Achillea setacea in the Czech Republic, with taxonomic remarks

***Achillea setacea* v České republice, s taxonomickými poznámkami**

Jiří Danihelka

Department of Botany, Faculty of Science, Masaryk University, Kotlářská 2, CZ-611 37 Brno, Czech Republic, and Administration of the Protected Landscape Area Pálava, Náměstí 32, CZ-692 01 Mikulov, Czech Republic, e-mail: danihel@palava.cz

Danihelka J. (2001): *Achillea setacea* in the Czech Republic, with taxonomic remarks. – Preslia, Praha, 73: 97–120.

A taxonomic account of *Achillea setacea* Waldst. et Kit. from the Central European perspective is given. The names *A. setacea*, *A. setacea* subsp. *dolopica* Freyn et Sint., *Achillea setacea* var. *brevifolia* Rochel, and *A. fililoba* Freyn are typified, the last one being excluded from the synonymy of *A. setacea*. The intraspecific variation observed need not to be expressed in taxonomic terms. The distribution maps of *A. setacea* in the Czech Republic are presented, based on examination of 785 herbarium specimens from almost all public Czech herbaria. Phytosociological affinity and interspecific relations of the species were studied using 205 relevés extracted from the Czech national vegetation database. Ecological requirements of *A. setacea* and regional distribution pattern are discussed on the background of its distribution in neighbouring countries and from a more general phytogeographical point of view.

K e y w o r d s : *Compositae*, taxonomy, *Achillea crithmifolia*, vegetation, phytogeography, Central Europe

Introduction

Achillea setacea Waldst. et Kit. is a diploid (2n = 18) member of the *A. millefolium* group. Its evolutionary significance was recognized by Ehrendorfer (1953, 1959). The morphological distinctiveness of this species among other yarrows was discovered already in the 16th century by the German herbalist Valerius Cordus (cf. Rauschert 1961). The formal description at the species level was provided by Waldstein-Wartemberg & Kitaibel (1799–1802) at the turn of the 18th century but it took about 150 years before the species has been widely accepted by other botanists. This might have been caused rather by overall confusion within the *A. millefolium* group than by other reasons because *A. setacea* clearly differs in several characters from other Central European yarrows. It can be easily recognized and displays unique phenological traits, ecological requirements, and a remarkable distribution pattern.

Achillea setacea appeared already in the second centuria of the earliest exsiccate series produced within what is now of the Czech Republic. It was Flora bohemica by F. W. Sieber (1789–1844), the second centuria of which was sold probably in 1815. It is noteworthy that the label bears not only the scientific but also the German name "Borstenblättrige garbe" and the Czech name "Řebříček sštětinolistý". The species was soon accepted by Czech and Moravian botanists and included in floras beginning with Presl & Presl (1819),

Kosteletzky (1824), and Rohrer & Mayer (1835). *Achillea setacea* was also clearly recognized by superior botanical writers L. Čelakovský and A. Oborny, both supporters of broadly defined species. The former, whilst subsuming all other taxa within the *A. millefolium* group as varieties, granted *A. setacea* subspecific status (Čelakovský 1870), explicitly stating (1873: 230): "The subspecies is constant, because I have never observed transitory plants towards a) [i.e. *A. millefolium* subsp. *genuina*]." Oborny (1885) recognized three species within *A. millefolium* group: *A. setacea*, *A. millefolium* L. (comprising four subspecies), and *A. asplenifolia* Vent.

Achillea setacea seems to have attracted an extraordinary attention of Central European botanists. It was subjected, alone or along with other group members, to several systematic and phytogeographic studies. The first modern, mainly karyological treatment of the *A. millefolium* group was published by Ehrendorfer (1953). The distribution of *A. setacea* in Germany and the south-eastern part of its range, its taxonomic status and ecology were studied by Walther & Walther (1960). The distribution of the species in Germany was later again mapped by Rauschert (1972) and revised by Beurton (1983), who continued her karyological, morphological and chemotaxonomic studies of the *A. millefolium* group (Biste 1978). Karyological, taxonomic and plant geographic studies of the *A. millefolium* group including *A. setacea* were also published for the territories of Poland, Ukraine, Bulgaria, and Austria, sometimes with respect to plants from other parts of the species range (Dąbrowska 1982, Sytnik 1984, Kuzmanov et al. 1989, Saukel & Länger 1992a, b). The Polish localities of *A. setacea* were summarized even twice by Dąbrowska (1984, 1997). A preliminary map of the Central European part of the species range was produced by Niklfeld (1971), while the whole distribution range of *A. setacea* was mapped by E. J. Jäger (in Wagenitz 1979, Meusel & Jäger 1992: 479). A review of chromosome counts published up to the present can be found in Danihelka & Rotreklová (2001), along with recent chromosome counts on plants from the Czech Republic and Slovakia.

In Czechoslovakia, the taxonomy and distribution of the *A. millefolium* group was studied by Spudilová (1957) but some of her conclusions are dubious. The distribution map of *A. setacea* in northern Bohemia was produced by Kubát (1970), that in Moravia by Šmarda (1963).

Materials and methods

The distribution map of the species is based on examination of specimens deposited at the following public herbaria in the Czech Republic, Slovakia, and Austria (abbreviations follow Holmgren et al. 1990): BRA, BRNL, BRNM, BRNU, CB, CHOM, FMM, GM, HR, LIM, LIT, MJ, MMI, MP, MZ, NJM, OL, OLM, OP, PL, PR, PRC, ROZ, SAV, SLO, VYM, W, WU, ZMT, and the herbarium of the District Museum Příbram (referred to as herb. Příbram), as well as in the private herbaria of Č. Deyl (Olomouc), I. Jongepierová (Veselí nad Moravou), R. Řepka (Brno), O. Šída (Praha), V. Žíla (Strakonice), and the present author (private collections indicated by the abbreviation "herb." and, if necessary, by the keeper's initials following the year). A total of 785 specimens of *A. setacea* from the Czech Republic were revised. Texts from the herbarium labels (see Appendix 1) were abridged and latinized (Quitt & Kucharský 1992). Obsolete and German toponyms were usually replaced by the recent ones. Quantitative characters were measured on herbarium specimens from the author's collections. Names of phytogeographic division units (espe-

cially in Appendix 1) follow Skalický (1988). The map of the mean annual rainfall was taken from Vesecký et al. (1958).

The phytosociological behaviour of the species was studied using relevés extracted from the Czech national vegetation database (Chytrý 1997), containing in October 1999 more than 22 000 both published and unpublished relevés. For the relevés published, the original classification was considered. Within a database including 13 206 relevés of grasslands, among them 205 relevés with *A. setacea*, the interspecific relations were evaluated using the statistics *u* suggested by Bruelheide (1995) for creating phytosociological species groups. The phytosociological relevé presented was recorded using the modified combined Braun-Blanquet scale of abundance and dominance (r, +, 1, 2m, 2a, 2b, 3, 4, 5).

When first mentioned, the names of syntaxa are given with authorities, following mainly Moravec (1995), those of plant species (except of yarrows) follow mostly Neuhäuslová & Kolbek (1982).

Results and discussion

Achillea setacea Waldst. et Kit., Pl. Rar. Hung. 1: 82, tab. 80, 1801.

Ind. loc.: "Crescit in clivis arenosis per planititiem, quae inde a Danubio per Comitatum Pesthiensem ad Tibiscum [Tisza river] extenditur."

Typus: specimen no. 26251/724 in PR, first plant from the left, no locality indicated (**lectotypus hoc loco designatus**) – cf. Chrtek & Skočdopolová (1982: 215 et tab. 10).

≡ *Achillea millefolium* ζ [var.] *setacea* (Waldst. et Kit.) W. D. J. Koch, Syn. Fl. Germ., ed. 1: 373, 1837.

≡ *Achillea millefolium* b) [subsp.] *setacea* (Waldst. et Kit.) Oelak., Květ. Okolí Praž.: 130, 1870.

– *Achillea setacea* subsp. *typica* E. Walther et K. Walther in Mitt. Florist.-Soziol. Arb.-Gem. 8: 71, 1960, nomen invalid. (cf. Art. 24.3 of ICBN; Greuter et al. 2000).

– *Achillea setacea* subsp. *orientalis* E. Walther et K. Walther in Mitt. Florist.-Soziol. Arb.-Gem. 8: 71, 1960, nomen invalid. (cf. Art. 37.1 of ICBN; Greuter et al. 2000).

= *Achillea setacea* subsp. *dolopica* Freyn et Sint. in Bull. Herb. Boiss. 5: 626, 1897. Ind. loc.: "[Graecia.] Sermeniko: in oropedio Nevropolis." Typus: specimen no. 16300/35 in BRNM, first plant from the left (**lectotypus hoc loco designatus**), Sintenis Iter Thessal. 1896 no. 1062, "Sermeniko: in oropedio Nevropolis", isolectotypes in BRNU and PRC.

≡ *Achillea setacea* ß) [f.] *dolopica* (Freyn et Sint.) Hayek, Prodr. Fl. Penins. Balcan. 2: 640, 1931.

= *Achillea setacea* c. [var.] *salina* Schur, Enum. Pl. Transsilv.: 328, 1866 (excl. var. a. *collina* et b. *subalpina*). Ind. loc.: "[Romania, Transsilvania:] Auf Salzboden: Salzburg, Torda, Kolos, Maros-Ujvár." Typus ignotus.

= *Achillea setacea* b. [var.] *brevifolia* Rochel, Pl. Banat. Rar.: 71, 1828. Ind. loc.: "[Serbia, Vojvodina:] Crescit in clivis arenosis [...] ad urbem Pancšowa [Pančevo]." Typus: WU (**lectotypus vel neotypus hoc loco designatus**), [Serbia, Vojvodina:] "II. Rg. [= regio secunda Banatus; cf. Rochel 1828] circa Pancšowa [Pančevo]. Rochel."

– *Achillea fililoba* auct. (Boiss., Fl. Or. Suppl.: 295, 1888; Huber-Morath in Ber. Schweiz. Bot. Ges. 84: 156, 1974; Franzén in Strid et Tan Kit, Mount. Fl. Greece 2: 444, 1991), non Freyn in Flora 64: 210, 1881.

– *Achillea odorata* auct. (verisimiliter Willd., Tract. de Achill.: 42, 1789 – excl. var. ß; Schleich., Pl. Helu., quas post impressionem Catalogi detexit ... et exsiccauit ..., Cent. I., no. 89, 1802 – cf. Schrader: Jour. für die Bot. 1801/1: 244–249, 1803; Reichenb. Fl. Germ. Excurs.: 229, 1831–1832), non L. Syst. Nat., ed. 10, 2: 1225, 1759 [non vidi].

Nomina excludenda: *Achillea fililoba* Freyn in Flora 64: 210, 1881. Ind. loc.: "Graecia septentrionalis. In monte Korax Aetoliae adjectae. In regione abietina inferiori prope pagum Musinitza alt. 3000'." Typus: specimen no. 16300/35 in BRNM, the plant with two flowering stems (**lectotypus hoc loco designatus**), Heldreich Iter per Graeciam septentrionalem, sine no., "In monte Korax Aetoliae adjectae. In regione abietina inferiori prope pagum Musinitza, alt. 3000'. Legit Th. de Heldreich, d. 21. Jul. 1879."

≡ *Achillea setacea* subsp. *fililoba* (Freyn) Nyman, Consp. Suppl. 2: 167, 1889.
= *Achillea setacea* ß [var.] *filifolia* Boiss., Fl. Or. Suppl.: 295, 1888 [nomen novum]. Ind. loc.: "In regione abietina inferiori montis Korax Aetoliae prope Musinitza 3000'." Leg. Th. Heldreich. Typus: identical with that of *A. fililoba* Freyn.

Exsiccata visa in finibus: Duffour Soc. Franc. Exs. no. 7200 (OLM, PR). – Fl. Exs. Austro-Hung. no. 993 (BRA, BRNM, BRNU, LIM, PR, WU). – Fl. Exs. Reipubl. Bohem. Slov. no. 939/I–V (BRNM, BRNU, GM, HR, OLM, OP, PR, SLO, W, WU). – Petrak Fl. Bohem. Morav. Exs. no. 1162 (BRNU, OLM, PR, PRC). – Reichenbach Fl. Germ. Exs. no. 43 (BRNM-herb. Münch-Bellinghausen, PRC, W). – Sieber Fl. Bohem., [Cent. 2.], no. 84. (PRC). – Tausch Herb. Fl. Bohem. no. 835 (ut *Achillea millefolium* L. ε *setacea* WK.; PR, PRC). – Tausch Pl. Select. Fl. Bohem., sine no. (PRC, W).

Exsiccata visa extra fines: Baenitz Herb. Eur. no. 3297 (PRC, W, WU). – Bornmüller Pl. Anatol. Orient. 1889 no. 557 (WU). – Callier Herb. Ross. (Reise durch die Krim 1895) no. 158 (WU). – Dörfler Herb. Norm. no. 5473 (BRNU, PR, PRC, W, WU). – Exs. Kotschy no. 302 (PR, PRC, WU). – Fl. Distr. Bacov. Exs. no. 12 (ut *Achillea collina* Becker; BRNU, LIM). – Fl. Graeca Exs. no. 43 (ut *Achillea fililoba* Freyn; PRC, W), no. 1142 (ut *Achillea fililoba* Freyn; WU). – Fl. Hung. Exs. no. 81 (BRA, BRNU, PR, W, WU). – Fl. Rom. Exs. no. 1387 (BRNU, PRC, W), no. 1387b (W). – Gerb. Fl. SSSR no. 3987 (BRNU, W). – Halácsy Iter Graecum Secund. a. 1893, sine no. (WU). – Halácsy Pl. Exs. Fl. Graecae no. 140 (PRC). – Heldreich Herb. Graecum Norm. no. 1552a (PR, PRC, W, WU), no. 1552b (PR, PRC, W, WU). – Reliq. Manisadjanae no. 47 (ut *Achillea fililoba* Freyn; BRNU). – Richter Fl. Hung. Orient. Exs., sine no. (BRNU). – Schleicher Pl. Helu., quas post impressionem Catalogi detexit [...] et exsiccauit [...], Cent. I., no. 89 (ut *A. odorata* Willd.; BRNM-herb. Münch-Bellinghausen, W). – Siehe Bot. Reise Cilicien 1895/96 no. 401. (PRC, WU). – Sintenis Iter Orient. 1894 no. 6194 (ut *Achillea setacea* Boiss.; PR). – Sintenis Iter Thessal. 1896 no. 918 (ut *Achillea crithmifolia* W. K.; PR), no. 1062 (ut *Achillea dolopica* "Fr. s. Sint. n. subsp."; BRNM, BRNU, PRC). – Wołoszczak Fl. Polon. Exs. no. 643 (ut *Achillea collina* Becker ex Koch; W, WU).

Icones: Dostál et al. Květ. ČSR 2: 1592, tab. 522, fig. 3, 1950. – Dostál Klíč Květ. ČSR, ed. 2: 696, tab. 258, fig. 2375, 1958. – Dostál Nová Květ. ČSSR 2: 1027, tab. 244, fig. 3, 1989 (ut *A. collina*). – Hayek in Hegi Ill. Fl. Mitteur. 6/2: 574, fig. 294a–c, 1928. – Jávorka et Csapody Icon. Fl. Part. Austro-orient. Eur. Centr.: tab. 521, fig. 3737, 1975. – Prodan (Achileele Românei) Bul. Acad. Stud. Agron. Cluj, Memorii, 2: tab. XXXVI, 1931. – Prodan et Nyarády in Săvulescu Fl. Reipubl. Pop. Romaîne. 9: 387, tab. 72, fig. 2, 1964. – Reichenbach Icon. Fl. Germ. Helv. 16: 127, tab. 1028, fig. 1 (icon minus bona), 1853–1854. – Rochel Pl. Banat. Rar.: tab. 31, fig. 65, 1828 (ut *A. setacea* b. *brevifolia*). – Rothmaler Exkursionsfl., ed. 6, 3: 528, 1987. – Sytnik Tysyachelistniki: 238, fig. 65, 1984. – Wagenitz in Hegi Ill. Fl. Mitteleur., ed. 2., 6/3: 339, fig. 153a–c, 1979.

