

## Notes on the oncioid genus *Diadenium* (Orchidaceae) and description of a new species from Ecuador

Marta Kolanowska, Dariusz L. Szlachetko & Katarzyna Mystkowska

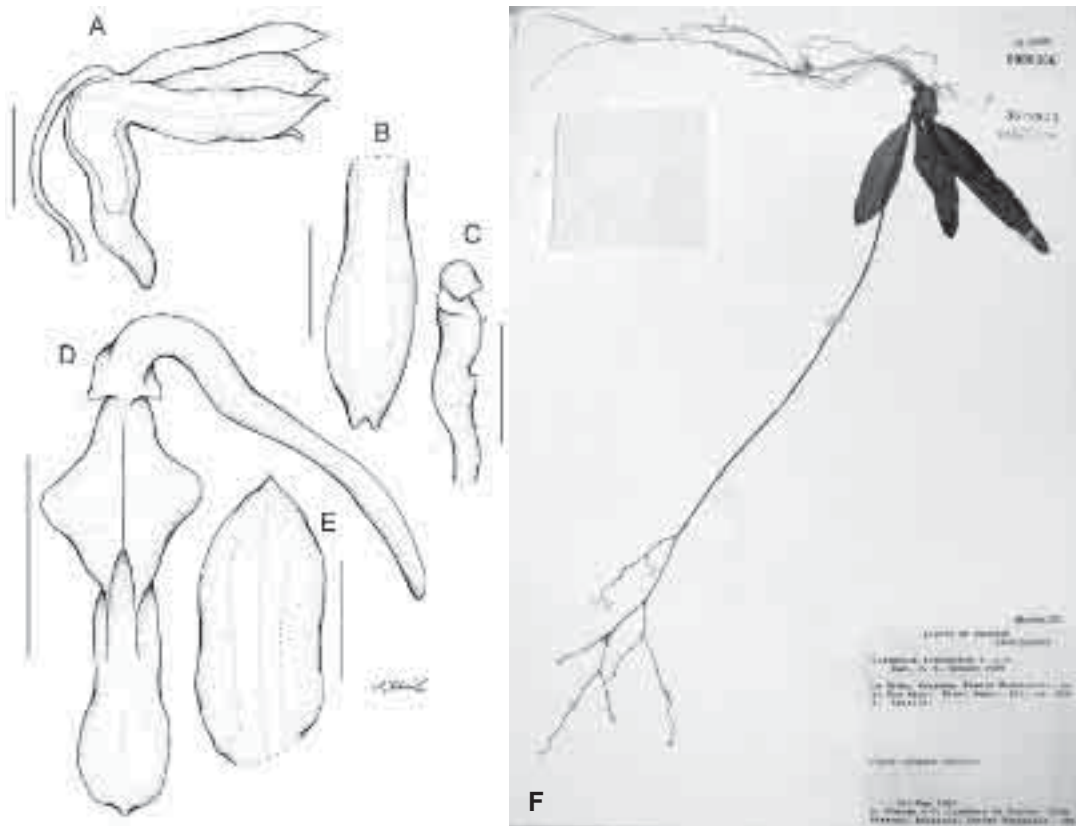
*Summary:* A new species of the genus *Diadenium* Poepp. & Endl. is described and illustrated based on plants from Ecuador. An identification key to all species of the genus is presented. The unique character of the new species is a sigmoid sepaline spur.

*Keywords:* Neotropics, *Diadenium*, flora of Ecuador, new species, taxonomy

The Neotropical orchid genus *Diadenium* Poepp. & Endl. was described by Eduard F. Poeppig and Stephan F. L. Endlicher in 1836. Description of this taxon was based on a plant collected in Peru and it was named *D. micranthum* Poepp. & Endl. (POEPPIG & ENDLICHER 1836). The generic name derived from Greek ‘di’ (two) and ‘aden’ (glands) in reference to the presence of two pollinia (SENGHAS 1995).

