



## ROSA DUMALIS BECHST. IN THE BUFFER ZONE OF THE LOW TATRAS NATIONAL PARK (SLOVAKIA) – MORPHOLOGICAL DIFFERENTIATION

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**Abstract.** The paper presents morphological diversity within *Rosa dumalis* Bechst., species identified among others in the buffer zone and the area of the Low Tatras National Park (Slovakia). This taxon belongs to the polymorphic section *Caninae* DC. em. Christ., and its morphological differentiation particularly relates to the degree of hairiness and glandularity leaves and the presence or absence glandules on pedicels. Based on these features nine varieties of this species were distinguished in Europe by POPEK (1996). Four of these varieties, *R. dumalis* Bechst. var. *afzeliana* (Fr.) Boulenger, *R. dumalis* Bechst. var. *dumalis*, *R. dumalis* Bechst. var. *caesia* (Sm.) Boulenger and *R. dumalis* Bechst. var. *coriifolia* (Fr.) Boulenger, were found in the analyzed area.

**Key words:** *Rosa dumalis*, Rosaceae, morphology, chorology, Low Tatras National Park, Carpathians, Slovakia

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### Introduction

*Rosa dumalis* Bechst., a very morphologically differentiated shrub, belongs to section *Caninae* DC. em. Christ. Just as in case of other species of this section its diversity mainly refers to the intensity of hairiness and the glandularity of leaves, the presence or absence of glands on pedicels, serration of leaf blade etc. On the basis of these variables, the taxon was divided among such distinct species, such as: *R. afzeliana* Fr., *R. bisserrata* Mérat, *R. acharii* (Billb.) Boulenger, *R. caballicensis* (Puget) Boulenger, *R. caesia* Sm., *R. coriifolia* Fr., *R. vosagiaca* Desp. (PROCHÁZKA & KRAHULEC 1982; ZIELIŃSKI 1987; VĚTVIČKA 1992; POPEK 1996, 2007). However, as the further comprehensive study of roses *Caninae* section showed, the morphological differences among the species mentioned above concern only the features in question and their variability is of clearly continuous nature (ZIELIŃSKI 1985, 1987; POPEK 1996). Therefore, it is more

reasonable to consider them as varieties of *R. dumalis* than separate individual species (POPEK 1996).

The variability of morphological features of *R. dumalis* has not been the subject of detailed rodological studies on the territory of Slovakia so far.

Therefore, the goal of this paper is to show the full spectrum of morphological diversity appearing within the species *R. dumalis* and to present its variations on the basis of our samples collected in the buffer zone of the Low Tatras National Park (NAPANT).

### Material and methods

*R. dumalis* is a shrub growing up to 3 m high. Prickles strongly hooked or needle-like prickles on flowering shoots sometimes. The leaves are compound, with 5-7 leaflets. Leaflets elliptic, roundish or obovate, wedge-shaped or rounded at the base, usually sine or purple stained. Margin of leaf single, double serrated or complex-glandular serrate. Leaves

glabrous or haired, particularly bilateral glandular. Fruits ovoid or roundish, glabrous or sometimes  $\pm$  glandular. Pedicles, especially central, shorter than fruit. Sepals pinnate, glabrous or glandular. Fruits crowned by spreading or erect-suberect sepals. Flowers separated or in multiflorous inflorescences, usually intensely pink. Disc flat, wide orifice (*orificium*) and styles of a woolly haired, hemispherical *capitulum* type.

Field investigations were carried out in the buffer zone of the Low Tatras National Park in the vegetation seasons 2011-2014. Fruiting short shoots of roses were collected during investigations. The following characteristics were reported: the shape of the prickles, the shape of a disc, intensity of hairiness of leaves and glandularity of margin of leaves. In case of the leaves, middle and top parts were taken into consideration, while in case of the prickles the top parts of one-year or two-year-old long shoots, which had already completed the process of growth and their prickles were not changing, were studied. Localities, wherein specimens were collected, were marked on the map (Fig. 1). Geographical coordinates were determined for each record of distinguished varieties. Collected herbarium material was deposited in the herbarium of the Ojców National Park (OPN).

Systematic approach and the nomenclature are following the work of POPEK (1996).

## Results

During the course of studies was stated that *R. dumalis* is a frequent species in the area of the buffer zone of the Low Tatras National Park. Considering the morphological characteristics of the collected specimens, four varieties of this species were distinguished in the study area (Tab. 1; Figs. 2, 3).