Description: Perennial, rarely shortly perennial, villous or later in the season in some parts glabrate, conspicuously scented plants (if rubbed) with creeping 1–6 (–8) cm long rhizome bearing sterile leaf rosettes and flowering shoots. Stems erect or shortly ascending, unbranched or branched in its upper part, round or, when dry, striate or slightly ribbed, (6–) 12–50 (–53) cm tall, (1.0–) 1.1–2.7 (–2.8) mm thick below, with (9–) 12–26 (–27) nodes, yellowish green (lighter than leaves), often red coloured. Leaves alternate, rosette ones shortly petiolate, lower cauline ones very shortly petiolate or sessile, both mostly cuneate at the base, middle and upper cauline leaves sessile, conspicuously auriculate, 2–3 times pinnatisect, often with leaf tufts in axils; primary segments broadly ovate or triangular in outline, 1–5 mm long and 1–4 mm wide, their terminal segments narrowly lanceolate to linear in outline, 0.4–1.0 mm long and 0.2–0.3 (–0.4) mm wide, with cartilaginous margin near the top, apiculate; the rachis 0.5–1.2 mm wide; rosette and lower stem leaves very narrowly ovate, narrowly linear or very narrowly obovate in outline, their segments three-dimensionally arranged, elliptic in cross-section, rosette leaves 3–13 cm long and 2.9–6.5 (–11.0) mm wide, lower cauline ones (2.0–) 3.0–11.5 (–15.0) cm long and (2–) 3–6 (–11) mm wide, middle and upper cauline leaves (very) narrowly ovate or

narrowly linear in outline, the middle cauline ones 1.8–6.0 (–7.3) cm long and 2.0–9.0 mm wide, the upper cauline ones 0.7–4.0 (–4.5) cm long and 1.5–9.0 mm wide. Capitula arranged in dense, 1.3–5.6 (–6.2) cm long and (0.7–) 1.5–5.6 (–6.1) cm wide corymbs; involucre narrowly ovoid or cylindrical, its base rounded or cuneate in outline, (2.9–) 3.0–4.0 (–4.1) mm long and (1.4–) 1.5–2.7 (–2.8) mm wide when flowering, involucral bracts ovate or narrowly ovate, pale or yellowish green, sometimes with yellowish brown to brown margin, hairy, sometimes almost glabrate in fruit. Corollas white, sometimes cream-coloured when dry, ligules (4–) 5 (–6), three-lobate, (0.6–) 0.8–1.7 (–1.9) mm long and (1.0–) 1.1–2.0 (–2.5) mm wide when dry. Achenes narrowly cuneate in outline, very narrowly winged, compressed, 1.1–1.4 mm long, grey-brown, with pale margin. Flowers from May to June, very rarely in July.

Morphological variation

The degree of morphological variation in Bohemian and Moravian populations of *A. setacea* is generally low. No remarkable variation which would merit formal taxonomic recognition was observed. The original specimens of *A. setacea* f. *pseudosetacea* Spudilová (in Přírod. Sborn. Ostrav. Kraje 18: 105, 1957) should be deposited in PRC but they have not been found as yet. It can be assumed that this taxon is based on taxonomically unimportant variation. All the differences observed, generally in growth habit, such as tall stature (plants up to 60 cm or even taller) or branching already from lower parts of the stem, are due to the damage caused by pests or due to untypical growing conditions as the *A. millefolium* group members generally exhibit quite high ecological plasticity. Even cultivated plants, growing taller and being more robust, retain their morphological characters and are easily recognizable, which is undoubtedly true of natural populations. Despite this fact, quite a considerable number of wrongly identified specimens, even by experienced botanists, was found in the herbaria studied. The misidentification of *A. pannonica* Scheele as *A. setacea* was most frequent although both species differ in their growth habit, dissection and spatial arrangement mainly of rosette leaves as well as in their flowering time.

Other infraspecific taxa, all of them in the rank of a form, were described by Prodan (1931) and Dąbrowska (1982) from Romania and Bulgaria, respectively. They are unlikely to be of taxonomic importance; however, I have not yet had the opportunity to study their type or original specimens. The mention of intermediates between *A. setacea* and *A. pannonica* from Banat and Transylvania (Prodan 1931: 37–38), which should approach *A. pannonica* mainly in leave dissection, is not in accordance with my observations either. All plants from Transylvania that I have seen in several herbaria (e.g. BRNM, BRNU, PR, PRC, W, and WU) were more or less typical *A. setacea*-specimens. It is necessary here to distinguish between variation requiring a special taxonomic treatment and morphological "convergence" in extreme habitats.

Some plants from south-eastern Europe and Asia Minor are believed to be different from the Central European ones. They should be taller (up to 80 cm), with more (15–32) nodes, more densely villous and serotinous (cf. Walther & Walther 1960, Huber-Morath 1974). This is in accordance with my own observations made on herbarium specimens. However, the only exact evaluation of Turkish material was made by Saukel & Länger (1992a, b; plants referred to as "*A. pseudosetacea*"), but the number of plants investigated was too small to draw any taxonomic conclusions. They assumed, because of the pollen

size, that the plants were tetraploid. If this is the case, such populations would certainly merit formal taxonomic recognition because the species *A. setacea*, with regard to its evolutionary position, should comprise exclusively diploid populations. On the other hand, Kuzmanov et al. (1989) did not encounter any *setacea*-like tetraploid yarrows in Bulgaria. Moreover, there have also been reports on the diploid *A. setacea* plants from Greece and Turkey (Contandriopoulos & Martin 1967, Martin-Noguet 1969).

Tall, robust, sometimes serotinous plants also occur in Switzerland. Unlike the Central European plants, at least some of them flower in summer and early autumn (cf. Hess et al. 1972). In fact, it is not clear whether this information is correct as the corresponding illustration (p. 554) is almost certainly not *A. setacea*. This is also likely to be the case with the photograph nr. 2119 in Lauber & Wagner (1998: 1090).

It is noteworthy that the analyses of leaf flavonoids in *A. setacea* from differents parts of the species range (Valant-Vetschera 1984) revealed no easily interpretable variation. Unfortunately, only one Central European population was included in the analyses so that the comparison was not much representative.

Nomenclatural notes

The lectotype of *A. setacea* was preliminarily chosen by Chrtek & Skočdopolová (1982) from Waldstein's collection used in the elaboration of "Icones" (Waldstein-Wartemberg & Kitaibel 1799–1802) and now preserved in PR. There are three sheets of this species stored in the collection of types: the first two sharing an old large label of the earliest museum collections with the handwriting of C. Sternberg (1761–1838) indicating "Aus Graf Waldsteins und Linda[c]kers[1] Herbarium" (nrs. 515129, 515130), and the third one with a small label "*Achillea setacea* mihi", written probably by P. Kitaibel, which was chosen by Chrtek & Skočdopolová (1982) as a potential lectotype. Their choice was correct: all plants on these sheets are undoubtedly *A. setacea* as now generally understood. For formal reasons, the best preserved specimen with one flowering stem and three sterile rosettes is proposed here as the lectotype. It should be also mentioned that the combination *A. millefolium* subsp. *setacea* (Waldst. et Kit.) Čelak. was for the first time published in the Flora of Prague's environs (Čelakovský 1870) and not in "Prodromus" (Čelakovský 1871), which was assumed for instance by Wagenitz (1979).

The names *A. setacea* subsp. *typica* and *A. s.* subsp. *orientalis* were both invalidly published (Walther & Walther 1960), the former because of its epithet and the latter with no indication of the type (after 1 January 1958!). Regardless of formal mistakes, the paper is quite confusing. It is not clear whether Walther & Walther (1960), discussing the *A. s.* subsp. *dolopica* Freyn et Sint., described from Greece, also included this taxon into the subspecies *orientalis*. First, they implicitly excluded it, arguing on the base of its protologue that the subspecies *dolopica* differs from *A. setacea* [s.str.] solely by its dense villous indumentum. A few lines below (p. 71) quite a contradictory statement can be found: "The original specimens of subspecies *dolopica* being at our disposal are similar to the newly described subspecies *orientalis*. [...] Consequently, *Achillea setacea* ssp. *dolopica* Freyn et Sintenis would merit not more than the rank of a variety [of the subspe-

[1] Johann Thaddeus Lindacker (1768–1816) was in charge of C. Sternberg's collections in the castle of Březina in northern Bohemia.

cies *orientalis*?]." If this is the correct interpretation of the text, as can be assumed from the distribution map and from the list of revised herbarium specimens also provided (in Greece, exclusively *A. s.* subsp. *orientalis* is present), then the undeliberately produced (superfluous) nomen novum was also invalidly published because the reference to the author and publication place is neither full nor direct (required for names published after 1 January 1953; Greuter et al. 2000, Art. 33.3).

The lectotypification of *Achillea setacea* var. *salina* Schur has been impossible yet because the original specimens collected by Schur could not be found; searches in LW, W, and WU gave no results. The brief discussion in Prodan (1931: 37) evokes some doubts about the real importance of this taxon, but clarity will be reached only after original specimens has been checked.

An undated herbarium specimen of *A. setacea* var. *brevifolia* Rochel collected by A. Rochel was found in herbarium of K. Keck[2] which is now deposited in WU and still kept separately. It is labelled "*Achillea setacea.* W. K. b. *brevifolia.* Rchl. / Rchl. Plant. Ban. rar., Tab. XXXI. f. 64. / II. Rg. [= regio secunda; cf. Rochel 1828] / circa Pancšowa [Pančevo]. / Rochel." The note "830" on the label, written with red ink by A. F. Láng[3], indicates that the specimens was acquired by him in 1830 and became part of his herbarium which was later purchased by K. Keck (W. Gutermann & W. Till, in verb.). The locality given to the label complies with the site information in the protologue (Rochel 1828: 71); the full reference to the publication place also allows no doubts about the authenticity of the specimen. Rochel's original diagnosis gives the differences from var. *setacea* as follows: "Ab *A. setacea* W. Kitbl. vix foliis brevioribus laciniis lineari-cuneatis incisis abbreviatis aberrat." In fact, the tiny plant on the herbarium sheet does not seem to exceed the variation range of the Central European populations; and I fully agree with the opinion of A. Heimerl who revised the specimen as *A. setacea*. This oppinion is also supported by Rochel's phenological observation: "Flor. Mrt. Ap. [sic!] Specierum omnium praecossima." and by the corresponding illustration (Rochel 1828: tab. 31) which seems to depict a more or less typical *A. setacea*-plant.

The name *A. fililoba* Freyn is based on plants collected by Th. Heldreich in central Greece and issued in the exsiccate series "Iter per Graeciam septentrionalem". Freyn (1881), describing *A. fililoba*, emphasized its relationship to *A. crithmifolia* Waldst. et Kit.: "*A. filifolia* has probably the same relationship to *A. crithmifolia* W. K. as *A. setacea* W. K. has to *A. millefolium* L. Nevertheless, it differs from *A. crithmifolia* by a more gracile growth habit, by the dense patent indument of the stem, by the twice pinnatisect [stem] leaves with hair-shaped segments ..." Freyn's taxon was, however, soon placed into the relationship of *A. setacea*. The first one who did it was probably E. Boissier (1888). Describing *A. setacea* ß [var.] *filifolia*, he cited *A. fililoba* Freyn as a synonym along with Heldreich's exsiccate specimen. He produced, probably undeliberately by a typographic error, a nomen novum. According to the Code, the name could also be interpreted solely as a typographic error and should be corrected as *A. setacea* var. *fililoba* ["*filifolia*"]. The former interpretation was favoured by Huber-Morath (1974), the latter by Franzén (1991). Since their publications, both names have been repeatedly times cited as synonyms of *A. setacea*, for instance, by Huber-Morath (1974) and Franzén (1991).

---

[2] Karl Keck (1825–1894) was a bookshop keeper in Vienna and later private researcher in the castles of Friedegg near Schwertberg and Aistersheim.

[3] Adolf Franz Láng (1795–1863) was a pharmacist in Bratislava and Nitra (Slovakia).

I had the opportunity to study plants from J. F. Freyn's (1845–1903) personal collection stored now in BRNM. The herbarium sheet of Heldreich's exsiccate contains one leaf rosette and a part of rootstock with two flowering stems. The plants without any creeping rhizome, with flat leaves, ultimate segments of which are obtuse and without any cartilaginous margin (which is the case within the *A. millefolium* group), as well as with shiny subglabrous involucral bracts, undoubtedly belong to the *A. crithmifolia* group. The exsiccate was issued as *A. setacea*, but J. Freyn revised it and described *A. fililoba* as a new species. The sheet from BRNM which I propose as the lectotype of *A. fililoba* has also a small hand-written label "*A. fililoba* m. in litt. ad Heldr. et in Flora"; the three last words concerning the publication place were probably added later. Consequently the name *A. fililoba* must be excluded from the synonymy of *A. setacea*. In fact, the incorrect interpretation of Freyn's name was rejected already by Walther & Walther (1960).

The name *A. dolopica* Freyn et Sint., cited by some authors (e.g. Halácsy 1902, Huber-Morath 1974) in the synonymy of *A. setacea*, has never been validly published. This can be explained by reading errors because the name was published in the form "*Achillea dolopica* Freyn et Sint. n. subsp. *A. setaceae* W. K." both in the original publication place (Freyn 1897) and in the exsiccate label of the series "Sintenis Iter Thessalicum". The earliest misinterpretation at the specific level can be found already in the index of the corresponding volume of "Bulletin de l'Herbier Boissier". The lectotype was chosen from Freyn's personal herbarium collection in BRNM.

General distribution

Achillea setacea occurs in north-eastern Germany, south-eastern Poland, Czech Republic, southern Slovakia, eastern Austria, Hungary, Ukraine, Switzerland, northern Italy, Croatia, Serbia, Bulgaria, Romania, Greece, and Turkey. Its occurrence in Moldavia, south-eastern Russia, Slovenia, and Iran is given in literature, but no herbarium specimens from these countries were available to me. For the general distribution map see E. J. Jäger (in Wagenitz 1979) and Meusel & Jäger (1992). The recent species range is disjunct and can be regarded, namely in Central Europe, as a relict of the more continuous past distribution.

The eastern boundary of the species range remains to be precised. Even the recent literature sources give a contradictory picture. In eastern Ukraine, according to Androshchuk (1978) and Sytnik (1984), *A. setacea* should be replaced by similar but tetraploid *A. stepposa* Klokov et Krytzka. On the other hand, *Achillea setacea* is reported as growing in south-western Siberia (Shaulo 1997) or, as an alien species, even in the Far East (Barkalov 1992), together with the diploid and tetraploid *A. asiatiaca* Serg. The situation in Greece, Asia Minor, and the Middle East was mentioned above.

