

New synonyms and new lectotypifications in neotropical *Plagiochila* (Marchantiophyta)

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Abstract – Based on type studies in neotropical *Plagiochila*, 66 new synonyms and 17 new lectotypes are proposed. The correct spelling of the name *Plagiochila adiantoides* is “*Plagiochila adianthoides*”.

Liverworts / *Plagiochila* / synonymy / lectotypification / tropical America

INTRODUCTION

Plagiochila (Dumort.) Dumort. (Plagiochilaceae) is considered the largest genus of liverworts with about 400-450 species worldwide. Knowledge of the species of tropical America has considerably been improved by the work of J. Heinrichs and his group (e.g., Heinrichs, 2002; Heinrichs & Gradstein 2000; Heinrichs *et al.*, 1998, 1999, 2000, 2001, 2002a, 2004, 2005; Groth *et al.*, 2002, 2003; Müller *et al.*, 1999, etc.). In the framework of the treatments of *Plagiochila* in “Guide to the liverworts and hornworts of Colombia and Ecuador” (in prep.) and “Annotated key to the species of *Plagiochila* (Marchantiophyta) from Brazil” (Gradstein, in press), types and other materials of *Plagiochila* species recorded from these areas have been examined. As a result of this study, 66 new synonyms and 17 new lectotypes are proposed. Location of holotypes and isotypes follows Sayre (1977), Vitt *et al.* (1985) and Stafleu & Cowan (1976-1988). Lectotypes from among Stephani syntypes are chosen based on their illustration in *Icones Ineditae* (Stephani, 1985). Specimens seen are indicated by an exclamation mark.

TAXONOMIC TREATMENT

***Plagiochila adianthoides* (Sw.) Lindenb.**, *Sp. Hepat.* 2-4: 77. 1840; *Jungermannia adianthoides* Sw., *Nov. Gen. Spec. Plant.*: 142. 1788. **Type:** Jamaica, P. Browne (?) *s.n.* (lectotype, S-Swartz 401, designated by Heinrichs *et al.*, 1998, p. 2).

The epithet of this species is often spelled “*adiantoides*” (e.g., Swartz, 1806; Heinrichs, 2002) but the original spelling “*adianthoides*” should be maintained (ICN Art. 60.1, Ex. 1). Heinrichs *et al.* (1998) pointed out that the species was

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originally described as “*Jungermannia adianthoi*” but I have seen the latter name only in the copy of Swartz (1788) in the library of herbarium Haussknecht (JE) and in the 1962 reprint. In all other copies of the original publication checked (PC 2 copies, F, S 2 copies) the name is spelled “*adianthoi-des*”. Apparently “*adianthoi*” was a printing error that occurred in some copies of the book, including the one used for the reprint.

= *Plagiochila keckiana* Steph., *Bull. Herb. Boissier* (sér. 2) 5: 358. 1905, **syn. nov. Type:** Peru, Tatanara, *Lechler 2524B*, “misit Keck” (holotype, G 00061481!, c.gyn.).

***Plagiochila area* Taylor**, *London J. Bot.* 5: 263. 1846. **Type:** Ecuador, Esmeraldas, *Jameson s.n.* (holotype, E 00002817, fide Heinrichs, 2002).

= *Plagiochila lutescens* Steph., *Spec. Hep.* 6: 179. 1921, **syn. nov. Type:** Brazil, São Paulo, Apiahy, *Puiggari 1412b* (holotype, G 00121454!, scrap). A small, sterile phenotype with almost horizontally spreading, ligulate leaves with two conspicuous apical teeth and a few smaller teeth, and with distinctly elongate cells. Schiffner & Arnell (1964) recorded the species from several further localities in São Paulo, including Alto da Serra. The latter material, which was distributed in *Cryptogamae exsiccatae editae a Museo Hist. Vindobonensi 4292* (PC!), belongs to *Plagiochila crispabilis*.

***Plagiochila bicornis* Hampe et Gottsche**, *Linnaea* 25: 338. 1852. **Type:** Puerto Rico, *Schwanecke s.n.* (isotypes, G 24266!, G 24268!, PC-Montagne PC0025862!).

= *Plagiochila herminieri* Steph., *Bull. Herb. Boissier* (sér. 2) 5: 748. 1905, **syn. nov. Type:** Guadeloupe, *l'Herminier s.n.* (lectotype, G 00061446!, designated by Heinrichs, 2002, p. 133). Description and illustration: Heinrichs (2002).

***Plagiochila bifaria* (Sw.) Lindenb.**, *Sp. Hepat.* 5: 127. 1843; *Jungermannia bifaria* Sw., *Nov. Gen. Spec. Plant.*: 145. 1788. **Type:** Jamaica, *Swartz s.n.* (holotype, S-Swartz 419, fide Heinrichs *et al.*, 1998).

= *Plagiochila geniculata* Lindenb., *Sp. Hepat.* 5: 131. 1843, **syn. nov. Type:** Barbados, unknown collector, ex hb. Hooker (holotype, W 2015-01916 [hb. Lindenberg 913b]!). A phenotype with obliquely spreading leaves.

= *Plagiochila atrovirens* Taylor, *London J. Bot.* 5: 266. 1846, **syn. nov. Type:** Ecuador, Pichincha, 1845, *W. Jameson s.n.* (holotype, FH 60094!).