The occurrence of varieties of *R. dumalis* in the study area:

1. Brezno, GPS: N= 48,811272° ; E= 19,62244°
2. Protected Site Jakub, GPS: N= 48,767618° ; E= 19,142303°

3. Protected Site Kopec GPS: N= 48,783003° ; E= 19,226074°
4. Hel'pa, GPS: N= 48,867199° ; E= 19,969883°
5. Horná Lehota, GPS: N= 48,842802° ; E= 19,54339°
6. Jasenie, GPS: N= 48,824271° ; E= 19,476357°
7. Javorie GPS: N= 48,813985° ; E= 19,24633°
8. Liptovská Lúžna, GPS: N= 48,943137° ; E= 19,316711°
9. Liptovské Sliache, GPS: N= 49,052945° ; E= 19,414129°
10. Liptovská Štiavnica, GPS: N= 49,046532° ; E= 19,35276°
11. Ludrová, GPS: N= 49,04732° ; E= 19,324951°
12. Mýto pod Ďumbierom, GPS: N= 48,848112° ; E= 19,617634°
13. Pohorelá, GPS: N= 48,861383° ; E= 20,033484°
14. Polomka, GPS: N= 48,859181° ; E= 19,84354°
15. Nature Reserve Mackov bok GPS: N= 48,762865° ; E= 19,254227°
16. Šumiac, GPS: N= 48,844949° ; E= 20,095625°
17. Telgárt, GPS: N= 48,858899° ; E= 20,176992°
18. Valkovňa GPS: N= 48,838396° ; E= 20,064726°
19. Vlačuhovo GPS: N= 48,832634° ; E= 19,265213°

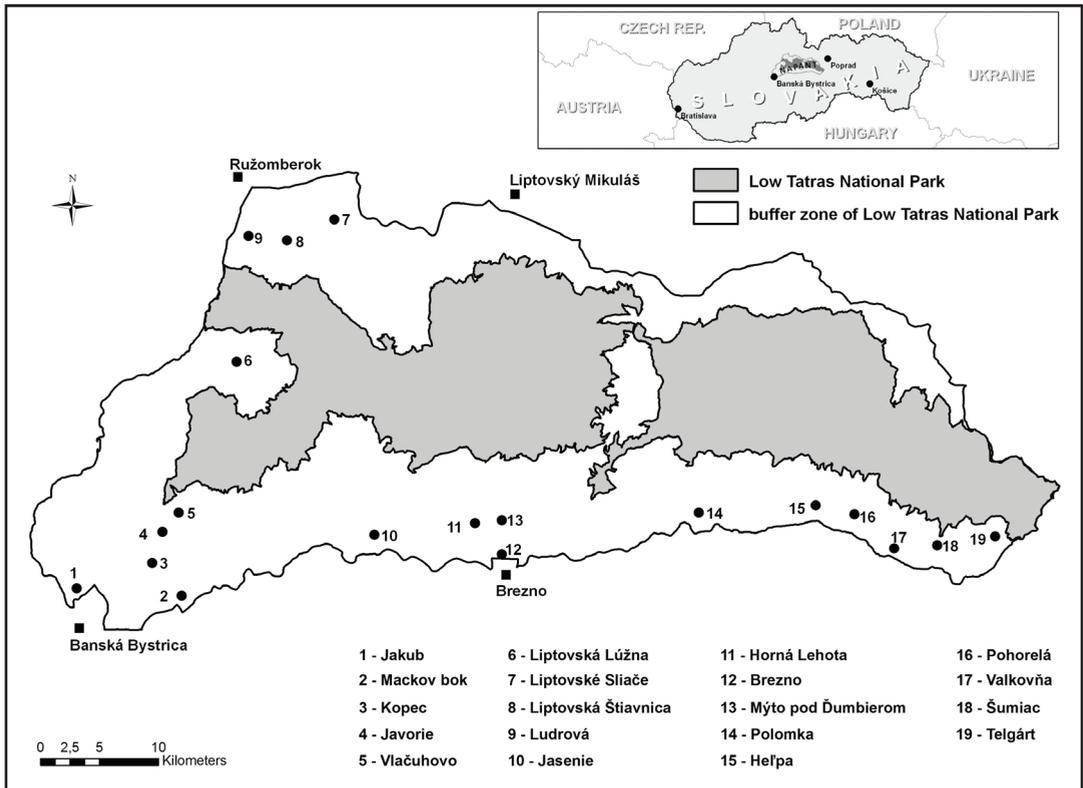
## *Rosa dumalis* Bechst. var. *afzeliana* (Fr.) Boulenger

