Chromosome number variation in the genus *Rubus* in the Czech Republic. II.

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

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Krahulcová A. et Holub J. (1997): Chromosome number variation in the genus *Rubus* in the Czech Republic. II. – Preslia, Praha, 69: 289–310.

Chromosome numbers are given for 26 species representing predominantly the subgenus *Rubus* (23 species) as well as the subgenera *Chamaerubus* (1 species) and *Idaeobatus* (2 species). The plants studied were collected from 84 localities in the Czech Republic (Bohemia and Moravia). Five ploidy levels were found including diploids (two species), triploids (five species), tetraploids (fifteen species), pentaploids (three species) and one octoploid: both diploids and the single octoploid do not belong to the subgenus *Rubus*. The chromosome numbers in the following thirteen species of the subgenus *Rubus* are reported here for the first time: *R. graecensis* Maurer, *R. henrici-egonis* Holub, *R. austromoravicus* Holub, *R. crispomarginatus* Holub (all triploid species, 2n = 21); *R. micans* Godron, *R. caflischii* Focke, *R. chaerophyllus* Sag. et W. Schultze, *R. vratnensis* Holub, *R. centrobohemicus* Holub, *R. epipsilos* Focke, *R. bavaricus* (Focke) Hruby, *R. lusaticus* Rostock and *R. lividus* G. Braun (all tetraploid species, 2n = 28). In addition to chromosome numbers, data on the geographical distribution of the species studied are also briefly mentioned. *Rubus caflischii* is reported here for the first time from the area of the Czech Republic (Český les Mts). *Rubus graecensis* was found as a new plant for Bohemia. *Rubus micans* occurs in the Czech Republic separated by a large hiatus of more than 700 km from its distribution in western Europe; it is also recorded as a new plant for the flora of Poland. The species *R. caflischii*, *R. lividus*, *R. lusaticus* and *R. micans* are known only from one locality each in the Czech Republic. All earlier data on *R. grossus* H. E. Weber 1989 from the Czech Republic belong to the newly described species *R. kuleszae* Zieliński 1996. *R. crispomarginatus* was found also in Germany and Austria as a new plant for the flora of these countries. A description of a new taxon – ser. *Idaei* Holub – belonging to subgen. *Idaeobatus* is given.

Keywords: Chromosome numbers, *Rubus*, distribution, Czech Republic

Introduction

This paper, the second of an intended series, gives karyological information about an additional group of species comprising the rich bramble flora of the Czech Republic (91 species in Holub 1995; further taxa under study). The material for karyological examination and the methods used have been already described (Krahulcová et Holub 1997). In this work, in addition, stem cuttings collected in the field and allowed to take root in the glasshouse were also used to obtain the root-tip meristems. Several plants used for chromosome counts in *R. henrici-egonis*, *R. austromoravicus*, *R. chaerophyllus*, *R. vratnensis*, *R. epipsilos*, *R. kuleszae* and *R. fabrimontanus* were obtained in this way. Young stem-tips were used as the source of meristematic tissue in *R. idaeus*. In comparison with the first paper, the coordinates characterizing individual localities are given. They are determined with the accuracy to ten seconds. The herbarium specimens are deposited in the collections of the authors, Institute of Botany, Průhonice.

Results and discussion

Subgen. *Chamaerubus* O. Kuntze

1. *Rubus chamaemorus* L. 2n = 56 (Fig. 2a)
Linnaeus Sp. Pl., 494, 1753.

Locality:

1. NE Bohemia; Krkonoše Mts; distr. Trutnov; in the eastern part of "Úpská rašelina" peatbog, 4.5 km NNW of Pec pod Sněžkou village, 1430 m a.s.l., 50°44'20"N, 15°42'50"E. Coll. L. Papáčková 20. 6. 1996.

The octoploid level found in this species is known from various places over its wide area of distribution. The same chromosome number was reported during the last 20 years from Great Britain (Hollingsworth et al. 1992), Norway (Engelskjön 1979), Poland (Skalińska et al. 1978), Byelorussia (Dmitrieva et Parfenov 1985), South Siberia (Krogulevič et Rostovceva 1984), northeastern Russia (Žukova 1982, Krogulevič et Rostovceva 1984) and from Canada (Löve et Löve 1982).

This circumpolar subarctic species is confined in the Czech Republic to the Krkonoše Mts, where it occurs at altitudes from 1235 m to 1430 m a.s.l. in subalpine peat bogs on the open plateaus (mountain peneplain). It is usually reported there from four localities (Holub 1995); after new finds and using the new more correct toponymy within this range, seven localities for *R. chamaemorus* are now known in this area (Soukupová et al. 1991). In the last mentioned publication the ecocoenological character of the occurrence of cloudberry in the Krkonoše Mts is also described and compared with that in Fennoscandia. The occurrence in the Krkonoše Mts is very isolated from its main centres of distribution. The nearest existing localities of cloudberry are situated in Oldenburg (northwestern Germany) and in Polish Pomerania. The earlier localities recorded from southwestern Germany are also isolated but they no longer exist. The occurrence on Mt. Hoher Meissner dates from the preceding century. The data from the Rhön Mts and the Schwarzwald Mts are uncertain as to their accuracy (cf. Weber 1995). *R. chamaemorus* – together with *Pedicularis sudetica* Willd. and *Saxifraga nivalis* L. – are considered to be relicts from the Glacial period in the flora of the Krkonoše Mts.

Subgen. *Idaeobatus* Focke

Sect. *Idaeus* S. F. Gray

Ser. *Idaei* Holub

2. *Rubus idaeus* L. 2n = 14
Linnaeus Sp. Pl., 492, 1753.

Locality:

1. C Bohemia; distr. Praha-východ; Říčany town, on the wood margin along the road on the eastern periphery of the town, 420 m a.s.l., 49°59'40"N, 14°41'30"E. Coll. J. Holub and A. Krahulcová 11. 7. 1995.

R. idaeus occurs almost exclusively as a diploid (for a survey of literature data see e.g. in Thompson 1997). In addition, several triploid and tetraploid varieties and cultivars of

R. idaeus have arisen spontaneously (Pratt et al. 1958, Thompson 1997). Three of the tetraploid varieties originating from northeastern Asia and included previously in this species (var. *melanolasius* Focke, var. *sibiricus* Kom. and var. *sachalinensis* (Lév.) Focke), are now classified as a separate species *R. sachalinensis* Lév. (Thompson 1997). The diploid chromosome number in *R. idaeus* was also reported from another locality in Central Bohemia, situated in the valley of the Sázava river (Měsíček et Jarolímová 1992).

Broadly circumscribed *R. idaeus* is a circumpolar species (or rather a circumpolar aggregate species); defined more narrowly, *R. idaeus* L. s.s. represents a Euro-West-Asian species. In addition to Europe, the Caucasus and West Siberia, its distribution area also comprises areas of Central Siberia and the mountain ranges of Central Asia. In Central Europe it is a widespread species; in the Czech Republic it is known in all 99 districts of the phytogeographical division used in the work "Květena České republiky" (Flora of the Czech Republic). It is cultivated in a series of cultivars (morphologically differing from the type of the wild plant), which sometimes escape from cultivation and may establish themselves in the wild. The diploid *R. idaeus* s.s. is partly substituted in Asia by the tetraploid taxon – *R. sachalinensis* Lév.; this species extends westwards as far as the eastern part of European Russia and overlaps with the eastern distribution area of *R. idaeus* s.s.

In Central Europe, *R. idaeus* is the only representative of the ser. *Idaei* (cf. Holub 1995: 82); syn.: ser. *Eu-idaei* Focke, Bibl. Bot. 72: 131, 1911. The nomenclature of this series is not very clear; Weber (1995: 309) would accept the name ser. *Weiheana* Tratt. Ros. Monogr. 3: 2, 1823 (the quotation is corrected here by J. Holub). The names of eight series by Trattinnick have not yet been typified and their problems will be solved elsewhere (Holub, in prep.); for ser. *Weiheana* the species *R. parvifolius* L. is proposed here as its type. As the name ser. *Idaei* Holub 1995 was not published as a valid name, its formal description follows:

Rubus L. ser. _Idaei_ Holub, ser. nova

Frutices dense aciculati glandulosique vel glabri, absque aciculis et glandulis. Folia ternata vel pinnato--quinata; foliolis subtus plerumque albo-tomentosis. Inflorescentiae breves; flores parvi, inconspicui; petali erecti.

Typus: *Rubus idaeus* Linnaeus 1753.

Ser. *Occidentales* Focke

3. *Rubus occidentalis* L. 2n = 14
Linnaeus Sp. Pl., 493, 1753.

Locality:

1. C Moravia; distr. Přerov; Kojetín town, the plant cultivated in a garden, 190 m a.s.l., 49°21'00"N, 17°18'40"E. Coll. B. Trávníček 15. 10. 1996.

