

The Orchidaceae of Ruiz & Pavón's "Flora Peruviana et Chilensis". A taxonomic study. II

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Abstract

Pupulin, F. 2012. The Orchidaceae of Ruiz & Pavón's "Flora Peruviana et Chilensis". A taxonomic study. II. *Anales Jard. Bot. Madrid* 69(2): 143-186.

The paper presents the second part of the study of the orchid illustrations produced during the Royal expedition to Peru and Chile, headed by Ruiz and Pavón in late XVIII century. Species of the genera included between *Oncidium* and *Zygopetalum* are discussed. For each taxon references to the nomenclatorial types, synonymy, illustrations and exsiccata prepared during the expedition, as well as to Ruiz' diaries and the unpublished manuscripts of the expedition's botanists, are provided. In the absence of any specimens referable to the type collections and associated with the protologues, *Maxillaria ciliata* and *M. undatiflora* are formally lectotypified with the type illustrations conserved in MA. *Rodriguezia lanceolata*, originally based on at least two syntypes, is lectotypified. New combinations are proposed for *Bletia uniflora*, *Humboldtia acutiflora*, *H. polystachya* and *Maxillaria undatiflora*.

Keywords: scientific expeditions, botanical illustrations, Hipólito Ruiz and José Pavón, Orchidaceae, Peru, Ecuador, typification.

INTRODUCTION

The background and aims of the Royal Botanical Expedition to Peru and Chile carried out by the Spanish monarchy in the second half of 18th Century, as well as the main results in orchidology of the expedition, have been highlighted in the first part of this study (Pupulin, 2012). We presented there the figures of the illustrators sent by King Carlos III to the colonies of the New World and of the other artists who joined the Expedition during the almost forty years spent in South America by Ruiz and Pavón and their attachés. The critical study of the orchid iconography, the manuscripts and the collections brought back by the expeditionaries from tropical South America, proved to be fundamental for the correct identification and typification of the orchid taxa originally described by Ruiz and Pavón (1794, 1798) and recorded in their documentary legacy. Whilst we previously discussed species arranged alphabetically from *Acianthera* Scheidw. to *Maxillariella* M.A. Blanco & Carnevali (Pupulin, 2012), in this contribution the discussion focuses on the interpretation of taxa from *Oncidium* Sw. to *Zygopetalum* Hook. At the light of the botanical illustrations prepared during the Expedition, each species is presented in this second part of the study with complete references to the nomenclatorial types and their synonyms –and lectotypified when required–, the unpublished manuscripts and exsiccata now kept at the Royal Botanical Garden (RJB), and to its mention in the the travel diaries by Ruiz (2007).

Resumen

Pupulin, F. 2012. Las Orchidaceae de la "Flora Peruviana et Chilensis" de Ruiz y Pavón. Estudio taxonómico. II. *Anales Jard. Bot. Madrid* 69(2): 143-186 (en inglés).

El trabajo presenta la segunda parte del estudio de las ilustraciones de orquídeas producidas durante la Real Expedición al Perú y Chile, liderada por Ruiz y Pavón. Se discuten las especies de los géneros incluidos entre *Oncidium* y *Zygopetalum*. Para cada uno de los táxones se proveen referencias a los tipos nomenclaturales, sinonimia, ilustraciones y exsiccata preparados durante la expedición, así como a los diarios de Ruiz y a los manuscritos inéditos de los botánicos de la expedición. En ausencia de especímenes de las recolectas tipo o de alguna manera asociables a los protólogos, se lectotifican *Maxillaria ciliata* y *M. undatiflora* con las ilustraciones de los tipos conservadas en MA. Se lectotifica *Rodriguezia lanceolata*, originalmente basada en por lo menos dos sintipos. Se proponen nuevas combinaciones para *Bletia uniflora*, *Humboldtia acutiflora*, *H. polystachya* y *Maxillaria undatiflora*.

Palabras clave: expediciones científicas, ilustración botánica, Hipólito Ruiz y José Pavón, Orchidaceae, Perú, Ecuador, tipificación.

ICONES

49. *Oncidium crocidipterum* (Rchb.f.) M.W. Chase & N.H. Williams, *Lindleyana* 21(3): 24. 2008. Fig. 33A, B

Basionym: *Odontoglossum crocidipterum* Rchb.f., *Gard. Chron.* 1129. 1871.

Type: Colombia (New Granada). Received through Stuart Low, *Bruchmüller s.n.* (holotype, W).

Synonyms: *Odontoglossum dormanianum* Rchb.f., *Gard. Chron.* n.s., 21: 11. 1884.

Odontoglossum crocidipterum subsp. *dormanianum* (Rchb.f.) Bockemühl, *Odontoglossum*, *Monogr.* 162. 1989.

Odontoglossum crocidipterum fo. *dormanianum* (Rchb.f.) O. Gruss & M. Wolff, *Orchid Atlas* 244. 2007.

Oncidium crocidipterum subsp. *dormanianum* (Rchb.f.) M.W. Chase & N.H. Williams, *Lindleyana* 21(3): 24. 2008.

Type: Colombia. *S.W. Dorman s.n.* (holotype, W).

Icons: AJB, Div. IV, 1232, tempera on paper by F. Pulgar, plant with flowers. «Fran.co Pulgar [signature] / Maxillaria / 77». AJB, Div. IV, 1233, tempera on paper by F. Pulgar, flower, floral dissections, pollinarium and anther. «Fran.co Pulgar [signature] / Maxillaria? / 77».

Herbarium: No material of this taxon is present in MA.

Oncidium crocidipterum ranges from Venezuela and Colombia to Peru, where it inhabits cool montane wet forests between 2200 and 2800 m. Zelenko and Bermúdez (2008) offered a photograph of a Peruvian specimen of this species. The

plant illustrated by F. Pulgar could have been collected in the region of Huánuco, where he traveled with Tafalla to Muña, Pillao, Pozuzo and Chicoplaya between 1791 and 1796.

The ovoid to elliptic pseudobulbs, sometimes blotched with purple, enveloped at the base by several distichous, imbricating sheaths, apically provided with 2 linear-lanceolate leaves, the relatively short inflorescence and the fragrant flowers, ochre with chestnut blotches and bars, with deeply lacerate-fringed column wings, distinguish *O. crocidipterum*.

50. *Oncidium planilabre* Lindl., J. Hort. Soc. London 6: 59. 1851. Fig. 33C

Type: Brazil. Locality unknown. "Received from R.A. Grey, esq., who obtained it from Brazil and presented it to the Society through Thomas Edgar, Esq.", *R.A. Grey s.n.* (holotype, K).

Synonyms: *Oncidium aloisii* Schltr., Repert. Spec. Nov. Regni Veg. Beih. 8: 102. 1921 (according to Dodson & Dodson 1980).

Type: Ecuador. Chimborazo: Puente de Chimbo, 600 m, *A. Sodiro 110A* (holotype, B†).

Oncidium hirundo Rchb.f., Bot. Zeitung (Berlin) 15(10): 158. 1857.

Type: Without locality. "Cultum communicavit nobiliss. princeps Camille de Rohan", *Rohan s.n.* (holotype, W, not seen; drawing of type, AMES!).

Oncidium pardothyrsus Rchb.f. & Warsz., Bot. Zeitung (Berlin) 15(10): 158. 1857.

Type: Peru. "Ex Peruvia attulit de Warszewicz", *J. Warzewicz s.n.* (holotype, W, not seen; drawing of type, AMES!).

Icones: AJB, Div. IV, 1248, tempera on paper without signature (but likely attributable to X. Cortés), plant habit with inflorescence, flower, floral dissection and fruit. «608. Maxillaria. Flor del Espiritu Santo» [Tafalla].

Herbarium: No material of this taxon is kept in MA.

Conserved in the Archives of the RJB is a manuscript description of this species by J.A. Manzanilla (AJB, Div. IV, 4, 3, fol. 83: «N. 374 / L. 608»), where the original collecting location is indicated as «*Habitat supra arbores Provincia Huayaquil. Floret tempore pluvarum. Vulgo Flor del Spiritu Santo*». The illustration in MA bears a manuscript number which corresponds to Manzanilla's description and was prepared in Ecuador, where *O. planilabre* is still relatively common in the tropical dry forests of the Pacific region, in the provinces of Guayas, El Oro and Manabí, from the sea level to about 300 meters. The species has been also recorded in Brazil (the type) and Peru.

O. planilabre is distinguished from other relatives in South America by elliptic, complanate, sulcate, subancipitous pseudobulbs, enclosed at the base by several foliaceous sheaths and diphylous at apex, the inflorescence has, usually, few branches; the flowers have a relatively small, 3-lobed lip, with the lateral lobes subequal in size to the subrounded midlobe, and the column is almost wingless.

51. *Oncidium undatiflorum* (Ruiz & Pav.) Pupulin, **comb. nov.** Fig. 34

Basionym: *Maxillaria undatiflora* Ruiz & Pav., Syst. Veg. Fl.

Peruv. Chil. 1: 225. 1798.

Type: Peru. Junín: "Habitat on nemoribus Tarmae ad Vitoc arce, unde Joannes Tafalla ad nos iconem ed descriptionem misit", *J.J. Tafalla s.n.* (lectotype, MA).

Icones: AJB, Div. IV, 1235, drawing of type, **selected here** as the Lectotypus; tempera on paper by F. Pulgar, plant habit with flowers, detail of a flower and floral dissections. «Franc.co Pulgar [signature] / 89 / 14 Maxillaria undatiflora [Tafalla]».

Herbarium: No type specimens of this taxon are known to exist.

The type specimen of *Maxillaria undatiflora* (not conserved) was found at Vitoc, where Tafalla and Pulgar are certain to have collected in 1794, according to several specimens annotated by Tafalla and kept in MA. The illustrations prepared from the material found in this region are among the last prepared by F. Pulgar, whose appointment as draftsman of the expedition was officially terminated in March, 1797. According to the protologue, Ruiz and Pavón (1798) prepared their short diagnosis of *M. undatiflora* on the basis of the illustration and the description sent by Tafalla; it is probable that they never received an actual specimen of this species. In the absence of any known specimen associated with the protologue, the illustration by Pulgar is chosen as the lectotype. It shows the several distichous, large, imbricating sheaths – the upper ones foliaceous – which envelope the pseudobulb, the prominently 5-veined, oblanceolate, subacuminate leaves, the erect, paniculate, inflorescence with few-flowered, short lateral branches, and the flowers with yellow sepals and petals, blotched with brownish red, wavy-undulated along the margins, and the white, 3-lobed lip, with the midlobe abruptly recurved, provided with a bilamellate, dentate callus, which distinguish *O. undatiflorum*.

Oncidium undatiflorum is known only from the region of Tarma, in central Peru. It could be the first name for *Odontoglossum ariasii* Dalström (syn. *Oncidium manuelariasii* M.W. Chase & N.H. Williams), another species endemic to the cool, wet montane forests of Peru, originally collected at Huasahuasi, not far from the type locality of *O. undatiflorum*.

52. *Ornithidium aggregatum* (Kunth) Rchb.f., Bonplandia 2: 18. 1854, *vel affinis*. Fig. 33D

Basionym: *Dendrobium aggregatum* Kunth, Nov. Gen. Sp. (quarto ed.) 1: 358. 1816.

Synonyms: *Maxillaria aggregata* (Kunth) Lindl., Gen. Sp. Orchid. Pl. 151. 1831. *Laricorchis aggregata* (Kunth) Szlach., Richardiana 7: 28. 2006.

Type: Peru. "Crescit on crepidinibus Andium mitioris temperiei inter villam Meneses et urbem Pasto, al 1480 hex.", *A.J.A. Bonpland & F.W.H.A. von Humboldt* (holotype, P, not seen).

Icones: AJB, Div. IV, 1319, tempera on paper by J. Brunete, plant habit and detail of a fruit. «Jph. Brunete [signature] / Complanata? [Ruiz] / [inverted] Limodorum? [Ruiz]».

Herbarium: MA 810829, plant, sterile. «Cochero».

The plate by Brunete illustrates a pendent species of *Ornithidium* without pseudobulbs, provided with a long, wiry rhizome and dense clusters of equitant (laterally flattened), fal-

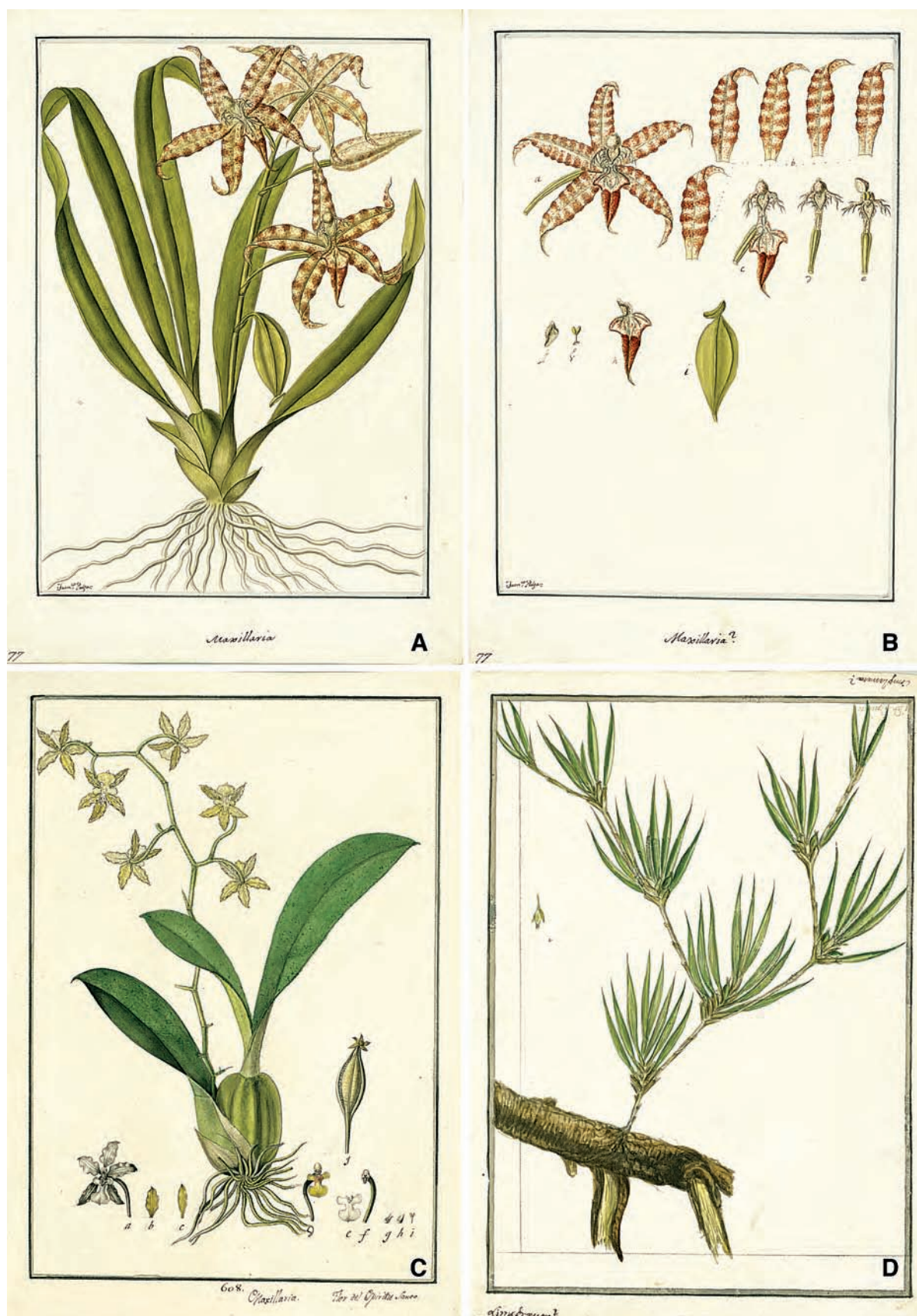


Fig. 33. A, *Oncidium crocidipterum*. AJB, Div. IV, 1232, plant with flowers, tempera on paper by F. Pulgar; **B,** *Oncidium crocidipterum*. AJB, Div. IV, 1233, flower, floral dissections, pollinarium and anther, tempera on paper by F. Pulgar; **C,** *Oncidium planilabre*. AJB, Div. IV, 1248, tempera on paper without signature; **D,** *Ornithidium aggregatum*. AJB, Div. IV, 1319, tempera on paper by J. Brunete.



Fig. 34. Lectotype of *Oncidium undatiflorum*. AJB, Div. IV, 1235, tempera on paper by F. Pulgar.

cate-recurved leaves, belonging to the so-called “*Maxillaria aggregata*” complex. The oldest name for this group is *Dendrobium aggregatum*, originally described from Peru; other species of this complex have been recorded there, among which are two closely allied species, *O. nubigenum* Rchb.f. (the type, Colombia) and *O. minutiflorum* (D.E. Benn. & Christenson) M.A. Blanco & Ojeda. In the absence of flowers, both in Brunete’s plate and in the only extant sheet in MA (probably referable to this illustration), a definitive identification is not possible.

According to a manuscript note on the actual specimen, the plant was collected at Cuchero, where the members of the expedition first collected between July and August of 1780, when their camp was attacked by Indians of Tupac Amaru II’s party, and again in the first months of 1784.

53. *Otoglossum* sp. Fig. 35A

Icones: AJB, Div. IV, 1234, tempera on paper by F. Pulgar, habit with flowers. «Fran.co Pulgar [signature] / 83 / Maxillaria».

Herbarium: No materials of this taxon are conserved in MA.

The large plant with a stout, several-flowered inflorescence, with conspicuous flowers, brown edged with yellow, provided with crisped-undulate sepals and petals and a shorter, 3-lobed, pandurate, cream-colored lip, easily distinguish species of the genus *Otoglossum* (Schltr.) Garay & Dunst.

The species illustrated by Pulgar, however, apparently differs from any other species of *Otoglossum s.str.* recorded in Peru (Zelenko & Bermúdez, 2009). While in the shape of the lip midlobe and general color it is somewhat similar to *O. brachypterum* (Rchb.f.) Garay & Dunst., the drawing in MA shows the lip provided with very narrow lateral lobes, a feature that does not agree with other Peruvian species of the genus. The *Otoglossum* painted by Pulgar strongly resembles an Ecuadorian plant illustrated in Dodson and Dodson (1984: pl. 975) as *O. coronarium*. As pointed out by Jenny (2010), this species is probably still undescribed. Unfortunately, no herbarium specimens of this taxon are kept in MA among the material of the Expedition.

54. *Pelexia pavonii* (Rchb.f.) Garay, Bot. Mus. Leaff. 28(4): 345. 1982. Fig. 35B

Basionym: *Spiranthes pavonii* Rchb.f., Bonplandia 4: 211. 1856.

Synonym: *Sarcoglottis pavonii* Rchb.f., Bonplandia 4: 211. 1856, et Schltr., Beih. Bot. Centralbl. 37(2): 419. 1920.

Type: Peru. “Cochero, exemplar unico”, J. Pavón s.n. (holotype, G 169153, digital image!).

Icones: AJB, Div. IV, 1259, drawing of type, tempera on paper by J. Brunete, plant with flowers. «Jph. Brunete [signature] / Satyrium luteum [Ruiz]».

