

## **ROSA CIESELSKII BŁOCKI OR ROSA × SUBCOLLINA (CHRIST) DALLA TORRE & SARNTH. – WHICH SPECIES DOES OCCUR IN LATVIA?**

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### **Abstract**

*Rosa cieselskii* Błocki, an obscure taxon, was included in the latest flora lists in Flora of Baltic States, commonly recognized as a widespread endemic rose species from Western Ukraine. During our studies, all available materials in large Latvian herbaria (HBA, DAU, LATV) were analysed. In addition, the largest part of the previously known localities of *R. cieselskii* were re-inventoried. At least 75 % of the historical and present localities of *R. cieselskii* occurred in parks, greeneries of villages and private houses, abandoned anthropogenic places and similar sites, as well as disturbed roadsides, where the species most likely grows spontaneously. *Rosa cieselskii* was found in semi-natural places in few sites of the Daugava Valley and Sēlija region. During the re-inventory, it was concluded that the species is no longer found in most of the earlier known sites in parks and plantations, which clearly indicates that the species is most likely an anthropophyte. Analysing the morphological characters of *R. cieselskii*, we found that the previously identified material of *R. cieselskii* is not homogeneous, and, in most cases, correspond to the morphologically similar species of hybridogenic origin *R. × subcollina* (Christ) Dalla Torre & Sarnth., which is relatively widespread in Northern Europe and the neighbouring countries around Latvia. We concluded that *R. cieselskii* is not found in Latvia, similarly as it is elsewhere in the Baltic region, while *R. × subcollina* is not a taxon of wild origin, has been cultivated since ancient times in the Baltic States and is well naturalised.

Keywords: Latvia, distribution, Red Data Book, *Rosa subcollina*, systematics

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## INTRODUCTION

Studies of Latvian wild roses date back to almost 250 years history – from the early works of J. B. Fischer, the first naturalist and student of Linnaeus, on the flora of Livland in 1778, in which only one *Rosa* species, *Rosa majalis* Herrm., was mentioned (Fischer 1778), and many Baltic naturalists of the 19<sup>th</sup> century whose works included ideas about the diversity of the *Rosa* genus (Friebe 1805, Fleischer & Lindemann 1839, Wiedemann & Weber 1852, Klinge 1882, Klinge 1883, Lehmann 1895). Later, several well-known Baltic and Latvian rhodologists paid more attention to the research of this taxonomically complicated group: the famous Baltic naturalist K. R. Kupffer whose main contribution is the extensively collected herbarium with more than 40,000 units, many of them belong to genus *Rosa*, different publications in plant geography that explained the distribution of species (Kupffer 1899, Kupffer 1925, Kupffer 1927), as well as P. Galeniņš (Galeniņš 1935, Galeniņš 1957) and I. Riekstiņš (Riekstiņš 1977, Riekstiņš 1980). Despite the relatively long history of research on roses in Latvia and in the Eastern Baltic in general, *Rosa cieselskii* Błocki is not mentioned in any of the published sources. The most distinguished rhodologist of the last decades, D. Šmite, did not also mention this species in her early works (Šmite 1977, Šmite 1979, Šmite 1986). The species is not mentioned also in the work of other Latvian dendrologists (Cinovskis et al. 1974, Cinovskis 1979).

*Rosa cieselskii* Błocki was described by a Polish botanist Bronisław Błocki (Błocki 1889) as a species found only in a narrow area near Lviv. An endemic species range also includes part of the Galicia, Volynia, and neighbouring regions. In the Baltic States, it was first mentioned in 1988 (Šmite 1988), later also in other publications (Šmite 1996, Buzunova 2001, Navasaitis et al. 2003, Kukk et al. 2020) and included in the last edition of the Latvian Red Data Book (Šmite 2003). This unclear taxon for the Eastern Baltic region is not included in the flora of Poland (Szafer 1935, Zieliński 1985, Mandacka et al. 1998), flora of Belarus (Tomin 1950), the flora of Finland (Väre et al. 2021) and flora of north-

eastern part of Russia Federation (Pskov region) (Efimov & Konechnaja 2018). This taxon is generally considered an endemic *Rosa* species occurring in the southeastern part of Europe or in an even narrower range in Western Ukraine (Hrzanovskij 1954, Prokudin 1987). Although the flora of the Baltic States declare that this rose species grows wild in Latvia and reaches the north-western border of its natural range (Šmite 1996), there is a reason to consider that this taxon is incorrectly listed in the floras of Latvia and the Baltic States.