= *P. exesa* Lindenb. et Gottsche, in Gottsche, Lindenberg & Nees, *Syn. Hepat.*: 629. 1847, **syn. nov. Type:** Mexico, Oaxaca, Mt. Sempoaltepec, *Liebmann 404* (isosytype, C CM7489!). A phenotype with caducous teeth on leaf margins.

= *Plagiochila fragilis* Taylor, *London J. Bot.* 7: 198. 1848, **syn. nov. Type:** Ecuador, on Pichincha, 3 Febr 1847, *W. Jameson s.n.* (holotype, FH 290640!). A phenotype with upper halves of leaves broken away; this form has been also described as *P. gradsteinii* Inoue (Inoue, 1980).

= *Plagiochila spinifera* Aongstr., 30, 5: 113. 1873, **syn. nov. Type:** Ecuador, Galapagos islands, Floreana (“Charles”), *Andersson s.n.* (holotype, S, fide Inoue & Gradstein, 1980). A phenotype of *P. bifaria* with fragile leaves and a very distinct vitta. *Plagiochila bifaria* is common on the Galapagos Islands but only female plants with unfertilized archegonia and immature perianths have been found. Male plants of *P. bifaria* are unknown from the Galapagos Islands.

= *Plagiochila pinnatidens* Steph., 6: 199. 1921, **syn. nov. Type:** Ecuador, El Altar, 4000 m, *H. Meyer s.n.*, hb. Levier 4024 p.p. (holotype, G 00061462!). A phenotype with large lobate teeth on leaf margins, which sometimes bear a few small secondary teeth on one side of the lobe.

***Plagiochila crispabilis* Lindenb.**, *Sp. Hepat.* 1: 15. 1839. **Type:** Brazil, Serra de Estrella, *Beyrich s.n.* (**lectotype**, W 1817 [hb. Lindenberg 493]!, **here designated**); “ex hb. Lehmannianum” (isosyntypes (?), PC-Montagne PC0167680!, PC0167681!).

= *Plagiochila patentissima* Lindenb., *Sp. Hepat.* 2-4: 64. 1840, **syn. nov.** **Type:** Brazil, Rio de Janeiro, *de Lambert s.n.* (lectotype, W-Lindenberg; isolectotype, PC-Montagne PC0167679!). The conspecificity of *P. crispabilis* and *P. patentissima* was earlier suggested by Gradstein & Costa (2003).

= *Plagiochila trichomanes* Spruce, *Bull. Soc. Bot. France (Congr. Bot.)* 36: 200 (“cc”). 1889, **syn. nov.** **Type:** Brazil, Rio de Janeiro, *Glaziou 9203* (isotype, G 00128796!).

= *Plagiochila subligulata* Steph., *Sp. Hepat.* 6: 224. 1921, **syn. nov.** **Type:** Brazil, Bahía, *Lützelburg s.n.* (holotype, G 00121563!).

Plagiochila crispabilis is a common species of eastern and southeastern Brazil. Characteristic are the terminal-dichotomous branching, the wide-spreading, narrowly rectangular leaves with almost parallel margins, the shortly decurrent leaf bases, and the narrowly recurved ventral leaf base, which is not ampliate and lacks a high shoulder.

***Plagiochila cristata* (Sw.) Lindenb.**, *Sp. Hepat.* 1: 33. 1840; *Jungermannia bifaria* Sw., *Nov. Gen. Spec. Plant.*: 143. 1788. **Type:** Jamaica, *Swartz s.n.* (holotype, S-Swartz 416, fide Heinrichs *et al.*, 1998).

= *Plagiochila arcuata* Lindenb., *Sp. Hepat.* 2-4: 91. 1840, **syn. nov.** **Type:** St. Vincent, unknown collector, ex hb. Hooker (isotype, PC-Montagne!, c.gyn.). A slender phenotype with distant to subimbricate leaves and weakly ampliate ventral leaf bases, which are not forming a crest.

***Plagiochila deflexirama* Taylor**, *London J. Bot.* 5: 262. 1846. **Type:** Ecuador (“Peru”), *W. Jameson 110* (isotype, G 17211 [00121285]!). William Jameson’s bryophyte collections are from Ecuador, not from Peru (Léon-Yáñez *et al.*, 2006).

= *Plagiochila bryopteroides* Spruce, *Trans. & Proc. Bot. Soc. Edinburgh* 15: 499. 1885, **syn. nov.** **Type:** Peru, San Martín, near Tarapoto, Mt. Campana, 1200 m, *Spruce s.n.* (isotype, G 00282700!).

= *Plagiochila confertissima* Steph., *Bull. Herb. Boissier* (sér. 2) 5: 182. 1905, **syn. nov.** **Type:** Brazil, Matto Grosso, *Lindman s.n.* (**lectotype**, G 23624 [00064147]!, **here designated**). Several further syntypes (Apiahy, leg. Puiggari; Petropolis, leg. Glaziou; Cuba, leg. Poeppig; etc.) are present in G. The specimen from Matto Grosso is selected as the lectotype since it is illustrated in *Icones Ineditae* (Stephani, 1985) and fits the original description very well.

