

DISTRIBUTION OF *DICRANUM VIRIDE* AND *DICRANUM TAURICUM* IN HUNGARY

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The distribution of *Dicranum viride* and *Dicranum tauricum* in Hungary has been revised on the basis of herbarium specimens, and a map is provided. *D. viride* occurs in Zemplén Mts, Gömör–Torna karst region (Bódvaszilas), Bükk, Nyírség (Bátorliget), Bakony (Ugod), and Göcsej (Tornafölde). Most of the records of this species are more than 30 years old. *D. tauricum* occurs in Bükk, Börzsöny, Pilis, Buda Mts, Mecsek, Nyírség and Maros–Körös köze. It appears to be extending its range at present. Erroneous literature data due to confusion of the two species are corrected. The diagnostic characters of the two species are described and in part illustrated. Issues of protection are discussed with respect to *D. viride*, as well as possible causes for the increase of *D. tauricum*.

Key words: diagnostic characters, *Dicranum viride*, *Dicranum tauricum*, distribution, Hungary, illustration, map

INTRODUCTION

In BOROS (1968) *Dicranum viride* (Sull. et Lesq.) Lindb. is listed as a rare species, and *Dicranum tauricum* Sap. (= *D. strictum* Schleich.) is mentioned as a species the occurrence of which in Hungary is open to question. According to ORBÁN and VAJDA (1983) both species are rare, but the area of *D. tauricum* is restricted to three regions of the Zemplén, the Bükk and the Mecsek Mts, whereas *D. viride* occurs in these as well as in five more regions. *D. tauricum* thus appears to be less widespread than *D. viride*.

Contrary to this, during bryofloristical studies in Hungary the author has frequently found *D. tauricum*, while up to 1998 he was not able to detect *D. viride*. This experience prompted the author to study the distribution of the two species in more detail.

For this purpose, all specimens of *D. viride* and *D. tauricum* in BP, EGR and the private collection of G. Jakab (Szarvas), as well as two specimens of the private collection of Z. Tóth (Budapest) were revised. To establish the actual distribution of these species in Hungary, some field records of the author and of 3 German bryologists who participated in a bryological research camp organized by the author in August 1998 in the Bükk Mts, were included as well. Since these species have often been confused, the main distinguishing features are discussed and presented.

RESULTS

While consulting the specimens inserted under *D. viride* and *D. tauricum* (as *D. strictum*) in BP, it became clear that the specimens of the Boros herbarium (stored separately) had already been revised by E. Hegewald in 1969–1971, whereas the other specimens in BP (“törzsgyűjtemény”) had not been subject to revision. 52 of the total 78 specimens seen represent collections from the present territory of the Hungarian state; only these are considered here. 29 specimens are *D. viride* and 16 *D. tauricum*, whereas 7 of them belong to other species (*Ditrichum flexicaule*, *Paraleucobryum longifolium*, and *Dicranum flagellare*). A list of the specimens examined is presented in the Appendix.

Hungarian distribution of *Dicranum viride* and *Dicranum tauricum*

D. viride has been recorded from the following areas (in parentheses: number of localities; year of latest record): Zemplén Mts (5; 1954), Gömör–Torna karst region (1; 1937), Bükk (10; 1998), Nyírség (1; 1996), Bakony (1; 1954), and Göcsej (1; 1955). Literature records from the Mátra, Buda and Mecsek Mts correspond to herbarium specimens not representing *D. viride*. Until true records

