

Chromosome numbers of some woody species from the Bulgarian flora

Daniella Ivanova & Vladimir Vladimirov

Institute of Botany, Bulgarian Academy of Sciences, Acad. Georgi Bonchev St., bl. 23, 1113 Sofia, Bulgaria, e-mail: dani@bio.bas.bg; vdvlad@bio.bas.bg

Received: March 01, 2007 ▷ Accepted: April 05, 2007

Abstract. Chromosome numbers of 11 woody species from the Bulgarian flora are presented in the paper. The number of *Daphne pontica* ($2n = 18$) is reported for the first time for this species. Counts of *Castanea sativa*, *Daphne laureola*, *Hedera helix*, *Juniperus sibirica*, *Rhamnus saxatilis*, *Ribes nigrum*, and *Robinia pseudoacacia* are given for the first time from Bulgarian accessions. The numbers of *Cercis siliquastrum*, *Pinus silvestris* and *Rubus sanguineus* confirm the earlier reported counts from Bulgaria and elsewhere.

Introduction

This publication presents the chromosome numbers of 11 woody species from the Bulgarian flora.

Material and methods

Live specimens were collected from natural habitats in Bulgaria and cultivated in the experimental glasshouse of the Institute of Botany (BAS).

The sporophyte chromosome numbers were counted in squashed root tip meristems, following the method given in Ivanova & al. (2006).

The species below are presented alphabetically.

Results and discussion

Castanea sativa Mill. (Fagaceae)

$2n = 24$ (Fig. 1)

Valley of River Strouma (Southern): N-NW of Gabrene village, Petrich district, shrubs of *Corylus avellana* and *Carpinus orientalis*, 41°22'18"N, 22°57'54"E, 26.04.2004, coll. D. Ivanova, D. Dimitrova & V. Vladimirov (no. VV 04-48); grassy places near the road N-NW of Gabrene village, Petrich district, 41°21'51"N, 22°57'38"E, 03.11.2004, coll. D. Ivanova & V. Vladimirov (no. VV 04-285).

No former record of a chromosome number of *C. sativa* is known from Bulgaria. Our counts yielded $2n = 24$ chromosomes confirming the number of $2n = 24$ or $n = 12$ given in Fedorov (1969), Goldblatt (1981) and Goldblatt & Johnson (1994, 2003).

However, our finding does not agree with the reports of $2n = 22$ (Wetzel 1928, 1929).

Cercis siliquastrum L. (Fabaceae)

$2n = 14$

Black Sea Coast (Northern): along the asphalt road between cape Kaliakra and Bulgarevo village, ca. 50 m, 17.09.2003, coll. V. Vladimirov (no. 203-126).

This chromosome number confirms the earlier counts from Bulgaria (Kuzmanov 1975) and elsewhere (Fedorov 1969).

Daphne laureola L. (Thymelaeaceae)

$2n = 18$

Forebalkan (Western): Mt Vrachanska, along the asphalt road from Vratsa town to the Ledenika cave, ca. 870 m, 43°10'57"N, 23°29'24"E, 26.06.2006, coll. V. Vladimirov (VV 06-32).

This chromosome number is reported for the first time from a Bulgarian accession. It confirms the earlier counts published from elsewhere (Goldblatt 1984; Goldblatt & Johnson 1994, 1996).

Daphne pontica* L. (Thymelaeaceae)*2n = 18** (Fig. 2)

Mt Strandzha: Kondolovo village, Byalata Prust locality, 42°05'51"N, 27°39'57"E, 10.11.2004, coll. D. Ivanova (no. 204-501).

As far as we know, there is no earlier published record of a chromosome count for this species.

Hedera helix* L. (Araliaceae)*2n = 48+0-1B**

Northeast Bulgaria: at the entrance of Orlova Chouka cave, Rousse district, 274 m, 43°35'39"N, 25°57'31"E, 28.03.2005, coll. D. Ivanova (no. 205-12) (Fig. 3).

