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Chromosome numbers in selected Angiosperms (2)

Chromosomové počty některých druhů krytosemenných rostlin (2)

Miloslav Kovanda

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Somatic chromosome numbers are reported for 30 species belonging to the families *Betulaceae* (3 spp.), *Caryophyllaceae* (13 spp.), *Asteraceae* (13 spp.) and *Liliaceae* (1 sp.). The material examined was collected in the wild in Czechoslovakia, Poland and the U.S.A. Brief taxonomic notes are added wherever appropriate or necessary.

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INTRODUCTION

This second part of a chromosome number study concerns *Betulaceae* (*Alnus*, *Duschekia*), *Caryophyllaceae* (*Dianthus*), miscellaneous species of the *Asteraceae* and one representative of the family *Liliaceae*, *Lilium martagon*. Attention was focused upon polyploid complexes and polymorphic species with unusual ecological amplitude. Care was taken to see that the material used for study came from contrasting habitats. Counts for *Dianthus superbus* L. subsp. *silvestris* ČELAK., *D. arenarius* L. subsp. *bohemicus* (NOVÁK) O. SCHWARZ, *D. carthusianorum* L. subsp. *capillifrons* (BORBÁS) NEUMAYER and *D. carthusianorum* L. subsp. *polonicus* (ZAPAŁ.) KOVANDA are believed to be the first counts reported for these taxa. New ploidy levels are established for *Dianthus hungaricus* PERS. subsp. *hungaricus* and *D. hungaricus* PERS. subsp. *pseudopraecox* (NOVÁK) KMEŤOVÁ. Brief notes are added wherever appropriate or necessary.

MATERIAL AND METHODS

The method of karyological investigation was the same as described in the first part of the study (KOVANDA 1983). In *Dianthus*, acetic carmine and propionic carmine were used as stains, in addition to lacto-propionic orceine, with satisfactory results. As previously, a minimum of five seedlings per sample were examined. Voucher specimens will be deposited in PR.

RESULTS

Betulaceae

Alnus glutinosa (L.) GAERTN.
2n = 28

Czechoslovakia

S. Bohemia: by a small pool in the Jankov forest, N.W. of Březina (distr. of Jindřichův Hradec), 510 m.

Alnus incana (L.) MOENCH
2n = 28

Czechoslovakia

N. Bohemia: marsh at Valcha, near Bělá pod Bezdězem, 240 m.

Duschekia alnobetula (EHRH.) POUZAR

[syn.: *Duschekia viridis* (CHAIX in VILL.) OPIZ, *Alnus viridis* (CHAIX in VILL.) DC.]

2n = 28

Czechoslovakia

S. Bohemia: thickets on the Deštěnská hora hill, near Deštná (distr. of Jindřichův Hradec), 590 m.

Caryophyllaceae

Dianthus sylvaticus HOPPE ex WILLD.

[syn.: *D. Seguieri* VILL. subsp. *glaber* ČELAK., *D. Seguieri* VILL. subsp. *sylvaticus* (HOPPE ex WILLD.) HEGI].

2n = 60

Czechoslovakia

1. W. Bohemia: Bory forest, near Vejprnice, 360 m.
2. W.C. Bohemia: Dřevíč, near Nižbor, light woodland 1 km N.W. of the hunting lodge, 380 m.
3. W.C. Bohemia: Chyňava, near Beroun, *Pinus silvestris* plantation on road from the gamekeeper's house to Poteplí, 430 m.
4. C. Bohemia: thickets 1 km S. of Řevnice, on road to Mníšek, 330 m.
5. C. Bohemia: clearings in the Propadník forest, near Kladno-Rozdělov, 430 m.
6. N. Bohemia: Bělá pod Bezdězem, margin of a pine wood on road from Valcha to Rečkov, 250 m.

A diploid chromosome number, 2n = 30, was reported for *Dianthus sylvaticus* HOPPE ex WILLD. by CAROLIN (1957). Plants from Bohemia, i.e. from the easternmost outposts of the species range, have however been shown to be tetraploid, with 2n = 60 (KMEŤOVÁ 1979). This number can now be confirmed on material from other Bohemian localities.