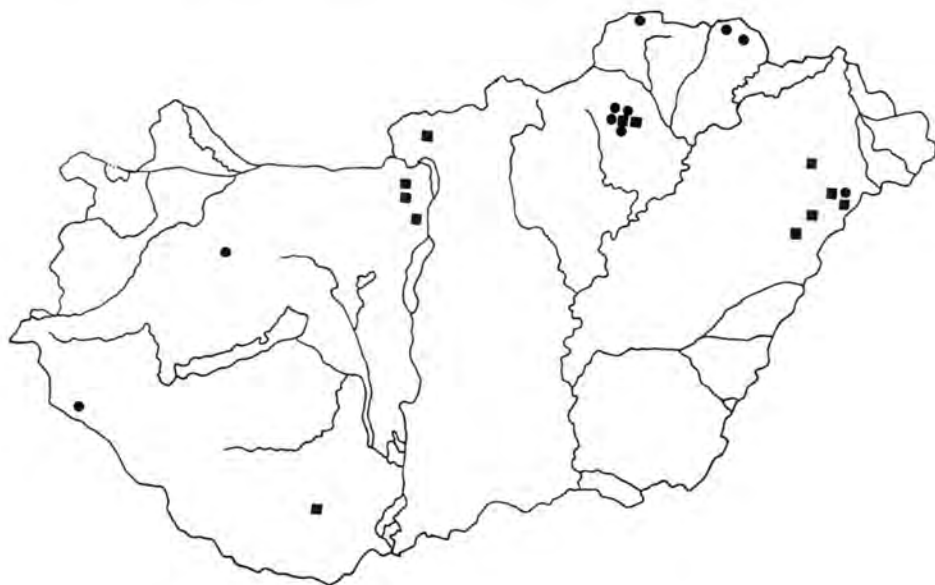


Fig. 1. Distribution of *Dicranum viride* and *Dicranum tauricum* in Hungary, according to herbarium specimens revised by the author. Circles: *Dicranum viride*, squares: *Dicranum tauricum*.

appear, these regions have therefore to be excluded from the area of *D. viride*. Except for the record from Nyírség, where *D. viride* was discovered in 1989, and the 3 recent records from the Bükk Mts, all records of *D. viride* are 30 years old or older.

D. tauricum, on the other hand, is reported in this paper from the following regions: Bükk (3; 1968), Börzsöny (2; 1996), Pilis (1; 1997), Buda Mts (4; 1998), Nyírség (5; 1998), Maros–Körös köze (1; 1998) and Mecsek (1; 1953). The literature record of the Zemplén Mts corresponds to specimens revised erroneously as *D. tauricum* by L. Vajda in 1969 and published in BOROS and VAJDA (1970). It represents a specimen of *D. viride*, as was already observed by E. Hegewald in 1971. Hence, at present, there is no specimen of *D. tauricum* available from the Zemplén Mts. In contrast to most records of *D. viride*, those of *D. tauricum* are fairly recent.

Figure 1 shows the distribution of the two species in Hungary according to the specimens seen by the author.

Distinction between *Dicranum viride* and *Dicranum tauricum*

D. viride and *D. tauricum* have often been confused, even recently, although the differences are quite pronounced. For this reason, the characters useful for correct determination are presented here.

	<i>Dicranum viride</i>	<i>Dicranum tauricum</i>
Length of cells above angular cells (ignore 3 rows of cells adjacent to the nerve, the margin and the auricles, each)	(14) 16–50 (76) μm , most cells less than 30 μm long	(25) 35–120 (150) μm , most cells more than 40 μm long
Length of mid-leaf cells	9–30 μm , most cells less than 20 μm	20–60 μm , most cells more than 30 μm
Length of cells in the leaf tip (where the lamina is 4–6 cells wide; ignore marginal cells)	(8) 9–30 (35) μm , always many oblate, i.e. shorter than broad	(11) 12–40 (50) μm , very rarely oblate

Both species differ from other species of the genus *Dicranum* (incl. *Orthodicranum*) by their fragile leaf tips, which can easily be observed in the field by slightly rubbing a moistened finger across the tuft. The leaf tips will stick to the finger.

In dry state the leaves of *D. tauricum* are stiff and more or less straight, whereas those of *D. viride* appear somewhat curled. This difference, however, is sometimes not very pronounced.

Using magnifications between 20–40 times, it is often possible to detect protonema-like threads of cells growing from the broken ends of *D. tauricum* leaves, a feature not observed in *D. viride*. Sometimes, the broken tips and the protonema form a real felt at the base of the tuft.

An easy and reliable way to distinguish the two species microscopically depends on the differences in the length of lamina cells (HEGEWALD 1972a, b):

In the transverse section of leaves, several distinguishing features can be observed. The lamina of *D. viride* is partially bistratose in the upper part, whereas the lamina of *D. tauricum* is unistratose throughout. The nerve of *D. viride* exhibits dorsal stereids; these are absent in *D. tauricum* (Fig. 2).

DISCUSSION

Dicranum viride is classified as “vulnerable” in the Red Data Book of European Bryophytes, it is also included in Appendix I of the Bern Convention and in Annex 2 of the EC Habitats and Species Directive (SCHUMACKER and MARTINY 1995). At present, threatened species of this kind attract the attention of bryologists concerned with the protection of nature in Europe (e.g. ENROTH 1989). The first aim is to assess the distribution of these species as accurately as possible. SCHUMACKER and MARTINY (1995, map 18) also present a map showing the distribution of *D. viride* in Europe. It shows only two points for Hungary,