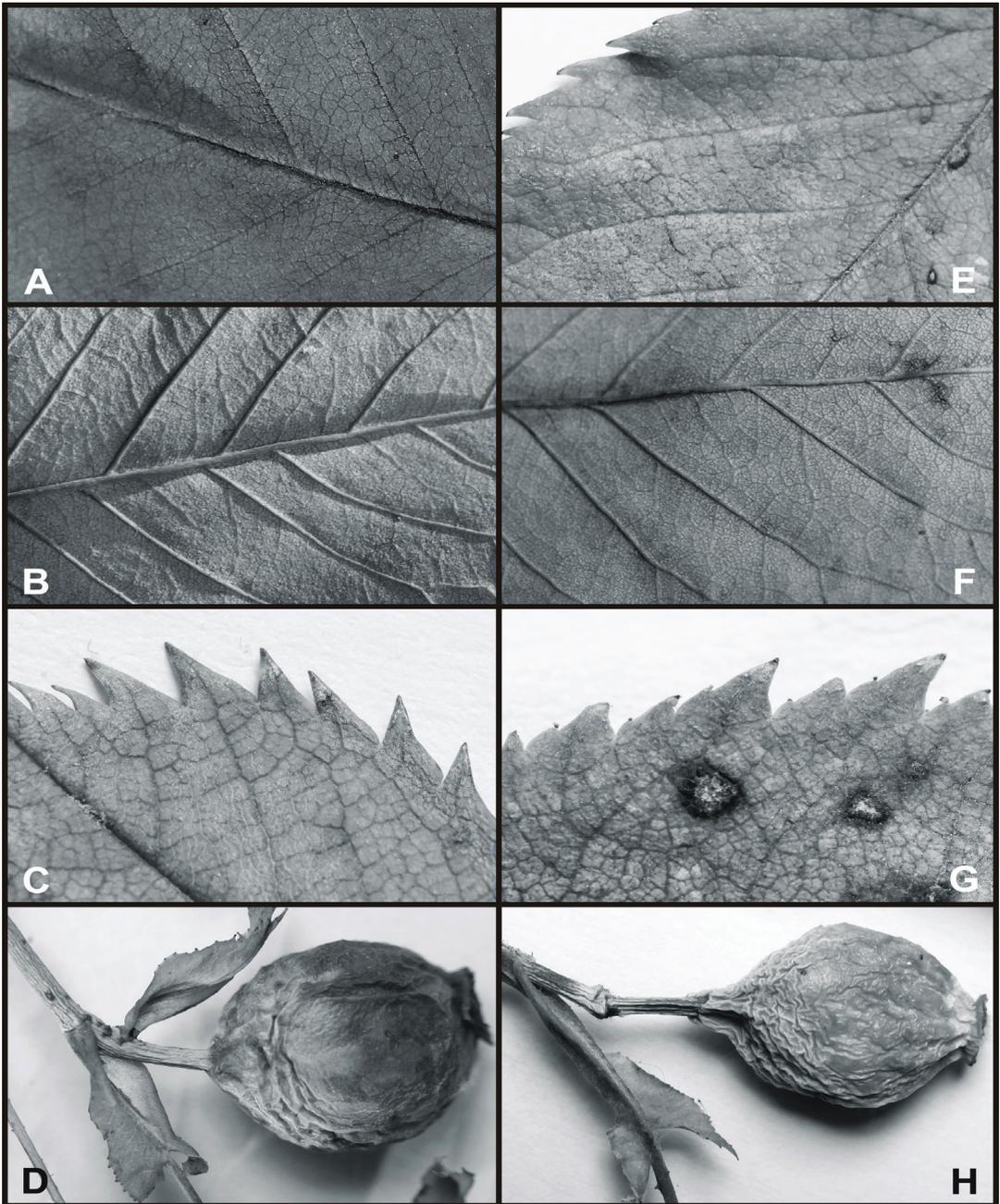
This variety is characterized by glabrous, simple or doubly serrate leaflets, normally glandless margin (Fig. 2 A-D).

141 records on 19 localities; **2011**: Protected Site Jakub, Protected Site Kopec, Javorie, Nature Reserve Mackov bok, Vlačuhovo; **2012**: Liptovská Lúžna, Liptovská Štiavnica, Liptovské Sliache, Ludrová; **2013**: Brezno, Jasenie, Horná Lehota, Mýto pod Ďumbierom; **2014**: Hel'pa, Pohorelá, Polomka, Šumiac, Telgárt, Valkovňa.

