

## Chromosome number variation in the genus *Rubus* in the Czech Republic. III.

Proměnlivost počtu chromozómů u rodu *Rubus* v České republice. III.

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The paper provides information on chromosome numbers in 20 species of the genus *Rubus*, belonging mostly to subgenus *Rubus* (18 species). The plants studied were collected at 67 localities in the Czech Republic (Bohemia and Moravia). Three ploidy levels were recorded: diploid (3 species), tetraploid (16 species) and one triploid. The diploid species represent the subgenera *Rubus*, *Idaeobatus* and *Cylactis*. New chromosome number reports are given for the following five tetraploid species ( $2n = 28$ ): *R. wimmerianus* (Sudre) Spribille, *R. thelybatos* Cafilisch, *R. acanthodes* H. Hofmann, *R. brdensis* Holub and *R. josefianus* H. E. Weber; the triploid *R. elatior* Gremli ( $2n = 21$ ) probably also belongs here. The karyology of *R. bohemiicola* Holub was studied for the first time. This species is characterized by a tetraploid level combined with a structural change of the karyotype; it is manifested by the chromosome number of  $2n = 27 + \text{fragment}$ , involving one heteromorphic pair of chromosomes. This record of a conspicuous karyotype rearrangement, concerning species of this genus of native occurrence, is reported only sporadically in the literature. For the remaining 13 species, the chromosome numbers published hitherto were confirmed: *R. illecebrosus* Focke, *R. xanthocarpus* Bureau et Franchet, *R. sulcatus* Vest, *R. plicatus* Weihe et Nees, *R. senticosus* Weihe, *R. ulmifolius* Schott, *R. nemoralis* P. J. Mueller, *R. laciniatus* Willd., *R. macrophyllus* Weihe et Nees, *R. sprengelii* Weihe, *R. gliviciensis* (Sudre) Spribille, *R. hirtus* Waldst. et Kit. and *R. gothicus* E. H. L. Krause. For all species studied, data on their overall distribution and on their occurrence in the Czech Republic are given. Notes on taxonomy are added to *R. elatior*; new data on chorology are given for *R. elatior*, *R. nemoralis*, *R. thelybatos*, *R. brdensis* and *R. josefianus*.

**Key words:** Chromosome numbers, *Rubus*, distribution, Czech Republic

### Introduction

This third contribution to the series of papers, focusing on karyology in *Rubus*, supplies information about chromosome numbers in an additional group of 20 species occurring in the Czech Republic. Together with the two papers already published (Krahulcová & Holub 1997a, b), karyological data on 66 species have now been ascertained. In addition, the chromosome count on *R. wessbergii* Pedersen et Walsemann (Sect. *Corylifolii*), published in the first contribution (Krahulcová & Holub 1997a), is completed here by counts made on plants from other localities found subsequently. The methods used, as well as the acquisition of plant material for karyological examination, have already been described elsewhere (Krahulcová & Holub 1997a, b). As distinct from other species examined here, the rooting plants taken from clones (in a morphological sense) were used for the cultivation of *R. illecebrosus* and *R. xanthocarpus*. The root-tips of germinating seeds and seedlings were used as a source of meristematic tissue in several specimens of *R. sulcatus*, *R. plicatus* and *R. laciniatus*.

## Results and discussion

Subgen. *Idaeobatus* Focke

Sect. *Rosifolii* Focke

1. *Rubus illecebrosus* Focke 2n = 14 (Fig. 1a)  
Focke, Abhandl. Naturwiss. Ver. Bremen 16: 278, 1899.

Locality:

1. C Bohemia; distr. Praha-západ [Prague-West]; Průhonice village, the plant cultivated in the area of the castle park near the church, 300 m a.s.l., 50°00'00"N, 14°33'30"E. Coll. A. Krahulcová and J. Holub 19. 6. 1997.

The diploid chromosome number ( $2n = 14$ ) is in agreement with literature data on this species (for the complete survey see in Thompson 1997, where references for 5 literature sources are given); the material of known origin, and studied previously, was collected in Japan (Jinno 1958), other data refer to cultivated plants. *Rubus illecebrosus*, native to Japan, occurs in the Czech Republic as a cultivated plant. It only rarely escapes from cultivation; in this country it was found only once as an ergasiolipophyte (Holub & Jirásek 1967: 107) at Ždár nad Sázavou (Holub 1995).

Subgen. *Cylactis* (Rafin.) Focke

Ser. *Xanthocarpus* Focke

2. *Rubus xanthocarpus* Bureau et Franchet 2n = 14 (Fig. 1b)  
Bureau et Franchet, J. Bot. (ed. Morot) 5: 46, Paris 1891.

Locality:

1. C Bohemia; distr. Mělník; in the loess-gorge in the southern periphery of Zeměchy village, 220 m a.s.l., 50°13'40"N, 14°16'10"E. Coll. J. Holub and A. Krahulcová 12. 9. 1997.

This species, native to China, has been naturalized in Europe. The same diploid chromosome number ( $2n = 14$ ) was reported for *R. xanthocarpus* both from its primary distribution area (China – Li et al. 1993), and from the sites of its naturalized occurrence (Poland – Boratyńska 1997) and from cultivation alike (Gustafsson 1933).

The native occurrence of *R. xanthocarpus* is confined to southwestern China (cf. Holub & Palek 1981). It is cultivated in Europe and is naturalized sporadically. Its secondary occurrences are known from Germany, Denmark, the Czech Republic (Holub & Palek 1981) and from central Poland (near Kielce; Bróz & Zieliński 1993). The history of the occurrence of this species on its single known locality in the Czech Republic is described in detail in the monographic study by Holub & Palek (1981). Twenty years ago the species occurred in this locality at Zeměchy very abundantly (see the photograph in Preslia 53/1981, no. 1, tab. II) in the lower part of the loess-gorge, where it entirely dominated the local vegetation. At present *R. xanthocarpus* has declined significantly here and occurs only as scattered individuals in dense stands of invasive *Urtica dioica*.

Subgen. *Rubus*Sect. *Rubus*Subsect. *Rubus* (Syn.: *Rubus* L. sect. *Suberecti* Lindl.)3. *Rubus sulcatus* Vest

2n = 28 (Fig. 1c)

Vest, Steiermärk. Z. 3: 162, 1821.

## Localities:

1. C Bohemia; distr. Praha-západ [Prague-West]; the cottage settlement of "Letovisko Slapy" 0.8 km NNW of Slapy village, 420 m a.s.l., 49°49'30"N, 14°24'20"E. Coll. J. Holub and A. Krahulcová 11. 7. 1995.
2. C Bohemia; distr. Píbram; on the woodland edge W of Ohrazenice village, beside the road leading to the military area E of the village, 480 m a.s.l., 49°47'30"N, 13°56'30"E. Coll. J. Holub and A. Krahulcová 27. 10. 1995.
3. S Bohemia; distr. Prachatice and Strakonice; in the wood along the road leading to the monastery of Lomec 1 km SE of Truskovice village, 510 m a.s.l., 49°05'50"N, 14°10'50"E. Coll. J. Holub and A. Krahulcová 3. 10. 1996.
4. C Bohemia; distr. Kutná Hora; in the wood on the NE foothill of Tisá skála hill SW of Bratčice village, 340 m a.s.l., 49°50'50"N, 15°25'20"E. Coll. J. Holub and A. Krahulcová 27. 9. 1996.

The tetraploid chromosome number of  $2n = 28$ , found in *R. sulcatus* from all four localities mentioned, corresponds to literature references; Thompson (1997) gives this number from eight literary sources. These data refer to plants collected in Great Britain (Maude 1939), in the Netherlands (Beijerinck 1956) and in southern Scandinavia (Gustafsson 1943).

