Cephalozia macrostachya confirmed in the Czech Republic

***Cephalozia macrostachya* potvrzena v České republice**

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Cephalozia macrostachya Kaal. has been recently found in the 'Swamp' mire near Doksy (Northern Bohemia). The following revision of herbarium specimens of *Cephalozia loitlesbergeri* Schiffn. revealed one more specimen of *C. macrostachya*, collected already in 1965 in the Krušné hory Mts. The habitat preferences for both species in Central Europe are discussed and it is assumed that while *C. loitlesbergeri* is a clearly upland species of open, acidic raised bogs, *C. macrostachya* seems to prefer lowland poor fens or lagg parts of bogs in middle altitudes.

K e y w o r d s : *Cephalozia*, Czech Republic, habitat preference

Having visited the 'Swamp' nature reserve (Northern Bohemia) in May 2001, the second author (JK) collected *Cephalozia* specimens that he later identified as *C. macrostachya* Kaal., then regarded as a speculative species of the Czech flora (Váňa 1998, annot. 1). As the first author (JV) hesitated to confirm the identification (the gametophytic characters somewhat resembled those of *C. loitlesbergeri* Schiffn. and only perianths were present in the material), JK repeatedly collected the plant during his second visit in late June in order to obtain unambiguous material. The perianths were numerous but antheridia were absent again. At last the third visit in September by JV yielded the antheridia, which confirmed the dioicous sexual condition and thus the identity of the plants.

As the plants from the 'Swamp' mire resembled *C. loitlesbergeri* when sterile (strongly thickened cell walls, leaf lobes often ending with two or even three cells in a row (Fig. 1a–c), the need for a revision of *C. loitlesbergeri* in the Czech Republic arose, and it was therefore performed by JV. The revision revealed one more specimen of *C. macrostachya* (with antheridia only), collected earlier in the Krušné hory Mts by JV. This specimen was gametophytically much closer to the typical plants from western Europe – the leaf cells thin-walled, basal leaf cells markedly different from the median ones, etc. (Fig. 1d–f).

The site details for the existing finds are as follows: 1. W Bohemia, Krušné hory Mts, distr. Karlovy Vary: the mire 'Smrčina' (Unter-Irrgang) on northern slopes of the Smrčina Mt, S of the road between the settlement Bludná and the village Horní Blatná (approx. 50°23.5'N, 12°47.5'E), 980 m a. s. l., 6 July 1965 coll. J. Váňa sub *C. loitlesbergeri* (Váňa 1967: 99, Váňa in Duda & Váňa 1987: 220), herb. Váňa (c. andr.). – 2. N Bohemia, Ralská pahorkatina hills, distr. Česká Lípa: the mire 'Swamp', ca. 2 km NNE of the town of Doksy, N edge of the mire 1.1 km SSE of the top of the Borný hill (50°34'49–52"N, 14°40'02–03"E; WGS-84), 270 m a. s. l.; growing on wet peat in the poor fen; 30, 31 May

