

Chromosome number and DNA ploidy level reports from Central Europe – 3

edited by Patrik MRÁZ*

Abstract: Third part of chromosome number and DNA ploidy level reports from Central Europe comprising whole Carpatho-Pannonian region includes the data for following taxa: *Scilla bifolia* s. str. ($2n = 18$), *S. bifolia* agg. ($2n = 36, 54$), *S. drunensis* subsp. *drunensis* ($2n = 36$), *S. drunensis* subsp. *buekkensis* ($2n = 36$), *S. kladnii* ($2n = 18$) and *S. vindobonensis* ($2n = 18$) by J. Kochjarová from Austria, Slovakia and the Czech Republic (nos. 27–32); *Campanula macrostachya* ($2n = ca\ 32$) and *Erysimum diffusum* ($2n = 14, 28$) by E. Michalková from Hungary (nos. 33–34).

Key words: Asparagaceae; Brassicaceae; Campanulaceae; Hyacinthaceae; ploidy level

Reports (27–32) by Judita Kochjarová

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27. *Scilla bifolia* L. s. str. (Asparagaceae)

$2n = 18$ Kochjarová

Locality: Austria, the town of Wolfpassing, the forest on the Klein Erlauf stream, WSW of the village of Zarnsdorf, coll. and det. J. Vlčko, B. Trávníček & J. Kochjarová, 6. IV. 2004 (BBZ *s.n.* – Herbarium of the Botanical Garden of the Comenius University in Blatnica).

This count agrees with those from Austria, France, Germany, Italy and Switzerland, as has been published by Austrian authors (Greilhuber & Speta 1977, 1985; Speta 1974, 1977, 2000).

28. *Scilla bifolia* agg. (Asparagaceae)

$2n = 36$ Kochjarová

Localities: 1. Czech Republic, Moravia, the town of Náměšť na Hané, the floodplain forest in the Terežské údolí valley, ca 250 m a.s.l., 49°35'58" N, 17°02'56" E, coll. and det. J. Vlčko & J. Kochjarová, 5. IV. 2004 (BBZ *s.n.* – Herbarium of the Botanical Garden of the Comenius University in Blatnica). 2. Slovakia, Tribeč Mts, the village of Velčice, the foot of the hill Hôrka, ca 260 m a.s.l., coll. M. Zemanová 2004, det. J. Vlčko (Herbarium of Jaroslav Vlčko *s.n.*). 3. Slovakia, Podunajská nížina lowland, the village of Malé Kozmálovce, the alluvial forest near the Korlát settlement, 200 m a.s.l., 48°16'45" N, 18°29'55" E, coll.

and det. J. Vlčko, R. Hrivnák & J. Kochjarová, 24. III. 2004 (BBZ *s.n.*). 4. Slovakia, Slovenský kras karst, the village of Brzotín, the oak-hornbeam forest near the Brzotínska jaskyňa cave, 263 m a.s.l., 48°36'22" N, 20°28'24" E, coll. and det. J. Vlčko, R. Hrivnák & J. Kochjarová, 9. IV. 2003 (BBZ *s.n.*). 5. Slovakia, Podunajská nížina lowland, the village of Dolné Naštice, coll. and det. J. Vlčko, 2004 (Herbarium of Jaroslav Vlčko *s.n.*). 6. Slovakia, Podunajská nížina lowland, the village of Čifáre, ca 170 m a.s.l., coll. and det. J. Vlčko, 28. III. 2004 (Herbarium of Richard Hrivnák, *s.n.*). 7. Slovakia, Slovenský raj Mts, the village of Stratená, the mountain meadow “Nižná záhrada” at the top of Mt. Honzovské, 1090 m a.s.l., 48°51'28" N, 20°17'22" E, coll. and det. J. Vlčko & J. Kochjarová, 3. V. 2004 (BBZ *s.n.*). 8. Slovakia, Slovenský raj Mts, the plateau Geravy, the beech forest ca 500 m NNE from the elevation point Gačovská skala, 1060 m a.s.l., 48°52'44" N, 20°23'27" E, coll. and det. J. Vlčko & J. Kochjarová, 3. V. 2004 (BBZ *s.n.*). 9. Slovakia, Slovenské rudohorie Mts, Mt. Hekerová, the mountain pastures near the forest road to the Jamina saddle, 1168 m a.s.l., 48°44'36" N, 20°39'24" E, coll. and det. J. Vlčko & J. Kochjarová, 3. V. 2004 (BBZ *s.n.*). 10. Slovakia, Slovenské rudohorie Mts, the village of Novoveská Huta, the mountain ridge between elevation points Malá Knola (1160 m) and Veľká Knola (1266 m), 1160 m a.s.l., 48°51'48" N, 20°29'11" E, coll. and det. J. Vlčko, R. Hrivnák & J. Kochjarová, 27. IV. 2004 (BBZ *s.n.*). 11. Slovakia, Veľká Fatra Mts, the village of Turecká, beech forest on the S slope of Mt. Líška, 1050 m a.s.l., 48°51'39" N, 19°05'11" E, coll. and det. J. Vlčko & J. Kochjarová, 6. V. 2004 (BBZ *s.n.*).