PFITZER (1887) included the genus into the subtribe Ionopsidinae (originally Ionopsidae) together with *Brachtia* Rchb. f., *Comparettia* Poepp. & Endl., *Ionopsis* Kunth, *Papperitzia* Rchb. f., *Rodriguezia* Ruiz & Pav., *Saundersia* Rchb. f., *Scelochilus* Klotzsch and *Trichocentrum* Poepp. & Endl. SCHLECHTER (1915) separated *Comparettia*, *Diadenium* and *Scelochilus* from Ionopsidinae and placed them with *Plectrophora* H. Focke and *Neokoehleria* Schltr. in the subtribe Comparettinae. Based on a morphological study, the genus was included into a broad concept of Oncidiinae (DRESSLER & WILLIAMS 1970; DRESSLER 1993) and this position of *Diadenium* was sustained by CHASE et al. (2003) based on molecular studies. SCHLECHTER’s (1915) classification was accepted by SZLACHETKO (1995), who, however, recognized some more genera in this group, as *Diadenopsis* Szlach., *Konantzia* Dodson & N.H. Williams, *Pfitzeria* Senghas, *Quekettia* Lindl., *Rodriguezia*, *Scelochiloides* Dodson & M.W. Chase, *Stigmatorthos* M.W. Chase & D.E. Benn and *Suarezia* Dodson (SZLACHETKO & MYTNIK-EJSMONT 2009).

CHASE et al. (2008) proposed to lump *Diadenium* together with representatives of *Neokoehleria*, *Pfitzeria*, *Scelochiloides*, *Scelochilopsis* Dodson & M.W. Chase, *Scelochilus* and *Stigmatorthos* into *Comparettia* on the basis of molecular researches. In this concept *Comparettia* is difficult to be defined in morphological aspect. The common character of its species is presence of sepaline spur and a horn or a pair of horns on the lip base secreting nectar. However, *Rodriguezia* and *Plectrophora*, which also produce similar sepaline spurs and lip basal calli, are in separated clades. More recently, NEUBIG et al. (2012) published the results of their extended molecular analyses of oncioid orchids based on five DNA regions. In the phylogenetic tree presented by the authors, two distinct clades are resolved within *Scelochilus* s.l. – one comprising species of *Neokoehleria*, the other one species of *Scelochilus* s.str. The clade comprising species of *Comparettia* s.str. is sister to the group embracing *Stigmatorthos* and *Diadenium*, while *Pfitzeria* is sister to all other taxa of *Comparettia* sensu CHASE et al. (2008). Since numerous species of the taxa in question



**Figure 1.** *Diadenium suarezorum* (drawings from the holotype). A – flower, B – synsepal, C – gynostemium, D – lip, E – petal, F – holotype. Scale bars = 2 mm.

were described recently, the morphological characteristics provided in the generic diagnoses were insufficient and the generic limits became more obscure. NEUBIG et al. (2012) approved the proposal of CHASE et al. (2008) to amalgamate all of the taxa with nectar horns into *Comparettia* s. latiss. (NEUBIG et al. 2012).

The morphological differences between *Scelochilus*, *Comparettia*, *Diadenium*, *Neokoeberlia*, *Scelochiloides*, *Stigmatorthos*, *Scelochilopsis* and *Pfitzeria* were recently evaluated by SZLACHETKO & KOLANOWSKA (2015) who suggested that the generic separateness of those orchids should be maintained at least until additional, representative molecular data are available.

Plants of *Diadenium* have short rhizomes and produce short and ovoid pseudobulbs. Their leaves are coriaceous. The inflorescence is a many-branched panicle composed of small, thin, pink flowers. The lateral sepals are basally connate forming a sepaline spur. The base of the 3-lobed lip is extended into the sepaline spur and the lip claw is attached to the column-foot along the median line. The lip is ornamented with a thin, laminar callus. The slender gynostemium is slightly arched at the apex. The terete column part is about 3 times longer than the anther and the column-foot is rather short. The subventral, incumbent anther is ellipsoid. The two pollinia are obliquely clavate-obovoid, slightly dorsiventrally compressed. The apical clinandrium forms a narrow, collar-like structure surrounding the anther base. The stigma is small, narrowly elliptic to slit-like, concave. The short rostellum is cylindrical, blunt and its remnant is canaliculate on the outer surface, with an oblique, slightly concave, apical plate surrounded by obscure, obliquely

