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RESEARCH ARTICLE

Representatives of Rosaceae Juss. in the various structure-functional types of decorative plantings of Kryvyi Rih city (Dnipropetrovsk region, Ukraine)

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Abstract

The objective of this study was to define the diversity of Rosaceae representatives in parks and squares of Kryvyi Rih city and to evaluate their vitality, longevity, and perspectives of a further application for landscaping of the region.

Material and methods. The object of our study were Rosaceae plantings in parks and garden squares of Kryvyi Rih. We used visual, morphometric, and statistical methods.

Results. In the parks and squares of Kryvyi Rih, family Rosaceae is the most diverse – it is represented by 43 species, five hybrids, and five cultivars, which together belong to 20 genera. The most represented genera are *Spiraea* (seven taxa), *Sorbus* (five), *Cotoneaster* (four), *Malus* (four), *Padus* (four), and *Prunus* (four), while the rest of genera comprises from one to three taxa. The geographic analysis suggests a significant prevalence of species from East-Asian (36.5 %) and Circumboreal (34.6 %) regions. According to the distribution of life forms, there is some predominance of shrubs; they represent 56 % of the total number of Rosaceae. With regard to height classes, trees of the third class of size (34.6 %) and undersized shrubs (25 %) prevail. As for age structure, 20–40-year-old shrubs and trees (about 70 %) predominate. The highest level of the vital state is noted for 60 % of plants of this family, the average level – for 30 %, and low level – for 10 %. 72 % of evaluated plants were classified as highly decorative and 28 % as decorative. In the future, enrichment of plantings of the region may be carried out by using the collection stock of arboreal plants of Kryvyi Rih Botanical Garden of the NAS of Ukraine, comprising about 350 species, varieties, and cultivars of 31 genera of the family Rosaceae.

Conclusions. Most of the investigated Rosaceae plants, in conditions of a large industrial city located in the Steppe zone of Ukraine, were characterized by high viability and decorativeness. Hence, these plants deserve to be more widely used for the greening of cities and towns of the Right-Bank of the Steppe zone of Ukraine.

Keywords: Rosaceae, species distribution, taxonomical composition, age structure, decorativeness, vitality

Introduction

The problem of conservation and enrichment of plant resources is especially actual for arid industrialized regions. The district of Kryvyi Rih has very complicated ecological conditions, which had arisen under enormous technogenic pressure amplified by the dry climate. Artificial plantings, in particular

parks and squares, are the local centers of phytodiversity, which play an essential role in the optimization of urban areas. Investigations on taxonomic structure and vitality of such plantings are crucial for the development of the strategy of their conservation and improvement.

Following the scheme of agroclimatic division, Kryvyi Rih district belongs to the continental temperate sub-boreal semiarid climatic subzone. The main features of this subzone are: hot and dry summer; a quite cold winter, very often without snow; short spring; frequent droughts, and dry winds (Diachuk al., 2003).

Many plantings of the different functional roles were created in Kryvyi Rih city in the 1920s. Today the total area of parks in Kryvyi Rih is about 334 ha and garden squares – about 155 ha. These plantings mostly represented by the family Rosaceae Juss., which comprises 52 taxa, or 26.0% from a total number of arboreal taxa of the parks and squares in the region. Rosaceae, together with Oleaceae Hoffmans, Salicaceae Mirb. and Cupressaceae Gray also dominate in other regions of Ukraine (Kokhno et al., 1980, 1983; Kramarets et al., 1992). For example, Rosaceae represents 24.7% of taxonomic diversity of cultural flora in Henichesk city (Maltseva, 2016), from 14.8 to 17.5% – in Kherson city (Zahorulko, 2018), about 29.0% – in Chernihiv city (Pototska, 2017), 22.5% – in Poltava city (Panasenko, 2007), and about 20.0% – in Khmelnytskyi city (Hanaba, 2016). In Volhynia, among the dominating genera are *Cotoneaster* Medik., *Crataegus* L., *Spiraea* L., and *Malus* Mill., which together comprise 10.2% of region's taxonomic diversity (Kotsun, 1999). In Ciscarpathia, genera *Cotoneaster*, *Crataegus*, *Sorbus* L., and *Padus* Mill. also widely represented, covering 18.4% of taxonomic diversity (Hniezdilova, 2003). In the industrial south-eastern region of Ukraine, Rosaceae represents about 37.0% from all urban plantings (Suslova et al., 2013), and consists of 27 taxa of trees and 24 taxa of shrubs. The most divers here are *Malus* (six species), *Spiraea* (four species and three cultivars), *Cerasus* Juss. (three species and two cultivars), *Prunus* L. (four species and two cultivars), *Cotoneaster* (three species and two cultivars), and *Crataegus* (three species) (Polyakov et al., 2015).