At the same time, the basic position in all dendrological works in Latvia is that *R. caesia* Sm. is a morphologically “broad” species which includes closely similar species, such as *R. coriifolia* Fr. and *R. × subcollina* (Christ) Dalla Torre & Sarnth., or, more often, separate all these taxa in species rank. The taxonomic approach to *R. caesia* group in the works of European rhodologists is very different, and it is often believed that such species are irrelevant and can be regarded as synonyms. For instance, in a work devoted to European wild roses, especially in sect. *Caninae* DC., such taxa as *R. caesia*, *R. × subcollina*, *R. coriifolia*, are all considered taxonomically insignificant synonyms of *R. dumalis* Bechst. (Zieliński 1985, Popek 2007), while *R. cieselskii* is not even mentioned in these papers. We do not agree with such a simplified approach and believe that there is a reason to distinguish these species as separate taxa, and it is necessary to understand in detail which species from this group is present in Latvia.

The aim of the study was to evaluate all available data of *R. cieselskii* and similar taxa from *R. caesia* group in Latvia, to clarify its distribution pattern, to compare the main morphological differences, and clarify the floristic status of *R. cieselskii* and other similar taxa from this group in Latvia.

## MATERIAL AND METHODS

A comprehensive revision of the historical, previously known localities of *R. cieselskii* as well as revision of all available materials in the largest Latvian dendrological herbarium collections was

done: Dendroflora Department of National Botanical Garden (HBA, 107 herbarium specimens including herbaria collected by rhodologists I. Riekstiņš and D. Šmite, also a wide dendrological herbarium from Lithuania and Estonia is stored), Daugavpils University (Institute of Life Sciences and Technology, Laboratory of Botany) (DAU, 33 herbarium specimens). Some material was revised also from other herbaria: University of Latvia (Institute of Biology, Laboratory of Botany) (LATV, 4 herbarium specimens) and Estonian University of Life Sciences (Institute of Agricultural and Environmental Sciences, Department of Botany) (TAA, 3 herbarium specimens). During our studies, a total of around 120 herbarium units collected until 1990 and 29 herbariums from 17 localities collected since 1991 were analysed (HBA, DAU, LATV, TAA), most of them were collected in 2021 and 2022, during our field studies, when the previously known localities of *R. cieselskii* were re-inventoried.

The comparison of diagnostic characters for *R. cieselskii* and other similar *Rosa* species was based on herbarium specimens collected in Latvia as well as on different relevant taxonomic literature (Christ 1873, Blocki 1889, Hrzanovskij 1954, Graham & Primavesi 1993, Šmite 1996, Buzunova 2001).

Species distribution maps for Latvia were prepared using grids which are related to the geographical coordinates, where one square corresponds approximately to  $7.6 \times 9.3$  km or 71 km<sup>2</sup>. The maps were made to enable the analysis of the species distribution dynamics (time of records) at the scale of Latvia. Therefore, the species occurrence is shown at two stages:

1. The species records at the turn of the 19<sup>th</sup>–20<sup>th</sup> centuries until 1990 (including World War I and World War II, and the years of Soviet occupation when the Baltic States experienced significant changes in land processing methods and transport flow, including the flow of cultivated plants in plant nurseries and gardens);
2. From 1991 until nowadays when land processing methods and directions of transport