= *P. trollii* Herzog, *Hedwigia* 74: 90. 1934, **syn. nov.** **Type:** Colombia, Cundinamarca, Tequendama, “Bergwald”, 2200-2400 m, 1929, *Troll 2132* (holotype, JE!).

Characteristic of *P. deflexirama* are the (bi)pinnate habit by terminal branching, leaves (sub)imbricate and ovate-oblong (1-1.8 × longer than wide), and leaf bases weakly to strongly ampliate (Gradstein & Costa, 2003). The new synonyms are plants with subimbricate leaves and rather weakly ampliate ventral leaf bases.

***Plagiochila disticha* (Lehm. et Lindenb.) Lehm. et Lindenb.**, in Lindenberg, *Sp. Hepat.* 2-4: 107. 1840; *Jungermannia disticha* Lehm. et Lindenb., in Lehmann, *Nov. Stirp. Pug.* 6: 64. 1834. **Type:** Guyana, unknown collector, ex Hb. Hooker (lectotype, W-Lindenberg 732, designated by Heinrichs & Gradstein, 2000, p. 164).

= *Plagiochila pensilis* Spruce, *Trans. & Proc. Bot. Soc. Edinburgh* 15: 497. 1885, **syn. nov.** **Type:** Ecuador, Chimborazo, 1200 m, *Spruce s.n.* (isotype,

G 00280487!, c.gyn.). A phenotype with strongly ampliate ventral leaf bases, forming a high crest, and with long ciliate teeth on ventral leaf bases. The holotype could not be found in MANCH (L. Loughtman, *in litt.*).

= *Plagiochila hoehnii* Herzog, *Hedwigia* 72: 220. 1932, **syn. nov.** **Type:** Brazil, São Paulo, Estação Biologica Alto da Serra, ca. 800 m, 25 April 1923, *F.C. Hoehne 684a* (holotype, JE!, ster.). A sterile phenotype with unbranched stems, obliquely spreading leaves, subentire ventral leaf bases and reduced underleaves.

= *Plagiochila blepharobasis* Herzog, *Hedwigia* 72: 216. 1932, **syn. nov.** **Type:** Colombia, Santander, Mesa de los Santos, 1500 m, *Killip 15066* (holotype, JÉ!). A phenotype with undulate ventral leaf margins, conspicuously ampliate ventral leaf bases with numerous cilia, and conspicuous, strongly ciliate underleaves.

***Plagiochila distinctifolia* Lindenb., *Sp. Hepat.* 1: 17. 1839. **Type:** Jamaica, Swartz *s.n.* (isolectotype, G-26174!, designated by M. Sauer, in sched.).**

= *Plagiochila miqueliana* Lehm. et Lindenb., in Lindenberg, *Sp. Hepat.* 2-4: 95. 1840, **syn. nov.** **Type:** Mexico, “Inter musgos...”, *Miquel s.n.* (**lectotype**, S B40754!, **here designated**, c. gyn.; isolectotype, S B40753!, c. andr.).

= *Plagiochila hypantra* Spruce, *Trans. & Proc. Bot. Soc. Edinburgh* 15: 465. 1885, **syn. nov.** **Type:** Ecuador, Baños, in cave (“in spelunca Sicsi-juaico dicta”), *Spruce s.n.*, *Hepaticae Spruceanae: Amazonicae et Andinae 1656* (**lectotype**, MANCH CC2919 [EM598392]!, **here designated**). The lectotype of *P. hypantra* is a delicate, sterile shade plant from the roof of a cavern. The plant deviates from typical *P. distinctifolia* by its almost horizontally spreading leaves (usually ventrad in *P. distinctifolia*) with rather few teeth (2-3 on branch leaves, up to 6 on stem leaves). The leaves are narrowly bordered by thicker-walled cells as is characteristic of *P. distinctifolia*. The other syntypes of *P. hypantra* (“etiam ad scopulos umbrosos in eodem monte et in sylvia Canelos”) were not available in MANCH (L. Loughtman, *in litt.*).

= *Plagiochila diffusa* Steph., *Bull. Herb. Boissier* (sér. 2) 2: 870. 1902, **syn. nov.** **Type:** Cuba, Monte Verde, *Wright s.n.* (**lectotype**, G 026600 [00064749]!, **here designated**, c. gyn. juv.; syntypes, G 026599!, 026601!, 026602!, 026603!). Although the collection 026600 lacks mature perianths (they are present in coll. G 026601, ex hb Jack), this specimen is chosen as the lectotype because it is the most copious collection and is the only one that is presumably from Stephani’s personal herbarium (the other syntypes are from hb. Jack or hb. Austin). The type fits the description and illustration of *P. diffusa* in Schuster (1980) very well. The species was erroneously treated as a synonym of *P. micropteryx* Gottsche (= *P. laetevirens* Lindenb.) by Inoue (1989).

