhova, Crimea, Ukraine

Breeders: Volodymyr Mezhenkyj, Liudmyla Mezhenka, and Victoriia Letukhova

Origin: Selected in natural populations of hawthorn near Staryi Krym in Crimea. A putative hybrid between *C. orientalis* Pall. ex M.Bieb. and *Crataegus* sp. in ser. *Erianthae* of sect. *Crataegus*

Time of flowering: May to June

Time of fruit ripening: September

Value: Fruits are flattened, dark cherry, weighing 2.0-2.5 g; pulp content 80%; stones 4-5. Fruits contain 6.6 mg/100 g ascorbic acid. Attractiveness 8 points, taste 7 points

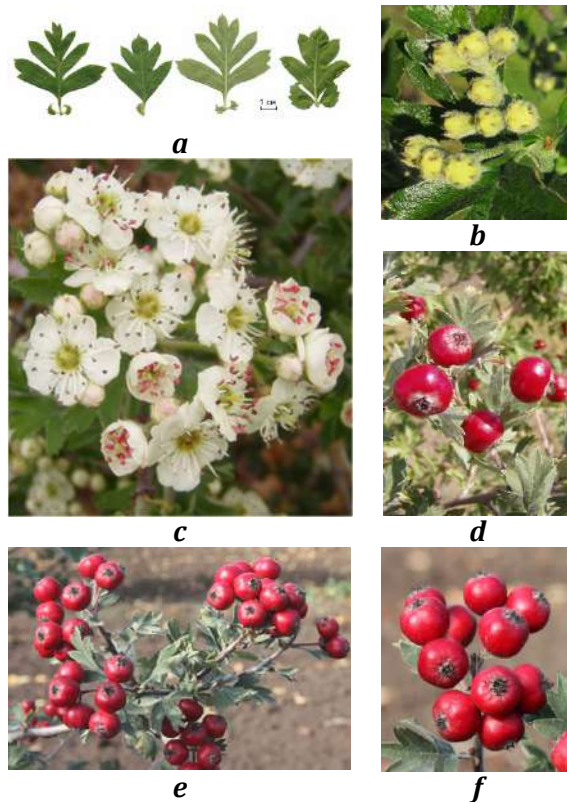


Figure 114. *Crataegus ×tournefortii* 'Eski Qirim' a) leaves, b) buds, c) flowers, d) fruit, e) fruit, f) fruit

Crataegus ucrainica 'Lubenskyi'

National catalog number: UN0900075

Collection number: 04281

Botanical name in Latin: *Crataegus ucrainica* Pojark.

Botanical name in English: Ukrainian hawthorn

Botanical name in Ukrainian: Hlid ukrainskyi

Crop name: Hlid

Accession name: 'Lubenskyi' (means "from Lubny", a town in Poltava Region, Ukraine)

Date of introduction: 23.08.2012

Donor: Volodymyr Mezhenkyj, Bakhmut, Donetsk Region, Ukraine

Breeders: Volodymyr Mezhenkyj and Lyudmyla Mezhenka

Origin: Originated from plants of the natural population of hawthorn near Lubny, Poltava Region

Time of flowering: May

Time of fruit ripening: September

Value: Fruits are spherical, faceted at the base, with indistinct outgrowths, red, weighing 1.0 g; pulp content 75%; one stone. Fruits contain 3.6% sugars, 5.1% pectin substances, 0.9% organic acids, 43.3 mg/100 g ascorbic acid. Attractiveness 8 points, taste 5 points

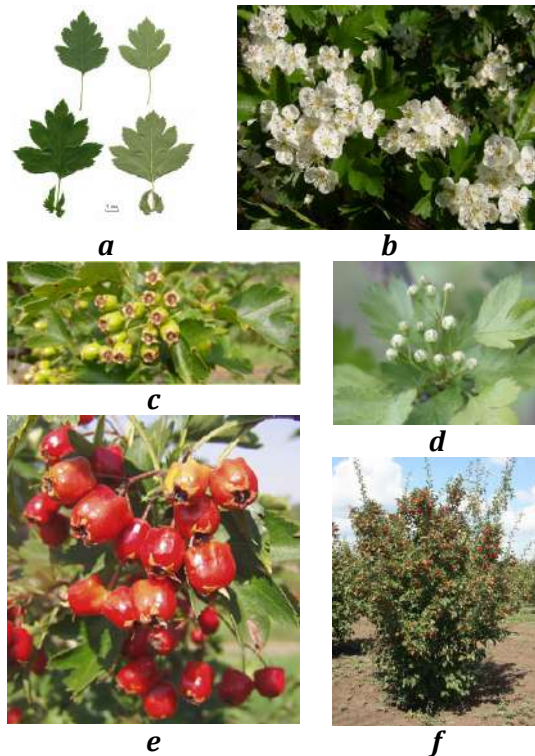


Figure 115. *Crataegus ucrainica* 'Lubenskyi' a) leaves of long shoots (bottom) and short shoots (top), b) flowers, c) young fruit, d) inflorescence in the bud, e) fruit, f) tree

ROSACEAE – CRATAEGUS

ROSE FAMILY – MEDLAR

MEDLAR

Under the genus name *Mespilus*, established by Linnaeus, where he included 7 species, several hundred species were subsequently described. Later, they were transferred to the genera *Aronia*, *Cotoneaster*, *Crataegus*, *Eriobotrya*, *Pyracantha*, *Sorbus*, etc. According to Friedrich Medikus (1789), the genus *Mespilus* is monotypic, which was agreed by most systematists. Phylogenetic studies have shown sisterly relationships between *Mespilus* and *Crataegus* (Campbell et al., 2007), and due to the lack of a single character that can distinguish *Mespilus germanica* (= *Crataegus germanica*) from any *Crataegus* species, it was proposed to unite both genera by assigning a section rank to *Mespilus* (Lo et al., 2007; Mezhenska and Mezhenskyj, 2013). With such a unification, for nomenclatural stability, it was proposed to retain the name *Crataegus*, and conserve it (Talent et al., 2008). In the newest system of the genus *Crataegus*, *Mespilus* has been elevated to the rank of subgenus (Ufimov and Dickinson, 2020). Instead, James Phipps (2016) provides numerous reasons to distinguish *Crataegus* and *Mespilus* as separate genera.

The medlar has a history spanning possibly 3 millenniums, from antiquity and during the Middle Ages, it to have held a high place among cultivated fruits. But later this fruit was “neglected and forgotten.” Bletted medlars, nevertheless, may be eaten out of hand for dessert and used for processing (Baird and Thieret, 1989). Now medlar is becoming increasingly widespread in Ukraine due to the introduction of varietal material (Oleshko, 1994; Mezhenskyj, 2008; Mezhenska and Mezhenskyi, 2013; Mezhenskyj and Mezhenska, 2015).

References

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Crataegus germanica 'Apyrena'

National catalog number: UN9500032

Collection number: 03823

Botanical name in Latin: *Crataegus germanica* (L.) Kuntze (= *Mespilus germanica* L.)

Botanical name in English: Common medlar, or medlar

Botanical name in Ukrainian: Mushmula nimetska

Crop name in Ukrainian: Mushmula, or Chyshka

Accession name: 'Apyrena' (means in Latin "lacking a hard kernel")

Date of introduction: 19.02.2013

Donor: Vladimiro Rocco, Stanghella, Italy

Breeder: -

Origin: Ancient variety

Time of flowering: May

Time of fruit ripening: November

Value: Fruit weight 2.5 g. Very late ripening period

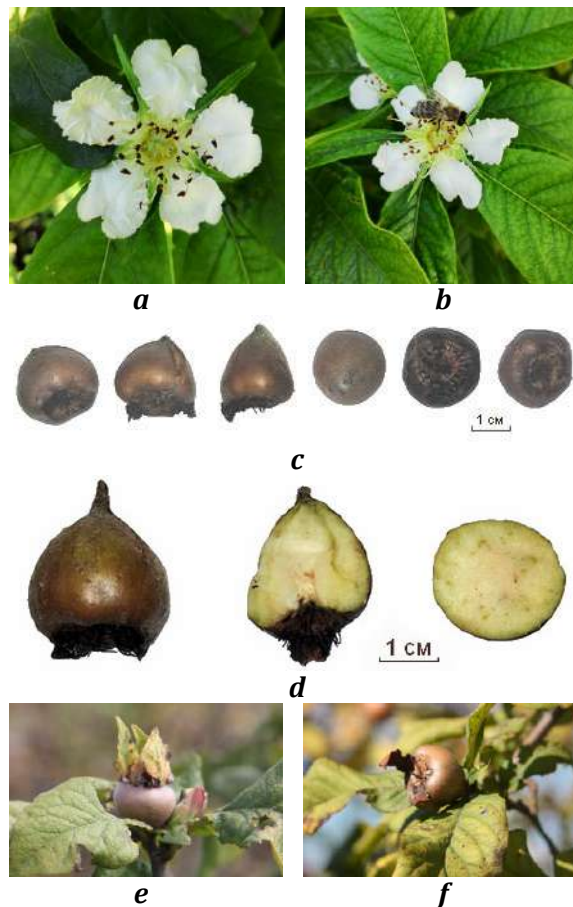


Figure 116. *Crataegus germanica* 'Apyrena' a) flowers, b) flower, c) varieties of fruit, d) longitudinal and transverse fruit sections, e) fruit, f) fruit

Crataegus germanica 'Delice des Vannes'

National catalog number: UN9500035

Collection number: 04520

Botanical name in Latin: *Crataegus germanica* (L.) Kuntze (= *Mespilus germanica* L.)

Botanical name in English: Common medlar, or medlar

Botanical name in Ukrainian: Mushmula nimetska

Crop name in Ukrainian: Mushmula, or Chyshka

Accession name: 'Delice des Vannes' (means "delight of the Vannes", a town in north-western France)

Date of introduction: 14.03.2017

Donor: Ömer Selim, Trabzon, Turkey

Breeder: -

Origin: An ancient Dutch variety

Time of flowering: May

Time of fruit ripening: October

Value: Fruit weight up to 20 g. Late ripening period

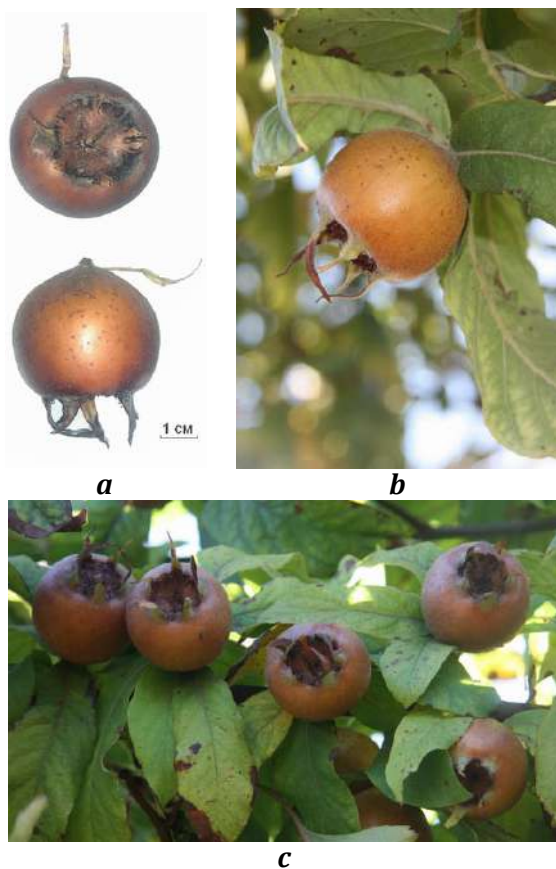


Figure 117. *Crataegus germanica* 'Delice des Vannes' a) shape and size of the fruit, b) fruit, c) fruit

Crataegus germanica 'Dutch Giant'

National catalog number: UN9500038

Collection number: 04522

Botanical name in Latin: *Crataegus germanica* (L.) Kuntze (= *Mespilus germanica* L.)

Botanical name in English: Common medlar, or medlar

Botanical name in Ukrainian: Mushmula nimetska

Crop name in Ukrainian: Mushmula, or Chyshka

Accession name: 'Dutch Giant'

Date of introduction: 25.03.2018

Donor: Julian Geyer, Graz, Austria

Breeder: -

Origin: An ancient variety of Dutch breeding

Time of flowering: May

Time of fruit ripening: October to November

Value: Fruit weight 35 (40) g. Late ripening period

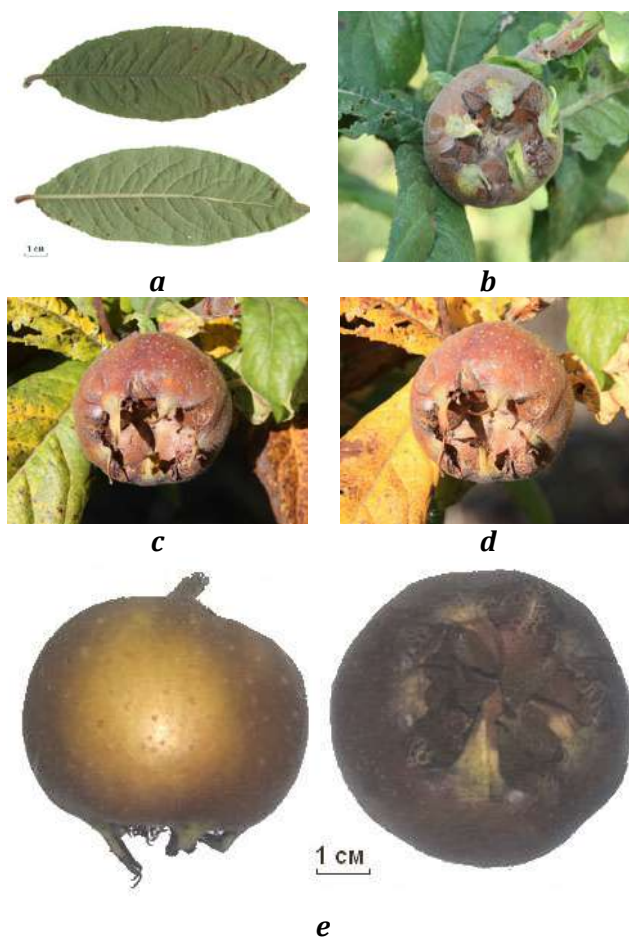


Figure 118. *Crataegus germanica* 'Dutch Giant' a) leaves, b) fruit, c) fruit, d) fruit, e) fruit

Crataegus germanica Flanders Giant®

National catalog number: UN9500036

Collection number: 04523

Botanical name in Latin: *Crataegus germanica* (L.) Kuntze (= *Mespilus germanica* L.)

Botanical name in English: Common medlar, or medlar

Botanical name in Ukrainian: Mushmula nimetska

Crop name in Ukrainian: Mushmula, or Chyshka

Accession name: Flanders Giant®

Date of introduction: 14.03.2017

Donor: Ömer Selim, Trabzon, Turkey

Breeder: Boomkwekerij Hortus Conclusus, Uitbergen, Belgium

Origin: Developed from 'Giant of Uitbergen' crossed with a sweet-fruited form of medlar in the Hortus Conclusus nursery

Time of flowering: May

Time of fruit ripening: October to November

Value: The fruits have a high percentage of pulp and good taste; under favorable conditions, they can reach 7 cm in diameter, but in Ukraine, the diameter of the fruit is only 4 cm. Fruit weighs 35 g. Late ripening period

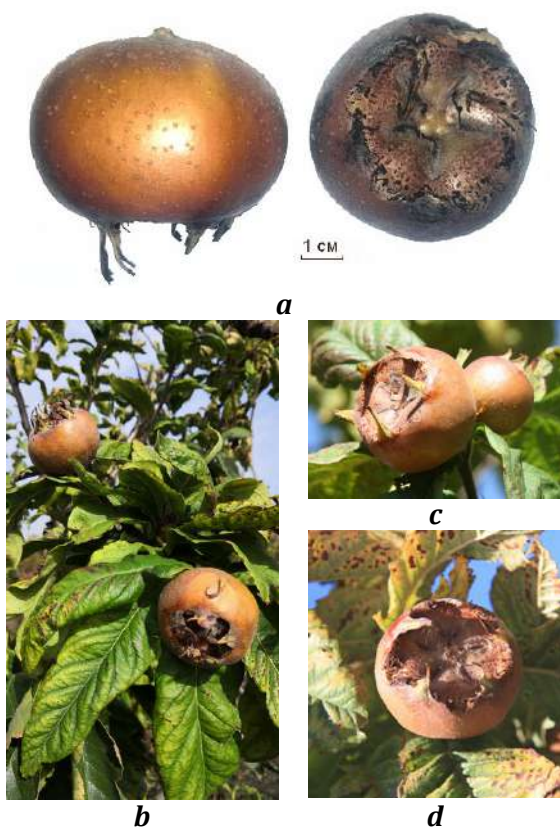


Figure 119. *Crataegus germanica* Flanders Giant® a) fruit, b) fruit, c) fruit, d) fruit

Crataegus germanica 'Gojtkhivska'

National catalog number: UN9500029

Collection number: 02655

Botanical name in Latin: *Crataegus germanica* (L.) Kuntze (= *Mespilus germanica* L.)

Botanical name in English: Common medlar, or medlar

Botanical name in Ukrainian: Mushmula nimetska

Crop name in Ukrainian: Mushmula, or Chyshka

Accession name: 'Gojtkhivska' (means "from Gojtkh", toponym in the Krasnodar Kray, Russia)

Date of introduction: 26.03.2005

Donor: Vladimir Svechnikov, Donetsk, Rostov Region, Russia

Breeder: Nikolaj Drachyov

Origin: The accession was collected near the village Gojtkh, Krasnodar Kray

Time of flowering: May

Time of fruit ripening: October

Value: Fruit weight 25 (35) g. Early ripening period

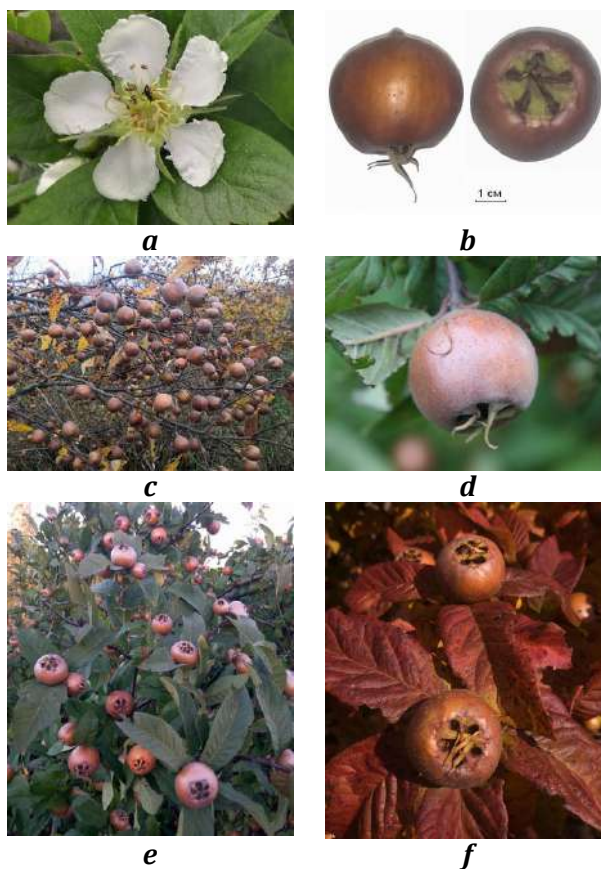


Figure 120. *Crataegus germanica* 'Gojtkhivska' a) flower, b) fruit, c) fruit, d) fruit, e) fruit, f) fruit and autumn leaves

Crataegus germanica 'Haidegger'

National catalog number: UN9500033

Collection number: 03950

Botanical name in Latin: *Crataegus germanica* (L.) Kuntze (= *Mespilus germanica* L.)

Botanical name in English: Common medlar, or medlar

Botanical name in Ukrainian: Mushmula nimetska

Crop name in Ukrainian: Mushmula, or Chyshka

Accession name: 'Haidegger' (from Haidegg Experimental Station for Fruit Growing and Viticulture in Graz, Styria, Austria)

Date of introduction: 14.03.2014

Donor: Julian Geyer, Graz, Austria

Breeder: -

Origin: Local Austrian variety

Time of flowering: May

Time of fruit ripening: October

Value: Fruit weight 20 (30) g. Average ripening period

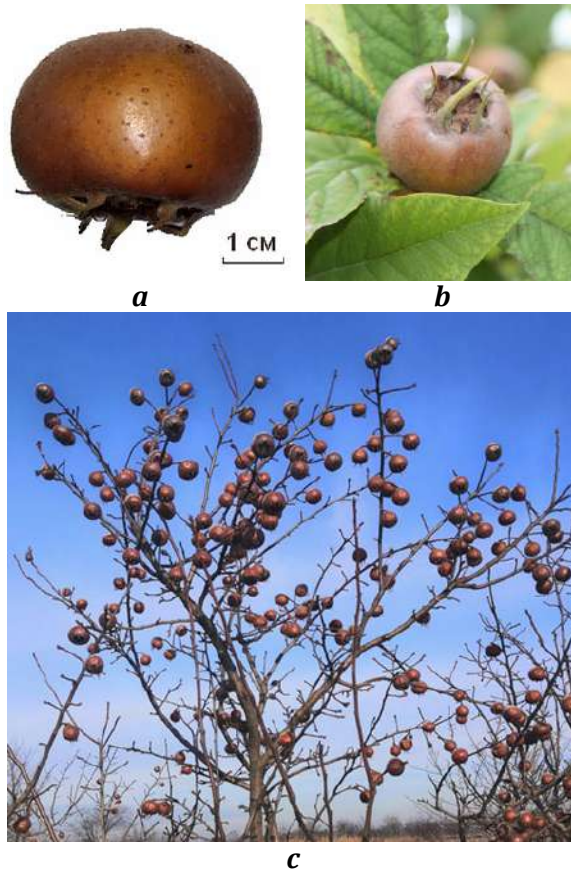


Figure 121. *Crataegus germanica* 'Haidegger' a) fruit, b) fruit, c) persistent fruit after leaf fall

Crataegus germanica 'Holland'

National catalog number: UN9500030

Collection number: 03124

Botanical name in Latin: *Crataegus germanica* (L.) Kuntze (= *Mespilus germanica* L.)

Botanical name in English: Common medlar, or medlar

Botanical name in Ukrainian: Mushmula nimetska

Crop name in Ukrainian: Mushmula, or Chyshka

Accession name: 'Holland'

Date of introduction: 25.01.2010

Donor: Faculty of Horticulture, Mendel University in Brno, Lednice, Czech Republic

Breeder: -

Origin: An ancient variety of Dutch breeding

Time of flowering: May

Time of fruit ripening: October

Value: Fruit weight 30 (40) g. Average ripening period

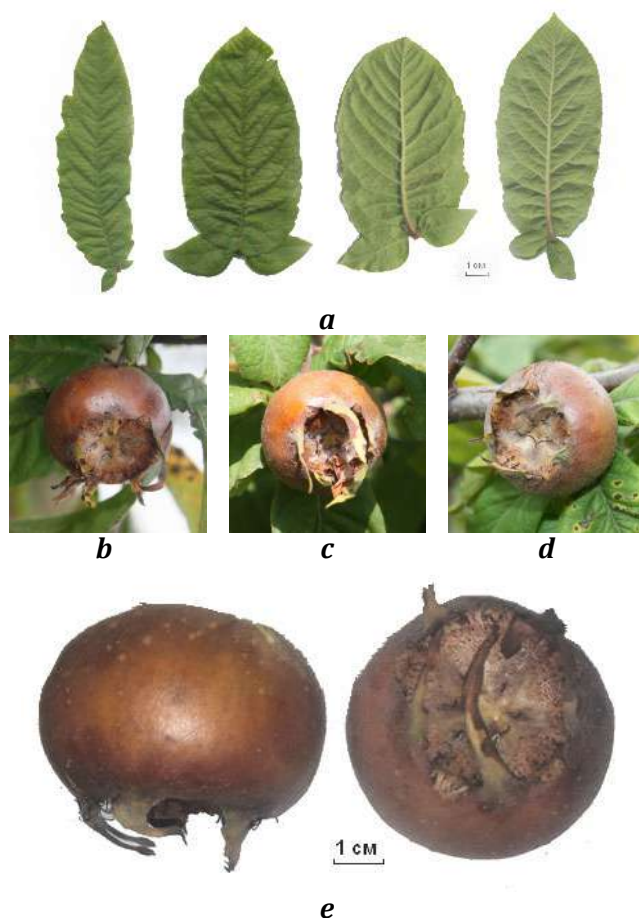


Figure 122. *Crataegus germanica* 'Holland' a) leaves, b) fruit, c) fruit, d) fruit, e) fruit

Crataegus germanica 'Karadazka'

National catalog number: UN9500026

Collection number: 02574

Botanical name in Latin: *Crataegus germanica* (L.) Kuntze (= *Mespilus germanica* L.)

Botanical name in English: Common medlar, or medlar

Botanical name in Ukrainian: Mushmula nimetska

Crop name in Ukrainian: Mushmula, or Chyshka

Accession name: 'Karadazka' (means "from Karadag", a volcanic rock formation in the Crimea; "black mount" in Crimean Tatar)

Date of introduction: 05.02.2004

Donor: Mikhail Kondratiev, Kurortne, Crimea, Ukraine

Breeder: Mikhail Kondratiev (introducer)

Origin: The accession was found by Kondratiev in the estates of Bulgarians deported from Crimea in 1944

Time of flowering: May

Time of fruit ripening: October

Value: Fruit weight 20 g. Early ripening period



a



b

Figure 123. *Crataegus germanica* 'Karadazka' a) fruit, b) fruit

Crataegus germanica 'Monstruose d'Evreinoff'

National catalog number: UN9500031

Collection number: 03822

Botanical name in Latin: *Crataegus germanica* (L.) Kuntze (= *Mespilus germanica* L.)

Botanical name in English: Common medlar, or medlar

Botanical name in Ukrainian: Mushmula nimetska

Crop name in Ukrainian: Mushmula, or Chyshka

Accession name: 'Monstruose d'Evreinoff'

Date of introduction: 19.02.2013

Donor: Vladimiro Rocco, Stanghella, Italy

Breeder: Vladimir Evreinoff

Origin: Selected by Evreinoff in France; it may be of Caucasian origin

Time of flowering: May

Time of fruit ripening: October to November

Value: Fruit weight 30 g. Late ripening period

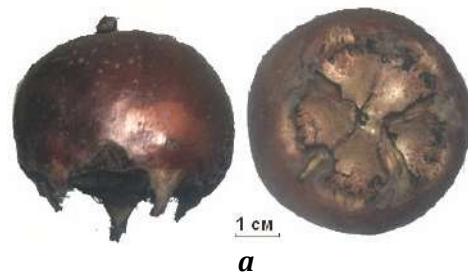


Figure 124. *Crataegus germanica* 'Monstruose d'Evreinoff' a) fruit, b) fruit, c) fruit

Crataegus germanica 'Seedless'

National catalog number: UN9500037

Collection number: 04744

Botanical name in Latin: *Crataegus germanica* (L.) Kuntze (= *Mespilus germanica* L.)

Botanical name in English: Common medlar, or medlar

Botanical name in Ukrainian: Mushmula nimetska

Crop name in Ukrainian: Mushmula, or Chyshka

Accession name: 'Seedless'

Date of introduction: 10.04.2019

Donor: Ömer Selim, Trabzon, Turkey

Breeder: -

Origin: Ancient variety

Time of flowering: May

Time of fruit ripening: October to November

Value: Fruit weight 10 (13) g. Late ripening period. It differs from accession No. 03823 'Apyrena' by larger fruit size

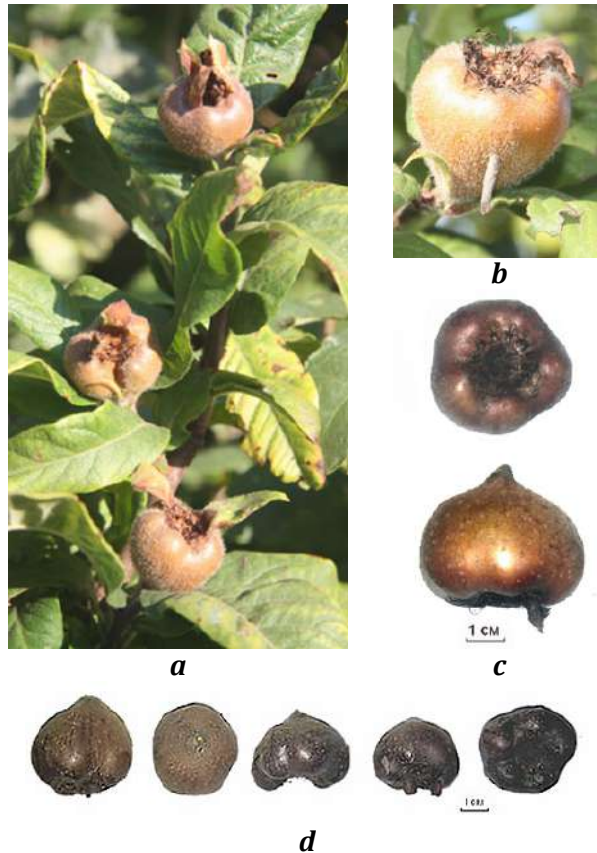


Figure 125. *Crataegus germanica* a) fruit, b) fruit, c) fruit shape and size, d) fruit shape and size

Crataegus germanica 'Silberberger'

National catalog number: UN9500034

Collection number: 03952

Botanical name in Latin: *Crataegus germanica* (L.) Kuntze (= *Mespilus germanica* L.)

Botanical name in English: Common medlar, or medlar

Botanical name in Ukrainian: Mushmula nimetska

Crop name in Ukrainian: Mushmula, or Chyshka

Accession name: 'Silberberger' (a mountain in Tyrol, Austria; "silver mountain" or "silver hill" in Germany)

Date of introduction: 14.03.2014

Donor: Julian Geyer, Graz, Austria

Breeder: -

Origin: Local Austrian variety

Time of flowering: May

Time of fruit ripening: October

Value: Fruit weight 20 g. Average ripening period



a



b



c



d

Figure 126. *Crataegus germanica* 'Silberberger' a) fruit, b) fruit, c) fruit, d) fruit

Crataegus germanica 'Sladkaja Drachyova'

National catalog number: UN9500028

Collection number: 02654

Botanical name in Latin: *Crataegus germanica* (L.) Kuntze (= *Mespilus germanica* L.)

Botanical name in English: Common medlar, or medlar

Botanical name in Ukrainian: Mushmula nimetska

Crop name in Ukrainian: Mushmula, or Chyshka

Accession name: 'Sladkaja Drachyova' ('Sladkaya Drachyova') (means "Drachyov's sweet"; Nikolaj Drachyov is a horticulturist in Tuapse, Russia)

Date of introduction: 26.03.2005

Donor: Vladimir Svechnikov, Donetsk, Rostov Region, Russia

Breeder: Nikolaj Drachyov

Origin: The accession was selected in the Krasnodar Kray, Russia

Time of flowering: May

Time of fruit ripening: October to November

Value: Fruit weight 20 g. Late ripening period

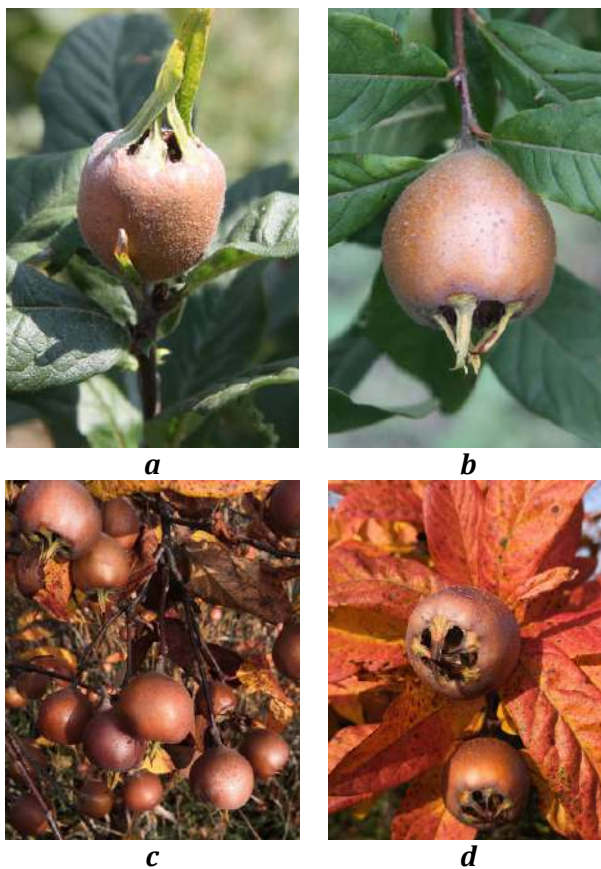


Figure 127. *Crataegus germanica* 'Sladkaja Drachyova' a) fruit, b) fruit, c) fruit, d) fruits and leaves in autumn

Crataegus germanica '25-hrammovaja'

National catalog number: UN9500027

Collection number: 02653

Botanical name in Latin: *Crataegus germanica* (L.) Kuntze (= *Mespilus germanica* L.)

Botanical name in English: Common medlar, or medlar

Botanical name in Ukrainian: Mushmula nimetska

Crop name in Ukrainian: Mushmula, or Chyshka

Accession name: '25-hrammovaja' ('25-hrammovaya') (means "with fruit weight 25 g")

Date of introduction: 26.03.2005

Donor: Vladimir Svechnikov, Donetsk, Rostov Region, Russia

Breeder: Nikolaj Drachyov

Origin: The accession was selected in the Krasnodar Kray, Russia

Time of flowering: May

Time of fruit ripening: October to November

Value: Fruit weight 20-25 g. Late ripening period

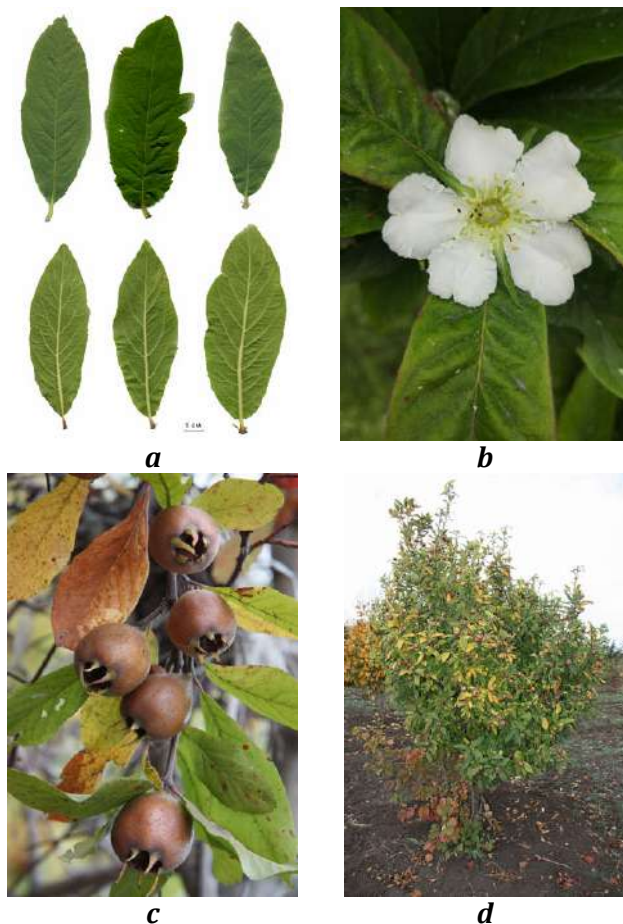


Figure 128. *Crataegus germanica* '25-hrammovaja' a) leaves, b) flower, c) fruit, d) tree

ROSACEAE – ×CYDOLUS
ROSE FAMILY – *CYDONIA* × *MALUS*

APPLE-QUINCE HYBRIDS, OR AQUINCE

This is the publication of a new hybrid Latin name. The first hybrids of *Cydolus oblonga* × *Malus domestica* were originated by Luther Burbank (Burbank, 1914, 1955), but they were sterile. Fertile hybrids have been developed in Ukraine, Bulgaria, and Russia (Ryabov, 1970; Shcherbenev, 1975; Rudenko, 1978; Matvienko et al., 2005). Ivan Rudenko (1978, 1983) raised a population of heterogeneous F₂ and F₃ seedlings and performed an important series of morphological and cytogenetic studies. In his honor, this interspecific hybrid was named ×*Cydolus rudenkoana* (Mezhenskyj, 2009, 2013).

Apple-quince hybrids, or aquince, are of interest in the breeding of apple varieties not prone to periodicity (Rudenko, 1978, 1983), and for new rootstocks for pome crops (Matvienko et al., 2005, 2006; Matvienko and Khodakivska, 2019). In Ukraine, breeding work using genetic resources of apple-quince hybrids continues (Mezhenskyj and Mezhenskaya, 2013; Mezhenskyj and Mezhenska, 2013; Mezhenskyj, 2015; Laba and Vasilieva, 2017).

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×Cydolus rudenkoana 'Mezhenskyj's hybrid 236'

National catalog number: U00100053

Collection number: 03869

Botanical name in Latin: *×Cydolus rudenkoana* Mezhenskyj

Botanical name in English: Cydolus, or Aquince

Botanical name in Ukrainian: Yabluneaiva Rudenkova

Crop name: Tsydol, or Yabluneaiva

Accession name: 'Mezhenskyj's hybrid 236' ('No. 236')

Date of introduction: 06.07.1989

Donor: Volodymyr Mezhenskyj, Bakhmut, Donetsk Region, Ukraine

Breeders: Volodymyr Mezhenskyj and Ivan Rudenko

Origin: Seedling of a mixture of seeds of the tetraploids, provided by Ivan Rudenko, Botanical Garden of the Academy of Sciences of Moldova, collection number 01001

Time of flowering: May

Time of fruit ripening: September

Value: Rooted by wood cuttings, worth testing as a rootstock for pome crops. Fruits are of quince type

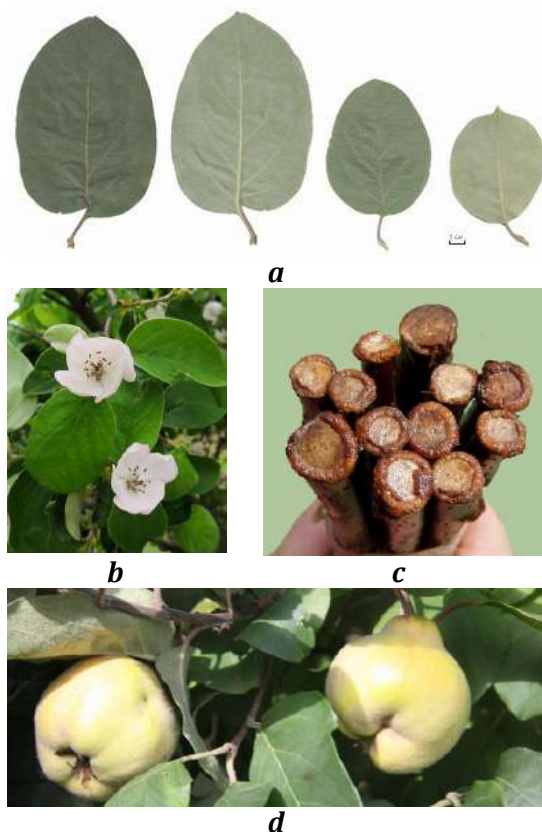


Figure 129. *×Cydolus rudenkoana* 'Mezhenskyj's hybrid 236' a) leaves, b) flowers, c) callused cuttings prepared for rooting, d) fruit

×Cydolus rudenkoana 'Panov's hybrid 1'

National catalog number: UN0600007

Collection number: 00058

Botanical name in Latin: *×Cydolus rudenkoana* Mezhen'skyj

Botanical name in English: Cydolus, or Aquince

Botanical name in Ukrainian: Yabluneaiva Rudenkova

Crop name: Tsydol, or Yabluneaiva

Accession name: 'Panov's hybrid 1' ('No. 1')

Date of introduction: 22.07.1981

Donor: Volgograd Research Station VIR - N. I. Vavilov Research Institute of Plant Industry, Krasnoslobodsk, Volgograd Region, Russia

Breeder: Vasyl Panov

Origin: Artificial hybrid of *Cydonia oblonga* Mill. 'Champion' × *Malus do mesticca* (Suckow) Borkh. 'Golden Delicious' + 'Jonathan' + 'Kandille' + 'Winter Gold Parmaene' + 'Yellow Belle-fleur'

Time of flowering: May

Time of fruit ripening: September

Value: One of the two Panov's hybrids that proved to be the best for further breeding. Fruit weight 150-190 g

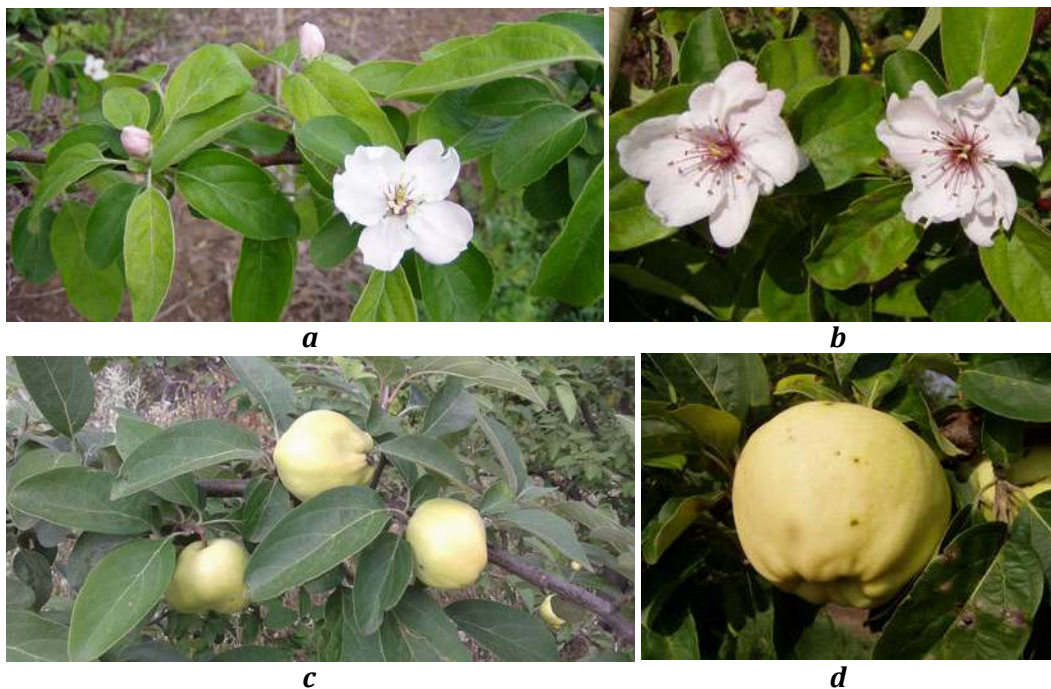


Figure 130. *×Cydolus rudenkoana* 'Panov's hybrid 1' a) branch with leaves, buds, and flowers, b) flowers, c) fruit, d) fruit

×*Cydolus rudenkoana* 'Rudenko's hybrid 2-69'

National catalog number: UN0600011

Collection number: 00997

Botanical name in Latin: ×*Cydolus rudenkoana* Mezhen'skyj

Botanical name in English: Cydolus, or Aquince

Botanical name in Ukrainian: Yabluneaiva Rudenkova

Crop name: Tsydol, or Yabluneaiva

Accession name: 'Rudenko's hybrid 2-69' ('No. 2-69')

Date of introduction: 06.07.1989

Donor: Botanical Garden of the Academy of Sciences of Moldova, Chişinău, Moldova

Breeder: Ivan Rudenko

Origin: Seedling of 'Panov's hybrid 1'

Time of flowering: May

Time of fruit ripening: September

Value: Triploid

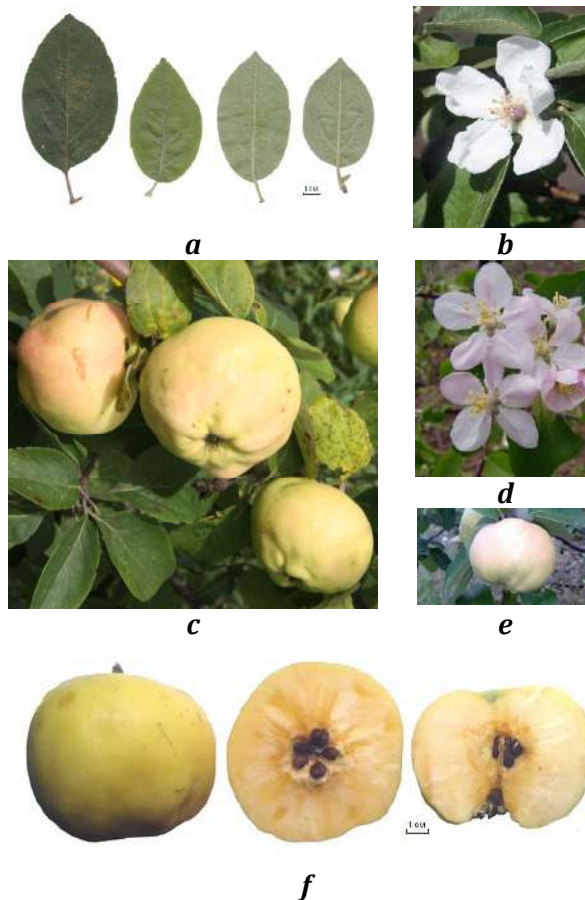


Figure 131. ×*Cydolus rudenkoana* 'Rudenko's hybrid 2-69' a) leaves, b) flower, c) fruit, d) flowers, e) fruit, f) fruit shape, transverse and longitudinal fruit sections

×Cydolus rudenkoana 'Rudenko's hybrid 7-72'

National catalog number: UN0600117

Collection number: 02338

Botanical name in Latin: *×Cydolus rudenkoana* Mezhen'skyj

Botanical name in English: Cydolus, or Aquince

Botanical name in Ukrainian: Yabluneaiva Rudenkova

Crop name: Tsydol, or Yabluneaiva

Accession name: 'Rudenko's hybrid 7-72' ('No. 7-72')

Date of introduction: 08.10.2002

Donor: Anatolii Laba, Pilnyi Oleksynets, Khmelnytskyi Region, Ukraine

Breeder: Ivan Rudenko

Origin: Seedling of 'Panov's hybrid 1'

Time of flowering: May

Time of fruit ripening: September

Value: Triploid

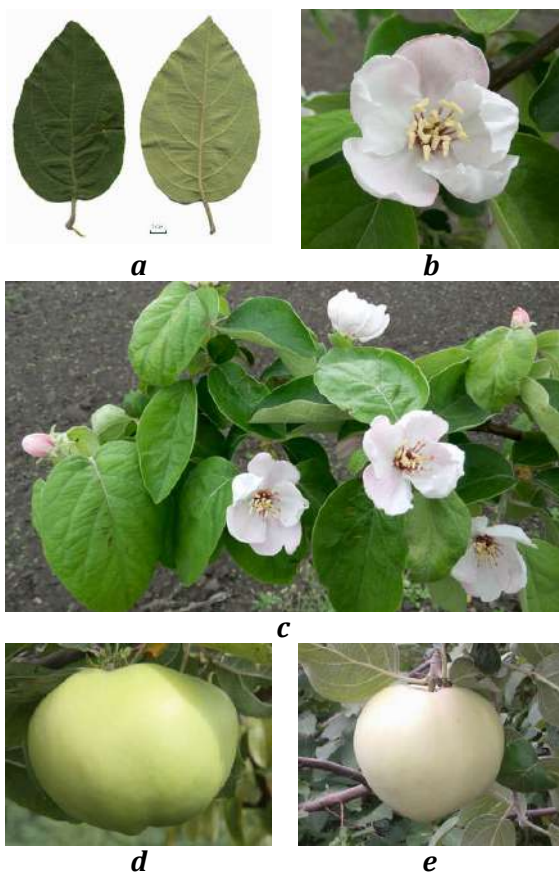


Figure 132. *×Cydolus rudenkoana* 'Rudenko's hybrid 7-72' a) leaves, b) full flower, c) flowering branches, d) fruit, e) fruit

×*Cydolus rudenkoana* 'Rudenko's hybrid 6-72'

National catalog number: UN0600009

Collection number: 00994

Botanical name in Latin: ×*Cydolus rudenkoana* Mezhen'skiy

Botanical name in English: Cydolus, or Aquince

Botanical name in Ukrainian: Yabluneaiva Rudenkova

Crop name: Tsydol, or Yabluneaiva

Accession name: 'Rudenko's hybrid 6-72' ('No. 6-72')

Date of introduction: 06.07.1989

Donor: Botanical Garden of the Academy of Sciences of Moldova, Chişinău, Moldova

Breeder: Ivan Rudenko

Origin: Seedling of 'Panov's hybrid 1'

Time of flowering: May

Time of fruit ripening: September

Value: Tetraploid. Promising in quince, aquince, and apple tree breeding

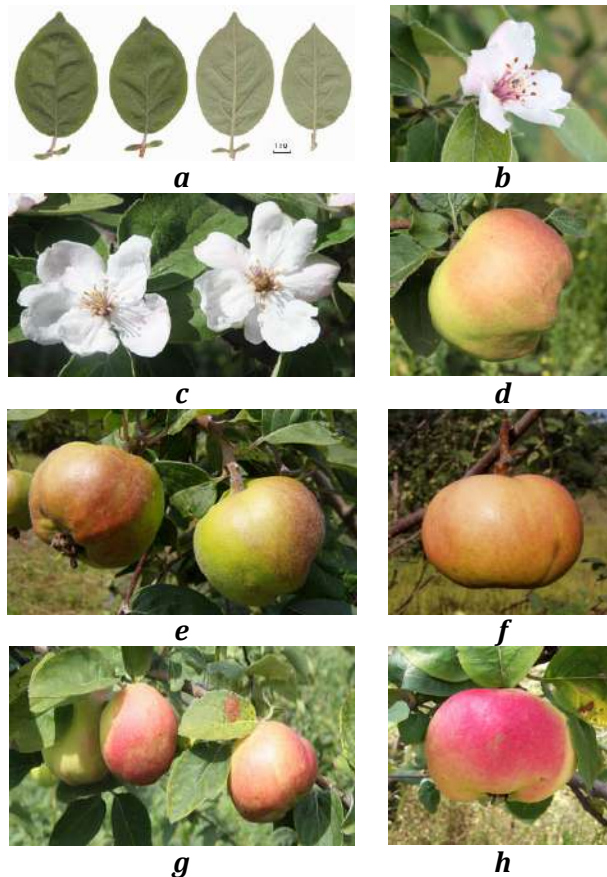


Figure 133. ×*Cydolus rudenkoana* 'Rudenko's hybrid 6-72' a) leaves, b) flower, c) flowers, d) fruit, e) fruit, f) fruit, g) fruit, h) fruit

×Cydolus rudenkoana 'Rudenko's hybrid 14-72'

National catalog number: UN060113

Collection number: 02341

Botanical name in Latin: *×Cydolus rudenkoana* Mezhen'skiy

Botanical name in English: Cydolus, or Aquince

Botanical name in Ukrainian: Yabluneaiva Rudenkova

Crop name: Tsydol, or Yabluneaiva

Accession name: 'Rudenko's hybrid 14-72' ('No. 14-72')

Date of introduction: 08.10.2002

Donor: Anatoly Laba, Pilnyi Oleksynets, Khmelnytskyi Region, Ukraine

Breeder: Ivan Rudenko

Origin: Seedling of 'Panov's hybrid 1'

Time of flowering: May

Time of fruit ripening: September

Value: Promising in quince, aquince, and apple tree breeding

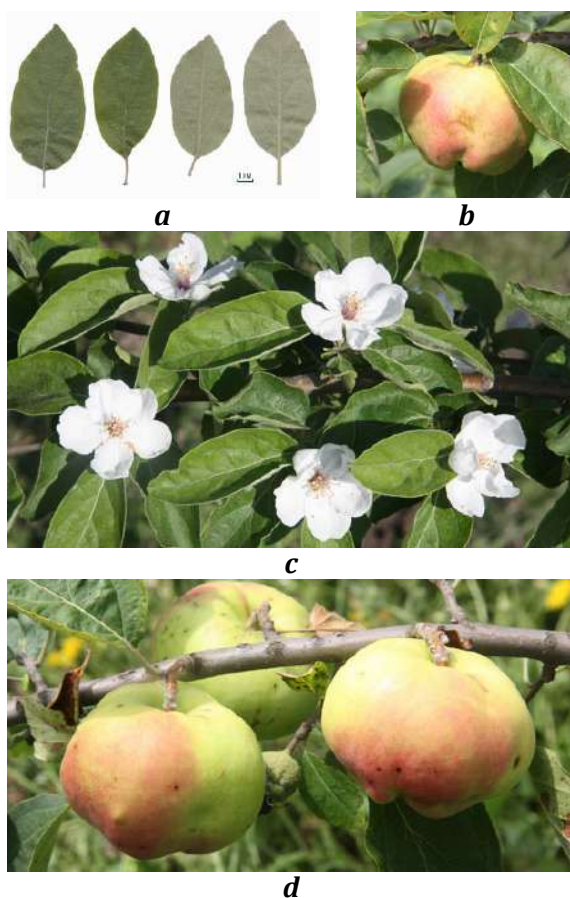


Figure 134. *×Cydolus rudenkoana* 'Rudenko's hybrid 14-72' a) leaves, b) fruit, c) flowers, d) fruit

×Cydolus rudenkoana 'Rudenko's hybrid 38-72'

National catalog number: UN0600010

Collection number: 00995

Botanical name in Latin: *×Cydolus rudenkoana* Mezhen'skyj

Botanical name in English: Cydolus, or Aquince

Botanical name in Ukrainian: Yabluneaiva Rudenkova

Crop name: Tsydol, or Yabluneaiva

Accession name: 'Rudenko's hybrid 38-72' ('No. 38-72')

Date of introduction: 06.07.1989

Donor: Botanical Garden of the Academy of Sciences of Moldova, Chişinău, Moldova

Breeder: Ivan Rudenko

Origin: Seedling of 'Panov's hybrid 1'

Time of flowering: May

Time of fruit ripening: September

Value: Tetraploid. Promising in quince, aquince, and apple tree breeding

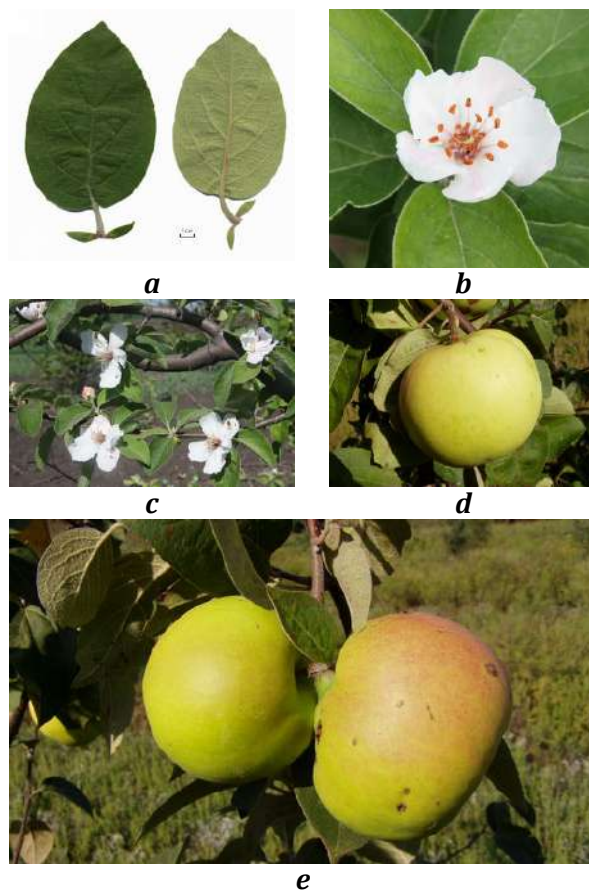


Figure 135. *×Cydolus rudenkoana* 'Rudenko's hybrid 38-72' a) leaves, b) flower, c) flowers, d) fruit, e) fruit

×Cydolus rudenkoana 'Turunchukskaja' × '6-62'

National catalog number: UN060119

Collection number: 02339

Botanical name in Latin: *×Cydolus rudenkoana* Mezhen'skyj

Botanical name in English: Cydolus, or Aquince

Botanical name in Ukrainian: Yabluneaiva Rudenkova

Crop name: Tsydol, or Yabluneaiva

Accession name: 'Turunchukskaja' (or 'Turunchukskaya') × '6-62' (the quince 'Turunchukskaja' got its name from the river Turunchuk in Moldova and Ukraine)

Date of introduction: 08.10.2002

Donor: Anatoly Laba, Pilnyi Oleksynets, Khmelnytskyi Region, Ukraine

Breeder: Ivan Rudenko

Origin: *Cydonia oblonga* Mill. 'Turunciukskaia' × 'Rudenko's hybrid 6-62'

Time of flowering: May

Time of fruit ripening: September

Value: Promising in quince breeding

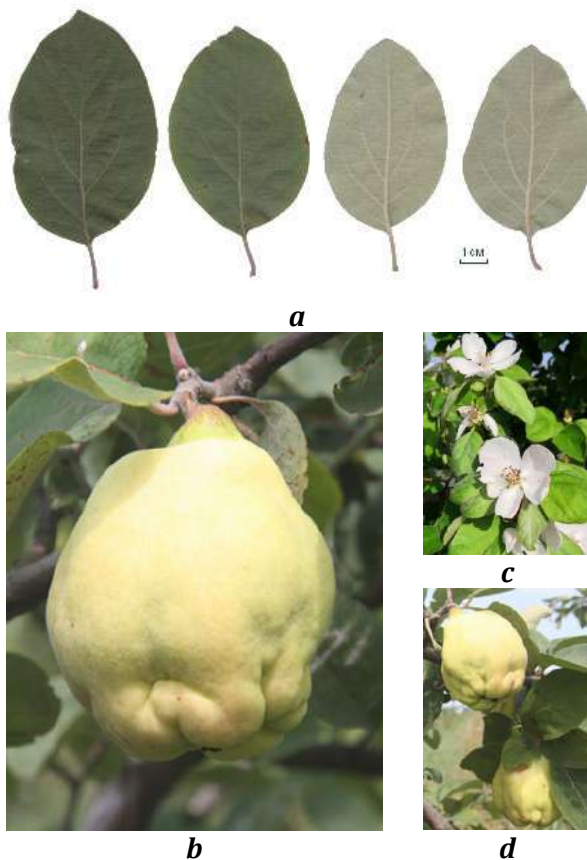


Figure 136. *×Cydolus rudenkoana* 'Turunchukskaja' × '6-62' a) leaves, b) fruit, c) flowers, d) fruit

×Cydolus rudenkoana 'UUPROZ-6'

National catalog number: U00100045

Collection number: 03846

Botanical name in Latin: *×Cydolus rudenkoana* Mezhen'skyj

Botanical name in English: Cydolus, or Aquince

Botanical name in Ukrainian: Yabluneaiva Rudenkova

Crop name: Tsydol, or Yabluneaiva

Accession name: 'UUPROZ-6' (abbreviation means "Ukrainian Universal Pidshchepa (rootstock) for ROZ (Rosaceae), clone 6)

Date of introduction: 17.04.2013

Donor: Institute of Horticulture of the National Academy of Sciences of Ukraine, Kyiv, Ukraine

Breeders: Viktor Chupryniuk, Mykola Matviienko, and Petro Kondratenko

Origin: Hybrid between a local semi-wild form of *Cydolus oblonga* Mill. \times *Malus domestica* L. 'Antonivka' + 'Calvill Snihovyi' + 'McIntosh'

Time of flowering: May

Time of fruit ripening: September

Value: The variety was included in the State Register of Plant Varieties of Ukraine in 2010 as a universal rootstock for pome fruit cultivars

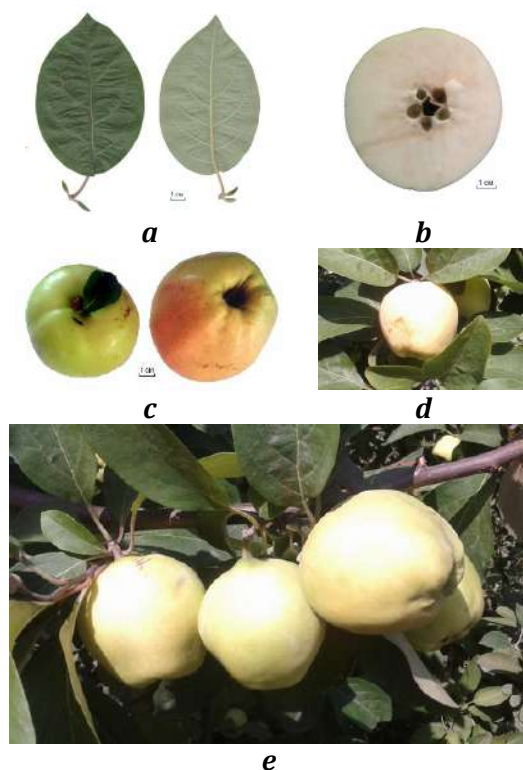


Figure 137. *×Cydolus rudenkoana* 'UUPROZ-6' a) leaves, b) transverse cross-section, c) fruit shape and integumentary color, d) fruit, e) fruit

ROSACEAE – MALUS

ROSE FAMILY – APPLE

RED FLESHED APPLE

More than 10 thousand apple cultivars are known, including a special red-fleshed *Malus Niedzwetzkyana* group. These varieties are initially related to the Central Asian *Malus sieversii* f. *niedzwetzkyana* (= *M. niedzwetzkyana*), which has anthocyanin coloration of all organs due to a specific mutation (Nocker et al., 2012; Volk et al., 2013). Anthocyanins provide apples with increased nutritional value due to their antioxidant properties, so red flesh is a desirable trait in apple breeding. Red-fleshed apples contain more healthy compounds and are an attractive novelty for consumers. Due to their special polyphenolic composition, they have additional positive health effects compared to common apples (Faramarzi et al., 2015; Yuste et al., 2022). Controlled by MYB-type transcriptomic factors, red flesh has two phenotypes (Espley et al., 2007; Chagné et al., 2013; Würdig et al., 2014; Sato et al., 2017). Breeding programs to improve the variety of red-fleshed apples are carried out in many countries (Volz et al., 2009; Neumüller and Dittrich, 2017; Shogo et al., 2018; Wang et al., 2018).

