



Notes on Early Land Plants Today. 70. Nomenclatural notes in hornworts (Anthocerotophyta)

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Prior to the publication of the world checklist of hornworts and liverworts (Söderström *et al.*, in press) some taxa still need to be validated, transferred or synonymized. We are here dealing with the remaining nomenclatural issues among the Anthocerotophyta. Several taxa have not been typified properly and we are here suggesting several new lectotypes to stabilize the nomenclature.

The format of the note follows Söderström *et al.* (2012).

Anthocerotaceae

Anthoceros cristatus Steph., *Sp. Hepat.* [Stephani] 5: 996, 1916 (Stephani 1916). Type:—ASCENSION. *Herb. Beschereille, pores from holotype Stephani herb. no. 24501* (G-00045042! [<http://www.ville-ge.ch/musinfo/bd/cjb/chg/adetail.php?id=141014&lang=en>]), lectotype **here designated** [or possibly holotype, *cf.* McNeill 2014] Fig. 1A.

Anthoceros expansus (Steph.) J.C.Villarreal et Cargill, **comb. nov.** Basionym:—*Aspiromitus expansus* Steph., *Sp. Hepat.* [Stephani] 5: 961, 1916 (Stephani 1916). Type:—CAMEROON. South-West: Buea, 24 September 1891, *Preuss 989, Stephani herb. no. 20510* (G-00045055! [<http://www.ville-ge.ch/musinfo/bd/cjb/chg/adetail.php?id=141040&lang=en>]), lectotype **here designated** [or possibly holotype].

Anthoceros myriandroecius Steph., *Wiss. Ergebn. Deut. Zentr.-Afr. Exped. (1907-08), Bot.* 2: 134 (Stephani 1911 [1910]). Type:—RWANDA. Kiwu lake, *Exped. Fr. Mildbraed 808* (G-00128028! [<http://www.ville-ge.ch/musinfo/bd/cjb/chg/adetail.php?id=133358&lang=en>]), lectotype **here designated** [or possibly holotype]. Note:—The specimen was used by Stephani for his illustrated *icones inedit* and it was annotated by Hasegawa in 1993 as “type” but it seems that he did not publish it.

= *Anthoceros volkensii* Steph., *Sp. Hepat.* [Stephani] 5: 997, 1916 (Stephani 1916), **syn. nov.** Type:—TANZANIA. Kilimanjaro, 17.12.1893, *Volkens 1504* (G-00045053! [<http://www.ville-ge.ch/musinfo/bd/cjb/chg/adetail.php?id=141027&lang=en>]), lectotype **here designated** [or possibly holotype]. Note:—The specimen is annotated by Hasegawa in 1993 as “type” (but it appears that he did not publish it) and conspecific with *Anthoceros myriandroecius*.

Anthoceros punctatus L., *Sp. Pl.* 1: 1139 (Linnaeus 1753). Type:—Herb. Dillen., Oxford, *Anthoceros minor*, in den oberen Ecken des Blättchens. *Hist. musc.* (1741) Tab. 68, Fig. 1. (lectotype designated by Proskauer 1958)

= *Aspiromitus dismieri* Steph., *Sp. Hepat.* [Stephani] 5: 961, 1916 (Stephani 1916), **syn. nov.** Type:—MADAGASCAR. s. loc. spec., *Spores from holotype, Rotereau s.n., Stephanie herb. no.00045054* [<http://www.ville-ge.ch/musinfo/bd/cjb/chg/adetail.php?id=141039&lang=en>]), lectotype **here designated** [or possibly holotype] Fig. 1B. Note:—The type specimen also includes an un-named *Phaeoceros* species which Hasegawa annotated in 1995.

Anthoceros subtilis Steph., *Sp. Hepat.* [Stephani] 5: 1003, 1916 (Stephani 1916). Type:—INDIA. Karnataka: Mangalore, R. Pfeiderer 12923, *Stephani herb. no. 12823* (G-00060882 [<http://www.ville-ge.ch/musinfo/bd/cjb/chg/adetail.php?id=115887&lang=en>] lectotype designated by Asthana & Srivastava 1991: 54).
 = *Anthoceros chevalieri* Steph., *Spec. Hepat.* [Stephani] 6: 425, 1923 (Stephani 1923), **syn. nov.** Type:—CENTRAL AFRICAN REPUBLIC. Ubangi, 1902, *Chevalier 43* (G-00128024! [<http://www.ville-ge.ch/musinfo/bd/cjb/chg/adetail.php?id=133363&lang=en>], lectotype **here designated** [or possibly holotype]).

