

A neglected endemic of the Eastern Sudeten

Přehlížený endemit Východních Sudet

Miloslav Kovanda

KOVANDA M. (1980): A neglected endemic of the Eastern Sudeten. — Preslia, Praha, 52 : 117–126.

An isolated population of *Dianthus carthusianorum* L. in the Velká kotlina glacial cirque, Hrubý Jeseník Mts. (Eastern Sudeten, Czechoslovakia) is shown to represent an endemic taxon for which the name *Dianthus carthusianorum* L. subsp. *sudeticus* KOVANDA is proposed. The subspecies is diploid, with $2n = 30$. Its morphology, variation, distinguishing characters, ecology, geographical distribution and taxonomic relationships are discussed. The taxon appears to be most closely related to var. *alpestris* (NEILR.) HEGI from the Eastern Alps from which it differs by its solitary, flexuous stems, scarious subtending bracts, few-flowered inflorescences and petal limb light rose, (11–)12–14(–15) mm long.

Czechoslovak Academy of Sciences, Botanical Institute, 252 43 Průhonice, Czechoslovakia.

INTRODUCTION

Dianthus carthusianorum L., even in its narrow circumscription excluding *D. Pontederacae* KERNER, *D. sanguineus* VIS. and *D. liburnicus* BARTL. (see e. g. TUTIN 1964, MEUSEL et MÜHLBERG 1971–1978) is a taxonomically complex species with an extensive range (from the Pyrenees to the Carpathians and from the Alps to southern Belgium and Denmark) and wide ecological plasticity, extending from the sea level to 2600 m in the Alps. Its excessive variability has led taxonomists to split it into a number of infraspecific taxa of every rank, often based on single morphological characters. ASCHERSON et GRAEBNER (1921–1929) attempted to arrange these taxa into a hierarchic system, resulting in a maze of incongruous units.

The available evidence would suggest that this complex infraspecific differentiation took place almost exclusively at the diploid level, $2n = 30$ (see e. g. ROHWEDER 1934). The tetraploid chromosome number ($2n = 60$) has so far been reported only for material of unknown origin (ANDERSON-KOTTÖ et GAIRDNER 1931) and for plants from Val d'Entremont, Switzerland (FAVARGER 1946) and is explained in terms of endomitosis. Further cytogeographic and experimental studies are desirable.

It now seems certain that more or less distinct races of higher rank (that is distinguished by a combination of characters) occur mainly in the Alps and Carpathians. Those from the Balkan are now generally regarded as separate species. In the lowlands, the variation is much more continuous and differences between the various populations are difficult to recognize.

Revising the Central European material of *Dianthus carthusianorum*, great difficulty was encountered in identifying plants from Velká kotlina, Hrubý

Jeseník Mts. (Eastern Sudeten) with anything currently recognized both within and without the species. A closer examination demonstrated that the population is taxonomically distinct both from subsp. *latifolius* (GRISEB. et SCHENK) HEGI with which it has been merged in the last fifty years and from all other members of the *Dianthus carthusianorum* species aggregate. A survey of the pertinent literature revealed that two attempts at taxonomic treatment had been made in the past, neither being effective from the viewpoint of nomenclature. The population was studied in the field in 1976–1978 and a number of plants are in cultivation in the experimental plot of the Botanical Institute of the ČSAV at Průhonice.

Morphology, variation, distinguishing characters, chromosome number, ecology, geographical distribution and taxonomic relationship of this Sudeten endemic are considered below.

HISTORICAL

The Velká kotlina population of *D. carthusianorum* has for long attracted the attention of botanists. Few have, however, undertaken to separate it as a taxon. Unlike other endemics and rare plants of the Eastern Sudeten, it was noticed relatively late. Early authors of Moravian and Silesian floras (see MATTUSCHKA 1776, KROCKER 1790, GÜNTHER, GRABOWSKI et WIMMER 1824, WIMMER et GRABOWSKI 1827, ROHRER et MAYER 1835) do not list any *D. carthusianorum* from the Sudeten. WIMMER (1840) does report that the species extends „bis an das Hochgebirge“ but the first record from Velká kotlina is found in GRABOWSKI (1843). FIEK (1881) emphasized that this was the only locality of *D. carthusianorum* in those mountains. OBORNY (1885) was the first to observe that these plants belonged to a special variety but did not consider it necessary to name it. This was done by the Liegnitz (now Legnica, Poland) apothecary A. Callier in *Flora silesiaca exsiccata* in 1893. The name he used, *f. alpestris* CALLIER, is a homonym of the Eastern Alpine *γ alpestris* NEILREICH, of which the author was apparently unaware. On the herbarium label (no. 786, leg. CALLIER, HIRTE et SCHOLZ, 21. 8. 1893), the name is cited as „forma *alpestris* CALLIER in Bemerkungen zur Flora silesiaca exsiccata Editio 1893“. This is probably an error. The Bemerkungen were being published in the Deutsche Botanische Monatschrift and later in *Allgemeine Botanische Zeitschrift* but the publication was discontinued in 1895 and the last collection commented upon is no. 717 of the 1892 edition. HEGI (1911) seems to have adopted the citation from the herbarium label, while ASCHERSON et GRAEBNER (1921–1929) cite the name from a letter received from Callier. Callier's classification is little known and the epithet has never been cited in literature, except by Hegi and Ascherson et Graebner.