*R. sulcatus* belongs to species with a wide distribution area (see the map of its distribution – Weber 1995: 351). In the Czech Republic it is dispersed throughout except for the mountains, usually at altitudes between 200 and 600 m a.s.l. It occurs as single plants rather than as a great number of individuals.

4. *Rubus plicatus* Weihe et Nees

2n = 28

Weihe et Nees Rubi Germ., 15, 1822.

## Localities:

1. N Bohemia; distr. Děčín; on the N periphery of Nová Oleška village beside the road near the pond, 240 m a.s.l., 50°48'40"N, 14°18'10"E. Coll. J. Holub and A. Krahulcová 10. 10. 1996.
2. NC Bohemia; distr. Mladá Boleslav; the protected landscape area "Český ráj"; in the wood beside the road 1.2 km SE of Žehrov village, 290 m a.s.l., 50°31'30"N, 15°06'30"E. Coll. J. Holub and A. Krahulcová 7. 8. 1996.
3. SW Bohemia; distr. Klatovy; on the woodland edge along the road between the villages of Strážov and Blata, 540 m a.s.l., 49°18'10"N, 13°13'00"E. Coll. J. Holub and A. Krahulcová 4. 10. 1996.
4. C Moravia; distr. Zlín; Hostýnské vrchy Hills; on the woodland edge along the road 0.5 km NW of the N periphery of Fryšták village, 310 m a.s.l., 49°18'00"N, 17°41'30"E. Coll. B. Trávníček and A. Krahulcová 17. 10. 1996.

The chromosome number of  $2n = 28$  was found in our plants originating from all four localities. This confirms the tetraploid level in *R. plicatus*, already reported for this species from Sweden (Gustafsson 1943), Great Britain (Heslop-Harrison 1953), the Netherlands (Beijerinck 1956) and Poland (Boratynska 1995a); Thompson (1995) gives the same chromosome number for cultivated plants of unknown origin.

*R. plicatus* is a species with a wide distribution, reaching North Italy, Rumania and Latvia. In the Czech Republic it is relatively frequently dispersed; in some regions it is very

frequent, in other it is absent, without any possibility of determining any distinct relationship to certain phytogeographical regions. Its occurrence extends into the mountains (usually to 800 m a.s.l.), its highest known locality being in the Hrubý Jeseník Mts – the saddle “Červenohorské sedlo” (ca. 1000 m a.s.l.).

5. *Rubus senticosus* Weihe 2n = 28 (Fig. 1d)  
Koehler ex Weihe in Wimmer et Grab. Fl. Siles. 1: 51, 1829.

Localities:

1. C Bohemia; distr. Mělník; along the path in the wood “Borek” 1.5 km SW of Lhotka village, 220 m a.s.l., 50°21'40"N, 14°32'20"E. Coll. J. Holub and A. Krahulcová 29. 10. 1996.
2. NE Bohemia; distr. Trutnov; in the wood along the road 2 km ESE of Horní Dehtov village, 410 m a.s.l., 50°25'10"N, 15°45'30"E. Coll. J. Holub and A. Krahulcová 16. 9. 1997.
3. NE Bohemia; distr. Trutnov; along the path on the woodland edge not far from the railway crossing, 0.5 km S of Bílá Třešněná village, 380 m a.s.l., 50°26'20"N, 15°44'50"E. Coll. J. Holub and A. Krahulcová 16. 9. 1997.

The plants collected at all three localities proved to be tetraploid (2n = 28). Our findings support the existing data characterizing plants from the Netherlands (Beijerinck 1956), Germany – Lower Saxony (Iwatsubo et al. 1995) and Poland (Boratynska 1995b). The same number is given also by Gustafsson (1943: 101, as *R. montanus* Wirtgen) for a plant cultivated in the Botanical Garden Lund, but its determination is not certain.

A Central European species with a wide distribution, extending eastwards into Mecklenburg, Lusatia, southwestern Poland (Silesia) and the Czech Republic; an isolated occurrence is also reported from central Poland (vicinity of Kalisz). It is a relatively rare plant in the Czech Republic, locally dispersed in the northern half of Bohemia and having only two localities in Moravia; the locality near Žďár nad Sázavou links it to its occurrence in Bohemia. The second Moravian locality in the Beskydy Mts in Moravian Silesia (Ostravice) is isolated from other localities in the Czech Republic. It is situated at the eastern border of its distribution and is connected with its occurrence in Polish Silesia. *R. senticosus* reaches the southern limit of its distribution in the Czech Republic.

Subsect. *Hiemales* E. H. L. Krause in Prahl

Ser. *Discolores* (P. J. Mueller) Focke

6. *Rubus ulmifolius* Schott 2n = 14  
Schott, Isis (ed. Oken) 2: 821, Jena 1818.

Locality:

1. C Bohemia; distr. Praha-západ [Prague-West]; Průhonice village, in the area of the castle park (the eastern part), 300 m a.s.l., 49°59'40"N, 14°33'50"E. Coll. J. Holub and A. Krahulcová 31. 10. 1996.

The karyological data referring to plants from various parts of the distribution area of *R. ulmifolius* are in agreement with our findings; this species is characterized by a diploid chromosome number of 2n = 14 (for a complete survey of references see in Thompson 1997, where data originating from 16 literary sources are cited). The plants studied hitherto originated for example in France (Gustafsson 1943), Great Britain (Heslop-Harrison 1953), the Netherlands (Beijerinck 1956), Ireland and from the Balkan Peninsula – former Yugoslavia (Thompson 1995).