Folioceros argillaceus (Steph.) J.C.Villarreal et Cargill, comb. nov. Basionym:—*Aspiromitus argillaceus* Steph., *Sp. Hepat.* [Stephani] 5: 970, 1916 (Stephani 1916). Type:—INDONESIA. Java: Bogor (“Buitenzorg”), February 1894, *Schiffner s.n.*, *Stephani herb. no. 20494* (G-00061272, lectotype **here designated**; G-00061271 [<http://www.ville-ge.ch/musinfo/bd/cjb/chg/adetail.php?id=130334&lang=en>], G-0061270, JE-04000311, isolectotypes). ≡ *Anthoceros argillaceus* (Steph.) Verd., *Ann. Bryol.* 5: 143, 1932 (Verdoorn 1932).

Folioceros dilatatus (Steph.) J.C.Villarreal et Cargill, comb. nov. Basionym:—*Anthoceros dilatatus* Steph., *Bot. Jahrb. Syst.* 8: 95, 1886 (Stephani 1886). Type:—EQUATORIAL GUINEA. Bioko (Fernando Pó): s. loc., May 1885, *Mönkemeyer 15*, *Stephani herb. no. 20500* (G-00128025! [<http://www.ville-ge.ch/musinfo/bd/cjb/chg/adetail.php?id=133424&lang=en>]), lectotype **here designated** [or possibly holotype]). Note:—The selected lectotype was annotated by J. Hasegawa in 1993 as belonging to *Anthoceros* subg. *Folioceros*.

Folioceros fuciformis (Mont.) D.C.Bharadwaj, *Geophytology* 5: 227, 1975 (Bharadwaj 1975). Basionym:—*Anthoceros fuciformis* Mont., *Ann. Sci. Nat. Bot. (ser. 2)* 20: 296, 1844 [1843] (Montagne 1844). Type:—RÉUNION. “Bourbon”, 1837, *Gaudichaud s.n.* (PC-0032647, lectotype selected by Piippo 1993: 36; G-00115646, isolectotype).

= *Aspiromitus hildebrandtii* Steph., *Sp. Hepat.* [Stephani] 5: 961, 1916 (Stephani 1916), **syn. nov.** Type:—MADAGASCAR. Tananarivo, *Hildebrandt s.n.* (G-00045056! [<http://www.ville-ge.ch/musinfo/bd/cjb/chg/adetail.php?id=141041&lang=en>]), lectotype **here designated**; G-00120707 [<http://www.ville-ge.ch/musinfo/bd/cjb/chg/adetail.php?id=163184&lang=en>], PC-0101754, [<http://science.mnhn.fr/institution/mnhn/collection/pc/item/pc0101754>], isolectotypes)

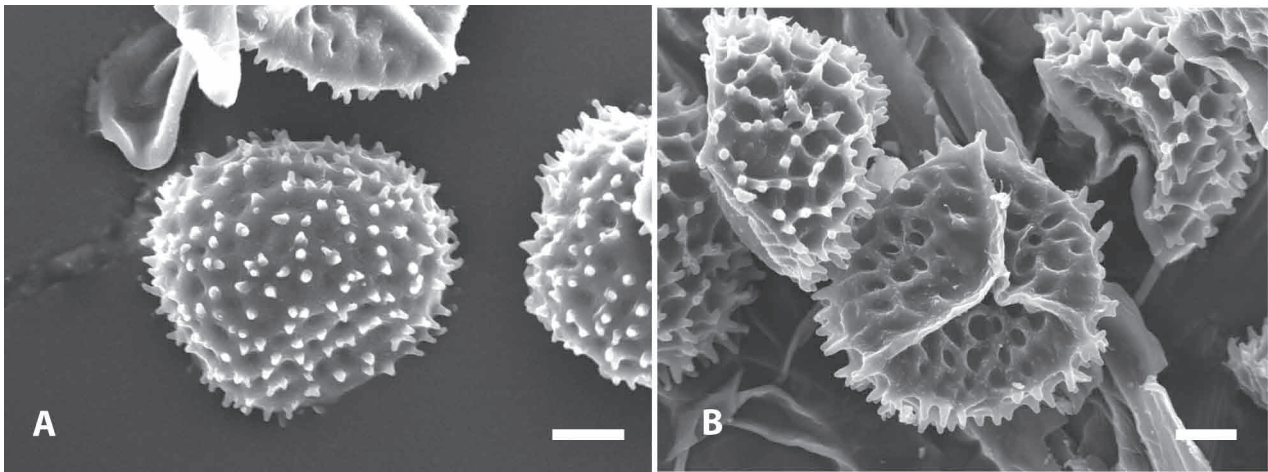


FIGURE 1. Spores of *Anthoceros cristatus*. (A) Spores from holotype Stephani herb. no. 24501 (G-00045042) and *Aspiromitus dismieri* (B). Scale bar is 10 µm. Spores from holotype, Rotereau s.n., Stephanie herb. no. 00045054