The first taxonomic survey of the parks in Kryvyi Rih was conducted in 1950–1960s by I.A. Dobrovolskiy, the professor of the Botany department of the Kryvyi Rih Pedagogical Institute (Dobrovolskiy, 1967). Among 40 dominating species distributed in parks and garden squares, he mentioned *Padellus mahaleb* (L.) Vassilcz. and *Spiraea* × *vanhouttei* (Briot.) Zabel. After that, the inventory of parks and garden squares in Kryvyi Rih was not conducted and becomes a necessary task for today.

This work aimed to revise the family Rosaceae in parks and squares of Kryvyi Rih city and to investigate vitality, longevity, and current decorativeness of its representatives. As well, to outline the perspectives of the application of Rosaceae representatives in the landscaping of the region.

Material and methods

Investigations were conducted in 23 parks and 93 garden squares located in seven districts of Kryvyi Rih city (Fig. 1). All these parks and squares officially belong to the Management of housing and communal services of the City Executive Committee.

Only in two parks and 17 garden squares, Rosaceae were not detected. In all other localities, surveys were conducted by the itinerary-visual method. The type of planting, the location, number, and age of individuals, as well as other parameters, were analyzed directly during the surveys. Identification of taxa was partly conducted directly in the field and partly – later, based on collected herbarium material with the use of identification guides (Kokhno et al., 2005). Taxa names are provided following ICN (2012) and IPNI (2013).

Vital condition of broad-leaved trees was evaluated following Saveleva's (1975) scale: 8 – the plant is robust, with intensive growth; 7 – the plant is robust, but growth is slowed down; 6 – apical growth is absent; 5 – accretion present only on lateral branches; 4 – accretion present only on lower lateral branches; 3 – accretion realized only by epicormic branches; 2 – only vegetative shoots are growing on the trunk, the crown of the tree shrinks out; 1 – only sprouts are present, the most of tree is dead; 0 – a tree is completely dead, including roots, any sprouts are absent.