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Malus domestica 'Airlie Red Flesh'

National catalog number: UN0110188

Collection number: 03096

Botanical name in Latin: *Malus domestica* (Suckow) Borkh.

Botanical name in English: Apple tree, or orchard apple

Botanical name in Ukrainian: Yablunia domashnia

Crop name in Ukrainian: Chervonomiakushna yablunia

Accession name: 'Airlie Red Flesh' ('Hidden Rose', 'Mountain Rose')

Date of introduction: 18.09.2009

Donor: One Green World Nursery, Molalla, Oregon, USA

Breeders: Lucky Newell, Louis Kimzey, and Eric Schwartz

Origin: A random seedling of unknown origin found by Lucky Newell on his farm in the community of Airlie, Oregon, USA

Time of flowering: May

Time of fruit ripening: September to October

Value: Source of anthocyanin coloration of the pulp, long-term storage of fruits, good taste

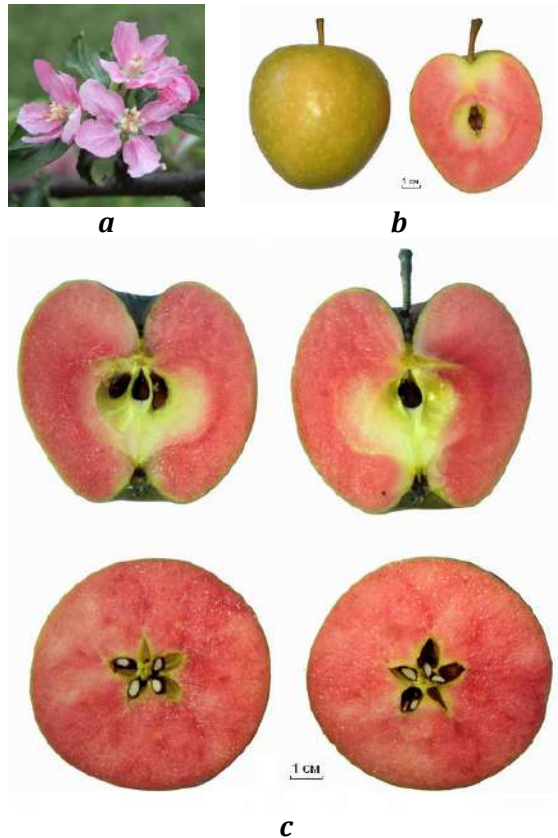


Figure 138. *Malus domestica* 'Airlie Red Flesh' a) flowers, b) fruit shape and longitudinal fruit section, c) transverse and longitudinal fruit sections

Malus domestica 'Bill's Red Flesh'

National catalog number: UN0110176

Collection number: 02991

Botanical name in Latin: *Malus domestica* (Suckow) Borkh. Niedzwetzkyana Group

Botanical name in English: Apple tree, or orchard apple

Botanical name in Ukrainian: Yablunia domashnia

Crop name in Ukrainian: Chervonomiakushna yablunia

Accession name: 'Bill's Red Flesh' (Firecracker™, Scarlet Surprise™)

Date of introduction: 02.01.2009

Donor: One Green World Nursery, Molalla, Oregon, USA

Breeder: Bill Schultz; Oregon, USA

Origin: Found in an abandoned garden

Time of flowering: May

Time of fruit ripening: September

Value: Source of anthocyanin coloration of the pulp

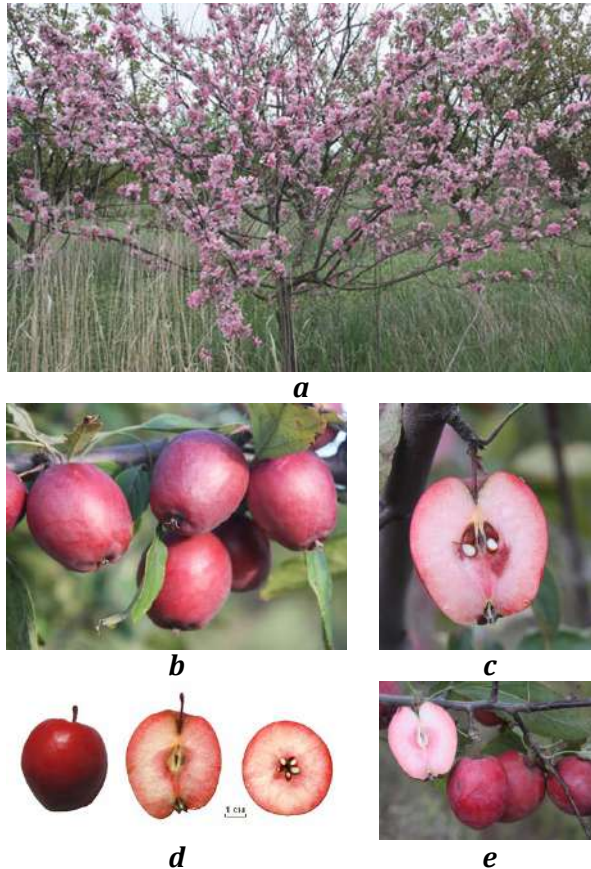


Figure 139. *Malus domestica* 'Bill's Red Flesh' a) flowering tree, b) fruit on the branch, c) longitudinal fruit section, d) fruit shape, longitudinal and transverse fruit sections, e) fruit on the branch, transverse fruit section

Malus domestica 'Dr. Campbell's'

National catalog number: UN0110212

Collection number: 04339

Botanical name in Latin: *Malus domestica* (Suckow) Borkh. Niedzwetzkyana Group

Botanical name in English: Apple tree, or orchard apple

Botanical name in Ukrainian: Yablunia domashnia

Crop name in Ukrainian: Chervonomiakushna yablunia

Accession name: 'Dr. Campbell's' ('Robert's', 'Robert's Crab', 'Robert's Red', 'Simontornya', 'Simontornya véralma', 'Véralma') (Dr. Ian Campbell was a scientist at the Long Ashton Research Station)

Date of introduction: 01.04.2017

Donor: Julian Geyer, Graz, Austria

Breeder: -

Origin: Origin is unknown. Discovered in a collection of apple trees at Showerings Cider Company, Somerset, UK and originally named 'Dr. Campbell's'. It is grown in Europe and the USA under the name 'Robert's' and derivative names. Renamed in Hungary after the town of Simontornya

Time of flowering: May

Time of fruit ripening: September

Value: Source of intense anthocyanin coloration of the flesh

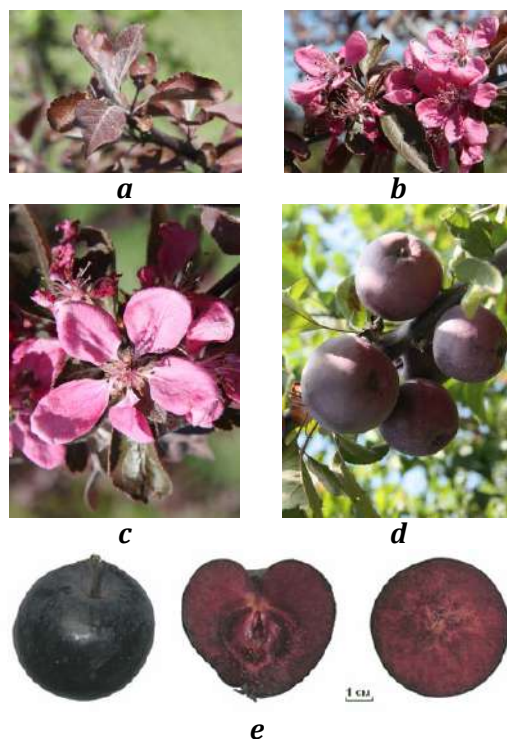


Figure 140. *Malus domestica* 'Dr. Campbell's' a) young shoot with leaves, b) flowers, c) flower, d) fruit on the branch, e) fruit shape, longitudinal and transverse fruit sections

Malus domestica 'Era'

National catalog number: UN0110193

Collection number: 03504

Botanical name in Latin: *Malus domestica* (Suckow) Borkh. Niedzwetzkyana Group

Botanical name in English: Apple tree, or orchard apple

Botanical name in Ukrainian: Yablunia domashnia

Crop name in Ukrainian: Chervonomiakushna yablunia

Accession name: 'Era'

Date of introduction: 20.03.2012

Donor: Vladimiro Rokko, Stanghella, Italy

Breeder: Markcus Kobelt; Lubera nursery, Buchs, Switzerland

Origin: The hybrid formula of this artificial cross is *M. domestica* × *M. sieversii* (Ledeb.) M.Roem. f. *niedzwetzkyana* (Dieck) Langenf. Belongs to the group of varieties registered under the trademark RedLove®

Time of flowering: May

Time of fruit ripening: September

Value: Source of anthocyanin coloration of the pulp

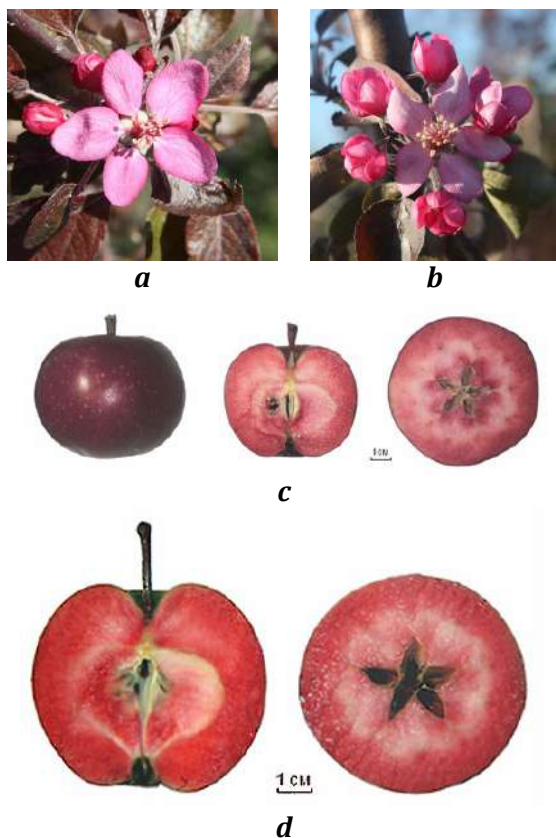


Figure 141. *Malus domestica* 'Era' a) flower, b) flowers, c) fruit shape, longitudinal and transverse sections, d) longitudinal and transverse sections

Malus domestica 'Jürgen'

National catalog number: UN0110175

Collection number: 02947

Botanical name in Latin: *Malus domestica* (Suckow) Borkh. Niedzwetzkyana Group

Botanical name in English: Apple tree, or orchard apple

Botanical name in Ukrainian: Yablunia domashnia

Crop name in Ukrainian: Chervonomiakushna yablunia

Accession name: 'Jürgen' (named by us after Jürgen Reckin)

Date of introduction: 19.09.2008

Donor: Jürgen Reckin, Schorfheide, Brandenburg, Germany

Breeder: -

Origin: Obtained under the name *M. niedzwedzkyana*. The hybrid formula of this artificial cross is *M. domestica* × *M. sieversii* (Ledeb.) M.Roem. f. *niedzwetzkyana* (Dieck) Langenf.

Time of flowering: May

Time of fruit ripening: September

Value: Source of anthocyanin coloration of the pulp

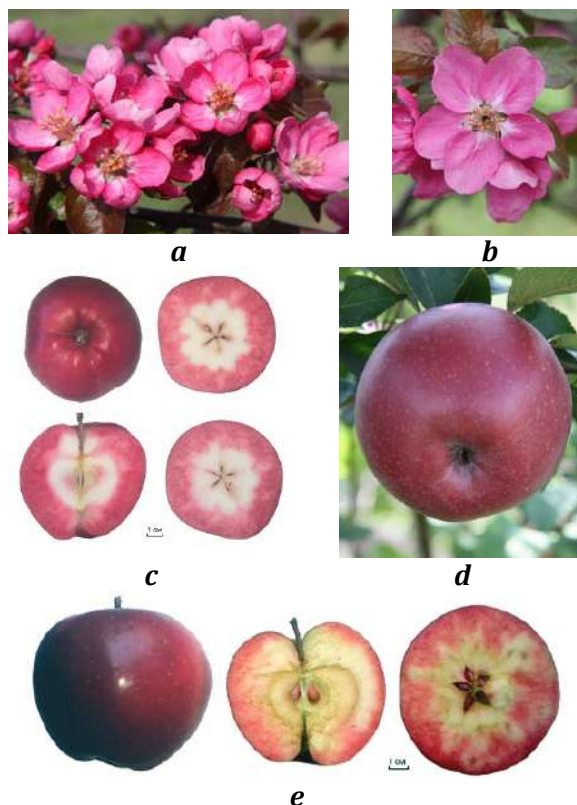


Figure 142. *Malus domestica* 'Jürgen' a) flowers, b) flower, c) top view of the fruit and longitudinal and transverse fruit sections, d) fruit, e) fruit shape, longitudinal and transverse fruit sections

Malus domestica 'Krasnyj Shtandart'

National catalog number: UN0110207

Collection number: 03805

Botanical name in Latin: *Malus domestica* (Suckow) Borkh. Niedzwetzkyana Group

Botanical name in English: Apple tree, or orchard apple

Botanical name in Ukrainian: Yablunia domashnia

Crop name in Ukrainian: Chervonomiakushna yablunia

Accession name: 'Krasnyj Shtandart' (means "red flag", "red standard")

Date of introduction: 09.08.2012

Donor: Pavlovsk Experimental Station of the VIR - N. I. Vavilov Research Institute of Plant Industry, Pavlovsk, Leningrad Region, Russia

Breeder: Ivan Michurin

Origin: The hybrid formula of this artificial cross is *M. domestica* 'Pepin Shafrannyj' × 'Rubinovoe'

Time of flowering: May

Time of fruit ripening: September

Value: Source of anthocyanin coloration of the pulp

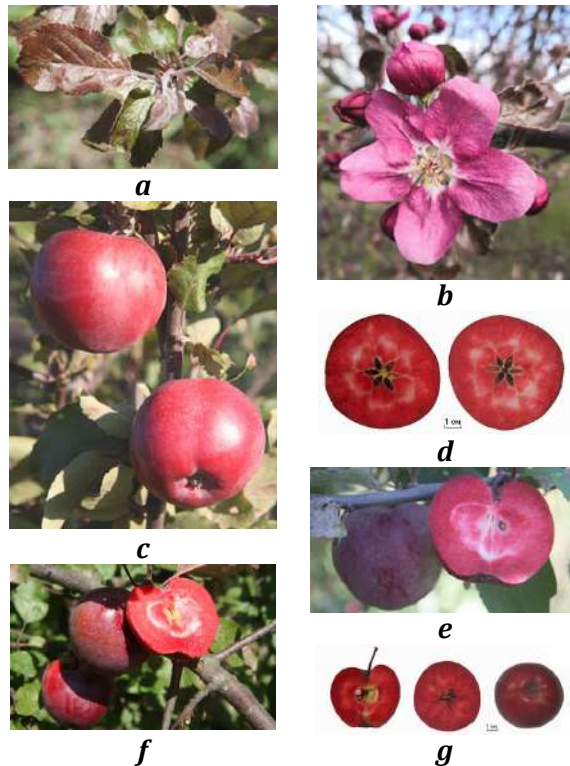


Figure 143. *Malus domestica* 'Krasnyj Shtandart' a) a young shoot with leaves, b) main flower of the inflorescence, c) fruit, d) transverse fruit sections, e) fruit on the branches, including longitudinal fruit section, f) fruit on the branches, including longitudinal fruit section, g) longitudinal and transverse fruit sections and top view

Malus domestica 'Marisa'

National catalog number: UN0110213

Collection number: 04448

Botanical name in Latin: *Malus domestica* (Suckow) Borkh. Niedzwetzkyana Group

Botanical name in English: Apple tree, or orchard apple

Botanical name in Ukrainian: Yablunia domashnia

Crop name in Ukrainian: Chervonomiakushna yablunia

Accession name: 'Marisa' ('Tickled Pink')

Date of introduction: 27.08.2015

Donor: Julian Geyer, Graz, Austria

Breeder: Michael Neumüller; Bavarian Fruit Center in Hallbergmoos

Origin: The hybrid formula of this artificial cross is *M. domestica* 'Weirouge' × 'Kreuzung' (Bred clone 166). Registered under the trademark Baya®

Time of flowering: May

Time of fruit ripening: September

Value: Source of anthocyanin coloration of the flesh and good flavor

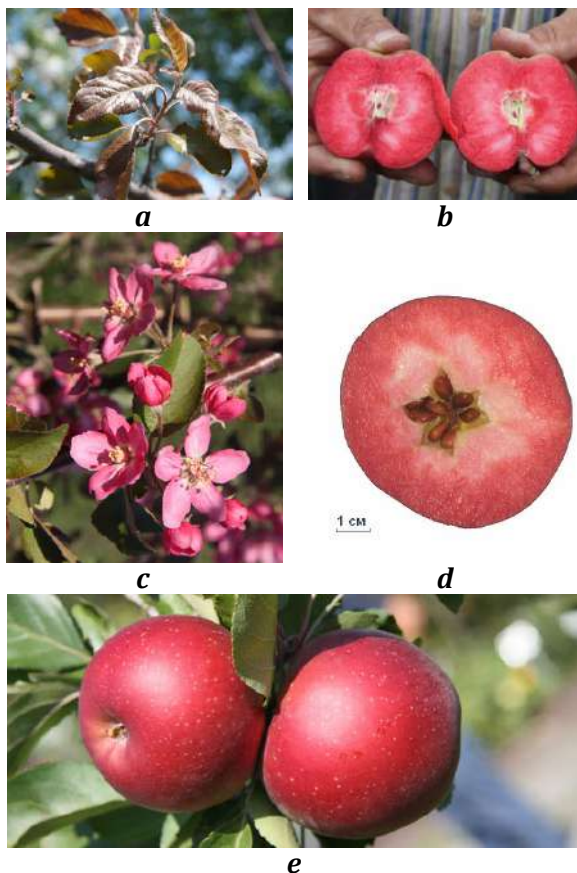


Figure 144. *Malus domestica* 'Marisa' a) young shoot with leaves, b) longitudinal fruit section, c) flowers, d) transverse fruit section, e) fruit

Malus domestica 'Maypole'

National catalog number: UN0110190

Collection number: 03175

Botanical name in Latin: *Malus domestica* (Suckow) Borkh. Niedzwetzkyana Group

Botanical name in English: Apple tree, or orchard apple

Botanical name in Ukrainian: Yablunia domashnia

Crop name in Ukrainian: Chervonomiakushna yablunia

Accession name: 'Maypole'

Date of introduction: 01.08.2010

Donor: All-Russian Research Institute of Fruit Crops Breeding, Orel, Russia

Breeder: Kenneth Richard Tobutt; East Malling Research Station, UK

Origin: The hybrid formula of this artificial cross is 'Wijik' × 'Baskatong'

Time of flowering: May

Time of fruit ripening: August to September

Value: Source of anthocyanin coloration of the pulp and columnar crown

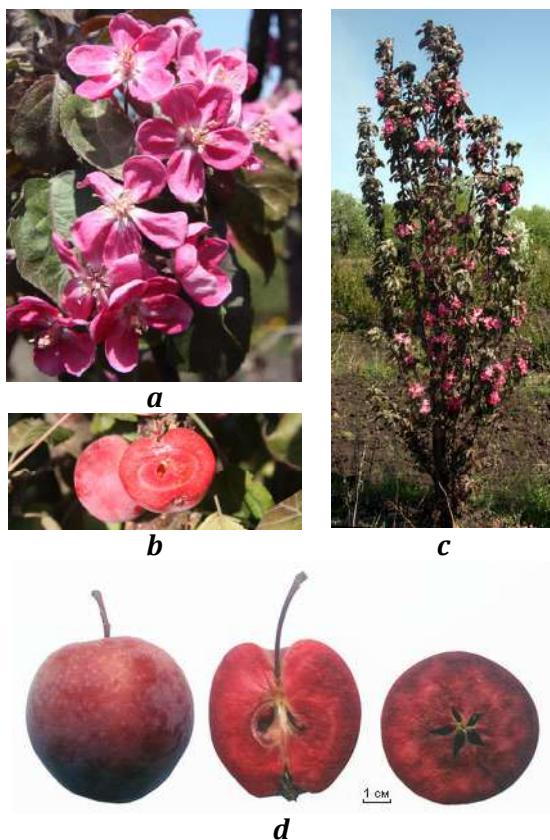


Figure 145. *Malus domestica* 'Maypole' a) flowers, b) fruit on the branch, longitudinal fruit section, c) flowering tree, d) fruit shape, longitudinal and transverse fruit sections

Malus domestica 'Müntzer'

National catalog number: UN0110195

Collection number: 03511

Botanical name in Latin: *Malus domestica* (Suckow) Borkh. Niedzwetzkyana Group

Botanical name in English: Apple tree, or orchard apple

Botanical name in Ukrainian: Yablunia domashnia

Crop name in Ukrainian: Chervonomiakushna yablunia

Accession name: 'Müntzer'

Date of introduction: 05.04.2012

Donor: Jürgen Reckin, Schorfheide, Brandenburg, Germany

Breeder: -

Origin: -

Time of flowering: May

Time of fruit ripening: September

Value: Source of anthocyanin coloration of the pulp

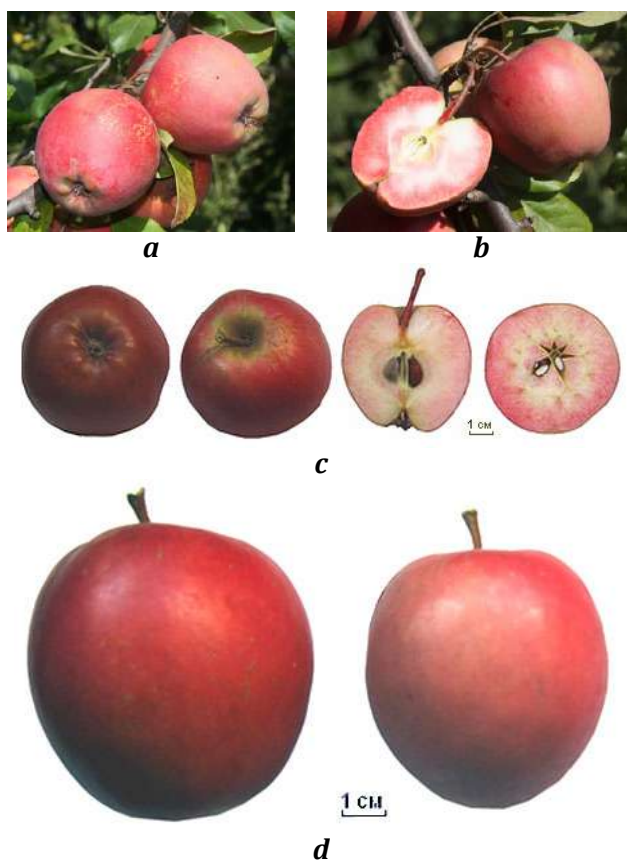


Figure 146. *Malus domestica* 'Müntzer' a) fruit on the branch, b) fruits on the branch with longitudinal fruit section, c) top and bottom views, longitudinal and transverse fruit sections, d) fruit shape

Malus domestica 'Pink Pearl'

National catalog number: UN0110177

Collection number: 03034

Botanical name in Latin: *Malus domestica* (Suckow) Borkh.

Botanical name in English: Apple tree, or orchard apple

Botanical name in Ukrainian: Yablunia domashnia

Crop name in Ukrainian: Chervonomiakushna yablunia

Accession name: 'Pink Pearl'

Date of introduction: 25.03.2009

Donor: Jürgen Reckin, Schorfheide, Brandenburg, Germany

Breeder: Albert Etter; California, USA

Origin: Seedling of 'Surprise'

Time of flowering: May

Time of fruit ripening: September

Value: Source of anthocyanin coloration of the pulp

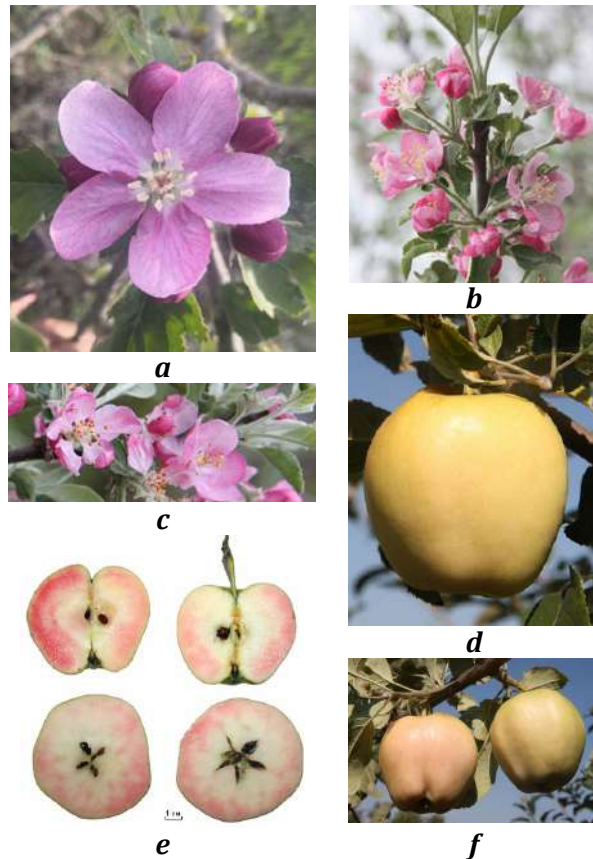


Figure 147. *Malus domestica* 'Pink Pearl' a) flower, b) flowers, c) flowers, d) fruit, e) longitudinal and transverse fruit sections, f) fruit on the branch

Malus domestica 'Sirena'

National catalog number: UN0110194

Collection number: 03505

Botanical name in Latin: *Malus domestica* (Suckow) Borkh. Niedzwetzkyana Group

Botanical name in English: Apple tree, or orchard apple

Botanical name in Ukrainian: Yablunia domashnia

Crop name in Ukrainian: Chervonomiakushna yablunia

Accession name: 'Sirena'

Date of introduction: 20.03.2012

Donor: Vladimiro Rokko, Stanghella, Italy

Breeder: Markus Kobelt; Lubera nursery, Buchs, Switzerland

Origin: The hybrid formula of this artificial cross is *M. domestica* × *M. sieversii* (Ledeb.) M.Roem. f. *niedzwetzkyana* (Dieck) Langenf.

Flowering time: Belongs to the group of varieties registered under the trademark RedLove®

Time of flowering: May

Time of fruit ripening: September

Value: Source of anthocyanin coloration of the pulp

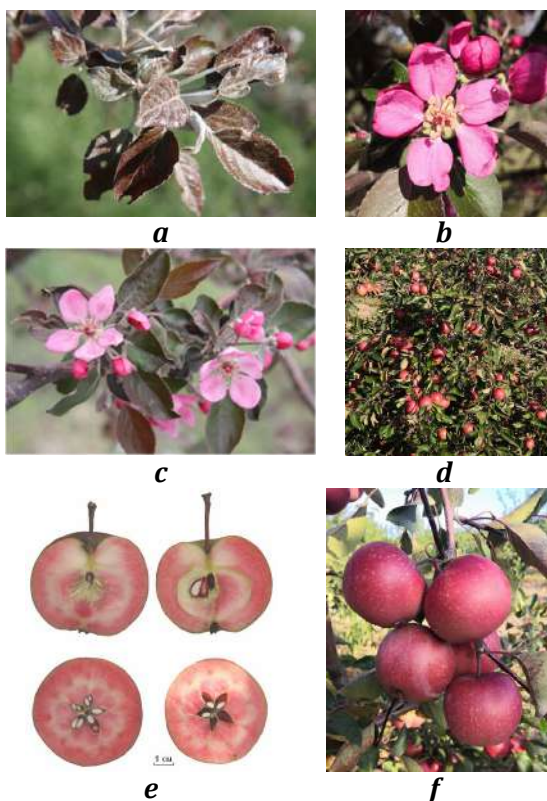


Figure 148. *Malus domestica* 'Sirena' a) young shoot with leaves, b) flower, c) flowers, d) fruiting tree, e) longitudinal and transverse fruit sections, f) fruit

Malus domestica '21-49'

National catalog number: UN0110208

Collection number: 03971

Botanical name in Latin: *Malus domestica* (Suckow) Borkh. Niedzwetzkyana Group

Botanical name in English: Apple tree, or orchard apple

Botanical name in Ukrainian: Yablunia domashnia

Crop name in Ukrainian: Chervonomiakushna yablunia

Accession name: '21-49'

Date of introduction: 15.04.2014

Donor: Institute of Horticulture of the National Academy of Sciences of Ukraine, Kyiv, Ukraine

Breeders: -

Origin: Progeny of *M. sieversii* (Ledeb.) M.Roem. f. *niedzwetzkyana* (Dieck) Langenf. obtained from Germany

Time of flowering: May

Time of fruit ripening: September

Value: Source of anthocyanin coloration of the pulp

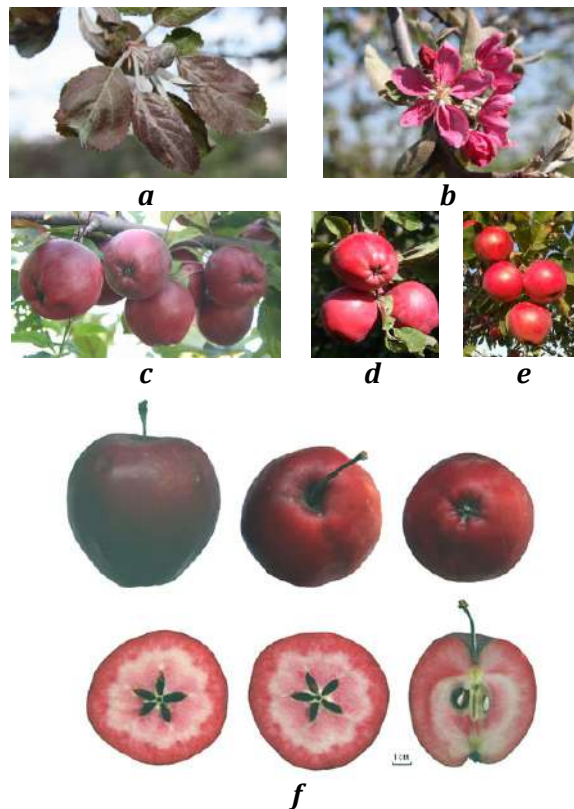


Figure 149. *Malus domestica* '21-49' a) young shoot with leaves, b) flowers, c) fruit on the branch, d) fruit on the branch, e) fruit on the branch, f) fruit shape, top and bottom views, transverse and longitudinal fruit sections

Malus domestica '62-396'

National catalog number: UN101982

Collection number: 02530

Botanical name in Latin: *Malus domestica* (Suckow) Borkh. Niedzwetzkyana Group

Botanical name in English: Apple tree, or orchard apple

Botanical name in Ukrainian: Yablunia domashnia

Crop name in Ukrainian: Chervonomiakushna yablunia

Accession name: '62-396'

Date of introduction: 18.08.2003

Donor: The I.V. Michurin All-Russian Research Institute of Horticulture, Michurinsk, Tambov Region, Russia

Breeders: Valentin Budagovskij, Vladimir Korovin, and Viktor Potapov

Origin: The hybrid formula of this artificial cross is No. 13-14 (= 'M8' × 'Tayozhnoe') × 'PB9' (= 'M8' × 'Krasnyi Shtandart')

Time of flowering: May

Time of fruit ripening: September

Value: The variety was included in the State Register of Breeding Achievements of the Russian Federation in 1996 as a clonal dwarf rootstock. Source of anthocyanin color of the flesh

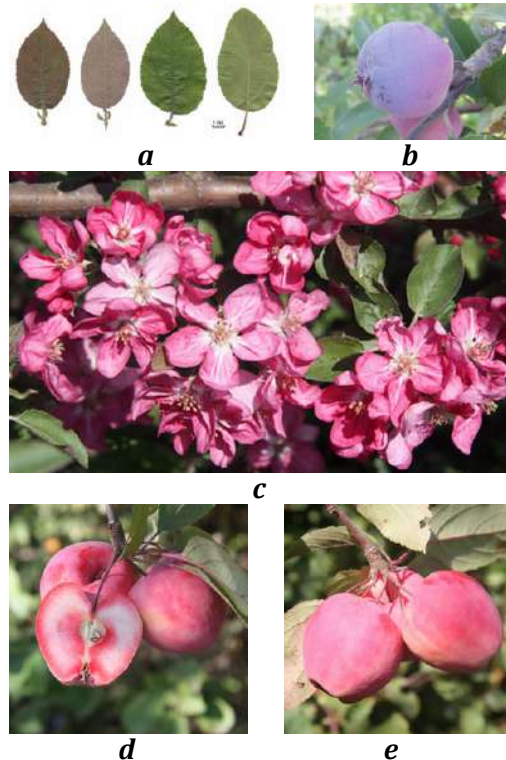


Figure 150. *Malus domestica* '62-396' a) leaves, b) fruit, c) flowers, d) fruit on the branch, longitudinal fruit section, e) fruit on the branch

ROSACEAE – MALUS

ROSE FAMILY – APPLE

RED FLOWERING APPLE

Malus sieversii f. *niedzwetzkyana* is the ancestor of most apple varieties with red and pink petals. It was involved in the formation of *M. ×gloriosa*, *M. ×moerlandsii*, *M. ×purpurea*, and some varieties of *M. domestica*. There are also other pink-flowered species, in particular *M. halliana*. The genealogy of red- and pink-flowered cultivars includes a wide range of species (Boer, 1959; Wyman, 1959; Roberts and Blaney, 1963; Krüssmann, 1977; Langenfeld, 1991; Fiala, 1994; Flint, 1997; Nocker et al., 2012; Rong et al., 2022). Many ornamental varieties have been developed and breeding work in this direction continues (Krüssmann, 1977; Fiala, 1994; Zakotenko, 2007; Guo et al., 2017; Li et al., 2021). There are ornamental varieties of this group in Ukraine (Lypa, 1952; Mezhenskyj, 2008; Honcharovska, 2016; Mezhenskyj and Mezhenska, 2021). The fruits of ornamental apple trees contain substances of nutritional value and can be used for processing (Yaremenko, 1959; Petrova, 1986).

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Malus domestica 'Velykokvitkova'

National catalog number: UN0110205

Collection number: 03692

Botanical name Latin: *Malus domestica* (Suckow) Borkh. Niedzwetzkyana Group

Botanical name in English: Apple tree, or orchard apple

Botanical name in Ukrainian: Yablunia domashnia

Crop name in Ukrainian: Chervonokvitkova yablunia

Accession name: 'Velykokvitkova' (means "large-flowered")

Date of introduction: 09.08.2012

Donor: Scientific and Production Centre "Agrobiotechnology", Pushkin, Leningrad Region, Russia

Breeder: Volodymyr Mezhenkyj (introducer)

Origin: -

Time of flowering: May

Time of fruit ripening: August to September

Value: Source of anthocyanin coloration and large flower size



a



b



c



d

Figure 151. *Malus domestica* 'Velykokvitkova' a) flowers on the branch, b) flower and flower buds, c) flower and flower buds, d) flowers

Malus ×gloriosa 'Chorna Perlyna'

National catalog number: UN0110192

Collection number: 03375

Botanical name in Latin: *Malus ×gloriosa* Lemoine

Botanical name in English: Gloriosa crab

Botanical name in Ukrainian: Yablunia slavna

Crop name in Ukrainian: Chervonokvitkova yablunia

Accession name: 'Chorna Perlyna' (means "black pearl")

Date of introduction: 22.08.2011

Donor: Donetsk Botanical Garden of the National Academy of Sciences of Ukraine, Donetsk, Ukraine

Breeders: Oleksandr Hlukhov, Nadiia Kravchenko, and Svitlana Zakotenko

Origin: Seedling of *M. ×gloriosa* 'Oekonomierat Echtermeyer' from free pollination. *M. ×gloriosa* originated from an artificial complex crossing *M. sieversii* (Ledeb.) M.Roem. f. *niedzwetzkyana* (Dieck) Langenf. × *M. ×scheideckeri* Späth ex Zabel [= *M. ×floribunda* Siebold ex Van Houtte (= *M. baccata* (L.) Borkh. × *M. toringo* (Siebold) de Vriese) × *M. prunifolia* (Willd.) Borkh.]

Time of flowering: May

Time of fruit ripening: August to September

Value: The variety was included in the State Register of Plant Varieties of Ukraine in 2001. Source of anthocyanin color of leaves and flowers

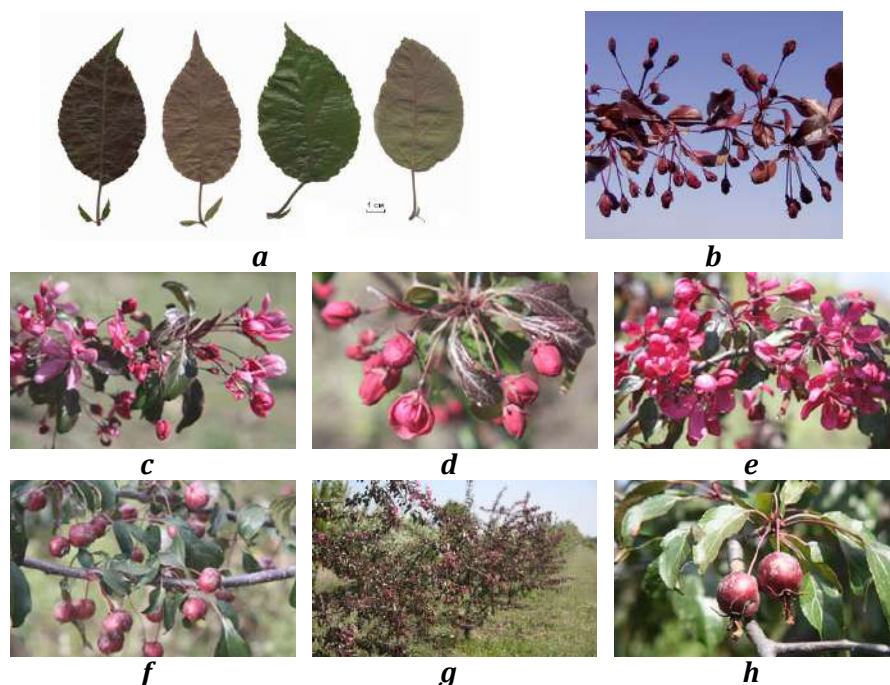


Figure 152. *Malus ×gloriosa* 'Chorna Perlyna' a) young leaves, b) branch with flower buds, c) branch with flowers, d) flower buds, e) branch with flowers, f) fruit on the branch, g) flowering trees, h) fruit

Malus halliana No. 03603

National catalog number: UN0110201

Collection number: 03603

Botanical name in Latin: *Malus halliana* Koehne

Botanical name in English: Hall crab

Botanical name in Ukrainian: Yablunia Hollova

Crop name in Ukrainian: Chervonokvitkova yablunia

Accession name: -

Date of introduction: 07.08.2012

Donor: Otradnoe Research Station of V. L. Komarov Botanical Institute of the Russian Academy of Sciences, Otradnoe, Leningrad Region, Russia

Breeder: -

Origin: -

Time of flowering: May

Time of fruit ripening: August to September

Value: Source of anthocyanin coloration of flowers

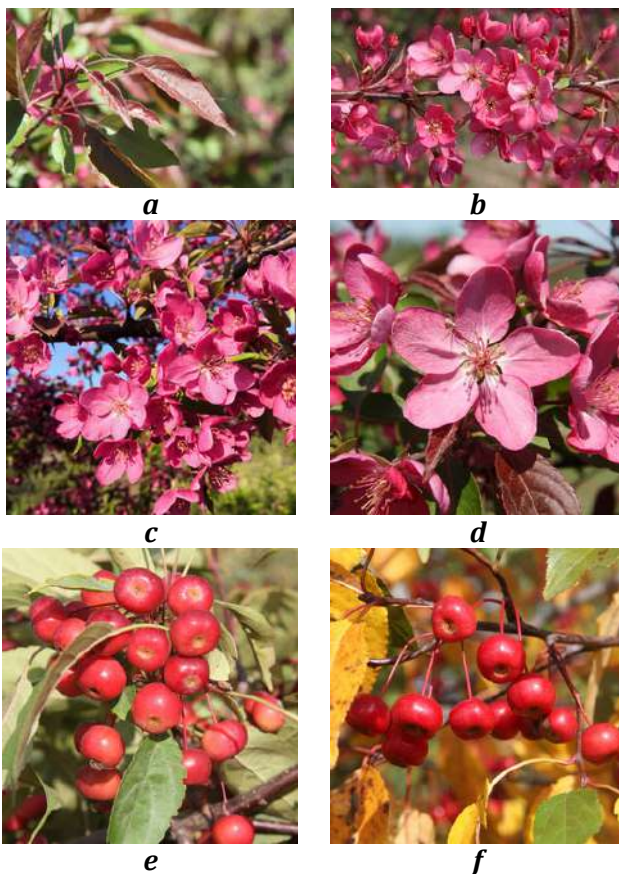


Figure 153. *Malus halliana* No. 03603 a) young leaves, b) flowers on the branch, c) flowers on the branches, d) flowers, e) fruit on the branch, f) fruit on the branch

Malus halliana No. 03656

National catalog number: UN0110202

Collection number: 03656

Botanical name in Latin: *Malus halliana* Koehne

Botanical name in English: Hall crab

Botanical name in Ukrainian: Yablunia Hollova

Crop name in Ukrainian: Chervonokvitkova yablunia

Accession name: -

Date of introduction: 08.08.2012

Donor: Botanical Garden of Peter the Great of the V. L. Komarov Botanical Institute of the Russian Academy of Sciences, St. Petersburg, Russia

Breeder: -

Origin: Reproduction from seeds obtained from the Otradnoe Research Station of the V. L. Komarov Botanical Institute

Time of flowering: May

Time of fruit ripening: August to September

Value: Source of anthocyanin coloration of flowers

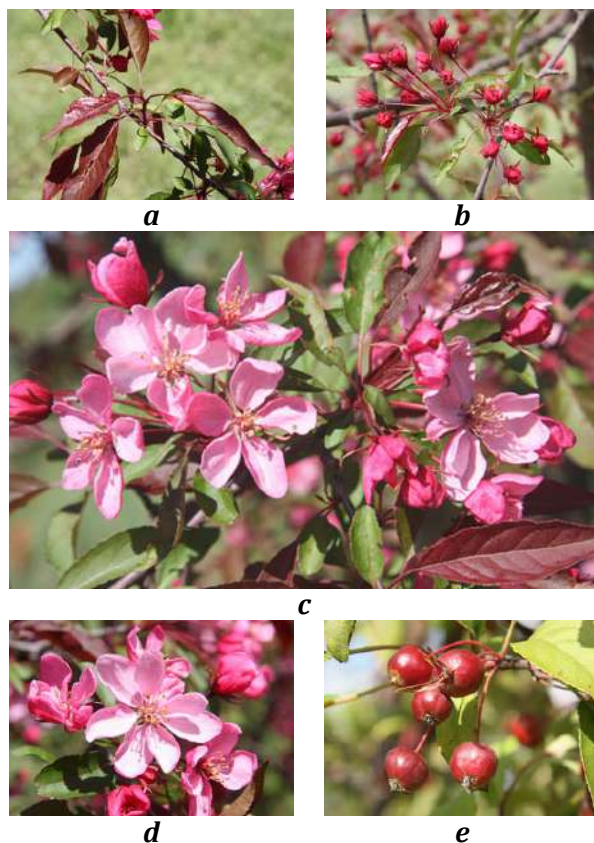


Figure 154. *Malus halliana* No. 03656 a) shoot with young leaves, b) flower buds, c) flowers on the branch, d) flowers, e) fruit on the branch

Malus ×purpurea 'Aldenhamensis'

National catalog number: UN0102242

Collection number: 02427

Botanical name in Latin: *Malus ×purpurea* (Barbier et Cie) Rehder

Botanical name in English: Purple crab

Botanical name in Ukrainian: Yablunia purpurova

Crop name in Ukrainian: Chervonokvitkova yablunia

Accession name: 'Aldenhamensis' (named for toponym, a settlement in Hertfordshire, England)

Date of introduction: 07.02.2003

Donor: Nikita Botanical Garden, Nikita, Crimea, Crimea

Breeder: Vicary Gibbs

Origin: Found as an accidental seedling in a garden in Elstree, Hertfordshire, UK. A hybrid *M. ×atrosanguinea* (Späth) C.K.Schneid. × *M. sieversii* (Ledeb.) M.Roem. f. *niedzwetzkyana* (Dieck) Langenf.

Time of flowering: May

Time of fruit ripening: August to September

Value: Source of anthocyanin coloration of leaves and flowers

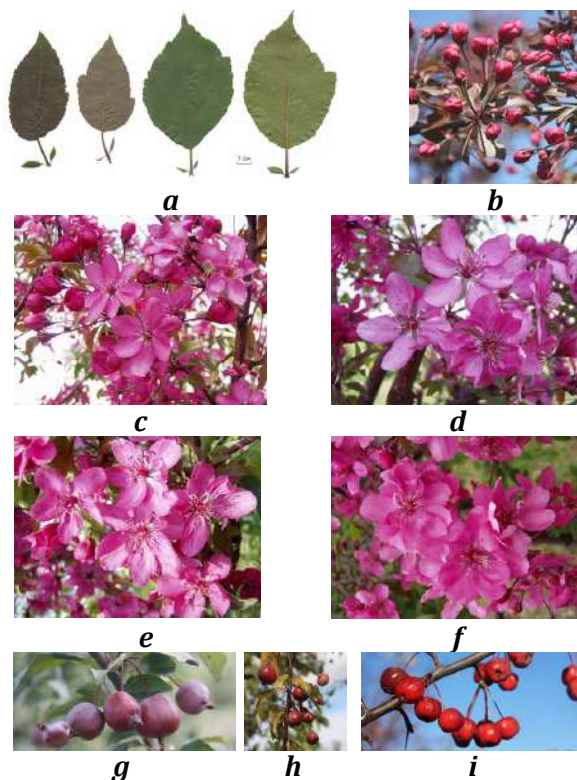


Figure 155. *Malus ×purpurea* 'Aldenhamensis' a) leaves, b) flower buds, c) flowers, d) flowers, e) flowers, f) flowers, g) fruit on the branch, h) fruit on the branch, i) fruit on the branch

Malus ×purpurea No. 03540

National catalog number: UN0110197

Collection number: 03540

Botanical name in Latin: *Malus ×purpurea* (Barbier et Cie) Rehder

Botanical name in English: Purple crab

Botanical name in Ukrainian: Yablunia purpurova

Crop name in Ukrainian: Chervonokvitkova yablunia

Accession name: -

Date of introduction: 24.06.2012

Donor: Central Botanical Garden of the Academy of Sciences of Belarus, Minsk, Belarus

Breeder: -

Origin: *M. ×purpurea* has a complex origin: [*M. ×atrosanguinea* (Späth) C.K.Schneid. × *M. halliana* Koehne] × *M. sieversii* (Ledeb.) M.Roem. f. *niedzwetzkyana* (Dieck) Langenf.