Herbarium: No material of this species is present in MA.

Ruiz (2007: 136; Ms. 12) refers to “*Satyrium luteum*” among the “plants discovered and described in the Province of Tarma and the frontiers of its Mountains” (*id.* 130; Ms. 10), from June 1779 to the beginning of January of the next year. However, the holotype was collected at least six months later,

during the stay of the Expedition in Huánuco and the excursion to Cuchero in July 1780 (*id.* 156-165; Ms. 18-21).

No original specimens of *P. pavonii* are conserved in MA. The manuscript, labeled by Pavón on the type sheet in G, clearly indicates that the specimen is an *unicatum*: «Exemplare unico / ex Gynandria / Orchys / Cochero” [Pavón] / herb. Pavon [alia manu]». It was received in Geneva with the Herbarium Barbey-Boissier, in which it was incorporated through the acquisition of specimens from Lambert’s herbarium, which included specimens bought from the collections of the Oficina Botánica in Madrid. Reichenbach described the new species among the novelties from Ruiz and Pavón’s Peruvian collections, which he had the opportunity to study in Boissier’s herbarium (Reichenbach, 1856).

Probably endemic to Peru, *P. pavonii* may be recognized by the cylindrical, thick roots, the oblong-lanceolate, acute leaves, by an inflorescence slightly puberulent with acute bracts, and by the flowers which are provided with a short spur, the petals apically agglutinate to the dorsal sepal, and a ligulate-pandurate lip with the midlobe semiovate, acute, crenulated along the margins. For further synonymy of this taxon, see Schweinfurth (1951).

55. *Phragmipedium boissierianum* (Rchb. f.) Rolfe, Orchid Rev. 4: 332. 1896. Fig. 35C

Basionym: *Selenipedium boissierianum* Rchb.f., Xen. Orch. 1: 3. 1854.

Synonyms: *Cypripedium boissierianum* (Rchb.f.) Rchb.f., Bonplandia 2: 116. 1854.

Selenipedium boissierianum Rchb.f., Xen. Orch. 1: 3. 1854.

Paphiopedilum boissierianum (Rchb.f.) Stein, Orchid.-Buch 456. 1892.

Paphiopedilum boissierianum (Rchb.f.) Pfitzer, Bot. Jahrb. Syst. 19: 41. 1894.

Phragmopedilum boissierianum (Rchb.f.) Pfitzer, Pflanzenr. IV. 50 (Heft 12): 50. 1903.

Type: Peru. Pillao, 1787, J. Pavón s.n. (holotype, G; possible isotype, BM).

Icones: AJB, Div. IV, 1324, tempera on paper by F. Pulgar, plant habit with flowers, floral dissection and fruit. «Fran.co Pulgar [signature] / 170. Cypripedium [Tafalla]».

Herbarium: MA 810806, inflorescences and flowers. «Gynand. Diandria / Cypripedium / F. P. c. L. N. 170 / Ex Vitoc. Año 94» [Tafalla]; «Herbarium Peruvianum / Ruiz et Pavon / 24/88». MA 810805, inflorescences, sterile. «Herbarium Peruvianum / Ruiz et Pavon / 24/88».

Reichenbach fillius twice described *Selenipedium boissierianum* in 1854. Current taxonomic literature usually quotes the original protologue as published in *Bonplandia*, where Reichenbach (1854b) presented an account on the recent South American collections by J. Ritter von Warszewicz. Here Reichenbach offers a checklist of the species of *Selenipedium*, quoting his *S. boissierianum* as already published, and providing a short diagnosis, but no information, about the origin of the type specimen. The ninth issue of *Bonplandia* for 1854, with Reichenbach’s note on *Selenipedium*, was published on May 1, 1854. Meanwhile, in the first volume of *Xenia Orchidacea*, distributed on 1st April, 1854, he also provided a latin diagnosis of

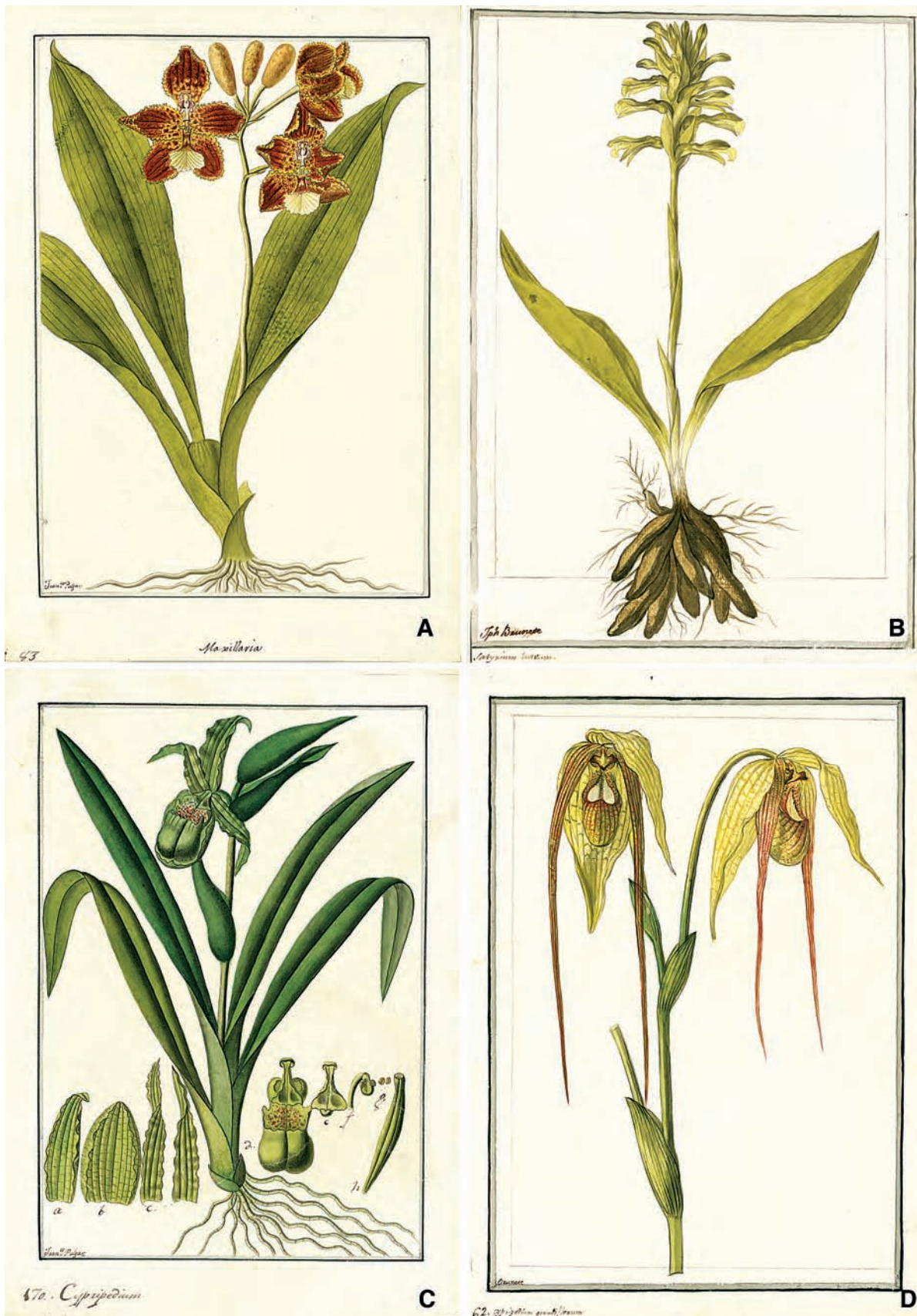


Fig. 35. **A**, *Otaglossum* sp. AJB, Div. IV, 1234, tempera on paper by F. Pulgar; **B**, *Pelexia pavonii*. AJB, Div. IV, 1259, drawing of type, tempera on paper by J. Brunete; **C**, *Phragmipedium boissierianum*. AJB, Div. IV, 1324, tempera on paper by F. Pulgar; **D**, *Phragmipedium caudatum*. AJB, Div. IV, 1323, inflorescence with two flowers; tempera on paper by J. Brunete.

S. boissierianum, quoting it among the species of *Selenipedium* section *Acaulia coriifolia* and including *Cypripedium boissierianum* Rchb.f. (“in Litt.”) as a synonym (Reichenbach, 1854a: 3). Further on in the same volume (Reichenbach, 1858: 176-177, and Pl. 62), the author offered a complete description and illustration of the species, where he expressly stated that he knew “only one specimen by Pavón”, originally labeled “*Cypripedium grandiflorum*. Pillao. 1787”. The illustration, which shows the apex of the inflorescence, with two flowers in profile and details of the staminode, was also prepared from Pavón’s specimen in the Boissier Herbarium.

McCook (correction label, 1989) considered the two exsiccata of *P. boissierianum* conserved in MA as isotypes, but this hypothesis has no foundation. MA 810806 bears an original label by Tafalla, expressly stating that the plant was collected at Vitoc in 1794, and MA 810805 has the same number of the “Herbarium Peruvianum” («24/88»), likely being part of the same original collection, while the holotype was collected at Pillao seven years before. The *Relación* by Ruiz makes no reference to “*Cypripedium grandiflorum*” among the plants collected at Pillao (Ruiz, 2007: 301-304; Ms. 58-59). The beautiful plate by Francisco Pulgar was prepared from the specimen conserved in Madrid, and the number of the “Lámina” corresponds to that indicated on the label by Tafalla («170»). A possible isotype of *P. boissierianum*, sterile, with original label by Pavón («*Cypripedium grandiflorum* / del Peru»), is conserved at the British Museum (BM 26164, digital image!). This is probably the “second species, taken by Mathews out of the same collection, but [...] too imperfect to be introduced here”, which Lindley (1840) saw in Sir William Jackson Hooker’s herbarium and mentioned in his description of *Cypripedium caudatum* (McCook, 1989).

The Archives of RJB also host a *recto* and *verso* manuscript description, in Tafalla’s handwriting, headed «L. 170. / Gynadria Diandria / *Cypripedium* / [...]» (AJB, Div. IV, 4, 3, fol. 104). According to the habitat notes provided by the manuscript, the plant illustrated by F. Pulgar was collected along the shores of the Maraynioc river («*Habitat Silvis Vitoc marginibus Fluvii Maray / nio*»).

Endemic to Peru [ranging to southern Ecuador if *P. czerwiakowianum* (Rchb. f.) Rolfe is considered as a synonym], *P. boissierianum* grows in premontane to montane wet forests, along the eastern slopes of the Andes, from 400 to 1500 m, where it is mostly found in exposed road cuts or rocky slopes, or on the forest edges along streams.

A member of *Phragmipedium* section *Lorifolia* (Kraenzl.) Garay, characterized by the petals being distinctly longer than the sepals and fully grown at anthesis, the flowers produced successively, and the lip with a pair of hornlike outgrowths at both sides of the opening, *P. boissierianum* can be recognized by its green flowers, sometimes flushed with bronze, and the undulate crisped margins of the petals.

56. *Phragmipedium caudatum* (Lindl.) Rolfe, *Orchid Rev.* 4: 332. 1896. Figs. 35D, 36A

Basionym: *Cypripedium caudatum* Lindl., *Gen. Sp. Orchid. Pl.* 531. 1840.

Selenipedium caudatum (Lindl.) Rchb.f., *Xenia Orchidacea*, 1: 3. 1854 [April] et *Bonplandia* 2: 116. 1854 [May].

Paphiopedilum caudatum (Lindl.) Pfitzer, *Bot. Jahrb. Syst.* 19: 164. 1880.

Phragmopedilum caudatum (Lindl.) Pfitzer, *Pflanzenr.* 4. 50(12): 51. 1903.

Type: Peru. “Hab. in Peruvia; In herbario Ruizii et Pavonii Lima conservato invenit Mathews, et Hookero misit” *J. Pavon s.n.* (holotype, K!).

Icones: AJB, Div. IV, 1323, tempera on paper by J. Brunete, inflorescence with two flowers. «Brunete [signature] / 62 / *Cypripedium grandiflorum* [Ruiz]». AJB, Div. IV, 1322, tempera on paper by J. Brunete, plant and base of the inflorescence. «Brunete [signature] / 62 *Cypripedium grandiflorum*».

Herbarium: MA 810807, fertile. «*Cypripedium grandiflorum* / Pillao 1787»; «Herbarium Peruvianum / Ruiz et Pavon / N° 2487». MA 810808, sterile. «Herbarium Peruvianum / Ruiz et Pavon / N° 2487».

According to Lindley (1840), the description of *C. caudatum* was prepared, on the basis of a mutilated flower, from a specimen of the herbarium of Ruiz and Pavón obtained in Lima by Mathews and sent to Sir William Jackson Hooker. The holotype at Kew does not have, unfortunately, any indication of the original collecting locality. On the type sheet it is mounted with another Peruvian specimen, collected by W. Davies in 1873 at Muña, one of the localities visited by Ruiz, Pavón, Brunete and Gálvez. From the diary of the Expedition, we know that the botanists observed populations of *Cypripedium grandiflorum* around Tarma, at Cuchero and Muña, and at least one of the specimens in MA was collected at Pillao. Ruiz (2007: 283-287; Ms. 53-54) prepared a description of *C. grandiflorum* during his stay in Muña, between August and September 1786, and, according to the diary, the species was probably illustrated at the same time (idem: 283; Ms. 53). It should be noted, however, that Ruiz apparently also employed the same name, *Cypripedium grandiflorum*, to refer to another species from Peru, eventually described by Reichenbach *filius* with the name *Selenipedium boissierianum* on the basis of a specimen by Ruiz and Pavón (Reichenbach, 1854a). A sterile specimen labelled «*Cypripedium grandiflorum* / del Peru» in Pavón’s handwriting, now in G (26164!), most probably corresponds to *P. boissierianum*, and Schweinfurth includes *Cypripedium grandiflorum* among the manuscript names under the synonymy of *P. boissierianum* but not under that of *P. caudatum* (Schweinfurth, 1958: 17-19).

The plant of *P. caudatum* illustrated by Brunete is likely from the area of Muña, but I do not include it among the type materials of *Cypripedium caudatum* because we have no data about the holotype to support this choice. On the other hand, I am tempted to consider that the specimen found by Mathews in Lima, which eventually became the holotype of *C. caudatum*, was not part of the primary set of *exsiccata* of the Spanish botanists, or they would not have left it in Peru.

Another sheet with a single flower of *Phragmipedium caudatum*, annotated by Pavón himself as «*Cypripedium grandiflorum* / del Peru / Flor», is kept in BM (26160!), but, according

to a manuscript label («Peru. Herb: Pavon»), this specimen was probably one of the plants sold by Pavón and acquired by the British Museum with the Lambert herbarium. In 1989, L.M. McCook annotated the specimen as *Isotype* (correction label, 1989; McCook, 1989) but with no indication of location or collecting date to support this decision. The Barbey-Boissier Herbarium in G also conserves a specimen of *P. caudatum* (G 169103!) that was originally part of the materials kept at the Oficina Botánica, obtained by Geneva through the Lambert herbarium. It is annotated by Reichenbach *filius* as “*Selenipedium caudatum*” and it was surely part of Ruiz and Pavón’s primary set of plants: like the specimens in MA, it includes all the vegetative parts and the inflorescence with a flower. McCook (1989, 1998) included the sheet in G and those in MA among the isotypes of *P. caudatum*, but there is no convincing evidence about their status as types.

In his diary, Ruiz makes no mention of any collection of *C. grandiflorum* at Pillao, where the members of the Expedition herborized from August to November, 1787. The illustration by Brunete was surely done before the journey of Ruiz, Pavón and Tafalla to Pillao because the artist died in Pasco on May 14, 1787, and his last works were prepared not later than November 1786, when he left Huánuco for Lima. Ruiz recorded *C. grandiflorum* from the mountains of Tarma (Ruiz, 2007: 136; Ms. 12), where the group collected in 1779; from Cuchero (*idem*: 165; Ms. 21), where the botanists and the craftsmen worked in July and August, 1780; and from the vicinity of Muña where, according to the diary (*idem*: 287; Ms. 55), the species was described and illustrated between August and November 1786. In the latter note, Ruiz recorded the local name of *C. grandiflorum* as “Rima-Rima” (*ibid.*), a name that is also referred to *Masdevallia uniflora* (*idem*: 136; Ms. 12).

As understood today, after the removal of Central American populations under *Phragmipedium humboldtii* (Warsz.) J.T. Atwood & Dressler, *P. caudatum* is apparently endemic to Peru, where it has been recorded in Cuzco, Huánuco, and Puno, as a terrestrial on fully exposed grassy slopes, more rarely as a lithophyte or epiphyte, at elevations of 1500-2500 m.

This large plant is characterized by ligulate, leathery, distichous leaves, an erect inflorescence subequal to the leaves, with 2-4 flowers open simultaneously. The flowers, with narrow petals that continue to grow after anthesis, reaching over 70 cm in length, are unmistakable.

57. *Pleurothallis cordata* (Ruiz & Pav.) Lindl., Gen. Sp. Orchid. Pl. 5. 1830. Fig. 36B

Basionym: *Humboldtia cordata* Ruiz & Pav., Syst. Veg. Fl. Peruv. Chil. 1: 234. 1798.

Synonyms: *Stelis cordata* (Ruiz & Pav.) Willd., Sp. Pl. 4: 140. 1805.

Acronia cordata (Ruiz & Pav.) Luer, Monogr. Syst. Bot. Missouri Bot. Gard. 103: 114. 2005.

Type: Peru. Huánuco: “Habitat in montibus Muña supra saxa et arbores, copiose ad Rinconada tractum”, H. Ruiz & J. Pavón *s.n.* (MA, B, BM, F).

Icons: AJB, Div. IV, 1327, possible drawing of type, tempera on paper by F. Pulgar; plant habit, with fruits. «157 /

Fran.co Pulgar [signature] / *Humboldtia cordata* [Ruiz?] / 42. F.».

Herbarium: MA 810811, Typus, sterile. «*Humboldtia cordata* / Pillao 1787 / *Gilbertia* [reverted, crossed]» [Ruiz]; «Herbarium Peruvianum / Ruiz et Pavon / 4/45». MA 810812, Typus, with a fruit. «Herbarium Peruvianum / Ruiz et Pavon / 4/45». MA 810813, Typus, with fruits. «Herbarium Peruvianum / Ruiz et Pavon / 4/45». MA 810814, Typus, sterile. «*Humboldtia cordata* / ta / Fl. Peruv. / Ex herb. Fl. Peruv. / anno 1824».

Humboldtia cordata is the first described taxon of a large, frequent and variable species-complex, distributed along all the Andes from Venezuela to Peru and Bolivia. It can be recognized by the large, horizontal, broadly ovate, deeply cordate leaves, the one to several flowers produced simultaneously with the synsepal a little broader than the dorsal sepal, the petals minutely denticulate, and the lip ovate provided with a small glenion. In his systematic treatment of *Acronia*, Luer (2005) recognizes three subspecies of *A. cordata*, of which subsp. *rhopalocarpa* (Schltr.) Luer has an obovate (vs. elliptic-ovate) dorsal sepal, distinctly longer than the synsepal; subsp. *trachysepala* (Kraenzl.) Luer has ciliate sepals and petals.

