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Article

2013

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#### How to cite

WILBRAHAM, Joanna, PRICE, Michelle. A lectotype for *Macromitrium cirrosum* Hedw.) Brid. (Orthotrichaceae). In: Journal of Bryology, 2013, vol. 35, n° 2, p. 119–122. doi: 10.1179/1743282013Y.0000000052

This publication URL: <https://archive-ouverte.unige.ch/unige:107842>

Publication DOI: [10.1179/1743282013Y.0000000052](https://doi.org/10.1179/1743282013Y.0000000052)

# A lectotype for *Macromitrium cirrosum* (Hedw.) Brid. (Orthotrichaceae)

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A lectotype for *Anictangium cirrosum* Hedw. [= *Macromitrium cirrosum* (Hedw.) Brid.] is designated herein from among the material on the single herbarium sheet bearing this name in the Hedwig-Schwägrichen herbarium (G). Lectotypification is necessary as the 11 specimens present on the sheet have different geographic and temporal origins, and represent two different taxa (*M. cirrosum* and *M. scoparium* Mitt). Hedwig's *A. cirrosum* was based on the pre-1801 *Hypnum cirrosum* Sw., proposed by Swartz, and four specimens collected by Olof Swartz from Jamaica as well as material from Montserrat are included on Hedwig's original herbarium sheet in G. With reference to Hedwig's protologue and original illustrations, a lectotype was selected from among these specimens. Probable duplicates of the Swartz material were located in NY and S.

**Keywords:** *Macromitrium cirrosum*, Lectotype, Hedwig, Mosses, Orthotrichaceae

## Introduction

*Species muscorum frondosorum* (Hedwig, 1801) is the designated starting point for the nomenclature of mosses, excepting the Sphagnaceae (Article 13, McNeill *et al.*, 2012). Although Hedwig described 84 new taxa in this work (see Price & Ellis, 2011), the other names originated from earlier works. These were considered as invalid until their publication in *Species muscorum frondosorum*, whereupon they were ascribed to Hedwig (see discussion in Dixon, 1932; Florschütz, 1960; Margadant, 1968). As a consequence, the specimens in Hedwig's herbarium (Hedwig-Schwägrichen herbarium, G) upon which his validating descriptions were based became syntypes (see Geissler, 2000). The Hedwig part of the Hedwig-Schwägrichen collection is an important source of material that is critical for ensuring the correct application of a number of early moss names (see discussion in Geissler, 2000; Price, 2005).

In *Species muscorum frondosorum* (Hedwig, 1801), seven species are described under the name *Anictangium* Hedw., which was later rejected in favour of the conserved name *Anoetangium* Schwägr. (McNeill *et al.*, 2006). Over time Hedwig's *Anictangium* species were transferred to six other genera in five different families, see Table 1. Three taxa were of European origin (*A. aquaticum* Hedw., *A. ciliatum* Hedw., and *A. lapponicum* Hedw.),

whereas the remainder were non-European, collected from 'Insulae australes' (*A. bulbosum* Hedw., *A. planifolium* Hedw., and *A. setosum* Hedw.) or the Caribbean (*A. cirrosum* Hedw.). The Caribbean plants were collected in part by Olof Peter Swartz (1760–1818), whereas those originating from 'Insulae australis' were likely collected by Archibald Menzies (1754–1842), see discussions in Touw (1971), Fife (1996), and Kruijer (2002).

The name *Anictangium cirrosum*, nomenclaturally dating from Hedwig (1801), was based on the pre-Hedwigian name *Hypnum cirrosum* of Swartz (1788) who described it from material he collected in Jamaica between 1783 and 1787. In an initial short diagnosis, Hedwig (1801) defined *A. cirrosum* by its creeping habit, branching pattern, linear-lanceolate leaves that were revolute in a dry state, turbinate capsule urns, mucronate opercula, and mitrate calyptrae. He then reiterated the short diagnosis of *Hypnum cirrosum* by Swartz (1788) and cited the localities 'Jamaica, Monserrat'. Two Caribbean localities (Jamaica and Montserrat) are also given on the specimen sheet in the Hedwig herbarium marked '*Anictangium cirrhosum*' [G00040187] (Figure 1). Below this in the protologue, Hedwig gave an expanded description of *A. cirrosum* as follows:

*Procerior planta decumbendo repens, ramis erectis subdivisis. Folia lineari-lanceolata, integerrima, ductulorum fasciculo ad apicem usque percursa, siccitate incurva, recurva, varie flexa. Pedunculi mediocres, palidi. Sporangia turbinata. Opercula*

