

A new natural hybrid, *Bletia xekmanii* (Orchidaceae), from Cuba

Authors: Niño, Maité Serguera, and Losada, Margarita Sánchez

Source: *Willdenowia*, 41(1) : 107-111

Published By: Botanic Garden and Botanical Museum Berlin (BGBM)

URL: <https://doi.org/10.3372/wi.41.41112>

BioOne Complete (complete.BioOne.org) is a full-text database of 200 subscribed and open-access titles in the biological, ecological, and environmental sciences published by nonprofit societies, associations, museums, institutions, and presses.

Your use of this PDF, the BioOne Complete website, and all posted and associated content indicates your acceptance of BioOne's Terms of Use, available at www.bioone.org/terms-of-use.

Usage of BioOne Complete content is strictly limited to personal, educational, and non - commercial use. Commercial inquiries or rights and permissions requests should be directed to the individual publisher as copyright holder.

BioOne sees sustainable scholarly publishing as an inherently collaborative enterprise connecting authors, nonprofit publishers, academic institutions, research libraries, and research funders in the common goal of maximizing access to critical research.

MAITÉ SERGUERA NIÑO^{1*} & MARGARITA SÁNCHEZ LOSADA¹**A new natural hybrid, *Bletia ×ekmanii* (Orchidaceae), from Cuba****Abstract**

Serguera Niño M. & Sánchez Losada M.: A new natural hybrid, *Bletia ×ekmanii* (Orchidaceae), from Cuba [Novitiae florum cubensis 35]. – Willdenowia 41: 107–111. – Online ISSN 1868-6397; © 2011 BGBM Berlin-Dahlem. doi:10.3372/wi.41.41112 (available via <http://dx.doi.org/>)

The natural hybrid *Bletia ×ekmanii* (*B. patula* × *B. purpurea*) is described and illustrated. Hybrid plants have a semi-hypogeous subglobose corm, incurved petals enclosing the column, flowers of intermediate size between those of the parental species, a trilobed lip of almost the same size as the lateral sepals with obtuse lateral lobes. Flowers of the hybrid resemble those of *B. purpurea* but are larger and with a patent lip as in *B. patula*. The hybrid was found along the roadside from Palenque to Bernardo town, Guantánamo Province, eastern Cuba.

Additional key words: *Bletia purpurea*, *Bletia patula*, terrestrial orchids, hybridisation, West Indies

Introduction

Among phanerogamous families, *Orchidaceae* are highly successful (Kull & al. 2006), displaying numerous pollination systems with extraordinarily high levels of interspecific diversity in associated floral traits (Cozzolino & al. 2006). *Bletia* is a neotropical terrestrial orchid genus of about 40 species, with six species on the Antilles according to Nir (2000), all of which occur in Cuba. However, recent changes to our knowledge resulted in the transfer of two species of *Bletia* to *Basiphylloa*: *Basiphylloa carabaiiana* (L. O. Williams) Sosa & M. A. Díaz and *B. volubilis* (M. A. Díaz) Sosa & M. A. Díaz (Díaz & al. 2001).

The four *Bletia* species now known from Cuba are *B. antillana*, *B. florida*, *B. patula* and *B. purpurea*. *B. purpurea* is the most widespread species of the genus,

ranging from Florida and Mexico to South America and the West Indies; in Cuba it is abundant in all the country, being found frequently growing along roadsides in full sunlight. *B. patula* is a relatively large, terrestrial orchid, growing in limestone soils at low to middle elevation, from southern Florida to Cuba, Hispaniola and Puerto Rico; this species occurs in northeastern Cuba, in the Nipe-Sagua-Baracoa massif, where it grows on exposed limestone banks and cliffs or on rocky mountain tops, and sometimes along roadsides. *B. florida* is restricted to Cuba, Jamaica and Hispaniola, but in Cuba it is currently known only from Cuchillas de Moa in Holguín (Mújica-Benítez 2003). *B. antillana* is restricted to northeastern Cuba, growing in the mountains of Holguín and Guantánamo provinces, usually on river banks or in temporarily flooded zones, on serpentine soils (Acuña

1 Jardín de los Helechos de Santiago de Cuba, Carretera del Caney No. 129, La Caridad, Caney, C.P. 90400, Santiago de Cuba, Cuba; *e-mail: maite@bioeco.ciges.inf.cu (author for correspondence), margarita@bioeco.ciges.inf.cu