In its broad acception, *Pleurothallis cordata* occupies a broad range of ecological zones, from tropical wet forest at 500 m, to cool, montane cloud forests up to elevations of 3400 m, where the plants grow epiphytically or as terrestrials on steep embankments. In Peru, it has been recorded in Amazonas, Cajamarca, Cusco, Huánuco, Pasco, Puno, and San Martín, where populations are found in premontane to montane wet forests from 1000 to over 3200 m.

According to the *Relación* by Ruiz, *Humboldtia cordata* was described and illustrated on the basis of material collected around Muña (Ruiz & Pavón, 1798: 234), when the Expeditionaries stayed there in August-September of 1876 (Ruiz, 2007: 287; Ms. 54-55). However, the only sheet in MA annotated with the name “*Humboldtia* [sic] *cordata*” in Ruiz’s handwriting, was ostensibly collected at Pillao, an area that Ruiz, Pavón and Tafalla visited only in August 1787, and where they stayed until the end of September of the same year. For this reason the specimen annotated by Ruiz, which would be logical to regard as the holotype, cannot be considered as such, and all the other materials that are part of the original collections of the Expedition cannot be assigned to any specific area. Other original *exsiccata* of *Humboldtia cordata* are kept in the Humboldt herbarium in Berlin (digital image!), in BM (digital image!), and F (digital image!).

58. *Pleurothallis revoluta* (Ruiz & Pav.) Garay, Caldasia 8(40): 520. 1962. Fig. 36C

Basionym: *Humboldtia revoluta* Ruiz & Pav., Syst. Veg. Fl. Peruv. Chil. 1: 235. 1798.

Synonym: *Stelis revoluta* (Ruiz & Pav.) Willd., Sp. Pl. 4: 140. 1806.

Type: Peru. Huánuco: “Habitat in Muña supra arbores et saxa”, H. Ruiz & J. Pavón *s.n.* (holotype, MA!; isotypes, MA!, B, digital image!).

Icons: AJB, Div. IV, 1329, drawing of type, tempera on paper by F. Pulgar; plant habit with fruits. «159 [?] / Fran.co Pulgar [signature] / *Humboldtia revoluta* / 41. F.».



Fig. 36. A, *Phragmipedium caudatum*. AJB, Div. IV, 1322, tempera on paper by J. Brunete, plant and base of the inflorescence; **B,** *Pleurothallis cordata*. AJB, Div. IV, 1327, possible drawing of type, tempera on paper by F. Pulgar; **C,** *Pleurothallis revoluta*. AJB, Div. IV, 1329, drawing of type, tempera on paper by F. Pulgar; **D,** *Psychmorchis glossomystax*. AJB, Div. IV, 1291, tempera on paper by I. Gálvez.

Herbarium: MA 810858, Holotypus, with fruit. «*Humboldtia revoluta* / Huasa huasi» [Ruiz]. «Herbarium Peruvianum / Ruiz et Pavon / 4/44». MA 810857, Isotypus, with fruit. «Herbarium Peruvianum / Ruiz et Pavon / 4/44».

Pleurothallis revoluta has an erect, stout, apically grooved ramicaul, enclosed at the base by tubular, inflated sheaths; a lanceolate-elliptic, subcoriaceous leaf, narrowing at the base into a conduplicate sinus; one to several simultaneous inflorescences, longer than the leaf, carrying numerous, non-resupinate flowers successively opened, the whitish flowers provided with a cymbiform synsepal and narrow, linear-oblong petals, variously thickened at apex. These features are diagnostic of this species. According to the systematic treatment by Luer (1999), the size and color of the flower of *P. revoluta* are variable, but they are commonly translucent green and finely spotted with purple. See Luer (1999) for a complete list of suggested synonyms of the species.

Pleurothallis revoluta ranges from Trinidad and Venezuela to Colombia, Ecuador, Peru, and Bolivia, where it has been found in wet montane wet forests at elevations of 1800-2000 m. In his *Relación*, Ruiz recorded that *Humboldtia revoluta* was described and illustrated while the Expedition was in Muña, in August-September of 1876 (Ruiz, 2007: 287; Ms. 55).

59. *Ponthieva fertilis* (F. Lehm. & Kraenzl.) Salazar, Ann. Bot. (London) 104: 416. 2009. Fig. 37

Basionym: *Goodyera fertilis* F. Lehm. & Kraenzl., Bot. Jahrb. Syst. 26: 498. 1899.

Synonyms: *Cranichis fertilis* (F. Lehm. & Kraenzl.) Schltr. Repert. Sp. Nov. Regni Veg. Beih. 8: 115. 1921.

Type: Ecuador. Circa Putzu (?) in Andibus occidentalibus ditionis Guarandae, 2000 m, *F. Lehmann 5380* (holotype ?).

Ophrys parviflora C. Presl, Reliq. Haenk. 2: 92. 1827, *non Cranichis parviflora* L.O. Williams, Lilloa 3: 478. 1938, based on *Cranichis micrantha* Griseb., Abh. Königl. Ges. Wiss. Göttingen 24: 337. 1879, *non Spreng.*, Syst. Veg. 3: 700. 1826.

Exalaria parviflora (C. Presl) Garay & G.A. Romero, Harvard Pap. Bot. 4: 480. 1999.

Type: Peru. «Hab. in montanis Peruviae ad Huanocco, *T. Haenke s.n.* (holotype, PR, not seen).

Cranichis pycnantha Schltr., Repert. Spec. Nov. Regni Veg. Beih. 7: 62. 1920.

Type: Colombia. Antioquia: 2000 m, *Madero 173* (holotype, B†; drawing of type, AMES!).

Cranichis koebleri Schltr., Repert. Spec. Nov. Regni Veg. Beih. 9: 55. 1921.

Type: Peru. Near La Merced, *Kobler s.n.* (holotype, B†).

Icones: AJB, Div. IV, 1264, tempera on paper by F. Pulgar, plant habit with flowers, single flower, floral dissection and fruit. «75 / Fran.co Pulgar [signature] / Satyrium?».

Herbarium: No material of this species found in MA.

Ponthieva fertilis are terrestrial, variable plants, which can be over 50 cm tall (but usually smaller), with fasciculate, slender-tuberous roots and sessile or short-petiolate leaves both basal and cauline. They have a dense, many-flowered, tomentose in-

florescence, floral bracts shorter than the ovary, and small, white, non-resupinate, pubescent flowers, provided with a concave-conduplicate, proximally scaccate, distally 3-lobed lip.

Ponthieva fertilis has been recorded in montane wet forests in Venezuela (?), Colombia, Ecuador, Peru, and Bolivia, up to 300 m of elevation. In Peru, populations have been found in Ayacucho, Cuzco, Huánuco, Junín, and Loreto, where the lances grow in open woods and dense evergreen forest, often on steep banks, at 500 to 2500 m.

60. *Psymorchis glossomystax* (Rchb.f.) Dodson & Dressler, Phytologia 24: 288. 1972. Fig. 36D

Basionym: *Oncidium glossomystax* Rchb.f., Bot. Zeit. 10: 696. 1852.

Erycina glossomystax (Rchb.f.) N.H. Williams & M.W. Chase, Lindleyana 16(2): 136. 2001.

Type: [Ecuador.] «Loxa», *J. Warszewicz s.n.* (holotype, W). Icones: AJB, Div. IV, 1291, tempera on paper by I. Gálvez, habit and flowers on a trunk. «187 / Galvez [signature] / 66 / Epidendrum equitans».

Herbarium: MA 810789, plants with flowers. «Ophrys [crossed] / Epidendrum / imbricatum / Pozum 84 / Muña». MA18790, sterile. «Gynand. Diand. / Orchys. F. P. c. l. N. 10 / Tiene mucha afinidad con el / del N.º y L. 366. / Ex Chicop. Año 97.».

The sterile specimen mounted on MA 810790, collected by Tafalla at Chicoplaya in 1897 («Orchys N. 10»), is probably also referable to this species. It was described in detail in a manuscript kept at the Archives of the RJB, «N. 10. / Gynadria Diandria / Orchys? an Ophrys? / [...]» (AJB, Div. IV, 4, 3, fol. 40). On the original label, it is compared to another collection by Tafalla («It has strong affinity with that of N.[umber] and L.[ámina = Plate] 366 »), a specimen of *Psymorchis pumilio* that was illustrated by J.G. Rivera (AJB, Div. IV, 1268, see hereafter). M. Rodríguez noted on a correction label (1984) that the specimen is probably referable to a species of the genus *Notylia* Lindl. [= *Macroclinium* Barb. Rodr.], but in the latter genus the leaves are distinctly articulated with the basal sheaths that envelop the pseudobulb, while in the ebulbose *P. glossomystax* there are no basal sheaths.

The very small plants, consisting of a flabelliform cluster of equitant leaves, the yellow flowers with brownish red spots on the petals and the base of the lip, and the disc of the lip with 2 pairs of lamellae terminating in deep fringes, are diagnostic of the species. Widespread and locally abundant, *P. glossomystax* is distributed in most of South America, from Venezuela to Brazil and from Colombia to Bolivia along the Andes. In Peru, it has been recorded in the provinces of Cuzco, Junín, Loreto, Madre de Dios, and San Martín, at elevations ranging from 300 to 900 m; it is common in old coffee plantations and on *Psidium guayava* L. trees.

61. *Psymorchis pumilio* (Rchb.f.) Dodson & Dressler, Phytologia 24(4): 288. 1972.

Fig. 11 *pro parte* (Pupulin, 2012: 39)

Basionym: *Oncidium pumilio* Rchb.f., Bot. Zeitung (Berlin) 10(40): 697. 1852.



Fig. 37. *Ponthieva fertilis*. AJB, Div. IV, 1264, tempera on paper by F. Pulgar.

Tolumnia pumilio (Rchb.f.) Hoehne, Iconogr. Orchid. Brasil, 1949.

Erycina pumilio (Rchb.f.) N.H. Williams & M.W. Chase, Lindleyana 16(2): 136. 2001.

Type: Brazil. "Von Martius Herb. Brasil. 564" (holotype, W?).
 Icones: AJB, Div. IV, 1268 [in part; the left portion of the plate illustrates a specimen of the genus *Cischweinfia*, while the upper part (as well as details "a, b, c", showing a flower, a capsule and the capsule valves) almost surely represents a saprophytic species of Gentianaceae (J. L. Fernández, pers. comm.)], tempera on paper by J.G. Rivera. Habit with flower, flower analysis, closed and split fruit. «J. G. R. del [signature] / [...] / 366 / Ophrys?». See Pupulin 2012.

Herbarium: MA 810796. Plant, sterile. «Gyn. Diand. / Orchys? / F.P.c.l. N° 366. / Epidendrum? [*alia manu*] / Ex Chicop. A° 97». «Herbarium Peruvianum / Ruiz et Pavon / 4/73».

Uncommon but locally abundant from Mexico, through Central America, to Venezuela, French Guyana, Surinam, and Brazil, and from Colombia to Peru along the Andes, *P. pumilio* inhabits tropical to premontane, warm forests at elevations of 200-1500 m.

The miniature plant with a fan-shaped spread of leaves with 1-2 axillary, erect to arching inflorescences, producing 2 to 3 flowers per inflorescence, singly in succession, and the concolorous yellow flowers with an obtriangular, thick callus, apically fimbriate distinguish the species. When compared to *P. glossomystax*, the plants of *P. pumilio* have broader leaves, the flowers are smaller and the apical callus is single, fimbriate (vs. in pair, deeply fringed in *P. glossomystax*).

At the Archives of the RJB is kept a full description of this plant with the title «L. 366. / Gynandria Diandria / Ophrys / [...]» (AJB, Div. IV, 4, 3, fol. 45).

62. *Restrepia contorta* (Ruiz & Pav.) Luer, Monogr. Syst. Bot. Missouri Bot. Gard. 59: 50. 1996. Fig. 38A

Basionym: *Humboldtia contorta* Ruiz & Pav., Syst. Veg. Fl. Peruv. Chil. 1: 235. 1798.

Synonym: *Stelis contorta* (Ruiz & Pav.) Pers., Syn. Pl. 2: 524. 1807.

Type: Peru. Huánuco: "Habitat in Muña supra arbores et saxa", H. Ruiz & J. Pavón s.n. (holotype, MA; isotype, W).

Icones: AJB, Div. IV, 1330, drawing of type, tempera on paper by F. Pulgar, habit with fruits. «160 / Fran.co Pulgar / Humboldtia contorta [Ruiz] / 179 / contorta».

Herbarium: MA 810823, Holotypus, sterile. «Humboldtia contor / ta» [Ruiz]. «Herbarium Peruvianum / Ruiz et Pavon / 4/55».

Belonging to the Subgenus *Restrepia*, Section *Restrepia*, *R. contorta* is a variable and widely distributed species, ranging from Venezuela to Colombia, Ecuador and Peru. Frequently, in its native habitats, it has been recorded growing epiphytically in wet submontane and wet montane forests, at 1100-3200 m of elevation.

In their systematic revision of *Restrepia*, Luer and Escobar (1996) treated *R. contorta* as a variable species-complex, grading into the smaller *R. elegans* and the larger *R. guttulata*. The peduncle of *R. contorta* bears the flower near or beyond the

apex of the leaf; its flowers are medium to relatively large (dorsal sepal 25-35 mm long); the synsepal is shortly bifid; the lip variably verrucose and spotted as the synsepal. However, as admitted by Luer & Escobar (1996), positive identification of many specimens is not possible.

The species has been known under its synonym, *R. maculata* Lindl. (1846), which is still in use. For a complete list of synonyms of *R. contorta*, see Luer & Escobar (1996). According to Ruiz's diary of the Expedition, *Humboldtia contorta* was described and illustrated during the stay in Muña in August-September of 1876 (Ruiz, 2007: 287; Ms. 55).

63. *Rodriguezia ensiformis* Ruiz & Pav., Syst. Veg. Fl. Peruv. Chil. 1: 218. 1798. Fig. 39

Type: Peru. "Habitat in nemoribus Pozuzo supra saxa et arbores, versus Cheniço et Tramo tractus" (holotype, MA; isotype, MA).

Icones: AJB, Div. IV, 1229, drawing of type, tempera on paper by J. Brunete. «140 / Brunete [signature] / 124 / Rodriguezia ensiformis / 119».

Herbarium: MA 810827, Holotypus, fertile. «Rodriguezia / ensiformis» [Ruiz]; «Herbarium Peruvianum / Ruiz et Pavon / 25/11»; «Gynand. Diand. / Orchys tripetala. / F.P.c.l. N° 326. / Ex Chicoplaya. A° 97» [misplaced label]. MA 810826, Isotypus, sterile. «Herbarium Peruvianum / Ruiz et Pavon / 25/11».

Prodrumus: Ic. 25, Rodriguezia. The flowers, and the lateral view of the lip and column, are ostensibly engraved from the original watercolor illustration.

According to Ruiz (2007: 281; Ms. 53), the original description of *R. lanceolata* was destroyed during the fire of Macora of August 1785, and it was redone during the journey of the expedition in Huánuco in 1785. The holotype in MA (810827) has two labels, one manuscript by Ruiz («Rodriguezia ensiformis») and the other, handwritten by Tafalla, indicating the collecting location as Chicoplaya, along the Río Monzón in central Huánuco department. It is obvious that the description of *R. ensiformis* makes no reference to the specimen of Tafalla, which was collected when the *Systema* had gone to press, in a region that Ruiz and Pavón themselves never visited. Fortunately, Tafalla's label refers to an illustration by J.G. Rivera (N. 326), which is still in existence in MA and has the same name, «Orchys tripetala», annotated on the label. However, the plate by Rivera depicts *Rodriguezia strobilii* Garay (see discussion under this entry below), a species with caespitose habit and with leaves much stouter than those of *R. ensiformis*. The specimens in MA, with their rhizomatous habit and the narrow, ligular leaves correspond to the illustration of the type prepared by Brunete, and Ruiz original manuscript (Div. IV, leg. 4, 3, fol. 4: «Gynandria Diandria 156 / Rodriguezia ensiformis ic. 140») explicitly refers to it.

A poorly known species, *R. ensiformis* is apparently endemic to Peru.

64. *Rodriguezia lanceolata* Ruiz & Pav., Syst. Veg. Fl. Peruv. Chil. 1: 219. 1798. Fig. 40

Syntypes: Peru. «Habitat in Tarmae Provinciae montibus, vul-

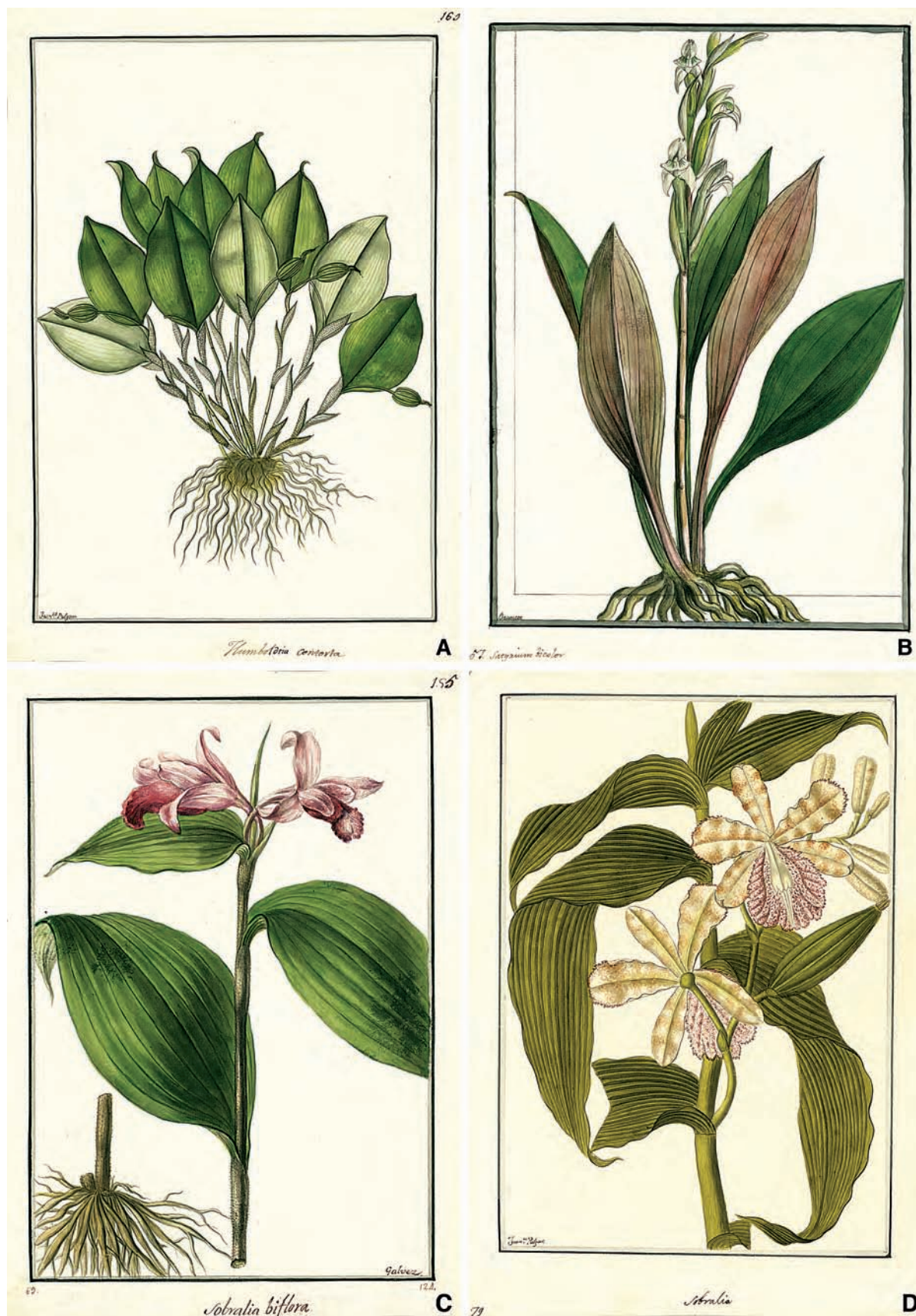


Fig. 38. A, *Restrepia contorta*. AJB, Div. IV, 1330, drawing of type, tempera on paper by F. Pulgar; **B,** *Sarcoglottis acaulis*. AJB, Div. IV, 1262, tempera on paper by J. Brunete; **C,** *Sobralia biflora*. AJB, Div. IV, 1305, drawing of type, tempera on paper by I. Gálvez; **D,** *Sobralia dichotoma*. AJB, Div. IV, 1298, apex of stem with inflorescence, flowers and fruit. Drawing of type, tempera on paper by F. Pulgar.