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**Figure 1** Original Hedwig herbarium sheet from the Hedwig-Schwägrichen collection in G for *Anictangium cirrosum* Hedw. [= *Macromitrium cirrosum* (Hedw.) Brid.], G00040187. Plants numbered 1–4 constitute original Hedwig material, collected by Olof Peter Swartz from Jamaica and/or Montserrat. Plants numbered 5–11 all appear to have been collected by Menzies from the Caribbean (St. Vincent). The plants present on the sheet were determined as follows: 1. *M. cirrosum*; 2. *M. cirrosum*; 3. *M. scoparium*; 4. *M. scoparium*; 5. *M. scoparium*; 6. *M. scoparium*; 7. *M. scoparium*; 8. *M. cirrosum*; 9. *M. scoparium*; 10. *M. scoparium*; 11. *M. cirrosum*. Plant 1 is the designated lectotype and was illustrated in Hedwig (1801: Tab. V, f. 1).

*convexo-rostellata, rostello recto. Sic reperi in exemplis ex insula Montserrat, peristomio omnino destitutis* Hedwig (1801: 42).

Hedwig's illustration of this species (Hedwig, 1801: Tab. V, f. 1–3) depicts a life-size portion of a stem with a single sporophyte as well as magnified illustrations of an operculate capsule and a leaf (Figure 2). No capsule completely lacking a peristome was seen in

the Hedwig material examined on sheet G00040187 (Figure 1, specimens 1–4). However, any specimens in this collection with a peristome (such as plants 2 and 4 on sheet G00040187) could tentatively be suggested to originate from Jamaica rather than Montserrat. The origin of the reference to the material from Montserrat, and the collector of this material, remains obscure. Swartz (1788) does not mention material from this locality and no other source is cited in the protologue or on the label of the original herbarium sheet in G.

On the single herbarium sheet for *Anictangium cirrosum* (= *M. cirrosum*) in G (Figure 1 — G00040187) the label is, in part, written in the hand of Hedwig, referring to '*Hypnum cirrhosum*' Swartz and indicating the presence of material from 'Jamaica, Montserrat'. Sheet G00040187 was further annotated by Schwägrichen (Figure 1), to indicate that plants 1–3 represented Hedwig's *A. cirrosum* while plants marked with the letter 'b' were from Menzies, 'St. Vincent' and Menzies, *s. loc.*, (Figure 1). Examination of all the material on the sheet revealed the presence of two species: *Macromitrium cirrosum* and *M. scoparium* Mitt.

*Macromitrium scoparium* was described much later by Mitten (1869) based on material from Jamaica. It is morphologically somewhat similar to *M. cirrosum* but differs in its larger plant size and in having elongate upper leaf cells that often form a variously developed border, and leaf margins mostly denticulate to at least half way down the leaf. The upper laminal cells of *M. cirrosum* are mostly irregular-rounded and its leaves lack a border of elongate marginal cells; the margin may be slightly toothed at the apex but teeth do not extend down the margin. Both species are quite variable and in need of taxonomic investigation (Allen, 2002). The information given in Hedwig's protologue of *M. cirrosum*

**Table 1** Species described under Hedwig's '*Anictangium*' in his 1801 publication *Species muscorum frondosorum*, with their current name

Basionym	Page, Figure	Origin	Label handwriting	Current name	Family
<i>A. aquaticum</i>	41, none	European	Schwägrichen	<i>Cinclidotus aquaticus</i> (Hedw.) Bruch & Schimp.	Cinclidotaceae
<i>A. bulbosum</i>	43, Tab. VI. f. 1–5	Australasian	Material not in G, see Kruijer (2002)	<i>Cyathophorum bulbosum</i> (Hedw.) Müll. Hal.	Hookeriaceae
<i>A. ciliatum</i>	40, none	European	Hedwig (annot. Schwägrichen)	<i>Hedwigia ciliata</i> (Hedw.) P. Beauv.	Hedwigiaceae
<i>A. cirrosum</i>	42, Tab. V. f. 1–2	Caribbean	Hedwig (annot. Schwägrichen)	<i>Macromitrium cirrosum</i> (Hedw.) Brid.	Orthotrichaceae
<i>A. lapponicum</i>	40, none	European	Hedwig	<i>Amphidium lapponicum</i> (Hedw.) Schimp.	Orthotrichaceae
<i>A. planifolium</i>	44, Tab. VI	Australasian	Material not in G, see Fife (1996)	<i>Hedwigia ciliata</i> (Hedw.) P. Beauv.	Hedwigiaceae
<i>A. setosum</i>	43, Tab. V, f. 4–6	Australasian	Schwägrichen	<i>Cyrtopus setosus</i> (Hedw.) Hook. f.	Cyrtopodaceae

**Note:** For each taxon, information on the page and figures from Hedwig (1801) are given alongside the geographic origin of the specimen. An indication of the handwriting that appears on the labels of the G herbarium specimens is given. When specimens are not present in G, the literature citation is given.