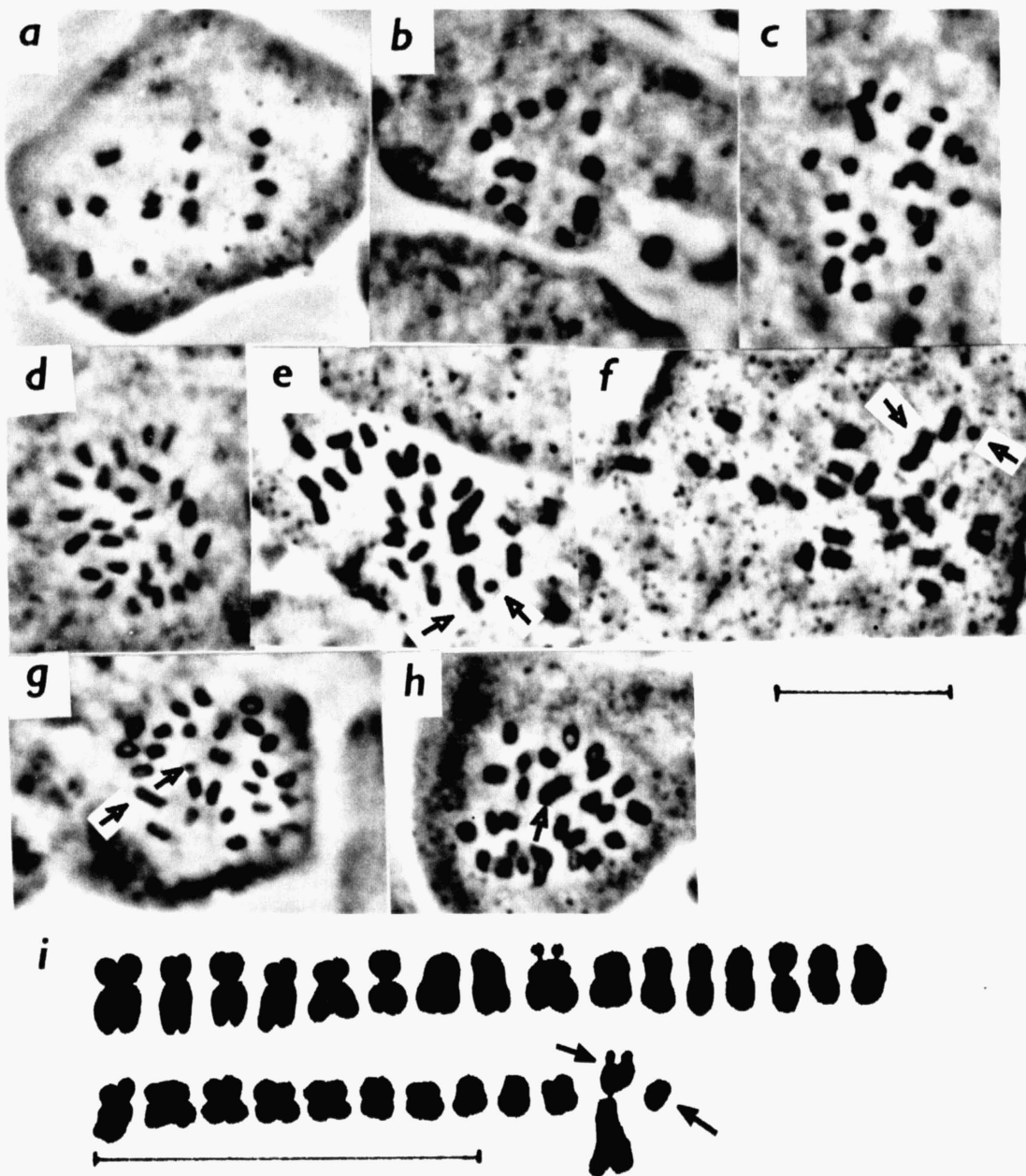


Fig. 1. – Somatic metaphases (a–h) and an individual karyogram based on the somatic metaphase (i) in following species of the genus *Rubus*; – a: *Rubus illecebrosus* Focke,  $2n = 14$ ; b: *Rubus xanthocarpus* Bureau et Franchet,  $2n = 14$ ; c: *Rubus sulcatus* Vest,  $2n = 28$ ; d: *Rubus senticosus* Weihe,  $2n = 28$ ; e–i: *Rubus bohemicicola* Holub,  $2n = 27 + \text{fragment}$ . A heteromorphic chromosome pair (i.e. the large “marker” chromosome and the fragment) is arrowed, resulting probably from translocation in *R. bohemicicola*; the fragment is not evident in one of the metaphases presented here (h). The figures c–i correspond to plants originating from three different localities of *R. bohemicicola*. [Scale bars = 10  $\mu\text{m}$ ].

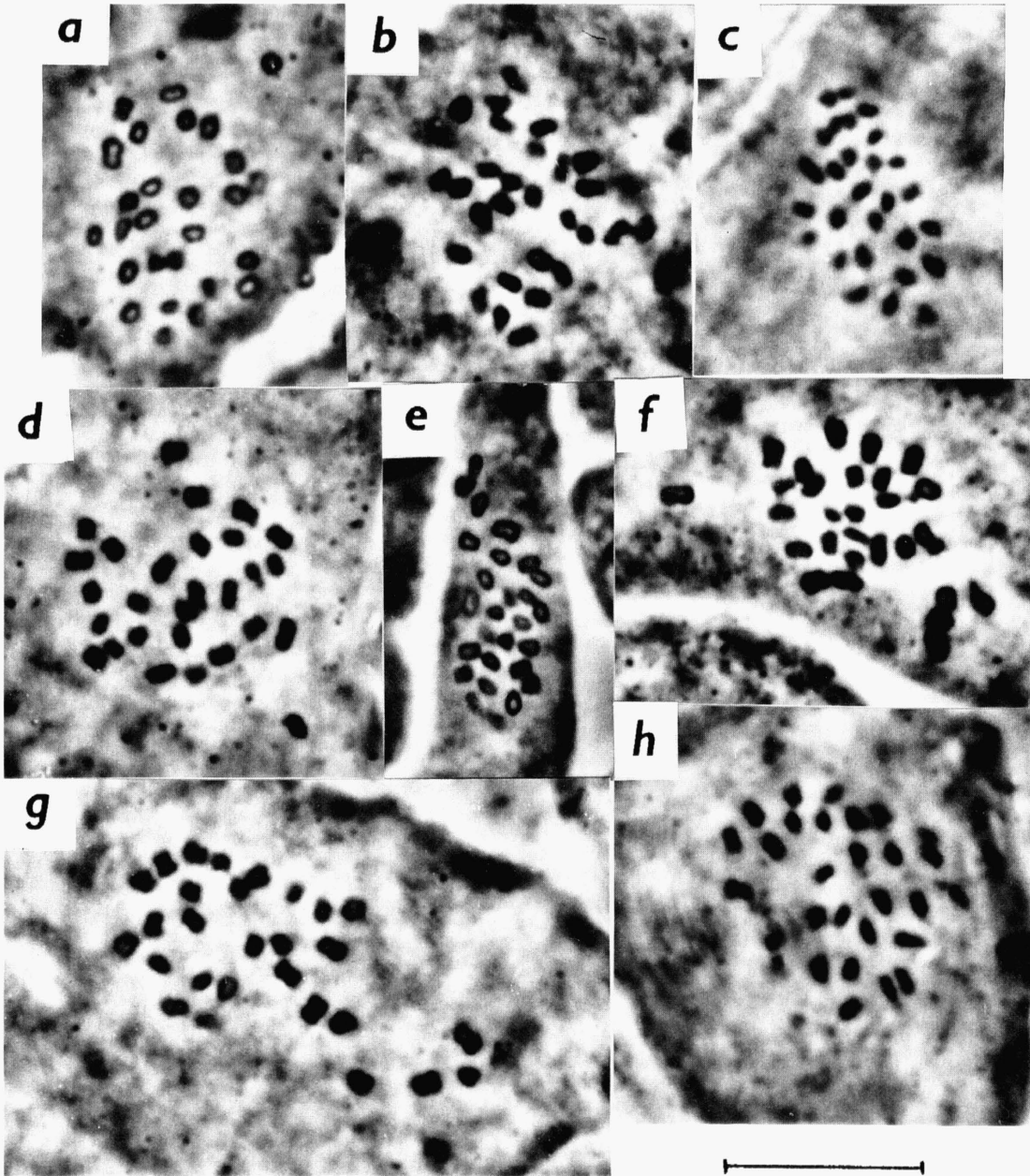


Fig. 2. – Somatic metaphases in eight tetraploid species of the genus *Rubus* (all species  $2n = 28$ ); – a: *Rubus nemoralis* P. J. Mueller; b: *Rubus laciniatus* Willd.; c: *Rubus sprengelii* Weihe; d: *Rubus thelybatos* Cafilisch; e: *Rubus acanthodes* H. Hofmann; f: *Rubus brdensis* Holub; g: *Rubus josefianus* H. E. Weber; h: *Rubus gothicus* E. H. L. Krause. [Scale bar = 10  $\mu$ m].

Earlier general data on the occurrence of *R. ulmifolius* in the area of the former Czechoslovakia are erroneous. This species is unknown from Slovakia. Plants of native occurrence have never been found in the Czech Republic; only one locality, of secondary occurrence, exists here at Průhonice, from where the material studied karyologically originates. This occurrence represents an old relict of an earlier cultivation (i.e. an ergasiolipophyte – cf. Holub & Jirásek 1967: 107).

7. *Rubus elatior* Gremlí

2n = 21

Focke ex Gremlí Beitr. Fl. Schweiz, 50, 1870.

Localities:

1. SW Bohemia; distr. Domažlice; on the woodland edge on the E slope of Orlovická hora hill SW of Orlovice village, 620 m a.s.l., 49°19'30"N, 13°05'30"E. Coll. J. Holub and A. Krauhlová 4. 10. 1996.
2. S Bohemia; distr. Strakonice; in the wood on the W slope of Tisovník hill, near the road between Strakonice town and Hubenov village ca. 4 km NNW of Strakonice town, 500 m a.s.l., 49°17'50"N, 13°52'30"E. Coll. J. Holub and A. Krauhlová 3. 10. 1996.
3. S Bohemia; distr. Strakonice; in the wood beside the former path to the gamekeeper's lodge, ca. 1.5 km NWN of Čekanice village, 530 m a.s.l., 49°23'20"N, 13°52'50"E. Coll. J. Holub and A. Krauhlová 3. 10. 1996.