Fig. 39. *Rodriguezia ensiformis*. AJB, Div. IV, 1229, drawing of type, tempera on paper by J. Brunete.



Fig. 40. *Rodriguezia lanceolata*. AJB, Div. IV, 1230, drawing of type, tempera on paper by F. Pulgar.

go Montañas de los Andes, ad [...] Palca, Collac et Monobamba vicos», *H. Ruiz & J. Pavón s.n.* (not located); «Vítoc», 1794, J. J. Tafalla 175, MA 810828, selected here as the Lectotypus.

Icones: AJB, Div. IV, 1230, drawing of a syntype, tempera on paper by F. Pulgar. Habit, flowers and floral dissections. «Fran.co Pulgar [signature] / 175 / *Rodriguezia lanceolata*». Fig. 46.

Herbarium: MA 810828, Lectotypus. Plant, sterile. «Gynand. Diandria / Orchys dependens / F.P.c.L. N° 175. / Ex Vítoc. Año 94».

The lectotype material conserved at MA is sterile and it bears the manuscript, intended name «Orchys [sic] dependens». However, the number 175 assigned to the specimen, as well as the collecting locality of Vítoc noted on the original label, unequivocally correspond to the number cited in Pulgar's illustration of *R. lanceolata*. According to the original label, the plant was collected in 1794, six years after Ruiz and Pavón sailed home from Peru, and the drawing by Pulgar was likely prepared in the same date. In his diary, Ruiz refers that the original description of *R. lanceolata* was destroyed at Macora, and that it was prepared another time in Huánuco in 1785 (Ruiz, 2007: 281; Ms: 53). This may leave some concern about the actual status of the specimen at MA. However, it is sure that Ruiz and Pavón received it, together with the corresponding drawing, before the publication of the *Systema* in 1898. Tafalla and Pulgar sent specimens and 165 drawings and descriptions in 1793, and again they sent materials from Huánuco and Tarma in 1795 (Steele, 1964: 270-271). As the shipment of the boxes required almost one year coming to Spain, the specimen collected at Vítoc and the relative drawing could have reached the hands of Ruiz in 1786, and both are therefore eligible for typification. The Archives of RJB kept two manuscript descriptions referred by Ruiz to «*Rodriguezia lanceolata*», the first prepared by the leading botanist on the basis of a plant collected before 1788 “*in umbrosis Cuchero montibus*” (AJB, Div. IV, leg. 4, 3, fol. 5: «Gynandria Diandria 157 / *Rodriguezia lanceolata s.ic.*»), and the other written by Tafalla (AJB, Div. IV, leg. 4, 3, fol. 3: «L. 175 Gynandria Diandria / Orchys [deleted] *Rodriguezia lanceolata* [Ruiz]»). Ruiz not only annotated Tafalla's description with the name «*Rodriguezia lanceolata*», but he also emended his original description to include morphological notes taken from the manuscript describing the plant from Vítoc. He added an improved description of the vegetative parts («*bulbi obovati [...] compressi, folio unico terminati / Scapi axillares solitarii dependentes, foliis brevioribus*») literally copied from the verso of Tafalla's manuscript, and changed the type locality according the field note provided by Tafalla. There are no doubts that the description of the species was therefore prepared using both the plants collected at Cuchero and at Vítoc. While MA 810828, chosen as the lectotype, is sterile, the drawing by Pulgar well illustrates the habit with flowers and includes accurate dissections of the flower.

The British Museum hosts another specimen (BM 74440!), annotated in Pavón's handwriting «*Rodriguezia* / Gen. nov.», with a manuscript label recording that the specimen was part of the herbarium of Pavón (originally at the “Oficina Botánica” in Madrid). The plant is sterile, and it

was tentatively annotated as Isotype, but it has no indication of locality and date, and its status as type is dubious.

65. *Rodriguezia strobilii* Garay, *Canad. J. Bot.* 34: 258. 1956. Fig. 41

Type: Ecuador. Guayas, flowered in cultivation at the Montreal Botanical Garden, February 15, 1955 and received from Dr. H. Teuscher, *Strobel s.n.* (holotype, AMES!).

Icones: AJB, Div. IV, 1254, tempera on paper by J.G. Rivera. «Jose Rivera del. [signature] / 326. Orchys tripetala».

Herbarium: No material of this taxon exists in the collections of Ruiz and Pavón in MA.

According to the manuscript description of this species by Tafalla, kept in the Archives of RJB (AJB, Div. IV, 4, 3). “Orchys tripetala” was collected in the «*Sylvis Chicoplayae supra Arborea*». A herbarium label by Tafalla «Orchys tripetala. / F.P.c.l. N° 326, / Ex Chicoplaya. A° 97») is affixed to the holotype of *Rodriguezia ensiformis* (MA 810827), but the specimen does not correspond, morphologically, to the illustration by Rivera. José Gabriel Rivera was hired to join Tafalla, J.A. Manzanilla and F. Pulgar and to be trained in botanical illustration only in October, 1796 (Pulgar's appointment was officially terminated on March 16, 1797). In 1797 and 1798 Tafalla, J.A. Manzanilla and J.G. Rivera visited San Antonio de Playa Grande, Chicoplaya and the Monzón mountains. During this time, Rivera prepared 90 illustrations (Tafalla, 1989). On May 11, 1799, the trio shipped for Guayaquil, only returning to Lima ten years later.

Rodriguezia strobilii is known from Ecuador and Peru, where it inhabits coastal dry tropical forests and premontane forests from sea level to 1300 m. The faintly fragrant flowers, white to pale rose finely speckled and suffused with purple, distinguish the species.

66. *Sarcoglottis acaulis* (Sm.) Schltr., *Repert. Spec. Nov. Regni Veg. Beih.* 6: 53. 1919. Fig. 38B

Basionym: *Neottia acaulis* Sm., *Exot. Bot.* 2: 91. 1806.

Synonym: *Spiranthes acaulis* (Sm.) Cogn., *Fl. Brasil.* 3(4): 221. 1895.

Type: Trinidad. “Mr. Evans of Stepney received it from Trinidad”, *Anderson s.n.* (holotype, S, not seen).

Sarcoglottis speciosa C. Presl., *Reliq. Haenk.* 1: 96. 1827.

Spiranthes speciosa (C. Presl) Lindl., *Gen. Sp. Orchid. Pl.* 475. 1840.

Gyrostachys sarcoglottis (C. Presl) Kuntze, *Revis. Gen. Pl.* 2: 663. 1891.

Type: Peru: “Hab. in montanis Peruviae ad Huanocco”, *T. Haenke s.n.* (holotype, PR, not seen).

Icones: AJB, Div. IV, 1262, tempera on paper by J. Brunete, plant with flowers. «Brunete [signature] / 57. *Satyrium bicolor*».

Herbarium: No specimens found in MA.

Widely distributed in the Neotropics, from El Salvador, through Central America, the Windwards, Trinidad and Tobago, to most of South America (Venezuela to Brazil and Colombia to Bolivia), *S. acaulis* is found at elevations of 100 to almost 3000 m, where it grows as a terrestrial in wet tropical to



José Rivera. del.

326. *Orchys tripetala.*

Fig. 41. *Rodriguezia strobilii*. AJB, Div. IV, 1254, tempera on paper by J.G. Rivera.

cool montane forests. In Peru, it has been recorded in the provinces of Amazonas, Huánuco, Junín, Loreto, and San Martín, from 100 to 1800 m.

The basal rosette of obovate-elliptic leaves with a distinct, elongate petiole, and the erect, pubescent inflorescence with long, acuminate bracts that exceed the ovary, distinguish this variable species.

According to Ruiz's journal, *Satyrium bicolor* was described and illustrated while the Expedition was in Pozuzo, in September, 1784 (Ruiz, 2007: 256; Ms. 44). For other synonyms of this species, see Garay (1978b), and Brako and Zarucchi (1993).

67. Sauroglossum corymbosum (Lindl.) Garay, Bot. Mus. Leaflet 26: 19. 1978. Fig. 42

Basionym: *Synassa corymbosa* Lindl., Edward's Bot. Reg. 19: sub. t. 1618. 1833.

Pelexia corymbosa (Lindl.) Lindl., Gen. Sp. Orchid. Pl. 482. 1840.

Type: "In Peru", *Pavón s.n.* (holotype, K).

Icones: AJB, Div. IV, 1266. Drawing of type, tempera on paper by F. Pulgar. Habit and floral dissections. «Fran.co Pulgar [signature] / 137 / *Satyrium* [Ruiz]».

Herbarium: No material of this taxon is present in MA.

Sauroglossum corymbosum is only known in Peru and Bolivia. In Peru, populations are found in cool regions in the provinces of Cusco and Junín, at 2500-2600 m. The plants grow terrestrially in crevices with poor lateritic soils in low, semi-xerophytic brush and grass (Dodson & Bennett, 1989).

The type, in Lindley's herbarium at Kew, was obtained through the acquisition of Hooker of Lambert's materials. Apparently, no isotypes were conserved, and none of the sheet in MA is attributable to species of the genus *Sauroglossum*. The plate painted by Francisco Pulgar was probably prepared from the only known collection of this species by the members of the Expedition, and I consider it an illustration of the type.

The terminal, corymbose inflorescence, provided with distant, tubular, acuminate bracts, and the pure golden yellow flowers, the lip crenate at the margin are diagnostic of the species.

68. Sauvetrea alpestris (Lindl.) Szlach., Richardiana 7(1): 29. 2007[2006]. Fig. 43

Basionym: *Maxillaria alpestris* Lindl., Pl. Hartw. 154. 1845.

Type: Ecuador. "Habitat inter Lichenes in montibus Loxa rarissima", *T. Hartweg s.n.* (holotype, K).

Icones: AJB, Div. IV, 1231, tempera on paper by F. Pulgar, plant habit (on a branch), single flower, floral dissection and immature fruit. «Fran.co Pulgar [signature] / *Maxillaria* / 74».

Herbarium: I have found no specimens of this species in MA.

This species is distinguished by a elongate, ascending rhizome with widely separated, compressed, rugose, monophyllous pseudobulbs; an erect, single-flowered inflorescence that rises from a mature pseudobulb, enveloped by distichous sheaths; a trigonous ovary; and greenish yellow flowers, with the lip orange-yellow, provided with a 3-lobed lip, denticulate

along the midlobe and on the apical margin of the lateral lobes.

Schweinfurth (1970) and Vásquez C. & Dodson (1982) included *Maxillaria trigona* C. Schweinf. [= *Sauvetrea trigona* (C. Schweinf.) Szlach.] in synonymy under *M. alpestris*. However, in the latter species, the midlobe of the lip has entire margins and the lateral lobes are striped with reddish-brown along the veins. Blanco & al. (2007) considered that the genus *Sauvetrea* needs a thorough taxonomic revision, and I favor maintaining the two taxa as distinct pending further studies in the group. For a complete list of possible synonyms of *S. alpestris*, see Vásquez & Dodson (1982).

Sauvetrea alpestris has been recorded in Venezuela, Colombia, Ecuador, Bolivia and Peru. In Peru, it is a widespread but uncommon species in Amazonas, Cajamarca, Cusco, Pasco, and Puno provinces, where populations are found in premontane and montane wet forests at 1500 to almost 3000 m of elevation.

69. Sauvetrea uniflora (Ruiz & Pav.) Pupulin, **comb. nov.** Fig. 44

Basionym: *Bletia uniflora* Ruiz & Pav., Syst. Veg. Fl. Peruv. Chil. 1: 230. 1798.

Type: Peru. Huánuco. "Habitat in Peruviae silvis ad Vitoc Provinciae Tarmae vicum supra arbores", H. Ruiz & J. Pavón s.n. (holotype, MA).

Synonym: *Maxillaria laevilabris* Lindl., Pl. Hartw. 155. 1845, **syn. nov.**

Sauvetrea laevilabris (Lindl.) M.A. Blanco, Lankesteriana 7(3): 535. 2007, **syn. nov.**

Type: Peru. A tracing by A. Mathews from the herbarium of Ruiz and Pavón conserved in Lima, based on Flora Peruviana N° 169 (holotype, K).

Icones: AJB, Div. IV, 1276, drawing of type, tempera on paper by F. Pulgar; plant with flowers, single flower and floral dissections. «Fran.co Pulgar [signature] / 169 / *Bletia uniflora* [Ruiz?]».

Herbarium: MA 810778, Holotypus, sterile. «Gynandria Dianthria / Ophrys? / F. P. c. L. N.° 169 / Ex Vitoc. Año 94» [Tafalla]. «Herbarium Peruvianum / Ruiz et Pavon / 25/35».

Ruiz and Pavón's diagnosis of *Bletia uniflora* ("*B. bulbis subrotundis compressiusculis, foliis linearibus carinatis, scapis radicalibus unifloribus*") was not detailed enough to allow an understanding of the generic placement of this species, and in the absence of any original specimen annotated by the authors with this name, the concept has remained obscure since its description. However, conserved among the illustrations prepared by Pulgar on the material collected by Tafalla and J.A. Manzanilla at Vitoc, in the province of Tarma, is a drawing of a species unmistakably referable to the genus *Sauvetrea*, which bears the manuscript name of «*Bletia uniflora*» and the number «169». The holotype in MA bears the same number and, although sterile, shows the typical habit of the species. Another herbarium specimen with the same number was still conserved in Lima in 1832, when Andrew Mathews studied it. Like the holotype, it had been collected at Vitoc, as stated in the prologue of *Bletia uniflora*.

The drawing of the type by F. Pulgar clearly shows the plant habit, the yellow flowers and the lip without a prominent callosity, which is diagnostic of the species in the genus *Sauvetrea*.



Fig. 42. *Sauroglossum corymbosum*. AJB, Div. IV, 1266, drawing of type, tempera on paper by F. Pulgar.



Fig. 43. *Sauvetea alpestris*. AJB, Div. IV, 1231, tempera on paper by F. Pulgar.



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Bletia uniflora

Fig. 44. *Sauvetrea uniflora*. AJB, Div. IV, 1276, drawing of type, tempera on paper by F. Pulgar.

Lindley (1845a) described *M. laevilabris* on the basis of a drawing sent by A. Mathews from Lima, which was probably traced from one of the specimens originally collected at Vitoc. The drawing at Kew shows the caespitose habit of the plant, with the characteristically falcate, distichously alternate, inflat-compressed, imbricating bracts of the inflorescence, and a detail of the ecallose lip. The manuscript note associated with the drawing indicates that the specimen was collected at Vitoc in 1794, «ex herb. R. et P. in Lima conservato». The number of the specimen in the system of the Flora Peruviana, «169», corresponds to that noted by Francisco Pulgar in his drawing of *Bletia uniflora*.

Maxillaria piestopus, based on a Costa Rican specimen collected by A. Tonduz in 1913, is apparently very close to *S. uniflora* in the plant habit, color of the flowers, and the lip without a prominent callus. The photograph in AMES (40549!) of the holotype destroyed in Berlin, with the original analytical drawing by Schlechter, shows a triquetrous ovary and a 3-lobed, ecallose lip, which are almost indistinguishable from those illustrated by Pulgar. I have not seen the type of *Maxillaria koehleri* Schltr., also described from Peru from a specimen collected by the brothers Köhler in 1920, which Blanco and co-authors (2007) included under the synonymy of *Sauvetrea laevilabris*.

Sauvetrea uniflora ranges at least from Ecuador to Peru and Bolivia (up to Costa Rica to the North, if *M. piestopus* is considered a synonym), where it is found growing epiphytically in wet montane forests, at 800-2100 m.

70. *Sobralia biflora* Ruiz & Pav., Syst. Veg. Fl. Peruv. Chil. 1: 232. 1798. Fig. 38C

Type: Peru. Huánuco: "Habitat in Pozuzo runcationibus et calidis locis, versus Cheniço et Tramo tractus", *H. Ruiz & J. Pavón s.n.* (holotype, MA).

Icones: AJB, Div. IV, 1305, drawing of type, tempera on paper by I. Gálvez, habit with flowers. «155 / Gálvez [signature] / 62 / 124 / *Sobralia biflora* [Ruiz]».

Herbarium: MA 810834, Typus, sterile. «*Sobralia biflora* [Ruiz]». «Herbarium Peruvianum / Ruiz et Pavon / 4/62»; MA 810833, Typus, sterile. «Herbarium Peruvianum / Ruiz et Pavon / 4/62»; MA 810832, Typus, sterile. «Herbarium Peruvianum / Ruiz et Pavon / 4/62».

The type material in MA includes three sheets, one of which is annotated in Ruiz's handwriting as «*Sobralia biflora*». The three specimens are sterile, and they bear an old label of the "Herbarium Horti Botanici Matritensi", with Mansfeld's determinations, indicating number «4/62». Even though these numbers were assigned at the herbarium, and have not to be understood as field numbers by Ruiz and Pavón (who do not used them), they, nevertheless, give evidence that the three specimens were part of the same original gathering.

According to Ruiz's diary, *S. biflora* was described and illustrated while the Expedition was in Pozuzo, in September, 1784 (Ruiz, 2007: 256; Ms. 44). Among the manuscripts of the *Flora Peruviana et Chilensis* («176 / *Sobralia biflora* ic. 155 [...]», AJB, Div. IV, 4, 3, fol. 91), is conserved the original description of the species by Ruiz, which makes explicit reference to Gálvez' illustration.

