NEW COMBINATIONS IN CROCODEILANTHE
(PLEUROTHALLIDINAE, ORCHIDACEAE)

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Abstract. Four new combinations in Crocodeilanthe (Pleurothallidinae, Orchidaceae) are proposed. A second-step lectotype is selected for Pleurothallis stellidioiodes and a first-step lectotype for Pseudostelis bradei.

Keywords: Crocodeilanthe, Niphanta, Physosiphon, Pseudostelis, Pleurothallis, Stelis

Crocodeilanthe Rchb. f. & Warsz., as currently recognized by the author, comprises ca. 90 epiphytic orchids mostly distributed in Central and South America, with one species restricted to the Greater Antilles and another reaching Trinidad and Tobago (Luer, 1998). Previously considered a monotypic genus (Garay, 1974) and a subgenus of Pleurothallis (Luer, 1986, 1998), Luer finally elevated it to the generic rank in 2004.

Pseudostelis Schltr., which included species distributed in Central America through the Andes down to southern Brazil, was first described in 1922 based on three names: Physosiphon spiralis Lindl., Stelis deregularis Barb. Rodr. and Pseudostelis bradei Schltr. They all have been proven to be conspecific, and the oldest available binomial for this taxon is Physosiphon spiralis, the basionym of Pseudostelis spiralis (Lindl.) Schltr. Schlechter did not select a type for his new genus, but Garay (1974) designated Physosiphon spiralis as the lectotype.

Luer (1999) treated Pseudostelis as a subgenus of Pleurothallis R. Br. and recognized six species: Pleurothallis bracteosa C. Schweinf., P. deregularis (Barb. Rodr.) Luer, P. magdalenaef Rchb.f., P. melanostele Luer & R. Vásquez, P. rufobrunnea (Lindl.) Luer, and P. simplex Ames & C. Schweinf. With exception of P. rufobrunnea, which is clearly a member of the genus Stelis and duly transferred to this genus by Williams (1939), the other five species share the same habit and floral morphology with Crocodeilanthe. While Pleurothallis bracteosa has been already transferred to Crocodeilanthe (Luer, 2011), the remaining names still await for the necessary nomenclatural changes.

The molecular evidence published so far (Pridgeon et al., 2001; Solano, 2005; Karremans et al., 2013) suggests that Crocodeilanthe is largely a monophyletic assemblage and closely related to Stelis Sw., but not embedded in it. Only five Crocodeilanthe species were sampled and the nomenclatural type of the genus, C. xiphiusa Rchb. f., was not. This renders the relationships of Crocodeilanthe still uncertain. In Karremans et al. (2013), Physosiphon spiralis (cited as Stelis deregularis), the nomenclatural type of Pseudostelis, was analyzed and found sister to Crocodeilanthe. Pleurothallis rufobrunnea (= Stelis rufobrunnea (Lindl.) O. Williams) was also sampled and not surprisingly found embedded in Stelis. This species presents typical sepals, petals, and lip found in Stelis and the column is not distinct from several others whose bilobed stigma coalesces in one. Luer (1999) erroneously placed it in Pleurothallis subgen. Pseudostelis (Schltr.) Luer.

Although vegetative and morphological alignment with available molecular data and support the inclusion of Pseudostelis in the synonym of Crocodeilanthe, additional studies employing a broader sample, using supplementary DNA fragments and additional methods of phylogenetic analysis combining morphological data, are required to clarify incongruences found in Karremans et al. (2013). The placement of Crocodeilanthe domingensis (Cogn.) Luer (cited as Stelis antillensis Pridgeon & M. W. Chase) next to Stelis nexitous Garay and to Niphanta gelida (Lindl.) Luer (cited as Stelis gelida (Lindl.) Pridgeon & M. W. Chase) should be further investigated and their assessment reconsidered.

Crocodeilanthe, including Pseudostelis, forms a well-defined group as presented by Luer (1998, 2004) and discussed in Luer & Toscano de Brito (2018). This genus may well include Niphanta Luer, as proposed by Carnevali & Ramírez (2014), with which it shares similar habit and floral morphology, but the transfer of all Crocodeilanthe species to Stelis, as proposed by Pridgeon & Chase (2002) and later advocated by Karremans et al. (2013) and Karremans (2015, 2016), is not justified and therefore not followed here.

In this article Pseudostelis is considered a synonym of Crocodeilanthe based on morphology and on the current molecular evidence. Therefore species previously treated in Pseudostelis and in Pleurothallis subgenus Pseudostelis are transferred herein to Crocodeilanthe, the only exception being Pleurothallis rufobrunnea for the reasons already stated in this article. Stelis duckei E. M. Pessoa & M. Alves, recently described for northeast Brazil, clearly belongs to this orchid group and it is also duly transferred to Crocodeilanthe.
**Taxonomy**

**Crocodeilanthe duckei** (E. M. Pessoa & M. Alves) Toscano, *comb. nov.*

This species has been recently described for the brejo forests of northeast Brazil. Reader should refer to Andrade Lima (1982) for a review of this type of forest. Together with *C. spiralis* (Lindl.) Toscano and another still unidentified species (A. L. V. Toscano de Brito and E. C. Smidt, unpubl. data), the genus is currently known to possess three species in Brazil.

**Crocodeilanthe magdalenae** (Rchb. f.) Toscano, *comb. nov.*

**Synomyms:** *Humboltia magdalenae* (Rchb. f.) Kuntze, Revis. Gen. Pl. 2: 667. 1891.


Luer (2009) designated a lectotype for *Pleurothallis stelidioides* based on an isotype at AMES, but there are two duplicates in that herbarium: AMES 14836 and AMES 118477. One of them, AMES 14836, is here selected as the second-step lectotype (see Article 9.17 of the Code in McNeill et al. 2012).

**Crocodeilanthe melanostele** (Luer & R. Vásquez) Toscano, *comb. nov.*


**Crocodeilanthe simplex** (Ames & C. Schweinf.) Toscano, *comb. nov.*

San José: Cerro de las Vueltas, 29 Dec. 1925–1 Jan 1926, alt 2700–3000 m, P.C. Standley & J. Valerio 44023 (Holotype: AMES).


**Crocodeilanthe spiralis** (Lindl.) Toscano, *comb. nov.*


**Stelis spiralis** (Lindl.) Cogn., Fl. Bras. 3 (4): 341. 1896.


Litterature cited