***Plagiochila diversifolia* Lindenb. et Gottsche, in Gottsche, Lindenberg & Nees, *Syn. Hepat.* 5: 640. 1847. **Type:** Mexico, Pico de Orizaba, 10.000 ft., *Liebmann 491* (lectotype, W-Lindenberg 655, designated by Heinrichs *et al.*, 2000, p. 127).**

= *Plagiochila subedentata* Steph., *Bull. Herb. Boissier* (sér. 2) 2: 679. 1902; *Plagiochila dichotoma* (P.Beauv.) Nees et Mont. var. *rivicola* Spruce, *Trans. & Proc. Bot. Soc. Edinburgh* 15: 490. 1885, **syn. nov.** **Type:** Peru. San Martín, Tavalosos, *Spruce s.n.* (holotype, G 00064170!; isotype, G 00064169!). A robust phenotype of *P. diversifolia* with rudimentary underleaves.

= *Plagiochila cava* Steph., *Bull. Herb. Boissier* (sér. 2) 4: 1213. 1904, **syn. nov.** **Type:** Brazil, São Paulo, Apiahy, *Puiggari 784* (**lectotype**, G 00281866!, **here designated**). *Plagiochila cava* is a phenotype with few-toothed leaves (5-7 teeth, near apex). Several further syntypes (leg. Horeau, leg. Pabst, leg. Puiggari, leg.

Regnell, leg. Rudolph, leg. Schenk, leg. Ule; all from Brazil) are present in G. The specimen *Puiggari* 784 is selected as the lectotype since it is illustrated in *Icones Ineditae* (Stephani, 1985) and fits the original description.

= *Plagiochila dilatata* Steph., *Bull. Herb. Boissier* (sér. 2) 5: 887. 1905, **syn. nov. Type:** Venezuela, *Fendler s.n.* (**lectotype**, G 00112950!, **here designated**). A further syntype collection in G (Costa Rica, *Pittier* 6076, G 00112951!) is *P. deflexirama* Taylor.

***Plagiochila flabelliflora* Steph.**, *Bull. Herb. Boissier* (sér. 2) 2: 880. 1902. **Type:** Brazil, *Glaziou* 11758 *p.p.* (holotype, G, fide Heinrichs, 2002).

= *Plagiochila uleana* Steph., *Bull. Herb. Boissier* (sér. 2) 2: 868. 1902, **syn. nov. Type:** Brazil, *Ule* 221 (**lectotype**, G 00061564!, **here designated**, c.gyn.); *ibid.*, *Ule* 222 (syntype, G without number!, c.andr.). Although the specimen *Ule* 222 was used by Stephani for his illustration of *P. uleana* (*Icones Ined.* 11740), the collection *Ule* 221 is chosen as the lectotype as it is female and more optimally developed.

***Plagiochila gymnocalycina* (Lehm. et Lindenb.) Mont. et Nees**, in d'Orbigny, *Voy. Amér. Mérid.*, *Bot.* 7: 81. 1839; *Jungermannia gymnocalycina* Lehm. et Lindenb., in Lehmann, *Nov. Stirp. Pug.* 5: 28. 1833. **Type:** Brazil, Rio de Janeiro, Novo Friburgo, *Beyrich s.n.* (syntype, W 1341 [hb. Lindenberg 565]!, scrap).

= *Plagiochila contorta* Lindenb. et Hampe, *Ann. Sci. Nat. Bot.* (sér. 4) 6: 188. 1856, **syn. nov. Type:** Costa Rica, “Matagalpo in Segovia”, alt. 4000 ft., *A.S. Oersted s.n.* (isotype, PC-Montagne!)

= *Plagiochila grateloupii* Mont., *Ann. Sci. Nat. Bot.* (sér. 4) 6: 188. 1856, **syn. nov. Type:** “Antilles” [Martinique], *Grateloup s.n.* (**lectotype**, PC-Montagne PC0167678!, **here designated**); *ibid.*, *Perrottet s.n.* (syntype, PC-Montagne PC0025869!).

= *Plagiochila polopolensis* Herzog, *Hedwigia* 67: 261. 1927, **syn. nov. Type:** Bolivia, “Polopolo bei Coroico, ca. 1300 m”, October 1912, *Buchtien* 199 (**lectotype**, JE!, **here designated**, c.gyn. & andr.); *ibid.*, “Hacienda Simaco am Weg nach Tipuani, ca. 1400 m”, *Buchtien* 86 (syntype, JE!).

= *Plagiochila benoistii* Dugas, *Contr. Etude Plagiochila*: 72. 1928, **syn. nov. Type:** French Guiana, Charvein, 15 January 1914, “troncs d’arbres pourris”, *R. Benoist s.n.* (**lectotype**, PC 0102851!, **here designated**); *ibid.*, “troncs d’arbre (forêt)”, *R. Benoist s.n.* (syntype, PC 0102852!). H. Inoue (in Gradstein & Hekking, 1989) reduced this species to synonymy under *P. divaricata* Lindenb.; however, the latter species is a synonym of *P. rutilans* (see below). Characteristic of *P. gymnocalycina* are the narrowly oblong, 2-2.5 × longer than wide, ventrad leaves without high shoulder, intercalary branching and “naked” perianths.

***Plagiochila heteromalla* (Lehm. et Lindenb.) Lehm. et Lindenb.**, in Lindenberg, *Sp. Hepat.* 2-4: 83. 1840; *Jungermannia heteromalla* Lehm. et Lindenb., in Lehmann, *Nov. Stirp. Pug.* 6: 62. 1834; *Plagiochilion heteromallum* (Lehm.) Hässel, *Bol. Soc. Argent. Bot.* 22: 124. 1983. **Type:** Peru, *Kunze s.n.* (isotypes, PC 104832!, PC-Montagne!).

