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The chromosome numbers of some selected plant species of flora in Slovakia

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Abstract. In the contribution there is the information about chromosome numbers of 16 mountain and alpine species of flora in Slovakia as follows: *Androsace obtusifolia* All. 2n = 40, *Calluna vulgaris* (L.) Hill. 2n = 16, *Campanula cochleariifolia* Lam. 2n = 34, *Campanula elliptica* Kit. in Schult. subsp. *subcapitata* (Popov) Májovský 2n = 30, *Dianthus glacialis* Haenke in Jacq. 2n = 30, *Festuca ovina* L. 2n = 14, *Galium spurium L.* subsp. *vaillantii* (DC.) Gaud. 2n = 20, *Pilosella caespitosa* agg. 2n = 45, *Oxytropis carpatica* L. 2n = 16, *Oxytropis halleri* Bunge ex Koch 2n = 32, *Poa margilicola* Bernátová et Májovská 2n = 28, *Poa seiuncta* Bernátová et Májovský 2n = 28, 56, *Poa babiogorensis* Bernátová et Májovský 2n = 42, *Silene acaulis* (L.) Jacq. s. l. 2n = 24, *Silene noctiflora* L. 2n = 24, *Tephroseris capitata* (Wahlenb.) Holub 2n = 96.

Key words: chromosome numbers, vascular plants

Introduction

The Karyotaxonomic Survey of Slovak Flora (Májovský *et al.* 1987) represents the chromosome numbers of many taxons of flora in Slovakia. However, some alpine species or some karyologically unkown species are missing. In the contribution we intend to complete the karyotaxonomic survey and to involve above mentioned mountain and alpine taxons. The results of karyological analyses of 16 taxons from the regions of Veľká Fatra, Západné, Vysoké and Belianske Tatry Mts. and Bukovské vrchy Mts. are presented. There were 7 species from Slovakia that for the first time were analyzed. The other 9 species, the chromosome numbers were confirmed or more detaily analyzed. From the region of Veľká Fatra Mts., the species were: *Poa margilicola, P. seiuncta, P. babiogorensis, Galium spurium* subsp. *vaillantii, Pilosella caespitosa* and *Silene noctiflora*. The first four species are considered as the contribution not only for our region but even for the World Databank (newly described species from aggregated genus *Poa glauca* and *Galium spurium* subsp. *vaillantii*) as well. The species *Campanula elliptica* subsp. *subcapitata* is also a new contribution into the World Databank. From the regions of Belianske, Západné, and Vysoké Tatry (mountains), the chromosome numbers were determined for the first time in the species: *Androsace obtusifolia, Oxytropis halleri, Tephroseris capitata.* In other species we confirmed or provided more detailed information about chromosome numbers: *Calluna vulgaris, Campanula cochleariifolia, Dianthus glacialis, Oxytropis carpatica,* and *Silene acaulis.*

Material and methods

The vegetative cones were pretreated in 0.5% colchicine for 2 - 3 hours. Then, the material was fixed in alcohol - acetic solution of the ratio 3 : 1 during 24 hours. After fixation the material was stored in 75% alcohol. Then the material was washed out in tap water, macerated in alcohol - HCl of the ratio 1 : 1 for 10 minutes. Again it was washed out then dyed in acetoorceine on microscope slide (Pazourková and Pazourek 1960). The nomenclature for particular taxons was done according Dostál (1989) and Májovský *et al.* (1987).

Results and discussion

Androsace obtusifolia All.
Locality: Vysoké Tatry Mts., Furkotská dolina , leg. Dúbravcová; 2n = 40 Uhríková.
This was the first data for our region and was different from other data published so far 2n = 36 Favarger (1954) and 2n = 38 Favarger (1958). It is sub-Atlantic European hemicryptophyte growing on arid non-limestone sites, and it was observed in Vysoké Tatry, Západné and Nízke Tatry Mts. Because the chromosome number must be confirmed, the karyologic analysis will have to be repeated and involve more localities.

Calluna vulgaris (L.) Hill.
Locality: Vysoké Tatry Mts., Huncovské pleso, leg. Dúbravcová; 2n = 16 Uhríková.
This boreal sub- Atlantic, European nanophanerophyt in its area is considered as a diploid one. In our region two former analyses Uhríková and Májovský in Löve (1980) and Uhríková and Paclová (1986) showed that it had 2n = 16. The same number was mentioned by Löve and Löve (1974) and Wcislo (1990).

Campanula cochleariifolia Lam.
Locality: Belianske Tatry Mts., Ždiarska vidla, leg. Dúbravcová; 2n = 34, Uhríková.
Alpine - European - Carpathian lime - loving species that has the stable chromosome number

2n = 34 in its area and it coincides with our number. The results of all ten analyses (Májovský *et al.* 1987) coincide with our data.

Campanula elliptica Kit. in Schult. subsp. *subcapitata* (Popov, Májovský)
Locality: BukovskÚ vrchy , Pľaša , leg. Háberová 2n = 30 Uhríková
This species belongs to Carpathian endemits, it grows mainly on limestone. So far, the chromosome number for the taxon has not been determined therefore it is a contribution to the World Databank.

Dianthus glacialis Haenke in Jacq.
Locality: Belianske Tatry Mts., Hlúpy, leg. Dúbravcová; 2n = 30 Uhríková.
This subalpine - alpine to subnival European hemicryptophyte belongs to diploids similarly according to data in literature (Májovský *et al.* 1987).

