

## Lectotypification and synonymy of *Plagiochila* sect. *Vagae* Lindenb. (Hepaticae)

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**Abstract** – Lectotypes are designated for *Plagiochila* sect. *Vagae* Lindenb. 1843: *P. patula* (Sw.) Lindenb., *P. sect. Frondescentes* Spruce 1885: *P. montana* Spruce, and *P. sect. Spinulosae* Spruce 1885: *P. distinctifolia* Lindenb. *Plagiochila* sect. *Frondecentes* and *P. sect. Spinulosae* as well as *P. sect. Contiguae* Carl 1931 and *P. sect. Crispatae* Carl 1931 are treated as new synonyms of *P. sect. Vagae*.

***Plagiochila* sect. *Contiguae* / *P. sect. Crispatae* / *P. sect. Frondescentes* / *P. sect. Spinulosae* / *P. sect. Vagae***

For the vast genus *Plagiochila* (Dumort.) Dumort. with an estimated number of 400-450 species worldwide (So & Grolle, 2000) a subdivision into natural groups of species has been repeatedly suggested (e.g., Lindenberg, 1839-1843; Spruce, 1884-1885; Carl, 1931). The classification of the Neotropical species of *Plagiochila* is still largely influenced by the work of Carl (1931), who recognized 19 sections in the Neotropics. The latter author discussed earlier attempts to arrange *Plagiochila* species, but unfortunately didn't take up section names of Lindenberg (1839-1843) or Spruce (1884-1885). As a result, some of his section names are illegitimate or threatened by older section names which were not lectotypified to date and based on heterogeneous elements: *P. sect. Vagae* Lindenb. 1843, *P. sect. Frondescentes* Spruce 1885, and *P. sect. Spinulosae* Spruce 1885.

Recent comprehensive morphological, phytochemical and molecular studies (Heinrichs *et al.*, 2000, in press) suggest a natural group of Neotropical *Plagiochila* species characterized by remote to moderately imbricate foliation, frequent terminal branching (pseudodichotomous or pinnate habit, see Figs 1, A & 2, A), asexual reproduction by cladia from leaf surface (Fig. 2, D), usually simple, intercalary androecia with opposite bracts overlapping dorsally, broadly cylindrical to triangular perianths (Fig. 2, A), and capsules with rather delicate valves with thickenings in all layers (Fig. 1, D-F). Species with the above features are usually placed in *P. sect. Contiguae* Carl 1931. Although originally established for a

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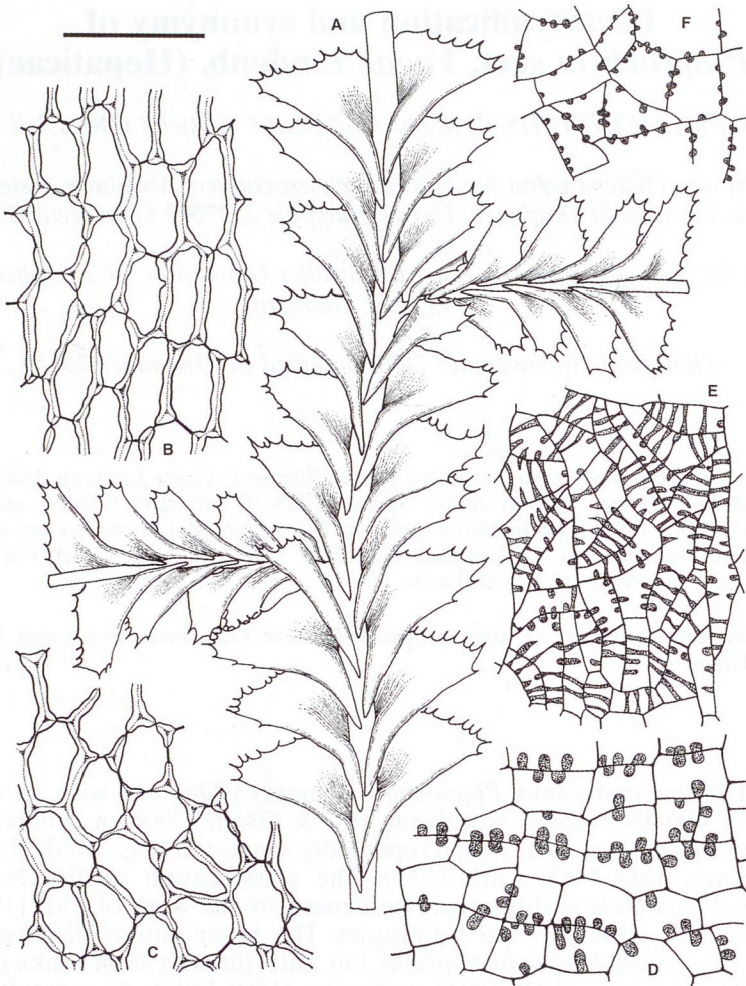