Time of flowering: May

Time of fruit ripening: August to September

Value: Source of anthocyanin coloration of flowers



a



b



c



d

Figure 156. *Malus ×purpurea* No. 03540 *a*) branch with flower buds, *b*) flowering tree, *c*) flowers on the branch, *d*) fruit on the branch

Malus sp. 'Makamik'

National catalog number: UN0102223

Collection number: 02332

Botanical name in Latin: *Malus domestica* Niedzwetzkyana Group

Botanical name in English: Apple tree, or Crabapple

Botanical name in Ukrainian: Yablunia

Crop name in Ukrainian: Chervonokvitkova yablunia

Accession name: 'Makamik' (named for Macamic Lake in Canada)

Date of introduction: 13.07.2002

Donor: Donetsk Botanical Garden of the National Academy of Sciences of Ukraine, Donetsk, Ukraine

Breeder: Isabelle Preston; Central Research Farm in Ottawa, Canada

Origin: Developed from free pollination of *M. sieversii* (Ledeb.) M.Roem. f. *niedzwetzkyana* (Dieck) Langenf. probably *M. baccata* (L.) Borkh. Representative of the Rosybloom series of varieties (Canadian Lake crab apples)

Time of flowering: May

Time of fruit ripening: August to September

Value: Source of anthocyanin coloration of flowers and pulp

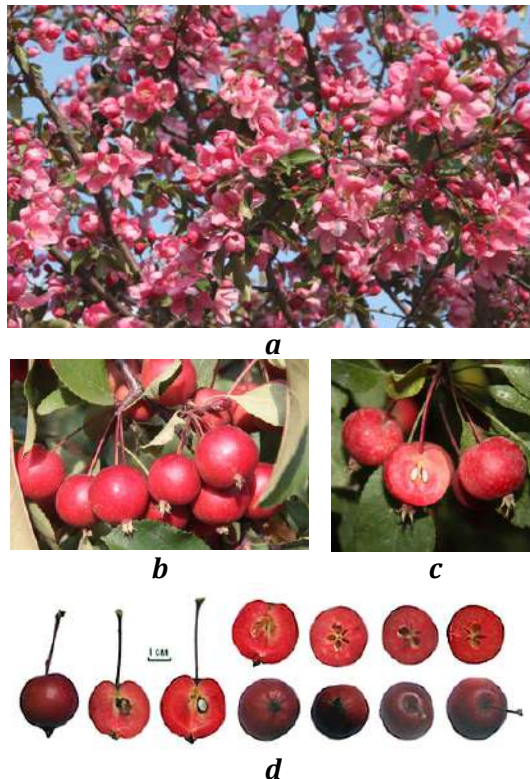


Figure 157. *Malus* sp. 'Makamik' a) flowering branches, b) fruit on the branch, c) fruit on the branch, longitudinal fruit section, d) fruit shape, top and bottom views, longitudinal and transverse fruit sections

Malus sp. 'Oksana'

National catalog number: UN0110214

Collection number: 04758

Botanical name in Latin: *Malus* Niedzwetzkyana Group

Botanical name in English: Apple tree, or Crab apple

Botanical name in Ukrainian: Yablunia

Crop name in Ukrainian: Chervonokvitkova yablunia

Accession name: 'Oksana' ('18-293') (female name; named after Oksana Tonkha, the dean of the agrobiological faculty of National University of Life and Environmental Sciences of Ukraine)

Date of introduction: 01.08.2019

Donor: National University of Life and Environmental Sciences of Ukraine, Kyiv, Ukraine

Breeders: Volodymyr Mezhenskyj and Liudmyla Mezhenska

Origin: Seedling of *M. prunifolia* (Willd.) Borkh. 'Stepashka' from free pollination, male parent probably is *M. ×gloriosa* Lemoine

Time of flowering: May

Time of fruit ripening: August to September

Value: The variety was included in the State Register of Plant Varieties of Ukraine in 2022. Source of anthocyanin color of flowers

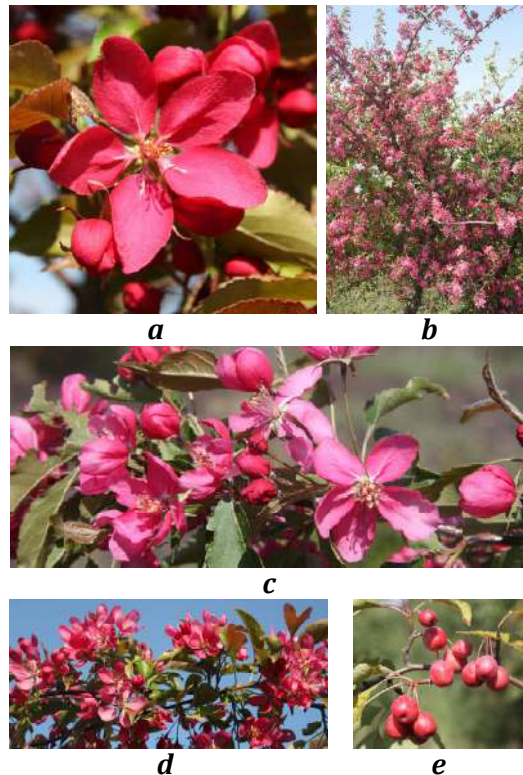


Figure 158. *Malus* sp. 'Oksana' a) flower, b) flowering tree, c) flowers on the branch, d) flowering branch

Malus sp. 'Pionerka'

National catalog number: UN0110204

Collection number: 03691

Botanical name: *M. sieversii* f. *niedzwetzkyana*

Botanical name in English: Apple tree, or Crabapple

Botanical name in Ukrainian: Yablunia

Crop name in Ukrainian: Chervonokvitkova yablunia

Accession name: 'Pionerka' (means "pioneer", *female*)

Date of introduction: 09.08.2012

Donor: Scientific and Production Centre "Agrobiotechnology", Pushkin, Leningrad Region, Russia

Breeder: Developed at the Pavlovsk Experimental Station of the VIR - N. I. Vavilov Research Institute of Plant Industry, Pavlovsk, Leningrad Region, Russia

Origin: Hybrid of *M. sieversii* (Ledeb.) M. Roem. f. *niedzwetzkyana* (Dieck) Langenf.

Time of flowering: May

Time of fruit ripening: August to September

Value: Source of anthocyanin coloration of flowers and pulp

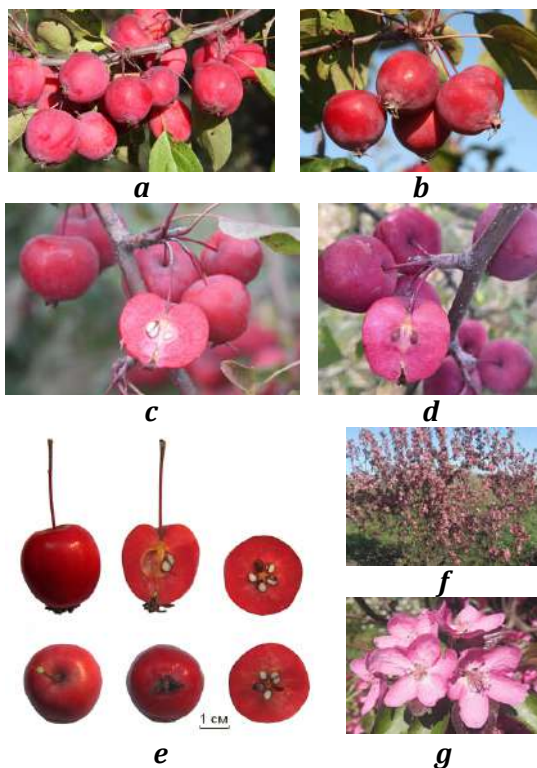


Figure 159. *Malus* sp. 'Pionerka' a) fruit on the branch, b) fruit on the branch, c) fruit on the branch, longitudinal fruit section, d) fruit on the branch, longitudinal fruit section e) fruit shape, bottom and top views, longitudinal and transverse fruit sections, f) flowering tree, g) flowers

Malus sp. 'Royalty'

National catalog number: UN0110174

Collection number: 02774

Botanical name in Latin: *Malus domestica* Niedzwetzkyana Group

Botanical name in English: Apple tree, or Crabapple

Botanical name in Ukrainian: Yablunia

Crop name in Ukrainian: Chervonokvitkova yablunia

Accession name: 'Royalty' ('Sutherland No. 2')

Date of introduction: 28.02.2007

Donor: "Rostock" Farm, Volokonovka, Belgorod Region, Russia

Breeder: William Leslie Kerr; Sutherland Forest Research Station, Saskatchewan, Canada

Origin: A representative of the Rosybloom series of varieties; a complex hybrid with the participation of *M. baccata* (L.) Borkh. × *M. sieversii* (Ledeb.) M.Roem. f. *niedzwetzkyana* (Dieck) Langenf.

Time of flowering: May

Time of fruit ripening: August to September

Value: Source of anthocyanin coloration of leaves and flowers



Figure 160. *Malus* sp. 'Royalty' a) young leaves and flower buds, b) flowers, c) flowers, d) flowering tree, e) fruit, f) fruit, g) fruit

Malus sp. No. 03157

National catalog number: UN0110189

Collection number: 03157

Botanical name in Latin: *Malus Niedzwetzkyana* Group

Botanical name in English: Apple tree, or Crab apple

Botanical name in Ukrainian: Yablunia

Crop name in Ukrainian: Chervonokvitkova yablunia

Accession name: -

Date of introduction: 01.08.2010

Donor: All-Russian Research Institute of Fruit Crops Breeding, Orel, Russia

Breeder: Volodymyr Mezhenkyi (introducer)

Origin: This small-fruited specimen obtained under the name 'Pionerka', is not similar to the larger-fruited specimen of the red-fleshed apple cultivar 'Pionerka'

Time of flowering: May

Time of fruit ripening: August to September

Value: Source of anthocyanin coloration of flowers

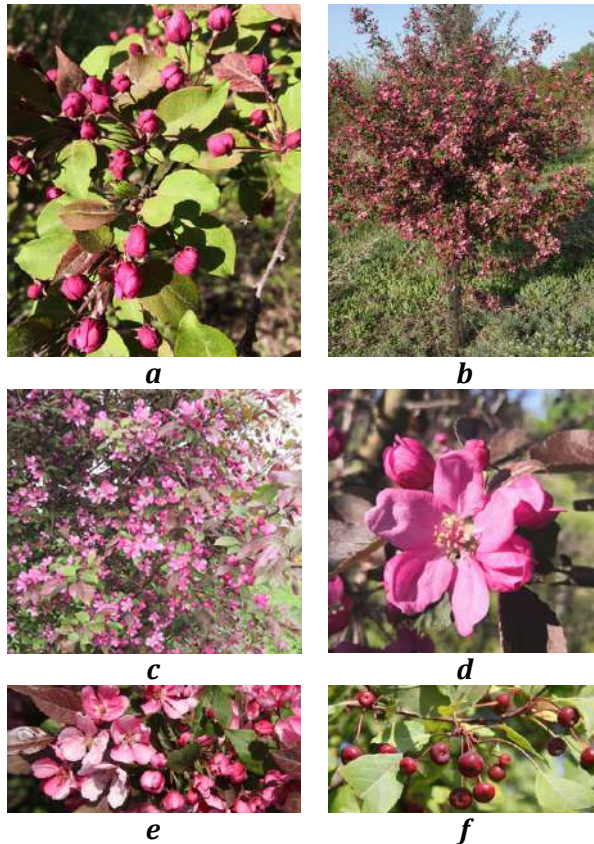


Figure 161. *Malus* sp. No. 03157 a) flower buds, b) flowering tree, c) flowering branches, d) flower, e) flowers, f) fruit on the branch

Malus sp. No. 03305

National catalog number: UN0110191

Collection number: 03305

Botanical name in Latin: *Malus Niedzwetzkyana* Group

Botanical name in English: Apple tree, or Crabapple

Botanical name in Ukrainian: Yablunia

Crop name in Ukrainian: Chervonokvitkova yablunia

Accession name: -

Date of introduction: 16.07.2011

Donor: I. V. Michurin Main Nursery, Michurinsk, Tambov Region, Russia

Breeder: -

Origin: -

Time of flowering: May

Time of fruit ripening: August to September

Value: Source of anthocyanin coloration of flowers

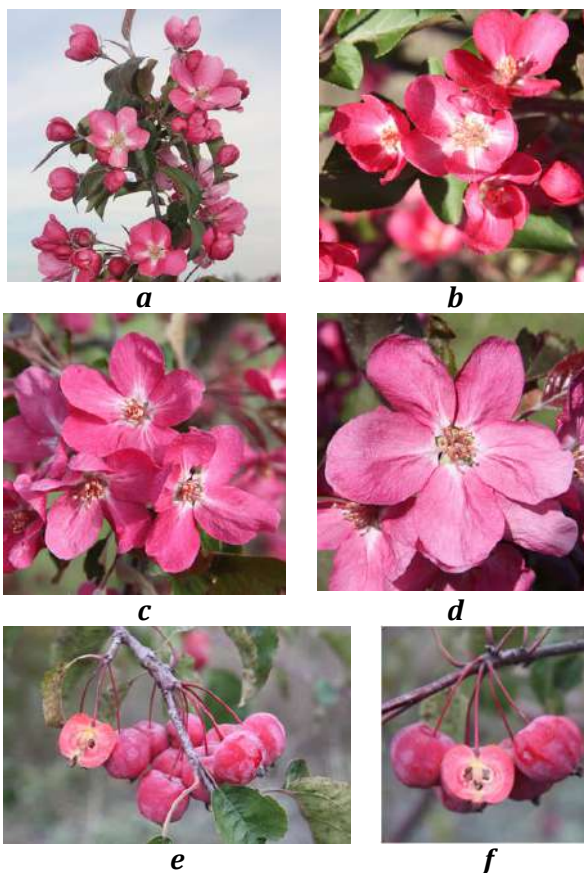


Figure 162. *Malus* sp. No. 03305 a) flowers on the branch, b) flowers, c) flowers, d) flower, e) fruit on the branch, longitudinal fruit section, f) fruit on the branch, longitudinal fruit section

ROSACEAE – MALUS

ROSE FAMILY – APPLE

WEeping APPLE TREE

According to the UPOV methodology (UPOV, 2003; Tkachyk, 2016), ornamental apple varieties are divided into columnar, cone-shaped, straight, spreading, drooping, and weeping habit. A typical representative of varieties with a drooping habit is 'Elise Rathke', and 'Oekonomierat Echtermeyer' with a weeping habit. 'Elise Rathke' has a branching angle of 70°-90°, and the 'Oekonomierat Echtermeyer' has one >90° (Rong et al., 2022). Therefore, 'Elise Rathke' and its descendants with a similar crown type should not be called weeping. The trait of weeping crown type is recessive in comparison with upright trees. Most likely, it is regulated by major genes as well as polygenes (Rong et al., 2022).

The original forms of weeping crown varieties are mutants of *Malus baccata* 'Pendula' and *Malus prunifolia* 'Pendula'. Subsequently, they gave rise to some diverse cultivars that have become widespread in Europe and North America (Jefferson, 1970; Krüssmann, 1977; Kolesnikov, 1974; Fiala, 1994; Kotov, 1997; Lindén and Iwarsson, 2014; Rong et al., 2022). In Ukraine, varieties of weeping apple are represented in dendrological collections and ornamental plantings; domestic varieties have been created (Kravchenko and Kostyrko, 1975; Glukhov et al., 2000; Klymenko, 2005; Mezhen'skyj, 2008; Opalko et al., 2016).

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Malus baccata 'Gazonnaja'

National catalog number: UN0101983

Collection number: 01723

Botanical name in Latin: *Malus baccata* Pendula Group / Niedzwetzkyana Group

Botanical name in English: Crabapple, or Weeping crab

Botanical name in Ukrainian: Yablunia

Crop name in Ukrainian: Plakuča yablunia

Accession name: 'Gazonnaja' ('Gazonnaya', 'Gazonnaja Zontichaja Krasnolepestichnaja', 'Gazonnaja Zontichaja Krasnolepestichnaya') (means "lawn")

Date of introduction: 21.04.1999

Donor: Sverdlovsk Experimental Station of Horticulture, Sverdlovsk, Russia

Breeder: Leonid Kotov

Origin: *M. baccata* (L.) Borkh. × *M. ×gloriosa* 'Oekonomierat Echtermeyer'

Time of flowering: May

Time of fruit ripening: September

Value: The variety was included in the State Register of Breeding Achievements of the Russian Federation in 1998.

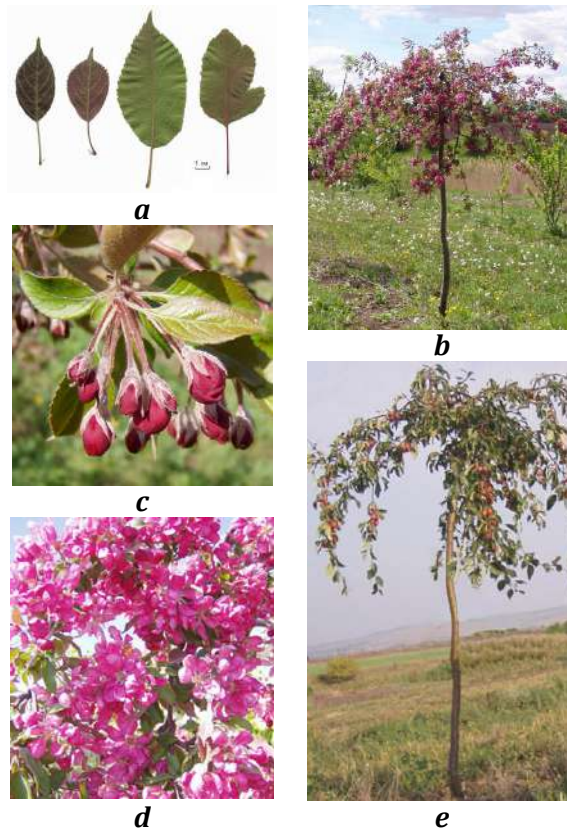


Figure 163. *Malus baccata* 'Gazonnaja' a) leaves, b) flowering tree with a tall stem, c) flower buds, d) flowers, e) tree with fruit

Malus baccata 'Pendula'

National catalog number: UN01011945

Collection number: 02774

Botanical name in Latin: *Malus baccata* (L.) Borkh. Pendula Group

Botanical name in English: Siberian crab

Botanical name in Ukrainian: Yablunia yahidna

Crop name in Ukrainian: Plakucha yabkunia

Accession name: 'Pendula'

Date of introduction: 28.02.2007

Donor: Fomin Botanical Garden of Taras Shevchenko National University of Kyiv, Ukraine

Breeder: -

Origin: Progeny of an ancient variety with a weeping habit

Time of flowering: May

Time of fruit ripening: September

The value of the specimen: Source of the weeping habit

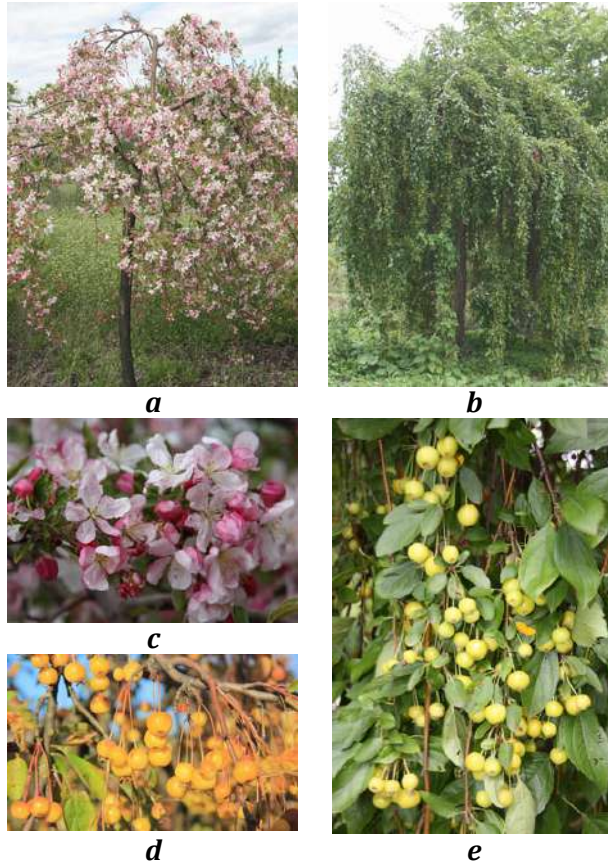


Figure 164. *Malus baccata* 'Pendula' a) flowering tree, b) tree with fruits in summer, c) flowers, d) fruit, e) fruit on the branches

Malus baccata 'Umbraculifera Rubrifolia'

National catalog number: UN0110203

Collection number: 03657

Botanical name in Latin: *Malus baccata* Pendula Group / Niedzwetzkyana Group

Botanical name in English: Crabapple, or Weeping crab

Botanical name in Ukrainian: Yablunia

Crop name in Ukrainian: Plakucha yablunia

Accession name: 'Umbraculifera Rubrifolia'

Date of introduction: 08.08.2012

Donor: Botanical Garden of Peter the Great of the V.L.Komarov Botanical Institute of the Russian Academy of Sciences, St. Petersburg, Russia

Breeder: -

Origin: Ancient variety

Time of flowering: May

Time of fruit ripening: September

Value: Source of the weeping habit



a



b



c



d

Figure 165. *Malus baccata* 'Umbraculifera Rubrifolia' *a*) flowering, *b*) trees during fruiting, *c*) flowers, *d*) fruits

Malus baccata 'Vystavkova'

National catalog number: UN0110206

Collection number: 03751

Botanical name in Latin: *Malus baccata* Pendula Group

Botanical name in English: Crab apple

Botanical name in Ukrainian: Yablunia

Crop name in Ukrainian: Weeping apple tree

Accession name: 'Vystavkova' (means "exhibition")

Date of introduction: 24.08.2012

Donor: Exhibition Center (former Exhibition of Achievements of the National Economy), Kyiv, Ukraine

Breeder: Volodymyr Mezhenkyj (introducer)

Origin: A mother tree of unknown origin grows on the territory of the Exhibition Center, which is why it was named 'Vystavkova'

Time of flowering: May

Time of fruit ripening: September

Value: Source of the weeping habit

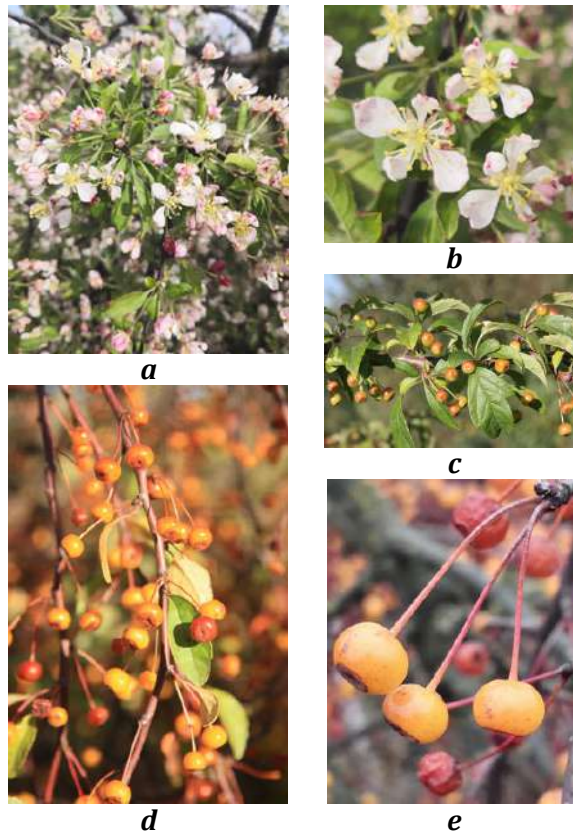


Figure 166. *Malus baccata* 'Vystavkova' a) flowers on the branch, b) flowers, c) branch with leaves and fruit, d) fruit on the branch, e) fruit

Malus ×gloriosa 'Travneva Krasunia'

National catalog number: UN0102238

Collection number: 02333

Botanical name in Latin: *Malus ×gloriosa* Lemoine Pendula Group / Niedzwetzkyana Group

Botanical name in English: Gloriosa crab

Botanical name in Ukrainian: Yablunia slavna

Crop name in Ukrainian: Plakucha yablunia

Accession name: 'Travneva Krasunia' (means "May beauty")

Date of introduction: 13.07.2002

Donor: Donetsk Botanical Garden of the National Academy of Sciences of Ukraine, Donetsk, Ukraine

Breeders: Oleksandr Hlukhov, Nadiia Kravchenko, and Svitlana Zakotenko

Origin: Seedling of *M. ×gloriosa* 'Oekonomierat Echtermeyer' from free pollination

Time of flowering: May

Time of fruit ripening: September

Value: The variety was included in the State Register of Plant Varieties of Ukraine in 2001

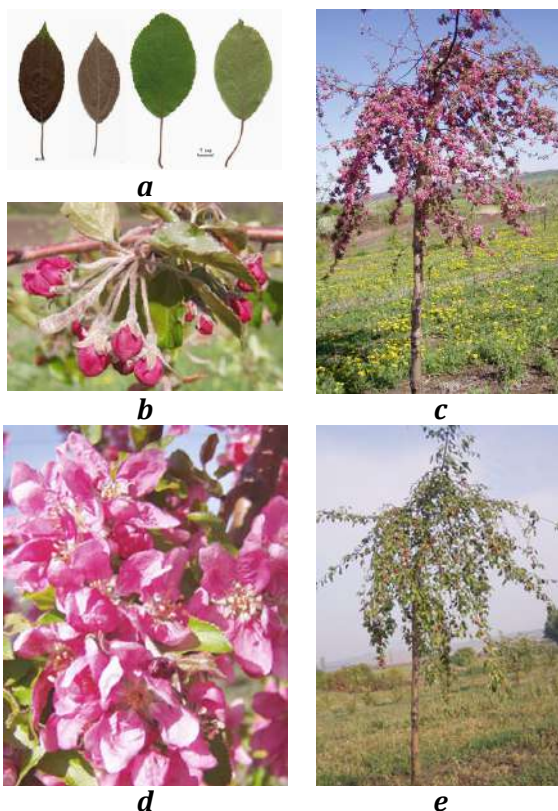


Figure 167. *Malus ×gloriosa* 'Travneva Krasunia' a) leaves, b) flower buds, c) flowering tree with a tall stem, d) flowers, e) tree with fruit

ROSACEAE – MALUS

ROSE FAMILY – APPLE

CHINESE CRAB

Malus prunifolia has long been cultivated in northern China, which is why it is called the Chinese crab, or Chinese crabapple. It originated probably from hybridization between *M. baccata* and *M. sieversii* (Duan et al., 2017). Chinese crab often is named apple trees of any genetic basis with fruits similar in size and quality to apples of *M. prunifolia*. Ukrainian and Russian names for it are “raika/rajka”, “ranetka”, or “kytaika/kitajka” (Mezhenskyj et al., 2012). Subsequent crosses with *M. domestica* and hybrids between them have produced many forms.

Fyodor Likhonos (1983) classifying the cultivated apple tree, established the subspecies *cerasifera*, in which he identified, in particular, the varieties ‘Ranetka Purpurovaja’ and ‘Rajka Krasnaja’; in the subspecies *prunifolia* the variety ‘Kitajka Saninskaja’, and in the subspecies *intermedia* the variety ‘Kitajka Zolotaja Rannaja’, which indicates the extreme variability of this collective group. In the English, wild apple species and their hybrids with each other and with *M. domestica*, which have small fruits, are traditionally called crabapples (Gerard, 1597; Downing, 1849; Hogg, 1851).

As a fruit crop, Chinese crab is widespread not only in regions with harsh natural conditions in Eurasia and North America but also where domestic apple trees are successfully grown. They are used in ornamental and phytomeliorative plantations, as rootstocks and pollinators in industrial apple orchards (Yaremenko, 1959; Simirenko, 1961; Crassweller et al., 1980; Likhonos, 1983; Dubravina et al., 2012; Mezhenskyj et al., 2012; Romer et al., 2003; Rong et al., 2022).

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Malus angustifolia × *M. domestica* 'Virginia Crab'

National catalog number: UN0102013

Collection number: 01745

Botanical name in Latin: *Malus angustifolia* (Aiton) Michx. × *M. domestica* (Suckow) Borkh.

Botanical name in English: Southern crab × orchard apple

Botanical name in Ukrainian: Yablunia vuzkolystkova × yablunia domashnia

Crop name in Ukrainian: Raika, or Yablunia-raika

Accession name: 'Virginia Crab' ('Cider Crab', 'Hewes Crab', 'Hugh's Crab', 'Hughes Crab')

Date of introduction: 21.04.1999

Donor: Bakhmut Experimental Station of Nurseries Cultivation, Bakhmut, Donetsk Region, Ukraine

Breeder: Thomas Jefferson

Origin: A spontaneous hybrid of *M. angustifolia* × *M. domestica*, selected at the Monticello Estate, near Charlottesville, Virginia, USA

Time of flowering: May

Time of fruit ripening: September

Value: Used as rootstock and pollinator; fruits as raw material for cider



a



b



c



d

Figure 168. *Malus angustifolia* × *M. domestica* 'Virginia Crab' a) flowers, b) fruit, c) fruit, d) fruit

Malus coronaria × *M. domestica* 'Kola'

National catalog number: UN0110187

Collection number: 03063

Botanical name in Latin: *Malus coronaria* (L.) Mill. × *M. domestica* (Suckow) Borkh.

Botanical name in English: Sweet crab × orchard apple

Botanical name in Ukrainian: Yablunia vinochkova × yablunia domashnia

Crop name in Ukrainian: Raika, or Yablunia-raka

Accession name: 'Kola'

Date of introduction: 04.07.2009

Donor: Botanical Garden of the Lomonosov Moscow State University, Moscow, Russia

Breeder: Niels Ebbesen Hansen; South Dakota Experiment Station, USA

Origin: Hybrid of *M. coronaria* 'Elk River' × *M. domestica* 'Duchess of Oldenburg'

Time of flowering: May

Time of fruit ripening: September

Value: Tetraploid. Source in breeding for polyploidy and high ascorbic acid content

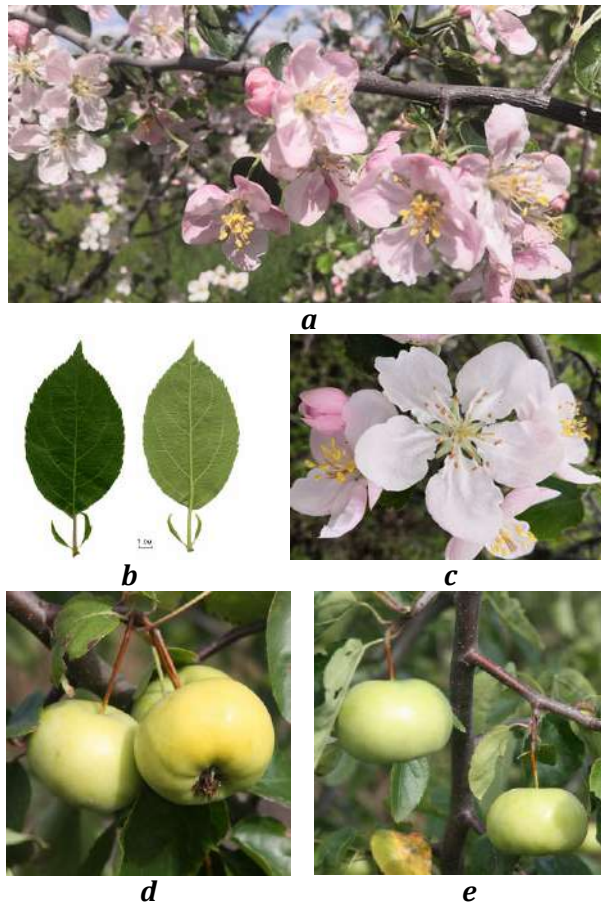


Figure 169. *Malus coronaria* × *M. domestica* 'Kola' a) flowers, b) leaves, c) flowers, d) fruit, e) fruit

Malus ×kaido No. 03539

National catalog number: UN0110196

Collection number: 03539

Botanical name in Latin: *Malus ×kaido* (Wenz.) Pardé (= *M. ×micromalus* Makino)

Botanical name in English: Kaido crab

Botanical name in Ukrainian: Yablunia kaido

Crop name in Ukrainian: Raika, or Yablunia-raika

Accession name: -

Date of introduction: 24.06.2012

Donor: Central Botanical Garden of the Academy of Sciences of Belarus, Minsk, Belarus

Breeder: -

Origin: The taxon has a garden origin of *M. baccata* (L.) Borkh. × *M. spectabilis* (Aiton) Borkh. The specimen in Minsk was grown from seeds obtained from St. Petersburg (Russia), which was probably pollinated by some large-fruited apple tree

Time of flowering: May

Time of fruit ripening: August

Value: Fruits are similar in size to raisins; suitable for technological processing

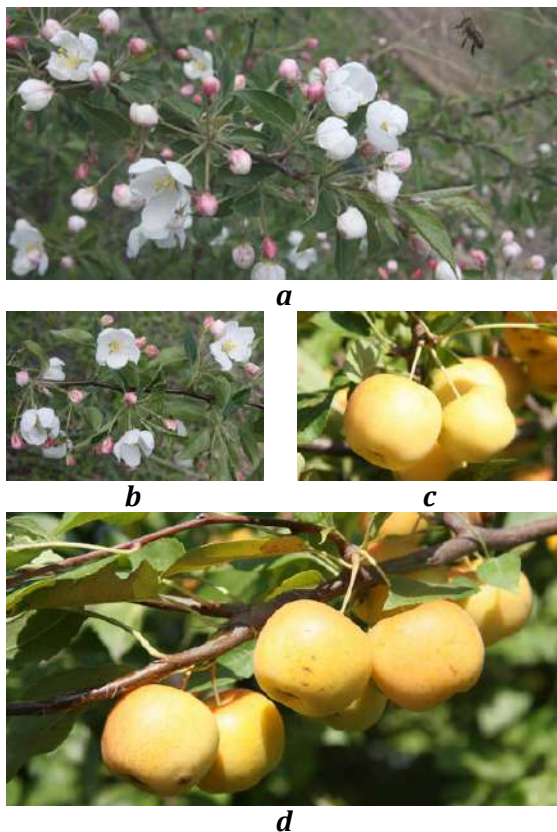


Figure 170. *Malus ×kaido* No. 03539 a) flowers and flower buds, b) flowers and flower buds, c) fruit, d) fruit

Malus prunifolia 'Dolgo'

National catalog number: UN0110198

Collection number: 03543

Botanical name in Latin: *Malus prunifolia* (Willd.) Borkh.

Botanical name in English: Chinese crabapple

Botanical name in Ukrainian: Yablunia slyvolystkova

Crop name in Ukrainian: Raika, or Yablunia-raika

Accession name: 'Dolgo' ('Pink Glow') (derivate of Russian word "dolgoe" – "long")

Date of introduction: 24.06.2012

Donor: Central Botanical Garden of the Academy of Sciences of Belarus, Minsk, Belarus

Breeder: Niels Ebbesen Hansen; South Dakota Research Station, USA

Origin: Seedling of an unknown variety of Siberian origin

Time of flowering: May

Time of fruit ripening: August

Value: Cultivar was accepted for variety testing in 1949 and was released in the northern regions of Russia and Siberia. Fruits for fresh eating and processing

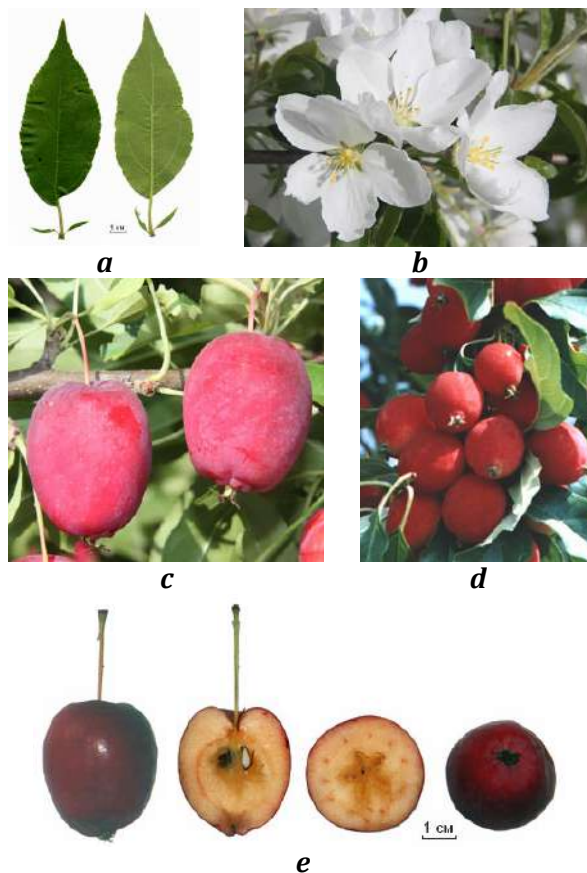


Figure 171. *Malus prunifolia* 'Dolgo' a) leaves, b) flowers, c) fruit, d) fruit, e) fruit shape, longitudinal and transverse fruit sections, and top view

Malus prunifolia 'Kerr'

National catalog number: UN0110186

Collection number: 03062

Botanical name in Latin: *Malus prunifolia* (Willd.) Borkh.

Botanical name in English: Chinese crab

Botanical name in Ukrainian: Yablunia slyvolystkova

Crop name in Ukrainian: Raika, or Yablunia-raika

Accession name: 'Kerr'

Date of introduction: 04.07.2009

Donor: Botanical Garden of the Lomonosov Moscow State University, Moscow, Russia

Breeder: William Leslie Kerr; Morden Agricultural Experiment Station, Manitoba, Canada

Origin: *M. prunifolia* 'Dolgo' × *M. domestica* (Suckow) Borkh. 'Haralson'

Time of flowering: May

Time of fruit ripening: August

Value: It has larger fruits than a typical Chinese crab. Fruits for fresh eating and processing

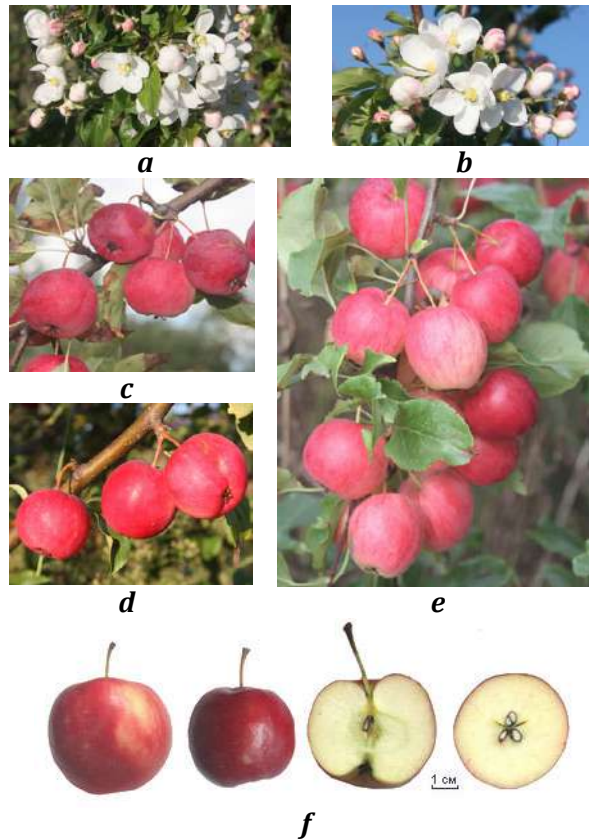


Figure 172. *Malus prunifolia* 'Kerr' a) flowers, b) flowers, c) fruit, d) fruit, e) fruit, f) fruit shape, longitudinal and transverse fruit sections

Malus prunifolia 'Peräpohjola'

National catalog number: UN0110209

Collection number: 03982

Botanical name in Latin: *Malus prunifolia* (Willd.) Borkh.

Botanical name in English: Chinese crab

Botanical name in Ukrainian: Yablunia slyvolystkova

Crop name in Ukrainian: Raika, or Yablunia-raika

Accession name: 'Peräpohjola' (Finnish toponym, means Southern Lapland)

Date of introduction: 05.05.2014

Donor: Julian Geyer, Graz, Austria

Breeder: Nursery Blomqvist, Pedersöre, Finland

Origin: -

Time of flowering: May

Time of fruit ripening: August

Value: Ornamental variety, fruits can be used for processing



a



b



c



d

Figure 173. *Malus prunifolia* 'Peräpohjola' a) flowers and flower buds, b) flowers, c) fruit, d) fruit

Malus prunifolia 'Ranetka Purpurovaja'

National catalog number: UN0110185

Collection number: 03057

Botanical name in Latin: *Malus prunifolia* (Willd.) Borkh.

Botanical name in English: Chinese crab

Botanical name in Ukrainian: Yablunia slyvolystkova

Crop name in Ukrainian: Raika, or Yablunia-raika

Accession name: 'Ranetka Purpurovaja' ('Ranetka Purpurovaya') (means "purple crab")

Date of introduction: 04.07.2009

Donor: Botanical Garden of the Lomonosov Moscow State University, Moscow, Russia

Breeder: Mikhail Nikiforov (introducer)

Origin: An ancient Chinese variety introduced to Russia by Nikiforov in the late 19th century

Time of flowering: May

Time of fruit ripening: August

Value: The variety has been zoned in Siberia since 1947. Source of high winter hardiness

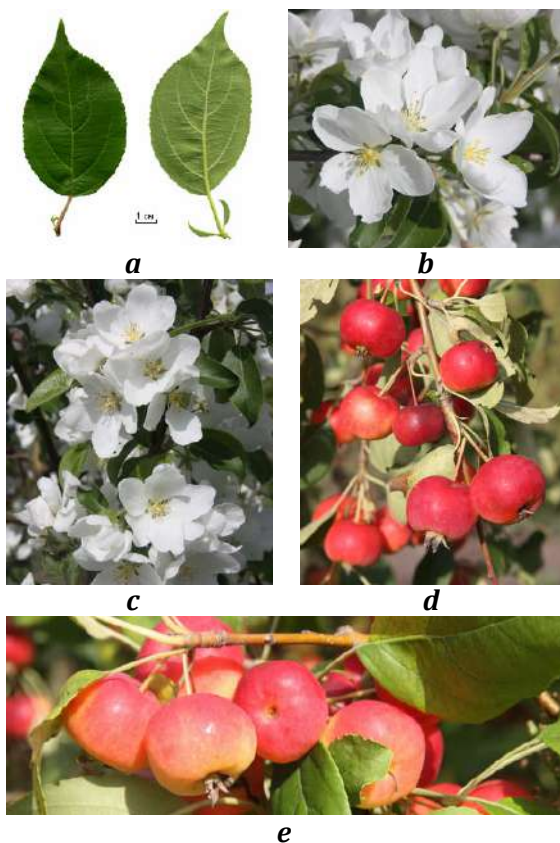


Figure 174. *Malus prunifolia* 'Ranetka Purpurovaja' a) leaves, b) flowers, c) flowers, d) fruit, e) fruit

ROSACEAE – MALUS

ROSE FAMILY – APPLE

ORNAMENTAL APPLE TREE

There are 32 species and 4 nothospecies of the apple tree (POWO, 2023). In Ukraine, dendrological collections include 35-37 species of *Malus* (Klymenko, 2005), but, taking into account synonymy, the number of introduced taxa is smaller. As one of the most ornamental species during flowering and fruiting, apple trees are used primarily in landscaping (Lypa, 1952; Yaremenko, 1964; Klimentko, 1988, 1994; Klymenko, 2005; Romer et al., 2003; Iles, 2009; Vanina and Vartapetyan, 2010; Honcharovska, 2016). Small-fruited apple species are a food source for birds and animals (Anderson and Crossley, 2008). Their fruits contain nutrients and biologically active substances and thus are also important for human nutrition (Yaremenko, 1959; Petrova, 1986; Altuntas and Karaosman, 2015; Arslaner and Salik, 2022). *Malus* species are used in the breeding of orchard apples (Pereira-Lorenzo et al., 2018).

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Malus denticulata No. 03046

National catalog number: UN0110180

Collection number: 03046

Botanical name in Latin: *Malus denticulata* Lavallée

Botanical name in English: Finely toothed crab

Botanical name in Ukrainian: Yablunia dribnopylchasta

Crop name in Ukrainian: Dekoratywna yablunia

Accession name: -

Date of introduction: 04.07.2009

Donor: Botanical Garden of the Lomonosov Moscow State University, Moscow, Russia

Breeder: -

Origin: Accession was selected from *M. denticulata* seedlings

Time of flowering: May

Time of fruit ripening: August to September

Value: Abundant flowering and fruiting provide the tree with an ornamental effect. The fruits remain on the branches for a long time and serve as food for birds

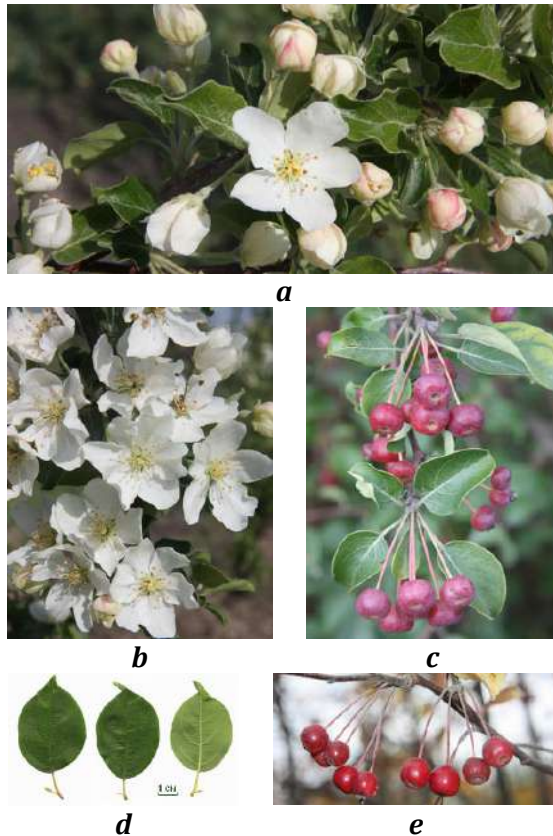


Figure 175. *Malus denticulata* No. 03046 a) flower and flower buds, b) flowers, c) fruit on the branch, d) leaves, e) fruit

Malus ×halliana 'Adirondack'

National catalog number: UN0110210

Collection number: 04224

Botanical name in Latin: *Malus ×halliana* Koehne

Botanical name in English: Hall crab

Botanical name in Ukrainian: Yablunia Holova

Crop name in Ukrainian: Dekoratywna yablunia

Accession name: 'Adirondack' (named for toponym, a massif of mountains in New York State, USA)

Date of introduction: 28.08.2015

Donor: Federal Research Institute of Horticulture Schönbrunn, Vienna, Austria

Breeder: Donald Roy Egolf; National Arboretum, Washington, USA

Origin: Seedling of *M. ×halliana* resistant to fungal and bacterial diseases obtained from Henry Kohankie and Sons nursery (Ohio), selected on an artificial provocative background

Time of flowering: May

Time of fruit ripening: August to September

Value: Cultivar is resistant to many pathogens, such as scab, bacterial burn, juniper-apple rust, and powdery mildew. It has a columnar habit. The fruits remain on the branches for a long time and serve as a food source for birds

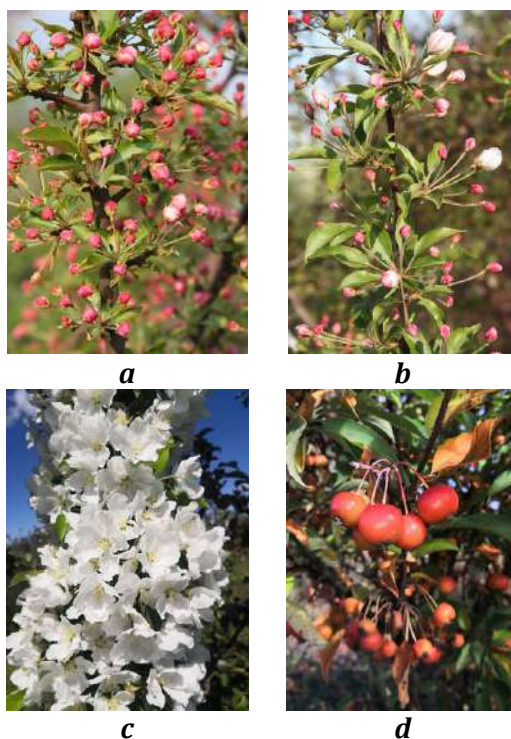


Figure 176. *Malus ×halliana* 'Adirondack' a) flower buds, b) flower buds, c) flowering branch, d) fruit

Malus hupehensis No. 03051

National catalog number: UN0110182

Collection number: 03051

Botanical name in Latin: *Malus hupehensis* (Pam.) Rehder

Botanical name in English: Chinese crab apple, Hebei crab

Botanical name in Ukrainian: Yablunia khebeiska

Crop name in Ukrainian: Dekoratywna yablunia

Accession name: -

Date of introduction: 04.07.2009

Donor: Botanical Garden of the Lomonosov Moscow State University, Moscow, Russia

Breeder: -

Origin: Accession selected from *M. hupehensis* seedlings

Time of flowering: May

Time of fruit ripening: August to September

Value: Abundant flowering and fruiting provide the tree with an ornamental effect. The fruits remain on the branches for a long time and serve as food for birds

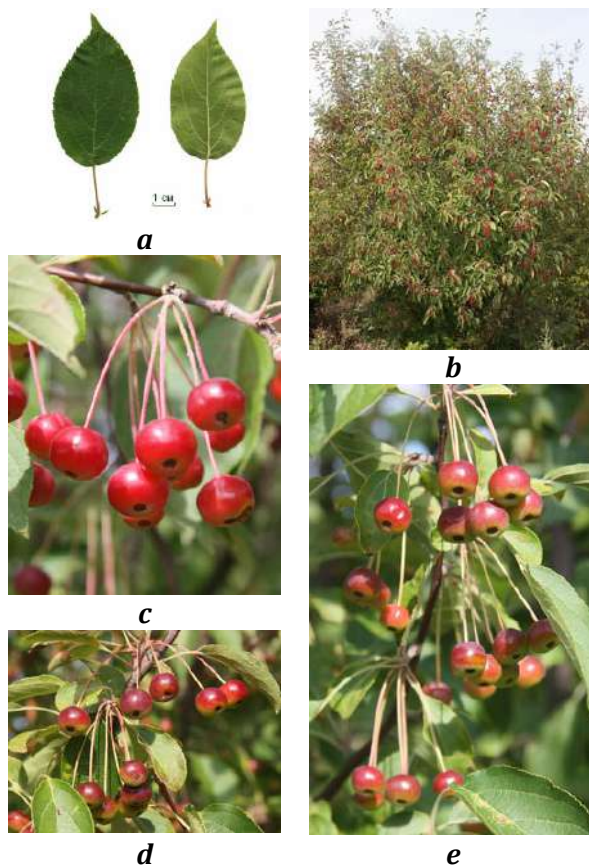


Figure 177. *Malus hupehensis* No. 03051 a) leaves, b) fruiting tree, c) fruit d) fruit, e) fruit

Malus ×kaido 'Velikan'

National catalog number: UN0110178

Collection number: 03044

Botanical name in Latin: *Malus ×kaido* (Wenz.) Pardé

Botanical name in English: Kaido crab

Botanical name in Ukrainian: Yablunia kaido

Crop name in Ukrainian: Dekoratyvna yablunia

Accession name: 'Velikan' (means "giant")

Date of introduction: 04.07.2009

Donor: Botanical Garden of the Lomonosov Moscow State University, Moscow, Russia

Breeders: Valentina Vartapetyan and Lyudmila Vanina

Origin: The cultivar was developed from *M. ×kaido* seedlings. *M. ×kaido* have been originated from the cross of *M. baccata* (L.) Borkh. × *M. spectabilis* (Aiton) Borkh.

Time of flowering: May

Time of fruit ripening: August to September

Value: Cultivar was included in the State Register of Breeding Achievements of the Russian Federation in 2001. Abundant flowering and fruiting provide a high decorative effect. Recommended for a solitaire tree. The fruits remain on the branches for a long time and serve as a food source for birds

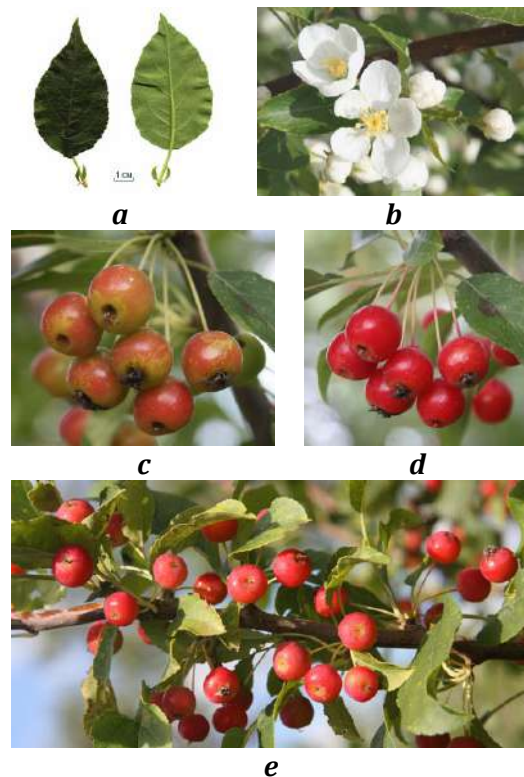


Figure 178. *Malus ×kaido* 'Velikan' a) leaves, b) flowers, c) unripe fruit, d) ripe fruit, e) branch with fruit

Malus mandshurica 'Sakhalinskaja Zhenchuzhina'

National catalog number: UN0110179

Collection number: 03045

Botanical name in Latin: *Malus mandshurica* (Maxim.) Kom. ex Skvortsov

Botanical name in English: Manchurian crab

Botanical name in Ukrainian: Yablunia mandzhurska

Crop name in Ukrainian: Dekoratywna yablunia

Accession name: 'Sakhalinskaja Zhenchuzhina' ('Sakhalinskaya Zhenchuzhina') (means "Sakhalin pearl")

Date of introduction: 04.07.2009

Donor: Botanical Garden of the Lomonosov Moscow State University, Moscow, Russia

Breeders: Valentina Vartapetyan and Lyudmila Vanina

Origin: Selected from seedlings of specimen obtained under the name *M. sachalinensis* Kom. ex Juz.

