

A SYNOPSIS OF THE GENUS *XYLOBIUM* (ORCHIDACEAE: MAXILLAREAE)

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Abstract. A synopsis is presented of the Neotropical orchid genus *Xylobium*, wherein 18 species are recognized, including one new species and three varieties. A key is supplied to help identify the species, along with discussion under each entity on its recognition characters, notes where necessary on the synonymy, and a list of specimens examined. The new names are *X. miliaceum* var. *patens*, *X. undulatum* var. *portillae*, *X. undulatum* var. *variegatum*, and *X. wilhelminae*. At the end of the treatment, a list of excluded taxa is provided, which includes the currently known status of each name. Among those taxa, *Dendrobium longifolium* is neotypified, and the combinations *Cyrtorchilum bicolor* and *Sudamerlycaste insolita* are proposed.

Keywords: *Xylobium*, synopsis, new species, varieties, transfers

The genus *Xylobium* was proposed by John Lindley in 1825 based on his own *Dendrobium squalens* from Brazil. However *Xylobium* was short-lived, its validity being doubted by Hooker (1827), before he eventually moved the sole species to *Maxillaria* Ruiz & Pavon in 1829. Lindley (1832a, b) accepted this view and afterward treated all *Xylobium* within the genus *Maxillaria*. The latter genus however always has single-flowered inflorescences, and conduplicate, often coriaceous leaves, whereas *Xylobium* has multiflowered inflorescences, and plicate,

papyraceous leaves. It would not be until 1881 when George Bentham reinstated *Xylobium* and outlined its distinctive characteristics. He did not make any transfers, but suggested 16 species belonged to it. He was soon followed by Hemsley (1883), Nicholson (1887), and Rolfe (1889). Eventually Rolfe (1912) published a small half-page enumeration of the genus, making seven new combinations. The following year, Schlechter (1913) contributed a slightly more detailed account of *Xylobium*, proposing an additional five new combinations.

TAXONOMY

Xylobium Lindl., Bot. Reg. 11: sub t.897. 1825.

Type species: *Dendrobium squalens* Lindl.

Homotypic synonyms: *Maxillaria* Ruiz & Pav. section *Xylobium* (Lindl.) Endl., Gen. Pl.: 197. 1836.

Maxillaria Ruiz & Pav. section *Racemosae* Lindl. & Paxt., Paxt. Fl. Gard. 3: 69. 1852 *nom. illeg.*

Maxillaria Ruiz & Pav. section *Spicatae* Rchb.f., Ann. Bot. Syst. 6: 507. 1863 *nom. illeg.*

Heterotypic synonyms: *Onkeripus* Raf., Fl. Tellur. 4: 42. 1838.

Type species: *Maxillaria pallidiflora* W.J. Hook.

Pentulops Raf., Fl. Tellur. 4: 42. 1838.

Type species: *Maxillaria decolor* Lindl.

Epiphytic or terrestrial *herbs*. *Roots* terete. *Pseudobulbs* clustered on a short rhizome, rarely long-creeping, terete, fusiform, to ovoid, 1–2(–3)-leaved apically. *Leaves* papyraceous, plicate, usually strongly 3(–5) veined below, subsessile to long petiolate. *Inflorescence* basal, few to many-flowered, erect, or rarely pendent, racemose; floral bracts very short to elongate. *Flowers* semi-closed to wide open, sometimes with a fine pubescence on the inner basal surfaces of the sepals and petals. *Pedicel plus ovary* clavate, terete to triquetrous, weakly ribbed, glabrous. *Sepals* similar, but the lateral ones with a dilated base decurrent on the column foot to form a short, open mentum. *Petals* similar

to sepals, but often slightly narrower and shorter. *Labellum* entire to trilobed, moderately arcuate, medially with a low 3–5 ribbed callus confined to the hypochile, rarely on the epichile; epichile (or midlobe) often much thickened apically, often adorned with keels or rows of papillae, or verrucae. *Column* stout, semiterete; *column foot* straight to slightly incurved, forming a mentum with the lateral sepals; *pollinia* 4, in two oblong-ellipsoid pairs, attached to broadly lunate *viscidium*; *rostellum* inverted V-shaped; *stigmatic area* elliptic to circular.

Distribution: About 18 species distributed in Mesoamerica (Mexico to Panama), the Caribbean, and South America (Colombia to Bolivia, and Brazil).

Etymology: The generic name is derived from the Classical Greek *xulon*, meaning wood, and *bios*, meaning life. It appears to be a homage to the similarly derived generic name *Dendrobium*, in which the type species was proposed. Suggestions the name *Xylobium* alludes to its epiphytic habit are wrong, since the type species was clearly noted in its protologue to be a terrestrial plant.

The majority of *Xylobium* species have a set of characters that makes it a relatively simple process to identify the various entities. Furthermore, most of the species have been ably illustrated over time. Nevertheless, one can be misled by variable features such as the shape and length of the pseudobulbs, the number, and width of the leaves, the length

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and density of the inflorescence, the size and color of the flowers, and of course details of the labellum and its parts.

Generally though, if a plant has slender, stick-like pseudobulbs it is likely either *X. elongatum* or *X. pallidiflorum* (however *X. leontoglossum* and *X. undulatum* can have slender pseudobulbs); if it has short floral bracts then it could be *X. corrugatum*, *X. leontoglossum*, or *X.*

zarumense; if it has short, dense inflorescences it could be *X. coelia*, *X. colleyi*, *X. stanhopeifolium*, *X. subpulchrum*, or *X. undulatum*.

Xylobium elongatum and *X. foveatum* have been entered twice in the following key, though both are relatively easy to identify. The epichile, a segment of the labellum, is used in several couplets below.

