Transfer of Polianthes geminiflora into Agave (Asparagaceae): new combinations (Nomenclature of Agave II)

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Transfer of *Polianthes geminiflora* into *Agave* (*Asparagaceae*): new combinations (Nomenclature of *Agave* II)

Abstract

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To accommodate the inclusion of *Polianthes* into *Agave*, which is strongly supported by molecular phylogenetic studies, four new combinations for the transfer of *Polianthes geminiflora* and its infraspecific taxa are proposed. A lectotype is selected for *Coetocapnia geminiflora*, and a neotype for *Robynsia geminiflora*.

Additional key words: *Agavaceae*, *Bravoa*, Flora of Mexico, nomenclature, taxonomy, typification

Introduction

Phylogenetic studies of *Agave* L. and related genera (*Asparagaceae*, *Agavoideae*) based on molecular data (Bogler & Simpson 1996; Bogler & al. 2006; Good-Ávila & al. 2006) or morphological data (Hernández-Sandoval 1995; Tambutti in Eguiarte & al. 2006) have shown that the small genera *Manfreda* Salisb., *Polianthes* L. (incl. *Bravoa* Lex.) and *Prochnyanthes* S. Watson are nested within the large *Agave*, thus rendering *Agave* paraphyletic as traditionally circumscribed. For a taxonomic synopsis, a monophyletic re-circumscription of *Agave* has been suggested (Thiede 2001): *Manfreda*, *Polianthes* and *Prochnyanthes* are included in *Agave* and together classified as *Agave* subg. *Manfreda* (Salisb.) Baker. To accommodate this revised circumscription of *Agave*, the necessary new combinations were published by Thiede & Eggli (1999, 2001), Etter & Kristen (2007) and Thiede (2012).

When transferring *Polianthes geminiflora* (Lex.) Rose 1903 into *Agave*, Thiede & Eggli (1999) chose *A. duplicata* Thiede & Eggli as a replacement name due to the earlier *A. geminiflora* (Tagl.) Ker Gawl. 1817. However, they overlooked that M. Roemer had published the replacement name *Bravoa coetocapnia* M. Roem. 1847 when transferring *Coetocapnia geminiflora* Link & Otto 1828 (which is now a heterotypic synonym of *P. geminiflora*) into *Bravoa* due to the earlier *B. geminiflora* Lex. 1824 (which is the basionym of *P. geminiflora*). Consequently, *B. coetocapnia* provides the second oldest epithet and has to serve as the basionym when transferring *P. geminiflora* and its infraspecific taxa into *Agave*.

Results and Discussion

Agave coetocapnia (M. Roem.) Govaerts & Thiede, **comb. nov.** ≡ *Bravoa coetocapnia* M. Roem., Fam. Nat. Syn. Monogr. 4: 245. 1847 ≡ *Coetocapnia geminiflora* Link & Otto, Icon. Pl. Rar.: 35. 1828. – Holotype: from cultivation in the Botanic Garden, Berlin, originally collected "*in Regno Mexicano ad Rincon de Temascaltepec*", 1826, *F. Deppe s.n.* (specimen apparently not extant). – **Lectotype (designated here):** [icon] "*Zetocapnia*" [sic!] in Link & Otto, Icon. Pl. Rar.: t. 18. 1828.
= *Bravoa geminiflora* Lex. in La Llave & Lexarza, Nov.

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Veg. Descr. 1: 6. 1824 ≡ *Polianthes geminiflora* (Lex.) Rose in Contr. U. S. Natl. Herb. 8: 12. 1903 ≡ *Agave duplicata* Thiede & Eggli in Kakteen And. Sukk. 50: 111. 1999. – Holotype: "*in montibus Micciacanis*, *et prope Vallisoletum*" [mountains near Valladolid (now Morelia) in the state of Michoacán], *Lexarza s.n.* (specimen apparently not extant). – Neotype (designated by Solano & García-Mendoza 2013: 4): *J. Rzedowski 39338* (ENCB; isoneotype: IEB).
= *Robynsia geminiflora* Drapiez in Lemaire, Hort. Universel 2: 127. 1840. – Type: "*collection de MM. Van der Maelen*" [from cultivation in Brussels, Belgium, originally collected in México, *H. Galeotti s.n.*] (specimen apparently not extant). – **Neotype (designated here):** [icon in] Lemaire, Hort. Universel 2: t. 69. 1841.
= *Polianthes americana* Sessé & Moc., Pl. Nov. Hisp.: 54. 1888. – Type: México: "*In Santi Angeli*, *hortis prope Mexicum*" (specimen apparently not extant).
= *Polianthes* [sphalm. "*Polyanthes*"] *tubulata* Sessé & Moc., Fl. Mexic., ed. 2: 88. 1894. – Type: not indicated.