*Diadenium* from Ecuador

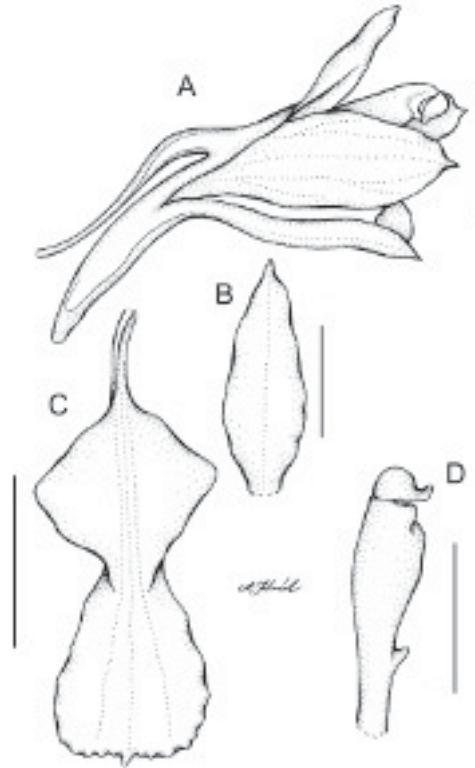


Figure 2. *Diadenium barkeri*. A – flower, B – dorsal sepal, C – lip, D – gynostemium. Scale bars = 2 mm

triangular lobules. The single, very small, thin viscidium is elliptic. The single tegula is thin, lamellate, linear in lower part and triangular-obovate or transversely elliptic in the apical half or third (DRESSLER & WILLIAMS 1970; SZLACHETKO & MYTNIK-EJSMONT 2009).

Representatives of *Diadenium* occur in Ecuador, Peru, Venezuela, Bolivia and Brazil at altitudes of 500–1000 m s.m. (SENGHAS 1995; CARNEVALI & RAMÍREZ-MORILLO 2003).

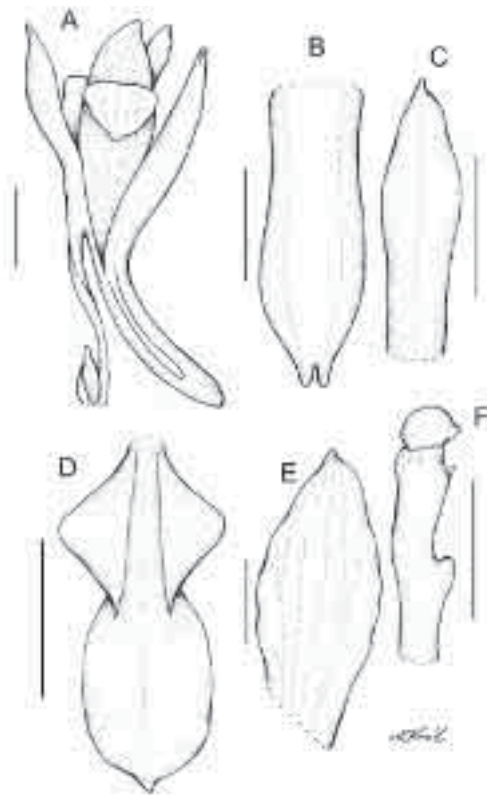
### Materials and methods

Dried herbarium specimens from the herbaria AMES, AMO, BM, COL, CUVC, F, FLAS, HUA, JAUM, K, MO, NY, P, PMA, RPSC, UGDA, VALLE and W were examined according to standard procedures. Each studied sheet was photographed and data were taken from the labels. The morphology of the perianth segments and gynostemium was examined after softening flowers in boiling water. Finally the measurements on the surface of each floral element were studied under a stereoscopic microscope.