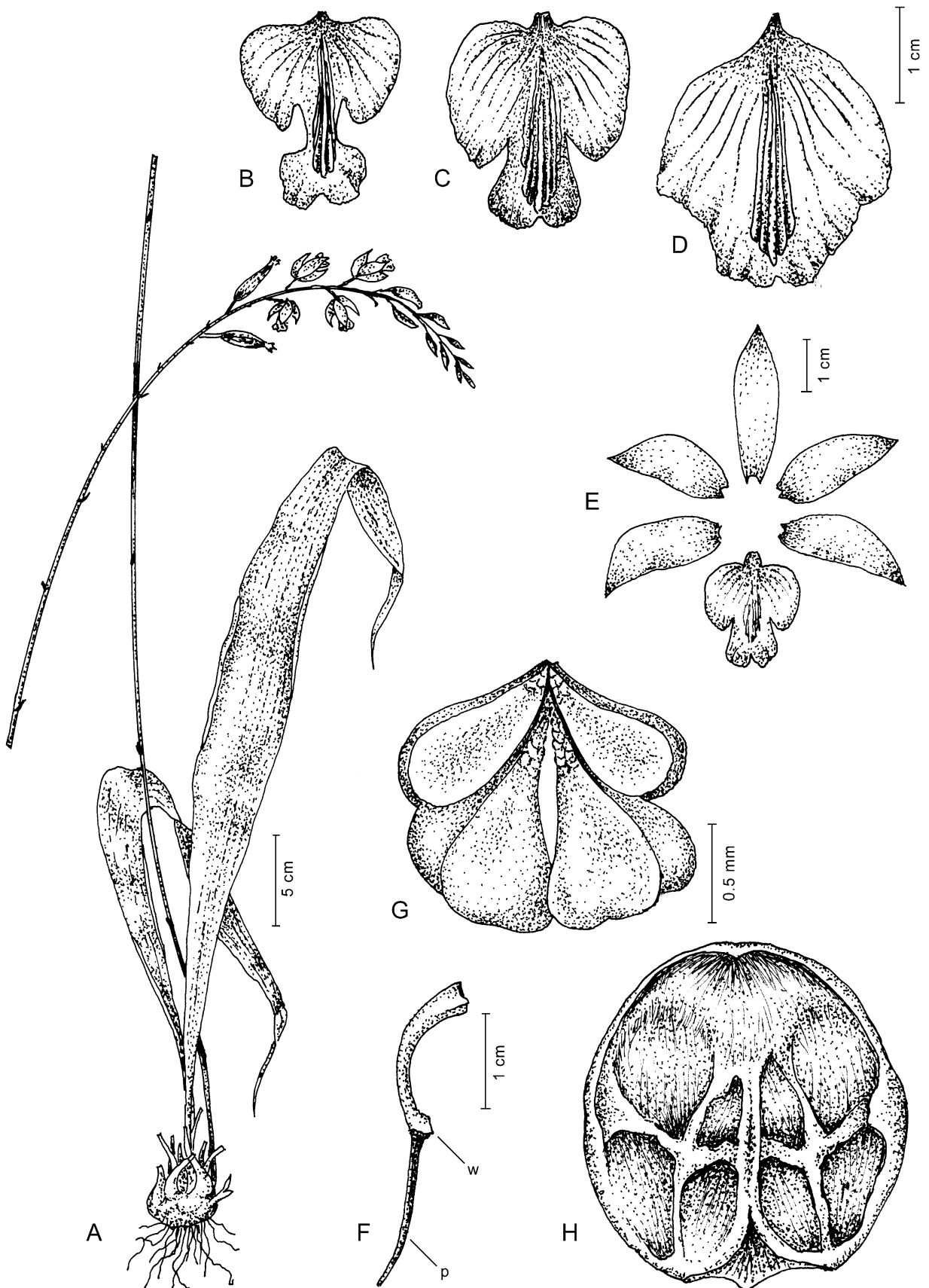


Fig. 1. *Bletia xekmanii* – A: habit; C: lip; B: lip of parental species *B. purpurea*; D: lip of parental species *B. patula*; E: floral elements; F: column (w = wings) on pedicel (= p); G: pollinia; H: anther cap (view from inside). – Scale bars: A = 8 cm, B–D = 1 cm, E = 1 cm, F = 1 cm, G = 0.5 mm. – Drawing by M. G. Caluff.

1939; León 1946; Garay & Sweet 1974; Ackerman 1995; Sosa & Díaz-Dumas 1997, in press; Nir 2000; Palestina & Sosa 2002; Llamacho & Larramendi 2005).