The species ranges from Colombia to Peru and Brazil. In

Peru, it apparently seems restricted to the warm, tropical forest of Huánuco and Junín, where it grows as an epiphyte between 200 and 450 m. The loosely leaved stems to about one meter tall, with large, ovate-lanceolate, thin leaves, the pubescent-scabridous sheaths, the terminal, sessile, cone-like, 2-flowered inflorescence, and the campanulate, lilac flowers with obovate petals and retuse lip provided with parallel keels distinguish the species.

71. *Sobralia ciliata* (C. Presl) C. Schweinf. & Foldats, Fl. Venezuela 15(1): 175. 1969. Fig. 45

Basionym: *Bletia ciliata* C. Presl, Reliq. Haenk. 1(2): 99. 1827. Type: Peru. "Habitat in montanis Peruviae ad Huanocco", *Haenke s.n.* (holotype, PRC).

Icones: AJB, Div. IV, 1307, tempera on paper by F. Pulgar. Apex of stem with flowers, single flower, floral dissections and fruit. «Fran.co Pulgar [signature] / 256. *Arethusa. Sobralia*».

Herbarium: MA 810846, fertile. «Gynand. Diandria / *Arethusa?* / F.P.c.l.d.N. 256. / Ex Chinchao Año 95»; «Herbarium Peruvianum / Ruiz et Pavón / 25/10».

The plate by Pulgar and the sheet in MA have the same number, and correspond to a plant collected by J.J. Tafalla in 1895.

These are tall plants (up to 2 meters), with a relatively short, lateral, many-flowered inflorescence and small, bright rose-purple flowers with the lip fringed apically. *Sobralia ciliata* is known from Venezuela, Ecuador, Bolivia and Peru; in the latter country it inhabits montane wet forests at 1700-2200 m.

72. *Sobralia dichotoma* Ruiz & Pav., Syst. Veg. Fl. Peruv. Chil. 1: 232. 1798. Figs. 38D, 46A, B

Cattleya dichotoma (Ruiz & Pav.) Beer, Prakt. Stud. Orchid. 215. 1854.

Type: Peru. Huánuco: "Habitat abunde in nemoribus Muña, Pozuzo et Chinchao per runcationes in locis calidis et saxosis", *H. Ruiz & J. Pavón s.n.* [MA; G; part of the type collection probably at P (P 441683; P 441685), from J. Dombey]. Heterotypic synonyms: *Sobralia mandonii* Rchb.f., *Xenia* Orchid. 2: 175. 1873.

Type: Peru. "Larecaja. Viciniis Sorata; Colle Catarguata et Valle Challasuyo, in scopulosis. 2700 m. Sept.-Decbr. 1858", *G. Mandon 1170* (holotype, W).

Sobralia mandonii f. *coerulea* Christenson, Orchids, Mag. Amer. Orchid Soc. 71(11): 998. 2002.

Type: Peru. Amazonas, kilometer marker 325 along road to Moyobamba to Pomacochas, 6500 ft., *E. Christenson et al. 2010* (holotype, CUZ; isotypes, HAO, USM).

Icones: AJB, Div. IV, 1298, drawing of type, tempera on paper by F. Pulgar, apex of stem with inflorescence, flowers and fruit. «Fran.co Pulgar [signature] / *Sobralia* [Ruiz] / 79».

AJB, Div. IV, 71, drawing of type, tempera on paper by F. Pulgar; flower, floral dissections, fruits. «Fran.co Pulgar [signature] / *Sobralia* [Ruiz] / 79». AJB, Div. IV, 1300, drawing of type, tempera on paper by F. Pulgar; roots and base of a stem. «Fran.co Pulgar [signature] / *Sobralia?* [Ruiz] / 79». Fig. 45B.



Fig. 45. *Sobralia ciliata*. AJB, Div. IV, 1307, tempera on paper by F. Pulgar.

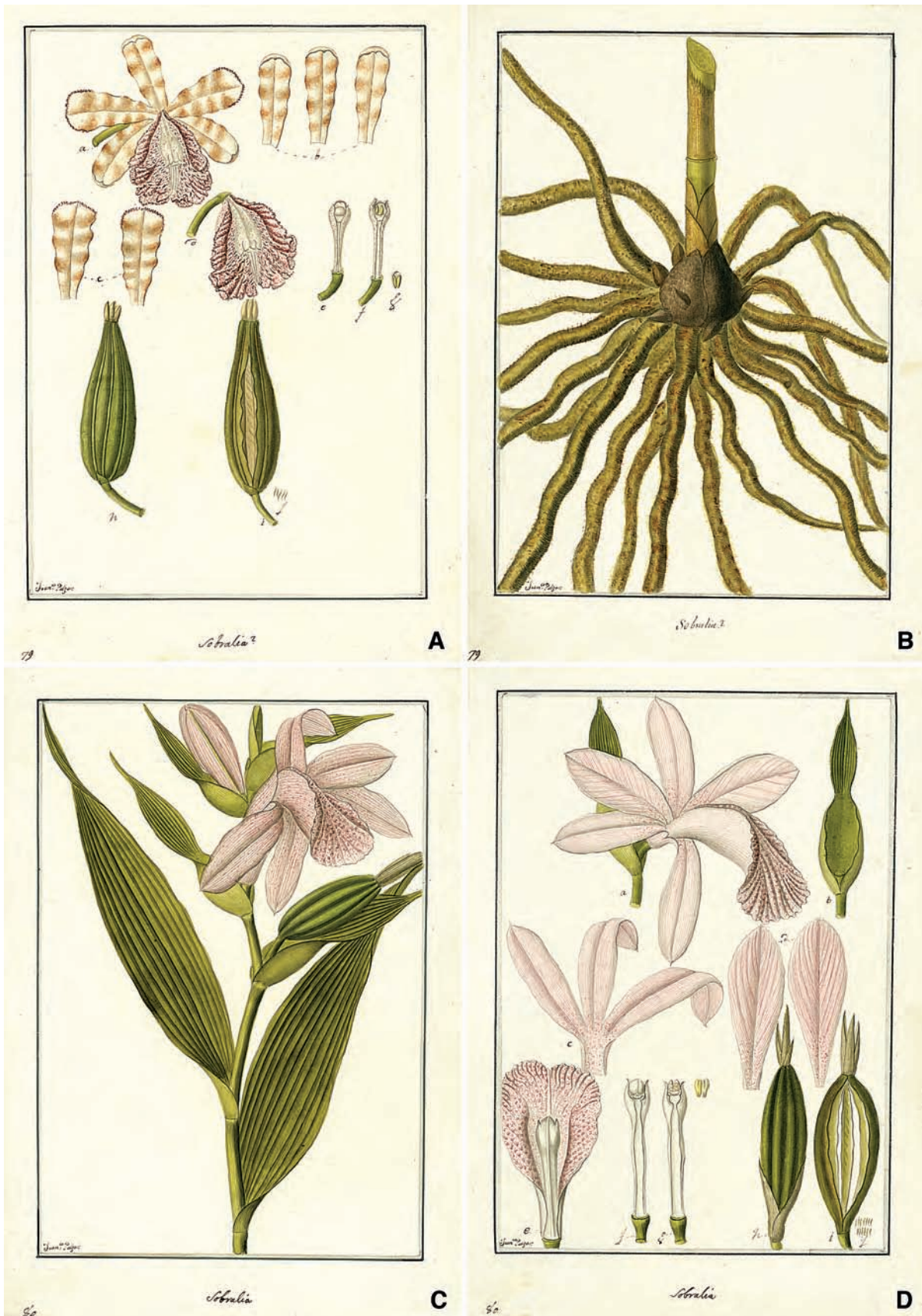


Fig. 46. A, *Sobralia dichotoma*. AJB, Div. IV, 1299, flower, floral dissections, fruits. Drawing of type, tempera on paper by F. Pulgar; **B,** *Sobralia dichotoma*. AJB, Div. IV, 1300, roots and base of a stem. Drawing of type, tempera on paper by F. Pulgar; **C,** *Sobralia rosea*. AJB, Div. IV, 1301, apex of stem with inflorescence, flower and fruit. Tempera on paper by F. Pulgar; **D,** *Sobralia rosea*. AJB, Div. IV, 1302, flower, floral dissections and fruits. Tempera on paper by F. Pulgar.

Herbarium: MA 810838, Typus, fertile. «*Sobralia dichotoma* / Peru [Ruiz]»; «Herbarium Peruvianum / Ruiz et Pavon / 4/61». MA 810840, Typus, fertile. «Herbarium Peruvianum / Ruiz et Pavon / 4/61». MA 810841, Typus, with an immature flower. «Herbarium Peruvianum / Ruiz et Pavon / 4/61». MA 810837, Typus, fertile. «*Sobralia dichotoma* [Ruiz] / Peru [alia manu]»; «Herbarium Peruvianum / Ruiz et Pavon / 4/64». MA 810836, Typus, fertile. «Herbarium Peruvianum / Ruiz et Pavon / 4/64». MA 810842, Typus, fertile. «Herbarium Peruvianum / Ruiz et Pavon / 4/64». MA 810835, Typus, with immature flowers. «(Serapias.) / 1780. Cochero». MA 810839, Typus?, fertile. «*Sobralia dichotoma* / Fl. Peruv. / Ex Herb. Fl. Peruv. / Anno 1824».

Sobralia dichotoma is known from Colombia to Bolivia and Peru, where it inhabits wet premontane and montane cloud forests, from 1400 to over 3500 m. The plants grow terrestrially in open woodlands on clay or rocky slopes, usually in shaded spots.

A giant sized species, with stems that can reach 5 m in length, with ovate-lanceolate, leathery leaves, tinged with purple on the back, *S. dichotoma* is distinguished by the lateral, dichotomously branched, many-flowered, successive inflorescences, the fleshy, long lasting, strongly fragrant red-brown flowers, edged with lighter red and violet, and the lacinate calus of the lip.

In his diary, Ruiz refers to *S. dichotoma* on several pages. It is first mentioned among the reach orchid collections made in the mountains of Tarma in the second half of 1779 (Ruiz, 2007: 136; Ms. 12), and recorded with other plants discovered at Cuchero in July, 1780 (idem: 165; Ms. 20). The description of *S. dichotoma* was prepared on the basis of at least three different collections recorded in Ruiz's manuscript. The first description was done in Chinchao, where Ruiz and the illustrators worked during the month of August 1780 [idem: 168; Ms. 21(a)]; the second in Pozuzo, between July and November 1784 (idem: 256; Ms. 44); and the third in Muña in July-September 1786 (idem 2007: 287; Ms. 54). According to Ruiz, the illustration was realized in Muña, and the botanist also noted the vernacular name of *S. dichotoma*, “Tahuetahue”, noting that “its flowers are beautiful for their size, color, and fragrance” (*ibid.*). Other vernacular names used in the Andean region for this species are “Flor de paraíso” (bird of Paradise), “Inquil”, and “Monte azucen”.

73. *Sobralia rosea* Poepp. & Endl., Nov. Gen. Sp. Pl. 1: 54, t. 93. 1836, non Lindl., Fol. Orchid. 5 (Sobralia): 2. 1854, *nom. illeg. hom.* Fig. 46C, D

Type: Peru. Pasco: “Crescit in runcationibus prope Cuchero”, *Poeppig 1076* (holotype, W).

Icones: AJB, Div. IV, 1301, tempera on paper by F. Pulgar, apex of stem with inflorescence, flower and fruit. «Fran.co Pulgar [signature] / 80 / Sobralia»; AJB, Div. IV, 1302, tempera on paper by F. Pulgar, flower, floral dissections, fruits. «Fran.co Pulgar [signature] / 80 / Sobralia».

Herbarium: No material of *S. rosea* is kept in the collection of Ruiz and Pavón in MA.

The species has been recorded in Ecuador, Colombia, Peru and Bolivia, along the eastern slopes of the Andes, but also in the coastal and Amazonian regions of Ecuador. It grows as a terrestrial on steep, brushy and grassy embankments in wet tropical to montane forests, from sea level to over 3000 m. In Peru, populations of *S. rosea* are found in the provinces of Amazonas, Cajamarca, Huánuco, Junín, and San Martín, at elevations between 500 and 2200 m.

The very long stems, up to 3 m tall, the narrowly lanceolate, long-acuminate leaves, the terminal, fractiflex, racemose inflorescence with large, cymbiform floral bracts, and the large, fragrant, successive, white to rose flowers with a darker, crisped-undulate lip marked with purple distinguish the species.

The illustrations by F. Pulgar may have been prepared during the trip by Tafalla and J.A. Manzanilla to the region of Huánuco in 1787, or in Ecuador, during the journey of the artist to that country from 1799 to 1809.

74. *Specklinia acutiflora* (Ruiz & Pav.) Pupulin, **comb. nov.** Fig. 47

Basionym: *Humboldtia acutiflora* Ruiz & Pav., Syst. Veg. Fl. Peruv. Chil. 1: 236. 1798.

Synonyms: *Pleurothallis acutiflora* (Ruiz & Pav.) Mansf. ex C. Schweinf., Fieldiana, Bot. 30: 271. 1959.

Stelis acutiflora (Ruiz & Pav.) Willd., Sp. Pl. 4: 139. 1805.

Type: Peru. Pasco: “Habitat in Pozuzo supra arborers et saxa”, *H. Ruiz & J. Pavon s.n.* (holotype, MA).

Icones: AJB, Div. IV, 1334, drawing of type, tempera on paper by I. Gálvez. Habit with inflorescences and flowers, two views of a flower, profile of the pedicel, ovary, column and lip. «164 / Galvez [signature] / 59. F. / Humboldtia acutiflora [Ruiz]».

Herbarium: MA 810809, Holotypus, sterile. «*Humboldtia acutiflora*» [Ruiz]; «Gynandria diandria»; «Herbarium peruvianum / Ruiz et Pavon / 4/53».

The sterility of the holotype of *Humboldtia acutiflora* in MA prevented previous researchers from correctly understanding the generic placement of this taxon. The illustration by Isidro Gálvez clearly shows the lax inflorescence, the bilabiate flowers, not completely spreading, and the acute-subacuminate synsepal, which are characteristics of the *Specklinia grobyi-picta* complex (*sensu* Luer, 2006), to which this species belongs. The group is quite difficult taxonomically, having specific circumscriptions that partially overlap and a multitude of intermediate forms between the recognized species. *Humboldtia acutiflora* could be the first available name for *Specklinia picta* (Lindl.) Pridgeon & M.W. Chase, a species that can be recognized within the complex by the narrowly acute to acuminate synsepal (Luer, 2006).

The generic circumscription of *Specklinia* Lindl. has been subject of an open debate (see Pridgeon & al., 2001; Pridgeon & Chase, 2001; Luer, 2002, 2006), but the characteristic features of *S. acutiflora* place it in the core group of *Specklinia* species. On this most of the authors agree.



Fig. 47. *Specklinia acutiflora*. AJB, Div. IV, 1334, drawing of type, tempera on paper by I. Gálvez.

An isotype of *H. acutiflora* is kept in the Willdenow herbarium in Berlin (B-W-16901-010, digital image!). MA 810810 (sterile!) is annotated by Mansfeld as part of the original material of *Humboldtia acutiflora*. However, the specimens on this sheet are much larger than those mounted on the holotype sheet, and they also differ from the type in the size and shape of the caulinary bracts. I do not consider this an isotype.

Ruiz's manuscript description of *Specklinia acutiflora* (AJB, Div. IV, leg. 4, 3, fol. 116. / «Gynandria Diandria / Humboldtia acutiflora») explicitly refers to the illustration number «1634», and it also includes the description of vegetative and floral features not included in the eventually published diagnosis (Ruiz & Pavón, 1798: 236).

According to the *Relación* by Ruiz, the original description of *H. acutiflora* was probably among those lost during the Macora fire in August, 1785; a new description was prepared while the Expedition was in Huánuco in 1785-86 (Ruiz, 2007: 281; Ms. 52).

75. *Stelis oblonga* (Ruiz & Pav.) Willd., Sp. Pl. 4: 139. 1805. Fig. 48

Basionym: *Humboldtia oblonga* Ruiz & Pav., Syst. Veg. Fl. Peruv. Chil. 1: 236. 1798.

Type: Peru. Huánuco. "Habitat in montibus Muña supra saxa", *H. Ruiz & J. Pavón s.n.* (holotype, MA!; isotype, B, digital image!).

Icones: AJB, Div. IV, 1333, drawing of type, tempera on paper by J. Brunete; habit with flowers and fruits, floral details. «163 / Brunete [signature] / Humboldtia oblonga [Ruiz] / 56.f».

Herbarium: MA 810851, 3 specimens. Specimen "A", on top right, TYPUS, sterile. «Humboldtia oblonga / ga / Fl. Peruv. / Ex Herb. Fl. Peruv. / anno 1828 / A». Specimen on the left, Typus, sterile. «Humboldtia / Gilibertia [crossed] / oblonga» [Ruiz]; «Herbarium Peruvianum / Ruiz et Pavon / 4/57». Specimen on bottom, right, *Stelis* sp. MA 810852, 3 specimens. Specimen on bottom, right, TYPUS, sterile. «Herbarium Peruvianum / Ruiz et Pavon / 4/57». Specimens on top, left and right, *Stelis* sp.

Stelis oblonga is known from Colombia to Ecuador and Peru, where populations are found in premontane and montane wet forests from 600 to almost 4000 m. The species is apparently quite variable vegetatively, with the leaves broad and elliptic-oblong. The multiple inflorescences as long as or longer than the leaves, the small, papillose flower and the lip with truncate, abruptly acuminate-apiculate apex distinguish the species.

For a complete synonymy of the species, see the systematic treatment by Luer (2009). In his monograph of the genus *Stelis*, however, Duque (2008) does not agree with such a view, noting that the habit of *S. oblonga* is entirely different from that of *S. apiculata* Schltr., *S. floribunda* Kunth, and *S. insignis* Ames.

According to Ruiz's journal, the original description and illustration of *S. oblonga* were prepared in Muña in August-September, 1786 (Ruiz, 2007: 287; Ms. 55). Ruiz' manuscript description is kept at the of the RJB, Div. IV, leg. 4, 3, fol. 115: «Gynandria Diandria / Humboldtia oblonga ic. 163»).

76. *Stelis parviflora* (Ruiz & Pav.) Pers., Syn. Pl. 2: 524. 1807. Fig. 49

Basionym: *Humboldtia parviflora* Ruiz & Pav. Syst. Veg. Fl. Peruv. Chil. 1: 236. 1798.

Type: Peru. Huánuco. "Habitat in montibus Pozuzo, Chinchao et Muña supra arbores et saxa", *H. Ruiz & J. Pavón s.n.* (holotype, MA!).

Icones: AJB, Div. IV, 1332, drawing of type, tempera on paper by F. Pulgar. Plant with inflorescences and flowers. «162. Fran.co Pulgar [signature] / 40. F / Humboldtia parviflora». Herbarium: MA 810853, Holotypus, fertile. «Gilibertia [crossed] Humboldtia / Parviflora» [Ruiz]; «Herbarium Peruvianum / Ruiz et Pavon / 4/58»; «Humboldtia parviflora / ra Fl. Peruv. / Ex Herb. Fl. Peruv. / anno 1828 / A».

