Rodriguésia 66(2): 661-664. 2015
http://rodriguesia.jbrj.gov.br
DOI: 10.1590/2175-7860201566229

Short Communication
Nomenclatural correction in *Cryptanthus* Otto & A. Dietrich. (Bromeliaceae - Bromelioideae).

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Abstract

Nomenclatural correction in *Cryptanthus* Otto & A. Dietrich. (Bromeliaceae - Bromelioideae). A nomenclatural correction of the author name of *Cryptanthus zonatus*, an endemic species of Northeastern Brazil, is provided. A new synonym of this species is also proposed.

Key words: Atlantic Forest, Monocotyledons, Poales, taxonomy.

Cryptanthus Otto & A. Dietr. *nom. cons.* (Bromeliaceae - Bromelioideae) is a genus endemic to eastern Brazil from Rio Grande do Norte to Rio de Janeiro and Minas Gerais (Versieux *et al*. 2013; Forzza *et al*. 2014). It is mainly limited to the humid and shady vegetation of the coastal Atlantic Forest (Smith & Downs 1979). It is also found in the rocky outcrops locally called "campos rupestres" in Cerrado vegetation, on sandy soils in dune vegetation along the coast "restingas", and also in dry-forest and humid-forest of high altitude in "Caatinga" vegetation locally called "brejos de altitude" (Ramírez-Morillo 1996; Versieux *et al*. 2013; Forzza *et al*. 2014).

Almost 80 species are accepted in the genus and ca. 30 of them grow in northeastern Brazil (Forzza *et al*. 2014). Ramírez-Morillo (1996, 1998) pointed out that 90% of the species has a very restricted distribution and indicated that some of them as *C. bivittatus* (Hook.) Regel can be already extinct in the wild because of the high deforestation rate in the Atlantic Forest. *Cryptanthus* is morphologically related to *Orthophytum* Beer and *Lapanthus* Louzada & Versieux (Smith & Downs 1979; Ramírez-Morillo 1996; Louzada *et al*. 2014). Recent studies reinforced the evolutionary relationship (with different levels of support) among the three genera including the non-monophyletic condition of *Orthophytum*, *Cryptanthus* as a sister-group of *Lapanthus*, and the weakness of the infrageneric classification of *Cryptanthus* (Alves 2013; Louzada *et al*. 2014).

Cryptanthus can be recognized by a set of characters such as plants terrestrial or saxicolous, short caulescent and andromonoecious or hermaphroditic with white to light-greenish flowers that are odorless or rarely fragrant. The andromonoecy is very seldom in Bromeliaceae with some examples in *Catopsis* Griseb., *Cryptanthus* (*C.* subgen. *Cryptanthus*), and *Hechtia* Klotzsch (Smith & Downs 1974; Smith & Till 1998; Ramírez-Morillo 1996). The sepals and petals are partially connate and the petal appendages are missing in the genus (Smith & Downs 1979; Ramírez-Morillo 1996; Siqueira-Filho & Leme 2006) which distinguishes it from *Orthophytum* and *Lapanthus*. The name of the genus refers to the nidular inflorescence and flowers with short pedicels (Ramírez-Morillo 1996), which leave them inserted in the rosette and not very conspicuous.

Some of the sections and species in *Cryptanthus* have problems with taxonomic delimitation, which is sometimes related to cultivated specimens which are described but with doubtful or unreliable indication of types, type-locality or herbarium where the samples were deposited (Ramírez-Morillo 1998). It reinforces

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that the common use as ornamental plants can produce nomenclatural and taxonomy instability with new species, some of them possible hybrids, published by local societies in horticultural magazines and often with a lack of scientific accuracy. This condition can be exemplified by *Cryptanthus bromelioide* var. *tricolor* Foster (synonym of *C. bromelioide* Otto & A. Dietr.), which was described based on cultivate plant with no accurate locality and *C. dorothyae* Leme which is considered a synonym of *C. acaulis* (Lindl.) Beer by Ramírez-Morillo (1996) and valid species by Forzza *et al*. (2014).