Fig. 1. *Plagiochila* (sect. *Vagae*) *deflexirama* Taylor. A, part of shoot with two terminal branches, dorsal view; B, C, cells from center of upper leaf half; D, cells from epidermal layer of capsule wall, surface view; E, cells from innermost layer of capsule wall, surface view; F, cells from subepidermal layer of capsule wall, surface view [A-C from syntype of *P. deflexirama*, Peru, Jameson 110 (FH), D-F from Bolivia, Heinrichs *et al.* s.n. (GOET), scale bar: A = 2 mm, B, C = 50  $\mu$ m, D, E, F = 40  $\mu$ m].

small group of Neotropical species only (Carl, 1931), several authors (e.g. Inoue, 1984; Piippo, 1989; So & Grolle, 2000; So, 2000; Heinrichs *et al.*, in press) extended the range of sect. *Contiguae* to Australasia, the Pacific region and Macaronesia. Some African species (e.g. *P. divergens* Steph.) match the features of the *Contiguae*, too.

Members of *P.* sect. *Crispatae* Carl differ from members of *P.* sect. *Contiguae* mainly by the more imbricate foliation (e.g. Schuster, 1980). Sporophytic features of several *Crispatae* species were described by Heinrichs &

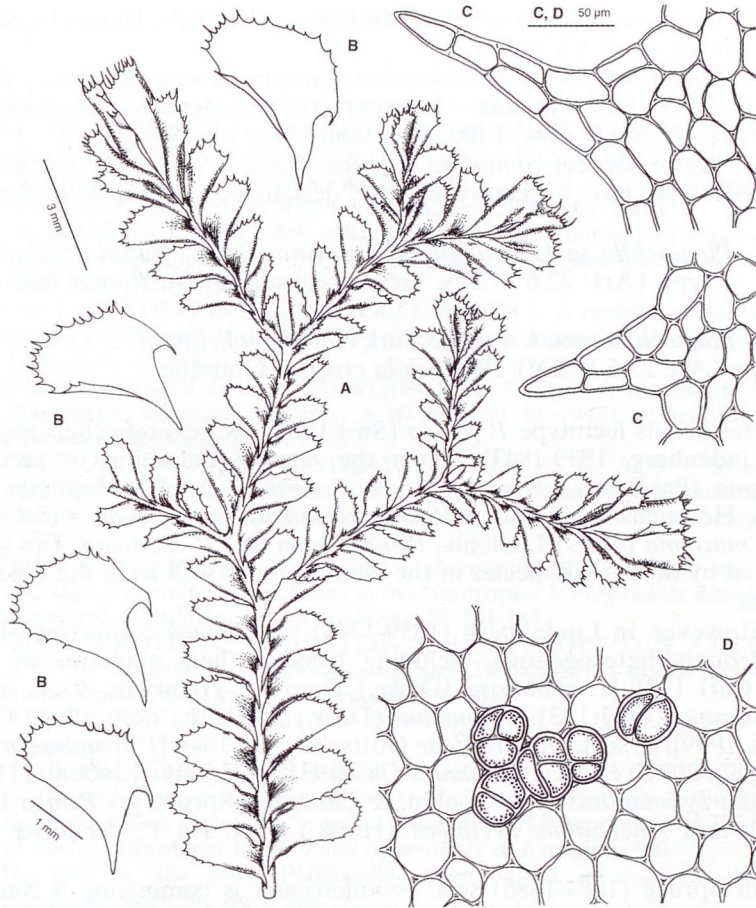


Fig. 2. *Plagiochila* (sect. *Vagae*) *laetevirens* Lindenb.: A, part of female plant, dorsal view; B, stem leaves; C, teeth of ventral leaf margin; D, cells of leaf-center with propagules [all from holotype, Ecuador: Banos, Jameson s.n. (W Lindenb. Hep. no. 656)].

Gradstein (2000) and are largely similar to those of species attributable to sect. *Contiguae* (Fig. 1, D-F; Heinrichs *et al.*, 2000). Likewise nrITS1- and 2-sequences of *P. raddiana* Lindenb. and *P. disticha* (Lehm. & Lindenb.) Lindenb. are similar to those of the *Contiguae* and place them together in one clade (Heinrichs, in prep.).

Hence, both sections should be combined. Old Neotropical species names to be included in the above natural group are *Plagiochila disticha*, *P. distinctifolia* Lindenb., *P. laetevirens* Lindenb., *P. montagnei* Nees, *P. patula* (Sw.) Lindenb., and *P. raddiana*. These taxa also appear in *P.* sect. *Vagae*, sect. *FronDESCENTES* or sect. *Spinulosae*.