SCHUBE (1904) and LAUS (1908, 1910) report *D. carthusianorum* from Velká kotlina but do not recognize any infraspecific taxa; the latter did however mention the large flowers. In HEGI's monographic study (1911) and *Flora* (1912), plants from Velká kotlina are included in subsp. *latifolius* (GRISEB. et SCHENK) HEGI, as are also in ASCHERSON et GRAEBNER's Synopsis (1921–1929). The next to propose a taxonomic classification was PODPĚRA (1905) who supplied a short diagnosis (regarding the type of growth and colour of the epicalyx scales) but used no infraspecific name. In his subsequent *Flora of Haná* (Květena Hané, 1910), this situation is reversed: a new name, var. *sudeticus* PODP., is coined to accommodate plants from Velká kotlina which are casually mentioned but no diagnosis or reference to the previous work is provided. As a nomen nudum, var. *sudeticus* PODP. also appears in POLÍVKA's *Excursion Flora* (1912) but is completely missing in its second edition (DOMIN et PODPĚRA 1928). This is most surprising because here, in a footnote, a number of forms and varieties of *D. carthusianorum* are recognized. Plants from Velká kotlina are not mentioned at all, however. It can only be surmised that they are included in subsp. *latifolius* var. *alpestris* NEILR. Only one of the many infraspecific taxa described by Podpěra, var. *robustus* PODP., is recognized, and another, var. *hannensis* PODP., is included in subsp. *tenuifolius* SCHUR. None of the subordinate taxa proposed by Podpěra only six years earlier (PODPĚRA 1922) were maintained by him in the *Flora*. Obviously, Podpěra became critical of the Aschersonian method which he had followed in his early studies of the Moravian flora (see also HENDRYCH 1978) and entirely renounced his elaborate subdivision of *D. carthusianorum* of 1922. This is also evident from the plentiful herbarium material gathered by him after 1928 in which even highly aberrant forms are consistently labelled *D. carthusianorum* L. and no infraspecific taxa are recognized. His students and friends seem to have been more con-

servative, however, having continued to use the epithet *sudeticus* in various ranks on both herbarium labels and in floristic reports. Examples include OTRUBA (1930) who describes "*Dianthus sudeticus*" beckoning the visitor to Velká kotlina and LAUS (1931) listing "*Dianthus carthusianorum* L. subsp. *sudeticus* PODP." as occurring in the „ostsudetische Matte". Herbarium material from Velká kotlina was named *D. carthusianorum* var. *sudeticus* PODP. (LAUS 1929 PRC, 1930 PRC, 1934 PRC; ŠMARDKA 1947 BRNM; SOUČKOVÁ 1949 BRNM) or rarely *D. sudeticus* PODP. (WEBER 1933 PRC). Unfortunately, the epithet was to remain a nomen nudum. DOSTÁL (1948–1950, 1954, 1958) took recourse to HEGI (1911, 1912) and ASCHERSON et GRAEBNER (1921–1929) in including plants from the Sudeten in his subsp. *montivagus* (DOMIN) DOST. So far the only author to query this classification has been JENÍK (1961) who suggested that the identity of these plants with subsp. *montivagus* was uncertain.

MORPHOLOGY

Morphologically, the plants may be defined as follows: Stems solitary or laxly caespitose, somewhat flexuous, 15–25(–30) cm long, with distinct nodes. Sheaths 5–9 mm long. Cauline leaves oblong-lanceolate, (1.5–) 1.8–2.6 (–3.2) mm wide. Involucral bracts scarious, stramineous to brown. Heads not conspicuously dense, 2–4(–5)-flowered, sometimes reduced to a single flower. Epicalyx scales brownish, awned. Calyx 15–17 mm long, light brownish-red. Petal limb (11–)12–14(–15) mm long, irregularly dentate in the upper part, light rose-coloured and hairy above, whitish and glabrous beneath. Claw longer than calyx.