Dianthus collinus WALDST. et KIT. subsp. *collinus*
2n = 90

Czechoslovakia

1. S. Slovakia: forest steppe on the S.W. side of the Vysoká hill, near Šahy, 240 m.
2. S. Slovakia: thickets on the Tichý vrch hill (258 m), near Opatovská Nová Ves.
3. S. Slovakia: in xerothermous vegetation on the E. side of the Stará hora hill, near Hrušov, 320 m.
4. S. Slovakia: S. side of the Devičie hill, near Čebovce, 380 m.

The same chromosome number has been reported by MÁJOVSKÝ et al. (1970b) for plants from near Hlohovec in western Slovakia.

Dianthus nitidus WALDST. et KIT.
2n = 30

Czechoslovakia

N. Slovakia: Nízke Tatry Mts., summit area of Mt. Salatín (1630 m), limestone.

This diploid count corroborates one published by MÁJOVSKÝ et al. (1970b) for material from Mt. Sivý vrch in the Západné Tatry Mts. The species is a West Carpathian palaeoendemic with unknown ancestry (see KMEŤOVÁ 1973).

Dianthus deltoides L.
2n = 30

Czechoslovakia

1. W.C. Bohemia: Dřevíč, near Nižbor, road cutting in a woodland 1.2 km S. of the hunting odge, 380 m.

2. N.E. Bohemia: Krkonoše Mts., dry meadow on path from Horní Rokytnice to the Světlanka chalet, 680 m.

3. E.C. Bohemia: short grassland on a serpentine outerop at Borek, near Chotěboř, 420 m.

4. S. Bohemia: small meadow on the Cihelný vrch hill, W. of Lodhéřov (distr. of Jindřichův Hradec), 608 m,

5. S.W. Moravia: Vanov, near Telč, on road to Řásná, 610 m.

6. S. Slovakia: dry, stony places E. of Pravica (distr. of Veľký Krtíš), on road to the Háj forest, 360 m.

7. E. Slovakia: Slovak Karst, short grassland between the Malý vrch and Drieňovec hills, near Brzotín, limestone, 650 m.

Poland

District of Opole: light pine woodland S. of Kup, 170 m.

Dianthus deltoides L. has been counted several times, yielding invariably the diploid chromosome number, 2n = 30 (for a review, see e.g. FEDOROV 1969, LÖVE et LÖVE 1974). For Czechoslovakia, only one report from Mt. Veľká Rača in the Západné Beskydy Mts., W. Slovakia, has been available (MÁJOVSKÝ et al. 1974a). The species is considered strictly calcifuge and this characteristic is mechanically copied from one paper or flora to another. However, it is occasionally found in calcareous habitats (as for instance locally in the Slovak Karst and in a number of localities in S. Poland), sometimes even in direct contact with the parental rock. Another perennial belief is that *Dianthus deltoides* L. and *D. carthusianorum* L. exclude each other by their ecology and distribution and are never found together in one locality. Yet there are places in the vicinity of Prague, in the České středohoří Mts., in parts of Moravia and elsewhere where the two species (admittedly quite different in their ecological requirements) occur side by side with little respect to the statements of botanists. Plants from serpentine habitats are conspicuously glaucous and require further taxonomic study.

Dianthus armeria L.
2n = 30

Czechoslovakia

S. Slovakia: S. slope of the Biely vrch hill, near Slovenské Ďarmoty, 180 m.

Dianthus superbus L. subsp. *superbus*
2n = 30

Czechoslovakia

1. C. Bohemia: wet meadow S.W. of the Vražda pond, near Nouzov (distr. of Nymburk), 210 m.

2. C. Bohemia: wet meadow on the W. margin of the Kersko forest, near Velenka (distr. of Nymburk), 180 m.

Dianthus superbus L. subsp. *alpestris* ČELAK.

[syn.: *Dianthus Wimmeri* WICHURA]

2n = 30

Czechoslovakia

N.E. Bohemia: Krkonoše Mts., Velká Kotelná jáma glacial cirque, in a tall herb community on stabilised scree, gneiss, 1150 m.

Dianthus superbus L. subsp. *silvestris* ČELAK.

2n = 30

Czechoslovakia

1. W.C. Bohemia: Dřevíč, near Nižbor, clearing on road N.W. of the hunting lodge, 320 m.
2. N. Bohemia: České středohoří Mts., Skalice near Litomčřice, light woodland on road to the Nový dvůr gamekeeper's house, 420 m.
3. E. Moravia: Bílé Karpaty Mts., light woodland on the W. side of the Bučník hill, near Bystřice pod Lopeníkem, 510 m.