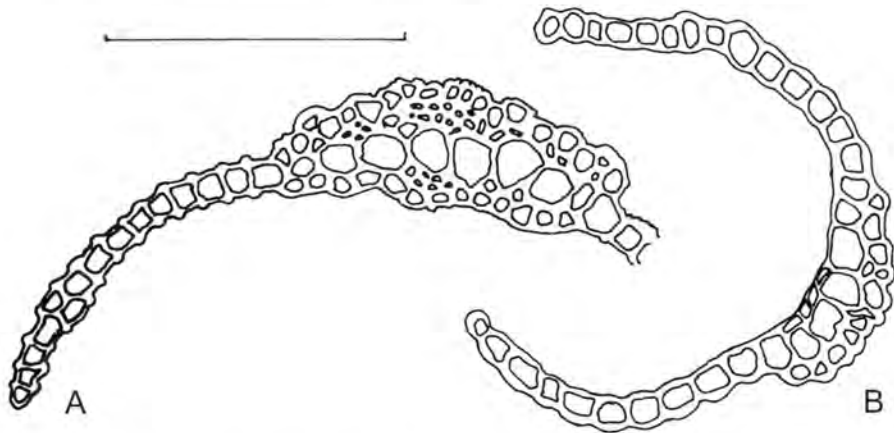


Fig. 2. A = Part of transverse leaf section of *Dicranum viride* (Herbarium Z. Tóth, Budapest, Hungary, No. 1989 1105.023. Flora Hungarica. Bátorliget TVT, Nyírláp, nyírfá törzsén, 3b erdőrézletben, Alt.: 130 m, Dat.: 1989.XI.4. leg. K. Barabás, Z. Tóth). – B = Transverse leaf section of *Dicranum tauricum* (Herbarium P. Erzberger, Berlin, Nr. 4227. Budapest, Hárshegy, Totholz, liegender Stamm unterhalb “Kilátó”, 9. April 1998 leg. P. Erzberger) Scale bar: 100 μ m. (drawn by P. Erzberger).

representing post-1950 herbarium material. One entry seems to correspond to the Göcsej region, while the other is roughly situated at the Nógrád basin, halfway between the Börzsöny and the Mátra Mts, and thus cannot be allocated to any of the specimens revised in this paper.

From the point of view of protection, only the records in the Bükk Mts and in the Nyírség are within protected areas of higher rank (Bükk National Park and Bátorliget Nature Reserves, respectively), whereas the other records come from less well-protected regions. But even in the Bükk National Park, where the greatest number of the localities of *D. viride* is situated, operations of forestry management could represent a considerable threat. This species is reported to require old trees (especially beech) in an undisturbed woodland environment with an even and high humidity (MARTINY and HALLINGBÄCK 1995). However, recently *D. viride* was found in 2 places in the Bükk Mts growing on the bark of *Quercus* species in rather open woodland at mountain ridges in southern exposition.

The remarkable fact that *D. viride*, a species of subcontinental-montane distribution (MARTINY and HALLINGBÄCK 1995), occurs at an altitude of only 130 m a.s.l. in the Great Hungarian Plain (at Bátorliget), has already been commented on elsewhere (STANDOVÁR *et al.* 1991). The existence of *D. viride* in this locality could be verified recently (JAKAB 1997b). For most other records from 1968 or earlier, an actual verification would be highly desirable.

D. tauricum, on the other hand, is one of the few moss species that have been reported to extend their range within the last decades (*e.g.* HEGEWALD 1969, SMITH 1978, DÜLL 1980, KLAUITTER 1984, DÜLL and MEINUNGER 1989, with distribution map, BUTTERFASS 1992, FRAHM and FREY 1992, FREY *et al.* 1995). For Hungary, MARSTALLER (1994, 1995) seems to be the first to have published results suggesting an increase of frequency. His detailed distribution map for the Budapest region (Pilis and Buda Mts) shows 14 entries. Marstaller's suspicion that the *D. viride* record for the Buda Mts in BOROS and VAJDA (1952) corresponds in fact to *D. tauricum*, is confirmed in the present paper. MARSTALLER (1994, 1995) found the most extensive stands of *D. tauricum* in disturbed habitats, especially around abandoned quarries (Ezüstkevély near Pilisborosjenő, Pribarinye northeast of Pilisszántó). This, he argues, is suggestive of a strong extension of range within the past decades. He also discusses the bryosociological affinities of this moss (MARSTALLER 1983, 1994, 1995).

The data of this paper also support the assumption that *D. tauricum* is at present in a phase of rapid increase. It is very unlikely that this species was simply overlooked by generations of former Hungarian bryologists, especially in areas as well researched as the Pilis-Buda Mts. Future detailed bryofloristical mapping could probably document this dynamic development in more detail.