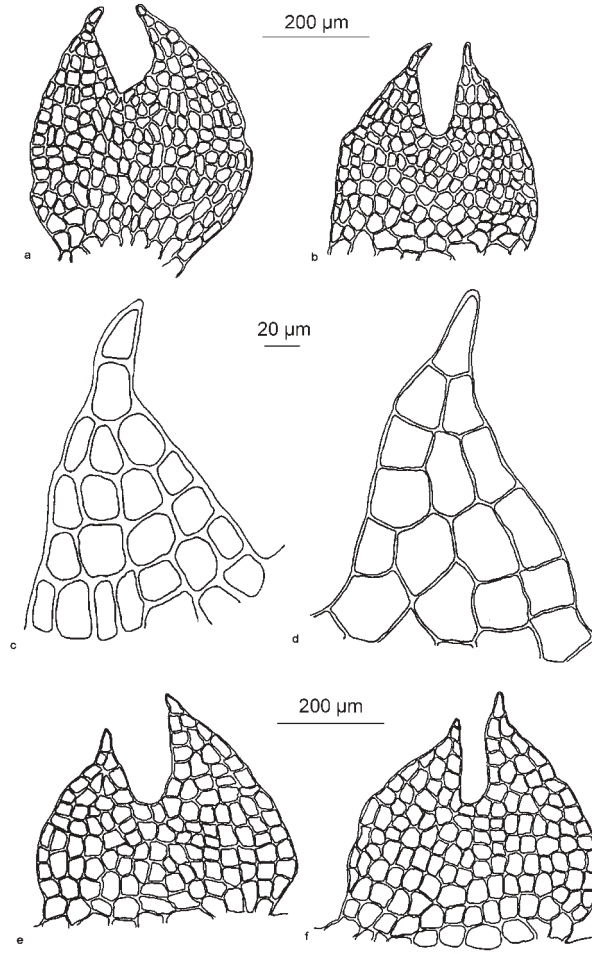

Fig. 1. – *Cephalozia macrostachya* Kaal., leaves and details of leaf lobes. a–c after plants from Swamp mire (herb. Kučera no. 7660), d–f after plants from Smrčina mire (Váňa s. n.); orig. J. Kučera.

and 24 June 2001 coll. J. Kučera (herb. Kučera no. 7591, 7650, 7653, 7655, 7657, 7660), ditto 3 Sept 2001 coll. J. Váňa (herb. Váňa).

The question as to whether the above records are the first ones in the Czech Republic will probably remain unanswered. *C. macrostachya* has been published from the country four times in the past – three localities are from the Krušné hory Mts and one from the Krkonoše Mts (for details see Rüster 1922, Váňa 1964, Duda & Váňa 1987). Despite the fact that *C. macrostachya* occurs on the German side of the Krušné hory Mts and that the raised bogs of both mountain ranges (including the Krkonoše) have been repeatedly surveyed in the past 40 years, the species has not been found consciously. Nevertheless, this search brought several localities of *C. loitlesbergeri*, also not known from the area before.

C. macrostachya occurs on mires in lowland to middle altitudes of western Europe (Ireland, Britain, Belgium, France, the Netherlands), around the North and Baltic seas (southern Norway and Sweden, Latvia, Lithuania, neighbouring Russia, northern Poland and

Table 1. – Summary of differences between *Cephalozia* species.

	Cephalozia lunulifolia	*Cephalozia macrostachya*	*Cephalozia loitlesbergeri*
Leaf cells	32–35 × 25–30 µm, thin-walled, basal cells only slightly larger	22–27 × 18–25 µm, slightly thick- or thin-walled, basal cells in 1–2 rows enlarged, 40–60 × 35–45 µm	30–40 × 28–38 µm, thick-walled, basal cells of nearly the same size or only slightly enlarged
Leaf lobes	connivent, terminating in 1 (–2), not elongated, superposed cells	not connivent, terminating in (1–) 2 (–3), not elongated, superposed cells	connivent, terminating in 2–3 (–4), elongated, superposed cells
Sexuality	dioicous	dioicous	autoicous
Female bracts	bilobed to 0.3–0.4 of their length, lobes entire, with 1 (–2) small marginal teeth	bilobed to 0.5–0.7 of their length, lobes dentate, at least with 2–3 marginal teeth	divided to 0.5–0.7 of their length in 3–4 narrow lobes with marginal teeth or lobes
Perianth mouth	crenulate to crenulate-dentate	ciliate, with cilia 2–4 cells long	ciliate or laciniate, with cilia 2–4 cells long

Germany, Denmark; it has not yet been reported from Finland and Estonia). It reaches Central Europe in Germany, Switzerland, Austria and even westernmost Hungary. In Central Europe, the species is rare and is always included in local Red lists, as it is also in Belgium and Lithuania (Söderström et al. 2002). Outside Europe, *C. macrostachya* (subsp. *macrostachya*) occurs only in northeastern USA (from Maine to New York – Schuster 1974: 750). Deviant populations, approaching *C. macrostachya* subsp. *australis* R. M. Schust. have been reported from the southeastern states westwards to eastern Texas. Subsp. *australis* has been described from North Carolina and Mississippi, growing "exclusively on rock walls and soil over rocks, usually along streams"; this taxon remains taxonomically somewhat obscure. A better known variety is var. *spiniflora* (Schiffn.) Müll. Frib., differing from the type in the shape of male and female bracts and size of the gemmae; the latter taxon has not yet been reported from Central Europe.

