



## Extension of the *Cryptanthus* range in Northeastern Brazil with new findings in the phenotypic variation including changes in the trichome's distribution, thus enhancing the understanding of the *Cryptanthus zonatus* complex (Bromeliaceae)

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### Abstract

In this paper we describe the first occurrences of the genus *Cryptanthus* in the state of Rio Grande do Norte (RN), establishing a new northern distribution limit for the genus. Additionally, we report the finding of three forms of *C. zonatus* growing in sympatry within two different localities in Rio Grande do Norte along with the phenotypic variation in this species complex including changes in trichome's distribution. *Cryptanthus zonatus* is one of the most popular bromeliads due to its banded leaves. Nevertheless, the fact that it exists in two distinct glabrous-leaved forms is not readily accepted by all the authors. Confusion could be attributed to the fact that they were described from cultivated material without any information about provenance. Based on extensive fieldwork and observations we document here that banded leaves can become glabrescent and that green and red-maroon leaves (treated as forms) may occur on the same shoot. Our finding is important for future biogeographic works when considering Bromelioideae genera distribution in Eastern Brazil center of diversification. This leads to a better understand of species delimitation within this poorly known complex and would impact conservation strategies, given that all the species related to *C. zonatus* are under threat.

**Key words:** Atlantic forest, Bromelioideae, color morphs, endemism, earth stars, *restinga*

### Introduction

Bromeliaceae is a key element in the Neotropical landscapes, however species definition in several groups may be difficult and taxa complexes are constantly being revised (e.g., Faria *et al.* 2010, Versieux 2011). The existence of distinct color phenotypes for one species in a single population (called color morphs), is documented under natural conditions for some species (e.g., Barbará *et al.* 2007). On the other hand, ornamentation due to discolourous pigmentation in leaves of a single specimen is a frequent characteristic within several genera (e.g., *Neoregelia*, *Vriesea*), and this has defined new cultivars much appreciated by horticulturists (Benzing 2000a). Leaf color varying from green to deep wine red in a single species of bromeliad is also traditionally accepted as a consequence of growing conditions, particularly sun light (Rauh 1990). Basically, (for other than yellow, green and white) this is a consequence of anthocyanin accumulation in leaves, which may be related to abiotic or biotic effects such as extensive light, UV-B radiation, nutrient deficiency, reactive oxygen molecules, water stress (osmoregulation), and herbivory (Close & Beadle 2003, Manetas 2006), which may be avoided due to aposematic coloration in red leaves (Cooney *et al.* 2012). In the genus *Alcantarea*, juvenile rosettes already show the color segregation pattern and color morphs (green and red individuals) may represent separate genetic clusters (Barbará *et al.* 2007), suggesting the necessity to keep studying these kind of plant variations in order to understand their genetic base. In the present paper we