Here is presented a correction on the author designation of a species as well as some input about synonymy and morphological variation. *Cryptanthus zonatus* (Vis.) Beer was cited by Mez (1896), Smith & Downs (1979), Versieux *et al*. (2013), and Forzza *et al*. (2014). However, there is a mistake that has been copied for years since Beer (1856).

Roberto de Visiani (1800-1878), botanist and director of the Botanical Garden of Padua (Italy) from 1837-1878, published in 1847 on the last page of a index of plants from the institution, a monospecific genus called *Pholidophyllum* Vis. Under this new genus, he provided a short description of *P. zonatum* Vis. and *P. zonatum* ß *fuscum* Vis. For both taxa, Roberto de Visiani also indicated as synonyms names that had never been published but were used for cultivated specimens at "Orto Botanico Patavino": *Tillandsia zonata* var. *viridis* Hort. (syn. of *P. zonatum*) and *Tillandsia zonata* var. *fusca* Hort. (syn. of *P. zonatum* ß *fuscum*). Both names are *nomen nudum*, indicated and first published as such by Visiani (1847) and not by Otto & Dietrich (1848) as cited by Mez (1896) and Smith & Downs (1979).

In 1854, Roberto de Visiani published a short and poorly known paper, which was found at the library of University of Padua. In this publication, he proposed a new combination for both taxa (under the genus *Pholidophyllum*) established by him 8 years previously. Two years after that, Beer (1856), in his major work about Bromeliaceae, not aware of the recent publication by Visiani (1854), also proposed the same new combinations.

No type is clearly indicated in the protolog of both taxa, except for the indication that the short descriptions were based on cultivated specimens from the botanical garden ("Orto Botanico") in Padua. Living specimens had possibly been sent from the Botanical Garden of Genova to Roberto de Visiani (at "Orto Botanico Patavino") and to Antonio Bertoloni (at "Horto Botanico Bolognese"). This assumption is based on the labels of bromeliad exsiccatae located at herbarium BOLO.

Smith & Downs (1979) cited as holotypes of *C. zonatus* f. *zonatus* and *C. zonatus* f. *fuscus* (Vis.) Mez two cultivated specimens deposited at herbarium PAD but not seen by him ("Padua Hortus s.n., holotype, PAD n.v."). The Bromeliaceae collection at herbaria PAD, where the original collection from Roberto de Visiani is deposited, and BOLO, which also holds some specimens studied by him, were carefully searched and no specimens of *Cryptanthus* (or under the name *Pholidophyllum* or *Tillandsia*) were found. So, the lack of type specimens for both names described under *Pholidophyllum* was confirmed as previously noted by Ramírez-Morillo (1996, 1998), who appropriately designated a neotype.

Cryptanthus zonatus (Vis.) Vis., Pl. Nuove Bromel.: 9. 1854. *Pholidophyllum zonatum* Vis., Ind. Sem. Hort. Patav.: 4. 1847. Neotype: Brazil: Pernambuco, Prov. Caruaru, fl. cult., 25 Jun 1972, *E. Waras s.n.* (HB!). *Tillandsia zonata* var. *viridis* Hort., Ind. Sem. Hort. Patav.: 4. 1847, *nom. nud*. *Cryptanthus zonatus* (Vis.) Beer, Fam. Bromel.: 76. 1856, *nom. sup., syn. nov.*

= *Podophyllum zonatum* Vis. var. ß fuscum Vis., Ind. Sem. Hort. Patav.: 4. 1847. *Tillandsia zonata* var. *viridis* Hort., Ind. Sem. Hort. Patav.: 4. 1847, *nom. nud. Cryptanthus zonatus* Vis. f. *fuscus* (Vis.) Mez in DC, Monogr. Phan. 9: 58. 1896.

= *Cryptanthus fosterianus* L.B. Smith, Bull. Bromeliad Soc. 2: 63. 1952. Holotype: Brazil, Pernambuco, Serra Negra, near Paraiba, 13 Oct 1948, *M.B. Foster 2431* (US!). *syn. nov.*

Cryptanthus sect. *Zonatae* I. Ranmírez is recognized by the transversal silver bands of trichomes on the adaxial surface of the foliar blades (Ramírez-Morillo 1996). The section was proposed to accommodate three morphologically and geographically related species: *C. zonatus* (Vis.) Vis., *C. fosterianus* L.B. Smith and *C. burle-marxii* Leme. All three, at that time, were considered endemic to the state of Pernambuco, northeastern Brazil.

