



***Deuterocohnia meziana* (Bromeliaceae): subspecies classification and the description of the new subspecies *D. meziana* subsp. *vogtii* from northern Paraguay**

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Abstract

Deuterocohnia meziana is distributed in southeastern Bolivia, northern Paraguay and western Brazil. The xerophytic species colonizes dry, rocky slopes or outcrops. This study classifies four subspecies of *Deuterocohnia meziana*: (1) *Deuterocohnia meziana* subsp. *meziana*; (2) *Deuterocohnia meziana* subsp. *carmineo-viridiflora*, which has formerly been described as a variety; (3) *Deuterocohnia meziana* subsp. *pedicellata*, previously described as a separate species; and (4) *Deuterocohnia meziana* subsp. *vogtii*, a new subspecies from northern Paraguay. In addition to notes on nomenclature, morphology and biogeography, a key to the subspecies is provided.

Introduction

Deuterocohnia Mez is one of the five genera belonging to the bromeliad subfamily Pitcairnioideae s.str. (Givnish et al. 2007, 2011). The genus comprises 17 species, which are all adapted to arid habitats. Most of the *Deuterocohnia* species are distributed in southern Bolivia and northern Argentina, some species occur in Brazil, Paraguay, Peru or Chile (Schütz 2013).

Deuterocohnia meziana Kuntze ex Mez was first published in 1896 by Carl Christian Mez. The publication based on a description of Kuntze, who had collected plants of this species in Corumbá, Brazil. Nowadays this species is also known from southeastern Bolivia and northern Paraguay (Fig. 1). Some of the largest plants within the genus belong to this species. Populations of *D. meziana* vary in leaf size and flower characters. In particular the sepals and petals can occur in numerous colour shades of rose, reddish, orange or yellow, the petals always exhibit a greenish tip. Despite the broad morphological variation among populations of this species, distinct groups can be distinguished, which differ morphologically as well as geographically and ecologically. Geographic distribution patterns are considered to be important for the recognition of infraspecific taxa (Stuessy 1990, Wendt et al. 2000). The present study assigns four subspecies to *D. meziana*: (1) *D. meziana* subsp. *meziana*, (2) *D. meziana* subsp. *carmineo-viridiflora*, which formerly had been treated as a single variety (Rauh 1985) or species (Gouda 2012), (3) *D. meziana* subsp. *pedicellata*, which had been designated as a separate species (*D. pedicellata* Till (2004: 42)), and (4) a new subspecies from Paraguay, *D. meziana* subsp. *vogtii*. This classification is based on the analyses of about 120 herbarium specimens as well as living plant material in the field and in botanical gardens. Selected morphological characters are shown in Table 1.

Molecular phylogenetic studies of the genus *Deuterocohnia* (Schütz 2013) revealed a close relationship between the species *D. meziana*, *D. brevispicata* Rauh & L.Hrom. (1988: 5) and *D. seramisiana* R. Vasquez, Ibisch & E. Gross (2002: 4). Species delimitation within the genus, however, proved to be difficult due to hybridization among geographically closely related species. Future projects include population genetics to analyse differentiation between the subspecies.

Specimens of *Deuterocohnia meiziana* not assignable to one of the subspecies (due to insufficient herbarium material):—
BOLIVIA. without precise locality: 16 July 1978, *Rauh s.n.* (US 00386035). Dept. Santa Cruz: Prov. Nuflo de Chavez: Lomerios at 359 km, 59°03' W, 300–400 m, 30 October 1999, *Agreda and Wood 30* (USZ). Prov. Caballero: Comarapa to Vallegrande, 17°55' S, 64°30' W, 2100 m, November 1947, *Cárdenas 4007* (US); 3 km (air line) WSW of Comarapa, 2.9 km by road from highway at Comarapa, on gravel road to Chilón, 17°55' S, 64°33' W, 1960 m, 26 November 1999, *Nee 50662* (NY, USZ); Saipina; 3 km E of Los Thacras, 18°03'18" S, 64°33'40" W, 1660 m, 20 January 1995, *Balcazar 100* (USZ); 7 km from Saipina, E side of Río Mizque, near archaeological pictograph site, 18°05' S, 64°35' W, 1450 m, 07 August 1987, *Nee and Coimbra 35574* (NY); 5.4 km E of Saipina on road to Pulquina, 18°05'38" S, 64°32'34" W, 1465 m, 10 December 2005, *Nee et al. 53741* (NY). Prov. Cordillera: Estancia Isla Verde, vicinity of Bañados del Izozog, Río Parapeti, 20 km air line NE of the Estancia, 19°25' S, 62°40' W, 300 m, 17 August 1997, *Fuentes and Navarro 1992* (USZ); Hacienda Yatihuiwa, 19°53' S, 63°31' W, 870 m, 25 July 1998, *Portugal et al. 198* (LPB); Estancia Cerro Colorado, near Cerro Colorado, 12 December 1993, *Navarro 2153* (USZ). Dept. Tarija: Prov. Gran Chaco: Palos Blancos 3 km towards Puerto Margarita via Río Pilcomayo, 21°25' S, 63°45' W, 625 m, 24 December 1983, *Beck and Liberman 9727* (LPB (2 sheets), USZ).

PARAGUAY: Near Mayor Santa Cruz, 22 October 1980, *Fernández Casas 4405* (NY); s.d., *Collins 9-19* (GH).

s. loco: *Arenas s.n.* (US 2825570); *coll. ign.* (HEID 600156).

Putative hybrid zones between the subspecies have been observed, e.g. in the border region of Chuquisaca, Santa Cruz and Cochabamba (Bolivia), where neighbouring populations showed gradual differences in certain characters (e.g., pedicel length). Sometimes different characters states (e.g., flower colour) were even found in the same population. Putative hybrids: Prov. Vallegrande: Road from Vallegrande to Villa Serrano, between Pucara and the bridge Santa Rosa over Río Grande, 18°42'20" S, 64°16'40" W, 1470 m, 29 September 2009, *Schütz et al. 09-004* (FR, LPB); *ibid.*: *Schütz et al. 09-005* (LPB); *Schütz et al. 09-006* (LPB); *Schütz et al. 09-007* (LPB).

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