The plant examined is diploid, which corresponds to four literature references cited by Thompson (1997) and by Goldblatt et Johnson (1996).

Sometimes cultivated in the Czech Republic; no escapes from cultivation nor an established occurrence are known in this country.

Subgen. *Rubus*

Sect. *Rubus*

Subsect. *Rubus* (Syn.: *Rubus* L. sect. *Suberecti* Lindl.)

4. *Rubus graecensis* Maurer 2n = 21 (Fig. 1a)
Maurer, Oesterr. Bot. Zeitschr. 115: 224, 1968.

Localities:

1. E Bohemia; distr. Ústí n. Orlicí; in the woods on Chlum hill (350 m), 2 km S of Choceň town, 335 m a.s.l., 49°58'50"N, 16°13'20"E. Coll. J. Holub 22. 9. 1996.
2. C Moravia; distr. Olomouc; in the wood beside the road 1 km N of Obectov village, ca. 5 km S of Mohelnice town, 340 m a.s.l., 49°43'50"N, 16°56'10"E. Coll. B. Trávníček 19. 10. 1995.
3. C Moravia; distr. Olomouc; on the wood margin beside the road between the villages of Velký Újezd and Kozlov, ca. 1.3 km NE of Velký Újezd village, 380 m a.s.l., 49°35'00"N, 17°30'10"E. Coll. B. Trávníček 10. 10. 1996.

The chromosome number in *R. graecensis* is here reported for the first time. The plants from all three localities were proved to be triploids.

The species was originally described by W. Maurer from Styria from the hills on the margin of the Eastern Alps. It occurs commonly in Styria and transgresses from there to neighbouring areas in southern Burgenland, Carinthia and northern Slovenia. Initially it was considered to be an endemic plant confined to the eastern and western hills of Styria (Maurer 1973: 384). In the 1980s J. Holub found this species in several localities in North Moravia and Moravian Silesia (localities are listed in Holub 1995). At that time it was thought to be a new species of the group *Suberecti*, for which the working name "*Rubus subvelutinellus* Holub" was used at communication with other botanists. Its identity with *R. graecensis* was determined by Professor H. E. Weber later. More recently Weber (1995) mentions small differences between Styrian and Moravian plants of this species in the indumentum of the lower surface of leaves. Comparison with the material from Styria sent to the second author of this publication by W. Maurer confirmed the taxonomic identity of the plants from the two regions. A hiatus exists between the two known areas of its distribution including Lower Austria and South Moravia. *R. graecensis* was later found close to the border between the Czech Republic and Poland (Prstná near Petrovice u Karviné – leg. J. Holub and B. Trávníček) and this species is now also recorded from Poland (Zieliński in Mirek et al. 1995). In 1996 the species was found also in East Bohemia in the vicinity of the town of Choceň (independently by B. Trávníček and J. Holub) as a new plant for Bohemia; the karyologically studied material also originates from there (loc. no 1). Surprisingly in 1997 plants similar to the species (and most probably identical with it) were found in an isolated locality in Central Bohemia near the village of Orlík (leg. J. Holub et B. Trávníček).

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

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

5. *Rubus armeniacus* Focke 2n = 28 (Fig. 1b)
Focke, Abh. Naturwiss. Ver. Bremen 4: 183, 1874.

Localities:

1. N Bohemia; distr. Děčín; in Janov village 3 km SE of Hřensko town, 300 m a.s.l., 50°51'30"N, 14°16'10"E. Coll. J. Holub and A. Krahulcová 10. 10. 1996.
2. N Bohemia; distr. Liberec; at the N edge of Dolní Sedlo village 2 km SSW of Hrádek nad Nisou town, 350 m a.s.l., 50°50'00"N, 14°50'20"E. Coll. J. Holub and A. Krahulcová 11. 10. 1996.
3. C Moravia; distr. Kroměříž; Chropyně town, close to the railway station, 190 m a.s.l., 49°22'00"N, 17°21'40"E. Coll. B. Trávníček 10. 9. 1995.
4. SE Moravia; distr. Uherské Hradiště; along the road ca. 0.7 km NNW of Velehrad town, 220 m a.s.l., 49°06'40"N, 17°23'30"E. Coll. B. Trávníček and A. Krahulcová 17. 10. 1996.

The same chromosome number corresponding to the tetraploid level was published by Gustafsson (1943), who examined cultivated plants from Sweden. In recent years tetraploidy was confirmed in *R. armeniacus* collected in Poland (Boratyńska 1995b) as well as in cultivated plants originating from the Caucasus, Russia (Thompson 1995).

The species does seem to be more frequently cultivated in the Czech Republic now. It has escaped from cultivation and is established in some localities. Its occurrence in this country is dispersed and is confined principally to the areas of the Thermophyticum phytogeographical region and to lower elevations of the Mesophyticum.

6. *Rubus grabowskii* Weihe 2n = 21 (Fig. 2b)

Weihe in Günther et al. Sched. Cent. Pl. Siles. Exsicc., 14, sine no., 1827.

Localities:

1. C Bohemia; distr. Mladá Boleslav; in the wood SW of Bezděčín village, S of Chrást settlement, ca. 225 m a.s.l., 50°23'00"N, 14°52'50"E. Coll. J. Holub 12. 11. 1994.
2. C Bohemia; distr. Mladá Boleslav; on wood margins near the gamekeeper's lodge of Ovčín (Nový Dvůr), E of Kbel village near Benátky nad Jizerou town, 235 m a.s.l., 50°17'50"N, 14°52'30"E. Coll. J. Holub 22. 10. 1994.
3. C Moravia; distr. Kroměříž; on the SE edge of the wood of "Rasina", beside the road 1 km SW of Kyselovice village, 190 m a.s.l., 49°22'10"N, 17°23'40"E. Coll. B. Trávníček 26. 9. 1996.
4. C Moravia; distr. Kroměříž; on the woodland edge close to the military installation 1.4 km NNE of Nětčice village, 300 m a.s.l., 49°15'40"N, 17°19'20"E. Coll. B. Trávníček 8. 10. 1996.

The chromosome number 2n = 3x = 21 is in agreement with most of literature data concerning this species. Earlier papers report this chromosome number in wild material from Scandinavia (Gustafsson 1939, plants under the name of *R. thyrsanthus* Focke) and from Switzerland (Christen 1950, plants under the name of *R. thyrsoideus* Wimmer). In recent years Boratyńska (1996) confirmed the triploid chromosome number in plants of *R. grabowskii* originating from 10 localities in Poland. The other chromosome numbers published previously in the literature seem to belong to other species, probably related to *R. grabowskii*: Heslop-Harrison (1953) gives a tetraploid number 2n = 28 in plants from Great Britain (under the name of *R. thyrsanthus* Focke), where, according to present knowledge, this species does not occur. In addition, Marks (1952) presents a pentaploid number (2n = 35) in material of garden origin (under the name of *R. thyrsoideus* Wimmer). Its taxonomic identity is not clear.

In the Czech Republic, the occurrence of the species is dispersed; it is locally common, but in large areas it is absent or occurs only rarely.

7. *Rubus henrici-egonis* Holub 2n = 21 (Fig. 1c)
Holub, Folia Geobot. Phytotax. 26: 334, 1991.

Localities:

1. C Bohemia; distr. Mladá Boleslav; in the wood beside the Praha – Mladá Boleslav highway, 0.5–1 km NW of Skorkov village, 220 m a.s.l., 50°14'20"N, 14°44'40"E. Coll. J. Holub and A. Krahulcová 7. 8. 1996.
2. S Bohemia; distr. Strakonice; along the road on the NE edge of Sedlice village, ca. 7 km SE of Blatná town, 500 m a.s.l., 49°22'50"N, 13°56'50"E. Coll. J. Holub and A. Krahulcová 3. 10. 1996.
3. 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.
4. S Moravia; distr. Brno-venkov; close to the woodland path 1 km NNW of the crossing in the W part of Zbraslav village, 490 m a.s.l., 49°13'50"N, 16°16'30"E. Coll. B. Trávníček 18. 9. 1995.

This is the first chromosome number reported for this triploid species described from the territory of the Czech Republic in recent years (Holub 1991).

The species was described from the Železné hory Hills in East Bohemia. One of the plants examined (loc. no 3) originates from the region including the type locality of this species. It occurs mostly in Central and East Bohemia and is dispersed in Moravia. It is absent from western and northwestern Bohemia and in the southern half of Bohemia the species is very rare, only three isolated localities being known (two are mentioned in Holub 1995 – Votice, České Budějovice). Material from the third locality found at Sedlice near Blatná by J. Holub in 1996 was studied karyologically (loc. no 2).