### Description and taxonomy

*Diadenium suarezorum* Kolan., Szlach. & Mystkowska, sp. nov. (Fig. 1)

**Diagnosis.** The new species is unique in the genus because it has a sigmoid sepaline spur. It differs from *D. barkeri* by its ligulate apical part of the lip and from *D. micranthum* by a lip apical part which is narrower and longer than the basal part of the lip and oblong elliptic petals.



**Figure 3.** *Diadenium micranthum*. A – flower, B – synsepal, C – dorsal sepal, D – lip, E – petal, F – gynostemium. Scale bars = 2 mm.

**Type.** Ecuador, Prov. Napo. La Cruz. Arajuno, Puerto Misahualli, en el Rio Napo. Alt. 500 m. Jul–Sep 1984. *A. Suarez & C. Lindberg de Suarez 0026* [Holotype: MO!].

**Description.** Pseudobulbs 1.5 cm long, 0.7 cm wide, ovoid, unifoliate, with a foliaceous sheath at the base. Leaf up to 9 cm long, 1.6 cm wide, oblong-ovate to narrowly elliptic, acute. Flower dark purple, sepals almost completely connate forming a spur, embracing the lip spur. Floral bract 1.5 mm long. Inflorescence 39 cm long, branching, many-flowered, branches up to 7.5 cm long. Pedicellate ovary 4 mm long, free from the sepal spur. Dorsal sepal 4.5 mm long, 1.3 mm wide, narrowly elliptic, obtuse, 1-veined. Free part of synsepal ligulate-obovate in outline, 2-veined, apically bifid, free apices acute. Sepaline spur 3 mm long, 1 mm wide, sigmoid, oblongoid, apically narrowed. Petals 4.6 mm long, 2.2 mm wide, oblong elliptic, subacute, 3-veined. Lip 3-lobed, shortly clawed; lip basal projection 4 mm long, oblongoid-cylindric, obtuse, sigmoid, enclosed within sepaline spur; the lip's basal part rhombic-triangular; lip's apical part ligulate, shortly apiculate; disc with a single vein running along whole lip length. Gynostemium 3.8 mm long, typical for the genus.

**Distribution and ecology.** This species is known so far exclusively from the western Amazon region. It was found growing epiphytically in forests at the altitude of about 500 m. Flowering between July and September.

**Notes.** According to our study the three species of *Diadenium* do not differ in the vegetative characters and they may be distinguished based on the form of the sepaline spur and the lip.

*Diadenium* from Ecuador

*D. suarezorum* is the only species of the genus hitherto known with a sigmoid sepaline spur. *D. barkeri* (Fig. 2) is characterized by the lip, the apical part of which is narrowly triangular in outline, widened at the apex. In *D. micranthum* (Fig. 3) the lip's apical part is elliptic. In contrast to the species mentioned above, the lip's apical part of *D. suarezorum* is ligulate. Additionally, both species are separable by the form of petals: oblong-elliptic in the new species and elliptic-ovate in *D. micranthum*.

Key to the species of *Diadenium*

- 1 Lip's apical part widened, lip narrowly triangular in outline ..... *D. barkeri*  
 1\* Lip's apical part ligulate to elliptic in outline, lip widest near the middle ..... 2  
 2 Sepaline spur narrowly cylindrical, pendent ..... *D. micranthum*  
 2\* Sepaline spur sigmoid, oblongoid, apically narrowed ..... *D. suarezorum*

## Acknowledgements

The curators and staff of MO are thanked for their kind hospitality and assistance during visits and for making specimens available to study. We are grateful to Anna Król for preparing the illustrations. The research has been supported by the Polish Ministry of Science and Higher Education (research grant no. 8124/B/PO1/2011/40).