The most conspicuous character is the light colour of the petal limb which may be likened to that of certain forms of *D. Lumnitzeri* WIESB. In *D. carthusianorum*, the colour is known to vary from rose to deep-purple red. No pale-flowered races have been reported, however, and albino forms are exceedingly rare. Mountain races, such as subsp. *latifolius* (GRISEB. et SCHENK) HEGI, subsp. *atrorubens* (ALL.) PERS. and subsp. *vaginatus* (CHAIX) SCHINZ et KELLER invariably have darker petals than *D. carthusianorum* of the lowlands and pigmentation of floral parts in general is known to increase with altitude. It is most interesting therefore to find that in the Velká kotlina population the contrary is the case.

All the other characters are known to occur within *D. carthusianorum* but their combination and association with the above feature is quite unique and unmatched in any of the many races hitherto recognized, as will be demonstrated below. Unusual in the mountain habitat are the diffuse stems, referred to in the original diagnosis by PODPĚRA (1905). The corresponding Alpine races tend to be densely caespitose.

CHROMOSOME NUMBER

The Sudeten *Dianthus* proved diploid, with a chromosome complement of $2n = 30$. The count was made from root-tips of young seedlings raised from seeds of plants transferred to the experimental plot in 1976 (three hours' pre-treatment with a saturated solution of hydroxyquinoline, followed by fixation in 1 : 3 glacial acetic alcohol and squashing in lacto-propionic orceine). The same number has been reported for subsp. *latifolius* (GRISEB. et SCHENK) HEGI (MÁJOVSKÝ et al. 1970, 1974, HOLUB et al. 1972 and present author's unpublished results) and for subsp. *subalpinus* (REHMANN) KRÁLÍK et MÁJOVSKÝ (MÁJOVSKÝ et al. 1974). The Moravian lowland *D. carthusianorum* is also diploid. To date, no counts are available for var. *alpestris* (NEILLR.) HEGI.

The Velká kotlina population of *D. carthusianorum* is very homogeneous in terms of morphology. A certain amount of variation can be seen only in the length of stem, number of flowers per inflorescence and length of petal limb. However, the variation ranges are distinctly narrower than in any population of *D. carthusianorum* sampled hitherto by the present author (unpublished results). Plants with lax inflorescences were collected in 1909 (LAUS BRNM) and 1949 (SOUČKOVÁ BRNM) but were not observed in 1976–1978. This variant is not at all rare in *D. carthusianorum* and has been repeatedly described under various names from different parts of the range: var. *anisopodus* SER., var. *proliferus* LENTICCHIA, var. *dissolutus* OSWALD et SAGORSKI, var. *longipedunculatus* GÉR. and var. *ramosus* DUFFT. As in other *Dianthus* species, a tendency to gynodioecy is shown in the population and several individuals with only female flowers were found. Transitional situations are also present.

In cultivation, the stems became somewhat taller (20–30 cm) and the petal limbs shorter (10–13 mm). The other distinguishing characters, including the distinctive colour of the petal limb, proved constant.

It is of some significance that no hybrids are produced, even though two *Dianthus* species, *D. deltoides* L. and *D. superbus* L. subsp. *alpestris* KABLIK ex ČELAK., occur in the same locality and both are known to be able to hybridize with *D. carthusianorum*.

ECOLOGY AND GEOGRAPHICAL DISTRIBUTION

The population is confined to a single locality, the magnificent Velká kotlina glacial cirque on the SE. side of Mt. Vysoká hole, Hrubý Jeseník Mts., where it occurs on steep, sunny (south and south-east facing) rocks with oscillating moisture at an altitude of 1200–1300 m. The absence of this *Dianthus* from similar localities elsewhere in the Sudeten has been confirmed by field research and the study of herbarium material. Associated species include *Agrostis alpina* SCOP., *Allium schoenoprasum* L. subsp. *sibiricum* (L.) HARTMANN, *Bartsia alpina* L., *Bupleurum longifolium* L. subsp. *vapincense* (VILL.) TODOR, *Calamagrostis villosa* (CHAIX) J. F. GMEL., *Calluna vulgaris* (L.) HULL, *Campanula Tatrae* BORB. subsp. *sudetica* (HRUBY) KOVANDA, *Carex montana* L., *Carlina acaulis* L., *Cystopteris fragilis* (L.) BERNH., *Deschampsia flexuosa* (L.) P. B., *Festuca supina* SCHUR, *Galium boreale* L., *Hedysarum hedysaroides* (L.) SCHINZ et THELL., *Helianthemum nummularium* (L.) MILL. subsp. *grandiflorum* (SCOP.) SCHINZ et THELL., *Hieracium villosum* JACQ., *Leontodon hispidus* L., *Phyteuma orbiculare* L., *Pimpinella saxifraga* L., *Polygala vulgaris* L., *Potentilla erecta* (L.) RÄUSCHEL, *Prunella grandiflora* (L.) SCHOLLER, *Scabiosa lucida* VILL., *Sedum alpestre* VILL., *Solidago virgaurea* L. subsp. *minuta* (L.) ARCANG., *Thymus praecox* OPIZ and *Vaccinium vitis-idaea* L. The geological substratum of the habitat is graphitic phyllite intercalated with plagioclases rich in calcium carbonate. Reports of *D. carthusianorum* from alpine grassland in the Velká kotlina refer to scattered individuals found established in a small meadow immediately below the rocks. The members of the population all grow in a breeding contact. Phytocoenologically, these plants may be said to occur in the open plant communities of the union *Agrostion alpinae* (see JENÍK, BUREŠ et BUREŠOVÁ 1980).