Time of flowering: May

Time of fruit ripening: August to September

Value: Cultivar was included in the State Register of Breeding Achievements of the Russian Federation in 2001. Maximum ornamental effect during budding, flowering, and fruiting. Fruits are stored on the branches for a long time and serve as a food source for birds



a



b

Figure 179. *Malus mandshurica* 'Sakhalinskaja Zhenchuzhina' a) flowers, b) fruit

Malus nan-shan 'Rozovoe Chudo'

National catalog number: UN0110183

Collection number: 03052

Botanical name in Latin: *Malus nan-shan* hort.

Botanical name in English: Nan-shan crab

Botanical name in Ukrainian: Yablunia nan-shan

Crop name in Ukrainian: Dekoratyvna yablunia

Accession name: 'Rozovoe Chudo' (means "pink miracle")

Date of introduction: 04.07.2009

Donor: Botanical Garden of the Lomonosov Moscow State University, Moscow, Russia

Breeders: Valentina Vartapetyan and Lyudmila Vanina

Origin: Cultivar selected from *M. nan-shan* seedlings. The obtained accession does not correspond to the original description of the variety 'Rozovoe Chudo' with rose flowers

Time of flowering: May

Time of fruit ripening: August to September

Value: Cultivar was included in the State Register of Breeding Achievements of the Russian Federation in 2001. Maximum ornamental effect during budding, flowering, and fruiting. Fruits are stored on the branches for a long time and serve as a food source for birds



a



b



c

d

Figure 180. *Malus nan-shan* 'Rozovoe Chudo' a) flowers, b) fruit, c) fruit, d) fruit

Malus sp. 'Chyzhyk'

National catalog number: UN0110199

Collection number: 03544

Botanical name in Latin: *Malus* sp.

Botanical name in English: Apple tree, or crabapple

Botanical name in Ukrainian: Yablonya

Crop name in Ukrainian: Dekoratywna yablunia

Accession name: 'Chyzhyk' (the surname of one excellent student of the National University of Life and Environmental Sciences of Ukraine, which means "a little siskin")

Date of introduction: 24.06.2012

Donor: Central Botanical Garden of the Academy of Sciences of Belarus, Minsk, Belarus

Breeder: Volodymyr Mezhenkyj

Origin: Variety was selected from self-seeding plants of the dendrological plantations of the Central Botanical Garden of the Academy of Sciences of Belarus

Time of flowering: May

Time of fruit ripening: September to October

Value: Original shape and intense green color of leaves in summer, late ripening of fruits that serve as food for birds

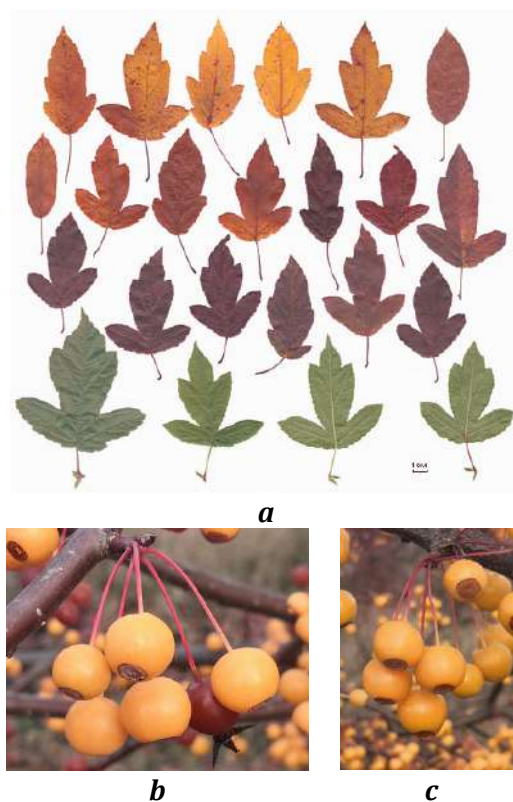


Figure 181. *Malus* sp. 'Chyzhyk' a) summer leaves in the bottom row and autumn color ones at the top rows, b) fruit, c) fruit

Malus sp. 'Courtabri'

National catalog number: UN0110211

Collection number: 04225

Botanical name in Latin: *Malus* sp.

Botanical name in English: Apple tree, or crabapple

Botanical name in Ukrainian: Yablunia

Crop name in Ukrainian: Dekoratywna yablunia

Accession name: 'Courtabri'

Date of introduction: 28.08.2015

Donor: Federal Research Institute of Horticulture Schönbrunn, Vienna, Austria

Breeder: Developed at the National Institute of Agricultural Research of France (INRA)

Origin: Originated under the breeding cooperation program of the Sapho Association. Known under the trademark Pom'Zai®. It is a dwarf form of the well-known variety 'Everest' (Perpetu®)

Time of flowering: May

Time of fruit ripening: September

Value: Cultivar is characterized by a compact spherical habit, resistant to scab and powdery mildew. Fruits are suitable for processing; they are stored on the branches for a long time and serve as a food source for birds



Figure 182. *Malus* sp. 'Courtabri' a) flower buds, b) flower and flower buds, c) fruit, d) fruit, e) fruit

Malus sp. 'Smarahdova Krasunia'

National catalog number: UN0110200

Collection number: 03545

Botanical name in Latin: *Malus* sp.

Botanical name in English: Apple tree, or crabapple

Botanical name in Ukrainian: Yablunia

Crop name in Ukrainian: Dekoratywna yablunia

Accession name: 'Smarahdova Krasunia' (means "emerald beauty")

Date of accession: 24.06.2012

Donor: Central Botanical Garden of the Academy of Sciences of Belarus, Minsk, Belarus

Breeder: Volodymyr Mezhenkyj

Origin: Variety selected from self-sowing plants of the dendrological plantations of the Central Botanical Garden of the Academy of Sciences of Belarus

Time of flowering: May

Time of fruit ripening: September to October

Value: Original shape and intense green color of leaves in summer, late ripening of fruits that serve as food for birds

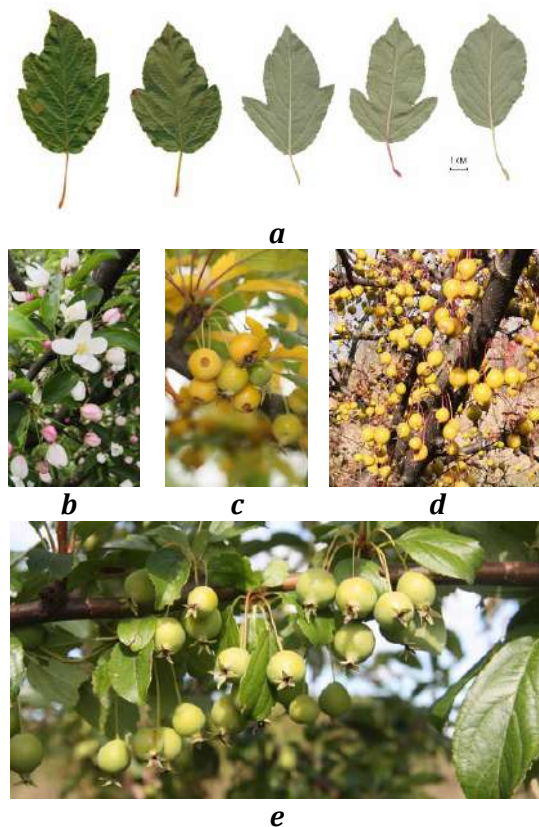


Figure 183. *Malus* sp. 'Smarahdova Krasunia' a) leaves, b) flowers and flower buds, c) fruits, d) fruit, e) fruiting branch

Malus toringo No. 03050

National catalog number: UN0110181

Collection number: 03050

Botanical name in Latin: *Malus toringo* (Siebold) de Vriese

Botanical name in English: Japanese crab, Siebold's crab, or Toringo crab

Botanical name in Ukrainian: Yablunia toringo

Crop name in Ukrainian: Dekoratywna yablunia

Accession name: -

Date of introduction: 04.07.2009

Donor: Botanical Garden of the Lomonosov Moscow State University, Moscow, Russia

Breeder: -

Origin: Aa accession was received under the name *M. sargentii* Rehder

Time of flowering: May

Time of fruit ripening: August

Value: Abundant flowering and fruiting provide the tree with an ornamental effect. The fruits remain on the branches for a long time and serve as food for birds

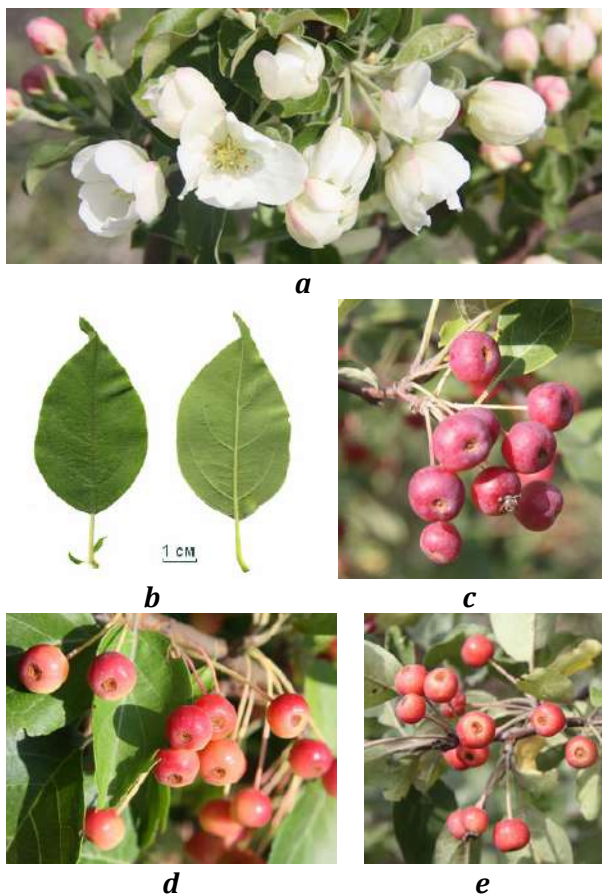


Figure 184. *Malus toringo* No. 03050 a) flowers, b) leaves, c) fruit, d) fruit e) fruit

Malus ×zumi 'Maljutka'

National catalog number: UN0110184

Collection number: 03055

Botanical name in Latin: *Malus ×zumi* (Matsum.) Rehder

Botanical name in English: Zumi crab

Botanical name in Ukrainian: Yablonia zumi

Crop name in Ukrainian: Dekoratywna yablonia

Accession name: 'Maljutka' ('Malyutka') (means "a dot of a child")

Date of introduction: 04.07.2009

Donor: Botanical Garden of the Lomonosov Moscow State University, Moscow, Russia

Breeders: Valentina Vartapetyan and Lyudmila Vanina

Origin: Cultivar selected from seedlings of *M. ×zumi*. This nothospecies is a naturally occurring hybrid, native to Japan, originated from crossing *M. mandshurica* (Maxim.) Kom. ex Skvortsov × *M. toringo* (Siebold) de Vriese

Time of flowering: May

Time of fruit ripening: August to September

Value: Cultivar was included in the State Register of Breeding Achievements of the Russian Federation in 2001. Maximum ornamental effect during budding, flowering, and fruiting. Fruits are stored on the branches for a long time and serve as a food source for birds



a



b

Figure 185. *Malus ×zumi* 'Maljutka' a) flowers, b) fruit

ROSACEAE – PRUNUS

ROSE FAMILY – APRICOTS AND PLUMS

APRICOT, BLACK APRICOT, AND PLUM CLONAL ROOTSTOCKS

Distant hybridization allows breeders to develop stone fruits with new traits as well as new rootstocks (Kostina and Ryabov, 1959; Eryomin, 1985; Eremin, 2012; Eryomin et al., 2000; Soldatov and Salas, 2007; Gradziel, 2012; Sottile et al., 2022). Such hybrids are important for fruit growing, nursery growing, and ornamental gardening. Important work in this area was carried out in the Nikita Botanical Garden, where valuable hybrids *Prunus brigantina* × *P. armeniaca* were raised (Kostina, 1971, 1978; Mezhenskyj, 2009). The black apricot (*P. ×dasycarpa*) originated as a result of spontaneous hybridization of apricot and myrobalan plum (Manaresi, 1950; Kostina and Ryabov, 1959; Mezhenskyj et al., 2012). *P. simonii* known as the apricot plum, has played a significant role in the breeding of the modern commercial plum variety (Topp et al., 2012; Sottile et al., 2022). Its probable origin is the hybridization between *P. salicina* × *P. armeniaca* (Faust and Surányi, 1999; Ruan et al., 2002; Duan et al., 2009; Yang et al., 2012).

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Prunus armeniaca × *P. brigantina* 'Briol'

National catalog number: UN0500811

Collection number: 02400

Botanical name in Latin: *Prunus armeniaca* L. × *P. brigantina* Vill.

Botanical name in English: Apricot × Alpine plum, Briançon apricot, or Briançon plum

Botanical name in Ukrainian: Slyva virmenska × slyva brygantska

Crop name in Ukrainian: Abrykososlyva

Accession name: 'Briol' ('8140') (abbreviation of parent names: *P. brigantina* and 'Olymp' (means Olympus))

Date of introduction: 07.02.2003

Donor: Nikita Botanical Garden, Nikita, Crimea, Ukraine

Breeders: Klavdiia Kostina, Valentyna Horina, Larysa Komar-Temna, Kateryna Polianichenko, Oleksandr Richter, and Volodymyr Smykov

Origin: Developed from a cross of *P. armeniaca* 'Olimp' × *P. brigantina*

Time of flowering: April

Time of fruit ripening: July to August

Value: High winter hardiness and resistance to frost. Blooms are later than apricot varieties. Late ripening period. Fruits are yellow, with a blush, weighing 25-30 g; the flesh is orange; the stone is not separated. Fruits contain 5.8% sugar, 4.0% organic acids, and 3.2 mg/100 g ascorbic acid

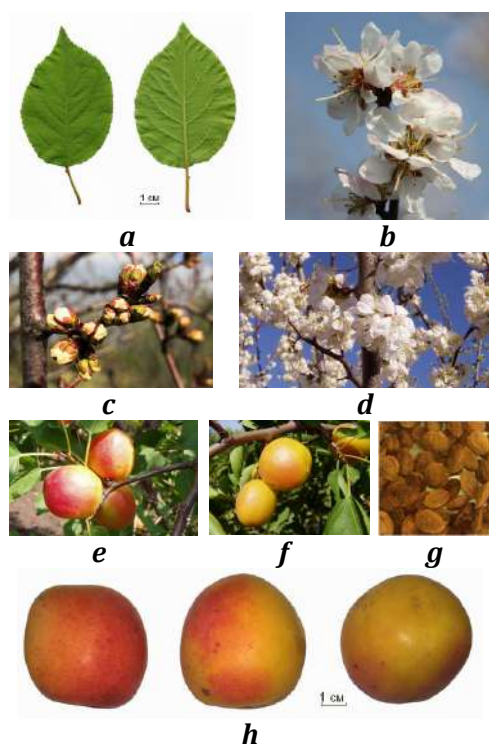


Figure 186. *Prunus armeniaca* × *P. brigantina* 'Briol' a) leaves, b) flowers, c) flower buds, d) flowering branches, e) fruit, f) fruits, g) stones, h) fruit

Prunus armeniaca × *P. brigantina* 'Yaltynskiy Klad'

National catalog number: UN0500887

Collection number: 02405

Botanical name in Latin: *Prunus armeniaca* L. × *P. brigantina* Vill.

Botanical name in English: Apricot × Alpine plum, Briançon apricot, or Briançon plum

Botanical name in Ukrainian: Slyva virmenska × slyva brygantska

Crop name in Ukrainian: Abrykososlyva

Accession name: 'Yaltynskiy Klad' ('8097') (means "Yalta treasure")

Date of introduction: 07.02.2003

Donor: Nikita Botanical Garden, Nikita, Crimea, Ukraine

Breeders: Klavdiia Kostina and others

Origin: Developed from a cross between *P. armeniaca* × *P. brigantina*

Time of flowering: April

Time of fruit ripening: July to August

Value: Blooms later than apricot varieties. Fruits are yellow, weighing 15-20 g; the flesh is orange; the stone is not separated

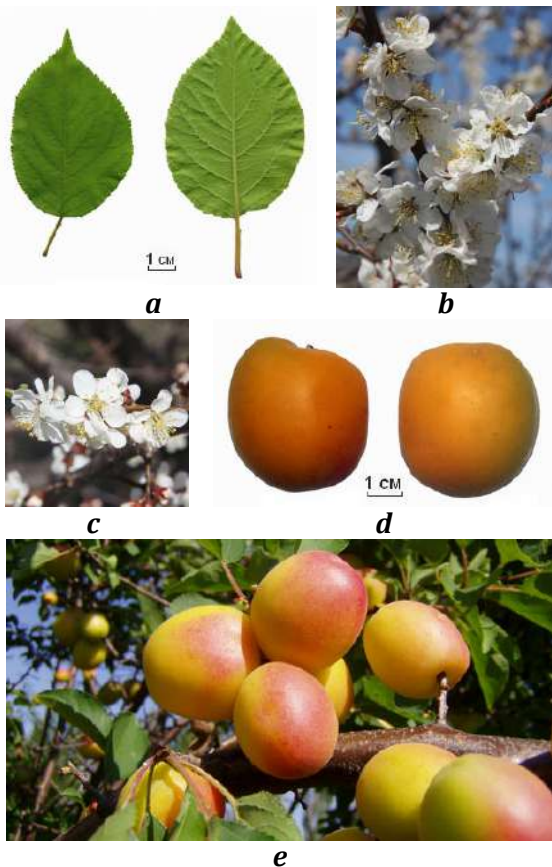


Figure 187. *Prunus armeniaca* × *P. brigantina* 'Yaltynskiy Klad' a) leaves, b) flowers, c) flowers, d) fruits, e) fruit on the branch

Prunus ×dasycarpa 'Chornyj Barkhat'

National catalog number: UN9700006

Collection number: 01838

Botanical name in Latin: *Prunus ×dasycarpa* Ehrh.

Botanical name in English: Black apricot, or Purple apricot

Botanical name in Ukrainian: Slyva shorstkovolosysta

Crop name in Ukrainian: Abrykososlyva, or Chorna abrykosa

Accession name: 'Chornyj Barkhat' ('Chjornyj Barkhat') (means "black velvet")

Date of introduction: 16.08.1999

Donor: Crimean Experimental Breeding Station VIR - N. I. Vavilov Research Institute of Plant Industry, Krymsk, Krasnodar Krai, Russia

Breeders: Gennady Eryomin and Aleksandr Isachkin

Origin: Seedling of 'Black Apricot' ('American Black') from free pollination

Time of flowering: April to May

Time of fruit ripening: July to August

Value: Cultivar was included in the State Register of Breeding Achievements of the Russian Federation in 2005. It is early bearer, winter-hardy, resistant to brown rot, shot hole, cytosporosis, and bacteriosis. Purple-black to black fruits, weighing 30 g, contains 8.2% sugars, 2.3% organic acids, and 5.3% ascorbic acid

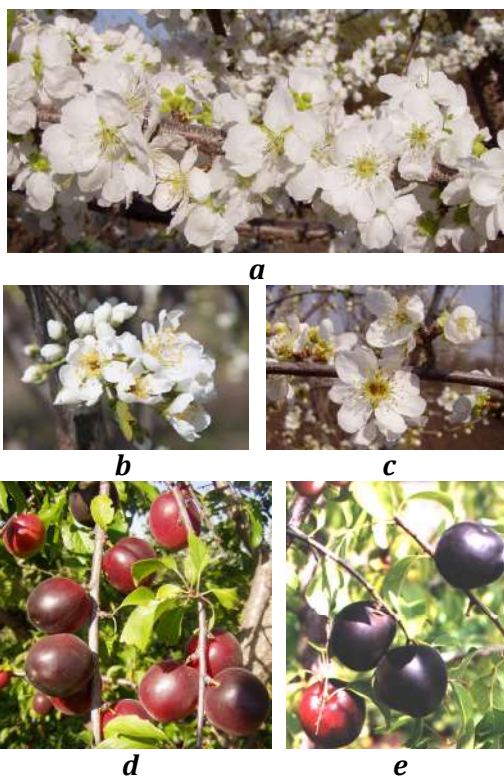


Figure 188. *Prunus ×dasycarpa* 'Chornyj Barkhat' a) flowers, b) flowers, c) flowers, d) fruiting, e) fruit

Prunus ×dasycarpa 'Kubanskij Chornyj'

National catalog number: UN9700015

Collection number: 02499

Botanical name in Latin: *Prunus ×dasycarpa* Ehrh.

Botanical name in English: Black apricot, or Purple apricot

Botanical name in Ukrainian: Slyva shorstkovolosysta

Crop name in Ukrainian: Abrykososlyva, or Chorna abrykosa

Accession name: 'Kubanskij Chornyj' ('Kubanskij Chjornyj') (means "Kuban black")

Date of introduction: 18.08.2003

Donor: Rossosh Experimental Station of Horticulture, Rossosh, Voronez Region, Russia

Breeders: Gennady Eryomin and Aleksandr Isachkin; Crimean Experimental Breeding Station VIR

Origin: Seedling of 'Manaresi' from free pollination

Time of flowering: April to May

Time of fruit ripening: July to August

Value: Cultivar was included in the State Register of Breeding Achievements of the Russian Federation in 2006. It is early bearer, winter-hardy, resistant to brown rot, shot hole, cytosporosis, and bacteriosis



a



b



c



d

Figure 189. *Prunus ×dasycarpa* 'Kubanskij Chornyj' *a*) flowers, *b*) flowers, *c*) ripening fruit, *d*) ripe fruit

Prunus ×dasycarpa 'Manaresi'

National catalog number: UN9700006

Collection number: 02043

Collection number: 01838

Botanical name in Latin: *Prunus ×dasycarpa* Ehrh.

Botanical name in English: Black apricot, or Purple apricot

Botanical name in Ukrainian: Slyva shorstkovolosysta

Crop name in Ukrainian: Abrykososlyva, or Chorna abrykosa

Accession name: 'Manaresi'

Date of introduction: 18.08.2000

Donor: Crimean Experimental Breeding Station VIR - N. I. Vavilov Research Institute of Plant Industry, Krymsk, Krasnodar Krai, Russia

Breeder: Angelo Manaresi; Institute of Woody Plants, University of Bologna

Origin: Italian variety selected in local gardens

Time of flowering: April to May

Time of fruit ripening: July

Value: Fruits are burgundy-blue to black, with a plague, weighing 60 g, with yellow flesh; contain 6.2% sugars, 1.5% organic acids, and 5.3 mg/100 g ascorbic acid

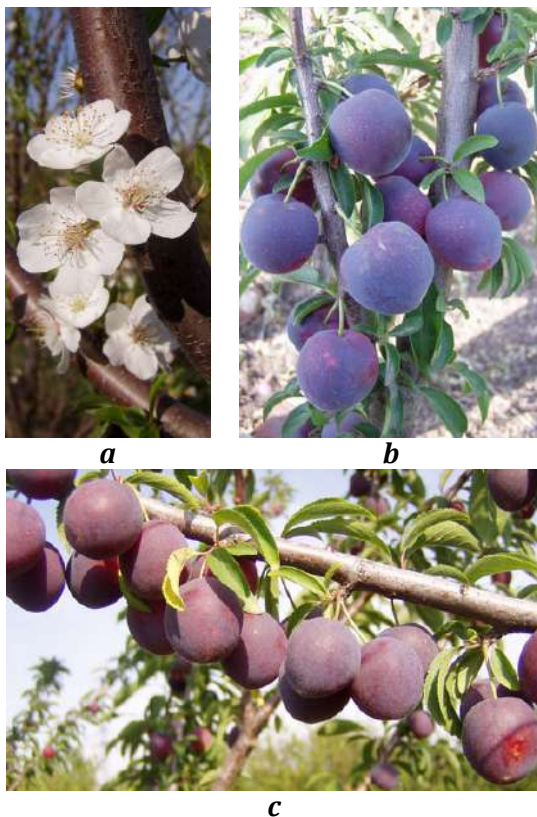


Figure 190. *Prunus ×dasycarpa* 'Manaresi' a) flowers, b) fruit, c) fruit

Prunus ×dasycarpa 'Melitopolska Chorna'

National catalog number: UN9700012

Collection number: 02466

Botanical name in Latin: *Prunus ×dasycarpa* Ehrh.

Botanical name in English: Black apricot, or Purple apricot

Botanical name in Ukrainian: Slyva shorstkovolosysta

Crop name in Ukrainian: Abrykososlyva, or Chorna abrykosa

Accession name: 'Melitopolska Chorna' ('Melitopolskyi Chorny') (means "Melitopol black")

Date of introduction: 01.08.2003

Donor: Melitopol Experimental Station of Horticulture, Melitopol, Zaporizhzhia Region, Ukraine

Breeders: Mikhailo Oratovskyi and Halina Fedchenkova

Origin: The putative seedling of 'Shlor Ziran'

Time of flowering: April to May

Time of fruit ripening: July to August

Value: The first Ukrainian variety of black apricot, but not registered. Fruits are burgundy-black, weighing 70 g; the flesh is yellow-red, sweet, with apricot aroma

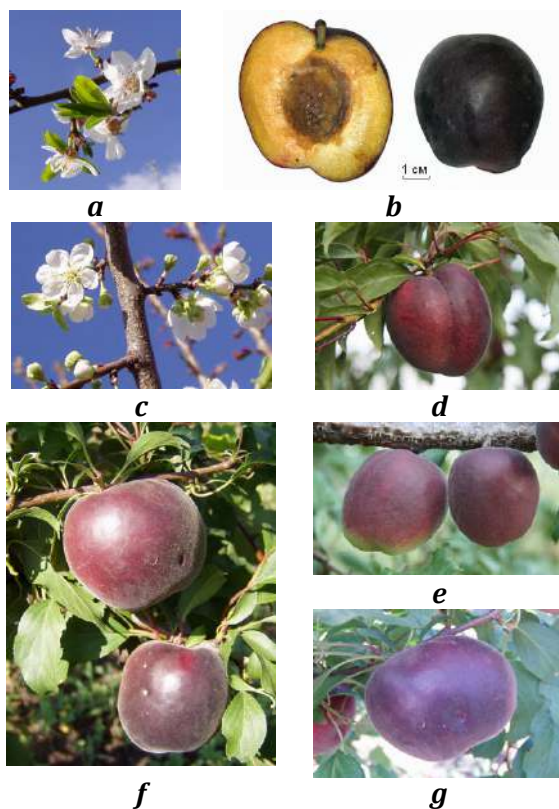


Figure 191. *Prunus ×dasycarpa* 'Melitopolska Chorna' a) flowers, b) longitudinal fruit section and fruit shape, c) flowers, d) fruit, e) fruit, f) fruit, g) fruit

Prunus ×dasycarpa 'Shlor Ziran'

National catalog number: UN9700012

Collection number: 02466

Botanical name in Latin: *Prunus ×dasycarpa* Ehrh.

Botanical name in English: Black apricot, or Purple apricot

Botanical name in Ukrainian: Slyva shorstkovolosysta

Crop name in Ukrainian: Abrykososlyva, or Chorna abrykosa

Accession name: 'Shlor Ziran' ('Ziran-salor') (means "black apricot")

Date of introduction: 01.08.2003

Origin:

Donor: Melitopol Experimental Station of Horticulture, Melitopol, Zaporizhzhia Region, Ukraine

Breeder: -

Origin: A natural hybrid of *P. armeniaca* × *P. cerasifera*, probably of Armenian origin; it is common in the Transcaucasus

Time of flowering: April to May

Time of fruit ripening: July to August

Value: Fruits are burgundy-black to black, weighing 30-65 g; flesh is yellow-red

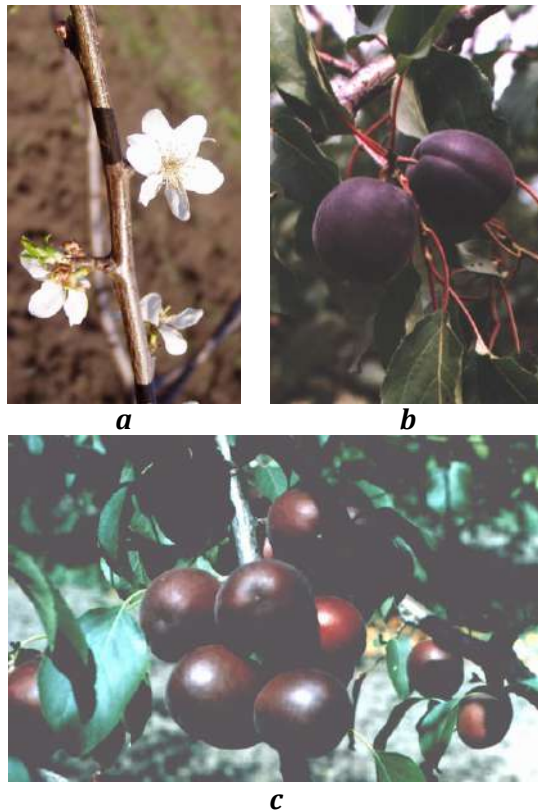


Figure 192. *Prunus ×dasycarpa* 'Shlor Ziran' a) flowers, b) fruit, c) fruit

Prunus sp. 'Red Aveo'

National catalog number: UN0300672

Collection number: 03800

Botanical name in Latin: *Prunus* sp.

Botanical name in English: Plum

Botanical name in Ukrainian: Slyva

Crop name in Ukrainian: Klonova pidshchepa slyvy

Accession name: 'Red Aveo'

Date of introduction: 20.10.2012

Donor: National University of Life and Environmental Sciences of Ukraine, Pshenychne, Kyiv Region, Ukraine

Breeder: Volodymyr Mezhenkyj

Origin: Bud mutation of 'Vesiennieie Plamia'

Flowering time: April-May

Fruit ripening time: fruits are not known

Value: Promising for testing as a dwarf rootstock of the "plum" group and for use in ornamental gardening for hedges and a solitaire tree



Figure 193. *Prunus* sp. 'Red Aveo' a) flowers, b) shoots with young leaves, c) flowers, d) flowers, e) same-aged trees: 'Red Aveo' - in the foreground, and 'Vesennee Plamja' - in the background

Prunus sp. 'Vesennee Plamja'

National catalog number: UN0400599

Collection number: 01815

Botanical name in Latin: *Prunus* sp.

Botanical name in English: Plum

Botanical name in Ukrainian: Slyva

Crop name in Ukrainian: Klonova pidshchepa slyvy

Accession name: 'Vesennee Plamja' ('Vesennee Plamya', 'Vesiennieie Plamia') (means "spring flame")

Date of introduction: 16.08.1999

Donor: Crimean Experimental Breeding Station VIR - N. I. Vavilov Research Institute of Plant Industry, Krymsk, Krasnodar Krai, Russia

Breeders: Gennadij Yeryomin, Vladimir Havrysh, Viktor Eryomin, Mykola Shevchuk, Petro Kondratenko, Svitlana Vasyuta

Origin: An artificial hybrid derived from a cross between 'Toka' (= *P. americana* Marsh. × *P. simonii* (Decne.) Carrière) × *P. cerasifera* Ehrh. 'Krasnoe Znamja'

Time of flowering: April to May

Time of fruit ripening: July

Value: Semi-dwarf clonal rootstock of the plum group for orchards with a density of up to 1000 trees/ha. In 2005, the variety was included in the State Register of Plant Varieties of Ukraine. It is also offered for landscaping, primarily for hedges, due to its dense crown and beautiful leaf color

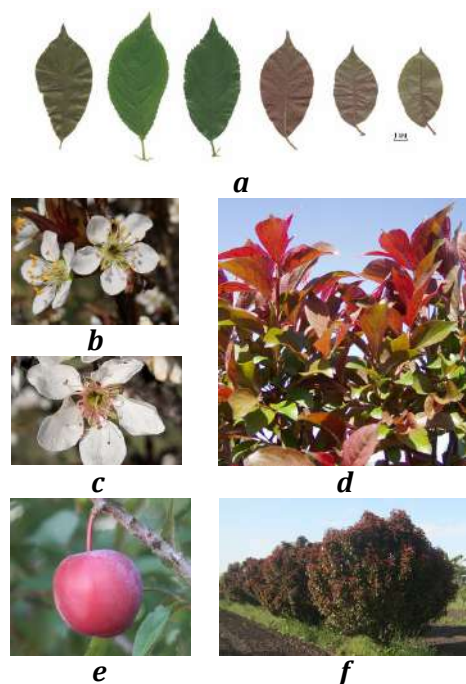


Figure 194. *Prunus* sp. 'Vesennee Plamja' a) leaves, b) flowers, c) flowers, d) young leaves, e) fruit, f) trees

ROSACEAE – PRUNUS

ROSE FAMILY – APRICOTS AND PLUMS

FLOWERING PLUM AND NANJING CHERRY

The former genus *Louiseania* included 3 species: *Louiseania triloba*, *L. ulmifolia*, and *L. pedicellata* (Pakhomova, 1959; Lomakin and Yushev, 1978; Eremyon et al., 1985). These species were also included in the genera *Amygdalus* or *Aflatunia*, and now they are included in the genus *Prunus* (POWO, 2023). Therefore, the varieties of the first type are known in culture under the names *Louisiana*, flowering almond, and flowering plum. Its double-flowering genotype, introduced to Europe in 1855, has gained popularity (Bean, 1976). It and its hybrids with other plum species are extremely ornamental too (Batochenko, 1996; Mezhenskyj, 2009; Mezhenskij, 2011; Mezhenskij and Mezhenskaya, 2011). In amateur fruit growing, Nanjing, or Nanking cherry with tasty fruits has gained popularity (Vasilchenko, 1954; Tsarenko, 1989; Yushev, 1990; Andriienko and Roman, 1991; Eryomin, 1995). It is also used as a dwarf rootstock of the plum group (Tretiak, 1975). Hybrids between Nanking plum and *Prunus ulmifolia* are more resistant to the *Monilia* and have fruits with denser flesh (Malyugin, 1984; Mezhenskyj, 2007; Mezhenskij, 2008).

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Prunus ×arnoldiana 'Olesia'

National catalog number: UN0400655

Collection number: 02324

Botanical name in Latin: *Prunus ×arnoldiana* Rehder

Botanical name in English: Arnold's plum

Botanical name in Ukrainian: Slyva Arnoldova

Crop name in Ukrainian: Prunozeaniia

Accession name: 'Olesia' (female name)

Date of introduction: 09.03.2003

Donor: Volodymyr Batochenko, Radyvyliv, Rivne Region, Ukraine

Breeder: Vladimir Batochenko

Origin: It is a cross of *P. cerasifera* Ehrh. × *P. triloba* Lindl.

Time of flowering: April to May

Time of fruit ripening: July

Value: Habit is tree-like. Increased resistance to *Monilia*. Flowers are simple, light pink, 3.0-3.5 cm in diameter. Fruits are spherical, burgundy, weighing 8-12 g, with semi-juicy sour flesh; stone with a wrinkled surface

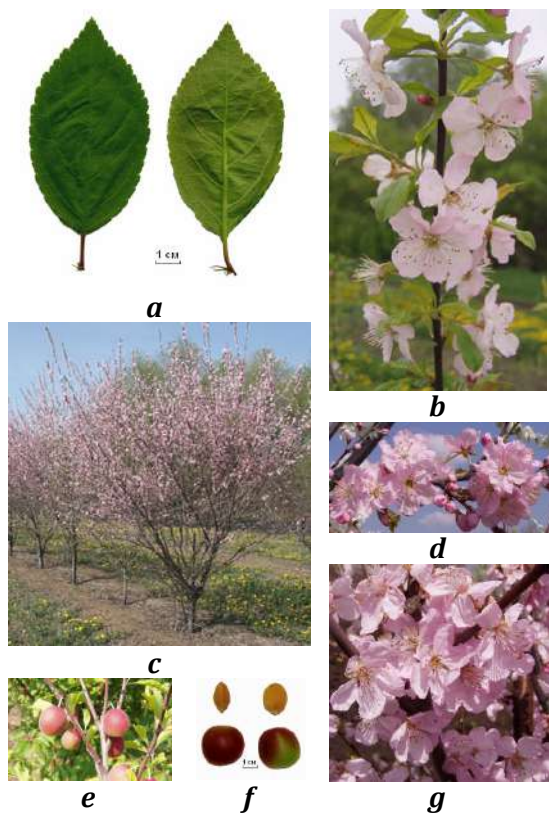


Figure 195. *Prunus ×arnoldiana* 'Olesia' a) leaves, b) flowers, c) flowering trees, d) flowers, e) fruit, f) fruit and stones, g) flowers

Prunus ×arnoldiana 'Pamiati Makhmeta'

National catalog number: UN0400655

Collection number: 02579

Botanical name in Latin: *Prunus ×arnoldiana* Rehder

Botanical name in English: Arnold's plum

Botanical name in Ukrainian: Slyva Arnoldova

Crop name in Ukrainian: Prunozeaniia

Accession name: 'Pamiati Makhmeta' (means "in memory of Makhmet"; Borys Makhmet was an Associate Professor, Head of the Department of Dendrology and Nature Protection at the former Ukrainian Agrarian Academy, now the National University of Life and Environmental Sciences of Ukraine)

Date of introduction: 09.02.2004

Donor: Volodymyr Batochenko, Radyvyliv, Rivne Region, Ukraine

Breeder: Vladimir Batochenko

Origin: It is a cross of *P. triloba* Lindl. × *P. domestica* L.

Time of flowering: April to May

Time of fruit ripening: Does not form fruit

Value: Habit is tree-like. Flowers double, pinkish-white, 3.5-4.0 cm in diameter, with 20-24 (29) petals

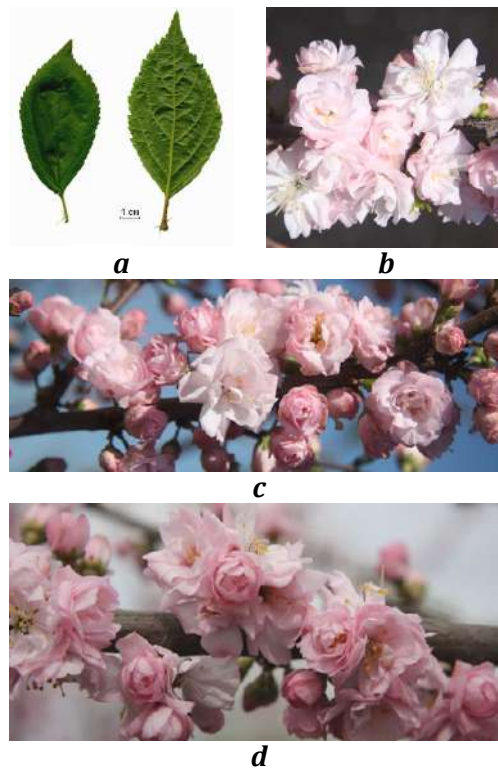


Figure 196. *Prunus ×arnoldiana* 'Pamiati Makhmeta' a) leaves, b) flowers, c) flowers, d) flowers

Prunus ×arnoldiana 'Snihy Uimury'

National catalog number: UN0400659

Collection number: 02326

Botanical name in Latin: *Prunus ×arnoldiana* Rehder

Botanical name in English: Arnold's plum

Botanical name in Ukrainian: Slyva Arnoldova

Crop name in Ukrainian: Prunozeaniia

Accession name: 'Snihy Uimury' (means "Uemura's snows"; Naomi Uemura is a Japanese hiker known for many achievements who died during one of the solo ascents of the highest mountain in North America in winter)

Date of introduction: 09.03.2003

Donor: Volodymyr Batochenko, Radyvyliv, Rivne Region, Ukraine

Breeder: Vladimir Batochenko

Origin: It is a cross of *P. triloba* Lindl. × (*P. cerasifera* Ehrh. + *P. domestica* L. + *P. salicina* Lindl.)

Time of flowering: April to May

Time of fruit ripening: July

Value: Habit is tree-like. Flowers are double, pinkish-white, 3.5-4.5 (5.5) cm in diameter, with 18-25 (43) petals. Fruits are spherical, dark maroon, weighing 6-10 g; the flesh is sour, with bitterness

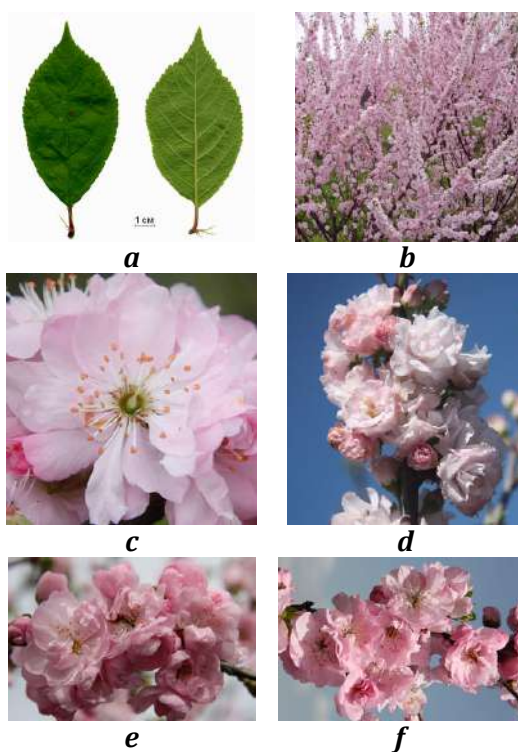


Figure 197. *Prunus ×arnoldiana* 'Snihy Uimury' a) leaves, b) flowering bush, c) flower, d) flowers, e) flowers, f) flowers

Prunus tomentosa 'Efimka'

National catalog number: UN0400641

Collection number: 01872

Botanical name in Latin: *Prunus tomentosa* Thunb.

Botanical name in English: Chinese bush cherry, Korean cherry, Manchu cherry, Nanjing cherry, or Nanking cherry

Botanical name in Ukrainian: Slyva povstiana

Crop name in Ukrainian: Povstiana vyshnia

Accession name: 'Efimka' (derivate of male name; named after Efim, or Yukhym Maliuhin, a dendrologist at Donetsk Botanical Garden)

Date of introduction: 16.08.1999

Donor: Volodymyr Mezhenkyj, Bakhmut, Donetsk Region, Ukraine

Breeder: Volodymyr Mezhenkyj

Origin: Originated from plants from the dendrological collections of the Donetsk Botanical Garden under the name *Aflatunia*. Probably a third-generation hybrid from crossing *P. tomentosa* × *P. ulmifolia* Franch.

Time of flowering: April

Time of fruit ripening: June to July

Value of the sample: The cultivar was registered in Poland in 2019. In 2007, the accession was registered in the National Center for Plant Genetic Resources of Ukraine for high productivity, winter hardiness, and resistance to *Monilia*; fruits are dark red with dense flesh, with a high content of ascorbic acid. Fruits are spherical, weighing 3-4 g; the flesh is sour-sweet, with a pleasant taste. Fruits contain 10.5% sugars, 1.7% organic acids, and 22.8 mg/100 g of ascorbic acid

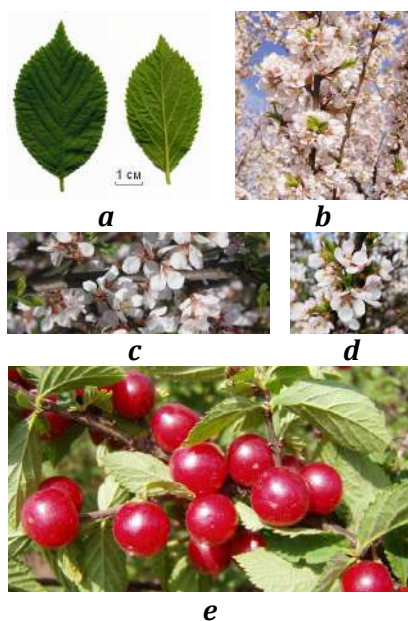


Figure 198. *Prunus tomentosa* 'Efimka' a) leaves, b) flowering branches, c) flowers, d) flowers, e) fruit

Prunus triloba 'Kyivska'

National catalog number: UN0400633

Collection number: 02320

Botanical name in Latin: *Prunus triloba* Lindl.

Botanical name in English: Flowering almond, or Flowering plum

Botanical name in Ukrainian: Slyva trylopatyva

Crop name in Ukrainian: Luizeaniia

Accession name: 'Kyivska' (means "from Kyiv")

Date of introduction: 09.03.2003

Donor: Volodymyr Batochenko, Radyvyliv, Rivne Region, Ukraine

Breeder: Vladimir Batochenko (introducer)

Origin: Originates from the plants of the M.M.Hryshko National Botanical Garden

Time of flowering: April to May

Time of fruit ripening: July

Value: Habit is bushy. Flowers are double, pinkish flowers, 2.5-3.0 cm in diameter, with 13-17 (21) petals. Forms fruits with viable seeds

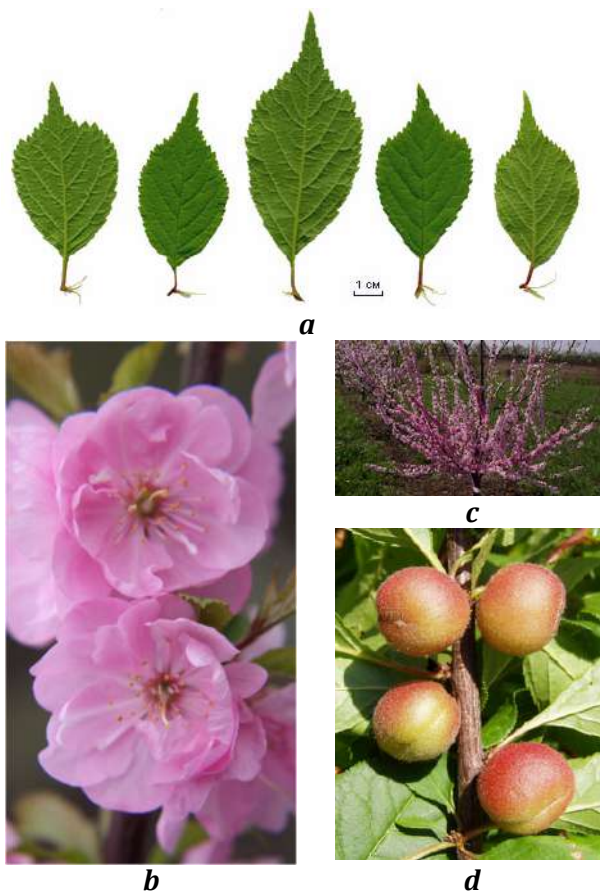


Figure 199. *Prunus triloba* 'Kyivska' a) leaves, b) flowers, c) flowering bush, d) fruit

Prunus triloba 'Ladyslava'

National catalog number: UP1800001

Collection number: 01764

Botanical name in Latin: *Prunus triloba* Lindl.

Botanical name in English: Flowering almond, or Flowering plum

Botanical name in Ukrainian: Slyva trylopateva

Crop name in Ukrainian: Luizeaniia

Accession name: 'Ladyslava' (name of the daughter of the breeder)

Date of introduction: 27.04.1999

Donor: Bakhmut Experimental Station Nurseries Cultivation, Bakhmut, Donetsk Region, Ukraine

Breeders: Volodymyr Batochenko and Volodymyr Mezhenkyj

Origin: Seedling of the 'Nova'

Time of flowering: April to May

Ripening time: Does not form fruit

Value: The accession was registered in the National Center for Plant Genetic Resources of Ukraine for high ornamental value, winter hardiness, and late flowering in 2007. The habit is bushy. Flowers are double, dark pink, 2.5 cm in diameter, with 25-32 (56) petals

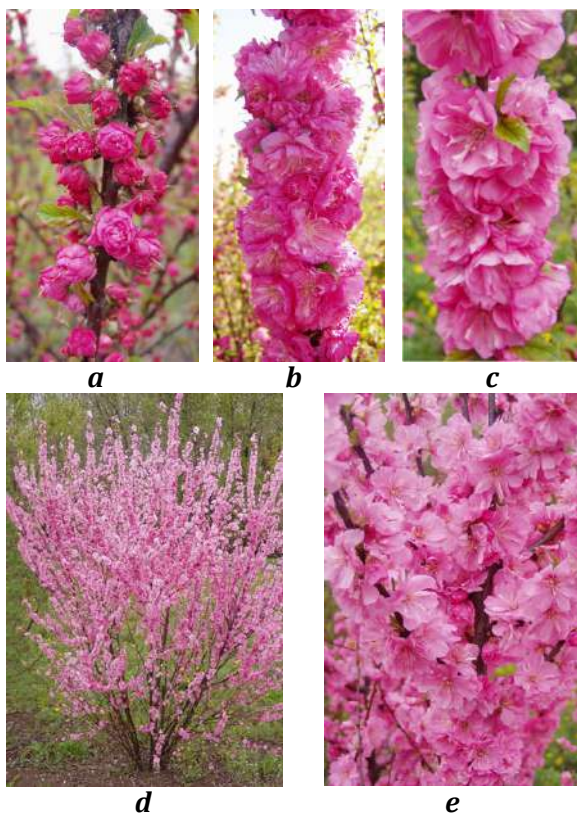


Figure 200. *Prunus triloba* 'Ladyslava' a) beginning of flowering, b) flowering branch, c) flowering branch, d) flowering bush, e) flowering branches

ROSACEAE – ×PYRARIA
ROSE FAMILY – *PYRUS* × *ARIA*

BOLWILLER PEAR

The Bolwiller pear was discovered in Alsace in the late 16th century (Bauhin et al., 1650; Hoff, 2007; Wimmer, 2014). It was first described as *Pirus polwilleriana* and depicted by Jean Bauhin et al. (1650), and its scientific name was proposed by Otto Münchhausen (Münchhausen, 1768). Friedrich Medikus (1789) established a genus *Lazarolus* for this species. Camillo Schneider (1906a, 1906b) proposed the nothogeneric name ×*Sorbopyrus*, following the concept of *Sorbus* s.l. However, within the narrow interpretation of the genus *Sorbus*, a nothogenus was established for the Bolwiller pear, which arose from the cross of *Pyrus* × *Aria*, therefore one belongs to ×*Pyraria* (Chevalier, 1925; Sennikov and Kurtto, 2017). It is a triploid (Sax, 1929) that does not form full-fledged seeds, so it is propagated by grafting. However, sometimes it is possible to obtain seed infructescence, so there are several morphologically distinct forms of Bolwiller pear (Spach, 1834; Decaisne, 1871-1872; Haussknecht, 1902; Schneider, 1906a, 1906b; Malinowski et al., 1968; Machnik, 1976; Postman, 1996, 2011; Hoff, 2007). Other forms likely originated from repeated crosses of Bolwiller pear with pear (Decaisne, 1871-1872), rowan, or Host's whitebeam (Chevalier, 1925). The variety 'Shipovo' is characterized by large and tasty fruits (Mezhenskyj et al., 2012).

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×*Pyraria irregularis* 'Shipovo'

National catalog number: U00100048

Collection number: 02992

Botanical name in Latin: ×*Pyraria irregularis* (Münchh.) Sennikov & Kurtto
(×*Sorbopyrus irregularis* (Münchh.) C.A.Wimm.)

Botanical name in English: Bolwiller pear

Botanical name in Ukrainian: Ariiehrusha nerivnomirna

Crop name in Ukrainian: Ariiehrusha

Accession name: 'Shipovo' ('Šipovo', 'Shipova') (it is a town in Bosnia and Herzegovina)

Date of introduction: 02.01.2009

Donor: One Green World Nursery, Molalla, Oregon, USA

Breeder: -

Origin: Putative seedling of a cross of ×*P. irregularis* 'Bollwiller' × *Pyrus communis* L., developed in the Balkan

Time of flowering: May

Time of fruit ripening: August

Value: Triploid. Fruits are flat-pear-shaped, yellow, with an intense blush on most of the surface, weighing 80 (120) g, and tasty

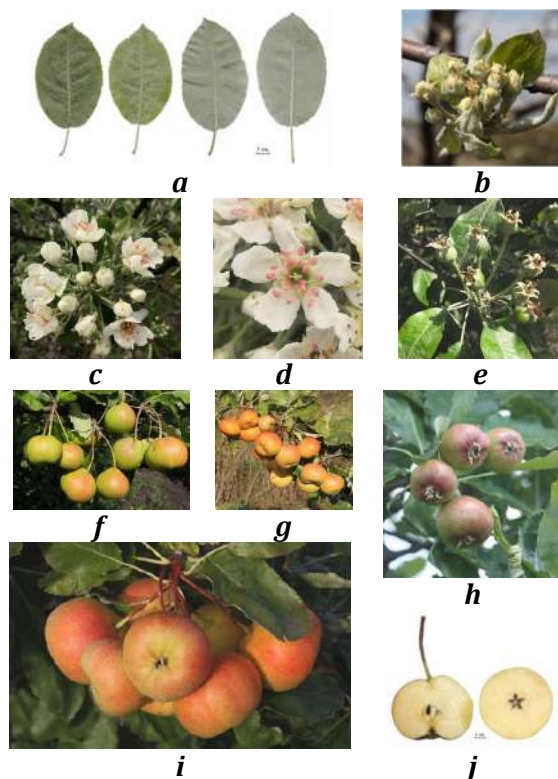


Figure 201. ×*Pyraria irregularis* 'Shipovo' a) leaves, b) flower buds, c) flower buds and young flowers, d) flower, e) young fruit, f) fruit, g) fruit, h) young fruit, i) ripe fruits, j) longitudinal and transverse fruit sections

×Pyraria irregularis No. 03891

National catalog number: U00100049

Collection number: 03891

Botanical name in Latin: *×Pyraria irregularis* (Münchh.) Sennikov & Kurtto
(*×Sorbopyrus irregularis* (Münchh.) C.A.Wimm.)