Figure 2 Original published plate of *Anictangium cirrosum* by Hedwig (1801, Tab. V) including (1) fertile shoot with sporophyte, (2) branch leaf, and (3) sporophyte.

does not allow for the separation of these two taxa (Hedwig, 1801).

The establishment of a lectotype for the over 200-year-old moss name *Anictangium cirrosum* Hedw. [= *Macromitrium cirrosum* (Hedw.) Brid.] is desirable given that this entity pre-dates Hedwig's (1801) publication and as material of two different species is present on the original Hedwig herbarium sheet. Suitable original material for typification of Hedwig's *Anictangium cirrosum*, as defined by the *International Code of Nomenclature for algae, fungi and plants* (McNeill *et al.*, 2012, Art. 9.2 and 9.3), consists of the material from Jamaica or Montserrat on the Hedwig herbarium sheet in G, duplicates of these specimens (e.g. original Swartz material from Jamaica and that from Montserrat), and Hedwig's original illustration of this species (Hedwig, 1801: Tab. V). A lectotype must be selected from among these elements, with reference to Hedwig's protologue and original drawings.

### A Lectotype for *Anictangium cirrosum*

Given their age and historical importance, the Hedwig specimens can be considered as oligotypes *sensu* Huhtinen (1994). All material on sheet G00040187 was examined, with minimal manipulation, in order to establish the identity of each specimen (specimens 1–11, Figure 1). In accordance with Huhtinen's recommendations, the designated type material has been annotated and the designated material has been illustrated herein (Figure 3).

Of the 11 specimens present on sheet G00040187, only four (Figure 1, specimens 1–4) are considered to represent original Hedwig material. These four specimens consist of *Macromitrium cirrosum* (Figure 1, specimens 1 and 2) and *M. scoparium*. (Figure 1, specimens 3 and 4), as currently circumscribed. The

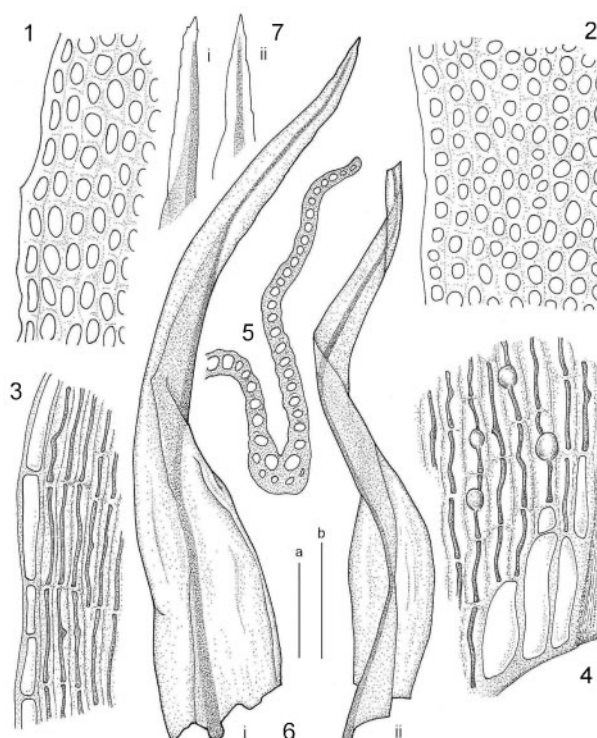


Figure 3 *Macromitrium cirrosum* (Hedw.) Brid.: (1, 2) upper laminal cells; (3, 4) basal laminal cells; (5) cross-section mid-leaf; (6 i–ii); branch leaves (7 i–ii) branch leaf apices. Drawn from Swartz s.n. G00040187 (plant 1), lectotype of *Anictangium cirrosum* Hedw. Scale bars: (1–4) b=0.04 mm; (5) a=0.05 mm; (6) a=0.5 mm; (7) a=0.2 mm.