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2n = 36, 54 Kochjarová

Locality: 12. Slovakia, Malé Karpaty Mts, the village of Dubová, the mixed oak forest NNW from the village, 300 m a.s.l., 48°22'26" N, 17°19'54" E, coll. and det. J. Vlčko, R. Hrivnák & J. Kochjarová, 29. III. 2004 (BBZ *s.n.*).

Several polyploid populations of *S. bifolia* aggregate from the Czech Republic (Moravia) and Slovakia have not been definitively classified yet. A detailed taxonomical revision of *S. bifolia* agg. in Central Europe is being under study. The tetraploid plants from localities 7–11, growing in the mountain belt of Slovenský raj Mts, Slovenské rudohorie Mts, and Veľká Fatra Mts are very similar to the populations determined before as "*S. drunensis* s.l. – mountain", and have the same chromosome number $2n = 36$ (cf. Kochjarová 2005).

Mixed cytotype population was recorded in the locality 12 (5 analysed individuals), where 4 hexaploids and 1 tetraploid were detected. Similarly, the populations consisting of the plants of tetra- and hexaploid level were found in the same mountain range of the Malé Karpaty Mts (cf. Váchová 1987; Letz et al. 1999; Kochjarová 2005), in southern Moravia (SE part of the Czech Republic; Trávníček 1996, 2002), and in Hungary (as *S. drunensis* subsp. *buekkensis*; Speta 1977; Kereszty & Szilágyi 1984).

29. *Scilla drunensis* (Speta) Speta subsp. *drunensis* (Asparagaceae)

2n = 36 Kochjarová

Localities: 1. Austria, the village of Au an der Traun, the alluvial forest on the river of Traun, 380 m a.s.l., 48°07'23" N, 13°58'01" E, coll. and det. J. Vlčko, B. Trávníček & J. Kochjarová, 6. IV. 2004 (BBZ *s.n.*). **2.** Austria, between the villages of Au an der Traun and Saag, the alluvial forest on the river of Traun, 375 m a.s.l., 48°07'23" N, 13°58'01" E, coll. and det. J. Vlčko, B. Trávníček & J. Kochjarová, 6. IV. 2004 (BBZ *s.n.*).

Both counts presented here were made on plant material originating from the *locus classicus* area of *S. drunensis* and confirm earlier reports for this taxon (Speta 1974, 1977, 2000; Greilhuber & Speta 1985; Kereszty & Szilágyi 1984, 1986; Kochjarová 2005).

30. *Scilla drunensis* subsp. *buekkensis* (Speta) Kereszty (Asparagaceae)

2n = 36 Kochjarová

Localities: 1. Slovakia, Tribeč Mts, the village of Horné Lefantovce, the ridge between the elevation points 442.9 m and 474.8 m, 400 m a.s.l., 48°26'23" N, 18°11'06" E, coll. and det. J. Vlčko, R. Hrivnák & J. Kochjarová, 29. III. 2004 (BBZ *s.n.*). **2.** Slovakia, Tribeč Mts, the village of Žirany, the hornbeam forest at the N foot of the hill Vápeník, 300 m a.s.l., 48°22'29" N, 18°09'44" E, coll. and det. J. Vlčko, R. Hrivnák & J. Kochjarová, 29. III. 2004 (BBZ *s.n.*). **3.** Slovakia, Pohronský Inovec Mts, the village of Jedľové Kostolany, the SW foot of the hill Hradište, the oak-hornbeam forest, 340 m a.s.l., 48°27'17" N, 18°30'08" E, coll. and det. J. Vlčko, R. Hrivnák & J. Kochjarová, 29. III.