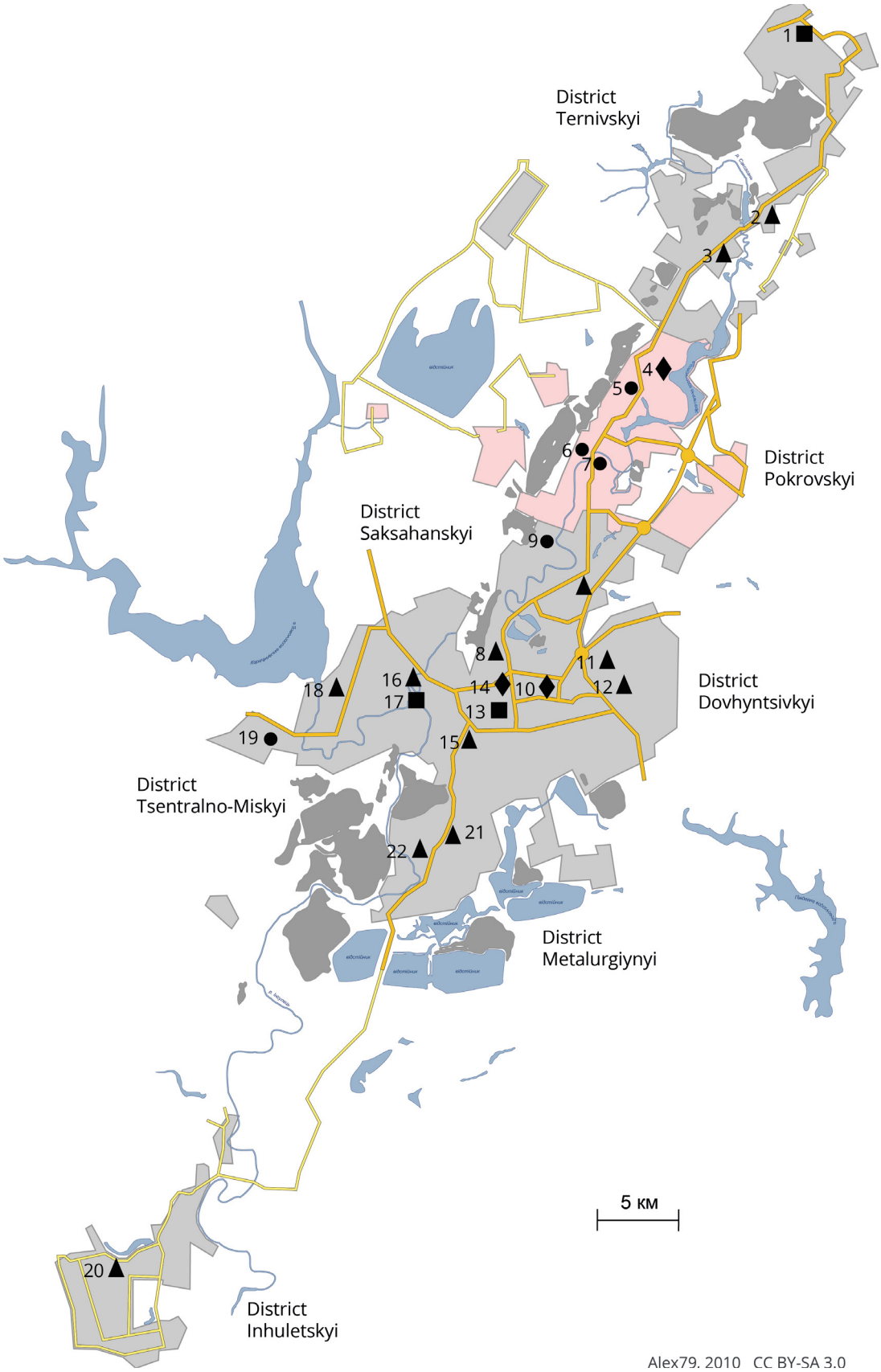

Figure 1. Administrative-territorial division of Kryvyi Rih city with locations of parks: 1 – Pivnichnyi; 2 – Veseli Terny; 3 – Ternivskyi; 4 – Shakhtarskyi; 5 – Dytiachyi; 6 – Park of Suvorov; 7 – Kosmonavtiv; 8 – Rudanivskyi; 9 – near Palace of culture of the mine "Rodina"; 10 – Yuvileinyi; 11 – Zaliznychnykiv; 12 – Druzhba; 13 – Park of Bohdan Khmelnytskyi; 14 – Heroyiv; 15 – Budivelnykiv; 16 – Park of Yurii Haharin; 17 – Park of Fedir Mershavtsev; 18 – Park of I. Pavlov; 19 – Park of O. Yehorov; 20 – Inhuletskyi; 21 – Yunatskyi; 22 – Park of I.I. Savytskyi. Number of taxa: ● – 11–30; ▲ – 31–50; ♦ – 51–70; ■ – 71–90.

Vital condition of broad-leaved shrubs was evaluated following the scale based on Luchnyk's (1988) classification: 1 – high, intensive growth of the plant, the number of new branches is higher than dead ones; 2 – moderate, the number of new branches is the same or slightly less than dead ones; 3 – a scanty, strong decrease of growth processes, the number of dead branches is higher that newly formed ones; 4 – low, shrub shrinks, new branches are few and weak if the plant has rhizome – the central part of such plant is dead and only low peripheral particles are alive; 5 – very low, the plant is completely dead.

The geographical analysis was realized in the context of the floristic regionalization of the Earth developed by Takhtajan (1978). Biomorphological study of cultivated flora was conducted following Serebryakov (1964). Plants were subdivided onto the classes by their height following Kolesnikov's (1974) scales for trees (I – 20 m, II – 10–20 m, III – 5–10 m) and shrubs (I – 2–5 m, II – 1–2 m, III – 0.5–1 m). The plants also were subdivided by age classes, independent for trees (I – 0–20 years; II – 21–40 years, III – 41–60 years, IV – 61–80 years, V – 81–100 years) and shrubs (I – 0–10 years; II – 11–20 years, III – 21–30 years, IV – 31–40 years). The age of plants was established by indirect calculations, taking into account species, trunk diameter, the general condition of an individual plant, growing conditions, etc.