The glacial cirque is renowned as the richest locality of vascular plants in Czechoslovakia (about 350 species). Here, arctic-alpine, Alpine, Carpathian and boreal elements intermingle with plants of the Central European lowland. Many plant species are found thriving in unusual habitats and in startling phytocoenological relationships, some of them reaching the alti-

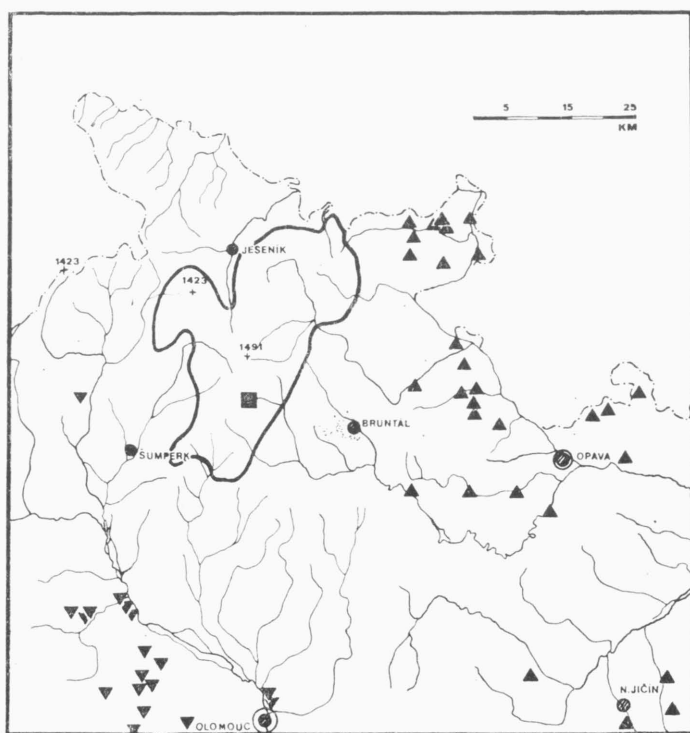


Fig. 1. — Distribution of *Dianthus carthusianorum* L. in NW. Moravia: ▼ populations with predominating subsp. *carthusianorum* (some intergraded with *D. Pontederæ* KERNER), ▲ populations with predominating subsp. *latifolius* (GRISEB. et SCHENK) HEGI, ■ subsp. *sudeticus* KOVANDA. Phytogeographical boundary of the Hrubý Jeseník Mts. shown by the thick line.

tudinal maxima or minima of their distribution in Czechoslovakia or even in Central Europe. A number of Sudeten endemics have been reported from Velká kotlina, including *Campanula Tatrae* BORB. subsp. *sudetica* (HRUBÝ) KOVANDA, *Plantago atrata* HOPPE subsp. *sudetica* (PILGER) HOLUB and several Hieraciiums, and two more, *Campanula gelida* KOVANDA and *Poa riphæa* (ASCHERS. et GRAEB.) FRITSCH, occur on Mt. Petrovy kameny in close proximity. The number of endemics is likely to increase when some critical species complexes have been subjected to detailed revision. The extraordinary habitat conditions, floristic riches and phytogeographical significance of the site have been commented on many times (see e.g. JENÍK 1961, JENÍK, BUREŠ et BUREŠOVÁ 1980).

TAXONOMIC RELATIONSHIPS

Morphologically, the Sudeten taxon appears most closely allied to var. *alpestris* (NEILR.) HEGI from the Eastern Alps. It differs mainly in its solitary, flexuous stems (densely caespitose and straight in var. *alpestris*), heads 2–4(–5)-flowered (3–6-flowered in var. *alpestris*), scarious subtending bracts (mostly herbaceous in var. *alpestris*), petal limb up to 15 mm long and light rose (only 9–12 mm long and various shades of purple red in var. *alpestris*). Both taxa resemble each other in the length of stem, shape of inflorescence and colour of calyx.