## References

- CARNEVALI G. & RAMÍREZ-MORILLO I. M. (2003): *Diadenium*. – In: STEYERMARK J. A., BERRY P. E., YATSKIEVICH K. & HOLST B. K. [eds]: Flora of the Venezuelan Guayana, vol. 7: 298. – St. Louis: Missouri Botanical Garden.
- CHASE M. W., CAMERON K. M., BARRETT R. L. & FREUDENSTEIN J. V. (2003): DNA Data and Orchidaceae systematics: a new phylogenetic classification. – In: DICKSON K. W., KELL S. P., BARRETT R. L. & CRIBB P. J. [eds]: Orchid conservation: 69–89. – Kota Kinabalu, Sabah: Natural History Publications.
- CHASE M. W., WILLIAMS N. H., NEUBIG K. M. & WHITTEN W. M. (2008): Taxonomic transfers in Oncidiinae to accord with Genera Orchidacearum, Volume 5. – *Lindleyana* **21**(3): 20–31.
- DRESSLER R. L. (1993): Phylogeny and classification of the orchid family. – Cambridge: Cambridge University Press.
- DRESSLER R. L. & WILLIAMS I. H. (1970): The genus *Systeloglossum*. – *Amer. Orchid Soc. Bull.* **39**: 323–329.
- NEUBIG K. M., WHITTEN W. M., WILLIAMS N. H., BLANCO M. A., ENDARA L., BURLEIGH J. G., SILVERA K., CUSHMAN J. C. & CHASE M. W. (2012): Generic recircumscriptions of Oncidiinae (Orchidaceae: Cymbidieae) based on maximum likelihood analysis of combined DNA datasets. – *Bot. J. Linn. Soc.* **168**: 117–146.
- PFITZER E. H. H. (1887): Entwurf einer natürlichen Anordnung der Orchideen. – Heidelberg: C. Winter.
- POEPPIG E. & ENDLICHER S. (1836): Nova genera ac species plantarum quas in regno Chilensi Peruviano et in terra Amazonica annis MDCCCXXVII ad MDCCCXXXIII legit, vol 1: 41–42. – Lipsiae: Friderici Hofmeister.
- SCHLECHTER R. (1915): Die Orchideen: ihre Beschreibung, Kultur und Züchtung. Handbuch für Orchideenliebhaber, Züchter und Botaniker. – Berlin: Parey.

M. KOLANOWSKA, D. L. SZLACHETKO & K. MYSTKOWSKA

- SENGHAS K. (1995): 765. *Diadenium* Poepp. & Endl. 1835 (374). – In: BRIEGER F.G., MAATSCH R. & SENGHAS K. [eds]: Rudolf Schlechter, Die Orchideen, Bd. 1, Teil B [3. Aufl.]: 1965–1966. – Berlin & Hamburg: Parey.
- SZLACHETKO D.L. & MYTNIK-EJSMONT J. (2009): *Gynostemia orchidalium* 4. – Acta Bot. Fenn. **180**: 254–255.
- SZLACHETKO D.L. & KOLANOWSKA M. (2015): A new species of *Scelochilus* (Orchidaceae) from Colombia. – Syst. Bot. **40**(1):94–103.

Address of the authors:

Dr Marta Kolanowska  
Prof. Dr Dariusz L. Szlachetko  
MSc Katarzyna Mystkowska (corresponding author)  
Department of Plant Taxonomy and Nature Conservation  
University of Gdańsk  
ul. Wita Stwosza 59  
80-308 Gdańsk  
Poland  
E-mail: martakolanowska@wp.pl  
dariusz.szlachetko@gmail.com  
kasiamyst@gmail.com

# ZOBODAT - [www.zobodat.at](http://www.zobodat.at)

Zoologisch-Botanische Datenbank/Zoological-Botanical Database

Digitale Literatur/Digital Literature

Zeitschrift/Journal: [Wulfenia](#)

Jahr/Year: 2015

Band/Volume: [22](#)

Autor(en)/Author(s): Kolanowska Marta, Szlachetko Dariusz L., Mystkowska Katarzyna

Artikel/Article: [Notes on the oncioid genus Diadenium \(Orchidaceae\) and description of a new species from Ecuador 239-244](#)