= *Plagiochila oresitropha* Spruce, *Trans. & Proc. Bot. Soc. Edinburgh* 15: 467. 1885, **syn. nov. Type:** Peru, near Tarapoto, Mt. Campana, *Spruce s.n.* (isolectotypes, G 00282680!, 00282681!, c.gyn., designated by J. Heinrichs, in sched.).

= *Plagiochila ovifolia* Steph., *Spec. Hep.* 6: 191. 1917, **syn. nov. Type:** Ecuador (“Columbia”), *W. Jameson s.n.* (holotype, G 00113028!). The South

American bryophyte collections of William Jameson are from Ecuador, not from Colombia or Peru (see León-Yáñez *et al.*, 2006). Jameson's name as collector of the type specimen is missing on the label of the holotype and in *Icones Ineditae* (11435, 11564); instead, it is mentioned "misit Cardot".

Plagiochila heteromalla is a little-studied Andean species that is readily recognized by the second, subopposite leaves with approximate (but not connate) leaf bases, the yellowish leaf border of thicker-walled cells, and the stalked perianth, which is not covered by bracts. The plants are rather robust (4-6 mm wide) and the leaf cells are 25-38 μ m wide in mid-leaf, with small, radiate trigones and intermediate thickenings. Hässel de Menendez (1983) transferred *P. heteromalla* to *Plagiochilion*, an Asiatic genus differing from *Plagiochila* by ventral-intercalary branching (lateral-intercalary in *Plagiochila*) and connate ventral and dorsal leaf bases (not connate in *Plagiochila*, except *P. bryhnii* Steph.). Since branching in *P. heteromalla* is lateral-intercalary and leaf bases approximate but not connate, this species should be returned to *Plagiochila* (see also Heinrichs, 2002, p. 51).

***Plagiochila heterophylla* Lindenb. ex Lehm.**, in Lehmann, *Nov. Stirp. Pug.* 10: 2. 1857. **Type:** Costa Rica, *Oersted s.n.* (lectotype, S B58739, designated by Heinrichs, 2002, p. 145).

= *Plagiochila abscedens* Gottsche, in Triana & Planchon, *Ann. Sci. Nat. Bot.* (sér. 5) 1: 104. 1864, **syn. nov.** **Type:** Colombia, Cundinamarca, Tequendama, 2500 m, August 1861, *Lindig 1710* (isotype, PC 0098170!). A delicate phenotype with few-toothed, bifid leaves (0-5 teeth on the ventral leaf margin, 2 larger teeth at leaf apex).

***Plagiochila laetevirens* Lindenb.**, *Sp. Hepat.* 2-4: 101. 1840. **Type:** Ecuador ("Columbia"), Tungurahua, Baños, *W. Jameson s.n.* (holotype, W 2010-00452 [hb. Lindenberg 656]!; isotype, G 00282926!). Illustration: Heinrichs *et al.* (2002b, Fig. 2). William Jameson's bryophyte collections are from Ecuador, not from Colombia or Peru (see León-Yáñez *et al.*, 2006).

= *Plagiochila contigua* Gottsche, *Mexik. Leverm.*: 30 (126). 1863, **syn. nov.** **Type:** Mexico, Orizaba, Aserradero de Santa Cruz, *F. Müller s.n.* (lectotype, G 00121773!, **here designated**). A phenotype with few-toothed leaves (5-6, near leaf apex). The above-cited specimen is chosen as the lectotype as it fits the protologue very well. Another type specimen in G (00121813) has pinnate branching and seems to belong to *P. tamariscina* Steph. The holotype of *P. contigua* Gottsche (in B) was destroyed in 1944.

= *Plagiochila micropteryx* Gottsche, in Triana & Planchon, *Ann. Sci. Nat. Bot.* (sér. 5) 1: 107. 1864, **syn. nov.** **Type:** Colombia, Cundinamarca, Tocarema, 2200 m, August 1859, *Lindig 1705* (isotype, G 026349 [00282930]!). The type material fits *P. laetevirens* very well. *Plagiochila binominis* Gottsche (isolectotype, PC 0098171!, c. gyn.) and *P. tocarema* Gottsche (isotype, G 00282661!), which were based on the same collection (*Lindig 1705*) as *P. micropteryx* and were described in the same publication (Gottsche, 1864), also belong to *P. laetevirens* (see also Inoue, 1989, under *P. micropteryx*).

= *Plagiochila flabellifrons* Spruce, *Trans. & Proc. Bot. Soc. Edinburgh* 15: 488. 1885, **syn. nov.** **Type:** Ecuador, Tungurahua, Mt. Guayrapata, *Spruce s.n.*, *Hepaticae Spruceanae: Amazonicae et Andinae 1617* (holotype, MANCH CC7681 [EM79045]!). A robust phenotype with few-toothed leaves (5-10).

= *Plagiochila bancroftii* Steph., *Spec. Hep.* 6: 127. 1917, **syn. nov.** **Type:** Jamaica, *Bancroft s.n.* (holotype, G 00064092!). A phenotype with few large teeth on leaf margins.