The holotype in MA comprises seven different plants, one of which (noted with the letter "A" on the sheet) was included in the herbarium in 1828. Several students annotated the sheet, doubting the common identity of the mounted specimens, but the species of *Stelis* are quite variable vegetatively so there is no reason to reject *a priori* the original identifications. A fragment of the holotype, consisting of an incomplete leaf with ramicaul and two sterile inflorescences is kept at the herbarium of the Field Museum in Chicago (F 40668F, digital image!), where it was received through the Real Jardín Botánico of Madrid. An isotype, part of the Humboldt collection, is in Berlin (digital image!). Two specimens are conserved, in P, originally from the Peruvian collections by Dombey, annotated as isotypes (P 489351 and 489352, digital images!). Schweinfurth (1958, 1970) considered *Stelis bicallosa* Schltr., also from Peru, as a synonym of *S. parviflora*, but I have no direct knowledge of the type material. However, in the drawing of *S. bicallosa* published by Duque (2008: 61), the lip is shown as obtuse-trapezoidal in outline (vs. ovate) and the petals have a distinct, rounded apiculate apex (vs. broadly obtuse).

Garay (1979) illustrated the flower of *S. parviflora*, which can be recognized by the glabrous flowers with free, 3-veined sepals, the transversely rectangular petals and the broadly ovate-subrhombic lip, provided with two mammillate calli forming a narrow channel under the column. The illustration provided by Duque (2008) differs in having a long-apiculate lip.

Apparently endemic to Peru, *S. parviflora* has been collected in Cusco, Huánuco, Junín, and Amazonas, from 1400 to over 3000 m. According to Ruiz's Journal, the original description and illustration of *Humboldtia parviflora* were prepared during Expedition's stay in Muña in August-September, 1786 (Ruiz, 2007: 287; Ms. 55). The original manuscript by Ruiz, explicitly referring to *icona* 162, is kept at the Archives of the RJB (Div. IV, leg. 4, 3, fol. 114: «Gynandria Diandria / Humboldtia parviflora ic. 162»).

77. *Stelis purpurea* (Ruiz & Pav.) Willd., Sp. Pl. 4: 140. 1805. Fig. 50

Basionym: *Humboldtia purpurea* Ruiz & Pav., Syst. Veg. Fl. Peruv. Chil. 1: 235. 1798.

Type: Peru. Huánuco: "Habitat in Muña supra arbores et saxa", *H. Ruiz & J. Pavón s.n.* (isotypes: B, digital image!; F, digital image!, MA 810855!, MA 810856!).



56.7.

Humboldtia oblonga

Fig. 48. *Stelis oblonga*. AJB, Div. IV, 1333, drawing of type, tempera on paper by J. Brunete.



Fig. 49. *Stelis parviflora*. AJB, Div. IV, 1332, drawing of type, tempera on paper by F. Pulgar.



Fig. 50. *Stelis purpurea*. AJB, Div. IV, 1331, drawing of type, tempera on paper by F. Pulgar.

Icones: AJB, Div. IV, 1331, drawing of type, tempera on paper by F. Pulgar, plant habit, flower and floral dissections. «160 / Fran.co Pulgar [signature] / Humboldtia purpurea [Ruiz] / 39. F».

Herbarium: MA 810854, Holotypus, fertile. «Humboldtia purpurea / rea [Ruiz]»; «Herbarium Peruvianum / Ruiz et Pavon / 4/59». MA 810855, Isotypus, fertile. «Gilibertia» [Ruiz]; «Herbarium Peruvianum / Ruiz et Pavon / 4/59». MA 810856, Isotypus, fertile. «Herbarium Peruvianum / Ruiz et Pavon / 4/59».

Prodromus: Icona 27, Figurae 1-3, 4,7(?).

Stelis purpurea is a common species along the Andean chain from Colombia to Bolivia, where populations are found growing epiphytically or frequently terrestrially on moss covered rock and clay embankments, in premontane wet to montane cool, cloud forest, between 1400 and 3500 m. In Peru, it has been recorded in the provinces of Amazonas, Cajamarca, Huánuco, Junín, and San Martín, in montane wet forest at elevations of 2000 to 2500 m.

Garay and Sweet (1972) selected *Humboldtia purpurea* as the lectotype of the genus *Humboldtia* Ruiz & Pav. (*non* Vahl 1794, Fabaceae, *nom. rej.*), originally published by Ruiz and Pavón (1794) as *Humboldtia* and corrected in their *Systema* of 1798. It is also the lectotype of *Stelis* sect. *Humboldtia* (Ruiz & Pav.) Pers., a large group of species distinguished by the bilabiate flowers with a synsepal formed by connation of the lateral sepals. Among them, *Stelis purpurea* may be recognized by the usually robust plant with many-flowered racemes that far exceed the elliptic leaves, with long floral bracts, 5- to 7-veined dorsal sepal and the lateral sepals connate into a concave synsepal.

In his Journal, Ruiz recorded that *Humboldtia purpurea* was collected in Muña, in August-September, 1786, when the original description and illustration were also prepared (Ruiz, 2007: 287; Ms. 55). The original manuscript is still in existence at the Archives of the RJB (Div. IV, leg. 4, 3, fol. 113: «Gynandria Diandria / Humboldtia purpurea ic. 160»).

According to Luer (2009), many of the trivial variations in size and shape of the leaves and flowers were recognized as distinct at the specific level, and in his systematic treatment the author reduced 20 names in synonymy under *S. purpurea* (Luer, 2009: 72). Among the names considered conspecific with *S. purpurea*, Luer included *Humboldtia spiralis* Ruiz & Pav. (the type, Peru, "Habitat in Huasahuasi locis saxosis"). The original diagnosis is too synthetic to provide useful information for the interpretation of this taxon ("H. with oblong-ovate leaves, solitary spikes longer than the leaf", Ruiz & Pavón, 1798: 237), and there are no illustrations bearing this name in the Herbarium Peruvianum of Ruiz and Pavón. However, the holotype is still in existence in MA (810766!). One of the original labels provides a short description of the species: «gynandria diandria / Humboldtia [Ruiz] / Spiralis [corrected spiralis] Cyripedium [crossed] radicibus fibroso = fasciculatis, peduncu / lio per caulem spiralis, foliis inferioribus obovatis, superioribus oblongis, flor. per. l. d. / radix fibroso = fasciculata albicantia, caulis folio- / sus, folia integerrima, glaberrima, nitida, inferio / ra obovata, Superiora oblongo - ovata, longiora / pedunculi axillares, filiformes, spicati, flores flavi / punctis sulfureis maculati, petalum inferius bifidum / lanceolatum, majus, duo later-

alis brevia». Another label gives the collecting locality and phenological data: «Cyripedium spirale / Huasahuasi inter saxa / floret Nobri». It is designated with number «4/52» in the series of the Herbarium Peruvianum / Ruiz et Pavon. At least two other specimens of Pleurothallidinae from Huasahuasi, part of the original collections by the Expedition, are kept in Madrid (MA 810861, «Humboldtia / Huasa huasi» [Ruiz]; MA 810862, «ophrys / Epidendrum / Huasa huasi»). Both these collections are of a small-sized species of *Stelis*, not referable to *S. purpurea*, but they are not conspecific with *Humboldtia spiralis*.

In creating the genus *Xenosia* for Pleurothallid plants with densely ascending habit provided with bundles of short ramicauls, Luer (2004) transferred to his new genus *Humboldtia spiralis*, but successively (Luer, 2006) he included *Xenosia spiralis* under the synonymy of *X. macrorhiza* (Lindl.) Luer. This move, however, is contrary to the rule of priority, *Humboldtia spiralis* Ruiz & Pav. (1798) being older than the basionym of *X. macrorhiza*, *Pleurothallis macrorhiza* Lindl. (1834). I agree with the generic placement suggested by Luer in 2004, but the color of the flowers of *X. spiralis*, as annotated on the original label ("yellow, spotted with sulphur yellow"), differs from that recorded from the other species recognized by Luer in his systematic treatment of *Xenosia* (Luer, 2006). *Xenosia spiralis* may perhaps represent the third valid species of the genus.

78. *Stenoptera peruviana* C. Presl, Reliq. Haenk. 1(2): 95. 1827. Fig. 51

Type: Peru. Huánuco: "Hab. in montanis Peruviae ad Huanoocco", 1836, , *T. Haenke s.n.* (holotype, PR, not seen).

Icones: AJB, Div. IV, 1261, tempera on paper by J. Brunete, plant habit with flowers, snuggle flower and floral details. «Brunete [signature] / 54. Satyrium virescens [Ruiz]».

Herbarium: MA 810864, fertile. «Orchis ?an Satyrium? [Tafalla]». «Herbarium Peruvianum / Ruiz et Pavon / 25/25».

The terrestrial plant over 60 cm tall, with fascicled, tuberous roots, the basally imbricating, oblong-lanceolate, acute leaves, narrowed below to a long-sheathing base, the shortly pubescent stem, the subdense, many-flowered inflorescence, and the small, yellowish-green, tubular-recurved flowers with the lip provided with membranous, denticulate margins distinguish the species.

Stenoptera peruviana is known from Colombia, Ecuador, and Peru. In Peru, it has been recorded in the provinces of Amazonas, Cajamarca, Huánuco, Junín, and Loreto, where it grows in open woods, in montane wet forests at 1300-3200 m. For a complete synonymy of *S. peruviana*, see the treatments by Schweinfurth (1958) and Garay (1978b), and the checklist of Peruvian plants by Brako and Zarucchi (1993).

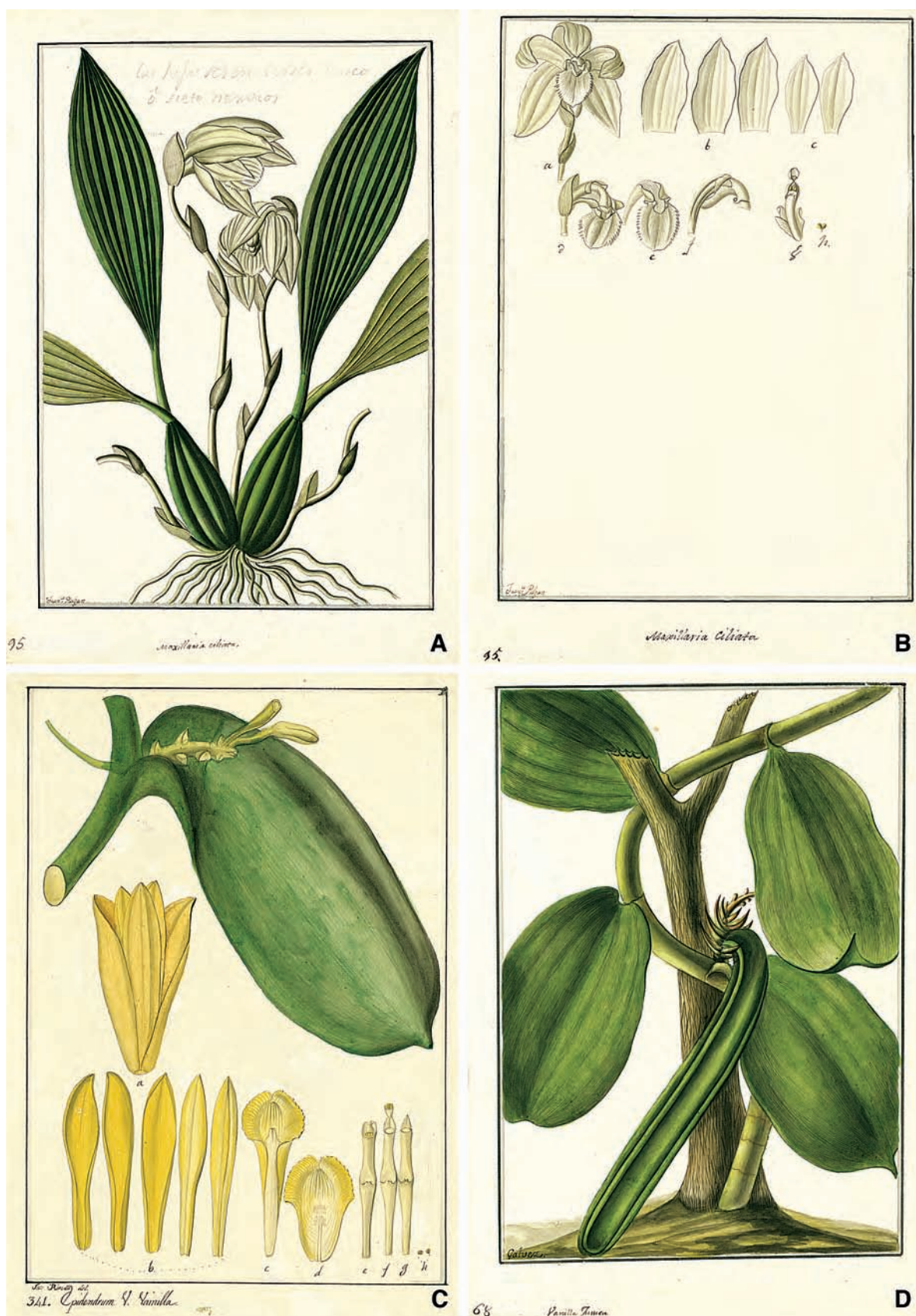
79. *Sudamerlycaste ciliata* (Ruiz & Pav.) Archila, Revista Guatemal. 5(3): 78. 2002. Fig. 52A, B

Basionym: *Maxillaria ciliata* Ruiz & Pav., Syst. Veg. Fl. Peruv. Chil. 1: 221. 1798.

Synonyms: *Dendrobium ciliatum* (Ruiz & Pav.) Pers., Syn. Pl 2: 523. 1807.



Fig. 51. *Stenoptera peruviana*. AJB, Div. IV, 1261, tempera on paper by J. Brunete.



Lycaste ciliata (Ruiz & Pav.) Lindl. ex Rchb. f., *Bonplandia* 4: 324. 1856.

Ida ciliata (Ruiz & Pav.), A. Ryan & Oakeley, *Orchid Digest* 67(1): 13. 2003.

Type: Peru. Huánuco: "Habitat in Muña, Chinchao, Chanchamayo et Palca saxosis locis", H. Ruiz & J. Pavón s.n. (lectotype, MA).

Lycaste fragrans Oakeley, *Orchid Digest* 58(1): 20. 1994, **syn. nov.**

Sudamerlycaste fragrans (Oakeley) Archila, *Revista Guatemal.* 5(3): 80. 2002, **syn. nov.**

Ida fragrans (Oakeley) A. Ryan & Oakeley, *Orchid Digest* 67(1): 13. 2003, **syn. nov.**

Type: Ecuador. [Napo]: Baeza, terrestrial on edge of woodland, July 1992, *H.F. Oakeley A78* (holotype, K).

Icones: AJB, Div. IV, 1238, drawing of type, proposed for typification by Oakeley (2008) and designated here as the Lectotypus, tempera on paper, partially rendered in color, by F. Pulgar; plant habit with flowers. «Fran.co Pulgar [signature] / 95. / *Maxillaria ciliata* [Ruiz]». AJB, Div. IV, 1239, drawing of type, selected here as the Lectotypus, black ink on paper by F. Pulgar; flower and floral dissections. «Fran.co Pulgar [signature] / *Maxillaria ciliata* / Ruiz / 95.».

Herbarium: No material referable to the type is apparently in existence in MA.

Oakeley (2008) refers to *Ida* [*Sudamerlycaste*] *ciliata* as a lost species, structurally similar to *Ida* [*Sudamerlycaste*] *fragrans* but mainly distinguished from it by the color of the flowers (pale cream vs. pale yellow-green). However, this is probably the result of an artifact. In the unpublished description of *Maxillaria ciliata* by Ruiz (folio manuscript, *recto*, headed «160 / Gynandria Diandria / *Maxillaria ciliata* / [...]», AJB, Div. IV, leg. 4, 3, fol. 8), the author explicitly refers to the tepals as yellow («*Corolla flava*»). On the other hand, in both the plates by F. Pulgar kept in MA, the flowers and the floral dissections of *Maxillaria cilata* are not colored, i.e. they are left with the basic rendering in black ink or tempera. In AJB, Div. IV, 1238, the fertile inflorescences are also not colored, while the pseudobulbs and leaves are completely painted and a first layer of color is applied to the lateral, sterile inflorescences. Oakeley probably intended to designate the plate 1238 as the species' lectotype, but the text of his proposal (Oakeley, 2008: 212) is not in agreement with the requirements by the ICBN (art. 7.11, McNeill & al., 2006), and a formal typification is required to fulfill the mandatory rules of the Code.

Two different sheets in MA have been annotated as type material of *Maxillaria ciliata*. The number «25/28» was originally assigned to both on the labels corresponding to the Herbarium Peruvianum of Ruiz and Pavón. The first sheet (MA 810771), which bears two original labels by Ruiz («*Arethusa?* *ciliata* [crossed] / *Maxillaria* / *ciliata*» [Ruiz]; «*Serapias?* an *Arethusa?* [crossed] / *Maxillaria* / *ciliata*»), includes mixed specimens, none of which is apparently referable to the concept of *Maxillaria ciliata*. The top left flower corresponds to Tafalla's label («Gynandr. Diand. / *Orchys* / F. P. c. l. N.º 377. / Ex Chicop. A.º 95.») and to the illustration by J.G. Rivera (AJB, Div. IV, 1255, «J.G.R. del / 377 / *Orchis*»), and it is referable to *Lycaste macrophylla*. A second

flower, with deeply fimbriate lip, may perhaps correspond to *Sudamerlycaste Cobbiana* (B.S. Williams) Archila, while the main vegetative parts (i.e., large leaves and long inflorescence) are probably of a species of *Ida* [*Sudamerlycaste*] sect. *Cinnabarinae* Oakeley. MA 810772, which has the same number («25/28») on the label of the Herbarium Peruvianum of Ruiz and Pavón, is probably part of the same, large vegetative specimen. Oakely (correction label 2009) identified it as *Ida beynderycxii* or *I. gigantea*.

Sudamerlycaste ciliata is known from Colombia, Ecuador, Peru, and Bolivia, where it inhabits wet submontane and montane forests at 1500 to over 2500 m as a terrestrial or epiphytic plant, frequently growing on steep roadside cliffs.

The short inflorescences (to 17 cm) and the fragrant flowers, with the finely lacinate the lip provided with a 5-keeld calyx, distinguish the species.

80. *Trichocentrum pulchrum* Poepp. & Endl., *Nov. Gen. Sp. Pl. Nov. Gen. Sp. Pl. 2: 11, pl. 115. 1836.* Fig. 53

Type: Peru. Huánuco: near Pampayacu, *Poeppig s.n.* (holotype, W!).

Icones: AJB, Div. IV, 1252, tempera on paper by I. Gálvez. Plant with flowers and fruits. «Galvez [signature] / 39. *Orchis punctata*».

Herbarium: No specimens of the genus *Trichocentrum* are preserved among Ruiz and Pavón's collections in MA.

The plant provided with rudimentary pseudobulbs and subcoriaceous leaves, and the flowers with white tepals, variously spotted and blotched with purple, and a long labellar spur, are diagnostic of the species (Pupulin, 1995). The plate by Isidro Gálvez is probably the first illustration of *T. pulchrum* (another was painted by one of the drafstams of Mutis' expedition to New Grenada; see Mutis, 2000), a species quite common along the mid-elevation regions of the Andes from Venezuela to Bolivia. In his diary, Ruiz (2007: 281; Ms: 53) quote *O. punctata* among the species of which the original description was lost during the Macora fire.