The occurrence coefficient was calculated as a relation of the number of areas with certain taxon to the total number of observed areas (parks and squares). Decorativeness was evaluated with the use of Vardanyan's (2017) modified scale, which is based initially on a comprehensive evaluation of the plant by nine criteria (with five points each) during the year and the following summation of resulting scores with winter hardiness grade. We substituted the winter hardiness for drought tolerance because it is more critical for dry conditions of the steppe zone. In turn, drought tolerance has been evaluated following modified scale of Pyatnitskiy (1961): 7 – plants without any evidence of drought influence, 6 – leaves loss turgor partly, 5 – leaves get partly damaged, obtain marginal necrosis, become brown and after that falling, 4 – leaves untimely obtain autumn coloration, 3 – young shouts death, 2 – the death of aboveground part of the plant, 1 – plant completely dead. Hence, by decorative value the plants were subdivided into classes: 1 – low decorativeness, plants received less than 25 points; 2 – moderate decorativeness, plants received 26–30 points; 3 – high decorativeness, plants received 31–35 points; 4 – exceptional decorativeness, plants received over 35 points.

Results and discussion

The inventory of plantings of the parks and garden squares of Kryvyi Rih revealed that family Rosaceae is represented here by 43 species, five hybrids, and five cultivars, which belong to 20 genera. The most diverse is the genus *Spiraea* (seven taxa). The second place has genus *Sorbus* (five taxa), third place share genera *Cotoneaster* (four taxa), *Malus* (four taxa), *Padus* (four taxa), and *Prunus* (four taxa). The rest of Rosaceae genera are represented here only by one to three taxa. Together they represent five regions of the temperate zone of the world (Takhtajan, 1978). Taxa from Eastern-Asian (36.5%) and Circumboreal regions (34.6%) are predominating. Taxa from North American (13.5%), Irano-Turanian (13.5%), and Mediterranean (1.9%) regions are weakly represented here.

The number of green areas, as well as the taxonomic diversity of Rosaceae growing there, differ dependently from the district of the city. In particular, in Ternivskyi district three parks of common use and two green areas of restricted access are located (the square of an industrial ground of the Northern Ore-Dressing and Processing Enterprise and the garden of the City Hospital Nr. 7), which comprises 30 species and one cultivar belonging to 18 genera of Rosaceae. In Pokrovskyi district there are located four parks and three garden squares with 11 species and one cultivar from the nine genera of Rosaceae. In Saksaganskyi district, there are two parks and 17 garden squares with 23 species and three cultivars from 16 genera of Rosaceae. In Dovhyntsivskyi district in three parks and 10 garden squares 19 species belonging to 14 genera of Rosaceae are distributed. Metalurgiynyi district has three parks and 26 garden squares with 26 species and three cultivars from 19 genera of the family. Tsentralno-Miskyi district has

arboretum (former botanical garden of the Kryvyi Rih State University, which currently is a garden square), three parks, and seven garden squares, which together comprises 26 species and three cultivars belonging to 19 genera of the family. Finally, in Inhuletskyi district, there are two parks and 20 garden squares with 25 species and one cultivar belonging to 16 genera of Rosaceae.

In Kryvyi Rih, the cultivated dendroflora of parks and garden squares has a total of 202 species and cultivars belonging to 89 genera and 41 families (Terlyga et al., 2014). 16 species of Rosaceae were found the most used (with over 200 registered plants per each) in the landscaping of the city: *Armeniaca vulgaris* Lam., *Cerasus avium* (L.) Moench, *C. tomentosa* (Thunb.) Yas. Endo, *Crataegus fallacina* Klokov, *Cydonia oblonga* Mill., *Malus domestica* Borkh., *Padus serotina* Borkh., *Physocarpus opulifolia* Raf., *Prunus divaricata* Ledeb., *P. pissardi* Carrière, *Pyrus communis* L., *Rosa canina* L., *Sorbus aucuparia* L., *Padus avium* Mill., *Padellus mahaleb*, and *Spiraea* × *vanhouttei* (Table 1).