The same triploid level (2n = 21) was found by Gustafsson (1943) in *R. elatior* cultivated in the Botanical Garden Lund. However, its determination is uncertain (cf. Gustafsson, l.c., p. 101). Our finding is the first report for plants of native occurrence and probably for the species.

*R. elatior* is a species of the southwestern part of Central Europe with its centre of distribution in Bavaria (see Schönfelder & Bresinsky 1990: 240, map 639), from where it transgresses to neighbouring areas of Austria, Baden-Württemberg, Thuringia and Bohemia. In the Flora of the Czech Republic (Květěna ČR – Holub 1995: 110) this species was consciously accepted within the circumscription containing two taxa – *R. elatior* s. s. and *R. verae* Holub ined. At present, the two taxa are classified by the second author as two species, being subject to further study (see below). The data on the chromosome number given above refer to *R. elatior* s. s. only. The distribution area of this species in Bohemia seems to be substantially less extensive than that of *R. verae*. *R. elatior* is with certainty known from the southwestern part of Bohemia only, namely from the southern part of the Český les Mts (at present only one locality at Chodov), from the phytogeographical district Branžovský hvozd (several localities – loc. 1 belongs here), from the hilly country Horažďovická pahorkatina (loc. 3) and from the phytogeographical subdistrict (limestone region) Strakonické vápence (loc. 2). Some additional data of localities published by Weber (1995) from Bohemia – such as Perštejn, Žehrov and the central Sázava basin – need further study and revision. The present situation is more complicated here, as *R. verae* is closely related to a newly described species *R. perperus* H. E. Weber 1996 (or identical with it?). These issues are under study (Holub, in prep.). It has to be mentioned here that the illustration of *R. elatior* in Květěna ČR (Holub 1995: 109, tab. 13, fig. 1a–e) belongs to *R. verae* Holub ined.

8. *Rubus bohemicola* Holub 2n = 27 + fragment (Fig. 1e–i)  
 Holub et Palek ex Holub, Folia Geobot. Phytotax. 26: 333, 1991.

## Localities:

1. C Bohemia; distr. Rokycany; Brdy Hills; in the wood along the road 0.5 km S of the upper part of Medový Ujezd village, ca. 510 m a.s.l., 49°45'50"N, 13°43'40"E. Coll. J. Holub and A. Krahulcová 22. 10. 1996.
2. C Bohemia; distr. Píbram; Brdy Hills; on the woodland edge ca. 0.2 km W of Felbabka village, 445 m a.s.l., 49°48'50"N, 13°56'20"E. Coll. J. Holub 19. 11. 1994.
3. C Bohemia; distr. Píbram; Brdy Hills; in the wood 1.2 km SWS of Obecnice village, 560 m a.s.l., 49°42'30"N, 13°56'30"E. Coll. J. Holub 15. 10. 1994.
4. C Bohemia; distr. Píbram; in the wood along the road leading from Občov village to Píbram town, 0.8 km SW from the village, 505 m a.s.l., 49°42'30"N, 14°03'30"E. Coll. J. Holub 13. 10. 1996.
5. C Bohemia; distr. Píbram; along the path in the wood 1.5 km SES of Skalice village close to the gamekeeper's lodge "Bělohrad", 460 m a.s.l., 49°42'20"N, 14°12'00"E. Coll. J. Holub and A. Krahulcová 2. 10. 1996.
6. C Bohemia; distr. Píbram; in the wood in the summit area of the hill (567.9 m) in the area of the gravel treatment factory, ca. 0.75 km SW of Bytíz settlement, 550 m a.s.l., 49°40'40"N, 14°04'00"E. Coll. J. Holub and A. Krahulcová 2. 10. 1996.
7. S Bohemia; distr. Písek; in the wood on the hill "Háj" 1.5 km NE of Mirovice village, 490 m a.s.l., 49°31'30"N, 14°03'50"E. Coll. J. Holub and A. Krahulcová 2. 10. 1996.
8. S Bohemia; distr. Strakonice; along the path in the wood "Ryšovy" 1.5 km N of Strakonice town, 480 m a.s.l., 49°16'40"N, 13°53'40"E. Coll. J. Holub and A. Krahulcová 3. 10. 1996.
9. S Bohemia; distr. Tábor; in the wood along the road leading from Sudoměřice u Bechyně village to Bechyně town, 1.5 km SW of Bežerovice village, 450 m a.s.l., 49°17'30"N, 14°30'20"E. Coll. J. Holub 9. 9. 1994.
10. S Bohemia; distr. Jindřichův Hradec; in the wood along the road leading from Kardašova Řečice town to Církar settlement near Popelov pond, ca. 2.5 km S of the town, 440 m a.s.l., 49°09'50"N, 14°50'40"E. Coll. J. Holub 29. 9. 1994.
11. E Bohemia; distr. Pardubice; Železné hory Hills; in the wood 1 km N of Turkovice village, 330 m a.s.l., 49°57'50"N, 15°32'50"E. Coll. J. Holub and A. Krahulcová 27. 9. 1996.

This species has not been studied karyologically up to now. The chromosome number of *R. bohemicola* ( $2n = 27 + \text{fragment}$ ) undoubtedly represents the tetraploid level (initially  $2n = 28$ ). The peculiar character of its karyotype is probably due to chromosomal translocation of the Robertsonian type, resulting in one large submetacentric chromosome of prominent size and a small fragment (Fig. 1e–i). Whether a part of the chromosomes was lost during their rearrangement, remains unclear: the chromosomes are too small and karyotype analysis is impossible using the classic methods of chromosome staining. The meiotic chromosome associations were not studied. Whereas the large "marker" chromosome was evident in all metaphases observed, the small fragment was recorded within each plant, but not in all of the metaphases examined. The changed karyotype was found in all plants collected at eleven localities; the greatest distance between the collecting sites was almost 150 km. It seems that the translocated karyotype is a typical character of the species *R. bohemicola*. Based on the examination of meiosis, the minute structural chromosome changes were also assumed by Gustafsson (1943: 120) in several species of the genus *Rubus* of native origin in Scandinavia. Iwatsubo et al. (1995) reported one extremely small chromosome within the chromosome complements of two cultivated tetraploid species *R. praecox* Bertol. and *R. muenteri* Marsson, collected in Germany (at one locality each), and they also assumed structural chromosome changes (translocations or deletions). Our findings in *R. bohemicola* supply the information about karyotype changes in this genus, in relation to species of native occurrence; such data have appeared sporadically in the literature up to now.



*R. bohemicola* is known only from Bohemia, where it occurs over a greater part of the region in a relatively large number of localities (more than 50). The delimitation of its distribution is given more precisely in Holub (1995). The species is absent from the northern (i.e. northwestern, northern and northeastern) and westernmost part of Bohemia. Its most westerly sites are Peruc, Plzeň and Plánice. The present extent of its distribution is an area ca. 230 km x 150 km; according to this, *R. bohemicola* is a normal regional species and it represents a very characteristic endemic species in Bohemia. A denser occurrence of *R. bohemicola* is known from the Plánický hřeben Hills and from the surroundings of the town of Příbram, where its type locality is also situated (loc. 6 of the material karyologically studied). It also occurs in the submontane belt, reaching 685 m a.s.l. near the town of Sušice. The record from Kožova hora hill near Kladno (Holub 1995, Weber 1995) must be deleted as these plants belong to *R. vratnensis* Holub.