No chromosome number information seems to have been published explicitly for this taxon but in view of the invariably diploid status of the entire species complex, the present counts are of no diagnostic value. Little is known of the geographical distribution of subsp. *silvestris* ČELAK. Its morphological delimitation from the type subspecies is poor, leaving the late flowering (from August to October, overlapping however considerably with that of subsp. *superbus*) and the distinctive ecology as the only distinguishing characters. Population studies conducted in this country by the present author (KOVANDA, unpublished) have failed to reveal any reliable morphological marker. It would appear that each of the two subspecies (and perhaps subsp. *alpestris* ČELAK. as well) represents a distinct ecotype but experimental evidence is not avilable. The identity of subsp. *silvestris* ČELAK. with subsp. *autumnalis* OBERD., taken for granted by some authors, is questionable because the diagnostic features given for subsp. *autumnalis* OBERD. (see OBERDORFER 1979) cannot very well be applied to Bohemian plants.

Dianthus hungaricus PERS. subsp. *hungaricus*

[syn.: *Dianthus praecox* KIT., *D. plumarius* L. subsp. *praecox* (KIT.) DOMIN, *D. Tatrae* BORBÁS]

2n = 60

Czechoslovakia

1. W. Slovakia: Strážovská hornatina Mts., rocks near the Súľov chalet, calcium-rich conglomerate, 380 m.
2. W. Slovakia: Strážovská hornatina Mts., rocks in the upper part of the Manínska tiesňava gorge, limestone, 460 m.
3. E. Slovakia: summit rocks of Mt. Havrania skala (1158 m), near Stratená, limestone.

Poland

4. S. Poland: Tatry Zachodnie Mts., Raptawicka Turnia rocks, near the Mylna cave, limestone, 1100 m.
5. S. Poland: Tatry Zachodnie Mts., Wąwóz Kraków ravine, scree below the Ratusz rocks, limestone, 1050 m.

6. Poland: Tatry Zachodnie Mts., Żleb pod Czerwoniec ravine (W. side of Mt. Kopa Królowa Mała), limestone, 1300 m.

2n = 90

Czechoslovakia

1. W. Slovakia: Biele Karpaty Mts., rocks below the ruin of the Vršatec castle, limestone, 750 m.
2. C. Slovakia: Muránska planina highlands, summit rocks of Mt. Hradová (887 m), near Tisovec, limestone.

Only diploids (2n = 30) and hexaploids (2n = 90) have so far been detected in this West Carpathian endemic (see e.g. FEDOROV et al. 1969, MÁJOVSKÝ et al. 1970b, 1974a). The majority of samples examined by the present author proved tetraploid, with 2n = 60. Thus the whole gamut of differentiation is present. The morphology and geographical distribution of the three cytodemes require further investigation. So far, neither triploids nor pentaploids have been found.

Dianthus hungaricus PERS. subsp. *pseudopraecox* (NOVÁK) KMEŤOVÁ

[syn.: *Dianthus Lumnitzeri* WIESB. subsp. *pseudopraecox* (NOVÁK) DOSTÁL)]

2n = 60

Czechoslovakia

1. E. Slovakia: Slovak Karst, summit rocks of the Drieňovec hill (675 m), near Brzotín, limestone.
2. E. Slovakia: Slovak Karst, summit rocks of the Zádielsky kameň hill (601 m), near Zádiel, limestone.

This endemic of the Slovak Karst has been counted on material from the Zádielsky kameň hill by KMEŤOVÁ (in MÁJOVSKÝ et al. 1974a) and shown to be hexaploid, with 2n = 90. Interestingly, both present collections are tetraploid, 2n = 60. Various ploidy levels seem to be present, as in other members of the *Dianthus hungaricus* species aggregate. This differentiation does not appear to follow the taxonomic pattern, however, and, vice versa, the taxonomic delimitation cannot be based on chromosome numbers.

Dianthus Lumnitzeri WIESB.

[syn.: *Dianthus plumarius* L. subsp. *Lumnitzeri* (WIESB.) DOMIN, *D. hungaricus* PERS. subsp. *Lumnitzeri* (WIESB.) HOLUB)]

2n = 90

Czechoslovakia

1. W. Slovakia: rocks below the ruin of the Čachtice castle, near Nové Mesto nad Váhom, limestone, 420 m.
2. W. Slovakia: Malé Karpaty Mts., rocks (S. and S.E.-facing) on top of the Raštún hill, near Sološnica, limestone, 748 m.
3. W. Slovakia: rocks below the ruin of the Devín castle, near Bratislava, limestone, 170 m.