Thirteen Rosaceae taxa (about quarter) were found to be moderately represented in flora of parks and squares of Kryvyi Rih and comprise from 100 to 200 plants each: *Amelanchier spicata* K. Koch, *Aronia melanocarpa* (Michx.) Elliott, *Cerasus vulgaris* Mill., *Chaenomeles maulei* (Mast.) C.K. Schneid., *Malus sylvestris* (L.) Mill., *Padus virginiana* (L.) Mill., *Physocarpus intermedia* (Rydb.) C.K. Schneid., *Prunus domestica* L., *P. domestica* L. 'Wengerka', *Rubus idaeus* L., *R. caesius* L., *Sorbus intermedia* (Ehrh.) Pers., and *Spiraea japonica* Raf.

Other taxa, which are promising for landscaping, are quite rare in parks and garden squares of Kryvyi Rih and comprises less than 100 plants each: *Amelanchier florida* Lindl., *Chaenomeles speciosa* (Sweet) Nakai, *Cotoneaster dammeri* C.K. Schneid., *C. lucidus* Schlecht., *C. procumbens* G. Klotz., *C.* × *suecica* G. Klodz., *Crataegus submollis* Sarg., *Kerria japonica* (L.) DC. 'Pleniflora', *Louiseania triloba* (Lindl.) Pachom., *L. ulmifolia* (Franch.) Pachom., *Malus baccata* (L.) Borkh., *M. prunifolia* (Willd.) Borkh., *Persica vulgaris* Mill., *Sorbus aucuparia* L. 'Pendula', *S.* × *thuringiaca* (Nyman) Schönach, *S. torminalis* (L.) Crantz, *Spiraea cantoniensis* Lour., *S. japonica* 'Macrophylla', *S.* × *bumalda* Burv., *S.* × *bumalda* 'Goldflame', *S. media* F. Schmidt.

Among the life forms, shrubs are predominating by both occurrences and taxonomic diversity, representing 56.0% of the total number of Rosaceae taxa in parks and squares of Kryvyi Rih. The amount of low-growing shrubs is 25.0% (13 taxa), medium-sized shrubs – 19.3% (10 taxa), and high shrubs – 11.5%. Trees are mostly represented by third class of height (18 taxa, 34.6%), while trees of the second class of height are much less diverse (5 taxa, 9.6%). In general, shrubs of III-IV age class (21–40 years old) and trees of II age class (21–40 years old too) are more abundant, representing about 70.0% of the total number of investigated plants.

Observed trees are mostly single planted, rarely – they grow as small groups or solitaires (e.g., *Pyrus communis*). Solitaire of *Sorbus* × *thuringiaca* was found in the park Yunatskyi (Inhuletskyi district). Moved bordure (0.5 m high) formed by *Cydonia oblonga* was located along the central lane in the square on Sedneva str. (Inhuletskyi district). Shrubs are mostly planted as small groups. Alley planting is represented only in the Park of Fedir Mershavtsev, where plants of *Crataegus fallacina* are shaped as single-trunk small trees. Plants of another species, *Crataegus submollis*, are formed as few-trunk small trees and used for solitaire in the park Yunatskyi.

Most parks and garden squares in Kryvyi Rih are located along the rivers Saksahan and Inhulets, i.e., in the best-watered places. However, some of the plantings are located far from natural water reservoirs and suffer from drought, dust, and gas pollution. This results in lower decorativeness and vitality of woody plants. Moreover, the condition of such plants also strictly depends on age, plantation density and solidity of crowns, and care works. Finally, the zonality of plantings also has a great influence on the growth of many species. In particular, a comparison of vitality parameters for plants from two remotely located districts, Ternivskiy in north and Inhuletskiy in the south, revealed that the in last district plants grow slowly with a weaker increase of height, have more dead branches, the irregular shape of crown, etc.

Analysis of vitality revealed that trees are more vulnerable, especially representatives of the genera *Cerasus*, *Malus*, *Padus*, *Prunus*, and *Sorbus*. Although most trees (about 70%) have satisfactory vitality, many plants from

Table 1. Rosaceae in plantings of parks and garden squares of Kryvyi Rih.