### Ser. *Rhamnifolii* (Bab.) Focke

#### 9. *Rubus nemoralis* P. J. Mueller

2n = 28 (Fig. 2a)

P. J. Mueller, Flora 41: 139, 1858.

#### Localities:

1. C Bohemia; distr. Rakovník; beside the woodland path above Farma settlement situated on the E foothill of Žalý hill, ca. 3 km NW of Nové Strašecí town, 485 m a.s.l., 50°10'00"N, 13°52'00"E. Coll. J. Holub and A. Krahulcová 29. 10. 1996.
2. NC Bohemia; distr. Mladá Boleslav; along the path in the wood "Petkovský les" 1 km S of the railway station Bcchov, ca. 3 km SWW of Dolní Bouzov village, 270 m a.s.l., 50°25'50"N, 15°05'10"E. Coll. J. Holub and A. Krahulcová 11. 10. 1996.
3. E Bohemia; distr. Rychnov n. Kněžnou; along the woodland path on Hradiště hill, ca. 1 km SES of Lično village, 320 m a.s.l., 50°10'10"N, 16°10'50"E. Coll. J. Holub and A. Krahulcová 27. 9. 1996.

The plants from all three localities proved to be tetraploid. This is in agreement with literature references on *R. nemoralis* (cf. Thompson 1997, where 5 literary sources are given). The material studied hitherto originated from Great Britain (Maude 1939, Heslop-Harrison 1953) and Poland (Boratyńska 1994).

*R. nemoralis* is a species with a wide distribution, extending from West European countries (Ireland, Great Britain, the Netherlands and West Germany) eastwards to Mecklenburg, Brandenburg, Poland and the Czech Republic with its easternmost occurrence in central Poland – near Kielce (see the map of its distribution – Weber 1995: 398). In the Czech Republic it is very rare; at present only four isolated occurrences are known, represented in three cases by a single locality only (in eastern Bohemia – loc. 3 – by one bush only). The localities of *R. nemoralis* are situated in the western part of Central Bohemia (near Nové Strašecí), in the northeastern part of Central Bohemia (eastern vicinity of Mladá Boleslav – with several microlocalities and one locality with numerous individuals = loc. 2), in northeastern Bohemia (Lično – loc. 3 – see Holub et al. 1995) and the fourth locality near Bohuslavice is in Moravian Silesia. The last locality links to the occurrence of the species in Polish Silesia. The above mentioned distribution map by Weber should be supplemented with data from the localities loc. 1 and loc. 3. The occurrence of *R. nemoralis* in the Czech Republic forms the southern limit of the distribution of the species.

10. *Rubus laciniatus* Willd.

2n = 28 (Fig. 2b)

Willdenow Hort. Berol. 2, tab. 82, 1806.

## Locality:

1. C Bohemia; distr. Praha-západ [Prague-West]; Průhonice village, in the area of the garden "Chotobuz" close to the castle park, 330 m a.s.l., 49°59'30"N, 14°34'20"E. Coll. J. Holub and A. Krahulcová 9. 8. 1995.

The same tetraploid level is reported for this species in the literature (for the complete survey of references see Thompson 1997, where 7 literary sources are given); the plants studied previously have been collected at various sites within the secondary distribution area of *R. laciniatus*. This species probably originated as a spontaneous mutation, became widely cultivated and often escaped from cultivation. Its original distribution area is not known or it may never have existed in the wild.

In the Czech Republic five localities of secondary distribution of *R. laciniatus* are known; the existence of some of them has not been revised during our study. Unfortunately, the above mentioned locality was destroyed in 1996 by a change of use of the plot. The plant examined belonged to the spiny morphotype of the species (not to be the cv. Inermis, which is more often cultivated here, now).

Ser. *Silvatici* (P. J. Mueller) Focke11. *Rubus wimmerianus* (Sudre) Spribille

2n = 28

(Spribille ex Sudre) Spribille, Jahresber. Schles. Vaterland. Cult. 87: 57, 1909.

## Localities:

1. C Bohemia; distr. Praha-západ [Prague-West], in the wood at the crossroads "V Paloukách", 1.5 km NW of Slapy village, 380 m a.s.l., 49°49'30"N, 14°23'00"E. Coll. J. Holub and A. Krahulcová 2. 10. 1996.
2. C Bohemia; distr. Kutná Hora; in the wood on the NE foothill of Tisá skála hill SW of Bratčice village, 340 m a.s.l., 49°50'50"N, 15°25'20"E. Coll. J. Holub and A. Krahulcová 27. 9. 1996.
3. S Moravia; distr. Znojmo; Rakšice village, along the woodland path ca. 1 km SWW of the railway station, 290 m a.s.l., 49°00'40"N, 16°20'10"E. Coll. B. Trávníček and J. Holub 20. 9. 1995.
4. C Moravia; distr. Kroměříž; Chropyně town, in the wood "Rasina" ca. 1.8 km E of the railway station, 190 m a.s.l., 49°22'10"N, 17°23'10"E. Coll. B. Trávníček 16. 9. 1995.

All plants studied showed the tetraploid chromosome number of 2n = 28. This is the very first karyological information about *R. wimmerianus*.

A Central European species with its distribution confined to the eastern part of Central Europe. It occurs in the southern part of Poland, in the whole of Slovakia (except for calcareous regions), in the Czech Republic and it transgresses from there to the northernmost part of Austria (Lower Austria, vicinity of Hardegg). In the Czech Republic it has numerous localities in Moravia, especially in eastern and central Moravia and Moravian Silesia, being rare or absent in southwestern and western parts of Moravia. According to information by J. Holub, Weber (1995) mentioned its absence from the Bílé Karpaty Mts., but *R. wimmerianus* is now known also from this range (Trávníček & Hájek 1996; Holub unpublished). As a Carpathian phytogeographical element it transgresses into Bohemia, where it is known from the northeastern part and then from several isolated localities in the central part of Bohemia (loc. 1 and 2). A very typical species, which may be easily determined

according to its short deflexed spines, special colouration of stems (slightly violet-greyish), large and foliaceous inflorescences and stamens shorter than the gynoecia.

12. *Rubus macrophyllus* Weihe et Nees

2n = 28

Weihe et Nees Rubi Germ., 35, tab. 12A, 1824.

Localities:

1. NC Bohemia; the protected landscape area Český ráj; distr. Mladá Boleslav; on the N slope of Valečov hill (under the castle ruin), 1 km NEN of Boseň village, 310 m a.s.l., 50°30'50"N, 15°01'50"E. Coll. J. Holub and A. Krahulcová 11. 10. 1996.
2. NC Bohemia; distr. Mladá Boleslav; on the woodland edge beside the road to the sand pit, 1 km SE of Oubrýv village, 275 m a.s.l., 50°27'10"N, 15°05'40"E. Coll. J. Holub and A. Krahulcová 11. 10. 1996.

Our finding confirms the literature references to *R. macrophyllus* summarized by Thompson (1997), where 6 literature sources are cited. They refer to plants from Great Britain (Heslop-Harrison 1953), the Netherlands (Beijerinck 1956), Germany – Lower Saxony (Iwatsubo et al. 1995), and Poland (Boratynska 1995a). The same chromosome number, i.e. the tetraploid, was also given for this species by Gustafsson (1943); the origin of plants studied by him (Botanical Garden Lund) remains unclear.

A species with a wide but not well known distribution. According to its distribution pattern in some countries (Bavaria – cf. Schönfelder & Bresinsky 1990: 242, map 646; Bohemia; Poland) it seems that its distribution in eastern parts of Central Europe is disjunctive. The data on its occurrence in Moravia (i.e. Frýdek), Slovakia, Hungary and Rumania should be critically revised. In the Czech Republic the species is confined to only one region in the northern part of central Bohemia – s.c. “Czech Paradise” (Český ráj). About five localities are known in this region, all except one (loc. 1 – Valečov) being represented only by individual bushes. The occurrence in Bohemia is isolated, the nearest other localities being in Polish Silesia, Lusatia, Saxony and Bavaria. The possibility should not be excluded that the species is overlooked in this country.