At first glance, *Coetocapnia geminiflora* Link & Otto 1828 as well as *Robynsia geminiflora* Drapiez 1841 both appear to represent new combinations based on *Bravoa geminiflora* Lex. 1824, i.e. "implied comb. nov." according to Art. 41.4 of the International Code of Nomenclature for algae, fungi, and plants (McNeill & al. 2012). However, Art. 41.4 does not apply, as both names are definitely based on different types and clear indication is given that they are new. Furthermore, if both names were considered new combinations, the new monotypic genera would become superfluous, which surely cannot have been the intention of their authors. It is a strange coincidence and possibly unique in the plant kingdom that three different authors independently gave the same epithet to the same species in three different genera.

An alternative to reviving the epithet of *Bravoa coetocapnia* would be a proposal to conserve the name *Agave duplicata*, thus avoiding another name change. We consider this undesirable for the following reasons: *A. duplicata* is a very recent name, its combinations under *Agave* are not yet accepted by many authors, and the species is of no special horticultural or other importance.

Regarding the type of *Coetocapnia geminiflora*, the type specimens of Deppe are apparently not extant at B according to a search in the BioCASE portal for BGBM collections (http://search.biocase.org/bgbm/) and in EDIT (the Specimen and Observation Explorer for Taxonomists database at BGBM: http://search.biocase.org/edit/index) and a search of the actual herbarium by N. Turland (pers. comm., 19 Nov 2013). Consequently, the plate accompanying the protologue is selected here as lectotype. Solano & García-Mendoza (2013: 4) wrongly cited this plate as the holotype.

Regarding the type of *Bravoa geminiflora*, Stafleu & Cowan (1979: 869) could not locate specimens of Lexarza, McVaugh (1989: 251) stated "No holotype is known to exist" and EDIT does not contain information for any specimen of Lexarza. Solano & García-Mendoza (2013: 4) recently designated a neotype, which is cited above.

Regarding the type of *Robynsia geminiflora*, Lemaire published a short validating description on p. 127 on 21 Oct 1840 (Stafleu & Cowan 1979: 835) quoting a description supplied by Drapiez; this is the protologue of the name. Later, on 3 Mar 1841 (Stafleu & Cowan l.c.), Drapiez published a detailed description on pp. 231–232(–234) accompanied by t. 69, adding that the plant was cultivated in Brussels by M. Van der Maelen, who obtained the plant from M. Galeotti, who collected it in Mexico. Because the illustration was published later than the validating description, the illustration does not constitute original material for the name (McNeill & al. 2012: Art. 9.3). It is not therefore eligible as the lectotype, but because there is no original material it can be designated as the neotype.

The varieties of *Polianthes geminiflora*, transferred to *Agave* at subspecific rank under *A. duplicata* by Thiede & Eggli (1999) and Thiede (2012), are recombined under *A. coetocapnia* as follows:

Agave coetocapnia (M. Roem.) Govaerts & Thiede subsp. ***coetocapnia***

Agave coetocapnia subsp. ***clivicola*** (McVaugh) Govaerts & Thiede, **comb. nov.** ≡ *Polianthes geminiflora* var. *clivicola* McVaugh in Fl. Novo-Galiciana 15: 250. 1989 ≡ *Agave duplicata* subsp. *clivicola* (McVaugh) Thiede & Eggli in Kakteen And. Sukk. 50: 111. 1999.

Agave coetocapnia subsp. ***pueblensis*** (E. Solano & García-Mend.) Govaerts & Thiede, **comb. nov.** ≡ *Polianthes geminiflora* var. *pueblensis* E. Solano & García-Mend. in Acta Bot. Mex. 78: 117. 2007 ≡ *Agave duplicata* subsp. *pueblensis* (E. Solano & García-Mend.) Thiede in Haseltonia 17: 94. 2012.

Another species, originally named *Polianthes graminifolia* Rose, was reduced to varietal rank under *P. geminiflora* by McVaugh (1989) and recombined at subspecific rank under *Agave duplicata* by Thiede & Eggli (1999), but then recognized again at species rank in a revision of *Polianthes* by Solano (2002), where it groups separately from both *P. geminiflora* var. *geminiflora* and *P. geminiflora* var. *clivicola* in a phenogram of morphological characters, hence it is here transferred at species rank to *Agave*. García-Mendoza & Solano (2007) recognized *P. graminifolia* as a species of its own, and the recent review of *P. geminiflora* by Solano & García-Mendoza (2013) excluded *P. graminifolia*.

Agave graminifolia (Rose) Govaerts & Thiede, **comb. nov.** ≡ *Polianthes graminifolia* Rose in Contr. U. S. Natl. Herb. 8: 11. 1903 ≡ *Bravoa graminifolia* (Rose) Conz.,

Fl. Taxon. Mexic., ed. 2, 2: 87. 1947 ≡ *Polianthes geminiflora* var. *graminifolia* (Rose) McVaugh in Fl. Novo-Galiciana 15: 251. 1989 ≡ *Agave duplicata* subsp. *graminifolia* (Rose) Thiede & Eggli in Kakteen And. Sukk. 50: 112. 1999.

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