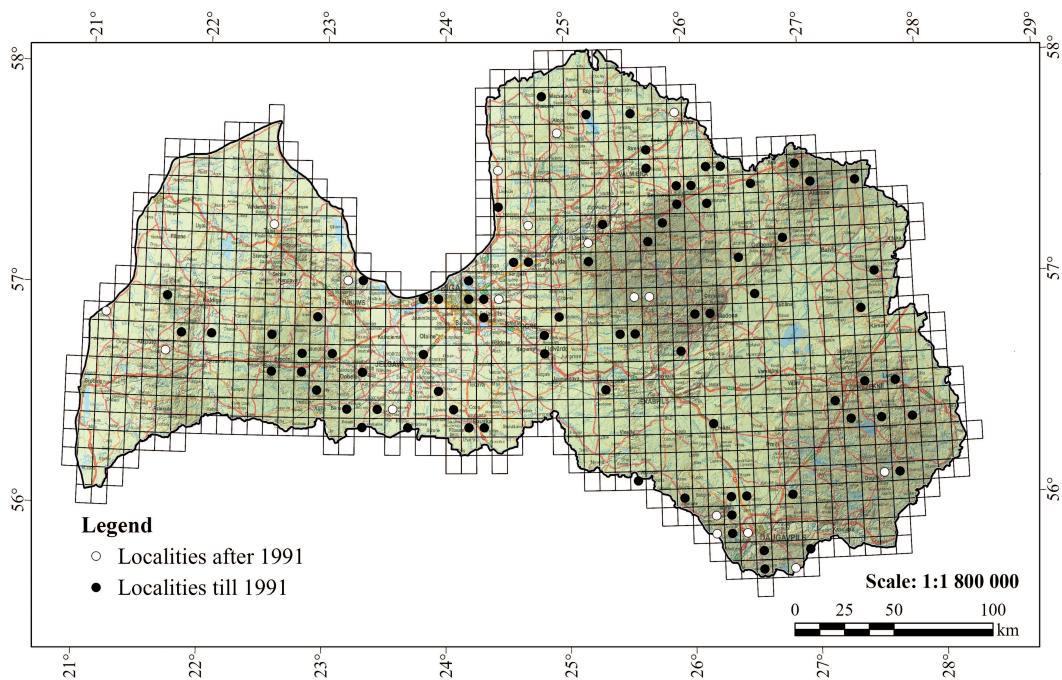
flow have again significantly changed (Fig. 1). For arboreal plants, we can regard the localities as current if they have been surveyed and the plant in it has been identified within the last 30 years, therefore the actual distribution of the species can be discussed only according to the locality maps made after 1990.

Morphometric measurements were done for three closely related rose species: *Rosa caesia*, *R. cieselskii*, *R. coriifolia* from section *Caninae*. To understand whether the herbarium material collected in Latvia corresponds to this species, morphometric measurements were compared with the first description of *R. cieselskii* (Blocki 1889).

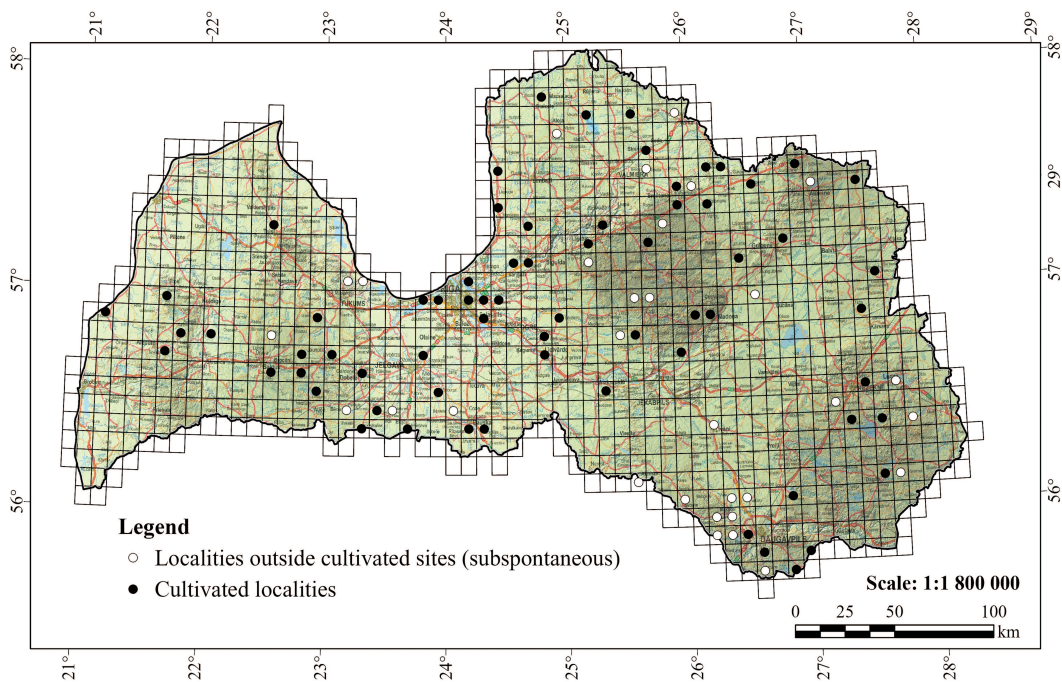
We selected the most common and valuable morphological features for morphometrical measurements of *R. cieselskii* from herbaria and published literature: leaflet length on flowering shoots, leaflets length on non-flowering shoots and length of pseudocarps (hips). The material used for morphometric measurements was taken from scientific herbarium collections of HBA and DAU. To make the data reliable, each measurement was repeated 50 times from different examples. In the case of *R. cieselskii*, only samples identified by D. Šmite were taken. Only properly collected herbarium samples were used for measurements.