Ser. *Sprengeliani* Focke

13. *Rubus sprengelii* Weihe

2n = 28 (Fig. 2c)

Weihe, Flora 2: 118, 1819.

Localities:

1. NE Moravia (Moravian Silesia); distr. Karviná; Chotěbuz village, beside the road in the wood “Loucký les”, close to the bridge ca. 2 km NW of the railway station, 290 m a.s.l., 49°47'30"N, 18°34'30"E. Coll. B. Trávníček 10. 10. 1996.
2. NE Moravia (Moravian Silesia); distr. Frýdek-Místek; Třinec town, on the woodland edge on the SW slope of Osůvka hill, 1.2 km N of the railway station, 340 m a.s.l., 49°41'50"N, 18°39'50"E. Coll. B. Trávníček 10. 10. 1996.

The tetraploid level found in all our plants corresponds to literature references to this species (Thompson 1997, where 6 literary sources are given) and relates to material from Great Britain (Datta 1932, Maude 1939, Heslop-Harrison 1953), the Netherlands (Beijerinck 1956) and Poland (Boratynska 1996). The same chromosome number was found also in plants cultivated in the Botanical Garden Lund (Gustafsson 1943).

The distribution of *R. sprengelii* has an Atlantic-Subatlantic character with its centre in Great Britain and northwestern parts of Central Europe (see the map in Weber 1995: 432). In the area between the Baltic Sea and the Sudeten-Carpathian mountain range it extends eastwards into northern and central Poland. The easternmost occurrences in the central part of Central Europe are known from Saxony and northern Bavaria. In the Czech Republic, *R. sprengelii* occurs, surprisingly, in the easternmost part of the country, i.e. in several (ca. 10) localities in eastern Moravian Silesia in the surroundings of Frýdek, Třinec, Karviná and Ostrava; in some of them it forms large local populations. Its occurrence here can be related to migration from Polish Silesia. The occurrence of *R. sprengelii* in Moravian Silesia forms the southern limit of the distribution of this species. From the point of view of the whole of the Czech Republic, this species is a rare and threatened plant. The threat is increased by its occurrence in an area heavily influenced by industrial activity.

### Ser. *Micantes* Sudre

#### 14. *Rubus thelybatos* Cafilisch

2n = 28 (Fig. 2d)

Focke ex Cafilisch Excursions-Fl. Südöstl. Deutschl. 92, 1878.

#### Localities:

1. SW Bohemia; distr. Plzeň-jih [Plzeň-South]; in the wood "Nepomucký les" beside the road between Žinkovy village and Nepomuk town ca. 4 km W of Nepomuk town, 490 m a.s.l., 49°29'20"N, 13°31'50"E. Coll. J. Holub and A. Krahulcová 14. 10. 1997.
2. SW Bohemia; distr. Klatovy; on the SW slope of Kvasetická hora hill (616.5 m) 0.5 km SWW of Kvasetice village, 590 m a.s.l., 49°24'10"N, 13°29'30"E. Coll. J. Holub and A. Krahulcová 14. 10. 1997.
3. SW Bohemia; distr. Klatovy; in the wood on the W slope of Jelení vrch hill (on the edge of the protected area) 1.5 km SE of Habartice village, 630 m a.s.l., 49°23'00"N, 13°25'30"E. Coll. J. Holub and A. Krahulcová 14. 10. 1997.
4. SW Bohemia; distr. Klatovy; Klatovy, in the wood on Výhořice hill (525 m), 1.5 km SW of Luby village (now a part of Klatovy town), 485 m a.s.l., 49°21'50"N, 13°17'40"E. Coll. J. Holub 18. 10. 1997.

The chromosome number of *R. thelybatos* was not known until now. All plants examined showed the tetraploid chromosome number of  $2n = 28$ .

*R. thelybatos* belongs to species with a restricted regional distribution, being confined to southwestern parts of Central Europe – Bavaria and southwestern Bohemia. The species was described from Bavaria; its distribution there is given in Schönfelder & Bresinsky (1990: 244, map 653), where about 11 localities are mapped. Later the species was found by Vondráček (1988) in Bohemia, where it occurs mostly in the area between Plzeň and Klatovy. Vondráček (l.c.) reports the species from seven localities, five of them being situated in the phytogeographical district of Plánický hřeben, and two in the phytogeographical district of Plzeňská pahorkatina. In 1997 the occurrence of *R. thelybatos* was revised by the present authors; it was found in seven localities, of which two are new; the species occurs now in Bohemia in at least 10 localities. Weber (1995) reports only one locality of *R. thelybatos* from Bohemia (at Nepomuk, which is the northernmost locality there – loc. 1) according to the collection by J. Holub. Other localities are situated between Nepomuk and Klatovy. The occurrence of *R. thelybatos* in Bohemia forms the northern and eastern limit of its distribution area.

15. *Rubus gliviciensis* (Sudre) Spribille

2n = 28

(Spribille ex Sudre) Spribille, Jahresber. Schles. Ges. Vaterland. Cult. 87: 58, 1910.

## Localities:

1. C Moravia; distr. Prostějov; in the wood 0.4 km SE of the place "Zámeček" SW of Hlučov village, 340 m a.s.l., 49°31'40"N, 16°58'40"E. Coll. B. Trávníček and A. Krahlucová 16. 10. 1996.
2. NC Moravia; distr. Olomouc; on the woodland edge beside the road 1.3 km W of Karlov settlement near Paseky village, 550 m a.s.l., 49°49'10"N, 17°14'10"E. Coll. B. Trávníček and A. Krahlucová 16. 10. 1996.
3. N (Moravicum Silesia); distr. Karviná; Chotěbuz village, on the slope close to the bridge nearby the wood "Louký les", ca. 2.2 km NW of the railway station, 290 m a.s.l., 49°47'30"N, 18°34'30"E. Coll. B. Trávníček 10. 10. 1996.
4. N (Moravicum Silesia); distr. Frýdek-Místek; on the woodland edge above the road leading from Dolní Lištná village (E of Třinec town) to the Czech-Polish border, 1.5 km NW of Vruzná hill, 360 m a.s.l., 49°41'30"N, 18°41'40"E. Coll. B. Trávníček 10. 10. 1996.

The tetraploid level was found in all plants studied. This supports the karyological data on *R. gliviciensis* from Poland, published in recent years by Boratyńska (1994).

*R. gliviciensis* is a regional species with a narrow distribution. It belongs to the group of species closely related to *R. silesiacus* and was neglected in earlier times. Its most important diagnostic characters are: stems usually greenish; spines on the stem denser and longer (7–8 mm long) than in *R. silesiacus*, petals and stamens rosaceous. The species is known only from the eastern part of Polish Silesia and Moravia. In Moravia it occurs mostly in the eastern part of Moravian Silesia (loc. 3 and 4) and in isolated localities in central Moravia (loc. 1 and 2). The species reaches here the southern and western limit of its distribution.

The species epithet is derived from the Polish name of the town Gliwice (Gleiwitz in German); Sudre (1908–1913: 45) who first validly published that epithet in 1908, used the orthographic variant "*gliviciensis*", which is therefore used also here, in contrast to the normally used variant "*glivicensis*".