Notes on the distribution in the Czech Republic and adjacent countries

Achillea setacea displays a remarkable distribution pattern within the Czech Republic. Its regional distribution range consists of two parts (Fig. 1–2). The species is confined to the regions of thermophilous flora ("Bohemian and Pannonian Thermophyticum", Skalický 1988), with minor overlaps to the adjacent regions of mesophilous flora mainly south of Prague and in south-western Moravia. This can be explained by the presence of suitable habitats such as rock outcrops. Close relations can be observed between the distribution

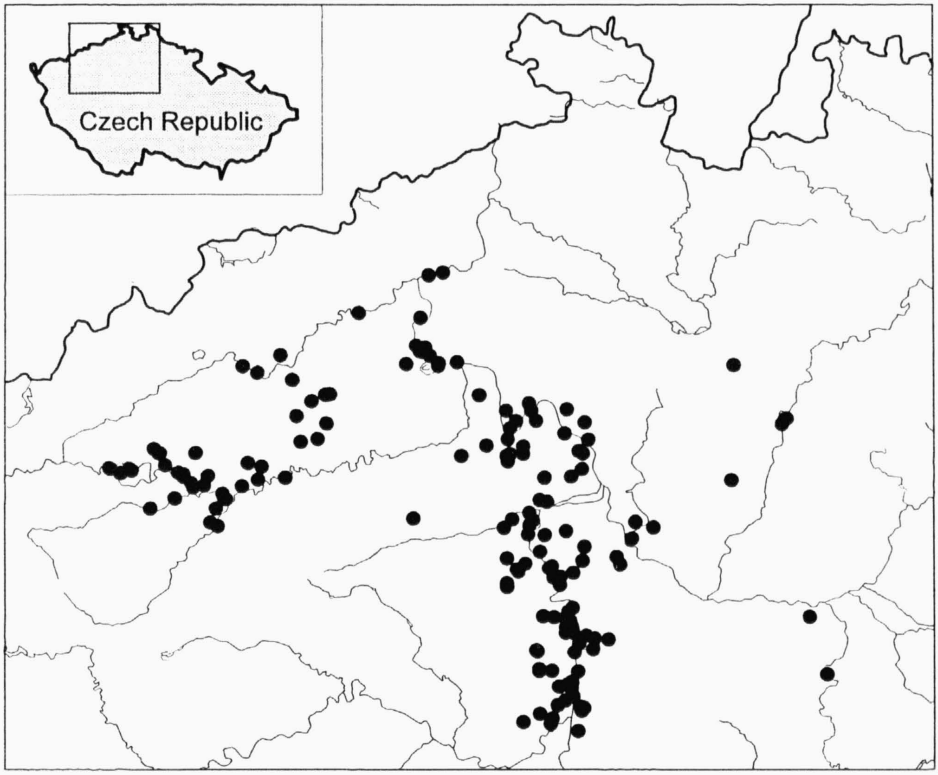

Fig. 1. – Distribution of *Achillea setacea* Waldst. et Kit. in central and northern Bohemia; for localities see Appendix 1.

pattern and the mean annual precipitation sum (Fig. 3): most of the localities are concentrated in regions with mean annual rainfall lower than 550 mm, and the isohyet of 600 mm is only exceptionally broken. These parts of the Czech Republic have also been almost continuosly inhabited since the Neolithic Age, and so human influence, together with low precipitation, helped to maintain open places as habitats suitable for *A. setacea*. Nevertheless, the recent distribution seems to be only the rest of the former, more continuous range in the early postglacial period.

The existence of isolated localities near the town of Mladá Boleslav (Hill Radouč; together with *Fumana procumbens*) and near the settlement of Chroustov (central Bohemia, distr. Kolín) can be explained by the circumstance that in both sites *A. setacea* could survive on rocky places protecting it from the competition of other vegetation. The situation in one or two localities near the town of Bělá pod Bezdězem and near the village of Chotětov remains unknown to me. It is remarkable that the species was collected there only once by I. Klášterský (1923, PR) and by L. F. Čelakovský (1916, PR), respectively. As both are believed to be very reliable collectors, deliberate falsifications must be excluded. The reliability of Klášterský's collection is supported by the fact that the surroundings of Bělá pod Bezdězem is a region marked by the occurrence of several relict subcontinental and/or psammophilous species such as *Astragalus arenarius*, *Gypsophila fastigiata*

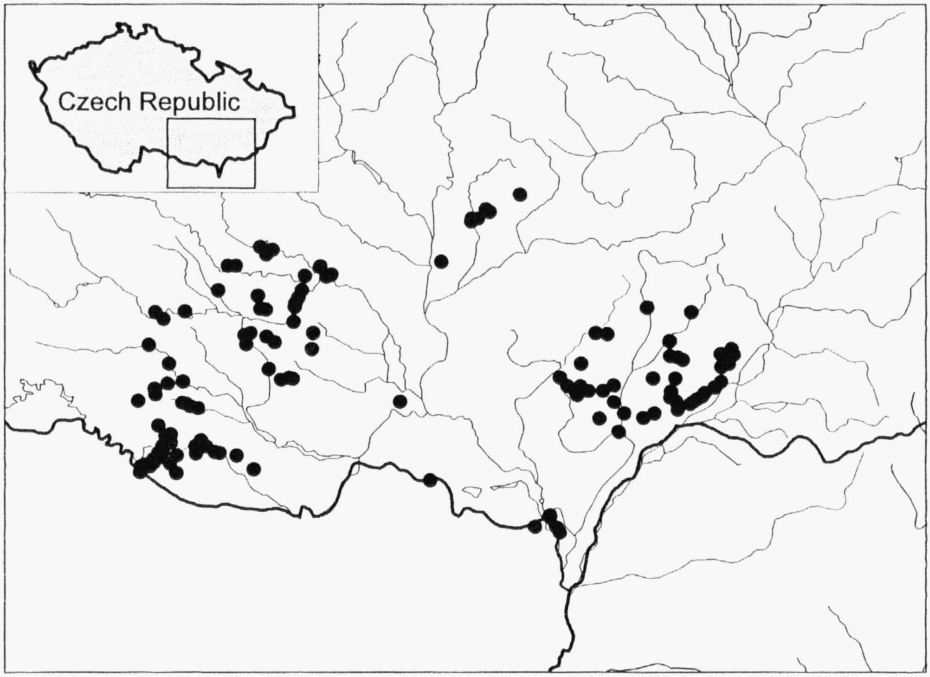

Fig. 2. – Distribution of *Achillea setacea* Waldst. et Kit. in southern Moravia; for localities see Appendix 1.

subsp. *arenaria*, and *Pulsatilla patens* (Machová 1999). This is why the presence of *A. setacea* would be in accordance wih the phytogeographical character of the region. Two remaining outlier localities in Bohemia are associated with some doubts. The herbarium sheet labelled "Distr. Nymburk: in colle Na Horkách prope oppidum Sadská", collected by A. Žertová in 1953 and stored in PR, contains both *A. setacea* and *A. pannonica*; this diminishes its reliability, and a mistake when handling herbarium material cannot be excluded. The same aplies to another sheet from PRC, bearing specimina mixta, collected by J. F. Knaf (1801–1865) near "Klein-Paletsch" [Páleček, distr. Kladno] in 1832 and now preserved in PRC (cf. Čelakovský 1873: 231).

An interesting herbarium sheet is stored in BRNM. The voucher specimen, labelled "Konskau bei Teschen" and already then correctly identified as *A. setacea*, was collected in 1825 near the village of Konská (today a part of Třinec) in former Austrian Silesia by Lutheran minister C. Kotschy (†1846). The climatic and soil conditions of this part of Silesia do not meet ecological requirements of the species; an accidental introduction (with grain) should be considered here a suitable explanation. It would be a parallel to several finds of *A. crithmifolia* in Bohemia, the first introduction of which was recorded about 120 years ago (J. Danihelka, unpubl.). The two rather old herbarium specimens of *A. setacea* from former Prussian Silesia discussed by Dąbrowska (1984) might have been of the same origin. Nevertheless, she omitted them for some reasons from her latest account of localities (Dąbrowska 1997).

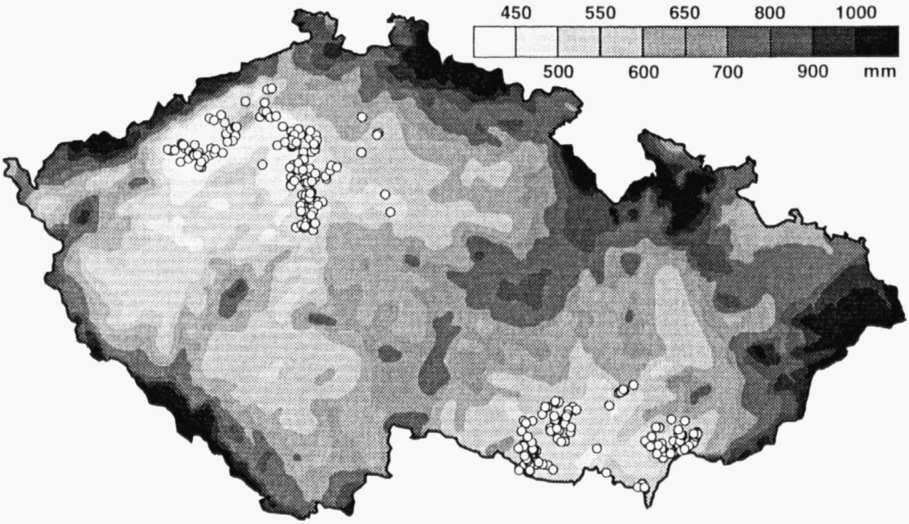

Fig. 3. – Distribution of *Achillea setacea* Waldst. et Kit. in the Czech Repubic in relation to the mean annual precipitation sum; data from Vesecký et al. (1958).

Many localities given in literature are probably erroneous. For space reasons, only Moravian and Silesian localities (see Fig. 2) will be briefly discussed here. The northernmost occurrence of *A. setacea* documented by a herbarium specimen is that near the village of Viničné Šumice east of Brno. All other localities such as Krásná and Fulnek, Hranice, and Opava (Oborny 1885), Hněvotín near Olomouc, the surroundings of Opava and Hlučín (Dostál et al. 1948–1950) as well as those of Olomouc, Hranice, and Opava (Spudilová 1957) are probably based on misidentified specimens of other yarrows. In most cases, the corresponding herbarium sheets has not found in the herbaria studied. These records were accepted by Šmarda (1963) and unfortunately passed by regional data suppliers to Niklfeld (1971); however they should be dropped from the map. If regional botanical literature is taken in account, other numerous doubtful records from localities even within the south Moravian range of the species could be mentioned here. They are mostly based on misidentified specimens of *A. pannonica*.

Phytogeographical comments

The disjunct distribution of *A. setacea* in the Czech Republic can be compared with regional distribution patterns of several species such as *Adonis vernalis*, *Astragalus austriacus*, *A. exscapus*, *Euphorbia seguieriana*, *Festuca valesiaca*, *Hypericum elegans*, *Linum tenuifolium*, *Orthantha lutea*, *Silene otites*, *Stipa capillata*, and *Viola ambigua*. Quite a different picture comes out if a more detailed scale is considered (cf. Fig. 1, 2). The local distribution of *A. setacea* coincides more or less with that of acidophilous or substrate-indifferent species but is vicarious with that of basiphilous ones, e.g. *Adonis vernalis*, *Astragalus austriacus*, *A. exscapus*, *Hypericum elegans*, *Linum tenuifolium*, *Orthantha lutea*, and *Viola ambigua*. The absence of *A. setacea* in some parts of southern-

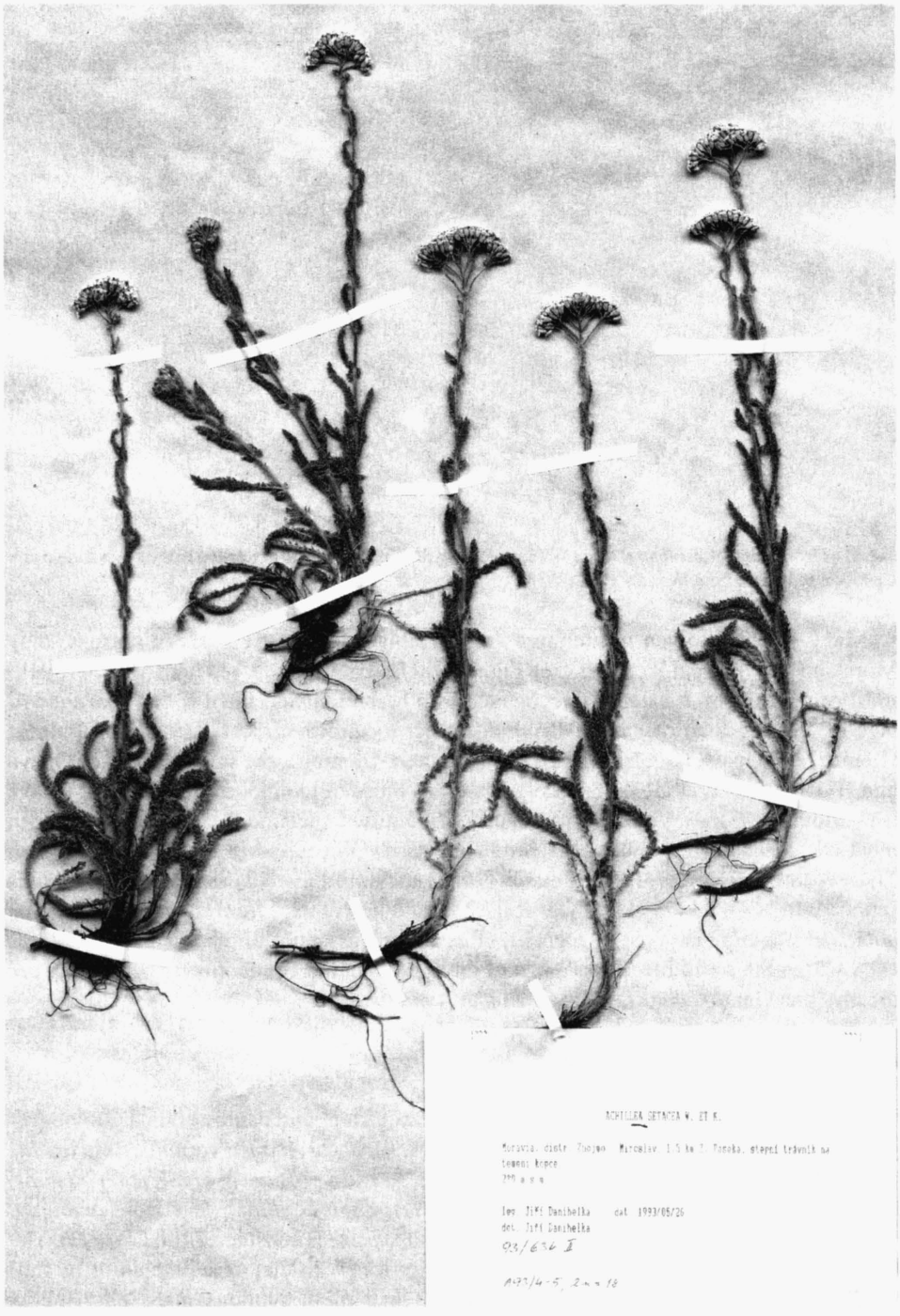

Fig. 4. – *Achillea setacea* Waldst. et Kit.; Moravia, distr. Znojmo, Miroslav: Hill Paseka, ca 1,5 km W of the town, 280 m a.s.l., leg. J. Danihelka, 26 May 1993, herb. J. D.

most Moravia can be explained by unsuitable soils as the region is built of calcareous Tertiary flysch deposits. A similar phenomenon was observed in Thüringer Becken in Germany (Rauschert 1972). Among the species listed above, *Adonis vernalis*, *Astragalus austriacus*, *Hypericum elegans*, and *Viola ambigua* can be, together with *A. setacea*, classified as Pontic-South Siberian floroelement.

The localities of *A. setacea* in northern Bohemia are connected by a rather continuous chain of occurrences along the Labe/Elbe river (as a possible migration route) with those in central Germany in the piedmonts of the Harz Mts which are situated on the north-western species limits (Rauschert 1972, Benkert et al. 1996). The nearest localities of *A. setacea* in Poland can be found in the surroundings of the town of Sandomierz in Kotlina Sandomierska about 670 km eastwards from the town of Halle (Dąbrowska 1997). Despite this large gap, presence of *A. setacea* in central Germany and even in central and northern Bohemia is likely to be explained as a result of plant migration via Sarmatian migration route in the early postglacial period. Nevertheless, there is no direct evidence for this opinion. On the contrary, the south Moravian localities of *A. setacea* have undoubtedly come into existence via Pannonian migration.