KEY TO SPECIES

- 1a. Floral bracts short, 0.5–7.0 mm long 2
 1b. Floral bracts longer, 10–55 mm long 4
 2a. Inflorescence few-flowered; labellum weakly trilobed; epichile broad, not thickened. *X. corrugatum*
 2b. Inflorescence densely many-flowered; labellum strongly trilobed, epichile narrower, strongly thickened 3
 3a. Pseudobulbs unifoliate; inflorescence erect; flowers whitish to light greenish, spotted with purple, epichile oblong *X. leontoglossum*
 3b. Pseudobulbs bifoliate; inflorescence semipendulous; flowers yellowish-green, petals with a brownish stripe; epichile ovate ... *X. zarumense*
 4a. Inflorescence peduncle less than 3 cm long 5
 4b. Inflorescence peduncle more than 5 cm long 7
 5a. Pseudobulbs 1–2 leaved; labellum entire *X. colleyi*
 5b. Pseudobulbs unifoliate; labellum strongly trilobed. 7
 6a. Leaf subsessile to shortly (5 cm) petiolate *X. subpulchrum*
 6b. Leaf long petiolate, petiole to 20 cm long. *X. stanhopeifolium*
 7a. Labellum with medial callus on epichile. *X. wilhelminae*
 7b. Labellum with medial callus on hypochile 8
 8a. Labellum with epichile broader than long. 9
 8b. Labellum epichile as wide as long, or longer than wide 10
 9a. Pseudobulbs bifoliate; mentum to 5 mm long. *X. foveatum*
 9b. Pseudobulbs unifoliate; mentum 6–9 mm long 11
 10a. Dorsal sepal elliptic; labellum strongly trilobed *X. coelia*
 10b. Dorsal sepal lanceolate; labellum weakly trilobed *X. palmifolium*
 11a. Epichile thin to fleshy, naked, obscurely papillose to ridged, or with well separated keels, cuneate, deltate, subcircular, to elliptic 12
 11b. Epichile much thickened, covered with papillae and verrucae, ovate, oblong, to lanceolate 16
 12a. Pseudobulbs bifoliate; epichile transversely elliptic, subcircular to cuneate, obliquely erect *X. foveatum*
 12b. Pseudobulbs 1 (rarely 2)–leaved; epichile elliptic, subcircular to deltate, apex decurved 13
 13a. Epichile with lamellate, dentate keels 14
 13b. Epichile without lamellae, rarely low, broad ridges, sometimes obscurely papillose. 15
 14a. Labellum with medial callus having curved, flared out lateral keels; epichile thickened in upper third to half, lamellae c. 0.5 mm tall *X. bractescens*
 14b. Labellum with medial callus having straight, sometimes bifurcate lateral keels; epichile only thickened near margins, if at all, lamellae to c. 0.3 mm tall, usually less *X. varicosum*
 15a. Labellum weakly lobed medially; medial callus distinct, of 3–5 raised lamellae. *X. pallidiflorum*
 15b. Labellum weakly lobed in upper third; medial callus obscure, of 3–5 low ridges *X. sulfurinum*
 16a. Lateral sepals falcate 17
 16b. Lateral sepals straight to weakly curved 18
 17a. Petals obliquely oblong; labellum epichile ovate, spreading, covered with rounded verrucae *X. undulatum* var. *portillae*
 17b. Petals obliquely lanceolate; epichile ovate, oblong to lanceolate, sides upcurved to infolded, inside with sharper, smaller verrucae and papillae *X. elongatum*
 18a. Pseudobulbs slender, finely or not sulcate dry, (5.5) 13–32 cm long; dorsal sepal to 4 mm wide *X. elongatum*
 18b. Pseudobulbs narrowly ovoid to fusiform, sulcate dry, generally 5–8 (–12) cm long; dorsal sepal 5 mm or more wide 19
 19a. Inflorescence laxly to subclaxly flowered; peduncle 18–30 cm long; floral bracts narrowly cymbiform 20
 19b. Inflorescence densely to subdensely (rarely subclaxly) flowered; floral bracts lanceolate. 21
 20a. Flowers erect, mentum pointing towards rachis *X. miliaceum*
 20b. Flowers patent, mentum pointing upwards or slightly outwards *X. miliaceum* var. *patens*
 21a. Rachis 12–20 cm long 22
 21b. Rachis 4–11 cm long 23
 22a. Peduncle 30–90 cm long, slender, ca. 2 mm thick; lateral sepals oblong; labellum epichile oblong-lanceolate *X. elatum*
 22b. Peduncle 12–30 cm long, ca. 3 mm thick; lateral sepals oblong-lanceolate; labellum epichile ovate *X. undulatum* var. *variiegatum*
 23a. Labellum epichile elliptic, subcircular, to obovate, 3–5 mm wide *X. undulatum*

ACCOUNT OF THE SPECIES OF *XYLOBIUM*

Xylobium bractescens (Lindl.) Kraenzl. ex Rolfe, Orch. Review 20: 359. 1912.

Basionym: *Maxillaria bractescens* Lindl., Edwards's Bot. Reg. 28: 84, misc. 92. 1842. TYPE: ECUADOR. Loja, leg. K. T. Hartweg, cult. Hort. Soc. s.n. (Holotype: K-L, image seen). Fig. 1.

Distribution: Ecuador; Peru.