## RESULTS AND DISCUSSION

At least 75 % of the herbarium material, earlier identified as *R. cieselskii*, was collected from parks, greeneries of villages and private houses, and other cultivated sites. The remaining herbarium material was collected along roadsides, surroundings of old manor parks, and abandoned anthropogenic places and grasslands, where the species most likely has established subspontaneously. The species has been found in relatively natural places in only few sites in Central Vidzeme and Sēlija region, but even there it was found often near the abandoned former human settlements (Fig. 2).



**Figure 1.** All historical and present localities of *Rosa x subcollina* (Christ) Dalla Torre & Sarnth., previously known as *Rosa cieszelskii* Błocki in Latvia till 1991 (black points) and after 1991 (white points).

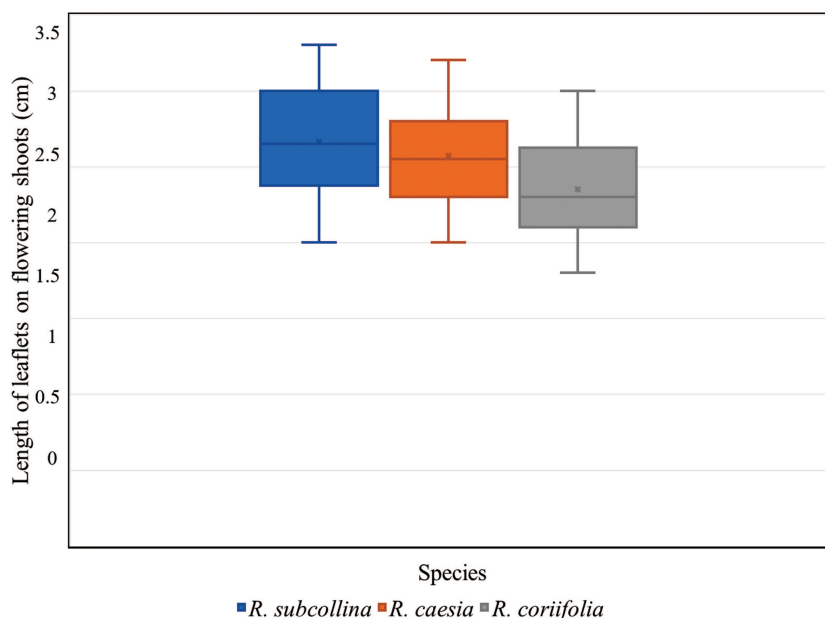


**Figure 2.** Cultivated (black points) and subspontaneous (white points) localities of *Rosa subcollina* (Christ) Dalla Torre & Sarnth. in Latvia.

During the re-survey of the largest proportion of historical localities, it was concluded that this ambiguous taxon, previously identified as *R. cieselskii*, is no longer found in most of the previously known locations in parks and other plantations. In general, this raises a question about the autochthonous nature of this species in Latvia. It is highly probable that the species is an anthropophyte. There is a probability that the species was planted in parks from the material obtained from the wild, however, since the species has not been preserved in cultivation in many places and has not been established back into natural and seminatural habitats, it seems doubtful. The inclusion of the taxon in the Latvian Red Data Book (Šmite 2003) for species with an uncertain floristic status should be regarded as insufficiently reasonable.