8. *Rubus austromoravicus* Holub 2n = 21 (Fig. 1d)
Holub, Folia Geobot. Phytotax. 26: 335, 1991.

Localities:

1. E Bohemia; distr. Chrudim; along the road between the villages of Podlažice and Dobrkov, 3 km E of Chrast village, 300 m a.s.l., 49°53'40"N, 15°58'30"E. Coll. J. Holub and A. Krahulcová 27. 9. 1996.
2. S Moravia; distr. Brno-venkov; Tišnov town, along the woodland path 0.9 km SW of the railway station, 330 m a.s.l., 49°20'30"N, 16°24'40"E. Coll. B. Trávníček and A. Krahulcová 18. 10. 1996.
3. S Moravia; distr. Třebíč; Kladeruby n. Oslavou village, on the edge of the wood beside the road 0.7 km W of the village, 420 m a.s.l., 49°08'40"N, 16°09'50"E. Coll. B. Trávníček and A. Krahulcová 18. 10. 1996.
4. S Moravia; distr. Znojmo; in the wood clearing along the road 1.5 km E of Mikulovice village, 350 m a.s.l., 48°57'30"N, 16°07'00"E. Coll. B. Trávníček and J. Holub 20. 9. 1995.
5. S Moravia; distr. Znojmo; along the path in the wood 2.2 km WWS of Hradiště settlement on the SW periphery of Znojmo town, 360 m a.s.l., 48°51'10"N, 16°00'30"E. Coll. B. Trávníček and J. Holub 19. 9. 1995.

The chromosome number of triploid *R. austromoravicus*, described recently (Holub 1991), is given in this paper for the first time.

The species was described from South Moravia, where it is common in the area westwards to Moravské Budějovice and Olešnice at Kunštát and eastwards to the surroundings of the towns of Hodonín and Zlín; it occurs also in Central Moravia in the vicinity of Prostějov. A northernmost isolated locality occurs near Bílovec. An isolated small area is also found in East Bohemia (several localities are known there); the studied material was collected from there (loc. no 1). Isolated localities were found surprisingly by J. Holub in South Bohemia near Strakonice in 1996 and in West Bohemia near Mýto in 1997. Weber (1995) records the species from Machov in northeastern Bohemia. This

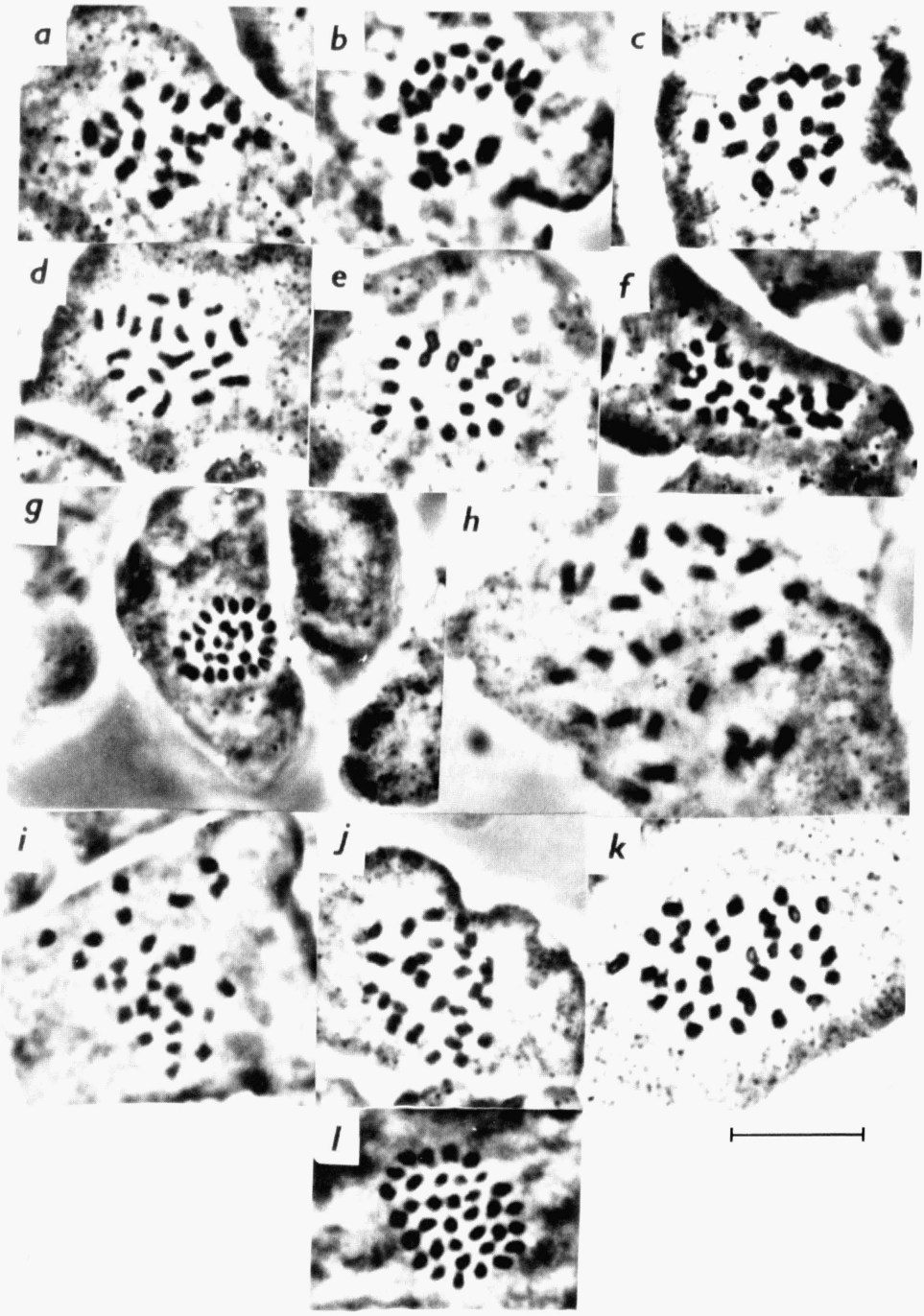

Fig. 1. – Microphotographs of somatic mitoses in 12 species of the genus *Rubus* – a: *Rubus graecensis* Maurer, 2n = 21; b: *Rubus armeniacus* Focke, 2n = 28; c: *Rubus henrici-egonis* Holub, 2n = 21; d: *Rubus austromoravicus* Holub, 2n = 21; e: *Rubus crispomarginatus* Holub, 2n = 21; f: *Rubus angustipaniculatus* Holub, 2n = 28; g: *Rubus vratnensis* Holub, 2n = 28; h: *Rubus rudis* Weihe, 2n = 28; i: *Rubus bavaricus* (Focke) Hruby, 2n = 28; j: *Rubus lusaticus* Rostock, 2n = 28; k: *Rubus fabrimontanus* Spribille, 2n = 35; l: *Rubus kuleszae* Zieliński, 2n = 35. [Scale bar = 10 μm].