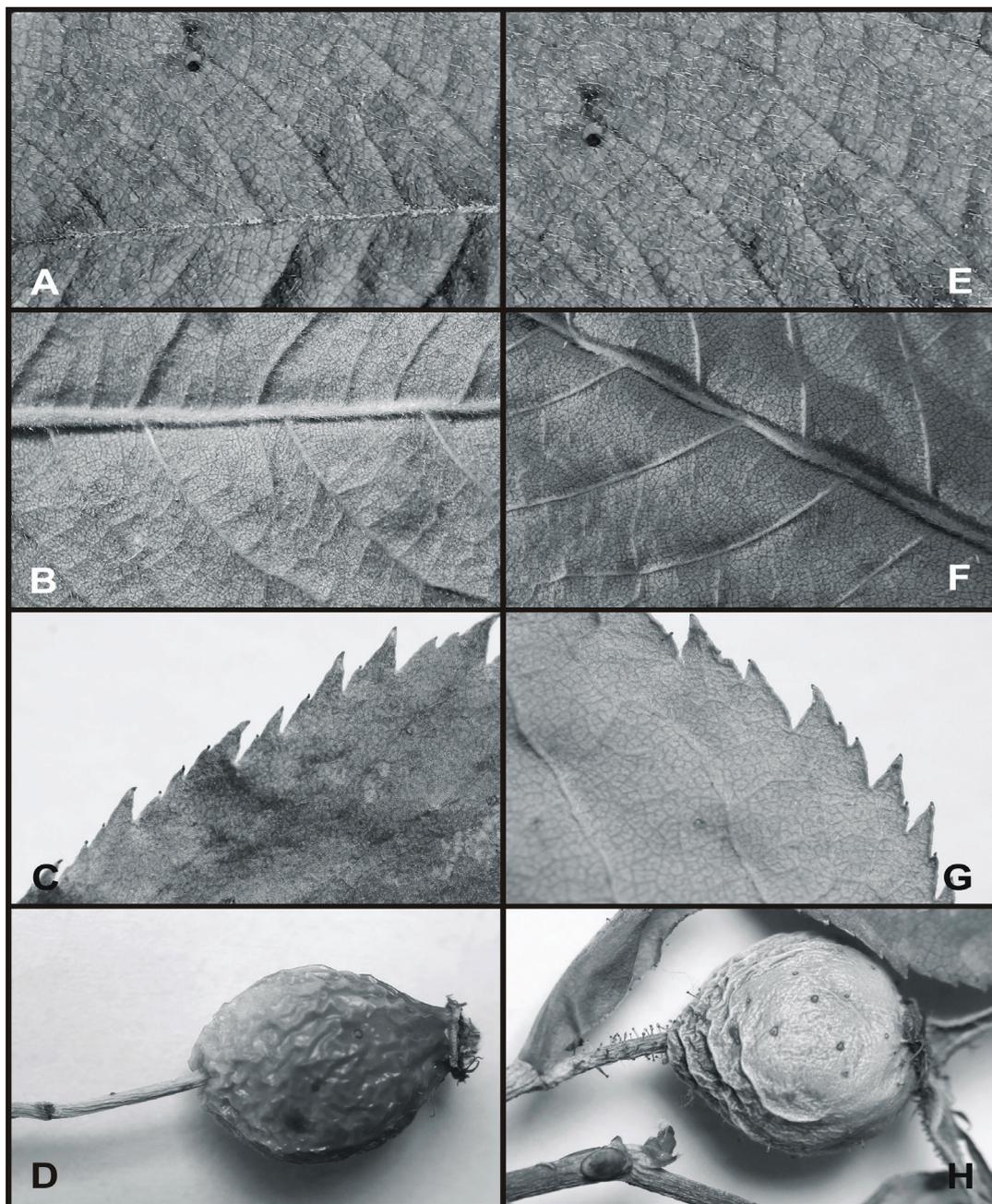
**Tab. 1.** Morphological features of *Rosa dumalis* varieties.

Characteristics	<i>Rosa dumalis</i>			
	var. <i>afzeliana</i>	var. <i>dumalis</i>	var. <i>coriifolia</i>	var. <i>caesia</i>
Pedicel	glabrous (exceptionally $\pm$ glandular)	glabrous	glabrous	glandular
Margin of leaf	single or double serrated	complexly serrated, glandular	single, double or complexly serrated, glandular	
Leaflets	glabrous (glandless or $\pm$ glandular on the underside)		haired (exceptionally glandular)	
Ridge sepals	glabrous	glabrous (or $\pm$ glandular on margin)	glabrous (exceptionally $\pm$ glandular)	glandular
Position of the sepals		spreading or erected-suberected		
Prickles		strongly hooked		
Disc		flat		
Orifice		wide (> 1mm)		
Styles		woolly haired, hemispherical capitulum type		

**Fig. 1.** Localization of stands in the study area.



**Fig. 2.** Examples of morphological traits of *Rosa dumalis* var. *afzeliana* (A-D) and *R. dumalis* var. *dumalis* (E-H): A, E – adaxial surface of leaf; B, F – abaxial surface of leaf; C, G – leaf margin; D, H – fruits and pedicel.