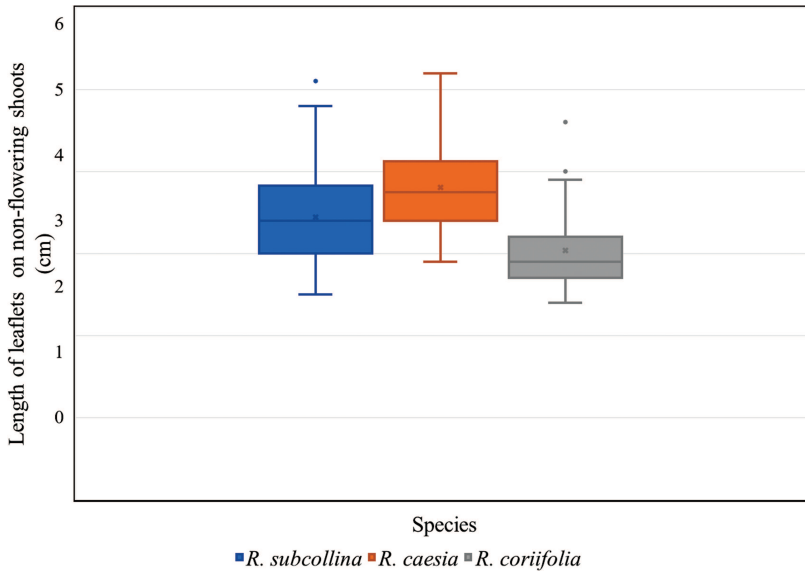
Analysis of the most characteristic morphological features of roses from *R. caesia* group (*R. caesia*, *R. coriifolia*, *R.* × *subcollina* (previously identified as *R. cieselskii*)) and comparing them with the first description of *R. cieselskii* (Błocki 1889), there are clearly distinguishable differences (Fig. 3,

Fig. 4, Fig. 5). The herbarium material earlier determined as *R. cieselskii* in Latvia, does not correspond to the original species description, as there are significant differences in leaf size on flowering shoots and fruit size. There is an inconsistency with another important feature in the identification of genus *Rosa* – the position of calyx during fruit time. Błocki's work emphasized that hips are ovoid, without glandular hairs with pinnate sepals characteristically appressed to the hip, absent during fruit time (Błocki 1889). The herbaria material collected in Latvia shows that hips are ovoid or elliptic, approximately 1.5 cm long with appressed or partially spreading sepals, at least partially persistent during fruit time (Tab. 1). It was also found that the previously identified material of *R. cieselskii* is not homogeneous, and, in most cases, the specimens correspond to the morphologically similar *R.* × *subcollina*, a relatively widespread taxon in Northern Europe and in the neighbouring countries around Latvia. In some cases, herbaria collected earlier have biserrate leaf margin with glandular hairs along the edge of the leaf blade and are more consistent with *Rosa caesia* (Tab. 1, Fig. 6, Fig. 7).

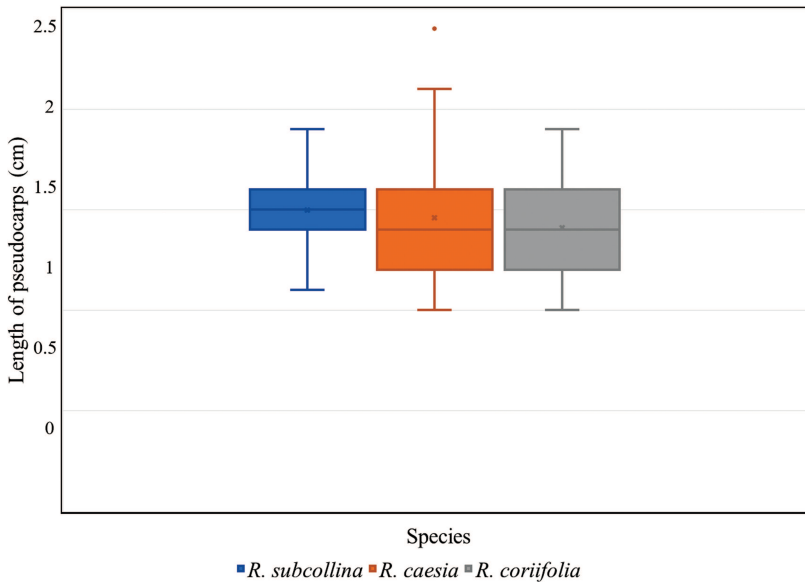


**Figure 3.** Comparison of leaflet length on flowering shoots. According to the first description, the leaflet length of *Rosa cieselskii* Błocki is not more than 2 cm. The average value is marked with a cross sign in each segment.