We discovered a large mixed population of *Bletia patula* and *B. purpurea* in 2004, along the road from Palenque to Bernardo, in Guantánamo Province. Both species bloom from March to June in this area. We found 46 plants (close to 20% of the population) with intermediate characteristics between *B. patula* and *B. purpurea*. We collected a few of these intermediate plants and cultivated them in the Santiago de Cuba's Fern Garden. On the basis of field work and a comparison between the plants cultivated ex situ we describe the intermediate plants as a wild natural hybrids new to science.

Bletia xekmanii* Serguera & Sánchez Losada, *nothosp. nov.

Holotypus: Cuba, Guantánamo Province, Yateras, Loma "El Cilindro", camino desde Palenque a Bernardo, en una pendiente de roca caliza, en vegetación secundaria, a pleno sol, conviviendo con *B. patula* y *B. purpurea*, 450–500 m, 5.5.2010, M. Serguera & M. Sánchez s.n. (BSC 6430; isotypus: B). – Fig. 1A, C, E–H.

Planta humicola, media inter parentes (*Bletia patula* et *B. purpurea*). Differt a *B. patula* petalis recurvis columnam amplectentibus (nec rectis), labello in media parte cristis flavis (nec albidis) ornato, lobis lateralibus oblongo-ellipticis (nec semiovatis), columna gynostemii arcuata (nec recta) basi (nec media in parte) roseo-bialata. *B. purpurea* discedit labello reflexo (in nostra porrecto apice subrecurso), lobis lateralibus ovatis, et columna gynostemii in parte distali alata.

Terrestrial perennial herb, erect, 35–41 cm tall; *corm* semihypogeous, erect, subglobose, 2.5–4 cm long,

2–3.8(–4.5) cm diam., covered by sheathing scarious bracts, with inconspicuous internodes; *roots* slender, velamentous. *Leaves* plicate, 2–4(–5), present or absent during flowering, growing from the corm apex, usually annually deciduous, linear-lanceolate, acuminate, basally articulated, 34–68 cm long, 1.5–5.5 cm wide. *Inflorescences* 1(–2), lateral, racemose, with up to 38 flowers, long-pedunculate, up to 50–140 cm long; *floral bracts* ovate-triangular, acuminate, pale green, in spiral arrangement, recurrent, 3.5–8 mm long, 1.5–4 mm wide. *Flowers* showy, erect, pale purple to pink, dorsal surface darker than the ventral one, 2–3 cm long not including the pedicellate ovary, 2.8–4.4 cm wide; *dorsal sepal* ovate-lanceolate, truncate at the base, apex reflexed, acute, pale purple to pink, 22–30 mm long, 6.3–8.1 mm wide; *lateral sepals* obliquely ovate-lanceolate, spreading, apex reflexed, acute, connate at the base, purple, the ventral surface in the lower half darker than in the upper half whitish at the base, 20–27 mm long, 5.7–9.5 mm wide; *petals* pale pink to rose purple, darker at the apex, ovate to elliptic, acute, falcate, enclosing the column and the lateral lobes, 18–28 mm long, 6–9.7 mm wide; *lip* trilobed, ovate, sessile, purple, the base cordate, whitish, 1.7–2.4(–2.7) cm long, 1.3–2 cm wide, lateral lobes oblong-elliptic, with several rose-purple veins, apex obtuse, incurved, semi-enclosing the column, 10.5–15.2 mm long, 4.6–6.5(–8) mm wide, sinuses short, 1–4.5 mm long, 1–2.3 mm wide, mid lobe suborbicular, margin crispate-undulate, apex emarginated, slightly curved downward, 7.5–11.2 mm long, 5.1–10.4 mm wide, disc with 5(–7) parallel yellow crests extending onto the mid lobe, up to 1 mm deep, the central crest longest, undulate; *column* arched, winged, with two pink wings near the base, 1.8 mm wide, whitish, 10–24 mm long; *ovary* reddish, pedicellate, pedicel 10–24 mm long; *stigma* translucent, entire; *anther* rose, incumbent, fleshy, round-

Table 1. Comparison of vegetative and floral traits among *Bletia xekmanii* and its parental species *B. purpurea* and *B. patula*. All measures are in [mm] and are taken from plants in the field.