Ortiz y Valdivieso (2000) quoted a specimen of *T. pulchrum* among the exsiccata of Ruiz and Pavón kept in MA, but I was unable to locate it in the collection.

81. *Trichoceros antennifer* (Humb. & Bonpl.) Kunth, *Nov. Gen. Sp. (quarto ed.) 1: 338. 1816.* Fig. 54

Basionym: *Epidendrum antenniferum* Humb. & Bonpl., *Pl. Aequinoct. 1: 98. 1808.*

Type: Peru. "Habitat in Peruviae Andibus, sub umbra arbusculorum", *A.J.A. Bonpland & F.W.H.A. von Humboldt s.n.* (holotype, P, not seen).

Synonyms: *Trichoceros parviflorus* Kunth, *Nov. Gen. Sp. (quarto ed.) 1: 337. 1816.*

Type: Colombia [but likely from Peru]. "Crescit in faucibus Andium Novogranatensium, juxta ripam fluminis Xayo et confluentem Sambingi, ubi sylvae humidis flatibus perstringuntur neque solis foventur radiis, alt. 118 hex.", *A.J.A. Bonpland & F.W.H.A. von Humboldt s.n.* (holotype, P, not seen).

Trichoceros armillatus Rchb.f., *Bonplandia* 4: 212. 1856.



39. *Trichocentrum pulchrum*

Fig. 53. *Trichocentrum pulchrum*. AJB, Div. IV, 1252, tempera on paper by I. Gálvez.



Fig. 54. *Trichoceros antennifer*. AJB, Div. IV, 1344, tempera on paper by F. Pulgar (probable drawing of type of *Trichoceros armillatus* Rchb.f.).

Type: Peru. *Pavón s.n.* (holotype, G).

Trichoceros muscifer Kraenzl., Bot. Jahrb. Syst. 37: 387. 1906.

Syntypes: Peru. Sandía, Felsen in 2100-2300 m ü. M, *A. Weberbauer* 542 (B?); Cajamarca: unterhalb der hacienda La Tatoma bei Hualgayoc, Felsen in 2600 m ü. M, *A. Weberbauer* 4061 (B?); Tarma: oberhalb Huacapistana, *A. Weberbauer* 2048 (B?).

Icones: AJB, Div. IV, 1344, probable drawing of type of *Trichoceros armillatus* Rchb.f., tempera on paper by F. Pulgar; plant habit with flowers, single flower, floral details and fruit. «Fran.co Pulgar [signature] / 113. / Genus novum? [Ruiz]».

Herbarium: MA 810865, probable Isotypus of *Trichoceros armillatus* Rchb.f., sterile. «Clas: 2o. oxn. 1.a / Gynandria Diandria / ¿An Ophrys? / F. P. c. l. N.º 113. / ex Huassahuassi Año 94» [Tafalla]; «Herbarium Peruvianum / Ruiz et Pavon / 25/33».

Heinrich Gustav Reichenbach described his *T. armillatus* from the collections of Ruiz and Pavón, acquired for Jules Paul Benjamin Delessert by Obadiah Rich at the auction of Lambert's specimens, which were originally sold by J. Pavón from the materials kept in the “Oficina Botánica”. For this reason I suggest that the specimen in MA (81086!), as well as the illustration of the same plant (AJB, Div. IV, 1344, Pulgar's plate number 113) are probably referable to the type collection.

The species is known from Colombia to Peru and Bolivia, where it grows on exposed steep slopes covered with mosses, usually at high elevations up to 4000 m. In Peru, populations of *T. antennifer* have been recorded in the montane wet forests of Cajamarca, Cuzco, Junín, Huánuco, and Puno provinces, where they are commonly found as terrestrial on dry, mossy cliffs and rocks, and more rarely as epiphytes in low highland woods, at 1800 to 3000 m. As well as other species of the genus, the flowers of *T. antennifer* are pollinated by pseudo-copulation, simulating female flies of the genus *Paragynnomma*.

The creeping habit, with distant, ovoid pseudobulb mostly covered by distichous, coriaceous, gray green, foliaceous sheaths, and a single, rudimentary leaf at apex, the flowers with a lip deeply 3-lobed at the base, the lateral lobes linear, ciliate, the pubescent midlobe much larger, with a fleshy thickening below in the middle, and the column provided with a cluster of long bristles at the rear distinguish *T. antennifer*.

82. *Vanilla hamata* Klotzsch, Bot. Zeitung (Berlin) 4: 563. 1846. Fig. 52C

Type: Peru, J.J. Tafalla *s.n.* (holotype, B†, photo, AMES 38629!, sterile; isotypes, BM, G 7889/124, digital image!, MA 810866!, MA 810866!, W).

Icones: AJB, Div. IV, 1292, tempera on paper by J.G. Rivera, illustration of type. Portion of the stem with a leaf and inflorescence, flower and floral dissection. «Jose Rivera del [signature] / 341. Epidendrum V. Vainilla».

Herbarium: MA 810866, Isotypus, sterile. «Epidendron Vanilla». «Herbarium Peruvianum / Ruiz et Pavon / 4/69». MA 810867, Isotypus, sterile. «Herbarium Peruvianum / Ruiz et Pavon / 4/69».

A quite poorly known species, *V. hamata* is a member of the *V. pompona* group (Soto Arenas & Cribb, 2009). The holotype in B was destroyed in 1943, but in the photograph of the type in AMES, the original label clearly indicates N° 341, the same as Rivera's illustration. The plate in MA well illustrates the trilobed, emarginate lip, with a penicillate callus and a thickened axial cushion in the apical third of the lip. Even though the original collection team of *V. hamata* is usually recorded as Ruiz and Pavón (i.e., Schweinfurth, 1958) or Pavón (i.e., Soto Arenas & Cribb, 2009), the type specimens were collected in 1798, ten years after the departure of the Spanish botanists for Cadiz. The signature by Pavón on the sheet labels in B and G was probably affixed when he sold part of collections of the Oficina Botánica to Lambert from 1816 to 1824.

The diary by Ruiz includes two references to species of the genus *Vanilla*, but both were described at least ten years before the group guided by Tafalla collected *V. hamata* (in 1795, according to the sheet destroyed in Berlin) and *V. ruiziana* in 1798. During the journey of the Expedition in Cuchero in July 1780, Ruiz noted that “the Indians are used to bringing the fruits [of “*Vanilla officinalis*”] to sell at Huánuco” (Ruiz, 2007: 164; Ms. 21). Another species of *Vanilla*, “*Vanilla volubilis* V. Vaynilla”, was collected at Pozuzo (Ruiz, 2007: 256; Ms. 44) in 1784-1785. Seed pods of the latter species are conserved in the carpological collection of MA, with Ruiz's manuscript label: «Epidendron Vanilla / Pozuzo 1785», MA Col. Carpológica Ruiz & Pav. n.º 100. 180 (MA 781125).

83. *Vanilla pompona* subsp. *grandiflora* (Lindl.) Soto Arenas, Lankesteriana 9(3): 340. 2010 *vel affinis*. Figs. 52D, 55

Basionym: *Vanilla grandiflora* Lindl., Gen. Sp. Orch. Pl. 435. 1840.

Type: French Guiana. *Martin s.n.* (holotype, K).

Icones: AJB, Div. IV, 1342, tempera on paper by I. Gálvez, plant habit with fruit. «Galvez [signature] / 68 Vanilla Jussieu».

Herbarium: No material of this taxon was found in MA.

The plant illustrated by Isidro Gálvez belongs to the *Vanilla pompona* group (*Vanilla* subgen. *Xanata* sect. *Xanata*), characterized by xerophytic plants with thick stem and very fleshy leaves, and the fruit trigonous. In their synopsis of *Vanilla*, Soto Arenas and Cribb (2010) treated *V. grandiflora* at the specific rank, while Soto Arenas and Dressler (2010) considered it a subspecific form of *V. pompona* Schiede. Being geographically limited to the Central American taxa of *Vanilla*, the latter contribution does not include specific citations of South American specimens, but the authors express some doubts about the real identity of the Andean taxa.

Broadly distributed from Trinidad & Tobago, Venezuela, Guyana and Brazil, to Peru, in the latter country *V. pompona* subsp. *grandiflora* has been recorded in the provinces of Loreto and San Martín at 1000-1100 m of elevation (Schweinfurth, 1958, as *V. pompona*).

It may be that this is the plant to which Ruiz refers in his *Relación* under the name of “*Vanilla officinalis* Vulgo Vaynilla”, explaining that the Indians of Cuchero collect the fruits to be sold in Huánuco (2007: 164; Ms. 20). The journal makes mention of another species of the genus *Vanilla*, collected du-



Fig. 55. *Vanilla pompona* subsp. *grandiflora*. Seed pods in the carpological collection, originally collected at Pozuzo, as «*Vanilla volubilis* V. Vaynilla», MA Col. Carpológica Ruiz & Pav. n.º 100.180 (MA 781125). Photograph: F. Pupulin.

ring the expedition in Pozuzo in 1784, and recorded as “*Vanilla volubilis* V. Vaynilla” (Ruiz, 2007: 256; Ms. 44), of which some fruits are conserved in the carpologic collection of the RJB (see *supra*, under the notes to *V. hamata*).

84. *Vanilla ruiziana* Klotzsch, Bot. Zeitung (Berlin) 4: 563. 1846. Fig. 56A

Type: Peru. Chicoplaya, J.J. Tafalla *s.n.* (holotype, B †, photo, AMES 38626!; isotypes, BM, G 190807, digital image!, MA 810868!, MA 810869!, MA 810870).

Icones: AJB, Div. IV, 1293, tempera on paper by J.G. Rivera, illustration of type. Habit with inflorescence and flowers, flower and floral dissection. «Jose Rivera del [signature] / 360. *Epidendrum lanceolatum*».

Herbarium: MA 810868, Isotypus, sterile. «Herbarium Peruvianum / Ruiz et Pavon / 4/70». MA 810869, Isotypus, sterile. «Herbarium Peruvianum / Ruiz et Pavon / 4/70». MA 810870, Isotypus, sterile. «Epidendrum / Vanilla». «Herbarium Peruvianum / Ruiz et Pavon / 4/70».

The photograph in AMES of the destroyed holotype clearly indicates on its label the number 360, the same which iden-

tifies the illustration by Rivera and one of the specimens in G. The other sheet in G (176205, digital image!), acquired from Lambert’s herbarium and annotated as *Typus*, has a label by Pavón («207 *Epidendrum lanceolatum* / *Vaynilla* vulgo. / folium cum caule, et / flos / [alia manu] M. Pavon») with a number different from the holotype (360). I hesitate in including it here among the isotypes. Even though the original collection of *V. ruiziana* was attributed to Ruiz and Pavón, the type specimens were collected at Chicoplaya by J.J. Tafalla in 1798. A manuscript with Tafalla’s description, making explicit reference to the illustration «N.º 360» and bearing an annotation by Ruiz as «*lanceolatum*», is kept at the Archives of RJB (Div. IV, leg. 4, 3, fol. 74: «N.º 360»).

As stated by Soto Arenas and Cribb (2009), the real identity of *V. ruiziana* has remained obscure since its publication, and the photograph of the holotype destroyed in Berlin only shows a sterile specimen. Rivera’s plate in MA clearly illustrates the distinctly 3-lobed, apically dentate lip, with the mid-lobe hemispherical, and a central, penicillate callus placed apically to two rounded, velutinous keels from the base of the lip. The species is known exclusively from Peru and Bolivia. For a discussion of *V. ruiziana*’s possible synonymy, see Soto Arenas and Cribb (2009).

85. *Xylobium squalens* (Lindl.) Lindl., Bot. Reg. 11: sub t. 897. 1825. Fig. 57

Basionym: *Dendrobium squalens* Lindl., Bot. Reg. 9: t. 732. 1823.

Synonym: *Maxillaria squalens* (Lindl.) Hook., Bot. Mag. 56: t. 2955. 1829.

Type: Brazil. “Growing in woods near Rio Janeiro, whence it was sent to England by Mr. John Forbes [...] in 1822”, J. Forbes *s.n.* (holotype, K).

Heterotypic synonyms: *Cyrtopera scabrilinguis* Lindl., Gen. Sp. Orchid. Pl. 189. 1833.

Maxillaria scabrilinguis (Lindl.) Lindl., Edwards’s Bot. Reg. 30: Misc. 71. 1844.

Xylobium scabrilingue (Lindl.) Schltr., Orchis 7: 23. 1913.

Type: Peru. “Habitat in Peruvia, Ruiz et Pavon (exam s. sp. in herb. Lambert)” (holotype, BM?).

Icones: AJB, Div. IV, 1257, tempera on paper by J. G. Rivera, habit and floral dissections. «J. G. R. del [signature] / 418 / Orchis».

Herbarium: No material referable to this taxon has been found in MA.

The species has been recorded in Costa Rica, Ecuador, Peru, Bolivia, and northern Brazil. In Peru, populations of *X. squalens* are broadly distributed in Ayacucho, Cajamarca, Huánuco, Junin, Loreto, Puno and San Martín, in wet tropical to montane forests at 400–1800 meters. According to the manuscript description kept at the RJB (AJB, Div. IV, 4, 3), the specimen illustrated by J.G. Rivera was collected in the forests of Chicoplaya, probably between 1796 and 1799.

Xylobium squalens may be recognized by the ovoid pseudobulbs, the basally inflated bracts of the inflorescence, the linear floral bracts, and the thick midlobe of the lip with conspicuous verrucous veins, disposed in lines. Schweinfurth (1970) and Bennett & Christenson (1995) treat this name as a

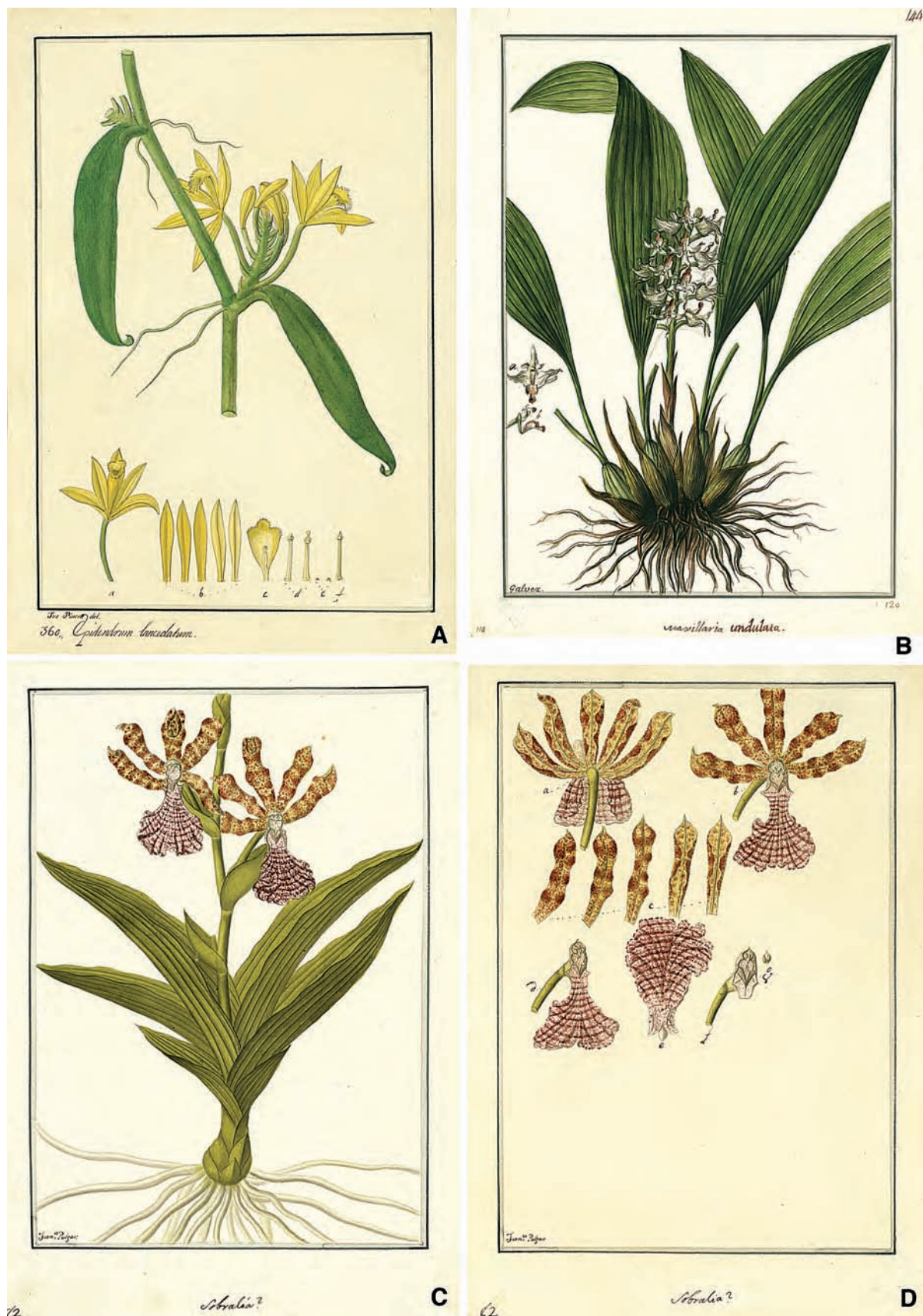


Fig. 56. A, *Vanilla ruiziana*. AJB, Div. IV, 1293, drawing of type, tempera on paper by J.G. Rivera; **B,** *Xylobium undulatum*. AJB, Div. IV, 1241, tempera on paper by I. Gálvez; **C,** *Zygopetalum maculatum*. AJB, Div. IV, 1304, plant habit with flowers; tempera on paper by F. Pulgar; **D,** *Zygopetalum maculatum*. AJB, Div. IV, 1303, flower (dorsal and frontal views) and floral dissections; tempera on paper by F. Pulgar.