Additional specimens examined: ECUADOR. Loja: KM 13 on Pan American Highway N of Loja, 2050 m, 1 May 1973, L. Holm-Nielsen, S. Jeppesen, B. Lojmant & B. Ollgard 4634 (AMES). PERU. Cajamarca: Prov. Chota, Rio Chotano, below Lajas, road to Chicalayo, 1925 m, 19 October 1964, P.C. Hutchison & J.K. Wright 7042 (AMES); Prov. Cutervo, above Socota, following the route to San Andres, 2000 m, 2 November 1981, I. Sanchez Vega, A. Sagastegui & J. Guevera 5875 (GH); near Socota, valley of Rio Cutervo, 1900–1980 m, 10 February 1988, A. Gentry, C. Diaz & C. Blaney 61464 (F, MO, SEL). Amazonas: Prov. Bongara, trail above highway to Chicalayo and Rio Utcubamba, 3–10 km NW of Pedro Ruiz Gallo, 1300–1400 m, 4 May 1981, K. Young & M. Eisenberg 292 (MO, NY); same data, K. Young & M. Eisenberg 288 (MO).

This species appears to grow exclusively as a terrestrial. Its flowers are reported to be yellow, with maroon keels on a white lip. Generally the species may be characterised by its narrowly ovoid to fusiform, 6–12 cm long, 1–2-leaved pseudobulbs, long-pedunculate (peduncle 29.0–48.5 cm) inflorescence with a lax-flowered (15.5–18.5 cm long) rachis, elongate (25–55 mm long) floral bracts, weakly trilobed lip, the median callus with lamellate lateral keels in its upper part, above it are five undulate, dentate lamellae which go to the apex of the midlobe, the midlobe is noticeably thickened in its apical quarter to third.

Xylobium bractescens is closely related to *X. varicosum*, the latter generally with a shorter rachis, and flowers in which the lip has a much lower medial callus without lamellate lateral keels, and the apical part of the midlobe only weakly thickened at the margins, if at all.

I have not examined any bifoliate examples of *X. bractescens*, but one such plant from Ecuador was depicted by Dodson (1984). The combination *X. bractescens* is usually attributed to Kraenzlin (1908) but he gave no hint of a basionym therein, so I have given the credit to Rolfe.

Xylobium coelia (Rchb.f. & Warc.) Rolfe, Orch. Review 20: 43. 1912.

Basionym: *Maxillaria coelia* Rchb.f. & Warc., Bonplandia 2: 97. 1854. TYPE: [PERU]. Without origin, J. R. Warcewicz s.n. (Holotype: W-R 41437, image seen).

Heterotypic synonyms: *Maxillaria ornata* Klotzsch, Allg. Gartenz. 23: 257. 1855 syn. nov. TYPE: PERU. Without data [1853, J.R. Warcewicz s.n.] (Holotype: B, destroyed; photograph seen: AMES, F, MO).

Xylobium ornatum (Klotzsch) Rolfe, Orch. Review 20: 43. 1912.

Xylobium latilabium C. Schweinf., Bot. Mus. Leaflet. Harv. Uni. 15: 155. 1952. TYPE: PERU. Junin: Prov.

Tarma, Vitoc, 1800 m, 1942, F.L. Woytkowski 10 (Holotype: AMES).

Distribution: Ecuador; Peru.

Additional specimens examined: ECUADOR. Pastaza: Cushillo Urco, c. 8 km N of Puerto Sarayacu, 6 October 1974, H. Lugo S. 3927 (AMES). PERU. Loreto: Alto Amazonas, Andoas [on Rio Pastaza], 180 m, 2 November 1983, R. Vasquez & N. Jaramillo 4514 (MO). Junin: Yaupi, 1470 m, 12 October 1964, D.E. Bennett 829 (AMES).

A beautiful species with dense racemes of yellowish to orange flowers, the lip with reddish-purple stripes inside. It is easily recognised by its unifoliate pseudobulbs, rather short inflorescences (peduncle shorter to longer than the pseudobulb) of showy flowers, a relatively large mentum (9 mm long) with the apex of the columnfoot slightly recurved, a broadly trilobed lip with wide truncate sidelobes, and a transversely oblong-elliptic, emarginate midlobe with a modestly thickened margin.

The name *X. ornatum* is very apt for this species but unfortunately it is predated by *X. coelia* (named for the resemblance of the inflorescence to that of *Coelia* Lindl.). It is highly likely that both names were based on living material from the same consignment, sent back from Peru by Josef Warcewicz, but that flowered in different collections.

Xylobium colleyi (Batem. ex Lindl.) Rolfe, Gard. Chron. s.3, 7: 288. 1890.

Basionym: *Maxillaria colleyi* Batem. ex Lindl., Edwards's Bot. Reg. 24: misc. 161. 1838. TYPE: Not cited [GUYANA: Demerara, leg. T. Colley, cult. J. Bateman s.n.] (Holotype: K-L, image seen).

Homotypic synonym: *Lycaste colleyi* (Batem. ex Lindl.) P.N. Don, in Donn, Hort. Cantabr. ed. 13: 721. 1845.

Heterotypic synonyms: *Maxillaria rebellis* Rchb.f., Fl. des Serres 9: 102. 1853. TYPE: Origin unknown, cult. Consul Schiller s.n. (Holotype: W-R 41366, image seen).

Xylobium rebellis (Rchb.f.) Schltr., Orchis 7: 23. 1913.

Xylobium brachystachyum Kraenzl., Gard. Chron. s.3, 40: 302. 1906. TYPE: BRAZIL. Santa Catarina: without locality, October 1906, cult. W. Hennis s.n. (Holotype: lost). Neotype (here proposed): BRAZIL. Santa Catarina: without locality, November 1907, cult. W. Hennis s.n. (Holotype: HBG, image seen).

Distribution: Belize; Guatemala; Costa Rica; Panama; Colombia (?); Venezuela; Trinidad; Guyana; Brazil.

Additional specimens examined: TRINIDAD. Valencia Forest Reserve, 1957, G.A.C. Herklots s.n. (= *Herb. Trin. 15449*) (AMES); Saut d'Eau, August 1930, W.E. Broadway 7435 (AMES).