Festuca ovina L.
Locality: Vysoké Tatry Mts., Štrba , leg. Májovský; 2n = 14 Uhríková.
This boreal subAtlantic - Eurosiberian species is in larger part of its growing area diploid one (Májovský *et al.* 1987). As a tetraploid one it was mentioned by authors from Portugal (Queiros 1977), from Baikal (Belaeva and Siplivinsky 1976) and from Himalayas(Mehra and Sharma 1975).

Galium spurium L. subsp. *vaillantii* (DC.) Gaud. Syn. *Galium infestus* Waldst. et Kit.
Locality: Veľká Fatra Mts., underlying limestone rock in Konský dol, leg. Bernátová; 2n = 20 Uhríková.
It belongs to sub - Mediterranean Eurasian terophytes presented as diploid (Májovský *et al.* 1987 and Galland 1988, x = 10).

Pilosella caespitosa agg. Syn. *Hieracium pratense* Tausch.
Locality: Veľká Fatra Mts., Malá Pustalovčia; leg. Bernátová. 2n = 45 Uhríková.
This aggregated species is shown in more numbers of ploidity from 2n = 18, 27, 36, 45 to 72. Pentaploid genotype that coincided with the first data from our region was published by Skalinska (1967).

Oxytropis halleri Bunge ex Koch
Localities: - Belianske Tatry, Hlúpy, leg. Dúbravcová, 2n = 32 Uhríková,
- Belianske Tatry Mts., Ždiarska vidla, leg. Dúbravcová, 2n = 32 Uhríková,
- Belianske Tatry Mts., Skalné vráta, leg. Dúbravcová, 2n = 32 Uhríková.
European hemicryptophyte with confirmed occurrence in Belianske Tatry Mts. on underlying limestones. Our populations were for the first time analyzed from the localities mentioned above, and they belong to tetraploids. From literature (Májovský *et al.* 1987), they are known not only as tetraploids but diploids as well.

Oxytropis carpatica Uechtr.
Locality: Belianske Tatry Mts., Hlúpy, leg. Dúbravcová, 2n = 16 Uhríková.
Carpathian endemic species presented from Belianske Tatry Mts. as a diploid (Murín and Májovský (1983).

Poa glauca agg.
On the basis of the study Bernátová and Májovský (1997), *Poa glauca* was divided into three small species that have differences in morphology, ecology, and chromosome number. Two small species grow in our territory, and the third one on the Polish side of Babia Gora .The taxa are as follows:

Poa margilicola Bernátová et Májovský
Locality: Veľká Fatra Mts. , Malá Pustalovčia, leg. Bernátová 2n = 28, Uhríková

Poa "seiuncta" Bernátová et Májovský sp. *nova* (in press).
Locality: the West Tatra mountains, Osobitá, leg. Bernátová; 2n = 28, 56, Uhríková.

Poa "babiogorensis" Bernátová et Májovský sp. *nova* (in press).
Locality: Babia Gora (Polish part), leg. Bernátová; 2n = 42 Uhríková.
As it is shown in the species *Poa margilicola* we analyzed only a tetraploid populations 2n = 28. In *Poa seiuncta* we found 2n = 28 in protomeristem and 2n = 56 in intercalar meristem. Both chromosome numbers in root tips were observed. In the species *Poa babiogorensis* we determined the chromosome number 2n = 42. In the aggregated species *Poa glauca* the chromosome numbers are known as: 2n = 28, 42, 44 - 46, 46, 56, 68, 78. We suppose that even in the future other small species will be selected, or there will be confirmed the increased number of chromosomes in intercalar meristem. So, there would be an explanation why in literature for the wide scale of chromosome numbers in the aggregated species is mentioned (Májovský *et al.* 1987).

Silene acaulis (L.) Jacq.
Locality: Belianske Tatry Mts., Hlúpy, leg. Dúbravcová; 2n = 24 Uhríková.
In the region of the Western Carpathians the species *Silene acaulis* there has two subspecies: *S. acaulis* subsp. *excapa* (All.) J. Braun that occures on non limestone parts of the Fatra and Tatra mountains, and subsp. longiscapa (Kern. ex Vierh.) Hayek, on limestone periphery of the Fatra and Tatra. The relation to the substrate was not confirmed in the species because subsp. *excapa* as well as *longiscapa* were observed on both substrates. As it is resulted from analyses (cf. Májovský *et al.* 1987, *Kochjarová* 1992) both species have the same chromosome number 2n = 24. So, this arcto-alpine circumpolar taxon is diploid one in all its area. The morphologic differences are likely based on other ecological factors.

Silene noctiflora L. Syn. *Melandrium noctiflorum* (L.) Fries.
Locality: Malá Fatra Mts., Martin, leg. Májovský; 2n = 24 Uhríková.
Similarly as previous species, this species is diploid one 2n = 24 in all its area (Májovský *et al.* 1987) which corresponded with our observation in the second locality.

Tephroseris capitata (Wahlenb.) Holub Syn. *Senecio capitatus* (Wahlenb.) Stendl.
Locality: Belianske Tatry Mts., Hlúpy, leg. Dúbravcová; 2n = 96 Uhríková.
The species belongs to sub - continental European alpine species. It grows on limestone underlying rock in Belianske as well as Západné Tatry Mts. In karyological analysis, there are chromosome numbers as follows: 2n = 96 (+0 - 4B) Tutin *et al.* (1976),
2n = 64 Váchová in Májovský *et al.* (1970) (Belianske Tatry, Havran); x = 48 Zinckler (1968).

Due to the fact that Zinckler(l.c.) analyzed chromosome numbers during meiosis, we can suppose that analyzed chromosome number will correspond to the number relevant for the mentioned taxon. The locality from Belianske Tatry Mts. and Havran will have to be reevaluated.

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