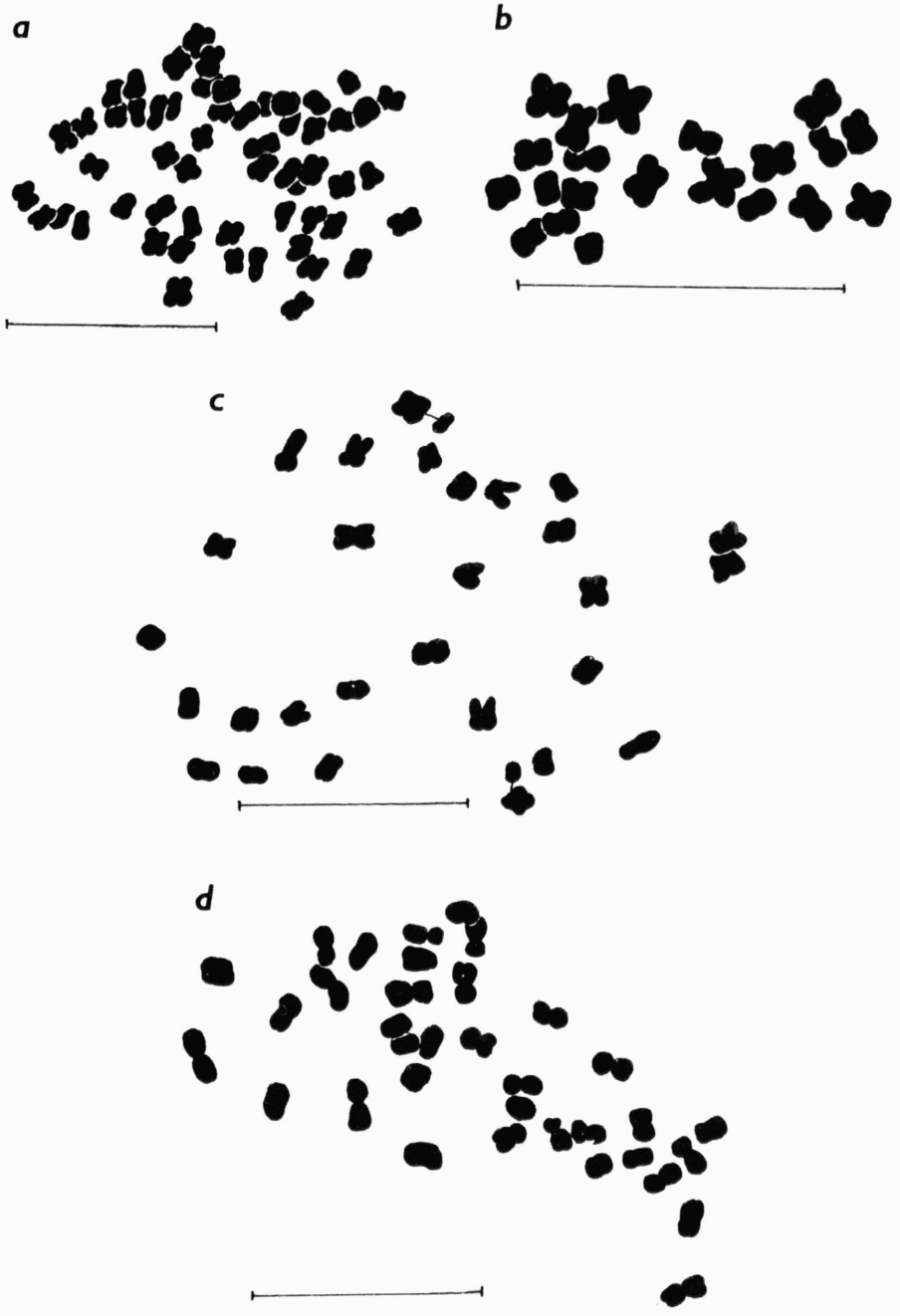

Fig. 2. – Drawings of somatic metaphases in four species of the genus *Rubus* – a: *Rubus chamaemorus* L., 2n = 56; b: *Rubus grabowskii* Weihe, 2n = 21; c: *Rubus centrobohemicus* Holub, 2n = 28; d: *Rubus pedemontanus* Pinkwart, 2n = 35. [Scale bars = 10 μm].

record requires a revision. From its main distribution area in South Moravia *R. austro-moravicus* transgresses to the northern part of Lower Austria, where it is known from several localities (leg. W. Maurer, det. J. Holub). The datum on the occurrence in Slovakia (Štúrovo = Parkáň; Holub 1991, 1995) is uncertain and requires taxonomic revision. However, plants similar to this species were collected in southwestern Slovakia at the village Brezová pod Bradlom (leg. Mácal, 1936, BRNU).

9. *Rubus crispomarginatus* Holub 2n = 21 (Fig. 1e)
Holub, Folia Geobot. Phytotax. 26: 336, 1991.

Localities:

1. C Bohemia; distr. Kolín; in woods NE of Kolín town, 2 km E of Kolín-Zálabí, 220 m a.s.l., 50°02'30"N, 15°14'30"E. Coll. J. Holub 11. 11. 1995.
2. C Bohemia; distr. Kolín; in the wood 1 km E from the settlement of Hradec between the villages of Stříbrná Skalice and Jevany, 415 m a.s.l., 49°55'40"N, 14°50'50"E. Coll. J. Holub and A. Krahulcová 6. 10. 1995.
3. C Bohemia; distr. Kutná Hora; in the wood beside the road between the villages of Dojetřice and Choratice, 2.5 km SW of Sázava town, 450 m a.s.l., 49°51'40"N, 14°52'10"E. Coll. J. Holub and A. Krahulcová 6. 10. 1995.
4. C Bohemia; distr. Benešov; Bělčice village, along the road close to the underpass of the Praha – Brno highway, 460 m a.s.l., 49°50'30"N, 14°48'30"E. Coll. J. Holub and A. Krahulcová 13. 10. 1995.
5. C Moravia; distr. Olomouc; on the edge of the wood 0.8 km SEE of Tovéř village, 300 m a.s.l., 49°38'20"N, 17°20'00"E. Coll. B. Trávníček 3. 10. 1996.
6. N Moravia (Silesia); distr. Frýdek-Místek; Třinec town, on the woodland edge on the SW slope of Osůvka hill, ca. 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 chromosome number in this species, described recently (Holub 1991), has not been reported in the literature up to now. All plants studied proved to be triploid.

A long time neglected species, though morphologically very distinct, so that it is usually possible to determine it safely as a sterile plant. In the Czech Republic it is scattered but very rare in South Bohemia (an isolated locality occurs in the Upper Otava valley at the village of Anín, south of the town of Sušice). In addition to the area of the Czech Republic, *R. crispomarginatus* occurs also in Poland (many localities) and in Slovakia; in the latter country in addition to its occurrence in the southwest (Malé Karpaty Mts), from where it has already been mentioned in its original description, it occurs also in South and East Slovakia (B. Trávníček, in verbis). In northwestern Bohemia it occurs at Děčín near to Saxony (Horní Žleb; Loubí). A sheet with this species was found in the material studied by J. Zieliński in Kórnik. It was collected by the well-known batologist G. Hoffmann at the beginning of this century at Thürmsdorf near the river Elbe, between the towns of Wehlen and Königstein, thus being in a close connection with the above mentioned occurrence in northwestern Bohemia. During a cursory visit of this locality by J. Holub in 1995 the species was not found there. The species was found also in Austria in the surroundings of Vienna in older herbarium material (Heuberg bei Dornbach, leg. 1857 J. N. Bayer, BRNU). In Moravia *R. crispomarginatus* occurs close to the Austrian border along the river Dyje (in German: Thaya) between the towns of Znojmo and Vranov, so that its occurrence in adjacent areas of Lower Austria is very probable. The data on the occurrence of this species in Germany and Austria represent new records of this plant for the flora of these countries.

Ser. *Rhamnifolii* (Bab.) Focke

10. *Rubus angustipaniculatus* Holub 2n = 28 (Fig. 1f)
Holub, Folia Geobot. Phytotax. 26: 339, 1991.

Localities:

1. N Bohemia; distr. Děčín; Děčín town, on the meadow edge above the railway in the suburb of Prostřední Žleb, 150 m a.s.l., 50°48'40"N, 14°13'20"E. Coll. J. Holub and A. Krahulcová 10. 10. 1996.
2. C Bohemia; distr. Praha-západ; Radlík village, along the road to Psáry village, 410 m a.s.l., 49°55'00"N, 14°30'10"E. Coll. J. Holub and A. Krahulcová 20. 10. 1995.
3. C Moravia; distr. Olomouc; Olomouc town, along the railway to Senice village, ca. 0.8 km SW of the main railway station, 210 m a.s.l., 49°35'10"N, 17°16'30"E. Coll. B. Trávníček 23. 10. 1995.
4. NE Moravia (Silesia); distr. Frýdek-Místek; Třinec town, along the path on the woodland edge ca. 1.8 km E of the railway station, 380 m a.s.l., 49°41'00"N, 18°41'20"E. Coll. B. Trávníček 10. 10. 1996.

The same tetraploid chromosome number is given to this species by Boratyńska (1994) from four localities in Poland (under the name of *R. pyramidaliformis* (Sudre) Zieliński).

A recently described species distinguished by its narrow and elongated inflorescence, which is dispersed in Bohemia except for the southern part. The southern line of its distribution is given by the following points: Radnice – Zbiroh – Radlík – Jevany – Železné hory Hills. It occurs more frequently in East Bohemia and in the northern half of Moravia (incl. Moravian Silesia); it is rare in South Moravia. The material studied karyologically comes also from marginal localities of the distribution area of the species in Bohemia, e.g. one of the westernmost occurrences of the species (loc. no 1, Děčín), and from the southern limit of its occurrence (loc. no 2, Radlík). The problems of nomenclature of this species will be discussed elsewhere (Holub, in prep.).

Ser. *Vestiti* (Focke) Focke

11. *Rubus vestitus* Weihe 2n = 28
Weihe in Bluff et Fingerhuth Compend. Fl. Germ. 1: 624, 1825.

Localities:

1. C Bohemia; distr. Mladá Boleslav; in the wood NW of Skorkov village, ca. 220 m a.s.l., 50°14'20"N, 14°44'40"E. Coll. J. Holub 21. 10. 1994.
2. E Bohemia; distr. Rychnov nad Kněžnou; on the edge of the wood of "Červíkov" 0.5 km SE of Hoděčín village, 310 m a.s.l., 50°09'30"N, 16°10'10"E. Coll. J. Holub and A. Krahulcová 27. 9. 1996.
3. E Moravia; distr. Zlín; Hostýnské vrchy Hills; on the edge of the wood on the NE periphery of Veliková village, 390 m a.s.l., 49°17'00"N, 17°45'50"E. Coll. B. Trávníček and A. Krahulcová 17. 10. 1996.