16. *Rubus acanthodes* H. Hofmann

2n = 28 (Fig. 2e)

H. Hofmann Pl. Crit. Saxon. Exs. 1899, no 101, 1900.

## Localities:

1. N Bohemia; distr. Děčín; along the road in the wood "Bludiště" 2 km W of Srbská Kamenice village, 310 m a.s.l., 50°49'10"N, 14°19'50"E. Coll. J. Holub and A. Krahlucová 10. 10. 1996.
2. W Bohemia; distr. Plzeň-sever [Plzeň-North]; along the road between the railway underpass and the crossing, 1 km NE of Horní Břiza village, 415 m a.s.l., 49°51'10"N, 13°23'40"E. Coll. J. Holub and A. Krahlucová 22. 10. 1996.
3. C Bohemia; distr. Rokycany; Brdý Hills; on the woodland edge beside the road close to the southern periphery of Medový Újezd village, 460 m a.s.l., 49°46'20"N, 13°43'20"E. Coll. J. Holub and A. Krahlucová 22. 10. 1996.
4. C Bohemia; distr. Rakovník; in the wood on the NE slope of Hlaváčov hill (405 m), 3.5 km NEN of Rakovník town, 380 m a.s.l., 50°08'00"N, 13°44'50"E. Coll. J. Holub 26. 10. 1996.

The chromosome number for this tetraploid species (2n = 28) is reported here for the first time.

A Central European regional species with a restricted distribution confined to the central part of Central Europe. Its distribution area covers part of Germany (Fichtelgebirge Mts, Saxony, Upper Lusatia), a small part of southwestern Poland (Polish Silesia bordering on Upper Lusatia) and Bohemia. This species occurs in Bohemia mostly in the north-western quadrant of the country, where it is relatively frequent. The area of its occurrence in Bohemia may be specified by the following boundary localities: Perštejn – Velká Černoc – Horní Břiza – Holoubkov – Rakovník – Roudnice – Mělník – Brodce n. Jiz. –

Podhorní Újezd – Hodkovice nad Mohelkou – Jizerské hory; it is especially frequent in the phytogeographical district of Labské pískovce (loc. 1 belongs here). The material studied originates also from several isolated localities – vicinity of Plzeň (loc. 2), Holoubkov (loc. 3) and Rakovník (loc. 4). The species may be of relatively recent origin; it seems to originate from hybridogenesis of *R. gracilis* and *R. koehleri*.

## Ser. *Hystrix* Focke

### 17. *Rubus brdensis* Holub

2n = 28 (Fig. 2f)

Holub, Folia Geobot. Phytotax. 26: 338, 1991.

#### Localities:

1. W Bohemia; distr. Plzeň-jih [Plzeň-South]; in the wood along the road 3 km W of Merklín village, 450 m a.s.l., 49°33'20"N, 13°09'20"E. Coll. J. Holub and A. Krahulcová 22. 10. 1996.
2. C Bohemia; distr. Rakovník; on the woodland edge at the foot of Louštín hill (537 m), SE of Krušovice village, 465 m a.s.l., 50°10'10"N, 13°48'20"E. Coll. J. Holub 21. 10. 1995.
3. C Bohemia; distr. Příbram; Brdy Hills (military area); in the target area "Jordán" between Houpák Mt. (794 m) and the bunker "Jordán", 710 m a.s.l., 49°44'10"N, 13°52'10"E. Coll. J. Holub 15. 10. 1994.
4. C Bohemia; distr. Příbram; Brdy Hills; in the wood 1.5 km N of Obecnice village, 0.6 km W of Malý Drahlín village, 590 m a.s.l., 49°43'50"N, 13°56'50"E. Coll. J. Holub 15. 10. 1994.
5. C Bohemia; distr. Příbram; Brdy Hills; on the woodland edge W of Orlov village, 5 km W of Příbram town, 660 m a.s.l., 49°41'10"N, 13°56'50"E. Coll. J. Holub and A. Krahulcová 20. 10. 1995.

This is the first information about the chromosome number of *R. brdensis* described recently from Bohemia (Holub 1991). The tetraploid number of 2n = 28 was found in plants from all five localities studied.

This is a Central European regional species with a restricted distribution; it was described from Bohemia and is known from there only. Its frequent occurrence is confined to the Brdy Hills (the species epithet is derived from the name of this mountain range) and to surrounding area (localities no. 3, 4 and 5 refer to this region). Two other localities (loc. 1 and 2) belong to marginal occurrences. In recent years additional localities of this species were found, so that its distribution area has somewhat increased. The distribution of *R. brdensis* extends in the West to the phytogeographical districts of Plzeňská pahorkatina and Plánický hřeben, to the South to the foothills of the Šumava Mts near Volyně, to the East to the vicinity of Bechyně (leg. P. Havlíček) and Orlík, to the North to Řevničov, Krupá and Krakovec. At present the area of *R. brdensis* is ca. 130 km x 80 km and includes at least 70 localities of this species.

## Ser. *Glandulosi* (Wimmer et Grab.) Focke

### 18. *Rubus hirtus* Waldst. et Kit.

2n = 28

Waldstein et Kitaibel Pl. Rar. Hung. 2: 150, 1804.

#### Localities:

1. N Bohemia; distr. Liberec; beside the road on the N slope of the hill (521.9), 2.5 km SW of Jindřichovice pod Smrkem village, 490 m a.s.l., 50°57'00"N, 15°13'10"E. Coll. J. Holub and A. Krahulcová 11. 10. 1996.
2. C Bohemia; distr. Rokycany; Brdy Hills; in the wood along the road at the upper part of Medový Újezd village, ca. 510 m a.s.l., 49°45'50"N, 13°43'40"E. Coll. J. Holub and A. Krahulcová 22. 10. 1996.

3. S Bohemia; distr. Prachatice; beside the road along the woodland edge on the SW periphery of Lhenice village, 600 m a.s.l., 48°59'30"N, 14°08'40"E. Coll. J. Holub and A. Krauhlová 3. 10. 1996.

The tetraploid level ( $2n = 28$ ) was confirmed for *R. hirtus* (see Thompson 1997, where 8 literary sources are cited). However, these data mentioned were placed in Thompson (1997) by H. E. Weber as unclear with regard to their taxonomic uncertainty. The chromosome number was studied previously on material from Great Britain (Maude 1939, Heslop-Harrison 1953), the Balkan Peninsula – former Yugoslavia (Thompson 1995) and Poland (Boratyńska 1995a); Gustafsson (1943) also examined cultivated plants from the Botanical Garden Lund.

The distribution of *R. hirtus* extends principally in mountain ranges from the Pyrenees in the West to the Caucasus and Elburz in the East; from these mountains it descends to surrounding areas at lower altitudes. In the Czech Republic it occurs mostly in submontane and montane belts at altitudes between 200–1000 m a.s.l. *R. hirtus* represents a taxonomic complex rather than a species; it is an aggregate of the taxonomically unstable morphotypes of the series *Glandulosi*, of which the violet coloured glandular hairs in the inflorescence are a characteristic feature. The uncertainty connected with the correct inclusion of the previously stated chromosome numbers, as mentioned above, very probably follows from this fact (Weber in Thompson 1997).

Sect. *Corylifolii* Lindl.

Ser. *Suberectigeni* H. E. Weber

19. *Rubus josefianus* H. E. Weber

$2n = 28$  (Fig. 2g)

H. E. Weber, Preslia 65: 22, 1993.

Localities:

1. NW Bohemia; distr. Louny; Džbán plateau; on the woodland edge 0.4 km E of "Zichovecká myslivna" gamekeeper's lodge, 2.5 km SES of Hříškov village, 430 m a.s.l., 50°16'10"N, 13°52'30"E. Coll. J. Holub and A. Krauhlová 12. 9. 1997.
2. C Bohemia; distr. Praha (Prague); the N edge of the capital, in the E part of Čimický háj wood, 320 m a.s.l., 50°07'50"N, 14°26'50"E. Coll. J. Holub 29. 10. 1994.
3. C Bohemia; distr. Pířibram; beside the road in Jince village between the railway station and the centre of the village, 390 m a.s.l., 49°47'10"N, 13°58'50"E. Coll. J. Holub 19. 11. 1994.