2004 (BBZ *s.n.*). **4.** Slovakia, Pohronský Inovec Mts, the village of Hronský Beňadik, the SE slope of the hill Klíča, 300 m a.s.l., 48°21'24" N, 18°34'18" E, coll. and det. J. Vlčko, R. Hrivnák & J. Kochjarová, 24. III. 2004 (BBZ *s.n.*). **5.** Slovakia, Štiavnické vrchy Mts, the top of Mt. Sitno, 980 m a.s.l., 48°24'03" N, 18°52'43" E, coll. and det. J. Vlčko 2004 (Herbarium of Jaroslav Vlčko *s.n.*). **6.** Slovakia, Kremnické vrchy Mts, the village of Trnavá Hora, the oak-hornbeam forest SE of the Ladno settlement, 620 m a.s.l., 48°36'10" N, 18°59'00" E, coll. and det. J. Kochjarová, 1. IV. 2004 (BBZ *s.n.*).

The populations from hills and low mountains at the northern limit of the Pannonian lowland (the North Hungary, South and Central Slovakia) have been usually distinguished as a separate taxon, *S. drunensis* subsp. *buekkensis*. Earlier reports for this subspecies are: $2n = 36, 54$ (Speta 1977; Váchová 1987) and $2n = 36$ (Greilhuber 1979; Kereszty & Szilágyi 1984, 1986; Kereszty et al. 1986; Kulová 1991; Letz et al. 1999; Kochjarová 2000, 2005). The chromosome number $2n = 36$ seems to be the most frequent one.

31. *Scilla kladnii* Schur (Asparagaceae)

2n = 18 Kochjarová

Localities: 1. Czech Republic, Moravia, the village of Hustopeče nad Bečvou, the oak-hornbeam forest above the river Bečva, ca 280 m a.s.l., 49°31'09" N, 17°50'38" E, coll. and det. J. Vlčko & J. Kochjarová, 5. IV. 2004 (BBZ *s.n.*). **2.** Czech Republic, Moravia, Vsetínské vrchy Mts, the village of Bystřička, the oak-hornbeam forest at foot of the hill Březina, ca 340 m a.s.l., 48°24'52" N, 17°57'07" E, coll. and det. J. Vlčko & J. Kochjarová, 5. IV. 2004 (BBZ *s.n.*). **3.** Slovakia, Strážovské vrchy Mts, the village of Lietavská Lúčka, the foot of the hill Drieňovica, above the Lietava stream, 377 m a.s.l., 49°09'59" N, 18°43'11" E, coll. and det. J. Kochjarová, 10. IV. 2004 (BBZ *s.n.*). **4.** Slovakia, Krivánska Malá Fatra Mts, the village of Strečno, riparian scrub along the Rečtorov potok stream, 425 m a.s.l., 49°11'20" N, 18°53'04" E, coll. and det. J. Kochjarová, 14. IV. 2005 (BBZ *s.n.*). **5.** Slovakia, Západné Beskydy Mts, N of the town of Tvrdošín, riparian scrub above the river of Oravica, 585 m a.s.l., 49°20'41" N, 19°34'35" E, coll. and det. J. Kochjarová, 15. IV. 2004 (BBZ *s.n.*). **6.** Slovakia, Západné Beskydy Mts, the village of Krivá, the mixed hazel-blackthorn scrub above the river Orava, 555 m a.s.l., 49°17'12" N, 19°29'03" E, coll. and det. J. Kochjarová, 15. IV. 2004 (BBZ *s.n.*). **7.** Slovakia, Západné Beskydy Mts, the town of Dolný Kubín, the mixed forest at the northern foot of the hill Kuzmínovo, 500 m a.s.l., 49°12'20" N, 19°16'30" E, coll. and det. J. Kochjarová, 15. IV. 2004 (BBZ *s.n.*). **8.** Slovakia, Nízke Tatry Mts, the village of Korytnica-kúpele, the mountain ridge Kozí chrbát above the Hiadeľské sedlo saddle, 1250 m a.s.l., 48°51'34" N, 19°17'45" E, coll. and det. J. Kochjarová & J. Vlčko, 6. V. 2004 (BBZ *s.n.*). **9.** Slovakia, Kremnické vrchy Mts, the village of Hronská Dúbrava, the alluvial forest on the Breznický potok stream, 300 m a.s.l., 48°34'30" N, 19°00'10" E, coll.