Character	<i>Bletia purpurea</i>	<i>Bletia xekmanii</i>	<i>Bletia patula</i>
Number of leaves	(1)–2–3	2–3(–1)	2–5
Leaf width	15–32	15–55	40–80
Flower length	13–20	20–30	30–40(–50)
Flower width	12–22	28–44	30–48
Dorsal sepal length	16–21	22–30	28–37
Dorsal sepal width	3.3–6.8	6.3–8.1	4.7–9.4
Lateral sepal length	12–19	20–27	21–34
Lateral sepal width	5.5–9.3	5.7–9.5	7.2–9.5
Petal length	13–18	18–28	25–38
Petal width	5.7–7.8	6–9.7	6–11
Lip length	10–15	17–24(–27)	26–38
Lip width	11–13	13–20	16–30
Column length	8–10	10–24	18–22(–24)
Pedicel length	5–11	10–24	11–33
Fruit length	2–3.7	2.2–5	3.5–6.6(–7.5)

ed, eight celled, 1.5–2.4 mm long, 1.8 mm wide; *pollinia* 8, subsessile, waxy, yellowish, 0.7–0.8 mm long, 0.4–0.5 mm wide, on a slender, elongate viscidium. *Fruits* cylindrical, erect and pale green when young, later pendent and yellowish, 2.2–5 cm long, 3–9 mm wide; *seeds* slender, brown, 0.3–0.7 mm long.

Etymology. — This new natural hybrid is dedicated to Erik Leonard Ekman (1883–1991), an eminent Swedish botanist who studied the Cuban flora in 1914–24.

Delimitation. — *Bletia ×ekmanii* is recognised by its inconspicuous corm internodes, medium pale purple to pink flowers (2–3 cm long, 2.8–4.4 cm wide), the crispate-undulate emarginate lip, which is almost of the same size as the lateral sepals (Fig. 1C, E), and the basally winged column. The flower of the hybrid resembles that of *B. purpurea* but is larger, with the patent lip as in *B. patula*. The column in the hybrid is arcuate (Fig. 1F), similar to *B. purpurea*, but with two pink basal wings (these are distal in *B. purpurea*, erect and in the middle of the column in *B. patula*). The differences between the hybrid and *B. patula* and *B. purpurea* are summarised in Table 1.

The plants cultivated in the Fern Garden of Santiago de Cuba are larger than those in the wild population. The differences may be due to conditions of cultivation, or they may also have a genetic basis as suggested for size variants of another natural orchid hybrid (Morales 2002).

Distribution, habitat and flowering. — NE Cuba, Guantánamo Province, Yateras Municipality, Loma “El Cilindro”. Terrestrial on rocky, limestone, sunny, humid slopes and cliffs, 450–500 m elevation, in open secondary forest. Infrequent, known only from a single locality.

The vegetation where *Bletia ×ekmanii* occurs is composed principally of low and sparse shrubs, herbs and grasses; thus, the orchid inflorescences usually rises above it and is easily seen. Other orchids growing together are: the parental species *B. patula* and *B. purpurea*; *Habenaria monorrhiza* (Sw.) Rehb. f. and the naturalised invasive *Spathoglottis plicata* Bl. The calciphyllous fern *Anemia adiantifolia* (L.) Sw. is a very common species at the site.

The hybrid flowers from March to June, at the same time as its parental species. Both *Bletia patula* and *B. purpurea* offer no pollinator rewards and both are considered to be food deceptive plants. Neither one of them is considered to be a threatened species in Cuba (Llamacho & Larramendi 2005).

In the mixed population we studied, a few pale pink and white-flowered morphs of *Bletia patula* were observed dispersed on the population. Such colour polymorphisms also occur in Puerto Rico and the Dominican Republic (Ackerman 1995; Ackerman & Carronero 2005). *B. purpurea* in Dominican Republic (Jiménez 1960) also shows colour variation; in our studied site few plants with

pale pink colour were observed. Such variation can be adaptive in deception-pollinated species (Ackerman & Carronero 2005; Cozzolino & Widmer 2005) and interspecific hybridisation does increase population variation which may result in new combinations of traits that may stabilise or add to population variation of one or both of the parental species.

Although the occurrence of interspecific orchid hybrids are often restricted locally (Luer 1975; Cozzolino & Aceto 1994; Cozzolino & al. 1998; Pellegrino & al. 2000), some do become widespread and stabilised (Catling & Catling 1997; Arft & Ranker 1998; Bullini & al. 2001). It remains to be seen whether *B. ×ekmanii* will become established and spread or just an ephemeral phenomenon.

Acknowledgements

The authors thank to Dr W. Greuter for the Latin diagnosis; to Dr J. Ackerman, Dra. V. Sosa and A. Vale for providing relevant literature. Thanks are due to Manuel G. Caluff, the first collector of the hybrid, for the revision of the manuscript and the illustrations and to Dr J. Ackerman and two further, anonymous reviewers for constructive criticism of the manuscript.