Valley of River Strouma (*Southern*): NE of Kolarovo village, grassy places and *Platanus orientalis*-forests, 41°22'N, 23°06'E, 27.04.2004, coll. D. Ivanova & V. Vladimirov (no. 204-66) (Fig. 4).

2n = 48

Forebalkan (*Western*): Mt Vrachanska, in a mixed deciduous forest in the vicinity of St. Ivan Pousti Monastery, 43°14'37"N, 23°27'48"E, 08.09.2004, coll. D. Ivanova (no. 204-489).

Our counts are the first report of *H. helix* from Bulgarian accessions. The number $2n = 48$ is in accordance with the earlier reported data (see in Fedorov 1969; Goldblatt 1981, 1984; Goldblatt & Johnson 1990, 2003). In some plates we have established one B-chromosome ($2n = 48 + 1B$) that confirms the record of Lövkvist & Hultgård (1999). Other chromosome numbers are given in Fedorov (1969) – $2n = 43-47$, *ca.* 44, 44-48.

Juniperus sibirica* Burgsd. (Cupressaceae)*2n = 22** (Fig. 5)

Vitosha Region: Mt Vitosha, Mecha Polyana locality near Aleko chalet, 350 m, 42°34'N, 23°17'E, 26.10.2003, coll. A. Petrova, V. Vladimirov & D. Ivanova (no. 203-100).

This is the first record of a chromosome number of *J. sibirica* from Bulgaria. Our count coincides with the data reported by other authors from elsewhere (see in Goldblatt 1981, 1984, 1988). Zhukova & Petrovsky (1975), however, give the number $2n = 24$, without a microphotograph or a drawing.

Pinus sylvestris* L. (Pinaceae)*2n = 24** (Fig. 6)

Vitosha Region: Mt Vitosha, near Aleko chalet, 300 m, 42°34'N, 23°15'E, 26.10.2003, coll. A. Petrova, V. Vladimirov & D. Ivanova (no. 203-96); Mecha Polyana locality near Aleko chalet, 42°34'N, 23°17'E, 26.10.2003, coll. A.

Petrova, V. Vladimirov & D. Ivanova (no. 203-107).

Our finding of $2n = 24$ is in agreement with the numerous reports of this species from Bulgaria (Petrova & al. 2006) and from other countries (see in Goldblatt 1981, 1984, 1985, 1988; Goldblatt & Johnson 1990, 1991, 1994, 1996, 1998, 2006). Mixoploidy has also been reported (Sedelnikova & Muratova 2001).

Rhamnus saxatilis* Jacq. (Rhamnaceae)*2n = 24**

Northeast Bulgaria: Kabiyushka Mogila locality, 43°21'N, 26°59'E, 19.09.2003, coll. V. Vladimirov (no. 203-143).

This is the first chromosome number report for Bulgaria. It confirms the earlier counts from elsewhere (Goldblatt 1984, 1988; Goldblatt & Johnson 1991, 2006).

Ribes nigrum* L. (Grossulariaceae)*2n = 16**

Rhodopi Mts (*Central*): along river Chepelarska, near Hvoyna village, 700–750 m, 41°48'06"N, 24°42'35"E, 06.06.2006, coll. V. Vladimirov (VV 06-15).

The chromosome count is published for the first time from a Bulgarian accession. It confirms the earlier counts published from elsewhere (Goldblatt 1984, 1985, 1988; Goldblatt & Johnson 1994, 1996, 1998, 2003).

Robinia pseudoacacia* L. (Fabaceae)*2n = 22**

Rhodopi Mts (*Western*): *ca.* 5 km above the town of Velingrad, along the asphalt road to Surnitsa village, 780 m, 41°58'21"N, 23°57'20"E, coll. V. Vladimirov (VV 06-19).

This is the first report of a chromosome number for the species from a Bulgarian accession. It confirms the earlier counts (Goldblatt & Johnson 1991, 1994, 1998). However, the chromosome number $2n = 20$ has also been published (Goldblatt 1998).