The Carpathian and Eastern Alpine subsp. *latifolius* (GRISEB. et SCHENK) HEGI (syn.: *D. montivagus* DOMIN) is readily separated by its tall, straight stems up to 60–70 cm long, leaves 3–6 mm wide, sheaths 7–16 mm long, inflorescence many-flowered, dense, subtending bracts herbaceous and petal limb 8–13 mm long and purple-red to purple. Both the Sudeten taxon and subsp. *latifolius* have the diffuse growth in common. It is important to note that subsp. *latifolius*, though essentially montane and submontane in its distribution, extends far into lowland Silesia (north of the Eastern Sudeten) and Central Moravia (south of the Eastern Sudeten) where it intergrades on a large scale with *D. carthusianorum* subsp. *carthusianorum*. It is completely missing from the Hrubý Jeseník Mts., however, (see Fig. 1) and no intermediates to var. *sudeticus* have been observed.

Another Carpathian taxon, subsp. *subalpinus* (REHMANN) KRÁLIK et MÁJOVSKÝ, is characterized by straight stems, cauline leaves up to 4 mm wide, calyx 13–15 mm long and purple-red petal limb 8–13 mm long. Characters shared with the Sudeten population include low stems and few-flowered inflorescences.

The West Alpine subsp. *vaginat*us (CHAIX) SCHINZ et KELLER differs by its caespitose growth, straight stems, narrow cauline leaves (only 1–2 mm wide), many-flowered heads and deep purple petal limb 6–9 mm long. The other West Alpine taxon, subsp. *atrorubens* (ALL.) PERS., has stout stems up to 60 cm long, dense heads with subtending bracts placed at a distance from them, petal limb deep purple, very narrow and only 4–6 mm long.

TAXONOMIC TREATMENT

It follows from the above survey that the Sudeten population cannot very well be accommodated in any of the major segments of *D. carthusianorum* and should therefore be kept separate — an idea advanced by CALLIER in 1893 and PODPĚRA in 1910. Both these tentative taxonomic proposals were abortive, however, at least under the present provisions of the Code. The epithet *alpestris* used by Callier is associated with a different taxonomic type and is therefore not available. Because the epithet *sudeticus*, though never validly published, was used in herbarium and literature for over 40 years and refers beyond any doubt to the Velká kotlina population of *D. carthusianorum*, it is suggested that it be retained. To satisfy the Code, the following treatment is proposed:

Dianthus carthusianorum L. subsp. ***sudeticus*** KOVANDA, subsp. nova

Syn.: *D. carthusianorum* L. f. *alpestris* CALLIER in Flora silesiaca exsiccata no. 786, 1893 (nomen nudum), non NEILR., Fl. Nieder-Österr. 805, 1859. — *D. carthusianorum* L. var. *sudeticus* PODPĚRA, Květena Hané 145, 1910 (nomen nudum).

Diagnosis: Caulibus solitariis vel laxiuscule caespitosis, modice flexuosis, 15–25(–30) cm longis, nodis obviis interstinctis; vaginis 5–9 mm longis; foliis caulinis oblongo-lanceolatis, (1.5–)1.8–2.6(–3.2) mm latis; bracteis involucralibus coriaceis, stramineis usque brunneis; fasciculis laxis, 2–4(–5) floribus formatis; squamis calycinis bruneis, aristatis; calyce 15–17 mm longo, dilute brunneo-purpureo; limbo petalino (11–)12–14(–15) mm longo, in parte superiore irregulariter dentato, superne pallide roseo, in parte media longe piloso, subtus albescente, glabro; ungue calyce longiore.

Holotypus: „Kotlina na Jeseníku“, PODPĚRA 1906 BRNU.