Botanical name in English: Bolwiller pear

Botanical name in Ukrainian: Ariiehrusha nerivnomirna

Crop name in Ukrainian: Ariiehrusha

Accession name: -

Date of introduction: 31.07.2013

Donor: Institute of Horticulture, Kyiv, Ukraine

Breeder: -

Origin: The natural hybrid originated by crossing between *Aria edulis* (Willd.) M.Roem. and *Pyrus communis* L.

Time of flowering: May

Time of fruit ripening: August

Value: Fruits are yellow, with a blush, weighing 6-9 g

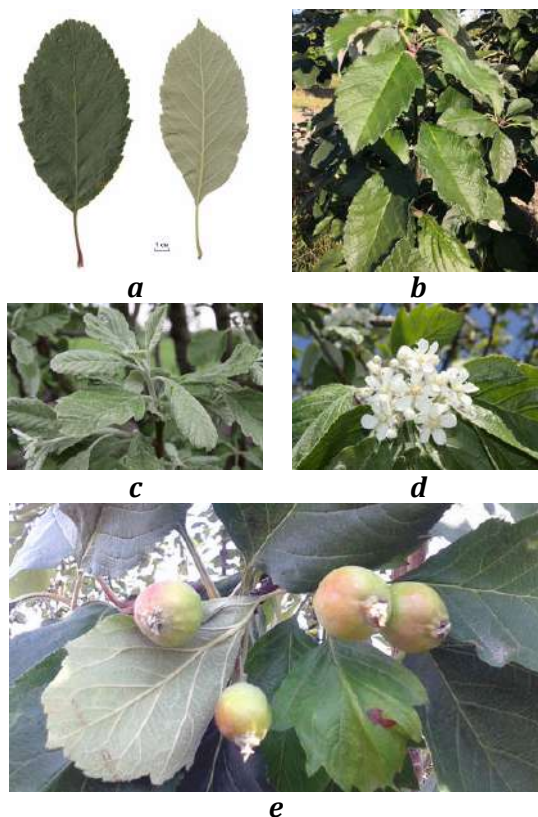


Figure 202. *×Pyraria irregularis* No. 03891 a) leaves, b) branch with leaves, c) young shoot with leaves, d) flowers, e) fruit

ROSACEAE – ×PYRALUS
ROSE FAMILY – MALUS × PYRUS

APPLE-PEAR HYBRIDS

The first artificial hybridization of *Malus domestica* and *Pyrus communis* was carried out by Luther Burbank (Burbank, 1914; Burbank, 1955), but the hybrids turned out to be sterile. Subsequent generations of scientists, in addition to these species, also involved other *Malus* and *Pyrus* species in crosses (Crane and Marks, 1952; Poyarkova, 1953; Gorshkova, 1956; Chernenko, 1957; Nikonenko, 1962; Dushutina, 1971; Brown, 1973; Dimitrov and Delipavlov, 1976; Rudenko, 1978; Kursakov, 1986; Shin et al., 1989; Shimura et al., 1980; Banno et al., 2003; Papikhin, 2006; Fischer et al., 2014). In different countries, fertile hybrids have been developed and used for further breeding work. Apple-pear hybrids were given the nothogeneric name ×*Pyralus* (Mezhenskij, 2005; Mezhenskij, 2011, 2013).

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×Pyralus chernenkoi 'No. 01'

National catalog number: U00100046

Collection number: 02894

Botanical name in Latin: *×Pyralus chernenkoi* Mezhenkyj, nom. nud.

Botanical name in English: *Pyralus*

Botanical name in Ukrainian: Yablunehrusha Chernenka

Crop name in Ukrainian: Yablunehrusha

Accession name: 'No. 01'

Date of introduction: 18.10.2011

Donor: I. V. Michurin All-Russian Research Institute of Genetics and Breeding of Fruit Plants, Michurinsk, Tambov Region, Russia

Breeder: Semyon Chernenko

Origin: Originated from pollination of *Pyrus communis* L. 'Tonkovetka' with a mixture of pollen from different varieties of *Malus domestica* (Suckow) Borkh.

Time of flowering: April to May

Time of fruit ripening: August to September

Value: It is characterized by high resistance to three components of winter hardiness; high heat and drought resistance; complex immunity to scab and powdery mildew. Has viable pollen; prone to the formation of unreduced gametes. Fruit weight 50 (85) g

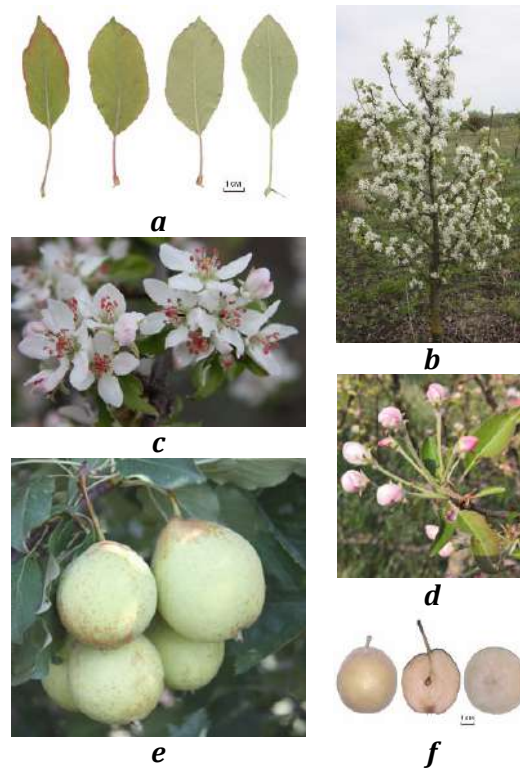


Figure 203. *×Pyralus chernenkoi* 'No. 01' a) leaves, b) flowering tree, c) flowers, d) flower buds, e) fruit, f) fruit shape, longitudinal and transverse fruit sections

×*Pyralus gorshkovae* 'No. 1'

National catalog number: U00100047

Collection number: 03303

Botanical name in Latin: ×*Pyralus gorshkovae* Mezhen'skyj, nom. nud.

Botanical name in English: *Pyralus*

Botanical name in Ukrainian: Yablunehrusha Gorshkovoï

Crop name in Ukrainian: Yablunehrusha

Accession name: 'No. 1'

Date of introduction: 15.07.2007

Donor: I. V. Michurin All-Russian Research Institute of Genetics and Breeding of Fruit Plants, Michurinsk, Tambov Region, Russia

Breeder: Tat'yana Gorshkova

Origin: Originated from pollination of *Malus baccata* (L.) Borkh. with a mixture of pollen from different varieties of *Pyrus communis* L.

Time of flowering: April to May

Time of fruit ripening: September

Value: Characterized by high heat and drought resistance; complex immunity to scab and powdery mildew. Recommended for breeding for restrained growth. Fruit weight 30 (40) g

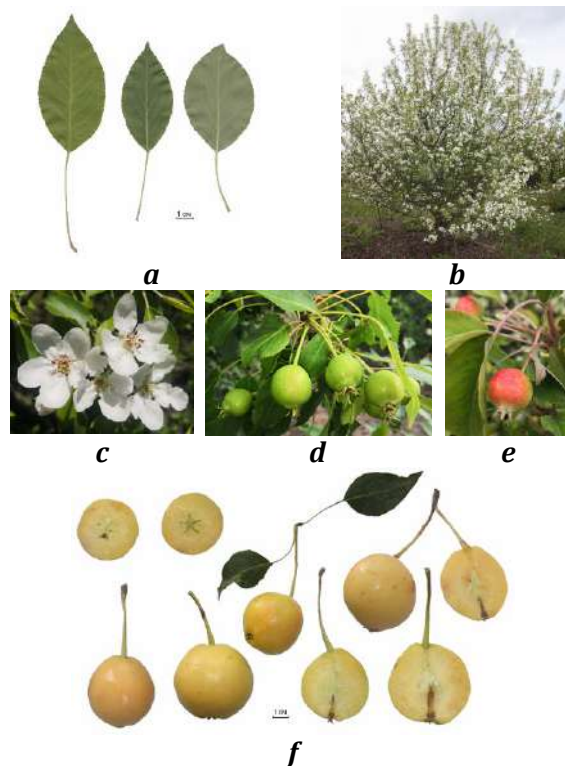


Figure 204. ×*Pyralus gorshkovae* 'No. 1' a) leaves, b) flowering tree, c) flowers, d) young fruit, e) anthocyanin colored fruit (on pear rootstock), f) fruit shape, longitudinal and transverse fruit sections

×Pyralus gorshkovae 'No. 818'

National catalog number: UN0201039

Collection number: 02533

Botanical name in Latin: *×Pyralus gorshkovae* Mezhen'skiy, nom. nud.

Botanical name in English: *Pyralus*

Botanical name in Ukrainian: Yablunehrusha Gorshkovoï

Crop name in Ukrainian: Yablunehrusha

Accession name: 'No. 818'

Date of introduction: 18.08.2003

Donor: I. V. Michurin All-Russian Research Institute of Genetics and Breeding of Fruit Plants, Michurinsk, Tambov Region, Russia

Breeder: Tat'yana Gorshkova

Origin: Originated from pollination of *Malus baccata* (L.) Borkh. with a mixture of pollen from different varieties of *Pyrus communis* L.

Time of flowering: May

Time of fruit ripening: September

Value: It has high potential for all four components of winter hardiness. It is characterized by high heat and drought tolerance; and complex immunity to scab and powdery mildew. Recommended for breeding for restrained growth. Fruit weight 10-20 g

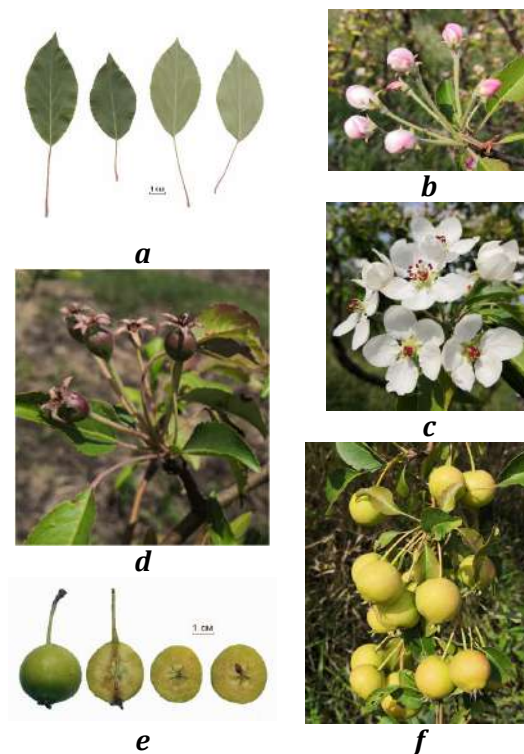


Figure 205. *×Pyralus gorshkovae* 'No. 818' a) leaves, b) flower buds, c) flowers, d) young fruit, e) fruit shape, longitudinal and transverse fruit sections, f) fruit

×Pyralus kursakovii 'No. 839/67'

National catalog number: UN0201040

Collection number: 02532

Botanical name in Latin: *×Pyralus kursakovii* Mezhen'skij

Botanical name in English: Kursakov's pyralus

Botanical name in Ukrainian: Yablunehrusha Kursakova

Crop name in Ukrainian: Yablunehrusha

Accession name: 'No. 839/67'

Date of introduction: 18.08.2003

Donor: I. V. Michurin All-Russian Research Institute of Genetics and Breeding of Fruit Plants, Michurinsk, Tambov Region, Russia

Breeder: Gennadij Kursakov

Origin: Developed from pollination of *Malus prunifolia* (Willd.) Borkh. 'Kitajka Rannaja' with a mixture of pollen *Pyrus communis* L. 'Doyenné d'hiver' 'Curé'

Time of flowering: May

Time of fruit ripening: August to September

Value: Characterized by high resistance to three winter hardiness components and complex immunity to scab and powdery mildew. Has viable pollen; prone to the formation of unreduced gametes. Fruit weight 45-60 g, tasty

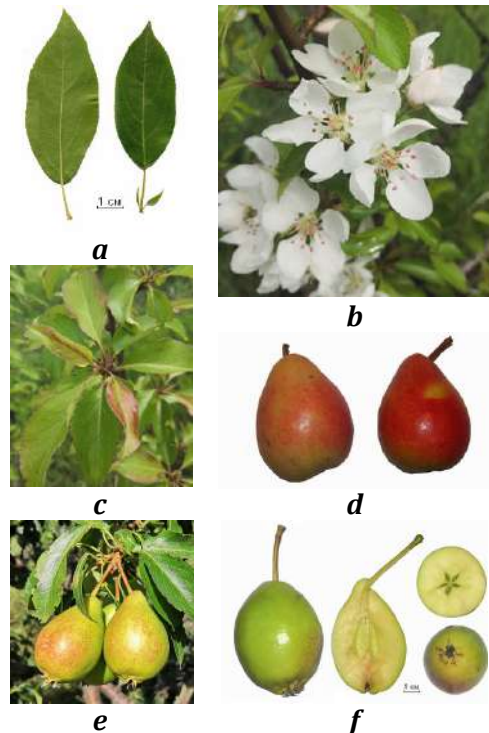


Figure 206. *×Pyralus kursakovii* 'No. 839/67' a) leaves, b) flowers, c) the top of a young shoot with leaves, d) ripe intense colored fruit e) fruit, f) fruit shape, top view, longitudinal and transverse fruit sections

×*Pyralus sychovii* '8-91'

National catalog number: UN0200971

Collection number: 01586

Botanical name in Latin: ×*Pyralus sychovii* Mezhen'skyj, nom. nud.

Botanical name in English: *Pyralus*

Botanical name in Ukrainian: Yablunehrusha Sychova

Crop name in Ukrainian: Yablunehrusha

Accession name: '8-91'

Date of introduction: 04.08.1995

Donor: Bakhmut Experimental Station of Nurseries Cultivation, Bakhmut, Donetsk region, Ukraine

Breeder: Oleksandr Sychov

Origin: Seedling of the pear bred by Pavel Yakovlev and Stanislav Yakovlev 'Svetljanka' ('Slavjanskaja') [= (*Pyrus ussuriensis* Maxim. × 'Beurré Liegel') × 'Clapp's Favorite'] or 'Nezhnost' [= 'Clapp's Favorite' × 'Tyoma'] from free pollination, probably with pollen of *Malus domestica* (Suckow) Borkh.

Time of flowering: May

Time of fruit ripening: August

Value: Fruit weighing 13.5 g

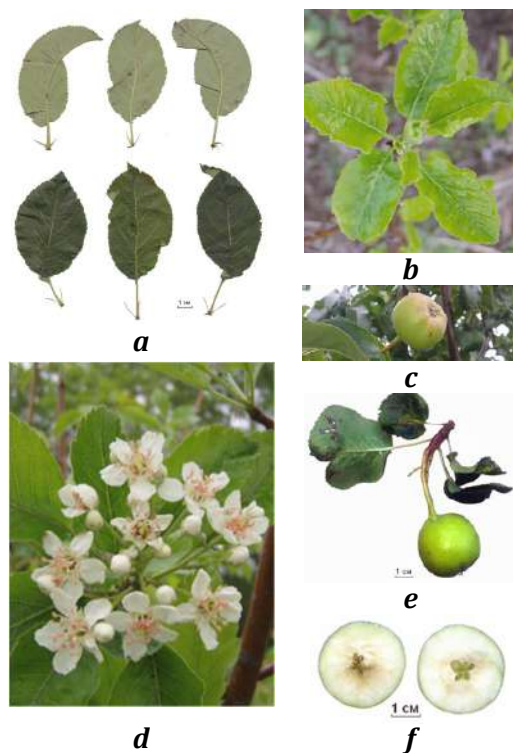


Figure 207. ×*Pyralus sychovii* '8-91' a) leaves, b) young shoot top with leaves, c) fruit, d) flowers and flower buds, e) fruit and leaves, f) transverse fruit sections

ROSACEAE – ×PYROMELES
ROSE FAMILY – CHAENOMELES × PYRUS

JAPANESE QUINCE-PEAR HYBRIDS

Many scientists have crossed Japanese quince with quince, pear, rowan and apple trees (Gleichgewichtówna, 1922; Michurin, 1948; Vekhov, 1937; Gabrielyan-Beketovskaya, 1955; Kostina and Ryabov, 1960; Kalmykov, 1962; Kursakov et al., 1976; Budagovsky, 1978; Ryabov, 1983; Dolmatov, 1992; Poplavskaya, 1985). Several authors reported obtaining viable seedlings with intermediate-type characteristics (Kalmykov, 1962; Kravtsov, 1987; Ryabov, 1983; Dolmatov, 1992). Unfortunately, there is no evidence of true hybridity of these plants (Rudenko, 1970). The new species *Chaenomeles thibetica* Yü, described by the authors as a putative hybrid of Japanese quince and *Docynia* (Yü and Kuan, 1963) is most likely only a form of *Ch. cathayensis* (Hemsl.) C.K.Schneid.

In 1984-1999 we carried out intergeneric crosses, pollinating more than 20 thousand flowers in 768 cross combinations (Mezhenskij, 2003). Most seedlings exhibited matrocliny, while some differed morphologically from the parents. The name ×*Pyromeles* (= *Chaenomeles* Lindl. × *Pyrus* L.) was proposed for hybrids (Mezhenskij, 1996).

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×Pyromeles weberae '2-3-25'

National catalog number: UN9100299

Collection number: 00252

Botanical name in Latin: ?*×Pyromeles weberae* Mezhen'skyj, nom. nud.

Botanical name in English: *Pyromeles*

Botanical name in Ukrainian: Aivohrusha Veber

Crop name in Ukrainian: Aivohrusha, or Pyromel

Accession name: '2-3-25'

Date of introduction: 22.07.2017

Donor: Bakhmut Research Station of Nurseries Cultivation, Bakhmut, Donetsk Region, Ukraine

Breeder: Volodymyr Mezhen'skyj

Origin: Possibly derived from a cross between *Chaenomeles japonica* (Thunb.) Lindl. ex Spach. \times *Pyrus communis* L.

Time of flowering: April

Time of fruit ripening: September

Value: Needs to be tested for hybridity, as it has characteristics of a pear, but not of a Japanese quince. Fruit weight 50 g

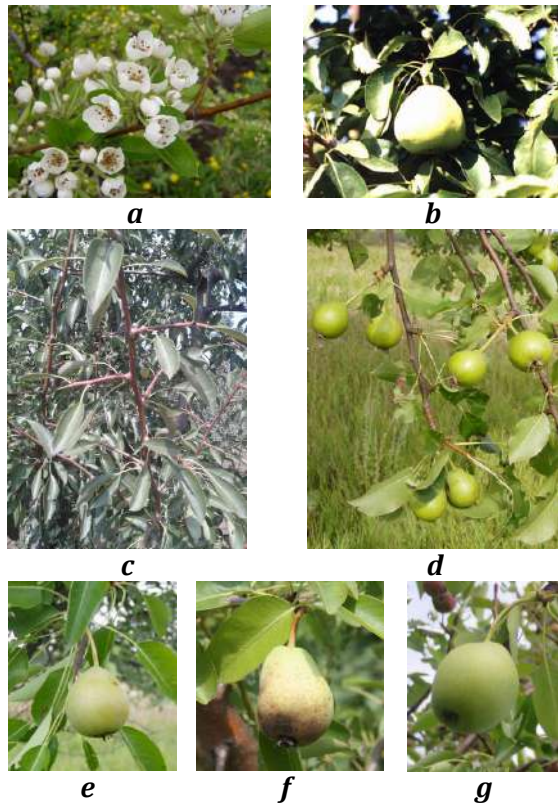


Figure 208. *×Pyromeles weberae* '2-3-25' a) flowers, b) fruit, c) branch with leaves, d) fruit on the branch, e) fruit, f) fruit, g) fruit

×*Pyromeles weberae* '9-19'

National catalog number: UN9100279

Collection number: 04448

Botanical name in Latin: ×*Pyromeles weberae* Mezhen'skyj, nom. nud.

Botanical name in English: *Pyromeles*

Botanical name in Ukrainian: Aivohrusha Veber

Crop name in Ukrainian: Aivohrusha, or Pyromel

Accession name: '9-19'

Date of introduction: 22.07.2017

Donor: Bakhmut Research Station of Nurseries Cultivation, Bakhmut, Donetsk Region, Ukraine

Breeder: Volodymyr Mezhen'skyj

Origin: Developed from a cross between *Chaenomeles japonica* (Thunb.) Lindl. ex Spach.

× *Pyrus communis* L. Japanese quince flowers were pollinated with a mixture of apple and pear pollen, pre-treated in the gas phase of para-aminobenzoic acid

Time of flowering: Does not bloom

Time of fruit ripening: Does not bear fruit

Value: The plant is intermediate between Japanese quince and pear. Needs to be studied more closely and possibly polyploidized to overcome sterility

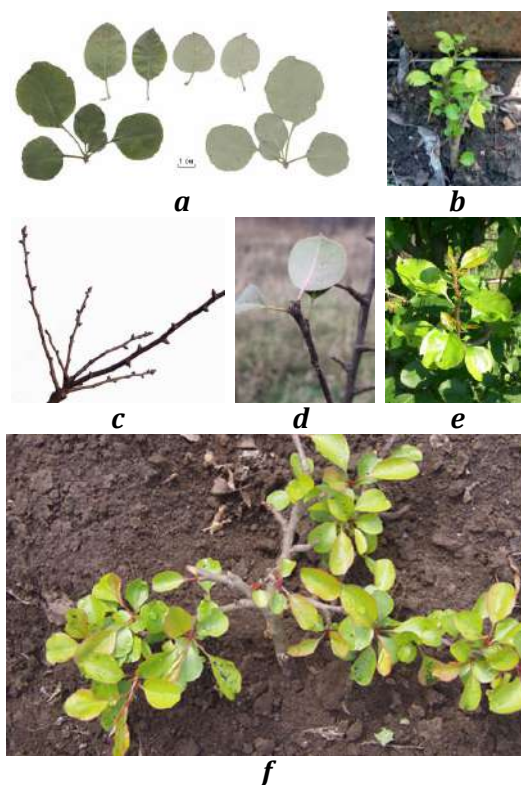


Figure 209. ×*Pyromeles weberae* '9-19' a) leaves, b) plant, c) twigs, d) branch with leaves, e) young shoot with leaves, f) plant grafted on a quince rootstock

ROSACEAE – ×PYRONIA
ROSE FAMILY – *CYDONIA* × *PYRUS*

PEAR-QUINCE HYBRIDS

The spontaneous hybridization of pear and quince could have occurred (Rajabli, 1959). The first artificial hybrid ×*Pyronia veitchii* (= *Cydonia oblonga* × *Pyrus communis*) was developed in Great Britain (Trabut, 1916; Guillaumin, 1925). Two hybrid seedlings were produced by the varieties 'John Seden' and 'Luxemburgeana' (Krüssmann, 1978). They were used to produce F₂ hybrids (Rogers, 1955; Rudenko, 1985). Another hybrid between these species originated in Bulgaria (Baev, 1985). In Japan, a successful hybridization of *Cydonia oblonga* × *Pyrus pyrifolia* was carried out (Shimura et al., 1983).

×*Pyronia veitchii* is important as an indicator for viruses (Desvignes and Savio, 1975; Schimanski, 1980; Kunze, 1986). It is of interest in further crosses to improve fruit quality and rootstock selection (Rogers, 1955; Rudenko, 1985; Browning and Watkins, 1991; Mezhenskij, 2005; Bell and Leitão, 2011; Mezhenskyj et al., 2012; Mărcășan et al., 2023). The fruits are edible (Trabut, 1916). They have medicinal properties because contain the glycoside arbutin (Herissey and Dillemann, 1951).

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×Pyronia veitchii 'Luxemburgiana'

National catalog number: UN0200969

Collection number: 00987

Botanical name in Latin: *×Pyronia veitchii* (Trab.) Guillaumin

Botanical name in English: Pyronia

Botanical name in Ukrainian: Hrusheaiva Vicha

Crop name in Ukrainian: Hrusheaiva, or Pyronia

Accession name: 'Luxemburgiana'

Date of introduction: 06.07.1999

Donor: Botanical Garden of the Academy of Sciences of Moldova, Chişinău, Moldova

Breeder: John Seden; Veitch Nurseries, Great Britain.

Origin: Artificial hybrid of *Pyrus communis* L. 'Bergamotte Esperen' × *Cydonia oblonga* Mill. 'Portugal' developed in the UK

Time of flowering: May

Time of fruit ripening: September

Value: Used as an indicator for viral diseases of fruit plants. It is promising in interspecific hybridization to improve pear/quince traits and in breeding pyronia as a new fruit crop and developing new rootstocks. Fruits contain 11.8% of sugars, 0.3% of organic acids, and 4.8 mg/100 g of ascorbic acid. Fruit weight 150-200 g



a



b



c

Figure 210. *×Pyronia veitchii* 'Luxemburgiana' *a*) flowers and leaves, *b*) flowers and shoot with leaves, *c*) longitudinal fruit section and fruit shape (photo by J. Rabensteiner)

ROSACEAE – PYRUS

ROSE FAMILY – PEAR

RED-FLESHED PEAR

The red-fleshed pear has been known in Germany since at least 1500, with the name 'Sanguinole' (Hogg, 1884; Brown, 1966). In Great Britain, it or similar varieties under the names 'Blood Red Pear' and 'Bloudy Pear' have been noted since the 17th century (Parkinson, 1629; Rea, 1665). At the end of the 18th century, Thomas Knight used the red-fleshed 'Blood Pear' in pear breeding, developing a new variety 'Carmine Core'. In the 20th century, the red-fleshed pears 'Bloody Bastard', 'Wick Court Alex', and others were used for the production of perry (Red Fleshed Pears, 2021). The gene pool of red-fleshed pears is stored in scientific collections and amateurs gardens in different countries (Hocking Hills Orchard, 2019; Pear growers, 2020; Red Fleshed Pears, 2021; Bergonzoni et al., 2023). In Ukraine, a large-fruited variety 'Vesilna' was developed (Tolstolyk, 2015; Tolstolyk and Krasulia, 2017). The interest in red-fleshed pears has increased due to the high content of anthocyanins and flavonoids in the fruit and their high antioxidant capacity, which is valued in the system of rational nutrition. In Italy, an ancient variety of red-fleshed pear 'Cocomerina' is cultivated, distinguishing between early-ripening and late-ripening ecotypes. The late-ripening 'Cocomerina' is characterized by the highest content of polyphenolic compounds and anthocyanins, while the content of flavonoids in ripe fruits is similar between the two ecotypes. The fruits of the early ripe ecotype accumulate more flavones and flavonols, while fruits of the later ecotype contain more dihydro flavonols. Fresh juices and extracts from 'Cocomerina' fruits have high anti-oxidant and anti-inflammatory properties and can be used for healthy nutrition (Bucchini et al., 2016; Giamperi et al., 2017).

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Pyrus communis 'Buriakivka'

National catalog number: UN0201009

Collection number: 02552

Botanical name in Latin: *Pyrus communis* L. Redflesh Group

Botanical name in English: Common pear

Botanical name in Ukrainian: Hrusha zvychaina

Crop name in Ukrainian: Chervonomiakushna hrusha

Accession name: 'Buriakivka' (means "like a beetroot")

Date of introduction: 27.01.1981

Donor: M. M. Hryshko National Botanical Garden of the National Academy of Sciences of Ukraine, Kyiv, Ukraine

Breeder: -

Origin: An ancient European variety

Time of flowering: May

Time of fruit ripening: July to August

Value: A source of anthocyanin coloration of the pulp. Fruit weight 25 g



a



b



c



d

Figure 211. *Pyrus communis* 'Buriakivka' a) fruit, b) fruit shape and longitudinal fruit section, c) fruit, d) fruit shape and longitudinal fruit section

Pyrus communis 'Cocomerina'

National catalog number: UN0201285

Collection number: 03506

Botanical name in Latin: *Pyrus commumis* L. Redflesh Group

Botanical name in English: Common pear

Botanical name in Ukrainian: Hrusha zvychaina

Crop name in Ukrainian: Chervonomiakushna hrusha

Accession name: 'Cocomerina' (means "watermelon")

Date of introduction: 20.03.2012

Donor: Vladimiro Rokko, Stanghella, Italy

Breeder: -

Origin: An ancient Italian variety

Time of flowering: May

Time of fruit ripening: September to October

Value: Source of anthocyanin coloration of the flesh. Fruit weight 60 g

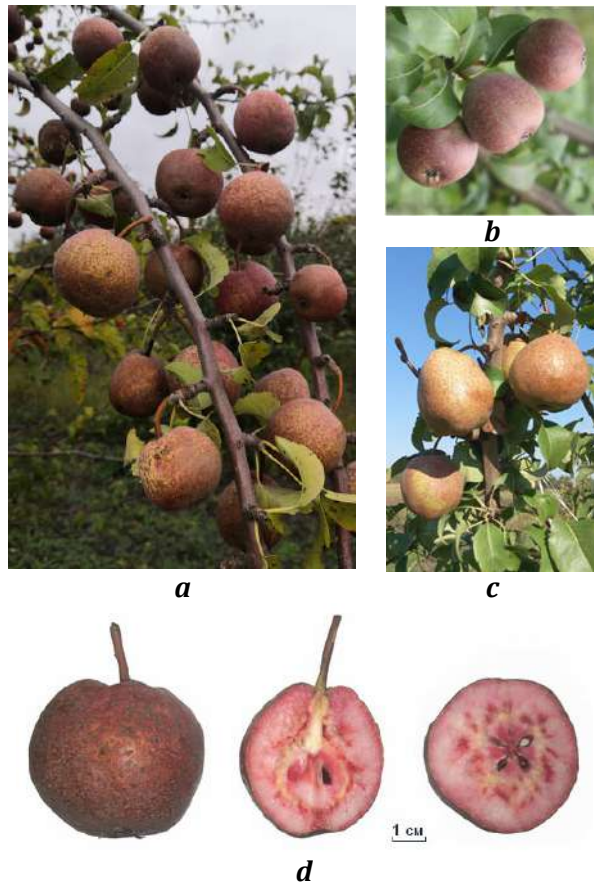


Figure 212. *Pyrus communis* 'Cocomerina' a) fruit on the branch, b) fruit, c) fruit, d) fruit shape, longitudinal and transverse fruit sections

Pyrus communis 'Krasnomjasaja'

National catalog number: UN0200377

Collection number: 03106

Botanical name in Latin: *Pyrus commumis* L. Redflesh Group

Botanical name in English: Common pear

Botanical name in Ukrainian: Hrusha zvychaina

Crop name in Ukrainian: Chervonomiakushna hrusha

Accession name: 'Krasnomjasaja' ('Krasnomyasaya') (means "red-fleshed")

Date of introduction: 07.11.2009

Donor: Botanical Garden at Taurida University, Simferopol, Crimea, Ukraine

Breeder: -

Origin: Originally from the Caucasus

Time of flowering: May

Time of fruit ripening: August

Value: Source of anthocyanin coloration of the flesh. Fruit weight 60 g

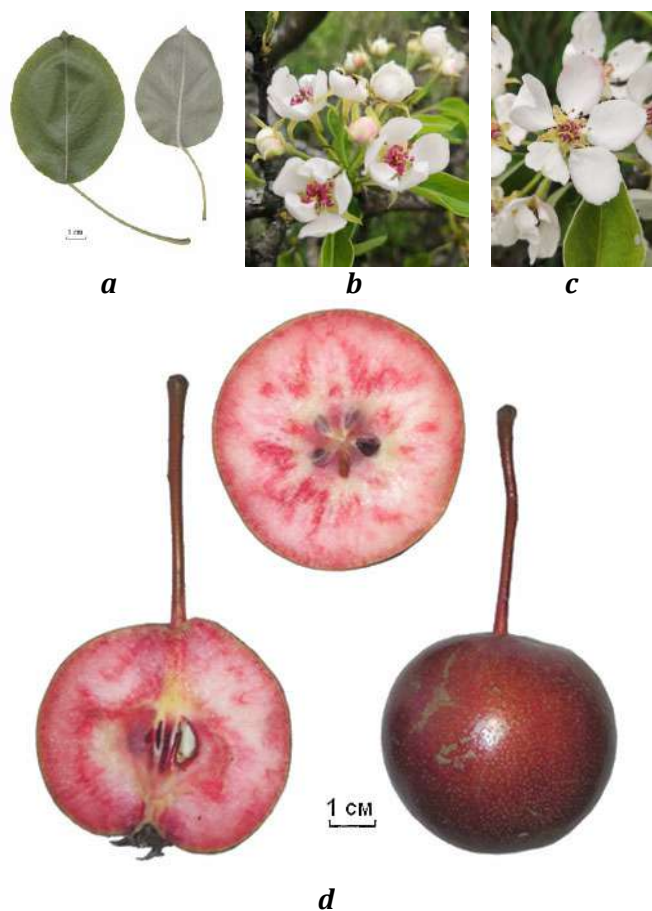


Figure 213. *Pyrus communis* 'Krasnomjasaja' a) leaves, b) flowers and flower buds, c) flower, d) fruit shape, longitudinal and transverse fruit sections

Pyrus communis 'Ribbeck'

National catalog number: UN0201287

Collection number: 04144

Botanical name in Latin: *Pyrus commumis* L. Redflesh Group

Botanical name in English: Common pear

Botanical name in Ukrainian: Hrusha zvychaina

Crop name in Ukrainian: Chervonomiakushna hrusha

Accession name: 'Ribbeck' (surname)

Date of introduction: 24.08.2015

Donor: Johannes Rabenstein, Graz, Austria

Breeder: -

Origin: German variety obtained by Rabensteiner through the Hungarian gardener Laki

Time of flowering: May

Time of fruit ripening: August

Value: Source of anthocyanin coloration of the flesh. Fruit weight 35 g

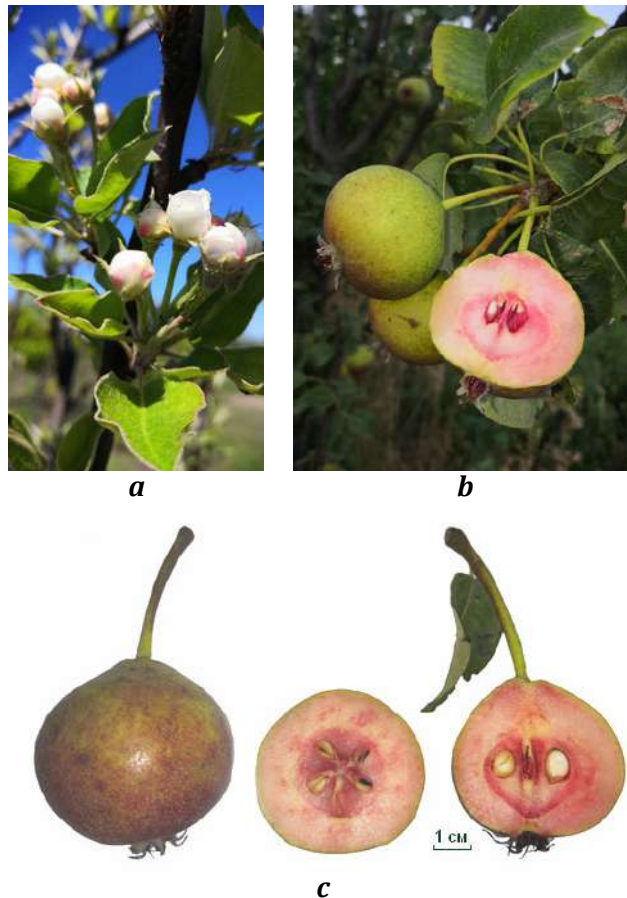


Figure 214. *Pyrus communis* 'Ribbeck' a) flower buds, b) fruit and longitudinal fruit section, c) fruit shape, transverse and longitudinal fruit sections

Pyrus communis 'Vérbélü Körte'

National catalog number: UN0201288

Collection number: 04263

Botanical name in Latin: *Pyrus commumis* L. Redflesh Group

Botanical name in English: Common pear

Botanical name in Ukrainian: Hrusha zvychaina

Crop name in Ukrainian: Chervonomiakushna hrusha

Accession name: 'Vérbélü Körte' ('Chervonomiakushna') (means "red-fleshed pear")

Date of introduction: 27.02.2016

Donor: Zakarpattia State Agricultural Experimental Station, Berehove, Zakarpattia Region, Ukraine

Breeder: -

Origin: An ancient Hungarian variety

Time of flowering: May

Time of fruit ripening: August

Value: Source of anthocyanin coloration of the flesh. Fruit weight 50 g



a



b

c

Figure 215. *Pyrus communis* 'Vérbélü Körte' a) fruit on the branch, b) fruit shape, bottom view, longitudinal and transverse fruit sections, c) longitudinal fruit section

Pyrus communis 'Vesilna'

National catalog number: UN0201057

Collection number: 04610

Botanical name in Latin: *Pyrus communis* L. Redflesh Group

Botanical name in English: Common pear

Botanical name in Ukrainian: Hrusha zvychaina

Crop name in Ukrainian: Chervonomiakushna hrusha

Accession name: 'Vesilna' (means "wedding")

Date of introduction: 20.01.2019

Donor: Amiran Hadzhomiia, Stryi, Lviv Region, Ukraine

Breeders: Iryna Maksymova, Liudmyla Tolstolyk, and Tetiana Krasulia; M. F. Sydorenko
Melitopol Experimental Station of Horticulture

Origin: It is a cross of 'Williams' × 'Krasnomjasaja'

Time of flowering: May

Time of fruit ripening: August

Value: A source of anthocyanin coloration of the flesh, compatibility with quince A, one-dimensionality of the fruit, attractive appearance and excellent taste (9 points), high content of biologically active substances (1375.0 mg/100 g). Fruits are yellow, with a blurred russet, weighing 150 (200) g

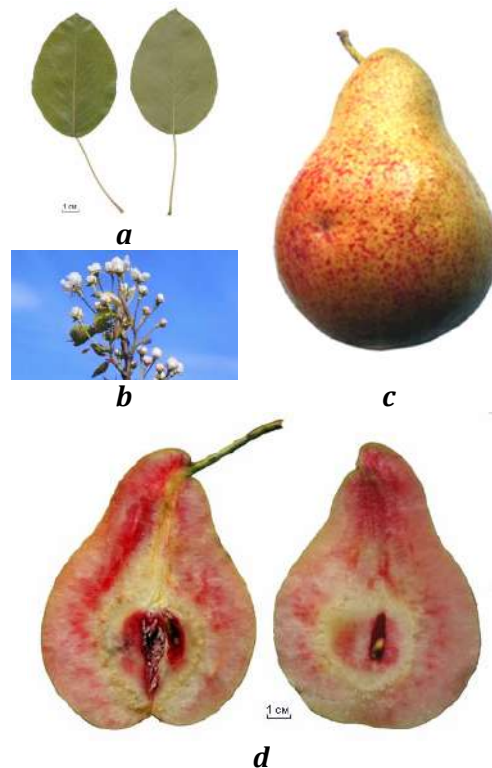


Figure 216. *Pyrus communis* 'Vesilna' a) leaves, b) flower buds and young flowers, c) fruit shape, d) longitudinal section of the fruit

ROSACEAE – PYRUS

ROSE FAMILY – ASIAN PEAR

ASIAN PEAR, OR NASHI

Fruit production in East Asia is based primarily on *Pyrus pyrifolia* and *P. ×bretschneideri*. In contrast to European pear varieties, which are valued for their delicate, buttery flesh, Asian pear varieties typically have a crispy texture. They are characterized by resistance to bacterial burn, so they are involved in hybridization with the European pear (Layne and Quamme, 1975; Lobachev, 1983; Bell, 1990; Bell et al., 1996; Zhang, 2002; Bao et al., 2007; Hancock and Lobos, 2008; Bell and Itai, 2011; Saito, 2016).

It is proposed to classify varieties based on them as Chinese White Pear Group, Japanese Pear Group, and Chinese Sand Pear Group (Bao et al., 2008; Iketani et al., 2012). Hybrids of *P. communis* × *P. pyrifolia* were given the name *P. ×lecontii* (Rehder, 1926). Recently, they have gained popularity under the name “papple”, and thus these varieties can be distinguished in the *Pyrus* Papple Group.

Asian pear varieties are gaining also popularity in Ukraine (Mezhenskij and Sychov, 1999; Mezhenskyj, 2009, 2015; Mezhenskij, 2013).

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Pyrus ×bretschneideri 'Pingguo Li'

National catalog number: UN0200160

Collection number: 01762

Botanical name in Latin: *Pyrus ×bretschneideri* Rehder (White Pear Group)

Botanical name in English: Chinese white pear

Botanical name in Ukrainian: Hrusha Bretsheidera

Crop name in Ukrainian: Kytaiska hrusha

Accession name: 'Pingguo Li' ('Pingo Li') (means "apple pear" or derived from a local toponym)

Date of introduction: 27.04.1999

Donor: Volodymyr Batochenko, Radyvyliv, Rivne Region, Ukraine

Breeder: -

Origin: An ancient Chinese variety selected in Jilin Province, China

Time of flowering: May

Time of fruit ripening: September

Value: Fruits are flattened to broadly conical, weighing 120-200 g. Greenish-yellow, with large dark spots; juicy, sweet flesh. Source of complex resistance to pathogens

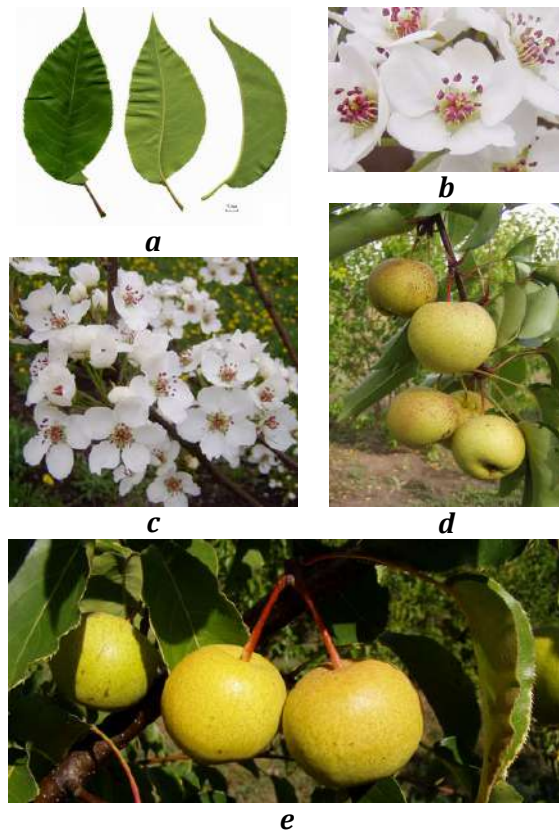


Figure 217. *Pyrus ×bretschneideri* 'Pingguo Li' a) leaves, b) flowers, c) flowers, d) fruit, e) fruit

Pyrus ×lecontei 'Bronzovaja'

National catalog number: UN0201015

Collection number: 01855

Botanical name in Latin: *Pyrus ×lecontei* Rehder (Papple Group)

Botanical name in English: Le Conte pear

Botanical name in Ukrainian: Hrusha Lekonte

Crop name in Ukrainian: Hibrydna hrusha

Accession name: 'Bronzovaja' ('Bronzovaya') (means "bronze")

Date of introduction: 06.08.1999

Donor: Crimean Experimental Breeding Station VIR - N. I. Vavilov Research Institute of Plant Industry, Krymsk, Krasnodar Krai, Russia

Breeders: Evgenij Sedov and Gennadiy Eryomin

Origin: Developed from seedlings from free pollination of Korean varieties

Time of flowering: May

Time of fruit ripening: August

Value: Tree of medium height, early maturity, complex resistance to pathogens (scab, ash leaf spot, fabraea leaf spot, fire blight). Fruits are flattened, spherical, with specks, weighing 140 g; juicy, crispy flesh

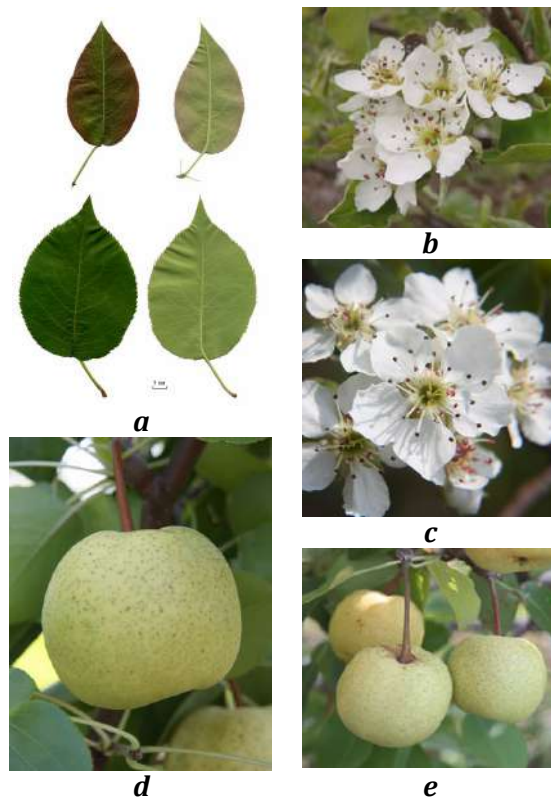


Figure 218. *Pyrus ×lecontei* 'Bronzovaja' a) young leaves (top), adult leaves (bottom), b) flowers, c) flowers, d) fruit, e) fruit

Pyrus ×lecontei 'PremP45'

National catalog number: UN0201286

Collection number: 04349

Botanical name in Latin: *Pyrus ×lecontei* Rehder (Papple Group)

Botanical name in English: Le Conte pear

Botanical name in Ukrainian: Hrusha Lekonte

Crop name in Ukrainian: Hibydna hrusha

Accession name: 'PremP45'

Donor: Julian Geyer, Graz, Austria

Breeder: Roy Hart, Nelson, New Zealand

Origin: A New Zealand variety developed from a cross between *Pyrus communis* L. 'Red Bartlett' and *Pyrus pyrifolia* (Burm.f.) Nakai 'Nijisseiki'. Distributed under the trademark Maxie®

Time of flowering: May

Time of fruit ripening: September

Value: Anthocyanin color of the fruit skin. Dwarf habit, complex resistance to pathogens. Fruits are flattened, spherical, with red integumentary color on most of the fruit surface, weighing 80 g; juicy, crispy flesh

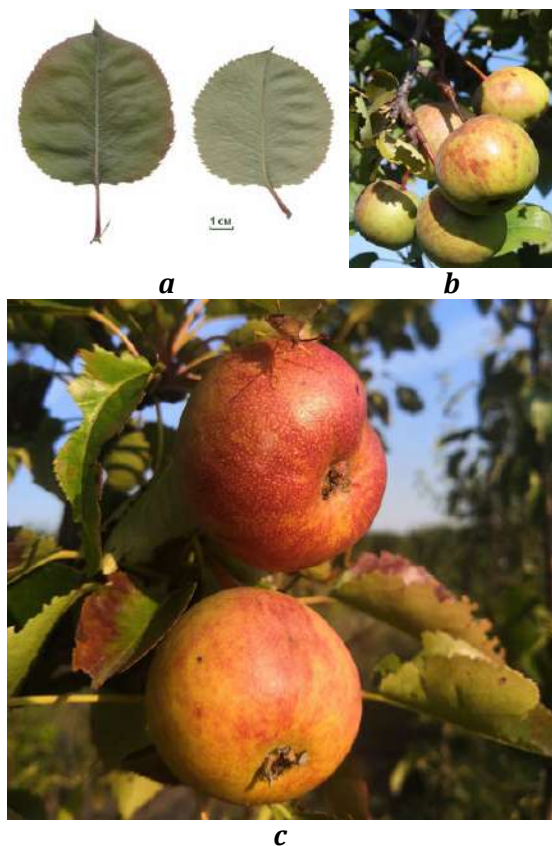


Figure 219. *Pyrus ×lecontei* 'PremP45' a) leaves, b) unripe fruit, c) ripe fruit

Pyrus ×lecontei 'Utrennjaja Svezhest'

National catalog number: UN0201010

Collection number: 01856

Botanical name in Latin: *Pyrus ×lecontei* Rehder (Papple Group)

Botanical name in English: Le Conte pear

Botanical name in Ukrainian: Hrusha Lekonte

Crop name in Ukrainian: Hibrydna hrusha

Accession name: 'Utrennjaja Svezhest' ('Utrennyaya Svezhest') (means "morning freshness")

Date of introduction: 06.08.1999

Donor: Crimean Experimental Breeding Station VIR - N. I. Vavilov Research Institute of Plant Industry, Krymsk, Krasnodar Krai, Russia

Breeders: Evgenij Sedov and Gennadiy Eryomin

Origin: Developed from seedlings from free pollination of Korean varieties

Time of flowering: May

Time of fruit ripening: August

Value: The variety was included in the State Register of Breeding Achievements of the Russian Federation in 2011. Tree of medium height, early maturity, complex resistance to pathogens (scab, ashy leaf spot, fabraea leaf spot, fire blight). Fruits are flattened, greenish, with specks, weighing 150 (300) g; the flesh is juicy, and crispy. Fruits contain 9.8% sugars, 0.4% organic acids, and 2.8 mg/100 g ascorbic acid

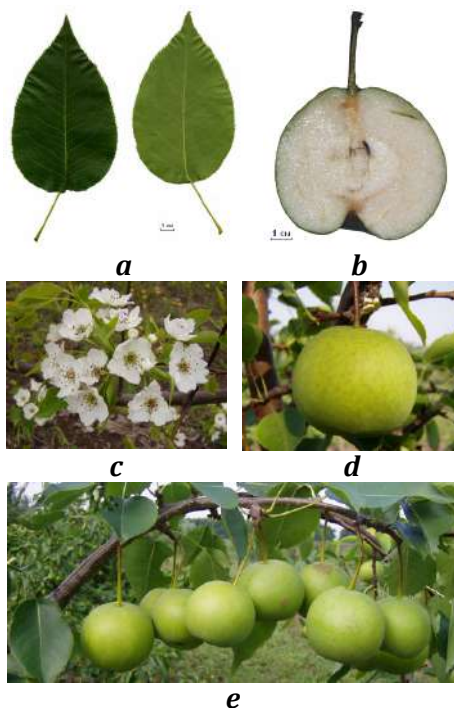


Figure 220. *Pyrus ×lecontei* 'Utrennjaja Svezhest' a) leaves, b) longitudinal fruit section, c) flowers, d) fruit, e) fruit on the branch

Pyrus pyrifolia 'Hosui'

National catalog number: UN0201029

Collection number: 02357

Botanical name in Latin: *Pyrus pyrifolia* (Burm.f.) Nakai (Japanese Pear Group)

Botanical name in English: Asian pear, Chinese pear, Japanese pear, Korean pear, Nashi, or Sand pear

Botanical name in Ukrainian: Hrusha hrusholystkova

Crop name in Ukrainian: Aziiska hrusha, Nashi, or Yaponska hrusha

Accession name: 'Hosui' (means "much water," indicating juicy flesh)

Date of introduction: 07.02.2003

Donor: Nikita Botanical Garden, Nikita, Crimea, Ukraine

Breeder: -

Origin: A Japanese variety developed from a cross of 'Kikusui' × 'Yakumo') × 'Yakumo' or probably 'Kosui' × 'Hiratsuka 1 gou'

Time of flowering: May

Time of fruit ripening: September

Value: Fruits are flattened, brownish, with large gray specks; the flesh is juicy, and crispy. Source of complex resistance to pathogens

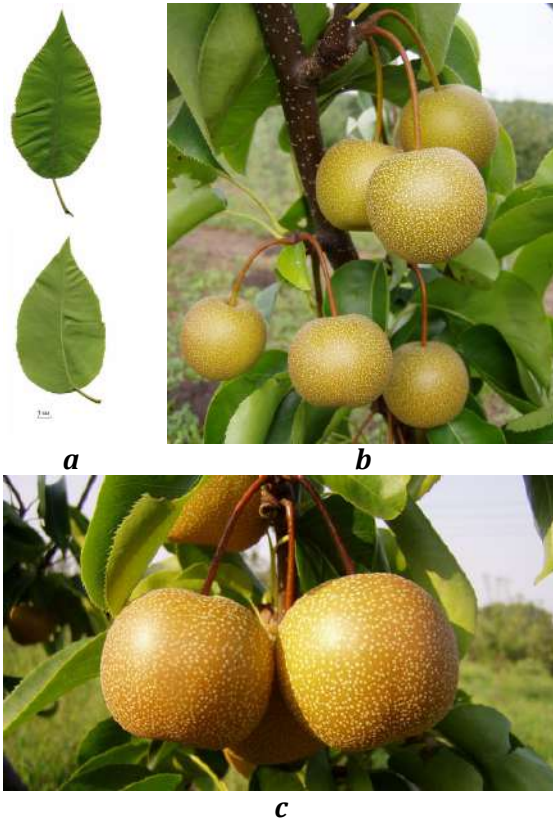


Figure 221. *Pyrus pyrifolia* 'Hosui' a) leaves, b) fruit, c) fruit

Pyrus pyrifolia 'Nijisseiki'

National catalog number: UN0201032

Collection number: 04326

Botanical name in Latin: *Pyrus pyrifolia* (Burm.f.) Nakai (Japanese Pear Group)

Botanical name in English: Asian pear, Chinese pear, Japanese pear, Korean pear, Nashi, or Sand pear

Botanical name in Ukrainian: Hrusha hrusholystkova

Crop name in Ukrainian: Aziiska hrusha, Nashi, or Yaponska hrusha

Accession name: 'Nijisseiki' (means "20th Century")

Date of introduction: 14.03.2017

Donor: Ömer Selim, Trabzon, Turkey

Breeder: -

Origin: Ancient Japanese variety of unknown origin

Time of flowering: May

Time of fruit ripening: September

Value: Fruits are flattened, yellow, with large gray spots; the flesh is juicy, and crispy. Source of complex resistance to pathogens