Rubus sanguineus* Friv. (Rosaceae)*2n = 14**

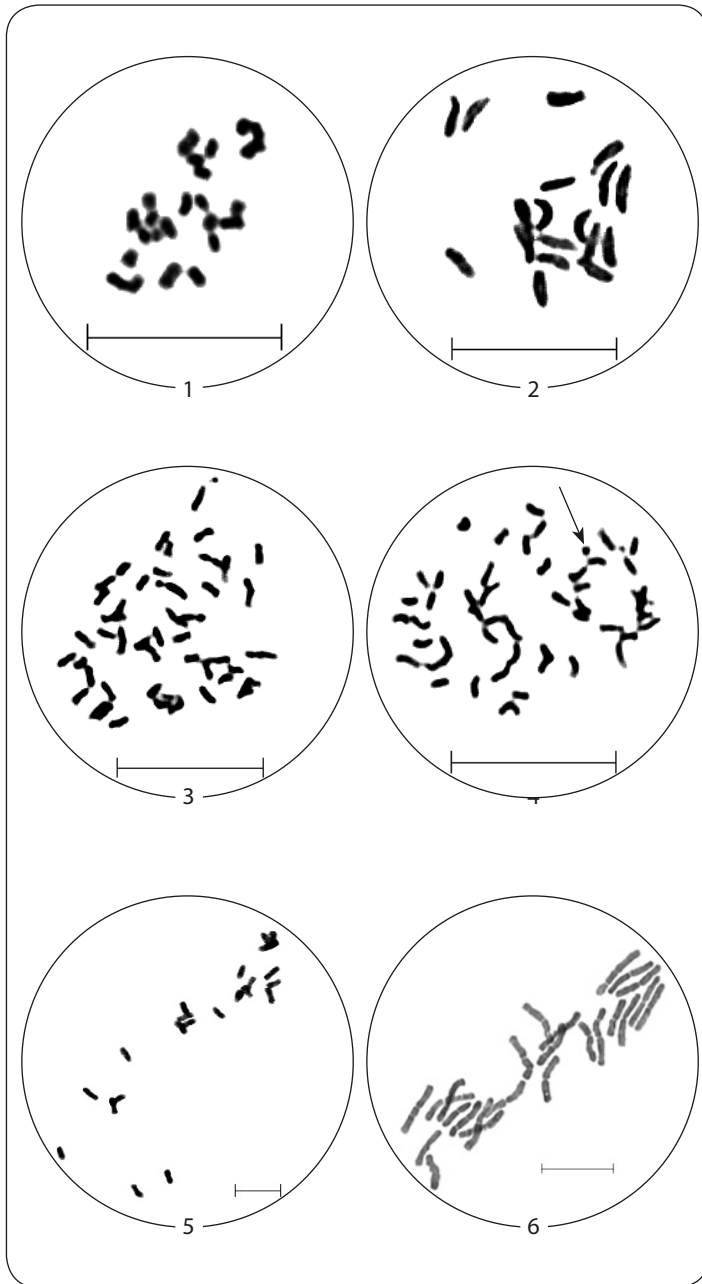
Valley of River Strouma (*Southern*): near Kolarovo village, along the asphalt road to Petrich town, 20.10.2003, coll. V. Vladimirov (no. 203-155).

The chromosome number confirms an earlier report by Markova (1968) from Mt Pirin in Bulgaria.

Acknowledgements. The financial support of the Bulgarian National Science Fund (Project 1303/03) is gratefully acknowledged.

References

- Fedorov, A.A. (ed.). 1969. Chromosome Numbers of Flowering Plants. Nauka, Leningrad.
- Goldblatt, P. (ed.). 1981. Index to plant chromosome numbers 1975-1978. – Monogr. Syst. Bot. Missouri Bot. Gard., 5.
- Goldblatt, P. (ed.). 1984. Index to plant chromosome numbers 1979-1981. – Monogr. Syst. Bot. Missouri Bot. Gard., 8.