Specimina examinata: „Gr. Kessel“, OBORNY 1876 BRNU, 1876 PRC; „ad rupes vallis Gr. Kessel“, FREYN 1878 BRNM; „Gr. Kessel“, OBORNY 1887 PRC; „Velká kotlina“, SPITZNER 1888 BRNU; „Grosser Kessel“, CALLIER, HIRTE et SCHOLZ 1893 PRC (Flora silesiaca exsiccata no. 786); „Gebüsch im Grunde des Gr. Kessels des Gesenkes“, TEUBER 1903 BRNM; „Kotlina na Jeseníku“, PODPĚRA 1904 BRNU, „Gr. Kessel“, LAUS 1905 BRNU; „Kotlina na Jeseníku“, PODPĚRA 1905 BRNM, 1906 PRC; „Gr. Kessel“, LAUS 1909 BRNM; „Velká kotlina“, DVOŘÁK 1911 BRNM; „Kotlina“, PICBAUER 1911 BRNU; „Kotlina na Jeseníku“, PODPĚRA 1912 BRNU; „Gr. Kessel“, LAUS 1929 PRC, 1930 PRC; „Gr. Kessel“, PRINZ 1931 PR; „horské louky ve Vys. kotlině“, WEBER 1933 PRC; „Velká kotlina supra Malá Morávka“, WEBER 1933 PR; „Gr. Kessel“, LAUS 1934 PRC; „Gr. Kessel“, MISSBACH 1934 PRC; „Velká kotlina“, JEDLIČKA 1946 BRNU; „Velká kotlina“, ŠMARDA 1946 BRNM; „na horské louce dole ve Velké kotlině“, ŠOUŘEK 1946 PR; „ad fontem fluminis Moravica“, MEDLINOVÁ 1947 PRC; „in declivibus graminosis loco Velká kotlina dictis“, MORAVEC 1947 PR; „Velká kotlina“, ŠMARDA 1947 BRNM; „Velká kotlina“, SOUČKOVÁ 1949 BRNM; „in valle glaciali Velká kotlina“, DEYL 1951 PR, 1952 PR; „Velká kotlina“, VICHEREK 1960 BRNU; „Velká kotlina“, KOVANDA 1976, 1978 PR; „V. kotlina“, JEDLIČKA s. d. PRC; „Gr. Kessel“, LENEČEK s. d. PRC.

Etymologia: E nomine Montium Sudeticorum nominatus.

Area geographica: Endemice in valle glaciali Velká kotlina dicta Montium Hrubý Jeseník (Sudetorum pars orientalis) nascitur.

Subspecific rank, equivalent to that of the Alpine [subsp. *vaginat*us (CHAIX) SCHINZ et KELLER, subsp. *atrorubens* (ALL.) PERS.] and Carpathian races [subsp. *latifolius* (GRISEB. et SCHENK) HEGI, subsp. *subalpinus* (REHMANN) KRÁLÍK et MÁJOVSKÝ] is preferred, the population being morphologically well-defined and representing a distinct regional facies of the species. This concept of subspecies follows BABCOCK (1947) and is often used in modern taxonomy. Further study is required to ascertain whether var. *alpestris* should be recognized at the same rank; it seems highly likely that it should.

It is unclear from which source the Velká kotlina population has arisen. During any of the glacial eras, Alpine biotypes of *D. carthusianorum* could have colonized the Eastern Sudeten, as did a number of Alpine plants. Examples include *Campanula barbata* L., *Gentiana punctata* L., *Cardamine resedifolia* L., *Campanula Scheuchzeri* VILL., *Poa glauca* VAHL and perhaps also *Plantago atrata* HOPPE; the latter three species are known to have produced endemic races in the Eastern Sudeten (see KOVANDA 1977, JIRÁSEK et CHRTEK 1963, HOLUB et al. 1971). In the rock habitat in Velká kotlina, the evolutionary ancestors of subsp. *sudeticus* might well have survived both the severest glaciation and the warm interglacial periods. Whether they had been pre-differentiated or whether the present subsp. *sudeticus* is the result of convergent evolution, is a matter of guesswork. The singular colour of the petal limb may be due to a gene mutation in the early stages of differentiation.

While no intermediates between subsp. *sudeticus* and subsp. *latifolius* have been found, they can be traced between subsp. *sudeticus* and var. *alpestris*.

Plants occur in the Eastern Alps which on leaf shape, texture of subtending bracts and length of petal limb come close to subsp. *sudeticus* and, by contrast, some plants from Velká kotlina approximate to var. *alpestris*. A constant difference is the colour of the petal limb.

Another possibility would be that subsp. *sudeticus* developed from local Moravian populations of *D. carthusianorum* subsp. *carthusianorum* or subsp. *latifolius*. In view of the available evidence, this hypothesis appears less likely. The absence of any intermediates is perhaps not decisive: they could have been eliminated by natural selection (though one may wonder why the intermediates between subsp. *sudeticus* and var. *alpestris* have survived). It seems impossible, however, for subsp. *sudeticus* to have been derived from the Central Moravian lowland *D. carthusianorum* which is conspicuously small-flowered (with petal limb only 6–10 mm long), and approaches the more southern *D. Pontederæ* KERNER. Except for the serpentine locality near Šumperk, it is absent from the foothills of the Eastern Sudeten (see Fig. 1). No intermediates to subsp. *sudeticus* are known, contrasting with the foothills of the Alps where *D. carthusianorum* is common and intergraded with var. *alpestris*.