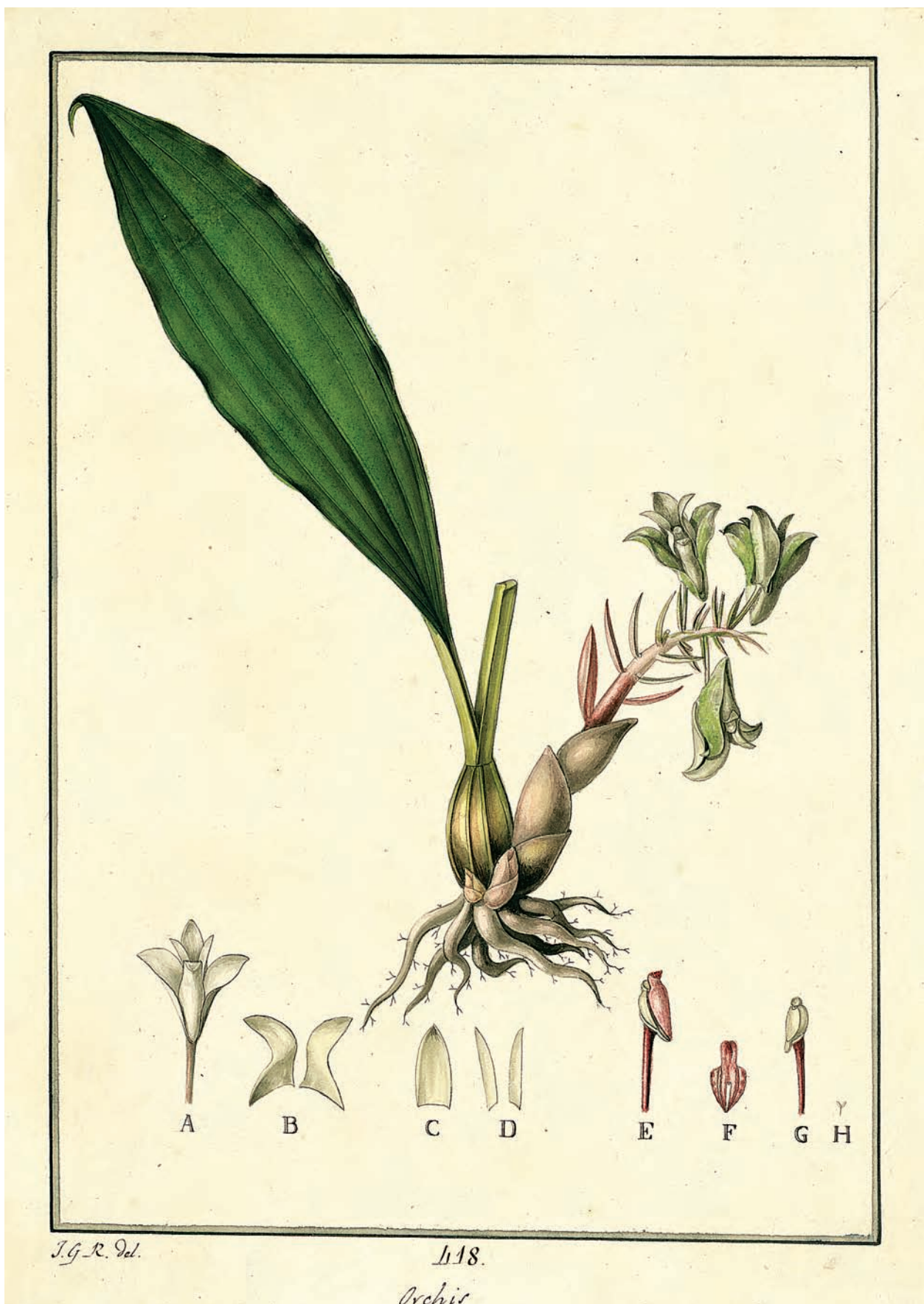


Fig. 57. *Xylobium squalens*. AJB, Div. IV, 1257, tempera on paper by J. G. Rivera.



Fig. 58. *Xylobium undulatum*. AJB, Div. IV, 1242, tempera on paper by I. Gálvez.



Fig. 59. *Xylobium variegatum*. AJB, Div. IV, 1244, drawing of type, tempera on paper by J. Brunete.

later synonym of *X. variegatum* (Ruiz & Pav.) Garay & Dunsterv. For a complete list of possible synonyms of *X. squalens*, see Brako and Zarucchi, 1993.

86. *Xylobium undulatum* (Ruiz & Pav.) Rolfe, *Orch. Rev.* 20: 43. 1912. Figs. 56B, 58

Basionym: *Maxillaria undulata* Ruiz & Pav., *Syst. Veg. Fl. Peruv. Chil.* 1: 221. 1798.

Type: Peru. "Habitat in nemoribus Chinchao et Muña supra arbores et saxa", *H. Ruiz & J. Pavón s.n.* (holotype, MA).

Icons: AJB, Div. IV, 1241, tempera on paper by I. Gálvez.

Habit, flower, details of the column and lip in lateral view.

«144 / Galvez [signature] / 120 / 110 / Maxillaria undulata [Ruiz]». AJB, Div. IV, 1242, tempera on paper by I. Gálvez.

Habit, flower, details of the column and lip in lateral view.

«144 / Galvez [signature] / Maxillaria undulata [Ruiz]».

Herbarium: MA 810873, Holotypus. A pseudobulb with inflorescence and flowers, and 2 detached leaves. «*Arethusa alba* [crossed] / *Maxillaria* / *undulata* [Ruiz]». «Herbarium Peruvianum / Ruiz et Pavon / 5/9».

Schweinfurth (1960) considered *X. undulatum* an obscure species, and suggested it is a synonym of *X. squalens* (Lindl.) Lindl. Ruiz (2007: 287; Ms. 54) prepared a description of *Maxillaria undulata* during his stay in Muña, between August and September, 1786 and, according to the diary, the species was probably illustrated at the same time. Both the drawings by Gálvez show a plant of the same species, and both are annotated «*Maxillaria undulata*» in Ruiz' handwriting. Ruiz's manuscript description of *Maxillaria undulata* («*Gynadria Diandria* / *Maxillaria undulata*», AJB, Div. IV, 4, 3, fol. 9) refers to the illustration number «144», but this is the number assigned to both the paintings by Gálvez, so I cannot indicate which one was actually taken from the type specimen.

87. *Xylobium variegatum* (Ruiz & Pav.) Garay & Dunst., *Venez. Orchid. Ill.* 2: 342. 1961. Fig. 59

Basionym: *Maxillaria variegata* Ruiz & Pav., *Syst. Veg. Fl. Peruv. Chil.* 1: 222. 1798.

Type: Peru. «Habitat in Muña nemoribus calidis», *H. Ruiz & J. Pavón s.n.* (holotype, MA).

Icons: AJB, Div. IV, 1244, tempera on paper by J. Brunete, drawing of type. Habit with flowers and fruits; details of the column and lip in lateral and ventral views. «Brunete [signature] / 60 / 110 / Maxillaria variegata».

Herbarium: MA 810871, Typus. Inflorescences with flowers and fruits. «*Maxillaria* / *Variegata* [Ruiz]». «Herbarium Peruvianum / Ruiz et Pavon / 5/10». MA 810872, Typus. Inflorescences with flowers and fruits. «*variegata* / *Maxillaria* [Ruiz]». «Herbarium Peruvianum / Ruiz et Pavon / 5/10».

Found in most South American countries from Venezuela and Colombia to Brazil, Bolivia and Peru, *X. variegatum* inhabits wet premontane to montane forests at 500 to 3000 m. In Peru, it is fairly common in montane wet forests at around 1500 m, with populations infrequently found up to 3000 m.

The subcylindric to pyriform pseudobulb with 2-3 apical, distinctly petiolate leaves, the lateral, densely many-flowered inflorescence provided with scarious, acuminate, loose bracts, and the membranaceous flowers, white internally and reddish brown externally, and the strongly verrucose lip are diagnostic.

88. *Zygopetalum maculatum* (Kunth) Garay, *Orquideología* 5: 189. 1970 Fig. 56C, D

Basionym: *Dendrobium maculatum* Kunth, *Nov. Gen. Sp.* (quarto ed.) 1: 359. 1816.

Type: Peru. "Crescit locis sylvosis Provinciae Bracomorensis juxta urbem Jaen, et pagos Sagique et Pucara: item prope cataractam Rentemae in ripa fluminis Amazonum, alt. 200-680 hex.", *A.J.A. Bonpland & F.W.H.A. von Humboldt s.n.* (holotype, P).

Synonyms: *Zygopetalum intermedium* Lodd. ex Lindl., *Edward's Bot. Reg.* 30: Misc. 9. 1844.

Type: Brazil (holotype, K).

Zygopetalum bolivianum Schltr., *Repert. Sp. Nov. Regni Veg. Beih.* 10: 50. 1922.

Type: Bolivia. La Paz: Yungas, 1890, *M. Bang* 453 (holotype, B†; isotypes, MO, digital image!, GH).

Icons: AJB, Div. IV, 1304, tempera on paper by F. Pulgar, plant habit with flowers. «*Fran.co Pulgar* [signature] / 82 / *Sobralia*? [Ruiz]». Fig. 55C. AJB, Div. IV, 1303, tempera on paper by F. Pulgar, flower (dorsal and frontal views) and floral dissections. «*Fran.co Pulgar* [signature] / 82 / *Sobralia*? [Ruiz]».

Herbarium: No materials of this taxon are conserved in MA.

Humboldt and Bonpland collected the type of *Dendrobium maculatum* in the province of Jaen de Bracamoros, along the eastern slopes of the Andes in northern Peru (Sandwith, 1926). *Zygopetalum maculatum* is known from Peru, Bolivia and Brazil, where it inhabits wet, semi-boggy areas.

The large and colorful flowers, pleasantly fragrant, with an obovate, pubescent lip veined with bluish-purple, distinguish the species. *Zygopetalum maculatum* is probably best known under the names of *Z. mackaii* Paxton, 1836), an illegitimate homonym of *Z. mackaii* Hook. (1827), the latter apparently endemic to Brazil, and *Z. intermedium*.

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REFERENCES

- Bennett, D.E. & E. Christenson. 1995. New species of Peruvian. Orchidaceae III. *Brittonia* 47(2):182-200.
- Blanco, M.A., G. Carnevali, W.M. Whitten, R.B. Singer, S. Koehler, N.H. Williams, I. Ojeda, K.M. Neubig & L. Endara. 2007. Generic realignments in Maxillariinae (Orchidaceae). *Lankesteriana* 7(3): 515-537.
- Brako, L. & J.L. Zarucchi 1993. Catalogue of the flowering plants and Gymnosperms of Peru. *Monographs in Systematic Botany from the Missouri Botanical Garden* 45: i-xl, 1-1286.
- Dodson, C.H. & D.E. Bennett. 1989. Orchids of Peru. Fasc. 2. *Icones Plantarum Tropicarum, ser. 2*: pl. 101-200.
- Dodson, C.H. & P.M. Dodson 1984. Orchids of Ecuador. *Icones Plantarum Tropicarum* 10: pl. 901-1000.
- Duque, O. 2008. Orchidaceae *Stelis* Swartz - Compendium. University of Antioquia, Antioquia, Colombia.
- Garay, L.A. 1978b. Orchidaceae (Cypripedioideae, Orchidoideae, Neottioideae). In: G. Harling. & B. Sparre (eds.), *Flora of Ecuador* 9: 1-305. University of Göteborg and Swedish Museum of Natural History, Göteborg and Stockholm.
- Garay, L.A. 1979. Systematics of the genus *Stelis* Sw. *Botanical Museum Leaflets, Harvard University* 27(7-9): 167-204, pl. 43-97.
- Garay, L.A. & H.R. Sweet. 1972. Notes on West Indian orchids, III. *Journal of the Arnold Arboretum* 53: 515-530.
- Jenny, R. 2010. *Otoglossum*, una revisión taxonómica. *Orquideología* 27(1): 63-93.
- Lindley, J. 1840. The Genera and Species of Orchidaceous Plants. J. Ridgways, London.
- Lindley, J. 1845a. Orchidaceae Loxenses. Pp. 149-156. In: G. Bentham, Plantas Hartwegianas imprimis Mexicanas adjectis nunnnullis Grahamianis enumerat novaque describit. Part 2. *Plantarum Hartwegianarum*. George Bentham, London.
- Luer, C.A. 1999. Systematics of *Pleurothallis*, sect. *Pleurothallis*, subsections *Antenniferiae*, *Longiracemosae*, *Macrophyllae-Racemosae* and *Perplexae* (Orchidaceae). Pp. 1-134. In: C.A. Luer. *Icones Pleurothallidarum XVI-II*. Systematics of *Pleurothallis* subgen. *Pleurothallis* sect. *Pleurothallis*, subsect. *Longiracemosae*, subsect. *Macrophyllae-Racemosae*, subsect. *Perplexae*, subgen. *Pseudostelis*, subgen. *Acuminatia*. Addenda to *Dracula*, *Lepanthes*, *Masdevallia* and *Pleurothallis*. Miscellaneous new species of *Dryadella*, *Lepanthes* and *Pleurothallis*. *Monographs in Systematic Botany from the Missouri Botanical Garden* 76.
- Luer, C.A. 2002. A systematic method of classification of the Pleurothallidinae versus a strictly phylogenetic method. *Selbyana* 23(1): 57-110.
- Luer, C.A. 2004. New species and combinations in the Pleurothallidinae. Pp. 253-265. In: C.A. Luer. *Icones pleurothallidarum XXVI*. *Monographs in Systematic Botany from the Missouri Botanical Garden* 95: 253-265.
- Luer, C.A. 2005. Systematics of *Acronia* section *Macrophyllae-fasciculatae*. Pp. 57-274. In: C.A. Luer. *Icones pleurothallidarum XXVII*. *Monographs in Systematic Botany from the Missouri Botanical Garden* 103: 1-311.
- Luer, C.A. 2006. *Icones Pleurothallidarum* 28. A reconsideration of *Masdevallia*. Systematics of *Specklinia* and vegetatively similar taxa. *Monographs in Systematic Botany from the Missouri Botanical Garden* 105: 1-274.
- Luer, C.A. 2009. Systematic of *Stelis*. *Stelis* of Ecuador, Part 4. *Monographs in Systematic Botany from the Missouri Botanical Garden* 115: 31-237.
- Luer, C.A. & R. Escobar. 1996. *Icones Pleurothallidarum XIII*. Systematics of *Restrepia* (Orchidaceae). *Monographs in Systematic Botany from the Missouri Botanical Garden* 59: 1-168.
- McCook, L.M. 1989. Systematics of *Phragmipedium* (Cypripedioideae; Orchidaceae). Ph.D. dissertation, Cornell University.
- McCook, L.M. 1998. An annotated checklist of the genus *Phragmipedium*. *Orchid Digest* Corp. California.
- McNeill, J., F.R. Barrie, H.M. Burdet, V. Demoulin, D.L. Hawksworth, K. Marhold, D.H. Nicholson, J. Prado, P.C. Sulva, J.E. Skog, J.H. Wiersema & N.J. Turland. 2006. International Code of Botanical Nomenclature (Vienna Code). *Repert. Sp. Nov. Reg. Veg.* 146. Available online at: <http://ibot.sav.sk/icbn/main.htm>.
- Mutis, J.C. 2000. Flora de la Real Expedición del Nuevo Reyno de Granada (1783-1816). Promovida y dirigida por José Celestino Mutis. Tomo XI. *Orquidáceas*, V. Ediciones de Cultura Hispánica, Madrid.
- Oakeley, H.F. 2008. *Lycaste, Ida and Anguloa*. The essential guide. Cambrian Printers, Aberystwyth, Wales, U.K.
- Ortiz y Valdivieso, P. 2000. *Trichocentrum pulchrum*. P. 256. In: J.C. Mutis. Flora de la Real Expedición del Nuevo Reyno de Granada (1783-1816). Promovida y dirigida por José Celestino Mutis. Tomo XI. *Orquidáceas*, V. Ediciones de Cultura Hispánica, Madrid, 2000.
- Pridgeon, A.M. & M.W. Chase. 2001. A phylogenetic reclassification of *Pleurothallidinae* (Orchidaceae). *Lindleyana* 16: 235-271.
- Pridgeon, A.M., R. Solano & M.W. Chase. 2001. Phylogenetic relationships in *Pleurothallidinae* (Orchidaceae): combined evidence from nuclear and Plastid DNA sequences. *American Journal of Botany* 88(12): 2286-2308.
- Pupulin, F. 1995. A revision of the genus *Trichocentrum* (Orchidaceae: Oncidiinae). *Lindleyana* 10: 183-210.
- Pupulin, F. 2012. The Orchidaceae of Ruiz & Pavón's "Flora peruviana et Chilensis". A taxonomic study. I. *Anales del Real Jardín Botánico de Madrid* 69(1): 21-79.
- Reichenbach, H. G. 1854a. Xenia Orchidacea. Beiträge zur Kenntniss der Orchideen. Erster Band (volume one). F.A. Brockhaus, Leipzig.
- Reichenbach, H.G. 1854b. Orchideae Warscewizianae recentiores. *Bonplandia* 2(9): 107-116.
- Reichenbach, H.G. 1856. Orchideae Ruizianae et Pavonianae Musaei Boissieriani. *Bonplandia* 2(18-19): 210-217.
- Reichenbach, H.G. 1858. Xenia Orchidacea. Beiträge zur Kenntniss der Orchideen. Erster Band (volume one). F.A. Brockhaus, Leipzig.
- Ruiz, H. 2007. Relación del viaje hecho a los reinos de Perú y Chile por los botánicos y dibujantes enviados por el Rey para aquella expedición, extractada de los diarios por el orden que llevó en éstos su autor. Introducción, transcripción y notas de Raúl Rodríguez Nozal y Antonio González Bueno. Los Libros de la Catarata. Madrid.
- Ruiz, H. & J. Pavón. 1794. *Flora peruviana et chilensis prodromus*. Madrid.
- Ruiz, H. & J. Pavón. 1798. *Systema vegetabilium Florae Peruvianae et Chilensis, characteres prodromi genericos differentiales, specierum omnium differentias, durationem, loca natalia, tempus florendi, nomina vernacula, vires et usus nonnullis illustrationibus interspersis complectens*. Typis Gabrielis de Sanha. Madrid.
- Sandwith, N.Y. 1926. Humboldt and Bonpland's itinerary in Ecuador and Peru. *Bulletin of Miscellaneous Information Kew* 1926(4): 181-190.
- Schweinfurth, C. 1951. Orchidaceae Peruviana VII. *Botanical Museum Leaflets, Harvard University* 15: 1-7.
- Schweinfurth, C. 1958. Orchidaceae, Orchids of Peru. *Fieldiana, Botany* 30(1): 1-260.
- Schweinfurth, C. 1960. Orchidaceae, Orchids of Peru. *Fieldiana, Botany* 30(3): 533-785.
- Schweinfurth, C. 1970. First supplement to the Orchids of Peru. *Fieldiana, Botany* 33: 1-85.
- Soto Arenas, M.A. & P. Cribb. 2010. A new infrageneric classification and synopsis of the genus *Vanilla* Plum. ex Mill. (Orchidaceae: Vanillinae). *Lankesteriana* 9(3): 355-398.
- Soto Arenas, M.A. & R.L. Dressler. 2010. A revision of the Mexican and Central American species of *Vanilla* Plumier ex Miller with a characterization of their ITS region of the nuclear ribosomal DNA. *Lankesteriana* 9(3): 285-354.
- Steele, A.R. 1964. *Flowers for the king: the expedition of Ruiz and Pavón and the Flora of Peru*. Duke University Press, Durham, North Carolina.
- Tafalla 1989. *Flora Huayaquilensis, sive descriptiones et icones plantarum Huayaquilensium secundum systema Linnaeanum digestae*. 2 vols. Icona and Real Jardín Botánico. Madrid.
- Vásquez C.R. & C.H. Dodson 1982. Orchids of Bolivia. *Icones Plantarum Tropicarum* Fasc. 6: 501-600.
- Zelenko, H. & P. Bermúdez. 2008. *Orchid species of Peru*. ZAI Publications, Quito.

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