References

- Ackerman J. D. 1995: An orchid flora of Puerto Rico and the Virgin Islands. – *Mem. New York Bot. Gard.* **73**.
- Ackerman J. D. & Carronero W. 2005: Is reproductive success related to color polymorphism in a deception pollinated tropical terrestrial orchid? – *Caribbean J. Sci.* **41**: 234–242.
- Acuña J. 1939 [“1938”]: Catálogo descriptivo de las orquídeas cubanas. – *Bol. Estaç. Exp. Agron. Cuba* **60**: 1–221.
- Arft A. M. & Ranker T. A. 1998: Allopolyploid origin and population genetics of the rare orchid *Spiranthes diluvialis*. – *Amer. J. Bot.* **85**: 110–122.
- Bullini L., Cianchi R., Arduino P., De Bonis L., Mosco M. C., Verardi A., Porretta D., Corrias B. & Rossi W. 2001: Molecular evidence for allopolyploid speciation and a single origin of the western Mediterranean orchid *Dactylorhiza insularis* (Orchidaceae). – *Biol. J. Linn. Soc.* **72**: 193–201.
- Catling P. M. & Catling V. R. 1997: Morphological discrimination of *Platanthera huronensis* in the Canadian Rocky Mountains. – *Lindleyana* **12**: 72–78.
- Cozzolino S. & Aceto S. 1994: Morphological and molecular characterization of *Orchiaceras bergonii* (Nanteuil) E. G. Cam. – *Giorn. Bot. Ital.* **128**: 861–867.
- Cozzolino S. & Widmer A. 2005: Orchid diversity: an evolutionary consequence of deception? – *Trends Ecol. Evol.* **20**: 487–494.
- Cozzolino S., Aceto S., Caputo P. & Menale B. 1998: Characterization of *Orchis ×dietrichiana* Bogenh., a natural orchid hybrid. – *Pl. Biosystems* **132**: 71–76.

- Cozzolino S., Nardella A. M., Impagliazzo S., Widmer A. & Lexer C. 2006: Hybridization and conservation of Mediterranean orchids: Should we protect the orchid hybrids or the orchid hybrid zones? – *Biol. Conservation* **129**: 14–23.
- Díaz M. A., Llamacho J. A. & Sosa V. 2001: Taxonomic changes in Cuban orchids: *Basiphyllaea*. – *Harvard Pap. Bot* **5**: 487–488.
- Garay L. A. & Sweet H. R. 1974: *Orchidaceae*. – In: Howard R. A. (ed.), *Flora of the Lesser Antilles. Leeward and Windward Island [1]*. – Jamaica Plain, Mass.: Arnold Arboretum.
- Jiménez J. de J. 1960: Novelties in the Dominican flora. *Rhodora* **62**: 235–238.
- Kull T., Kindlmann P., Hutchings M. J. & Primack R. B. 2006: Conservation biology of orchids: Introduction to the special issue. – *Biol. Conservation* **129**: 1–3.
- León [bro.] 1946: *Flora de Cuba 1*. – *Contr. Ocas. Mus. Hist. Nat. Colegio “De La Salle”* **8**.
- Llamacho J. A. & Larramendi J. A. 2005: *Las orquídeas de Cuba*. – Lleida: Greta.
- Luer C. A. 1975: *The native orchids of the United States and Canada, excluding Florida*. – New York: New York Botanical Garden.
- Morales C. 2002: *Trichopilia ×ramonensis (Orchidaceae)*, un híbrido natural de Costa Rica. – *Lankesteriana* **2(3)** [= 5]: 17–21.
- Mújica-Benítez E. 2003: Notas acerca de la colección de *Orchidaceae* del Herbario del Instituto Superior Pedagógico de Pinar del Río (HPPR), Cuba. – *Lankesteriana* **3(1)** [= 6]: 9–16.
- Nir M. A. 2000: *Orchidaceae antillanae*. – New York: DAG Publishing.
- Palestina R. A. & Sosa V. 2002: Morphological variation in populations of *Bletia purpurea (Orchidaceae)* and description of the new species *B. riparia*. – *Brittonia* **54**: 99–111.
- Pellegrino G., Caputo P., Cozzolino S., Menale B. & Musacchio A. 2000: Molecular characterization of a hybrid zone between *Orchis mascula* and *Orchis pauciflora* in southern Italy. – *Biol. Pl.* **43**: 13–18.
- Sosa V. & Díaz M. A. 1997: Orchids from the Greater Antilles I. A new species of *Bletia*. – *Brittonia* **49**: 79–83.
- Sosa V. & Díaz M. A. [in press]: *Bletia* Ruíz & Pavón. – In: Ackerman J. D. (ed.), *Flora of the Greater Antilles: Orchidaceae*. – *Mem. New York Bot. Gard.*