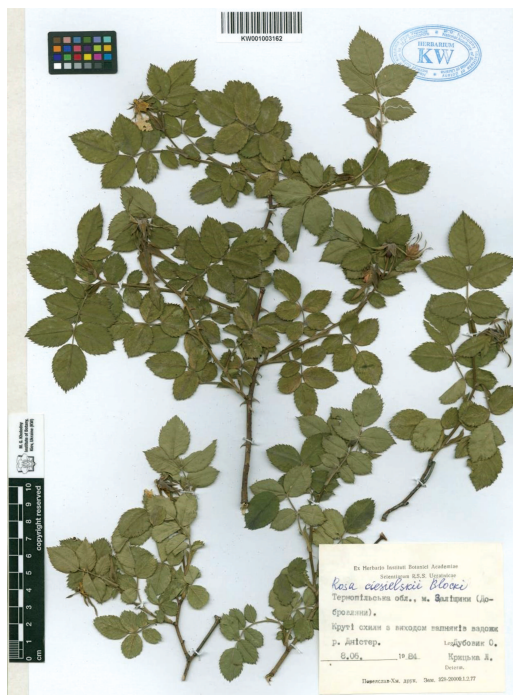
The length of leaflets on flowering shoots do not differ significantly among *R. subcollina*, *R. caesia*, *R. coriifolia* ( $\chi^2=0.02$ ,  $p=0.99$ ).



**Figure 4.** Comparison of leaflet length on vegetative shoots. According to the first description, the leaflet length of *Rosa cieszelskii* Blocki on non-flowering shoots is 3–5 cm. The average value is marked with a cross sign in each segment. The length of leaflets on non-flowering shoots do not differ significantly among *R. subcollina*, *R. caesia*, *R. coriifolia* ( $\chi^2=0.08$ ,  $p=0.96$ ).



**Figure 5.** Length of pseudocarps. According to the first description, the length of *Rosa cieszelskii* pseudocarps is no more than 1 cm. The average value is marked with a cross sign in each segment. The length of pseudocarps do not differ significantly among *R. subcollina*, *R. caesia*, *R. coriifolia* ( $\chi^2<0.01$ ,  $p=1.00$ ).



**Figure 6.** *Rosa cieselskii* Blocki from KW herbarium. Label: Ternopol region (W Ukraine), Zalischiki village, steep slope by the river Dnister, voucher no. KW001003162.



**Figure 7.** *Rosa* × *subcollina* (Christ) Dalla Torre & Sarnth. form DAU herbarium. Label: Latvia, Krāslava region, Ezernieki parish, appr. 250 m S from Jaundome manor, roadside, Lat: 56.14542, Lon: 27.61465, voucher no. DAU106805.

*R. × subcollina* is most often considered as a stabilized hybridogenic species (*R. caesia* × *R. corymbifera* Borkh.) (Väre et al. 2021) that occurs in the temperate and submeridional zone of Europe. In Latvia, it grows as a medium-sized shrub up to 1.5–2 m height. The young shoots are often olive-green or greyish, prickles broad-based and strongly curved, leaflets relatively small, 2–3.3 cm (on vegetative shoots up to 5 cm) long, dark green above and caesious beneath, relatively densely pubescent with simple hairs (without glands). Quite often *R. × subcollina*, *R. cieselskii* and *R. coriifolia*, closely related and similar species of *R. caesia* group, are not recognized as separate taxa by many East European rhodologists (Zieliński 1985, Popek 2007), but only as synonyms of *R. caesia* or *R. dumalis* Bechst. We

consider that morphologically they are sufficiently well differentiated, and it is reasonable to separate this species into an independent rank.