Taxa	Occurrence coefficient		Age class	Biomorphic type and class of height *	Composition type **	Vitality	Decorativeness
	Parks (22)	Squares (93)					
Amelanchier florida Lindl.	0	1	III	S, I	Gr.	2	4
Amelanchier spicata K. Koch	4	0	III	S, I	Gr.	1	4
Armeniaca vulgaris Lam.	54	25	II, III	T, III	Sing., Gr.	6–8	4
Aronia melanocarpa (Michx.) Elliott	4	9	II, III	S, I	Gr.	1–2	4
Cerasus avium (L.) Moench	23	4	I, II	T, III	Sing., Gr.	6–8	4
Cerasus tomentosa (Thunb.) Yas. Endo	18	5	II	S, III	Gr.	1–3	4
Cerasus vulgaris Mill.	9	7	II, III	T, III	Sing., Gr.	7–8	4
Chaenomeles japonica (Thunb.) Lindl. ex Spach	14	6	I–IV	S, III	Gr.	1–3	4
Chaenomeles maulei (Mast.) C. K. Schneid.	9	2	I–IV	S, III	Gr.	1	4
Chaenomeles speciosa (Sweet) Nakai	0	1	I–IV	S, III	Gr.	1	4
Cotoneaster dammeri C.K. Schneid.	0	1	I	S, III	Gr.	1	4
Cotoneaster lucidus Schlecht.	4	0	II, III	S, II	Gr.	1–2	4
Cotoneaster procumbens G. Klotz.	0	2	I	S, III	Gr.	1	4
Cotoneaster × *suecica* G. Klodz.	0	1	I	S, III	Gr.	1	4
Crataegus fallacina Klokov	46	3	I–IV	S, I	Sing., Gr., All.	I	4
Crataegus submollis Sarg.	4	0	II	S, I	Sol.	1	4
Cydonia oblonga Mill.	23	4	II–IV	T, III	Gr., Brd.	8	4
Kerria japonica (L.) DC. 'Pleniflora'	0	2	II	S, III	Gr.	1	3
Louiseania triloba (Lindl.) Pachom.	0	1	II	S, III	Gr.	2	3
Louiseania ulmifolia (Franch.) Pachom.	0	1	II	S, II	Gr.	1	3
Malus baccata (L.) Borkh.	0	1	III	T, III	Sing.	8	4
Malus domestica Borkh.	45	12	I–III	T, III	Sing., Gr.	5–8	4
Malus prunifolia (Willd.) Borkh.	0	1	II	T, III	Sing., Gr.	5–7	4
Malus sylvestris (L.) Mill.	20	10	II–III	T, III	Sing.	6–7	4
Padus avium Mill.	27	3	III	T, II	Sing., Gr.	7–8	3
Padus mahaleb Borkh.	14	3	II–IV	T, II	Sing., Gr.	7–8	3
Padus serotina Borkh.	18	7	III	T, II	Sing., Gr.	7–8	3
Padus virginiana (L.) Mill.	4	1	III–IV	T, II	Sing., Gr.	8	4
Persica vulgaris Mill.	0	2	I–II	T, III	Sing.	7–8	3
Physocarpus intermedia (Rydb.) C.K. Schneid.	4	2	III–IV	S, II	Gr., Hdg.	1–2	3
Physocarpus opulifolia Raf.	50	4	III–IV	S, II	Gr., Hdg.	1–2	3
Prunus divaricata Ledeb.	14	5	I–III	T, III	Sing.	5–8	4

Note: * S – shrub; **T** – tree. **** Sing.** – single planting; **Gr.** – group; **All.** – alley; **Brd.** – bordure; **Hdg.** – hedge; **Sol.** – solitaire.

Table 1. Continued.