***Plagiochila macrostachya* Lindenb.**, *Sp. Hepat.* 2-4: 75. 1840. **Type:** Jamaica, ex hb. Hooker (lectotype, W-Lindenberg 660, designated by Heinrichs, 2002, p. 103).

= *Plagiochila latifolia* Steph., *Bull. Herb. Boissier* (sér. 2) 5: 742. 1905, **syn. nov. Type:** Brazil, São Paulo, Apiahy, *Puiggari 228b* (holotype, G 00061576!).

= *Plagiochila minarum* Herzog, *Hedwigia* 72: 208. 1932, **syn. nov. Type:** Brazil, Minas Gerais, Mun. de Virginia, ca. 800 m, Passa Quatro, March 1921, *J.F. Zikán 338* (lectotype, JE!, here designated), *ibid.*, *Zikán 273* (syntype, JE!); Rio de Janeiro, Teresopolis, Poco d'Antas, 24 March 1925, *M.C. Bandeira s.n.*, *Herbario do Jardim Botânico do Rio de Janeiro 150* (syntype, JE!).

***Plagichila montagnei* Nees**, in Nees & Montagne, *Ann. Sci. Nat. Bot.* (sér. 2) 5: 53. 1836. **Type:** French Guiana, *Leprieur s.n.* (lectotype, STR-Nees, designated by Heinrichs & Gradstein, 2000, p. 170).

= *Plagiochila bogotensis* Gottsche, in Triana & Planchon, *Ann. Sci. Nat. Bot.* (sér. 5) 1: 98. 1864, **syn. nov. Type:** Colombia, Cundinamarca, Cipacón, 2600 m, *Lindig s.n.* (isosyntype, PC 0098168!, c.gyn.). A phenotype with subentire ventral leaf bases.

***Plagiochila pachyloma* Taylor**, *London J. Bot.* 5: 267. 1846. **Type:** Ecuador, Pichincha, *W. Jameson s.n.* (isotype, G 00282703!).

= *Plagiochila wallisiana* Steph., *Bull. Herb. Boissier* (sér. 2) 5: 936. 1905, **syn. nov. Type:** Colombia, Ocaña, *G. Wallis s.n.* (holotype, G 024290 [00061505]!). The glossy brownish color of the leaf border, characteristic of fresh material of *P. pachyloma*, is lacking in this old herbarium specimen.

***Plagiochila patula* (Sw.) Lindenb.**, *Sp. Hepat.* 1: 21. 1839; *Jungermannia patula* Sw., *Fl. Ind. Occid.* 3: 1844. 1806. **Type:** Jamaica, *Swartz s.n.* (lectotype S-Swartz 408b, designated by Heinrichs *et al.*, 1998, p. 22).

= *Plagiochila martiana* (Nees) Lindenb., *Sp. Hepat.* 1: 12. 1839; *Jungermannia martiana* Nees, *Linnaea* 6: 617. 1831., **syn. nov. Type:** Brazil, "Minas", *Martius s.n.* (lectotype, STR-Nees!, designated by J. Heinrichs, in sched.). The original material of *Jungermannia martiana* seems to have been a mixture of several species. The lectotype in the Nees herbarium consists of one well-developed, 6.5 cm long female plant of *P. patula* and a fragment of a male plant of *P. raddiana*. Since only the female plant is described in the protologue, this should be considered the lectotype of *J. martiana*. The plant represents a phenotype of *P. patula* with rather shortly decurrent ventral leaf bases. A further syntype in the Nees herbarium consists of a mixture of *P. distinctifolia* and *P. raddiana*, and a putative isosyntype in the Montagne herbarium ("*Jungermannia martiana* N. ab E., Brasilia, Ex dono Illustr. Neesii"; PC 3303 [PC0025856]!) belongs to *P. crispabilis*.

= *Plagiochila fallax* Lindenb. *et* Hampe, *Linnaea* 24: 300. 1851, **syn. nov. Type:** Costa Rica, *Oersted s.n.* (isotype, G 00282693!).

= *Plagiochila thamniopsis* Spruce, *Bull. Soc. Bot. France (Congr. Bot.)* 36: 200 ("cc"). 1889, **syn. nov. Type:** Brazil, Rio de Janeiro, *Glaziou 9198* (isotypes, G 00260062!, 00260063!). A phenotype with moderately decurrent ventral leaf bases.

= *Plagiochila beskeana* Steph., *Bull. Herb. Boissier* (sér. 2) 2: 863. 1902, **syn. nov. Type:** Brazil, unknown collector, misit Beske, hb. Gottsche as *P. martiana* (lectotype, G 026120 [00283042]!), designated by J. Heinrichs, in sched.). A phenotype with rather shortly decurrent ventral leaf bases and minute, bifid underleaves.

= *P. caldana* Steph., *Bull. Herb. Boissier* (sér. 2) 2: 879. 1902, **syn. nov.**
Type: Minas Gerais, Caldas, 1854, *G.A. Lindberg s.n.* (holotype, G 00280493!).
 A phenotype with rather distant leaves and rather shortly decurrent ventral leaf bases.

Study of these type materials indicates that the length of the decurrent part of the ventral leaf base in *P. patula* is subject to much variation. Typical phenotypes possess a longly decurrent ventral leaf base, other forms have moderately to rather shortly decurrent ventral bases (e.g., the type of *P. martiana*). Similar variation is seen in the closely related *P. raddiana* (Heinrichs & Gradstein, 2000, p. 179).