and det. J. Kochjarová, 1. IV. 2004 (BBZ *s.n.*). **10.** Slovakia, Cerová vrchovina hills, E of the village of Drňa, 177 m a.s.l., 48°16'21.2" N, 20°08'52.5" E, coll. and det. R. Hrivnák 27. III. 2003 (Herbarium of Richard Hrivnák, *s.n.*). **11.** Slovakia, Nízke Beskydy Mts, the village of Vyšná Jablonka, N of the village, the beech forest on the mountain ridge between the Mt. Hlboký vrch, and Mt Vysoký Grúň, 880 m a.s.l., 49°12'14" N, 22°06'33" E, coll. J. Kochjarová, J. Vlčko & J. Terray, 19. IV. 2004, det. J. Vlčko & J. Kochjarová (BBZ *s.n.*). **12.** Slovakia, Nízke Beskydy Mts, the town of Hanušovce nad Topľou, the mixed forest "Grodzin" N of the town, above the river of Topľa, 200 m a.s.l., 49°02'36" N, 21°30'39" E, coll. and det. J. Kochjarová & J. Vlčko, 13. IV. 2004 (BBZ *s.n.*). **13.** Slovakia, Nízke Beskydy Mts, the village of Lipníky, the beech forest at the Petič saddle, 300 m a.s.l., 49°03'04" N, 21°25'31" E, coll. and det. J. Kochjarová & J. Vlčko, 13. IV. 2004 (BBZ *s.n.*). **14.** Slovakia, Stráže hills, NE of the town of Prešov, the village of Fintice, Fintické sedlo saddle, 430 m a.s.l., 49°04'05" N, 21°16'25" E, coll. and det. J. Kochjarová & J. Vlčko, 13. IV. 2004 (BBZ *s.n.*). **15.** Slovakia, Šarišská vrchovina Mts, the town of Prešov, the mixed beech-hornbeam forest near mineral water spring "Kvašná voda" SE of the town, 360 m a.s.l., 48°58'22" N, 21°11'30" E, coll. and det. J. Kochjarová & J. Vlčko, 13. IV. 2004 (BBZ *s.n.*). **16.** Slovakia, Stredné Pohornádie hills, the village of Trebejov (N of the town of Košice), the beech forest N of the village, 260 m a.s.l., 48°50'36" N, 21°13'44" E, coll. and det. J. Kochjarová & J. Vlčko, 13. IV. 2004 (BBZ *s.n.*). **17.** Slovakia, Vihorlat Mts, S of the town of Humenné, the beech forest on the NE foot of the Červená skala hill near the village of Podskalka, 200 m a.s.l., 48°54'39" N, 21°55'48" E, coll. J. Kochjarová, J. Vlčko & J. Terray, 19. IV. 2004, det. J. Vlčko & J. Kochjarová (BBZ *s.n.*). **18.** Slovakia, Zemplínske vrchy hills, the village of Velaty, the NW foot of the hill Viničná hora S of the village, 200 m a.s.l., 48°30'16" N, 21°39'19" E, coll. and det. J. Vlčko & J. Kochjarová, 30. III. 2004 (BBZ *s.n.*).

For this species only the diploid chromosome number $2n = 18$ is known from the whole range of distribution (e.g. Speta 1977; Kereszty et al. 1986; Svешnikova 1988; Trávníček 2002; Kochjarová 2005).

32. *Scilla vindobonensis* Speta (Asparagaceae)

$2n = 18$ Kochjarová

Localities: **1.** Slovakia, Podunajská nížina lowland, the town of Chynorany, the floodplain forest "Chynoriánsky luh", 178 m a.s.l., 48°37'00" N, 18°16'00" E, coll. and det. J. Kochjarová, 26. III. 2004 (BBZ *s.n.*). **2.** Slovakia, Podunajská nížina lowland, the village of Bánov, the floodplain forest "Zátóny" between the river Nitra and the Chrenovka stream, 120 m a.s.l., 48°02'26" N, 18°13'08" E, coll. and det. J. Vlčko, R. Hrivnák & J. Kochjarová, 24. III. 2004 (BBZ *s.n.*). **3.** Slovakia, Podunajská nížina lowland, the village of Čičov, the floodplain forest near the castle park, 110 m a.s.l., 47°46'30" N, 17°46'00" E, coll. and det. J.