I cannot vouch for the above-cited distribution, having seen very few collections of this species. Records from Colombia, Ecuador, and Peru were referred by Dressler to his *X. subpulchrum*, a taxon with white flowers, and a trilobed lip with a reddish midlobe.

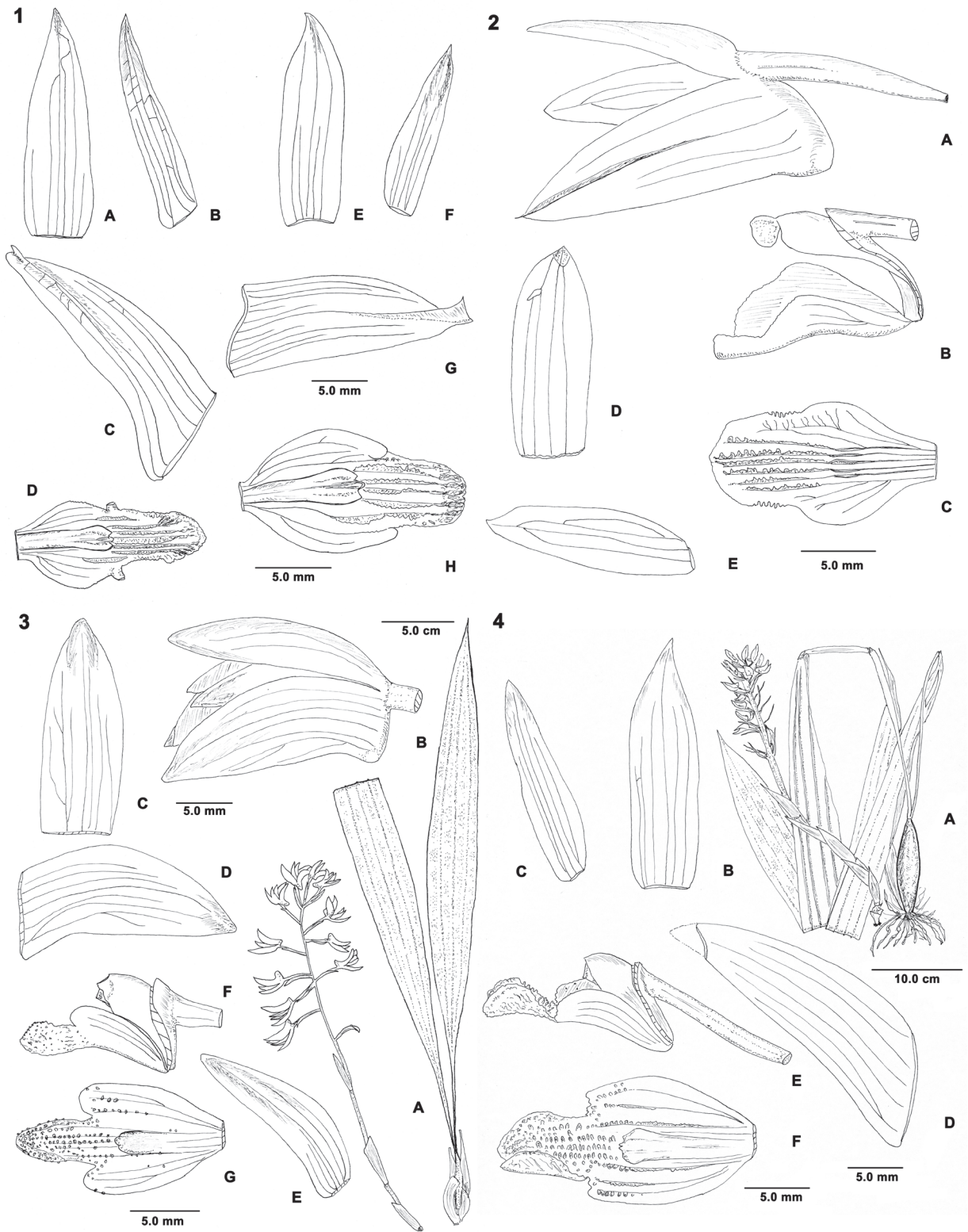


FIGURE 1. *Xylobium bractescens* (Lindl.) Rolfe. **AE**, dorsal sepals; **BF**, petals; **CG**, lateral sepals; **DH**, labellums. **A-D** from *Gentry et al.* 61464 (MO), **E-H** from *Hutchison & Wright* 7042 (AMES). FIGURE 2. *Xylobium corrugatum* (Lindl.) Rolfe. **A**, flower; **B**, flower minus tepals; **C**, labellum; **D**, dorsal sepal; **E**, petal. Drawn from *Bristol* 756 (AMES). FIGURE 3. *Xylobium miliaceum* (Rchb.f.) Rolfe var. *patens* Ormerod. **A**, plant and inflorescence; **B**, flower; **C**, dorsal sepal; **D**, lateral sepal; **E**, petal; **F**, flower minus tepals; **G**, labellum. Drawn from holotype. FIGURE 4. *Xylobium undulatum* (Ruiz & Pav.) Rolfe var. *undulatum*. **A**, plant; **B**, dorsal sepal; **C**, petal; **D**, lateral sepal; **E**, flower minus tepals; **F**, labellum. Drawn from *Cuatrecasas* 13140 (US).

Xylobium colleyi may be recognised by its 1–2-leaved pseudobulbs, short, pendent, few-flowered inflorescences with large, cymbiform floral bracts, the rather attractive flowers are whitish to yellowish with numerous reddish-brown spots, and the fleshy, oblong, entire lip also has some reddish-brown spotting, with blackish margins and a blackish apex.