Figs 1-6. Microphotographs of metaphase plates of: 1, *Castanea sativa*, $2n=24$; 2, *Daphne pontica*, $2n=18$; 3, *Hedera helix* (no. 205-12), $2n=48$; 4, *H. helix* (no. 204-66), $2n=48+1B$ (arrow indicates the B-chromosome); 5, *Juniperus sibirica*, $2n=22$; 6, *Pinus sylvestris*, $2n=24$. Scale bars – 10 μm .

- Goldblatt, P. (ed.). 1985. Index to plant chromosome numbers 1982-1983. – Monogr. Syst. Bot. Missouri Bot. Gard., 13.
- Goldblatt, P. (ed.). 1988. Index to plant chromosome numbers 1984-1985. – Monogr. Syst. Bot. Missouri Bot. Gard., 23.
- Goldblatt, P. & Johnson, D.E. (eds). 1990. Index to plant chromosome numbers 1986-1987. – Monogr. Syst. Bot. Missouri Bot. Gard., 30.
- Goldblatt, P. & Johnson, D.E. (eds). 1991. Index to plant chromosome numbers 1988-1989. – Monogr. Syst. Bot. Missouri Bot. Gard., 40.
- Goldblatt, P. & Johnson, D.E. (eds). 1994. Index to plant chromosome numbers 1990-1991. – Monogr. Syst. Bot. Missouri Bot. Gard., 51.
- Goldblatt, P. & Johnson, D.E. (eds). 1996. Index to plant chromosome numbers 1992-1993. – Monogr. Syst. Bot. Missouri Bot. Gard., 58.
- Goldblatt, P. & Johnson, D.E. (eds). 1998. Index to plant chromosome numbers 1994-1995. – Monogr. Syst. Bot. Missouri Bot. Gard., 69.
- Goldblatt, P. & Johnson, D.E. (eds). 2003. Index to plant chromosome numbers 1998-2000. – Monogr. Syst. Bot. Missouri Bot. Gard., 94.
- Goldblatt, P. & Johnson, D.E. (eds). 2006. Index to plant chromosome numbers 2001-2003. – Monogr. Syst. Bot. Missouri Bot. Gard., 106.
- Ivanova, D., Dimitrova, D. & Vladimirov, V. 2006. Chromosome numbers of selected woody species from the Bulgarian flora. – Phytol. Balcan., 12(1): 79-84.
- Kuzmanov, B. 1975. Reports. – In: Löve, Á. (ed.), IOPB chromosome number reports XLIX. – Taxon, 24(4): 504.
- Lövkvist, B. & Hultgård, U.-M. 1999. Chromosome numbers in south Swedish vascular plants. – Opera Bot., 137: 1-42.
- Markova, M. 1968. Chromosome numbers of four Bulgarian taxa of the genus *Rubus* L. – Izv. Bot. Inst. (Sofia), 18: 75-77.
- Petrova, A., Zieliński, J. & Natcheva, R. 2006. Reports (1584-1603). – In: Kamari, G., Blanché, C. & Garbari, F. (eds), Mediterranean chromosome number reports – 16. – Fl. Medit., 16: 431-442.
- Sedelnikova, T.S. & Muratova, E.N. 2001. Karyological studies of “witches’-broom” type *Pinus sylvestris* (*Pinaceae*) from a bog. – Bot. Zhurn. (Moscow & Leningrad), 86(12): 50-60 (in Russian).
- Zhukova, P.G. & Petrovsky, V.V. 1975. Chromosome numbers of some Western Chukotka plant species. – Bot. Zhurn. (Moscow & Leningrad), 60(3): 395-401 (in Russian).
- Wetzel, G. 1928. Chromosomenstudien bei den *Fagales*. – Ber. Deutsch. Bot. Ges., 46(3): 212-214.
- Wetzel, G. 1929. Chromosomenstudien bei den *Fagales*. – Bot. Arch., 25: 257-283.