Vlčko, R. Hrivnák & J. Kochjarová, 12. III. 2003 (BBZ *s.n.*). **4.** Slovakia, Podunajská nížina lowland, between the villages of Nána and Kamenica nad Hronom, near the confluence of the Hron river with the Danube, 106 m a.s.l., 47°48'58" N, 18°43'14" E, coll. and det. J. Vlčko, R. Hrivnák & J. Kochjarová, 24. III. 2004 (BBZ *s.n.*). **5.** Austria, the village of Seibersdorf, the floodplain forest on the Grosser-Bach stream, 231 m a.s.l., 47°57'29" N, 16°31'49" E, coll. and det. J. Vlčko & J. Kochjarová 22. III. 2004 (BBZ *s.n.*). **6.** Austria, the village of Maria-Lanzendorf, the mixed forest SE of the village, 228 m a.s.l., 48°05'31" N, 16°25'39" E, coll. and det. J. Vlčko & J. Kochjarová 22. III. 2004 (BBZ *s.n.*). **7.** Czech Republic, Moravia, Hostýnské vrchy Mts, the village of Blazice-Sovadina, the floodplain forest along the Libosvárka stream, ca 260 m a.s.l., 49°26'11" N, 17°39'23" E, coll. and det. J. Vlčko & J. Kochjarová, 5. IV. 2004 (BBZ *s.n.*).

For this species only the diploid chromosome number $2n = 18$ is known in whole range of distribution (e.g. Speta 2000; Kereszty et al. 1986; Trávníček 2002; Kochjarová, 2005).

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33. *Campanula macrostachya* Waldst. & Kit. ex Willd. (Campanulaceae)

$2n = ca 32$ E. Michalková

Localities: **1.** Hungary, Visegrád Mts, Szentendre NW ("Szaravoda"), southern slope of Mt. Asztalkő, andesite steppe grassland, 353 m a.s.l., coll. and det. E. Michalková & L. Somlyay, 8. VI. 2006 (SAV *s.n.*, 3 plants). **2.** Hungary, Visegrád Mts, Szentendre NW, southern slope of Mt. Nyerges-hegy, andesite rocky forest-steppe, 286 m a.s.l., coll. and det. E. Michalková & L. Somlyay, 8. VI. 2006 (SAV *s.n.*, 2 plants).

The present chromosome numbers are new to Hungary. The previous record $2n = 18$ (based on $x = 9$) from the vicinity of Szentendre (cf. Baksay 1958) was not confirmed. Sigiura (1942) counted $2n = 16$ in plants of unknown origin. For the first time, the tetraploid ploidy level ($2n = 32$) for this species was stated by Gadella (1964) on the plants cultivated in the Botanical Garden in Bonn (Germany). According to him, records of Sigiura (1942) and Baksay (1958) could have been related to haploid state. The occurrence of tetraploid pop-

ulations from Bulgaria and Slovakia was confirmed by Anchev (1982, 1994) and Murín & Svobodová (1992).

34. *Erysimum diffusum* Ehrh. (Brassicaceae)

2n = 14 E. Michalková

Locality: Hungary, Szentendre – Sziget, Pócsmegyer E, steppe on the top of the sandy dune, 125 m a.s.l., coll. E. Michalková & R. Letz, 8. IX. 2005, det. E. Michalková (SAV *s.n.*, several plants).

2n = 28 E. Michalková

Locality: Hungary, Szentendre – Sziget, Szigetmonostor S, sandy road margin, near the cottage settlement, 120 m a.s.l., coll. E. Michalková & R. Letz, 8. IX. 2005, det. E. Michalková (SAV *s.n.*, several plants)

Both chromosome numbers are new to Hungary, where only decaploids with $2n = 10x = 70$ were hitherto known (Polatschek, ined.). It seems that rare diploid populations in Slovakia are confined mostly to the natural sandy habitats in the warmest and the driest regions, whereas tetraploids predominate in semi-natural or ruderal sandy habitats (Michalková 2005).

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