There is an interesting question about the habitat preferences for *C. macrostachya* and *C. loitlesbergeri.* The literature sources indicate virtually no difference between the two taxa, assigning them to the communities of raised, valley and blanket bogs (Müller 1951–1958, Schuster 1974, Paton 1999, Dierßen 2001). The Czech localities for the two species seem to differ markedly. While *C. macrostachya* was found in either the lagg part of an upland raised bog or in a lowland poor fen, *C. loitlesbergeri* has been found exclusively in open, ombrotrophic upland raised bogs of extremely acid nature. Typical associates of *C. loitlesbergeri* in the Czech Republic (and to our knowledge elsewhere in Central Europe) are *Sphagnum rubellum* Wilson*, S. fuscum* (Schimp.) H. Klinggr.*, S. magellanicum* Brid.*, Cephalozia connivens* (Dicks.) Lindb. and other species. *C. macrostachya*, however, is more likely to be associated with poor-fen species like *Sphagnum papillosum* Lindb.*, S. denticulatum* Brid.*, Odontoschisma sphagni* (Dicks.) Dumort., or *Rhynchospora alba* (L.) Vahl among vascular plants. If this difference is not accidental, then the literature records which all refer to upland raised bogs would be very probably erroneous. The likely confusion with *C. loitlesbergeri* could be explained by the fact that this species has generally been neglected in Central Europe (the first conscious find in the Czech Republic was made in 1962 although *C. loitlesbergeri* is rather common in our bogs).

Detailed descriptions and illustrations of *C. macrostachya* can be found e.g. in Müller (1951–1958), Schuster (1974) or Paton (1999). It can be mistaken for, and indeed is nearly indistinguishable when sterile from, *C. loitlesbergeri* and *C. lunulifolia* (Dumort.) Dumort.

It is assumed that the actual distribution of *C. macrostachya* will not be confined to the only recent locality but the species is certainly rare. The bryologists in the Czech Republic are therefore encouraged to search for *Cephalozia* plants with ciliate perianths and small cells (as opposed to the common *C. connivens*), especially in sites similar to those described in the present paper.

Souhrn

V loňském roce se autorům podařilo prokázat oprávněnost zařazení játrovky *Cephalozia macrostachya* do flóry České republiky na základě opakovaného nálezu na lokalitě Swamp u Máchova jezera. Následná revize druhu *Cephalozia loitlesbergeri* přinesla objev další historické lokality – rašeliniště Smrčina u Bludné v Krušných horách, kde byla sbírána v r. 1965 jako *C. loitlesbergeri*. Otázka, zda tyto dvě lokality jsou jedinými v naší zemi, zůstává zatím nezodpovězena – historické údaje bohužel nejsou herbářově doloženy a pravděpodobnost záměny za jiné druhy rodu, zejména *C. loitlesbergeri*, je značná. Jsou diskutovány stanovištní nároky obou druhů. Ačkoli jsou v literatuře uváděné takřka shodně – má jít o druhy spíše vrchovištní, v silně oceanické části Evropy pak nepříliš vyhraněné, dosud známá stanoviště u nás se pro tyto dva druhy liší. Oba sice obvykle rostou na vlhké rašelině, ale *C. loitlesbergeri* je skutečně druhem vrchovištním, zatímco *C. macrostachya* byla jednou sbírána v laggové části vrchoviště v montánním pásmu, podruhé pak v přechodovém nížinném rašeliništi – v obou případech šlo tedy o méně kyselé biotopy.

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