Dendrocerotaceae

Dendroceros breutelii Nees, *Syn. Hepat.* 4: 581, 1846 (Gottsche *et al.* 1846). Type:—ST. KITTS. *Breutel s.n.* (G-00115617!). Note:—We do not lectotypify this name as we do not know if any material exists in STR.

= *Dendroceros macrosporus* Steph., *Spec. Hepat.* [Stephani] 5:1014, 1917 (Stephani 1917), **syn. nov.** Type:—BRAZIL. São Paulo: Rio Grande, ad São Paulo Railway, 7 June 1901, *Schiffner 700*, *Stephani herb. no. 24035* (G-00067711! lectotype **here designated** [or possibly holotype]).

= *Dendroceros angustifrons* Steph., *Spec. Hepat.* [Stephani] 5:1016, 1917 (Stephani 1917), **syn. nov.** Type:—

- BRAZIL. São Paulo: “in sylvaticis ad Rio Mambu in districtis urbis Concecao de Itanhaen”, 30 June 1901, *Schiffner 726, Stephani herb. no. 24025* (G-00060906! [http://www.ville-ge.ch/musinfo/bd/cjb/chg/adetail.php?id=115857&lang=en], lectotype **here designated** [or possibly holotype]).
- = *Dendroceros schiffneri* Steph., *Spec. Hepat. [Stephani]* 5: 1017, 1917 (Stephani 1917), **syn. nov.** Type:—BRAZIL. São Paulo: “ad flumen Rio Branco prope Santos”, 13 September 1901, *Schiffner 2147, Stephani herb. no. 24037* (G-00067709! [http://www.ville-ge.ch/musinfo/bd/cjb/chg/adetail.php?id=127941&lang=en], lectotype **here designated** [or possibly holotype]).
- = *Dendroceros ecuadoriensis* Steph., *Spec. Hepat. [Stephani]* 6: 429, 1923 (Stephani 1923), **syn. nov.** Type:—ECUADOR. Gualaquiza, “Llionis salesianum”, 1908, *Allioni 6511* (G-00060904, lectotype **here designated**), *Allioni 6510* (G-00060903, lectosyntype). Note:—The lectotype was annotated as “lectotypus nov.” by Hasegawa in 1995 but we are unable to find any publication of it.
- Dendroceros crispus*** (Sw.) Nees, *Syn. Hepat.* 4: 581, 1846 (Gottsche *et al.* 1846). Basionym:—*Anthoceros crispus* Sw., *Prodr. [O.P.Swartz]*: 146, 1788 (Swartz 1788). Type:—JAMAICA. *Swartz s.n.* (S-B20564 [http://andor.nrm.se/fmi/xsl/kryptos/kbo/publDetailitems.xml?-lay=webbkollekter&-token.nav=items&-db=kbo_mossregister&-recid=20141&-find=-find&-token.post=all&-token.languagecode=en-GB], lectotype selected by Proskauer 1960).
- = *Dendroceros foliatus* Spruce, *Trans. & Proc. Bot. Soc. Edinburgh* 15: 574, 1885 (Spruce 1885). Type:—ECUADOR. Canelos, Cuesta de Mapoto, *Spruce s.n.* (E-00002013! [http://elmer.rbge.org.uk/bgbase/vherb/bgbasevherb.php?current_names_family=¤t_names_genus=Dendroceros¤t_names_species=foliatus&coll_name=&coll_num=&specimens_barcode=&full_name=&specimens_region=&cfg=bgbase%2Fvherb%2Fbgbasevherb.cfg], lectotype **here designated**; NY, isolectotype).
- Dendroceros javanicus*** (Nees) Nees, *Syn. Hepat.* 4: 582, 1846 (Gottsche *et al.* 1846). Basionym:—*Anthoceros javanicus* Nees, *Enum. Pl. Crypt. Javae*: 1, 1830 (Nees 1830). Type:—INDONESIA. Java: *hb. Nees* (G-00115610, E-00002014, isotypes). Note:—Proskauer named the E specimen as isotype in 1964 (possibly also the specimen in G).
- = *Dendroceros fenestratus* Ångstr., *Öfvers. Kongl. Vetensk.-Akad. Förh.* 33(4): 53, 1876 (Ångström 1876), **syn. nov.** Type:—TAHITI. 1852, *N. J. Andersson s.n.* (S-B22419, B22420, isotypes).
- Nothoceros vincentianus*** (Lehm.) J.C.Villarreal, *Bryologist* 113 (1): 111, 2010 (Villarreal *et al.* 2010). Basionym:—*Anthoceros vincentianus* Lehm., *Nov. Stirp. Pug.* 6: 16, 1834 (Lehmann 1834). Type:—ST. VINCENT. *Rev. Guilding s.n.* (S-B20587!), lectotype selected by Proskauer 1957: 134; W!, NY!, isolectotypes).
- = *Megaceros columbianus* Steph., *Spec. Hepat. [Stephani]* 5: 950, 1916 (Stephani 1916) **syn. nov.** Type:—COLOMBIA. *Karsten XXXV, herb. Schiffner, Stephani herb. no. 24042* (G-00112634! [http://www.ville-ge.ch/musinfo/bd/cjb/chg/adetail.php?id=142898&lang=en], lectotype **here designated** [or possibly holotype]).
- = *Megaceros jamaicensis* Steph., *Spec. Hepat. [Stephani]* 6: 424, 1923 (Stephani 1923) **syn. nov.** Type:—JAMAICA. *Börgeesen s.n.* (G-00112670! [http://www.ville-ge.ch/musinfo/bd/cjb/chg/adetail.php?id=142899&lang=en], lectotype **here designated** [or possibly holotype]).