The tetraploid chromosome number corresponds to three reports given previously from Sweden (Gustafsson 1939), Switzerland (Christen 1950) and the Netherlands (Beijerinck 1956).

The distribution of *R. vestitus* in the Czech Republic is isolated and disjunct; it is known to occur in three small areas – Central Bohemia (Skorkov), East Bohemia (vicinity of the town of Rychnov nad Kněžnou) and East Moravia (near Zlín). Material from each of these areas was at our disposal for karyological investigation. The localities of *R. vestitus* in the Czech Republic are placed on the eastern limit of its distribution. Only plants with rose-coloured petals occur in the Czech Republic.

Ser. *Micantes* Sudre

12. *Rubus micans* Godron 2n = 28
Godron in Grenier et Godron Fl. Fr. 1: 546, 1848.

Locality:

1. C Moravia; distr. Olomouc; Šternberk town, on the edge of the grove ca. 0.4 km N of the gamekeeper's lodge of Aleš, 2 km S of the town, 300 m a.s.l., 49°42'30"N, 17°18'10"E. Coll. B. Trávníček and A. Krahulcová 16. 10. 1996.

This is the first chromosome number reported for this species.

The species is known from only one locality in the Czech Republic where it is very rare. It was surprising to find this West European species in a very isolated site in Central Moravia at Šternberk (leg. V. Pluhař et B. Trávníček). It was determined later (via J. Holub) by Professor H. E. Weber (Holub 1993, 1995; Weber 1995). The locality was visited and revised by J. Holub in 1992. Its main area of distribution extends from Great Britain to France and West Germany – including the Vosges Mts, the Saar, Rhineland-Pfalz and northwestern Holstein. The nearest localities are 720–750 km distant from the Moravian site. A similar geographically isolated site was recently found and determined by Professor H. E. Weber in older *Rubus* collections of the herbarium in Nürnberg at the fifth Bavarian batological meeting at the Rhön Mts (vidi, J. Holub). The material was collected by Spribille at the beginning of this century near the town of Prudnik (in German: Neustadt) in Polish Silesia close to the border with the Czech Republic (cf. Holub 1997: 151). This newly found locality is ca. 70 km distant from the Moravian site at Šternberk; the species is new for the flora of Poland. Recent confirmation of this occurrence is lacking.

13. *Rubus caflischii* Focke 2n = 28
Focke Syn. Rub. Germ., 278, 1877.

Locality:

1. W Bohemia, distr. Tachov; Halže village near Tachov town, in the wood beside the road towards to the settlement of Žďár 0.75 km N of Halže village, 620 m a.s.l., 49°50'20"N, 12°35'10"E. Coll. J. Holub and A. Krahulcová 4. 10. 1996.

The chromosome number in *R. caflischii* is reported here for the first time. The chromosome number of this species was published earlier by Gustafsson (1943) – 2n = 28; this record was inserted by Weber (in Thompson 1997: 155) among taxonomically uncertain cases, and our finding should therefore be considered as the first certain determination of the chromosome number of this species.

R. caflischii represents a new species for the flora of the Czech Republic, found and collected by J. Holub in 1995 and then determined by Professor H. E. Weber. It is therefore not included in the monographic study of brambles of the Czech Republic (Holub 1995); the possibility of its occurrence in this country was, however, already predicted there (l.c., p. 138). Regarding its general distribution, the species is confined mostly to Bavaria from where it probably transgresses to adjacent Upper Austria. Our locality is situated ca. 6 km from the state border between Bohemia and Bavaria (in the area, which was not accessible to the public during the preceding political régime). The next nearest locality

of *R. caflischii* in Bavaria is ca. 35–40 km distant from our site (see Schönfelder et Bresinsky 1990, map no 652).

14. *Rubus silesiacus* Weihe 2n = 28

Weihe in Günther et al. Sched. Cent. Pl. Siles. Exsicc., 14, sine no., 1827.

Localities:

1. C Bohemia; distr. Rakovník; the protected landscape area "Křivoklátsko"; in the wood close to the bus stop "U ručiček" ca. 2 km S of Skryje village, 420 m a.s.l., 49°56'50"N, 13°46'00"E. Coll. J. Holub and A. Krahulcová 27. 10. 1995.
2. C Bohemia; distr. Praha-západ; in the wood on the E slope of Vyhlídka hill 1 km N of Slapy village, 420 m a.s.l., 49°49'20"N, 14°23'50"E. Coll. J. Holub and A. Krahulcová 2. 10. 1996.
3. E Bohemia; distr. Pardubice; Železné hory Hills; beside the road near the quarry 1.2 km SE of Zdechovice village, 350 m a.s.l., 50°00'20"N, 15°29'00"E. Coll. J. Holub and A. Krahulcová 27. 9. 1996.
4. C Moravia; distr. Prostějov; in the quarry 0.8 km SWW of Kobeřice village, 240 m a.s.l., 49°22'10"N, 17°06'20"E. Coll. B. Trávníček and A. Krahulcová 16. 10. 1996.
5. S Moravia; distr. Znojmo; along the woodland path 2 km NW of Hnanice village, 340 m a.s.l., 48°48'40"N, 15°58'20"E. Coll. J. Holub and B. Trávníček 19. 9. 1995.

The same tetraploid chromosome number is given in *R. silesiacus* by Boratyńska (1995b) from Poland. *R. silesiacus* does not occur in the British Isles at all (Edees et Newton 1988) and therefore the record of 2n = 28 for this species by Heslop-Harrison (1953) must refer to another species or is taxonomically dubious.

The name *R. silesiacus* was used for a long time for *R. tabanimontanus* Figert and therefore the accurate distribution of this species is not sufficiently known. In the Czech Republic it occurs dispersed, mostly in central, northern and northeastern part of Bohemia. In West Bohemia an isolated locality is known in the surroundings of Plzeň – near the village of Dnešice (Holub 1995); in Moravia it is rare. The southernmost locality occurs there at Hnanice (loc. no 5), from where, according to Maurer's collection, it transgresses also into Austria (Retz – cf. Weber 1995); surprisingly, the species is not mentioned by Maurer in the new determination handbook for Austria (Adler et al. 1994). In Germany the species is absent and is replaced there by *R. geminatus* H. E. Weber.

15. *Rubus chaerophyllus* Sag. et W. Schultze 2n = 28

Sagorski et W. Schultze, Deutsche Bot. Monatsschr. 12: 1, 1894.

Localities:

1. C Bohemia; distr. Mladá Boleslav; in the wood near the farm Josefov between the villages of Brodce nad Jizerou and Luštěnice, 220 m a.s.l., 50°19'20"N, 14°54'10"E. Coll. J. Holub 22. 10. 1994.
2. C Bohemia; distr. Mladá Boleslav; in the wood beside the Praha – Mladá Boleslav highway, 0.5–1 km NW of Skorkov village, 220 m a.s.l., 50°14'20"N, 14°44'40"E. Coll. J. Holub and A. Krahulcová 7. 8. 1996.
3. S Bohemia; distr. České Budějovice; in the eastern part of Chlum hill (503 m) situated W of Chrášťany village near Bechyně town, 470 m a.s.l., 49°17'40"N, 14°22'00"E. Coll. J. Holub 11. 9. 1994.
4. S Bohemia; distr. Prachatice and Strakonice; in the wood along the road 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.

All plants studied proved to be tetraploids. The chromosome number in *R. chaerophyllus* is here probably given for the first time. The only report by Beijerinck (1956) about tetraploid *R. chaerophyllus* from the Netherlands is dubious, taking the present knowledge about the distribution of this species into consideration.

In the Czech Republic the species is restricted principally to northern, central and southern part of Bohemia. The plants studied karyologically originate from Central and South Bohemia. The general distribution area of this species corresponds to the western type of Central European distribution group of brambles and in the Czech Republic reaches its eastern limit (cf. Holub 1995). It extends from North Bavaria across Saxony to Brandenburg and from Bohemia to Polish Silesia and to the vicinity of Poznań. Weber (1995) records this species also from Moravian Silesia (surrounding of Opava) and from South Moravia (Hnanice); these two localities are unknown to Czech batologists and require revision. The eastern limit of occurrence in Bohemia is demarcated by the line: Dvůr Králové – Hořice – Beroun – Orlík – Bechyně – Písek.

16. *Rubus vratnensis* Holub 2n = 28 (Fig. 1g)
Holub, Preslia 64: 139, 1993.