As has been pointed out above, although the Carpathian subsp. *latifolius* is widespread and variable at lower altitudes in Moravia and Silesia, it has failed to colonize the Hrubý Jeseník Mountains. This is remarkable, because the subspecies is ecologically plastic and occurs in a variety of habitats. This peculiar geographical distribution alone makes it improbable for subsp. *latifolius* to have participated in the origin of subsp. *sudeticus*. Considering the morphological discontinuity (mainly in the morphology of the inflorescence and size of petal limb) it is also hard to think of subsp. *latifolius* as an evolutionary ancestor of subsp. *sudeticus*.

ACKNOWLEDGEMENTS

Thanks are due to Ministry of Culture, Prague, for their kind permission to carry out research in the Velká Kotlina State Nature Reserve, and to Hrubý Jeseník Protected Landscape Area Authority, Malá Morávka, for providing facilities.

SOUHRN

Isolovaná diploidní ($2n = 30$) populace druhu *Dianthus carthusianorum* L. ve Velké kotlině v Hrubém Jeseníku se při taxonomické revizi ukázala být endemickým taxonem Východních Sudet, pro nějž je navrženo jméno *D. carthusianorum* L. subsp. *sudeticus* KOVANDA. V práci je nastíněn vývoj taxonomického pojetí a je podán stručný rozbor morfologických znaků, včetně jejich variability a diakritické hodnoty. Dále je uvedena ekologická charakteristika a zhodnocen výskyt ve Velké kotlině. Srovnání s montikolními deriváty druhu *D. carthusianorum* L. z Alp a Karpat ukázalo, že subsp. *sudeticus* jeví nejbližší vztahy k var. *alpestris* (NEILR.) HEGI z Východních Alp, od níž se liší netrsnatým nebo jen velmi volně trsnatým vzrůstem, chudokvětými strbouly, kožovitými zákrovními listeny a světle růžovou, (11–)12–14 (–15) mm dlouhou čepelí korunních plátek. Od subsp. *latifolius* (GRISEB. et SCHENK) HEGI (*D. montivagus* DOMIN), k níž byla dosud přiřazována, se sudetská populace odlišuje nižší, krivolakou lodyhou, užšími lodyžními listy, pochvami jen 5–9 mm dl., chudokvětými, volnými strbouly, kožovitými zákrovními listeny a barvou a velikostí čepelí korunních plátek. Subsp. *sudeticus* je spojena přechodnými tvary s var. *alpestris* a přes ni i se subsp. *carthusianorum*. Přechodné tvary jsou známy také mezi subsp. *latifolius* a subsp. *carthu-*

sianorum, ne však mezi subsp. *sudeticus* a subsp. *latifolius*. Epitheton *sudeticus* bylo publikováno v hodnotě variety jako nomen nudum v Podpěrově Květeně Hané roku 1910; v této práci je doplněno latinskou diagnosou a uvedeno tak v soulad s Mezinárodním kódem botanické nomenklatury.