***Plagiochila punctata* (Taylor) Taylor**, *London J. Bot.* 5: 261. 1846; *Jungermannia punctata* Taylor, *Trans. Bot. Soc. Edinburgh* 1: 179. 1843 “1844”. **Type:** Ireland, unknown collector (isosyntype, BM, fide Grolle, 1976, p. 219).

= *Plagiochila chinantlana* Gottsche, *Mexik. Leverm.*: 12 (108). 1863, **syn. nov.** **Type:** Mexico. Puebla, Chinantla, May 1841, *Liebmann 506* (var. α) (isotype, C CM7488!)

= *Plagiochila paramicola* Herzog, *Bot. Centralbl. Beih.* 61, B: 563. 1942, **syn. nov.** **Type:** Ecuador, Chimborazo Prov., El Altar, “Paramoregion”, ca. 4000 m, *Hans Meyer 4212* (holotype, JE!). A delicate phenotype with short-bifid, 2-3-toothed leaves.

= *P. subrara* Herzog, *Hedwigia* 74: 87. 1934, **syn. nov.** **Type:** Colombia, Cundinamarca, páramo El Boquerón, 1929, *K. Troll 2181* (holotype, JE!). A delicate phenotype with 2-3-toothed leaves.

***Plagiochila raddiana* Lindenb.**, *Sp. Hepat.* 1: 9. 1839. **Type:** Brazil, Rio de Janeiro, *Raddi s.n.* (holotype, W-Lindenberg 468, fide Heinrichs & Gradstein, 2000).

= *Plagiochila aliena* Gottsche, *Mexik. Leverm.*: 22 (118). 1863, **syn. nov.** **Type:** Mexico, *Liebmann s.n.* (isotype, G 026056 [00282892]!). A phenotype with moderately ampliate ventral leaf bases, extending across the stem but not forming a crest.

= *Plagiochila subcristata* Gottsche, *Mexik. Leverm.*: 54 (150). 1863, **syn. nov.** **Type:** Mexico, Orizaba, Hacienda de Mirador, *Liebmann s.n.* (isotype, G 00064745!). A phenotype with moderately ampliate ventral leaf bases and a weak crest.

= *Plagiochila silvatica* Gottsche, in Triana & Planchon, *Ann. Sci. Nat. Bot.* (sér. 5) 1: 108. 1864, **syn. nov.** **Type:** Colombia, Cundinamarca, Aserradero, 2500 m, July 1860 *Lindig 1729B* (lectotype, PC 0103038!, **here designated**, c.gyn.). A robust phenotype with rather plump leaves.

***Plagiochila rutilans* Lindenb.**, *Sp. Hepat.* 2-4: 47. 1840. **Type:** Brazil, Rio de Janeiro, *Raddi 57* (holotype, W-Lindenberg 583, fide Heinrichs *et al.*, 2001).

= *Plagiochila divaricata* Lindenb., *Spec. Hep.* 5: 147. 1843, **syn. nov.** **Type:** St. Vincent, unknown collector, ex hb. Hooker (isotypes, G 026409 [00121432]!, 026410 [00121433]!, 026411 [00121434]!).

= *Plagiochila perrottetiana* Mont. et Gottsche, in Montagne, *Ann. Sci. Nat. Bot.* (sér. 4) 6: 195. 1856, **syn. nov.** **Type:** Guadeloupe, *Perrottet s.n.* (holotype, PC-Montagne [PC0025873]!, ster.; isotype, PC 102949!, ster.).

***Plagiochila simplex* (Sw.) Lindenb.**, *Sp. Hepat.* 2-4: 54. 1840; *Jungermannia simplex* Sw., *Nov. Gen. Spec. Plant.*: 143. 1788. **Type:** Jamaica, *Swartz s.n.* (holotype, S-Swartz 412, fide Heinrichs *et al.*, 1998).

= *Plagiochila fendleri* Mont., *Ann. Sci. Nat. Bot.* (sér. 4) 6: 198. 1856, **syn. nov.** **Type:** Venezuela, *Fendler s.n.* (holotype, PC-Montagne, not found; isotypes, G 026205 [0012147]!, G 026206 [00121472]! scrap).

= *Plagiochila regeliana* Steph., *Bull. Herb. Boissier* (sér. 2) 2: 675. 1902, **syn. nov. Type:** Colombia, *Regel s.n.* (holotype, G 026402 [00121475]!).

= *Plagiochila scissifolia* Steph., *Bull. Herb. Boissier* (sér. 2) 2: 865. 1902, **syn. nov. Type:** Brazil, São Paulo, *Apiahy, Puiggari 2081* (holotype, G 00061548!).

= *Plagiochila pulchella* Steph., *Bull. Herb. Boissier* (sér. 2) 2: 871. 1902, **syn. nov. Type:** Brazil, São Paulo, *Apiahy, Puiggari 822a* (**lectotype**, 023063 [00061625]!, **here designated**). Syntype: Brazil, São Paulo, *Apiahy, Puiggari 1100* (G 024064 [00061624]!). The collection “Venezuela, *Funck & Schlim s.n.*” used by Stephani for his illustration of the species (*Icones Ined.* 11722) could not be found in G.