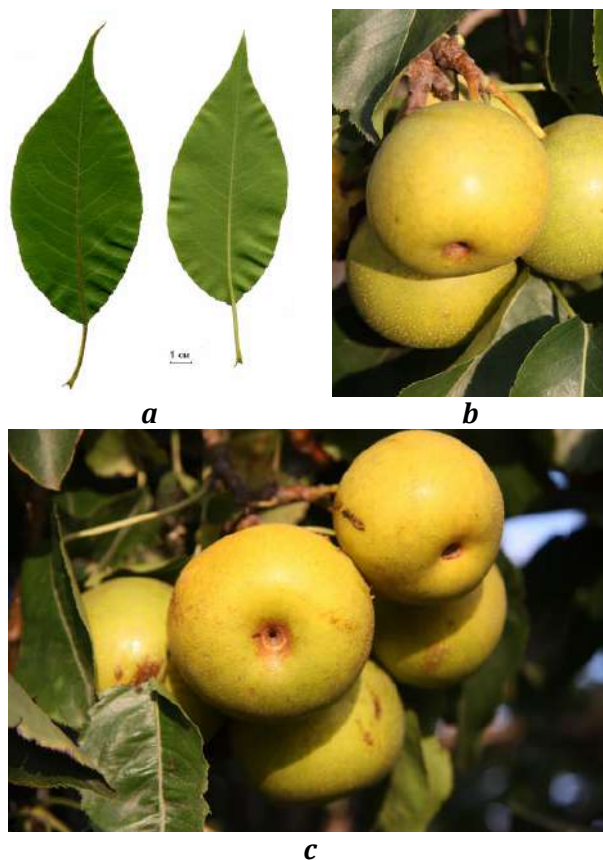


Figure 222. *Pyrus pyrifolia* 'Nijisseiki' a) leaves, b) fruit, c) fruit

Pyrus pyrifolia 'Shin Li'

National catalog number: UN0201096

Collection number: 02988

Botanical name in Latin: *Pyrus pyrifolia* (Burm.f.) Nakai (Japanese Pear Group)

Botanical name in English: Asian pear, Chinese pear, Japanese pear, Korean pear, Nashi, or Sand pear

Botanical name in Ukrainian: Hrusha hrusholystkova

Crop name in Ukrainian: Aziiska hrusha, Nashi, or Yaponska hrusha

Accession name: 'Shin Li' (means "new pear")

Date of introduction: 02.01.2009

Donor: One Green World Nursery, Molalla, Oregon, USA

Breeder: Ben T. Iwakiri; University of California, Davis, California, USA

Origin: American variety derived from a cross of 'Kikusui' × 'Tsu Li'

Time of flowering: May

Time of fruit ripening: September

Value: Fruits are flattened, green, with large gray spots; the flesh is juicy, and crispy. Source of complex resistance to pathogens

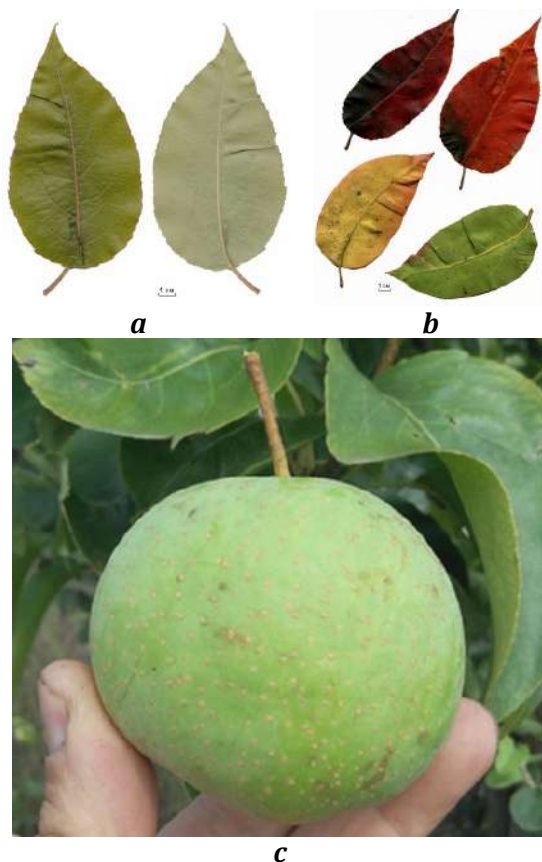


Figure 223. *Pyrus pyrifolia* 'Shin Li' a) leaves, b) autumn leaves, c) fruit

Pyrus pyrifolia 'Shinko'

National catalog number: UN0201097

Collection number: 02989

Botanical name in Latin: *Pyrus pyrifolia* (Burm.f.) Nakai (Japanese Pear Group)

Botanical name in English: Asian pear, Chinese pear, Japanese pear, Korean pear, Nashi, or Sand pear

Botanical name in Ukrainian: Hrusha hrusholystkova

Crop name in Ukrainian: Aziiska hrusha, Nashi, or Yaponska hrusha

Accession name: 'Shinko' (means "new fragrance")

Date of introduction: 02.01.2009

Donor: One Green World Nursery, Molalla, Oregon, USA

Breeder: It is bred through Research Stations in Niigata and Okayama, Japan

Origin: Japanese variety developed from a cross of 'Nijisseiki' × 'Amanogawa'

Time of flowering: May

Time of fruit ripening: September

Value: Fruits are flattened, brownish, with large gray specks; the flesh is juicy, and crispy. Source of complex resistance to pathogens

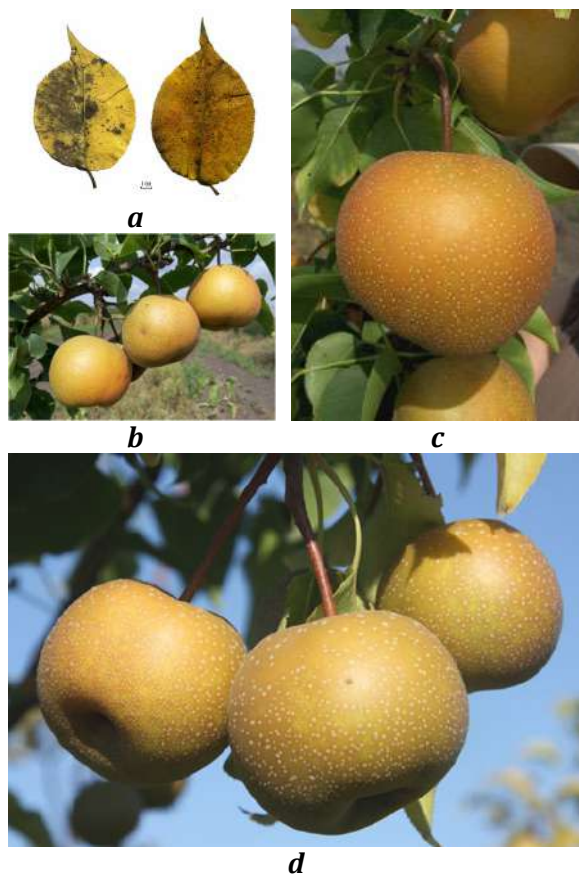


Figure 224. *Pyrus pyrifolia* 'Shinko' a) late autumn leaves, b) fruit, c) fruit, d) fruit

Pyrus pyrifolia 'Shinseiki'

National catalog number: UN0201031

Collection number: 02359

Botanical name in Latin: *Pyrus pyrifolia* (Burm.f.) Nakai (Japanese Pear Group)

Botanical name in English: Asian pear, Chinese pear, Japanese pear, Korean pear, Nashi, or Sand pear

Botanical name in Ukrainian: Hrusha hrusholystkova

Crop name in Ukrainian: Aziiska hrusha, Nashi, or Yaponska hrusha

Accession name: 'Shinseiki' (means "a new century")

Date of introduction: 07.02.2003

Donor: Nikita Botanical Garden, Nikita, Crimea, Ukraine

Breeder: Teji Ishikawa; Agricultural Research Station in Okayama Prefecture, Japan

Origin: It is a cross between 'Nijiseiki' and 'Chojuro'

Time of flowering: May

Time of fruit ripening: September

Value: Fruits are flattened, greenish-yellow, with large gray spots, weighing 100-190 g; the flesh is juicy, and crispy. Source of complex resistance to pathogens

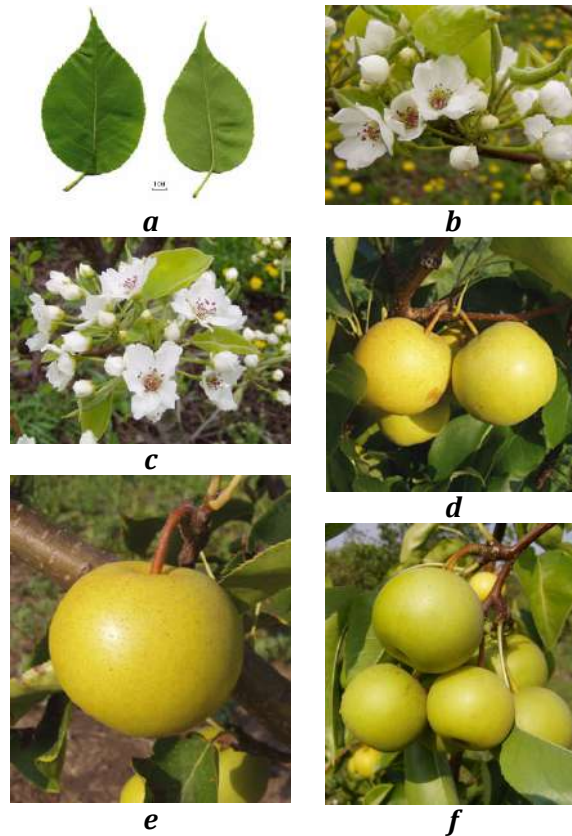


Figure 225. *Pyrus pyrifolia* 'Shinseiki' a) leaves, b) flowers and flower buds, c) flowers and flower buds, d) fruit, e) fruit, f) fruit

Pyrus pyrifolia 'Sychovka'

National catalog number: UN0201034

Collection number: 02553

Botanical name in Latin: *Pyrus pyrifolia* (Burm.f.) Nakai (Japanese Pear Group)

Botanical name in English: Asian pear, Chinese pear, Japanese pear, Korean pear, Nashi, or Sand pear

Botanical name in Ukrainian: Hrusha hrusholystkova

Accession name: 'Sychovka' [derivate of surname Sychov]

Date of introduction: 07.02.2003

Donor: Bakhmut Experimental Station of Nurseries Cultivation, Bakhmut, Donetsk Region, Ukraine

Breeders: Oleksandr Sychov and Volodymyr Mezhenskyj

Origin: Seedling of an unknown pear variety obtained from Korea

The flowering time: May

Time of fruit ripening: September

Value: Fruits are flattened to broadly conical, brownish, with large gray spots, weighing 100-150 g; the flesh is juicy, and crispy. Source of complex resistance to pathogens

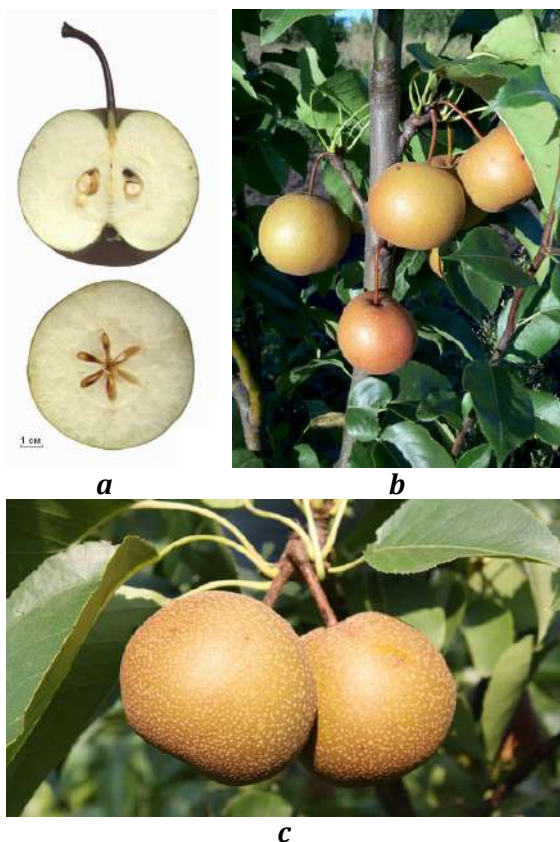


Figure 226. *Pyrus pyrifolia* 'Sychovka' a) longitudinal and transverse fruit sections, b) fruit, c) fruit

ROSACEAE – ROSA

ROSE FAMILY – ROSE

APPLE ROSE, CINNAMON ROSE, DOG ROSE, AND CHESTNUT ROSE

The genus *Rosa* is numerous, with up to 268 species (POWO, 2023). There are 60-80 species in the natural flora of Ukraine that require critical analysis; more than 30 species have been introduced (Mitin, 1993; Kokhno and Kurdyuk, 1994; Kliuienko and Sobko, 2005). A long history of cultivation, high level of hybridization processes, and multiple polyploidy in the evolution of the genus *Rosa* have led to nomenclatural chaos and prevented the final establishment of phylogenetic relationships (Kurtto et al., 2004; Wissemann and Ritz, 2005; Bruneau et al., 2007; Koopman et al., 2008; Werlemarkand and Nybom, 2010).

Rose hips are characterized by a high content of vitamin C and contain a complex of other biologically active substances, which determines their value as raw materials for the pharmaceutical industry (Zakordonets, 1953; Ban'kovskij and L'vov, 1962; Petrova, 1986; Strelets, 2009; Mezhenskij and Mezhenskaya, 2013; Mezhenskyj et al., 2014, 2022; Mezhenskyj and Mezhenska, 2016).

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Rosa canina 'Ukrainska Bezshipna'

National catalog number: UR4600568

Collection number: 03358

Botanical name in Latin: *Rosa canina* L.

Botanical name in English: Dog rose

Botanical name in Ukrainian: Shypshyna sobacha

Crop name in Ukrainian: Shypshyna

Accession name: 'Ukrainska Bezshipna' (means "Ukrainian thornless")

Date of introduction: 20.08.2011

Sample origin:

Donor: Volodymyr Mezhenkyj, Bakhmut, Donetsk Region, Ukraine

Breeder: Volodymyr Mezhenkyj

Origin: Seedling of 'Artemivska Bezshipna'

Time of flowering: May-June

Time of fruit ripening: September

Value: The cultivar was included in the State Register of Plant Varieties of Ukraine in 2022. Shoots are thornless. Fruits are ellipsoidal to ellipsoidal-ovoid, red, weighing 3.0 (4.0) g. Fruits contain 3.8% sugars, 2.6% organic acids, 200.0 mg/100 g of ascorbic acid, and 24.1 mg/100 g of carotene

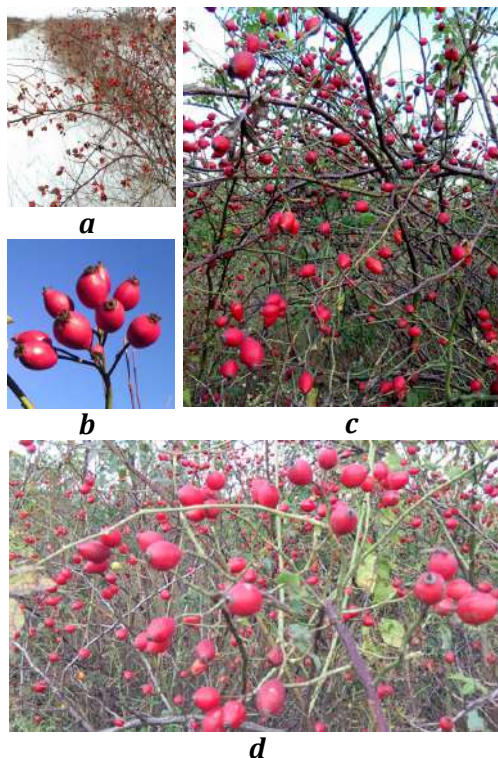


Figure 227. *Rosa canina* 'Ukrainska Bezshipna' a) bushes with fruits in winter, b) fruit on the branches, c) fruit, d) fruit on the branches

Rosa majalis × *R. webbiana* 'Spalakh'

National catalog number: UR4600567

Collection number: 03356

Botanical name in Latin: *Rosa majalis* Herrm. × *R. webbiana* Royle

Botanical name in English: Cinnamon rose × Webb's rose

Botanical name in Ukrainian: Shypshyna travneva × shypshyna Vebbova

Crop name in Ukrainian: Shypshyna

Accession name: 'Spalakh' (means "flash")

Date of introduction: 20.08.2011

Donor: Volodymyr Mezhenkyj, Bakhmut, Donetsk Region, Ukraine

Breeder: Volodymyr Mezhenkyj

Origin: Seedling of 'Vitaminnyj VNIVI' from free pollination

Time of flowering: May to June

Time of fruit ripening: August

Value: The cultivar was included in the State Register of Plant Varieties of Ukraine in 2022. Shoots are practically thornless in the fruiting zone. Fruits are elongated-ovoid, red, weighing 2.5-3.0 g. Fruits contain 200.0 mg/100 g of ascorbic acid, 24.0 mg/100 g of carotene

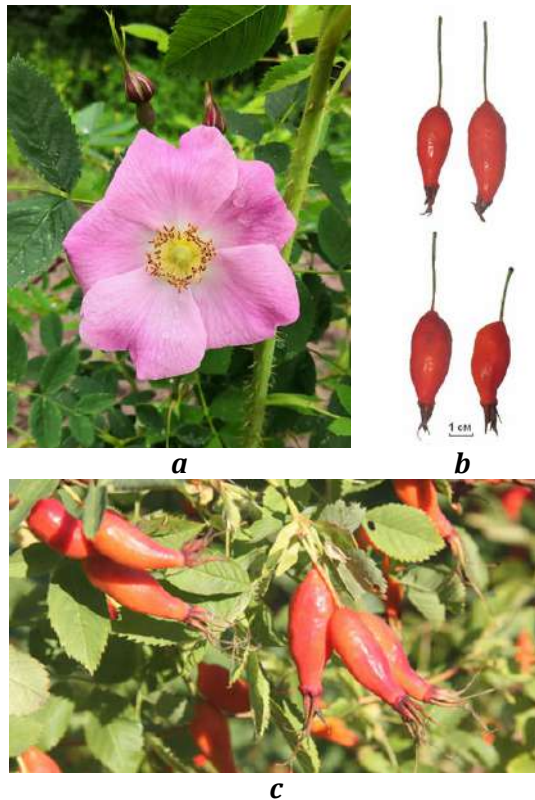


Figure 228. *Rosa majalis* × *R. webbiana* 'Spalakh' a) flower, b) fruit shape, c) fruit on the branches

Rosa majalis × *R. webbiana* 'Volonter'

National catalog number: UR4600566

Collection number: 03355

Botanical name in Latin: *Rosa majalis* Herrm. × *R. webbiana* Royle

Botanical name in English: Cinnamon rose × Webb's rose

Botanical name in Ukrainian: Shypshyna travneva × shypshyna Vebbova

Crop name in Ukrainian: Shypshyna

Accession name: 'Volonter' (means "volunteer")

Date of introduction: 20.08.2011

Sample origin: Bakhmut, Donetsk region, Ukraine

Donor: Volodymyr Mezhenkyj, Bakhmut, Donetsk Region, Ukraine

Breeder: Volodymyr Mezhenkyj

Origin: Seedling of 'Vitaminnyj VNIVI' from free pollination

Time of flowering: May to June

Time of fruit ripening: August

Value: The cultivar was included in the State Register of Plant Varieties of Ukraine in 2021. Shoots are thornless in the fruiting zone. Fruits are ellipsoidal, ovoid or obovate, orange-red or red, weighing 2.5-3.0 (4.0) g. Fruits contain 264.8 mg/100 g of ascorbic acid, 25.0 mg/100 g of carotene

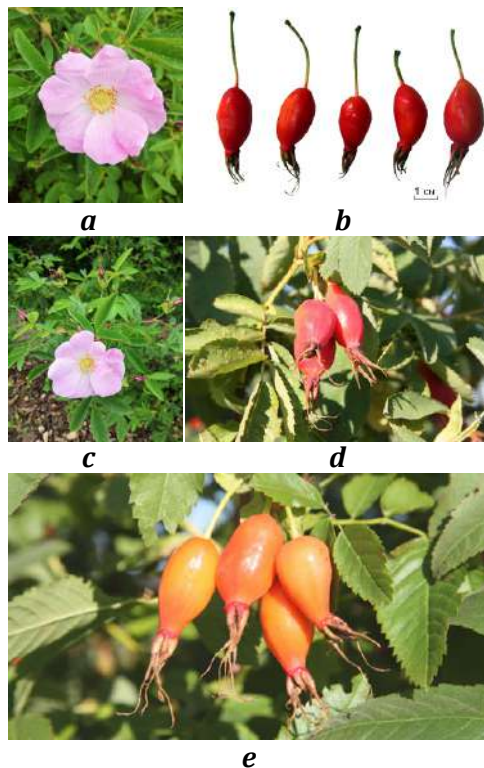


Figure 229. *Rosa majalis* × *R. webbiana* 'Volonter' a) flower, b) fruit shape, c) flower and flower buds, d) fruit, e) fruit

Rosa roxburgii No. 02631

National catalog number: UR4600563

Collection number: 02631

Botanical name in Latin: *Rosa roxburgii* Tratt.

Botanical name in English: Burr rose, or Chestnut rose

Botanical name in Ukrainian: Shypshyna Roksburga

Crop name in Ukrainian: Shypshyna

Accession name: -

Date of introduction: 10.11.2004

Donor: Fomin Botanical Garden of Taras Shevchenko National University of Kyiv, Ukraine

Breeder: -

Origin: The native range of this species is Eastern Himalayas to Central and Southern China

Time of flowering: May to June

Time of fruit ripening: August to September

Value: Fruits are flattened, spherical, prickly, green (yellow when fully ripe), weighing 10-20 g. Source of large fruit size and thick pulp layer

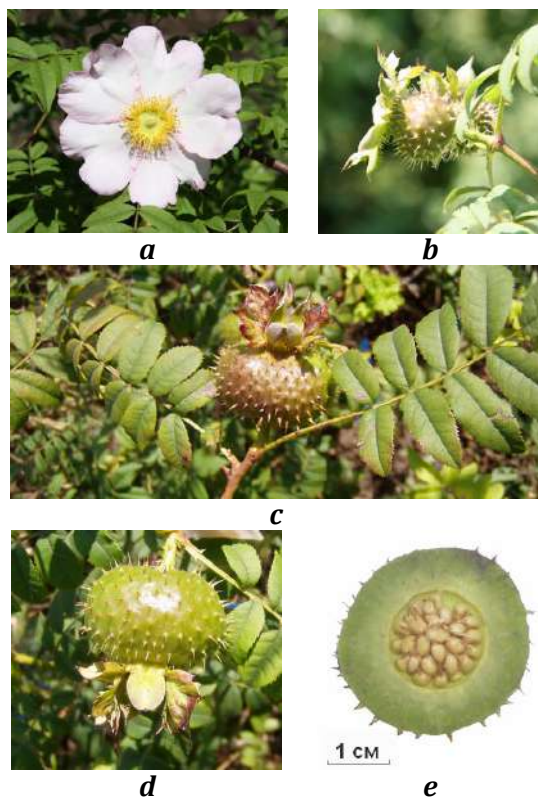


Figure 230. *Rosa roxburgii* No. 02631 a) flower, b) young fruit, c) fruit and leaves, d) fruit, e) transversal fruit section

Rosa rugosa 'Oladushka'

National catalog number: UR4600564

Collection number: 02648

Botanical name in Latin: *Rosa rugosa* Thunb.

Botanical name in English: Beach rose, Japanese rose, Ramanas rose, or Rugosa rose

Botanical name in Ukrainian: Shypshyna zmorshkuvata

Crop name in Ukrainian: Shypshyna

Accession name: 'Oladushka' (means "pancakes, flitter, blini" in a diminutive form)

Date of introduction: 22.02.2005

Origin:

Donor: I.V. Michurin All-Russian Research Institute of Horticulture, Michurinsk, Tambov Region, Russia

Breeders: Evgenyj Kuminov, Tat'yana Zhidyokhina

Origin: Cultivar selected in a population of *R. rugosa* seedlings

Time of flowering: May to August

Time of fruit ripening: August

Value: Fruits are flattened, red, weighing 7.0-10.0 g. Source of large fruit size



a



b

c



d

Figure 231. *Rosa rugosa* 'Oladushka' a) flowering bush, b) remontant flowering and young fruit, c) fruiting bush, d) fruit

Rosa villosa 'Pomifera'

National catalog number: UR4600565

Collection number: 03112

Botanical name in Latin: *Rosa villosa* L. (= *Rosa pomifera* Herm.)

Botanical name in English: Apple rose

Botanical name in Ukrainian: Shypshyna volokhata

Crop name in Ukrainian: Shypshyna

Accession name: 'Pomifera'

Date of introduction: 28.12.2009

Donor: One Green World Nursery⁶ Molalla, Oregon, USA

Breeder: Jim Gilbert (introducer)

Origin: The native range of this species is Europe to the Caucasus

Time of flowering: May-June

Time of fruit ripening: August

Value: Fruits are ovoid-globular, orange, weighing 3.0-4.0 g. Fruits contain 43.9 mg/100 g of carotene

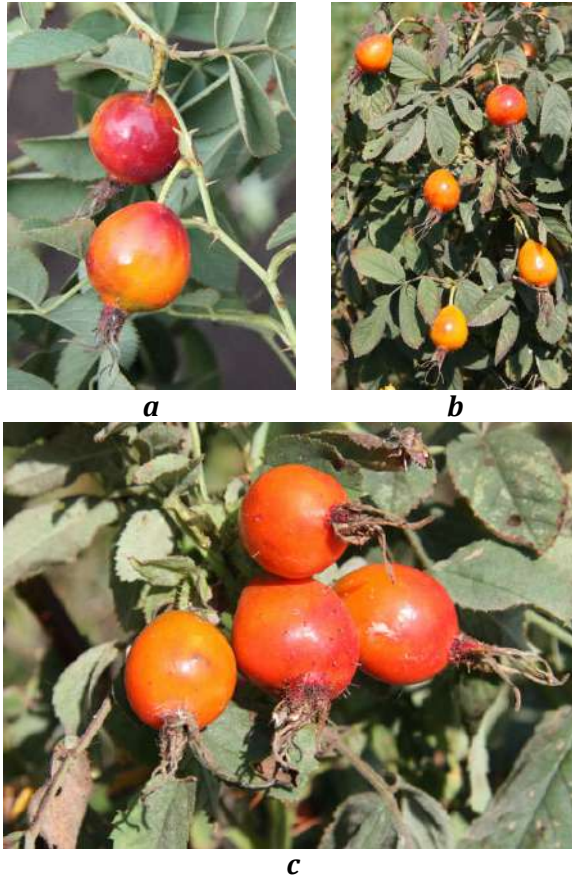


Figure 232. *Rosa villosa* 'Pomifera' a) fruit, b) fruit, c) fruit

ROSACEAE – ×SORBARONIA
ROSE FAMILY – ARONIA × SORBUS

ROWAN-CHOKEBERRY HYBRIDS

Hybrids between rowan and aronia found in European gardens were first described by Konrad Moench (1785) and Jean Poiret (1816) as *Pyrus hybrida* and *Mespilus sorbifolia*, respectively. At the turn of the 19th and 20th centuries, some systematists adhered to the concept of *Sorbus* s.str. (Koehne, 1893), while others used *Sorbus* s.l., including chokeberry species (Schneider, 1906a). At the same time, Camillo Schneider (1906a) included *Aronia* in *Sorbus* only conditionally in order not to create unnecessary names. In the next work of the same year, he established a new genus *Sorbaronia* for hybrids between rowan and chokeberry species (Schneider, 1906b).

Ivan Michurin (1948) created a new fruit crop as a result of his experiments, which he called the “black chokeberry”, believing that it belonged to *S. melanocarpa*. It is widely cultivated in the USSR and other countries as *A. melanocarpa* (Mezhenskij, 2005; Kokotkiewicz et al., 2010; Brand et al., 2017). Now that intergeneric hybrid between black chokeberry and rowan is named *A. mitschurinii* (Skvortsov and Maitulina, 1982; Shipunov et al., 2019) or ×*Sorbaronia mitschurinii* (Sennikov and Phipps, 2013). The last name is proposed for apomictic microspecies of cultigenous origin that is taxonomically distinct from ×*S. fallax*, which is used for hybrids of *A. melanocarpa* with *S. aucuparia* (Sennikov and Phipps, 2013). Michurin’s “rowan” varieties belong really to ×*S. fallax*. In the cultural flora of Ukraine, a new hybridogenous taxon ×*S. kovalevii* has been described (Mezhenskyj, 2009).

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×*Sorbaronia fallax* 'Burka'

National catalog number: U00100037

Collection number: 00156

Botanical name Latin: ×*Sorbaronia fallax* (C.K.Schneid.) C.K.Schneid.

Botanical name in English: *Fallax sorbaronia*

Botanical name in Ukrainian: Horobynoaroniia omanlyva

Crop name in Ukrainian: Horobyna, or Horobynoaroniia

Accession name: 'Burka' (means "brown")

Date of introduction: 20.03.1982

Donor: I. V. Michurin All-Russian Research Institute of Genetics and Breeding of Fruit Plants, Michurinsk, Tambov Region, Russia

Breeder: Ivan Michurin

Origin: According to Michurin, it was obtained by crossing *Sorbus alpina* (Willd.) Hedl. × wild *S. aucuparia* L. or by hybridization of Dyadyusha's rowan with *S. aucuparia* 'Moravica'

Time of flowering: May

Time of fruit ripening: August to September

Value: Cultivar was included in the State Register of Varieties of Belarus in 2012. Fruits are almost spherical, black-brown, weighing 0.6-0.8 g, 22-63 in corymb. Fruits contain 8.9% of sugars, 1.8% of pectin residues, 0.7% of organic acids, and 5.7 mg/100 g of ascorbic acid. Promising in the breeding of plants of the sorboid group

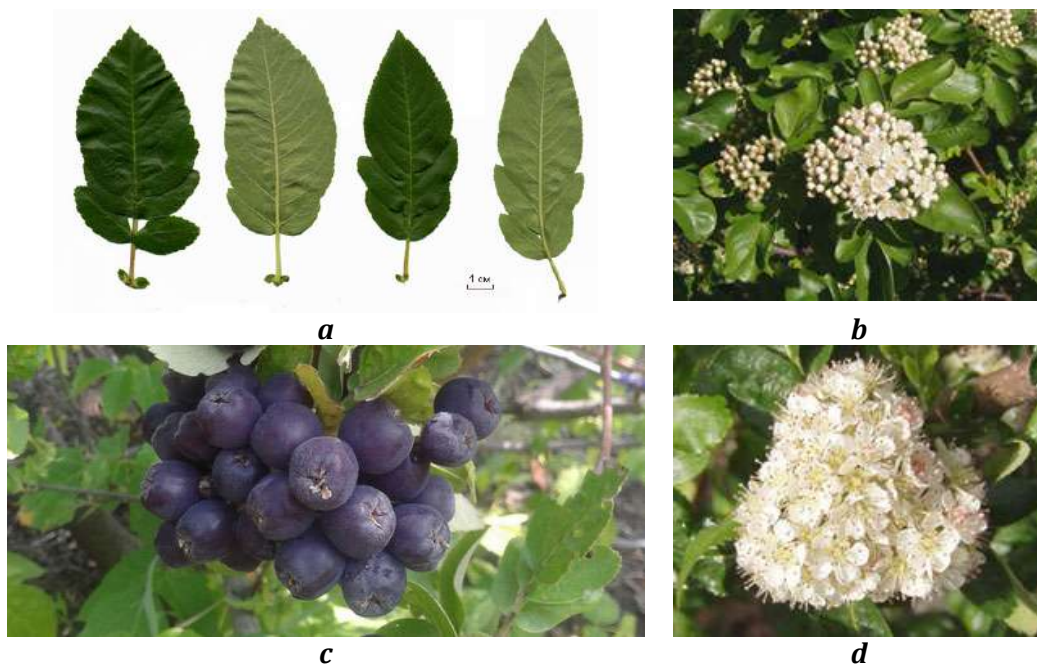


Figure 233. ×*Sorbaronia fallax* 'Burka' a) leaves, b) beginning of flowering stage, c) fruit, d) flowers

×*Sorbaronia fallax* 'Granatnaja'

Number of the National Catalog: UN0700006

Collection number: 00157

Botanical name Latin: ×*Sorbaronia fallax* (C.K.Schneid.) C.K.Schneid.

Botanical name in English: *Fallax sorbaronia*

Botanical name in Ukrainian: Horobynoaroniia omanlyva

Crop name in Ukrainian: Horobyna, or Horobynoaroniia

Accession name: 'Granatnaja' ('Granatnaya', 'Ivan's Belle') (means "colored like garnet")

Date of introduction: 20.03.1982

Donor: I. V. Michurin All-Russian Research Institute of Genetics and Breeding of Fruit Plants, Michurinsk, Tambov Region, Russia

Breeder: Ivan Michurin

Origin: According to Michurin, it was developed as a result of pollination of wild *Sorbus aucuparia* L. with pollen of *Crataegus sanguinea* Pall. that does not correspond to the morphological characters of the variety, according to which it is related to ×*S. fallax*

Time of flowering: May

Time of fruit ripening: August to September

Value: Registered in the Czech Republic and Slovakia in 1992 as a clone 'Granatina'. The variety was included in the State Register of Varieties of Belarus in 2008. The accession was registered in the National Center for Plant Genetic Resources of Ukraine based on high-yield, large fruits with a sweet-astringent taste, without bitterness, in 2007. Fruits are burgundy, weighing 1.5 g, up to 90 in corymb. Fruits contain 5.7% of sugars, 0.8% of organic acids, 6.3 mg/100 g of ascorbic acid, and 8.8 mg/100 g of carotene

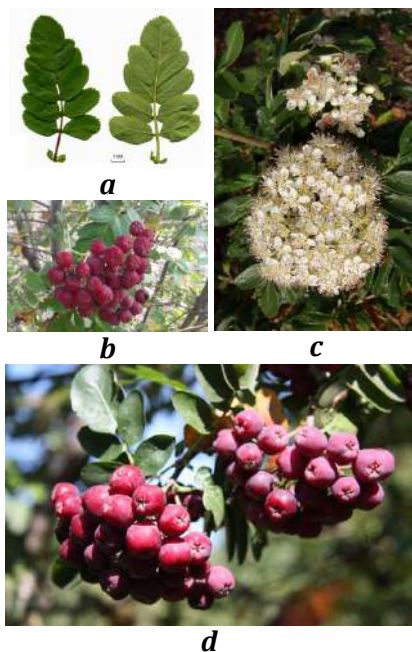


Figure 234. ×*Sorbaronia fallax* 'Granatnaja' a) leaves, b) fruit, c) lowers, d) fruit

×*Sorbaronia fallax* 'Likernaja'

National catalog number: U00100042

Collection number: 04202

Botanical name Latin: ×*Sorbaronia fallax* (C.K.Schneid.) C.K.Schneid.

Botanical name in English: *Fallax sorbaronia*

Botanical name in Ukrainian: Horobynoaroniia omanlyva

Crop name in Ukrainian: Horobyna, or Horobynoaroniia

Accession name: 'Likernaja' ('Ivan's Beauty', 'Likjernaja', 'Likernaya' 'Likyernaya') (means "liqueur")

Date of introduction: 27.07.2015

Donor: Julian Geyer, Graz, Austria

Breeder: Ivan Michurin

Origin: According to Michurin it was developed by crossing the wild *Sorbus aucuparia* L. with *S. melanocarpa* (Michx.) Elliot. However, Michurin used the same photograph to illustrate both the chokeberry-rowan hybrid ('Likernaja') and his "black rowan" (now ×*S. mitschurinii* (A.Skvortsov & Maitul.) Sennikov), which led to confusion. It was not possible to find a cultivar 'Liquornaja' that corresponded to the author's description in the Michurinsk. It is not known which hybrid is distributed under this name

Time of flowering: May

Time of fruit ripening: August to September

Value: Promising in the selection of plants of the sorboid group

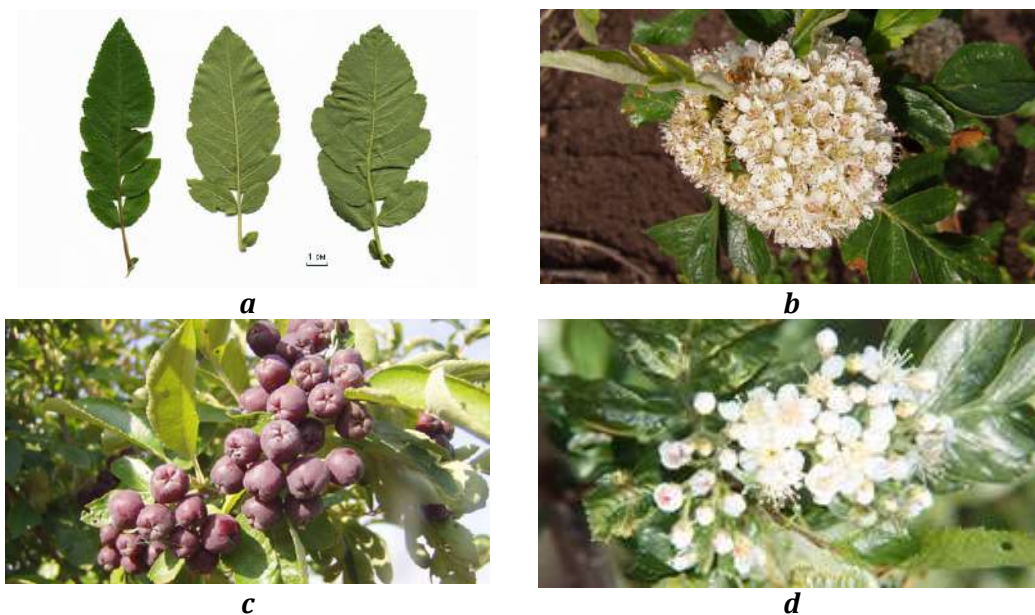


Figure 235. ×*Sorbaronia fallax* 'Likernaja' a) leaves, b) flowers, c) ripening fruit, d) flowers and flower buds

×Sorbaronia fallax 'Rubinovaja'

Number of the National Catalog: UN0700008

Collection number: 00161

Botanical name Latin: *×Sorbaronia fallax* (C.K.Schneid.) C.K.Schneid.

Botanical name in English: *Fallax sorbaronia*

Botanical name in Ukrainian: Horobynoaroniia omanlyva

Crop name in Ukrainian: Horobyna, or Horobynoaroniia

Accession name: 'Rubinovaja' ('Rubinovaya') (means "ruby")

Date of introduction: 20.03.1982

Donor: I. V. Michurin All-Russian Research Institute of Genetics and Breeding of Fruit Plants, Michurinsk, Tambov Region, Russia

Breeder: Ivan Michurin and Aleksandra Tikhonova

Origin: The origin is indicated to be from pollination of *Sorbus aucuparia* L. by pear pollen, but leaf morphology and fruit coloration indicate a certain admixture of *sorbaronia*

Time of flowering: May

Time of fruit ripening: August to September

Value of the sample: Cultivar was included in the State Register of Breeding Achievements of the Russian Federation in 1999. The accession was registered in the National Center for Plant Genetic Resources of Ukraine based on short stature and high yield in 2007. Fruits are almost spherical, burgundy-red, sweetish-astringent without rowan bitterness, weighing 0.8 (1.3) g, up to 100 in a large corymb. Fruits contain 8.3% sugars, 0.8% organic acids, and 9.0 mg/100 g of ascorbic acid

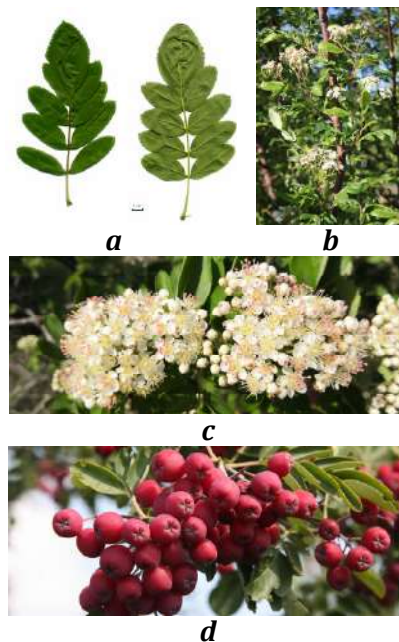


Figure 236. *×Sorbaronia fallax* 'Rubinovaja' a) leaves, b) flowers on the branch, c) flowers and flower buds, d) fruit

×Sorbaronia fallax 'Ruslana'

National catalog number: U00100040

Collection number: 04018

Botanical name Latin: *×Sorbaronia fallax* (C.K.Schneid.) C.K.Schneid.

Botanical name in English: *Fallax sorbaronia*

Botanical name in Ukrainian: Horobynoaroniia omanlyva

Crop name in Ukrainian: Aroniia, or Horobynoaroniia

Accession name: 'Ruslana' (name of a breeder's granddaughter)

Date of introduction: 16.08.2013

Donor: Volodymyr Mezhenkyj, Bakhmut, Donetsk Region, Ukraine

Breeder: Volodymyr Mezhenkyj

Origin: Seedling of 'Vseslava' from free pollination

Time of flowering: May

Time of fruit ripening: August to September

Value: Fruit weight 1.5 (3.0) g, 18-47 in corymb. Fruits contain 5.2-9.5% sugars, 0.7% pectin substances, 1.7% organic acids, 1.8-2.0% polyphenols, 38.5-44.5 mg/100 g ascorbic acid, and 7.3 mg/100 g carotene. The sample is promising in the breeding of plants of the sorboid group

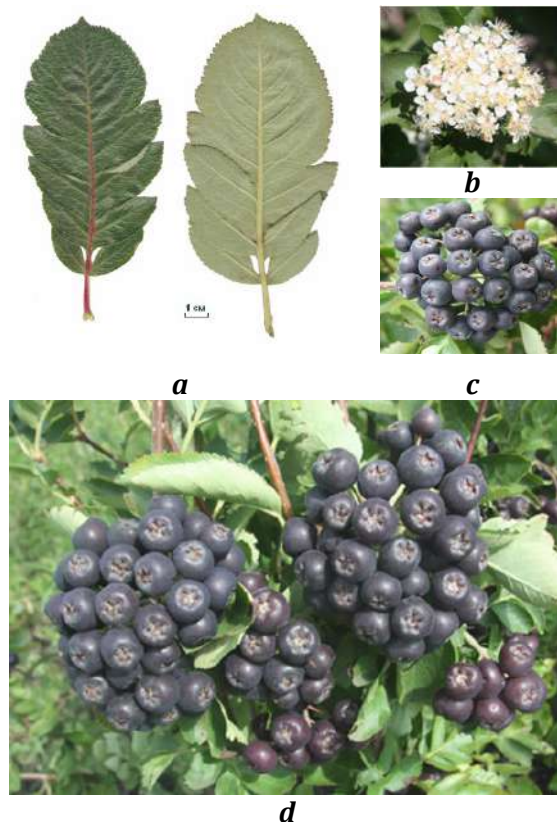


Figure 237. *×Sorbaronia fallax* 'Ruslana' a) leaves, b) flowers, c) fruit, d) fruit

×*Sorbaronia fallax* 'Titan'

National catalog number: U00100038

Collection number: 02900

Botanical name Latin: ×*Sorbaronia fallax* (C.K.Schneid.) C.K.Schneid.

Botanical name in English: *Fallax sorbaronia*

Botanical name in Ukrainian: Horobynoaroniia omanlyva

Crop name in Ukrainian: Horobyna, or Horobynoaroniia

Accession name: 'Titan'

Date of introduction: 18.10.2007

Donor: I. V. Michurin All-Russian Research Institute of Genetics and Breeding of Fruit Plants, Michurinsk, Tambov Region, Russia

Breeders: Ivan Michurin and Aleksandra Tikhonova

Origin: Putative seedling of 'Burka', which was pollinated with a mixture of apple pollen and then a mixture of pear pollen at first flowering

Time of flowering: May

Time of fruit ripening: August to September

Value of the sample: Cultivar was included in the State Register of Breeding Achievements of the Russian Federation in 1999. The accession was registered in the National Center for Plant Genetic Resources of Ukraine in 2007. Fruits are almost spherical, burgundy, weighing 1.3 (1.7) g, up to 60 in corymb, sweet and astringent taste. Fruits contain 8.0-8.4% sugars, 0.4-0.6 pectin substances, 0.8-2.0% organic acids, 453.7-998.0 mg/100 g polyphenols, and 12.7-25.3 mg/100 g ascorbic acid

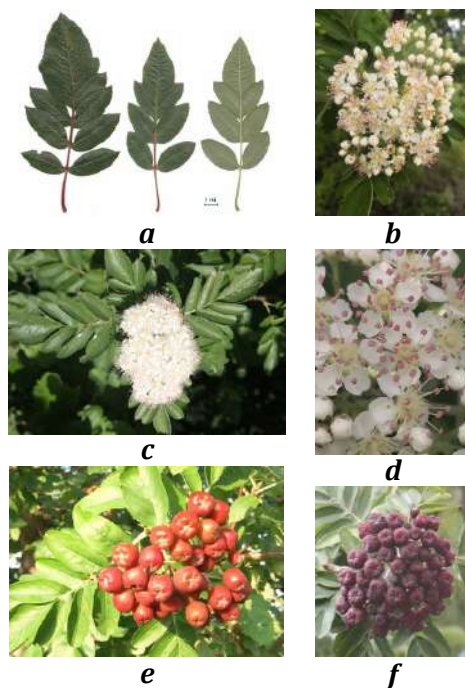


Figure 238. ×*Sorbaronia fallax* 'Titan' a) leaves, b) flower buds and flowers, c) leaves and flowers, d) flowers, e) young fruits, f) overripe fruit

×*Sorbaronia fallax* 'Vseslava'

National catalog number: U00100039

Collection number: 03350

Botanical name Latin: ×*Sorbaronia fallax* (C.K.Schneid.) C.K.Schneid.

Botanical name in English: *Fallax sorbaronia*

Botanical name in Ukrainian: Horobynoaroniia omanlyva

Crop name in Ukrainian: Aroniia, or Horobynoaroniia

Accession name: 'Vseslava' (name of the daughter of breeder)

Date of introduction: 20.08.2011

Donor: Volodymyr Mezhenkyj, Bakhmut, Donetsk Region, Ukraine

Breeder: Volodymyr Mezhenkyj

Origin: Putative seedling of 'Burka' from free pollination by ×*S. mitschurinii* (A. Skvortsov & Maitul.) Sennikov pollen

Time of flowering: May

Time of fruit ripening: August to September

Value of the sample: Cultivar was included in the State Register of Plant Varieties of Ukraine in 2020. The accession was registered in the National Center for Plant Genetic Resources of Ukraine for the traits of uprightness, high yield, and large fruits in multi-fruited corymbs, in 2007. There are 36-46 fruits in corymb, with a weight of 1.5 (1.8) g. Fruits contain 6.0-9.4% sugars, 0.5-0.7% pectin, 1.3-1.5% organic acids, 1.2-2.3% polyphenols, 34.0-40.6 mg/100 g ascorbic acid, and 7.3 mg/100 g carotene. Breeding plants of the sorboid group aim to increase the size of fruits, their number in the fruit, and the content of bioflavonoids

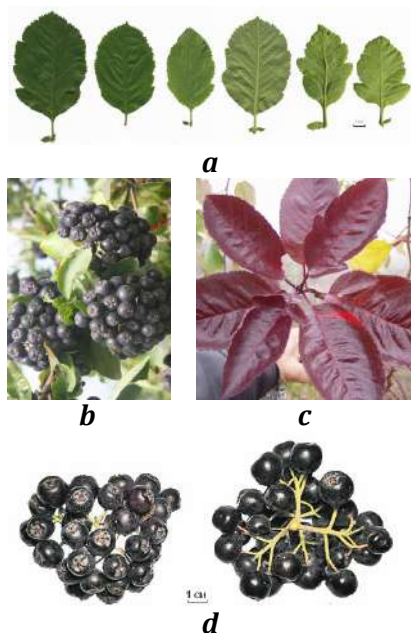


Figure 239. ×*Sorbaronia fallax* 'Vseslava' a) variety of leaves, b) fruits, c) autumn-colored leaves, d) infructescence

×*Sorbaronia kovalevii* No. 02471

National catalog number: UN0700079

Collection number: 02471

Botanical name in Latin: ×*Sorbaronia kovalevii* Mezhen'skiy

Botanical name in English: Kovalov's sorbaronia

Botanical name in Ukrainian: Horobynoaroniia Kovalova

Crop name in Ukrainian: Horobyna, or Horobynoaroniia

Accession name: -

Date of introduction: 06.08.2003

Donor: Yakiv Kovalov, Sievernyi, Luhansk Region, Ukraine

Breeder: Yakiv Kovalov

Origin: A spontaneous hybrid of *Sorbus sambucifolia* (Cham. & Schltdl.) M.Roem. × *S. mitschurinii* (A. Skvortsov & Maitul.) Sennikov

Time of flowering: May

Time of fruit ripening: August to September

Value: Fruits are red-brown to dark purple; flesh is orange, juicy, sour-sweet, astringent. The accession is promising in the breeding of plants of the sorboid group for dwarf growth

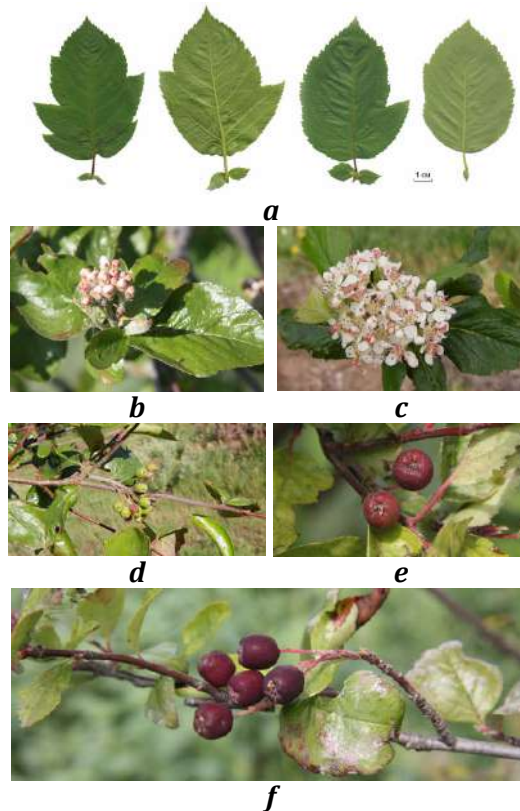


Figure 240. ×*Sorbaronia kovalevii* No. 02471 a) variety of leaves, b) flower buds, c) flowers, d) unripe fruit, e) fruit, f) fruit

×Sorbaronia mitschurinii 'Ahrostantsiia'

National catalog number: U00100032

Collection number: 03368

Botanical name in Latin: *×Sorbaronia mitschurinii* (A.Skvortsov & Maitul.) Sennikov

Botanical name in English: Black rowan, Garden chokeberry, Michurin's chokeberry, or Michurin's sorbaronia

Botanical name in Ukrainian: Horobynoaroniia Michurina

Crop name in Ukrainian: Aroniia, or Horobynoaroniia

Accession name: 'Ahrostantsiia' (abbreviation of "agronomic station")

Date of introduction: 27.08.2011

Donor: Volodymyr Mezhenkyj, Pshenychne, Kyiv Region, Ukraine

Breeder: Volodymyr Mezhenkyj

Origin: Ivan Michurin developed a new fruit plant as a result of his experiments, naming it "black rowan". Nowadays it is widely cultivated in orchards under the name "chokeberry", which is apomictic tetraploid microspecies of cultivated origin. In many countries, genotypes have been selected from their populations and given varietal names. A sample of early chokeberry among hedge plants in Pshenychne village

Time of flowering: May

Time of fruit ripening: August to September

Value: Fruit weight 1.0 (1.5) g, 16-31 in corymb. Fruits contain 8.2-8.6% sugars, 0.2-0.6% pectin substances, 1.6% organic acids, 2.2-2.3% polyphenols, and 42.3-47.8 mg/100 g ascorbic acid

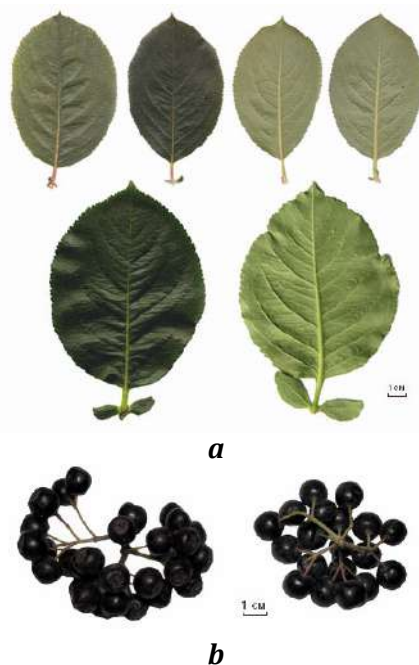


Figure 241. *×Sorbaronia mitschurinii* 'Ahrostantsiia' a) leaves on generative shoots (top), ones on sprouts (bottom), b) infructescence

×Sorbaronia mitschurinii 'Amit'

National catalog number: U00100033

Collection number: 04213

Botanical name in Latin: *×Sorbaronia mitschurinii* (A.Skvortsov & Maitul.) Sennikov

Botanical name in English: Black rowan, Garden chokeberry, Michurin's chokeberry, or Michurin's sorbaronia

Botanical name in Ukrainian: Horobynoaroniia Michurina

Crop name in Ukrainian: Aroniia, or Horobynoaroniia

Accession name: 'Amit' (abbreviation "Aronia mitschurina")

Date of introduction: 28.08.2015

Donor: Federal Research Institute of Horticulture Schönbrunn, Vienna, Austria

Breeder: -

Origin: Ivan Michurin developed a new fruit plant as a result of his experiments, naming it "black rowan". Nowadays it is widely cultivated in orchards under the name "chokeberry", which is apomictic tetraploid microspecies of cultivated origin. In many countries, genotypes have been selected from its populations and given varietal names, including 'Amit'

Time of flowering: May

Time of fruit ripening: August to September

Value: Fruit weight 0.9 g, 17-19 in corymb

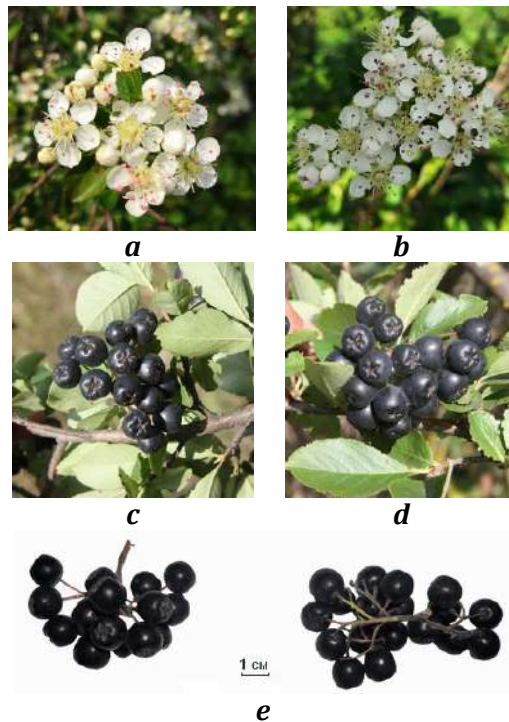


Figure 242. *×Sorbaronia mitschurinii* 'Amit' a) flowers, b) flowers, c) fruit d) fruit, e) infructescence