Remarks on ecology and synecology of the species

Achillea setacea is a heliophilous plant requiring shallow, pervious, often skeletal soils which usually dry out throughout summer. The most frequent bedrock in the localities of *A. setacea* are various eruptives (e.g. basalt, granite), metamorphites (gneiss) and sedimentary rocks (conglomerate, acidic and neutral sands). In the Czech Republic the species seems to be a calcifuge. Its only occurrence on limestone in the Šibeničník Hill (southern Moravia; see relevé 1) in the vegetation of the alliance *Festucion valesiacae* Klika 1931 can be explained by dolomitization of the rock.

Relevé 1. Number in the Czech national phytosociological database 452386: Mikulov (distr. Břeclav): Šibeničník Hill, cca 2.1 km S–SSW of the church near the town square, 220 m a.s.l.; recorded by J. D., 1 September 1997; area analysed 25 m^2, total cover 75%, cover E_1 75%, cover E_0 3% (not identified), aspect WNW, slope 12°, number of species 34. E_1: *Festuca valesiaca* 2b, *Festuca rupicola* 2a, *Koeleria macrantha* 2a, *Phleum phleoides* 2a, *Pseudolysimachion spicatum* 2a, *Achillea setacea* 1, *Centaurea rhenana* 1, *Potentilla arenaria* 1, *Sedum acre* 1, *Poa pratensis* agg. +, *Teucrium chamaedrys* 1, *Thymus praecox* 1, *Acinos arvensis* +, *Allium flavum* +, *Alyssum alyssoides* +, *Artemisia campestris* +, *Astragalus austriacus* +, *Avenula pubescens* +, *Bromus japonicus* +, *Carex humilis* +, *Centaurea scabiosa* +, *Dianthus pontederae* +, *Dorycnium germanicum* +, *Elytrigia intermedia* +, *Eryngium campestre* +, *Euphorbia cyparissias* +, *Galium verum* +, *Globularia punctata* +, *Orobanche alba* +, *Orobanche elatior* +, *Seseli hippomarathrum* +, *Silene otites* +, *Stachys recta* +, *Stipa capillata* +.

In Czech and Moravian localities *A. setacea* is confined mainly to dry grasslands of the order *Festucetalia valesiacae* Br.-Bl. et Tüxen ex Br.-Bl. 1949, most of all to the communities of the alliance *Festucion valesiacae*. As the syntaxonomic classification of these communities needs a thorough revision, names of communities are not given here. In central and northern Bohemia, and in south-western Moravia, the species is present in several communities of rocky slopes and dry grasslands on mainly acidic rock, classified within the alliance *Alysso-Festucion pallentis* Moravec in Holub et al. 1967. As a typical example of this vegetation hosting *A. setacea* at its localities in south-western Moravia, the association *Helichryso-Festucetum pallentis* Vicherek in Chytrý et al. 1997 can be given. In the same region, *A. setacea* was recorded in the subcontinental heathland communities of the

associations *Carici humilis-Callunetum* Ambrozek et Chytrý 1990 and *Agrostio vinealis-Genistetum pilosae* Ambrozek et Chytrý 1990, both of the alliance *Genistion pilosae* Duvigneaud 1942 (order *Vaccinio-Genistetalia* Schubert 1960), and in the acidophilous dry grasslands of the alliance *Koelerio-Phleion phleoidis* Korneck 1974 (order *Koelerio-Phleetalia phleoidis* Korneck 1974). The vegetation covering localities of *A. setacea* on stabilized sand dunes along the lower Dyje river is assigned to the alliance *Koelerio-Phleion phleoidis* Korneck 1974 (order *Koelerio-Phleetalia phleoidis* Korneck 1974). In the surroundings of the towns of Roudnice nad Labem (northern Bohemia) and Hodonín (southern Moravia), *A. setacea* is present in psammophilous vegetation of the alliance *Plantagini-Festucion ovinae* Passarge 1964 (order *Corynephoretalia canescentis* Klika 1934). It also overlaps to other types of communities such as pioneer vegetation of the association *Gageo bohemicae-Veronicetum dillenii* Korneck 1975 of the alliance *Arabidopsion thalianae* Passarge 1964 and dry grasslands of the alliance *Bromion erecti* Koch 1926 (order *Brometalia erecti* Koch 1926). Numerous vegetation relevés with *A. setacea* can be found for instance in Chytrý et al. (1997), Klika (1929), Kubíková (1982), and Toman (1981, 1988).

Within the group of 205 relevés containing *A. setacea*, sixteen species with the strongest relation to this species were selected (Table 1). The significance of the relationship is extraordinarily high in all cases. Among the species with the strongest positive relation, the order *Festucetalia valesiacae* is indicated by *Asperula cynanchica*, *Dianthus carthusianorum* agg., *Koeleria macrantha*, and *Potentilla arenaria* ("*K. macrantha* group"), while the alliance *Festucion valesiacae* by *Festuca valesiaca*, *Silene otites* and *Stipa capillata* ("*F. valesiaca* group") (Chytrý, in litt.). These results can be considered highly representative as the vegetation types in which *A. setacea* occurs are favoured by botanists and frequently recorded.

Table 1. – Values of *u* statistics (Bruelheide 1995) reflecting the relation between *Achillea setacea* and other species. Calculated on the basis of 13 206 relevés. *Achillea setacea* was present in 205 relevés, u_{max} = 113.74; m = number of occurrences in the whole database, n = number of occurrences together with *A. setacea*. Species are ranked according to the decreasing strength of positive relationship to *A. setacea*.

Species	u	m : n
Verbascum phoeniceum	31.03	163 : 52
Festuca valesiaca	29.34	963 : 128
Thymus pannonicus	28.27	550 : 91
Silene otites	26.42	531 : 84
Veronica prostrata	26.40	350 : 67
Dianthus carthusianorum agg.	25.88	1401 : 142
Eryngium campestre	25.76	1050 : 120
Taraxacum serotinum	25.72	51 : 24
Carex supina	24.93	249 : 53
Koeleria macrantha	24.69	1518 : 143
Armeria elongata	23.56	219 : 47
Potentilla incana	23.19	1561 : 138
Salvia nemorosa	22.55	232 : 46
Stipa capillata	21.84	559 : 73
Asperula cynanchica	18.77	1377 : 108
Astragalus austriacus	18.45	245 : 40

A considerable part of localities of *A. setacea* is small islands of primary open vegetation in which succession is blocked by special soil conditions such as extreme drought. *Achillea setacea* is protected there from strong interspecific competition. These habitats might have survived almost unchanged since the early postglacial (Ehrendorfer 1959). They host several species with similar regional and general distribution ranges which can also be viewed as relicts of the early Holocene steppes. These species, like *A. setacea*, are often continental migrants (e.g. *Helictotrichon desertorum*). It should be stressed that the ecological requirements and phytosociological affinity of this yarrow are in agreement with its putative origin as a direct descendant of an old diploid taxon which has taken part in constituting a polyploid complex.

Acknowledgements

I am obliged to M. Chytrý, V. Grulich, Z. Kaplan, M. Kočí, K. Marhold, and J. Štěpánek for their valuable help including consultations on vegetation science, phytogeography, nomenclature, mapping software, and early exsiccate collections. The comments of Z. Kaplan (Průhonice), J. Kirschner (Průhonice), and M. Štech (České Budějovice) helped me to improve the quality of the paper. I also thank to owners of private herbaria and persons in charge of public herbarium collections mentioned above; among them, namely M. Dvořáková, J. Hadinec, O. Ondráček, B. Skočdopolová, and W. Till provided me extraordinary support. The research was financed by the grant MŠM 143100010 and by the grant no. 206/98/1545 from the Grant Agency of the Czech Republic.

Souhrn

Řebříček štětinolistý (*Achillea setacea*) je diploidní (2n = 18), a tudíž pravděpodobně primitivní taxon z polyploidní řady *A. millefolium* agg. Nejstarší písemnou zmínku, která se pravděpodobně vztahuje k řebříčku štětinolistému, lze nalézt v herbáři německého lékaře Valeria Corda (1515–1554), jenž také botanizoval v Čechách. Jako nový druh pro vědu byla *A. setacea* popsána v „Descriptiones et icones" (Waldstein-Wartemberg & Kitaibel 1799–1802). Záhy byla rozpoznána také českými botaniky, takže se ocitla již ve druhé centurii nejstarší české exsikátové sbírky „Flora bohemica", vydané F. W. Sieberem (1789–1844) pravděpodobně již v roce 1815. Je pozoruhodné, že kromě vědeckého a německého jména nese etiketa i české jméno „Řebříček sstětinolistý", jehož se užívá dodnes. V „Kwěteně české" (Presl & Presl 1819) je přívlastek „sstětinolistý" kupodivu nahrazen epitetem „ssťetinatý". *Achillea setacea* byla jako samostatný druh vzápětí přijata v dalších českých a moravských flórách (Kosteletzky 1824, Rohrer & Mayer 1835).

Taxonomickým a chorologickým studiem skupiny *A. millefolium* (včetně *A. setacea*) v bývalém Československu se zabývala Spudilová (1957); na základě novějších poznatků nelze však s mnohými jejími závěry souhlasit. Mapu rozšíření *A. setacea* v České středohoří zpracoval Kubát (1970), mapu rozšíření na Moravě pak Šmarda (1963). Chromozomové počty z osmi lokalit z České republice zjistili Danihelka & Rotreklová (2001).

Achillea setacea (obr. 4) je vytrvalá, vlnatá, v mládí až hustě vlnatá, po rozemnutí nápadně vonná bylina s plazivým, 1–6 (–8) cm dlouhým oddenkem. Lodyha je přímá nebo krátce vystoupavá, obvykle nevětvená, oblá, za sucha slabě žebernatá, (6–) 12–50 (–53) cm vysoká, nažloutle zelená, často červeně naběhlá. Přízemní listy jsou krátce řapíkaté, 3–13 cm dlouhé a 2,9–6,5 (–11.0) mm široké, v obrysu velmi úzce obkopinaté, úzce podlouhlé nebo velmi úzce kopinaté, s nápadně trojrozměrně uspořádanými úkrojky; dolní lodyžní listy jsou krátce řapíkaté nebo přisedlé, většinou s klínovitou bází, (2,0–) 3,0–11,5 (–15,0) cm dlouhé a (2–) 3–6 (–11) mm široké; střední a horní lodyžní listy přisedlé, v obrysu úzce kopinaté nebo podlouhlé, s nápadně rozšířenou objímavou bází (ouškaté), v paždí často se svazečky listů; listové úkrojky 1. řádu v obrysu široce vejčité nebo trojúhelníkovité, 1–5 mm dlouhé a 1–4 mm široké, jejich koncové úkrojky úzce kopinaté nebo čárkovité, 0,4–1 mm dlouhé a 0,2–0,3 (–0,4) mm široké, poblíž vrcholu s chrupavčitým lemem, hrotité, listové vřeteno 0,5–1,2 mm široké, střední lodyžní listy 1,8–6 (–7,3) cm dlouhé a 2–9 mm široké, horní lodyžní listy 0,7–4 (–4,5) cm dlouhé a 1,5–9 mm široké. Úbory jsou uspořádány v hustých, 1,3–5,6 (–6,2) cm dlouhých a (0,7–) 1,5–5,6 (–6,1) cm širokých chocholičnatých latách; zákrov úzce vejcovitý nebo válcovitý, za květu (2,9–) 3–4 (–4,1) mm dlouhý a (1,4–) 1,5–2,7 (–2,8) mm široký, zákrovní listeny vejčité nebo úzce vejčité, bledě zelené nebo žlutozelené, někdy s žlutohnědým až hnědým lemem, vlnaté, za plodu někdy olysalé. Květy jsou bílé, někdy za sucha smetanově bílé. Jazykovité květy v úborech v počtu (4–)5(–6), ligu-

ly trojlaločné, za sucha (0,6–) 0,8–1,7 (–1,9) mm dlouhé a (1–) 1,1–2 (–2,5) mm široké. Nažky jsou v obrysu úzce klínovité, smáčklé, 1,1–1,4 mm dlouhé. Kvete v květnu a červnu, zřídka ještě počátkem července.

Morfologická variabilita českých a moravských populací je ve srovnání s ostatními taxony okruhu *A. millefolium* poměrně malá. Nebyly zjištěny žádné odchylky, které by mohly mít taxonomický význam. I v neobvyklých růstových podmínkách si druh zachovává typický vzhled a je možné jej bez potíží rozeznat. Navzdory tomu bylo nalezeno značné množství směsných a chybně určených herbářových dokladů. Nejčastější záměny, snad v důsledku častého společného výskytu, byly zaznamenány s druhem *A. pannonica*, méně často s druhem *A. collina*. Výskyt rostlin přechodného vzhledu mezi druhy *A. setacea* a *A. pannonica*, zmiňovaný v literatuře, se nepodařilo potvrdit.

V českých zemích vytváří řebříček štětinolistý dvě arely – českou a moravskou (obr. 1 a 2). Téměř veškeré lokality jsou soustředěny v českém a moravském termofytiku; pouze v okolí Prahy a na jihozápadní Moravě, kde se vyskytují vhodné geologické substráty, přesahuje druh do přilehlých území mezofytika. Většina lokalit se nachází v oblastech s průměrným ročním srážkovým úhrnem do 550 mm (obr. 3). Jde vesměs o tzv. starosídelní oblasti souvisle osídlené již od neolitu, což spolu s nízkými srážkami jistě přispělo k udržení ostrůvků bezlesí jako vhodných biotopů druhu *A. setacea*. Pozoruhodný je nález u Třince (C. Kotschy 1825 BRNM); druh v této oblasti nemá vhodné ekologické podmínky, a proto mohlo jít o synantropní výskyt, např. v důsledku zavlečení s obilím. Četné literární údaje o výskytu řebříčku štětinolistého jsou pravděpodobně mylné, založené na záměnách s jinými řebříčky. Jsou to např. tyto údaje (z prostorových důvodů uvedeny jen moravské a slezské lokality): Krásná, Fulnek, Hranice, Opava (Oborny 1885), Hněvotín, okolí Opavy a Zlína (Dostál et al. 1948–1950), okolí Olomouce, Hranice a Opava (Spudilová 1957). Nejsevernější doloženou moravskou lokalitou jsou však Hynčicovy skály u Viničných Šumic východně od Brna.

Achillea setacea vyžaduje mělké, propustné, v létě suché půdy. Často roste na výchozech různých eruptiv (čediče, žuly), metamorfik (ruly) a usazených hornin (slepence, písky). Je to druh spíše kalcifugní než acidofilní. Na českých a moravských lokalitách je *A. setacea* vázána převážně na stepní trávníky řádu *Festucetalia valesiacae*, zejména na společenstva svazu *Festucion valesiacae*. Ve středních a severních Čechách a na jihozápadní Moravě roste řebříček štětinolistý v několika společenstvech svazu *Alysso-Festucion pallentis*. Na jihozápadní Moravě se *A. setacea* vyskytuje také na suchých vřesovištích svazu *Genistion pilosae* a v acidofilních trávnících svazu *Koelerio-Phleion phleioidis*. Na Roudnicku a Hodonínsku je přítomna v psamofilní vegetaci svazu *Plantagini-Festucion ovinae*. Kromě toho svým výskytem přesahuje i do některých společenstev svazů *Arabidopsion thalianae* a *Bromion erecti*. Velká část lokalit druhu *A. setacea* představuje malé ostrůvky primární vegetace zachované na stanovištích, na nichž je sukcese blokována extrémními půdními podmínkami a která přežívají v téměř nezměněné podobě pravděpodobně již od raného postglaciálu. Fytocenologická vazba a ekologické nároky jsou v souladu s domnělou evoluční rolí tohoto druhu, který je zřejmě přímým potomkem starého diploidního taxonu.