Diploids (2n = 30), tetraploids (2n = 60) and hexaploids (2n = 90) have been reported for *Dianthus Lumnitzeri* WIESB., the latter two occurring sometimes in the same locality (e.g. FEDOROV et al. 1969, MÁJOVSKÝ et al.

1974a). Thus the distribution of the cytodemes seems to be partly sympatric. Plants from near the Čachtice and Devín ruins have previously been shown to be hexaploid (MÁJOVSKÝ et al. l.c.).

Dianthus moravicus KOVANDA

[syn.: *Dianthus gratianopolitanus* VILL. subsp. *moravicus* (KOVANDA) HOLUB]

2n = 60

Czechoslovakia

S. Moravia: Tábor hill, near Rokytná, upper edge of rocks (N.-facing) above the river Rokytná, calcium-rich conglomerate, 280 m.

Of the six topodemes which, according to present knowledge, constitute this species, the smallest one, from the Tábor hill, has remained karyologically unknown (see KOVANDA 1982). The chromosome number can now be provided from material transferred to the experimental garden at Průhonice. Evidence was presented (KOVANDA l.c.) that the Moravian plants are taxonomically distinct and aberrant within *Dianthus gratianopolitanus* VILL. Failure to acknowledge this fact (HOLUB 1983) is regrettable.[1])

Dianthus arenarius L. subsp. *borussicus* (VIERH.) KLEOPOV
2n = 60

Poland

1. District of Suwałki: light pine wood on sands on the W. coast of the Bełdany lake, near Mikołajki, 110 m.
2. District of Białystok: Puszcza Białowieska Virgin Forest, on sands 3 km S. of Topiło, 173 m.

Dianthus arenarius L. subsp. *bohemicus* (NOVÁK) O. SCHWARZ

[syn.: *Dianthus Novakii* SOJÁK]

2n = 60

Czechoslovakia

N. Bohemia: sands S.E. of Kleneč, near Roudnice nad Labem, 200–210 m.

Dianthus arenarius L., a boreal-subcontinental European species, has been subject to an authoritative monographic study by NOVÁK (1927). Using Wettstein's geographical-morphological method, he divided the species into four major races connected by transitional forms but replacing each other by their geographical distribution; he treated these as varieties. This subdivision proved viable and has been retained, partly or entirely, even by modern authors (e.g. TUTIN 1964, MEUSEL et MÜHLBERG 1971–1978), with the varieties elevated to the rank of subspecies and their number increased to five. Whereas subsp. *borussicus* (VIERH.) KLEOPOV occurs almost throughout the range of the species, the other four are more or less local, subsp. *arenarius* being confined to Sweden, subsp. *pseudoserotinus* (BŁOCKI) TUTIN and subsp. *pseudo-*

[1]) Strangely, although the name *Dianthus moravicus* KOVANDA was published on 20 August, 1982 (see Preslia, Praha, 54 : 289, 1982), Holub's reclassification had reached the editor of Folia Geobotanica et Phytotaxonomica already on 11 August, 1982 (see Folia Geobot. Phytotax., Praha, 18 : 206, 1983).

squarrosus (NOVÁK) KLEOPOV to the Ukraine and subsp. *bohemicus* (NOVÁK) O. SCHWARZ to one locality in Bohemia. The latter three subspecies are of particular interest because in certain characters (different in each of them) they approach *Dianthus serotinus* WALDST. et KIT. For subsp. *bohemicus* this was first recognised by NOVÁK (1915) but contradicted in his monograph of 1927. Yet the similarity in the shape of the calyx [moderately attenuated from the base to the apex, a feature also present in subsp. *pseudoserotinus* (BŁOCKI) TUTIN], is apparent. On other characters, however, subsp. *bohemicus* fits clearly into the variation amplitude of *Dianthus arenarius* L., representing the most south-western outpost of the species range. Though isolated geographically, subsp. *bohemicus* (NOVÁK) O. SCHWARZ intergrades with subsp. *borussicus* (VIERH.) KLEOPOV (which is geographically the closest taxon), one-flowered plants being found commonly in the area of subsp. *borussicus*. They are also diagnostic of subsp. *arenarius*. The glaucous appearance (the only other character separating subsp. *bohemicus* from subsp. *borussicus*) can easily be modified in cultivation. Therefore the specific status proposed for the Bohemian race by SOJÁK (1980) appears an overestimate. At present, subsp. *bohemicus* is represented by one single topodeme consisting of some 35 individuals.