To minimize nomenclatural changes, the above section names are lectotypified as follows:

***Plagiochila* sect. *Vagae*** Lindenb., *Spec. Hepat.* (fasc. 5): XV. 1843.

Lectotype (here designated): *Plagiochila patula* (Sw.) Lindenb.

Description and synonymy: Heinrichs *et al.* (1998), Heinrichs & Renker (2001), Heinrichs *et al.* (in press).

= *Plagiochila* sect. *FronDESCENTES* Spruce, *Trans. & Proc. Bot. Soc. Edinburgh* 15: 460. 1885; **syn. nov.** – Lectotype (here designated): *Plagiochila montana* Spruce [= *P. patula* (Sw.) Lindenb., Heinrichs *et al.*, 1998].

= *Plagiochila* sect. *Spinulosae* Spruce, *Trans. & Proc. Bot. Soc. Edinburgh* 15: 454. 1885; **syn. nov.** – Lectotype (here designated): *Plagiochila distinctifolia* Lindenb.

= *Plagiochila* sect. *Contiguae* Carl, *Ann. Bryol., Suppl.* 2: 46, 81. 1931; **syn. nov.** – Type (Art. 22.6 ICBN, Greuter *et al.*, 2000): *Plagiochila contigua* Gottsche.

= *Plagiochila* sect. *Crispatae* Carl, *Ann. Bryol., Suppl.* 2: 43, 48. 1931; **syn. nov.** – Type (Art. 22.6 ICBN): *Plagiochila crispata* Gottsche.

Besides its lectotype *P. patula* (Sw.) Lindenb., several other original elements (Lindenberg, 1839-1843) match the current definition of sect. *Vagae*: *P. dichotoma* (Pal.Beauv.) Nees & Mont., *P. disticha* (as *P. orbigniana* Nees & Mont., see Heinrichs & Gradstein, 1999), *P. distinctifolia*, *P. javanica* (Sw.) Nees & Mont., *P. martiana* (Nees) Lindenb., *P. montagnei* and *P. raddiana*. The section is represented by numerous species in the Neotropics as well as in the Paleotropics and Africa.

However, in Lindenberg (1839-1843) sect. *Vagae* comprises 31 species and is strongly heterogenous, including beside others elements of *P.* sect. *Arrectae* Carl 1931 [*P. spinulosa* (Dicks.) Dumort., Heinrichs *et al.*, in press], *P.* sect. *Bursatae* Carl 1931 [*P. bursata* (Desv.) Lindenb., nom. illeg., Grolle & Heinrichs, 1999], *P.* sect. *Dendroideae* Gottsche *et al.* 1844 [*P. frondescens* (Nees) Lindenb., So, 2001], *P.* sect. *Rutilantes* Carl 1931 [*P. rutilans* Lindenb., Heinrichs *et al.*, 2001], *Tylimanthus laxus* (Lehm. & Lindenb.) Spruce [as *P. laxa* Lehm. & Lindenb.], and *Adelanthus decipiens* (Hook.) Mitt. [as *P. decipiens* (Hook.) Dumort.].

In Spruce (1884-1885) sect. *FronDESCENTES* is comprising 9 Neotropical species. Among them six (*P. dichotoma* (Pal.Beauv.) Nees & Mont., *P. flabellifrons* Spruce, *P. impluviata* Spruce, *P. laetevirens* Lindenb., *P. montana* Spruce [= *P. patula* (Sw.) Lindenb.] and *P. xanthochroma* Spruce) belong to sect. *Vagae*, as understood here. *P. diversifolia* Lindenb. & Gottsche and *P. longispina* Lindenb. are referable to sect. *GlaucESCENTES* Carl 1931 (Heinrichs *et al.*, 2000; Heinrichs *et al.*, in press); *P. amazonica* Spruce was placed in the synonymy of *P. subplana* Lindenb. and belongs to *P.* sect. *SubplanAE* Carl 1931 (Heinrichs *et al.*, 1999). The paleotropic *P. frondescens* (Nees) Lindenb., however, was not included in sect. *FronDESCENTES* by Spruce (1884-1885).

In Spruce (1884-1885) sect. *Spinulosae* is comprising 14 species from the Neotropics but not the European *P. spinulosa*, and is strongly heterogenous. At least two original elements belong to sect. *Vagae*: *P. distinctifolia* and *P. hypantra* Spruce. Of the other ones *P. bursata* and *P. aerea* Taylor belong to sect. *Bursatae* Carl (Grolle & Heinrichs, 1999) and *P. rutilans* to sect. *Rutilantes* Carl.

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