×Sorbaronia mitschurinii 'Aron'

National catalog number: U00100034

Collection number: 04214

Botanical name in Latin: *×Sorbaronia mitschurinii* (A.Skvortsov & Maitul.) Sennikov

Botanical name in English: Black rowan, Garden chokeberry, Michurin's chokeberry, or Michurin's sorbaronia

Botanical name in Ukrainian: Horobynoaroniia Michurina

Crop name in Ukrainian: Aroniia, or Horobynoaroniia

Accession name: 'Aron' (probably a contraction "aronia")

Date of introduction: 28.08.2015

Donor: Federal Research Institute of Horticulture Schönbrunn, Vienna, Austria

Breeder: Poul Erik Brander; Denmark

Origin: Ivan Michurin developed a new fruit plant as a result of his experiments, naming it "black rowan". Nowadays it is widely cultivated in orchards under the name "chokeberry", which is apomictic tetraploid microspecies of cultivated origin. In many countries, genotypes have been selected from its populations and given varietal names, including 'Aron'

Time of flowering: May

Time of fruit ripening: August to September

Value: Fruit weight 1.0 g, 12-17 in corymb



a



b



c

Figure 243. *×Sorbaronia mitschurinii* 'Aron' a) flowers, b) fruit on the branches, c) infructescence

×*Sorbaronia mitschurinii* 'Chornookaja'

National catalog number: UR5200004

Collection number: 02536

Botanical name in Latin: ×*Sorbaronia mitschurinii* (A.Skvortsov & Maitul.) Sennikov

Botanical name in English: Black rowan, Garden chokeberry, Michurin's chokeberry, or Michurin's sorbaronia

Botanical name in Ukrainian: Horobynoaroniia Michurina

Crop name in Ukrainian: Aroniia, or Horobynoaroniia

Accession name: 'Chornookaja' ('Chornookaya') (means "black-eyed")

Date of introduction: 18.08.2003

Donor: I. V. Michurin All-Russian Research Institute of Genetics and Breeding of Fruit Plants, Michurinsk, Tambov Region, Russia

Breeder: Tat'yana Poplavskaya

Origin: Ivan Michurin developed a new fruit plant as a result of his experiments, naming it "black rowan". Nowadays it is widely cultivated in orchards under the name "chokeberry", which is apomictic tetraploid microspecies of cultivated origin. In many countries, genotypes have been selected from its populations and given varietal names, including 'Chornookaja'

Time of flowering: May

Time of fruit ripening: August to September

Value: Fruit weight 1.0 (1.3) g, 12-31 in corymb. Fruits contain 9.3% of sugars, 1.8% of organic acids, and 77.4 mg/100 g of ascorbic acid

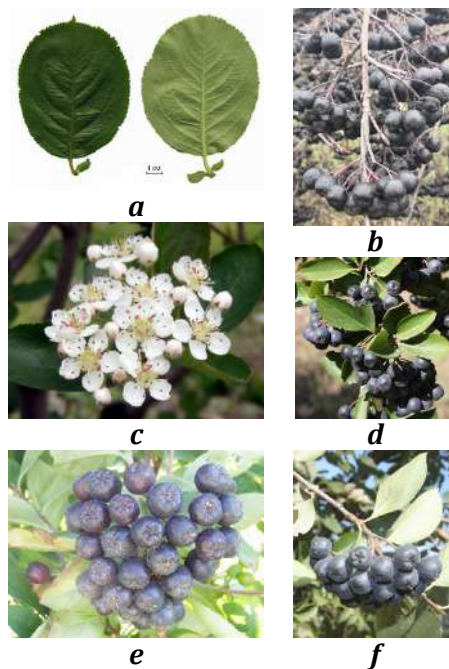


Figure 244. ×*Sorbaronia mitschurinii* 'Chornookaja' a) leaves, b) fruit on the branch after the autumn leaf fall, c) flowers and flower buds, d) fruit, e) fruit, f) fruit

×Sorbaronia mitschurinii 'Eastland'

National catalog number: U00100036

Collection number: 04211

Botanical name in Latin: *×Sorbaronia mitschurinii* (A.Skvortsov & Maitul.) Sennikov

Botanical name in English: Black rowan, Garden chokeberry, Michurin's chokeberry, or Michurin's sorbaronia

Botanical name in Ukrainian: Horobynoaroniia Michurina

Crop name in Ukrainian: Aroniia, or Horobynoaroniia

Accession name: 'Eastland' (an obsolete name for Estonia)

Date of introduction: 28.08.2015

Donor: Schönbrunn Federal Research Institute for Horticulture, Vienna, Austria

Breeder: Variety is selected in Finland

Origin: Ivan Michurin developed a new fruit plant as a result of his experiments, naming it "black rowan". Nowadays it is widely cultivated in orchards under the name "chokeberry", which is apomictic tetraploid microspecies of cultivated origin. In many countries, genotypes have been selected from its populations and given varietal names, including 'Eastland'

Time of flowering: May

Time of fruit ripening: August to September

Value: Fruit weight 1.0 (1.1) g, 14-29 in corymb

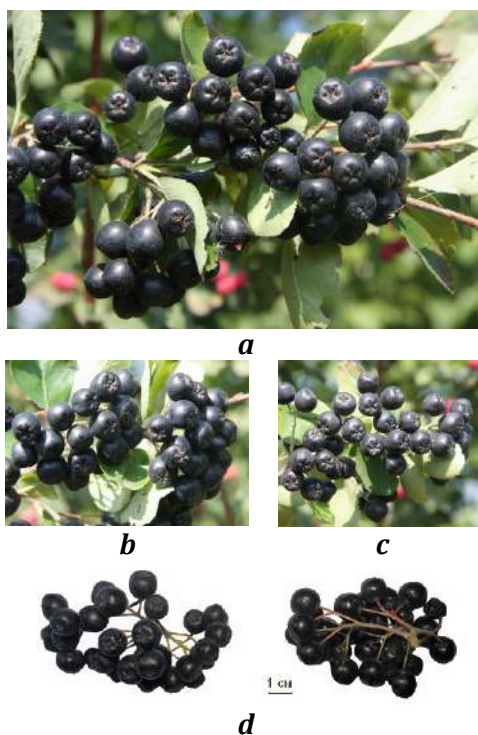


Figure 245. *×Sorbaronia mitschurinii* 'Eastland' a) fruit, b) fruit, c) fruit, d) infructescence

×Sorbaronia mitschurinii 'Karhumäki'

National catalog number: U00100035

Collection number: 04215

Botanical name in Latin: *×Sorbaronia mitschurinii* (A.Skvortsov & Maitul.) Sennikov

Botanical name in English: Black rowan, Garden chokeberry, Michurin's chokeberry, or Michurin's sorbaronia

Botanical name in Ukrainian: Horobynoaroniia Michurina

Crop name in Ukrainian: Aroniia, or Horobynoaroniia

Accession name: 'Karhumäki' (the Finnish name of Medvezhyegorsk, a town in Russian)

Date of introduction: 28.08.2015

Donor: Federal Research Institute of Horticulture Schönbrunn, Vienna, Austria

Breeder: Variety is selected in Finland

Origin: Ivan Michurin developed a new fruit plant as a result of his experiments, naming it "black rowan". Nowadays it is widely cultivated in orchards under the name "chokeberry", which is apomictic tetraploid microspecies of cultivated origin. In many countries, genotypes have been selected from its populations and given varietal names, including 'Karhumäki'

Time of flowering: May

Time of fruit ripening: August to September

Value: Fruit weight 1.0 g, 12-22 in corymb

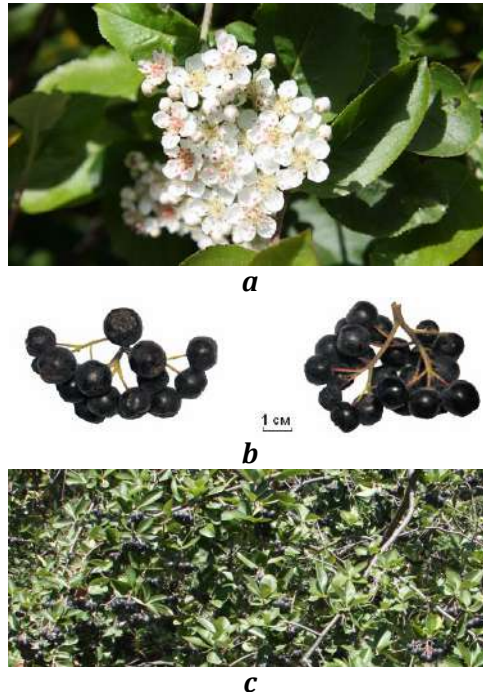


Figure 246. *×Sorbaronia mitschurinii* 'Karhumäki' a) flowers, b) infructescence, c) fruit on the branches

×Sorbaronia mitschurinii 'Nadzeja'

National catalog number: U00100029

Collection number: 02863

Botanical name in Latin: *×Sorbaronia mitschurinii* (A.Skvortsov & Maitul.) Sennikov

Botanical name in English: Black rowan, Garden chokeberry, Michurin's chokeberry, or Michurin's sorbaronia

Botanical name in Ukrainian: Horobynoaroniia Michurina

Crop name in Ukrainian: Aroniia, or Horobynoaroniia

Accession name: 'Nadzeja' ('Nadzeya') (means "hope")

Date of introduction: 03.09.2007

Donor: Research Institute of Fruit Growing, Samokhvalovichi, Belarus

Breeders: Anna Bachylo, Larisa Isachenko, and Alla Dmitrieva

Origin: Ivan Michurin developed a new fruit plant as a result of his experiments, naming it "black rowan". Nowadays it is widely cultivated in orchards under the name "chokeberry", which is apomictic tetraploid microspecies of cultivated origin. In many countries, genotypes have been selected from its populations and given varietal names, including 'Nadzeya'

Time of flowering: May

Time of fruit ripening: August to September

Value: Cultivar was included in the State Register of Varieties of Belarus in 2008. Fruit weight 1.0 (1.5) g, 15-30 in corymb. Fruits contain 6.8-7.7% sugars, 0.3-0.5% pectin substances, 1.3-1.4% organic acids, 1.8-3.1% polyphenols, and 39.0-45.9 mg/100 g ascorbic acid



Figure 247. *×Sorbaronia mitschurinii* 'Nadzeja' a) flowers, b) fruit, c) young fruits, d) infructescence

×Sorbaronia mitschurinii 'Nero'

National catalog number: U00100031

Collection number: 03093

Botanical name in Latin: *×Sorbaronia mitschurinii* (A.Skvortsov & Maitul.) Sennikov

Botanical name in English: Black rowan, Garden chokeberry, Michurin's chokeberry, or Michurin's sorbaronia

Botanical name in Ukrainian: Horobynoaroniia Michurina

Crop name in Ukrainian: Aroniia, or Horobynoaroniia

Accession name: 'Nero'

Date of introduction: 18.09.2009

Donor: One Green World Nursery, Molalla, Oregon, USA

Breeder: -

Origin: Ivan Michurin developed a new fruit plant as a result of his experiments, naming it "black rowan". Nowadays it is widely cultivated in orchards under the name "chokeberry", which is apomictic tetraploid microspecies of cultivated origin. In many countries, genotypes have been selected from their populations and given varietal names, including 'Nero'. 'Nero' originated from seeds brought to former Czechoslovakia by a graduate student at VIR

Time of flowering: May

Time of fruit ripening: August to September

Value of the sample: Cultivar registered in the Czech Republic and Slovakia in 1973; Romania in 1991; and Serbia in 2010. Fruit weight 1.0 (1.5) g, 15-36 in corymb. Fruits contain 7.5-9.2% sugars, 0.6-1.0% pectin, 1.1-1.2% organic acids, 2.2-3.1% polyphenols, and 33.5-38.2 mg/100 g ascorbic acid

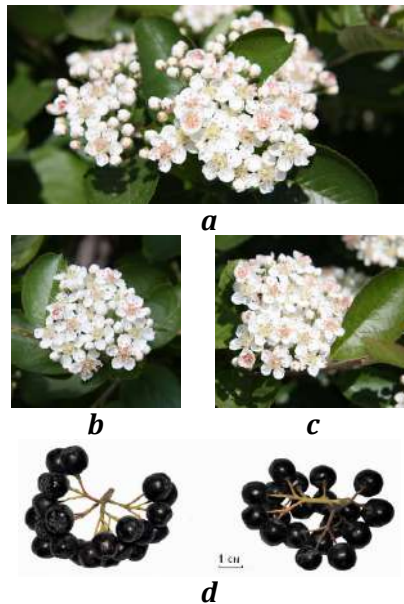


Figure 248. *×Sorbaronia mitschurinii* 'Nero' a) flowers, b) flowers, c) flowers, d) infructescence

×Sorbaronia mitschurinii 'Venisa'

National catalog number: U00100028

Collection number: 02862

Botanical name in Latin: *×Sorbaronia mitschurinii* (A.Skvortsov & Maitul.) Sennikov

Botanical name in English: Black rowan, Garden chokeberry, Michurin's chokeberry, or Michurin's sorbaronia

Botanical name in Ukrainian: Horobynoaroniia Michurina

Crop name in Ukrainian: Aroniia, or Horobynoaroniia

Accession name: 'Venisa' (means presumably almandine) a type of precious garnet)

Date of introduction: 03.09.2007

Donor: Research Institute of Fruit Growing, Samokhvalovichi, Belarus

Breeders: Anna Bachylo, Larisa Isachenko, and Alla Dmitrieva

Origin: Ivan Michurin developed a new fruit plant as a result of his experiments, naming it "black rowan". Nowadays it is widely cultivated in orchards under the name "chokeberry", which is apomictic tetraploid microspecies of cultivated origin. In many countries, genotypes have been selected from its populations and given varietal names, including 'Venisa'

Time of flowering: May

Time of fruit ripening: August to September

Value: Cultivar was included in the State Register of Varieties of Belarus in 2008. Fruit weight 1.0 (1.5) g, 14-29 in corymb. Fruits contain 6.4-9.8% sugars, 0.4-0.5% pectin substances, 1.4-1.6% organic acids, 1.8-2.5% polyphenols, and 40.0-51.7 mg/100 g ascorbic acid



a



b



c

Figure 249. *×Sorbaronia mitschurinii* 'Venisa' a) flowers, b) flowering hedge, c) infructescence

×*Sorbaronia mitschurinii* 'Viking'

National catalog number: U00100030

Collection number: 03092

Botanical name in Latin: ×*Sorbaronia mitschurinii* (A.Skvortsov & Maitul.) Sennikov

Botanical name in English: Black rowan, Garden chokeberry, Michurin's chokeberry, or Michurin's sorbaronia

Botanical name in Ukrainian: Horobynoaroniia Michurina

Crop name in Ukrainian: Aroniia, or Horobynoaroniia

Accession name: 'Viking'

Date of introduction: 18.09.2009

Donor: One Green World Nursery, Molalla, Oregon, USA

Breeder: Jaakko Säkö, Finland

Origin: Ivan Michurin developed a new fruit plant as a result of his experiments, naming it "black rowan". Nowadays it is widely cultivated in orchards under the name "chokeberry", which is apomictic tetraploid microspecies of cultivated origin. In many countries, genotypes have been selected from its populations and given varietal names, including 'Viking'

Time of flowering: May

Time of fruit ripening: August to September

Value: Cultivar registered in Hungary in 2002, and in Turkey in 2017. Fruit weight 1.0 (1.6) g, 10-31 in corymb. Fruits contain 7.9-10.0% sugars, 0.3-0.6% pectin substances, 1.4-1.5% organic acids, 1.5-2.8% polyphenols, and 30.6-57.3 mg/100 g ascorbic acid

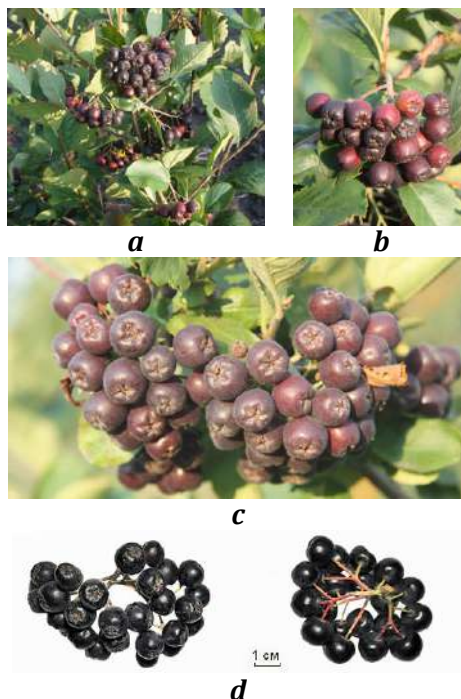


Figure 250. ×*Sorbaronia mitschurinii* 'Viking' a) fruit, b) fruit, c) fruit, d) infructescence

ROSACEAE – ×SORBOCOTONEASTER

ROSE FAMILY – COTONEASTER × SORBUS

COTONEASTER-ROWAN HYBRIDS

Lev Pozdnyakov (1952) found spontaneous intergeneric hybrids in southern Yakutia. Antonina Poyarkova (1953) diagnosed ×*Sorbocotoneaster pozdnjakovii*, indicating that it has two morphologically differ forms. Gladkova (1967), having cytologically examined these morphotypes, found that they have a chromosome number of $2n = 85$ (pentaploid of the *Cotoneaster* phenotype, genomic formula CCCSS) and $2n = 68$ (tetraploid of the intermediate phenotype, genomic formula CCSS). The primary hybrid is triploid with genomic formula CCS (Krugel, 1990). The parents of these hybrids are *S. aucuparia* subsp. *glabrata* and *C. laxiflorus* (Sennikov and Phipps, 2013). ×*S. pozdnjakovii* has fertile pollen and continues to be crossed non-reciprocally with rowan (Asbaganov et al., 2016). There is also a third form like the rowan phenotype (Grevtsova and Kazanskaya, 1997; Grevtsova et al., 2021). Perhaps two species of *Cotoneaster*, including *C. jakuticus*, participated in the hybridization with rowan (Grevtsova et al., 2021). ×*Sorbocotoneaster* has ornamental value and edible fruits and can be used in the breeding of rowan as a fruit crop (Grevtsova and Kazanskaya, 1997; Mezhenskyi, 2007; Hrevtsova et al., 2012; Mezhenskyj and Mezhenska, 2015).

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×Sorbocotoneaster pozdnjakovii '1st form'

National catalog number: U00100062

Collection number: 04031

Botanical name in Latin: *×Sorbocotoneaster pozdnjakovii* Pojark.

Botanical name in English: Pozdnyakov's sorbocotoneaster, or Sorbocotoneaster

Botanical name in Ukrainian: Horobynoirha Pozdniakova

Crop name in Ukrainian: Horobynoirha

Accession name: '1st form'

Date of introduction: 14.03.2015

Donor: Fomin Botanical Garden of Taras Shevchenko National University of Kyiv, Ukraine

Breeder: Hanna Hrevtsova (introducer)

Origin: Endemic to Yakutia. Natural hybrid of *Cotoneaster laxiflorus* J.Jacq. ex Lindl. (= *C. melanocarpus* (Bunge) G.Lodd. ex M.Roem.) × *Sorbus aucuparia* L. subsp. *glabrata* (Wimm. & Grab.) Hedl. (= *Sorbus sibirica* Hedl.). Pentaploid of the genomic formula CCCSS, formed as a result of fertilization of an unreduced egg of the triploid F₁ hybrid with *Cotoneaster* pollen. It has a *Cotoneaster* phenotype

Time of flowering: May

Time of fruit ripening: August to September

Value: Pentaploid. Ornamental plant

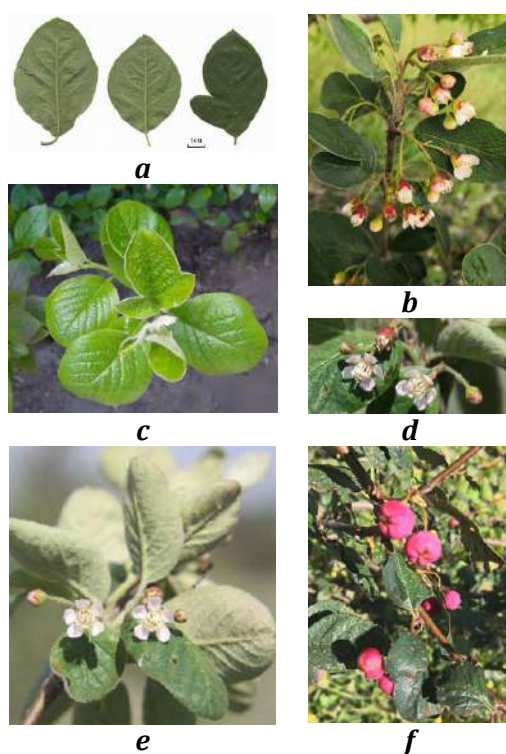


Figure 251. *×Sorbocotoneaster pozdnjakovii* '1st form' a) leaves, b) flowers, c) young shoots with leaves, d) flowers, e) flowers and leaves, f) fruit

×Sorbocotoneaster pozdnjakovii '2nd form'

National catalog number: U00100050

Collection number: 03841

Botanical name in Latin: *×Sorbocotoneaster pozdnjakovii* Pojark.

Botanical name in English: Pozdnyakov's sorbocotoneaster, or Sorbocotoneaster

Botanical name in Ukrainian: Horobynoirha Pozdniakova

Crop name in Ukrainian: Horobynoirha

Accession name: '2nd form'

Date of introduction: 09.04.2013

Donor: Fomin Botanical Garden of Taras Shevchenko National University of Kyiv, Ukraine

Breeder: Hanna Hrevtsova (introducer)

Origin: Endemic to Yakutia. Natural hybrid of *Cotoneaster laxiflorus* J. Jacq. ex Lindl. \times *Sorbus aucuparia* L. subsp. *glabrata* (Wimm. & Grab.) Hedl. Genomic formula CCSS. Accession collected in nature

Time of flowering: May

Time of fruit ripening: August to September

Value of the sample: The accession registered in the National Center for Plant Genetic Resources of Ukraine for winter and drought tolerance, red-blue edible sweetish fruits without bitterness in 2007. Fruit weight 0.5 g contains 3.9% sugars, 1.6% pectin substances, 0.8% organic acids, and 12.3-21.1 mg/100 g ascorbic acid. Tetraploid. It has the intermediate phenotype

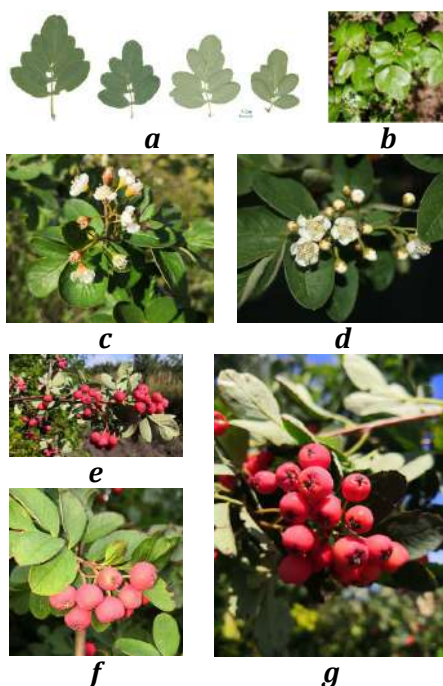


Figure 252. *×Sorbocotoneaster pozdnjakovii* '2nd form' a) leaves, b) young shoot with leaves, c) flowers, d) flowers, e) fruit on the branch, f) fruit, g) fruit

×Sorbocotoneaster pozdnjakovii '3rd form'

National catalog number: U00100051

Collection number: 03842

Botanical name in Latin: *×Sorbocotoneaster pozdnjakovii* Pojark.

Botanical name in English: Pozdnyakov's sorbocotoneaster, or Sorbocotoneaster

Botanical name in Ukrainian: Horobynoirha Pozdniakova

Crop name in Ukrainian: Horobynoirha

Accession name: '3rd form'

Date of introduction: 09.04.2013

Donor: Fomin Botanical Garden of Taras Shevchenko National University of Kyiv, Ukraine

Breeder: Anna Hrevtsova (introducer)

Origin: Endemic to Yakutia. Natural hybrid of *Cotoneaster laxiflorus* J.Jacq. ex Lindl. (= *C. melanocarpus* (Bunge) G.Lodd. ex M.Roem.) × *Sorbus aucuparia* L. subsp. *glabrata* (Wimm. & Grab.) Hedl. The accession was collected in nature. It has a rowan phenotype

Time of flowering: May

Time of fruit ripening: August to September

Value: Differs among the tree forms with the best quality fruits

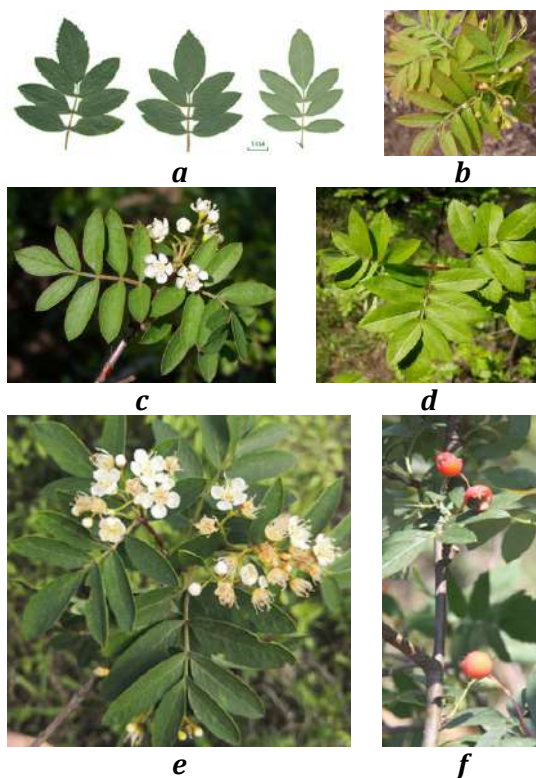


Figure 253. *×Sorbocotoneaster pozdnjakovii* '3rd form' a) leaves, b) young shoot with leaves and flower buds, c) flowers and leaves, d) young shoot with leaves, e) flowers and leaves, f) fruit

ROSACEAE – ×SORBOPYRUS
ROSE FAMILY – PYRUS × SORBUS

ROWAN-PEAR HYBRIDS

Camillo Karl Schneider (1906) established the hybrid genus *Sorbopyrus*, including the spontaneous hybrid *Pyrus communis* × *Sorbus aria*, where the latter species belongs to the genus *Sorbus* sensu lato. With the division of *Sorbus* s.l. into several species genera and the separation of the genus *Aria*, the above-mentioned hybrid between pear and whitebeam, known under the names *Pyraria irregularis*, *Sorbopyrus irregularis*, or *Sorbopyrus auricularia* was transferred to ×*Pyraria*, as a result of which ×*Sorbopyrus* lost its only representative. However, gardeners have created artificial hybrids between *S. aucuparia* and *P. communis*, for which the name ×*S. kurjanovii* Mezhen'skyj, nom. nud. The proposed name ×*Pyrosorbus* Mezhen'skyj (Mezhen'skyj et al., 2012) is a redundant name for ×*Sorbopyrus* (A. Sennikov, pers. comm., 2017). Thus, with the recognition of the genus *Sorbus* s. str., the ×*Sorbopyrus* is a monotypic nothogenus including only artificial hybrids between pear and rowan, not whitebeam.

In 1962-1982, Mikhail Kuryanov (Kuryanov and Kravtsov, 1974; Kuryanov, 1983) at the I. V. Michurin Central Genetic Laboratory carried out a large number of crosses of rowan with other species and cultivars of the family *Malinae*. More than 500,000 castrated flowers were artificially pollinated. The crosses involved rowan, rowan-chokeberry hybrids, rowan-whitebeam hybrids, as well as pear, apple, quince, chokeberry, hawthorn, and serviceberry. The best maternal form in the crosses was *S. aucuparia* 'Moravica'. More than 500 seeds were obtained, but most of them (over 80%) died in the cotyledonary state or the first months of life, and about 15% died at the age of two to three years. The vast majority of surviving seedlings are probably apomictes of morphologically matriculate structure. Seedlings with morphological signs of hybridity are characterized by weak growth, reduced winter hardiness, short life, and sometimes morphological and physiological abnormalities, and, as a rule, die at a young age. The use of isolated germplasm culture made it possible to obtain plants with signs of hybridity even from probe seeds that died during germination in the soil. Only up to 1% of the surviving seeds have intermediate traits. Several *Sorbus* × *Pyrus* hybrids are viable and grow for a long time.

The experiments of Roman Papikhin (2006) on the hybridization of rowan with pears show that the use of physiologically active preparations applied to flower stigmas helps to overcome the barriers of incompatibility at the stages of pollen germination, pollen tube growth, seed set, and seed formation.

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×Sorbopyrus kurjanovii 'Kuryanov'

National catalog number: U00100052

Collection number: 02893

Botanical name in Latin: *×Sorbopyrus kurjanovii* Mezhen'skyj, nom. nud.

Botanical name in English: Kuryanov's sorbopyrus, or True sorbopyrus

Botanical name in Ukrainian: Horobynohrusha Kurianova

Crop name in Ukrainian: Rowan pear

Accession name: 'Kuryanov'

Date of introduction: 18.10.2007

Donor: I. V. Michurin All-Russian Research Institute of Genetics and Breeding of Fruit Plants, Tambov Region, Russia

Breeder: Mikhail Kuryanov

Origin: It is a hybrid between *Sorbus aucuparia* L. 'Moravica' × *Pyrus communis* L. The specimen was received as No. 136, but the author's figure and description of this hybrid (Kuryanov and Kravtsov, 1974; Kuryanov, 1983) correspond to hybrids No. 1117-78 and No. 142 or ? 192

Time of flowering: May

Time of fruit ripening: September

Value: It is characterized by complex immunity to scab and powdery mildew. Recommended for selection for restrained growth. Fruits are almost spherical, orange, weighing 3 g

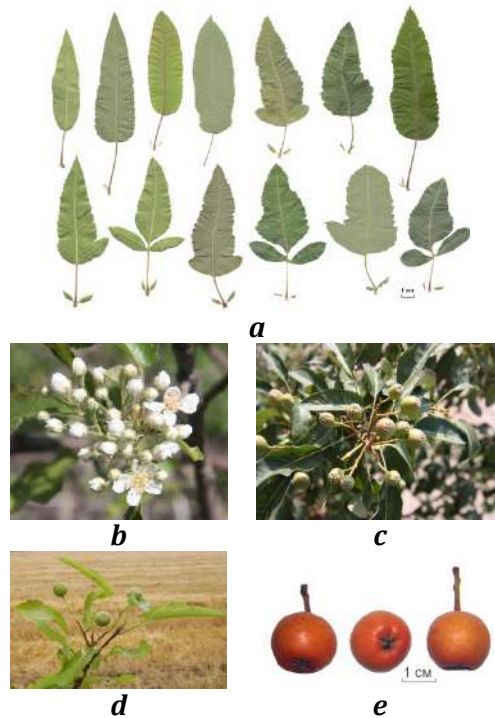


Figure 254. *×Sorbopyrus kurjanovii* 'Kuryanov' a) variety of leaves, b) flower buds and flowers, c) unripe fruit, d) unripe fruit, e) ripe fruit

ROSACEAE – SORBUS

ROSE FAMILY – ROWAN

MOUNTAIN ASHES, OR ROWANS

Carl Linnaeus (Linnaeus, 1753), having established the genus *Sorbus*, included two species with pinnate leaves: *S. aucuparia* and *S. domestica*. He referred other known species of *Sorbus* s.l. to *Crataegus* and *Mespilus*. During the twentieth century, the system of the genus *Sorbus* s.l. became generally recognized (Hedlund, 1901; Gabrielyan, 1978; Aldasoro et al., 1998). However, it has been argued that *Aria*, *Cormus*, *Sorbus*, *Torminaria*, and *Chamaemespilus* should be considered independent genera (Kovanda, 1965; Robertson et al., 1991). This was confirmed by the analysis of molecular data (Potter et al., 2007; Li et al., 2012; Lo and Donoghue, 2012; Sun et al., 2018). But some experts still hold opposing views (McAllister, 2005; Rich et al., 2010; Fay and Rich, 2022). Due to its multivitamin fruits, mountain ash is valuable for fruit growing, nutrition, and medicine. The fruits of *S. aucuparia* are characterized by strong bitterness, so the sweet fruits of both Moravian and Nevezhino rowans as well as *S. sambucifolia* have become widespread. Rowan species are also important as ornamental plants (Kovalev, 1934; McAllister, 2005; Mezhenkij, 2006, 2008; Poplavskaya, 2006; Mezhenkij et al., 2012).

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Sorbus americana No. 00249

Number of the National Catalog: UN0700020

Collection number: 00249

Botanical name in Latin: *Sorbus americana* Marsh.

Botanical name in English: American mountain ash, or American rowan

Botanical name in Ukrainian: Horobyna amerykanska

Crop name in Ukrainian: Horobyna

Accession name: -

Date of introduction: 14.02.1983

Donor: M. V. Tsitsin Main Botanical Garden of the Russian Academy of Sciences, Moscow, Russia

Breeder: -

Distribution: The native range of this species is North America. The introduction number of the Main Botanical Garden is 2219

Time of flowering: May

Time of fruit ripening: September

Value: Most decorative during flowering and fruiting. Source of food for birds and animals

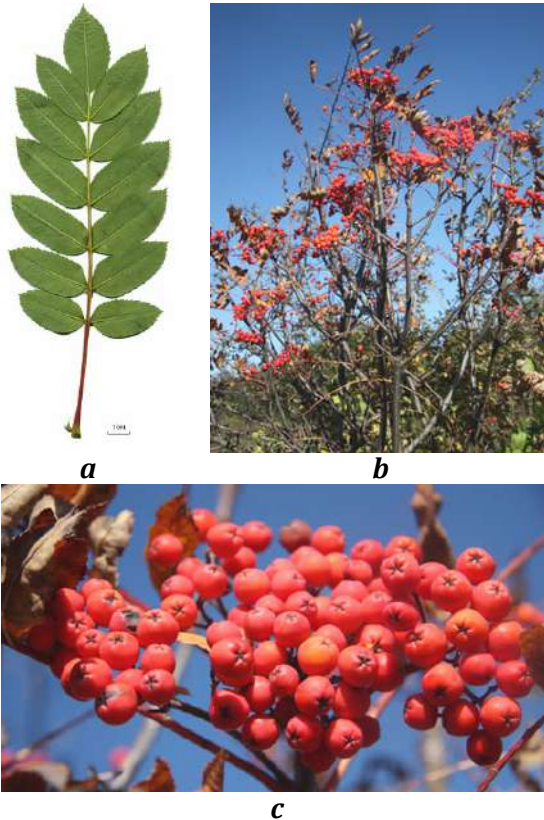


Figure 255. *Sorbus americana* No. 00249 a) compound leaf, b) fruiting tree, c) fruit

Sorbus amurensis No. 03563

National catalog number: UN0700094

Collection number: 03563

Botanical name in Latin: *Sorbus amurensis* Koehne

Botanical name in English: Amur mountain ash, or Amur rowan

Botanical name in Ukrainian: Horobyna amurska

Crop name in Ukrainian: Horobyna

Accession name: -

Date of introduction: 24.06.2012

Donor: Central Botanical Garden of the Academy of Sciences of Belarus, Minsk, Belarus

Breeder: -

Origin: Introduced from the Far East

Time of flowering: May

Time of fruit ripening: August to September

Value: Most ornamental during flowering and fruiting. Source of food for birds and animals



a



b



c

Figure 256. *Sorbus amurensis* No. 03563 a) corymb, b) fruiting tree, c) infructescence

Sorbus ×arnoldiana 'Coral Pink'

Number of the National Catalog: UN0700109

Collection number: 04989

Botanical name in Latin: ? *Sorbus ×arnoldiana* Rehder

Botanical name in English: Arnold mountain ash, or Arnold rowan

Botanical name in Ukrainian: Horobyna Arnoldieva

Crop name in Ukrainian: Horobyna

Accession name: 'Coral Pink'

Date of introduction: 19.08.2018

Donor: Brusviana Nursery, Kostivtsi, Zhytomyr Region, Ukraine

Breeders: Jacques Lombarts; Pierre Lombarts Nursery in Zundert, the Netherlands

Origin: *S. aucuparia* L. × *S. discolor* (Maxim.) Maxim. or *S. prattii* Koehne

Time of flowering: May

Time of fruit ripening: August to September

Value: The greatest decorativeness during flowering and fruiting. Fruits are pinkish-white. Source of food for birds and animals



a



b



c

Figure 257. *Sorbus ×arnoldiana* 'Coral Pink' a) fruit, b) fruit, c) fruit

Sorbus ×arnoldiana 'Maiden Blush'

National catalog number: UN0700017

Collection number: 00245

Botanical name in Latin: *Sorbus ×arnoldiana* Rehder

Botanical name in English: Arnold mountain ash, or Arnold rowan

Botanical name in Ukrainian: Horobyna Arnoldieva

Crop name in Ukrainian: Horobyna

Accession name: 'Maiden Blush'

Date of introduction: 14.02.1983

Donor: M. V. Tsitsin Main Botanical Garden of the Russian Academy of Sciences, Moscow, Russia

Breeder: Jacques Lombarts; Pierre Lombarts Nursery in Zundert, the Netherlands

Origin: *S. aucuparia* L. × *S. discolor* (Maxim.) Maxim. or *S. prattii* Koehne. The introduction number of the Main Botanical Garden is 86357

Time of flowering: May

Time of fruit ripening: August to September

Value: The greatest decorativeness during flowering and fruiting. Fruits are pinkish to pinkish. Source of food for birds and animals

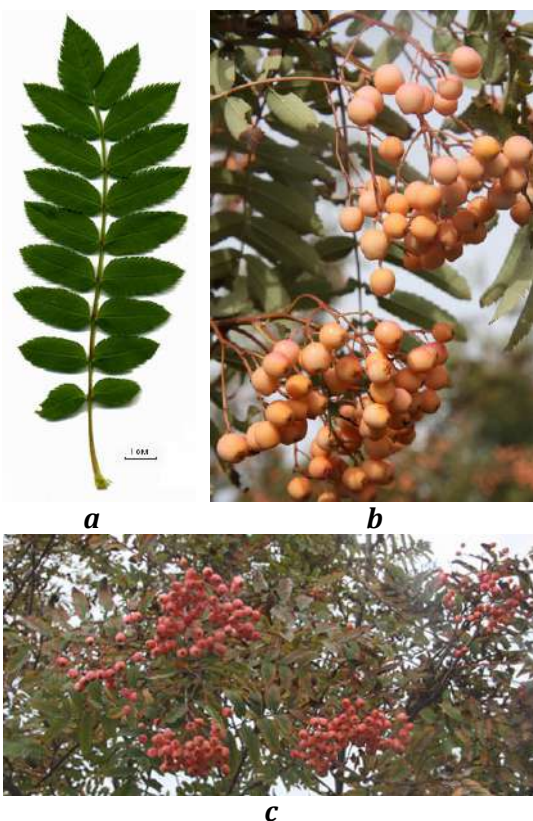


Figure 258. *Sorbus ×arnoldiana* 'Maiden Blush' a) compound leaf, b) fruit, c) fruit

Sorbus aucuparia 'Alaja Krupnaja'

National catalog number: UN0700011

Collection number: 00164

Botanical name in Latin: *Sorbus aucuparia* L.

Botanical name in English: European mountain ash, Mountain ash, or Rowan

Botanical name in Ukrainian: Horobyna ptakholovna, or Horobyna zvychaina

Crop name in Ukrainian: Horobyna

Accession name: 'Alaja Krupnaja' ('Alaja Krupnaya') (means "scarlet large")

Date of introduction: 18.10.2007

Donor: I. V. Michurin All-Russian Research Institute of Genetics and Breeding of Fruit Plants, Tambov Region, Russia

Breeders: Aleksandra Tikhonova and Tatyana Poplavskaya

Origin: 'Elita No. 10' (= *S. aucuparia* × *Pyrus* pollen mixture) × 'Moravskaja'

Time of flowering: May

Time of fruit ripening: August to September

Value: The variety was included in the State Register of Breeding Achievements of the Russian Federation in 1999; and in the State Register of Varieties of Belarus in 2008. Fruits are spherical, red, with bitterness, weighing 2.0 (3.0) g, up to 131 in a large corymb. Fruits contain 8.1% sugars, 1.9% organic acids, 7.8-14.4 mg/100 g ascorbic acid, and 11.1 mg/100 g carotene

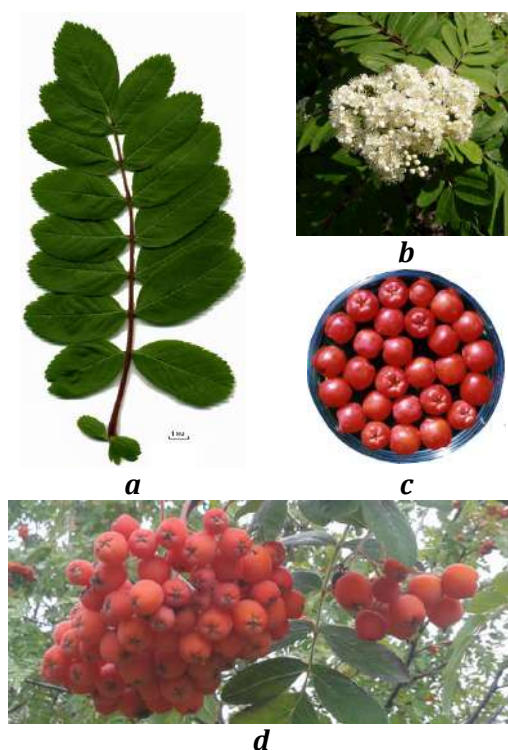


Figure 259. *Sorbus aucuparia* 'Alaja Krupnaja' a) compound leaf, b) corymb, c) fruit (in a Petri dish with a diameter of 10 cm), d) fruit

Sorbus aucuparia 'Doch Kubovoj'

National catalog number: UN0700065

Collection number: 03292

Botanical name in Latin: *Sorbus aucuparia* L.

Botanical name in English: European mountain ash, Mountain ash, or Rowan

Botanical name in Ukrainian: Horobyna ptakholovna, or Horobyna zvychaina

Crop name in Ukrainian: Horobyna

Accession name: 'Doch' Kubovoj' ('Solnechnaja', 'Solnechnaya') (means "daughter of 'Kubovaja'")

Date of introduction: 18.10.2007

Donor: I. V. Michurin All-Russian Research Institute of Genetics and Breeding of Fruit Plants, Tambov Region, Russia

Breeders: Alexandra Tikhonova and Tatyana Poplavskaya

Origin: Seedling 'Kubovaja' from free pollination

Time of flowering: May

Time of fruit ripening: August to September

Value: Cultivar was included in the State Register of Breeding Achievements of the Russian Federation in 1998. The fruits are almost spherical, red, pleasant to the taste, and contain 14.5 mg/100 g of carotene

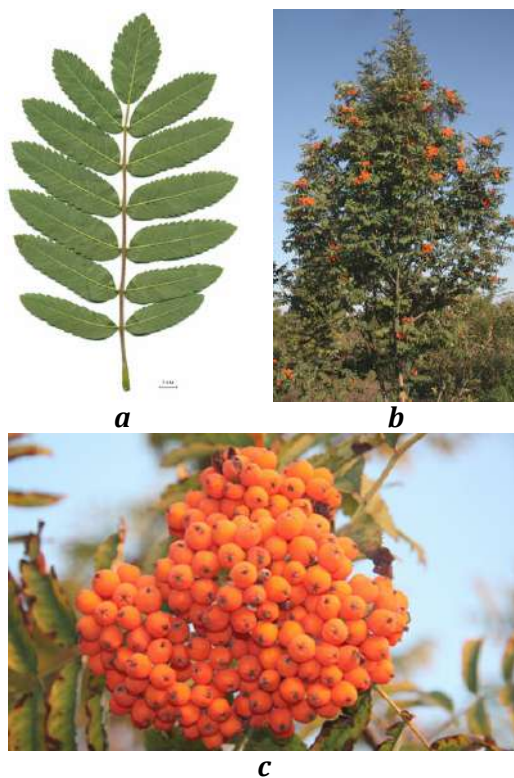


Figure 260. *Sorbus aucuparia* 'Doch' Kubovoj' a) compound leaf, b) fruiting tree, c) infructescence

Sorbus aucuparia 'Klosterneuburg IV'

National catalog number: UN0700107

Collection number: 03961

Botanical name in Latin: *Sorbus aucuparia* L.

Botanical name in English: European mountain ash, Mountain ash, or Rowan

Botanical name in Ukrainian: Horobyna ptakholovna, or Horobyna zvychaina

Crop name in Ukrainian: Horobyna

Accession name: 'Klosterneuburg IV' (named for a town in the Lower Austria)

Date of introduction: 14.03.2014

Donor: Julian Geyer, Graz, Austria

Breeder: Reinhard Eder; Klosterneuburg nursery, Austria

Origin: Selection in *S. aucuparia* var. *moravica*

Time of flowering: May

Time of fruit ripening: August to September

Value: Fruits are almost spherical, red, and pleasant in taste



a



b

Figure 261. *Sorbus aucuparia* 'Klosterneuburg IV' a) infructescence, b) infructescence

Sorbus aucuparia 'Krasnaja'

National catalog number: UN0700040

Collection number: 00924

Botanical name in Latin: *Sorbus aucuparia* L.

Botanical name in English: European mountain ash, Mountain ash, or Rowan

Botanical name in Ukrainian: Horobyna ptakholovna, or Horobyna zvychaina

Crop name in Ukrainian: Horobyna

Accession name: 'Krasnaja' ('Krasnaya') (means "red")

Date of introduction: 28.07.1988

Donor: Polly Research Station, Nuja, Estonia

Breeder: Efrem Petrov, Russia

Origin: Selection in populations plants of *S. aucuparia* Nevezhino Group

Time of flowering: May

Time of fruit ripening: August to September

Value: Fruits are almost spherical, red, and pleasant in taste

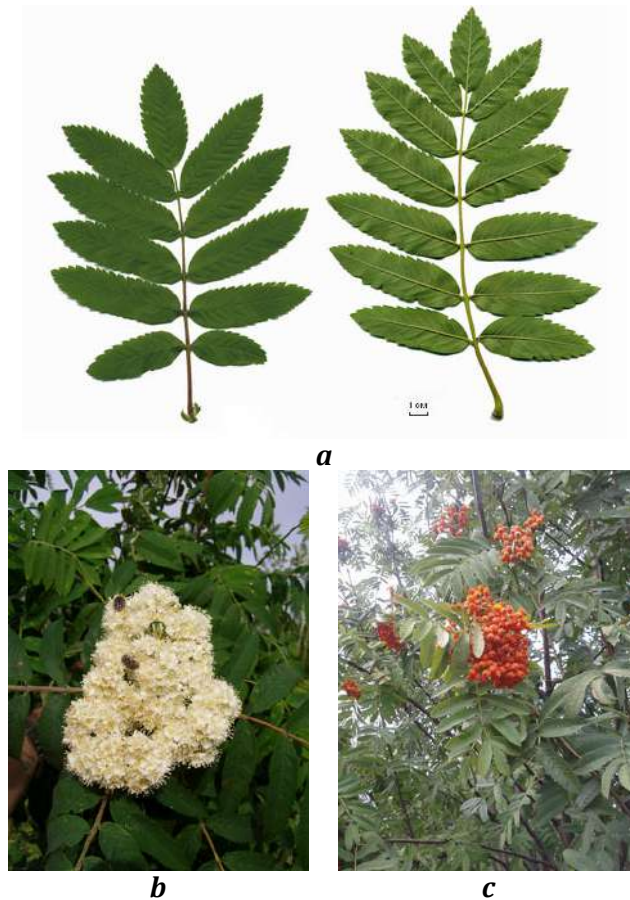


Figure 262. *Sorbus aucuparia* 'Krasnaja' a) leaves, b) corymb, c) fruit and leaves on the branches

Sorbus aucuparia 'Moravica'

National catalog number: UN0700012

Collection number: 00189

Botanical name in Latin: *Sorbus aucuparia* L.

Botanical name in English: European mountain ash, Mountain ash, or Rowan

Botanical name in Ukrainian: Horobyna ptakholovna, or Horobyna zvychaina

Crop name in Ukrainian: Horobyna

Accession name: 'Moravica' ('Moravsky Sladkoplody', 'Moravskaja', and 'Moravskaya')

Date of introduction: 12.04.1988

Donor: I. V. Michurin All-Russian Research Institute of Genetics and Breeding of Fruit Plants, Tambov Region, Russia

Breeder: -

Origin: The clone of *S. aucuparia* Moravian Group was selected in Moravia (now Czech Republic)

Time of flowering: May

Time of fruit ripening: August to September

Value: In the Czech Republic and Slovakia, the variety was registered in 1954 under the name 'Moravsky Sladkoplody'. Fruits are almost spherical, orange-black, without bitterness, weighing 1.0 (1.2) g, up to 200 in a large corymb. The fruits contain 9.0% sugars, 1.6% organic acids, and 42.1-77.8 mg/100 g of ascorbic acid

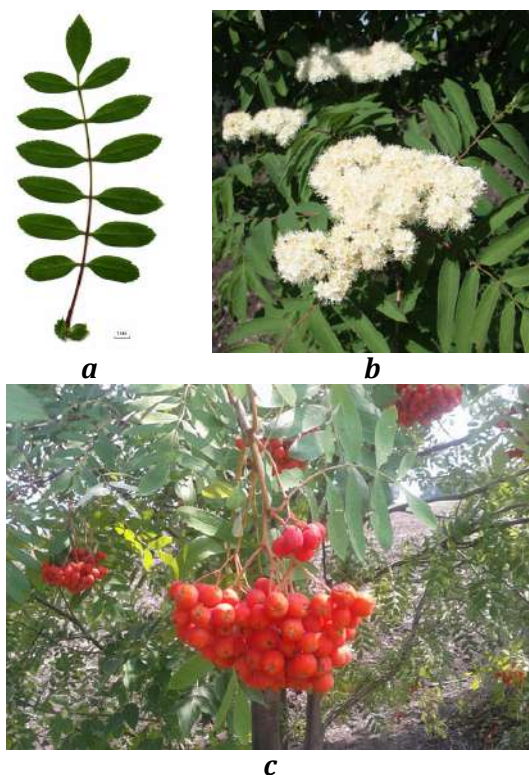


Figure 263. *Sorbus aucuparia* 'Moravica' a) compound leaf, b) corymbs, c) fruit

Sorbus aucuparia 'Moravska Vrozhaina'

National catalog number: UN0700108

Collection number: 04068

Botanical name in Latin: *Sorbus aucuparia* L.

Botanical name in English: European mountain ash, Mountain ash, or Rowan

Botanical name in Ukrainian: Horobyna ptakholovna, or Horobyna zvychaina

Crop name in Ukrainian: Horobyna

Accession name: 'Moravska Vrozhaina' (means "Moravian prolific")

Date of introduction: 08.01.2013

Donor: Volodymyr Mezhenkyj, Bakhmut, Donetsk Region, Ukraine

Breeder: Volodymyr Mezhenkyj

Origin: Belong to *S. aucuparia* Moravica Group; seedling of accession No. 00189 'Moravica' ('Moravskaja')

Time of flowering: May

Time of fruit ripening: August to September

Value: Fruits are almost spherical, orange-red, without a mountain, weighing 1.0 g, up to 250 in a large corymb. Fruits contain 19.5 mg/100 g of carotene

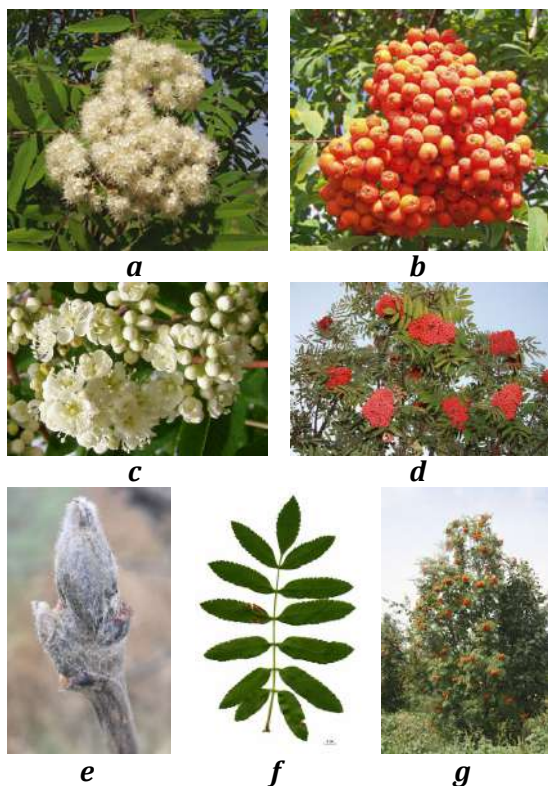


Figure 264. *Sorbus aucuparia* 'Moravska Vrozhaina' a) corymb, b) infructescence, c) flowers, d) fruit corymbs in the crown of the tree, e) apical buds, f) compound leaf, g) fruiting tree

Sorbus aucuparia 'Nevezhinskaja'

National catalog number: UN070003

Collection number: 00026

Botanical name in Latin: *Sorbus aucuparia* L.