Xylobium corrugatum (Lindl.) Rolfe, Gard. Chron. s.3, 5: 459. 1889.

Basionym: *Maxillaria corrugata* Lindl., Edwards's Bot. Reg. 30: misc. 14. 1844. TYPE: COLOMBIA/VENEZUELA. Between Maracaibo (Venezuela) and Bogota (Colombia), leg. J. Linden, cult. G. Barker s.n. (Holotype: K-L, image seen). Fig. 2.

Heterotypic synonyms: *Maxillaria wagneri* Rchb.f., Bot. Zeit. 10: 735. 1852. TYPE: VENEZUELA. Federal [District]: Caracas, leg. H. Wagner, cult. in Krollwitz by Bottyer for C. Keferstein s.n. (Holotype: W-R 40285, image seen).

Xylobium corrugatum (Lindl.) Rolfe var. *wagneri* (Rchb.f.) Schltr., Orchis 7: 22. 1913.

Xylobium wagneri (Rchb.f.) Schltr., Rep. Sp. Nov. Regni Veg., Beih. 6: 85. 1919.

Distribution: Venezuela; Colombia; Ecuador (?).

Additional specimens examined: COLOMBIA.

Putumayo: Valle de Sibundoy, 1 km S of Sibundoy, 2200 m, 12 April 1963, *M.L. Bristol 756* (AMES, US). Valle: W Andes of Cali, 1500–2000 m, February/March, *F.C. Lehmann 4529* (AMES, NY); “Calima” on Rio Calima, 14–15 September 1922, *E.P. Killip 11197* (AMES); Pavas, 1500–1800 m, 24 & 29 September 1922, *E.P. Killip 11573* (AMES). Santander: S slope of Mt. San Martin, near Charta, 2300–2500 m, 10 February 1927, *E.P. Killip & A.C. Smith 19171* (AMES, US); vicinity of California, 2300 m, 11–27 January 1927, *E.P. Killip & A.C. Smith 17076* (AMES, US); Rio Surata valley, 2000–2300 m, 5–6 January 1927, *E.P. Killip & A.C. Smith 16644* (AMES). Cesar: Sierra Nevada de Santa Marta, near junction of next creek E of Quebrada Indiana and the Rio Frio, 1270 m, 29 August 1972, *J.H. Kirkbride Jr. 1974* (NY).

An easily recognisable species by virtue of its small (2–4 cm tall), unifoliate pseudobulbs, consistently narrow (2–4 cm wide) leaves, wiry, laxly few-flowered inflorescences, short (to 7 mm long) floral bracts, pale brownish-suffused flowers, and broad, weakly trilobed, yellowish lip with red spots and lines, on which the medial callus is formed of five well-separated keels which are superseded by 7–9 lines of undulate, dentate lamellae on the midlobe.

Some references (e.g., Kolanowska and Szlachetko, 2016) list *Linden 655* (or 659?) (K-L, P, images seen) as the type of *X. corrugatum* but this collection from “Estado Mérida,” Venezuela differs in having much longer floral bracts, and a strongly trilobed lip. Lindley (1846) referred it to *Maxillaria scabrilinguis* (i.e. *Xylobium undulatum* var. *variegatum*). The identity of *Linden 655* remains unresolved, but it certainly is not referable to *X. corrugatum*.

It is possible *X. corrugatum* occurs in northern Ecuador but I have not examined any material from there though one specimen is listed in the Kew alcohol collection.

Xylobium elatum Rolfe, Bull. Misc. Inf. Kew: 341. 1914. TYPE: PERU. Without locality, leg. L. Forget, cult. Messrs. Sander & Sons s.n. (Holotype: lost).

Distribution: Peru.

Additional specimens examined: PERU. Junin: Prov. Tarma, canyon of Rio Huasahuasi, below Huasahuasi, in valley bottom, mouth of gorge near river, 2400m, 10 August 1957, leg. P.C. Hutchison 1080, 18 September 1959, cult. Univ. Calif. Bot. Gard., Acc. No. 61-359-1 (NY); Utcuyacu, leg. F. Woytkowski 61, 21 November 1958, cult. Univ. Calif. Bot. Gard., Acc. No. 50.1779-2 (AMES).

I have seen two collections of this species, both consisting of inflorescences only. Specimens with a 90 cm long peduncle as noted by Rolfe in the protologue remain to be rediscovered. The species may be characterised by its bifoliate pseudobulbs, long (30–90 cm), wiry, erect peduncle, subaxly to densely rachis, yellowish to greenish flowers with coalesced reddish to brown mottling on the back of the sepals, the lip yellowish to greenish with reddish to brownish spotting, the lateral sepals are oblong, sometimes twisted 90 degrees halfway, petals ligulate-lanceolate, and the lip strongly trilobed, with a smooth three-ridged median callus, above which numerous laxly scattered verrucae, and a relatively narrow (less than 2 mm wide) oblong-lanceolate midlobe.

Xylobium elongatum (Lindl. & Paxt.) Hemsl., in Godm. & Salv., Biol. Centr.-Amer., Bot. 3: 252. 1883.

Basionym: *Maxillaria elongata* Lindl. & Paxt., in Paxt. Fl. Gard. 3: 69. 1852. TYPE: GUATEMALA. Without locality, G. U. Skinner s.n. (Holotype: K-L, image seen).

Heterotypic synonyms: *Maxillaria cylindrobulba* Regel, Gartenfl. 7: 341. 1858. TYPE: MEXICO. Without locality, leg. H.G. Galeotti, cult. Bot. Gard. St. Petersb. s.n. (Holotype: LE, image seen).

Xylobium cylindrobulbum (Regel) Schltr., Beih. Bot. Centralbl. 36, Abt. 2: 493. 1918.