The causes for the extension of range observed in many European countries are still far from clear. One hypothesis states that in and around industrial regions

in Central Europe *D. tauricum* occupies ecological niches that have been abandoned by other epiphytic moss species as a consequence of acid rain (FREY *et al.* 1995). Field observations of the author are not in agreement with this view. For example, on a single oak at Hárs-hegy (Budapest), *D. tauricum* was found growing together with *Frullania dilatata*, a liverwort of well-known and high sensitivity towards acid immissions, which, for this very reason, has already disappeared from a number of regions subject to sulphur dioxide pollution (*e.g.* DÜLL and MEINUNGER 1989, BENKERT *et al.* 1995). It seems, then, that in the surroundings of Budapest, at least, acid rain cannot be the effective cause.

A different hypothesis assumes that *D. tauricum* favours increased nitrogen oxide concentrations due to traffic air pollution resulting in general eutrophication (BUTTERFASS 1992). Again, more detailed mapping could help to answer the question as to whether *D. tauricum* shows, in fact, preference for sites around human settlements and agglomerations.

Studying transverse leaf sections of *D. viride*, the author noticed a morphological feature, which is also visible in Figure 2. The cell walls show projections, which are not observed in *D. tauricum*. In the literature, this character ("Pfeilerpapillen, papillenartige Auftreibungen über den Zellwänden") is described especially in *Dicranum fulvum* (LIMPRICHT 1889, ROTH 1903, BROTHERRUS 1923, BURCK 1947), but also in *Kiaeria falcata*, *K. blyttii* (BURCK 1947, MAIER 1997) and *Dicranoweisia crispula* (MAIER and GEISSLER 1995). According to NYHOLM (1954, 1986) and the experience of the author, it is characteristic of section *Crassinervia* Roth of the genus *Dicranum*, comprising *D. scottianum*, *D. fulvum* and *D. viride*. However, HEGEWALD (1991a, b) also reports this feature ("Zellwände der Lamina stark verdickt mit warzenförmigen Ausbildungen") in leaves of *D. fragilifolium* and *D. tauricum*. The taxonomic value of this character obviously requires further study.

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APPENDIX

List of specimens examined

In the following list the original data from the specimen labels are quoted. In case of duplicates, minor variations of the label data are ignored. Where the record has been published, the publication is cited as well. A few records of the author are also included. [The contents of revision slips and explanatory remarks of the author are put in square brackets.]

DICRANUM VIRIDE

Zemplén Mts

Hungar. bor., Comit. Abaúj-Torna, in rupibus in quercetis vallis Szárazkút-völgy (Kőkapu) prope pag. Pálháza, 25. Mai 1947, leg. László Vajda BP 100840 [sub *D. viride*, t. Boros, 30.9.1947; rev. L. Vajda 13. Nov. 1969 as *D. strictum* Schleich., see BOROS and VAJDA 1970; rev. E. Hegewald 15.5.1971 as *D. viride* "Rippe 1/6 der Blattbreite, Zellen oberhalb der Blattflügel: 18–55 µm; Zellen der Blattspitze (8 Zellen breit): 9–25 µm; Blättchen weit hinab mit doppelschichtiger Lamina"], EGR [sub *D. viride*, but with the later remark "(Est: *Dicranum strictum* Schleich.)", see BOROS and VAJDA 1970; rev. E. Hegewald 15.V.1971 as *D. viride*]

Comit. Abaúj-Torna. Ad saxa andesit. silv. pedis montis Szárazkút-bérc ad Kőkapu vallis Kemence-patak prope Pálháza ca. 250 m.s.m. 5. Jul. 1949, leg. Á. Boros t. E. Hegewald, in litt. 29.6.1969. BP 100837, EGR [sub *D. viride*, but with the later remark "(Est: *Dicranum strictum* Schleich.)"]

Comit. Abaúj-Torna. In truncos putrescens in cacumine montis Vadásztető supra vall. Ördög völgy prope Pálháza, 1. Aug. 1953, leg. L. Vajda, BP 26285, EGR [2 specimens], BOROS and VAJDA 1955.

Comit. Abaúj-Torna. In truncos putrescens in sylvestribus vallis Vajdavölgy pr. pag. Pálháza, 6. Okt. 1953, leg. L. Vajda BP 26564, BP 100836 t. E. Hegewald Nov. 1971, EGR, BOROS and VAJDA 1955.

Comit. Abaúj-Torna. In truncos Fagus sylvaticae in monte [?] Pipekatető prope pag. Hollóháza, 30. Feb. 1954, leg. L. Vajda BP 27966.

Gömör-Torna karst region

Comit. Abaúj-Torna. In rupibus calcar. silvat. ad "Vecsembükki-zsomboly" montis Vecsembükk prope Bódvaszilas ca. 550 m.s.m. 2. Nov. 1937, leg. Á. Boros BP 100839 [t. E. Hegewald, Nov. 1971, soc. *Isothecium alopecuroides*, *Bryum subelegans*, *Hypnum cupressiforme*, *Metzgeria spec.*]

Bükk

Comit. Borsod. In petrosis vallis "Sáros völgy" prope pagum Hámor, 300–450 m.s.m., 3. Aug. 1922, leg. Á. Boros BP 100835 [t. E. Hegewald, Nov. 1971].