The previous chromosome number counts for *Dianthus arenarius* L. of known wild origin (all 2n = 60) refer, in all probability, to subsp. *borussicus* (VIERH.) KLEOPOV. A diploid chromosome number, 2n = 30, was reported for material of unknown provenance (see FEDOROV et al. 1969). No chromosome number information has previously been available for subsp. *bohemicus* (NOVÁK) O. SCHWARZ.

Dianthus serotinus WALDST. et KIT.
2n = 90

Czechoslovakia

W. Slovakia: Pernek, near Malacky, disused sandpit in a pine wood on sands, 4 km N.W. of the village, 200 m.

Dianthus serotinus WALDST. et KIT. is known to include tetraploid (2n = 60) and hexaploid (2n = 90) cytodemes, both of which are present in Slovakia, the former in the east, the latter in the west (MÁJOVSKÝ et al. 1970b, KMEŤOVÁ 1982). The present count comes from the N.W. margin of the species' distribution range.

Dianthus carthusianorum L. subsp. *carthusianorum*
2n = 30

Czechoslovakia

1. N. Bohemia: České středohoří Mts., dry grassland at the S.W. foot of the Krkavčí skála hill, near Sebuzín, 280 m.
2. Prague-Bohnice: rocks of the Tříkrálka hill in the valley of the river Vltava, Algonkian schist, 210–230 m.
3. C. Bohemia: Bukovany, near Týnec nad Sázavou, grassy knoll in the fields N.W. of the village, 350 m.
4. W.C. Bohemia: Dřevíč near Nižbor, road cutting in a wood 1.2 km S. of the Dřevíč hunting lodge, 380 m.

Dianthus carthusianorum L. subsp. *capillifrons* (BORBÁS) NEUMAYER
2n = 30

Czechoslovakia

S. Bohemia: light pine wood in the valley of the Křemžský potok brook, E. of Holubov, serpentine, 480 m.

This is apparently the first chromosome count for the serpentinicolous race of *Dianthus carthusianorum* L., placing it at the same ploidy level as other intraspecific taxa. Subsp. *capillifrons*, as circumscribed by NEUMAYER (1930) and MEUSEL et MÜHLBERG (1971—1978), is not homogeneous from a taxonomic viewpoint, as it includes various lower units which have evolved from local populations of *Dianthus carthusianorum* L. The inclusion of Czechoslovak plants, first proposed by DOSTÁL (1982), is therefore tentative and further study is required. The population from the south Bohemian outcrop of serpentine is fairly uniform and distinct in having flaccid and decumbent stems, lower cauline leaves 1.2—2.5 (—2.9) mm wide, heads often dissolving, calyx 12—15(—16) mm long and lamina of petals light rose, 7—9(—10) mm long. Plants from the Austrian serpentines are described as having leaves only 0.5—1.3 mm wide. In the ČSR, the serpentinicolous taxon is known to occur, in addition to southern Bohemia, only near Raškov in N. Moravia. It is absent from all other serpentine areas, these having apparently never been colonized by *Dianthus carthusianorum* L.

Dianthus carthusianorum L. subsp. *latifolius* (GRISEB. et SCHENK) HEGI

[syn.: *Dianthus montivagus* DOMIN]

2n = 30

Czechoslovakia

1. N. Moravia: Pítárné, near Osoblaha, grassy roadside S. of the village, 330 m.
2. S.E. Moravia: Stříbrnické Paseky near Uherské Hradiště, woodland margin N. of the village, 390 m.
3. C. Slovakia: Kremnické pohorie Mts., grassy slope just W. of Trnie, near Zvolen, 480 m.
4. C. Slovakia: Štiavnické pohorie Mts., dry grassland N.E. of Kozelník, on road to Hronská Breznica, 370 m.
5. C. Slovakia: Muránska planina highlands, mountain meadow in the Dudlavka valley, on path to Kamenná brána, 980 m.
6. C. Slovakia: Muránska planina highlands, summit area of Mt. Hradová (887 m), near Tisovec, limestone.
7. S. Slovakia: grazed grassland S.E. of Lentvora (distr. of Veľký Krtíš), on road to the Lysec hill, 550 m.
8. S. Slovakia: between the Španí vrch and Stráňa hills, near Hrušov (distr. of Veľký Krtíš), 450 m.
9. E. Slovakia: summit rocks of the Majerská hill (645 m), near Letanovce, limestone.
10. E. Slovakia: Branisko Mts., N. side of Mt. Rudník, limestone, 950 m.