Xylobium papillosum Archila, Szlach. & Perez-Garcia, Richardiana 14: 119. 2014, syn. nov. TYPE: GUATEMALA. Alta Verapaz: Barrancas de Kaquipeck, near old mining camp, 1500 m, *F. Archila s.n.* (Holotype: BIGU, not seen).

Xylobium tubilabium Szlach. & Kolan., Phytan (Horn) 54, 1: 78. 2014 syn. nov. TYPE: COLOMBIA. Choco: Pacific N coast, 10–100 m, July 1988, *G. Misas Urreta 148* (Holotype: COL, not seen).

Distribution: Mexico; Guatemala; El Salvador; Costa Rica; Panama; Colombia; Ecuador; Peru (?).

Additional specimens examined: MEXICO. Vera Cruz: San Andreas Tuxtla region, near Cerro Tapalcapan and Cerro Mastagaga, NW of Catemarcó, 23 August 1953, *R.L. Dressler & Q. Jones 144* (AMES); Volcan San Martin, 600 m, 3 May 1937, *O. Nagel & J. Gonzalez 5798* (AMES). Chiapas: NE of Comitán, near settlements of “La Selva” and La Florida, 900–1000 m, 16 March 1936, *O. Nagel 5575* (AMES). GUATEMALA. Alta Verapaz: Cobán, 1280 m, 7 March 1940, *M.W. Lewis 224* (AMES). COSTA RICA. Alajuela: Vara Blanca de Sarapiquí, N slope

of Central Cordillera, 1500–1750 m, July to September 1937, *A.F. Skutch 3327* (AMES); same area, between Poas and Barba Volcanoes, 1340 m, *A.F. Skutch 3637* (AMES); Canton Alfaro Ruiz, Guadeloupe de Zareero, 1550 m, 24 August 1938, *A. Smith H1126* (AMES); Canton San Carlos, Zapote, 1575 m, 4 July 1938, *A. Smith H827* (AMES). Cartago: Tapanti, 1200 m, September 1937, *M. Valerio 2607* (AMES); S of Navarro, El Muneco, 1400 m, 8–9 February 1924, *P.C. Standley 33523* (AMES); La Palma de San Jose, 28 September 1932, *M. Valerio 158* (AMES). San Jose: La Hondura, 1300–1700 m, 16 March 1924, *P.C. Standley 37784* (AMES). PANAMA. Chiriqui Prov., 1220 m, January 1919, *C.W. Powell 167* (AMES); March 1923, *cult. C.W. Powell 167* (= *C.W. Powell 3154*) (AMES); near Boquete, *C.W. Powell 3154* (AMES). Cocle: hills N of El Valle de Anton, trail to las Minas, 1000 m, 1 September 1941, *P.H. Allen 2705* (AMES); trail to La Mesa, 1000 m, 2 September 1941, *P.H. Allen 2745* (AMES). ECUADOR. Esmeraldas: off road to Lita, N of Rio Mira, between Guallupe and Parambas, 900 m, 16 February 1986, *A. Hirtz & X. Hirtz 6298* (SEL). Imbabura: Cordillera Occidental, along trail to Rio Chaguayaco, below Magnolia, lower Intag Valley, 1220 m, 12 September 1944, *W.B. Drew E-578* (AMES). Pichincha: lower end of old road to Santo Domingo de los Colorados, c. 1.6 km E of junction with new road, 920 m, 15 January 1971, *B. MacBryde 90* (AMES); Aloag to Santo Domingo road, Tandapi (M. Cornejo Astorga), at the confluence between Rio Tandapi and Rio Pilaton, 1500 m, 11 February 1967, *B. Sparre 14374* (MO, US); Hacienda La Palma del Sr. Alfonso Darquea, KM 35, Santo Domingo to Quito, 900–1250 m, 3 February 1985, *C.H. Dodson & D. Neill 15553* (MO).

I am not sure this species occurs in Peru, though it is found in nearby Ecuador. The Peruvian record is based on a determination by Kraenzlin, mentioned in Weberbauer (1911). It is possible the now destroyed specimen was a misdetermined collection of *X. pallidiflorum*. *Xylobium papillosum* agrees well with Lindley's sketches on the type sheet of *X. elongatum*, which also came from Guatemala. *Xylobium tubilabium* from Colombia also fits into the variation of *X. elongatum*, under which latter name Misa Urruta (2005) illustrated the type specimen.

The species is easily recognised by its slender, elongate, bifoliate pseudobulbs, the peduncle can be shorter or longer than the pseudobulbs, the rachis densely to laxly flowered, 4–12 cm long, the flowers variable in color, white, pale yellow, to buffy pink, sometimes with purplish tips, the lip is trilobed, with a reddish to purplish, rarely yellow-orange midlobe and papillae, the hypochile with a three-keeled (lateral keels often sulcate) median callus, superseded by five lines of low, undulate, papillate, dentate lamellae, the midlobe ovate to lanceolate, obtuse, usually with raised, variously rugose, often infolded margins.

Xylobium foveatum (Lindl.) G. Nicholson, Ill. Dict. Gard. 4: 225. 1887.

Basionym: *Maxillaria foveata* Lindl., Edwards's Bot. Reg. 25: misc. 2. 1839. TYPE: GUYANA. Demerara, *imp. & cult. Messrs. Loddiges s.n.* (Holotype: K-L, image seen).

Heterotypic synonyms: *Maxillaria concava* Lindl., Edwards's Bot. Reg. 30: misc. 12. 1844. TYPE: GUATEMALA. Without locality, 1841, *leg. K.T. Hartweg, cult. Hort. Soc. s.n.* (Holotype: K-L, image seen).

Xylobium concavum (Lindl.) Hemsl., in Godm. & Salv., Biol. Centr.-Amer., Bot. 3: 252. 1883.