Comit. Borsod. Ad truncos arborum ad "Szent István kilátó" supra Lillafüred, ca. 500 m.s.m., 25. Jun. 1932, leg. Á. Boros BP 100832 [t. Loeske "(Schattenform)" 2.4.1933; t. E. Hegewald Nov. 1971].

Comit. Borsod. Ad corticem Fagi in silvis montis Magoskő prope Ómassa, ca. 600 m.s.m., 16. Mai 1951, leg. Á. Boros BP 100831 [t. E. Hegewald Nov. 1971].

[Comit. Heves] Bükkfa tövén, Tarkő erdejében, Bükk hegység, 6. Okt. 1951, leg. L. Vajda BP 21365 [soc. *Dicranum montanum*, *Isothecium alopecuroides*].

Comit. Borsod. Ad corticem in silvis culminis montis Tarkő pr. Szilvásvár, ca. 950 m.s.m., 6. Oct. 1951, leg. Á. Boros BP 100829 [t. E. Hegewald Nov. 1971], EGR.

Comit. Borsod. Ad corticem Quercus in silvis montis Füzérkő prope Cserépfalu, ca. 300–400 m.s.m., 30. Marc. 1959, leg. Á. Boros BP 100833, BP 100834 [t. E. Hegewald in litt. 29.6.1969, soc. *Frullania dilatata*].

Comit. Borsod. Montes Bükk. Ad truncos putresc. in Fagetis supra "Létrás", ca. 650 m.s.m., 19. Sep. 1968, leg. Á. Boros BP 100830 [t. E. Hegewald, Nov. 1971].

Comit. Borsod-Abaúj-Zemplén, Ódor-vár unterhalb Ódor-hegy, 5 km NNW Cserépfalu, süd-ostexponierte thermophile Eichenwälder und Felsrasen auf Trias-Kalk, Phorophyt: *Quercus cerris*. ca. 350 msm, DU 61, 06.08.1998, leg. U. de Bruyn et P. Erzberger, Herb. P. Erzberger, Berlin, Nr. 4699.

Comit. Heves, Várhegy (nördl. Teil), 2,5 km ESE Felsőtárkány, bodensaure Eichenwälder (Genisto-Quercetum) auf Lehm-schiefer und anderen Silikat-Gesteinen, Substrat: Silikatblock. ca. 600 msm, DU 51, 08.08.1998, leg. M. Siemsen et P. Erzberger, Herb. P. Erzberger, Berlin, Nr. 4762a.

Comit. Borsod-Abaúj-Zemplén, Szarba-oldal, ca. 7 km N Cserépfalu, thermophile Eichenwälder und Felsrasen am Berggrat, Phorophyt: *Quercus sp.* ca. 450 msm, DU 61, 09.08.1998, leg. J. Klawitter et P. Erzberger, Herb. P. Erzberger, Berlin, Nr. 4778.

Nyírség

Bátorliget TVT, Nyírláp, nyírfa törzsén, 3b erdőrézletben (17.), 130 m, 1989.XI.4, leg. K. Barabás, Z. Tóth, det. Z. Tóth, S. Orbán, Herbarium Z. Tóth, Budapest, 1989 1105.023. STANDOVÁR *et al.* 1991.

Bátorliget TVT, Füzláp, 3b erdőrézletben, 1989.XI.4.-7, leg. K. Barabás, Z. Tóth, det. Z. Tóth, K. Barabás, S. Orbán, Herbarium Z. Tóth, Budapest, 1989 1105.023. STANDOVÁR *et al.* 1991.

Bátorliget, ősláp, nyírláp, nyírfa törzse, 30.6.1996 leg. et det. Gusztáv Jakab, Herbarium G. Jakab, Szarvas. JAKAB 1997a, b, 1998.

Bakony

Comit. Veszprém. Ad truncos Fagi in umbrosis vallis Somberek-séd prope Ugod, ca. 300 m.s.m., 17. Mai 1954, leg. L. Vajda BP 27063 [soc. *Pterigynandrum filiforme*, *Metzgeria furcata*], leg. Á. Boros, BP 100842 [t. Vajda 13. Nov. 1969; t. Hegewald, Nov. 1971], EGR. BOROS and VAJDA 1955.

Göcsej

Comit. Zala. Ad truncos putresc. an Fagetis "Szurkosárok" ad Vétym prope Tormafölde, ca. 200–300 m.s.m., 12. Jul. 1955, leg. Á. Boros BP 100841 [t. E. Hegewald, Nov. 1971], EGR. BOROS and VAJDA 1958.