Botanical name in English: European mountain ash, Mountain ash, or Rowan

Botanical name in Ukrainian: Horobyna ptakholovna, or Horobyna zvychaina

Crop name in Ukrainian: Horobyna

Accession name: 'Nevezhinskaja' ('Nevezhinskaya') (means "from Nevezhino", a toponym in Vladimir region, Russia)

Date of introduction: 21.07.1981

Donor: M. M. Hryshko National Botanical Garden of the National Academy of Sciences of Ukraine, Kyiv, Ukraine

Breeder: -

Origin: Selection in populations plants of *S. aucuparia* Nevezhino Group

Time of flowering: May

Time of fruit ripening: August to September

Value of the sample: Cultivar was zoned in the Russian Federation in 1947; and included in the State Register of Varieties of Belarus in 2008. Fruits are almost spherical, orange-red, without bitterness, weighing 0.6-0.8 (1.2) g, up to 235 in large corymb. Fruits contain 9.1% of sugars, 2.8% of organic acids, and 63.4 mg/100 g of ascorbic acid

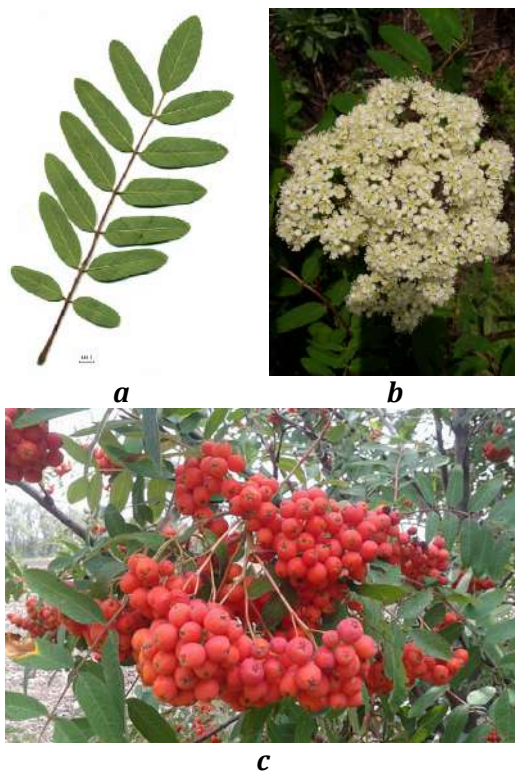


Figure 265. *Sorbus aucuparia* 'Nevezhinskaja' a) compound leaf, b) corymb, c) fruit

Sorbus aucuparia 'Oranzhevaja'

National catalog number: UN0700125

Collection number: 03770

Botanical name in Latin: *Sorbus aucuparia* L.

Botanical name in English: European mountain ash, Mountain ash, or Rowan

Botanical name in Ukrainian: Horobyna ptakholovna, or Horobyna zvychaina

Crop name in Ukrainian: Horobyna

Accession name: 'Oranzhevaja' ('Oranzhevaya') (means "orange")

Date of introduction: 09.08.2012

Donor: Pavlovsk Experimental Station of the VIR - N. I. Vavilov Research Institute of Plant Industry, Pavlovsk, Leningrad Region, Russia

Breeder: -

Origin: Accession received from Balsgård, Sweden; introduction number of Pavlovsk Experimental Station 42570

Time of flowering: May

Time of fruit ripening: August to September

Value: Fruits are almost spherical, red, and pleasant in taste

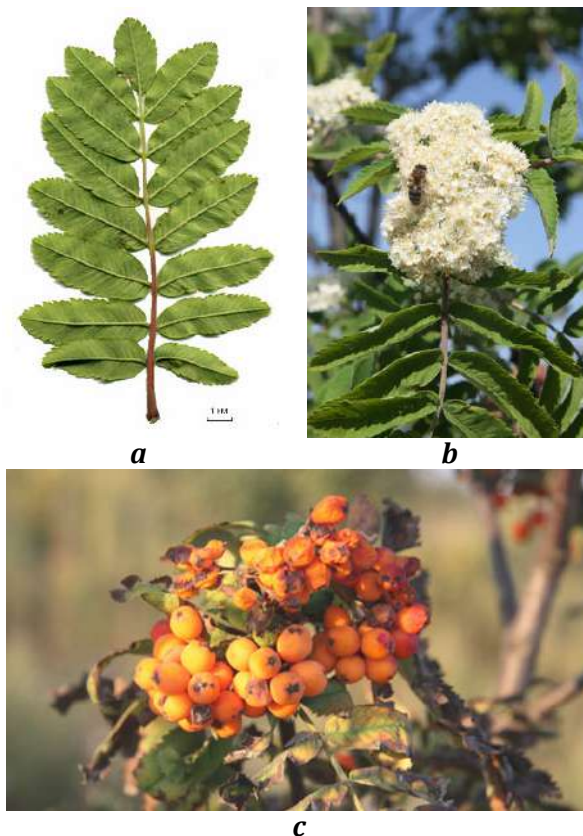


Figure 266. *Sorbus aucuparia* 'Oranzhevaja' a) compound leaf, b) corymb, c) overripe fruit

Sorbus aucuparia 'Rossica'

National catalog number: UN070048

Collection number: 00932

Botanical name in Latin: *Sorbus aucuparia* L.

Botanical name in English: European mountain ash, Mountain ash, or Rowan

Botanical name in Ukrainian: Horobyna ptakholovna, or Horobyna zvychaina

Crop name in Ukrainian: Horobyna

Accession name: 'Rossica' ('Russkaja', 'Russkaya')

Date of introduction: 28.07.1988

Donor: Botanical Garden of the Latvian Academy of Sciences, Riga, Latvia

Breeder: Franz Ludwig Späth (introducer)

Origin: The variety was introduced from Ukraine to Germany by Baumschule Späth

Time of flowering: May

Time of fruit ripening: August to September

Value: Fruits are almost spherical, orange-red, without a mountain, weighing 0.7 g, in large corymbs. Fruits contain 6.3 mg/100 g of sugars, 1.9% organic acids, 54.6 mg/100 g of ascorbic acid, and 19.2 mg/100 g of carotene

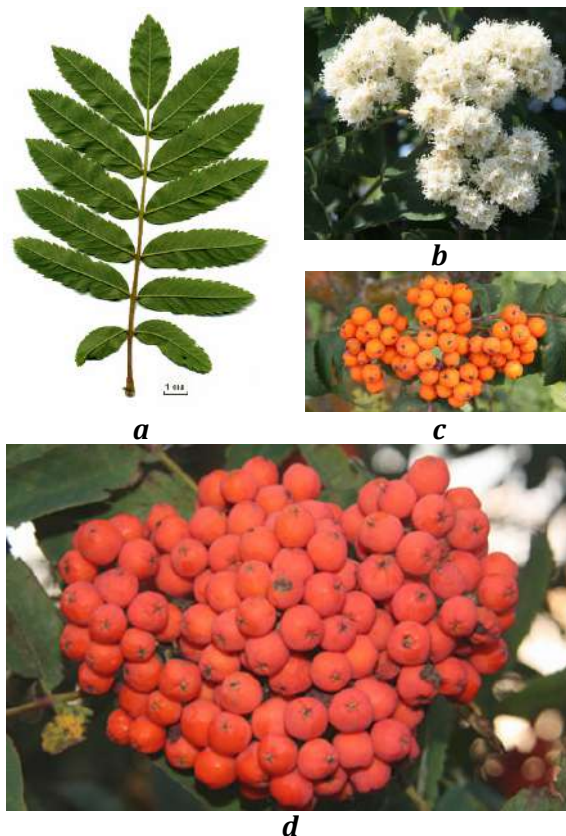


Figure 267. *Sorbus aucuparia* 'Rossica' a) compound leaf, b) corymb, c) fruit, d) infructescence

Sorbus aucuparia 'Sakharnaja'

National catalog number: UN0700046

Collection number: 00930

Botanical name in Latin: *Sorbus aucuparia* L.

Botanical name in English: European mountain ash, Mountain ash, or Rowan

Botanical name in Ukrainian: Horobyna ptakholovna, or Horobyna zvychaina

Crop name in Ukrainian: Horobyna

Accession name: 'Sakharnaja' ('Sakharnaya') (means "sugar")

Date of introduction: 28.07.1988

Donor: Polly Research Station, Nuja, Estonia

Breeder: Efrem Petrov, Russia

Origin: Selection in populations plants of *S. aucuparia* Nevezhino Group

Time of flowering: May

Time of fruit ripening: August to September

Value: Fruits are almost spherical, red, up to 120 in corymb, pleasant to the taste



a



b

Figure 268. *Sorbus aucuparia* 'Sakharnaja' a) compound leaves, b) fruit

Sorbus aucuparia 'Skazochnaja'

National catalog number: UN0700084

Collection number: 02897

Botanical name in Latin: *Sorbus aucuparia* L.

Botanical name in English: European mountain ash, Mountain ash, or Rowan

Botanical name in Ukrainian: Horobyna ptakholovna, or Horobyna zvychaina

Crop name in Ukrainian: Horobyna

Accession name: 'Skazochnaja' ('Skazochnaja') (means "fabulous, phenomenal, stupendous")

Date of introduction: 18.10.2007

Donor: I. V. Michurin All-Russian Research Institute of Genetics and Breeding of Fruit Plants, Tambov Region, Russia

Breeders: Nikolai Savelyev, Tatiana Poplavskaya, and Marina Griбанова

Origin: A hybrid of a selected form *S. aucuparia* Moravica Group with a selected form of *S. aucuparia* Nevezhino Group

Time of flowering: May

Time of fruit ripening: August to September

Value: Cultivar was included in the State Register of Breeding Achievements of the Russian Federation in 2006. It is a source of large fruits, self-fertility, and high carotenoid content. Fruits are almost spherical, red, pleasant to the taste, and contain 11.7 mg/100 g of carotene



a



b



c

Figure 269. *Sorbus aucuparia* 'Skazochnaja' a) infructescence, b) compound leaves, c) fruiting tree

Sorbus aucuparia 'Vefed'

National catalog number: UN0700064

Collection number: 01619

Botanical name in Latin: *Sorbus aucuparia* L.

Botanical name in English: European mountain ash, Mountain ash, or Rowan

Botanical name in Ukrainian: Horobyna ptakholovna, or Horobyna zvychaina

Crop name in Ukrainian: Horobyna

Accession name: 'Vefed' (abbreviations of two names)

Date of introduction: 31.10.1997

Donor: I. V. Michurin All-Russian Research Institute of Genetics and Breeding of Fruit Plants, Tambov Region, Russia

Breeder: Tatiana Poplavskaya

Origin: 'Nevezhinskaja No. 1' × 'Nevezhinskaja No. 7'

Flowering time: May

Time of fruit ripening: August to September

Value: Cultivar was included in the State Register of Breeding Achievements of the Russian Federation in 1999; and in the State Register of Varieties of Belarus in 2012. Fruits are almost spherical, red, pleasant to taste

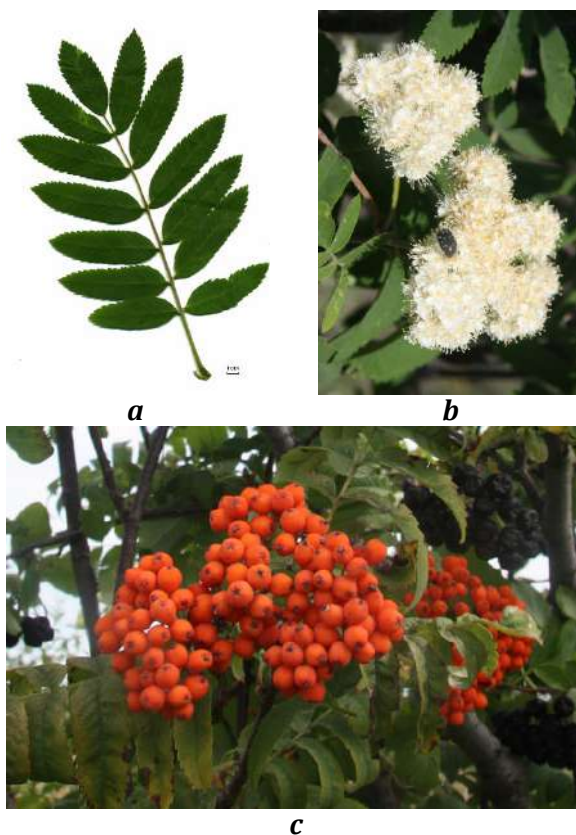


Figure 270. *Sorbus aucuparia* 'Vefed' a) compound leaf, b) corymbs, c) fruit

Sorbus decora No. 03639

Number of the National Catalog: UN0700099

Collection number: 03639

Botanical name in Latin: *Sorbus decora* (Sarg.) C.K. Schneid.

Botanical name in English: Northern mountain ash, or Showy mountain ash

Botanical name in Ukrainian: Horobyna prykrashena

Crop name in Ukrainian: Horobyna

Accession name: -

Date of introduction: 08.08.2012

Donor: Botanical Garden of Peter the Great of the V.L. Komarov Botanical Institute of the Russian Academy of Sciences, St. Petersburg, Russia

Breeder: -

Origin: The native range of this species in North America

Flowering time: May to June

Time of fruit ripening: September

Value: Low habit. The greatest decorativeness during flowering and fruiting. Fruits contain 9.1 mg/100 g of carotene. A source of food for birds and animals



a



b



c



d

Figure 271. *Sorbus decora* No. 03639 *a*) unripe fruit, *b*) ripe fruit, *c*) inflorescence, *d*) inflorescence

Sorbus decora No. 03678

National catalog number: UN0700103

Collection number: 03678

Botanical name in Latin: *Sorbus decora* (Sarg.) C. K. Schneid.

Botanical name in English: Northern mountain ash, or Showy mountain ash

Botanical name in Ukrainian: Horobyna prykrashena

Crop name in Ukrainian: Horobyna

Accession name: -

Date of introduction: 09.08.2012

Donor: Pavlovsk Experimental Station of the VIR - N. I. Vavilov Research Institute of Plant Industry, Pavlovsk, Leningrad Region, Russia

Breeder: -

Origin: The native range of this species is North America. Originally from Wesley, Great Britain; the Pavlovsk Experimental Station's introduction number is 42622

Flowering time: May to June

Time of fruit ripening: September

Value: Low habit. Most ornamental during flowering and fruiting. Source of food for birds and animals



a



b



c

Figure 272. *Sorbus decora* No. 03678 *a*) corymb, *b*) fruiting tree, *c*) fruit

Sorbus commixta No. 00251

National catalog number: UN0700022

Collection number: 00251

Botanical name in Latin: *Sorbus commixta* Hedl.

Botanical name in English: Japanese mountain ash, or Japanese rowan

Botanical name in Ukrainian: Horobyna zmishana

Crop name in Ukrainian: Horobyna

Accession name: -

Date of introduction: 14.02.1983

Donor: M. V. Tsitsin Main Botanical Garden of the Russian Academy of Sciences, Moscow, Russia

Breeder: -

Origin: The native range of this species is Central China to Korea and Sakhalin to Japan. The accession is obtained from Sakhalin. The introduction number of the Main Botanical Garden is 54463

Time of flowering: May

Time of fruit ripening: August to September

Value: Most ornamental during flowering and fruiting. Source of food for birds and animals

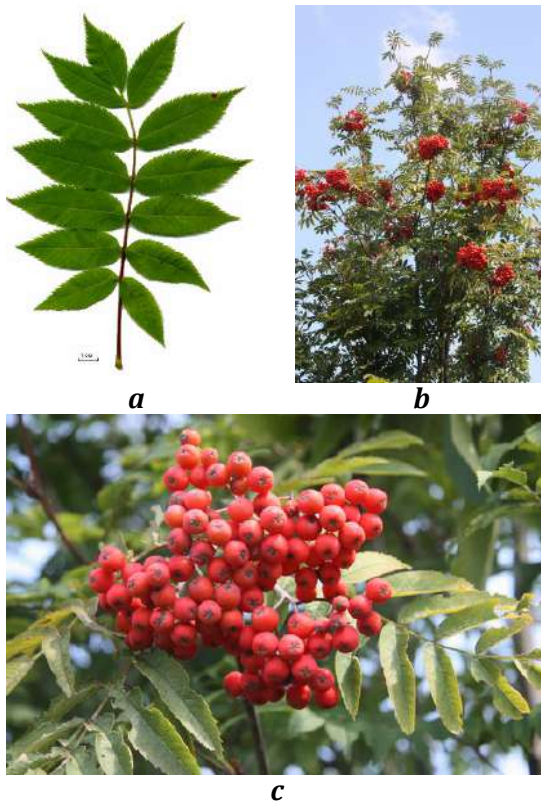


Figure 273. *Sorbus commixta* No. 00251 a) compound leaf, b) fruiting tree, c) fruit

Sorbus koehneana No. 03616

National catalog number: UN0700097

Collection number: 03616

Botanical name in Latin: *Sorbus koehneana* C.K.Schneid.

Botanical name in English: Koehne mountain ash, or Koehne rowan

Botanical name in Ukrainian: Horobyna Kene

Crop name in Ukrainian: Horobyna

Accession name: -

Donor: Otradnoe Research Station of V. L. Komarov Botanical Institute of the Russian Academy of Sciences, Otradnoe, Leningrad Region, Russia

Breeder: -

Origin: The native range of this species in China

Time of flowering: May

Time of fruit ripening: August

Value: Low growth. The greatest decorativeness during fruiting. The fruits are white. Source of food for birds and animals



a



b

Figure 274. *Sorbus koehneana* No. 03616 a) leaves and young fruit, b) ripe, fruit

Sorbus maderensis No. 03684

National catalog number: UN0700105

Collection number: 03684

Botanical name in Latin: *Sorbus maderensis* (Lowe) Dode

Botanical name in English: Madeira mountain ash, or Madeira rowan

Botanical name in Ukrainian: Horobyna madeirskara

Crop name in Ukrainian: Horobyna

Accession name: -

Date of introduction: 09.08.2012

Donor: Pavlovsk Experimental Station of the VIR) N. I. Vavilov Research Institute of Plant Industry, Pavlovsk, Leningrad Region, Russia

Breeder: -

Origin: Originally from Wesley, Great Britain; the Pavlovsk Experimental Station introduction number is 42669. Morphologically the accession does not correspond to the description of *S. maderensis*, which is characterized by red fruits

Time of flowering: May

Time of fruit ripening: August to September

Value: The greatest decorativeness during flowering and fruiting. Fruits are white. Source of food for birds and animals



Figure 275. *Sorbus maderensis* No. 03684 a) fruiting tree, b) fruit, c) fruit

Sorbus prattii No. 03566

National catalog number : UN0700096

Collection number: 03566

Botanical name in Latin: *Sorbus prattii* Koehne

Botanical name in English: Pratt's mountain ash, or Pratt's rowan

Botanical name in Ukrainian: Horobyna Pratta

Crop name in Ukrainian: Horobyna

Accession name: -

Date of introduction: 24.06.2012

Donor: of the Academy of Sciences of Belarus, Minsk, Belarus

Breeder: -

Origin: The native range of this species in China. The introduction number of Central Botanical Garden is 175452

Time of flowering: May

Time of fruit ripening: August to September

Value: The greatest decorativeness during flowering and fruiting. The fruits are pink. Source of food for birds and animals

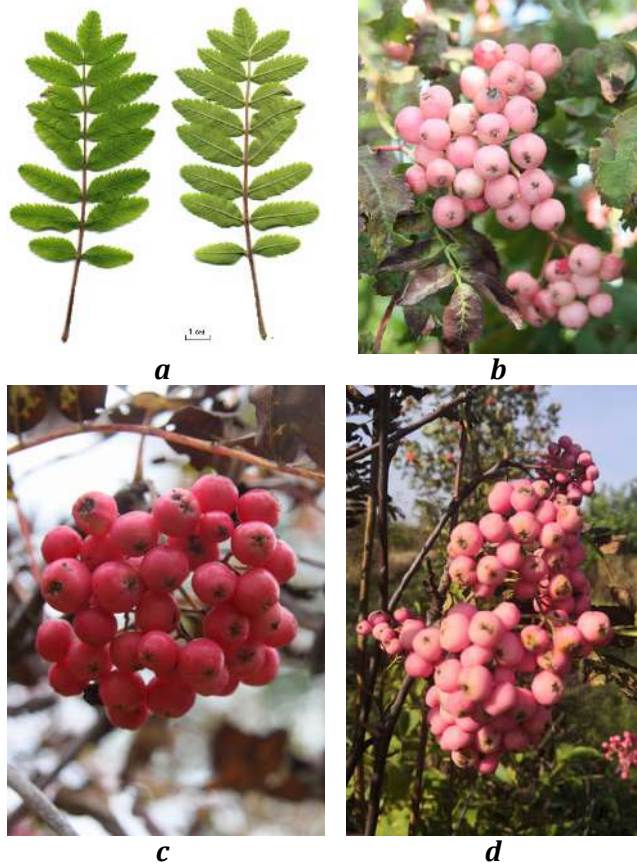


Figure 276. *Sorbus prattii* No. 03566 a) compound leaves, b) fruit, c) fruit, d) fruit

Sorbus sambucifolia No. 00264

Number of the National Catalog: UN070029

Collection number: 00264

Botanical name in Latin: *Sorbus sambucifolia* (Cham. & Schltdl.) M.Roem.

Botanical name in English: Aleutian mountain ash, or Aleutian rowan

Botanical name in Ukrainian: Horobyna buzynolystkova

Crop name in Ukrainian: Horobyna

Accession name: -

Date of introduction: 14.02.1983

Donor: M. V. Tsitsin Main Botanical Garden of the Russian Academy of Sciences, Moscow, Russia

Breeder: -

Origin: The native range of this species to Korea, northern and central Japan, the Russian Far East, and Alaska. Accession is originally from the Far East. The introduction number of the Main Botanical Garden is 203892

Time of flowering: May

Time of fruit ripening: August

Value: Fruits are almost spherical, red, without bitterness, weighing 0.5 g, up to 20 in corymb. Fruits contain 3.6% of sugars, 1.4% of organic acids, and 34.8-58.0 mg/100 g of ascorbic acid

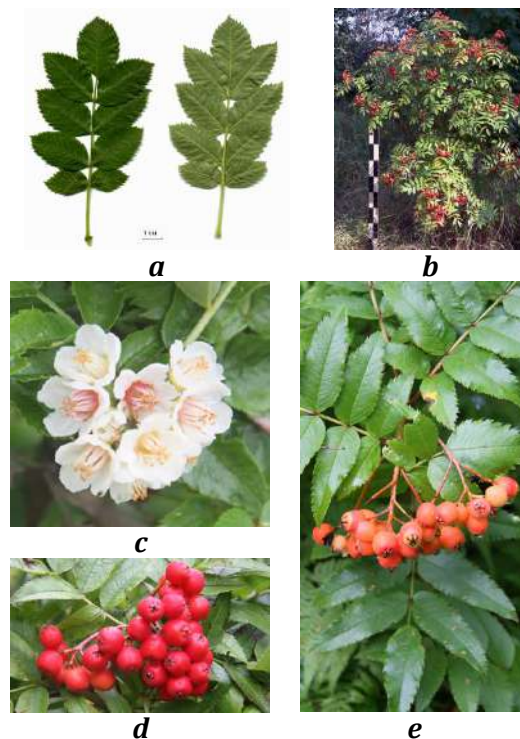


Figure 277. *Sorbus sambucifolia* No. 00264 a) compound leaves, b) fruiting, tree, c) flowers, d) fruit, e) fruit and leaves

Sorbus rehderiana No. 03643

National catalog number: UN0700100

Collection number: 03643

Botanical name in Latin: *Sorbus rehderiana* Koehne

Botanical name in English: Rehder's mountain ash, or Rehder's rowan

Botanical name in Ukrainian: Horobyna Rederova

Crop name in Ukrainian: Horobyna

Accession name: -

Date of introduction: 08.08.2012

Donor: Botanical Garden of Peter the Great of the V.L. Komarov Botanical Institute of the Russian Academy of Sciences, St. Petersburg, Russia

Breeder: -

Origin: The native range of the species is Qinghai to S. Central China. The accession was obtained from Cornelius Wilhelm Sönksen, Breklum, Germany

Time of flowering: May

Time of fruit ripening: September

Value: The greatest decorativeness during flowering and fruiting. The fruits are red. Source of food for birds and animals

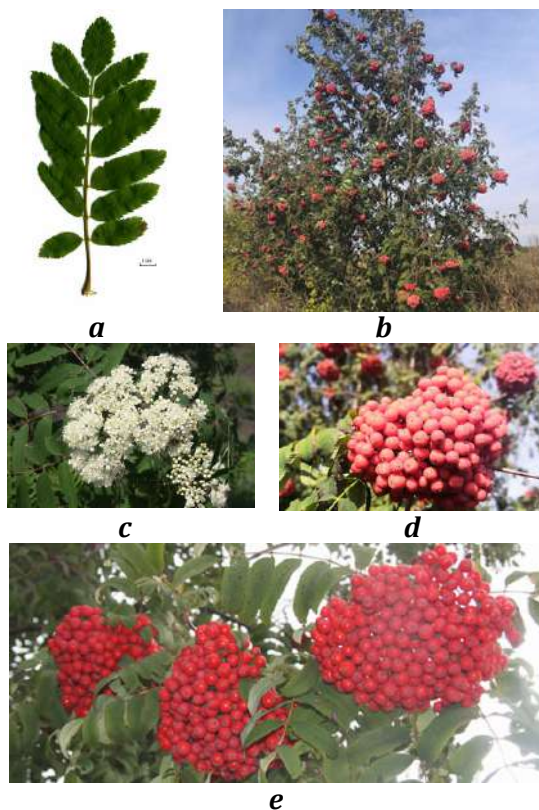


Figure 278. *Sorbus rehderiana* No. 03643 a) compound leaf, b) fruiting tree, c) corymb, d) fruit, e) infructescences

Sorbus shurogavae No. 03622

National catalog number: -

Collection number: 03622

Botanical name in Latin: *Sorbus shurogavae*

Botanical name in English: Mountain ash, or Rowan

Botanical name in Ukrainian: Horobyna

Crop name in Ukrainian: Horobyna

Accession name: -

Date of introduction: 07.08.2012

Donor: Otradnoe Research Station of V. L. Komarov Botanical Institute of the Russian Academy of Sciences, Otradnoe, Leningrad Region, Russia

Breeder: -

Origin: Accession identification is required. Searches for species epithet were unsuccessful

Flowering time: May to June

Time of fruit ripening: September to October

Value: Low habit. The greatest decorativeness during flowering and fruiting. Fruits are small and red. Source of food for birds and animals

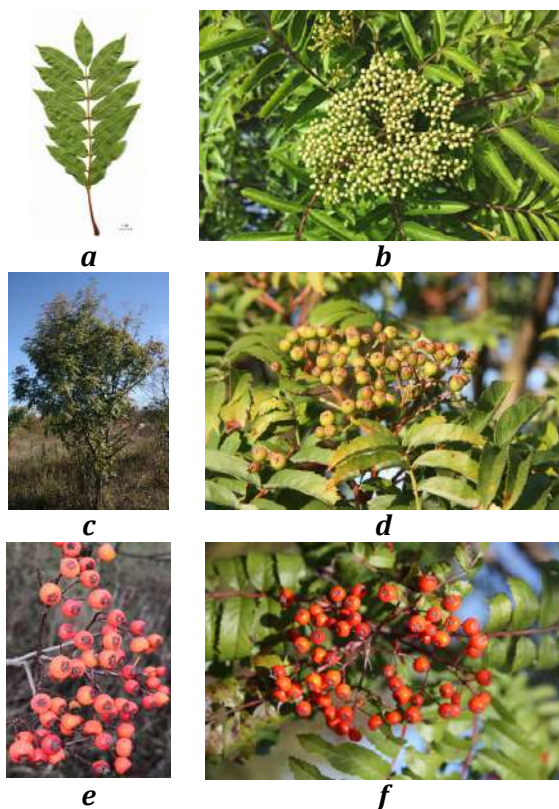


Figure 279. *Sorbus shurogavae* No. 03622 a) compound leaf, b) corymb in flower bud stage, c) tree, d) fruit, e) fruit, f) infructescence

Sorbus sp. 'Hybrida Serrulata'

National catalog number: UN0700104

Collection number: 03680

Botanical name in Latin: *Sorbus* sp.

Botanical name in English: Mountain ash, or Rowan

Botanical name in Ukrainian: Horobyna

Crop name in Ukrainian: Horobyna

Accession name: "Hybrida Serrulata"

Date of introduction: 09.08. 2012

Donor: Pavlovsk Experimental Station of the VIR - N. I. Vavilov Research Institute of Plant Industry, Pavlovsk, Leningrad Region, Russia

Breeder: -

Origin: It is accession from the Introduction and Quarantine Nursery of the Pavlovsk Experimental Station No. 156620a

Time of flowering: May

Time of fruit ripening: September to October

Value: The greatest decorativeness during flowering and fruiting. Fruits are yellow. Source of food for birds and animals



a



b



c

Figure 280. *Sorbus* sp. 'Hybrida Serrulata' a) fruits and leaves, b) fruiting tree, c) fruit

Sorbus sp. 'Joseph Rock'

National catalog number: UN0700102

Collection number: 03669

Botanical name in Latin: *Sorbus* sp.

Botanical name in English: Mountain ash 'Joseph Rock', or Rowan 'Joseph Rock'

Botanical name in Ukrainian: Mountain ash

Crop name in Ukrainian: Mountain ash

Accession name: 'Joseph Rock'

Date of introduction: 09.08. 2012

Donor: Pavlovsk Experimental Station of the VIR - N. I. Vavilov Research Institute of Plant Industry, Pavlovsk, Leningrad Region, Russia

Breeder: -

Origin: A putative hybrid of *S. comixta* Hedl. × *S. monbeigii* (Cardot) N.P.Balacr. It is believed to have originated from seeds collected in Yunnan Province, China

Time of flowering: May

Time of fruit ripening: September to October

Value: The greatest decorativeness during flowering and fruiting. Fruits are yellow. Source of food for birds and animals

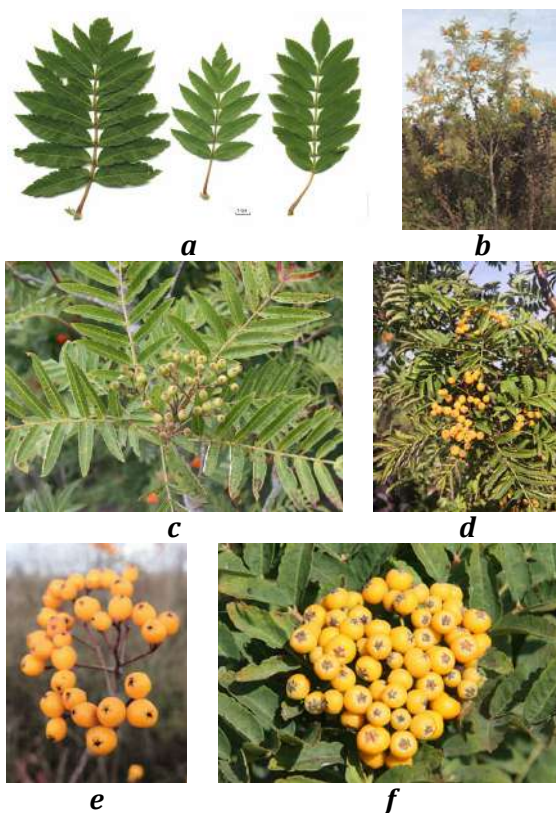


Figure 281. *Sorbus* sp. 'Joseph Rock' a) compound leaves, b) fruiting tree, c) young fruit and leaves, d) ripe fruit and leaves, e) fruit, f) infructescence

Sorbus sp. '15-15'

National catalog number: UN0700101

Collection number: 03880

Botanical name in Latin: *Sorbus* sp.

Botanical name in English: Mountain ash, or Rowan

Botanical name in Ukrainian: Horobyna

Crop name in Ukrainian: Horobyna

Accession name: '15-15'

Date of introduction: 27.07.2013

Donor: Volodymyr Mezhenkyj, Bakhmut, Donetsk Region, Ukraine

Breeder: Volodymyr Mezhenkyj

Origin: It is a seedling of probable accession No. 00158 'Krasavitsa' (UN 0700007) obtained from the Michurin All-Russian Research Institute of Genetics and Breeding of Fruit Plants

Time of flowering: May

Time of fruit ripening: August to September

Value: Most decorative during flowering and fruiting. The leaf blade is corrugated. Fruits are bright black. Source of food for birds and animals

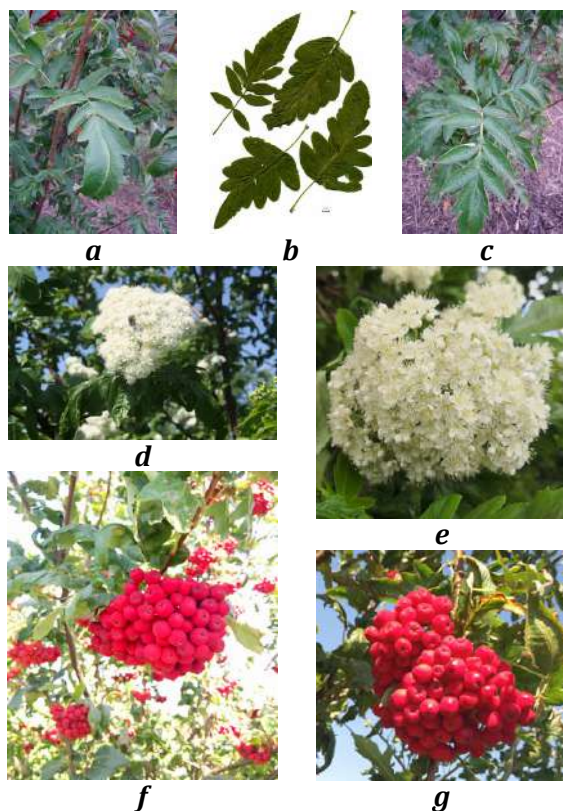


Figure 282. *Sorbus* sp. '15-15' a) compound leaf, b) compound leaves, c) compound leaves, d) corymb, e) corymb, f) fruit, g) inflorescence

ROSACEAE – ×TORMARIA
ROSE FAMILY – ARIA × TORMINALIS

WHITEBEAMS-CHECKER TREE HYBRIDS

Jean Baptiste Lamarck (Lamarck, 1779) found a new species in the forest of Fonteblo near Paris, which he described as *Crataegus latifolia*. Christian Persoon (1807) transferred it to *Sorbus*. *S. latifolia* s.str. occurs in France and Germany, and has been naturalized in the Czech Republic, Scandinavia, and the British Isles. *S. latifolia* s.l. reaches as far south as Algeria and the Baltics and Asia Minor (Sell, 1989; Aldasoro et al., 2004; Zieliński and Vladimirov, 2013; Sennikov and Kurtto, 2017). These hybrids arose as a result of natural crossings between whitebeams and checker tree (Liljefors, 1955; Nelson-Jones et al., 2002; Meyer et al., 2005, 2015; Pellicer et al., 2012; Fay and Rich, 2022; Rich et al., 2022). In connection with the separation of the both genera *Aria* and *Torminalis* from *Sorbus* s.l. (Campbell et al., 2007; Potter et al., 2007), the nothogenus ×*Tormaria* (Mezhenskyj et al., 2012) and the new genus *Karpatiosorbus* (Sennikov and Kurtto, 2017) were established for hybrids between them. In Europe, 86 predominantly apomictic species of such hybridogenous origin occur (Sennikov and Kurtto, 2017; Kurtto et al., 2018).

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×Tormaria bristoliensis No. 03607

National catalog number: U00100055

Collection number: 03607

Botanical name in Latin: *×Tormaria bristoliensis* (Wilmott) Mezhen'skyj (= *Karpatiosorbus bristoliensis* (Wilmott) Sennikov & Kurtto)

Botanical name in English: Bristol whitebeam

Botanical name in Ukrainian: Berekoariia bristolska, or Karpatiia bristolska

Crop name in Ukrainian: Berekoariia

Accession name: -

Date of introduction: 07.08.2012

Donor: Otradnoe Research Station of V. L. Komarov Botanical Institute of the Russian Academy of Sciences, Otradnoe, Leningrad Region, Russia

Breeder: -

Origin: Originates from a natural population in the Avon Gorge in the United Kingdom. Triploid microspecies related to *×T. latifolia* (Lam.) Mezhen'skyj

Time of flowering: May

Time of fruit ripening: September

Value: Most ornamental during flowering and fruiting. Source of food for birds and animals

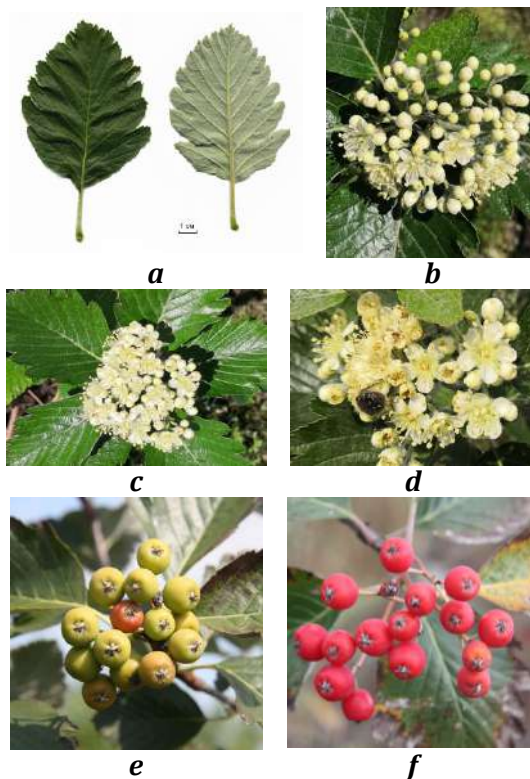


Figure 283. *×Tormaria bristoliensis* No. 03607 a) leaves, b) corymb with flower buds and flowers, c) flowers, d) flowers, e) unripe fruit, f) ripe fruit

×Tormaria devoniensis 'Devon Beauty'

National catalog number: U00100057

Collection number: 04020

Botanical name in Latin: *×Tormaria devoniensis* (E.F.Warburg) Mezhenkyj (= *Karpatiosorbus devoniensis* (E.F.Warburg) Sennikov & Kurtto)

Botanical name in English: Devon whitebeam

Botanical name in Ukrainian: Berekoariia devonska, or Karpatiia devonska

Crop name in Ukrainian: Berekoariia

Accession name: 'Devon Beauty'

Date of introduction: 24.02.2015

Donor: Sven Maksymiuk, Milanówek, Poland

Breeder: Agroforestry Research Trust, Devon, UK

Origin: Accession originates from natural populations in the British Isles. Tetraploid close to *×T. latifolia* (Lam.) Mezhenkyj

Time of flowering: May

Time of fruit ripening: September to October

Value: Most ornamental during flowering and fruiting. Source of food for birds and animals



a



b

Figure 284. *×Tormaria devoniensis* 'Devon Beauty' a) leaf and fruit, b) branch with leaves and fruit

×*Tormaria latifolia* No. 00263

National catalog number: UN0700028

Collection number: 00263

Botanical name in Latin: ×*Tormaria latifolia* (Lam.) Mezhen'skyj (= *Karpatiosorbus latifolia* (Lam.) Sennikov & Kurtto)

Botanical name in English: Broad-leaved whitebeam, or Service tree of Fontainebleau

Botanical name in Ukrainian: Berekoariia shyrokolystkova, or Karpatiiia shyrokolystkova

Crop name in Ukrainian: Berekoariia

Accession name: -

Date of introduction: 14.02.1983

Donor: M. V. Tsitsin Main Botanical Garden of the Russian Academy of Sciences, Moscow, Russia

Breeder: -

Origin: A natural tetraploid hybrid of *Aria edulis* (Willd.) M.Roem. × *Torminalis glaberrima* (Gand.) Sennikov & Kurtto, which occurs in Germany, France, and North Africa. The introduction number of the Main Botanical Garden is 31354/73.

Time of flowering: May

Time of fruit ripening: August to September

Value: Most ornamental during flowering and fruiting. Source of food for birds and animals



a



b

Figure 285. ×*Tormaria latifolia* No. 00263 a) leaves and fruit, b) leaves and fruit

ROSACEAE – ×TORMARIOSORBUS
ROSE FAMILY – ARIA × SORBUS × TORMINALIS

WHITEBEAMS-ROWAN-CHECKER TREE HYBRIDS

A student of Carl Linnaeus, Jakob Friedrich Ehrhart (1789), gave a scientific description of a new species of *Pyrus intermedia*, which occurs in the natural flora of the Baltic region. It was assumed that the species is of hybrid origin from the crossing of whitebeam with checker tree (Liljefors, 1955) or is a three-species hybrid (Challice and Kovanda, 1978; Jankun, 1993; Lemche, 1999; Nelson-Jones et al., 2002; Chester et al., 2007; Rich et al., 2014; Pellicer et al., 2012; Lepší et al., 2019). In addition to this apomictic tetraploid species, another hybrid is known for crossing it with *Sorbus aucuparia* (Rich, 2007). It is assumed that several species that were previously attributed to a two-species origin are also triploid (Németh et al., 2020). The nothogeneric name ×*Tormariosorbus* (Mezhenskyj et al., 2012) or the genus name *Scandosorbus* (= *Borkhausenia*) (Sennikov and Kurtto, 2017; Kurtto et al., 2018; Sennikov, 2018) have been proposed for hybridogenic taxa combining *Aria* × *Sorbus* × *Torminalis*.

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×*Tormariosorbus intermedia* '24-42'

National catalog number: U00100056

Collection number: 03718

Botanical name in Latin: ×*Tormariosorbus intermedia* (Ehrh.) Mezhenkyj (= *Scandosorbus intermedia* (Ehrh.) Sennikov)

Botanical name in English: Swedish whitebeam

Botanical name in Ukrainian: Berekohorobynoariia promizhna, or Skandynavska horobyna promizhna

Crop name in Ukrainian: Berekohorobinoariia, or Skandynavska horobyna

Accession name: '24-42'

Date of introduction: 23.08.2012

Donor: Volodymyr Mezhenkyj, Bakhmut, Donetsk Region, Ukraine

Breeder: -

Origin: The native range of this species is Northern Europe. A tetraploid of three species origin, combining characters of *Aria edulis* (Willd.) M.Roem., *Sorbus aucuparia* L., and *Torminalis glaberrima* (Gand.) Sennikov & Kurtto. Probably derived from the fusion of the unreduced egg of the triploid *Hedlundia anglica* with the reduced gamete of *Torminalis glaberrima*. The accession is a seedling of park trees in Bakhmut, introduction number 00213

Time of flowering: May

Time of fruit ripening: September

Value: Seed rootstock for plants of the sorboid group and serviceberry. Most ornamental during flowering and fruiting. Source of food for birds and animals

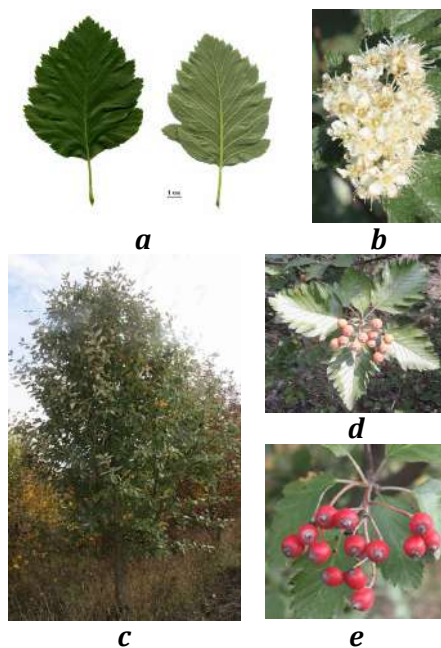


Figure 286. ×*Tormariosorbus intermedia* '24-42' a) leaves, b) flowers, c) tree, d) leaves and young fruit, e) ripe fruit

×Tormariosorbus liljeforsii '0-46'

National catalog number: U00100054

Collection number: 02915

Botanical name in Latin: *×Tormariosorbus liljeforsii* (T.C.G.Rich) Mezhen'skyj, comb. nov. 25: 339. 2008; *Borkhausenia ×liljeforsii* (T.C.G.Rich) Sennikov & Kurtto, Memoranda Soc. Fauna Fl. Fenn. 93: 46. 2017; *Scandosorbus ×liljeforsii* (T.C.G.Rich) Sennikov, Ann. Bot. Fennici 55: 323. 2018

Botanical name in English: Liljefors's whitebeam

Botanical name in Ukrainian: Berekohorobynoariia Lilieforsa, or Skandynavska horobyna Lilieforsa

Crop name in Ukrainian: Berekohorobinoariia, or Skandynavska horobyna

Accession name: '0-46'

Date of introduction: 25.07.2007

Donor: Volodymyr Mezhen'skyj, Bakhmut, Donetsk region, Ukraine

Breeder: Volodymyr Mezhen'skyj

Origin: A spontaneous hybrid *×T. intermedia* (Ehrh.) Mezhen'skyj \times *Sorbus aucuparia* L. The accession '0-46' was selected among seedlings of the accession *×T. intermedia* No. 00213 from free pollination

Time of flowering: May

Time of fruit ripening: September

Value: Taxon, which was first discovered in Ukraine. It can be used as a seed rootstock for plants of the sorboid group; the fruits are suitable for processing and serve as fodder for birds and animals

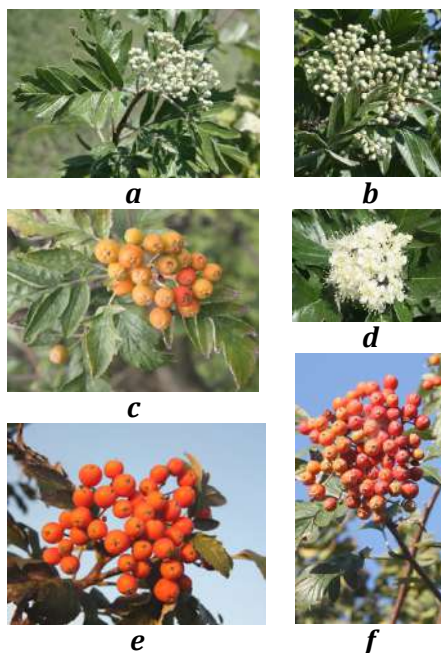


Figure 287. *×Tormariosorbus liljeforsii* '0-46' a) shoot with leaves and corymb, b) flower buds in a corymb, c) young fruit, d) flowers, e) fruit, f) fruit

ROSACEAE – TORMINALIS

ROSE FAMILY – CHECKER TREE

WILD SERVICE TREE, CHEQUERS, OR CHECKER TREE

Carl Linnaeus (1753) included a checker tree to the genus *Crataegus*, based on its lobed leaves. Other botanists placed it in the genera *Aria*, *Azarolus*, *Hahnia*, *Lazarolus*, *Malus*, *Mespilus*, *Pyrenia*, *Pyrus*, *Sorbus*, *Torminalis*, and *Torminaria*. Within *Sorbus* s.l., it was assigned the rank of section (Dumortier, 1827) or subgenus (Koch, 1869). Phylogenetic studies have proved the expediency of dividing *Sorbus* s.l. into several genera, distinguishing the genus *Torminalis* (Potter et al., 2007; Lo and Donoghue, 2012; Sun et al., 2018). There is a proposal to include *Torminalis* in *Aria* to solve the problem associated with significant nomenclatural changes due to the establishment of new hybridogenic genera and nothogenera (Mosyakin et al., 2022).

The checker tree is listed in the Red Data Book of Ukraine (Mezhenskyj and Mezhenska, 2010). It has forest, ornamental, and fruit value. The natural variability of the species allows for the selection of improved forms and the start of breeding improvement (Kosets, 1941; Mahmet, 1965; Mezhenskyj et al., 2012; Hrynyk et al., 2019; Mezhenskyj, 2019; Shpak, 2021).

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Torminalis glaberrima 'Eva'

National catalog number: UN0700091

Collection number: 04730

Botanical name in Latin: *Torminalis glaberrima* (Gand.) Sennikov & Kurtto

Botanical name in English: Checker tree, Chequers, or Wild service tree

Botanical name in Ukrainian: Bereka naiholisha

Crop name in Ukrainian: Bereka

Accession name: 'Eva'

Date of introduction: 16.03.2019

Donor: Viacheslav Frantsishko, Kamianets-Podilskyi, Khmelnytskyi Region, Ukraine

Breeder: Viacheslav Frantsishko

Origin: Selected in local populations of checker tree

Time of flowering: May

Time of fruit ripening: August to September

Value: Ornamental, fruit, food for birds and animals. Promising in the breeding of plants of the sorboid group

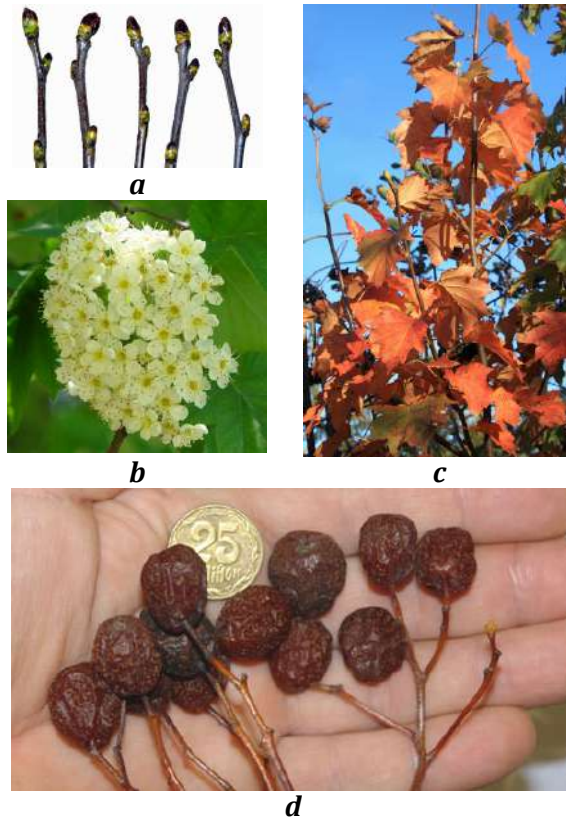


Figure 288. *Torminalis glaberrima* 'Eva' a) annual shoot with buds (photo by V. Frantsishko), b) flowers (photo by V. Frantsishko), c) autumn-colored leaves, d) fruit (photo by V. Frantsishko)

Torminalis glaberrima 'Podolianochka'

National catalog number: UN0700092

Collection number: 04731

Botanical name in Latin: *Torminalis glaberrima* (Gand.) Sennikov & Kurtto

Botanical name in English: Checker tree, Chequers, or Wild service tree

Botanical name in Ukrainian: Bereka naiholisha

Crop name in Ukrainian: Bereka

Accession name: 'Podolianochka' (means "from Podillia")

Date of introduction: 16.03.2019

Donor: Viacheslav Frantsishko, Kamianets-Podilskyi, Khmelnytskyi Region, Ukraine

Breeder: Viacheslav Frantsishko

Origin: Selected in local populations of checker tree

Time of flowering: May

Time of fruit ripening: August to September

Value: Ornamental and fruit plants, food for birds and animals. Promising in the breeding of plants of the sorboid group

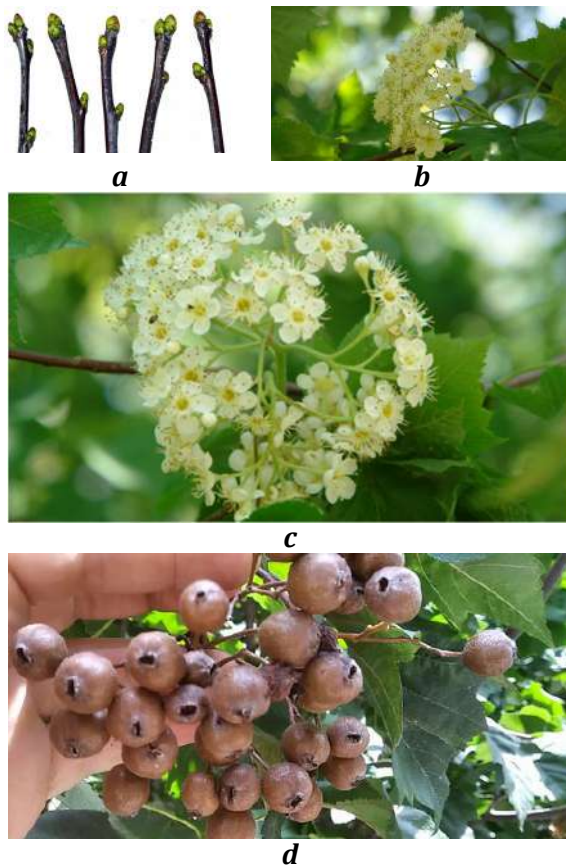


Figure 289. *Torminalis glaberrima* 'Podolianochka' a) annual shoot with buds, b) corymb, c) flowers in corymb, d) fruit (all photo by V. Frantsishko)

Torminalis glaberrima No. 04030

Number of the National Catalog: UN0700110

Collection number: 04030

Botanical name in Latin: *Torminalis glaberrima* (Gand.) Sennikov & Kurtto

Botanical name in English: Checker tree, Chequers, or Wild service tree

Botanical name in Ukrainian: Bereka naiholisha

Crop name in Ukrainian: Bereka

Accession name: -

Date of introduction: 28.03.2015

Donor: Donetsk Botanical Garden of the National Academy of Sciences of Ukraine, Donetsk, Ukraine

Breeder: -

Origin: Accession grown from seeds collected from a tree in the arboretum of the Donetsk Botanical Garden, which in turn originated from the seed obtained in Mariupol Forest Experimental Station

Time of flowering: May

Time of fruit ripening: August to September

Value: Ornamental and fruit plants, food for birds and animals. Promising in the breeding of plants of the sorboid group

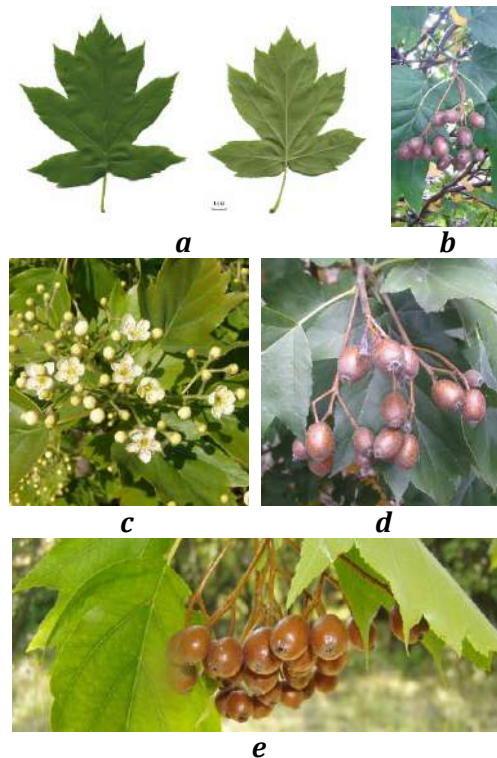


Figure 290. *Torminalis glaberrima* No. 04030 a) leaves, b) fruit, c) flowers buds and flowers, d) fruit, e) fruit

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