This is the first information about the chromosome number in this tetraploid species ( $2n = 28$ ), described recently by Weber (1993).

*R. josefianus* belongs to Central European regional species with a distribution confined to the western part of Central Europe. It is known from Germany and Bohemia, being described from the latter. The type locality lies in central Bohemia. The westernmost localities are known from Baden-Württemberg; in Bavaria it occurs especially in the northern part (North of the Danube river) and also in Thuringia. Its occurrence in the Czech Republic is restricted to Bohemia only, where *R. josefianus* reaches the eastern limit of its distribution at the following localities: eastern vicinity of Mladá Boleslav – Lysá nad Labem – Vysoký Újezd and Živohoř' in the central Vltava basin. A new marginal locality was found by P. Havlíček at Klatovy town in southwestern Bohemia.

Ser. *Subthyrsoidei* (Focke) Focke20. *Rubus gothicus* E. H. L. Krause

2n = 28 (Fig. 2h)

Friderichsen et Gelert ex E. H. L. Krause, Ber. Deutsch. Bot. Ges. 16: 108, 1888.

## Localities:

1. C Bohemia; distr. Kolin; beside the road on the woodland edge 1 km WSW of Býchory village, 210 m a.s.l., 50°04'00"N, 15°15'50"E. Coll. J. Holub and A. Krahulcová 25. 10. 1996.
2. S Moravia; distr. Znojmo; along the track in the fields close to the E periphery of Popice village, 260 m a.s.l., 48°49'10"N, 16°01'40"E. Coll. B. Trávníček and J. Holub 19. 9. 1995.
3. SW Moravia; distr. Třebíč; beside the road 1.5 km NEN of Slavětice village, 420 m a.s.l., 49°06'50"N, 16°07'10"E. Coll. B. Trávníček and J. Holub 18. 9. 1995.
4. S Moravia; distr. Brno-venkov [Brno-country]; along the path on the woodland edge 1.2 km E of Ketskovice village, 440 m a.s.l., 49°09'40"N, 16°17'00"E. Coll. B. Trávníček and J. Holub 5. 9. 1996.

The same tetraploid chromosome number ( $2n = 28$ ) is given by several authors; Thompson (1997) cites 6 literary sources. This chromosome number was counted in plants from Sweden, Denmark (Gustafsson 1939) and Poland (Boratyńska 1997). However, the two cytotypes of *R. gothicus*, tetraploid ( $2n = 28$ ) and pentaploid ( $2n = 35$ ), were found in plants collected on the island of Bornholm, Denmark (Gustafsson 1939).

*Rubus gothicus* is a Central European species with a wide distribution, belonging to the group of species with a more northerly occurrence. Its distribution is given in a map by Weber (1995: 550; state May 1992) to which the data on the occurrence of this species in the Czech Republic must be added; the locality Trenčín (W Slovakia), mentioned by Weber (l.c.) in the text, is missing in the map. Its distribution extends from southern Sweden to Central Europe, southwards to the northern part of Bavaria (Oberfranken – cf. Schönfelder & Bresinsky 1990: 249, map 676) and the Czech Republic; an isolated site occurs in Austria in Vorarlberg. In the Czech Republic the species occurs mostly in the southern half of Moravia, where several localities are known, especially in the region between Znojmo and Brno (from where the material studied originates – loc. 2, 3 and 4). The species is very rare in Bohemia. The plants of *R. gothicus* from the Czech Republic require further taxonomic study and comparison with the plants from other parts of its distribution area.

**Additional data:**

*Rubus wessbergii* Pedersen et Walsemann [cf. Krahulcová & Holub, Preslia 68/1996: 252, 1997.]

The tetraploid chromosome number of  $2n = 28$  given for *R. wessbergii*, sect. *Corylifolii* (Krahulcová & Holub 1997a), was based on examination of the plant from a single locality in the river port in Mělník town. Several other localities of this species were later discovered in the Czech Republic in central and northern Bohemia; the plants collected at three of them showed the same chromosome number of  $2n = 28$ .



## Localities:

1. N Bohemia; distr. Děčín; beside the road on the northern periphery of Studený village, 350 m a.s.l., 50°50'50"N, 14°16'20"E. Coll. J. Holub and A. Krahulcová 10. 10. 1996.
2. N Bohemia; distr. Děčín; beside the road between the villages of Studený and Lipnice, 330 m a.s.l., 50°50'30"N, 14°16'10"E. Coll. J. Holub and A. Krahulcová 10. 10. 1996.
3. C Bohemia; distr. Mělník; beside the path on the woodland edge ca. 1.2 km NW of Chloumek village N of Mělník town, 240 m a.s.l., 50°22'50"N, 14°29'50"E. Coll. J. Holub and A. Krahulcová 29. 10. 1996.

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## Souhrn

V pořadí třetí z plánované série prací, zabývajících se karyologií zástupců rodu *Rubus* v České republice, zahrnuje 20 druhů naší ostružiníkové flóry. Soubor druhů obsažených v tomto příspěvku byl shromážděn celkem z 67 lokalit v Čechách a na Moravě. Mezi těmito druhy se vyskytly tři ploidní stupně – diploidní (3 druhy), tetraploidní (16 druhů) a jeden druh triploidní. V této práci uvedené diploidní druhy patří do podrodů *Rubus*, *Idaeobatus* a *Cylactis*.

V rámci podrodu *Rubus*, nejvíce zastoupeném v naší ostružiníkové flóře, jsou zde uvedeny nové chromozómové počty pro 7 druhů. Tetraploidní počet ( $2n = 28$ ) byl zjištěn pro: *R. wimmerianus* (Sudre) Spribille, *R. thelybatos* Calfish, *R. acanthodes* H. Hofmann, *R. brdensis* Holub a *R. josefianus* H. E. Weber. Triploidní počet ( $2n = 21$ ) byl pravděpodobně stanoven jako prvopočet pro *R. elatior* Greml. Karyologie druhu *R. bohemicola* Holub, popsáno z území Čech, je zde rovněž studována poprvé. Tento taxon ze série *Discolores* se vyznačuje tetraploidii a chromozómovým počtem  $2n = 27 + \text{fragment}$ ; heteromorfní pár chromozómů v jeho karyotypu je tvořen jedním velkým submetacentrickým chromozómem a fragmentem. Tato zvláštnost, pozorovaná u rostlin pocházejících ze všech jedenácti navštívených lokalit, je zřejmě následkem translokace Robertsonovského typu a je pro tento druh charakteristická (největší vzdálenost mezi uvedenými lokalitami dosahovala téměř 150 km). Naše zjištění doplňuje dosud sporadické publikované údaje o drobných přestavbách karyotypu, vztahující se k planě rostoucím druhům rodu *Rubus*. U 13 zbývajících druhů byl potvrzen chromozómový počet shodující se s údaji v literatuře, zjištěnými u rostlin z jiných částí jejich areálů.

Pro všechny pojednávané druhy jsou zmíněny údaje o charakteru jejich celkového areálu a o výskytu v České republice, zvláště pokud přibýly nové chorologické poznatky, doplňující zpracování rodu *Rubus* v Květeně ČR, svazek 4 z r. 1995. Taxonomické poznámky jsou uvedeny pro *R. elatior*, zahrnující v Květeně ČR dva druhy, kde se taxonomická problematika dále zkomplikovala popsáním nového druhu *R. perperus* H. E. Weber 1996. Doplnky o chorologii jednotlivých druhů jsou uvedeny u *R. elatior*, *R. nemoralis*, *R. wimmerianus*, *R. thelybatos*, *R. brdensis* a *R. josefianus*. Zdomácnělý druh *R. xanthocarpus* na své jediné lokalitě v ČR v posledních 20 letech podstatně ustoupil. Pro *R. gliviciensis* je v jeho jméně pro druhové epitheton užitá orthografická varianta „gliviciensis“ (oproti „glivicensis“).

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