Localities:

1. NW Bohemia; distr. Teplice; on the E edge of Přítkov village, on the woodland edge above the road to Krupka town, 330 m a.s.l., 50°40'50"N, 13°50'20"E. Coll. J. Holub and A. Krahulcová 9. 10. 1996.
2. NC Bohemia; distr. Mladá Boleslav; the protected area "Český ráj"; beside the road between the village of Podkost and the settlement of Kozlov, 0.75 km NW of Podkost village, 300 m a.s.l., 50°29'30"N, 15°08'00"E. Coll. J. Holub and A. Krahulcová 7. 8. 1996.
3. C Bohemia; distr. Mělník; in the wood N of Chloumek village, ca. 3 km NNE of Mělník town, 260 m a.s.l., 50°22'30"N, 14°30'40"E. Coll. J. Holub and A. Krahulcová 29. 10. 1996.
4. C Bohemia; distr. Kladno; Kožova hora hill, in the wood along the road from Braškov village to Kladno town, ca. 0.5 km N of the excursion restaurant, 430 m a.s.l., 50°07'10"N, 14°06'10"E. Coll. J. Holub and A. Krahulcová 29. 10. 1996.

The chromosome number in *R. vratnensis*, described in recent years (Holub 1993), was unknown up to now. The tetraploid number of 2n = 28 was found in all plants studied.

A very characteristic species known only from Bohemia. Some of its localities in northwestern Bohemia are situated very close to Germany (Saxony), e.g. locality no 1 and the locality near Chlumec u Chabařovic, lying at foot and on the slopes of the Krušné hory Mts. The material studied karyologically includes plants from the westernmost known locality (loc. no 1), as well as from the easternmost locality found recently by J. Holub in the Český ráj – Bohemian Paradise area (loc. no 2 – the species was represented there by only one individual). The course of determination of this morphologically distinct species, known originally from only a very small area and now known to occur over an area corresponding to that of a regional species, is mentioned in Holub (1997: 152). The number of localities listed in Holub (1993) has recently increased by the finding of further three localities. The plants from locality no 4 (Kladno) still require taxonomic investigation (colour of petals). The species epithet is derived from the name of the village of Vrátno; the name of the hill, Vrátenská hora, (with the type locality of the species at its foot) is also derived from the name of that village. The correct orthography of the species epithet is therefore *R. vratnensis* (cf. Weber 1995: 461).

17. *Rubus centrobohemicus* Holub 2n = 28 (Fig. 2c)
Holub, Folia Geobot. Phytotax. 26: 337, 1991.

Localities:

1. C Bohemia; distr. Příbram; in the wood situated above Eugenov village near Jince town, 470 m a.s.l., 49°47'50"N, 13°57'40"E. Coll. J. Holub 19. 11. 1994.
2. C Bohemia; distr. Praha-západ; in the wood on the E slope of Vyhlídka hill, 1 km N of Slapy village, 420 m a.s.l., 49°49'20"N, 14°23'50"E. Coll. J. Holub and A. Krahulcová 2. 10. 1996.
3. C Bohemia; distr. Benešov; in woods on the hill (382 m) NE of Měřín village, 360 m a.s.l., 49°47'30"N, 14°26'10"E. Coll. J. Holub 5. 11. 1994.
4. C Bohemia; distr. Benešov; Vrážský vrch hill 1–1.5 km N of Bělčice village, 430 m a.s.l., 49°51'10"N, 14°48'30"E. Coll. J. Holub and A. Krahulcová 13. 10. 1995.

The chromosome number of this tetraploid species, described recently from Central Bohemia (Holub 1991), has not been known previously.

An endemic plant of Bohemia with a relatively restricted distribution, extending 150 km West to East from Plzeň to Zbýšov, and ca. 60 km North to South from Rakovník and Praha to Příbram, with the greatest number of localities in the central Vltava and lower Sázava river basins. A morphologically distinct species (with long stalked glands several times longer than the tomentose indumentum of the inflorescence); it most closely resembles the species of the East Alpine hilly country in Styria – *R. styriacus* Halácsy.

Ser. *Radula* (Focke) Focke

18. *Rubus epipsilos* Focke 2n = 28
Focke Syn. Rub. Germ., 258, 1877.

Localities:

1. S Bohemia; distr. Prachatice and Strakonice; in the wood along the road 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.
2. S Bohemia; distr. Prachatice; on the edge of the wood close to the crossroads "U Ptáčníků", 2 km NNW of Netolice town, 490 m a.s.l., 49°04'00"N, 14°11'20"E. Coll. J. Holub and A. Krahulcová 3. 10. 1996.
3. S Bohemia; distr. Prachatice; Lhenice village, beside the road along the woodland edge 1 km SSW of the village, between the village and the chapel, 600 m a.s.l., 48°59'20"N, 14°08'50"E. Coll. J. Holub and A. Krahulcová 3. 10. 1996.

The same tetraploid level found in all the plants studied represents the first chromosome number reported for *R. epipsilos*.

The species occurs predominantly in Bavaria and slightly transgresses to adjacent areas of Austria – to North Tirolia and Upper Austria. In the Czech Republic it is known only from South Bohemia, where (as an Austral migrant) it has a limited distribution area in the surroundings of Netolice (Lomec, Netolice, Lhenice, Smědeč) and in the southern surroundings of České Budějovice (Kluk hill). Weber (1995), according to an earlier collection by J. Holub, also records a very isolated locality for this species from Central Moravia. This record requires confirmation.

19. *Rubus rudis* Weihe 2n = 28 (Fig. 1h)
Weihe in Bluff et Fingerhuth Compend. Fl. Germ. 1: 687, 1825.

Localities:

1. C Bohemia; distr. Beroun; in the wood near the top of the ski-piste "U vodárny", ca. 1.5 km SE of Hořovice town, ca. 380 m a.s.l., 49°49'50"N, 13°54'40"E. Coll. J. Holub and A. Krahulcová 27. 10. 1995.
2. C Bohemia; distr. Příbram; on the western periphery of Křešín village near Jince town, ca. 480 m a.s.l., 49°48'00"N, 13°56'40"E. Coll. J. Holub 19. 11. 1994.
3. E Bohemia; distr. Chrudim; in the wood 2.5 km SW of Slatiňany village at the crossroads "U Kochánek", 310 m a.s.l., 49°54'00"N, 15°47'40"E. Coll. J. Holub and A. Krahulcová 27. 9. 1996.
4. C Moravia; distr. Olomouc; on the woodland edge close to the road between the villages of Olešnice and Hrabí ca. 1.3 km NE of Olešnice village, 390 m a.s.l., 49°42'30"N, 16°57'10"E. Coll. B. Trávníček and A. Krahulcová 16. 10. 1996.

This species was first examined by Gustafsson (1943), who found the tetraploid level in plants of garden origin. Later, the same chromosome number of 2n = 28 was reported in *R. rudis* from Switzerland (Berger 1953) and the Netherlands (Beijerinck 1956).

This rarely dispersed species occurs in the Czech Republic mostly in Bohemia and only very rarely in the western part of Central Moravia. The material from locality no 4 originates from this latter area. Its occurrence in Bohemia is of an insular character. Localities known from the Czech Republic constitute part of the eastern limit of the general distribution of the species. North of the Sudeten Mts and Carpathians, *R. rudis* penetrates much further eastwards – as far as Lvov in West Ukraine. The map of the distribution of *R. rudis* in Weber (1995, state 1992) does not include several localities found recently in the Czech Republic, e.g. Železné hory Hills in East Bohemia, localities in Central and South Bohemia and the occurrence in Moravia. Recently the species was found also on Mt. Čerchov in the Český les Mts at an altitude of 850 m a.s.l., which represents the highest known locality of this species in the Czech Republic (leg. J. Holub; det. H. E. Weber).

Ser. *Hystrix* Focke

20. *Rubus bavaricus* (Focke) Hruby 2n = 28 (Fig. 1i)
Hruby in Polívka et al. Klíč Květ. Republ. Československ., 277, 1928.

Localities:

1. C Bohemia; distr. Praha-východ; Strašín village near Říčany town, in the wood between the village and the settlement of Vojkov, 420 m a.s.l., 49°59'30"N, 14°42'30"E. Coll. J. Holub and A. Krahulcová 6. 10. 1995.
2. SW Bohemia; distr. Domažlice; on the woodland edge on the E slope of the 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. Krahulcová 4. 10. 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. S Bohemia; distr. Prachatice; Lhenice village, beside the road along the woodland edge 1 km SSW of the village, between the village and the chapel, 600 m a.s.l., 48°59'20"N, 14°08'50"E. Coll. J. Holub and A. Krahulcová 3. 10. 1996.

The chromosome number in *R. bavaricus* is presented here for the first time. The plants from all four localities proved to be tetraploid.

