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## The status of *Dicranodontium didymodon* (Griff.) Par.

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**Abstract:** *Dicranodontium didymodon*, a species described from the Himalaya was recently reported from Spain. It has been distinguished from *D. denudatum* by a smooth subula. A re-examination of the type of this species revealed no additional characters which would support the recognition of a separate species. Therefore *D. didymodon* is synonymised with *D. denudatum*. The specimen from Spain is referred to *D. denudatum* var. *glabrum*, which differs from *D. didymodon* by larger stature and lack of brood leaves.

### Introduction

In a revision of *Dicranodontium*, the 39 species included so far in the genus were reduced to seven (Frahm 1997). Amongst the remaining species was *Dicranodontium didymodon* (Griff.) Par. This species was described by Griffith in 1842 as *Dicranum didymodon* based on an unnumbered specimen collected by him in India “in sylvis Myrung et ad truncos in pinetis Moflong”. Isotypes are kept in NY and H-SOL. (In the herbarium of William Mitten at NY is another specimen labelled *D. didymodon*, Griffith 101 without locality, which seems to consist of *Campylopus subulatus*. The latter was described in 1861, twenty years later. Any taxonomic changes are, however, not made since this specimen has no information about the type locality provided in the protologue).

Later, *Dicranodontium didymodon* was described under 5 more names. It is closely related to *D. denudatum*, which shares the not much differentiated inner basal laminal cells with *D. didymodon*, whereas all other species of the genus have large, hyaline inner basal laminal cells, which are strongly contrasting with the outer ones. It was distinguished by the author from *D. denudatum* (=longirostre) the other species of the genus by the almost smooth subula, a character which was not met in any other species of the genus, and in addition by not deciduous leaves and longer capsule. However, one of the plants in NY shows deciduous leaves (or stems with attached leaf bases, giving the appearance of a branch of *Picea*) and the isotypes in H-SOL and NYA are sterile. The smooth subula induced Brotherus to describe this species as *D. subintegrifolium*. Furthermore, the material of *D. didymodon* turned out to be more slender (and has therefore been named as *Dicranella attenuata*).

Recently, a *Dicranodontium* with a smooth subula was found in Asturias (Spain), identified as *D. didymodon* and reported as new to Europe (Frahm 2013).

The presence of a species from Asia in northern Spain is not unlikely. Some time ago, *Tetralophozia filiformis* from Asia was found in the neighbouring region (Urmí 1983), the locality is known for the presence of *Woodwardia radicans*, a fern, which is regarded as relic from the Tertiary, and at least all species of *Dicranodontium* known from Europe are also found in the Himalayas. The plants from Asturias were, however, much larger, which raised the question whether a smooth subula alone would justify to distinguish a separate species. Therefore a new attempt was made to clarify the position of *Dicranodontium didymodon* by re-examining the type

material and checking the variability of the subula. Unfortunately the material from the S.O. Lindberg herbarium in Helsinki studied for the revision was no more available, because all loan requests were not responded, that another isotype from NY was studied.

### Questions

The questions are:

- is *D. didymodon* a good species, especially is the smooth subula (and perhaps the small size) sufficient to distinguish it from *D. denudatum*?
- is *D. didymodon* present also in Europe?

### Discussion

The isotype of *D. didymodon* is illustrated in figs. 1-3. It differs from *D. denudatum* mainly in the smooth subula. The revision of European material of *D. denudatum* revealed that there are also specimens with smooth subulas. Specimens with smooth and serrate subulas were present even in different tufts from the same locality.

According to Frahm (2013), the nerve of *D. denudatum*, is – in contrast to *D. didymodon*, not clearly separated from the lamina, which corresponds to the remark of Nyholm (1954) “*D. denudatum* is recognized by the nerve which is indistinct below”, but also this character varies much in leaf types such as perichaetial leaves, brood leaves and “normal” leaves (figs. 4-5).

Apparently the degree of serrulation of the subula varies much. Smith (1978) describes the subula as “smooth to faintly denticulate”, Mönkemeyer (1927) als “fein gesägt” (finely serrulate). Special is the serrulation “all around” (as a rat’s tail file) and not in two rows as a continuation of the leaf margin. All other character states provide no useful distinction between *D. denudatum* and *D. didymodon*.