Within the intricate *Dianthus carthusianorum* species complex, the broad-leaved race, conveniently referred to as "*Dianthus latifolius*", stands out as a complex in itself. It seems to be confined to the eastern and south-eastern part of the species range, being centered on the lower altitudinal belts of the Carpathians and Eastern Alps and adjacent lowlands. Attempts to subdivide it into more natural units (e.g. ASCHERSON et GRAEBNER 1920—1929, KULCZYŃSKI 1920) have merely resulted in the description of countless varieties, subvarieties, formae and subformae, often based on single herbarium specimens. In Czechoslovakia, "*Dianthus latifolius*" is frequent in the whole of the Carpathian region, extending far into central and southern Mo-

ravia where it intergrades on a large scale with subsp. *carthusianorum* and *Dianthus Pontederae* KERNER. Plants from northernmost Moravia are transitional to subsp. *polonicus* (ZAPAŁ.) KOVANDA. Plants morphologically very close to subsp. *latifolius* and subsp. *polonicus* may be found as far as central and northern Bohemia. The counts reported here complement those made by MÁJOVSKÝ (1970b, 1974a) on material originating mainly from western Slovakia.

Dianthus carthusianorum L. subsp. *polonicus* (ZAPAŁ.) KOVANDA, comb. nova

[Bas.: *Dianthus polonicus* ZAPAŁOWICZ, Krytyczny przegląd roślinności Galicyi 3 : 122, 1911]

2n = 30

Poland

1. Distr. of Wrocław: Gruszeczka, near Milicz, in a pine wood on road to Ujeździec Mały, 2 km S.W. of the village.
2. Distr. of Katowice: pine wood N.E. of Ciężkowice, near Jaworzno.
3. Distr. of Kraków: limestone outcrop between Tyniec and Podgórki, near Kraków.
4. Distr. of Kraków: Żelków, on road to Biały Kościół, 0.5 km E. of the village.

With robust stems, lower cauline leaves 1.5—3 mm wide, inflorescence few to many-flowered and calyx 14—17 mm long, this subspecies may be considered a geographical extension of subsp. *latifolius* (GRISEB. et SCHENK) HEGI. It seems to be widely distributed in S. Poland and adjacent Ukraine (ZAPAŁOWICZ 1911), being especially characteristic of the margins of pine woods on sands. It has also been reported from the Rumanian Carpathians (PRODAN 1953). The above counts are apparently the first made on material referable to this taxon.

Dianthus Pontederae KERNER
2n = 30

Czechoslovakia

1. S. Bohemia: naturalised in a shallow railway cutting about 2 km N.W. of Lužnice railway station, 420 m.
2. S. Moravia: thickets on top of the Sealsfieldův kámen hill, near Znojmo, 320—340 m.
3. S. Moravia: short grassland on the Kamenný vrch hill, near Kurdějov, 280 m.
4. S. Slovakia: forest steppe on the S.W. side of the Vysoká hill, near Šahy, 240 m.
5. S. Slovakia: S. side of the Zaviate hill, near Kleňany (distr. of Veľký Krtíš), 350 m.
6. S. Slovakia: summit rocks of the Ragač hill, near Hajnáčka, 537 m.
7. E. Slovakia: Slovak Karst, N.W. margin of the Silica plateau, between the Malý vrch and Drieňovec hills, 630 m.