According to its distribution area, this Central European species belongs to the western type of that distribution group; the main centre of its occurrence is in Bavaria. In the Czech Republic it transgresses only into Bohemia, where it occurs in its western, southwestern, southern and central parts; in the latter region it is known from the broader surroundings of Prague (the material from loc. no 1 originates from there). Its occurrence in Central Bohemia is isolated from that in southwestern and southern parts of Bohemia, a site in the phytogeographical district of the Central Vltava river basin at Soběd̆ráž acting as a link. The tomentose indumentum of the lower surface of the leaves is very variable in this species and *R. bavaricus* requires further study in this point.

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

21. *Rubus pedemontanus* Pinkwart 2n = 35 (Fig. 2d)
Pinkwart in Baenitz Herb. Eur., no 9550, 1898.

Localities:

1. SW Bohemia; distr. Domažlice; Český les Mts; the wood between the villages of Nemanice and Jindřichova Hora, 640 m a.s.l., 49°25'40"N, 12°43'50"E. Coll. J. Holub 16. 9. 1994.
2. C Bohemia; distr. Příbram; in the woods "Polesí Těně" SE of Strašice village, 510 m a.s.l., 49°43'10"N, 13°47'00"E. Coll. J. Holub 27. 10. 1994.
3. C Bohemia; distr. Příbram; Brdy Mts; in the wood "Za Borkem" near Borek settlement, SW of Obecnice village, 540 m a.s.l., 49°42'40"N, 13°56'20"E. Coll. J. Holub 15. 10. 1994.
4. C Bohemia; distr. Benešov; in the wood along the road between the villages of Ostředek and Divišov, ca. 2.5 km NNW of Divišov village, 420 m a.s.l., 49°48'40"N, 14°51'40"E. Coll. J. Holub and A. Krahulcová 13. 10. 1995.
5. S Moravia; distr. Brno-venkov; on the woodland edge on the W periphery of Radostice village, 300 m a.s.l., 49°08'10"N, 16°28'30"E. Coll. B. Trávníček and A. Krahulcová 18. 10. 1996.

Two ploidy levels, pentaploid and tetraploid, are reported for this species. Pentaploids characterized by a chromosome number of 2n = 35 are reported from Poland (Boratyńska 1995a) and Germany (Iwatsubo et al. 1995), and, under the name of *R. bellardii* Weihe et Nees, also from Sweden (Gustafsson 1943) and the Netherlands (Beijerinck 1956). Tetraploids (also under the name of *R. bellardii*) with a chromosome number of 2n = 28 are reported by Maude (1939) and Heslop-Harrison (1953) from Great Britain and by Czapik (1983, 1987) from Poland. From the literature cited above, it appears that the two ploidy levels are found only in Poland. A more detailed karyological study of this point is necessary.

A Central European species with a wide distribution, extending West–East from England to East Prussia (Kaliningradskaja oblasť) and from southeastern Sweden to the Alps (Switzerland and Vorarlberg in Austria). In the Czech Republic it reaches the eastern limit of its distribution. It is common in the western half of Bohemia and here and there in this area it is the most common species of the subgen. *Rubus*. In Moravia there is an isolated occurrence in the central part (Drahanská vrchovina Hills), from where the karyologically studied material from locality no 5 originates. It transgresses from the adjacent Polish Silesia to northeastern Moravia (Silesia). The eastern limit of the continuous distribution area in Bohemia is demarcated by the line : Krkonoše Mts – Chotěboř – Humpolec – Český Krumlov. Weber's distribution map in Hegi (Weber 1995, state 1992)

does not include the occurrence of *R. pedemontanus* in South (and South East) Bohemia nor the isolated occurrence in Central Moravia.

22. *Rubus lusaticus* Rostock 2n = 28 (Fig. 1j)
Rostock, Mittheil. Voigtl. Ver. Allg. Naturk. Reichenbach 4: 22, 1884.

Locality:

1. N Bohemia; distr. Děčín; the protected area "Labské pískovce"; beside the road in the wood "Bludiště" 2 km SE of Růžová village, 340 m a.s.l., 50°49'20"N, 14°18'50"E. Coll. J. Holub and A. Krahulcová 10. 10. 1996.

The chromosome number in *R. lusaticus* has not yet been determined.

R. lusaticus belongs to those species which are known in the Czech Republic from only one locality; it was found by J. Holub and determined by Professor H. E. Weber. An earlier record exists in the literature referring to a locality lying close to the site found by J. Holub (or identical with it ?). Weber (1995) challenges the occurrence of this species in the Czech Republic; this probably refers to another record in the literature on its occurrence in the Jizerské hory Mts. *R. lusaticus* has a disjunct distribution; in addition to its main occurrence in Upper Lusatia adjacent to North Bohemia including its only site in the Czech Republic, the species occurs in an isolated area in West Germany (East Westfalia); the taxonomic relationship of the plants from these two areas requires further study. With regard to the scarcity of the species in the Czech Republic (only one small local population of a few bushes only) the species deserves attention from the point of view of nature conservation.

23. *Rubus lividus* G. Braun 2n = 28
G. Braun Herb. Rub. Germ., no 18, 1877.

Locality:

1. NW Bohemia; distr. Karlovy Vary; beside the woodland path above the valley of Ohře river ca. 0.5 km SE of Boč village, 370 m a.s.l., 50°21'40"N, 13°05'30"E. Coll. J. Holub, J. Lorber and A. Krahulcová 9. 10. 1996.

This is the first chromosome number reported for *R. lividus*.

This species also belongs to those brambles having only one locality in the Czech Republic. In the taxonomically intricate group ser. *Glandulosi* it belongs to those taxa which may be distinguished only with great difficulty from a series of morphologically similar singular types. The species was collected at Boč by J. Lorber, determined by J. Holub and this determination was later confirmed by Professor H. E. Weber. The Bohemian locality is in connection with the general distribution area of the species, which extends from the Harz Mts to northeastern Bavaria and Upper Lusatia. Some older data on its occurrence in the Jizerské hory Mts exist, but they require revision. The population of the species in the locality at Boč is very small in extent (occupying only a few square meters) and can be found in the field only with great difficulty.

Sect. *Corylifolii* Lindl.

Ser. *Subthyrsoidei* (Focke) Focke

24. *Rubus kuleszae* Zieliński 2n = 35 (Fig. 11)
Zieliński, Fragm. Flor. Geobot. 46: 249, 1996.

Localities:

1. W Bohemia; distr. Domažlice; along the road near the settlement of Výrov, 1.5 km S of Chodská Lhota village, 510 m a.s.l., 49°20'50"N, 13°05'30"E. Coll. J. Holub and A. Krahulcová 4. 10. 1996.
2. C Bohemia; distr. Benešov; Bělčice village, beside the road close to the underpass of the Praha – Brno highway, 460 m a.s.l., 49°50'30"N, 14°48'30"E. Coll. J. Holub and A. Krahulcová 13. 10. 1995.
3. E Bohemia; distr. Chrudim; along the road between the towns of Čáslav and Chrudim, at the sharp bend N of Podhořany u Ronova village, 350 m a.s.l., 49°56'40"N, 15°32'20"E. Coll. J. Holub and A. Krahulcová 27. 9. 1996.
4. C Moravia; distr. Přerov; on the S edge of the wood "Doubrava" 1.7 km SSW of Kovalovice village, 330 m a.s.l.,49°18'10"N, 17°17'00"E. Coll. B. Trávníček 2. 10. 1996.

Our record of pentaploid plants is in agreement with the only report of Boratyńska (1994), who studied this species from two localities in Poland (under the name of *R. grossus*).

This very recently described species was recorded in the Czech Republic and in Poland as *R. grossus* H. E. Weber 1989. The original concept of the latter species by Weber (1989) also included plants belonging now to *R. kuleszae* Zieliński 1996. The original description of *R. grossus* also cited plants from Bohemia and Moravia, which, however, are taxonomically not identical with *R. grossus* H. E. Weber sensu holotypo. Zieliński (1996) therefore described plants from Poland and the Czech Republic (these were collected by him together with J. Holub in 1994) as a new species on the basis of differences in the angularity of the stem, foliation type of the inflorescence, deflexion of sepals, pubescence of gynoecea and the distinct undulation of leaflet margins. All karyologically studied material (collected in the field as *R. grossus*) belongs to *R. kuleszae*. Whether *R. grossus* s.s. does occur in the Czech Republic at all, is unknown at present. The data on the distribution of *R. grossus*, as well as its illustration included in "Květena ČR" (Holub 1995), refer to the newly described species *R. kuleszae*. The data published by Boratyńska (1994) given under the name of *R. grossus*, also refer to the new species (see above). To the synonymy of *R. kuleszae* the following name (falsonym) should be given: *R. grossus* sensu auct., i. e. H. E. Weber 1989 et 1995 p.p. (excl. typo), Boratyńska 1994, Zieliński in Mirek et al. 1995, Holub 1995.