remainder of the material on sheet G00040187 was collected by Menzies, probably between 1791 and 1794, when he served in the Royal Navy in the West Indies as the naturalist aboard the HMS Discovery. The material annotated 'St. Vincent' includes both *M. cirrosum* (Figure 1, specimen 8) and *M. scoparium* (Figure 1, specimens 6 and 9). Two specimens annotated as 'c. var. longifolia Menzies', but of an unknown origin, are both *M. scoparium* (Figure 1, specimens 7 and 10). The un-annotated specimen (11), identified as *M. cirrosum*, located below specimen 8 from St. Vincent appears to be linked to it. A second ambiguous specimen (5), identified as *M. scoparium*, is un-annotated and of uncertain origin but, given its position on the herbarium sheet, also appears to be linked to the Menzies material marked 'b'. The plants collected by Menzies were presumably attached to the sheet by Schwägrichen at a later date for comparative purposes, either when he was completing Hedwig's 1801 work for publication or working on his own supplements to *Species muscorum frondosorum* (see Price & Ellis, 2011). Material collected by Menzies from St. Vincent is not mentioned in the protologue and so it can be concluded that it was not seen by Hedwig when describing this taxon (Hedwig, 1801). These latter plants (specimens 5–11) must be excluded from the



definition of the original material suitable for lectotypification.

Swartz's original herbarium is in S where two specimens corresponding to the protologue were located (B91510 and B118402). Florschütz (1964: 226) previously indicated the presence of a type for *Anictangium cirrosum* in NY, although the designation of this type was not specified. A single specimen collected by Swartz from Jamaica has been located in NY (00633770). The specimens in S and NY constitute possible duplicate material, although they were not necessarily seen by the validating author of the species. A specimen from BM collected by Swartz in Jamaica and labelled as *Macromitrium cirrosum* (BM000862650) was examined and found to be *Macromitrium scoparium*.

Of the four specimens on sheet G00040187 that were most likely seen by Hedwig (Figure 1, specimens 1–4), specimens 1 and 2, determined as *Macromitrium cirrosum*, accord with the protologue description and the modern circumscription of *M. cirrosum*. Specimen 1 on sheet G00040187 clearly corresponds to Hedwig's illustration of this taxon (Hedwig, 1801: Tab. V, f. 1) and the protologue description. It is thus the most unequivocal material to serve as lectotype.

*Anictangium cirrosum* Hedw. in Sp. Musc. Frond. 42. 5 f. 1–3. 1801.

≡ *Hedwigia cirrosa* (Hedw.) Brid. in J. Bot. (Schrader) 1800(1): 272. 1801.

≡ *Neckera cirrosa* (Hedw.) F. Weber & D. Mohr in Index Mus. Pl. Crypt. [3]. 1803.

≡ *Schlotheimia cirrosa* (Hedw.) Brid. in Muscol. Recent. Suppl. 2: 19. 1812.

≡ *Orthotrichum cirrosum* (Hedw.) Hook. & Grev. in Edinburgh J. Sci. 1: 130. 6. 1824.

≡ *Macromitrium cirrosum* (Hedw.) Brid. in Bryol. Univ. 1: 316. 1826.

**Protologue citation:** Jamaica, Montserrat.

**Lectotype (designated here):** Jamaica, *sin. coll.*, *s.n.*, G (G00040187, Hb. Hedwig-Schwägrichen). First stem on the left of the upper row (specimen 1, Figure 1) on herbarium sheet G00040187 labelled '*Anictangium cirrhosum* Spec. Musc. p.42. t.5. f.1-3. Hypnum cirrhosum Swartz. Prodr. p.142. [b. St. Vincent Menzies c. var. longifolia Menzies] Jamaica, Montserrat.' The handwriting of Schwägrichen is indicated using square brackets.

**Probable duplicate material:** Jamaica, Swartz *s.n.*, S (S — B91510, B118402); Jamaica, Swartz *s.n.*, NY (NY00633770). Not examined.

## Acknowledgements

This work was supported by the Natural History Museum, London (BM) and the Conservatoire et Jardin botaniques de la Ville de Genève (G). We would like to thank Anders Tehler and Lars Hedenäs (S) and Barbara Thiers and Bill Buck (NY) for looking for Swartz material in their respective collections. We are grateful to Len Ellis and two anonymous reviewers for their critical comments on an earlier version of this manuscript.

Taxonomic Additions and Changes: Nil.

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