**Fig. 3.** Examples of morphological traits of *Rosa dumalis* var. *coriifolia* (A-D) and *R. dumalis* var. *caesia* (E-H): A, E – adaxial surface of leaf; B, F – abaxial surface of leaf; C, G – leaf margin; D, H – fruits and pedicel.

***Rosa dumalis* Bechst. var. *dumalis***

Variety is characterized by complex serrate leaflets, glandless or  $\pm$  glandular on the underside. (Fig. 2 E-H).

118 records on 18 localities; **2011**: Protected Site Jakub, Javorie, Nature Reserve Mackov bok, Vlačuhovo; **2012**: Liptovská Lúžna, Liptovská Štiavnica, Liptovské Sliače, Ludrová; **2013**: Brezno, Jasenie, Horná Lehota, Mýto pod Ďumbierom; **2014**: Hel'pa, Pohorelá, Polomka, Šumiac, Telgárt, Valkovňa.

***Rosa dumalis* Bechst. var. *coriifolia* (Fr.)****Boulenger**

This variety in study area is distinguished normally by simple serrate leaflets, bilaterally haired or glabrous on the upper side, underside haired on the veins or whole surface (Fig. 3 A-D).

95 records on 18 localities; **2011**: Protected Site Kopec, Javorie, Nature Reserve Mackov bok, Vlačuhovo; **2012**: Liptovská Lúžna, Liptovská Štiavnica, Liptovské Sliače, Ludrová; **2013**: Brezno, Jasenie, Horná Lehota, Mýto pod Ďumbierom; **2014**: Hel'pa, Pohorelá, Polomka, Šumiac, Telgárt, Valkovňa.

***Rosa dumalis* Bechst. var. *caesia* (Sm.)****Boulenger**

This variety in study area is distinguished normally by simple serrate leaflets, bilaterally haired or glabrous only on the upper side. Pedicels are glandular (Fig. 3 E-H).

3 records on 3 localities; **2013**: Brezno; **2014**: Šumiac, Telgárt.

**Discussion**

Geographically *R. dumalis* Bechst. belongs to the European-temperate-Mediterranean (northern) element (ZAJAČ & ZAJAČ 2009). The shrub grows mainly in the area of Central and Southern Europe. The highest localities of *R. dumalis* were found in the Alps – up to 2000 m a.s.l. (POPEK 2007). In Slovakia it occurs in the territory of the whole country; the highest places of occurrence have been found on 1200 m a.s.l. (VĚTVIČKA 1992; POPEK 2007).

As it has already been mentioned, the high variability of morphological forms is characteristic of *R. dumalis*. Among European roses the species is the biggest “aggregate” which is often used to place very different morphological forms (VĚTVIČKA 1992). The mentioned variability refers to degree of hairiness and the glandularity of leaves, serration of leaf blade and presence or absence of glands on pedicels. Whereas a common feature of all the varieties of this species is broad estuary of orificium (Tab. 1).

In Slovakia *R. dumalis* is considered to be one of the most polymorphic species. Based on the diversity of morphological features *R. vosagiaca* (bare leaves and erected sepals) and *R. coriifolia* (hairy and glandular stems and leaves) were distinguished as a distinct species (PROCHÁZKA & KRAHULEC 1982; VĚTVIČKA 1992). At present there are varieties of *R. dumalis* (POPEK 1996, 2007).

POPEK (1996) distinguished on the area of Middle Europe nine varieties of *R. dumalis*, four of them have been found in buffer zone of NAPANT so far. They are clearly morphologically different but do not exhibit differences in the range of occurrence nor the type of occupied habitats. The most commonly noticed variety was *R. dumalis* var. *azfeliana* – 141 records – bare leaves, single or double serrated. Very common was *R. dumalis* var. *dumalis* – 118 records – complexly serrated leaves, on edge glandular. Mentioned varieties are very common in Europe (POPEK 2007). On the study area *R. dumalis* var. *caesia* was the most rare – 3 records – glandular pedicels and hairy leaves. The exact distribution of the variety on the territory of Slovakia is unknown. In Poland it is infrequent (POPEK 1996).

The morphological variability of *R. dumalis* is estimated as significantly well recognized in Europe (POPEK 1996). In contrast, distribution of species and varieties distinguished in the territory of Slovakia requires further examinations. Therefore the above considerations constitute contribution to the continuation of rodological research in that region.

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