Ser. *Subsilvatici* (Focke) Focke

25. *Rubus camptostachys* G. Braun 2n = 28
G. Braun Herb. Rub. Germ., Übersicht, 1881.

Localities:

1. E Bohemia; distr. Pardubice; Železné hory Hills; in the woods Horušické polesí near the sharp bend of the road at the place Vinice, NE of Svobodná Ves village, 295 m a.s.l., 49°59'10"N, 15°27'50"E. Coll. J. Holub 7. 10. 1995.
2. E Bohemia; distr. Pardubice; Železné hory Hills; beside the road near the quarry 1.2 km SE of Zdechovice village, 350 m a.s.l., 50°00'20"N, 15°29'00"E. Coll. J. Holub and A. Krahulcová 27. 9. 1996.

This species was already studied by Gustafsson (1943) in Scandinavia under the name of *R. ciliatus* Lindeb. He also gives the tetraploid chromosome number (2n = 28), in addition to the hexaploid number (2n = 42) found in *R. ciliatus* var. *tiliaceus* (Aresch.) C. E. Gust. The hexaploid level was earlier also given by him to plants under the name of *R. divergens* Neuman (Gustafsson 1933). However, in the estimation of some authors (Boratyńska 1996), the hexaploid level (2n = 42) presented by Gustafsson (1943) in *R. ciliatus* var. *tiliaceus*, might refer to another species. Recently, the tetraploid level was confirmed in *R. camptostachys* from Poland (Boratyńska 1996).

The species is confined in the Czech Republic to a small area in East Bohemia, in the western part of the Železné hory Hills, including ca. 6 microlocalities. This occurrence is very isolated from other areas of its distribution, its nearest localities being in Saxony (e.g. Zwickau, Colditz) and in Poland (the surroundings of Poznań). The distribution map is given by Weber (1995: 563); the data given by him in the text and in the map for Poland do not correspond very well.

Ser. *Subradulae* W. C. R. Watson

26. *Rubus fabrimontanus* Spribille 2n = 35 (Fig. 1k)
Spribille, Jahresber. Schles. Ges. Vaterl. Cult. 83: 108, 1905.

Localities:

1. C Bohemia; distr. Mladá Boleslav; in the woods "Dubový les" along the way Luštěnická cesta, between the villages of Brodce nad Jizerou and Lipník, ca. 230 m a.s.l., 50°18'00"N, 14°53'30"E. Coll. J. Holub 22. 10. 1994.
2. C Bohemia; distr. Mladá Boleslav; in the wood beside the Praha – Mladá Boleslav highway, 0.5–1 km NW of Skorkov village, 220 m a.s.l., 50°14'20"N, 14°44'40"E. Coll. J. Holub and A. Krahulcová 7. 8. 1996.
3. C Bohemia; distr. Praha (Prague); the N edge of the capital, in the wood "Čimický háj", ca. 325 m a.s.l., 50°07'50"N, 14°26'30"E. Coll. J. Holub 29. 10. 1994.
4. C Bohemia; distr. Praha-východ; Strašín village near Říčany town, in the wood between the village and the settlement of Vojkov, 420 m a.s.l., 49°59'30"N, 14°42'30"E. Coll. J. Holub and A. Krahulcová 6. 10. 1995.
5. C Moravia; distr. Prostějov; on the slope above the road 0.7 km NE of Čechy pod Kosířem village, 310 m a.s.l., 49°33'20"N, 17°02'20"E. Coll. B. Trávníček and A. Krahulcová 16. 10. 1996.

The pentaploid chromosome number found in all plants studied is in agreement with the reference by Boratyńska (1995b) who examined plants of this species from four localities in Poland.

The species is dispersed in the Czech Republic and reaches here the eastern limit of its general distribution. It occurs in Bohemia much more often than in Moravia. The distribution map by Weber (1995: 570; state 1992) does not include any occurrence of this species in the southern half of Bohemia (here it is known e.g. from the surroundings of Březnice, Mirovice and Kunžak); from Moravia it includes two localities (? Olbramkostel, Vidnava – perhaps not correctly placed on the map). The eastern limit of its distribution in Moravia passes near the points of Znojmo – Prostějov – Frýdek – Karviná. The material examined karyologically includes plants from locality no 5 from Central Moravia.

Acknowledgments

The authors wish to thank Professor Dr. Dr. H. E. Weber (Vechta) for his kind determinations of various *Rubus* material, especially for that of *R. caflischii*. We are very grateful to Dr. B. Trávníček for collecting and determining plants from localities in Moravia and for valuable informations. We would like to express our thanks also to Mr J. Lorber (80; Chomutov) who helped us in searching for the locality of *R. lividus*, to Dr. L. Papáčková, who collected *R. chamaemorus*, and to Dr. J. Chrtek jun. for technical assistance. We thank also Dr. K. Boratyńska (Kórnik, Poland) for making possible the visit of Dr. A. Krahulcová in the Kórnik Institute as well as for her friendly reception there. We are also grateful to Dr. John R. Cross for language revision of this paper. This study was supported by the Grant Agency of the Academy of Sciences of the Czech Republic (project no. A6005506).

Souhrn

Tento příspěvek, druhý v pořadí z plánované série, přináší originální chromozómové počty 26 druhů ostružiníků květeny České republiky. Studovaný soubor druhů zahrnuje většinou zástupce podrodu *Rubus* (23 druhů), dva druhy náleží do podrodu *Idaeobatus* a jeden druh do podrodu *Chamaerubus*. Rostliny pocházejí celkem z 84 lokalit v Čechách a na Moravě. Mezi studovanými druhy bylo zjištěno celkem pět stupňů ploidie, přičemž obě mezní ploidie – u dvou druhů diploidní a u jednoho druhu oktoploidní – byly v tomto souboru nalezeny mimo podrod *Rubus*. U zástupců podrodu *Rubus* se vyskytovaly převážně tetraploidní chromozómové počty (2n = 28, 15 druhů), vedle triploidních (2n = 21, 5 druhů) a pentaploidních (2n = 35, 3 druhy). Mezi ostružiníky, jejichž chromozómový počet je zde uveden poprvé, je mimo jiné zastoupeno i pět druhů popsaných druhým z autorů z území České republiky během posledních několika let. V této práci jsou poprvé publikovány chromozómové počty pro následujících třináct druhů podrodu *Rubus*: *R. graecensis* Maurer, *R. henrici-egonis* Holub, *R. austromoravicus* Holub, *R. crispomarginatus* Holub (vše triploidní druhy, 2n = 21) a dále pro *R. micans* Godron, *R. caflischii* Focke, *R. chaerophyllus* Sag. et W. Schultze, *R. vratnensis* Holub, *R. centrobohemicus* Holub, *R. epipsilos* Focke, *R. bavaricus* (Focke) Hruby, *R. lusaticus* Rostock a *R. lividus* G. Braun (vše tetraploidní druhy, 2n = 28). Chromozómové počty nalezené u dalších třinácti druhů odpovídají dřívějším údajům z literatury, vztahujícím se k jiným oblastem jejich výskytu.

Obstarávání materiálu pro karyologický výzkum rodu *Rubus*, jakož i intenzivně dále probíhající taxonomicko-chorologický výzkum ostružiníků v České republice v terénu i v herbářích přinesly některé nové výsledky týkající se zde karyologicky studovaných druhů. *R. caflischii* byl zjištěn jako nový druh pro Českou republiku (jedna lokalita v Českém lese). *R. graecensis* byl nalezen ve východních a nejnověji i středních Čechách jako nová rostlina pro Čechy. *R. micans* se vyskytuje na Moravě po hiátu, oddělujícím moravskou lokalitu od hlavního areálu druhu mezerou širší než 700 km. Druh je zde uveden též z polského Slezska od Prudniku těsně při hranici s Českou republikou. Je to nový druh pro Polsko. *R. austromoravicus* byl nalezen vedle výskytu ve východních Čechách též izolovaně v jižních Čechách v okolí Strakonic a v západních Čechách v okolí Mýta. Pro druh *R. crispomarginatus* byly ve starším herbářovém materiálu zjištěny doklady z Německa a Rakouska, odkud tento nedávno popsaný druh nebyl dosud znám. Druhy *R. caflischii*, *R. lividus*, *R. lusaticus* a *R. micans* jsou známy z České republiky vždy jen z jedné lokality a zaslouží si proto i povšimnutí z hlediska ochrany přírody. Všechny dříve uvedené údaje o výskytu druhu *R. grossus* H. E. Weber 1989 z území ČR patří k nejnověji popsanému druhu *R. kuleszae* Zieliński 1996. V práci je popsán nový taxon ser. *Idaei* Holub z podrodu *Idaeobatus*.

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Received 12 September 1997
Accepted 16 October 1997