Mitten (1859) compared *D. didymodon* with *D. uncinatum* (“*D. uncinato* affine, sed structura foliorum cellularum ad folii basin, ubi cellulae majores vix conspicuae sunt, et peristomio pallido differt”), from which it differs by the not inflated inner basal laminal cells. He doesm however, compare the species with the much closer related *D. denudatum*, which he did not know from “India Orientalis”.

The confusion distinguishing both species raises if Gangulee (1969-80) is consulted. He illustrates a plant as *D. didymodon* with shortly rectangular upper laminal cells which indicates that this is not a *Dicranodontium* rather than a species of *Campylopus*. He described the species as having serrulate leaf tips, which does not fit the type of this species.

Still conspicuous is that deciduous brood leaves in *D. denudatum* are common in Europe, even typical for this species, but are rarely found within the range of *D. didymodon* (Nepal, Sikkim, Bhutan, China).

A special argument for the synonymization is that *D. denudatum* is found In Asia within the range of *D. didymodon*, which is sympatric.

Therefore both species are synonymised:

*Dicranodontium denudatum* (Brig.) Britt. in Williams, N.Am. Fl. 15:151, 1913.

*Dicranum denudatum* Brid. Musc, Rev. 1:184, 1896

*Dicranodontium didymodon* (Griff.) Par. Ind., Bryol. 338, 1896.

*Dicranum didymodon* Griff. Calcutta J. Nat. Hist. 2: 499, 1842, syn. nov.

Certain plants of *D. denudatum* with smooth subulas have been named var. *glabrum* Loeske et Bauer. They are also characterized by non deciduous leaves, robust and golden-yellow plants and fit the specimen from Asturias named as *D. didymodon*.

I like to thank W.R. Buck (New York Botanical Garden) for the loan of the type material of *Dicranodontium didymodon*.

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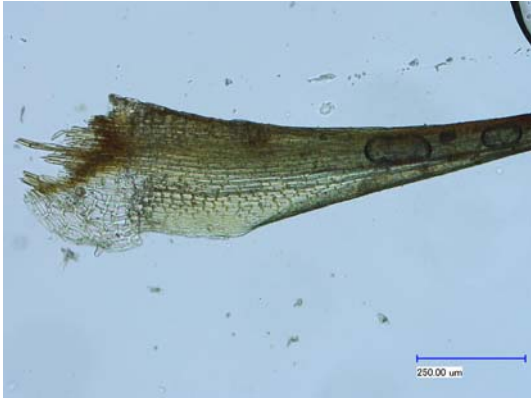


Fig. 1.



Fig. 2.



Fig. 3.

Figs. 1-3: *Dicranodontium didymodon*, isotype (NY) 1. Leaf base with well delimited costa and large auricles, 2. smooth subula, 3. plants (scale = 10 mm).  
 Figs. 4-5: *Dicranodontium denudatum* (Frahm V6591 hb Frahm BONN. Leaf bases. (the colors are modified by optical contrast). The bistratose margin of the nerve is probably that what Nyholm (1957) described as indistinct costa, which is also visible in the type of *D. didymodon* (fig. 1).

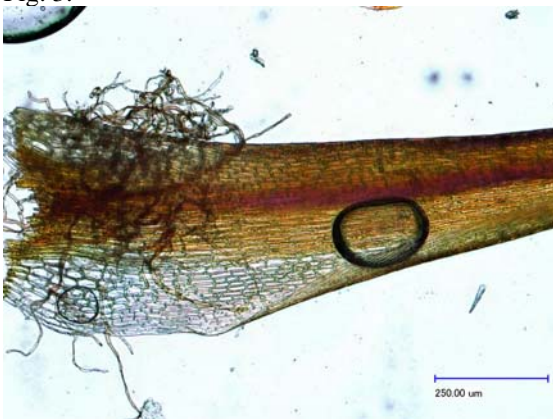


Fig. 4.



Fig. 5