The following specimens do not represent records of *Dicranum viride*

Gömör–Torna karst region

Comit. Abaúj-Torna. Ad truncos in silvis montis Nagyoldal prope Jósvafő, ca. 500–600 m.s.m., 2. Mai 1953, leg. Á. Boros BP 100838 [sub *D. viride*, E. Hegewald: "*Distichium spec.*, *Didymodon spec.*"] This specimen contains *Ditrichum flexicaule* soc. *Fissidens dubius*, *Abietinella abietina*, i.e. moss species that usually grow on calciferous soil, but not on tree trunks ("truncos?"). Perhaps labels have been exchanged.]

Bükk

Comit. Borsod. Ad truncos putresc. silvat. ad fontem Ilona-kút prope Répáshuta (Nagyrészt *Daedalea quercina* korhadó egyedein, *Dicranum montanum*-mal is), ca. 560 m.s.m., 23. Jun. 1950, leg. Á. Boros BP 100878, EGR [sub *D. viride*, see BOROS 1951; rev. E. Hegewald, 27.11.1971 as *D. tauricum* (+ *D. montanum*). This specimen contains predominantly *Dicranum tauricum* mixed with *Dicranum flagellare* (not *D. montanum*)].

Comit. Borsod. In rupibus diabolicis umbrosis montis Nagy István erőse prope pag. Szilvás-várad, 3. Okt. 1951, leg. L. Vajda BP 21366 [sub *D. viride*, see BOROS 1954. Mostly *Paraleucobryum longifolium* (Hedw.) Loeske with little cf. *Cynodontium spec.*]

Comit. Borsod. Ad pedem fagi in sylvestribus montis Tarkő prope pag. Szilvás-várad, 6. Okt. 1951, leg. L. Vajda BP 21367 [sub *D. viride*. In fact it is pure *Paraleucobryum longifolium* (Hedw.) Loeske].

Comit. Borsod. Ad truncos putr. in Piceetis cult. ad Hollóstető prope Bükkszentkereszt, ca. 550 m.s.m., 23. Oct. 1957, leg. Á. Boros BP 100880 [sub *D. viride*, see BOROS and VAJDA 1958; rev. L. Vajda, 13. Nov. 1969 as *D. strictum* Schleich.; "vidit E. Hegewald". *Dicranum tauricum*.]

Comit. Borsod. Ad corticem Betulae in apertis "Borókás teber", ca. 620 m.s.m., 29. Sep. 1968, Á. Boros BP 100881 [sub *D. viride*; rev. E. Hegewald in litt. 22.10.1969 as *O. strictum* (= *D. tauricum*)].

Mátra

Comit. Heves. In truncos putrescens in sylvestribus supra vall. rivi Hidaspatak prope Mátraháza, ca. 450 m.s.m., 25.X.1957 leg. László Vajda EGR [sub *D. viride*, see BOROS and VAJDA 1955. The specimen consists of *D. flagellare* with little *D. scoparium*].

Nyírség (see JAKAB 1997a, b, 1998)

Piricse, Júlia-liget, telepített erdőfenyves, korhadék, 12.5.1996, leg. et det. G. Jakab, Herbarium G. Jakab, Szarvas [sub *D. viride*; the specimen represents *D. tauricum*].

Kállósemlén, Nagymohos, telepített erdőfenyves, égerfa kérgén, 27.8.1996, leg. et det. G. Jakab, Herbarium G. Jakab, Szarvas [sub *D. viride*; the specimen represents *D. tauricum*].

Nyírcsád, Jónás-rész, erdőfenyves, korhadék, 10.6.1997 leg. et det. G. Jakab, Herbarium G. Jakab, Szarvas [sub *D. viride*; the specimen represents *D. tauricum*].

Önböly, Szénási őrház, erdőfenyves, korhadékon, 16.7.1997 leg. et det. G. Jakab, Herbarium G. Jakab, Szarvas [sub *D. viride*; the specimen represents *D. tauricum*].

Buda Mts

Comit. Pest. Ad pedem quercus montis Nagyszénás, prope pag. Nagykovácsi, 29. Mai 1949, leg. László Vajda [sub *D. viride*, see BOROS and VAJDA 1952. In fact, it is *D. tauricum*].

Comit. Pest. Ad truncos quercus in sylvestribus montis Hársborkorhegy prope pag. Budakeszi, 20.XI.1951, leg. László Vajda [sub *D. viride*, see BOROS and VAJDA 1952. The specimen contains mostly *D. tauricum*, accompanied by little *D. scoparium* and *Lophocolea heterophylla*].