REFERENCES

- ANDERSON-KOTTÖ I. et A. E. GAIRDNER (1931): Interspecific crosses in the genus *Dianthus*. — Genetics, the Hague, 13 : 77—112.
- ASCHERSON P. et P. GRAEBNER (1920—1929): Synopsis der mitteleuropäischen Flora. Vol. 5/2. — Leipzig.
- BABCOCK E. B. (1947): The genus *Crepis*. — Berkeley et Los Angeles.
- DOMIN K. et J. PODPĚRA (1928): Klíč k úplné květeně republiky československé. — Olomouc.
- DOSTÁL J. (1948—1950): Květena ČSR. — Praha.
- (1954): Klíč k úplné květeně ČSR. Ed. 1. — Praha.
- (1958): Klíč k úplné květeně ČSR. Ed. 2. — Praha.
- FAVARGER C. (1946): Recherches caryologiques sur la sous-famille des Silénoidées. — Ber. Schweiz. Bot. Ges., Bern, 56 : 364—466.
- FEDOROV A. A. [ed.] (1969): Chromosomnyje čisla cvetkovych rastenij. — Leningrad.
- FIEK E. (1881): Flora von Schlesien preussischen und österreichischen Antheils. — Breslau.
- GRABOWSKI H. (1843): Flora von Ober-Schlesien und dem Gesenke. — Breslau.
- GÜNTHER K. CH., H. GRABOWSKI et F. WIMMER (1824): Enumeratio stirpium phanerogamarum quae in Silesia proveniunt. — Vratislaviae.
- HEGI G. (1911): Systematische Gliederung des *Dianthus carthusianorum* L. — Allg. Bot. Zeitschr., Karlsruhe, 17 : 11—18.
- (1912): Illustrierte Flora von Mitteleuropa. Vol. 3. — München.
- HENDRYCH R. (1978): Josef Podpěra (1878—1954). Jeho dílo a význam pro českou botaniku. Preslia, Praha, 50 : 281—285.
- HOLUB J., J. MĚSÍČEK et V. JAVŮRKOVÁ (1971): Annotated chromosome counts of Czechoslovak plants (16—30). — Folia Geobot. Phytotax., Praha, 6 : 179—214.
- HOLUB J., J. MĚSÍČEK et V. JAVŮRKOVÁ (1972): Annotated chromosome counts of Czechoslovak plants (31—60). — Folia Geobot. Phytotax., Praha, 7 : 167—202.
- JENÍK J. (1961): Alpínská vegetace Krkonoš, Králického Sněžníku a Hrubého Jeseníku. — Praha.
- JENÍK J., L. BUREŠ et Z. BUREŠOVÁ (1980): Syntaxonomical study of vegetation in Velká kotlina cirque, the Sudeten Mountains. — Folia Geobot. Phytotax., Praha, 15 : 1—28.
- JIRÁSEK V. et J. CHRTEK (1963): *Poa riphaea* (A. et Gr.) Fritsch, ein Endemit des Gesenkes. — Novit. Bot., Praha, 1963 : 20—27.
- KOVANDA M. (1977): Polyploidy and variation in the *Campanula rotundifolia* complex. Part II. (Taxonomic) 2. Revision of the groups *Vulgares* and *Scheuchzerianae* in Czechoslovakia and adjacent regions. — Folia Geobot. Phytotax., Praha, 12 : 23—89.
- KROCKER A. I. (1787): Flora silesiaca. Vol. 2/1. — Vratislaviae.
- LAUS H. (1908): Schulflora der Sudetenländer. — Brünn.
- (1910): Der grosse Kessel im Hochgesenke. — Beih. Bot. Cbl., Dresden, 26/2 : 103—131.
- (1931): Aus der Pflanzenwelt des Grossen Kessels im Altwatergebirge. — Natur u. Heimat, Aussig, 2 : 99—105.
- MÁJOVSKÝ J. et al. (1970): Index of chromosome numbers of Slovakian flora (Part 2.). — Acta Fac. Rer. Nat. Univ. Comen., Bratislava, 18 : 45—60.
- MÁJOVSKÝ J. et al. (1974): Index of chromosome numbers of Slovakian flora (Part 3.). — Acta Fac. Rer. Nat. Univ. Comen., Bratislava, 22 : 1—20.
- MATTUSCHKA H. G. (1776): Flora silesiaca. Vol. I. — Leipzig.
- MEUSEL H. et H. MÜHLBERG (1971—1978): *Dianthus* L. In: HEGI G., Illustrierte Flora von Mitteleuropa, ed. 2, vol. 3/2, p. 984—1037. — München, Berlin et Hamburg.
- OBORNÝ A. (1885): Flora von Mähren und österr. Schlesien. — Brünn.
- OTRUBA J. (1930): Rostlinné útvary župy Olomoucké. In: Vlastivěda střední a severní Moravy, vol. 1, p. 129—274. — Kroměříž.
- PODPĚRA J. (1905): Floristické poznámky. — Věstn. Kl. Přírod. Prostějov 7 : 111—118.
- (1910): Květena Hané. — V Brně.
- (1922): Plantae moravicae novae vel minus cognitae. — Spisy Přírod. Fak. Masarykovy Univ., Brno, 1922/12 : 1—35.
- POLÍVKA F. (1912): Klíč k úplné květeně zemí koruny české. — Olomouc.

- ROHRER R. et A. MAYER (1835): Vorarbeiten zu einer Flora des Mährischen Gouvernements. — Brünn.
- ROHWEDER H. (1934): Beiträge zur Systematik und Phylogenie des Genus *Dianthus* unter Berücksichtigung der karyologischen Verhältnisse. — Bot. Jb., Leipzig, 66: 249—368.
- SCHUBE T. (1904): Flora von Schlesien preussischen und österreichischen Anteils. — Breslau.
- TUTIN T. G. (1964): *Dianthus* L. In: TUTIN T. G. et al. [ed.]: *Flora europaea*, vol. 1, p. 188—204. — Cambridge.
- WIMMER F. (1840): Flora von Schlesien preussischen und österreichischen Anteils. — Breslau, Ratibor et Pless.
- WIMMER F. et H. GRABOWSKI (1827): *Flora silesiaca*. Vol. 1. — Vratislaviae.

Received 28 April, 1979