Notothyldaceae

- Paraphymatoceros pearsonii*** (Howe) J.C.Villarreal et Cargill, **comb. nov.** Basionym:—*Anthoceros pearsonii* Howe, *Bull. Torrey Bot. Club* 25 (1): 8, 1898 (Howe 1898). Type:—USA. California: Marin Co., Mill Valley, 7 May 1892, *M.A.Howe 16* (NY-253464! lectotype selected by Hässel 1989; G-00115627, isolectotype). ≡ *Phaeoceros pearsonii* (Howe) Prosk., *Bull. Torrey Bot. Club.* 78 (4): 347, 1951 (Proskauer 1951).
- Paraphymatoceros proskaueri*** (Stotler, Crand.-Stotl. et W.T.Doyle) J.C.Villarreal et Cargill, **comb. nov.** Basionym:—*Phaeoceros proskaueri* Stotler, Crand.-Stotl. et W.T.Doyle, *Fieldiana, Bot. (n. ser.)* 47: 232 (Crandall-Stotler *et al.* 2008). Type:—USA. California: Monterey Co., Barloy Canyon Road, Native Plant Reserve, 14 April 2005, *Doyle 11350* (UC, holotype; ABSH, BA, BM, FH, G, MANCH, NY, W, isotypes)

- Phaeoceros carolinianus* (Michx.) Prosk., *Bull. Torrey Bot. Club* 78(4): 347, 1951 (Proskauer 1951). Basionym:—*Anthoceros carolinianus* Michx., *Fl. Bor.-Amer. (Michaux)* 2: 280, 1803 (Michaux 1803). Type:—USA. South Carolina: “in humidis Carolinae inferioris” (PC, lectotype selected by Hässel 1987)
- = *Anthoceros callistictus* Spruce, *Trans. & Proc. Bot. Soc. Edinburgh* 15: 576, 1885 (Spruce 1885). **syn. nov.** Type:—BRAZIL. Fl. Bombonasa, *Spruce s.n.* (NY-00364001!, [http://sweetgum.nybg.org/vh/specimen.php?irn=192134]), lectotype **here designated** [or possibly holotype].
- = *Anthoceros tenuissimus* Steph., *Hedwigia* 32(3): 145, 1893 (Stephani 1893), **syn. nov.** Type:—ANGOLA. Lubango: Chella Mt., March 1883, *F. Newton s.n.* (G-00045052! [http://www.ville-ge.ch/musinfo/bd/cjb/chg/adetail.php?id=141024&lang=en], lectotype **here designated** [or possibly holotype])
- Phaeoceros tigrinus* (Gola) J.C.Villarreal, **comb. nov.** Basionym:—*Anthoceros tigrinus* Gola, *Ann. Bot. (Rome)* 13: 72, 1914 (Gola 1914). Type:—ETHIOPIA. Amhara: Debarek, 1 November 1909, *Chiovenda 2981* (FT, holotype).

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