References

Androshchuk A. F. (1978): Diploidnaya i tetraploidnaya geograficheskie rasy *Achillea setacea* Waldst. et Kit. (*Asteraceae*) na Ukraine. – Bot. Zhurn. 63: 1321–1326.

Barkalov V. Ju. (1992): Tysjachelistnik – *Achillea* L. – In: Kharkevich S. S. (eds.), Sosudistye rasteniya sovetskogo dalnego Vostoka. 6: 95–100, Nauka, Sankt Peterburg.

Benkert D., Fukarek F. & Korsch H. (eds.) (1996): Verbreitungsatlas der Farn- und Blütenpflanzen Ostdeutschlands. – Gustav Fischer, Jena etc.

Beurton C. (1983): Einige Bemerkungen zu Morphologie und Verbreitung von *Achillea setacea* W. et K. (*Compositae*) in der DDR. – Feddes Repert. 94: 91–106.

Biste C. (1978): Zytotaxonomische Untersuchungen des Formenkreises *Achillea millefolium* (*Asteraceae*) in der DDR. – Feddes Repert. 88: 533–613.

Bruelheide H. (1995): Die Grünlandgesellschaften des Harzes und ihre Standortsbedingungen. Mit einem Beitrag zur Gliederungsprinzip auf der Basis von statistisch ermittelten Artengruppen. – Diss. Bot. 244: 1–338.

Chrtek J. & Skočdopolová B. (1982): Waldstein's collection in herbarium of the National Museum in Prague. – Sborn. Nár. Muz., sci. natur., 38: 231–238.

Chytrý M. (1997): Česká národní fytocenologická databáze: počáteční stav a perspektivy. – Zpr. Čes. Bot. Společ., 32, Mater. 15: 27–40.

Chytrý M., Mucina L., Vicherek J., Pokorny-Strudl M., Strudl M., Koó A. J. & Maglocký Š. (1997): Die Pflanzengesellschaften der westpannonischen Zwergstrauchheiden und azidophilen Trockenrasen. – Diss. Bot. 277: 1–108.

Contandriopoulos J. & Martin D. (1967): Contribution a l'etude cytotaxinomique des *Achillea* de Grèce. Irrégularités de la meiose. – Bull. Soc. Bot. Fr. 114: 257–275.

Čelakovský L. (1870): Květena okolí pražského. – Živa, Sborn. Věd. Mus. Král. Čes. 4: 1–164.

Čelakovský L. (1871): Prodromus der Flora von Böhmen ... II. – In: Arch. Naturwiss. Landesdurchforsch. Böhm., sect. 3a, fasc. 2: 113–388.

Čelakovský L. (1873): Prodromus květeny české. II. – In: Arch. Přírod. Výzk. Čech, sect. 3a, fasc. 2: 110–384.

Dąbrowska J. (1982): Systematic and geographic studies of the genus *Achillea* L. in Poland with special reference to Silesia. – Acta Univ. Wratislav. – Pr. Bot. 24: 1–223.

Dąbrowska J. (1984): Zum Auftreten der *Achillea setacea* W. et K. in Polen, unter besonderer Berücksichtigung des ehemaligen Schlesiens. – Feddes Repert. 95: 679–686.

Dąbrowska J. (1997): Rozmieszczenie rodzaju *Achillea* L. w Polsce ze szczególnym uwzględnieniem Śląska. – Acta Univ. Wratisl. no. 1892: 1–99.

Danihelka J. & Rotreklová O. (2001): Chromosome numbers within the *Achillea millefolium* and the *A. distans* groups in the Czech Republic and Slovakia. – Folia Geobot. 35: 163–191.

Dostál J. et al. (1948–1950): Květena ČSR. 1–2. – Praha.

Ehrendorfer F. (1953): Systematische und zytogenetische Untersuchungen an europäischen Rassen des *Achillea millefolium*-Komplexes. – Österr. Bot. Z. 100: 583–592.

Ehrendorfer F. (1959): Differentiation-hybridization cycles and polyploidy in *Achillea*. – Cold Spring Harbor Symp. Quant. Biol. 24: 141–152.

Franzén R. (1991): *Achillea* L. – In: Strid A. & Tan Kit (eds.), Mountain flora of Greece 2: 431–450, Edinburgh University Press.

Freyn J. (1881): Phytographische Notizen. – Flora 64: 209–220.

Freyn J. (1897): Ueber neue und bemerkenswerthe orienthalische Pflanzenarten. II. – Bull. Herb. Boiss. 5: 579–626.

Greuter W. et al. (eds. & compils.) (2000): International code of botanical nomenclature (Saint Louis Code) adopted by the Sixteenth International Botanical Congress St. Louis, Missouri, July–August 1999. – Koeltz Scientific Books, Königstein. [Regnum Veg. 138]

Halácsy E. (1902): Conspectus florae Graecae. 2. – Lipsiae.

Hess H., Landolt E. & Hirzel R. (1972): Flora der Schweiz und angrenzender Gebiete. Band 3: *Plumbaginaceae* bis *Compositae*. – Birkhäuser Verlag, Basel & Stuttgart.

Holmgren P. K., Holmgren N. H. & Barnett L. C. (1990): Index herbariorum. Part I: Herbaria of the World. Ed. 8. – Regn. Veg. 120: 1–693.

Huber-Morath A. (1974): Die türkischen Arten der Gattung *Achillea* L. – Ber. Schweiz. Bot. Ges. 84: 123–172.

Klika J. (1929): Ein Beitrag zur geobotanischen Erforschung des Steppengebietes im Böhmischen Mittelgebirge. – Beih. Bot. Cbl., sect. B, 45: 495–539.

Kosteletzky V. F. (1824): Clavis analytica in floram Bohemiae phanerogamicam. – Pragae.

Kubát K. (1970): Rozšírení některých druhů rostlin v Českém středohoří. Fytogeografická studie. – Okresní vlastivědné muzeum, Litoměřice.

Kubíková J. (1982): Chráněná území Šáreckého údolí a jejich současná vegetace. – Natura Prag. 1: 5–70.

Kuzmanov B. A., Zdravkova M. A. & Georgieva S. (1989): Izmenchivost na balgarskite vidove ravnets ot grupata *Achillea millefolium* i na *A. crithmifolia*. 1. Morfologichno i kariologichno prouchvane. – Fitologija 36: 26–43.

Lauber K. & Wagner G. (1998): Flora Helvetica. Ed. 2. – Verlag Paul Haupt, Bern.

Machová I. (1999): Zvláště chráněné druhy rostlin z fytogeografických okresů Ralsko-bezdězská tabule a Podještědí. 1. Kriticky ohrožené druhy. 2. Silně ohrožené druhy. – Severočes. Přír., suppl. 11: 97–110 & 110–134.

Martin-Noguet D. (1969): Contribution à l'étude cytotaxonomique des *Achillea* et des *Pyrethrum* de Turquie. – Bull. Soc. Bot. Fr. 116: 197–206.

Meusel H. & Jäger E. J. (eds.) (1992): Vergleichende Chorologie der zentraleuropäischen Flora. Band 3. – G. Fischer, Jena etc.

Moravec J. (ed.) (1995): Rostlinná společenstva České republiky a jejich ohrožení. Ed. 2. – Severočes. Přír., suppl. 1995: 1–206.

Neuhäuslová Z. & Kolbek J. (eds.) (1982): Seznam vyšších rostlin, mechorostů a lišejníků střední Evropy užitých v bance geobotanických dat BÚ ČSAV. – Botanický ústav ČSAV, Průhonice.

Niklfeld H. (1971): Bericht über die Kartierung der Flora Mitteleuropas. – Taxon 20: 545–571.

Oborny A. (1885): Flora von Mähren und österr. Schlesien. Pars 3. – Verh. Naturforsch. Ver. Brünn 23 (1884): 637–888.

Presl J. S. & Presl C. B. (1819): Flora čechica. Květena česká. – Pragae.
Prodan J. (1931): Achileele Românici. – Bul. Acad. Inalte Stud. Agron. Cluj, Memorii, 2: 1–68.
Quitt Z. & Kucharský P. (1992): Česko-latinský slovník starověké a současné latiny. – Státní pedagogické nakladatelství, Praha.
Rochel A. (1828): Plantae Banatus rariores. – Pestini.
Rauschert S. (1967): Valerius Cordus (1515–1544) als Entdecker der *Achillea setacea* W. et K. – Hercynia 4: 339–343.
Rauschert S. (1972): Verbreitungskarten mitteldeutscher Leitpflanzen. 13. Reihe. – Wiss. Z. Univ. Halle, ser. math.-nat., 21 (1972): 7–68.
Rohrer R. & Mayer A. (1835): Vorarbeiten zu einer Flora des Mährischen Gouvernements. – Brünn.
Saukel J. & Länger R. (1992a, b): Die *Achillea millefolium*-Gruppe (*Asteraceae*) in Mitteleuropa 1, 2. – Phyton (Horn) 31: 185–207 & 32: 47–78.
Shaulo D. N. (1997): *Achillea* L. – Tysjachelistnik. – In: Krasnoborov I. M. (ed.), Flora Sibiri, 13: 65–70, Nauka, Novosibirsk.
Skalický V. (1988): Regionálně fytogeografické členění. – In: Hejný S. & Slavík B. (eds.), Květena České socialistické republiky, 1: 103–121, Academia, Praha.
Spudilová V. (1957): Studie k monografii rodu *Achillea* v Československu – IV. – Přírod. Sborn. Ostrav. Kraje 18: 101–106.
Sytnik K. M. (1984): Tysjachelistniky. – Naukova Dumka, Kiev.
Šmarda J. (1963): Rozšíření xerothermních rostlin na Moravě a ve Slezsku. – Brno.
Toman M. (1981): Die Gesellschaften der Klasse *Festuco-Brometea* im westlichen Teil des böhmischen Xerothermgebietes. Teil II. – Feddes Repert. 92: 433–498.
Toman M. (1988): Beiträge zum xerothermen Vegetationskomplex Böhmens. 1. Die Xerothermvegetation im Nordböhmischen Waldsteppenbezirk. – Feddes Repert. 99: 33–80.
Valant-Vetschera K. M. (1984): Laubblattflavonoide der *Achillea millefolium*-Gruppe I: Infraspezifische Variabilität bei *A. setacea* W. et K. und verwandte [*sic*!] Arten. – Sci. Pharm. 52: 307–311.
Vesecký A. et al. (1958): Atlas podnebí Československé republiky. – Praha.
Wagenitz G. (1979): *Achillea* Linnaeus 1753. – In: Hegi G., Illustrierte Flora von Mitteleuropa. Ed. 2. Vol. 6/3: 310–349, Paul Parey, Berlin & Hamburg.
Waldstein-Wartemberg von F. A. & Kitaibel P. (1799–1802): Descriptiones et icones plantarum rariorum Hungariae 1. – Viennae.
Walther E. & Walther K. (1960): Beiträge zur Kenntnis von *Achillea setacea* W. et K. – Mitt. Florist.-Soziol. Arb.-Gem. 8: 68–77.

Received 24 February 2000
Accepted 16 January 2001

Appendix 1. – Specimina visa

Thermophyticum: **1. Doupovská pahorkatina.** Tušimice: clivus apricus supra ripam septentr. lacus structilis Nechranice (pars occident.), 0,65–0,7 km situ merid. a summo colle (cum cota 350,3) Běšický chochol (Č. Ondráček 1998 CHOM). Tušimice: clivus saxosus supra ripam sinistram fluminis Ohře locis publice protectis Želinský meandr dictis 2 km situ occident.-septentr.-occident. abs colle Běšický chochol (Č. Ondráček 1998 CHOM). Tušimice: collis Čachovický vrch (Č. Ondráček 1995 CHOM). Tušimice: declivia saxosa supra flumen Ohře infra opus mercatorium Sempra dictum (K. Kubát 1984 LIT). Tušimice: declivia supra ripam septentr. lacus structilis Nechranická přehrada 0,5 km situ merid.-orient. abs colle Čachovický vrch (Č. Ondráček 1997 CHOM). **2a. Žatecké Poohří.** Bezděkov: clivus supra ferriviam 0,6 km situ septentr.-orient. a pago (Č. Ondráček 1986 CHOM). Bezděkov: in clivo supra ferriviam 0,4 km situ septentr.-orient. ab area pagi (J. Sládek 1994 CHOM). Bitozeves: secundum viam publicam ad marginem septentr.-orient. pagi (Č. Ondráček 1986 CHOM). Březno: collis Březenský vrch (V. Kneblová 1948 PR). Čejkovice: clivus apricus supra marginem septentr. pagi (Č. Ondráček 1993 CHOM). Dolejší Hůrky: clivus 0,4 km situ orient.-merid.-orient. a medio pago (J. Sládek 1994 CHOM). Holedeč: declivia ad septentr.-orient. a pago versus (K. Kubát 1980 LIT). Holedeček (J. Klika 1950 PR; V. Horák 1962 MP, ut Holeček nad Belšankou). In declivibus ad ripam dextram rivi Liboc inter pagos Libočany et Žabokliky (K. Kubát 1980 LIT, M. Hostička 1955 PR). Postoloprty: ad locum Levonická bažantnice ("Levanitzer Fasangarten") dictum (F. Bubák 1890 PR). Rvenice: declivia terrassae rivi Chomutovka