Göcsej

Comit. Zala. Ad lign. putresc. pr. pag. Múmor, ca. 200 m.s.m., 1. Mai 1958, leg. Á. Károlyi det. Boros BP 2124 [sub *D. viride*, see BOROS 1951. The specimen represents *Dicranum flagellare* Hedw. with typical flagellae].

Mecsek

Comit. Baranya. Ad lign. putresc. in silvis vallis Farkas-árok supra vallem Nagymély-völgy prope Mánfa, ca. 300 m.s.m., 11. Aug. 1946, leg. Á. Boros BP 2125 [sub *D. viride*, see BOROS 1951. Just as the preceding specimen, this one consists of *Dicranum flagellare* Hedw. with flagellae].

Comit. Baranya. Ad truncos Quercus cerris in silvis versus Árpádtető prope Mecsekszalóc, 300–400 m.s.m., 4. Apr. 1953 leg. Á. Boros BP 100877 [sub *D. viride*, see BOROS and VAJDA 1955; rev. E. Hegewald in litt. 29.5.1969 as *Orthodicranum strictum* (Schleich.) Culm.: "Hierbei handelt es sich aber nach meinen Untersuchungen um *O. strictum* Broth. auf Grund der Zelllänge der Blättchen, der schmalen Rippe (1/5–1/8), den typischen Brutkörpern der abgebrochenen Blattspitzen, sowie des Habitus. Die Pfriemen sind zwar oft $\pm$ gezähnt, doch ist das auch bei anderen "*strictum*"-Proben nicht selten." (*Dicranum tauricum*)], EGR [*Dicranum tauricum*].

DICRANUM TAURICUM

Bükk

Comit. Borsod. Ad truncos putresc. silvat. ad fontem Ilona-kút prope Répáshuta (Nagyrészt *Daedalea quercina* korhadó egyedein, *Dicranum montanum*-mal is), ca. 560 m.s.m., 23. Jun. 1950, leg. Á. Boros BP 100878 [sub *D. viride*, see BOROS 1951; rev. E. Hegewald, 27.11.1971 as *D. tauricum* (+ *D. montanum*). As mentioned above, this specimen contains predominantly *Dicranum tauricum* mixed with *Dicranum flagellare* (not *D. montanum*)], EGR.

Comit. Borsod. Ad corticem Betulae in apertis "Borókás teber", ca. 620 m.s.m., 29. Sep. 1968, leg. Á. Boros BP 100881 [sub *D. viride*; rev. E. Hegewald in litt. 22.10.1969 as *O. strictum* (= *D. tauricum*)] BOROS and VAJDA 1970.

Comit. Borsod. Ad truncos putr. in Piceetis cult. ad Hollóstető prope Bükkszentkereszt, ca. 550 m.s.m., 23. Oct. 1957, leg. Á. Boros BP 100880 [sub *D. viride*, see BOROS and VAJDA 1958; rev. L. Vajda, 13. Nov. 1969 as *D. strictum* Schleich.; "vidit E. Hegewald". *Dicranum tauricum*] BOROS and VAJDA 1970.

Comit. Heves, Nagy-István-erőse, ca. 5 km östl. Szilvásvár, nordexponierter Steilhang mit Porphyrit-Felsen, Phorophyt: *Fagus sylvatica*, ca. 900 msm, DU52/62, 07.08.1998, leg. P. Erzberger, Herb. P. Erzberger, Berlin, Nr. 4726.

Börzsöny

Comit. Nógrád. Ad lign. putresc. in Lariceto ad "Foltán-Kereszt" supra rivum Kemence-patak prope Diósjenő, 600–650 m.s.m., 31. Mar. 1961, leg. Á. Boros BP 100879 [sub *D. strictum* Schleich. Vidit E. Hegewald. Inside the envelope there is a note reading "*Dicranodontium denudatum*" and the correct determination "*Dicr. strictum*!". Presumably, Boros corrected the misidentification only after writing his "Biogeographie" (BOROS 1968), which would explain, why this record is not evaluated in the monograph].

Magosfa, *Fagus*, liegender Stamm, Totholz, sehr alt, ohne Rinde, 10. April 1996, leg. P. Erzberger, Herbarium Erzberger, Berlin, Nr. 2340.

Pilis

Comit. Pest, Pilis-Gebirge, Hosszú-hegy nördl. Csobánka, *Quercus pubescens* Stammbasis, 11. Juli 1997, leg. P. Erzberger, Herbarium Erzberger, Berlin, Nr. 3478.

Buda Mts

Comit. Pest. Ad pedem quercus montis Nagyszénás, prope pag. Nagykovácsi, 29. Mai 1949, leg. László Vajda [sub *D. viride*].