In Czechoslovakia, *Dianthus Pontederae* includes two clear-cut taxa: one with calyx 9—11 mm long and lamina of petals 3—5 mm long, dark red (corresponding to *D. Pontederae* as conceived by Kerner and confined to S. Slovakia), the other with calyx 10—13 mm long and lamina of petals (4—)5—7(—8) mm long, pink to bright red (confined to S. Moravia). This variation has so far passed unnoticed. No intermediates between the two forms have been found. The small-flowered one shows little propensity to hybridise but the other is strongly introgressed with *Dianthus carthusianorum* L. subsp. *carthusianorum* and subsp. *latifolius* (GRISEB. et SCHENK) HEGI, resulting in a chaotic situation which cannot very well be treated by conventional taxonomic categories. Plants naturalised in southern Bohemia belong to the

small-flowered taxon. They are confined to two localities along the railway track and do not spread into the vicinity. From Czechoslovakia, only one diploid chromosome count has been available for *Dianthus Pontederae* KERNER (MÁJOVSKÝ et al. 1970b).

Asteraceae

Eupatorium cannabinum L.
2n = 20

Czechoslovakia

C. Bohemia: Nová Rabyně, roadside ditch near the Slapy dam, 240 m.

Solidago virgaurea L. subsp. *minuta* (L.) ARCANGELI

[syn.: *Solidago virgaurea* L. subsp. *alpestris* (WALDST. et KIT. ex WILLD.) HAYEK]

2n = 18

Czechoslovakia

1. E. Bohemia: Orlické hory Mts., mountain grassland on road from Šerlich to Bukačka, near the 1027 m point.
2. E. Bohemia: Mt. Králický Sněžník, mountain grassland in the summit area, near the source of the river Morava, 1400 m.

Aster amellus L.
2n = 18

Czechoslovakia

W.C. Bohemia: rocky ledges of the Čertova skála hill (401 m), near Týřovice (district of Rakovník), Algonkian schist, 380 m.

Little is known of the morphology, geographical distribution and taxonomic significance of the various cytodemes (2n = 18, 27, 36, 54, 66) reported repeatedly for *Aster amellus* L. (e.g. CHATTERJI 1962, HUZIWARA 1962, ČUKSANOVA et al. 1968). Plants from Slovakia proved hexaploid (2n = 54) and were transferred to *Aster amelloides* BESS. (see MÁJOVSKÝ et al. 1970b, 1978). Hexaploids have also been reported from the vicinity of Brno, Moravia (DVOŘÁK et DADÁKOVÁ 1974, DVOŘÁK et DADÁKOVÁ in LÖVE 1974). The only count so far published for Bohemian plants was diploid, 2n = 18 (HOLUB et al. 1970) and is corroborated by the present report. WCISŁO (in POGAN et al. 1980) reported diploid *Aster amellus* L. from five localities in Poland.

Crinitina linosyris (L.) SOJÁK

[syn.: *Chrysocoma linosyris* L., *Linosyris vulgaris* CASS., *Aster linosyris* (L.) BERNH.]

2n = 36

Czechoslovakia

1. C. Bohemia: S. side of the Doutnáč hill, near Srbsko, 410 m.
2. C. Bohemia: on top of the Homole hill, near Vrané nad Vltavou, 327 m.

This species is known to contain diploid (2n = 18) and tetraploid (2n = 36 + 0—3B) cytodemes (e.g. BAKSAY 1958, MONTI, PAGNI et VIEGI 1978). In

Czechoslovakia, only diploids have so far been known to occur, with the counts based on material from two localities in Slovakia (MÁJOVSKÝ et al. 1970a).

Conyza canadensis (L.) CRONQUIST
2n = 18

Czechoslovakia

C. Bohemia: Prague-Modřany, waste land on the right bank of the river Vltava, below the Hydrometeorological Institute, 210 m.

Dendranthema Zawadskii (HERBICH) TZVELEV

[syn.: *Chrysanthemum Zawadskii* HERBICH]

2n = 54

Czechoslovakia

N. Slovakia: Pieniny Mts., limestone rocks in the valley of the river Dunajec (W. foot of the Holica hill), 470 m.

Three different chromosome numbers have been reported under the name of *Chrysanthemum Zawadskii* HERBICH (see FEDOROV et al. 1969), but plants from natural habitats in the Pieniny Mts. proved invariably hexaploid, with 2n = 54 (see SKALIŃSKA, CZAPIK, PIOTROWICZ et al. 1959, MÁJOVSKÝ et al. 1974b).

Carlina acaulis L. subsp. *acaulis*
2n = 20

Czechoslovakia

S. Bohemia: grassy roadside 1 km E. of Radomyšl (distr. of Strakonice), 470 m.

Onopordum acanthium L.
2n = 34

Czechoslovakia

S. Moravia: grassy roadside on the S. side of the Vysoký roh hill, near Mikulov, 280 m.

Lapsana communis L.
2n = 14

Czechoslovakia

C. Bohemia: thickets near the Kouřimecký přívoz ferry, N. of Týřovice (distr. of Rakovník), 280 m.

Lactuca canadensis L.
2n = 34

U.S.A.