ad merid. a pago versus (S. Kučera et F. Mladý 1968 PR). Stranná: in declivibus argillosis supra vicum (M. Deyl 1958 PR). Stroupeč (ut Skorepice/Skraupitz): declivia ad ripam dextram fluminis Ohře (M. Hostička 1955 PR). Stroupeč: via glareosa ad ripam fluminis Ohře (K. Kubát 1984 LIT). Stroupeček: clivus 0,5 km situ septentr.-occident. a pago (Č. Ondráček 1988 CHOM). Střezov: clivus apricus 0,55 km situ merid.-orient. a pago (Č. Ondráček 1995 CHOM). Střezov: clivus supra ripam sinistram rivi Hutná, 0,5 km situ orient. a pago (Č. Ondráček 1986 CHOM). Střezov: clivus prope pagum (J. Lorber 1973 LIT). Trnovany: 0,4 km situ septentr.-occident. a medio pago (J. Sládek 1994 CHOM). Trnovany: jugum collis supra viam publicam in oppidum Žatec versus, 0,3 km situ occident.-septentr.-occident. a medio pago (J. Sládek 1994 CHOM). Velichov: vallis angusta 0,4 km situ septentr.-septentr.-orient. a pago, a ferrivia ad occident. versus (Č. Ondráček 1985 CHOM). Vysočany: in graminosis stepposis vallis prope vicum (S. Hejný 1961 PR). Vysočany: vallis angusta prope vicum (J. Lorber 1972 LIT). Záhoří: declivia cum stipetis infra pagum (J. Pištělák 1982 LIT). Žatec: ad ripam sinistram fluminis Ohře ad occident. ab oppido versus (K. Kubát 1980 LIT). Žatec: declivia infra stadium militarem (J. Smazík 1983 ROZT). Žatec: in vicinitate vinearum veterum collis Starý vrch ad peripheriam septentr. oppidi (J. Sládek 1983 LIT). **4a. Lounské středohoří.** Bělušice: collis Bečovský vrch (J. Klika 1928 PR [*A. pannonica* admixta!]). Braňany: collis Kaňkov (F. Bubák 1889 PR). Colles inter pagos Raná et Libčeves (I. Musil 1970 OP). Kozly: collis Svinky (J. Šimr 1936 PRC). Kozly: collis Svinky, locis graminosis in cacumine inferiori (K. Kubát 1974 LIT). Libčeves: cacumen occidentale collis Vraník (Č. Ondráček 1990 CHOM). Libčeves: collis Šibeník (J. Šimr 1936 PRC). Louny: collis Oblík (ex herb. F. Mittelbach 1936 LIT; O. Leneček 1936 PRC; J. Šimr 1936 PRC). Louny: in cacumine collis Oblík (R. Businský 1967 ROZT). Měrunice: prope cotam 509,5 situ orient. a pago (K. Kubát 1968 LIT). Most: collis Hněvín (L. Čelakovský fil. 1887 PR). Raná: collis Raná (E. Liebaldt 1914 PR; J. Šimr 1914 PRC; J. Rohlena et J. Klika 1922 PRC; I. Klášterský 1926 PR; J. Klika 1927 PRC; s. coll. 1927 PRC; R. Kurka 1967 CB). Svinčice: in clivo merid. collis Kamenec (J. Klika 1928 PR; J. Sládek 1981 LIT). **4b. Labské středohoří.** Dolní Zálezly (J. et R. Wihan 1923 [*A. pannonica* admixta!], J. et R. Wihan 1926 PR). Krásné Březno: in pratis ad ripam fluminis Labe (J. Wiesbaur 1886 W). Litoměřice: collis Radobýl (J. F. Freyn 1879 BRNM; E. Liebaldt 1911 PR; K. Boresch 1912 PR; E. Korb 1920 W; I. Klášterský 1927 PR; J. Dostál 1930 PRC; V. Kavka 1931 PRC, MP; V. Kavka 1932 PRC; J. Klika 1932 PR; E. Hejný 1934 PRC; R. Fischer 1935 LIT; R. Fischer 1936 LIT; K. Kubát 1971 LIT; M. Tetera 1995 herb. J. D.; K. Preis s. anno PRC). Litoměřice: declivia merid. collis Radobýl (J. Krauskopf 1925 PRC; J. Dostál 1952 PR; E. Šťastný 1954 LIT). Lovosice: collis Lovoš (E. Binder 1891 MP). Malé Žernoseky: collis Hnatek [non legibile; an collis Hrádek ad ripam dextram fluminis Labe?] (ex herb. Reichenbach fil. 1842 W). Rtyně nad Bílinou: collis Chotyně (K. Kubát 1967 LIT). Svádov: ad ripam fluminis Labe (J. Wiesbaur s. anno PR). Rudolice: colles prope pagum (F. Bubák 1890 BRNU). Circa urbem Ústí nad Labem (J. Schubert 1904 PR). Velké Žernoseky (ex herb. Reichenbach fil. 1842 W). Velké Žernoseky: collis Hrádek (K. Kubát 1973 LIT). Velké Žernoseky: collis Kalvárie (F. Firbas 1932 PRC; J. Dostál 1954 PR [*A. pannonica* admixta!]; J. Sofron 1978 PL; P. Pyšek 1978 ROZT). Velké Žernoseky: collis Kalvárie, in rupibus basalticis supra flumen Labe (J. Dostál 1954 PR). Velké Žernoseky: declivia merid. collis Kalvárie ([J. Klika] 1946 PR [*A. pannonica* admixta!]). Velké Žernoseky: locus praeruptus situ merid.-occid. inter colles Kalvária et Vendula („Wendula-Graben") (Meissner 1937 PR). Velké Žernoseky: collis Vendula (K. Preis 1934 PRC; R. Kurka 1967 CB; I. Musil 1970 OP; A. Hájková 1970 FMM; Č. Ondráček 1997 CHOM). Velké Žernoseky: collis Vendula, ripa saxosa supra flumen Labe (K. Kubát 1982 LIT). Velké Žernoseky: jugamentum ad vicum Malíč versus (K. Kubát 1965 LIT). Velké Žernoseky: limes arvensis adversum collem Kalvárie ([F. Firbas] 1922 PRC; [K. Rudolph] 1922 PRC). Velké Žernoseky: pars inferior declivium collis Kalvárie, supra ferriviam (L. Hrouda 1973 LIM [*A. pannonica* admixta!]). Velké Žernoseky: collis Strážiště (J. Klika 1931 PR). Velké Žernoseky: cacumen collis Strážiště ([J. Klika] 1946 PR [*A. pannonica* admixta!]). „Žernoseky" ([G. Beck] 1922 PRC). Žalhostice (K. Tocl 1894 MP). **5a. Dolní Poohří.** Litoměřice: loco Insel dicto (Krombholz s. anno LIT). **5b. Roudnické písky.** Černěves: ad marginem silvae ad orient. a pago versus (J. Buriánek 1975 LIT). Černěves: in pineto apud pagum (J. Dostál 1952 PR). Kozlovice (J. Klika 1930 PR). Oleško: in prato secundum ferriviam ad occident. a pago versus (J. Šourek 1943 PR, PRC). Předonín: ad viam arenosam secundum marginem septentr.-orient. silvae Pomokliny dictae (K. Kubát 1977 LIT). Roudnice nad Labem: clivus merid. collis Sovice (s. coll. 1867 PR; J. Wiesbaur s. anno PR). Roudnice nad Labem: loca arenosa cis pinetos ad ripam dextram fluminis Labe (L. F. Čelakovský 1915 PR). Zavadilka (ut Zouvalka): ad marginem pineti ca. 0,5 km situ orient. a pago (J. Unar 1980 BRNU). **7a. Libochovická tabule.** In declivibus non procul a mola inter pagos Kleneč et Vražkov (K. Kubát 1965 LIT). Vrbka: in declivibus collis Holý vrch (J. Dostál et F. A. Novák 1947 PRC; K. Kubát 1983 LIT). **7b. Podřipská tabule.** Ad pedem collis Říp (L. Viniklář s. anno PRC). Býkev: arenaria ad ferriviam (Č. Deyl 1993 herb.). Cítov: ad ripas arenifodinae pristinae loco Pod vsí dicto, ca. 1,8 km situ merid.-orient. a pago (J. Ptáčková 1993 OLM). Dolní Beřkovice (E. Wessely 1878 OP; J. Velenovský 1883 PR). Horní Beřkovice (J. Velenovský 1883 PRC). Horní Počaply (J. Velenovský 1883 PRC). Ješovice (F. Firbas 1923 PRC). Kleneč: clivus Klenečská stráň dictus (K. Domin 1916 PRC). Kleneč: in pascuis prope pagum (F.

Schustler 1915 PR). Kleneč: clivus arenosus juxta pagum, 100 m a locis publice protectis ad septentr. versus (R. Businský 1967 ROZT). Kleneč: arenaria ad orient. a pago versus (J. Buriánek 1977 LIT). Kleneč: loco Na Sádlovci dicto, ad orient. a pago versus (J. Buriánek 1977 LIT). Kleneč: limes arenosus ca. 0,3 km situ septentr.-orient. a mola Lorencův mlýn (K. Kubát 1980 LIT). Libčchov (s. coll. s. anno LIT). Mlčechvosty: clivus ca. 0,8 km situ septentr.-occident. a pago (L. Palek 1972 MP). Mlčechvosty: via cava inter stationem ferriviae et pagum (L. Palek 1974 MP). Podvlčí: ad marginem pineti (L. F. Čelakovský 1913 PR). Přestavlky: ad marginem pineti ca. 1 km situ orient. a pago (K. Kubát 1983 LIT). Roudnice nad Labem-Hracholusky: rudera cis rivum Čepel (J. Sückerová 1969 LIT). Roudnice nad Labem: loco Slavín dicto ad merid. ab oppido versus (J. Buriánek 1977 LIT). Rovné: silva Rovenský háj (s. coll. 1931, 1939 PRC). Štětí: prope oppidum (J. Wiesbaur s. anno PR [*A. pannonica* admixta!]). **7c. Slánská tabule.** Dřínov: silva Dřínovský háj dicta (J. G. Homolka 1904 PRC). Hleďsebe (J. E. Kabát 1888 PR). Chržín: ad viam ab oppido Velvary versus ca. 0,3 km situ merid.-occident. a pago (L. Palek 1972 MP). Chržín: loca publice protecta (J. Klika 1942 PR). Kralupy nad Vltavou: aedificatio fabricae Kaučuk Kralupy, ad officinam parietum praefabricatorum (H. Smělá 1961 PR). Nelahozeves: terrassae glareosae fluminis Vltava ca. 1 km a statione ferriviae (B. Trávníček 1993 OL). Nelahozeves: declivia 1 km situ septentr. ab oppido (O. Šída 1993 herb.). Nové Ouholice: clivus graminosus ca. 1,3 km situ occident. usque occident.-merid.-occident. a statione ferriviae (L. Palek 1972 MP). Olovnice (ut Volovice): clivus stepposus (J. Rohlena 1922 PR, PRC). Otvovice: in declivibus substepposis cotae 269 infra [sic!] pagum (J. Dostál 1954 PR). Otvovice: loco Otvovická skála dicto, ca. 0,9 km situ occidentali a statione ferriviae (J. Danihelka 1997 herb.). Páleček (J. F. Knaf 1832 PR [*A. pannonica* admixta!]). Veltrusy: declivia Bílé stráně dicta (I. Klášterský 1923, 1941 PR). Velvary (O. Leneček s. anno OLM). Zákolany: prope pagum in valle rivuli Zákolanský potok (M. Deyl 1941 PR). **7d. Bělohorská tabule.** Černý Vůl (S. Trapl 1943 PR). Kováry (J. Rohlena 1922 PR, PRC). Únětice: collis Kozí hřbety (s. coll. s. anno PRC). **8. Český kras.** Choteč: loca stepposa supra vallem Chotečské údolí (F. Schustler 1914 PR). Kosoř: loco Cikánka dicto, ca. 1,5 km situ septen.-occident. a pago (F. Kvapilík 1940 OLM). Praha-Hlubočepy ([Linhart] 1829 PRC; F. M. Opiz 1847 PR). Praha-Hlubočepy: declivia ad ripam sinistram fluminis Vltava (J. Smažík 1979 ROZT). Praha-Hlubočepy: vallis Prokopské údolí, collis Děvín (J. Polívka 1967 PR; M. Šrůtek 1978 ROZT). Praha-Hlubočepy: in summo colle Děvín (J. Kubíková 1972 PR). Praha-Hlubočepy: vallis Prokopské údolí (C. Purkyně 1879 PRC; J. Podpěra 1898 BRA, BRNL, BRNU, PR, PRC; R. Veselý 1926 PRC; R. Kurka 1946 CB). Praha-Hlubočepy, vicum Zlíchov: in pascuis petrosis (G. Beck 1918 PRC). Praha-Hlubočepy, vicum Zlíchov: in clivo aprico calcareo [sic!] ad marginem bor.-occid. suburbii (V. Žíla 1997 herb.). Praha-Chuchle (F. Schustler 1922 PR; V. Krajina et J Dostál 1933 PRC). Praha-Malá Chuchle [= Chuchelský háj] (A. E. Vogl 1871 PR [*A. pannonica* admixta!]). Praha-Malá Chuchle: declivia petrosa prope vicum (J. Sterneck 1918 PRC). Praha-Velká Chuchle: clivus supra locum Doly dictum trans pagum (L. F. Čelakovský 1912 PR). Praha-Radotín: in declivibus apricis ad vicum (A. Wildt 1883 BRNM). Praha-Radotín: vallis Radotínské údolí (K. Domin s. anno PRC). **9. Dolní Povltaví.** Brnky: in rupibus schistaceis ad flumen Vltava (J. Suza 1937 BRNU). Čenkov: loca stepposa abs colle Čenkov (282) ad septentr.-orient. versus (R. Businský 1967 BRNM, ROZT). Dolany (J. Rohlena 1924 PRC). Dolánky (Metzelová-Ondráčková 1947 PRC). Kopeč: colles Kopečské vrchy (J. Hašková 1987 ROZT). Kopeč: in colle cca 0,5 km situ septentr.-orient. abs cota 221 supra pagum (L. Palek 1975 MP). Libčice nad Vltavou (J. Košťál 1894 PR [*A. pannonica* admixta!]). Libčice nad Vltavou: rupes prope pagum (K. Tocl 1894 PL). Libčice nad Vltavou: declivia Větrušická rokle dicta adversus pagum (J. Košťál 1894 MP). Máslovice: declivia schistacea apud pagum (J. Dostál 1954 PR). Minice (Studničková 1970 LIM). Minice: clivus saxosus Minická skála dictus (R. Businský 1967 BRNM, ROZT; J. Danihelka 1997 herb.). Praha-Bohnice: declivia supra flumen Vltava prope pagum (A. Žertová 1953 PR). Praha-Bohnice: declivia vallis Lísek (J. Dostál 1953 PR). Praha-Bohnice: in saxis collis Kalvarie (266) supra flumen Vltava (J. Dostál 1930 PRC). Praha-Bohnice: loca stepposa Zámky dicta supra vallem fluminis Vltava (J. Dostál 1933 PR [*A. pannonica* admixta!], PRC; J. Dostál 1943 PRC). Praha-Bohnice: robinietum in declivibus supra ripam dextram fluminis Vltava, loco Zabitý háj dicto (J. Dostál 1953 PR). Praha-Dolní Liboc: vallis Šárecké údolí (s. coll. 1918 PRC, M. Deyl 1941 PR). Praha-Dolní Liboc: vallis Šárecké údolí loco Divoká Šárka dicto (s. coll. s. a. PR; J. Smažík 1979 ROZT [*A. pannonica* admixta!]). Praha-Dolní Liboc: collis Džbán (K. Pavlík 1931 OLM). Praha-Dolní Liboc: vallis Šárecké údolí, in vicinitate collis Džbán (B. Deylová 1980 PR [*A. pannonica* admixta!]). Praha-Holešovice (Hennevogel 1857 PRC). Praha-Holešovice: declivia Na Zámečku dicta [an Praha-Troja?] (J. Rohlena 1897 HR; J. Rohlena 1908 PRC). Praha-Holešovice: hortus publicus Stromovka (ex herb. Reichenbach fil. 1841 W; [F. X. Ramisch] 1843 PRC; F. M. Opiz 1850 PR [etiam *A. pannonica* admixta!]; F. M. Opiz [ut Opitz] s. anno BRNU; s. coll. 1854 PRC; Hennevogel 1857 PRC; F. Rosický 1879 PR). Praha-Hradčany: hortus publicus Chotkovy sady (F. M. Opiz 1834 MJ; J. Opiz 1834 BRNU, PR; [F. X. Ramisch] 1847 PRC; F. Tempsky s. anno PRC). Praha-Košíře: loco Cibulka dicto (F. M. Opiz 1850 PR [*A. millefolium* admixta!]). Praha-Motol (F. Schustler 1914 PR). Praha-Motol: rupes diabasitices supra pagum (J. Klika 1914 PRC). Praha-Motol: collis Kalvárie (V. Faltys 1969 MP; J. Kubíková 1972 PR). Praha-Motol: loco Skalka dicto (V. Novák 1934 PR). Praha-Motol: petra adversum