The taxonomic approach which relates to the taxonomy of *R. caesia* unformal group in the works of various Latvian dendrologists differs significantly. In scientific papers published in Latvia, *R. × subcollina* is known since the end of the 19<sup>th</sup> century, and several well-known dendrologists recognize it (Riekstiņš 1980). In works by K. R. Kupffer, P. Galenieks and D. Šmite, it is considered a synonym of other similar taxa: *Rosa coriifolia*, *R. cieselskii* or *R. caesia*, or it is considered that the species is not present in Latvia which has created confusion and misunderstandings.

**Table 1.** Comparison of the most important morphological features of *Rosa caesia* species group in Latvia.

Species and most important morphological features	<i>Rosa caesia</i> Sm.	<i>Rosa cieselskii</i> Bołcki (according Bołcki 1889)	<i>Rosa coriifolia</i> Fr.	<i>Rosa</i> × <i>subcollina</i> (Christ) Dalla Torre & Sarnth.
Habitus	1.5–2 m, with bluish green foliage	1.5 m, with ash-grey foliage	1.5–2 m, grayish-green foliage	1.5–2 m, with bluish green foliage
Young shoots	Greyish green	Greyish, with bluish wax layer	Purplish brown with wax layer	Olive green of greyish green
Prickles	Broad-based, strongly curved, greyish	Broad-based, slightly curved, yellowish brown	Broad based, strongly curved, greyish	Broad based, strongly curved, greyish
Leaflets	5–7, densely pubescent with simple hairs and sparsely with glandular hairs beneath and on margin of leaf blade, 2.5–3.5 cm long, with rounded base	7, densely pubescent with simple hairs, without glands, small, 2 cm long, with rounded base	7, densely pubescent with simple hairs, without glands, 3–3.5 cm long, with acute base	5–7, densely pubescent with simple hairs, without glands, 2.5–3.2 cm long, with acute or near rounded base
Length-width ratio of leaflets	3:2	3:2	2:1	3:2
Type of tothing of the leaf margin	Biserrate with glandular hairs	Serrate, obtuse, widely triangular	Serrate	Serrate
Pseudocarps	Hips 1.5–2.5 cm long, elliptic, without glandular hairs	Hips small, 1 cm long, spherical or elliptic, without glandular hairs	Hips 1.5–2.5 cm long, elliptic, without glandular hairs	Hips 1.5–2.0 cm long, elliptic, without glandular hairs
Sepals	Pinnate, erected, partially present during fruit time	Pinnate, appressed to the hip, absent during fruit time	Pinnate, erected, present during fruit time	Pinnate, appressed to the hip, present during fruit time

*Rosa cieselskii* is widely considered as synonym in different internationally recognized databases – as synonym of *Rosa corymbifera* (*Rosa ciesielskii* Blocki in GBIF Secretariat 2022), or *Rosa tomentosa* Sm. (WFO 2023). At this case, we did not draw any inconsiderate conclusions about synonyms, based only on such databases or general floras as well. *Locus classicus* of this species is Western Ukraine – Lviv surroundings, therefore we first analyzed scanned species material from the native distribution range, as well as the first description of this species (Blocki 1889). In this discription clear differences between main morphological characters of *R. cieselskii*, *R. corymbifera* and *R. tomentosa* are seen. As an outcome, we cannot agree with opinion, that all these species are synonyms, rather than com-

pletely different species. We do not agree to place together roses with glandular hairs and small rounded hips with characteristic calyx form and roses without glandular hairs and completely different fruit morphology. It is known that presence or absence of glandular hairs is a quite important morphological character in many plant genera (*Oenothera*, *Euphrasia*, *Epilobium*, and, of course, *Rosa*).

## CONCLUSIONS

Our study concludes that *Rosa cieselskii* is not present in Latvia, similarly as elsewhere in the Baltic Sea region. All the collected herbarium material earlier identified as *R. cieselskii*, although



visually similar to specimens of this taxon from Ukraine, after analysis of morphological characters differs significantly from the original description of this species. The previously determined material of *R. cieselskii*, in our opinion, corresponds to *Rosa* × *subcollina*, a species that is relatively rare with scattered distribution. Most likely, *R. × subcollina* is a non-native species in the Baltic region, but is considered as an ornamental plant that has been cultivated for a long time and escaped to the wild.

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