Comit. Pest. Ad truncos quercus in sylvestribus montis Hársborkorhegy prope pag. Budakeszi, 20. XI. 1951, leg. László Vajda [sub *D. viride*; soc. *D. scoparium*, *Lophocolea heterophylla*].

Budapest. Hárshegy. Toter liegender Baumstamm unterhalb "Kilátó" 20. April 1994, leg. P. Erzberger, Herbarium Erzberger, Berlin, Nr. 1888. Liegender Baumstamm, Totholz 23. April 1994, leg. P. Erzberger, Herbarium Erzberger, Berlin, Nr. 1908. *Quercus* Stammbasis, 23. April 1994, leg. P. Erzberger, Herbarium Erzberger, Berlin, Nr. 1911. Baumstubben, auch auf Sandstein übergehend, 12. April 1996, leg. P. Erzberger, Herbarium Erzberger, Berlin, Nr. 2362. *Quercus*-Ast, ca. 3 m Höhe; am gleichen Baumstamm *Frullania dilatata*, 9. April 1998, leg. P. Erzberger, Herbarium Erzberger, Berlin, Nr. 4225. Totholz, liegender Stamm unterhalb "Kilátó", massenhaft, 9. April 1998, leg. P. Erzberger, Herbarium Erzberger, Berlin, Nr. 4227.

Budapest. Wald südlich Makkosmária, *Quercus-cerris*-Stammbasis, 25. März 1997, leg. P. Erzberger, Herbarium Erzberger, Berlin, Nr. 3097, Nr. 3103. Basis eines abgestorbenen *Quercus-cerris*-Stammes, 25. März 1997, leg. P. Erzberger, Herbarium Erzberger, Berlin, Nr. 3099.

Nyírség (see JAKAB 1997a, b, 1998)

Piricse, Júlia-liget, telepített erdeifenyves, korhadék, 12.5.1996, leg. et det. G. Jakab, Herbarium G. Jakab, Szarvas [sub *D. viride*; the specimen represents *D. tauricum*].

Kállósemlén, Nagymohos, telepített erdeifenyves, égerfa kérgén, 27.8.1996, leg. et det. G. Jakab, Herbarium G. Jakab, Szarvas [sub *D. viride*; the specimen represents *D. tauricum*].

Nyírácsád, Jónás-rész, erdeifenyves, korhadék, 10.6.1997 leg. et det. G. Jakab, Herbarium G. Jakab, Szarvas [sub *D. viride*; the specimen represents *D. tauricum*].

Önböly, Szénási őrház, erdeifenyves, korhadékon, 16.7.1997 leg. et det. G. Jakab, Herbarium G. Jakab, Szarvas [sub *D. viride*; the specimen represents *D. tauricum*].

Haláp, Molnár-tanya, telepített erdeifenyves, korhadék, 7.4.1998, leg. et det. G. Jakab, Herbarium G. Jakab, Szarvas.

Maros-Körös köze

Zsadány, Kisvátónyi-erdő, cseres-kocsányos tölgyes, 5.2.1998, leg. et det. G. Jakab, Herbarium G. Jakab, Szarvas.

Mecsek

Comit. Baranya. Ad truncos Quercus cerris in silvis versus Árpádtető prope Mecsekszabolcs, 300–400 m.s.m., 4. Apr. 1953 leg. Á. Boros BP 100877 [sub *D. viride*, see BOROS and VAJDA 1955; rev. E. Hegewald, see above], leg. L. Vajda EGR. BOROS and VAJDA 1970.

The following specimens do not represent records of *Dicranum tauricum*

Zemplén Mts

Hungar. bor., Comit. Abaúj-Torna, in rupibus in quercetis vallis Szárazkút-völgy (Kőkapu) prope pag. Pálháza, 20. Mai 1947, leg. László Vajda BP 100840 [sub *D. viride*, t. Boros, 30.9.1947; rev. L. Vajda 13. Nov. 1969 as *D. strictum* Schleich., see BOROS and VAJDA 1970, rev. E. Hegewald 15.5.1971 as *D. viride*, see above], EGR [sub *D. viride*, but with the later remark "(Est: *Dicranum strictum* Schleich.)", see BOROS and VAJDA 1970, and a note reading "rev. E. Hegewald 15.V.1971" as *D. viride*].

Comit. Abaúj-Torna. Ad saxa andesit. silv. pedis montis Szárazkút-bérc ad Kőkapu vallis Kemence-patak prope Pálháza ca. 250 m.s.m. 5. Jul. 1949, leg. Á. Boros t. E. Hegewald, in litt. 29.6.1969. BP 100837, EGR [sub *D. viride*, but with the later remark "(Est: *Dicranum strictum* Schleich.)" The original determination is correct].

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