crucem (J. Švec 1949 ROZT). Praha-Podbaba: clivus supra ferriviam (s. coll. 1949 PR). Praha-Podbaba: declivia supra ferriviam inter ostium rivi Šárecký potok et officinam laterariam apud pagum Sedlec (J. Soják 1956 PR). Praha-Podbaba: in declivibus graminosis supra rupes (F. Weber 1949 BRNM). Praha-Podbaba: loco Podbabské skály dicto (J. Kubíková 1972 PR; J. Danihelka 1997 herb.). Praha-Podbaba: in clivo petroso ad viam publicam versus vicum Sedlec (K. Krčan 1927 MP [*A. pannonica* admixta!]). Praha: ad viam inter vicos Podbaba et Suchdol (F. Procházka 1959 MP). Praha-Podhoří: ad marginem silvae supra rupes vallis fluminis Vltava, adversus pagum Sedlec (M. Hostička 1957 MP). Praha-Podhoří: collis Černý vrch (M. Hostička 1957 MP). Praha-Podhoří: rupes Kalvárie supra ripam dextram fluminis Vltava (M. Hostička 1957 MP). Praha-Podhoří: pars superior declivium (J. Kubíková 1972 PR). Praha: inter vicos Troja et Podhoří in valle fluminis Vltava (K. Domin 1932, s. anno PRC). Praha-Sedlec (Metzelová-Ondráčková 1947 PRC). Praha-Sedlec: declivia supra pagum (V. Skalický 1950 PR). Praha-Troja: prope castellum Trojský zámek (J. Rohlena 1897 BRNU, PR, PRC). Roztoky (O. Nickerl 1862 PR). **10a. Jenštejnská tabule.** In collibus inter vicos Čakovičky et Zlonín (M. Deyl 1949 PR). In agris inter pagos Vodochody et Dolínek (J. Dostál 1954 PR [*A. pannonica* admixta!]). Kojetice: in pascuis petrosis (s. coll. 1923 PRC). Praha-Libeň (F. M. Opiz 1832 LIT, PR; F. M. Opiz 1847 LIT, OP, PR; F. M. Opiz s. anno PRC; H. Borges 1854 BRNU; Weiß 1854 W; F. Bozděch 1855 PR; F. Bozděch s. anno PRC). Praha-Libeň: in collibus apricis prope vicum (J. Kalmus 1855 BRNU, PR). Praha-Vysočany (Konopásek s. anno PR). **10b. Pražská kotlina.** Praha-Hodkovičky: in collibus apricis (V. Bauer 1891 PRC). Praha-Karlín: apud flumen Vltava (R. Hendrych 1947 PRC). Praha-Karlín: rudera ad portum (R. Hendrych 1947 PR). Praha-Lhotka (O. Nickerl 1859 PR). Praha-Lhotka: ad marginem pineti ca. 0,8 km situ orient. a praedio eiusdem nominis et 0,3 km situ occidentali a margine silvae Kamýk dictae (L. Palek 1951 MP). Praha-Vyšehrad (E. Hofmann 1855 PRC). **11a. Všetatské Polabí.** Neratovice (K. Domin 1901 PRC). Přívory: in declivi stepposo Bílé Břehy ad occidentem a pago versus (S. Staněk 1954 BRNM). Všetaty (K. Domin 1908 PRC). **11b. Poděbradské Polabí.** Chroustov: loca graminosa saxosaque supra ferriviam situ occident. a pago (J. Chrtek et B. Deylová 1979 PR). Chroustov: loca publice protecta Stráně u Chroustova dicta (M. Rivola 1968 CB; S. Ondráčková 1968 ZMT; Jiráková 1979 ROZT; K. Kubát 1979 LIT). Sadská: collis Horka (A. Žertová 1953 PR [*A. pannonica* amixta!]). **12. Dolní Pojizeří.** Chotětov: vallis Černý Důl (L. F. Čelakovský 1916 PR). In valle inter silvam vivariam Kosmonoská obora et viam publicam Kosmonosy – Debř (Č. Novotný 1970 ROZT). Kosmonosy: silva vivaria Kosmonoská obora (J. K. Hippeli s. anno PR). Margo superior vallis angustae in clivo merid. silvae vivariae Kosmonoská obora versus viam publicam Debř – Kosmonosy (Č. Novotný 1969 ROZT). Mladá Boleslav: declivia prope oppidum (F. Merkl 1856 PR [*A. millefolium* admixta!]). Mladá Boleslav: collis Radouč (J. Podpěra 1895 OLM [*A. pannonica* admixta!]). Mladá Boleslav: in collibus siccis [= Radouč] (J. Himmer 1852 PR). **16. Znojemsko-brněnská pahorkatina.** Biskoupky: collis Biskoupský kopec (J. Podpěra 1911 BRNU; K. Sutorý 1978 BRNM; D. Sedlářová 1983 BRNU). Bohumilice (V. Skřivánek jun. 1957 OP [*A. pannonica* admixta!]). Bohumilice: collis Šibeník (F. B. Teuber 1898 BRNM). Bohutice: collis Kameniště, loco U Michálka dicto (F. Weber 1931 OLM; F. Weber 1932 PR; J. Podpěra 1932 BRNM, BRNU, GM, HR, OLM, OP, PR, SLO, W, WU; V. Krist 1933 BRNU; A. Hrabětová 1957 BRNU; J. Horňanský 1951 BRNM; M. Součková 1952 BRNM; J. Horňanský 1955 BRNM; J. Šmarda 1961 BRNM; V. Pospíšil 1963 BRNM; V. Grulich 1982 MMI; K. Sutorý 1984 BRNM; J. Danihelka 1996 herb.). Dobřínsko: collis Pipele situ merid. a pago (B. Trávníček 1991 OL). Dolní Dubňany: in pascuis circum cotam 326, 1,5 km situ merid.-orient. a pago (S. Ondráčková 1983 ZMT; S. Ondráčková 1984 [*A. collina* admixta!] ZMT). Dolní Dubňany: pascua aprica in declivi vallis rivi Dobřínský potok, supra lacum irrigatorium (S. Ondráčková 1984 ZMT). Dyje (A. Oborny 1882 OP). Dyje: clivus saxosus ad ripam sinistram fluminis Dyje (K. Kubát 1982 LIT). Dyje: collis Palice 1,1 km situ merid.-occident. a pago (A. Oborny 1908 PRC). Dyje: declivia ca. 1 km situ merid.-merid.-orient. a pago (K. Sutorý 1985 BRNM). Inter pagos Dyje et Tasovice loco Frauenholz dicto ad ripam dextram fluminis Dyje (A. Oborny 1871 PRC). Dzbánice: in collibus Cingulka dictis (J. Dostál 1943 PRC). Džbánice: in collibus stepposis prope pagum (J. Dostál 1944 PRC). Havraníky (A. Oborny 1879 PRC; F. Švestka 1949 BRNU). Havraníky: callunetum Havranické vřesoviště, circum cotam Staré vinice, 1 km situ occident. a pago (I. Růžička 1989 MJ). Havraníky: callunetum Havranické vřesoviště, circum cotam Staré vinice, 1,2 km situ occident. a pago (K. Sutorý 1979 BRNM). Havraníky: callunetum situ occident. a pago (S. Ondráčková 1981 ZMT; J. Belicová 1986 HR; J. Danihelka 1995 herb.). Hnanice (A. Oborny 1882 PR, BRNU; F. Švestka 1948 BRNU). Hnanice: callunetum 1 km situ septentr.-occid. a pago (V. Grulich 1982 MMI). Hnanice: callunetum 1,2 km situ septentr a pago (V. Grulich 1984 MMI). Hnanice: ad marginem silvae 1,2 km situ occident. a pago (P. Bureš et V. Grulich 1990 BRNU). Hnanice: in declivibus prope locum dictum Devět mlýnů (V. Skřivánek jun. 1946 BRNM). Hostěradice (J. Šmarda 1962 BRNM). Hostěradice: prope pagum (J. Suza 1930 BRNM, BRNU, GM, HR, OLM, OP, PR, SLO, W, WU). Hostěradice: loco U kapličky dicto (J. Horňanský 1946 BRNM, GM; J. Šmarda 1961 BRNM; V. Grulich 1982 MMI). Hradiště (A. Oborny 1909 BRNU; A. Oborny 1916 BRNM). Hradiště: vallis rivi Gránice (A. Oborny 1918 BRNM, BRNU). Ivančice (F. Weber 1931 PR). Ivančice: collis Réna, 1,8 km situ merid.-orient. a pago

(J. Podpěra 1932 BRNU). Ivančice: declivia petrosa in valle fluminis Jihlava apud mollam Střibský mlýn dictam (S. Staněk 1934 BRNM). Konice (Thenius 1922 BRNU). Konice: callunetum situ septentr. a pago (K. Kubát 1982 LIT). Konice: collis Konický vrch, callunetum supra marginem merid.-occident. pagi (V. Grulich 1984 MMI). Krhovice: collis Na skále [= Vraní vrch] (V. Pospíšil 1964 BRNM, OLM). Letkovice: collis Letkovský kopec (A. Hrabětová 1969 BRNU). Miroslav (J. Podpěra 1924 BRNU; J. Podpěra 1928 BRNU). Miroslav: collis Kalvaria dictus (F. Weber 1932 PR). Miroslav: collis Markův kopec (J. Šmarda 1947 BRNM). Miroslav: collis Paseka (J. Suza 1930 BRNU; J. Danihelka 1993 herb.). Miroslav: loco Pustiny dicto (J. Koblížek 1978 BRNL). Inter oppidos Miroslav et Hostěradice (J. Šmarda 1961 BRNM). Mohelno: loco Staré hory dicto, 1,8 km situ merid.-merid.-occident. ab oppido (R. Dvořák 1908 BRNM; R. Dvořák 1932 ZMT; J. Podpěra 1925 BRNU). Moravský Krumlov (R. Dvořák 1930 ZMT; J. Koblížek 1968 BRNL). Moravský Krumlov: collis Floriánek (V. Skřivánek jun. 1946 BRNM; J. Horňanský 1947 BRNM). Moravský Krumlov: collis Křepelčin vrch, etiam Křížová hora (J. Podpěra 1934 BRNU; M. Reška 1995 herb. J. D.). Moravský Krumlov: silva Krumlovský les (M. Součková 1949 BRNM). Načeratice: collis Načeratický kopec (F. B. Teuber 1898 BRNM). Popice: loco Popitzer Heide dicto [situ merid.-occident. a pago] (A. Oborny 1897 PRC). Popice: callunetum 0,4 km situ merid.-occident. a pago, ad sacrarium (V. Grulich 1984 MMI). Popice: collis Popický vrch (ut Popické kopečky) (M. Frank 1992 OP [*A. pannonica* admixta!]). Popice: collis Pustý kopec, locis publice protectis eiusdem nominis (V. Pospíšil 1969 BRNM). Popice: clivus apricus ad marginem silvae 0,7 km situ orient.-septentr.-orient. a pago (J. Čáp 1993 herb.). Rakšice: loco Slatina dicto (J. Horňanský 1964 BRNM). Rokytná: collis Na Babě (J. Suza 1932 BRNU; F. Šmarda 1946 BRNM). Rokytná: collis Vinohrady [= Tábor] (G. I. Širjaev 1926 BRNM, BRNU, GM, HR, OLM, OP, PR, SLO, W, WU; J. Podpěra 1930 BRNU; s. coll. 1950 BRNL). Sedlešovice (F. B. Teuber 1922 BRNM). Skalice (F. Šmarda 1962 BRNM). Suchohrdly: silva Purkrábka (F. Kvapilík 1932 OLM). Šaldorf (G. Niessl 1867 MMI). Tasovice: collis stepposus supra cellam vinariam inter viam publicam in pagum Načeratice versus et alteram ad lapicidinas in colle Kraví kopec versus (J. Danihelka 1996 herb.). Trstěnice: collis Žlíbky (V. Pospíšil 1963 BRNM). Trstěnice: situ septentr. a pago (V. Pospíšil 1963 BRNM). Únanov (V. Pospíšil 1963 BRNM). Únanov: a mola Únanovský mlýn ad septentr.-occident. versus (F. Kvapilík 1932 OLM). Únanov: collis graminosus 1 km situ orient. a pago (V. Grulich 1985 MMI). Vedrovice: collis Leskoun (J. Suza 1930 BRNU; J. Klika 1938 PR; H. Šmardová 1949 BRNU; J. Horňanský 1951 BRNM). Vémyslice: collis Na Vartě loco Na Kocourkách dicto (J. Horňanský 1943 BRNM, PRC; J. Horňanský 1946 BRNM; F. Grüll 1984 BRNU). Vémyslice (V. Grulich 1984 MMI). Znojmo (A. Oborny 1874 WU; A. Oborny 1880 BRNU; A. Oborny 1883 BRNM). Znojmo: prope oppidum (A. Fröhlich 1956 BRNU). Znojmo: collis „Kl. Kuhberg" (A. Oborny 1918 BRNM, BRNU). Znojmo: collis Kraví hora (F. Kvapilík 1933 OLM; A. Hájková 1982 FMM; B. Deylová 1982 PR; V. Grulich 1982 MMI; I. Růžička 1982 MJ; V. Grulich 1984 MMI; V. Crlíková 1984 BRNU; V. Crlíková 1985 BRNU; R. Hlaváček 1992 herb. Příbram [*A. pannonica* admixta!], MZ [*A. pannonica* admixta!]). Znojmo: in clivo septentr. collis Kraví hora (F. Kvapilík 1933 OLM). Znojmo: declivia vallis fluminis Dyje (A. Oborny 1880 PRC). Znojmo: collis Cínová hora (I. Ambrozková 1987 PRC [*A. collina* admixta!]). „Non procul ab oppido Znojmo, in pascuo sicco Větrníky" (M. Sedláčková 1982 NJM). **17b. Pavlovské kopce.** Mikulov: collis Šibeničník (R. Dvořák 1912 PR, ZMT; E. Korb 1913 W; J. Vetter 1913 W; H. Laus 1914 BRNU, OLM; H. Laus 1921 OLM; J. Podpěra 1921 BRNU; F. Weber 1922 OLM; F. Weber 1923 BRNM, PR; Thenius 1923 BRNU; P. Sillinger 1926 PR; H. Laus 1930 BRNU; T. Martinec 1931 PR; I. Klášterský et M. Deyl 1935 PR; H. Laus 1935 PRC, SLO; J. Suza s. anno BRNM; H. Neumayer 1939 WU; M. Rigasová 1991 MMI). Mikulov: ad pedem orientalem cacuminis septentrionalis collis Šibeničník (J. Danihelka 1995 herb.). **18a. Dyjsko-svratecký úval.** Pasohlávky: in clivo aprico inter collem Hradisko et pagum (J. Dvořák 1973 BRNM). Břeclav: loca arenosa ad marginem septentr.-orient. castelli Pohansko 0,7 km situ septentr.-septentr.-orient. a turrite (V. Grulich 1984 MMI; V. Grulich 1992 BRNU). Břeclav-Poštorná: in arenosis ad piscinam Františkův rybník, 2 km situ merid. a statione ferriviae Boří les (J. Danihelka 1993 herb.). Lanžhot: loca arenosa Lány dicta 3,5 km situ occident.-merid.-occident. a pago (V. Grulich 1982 MMI; K. Šumberová 1995 herb. J. D.; J. Danihelka 1995 herb.). Lanžhot: loca arenosa Lány dicta in pratis 3 km situ merid.-occident. a pago (V. Grulich 1990 BRNU). **18b. Dolnomoravský úval.** Bzenec (ex herb. R. Rohrer 1823 PRC; J. Bubela s. anno BRA, BRNM, BRNU, LIM, PR, W, WU; H. Laus 1910 OLM; J. Otruba 1929 PR; F. Weber 1974 OLM). Bzenec: ad marginem pineti (F. Weber 1977 PR). Bzenec: stadium militare (J. Michalko 1960 SAV; I. Jongepierová 1996 herb.). Bzenec: loca arenosa secundum viam publicam 2,5 km situ merid.-orient. ab oppido (K. Sutorý 1981 BRNM). Bzenec: silva Háj prope vicum U Nádraží (J. Bubela 1881 BRNU, PR, PRC, W). Loca arenosa ad stationem ferriviae Bzenec-přívoz (F. Weber 1930 PR; J. Stonawski 1981 BRNM; J. Danihelka 1996 herb.). Loca arenosa inter oppidum Bzenec et stationem ferriviae Bzenec-přívoz (J. Jedlička 1944 GM). Moravský Písek: ad marginem merid.-orient. silvae Hrubý háj dictae prope vicum U Nádraží (L. Pokluda 1956 BRNM). Dolní Bojanovice: loca arenosa prope pagum (F. Weber 1976 OLM). Dubňany (A. Schierl 1898 BRNM). Hodonín (C. Theimer 1864 BRNU). Hodonín: in arenosis prope oppidum [an Pánov?]