Taxa	Occurrence coefficient		Age class	Biomorphic type and class of height *	Composition type **	Vitality	Decorativeness
	Parks (22)	Squares (93)					
Prunus domestica L.	10	0	II	T, III	Sing.	5–8	4
Prunus domestica L. 'Wengerka'	45	9	II	T, III	Sing.,	6	4
Prunus pissardi Carrière	18	8	I–III	T, III	Gr.	4–8	4
Pyracantha coccinea (L.) M. Roem.	0	1	I	S, II	Gr.	1–2	4
Pyrus communis L.	45	11	I–IV	T, II	Sol., Sing., Gr.	8	3
Rosa canina L.	64	31	I–III	S, II	Sing., Gr.	1	3
Rubus caesus L.	4	0	II–III	S, II	Sing.	1	3
Rubus idaeus L.	9	0	II–III	S, II	Sing., Gr.	1	3
Sorbus aucuparia L.	68	39	I–III	T, III	Sing., Gr.	6–7	4
Sorbus aucuparia L. 'Pendula'	0	1	I	T, III	Sing.	8	4
Sorbus intermedia (Ehrh.) Pers.	4	2	II–III	T, III	Gr.	8	4
Sorbus × *thuringiaca* (Nyman) Schönach	4	2	II–III	T, III	Gr.	8	4
Sorbus torminalis (L.) Crantz	4	0	III	T, III	Sol.	8	4
Spiraea × *bumalda* Burv.	4	0	I–II	S, III	Gr.	1	4
Spiraea × *bumalda* Burv. 'Goldflame'	0	2	I	S, III	Gr.	1	4
Spiraea cantoniensis Lour.	9	0	II	S, II	Gr.	1	4
Spiraea japonica Raf.	4	2	I–II	S, III	Gr.	1	4
Spiraea japonica Raf. 'Macrophylla'	9	2	I–II	S, II	Gr.	1	4
Spiraea media F. Schmidt	4	0	III–IV	S, III	Gr.	1	3
Spiraea x vanhouttei (Briot) Zabel	41	44	III–IV	S, I	Gr.	1	4

Note: * S – shrub; **T** – tree. **** Sing.** – single planting; **Gr.** – group; **All.** – alley; **Brd.** – bordure; **Hdg.** – hedge; **Sol.** – solitaire.

the plantings of *Armeniaca vulgaris*, *Cerasus avium*, *Malus prunifolia*, *Prunus divaricata*, *P. domestica*, and *Sorbus aucuparia* have 5–6 grades of vitality only. Shrubs appeared to be more labile to urban-technological environment conditions. They actively renew from underground buds if remove the dead branches. Hence, the vitality for the most shrubs was evaluated as high (first grade), and for the rest – as moderate (second grades).

About 60% of investigated plantings of Kryvyi Rih are left without care, and their distant parts look like dense tangles formed by self-sown plants, among which are *Acer negundo* L., *A. platanoides* L., *Ailanthus altissima* (Mill.) Swingle, *Robinia pseudoacacia* L., *Ulmus pumila* L., *Morus nigra* L., *Fraxinus lanceolata* Borkh. and other. Mass self-seeding also observed for some Rosaceae, including *Crataegus fallacina* and *Padus mahaleb*. Sometimes self-seeding also occurs in *Cerasus vulgaris*, *C. avium*, *Prunus domestica*, and *Pyrus communis*. Such uncontrolled self-recovering of woody vegetation can result in a complete change of species composition of these plantings because self-seeded and spear-originated ones will substitute artificially planted plants.

Trees and shrubs of Rosaceae are very decorative plants with numerous and

attractive flowers, which can be both solitary or gathered in inflorescences. Usually, these plants have flowers of white or pink tints, and only *Kerria japonica* 'Pleniflora' has the yellow coloration of the perianth. The most representatives (38 taxa) of Rosaceae in Kryvyi Rih were evaluated as exceptionally decorative (4 grades), the rest – as highly decorative (3 grades).

Presence of some rare and unusual representatives of Rosaceae, which are perfectly adapted to the urban-technological environment of Kryviy Rih testify to the possibility of their future use in landscaping. For example, *Chaenomeles speciosa*, *Cotoneaster divaricatus* Rehd. et Wils., *Padus serotina*, *Prunus pissardi*, *Sorbus aucuparia*, and *Spiraea* × *bumalda* 'Goldflame' were successfully introduced in parks and squares during the last five years. However, the significant disadvantage is the low variation of newly created compositions and their greatly simplified structure (e.g., absence of accent-creating and nicely flowering plants). Regular care is realized only in few such plantings.