= *Plagiochila itatiajensis* Steph., *Bull. Herb. Boissier* (sér. 2) 2: 874. 1902, **syn. nov. Type:** Brazil, Itatiaia, *Ule 443* (holotype, G 00061481!).

= *Plagiochila umbrosa* Steph., *Spec. Hep.* 6: 235. 1921, nom. illeg., **syn. nov. Type:** Mexico, *Arsén s.n.* (holotype, G 00061563!). A rather robust phenotype.

= *Plagiochila incisa* Dugas, *Contrib. Etude Plagiochila*: 112. 1928, **syn. nov. Type:** Brazil, Santos, April 1854, *G.A. Lindberg s.n.* (holotype, PC 0102777!). A poor specimen with a few female shoots and strongly caducous leaves.

***Plagiochila subplana* Lindenb., *Sp. Hepat.* 2-4: 73. 1840. Type:** Brazil, “mis. Martius 1832 sub *J. adianthoides*” (lectotype, W-Lindenberg 650, designated by Heinrichs *et al.*, 1999, p. 171).

= *Plagiochila harlingii* S.W. Arnell, *Svensk Bot. Tidskr.* 56: 346. 1962, **syn. nov. Type:** Ecuador, Esmeraldas, Río San Miguel, virgin forest, 70 m, *G. Harling 4670* (holotype, S-B40416!).

***Plagiochila tamariscina* Steph., *Bull. Herb. Boissier* (sér. 2) 2: 685. 1902. Type** (*Icones Ined.* 11668): Puerto Rico, 22 May 1986, *Sintenis s.n.* (syntype, PC 00061498!, c.gyn.).

= *Plagiochila subdeflexiramea* Herzog, *Hedwigia* 72: 235. 1932, **syn. nov. Type:** Bolivia, “Polopolo bei Coroico, N Yungas, ca. 1300 m”, 1912, *O. Buchtien 186* (**lectotype**, JE!, **here designated**, c. gyn. juv.); Bolivia, “Hacienda Simaco, am Weg nach Tipuani, ca. 1400 m”, 1920, *O. Buchtien 145* (syntype, JE!, c.andr.). The original publication mentions only one collection: “Polopolo bei Coroico, N. Yungas, ca. 1300 m (leg. O. Buchtien 145)”. However, the label of this specimen (a female plant) in the Herzog herbarium bears the number “Buchtien 186”, not “145”. The latter number refers to a specimen from Hacienda Simaco (a male plant). It thus seems that a mix-up of label numbers has occurred in the original publication. Since the characters of both the gynoecium and the androecium are included in the original description, the two specimens are treated here as syntypes. The collection *Buchtien 186* is chosen as the lectotype as it is marked “Typus!” in Herzog’s handwriting and contains the female plant, which was used for the illustration of *P. subdeflexiramea* in the original publication.

***Plagiochila tenuis* Lindenb., *Sp. Hepat.* 2-4: 50. 1840. Type:** St. Vincent, unknown collector, ex hb. Hooker (W 2010-02588 [hb. Lindenberg 551]!; isotypes, G 00280489!, G0028090!).

= *Plagiochila bidens* Gottsche, *Ann. Sci. Nat. Bot.* (sér. 4) 8: 322. 1857, **syn. nov. Type:** Guadeloupe, *l’Herminier s.n.* (isosyntypes, G six colls.!). The material fits *P. tenuis* very well.

***Plagiochila trichostoma* Gottsche**, in Triana & Planchon, *Ann. Sci. Nat., Bot.* (sér. 5) 1: 113. 1864. **Type**: Colombia, Cundinamarca, Tequendama, 2500 m, August 1861, *Lindig 1720b* (lectotype, G 00128771!, designated by Heinrichs *et al.*, 2002a, p. 198; isoelectotype, PC 097293!, c.sp.).

= *Plagiochila granatensis* Gottsche, in Triana & Planchon, *Ann. Sci. Nat., Bot.* (sér. 5) 1: 111. 1864, **syn. nov.** **Type**: Colombia, Cundinamarca, Tequendama, 2500 m, August 1861, *Lindig 1730* (holotype, G 00064746!). A delicate phenotype with rather distant leaves and a stalked perianth.

= *Plagiochila saltuensis* Steph., *Bull. Herb. Boissier* (sér. 2) 5: 927. 1905, **syn. nov.** **Type**: Ecuador, „Andes Quitenses: Canelos et Mt. Tunguragua“, *Spruce s.n., Hepaticae Spruceanae: Amazonicae et Andinae* (lectotype, G 00281868!, **here designated**, c.gyn.; isoelectotypes, G 00128791!, 00128792!). A robust phenotype with strongly ampliate leaves.

= *Plagiochila hansmeyeri* Steph., *Spec. Hep.* 6: 164. 1918, **syn. nov.** **Type**: Ecuador, El Altar, 3900 m, July 1903, *H. Meyer s.n.* (holotype, G 00121426!).

= *Plagiochila ovato-obconica* Steph., *Spec. Hep.* 6: 164. 1918, **syn. nov.** **Type**: Colombia, *Irmscher 52 p.p.* (holotype, G 00069891!). A weakly developed, sterile specimen.

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