(M. Deyl 1960 PR). Hodonín, Pánov: loca arenosa Hrubá louka dicta (S. Staněk 1922 BRNM; S. Staněk 1948 BRNM; A. Ivanová 1972 BRNU). Hodonín: silva Dúbrava (H. Laus 1907 BRNU; J. Šmarda 1946 BRNM; s. coll. [ex herb. Reichenbach fil.] s. anno W). In silvis ad viam publicam Hodonín – Zbrod non procul abs casa venatoria Zbrod (M. Holzknecht 1946 BRNU). Inter oppidos Hodonín et Dubňany (J. Podpěra 1922 BRNU). Hovorany: loca arenosa graminosaque ad oppidum Dubňany versus (S. Staněk 1922 BRNM). Inter pagos Rohatec et Lidéřovice [quod est verisimiliter statio ferriviae Bzenec-přívoz] (J. Otruba 1929 BRNM, BRNU, GM, HR, OLM, OP, PR, SLO, W, WU; s. coll. 1937 PRC; F. Weber s. anno PRC). Lidéřovice [verisimiliter statio ferriviae Bzenec-přívoz] (H. Laus 1907 BRNM; F. Weber 1930 PR; F. Weber 1935 PR, W; O. Leneček 1937 PRC; V. Skřivánek jun. 1945 BRNM). Milotice: Náklo, etiam loco Horky dicto (J. Podpěra 1941 BRNU; P. Švanda 1949 BRNM; s. coll. 1949 BRNM [*A. collina* et *A. pannonica* admixtae!]). Moravský Písek: secundum ferriviam (M. Rivola 1958 GM). Moravský Písek: in declivi stepposo inter ferriviae ductum et pagum (F. Weber 1977 PR). Moravský Písek: loca arenosa in silva Kladíkov (F. Weber 1971 PR). Moravský Písek: loca arenosa ad stationem ferriviae (F. Weber 1971 PR). Mutěnice (P. Švanda 1924 BRNM). Mutěnice: loca arenosa prope pagum (J. Podpěra 1922 BRNU; V. Skřivánek jun. 1949 BRNM; J. Belicová 1967 HR). Mutěnice: loca arenosa Srálek dicta ad stationem ferriviae (J. Šmarda 1962 BRNM; B. Šula 1967 OLM). Mutěnice: „loca publice protecta Hrádek dicta" (K. Kubát 1967 LIT). Ratíškovice (F. Weber 1975 BRNM). Ratíškovice: loca arenosa prope pagum (F. Weber 1933 PR; F. Weber 1975 OLM). Ratíškovice: ad marginem occident. silvae Rudníček, 1 km situ septentr.-orient. a pago (K. Sutorý 1981 BRNM). Ratíškovice: ad marginem silvae Dúbrava (F. Šmarda 1955 BRNM). Ratíškovice: silva Dúbrava (F. Petrak 1912 BRNU, OLM, PR, PRC). In silva inter pagos Ratíškovice et Rohatec (F. Šmarda 1946 BRNM). Rohatec (H. Laus 1906 OLM; H. Laus 1914 BRNU; V. Skřivánek 1920 PRC; H. Laus 1927 PRC; F. Weber 1934 BRNM, OLM, PR; J. Tomášek 1953 BRNM, BRNU). Rohatec: in quercetis prope pagum (F. Weber 1929 PR). Rohatec: loca arenosa in pinetis versus casam venatoriam Roztrhánky (J. Podpěra 1932 BRNU). Rohatec: loco Roztrhánky dicto ad merid.-orientem a pago Ratíškovice versus, ad viam ad stationem ferriviae Rohatec versus (S. Staněk 1946 BRNM). Rohatec: loca arenosa prope pagum (H. Laus 1929 PRC; J. Otruba 1929 BRNM, OLM; H. Laus 1932 MMI, OP; R. Dvořák 1933 ZMT; F. Weber 1933 PR, PRC; H. Laus 1934 OP, PRC; F. Weber 1934 PR; H. Laus 1935 SLO; J. Otruba 1937 BRNM; H. Laus 1938 OLM; V. Skřivánek jun. 1955 BRNM). Rohatec: loca arenosa secundum ferriviam inter stationes Rohatec et Bzenec-přívoz (J. Hadinec 1976 MP). Rohatec: loca arenosa secundum ferriviam inter stationes Rohatec et Bzenec-přívoz, loco Jánová dicto (J. Dostál 1942 PRC). Rohatec: loca publice protecta Váté písky dicta (I. Jongepierová et J. W. Jongepier 1990 OLM). Rohatec: silva Dúbrava (V. Skřivánek jun. 1946 BRNM). Rohatec-Soboňky (F. Weber 1923 BRNM; F. Weber 1930 PR; F. Weber 1941 BRNM; S. Staněk 1946 BRNM; P. Švanda 1955 BRNM; S. Staněk 1956 BRNM; F. Weber 1967 PR; F. Weber 1975 OLM). Vacenovice: loca arenosa prope pagum (K. Domin et V. Jirásek 1939 PRC). Vlkoš (s. coll. 1898 BRNM; Thenius 1942 BRNU; F. Weber 1971 PR; F. Weber 1977 PR). Vracov: ad marginem pineti prope pagum (J. Podpěra 1912 BRNU; F. Weber 1977 PR). Vracov: ad viam in pineto Moraště dicto situ merid.-occident. a pago (S. Staněk 1945 BRNM). **20b. Hustopečská pahorkatina.** Bedřichovice (F. Weber 1925 OLM; F. Weber 1935 PR). Bedřichovice: collis stepposus supra locum Pindulka dictum (S. Staněk 1920 BRNU). Bedřichovice: saxa syenithica ad occident. a pago versus (D. Novák 1950 BRNM). Bohuslavice (F. Weber 1977 PR). Bzenec: collis Florianberg [loco Starý hrad dicto] (H. Laus 1908 BRNM). Čejč (ex herb. R. Rohrer 1822 PRC; ex herb. J. N. Bayer 1846 PR; J. B. [= J. N. Bayer] 1846 PR; A. Makowsky 1887 W; K. Rothe 1894 BRNU; E. Korb 1907 W; Thenius 1914 BRNU; V. Krist 1932 BRNU [*A. pannonica* admixta!]; G. I. Širjaev 1924 BRNU; F. B. Teuber 1926 BRNM; F. Weber 1932 OLM, PR; F. Weber 1936 BRNM, OLM, PR, W; F. Weber 1944 BRNM; F. Weber 1970 PR; J. Štefan 1973 MMI; s. coll. s. anno BRNM). Čejč: collis Špidlák (J. Podpěra 1921 BRNU; J. Podpěra 1923 BRNU; J. Jedlička 1944 GM; J. Šmarda 1951 BRNM; E. Heřmanská 1953 PR; J. Vicherek 1960 BRNU; J. Šmarda 1961 BRNM; J. Reitmayer 1969 BRNU, PR; K. Sutorý 1980 BRNM; V. Grulich 1984 MMI; V. Grulich 1987 MMI; J. Danihelka 1996 herb.; J. Čáp [annum non denotatum] OLM). Čejč: declivia stepposa collis Prostřední špidlák 2,3 km situ merid. a pago (V. Grulich 1984 MMI; V. Grulich 1987 MMI; V. Grulich 1990 BRNU; V. Grulich 1992 BRNU; B. Trávníček 1992 OL; J. Danihelka 1993 herb.). Čejč: declivia stepposa Luka dicta [= Žleby] (V. Krist 1938 BRNU; J. Reitmayer 1969 BRNM). Čejkovice: in clivis apricis Čejkovické špidláky dictis, ca. 2 km situ bor.-orient. a pago (V. Žíla 1995 herb.). Inter pagos Čejč et Mutěnice (J. Bílý 1923 BRNM; V. Krist 1933 BRNU; V. Krist 1940 BRNU; M. Součková 1955 BRNM). Ježov (F. Weber 1970 OLM). Hovorany: declivia stepposa Jezovitky dicta [loca publice protecta Hovoranské louky] (V. Grulich 1987 MMI). Kobylí: collis Kobylská skála, etiam Velký vrch (F. Weber 1936 BRNM; M. Deyl 1939 PR, SLO; R. Picbauer 1943 BRNM; V. Skřivánek jun. 1944 BRNM; V. Pospíšil 1963 BRNM; F. Weber 1976 OLM; K. Sutorý 1977 BRNM; V. Grulich 1984 MMI; L. Ambrozek 1987 MMI). Kobylí: in declivibus merid. collis Kobylská skála (K. Domin et V. Jirásek 1939 PRC; A. Komenderová 1969 BRNU). Kyjov (T. Martinec 1933 PR [*A. pannonica* admixta!]). Kyjov: in declivibus stepposis ad pagos Kelčany et Vlkoš versus (J. Podpěra 1932 BRNU).

Mutěnice: collis Vyšicko (F. Weber 1933 PR). Rebešovice (J. Bílý 1920 BRNM; A. Wildt 1923 BRNM; L. David 1943 OP; J. Šmarda 1951 BRNM). Rebešovice: declivia graminosa Velké Družďavy (J. Čáp 1978 VYM). Starý Poddvorov: silva Kapánsko (F. Weber 1973 PR). Starý Poddvorov: silva Horní Kapánsko, loco Šlajfová alej dicto (V. Pospíšil 1963 BRNM). Stavěšice (F. Weber 1971 PR). Stavěšice: loca arenosa prope pagum (F. Weber 1971 PR). Šlapanice (A. Wildt 1922 BRNM; E. Formánek s. anno BRNM; G. Nießl s. anno BRNM, BRNU). Tvarožná (J. Podpěra 1921 BRNU; Langer 1942 VYM). Tvarožná: collis Santon (F. Skyva 1922 BRNM; F. Weber 1926 OLM; F. Weber 1929 BRNM; F. Weber 1931 PR; V. Skřivánek jun. 1942 PRC; J. Šindelář 1952 PR; Doubek 1965 BRNU; F. Weber 1971 PR; J. Hanousek 1978 BRNU, VYM). Tvarožná: collis Žuráň (F. Weber 1963 PR). Velatice (F. Švestka 1932 BRNM, BRNU, GM, HR, OLM, OP, PR, SLO, W, WU; F. Weber 1933 OLM; J. Podpěra s. anno MP; K. Vlašicová 1968 BRNU). Vlkoš: in collibus prope pagum (F. Weber 1970 PR). Želetice: declivia Na Adamcích (F. Šmarda 1957 BRNM). Viničné Šumice: in saxis supra pagum [loco Hynčicovy skály dicto] (F. Weber 1977 PR).

Mesophyticum: **41. Střední Povltaví.** Točná: loco Šance dicto (L. Kirschnerová 1983 ROZT). Modřany (P. Hora 1883 PRC; J. Velenovský 1883 PRC; J. Rohlena 1919 PRC; J. Rohlena 1922 PR, PRC). Modřany: vallis Modřanská rokle (E. Hejný 1914 PRC; J. Rohlena 1919 PR). **52. Ralsko-bezdězská tabule.** Vrchbělá (I. Klášterský 1923 PR). Secundum viam publicam inter pagum Vrchbělá et oppidum Bělá pod Bezdězem (I. Klášterský 1923 PR). **68. Moravské podhůří Vysočiny.** Biskupice: in pascuis ad flumen Rokytná (J. Suza 1929 BRNU). Čučice: loco Doubravka dicto supra flumen Oslava (J. Suza 1932 BRNU). Heřmanice-Kordula: declive stepposum ad ripam sinistram rivi Heřmanický potok (sine coll. 1976 ZMT). Hluboké Mašůvky: declivia aprica in valle rivi Plenkovický potok 1 km situ septentr.-orient. a pago (K. Sutorý 1985 BRNM). Jevišovice: clivus apricus supra flumen Jevišovka (Jiráková 1977 ROZT). Mohelno: cacumen collis graminosi ad tramitem arvensem ca. 150 m situ orient. abs cota 407 U Jezera dicta, 2,2 km situ occident.-merid.-occident. ab ecclesia in pago (R. Řepka 1994 herb.). Plaveč: declivia supra molam Culpovec, ca. 1,5 km situ septen.-occident. a pago (K. Sutorý 1977 BRNM). Plenkovice (J. Šmarda 1961 BRNM). Plenkovice: declivia aprica collis supra marginem orient. piscinae (K. Sutorý 1985 BRNM). Přešovice: in pascuis dictis Kopaniny (ut Kopaninky) supra flumen Rokytná (J. Suza 1932 BRNU). Senorady: declivia merid. collis Malá skála (K. Sutorý 1977 BRNM). Senorady: supra molam Senoradský mlýn ad flumen Oslava (J. Suza 1932 BRNU). Inter pagos Újezd et Rozkoš (K. Kubát 1977 LIT). Vevčice (J. Šmarda 1962 BRNM). Vevčice: declivia saxosa Vevčické kopce dicta 0,7 km situ septentr.-orient. a pago (V. Grulich 1985 MMI). Vevčice: declivia cis molam ca. 0,7 km situ occident. a pago (K. Sutorý 1978 BRNM). Žerůtky: lapidicinae ad marginem orientalem pagi (K. Sutorý 1985 BRNM).

Praesentia verisimiliter adventiva: **84a. Beskydské podhůří.** Konská (C. Kotschy 1825 BRNM).

Localitates non satis indicatae: „Nordböhmen" (s. coll. 1851 PR). České středohoří (illeg. 1853 PR). Bílina (A. Reuss 1869 WU). Litoměřice (E. Keil sine anno PRC, WU; A. C. Mayer 1870 MJ, PR). „In pratis Mold. inf." (Gebhard s. anno W). „In sylvis Moldau. infer." (Gebhard s. anno W). Praha (s. coll. 1811 PR; F. J. Ruprecht s. anno PR, PRC, WU; I. F. Tausch [ex herb. Fenzl] s. anno W; W. Mann 1820 LIT [*A. millefolium* admixta!]; E. Hofmann 1840 PR; E. Hofmann 1845 PR; E. Hofmann 1846 PR; F. M. Opiz 1846 PR; E. Opiz s. anno BRA, PR; V. Weidenhofer s. anno PR; Wolfner s. anno PRC; Matzialek 1857 ROZT; Prevol? [non legibile] 1857 PR; K. Polák 1875 PR; W... [illeg.] 1888 OP; Neumann s. anno PR; s. coll. s. anno PRC). Roudnice nad Labem (ex herb. Reichenbach fil. 1844 W; S. Trapl 1928 PRC). Roudnice nad Labem: in arenosis (s. coll. 1867 PR).

Localitates dubiosae, ambiguae vel confusae: Hustopeče (H. Laus 1910 BRA). Jičín: prope oppidum [an domicilium?] (F. Sitenský 1871 PR). Kobeřice (F. Weber 1977 PR). „Kunratice-Všetaty" (R. Janele 1903 PRC). Oberthomasdorf [an Horní Domašov?] (sine coll. s. anno BRNM). Neuhaus (Schöbl 1854 PR [*A.* cf. *millefolium* s. str. admixta!]). „Plešivec u Prahy" (E. Hadač 1935 MP). „Polabí" (J. Dostál 1952 PRC). „Spitze der Pollauer Berge" (F. B. Teuber 1897 BRNM [*A. pannonica* admixta!]). Teplice [an domicilium?] (M. Winkler 1853 BRNU, PR). Terezín: loca salsa inter ferriviam et viam publicam (O. Grebenščikov 1955 SAV).

Plantae cultae. Praha: in horto botanico (Hennevogel 1851 PRC). Praha-Michle: in horto hortulani et librorum auctoris M. Fulín (K. Tocl 1896 PR). Olomouc: culta [an in horto botanico?] (H. Laus 1911 BRNU).