Maxillaria stachyobiorum Rchb.f., Bot. Zeit. 10: 735. 1852. TYPE: PANAMA. Chiriqui, *J.R. Warcewicz s.n.* (Holotype: W-R 41346; Isotype: K-L, images seen).

Xylobium stachyobiorum (Rchb.f.) Hemsl., in Godm. & Salv., Biol. Centr.-Amer., Bot. 3: 252. 1883.

Maxillaria hyacinthina Rchb.f., Linnaea 22: 855. 1852 *syn. nov.* TYPE: VENEZUELA. Merida: Rio Chama, December, *J.W.K. Moritz 1084* (Lectotype here designated: BM; Isolectotype: W-R 41337, images seen).

Xylobium hyacinthinum (Rchb.f.) Schltr., Orchis 7: 22. 1913.

Maxillaria affinis Hort. Petrop. ex Rchb.f., Ann. Bot. Syst. 6: 511. 1863, *pro syn.* [*non* (Poepp. & Endl.) Garay 1962]. BASIS FOR NAME: ORIGIN UNKNOWN. *Cult. Hort. Bot. Petrop. s.n.* (W-R?, not seen).

Maxillaria chapadensis Barb. Rodr., Plant. Mattoagr.: 35. 1898. TYPE: BRAZIL. Mato Grosso: Capao Secco to Serro da Chapada, March, *J. Barbosa Rodrigues s.n.* (Holotype: lost; Lectotype, here designated: t. 12B in Barb. Rodr., Plant. Mattoagr. 1898).

Xylobium chapadense (Barb. Rodr.) Cogn., Chron. Orchideenne 1, 22: 172. 1898.

Xylobium chapadense (Barb. Rodr.) Cogn. var. *luteoalbum* Hoehne, Relat. Commiss. Linhas Telegr. Estrateg. Matto Grosso Amaz. 5, Bot. 1: 46. 1910. TYPE: BRAZIL. Mato Grosso: Tapiripua, banks of Rio Sepatuba, March 1909, *F.C. Hoehne 1700* (Syntype: R, image seen); same data, *F.C. Hoehne 2263* (Syntype: R?, not seen).

Xylobium ecuadorensis Rolfe, Bull. Misc. Inf. Kew: 341. 1913. TYPE: ECUADOR. Canar: Naranjapata, 75 miles (= 120 km) from the coast, 305 m, 1911, *leg. J.L. Lipscomb*, fl. in cult. November 1912, Wimbledon, *Mrs. Lipscomb s.n.* (Holotype: K, image seen).

Xylobium filomenoi Schltr., Rep. Sp. Nov. Regni Veg., Beih. 9: 100. 1921. TYPE: PERU. Loreto: near Moyobamba, *Dr. S. Filomeno s.n.* (Holotype: B, destroyed).

Xylobium modestum Schltr., Rep. Sp. Nov. Regni Veg., Beih. 27: 142. 1924 *syn. nov.* TYPE: COLOMBIA. Cundinamarca: Eastern Cordillera, Rio Pescado, 1200 m, March 1922, *A. Schultze 25* (Holotype: B, destroyed).

Distribution: Jamaica; Mexico; Guatemala; Nicaragua; Costa Rica; Panama; Colombia; Ecuador; Peru; Bolivia; Brazil; French Guiana; Guyana; Venezuela.

Additional specimens examined: VENEZUELA. Sucre: El Guayabito, along Rio Guayabo, at its juncture with Rio Zumbador (future basin of Neveri Dam), 230–250 m, 20–22 November 1981, *G. Davidse & A.C. Gonzalez 19201* (MO). COLOMBIA. Antioquia: Municipio de San Luis, canyon of the Rio Claro, 300–450 m, 29 April 1984, *A. Cogollo & R. Borja 1596* (MO). Cauca: Murillo, 2 July 1853, *I.F. Holton s.n.* (NY); Murillo, 9 July 1853, *I.F. Holton s.n.* (NY). Meta: Sabanas de San Juan de Arama, left hand bank of the Rio Guejar, near the “Los Micos” landing, 500 m, 22 January 1951, *J.M. Idrobo & R.E. Schultes 1231* (GH, US); Cordillera Macarena, path between the Rio Guejar and the Cano Guapayita, 500–600 m, 20–28 December 1950, *J.M. Idrobo & R.E. Schultes 763* (US). ECUADOR. Imbabura: Playa Luisa, below Magnolia, lower Intag Valley, 1035 m, 17 September 1944, *W.B. Drew E-671* (AMES). PERU. Cajamarca: San Ignacio, San Jose de Lourdes, El Crucero, 1200 m, 8 June 1999, *C. Diaz & S. Flores 10673* (MO); Distrito Namballe, El Pacashal forest, right hand bank of Rio Canchis, 650–800 m, 10 July 1997, *E. Rodriguez & O. Pesantes 1699* (MO); Caserio Las Abejas, 690–780 m, 7 July 1997, *J. Campos & J. Pezantes 4085* (MO); Distrito Huarango, Caserio el arenal, 1100 m, 24 May 2006, *J. Perea & V. Flores 2314* (MO); San Martin to Alrededores de San Martin, 900 m, 18 May 1996, *J. Campos, R. Vasquez, A. Vasquez & P. Lopez 2808* (MO); along Rio Chichipe, between Tamborapa and San Ignacio, 500 m, 23 August 1980, *C. Luer, J. Luer, W. Koeniger & H. Koeniger 5413* (SEL). Junin: E of Quimiri, near La Merced, 800–1300 m, 1–3 June 1929, *E.P. Killip & A.C. Smith 23869* (AMES); Prov. Chanchamayo, Puntayacu, 1800 m, 1 September 1992, *O. del Castillo & D.E. Bennett 5436* (NY); Puntayacu, 1800 m, 1 September 1993, *D.E. Bennett 5436* (NY). San Martin: Prov. Lamas, to the E of San Juan de Pacayzapa (road to Moyobamba), Alonso de Alvarado, 900 m, 19 April 1973, *J. Schunke V. 5986* (NY); Moyobamba, 1100–1600 m, July 1937, *G. Klug 10113* (AMES). BOLIVIA. Santa Cruz: Prov. Nuflo de Chavez, Perseverancia, Rio Negro vicinity, tributary of the Rio Baures, 75 km S of the border of the Dept. Beni, and 150 km W of the Rio Paragua, 200 m, 16 May 1991, *B. Mostacedo & R. Foster 94* (NY).