Parks and squares can be effectively enriched by Rosaceae from the collection of woody cultures of the Kryviy Rih Botanical Garden of the NAS of Ukraine. Today this collection hosts over 330 taxa from 31 genera of Rosaceae, which were tested during many-years of introductive trial. Most of these taxa revealed to be drought-tolerant and suitable for growth in the condition of an industrial city. *Amelanchier utahensis* Koehne, *Cerasus besseyi* Smyth, *Chaenomeles speciosa* 'Brilliant', *Cotoneaster gracilis* Rehder et E.H. Wilson, *C.* × *suecicus* G. Klotz 'Coral Beauty', *Crataegus microphylla* K. Koch, *Padus virginiana* (L.) Mill., *Pyrus salicifolia* Pall., *Physocarpus ribesifolius* Komarov, *Sorbaria sorbifolia* (L.) A. Braun, *Spiraea menziesii* Hook., *Spiraea prunifolia* Siebold et Zacc. 'Plena' and some other taxa were found to be the most perspective for such purposes.

Conclusions

1. 43 species, five hybrids, and five cultivars were revealed in 23 parks and 93 garden squares of Kryviy Rih; this corresponds to 26.0% from the total amount of taxa represented there.
2. In two parks and 17 squares, representatives of Rosaceae were not found; this corresponds to 16%.
3. Rosaceae in plantings of Kryviy Rih is mostly represented by trees of third height and low-growing shrubs, which were aged from 20 to 40 years and are tolerant to the conditions of this region.
4. The most diverse is genus *Spiraea* with seven taxa, second place belongs to genus *Sorbus* with five taxa. Plants from East-Asian (36.5%) and Circumboreal (34.6%) floristic regions predominate there.
5. Rosaceae trees are mostly planted as single plants, while shrubs – in groups.
6. The vitality of most examined woody plants is satisfactory and has been evaluated with 7–8 grades for trees (70%) and 1–2 grades for shrubs (90%).
7. Parks and garden squares can be enriched by plants of Rosaceae from the collection of woody cultures of the Kryviy Rih Botanical Garden of the NAS of Ukraine.

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Представники родини Rosaceae Juss. у декоративних насадженнях різного структурно-функціонального типу у м. Кривий Ріг (Дніпропетровська обл.)

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Мета – визначити різноманітність представників родини Rosaceae в парках та скверах м. Кривий Ріг, оцінити їхню життєздатність, довговічність, декоративність і перспективи подальшого використання в озелененні регіону.

Матеріал та методи. Об'єкт досліджень – насадження представників родини Rosaceae у парках та скверах м. Кривий Ріг. Методи досліджень – візуальні, морфометричні, статистичні.

Результати. У насадженнях парків та скверів м. Кривий Ріг родина Rosaceae є найчисельнішою (представлена 43 видами, п'ятьма гібридами та п'ятьма культиварами, які належать до 20 родів). Перше місце за кількістю таксонів посідає рід *Spiraea* (сім), друге – *Sorbus* (п'ять), третє – роди *Cotoneaster* (чотири), *Malus* (чотири), *Padus* (чотири) і *Prunus* (чотири таксони). Решта родів презентовані одним-трьома таксонами. Географічний аналіз показав значне переважання видів із Східноазійської (36,5 %) та Циркумбореальної (34,6 %) областей. Серед життєвих форм у таксономічному та кількісному відношенні дещо переважають чагарники, на частку яких припадає 56 % від загальної кількості видів і культиварів. Переважають дерева третьої величини (34,6 %) та низькорослі чагарники (25 %). Найбільшою є частка 20–40-річних чагарників і дерев (близько 70 %). Найвищий рівень життєвого стану встановлено у 60 % рослин, середній – у 30 %, низький – у 10 %. До високодекоративних рослин віднесено 72 %, до декоративних – 28 %. Оптимізація насаджень парків і скверів населених пунктів можлива за рахунок використання колекційного фонду деревних рослин Криворізького ботанічного саду НАН України, який налічує близько 350 видів, різновидів та культиварів із представників 31 роду родини Rosaceae.

Висновки. Більшість видів та культиварів родини Rosaceae в умовах великого промислового міста у степовій зоні України характеризуються високою життєздатністю та декоративністю. Ці рослини заслуговують на широке використання в озелененні населених пунктів Правобережного степового Придніпров'я.

Ключові слова: Rosaceae, трапляння видів, таксономічний склад, вікова структура, декоративність, життєвий стан