Cryptanthus zonatus is listed as Vulnerable by CNCFlora (2014) and grows from the state of Sergipe to Rio Grande do Norte, with no record

yet from the state of Paraíba (Mendes *et al*. 2010; Forzza *et al*. 2014), although it has been seen very close to the northern border of the state (Versieux *et al*. 2013). *Cryptanthus fosterianus* and *C. burle-marxii* are basically known from the type-specimens which bloomed under cultivation (Smith 1952; Leme 1990).

Smith & Downs (1979) and Ramírez-Morillo (1996) provided few differences among the three species but some characters used to recognize the species are clearly variable among the studied specimens, such as the leaf texture and color. Versieux *et al*. (2013) reinforced this variability by noting the occurrence of specimens growing together with silver bands on the leaves, with no bands, as well as green to dark wine-red, almost maroon, leaves. Illustrations and photos are provided by Smith & Downs (1979) and Versieux *et al*. (2013).

The size of the floral bracts and margin of the sepals were also used to separate *C. zonatus* from *C. fosterianus* by Smith & Downs (1979) and Siqueira-Filho & Leme (2006). However, the differences are not consistent in the type-collections as well as among other specimens studied. Based on these findings, this name is here proposed as a new synonym of *C. zonatus*.

Cryptanthus zonatus and *C. buirle-marxii* have been distinguished by the short axillary shoots vs. long and slender stolons (Ramírez-Morillo 1996), which has also been confirmed as variable among the specimens of *C. zonatus* (Versieux *et al*. 2013). Leme (1990) cited the occurrence of two conspicuous longitudinal calli on the petals of *C. buirle-marxii* and Ramírez-Morillo (1996) describes *C. zonatus* referring to both states in her work: without calli (on p.118) and with calli (on p.223). She also suggested that the pair of calli found in some species of the genus could be homologous with the petal appendages in other bromeliads. The poor condition of the type-specimen of *C. burle-marxii* (Pernambuco, Gravatá, fl. cul., *R. Burle-Marx s.n.* - HB!) and its original description and illustration (Leme 1990) in addition to the fact that most of the herbarium specimens located lack well-preserved flowers do not allow for precise observation of the presence of calli on the petals. A better evaluation of fresh flowers or in spirit collections is mandatory to verify the validity of this character. For now, we would prefer to keep both species as distinct taxa. Given that the identification of *C. burle-marxii*, based on the descriptions and key available (Leme 1990; Ramírez-Morillo 1998), is not accurate or reliable, besides that both type localities are very close to each other (municipalities of Caruaru and Gravatá, Pernambuco), and probably coexist in the same area, the reality behind recognizing two distinct taxa is perhaps doubtful.

Selected studied specimens: BRAZIL. S. loc., in cult., 1958, *J. Roehrs s.n.* (US), 4.I.1982, *Schwerdtfeger 11415* (B), 7.VIII.1988, *G. Martinelli 4863* (RB). Pernambuco: Igarassu, Usina Sao José, 17.VIII.2011, *B. Amorim et al. 992* (JPB, UFP); Jaqueira, Usina Catende, 18.IV.2004, *J. Siqueira-Filho 1429* (UFP); Recife, Dois Irmaos, 2.XI.1954, *D. Andrade-Lima 54-1920* (IPA, US). Rio Grande do Norte: Baia Formosa, Mata da Estrela, VIII.1998, *G. Martinelli 15079* (RB). Sergipe: Areia Branca, Parque Nacional Serra de Itabaina, 21.IV.2008, *K. Mendes et al. 208* (UFP).

Acknowledgements

Financial support for visiting the European herbaria and libraries was provided by Capes-Probral and CNPq. We thank the curators of the visited herbaria and Scott Heald for the English review.

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Artigo recebido em 22/10/2014. Aceito para publicação em 27/03/2015.