Washington D.C., along the Chesapeake & Ohio Canal at Georgetown.

Prenanthes purpurea L.
2n = 18

Czechoslovakia

E. Bohemia: Orlické hory Mts., valley of the rivulet Bělá, near Nový hrad, N. of Skuhrov, 460 m.

Crepis biennis L.
2n = 40

Czechoslovakia

C. Bohemia: Prague-Modřany, disused railway track, 210 m.

Crepis succisifolia (All.) Tausch
2n = 12

Czechoslovakia

N. Moravia: Nízký Jeseník Mts., meadow on the N.W. side of the Velký Roudný hill, near Roudno, 670 m.

Liliaceae

Lilium martagon L.
2n = 24

Czechoslovakia

1. C. Bohemia: light deciduous woodland on the S. side of the Doutnáč hill, near Srbsko, 380 m.
2. N.E. Bohemia: Krkonoše Mts., Velká kotelná jáma glacial cirque, in a tall herb community on stabilised scree, gneiss, 1150 m.

SOUHRN

Podávají se chromosomové počty dalších 30 druhů krytosemenných rostlin. Z čeledi *Betulaceae* byly studovány druhy *Alnus glutinosa* (L.) Gaertn. (2n = 28), *A. incana* (L.) Moench (2n = 28) a *Duschekia alnobetula* (Ehrh.) Pouzar (2n = 28), z čeledi *Caryophyllaceae Dianthus sylvaticus* Hoppe ex Willd. (2n = 60), *D. collinus* Waldst. et Kit. subsp. *collinus* (2n = 90), *D. nitidus* Waldst. et Kit. (2n = 30), *D. deltoides* L. (2n = 30), *D. armeria* L. (2n = 30), *D. superbus* L. subsp. *superbus* (2n = 30), *D. superbus* L. subsp. *alpestris* Čelak. (2n = 30), *D. superbus* L. subsp. *silvestris* Čelak. (2n = 30), *D. hungaricus* Pers. subsp. *hungaricus* (2n = 60, 90), *D. hungaricus* Pers. subsp. *pseudopraecox* (Novák) Kmeťová (2n = 60), *D. Lumnitzeri* Wiesb. (2n = 90), *D. moravicus* Kovanda (2n = 60), *D. arenarius* L. subsp. *borussicus* (Vierh.) Kleopov (2n = 60), *D. arenarius* L. subsp. *bohemicus* (Novák) O. Schwarz (2n = 60), *D. serotinus* Waldst. et Kit. (2n = 90), *D. carthusianorum* L. subsp. *carthusianorum* (2n = 30), *D. carthusianorum* L. subsp. *capillifrons* (Borbás) Neumayer (2n = 30), *D. carthusianorum* L. subsp. *latifolius* (Griseb. et Schenk) Hegi (2n = 30), *D. carthusianorum* L. subsp. *polonicus* (Zapał.) Kovanda (2n = 30) a *D. Pontederae* Kerner (2n = 30), z čeledi *Asteraceae Eupatorium cannabinum* L. (2n = 20), *Solidago virgaurea* L. subsp. *minuta* (L.) Arcangeli (2n = 18), *Aster amellus* L. (2n = 18), *Crinitina linosyris* (L.) Soják (2n = 36), *Conyza canadensis* (L.) Cronquist (2n = 18), *Dendranthema Zawadskii* (Herbich) Tzvelev (2n = 54), *Carlina acaulis* L. subsp. *acaulis* (2n = 20), *Onopordum acanthium* L. (2n = 34), *Lapsana communis* L. (2n = 14), *Lactuca canadensis* L. (2n = 34), *Prenanthes purpurea* L. (2n = 18), *Crepis biennis* L. (2n = 40) a *C. succisifolia* (All.) Tausch (2n = 12), z čeledi *Liliaceae Lilium martagon* L. (2n = 24). Studovaný materiál pochází z nalezišť v Československu, Polsku a U.S.A. U většiny druhů jsou připojeny stručné poznámky ke karyologii, taxonomii a geografickému rozšíření.

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