This species has the widest distribution in the genus, found from Mexico and Jamaica to Brazil and Bolivia. It is easily recognised by its ovoid, bifoliate pseudobulbs, subaxillary, usually many-flowered inflorescences, often starry flowers colored white to yellow, with pinkish to brownish stripes on the lip sidelobes, the lip has an elliptic-obovate hypochile with a 3–5 ridged medial callus, and a small, reniform, cuneate to suborbicular, fleshy midlobe.

I cannot find any characters justifying the separation of *X. hyacinthinum*. In the sense of Dunsterville and Garay (1979) it would appear to have a shorter columnfoot and medially narrower lateral sepals. However the type material of *X. hyacinthinum* does not have these characters (which are of trivial value), and matches other material of *X. foveatum*. The combination *X. hyacinthinum* cannot be attributed to Gentil (1907) because there is no reference at all to a basionym either under *Maxillaria* or *Xylobium*. I have also added *X. modestum* to the synonymy, its

protologue offers no distinguishing features of any value. There is in LE material (images seen) cultivated by the St. Petersburg Botanical Gardens (*Hort. Petrop.*) under the name *Maxillaria hyacinthina* but none of it bears the manuscript appellation “*M. affinis*.”

Xylobium leontoglossum (Rchb.f.) Rolfe, Gard. Chron. s. 3, 5: 458. 1889.

Basionym: *Maxillaria leontoglossa* Rchb.f., Bonplandia 3: 67. 1855. TYPE: COLOMBIA. Norte de Santander [as Ocana]: San Pedro, 1830 m, *H. Wagens s.n.* (Holotype: W-R; Isotype: G, images seen).

Heterotypic synonym: *Xylobium gracile* Schltr., Rep. Sp. Nov. Regni Veg., Beih. 8: 92. 1921. TYPE: ECUADOR. Pichincha: Nanegal, August 1871, *A. Sodiro 139* (Holotype: B, destroyed; Isotype: BR, image seen).

Xylobium squalens (Lindl.) Lindl. var. *gracile* (Schltr.) C. Schweinf., Bot. Mus. Leaf. Harv. Uni. 11: 198. 1944.

Distribution: Peru; Ecuador; Colombia; Venezuela.

Additional specimens examined: PERU. Amazonas: Prov. Bongara, Shillac, 2320 m, 12–13 September 1983, *M.L. Luna 333* (MO); Shillac, N by trail from Pedro Ruiz, 2300 m, 31 August to 2 September 1983, *D.N. Smith & S. Vasquez S. 4921* (MO); Distrito Pomacocha, on main Moyobamba to Chachapoyas road, 2330 m, 14 April 1984, *T.B. Croat 58256* (GH, MO, SEL); Pomacochas, 1985, *L. Moore s.n.* (SEL); Prov. Chachapoyas, Cerros Calla Calla, W side, 45 km above Balsas, midway on road to Leimebamba, 3100 m, 22 June 1964, *P.C. Hutchison & J.K. Wright 5803* (A); 5 km from N end of Lake Pomacocha, 2000 m, 8 October 1964, *P.C. Hutchison & J.K. Wright 6793* (AMES); Distrito Yambrasbamba, 1860–2000 m, 2 March 1967, *S.S. Tillett 673-245* (GH). Pasco: Prov. Oxapampa, 4–5 km N of Mallampampa, 2400 m, 22 January 1984, *D.N. Smith & J. Canne 5813* (MO); Huancabamba, Parque Nacional Yanachaga-Chemillen, Quebrada Diablo Fuerte, 2300 m, 31 November 2006, *A. Monteagudo, A. Pena, J.L. Mateo & R. Francis 13007* (SEL); road in construction between Oxapampa and Villa Rica, KM 7, 2100 m, 4 January 1984, *R. Foster, M. Chanco, D.N. Smith & J. Alban 7803* (F). ECUADOR. Carchi: Mira, El Carmen, Cerro Golondrinas, 2000–2400 m, 18–25 August 1994, *M. Tirado, P. Fuentes, R. Zurita & L. Chamorro 1203* (SEL). Imbabura: along trail to Rio Chalguayaco, below Magnolia, lower Intag Valley, 1495 m, 12 September 1944, *W.B. Drew E-599* (AMES). Morona-Santiago: Macasto to Guamote road, 2200 m, March 2000, *A. Hirtz, C. Luer & J. Luer 7222* (SEL). Napo: Baeza to Tena road, near Cosanga, 13 December 1976, *E.W. Davis 352* (AMES); road between Baeza and Tena, 72 km N of Archidona, 2000 m, 21 December 1979, *T.B. Croat 49588A* (NY); Santa Barbara to La Bonita road, trail towards La Bonita, 25–28 km S of Santa Barbara, along Rio Chingual, 2135–2345 m, 17 May 1982, *J.L. Luteyn, H. Balslev & B.M. Boom 8446* (NY). Pichincha: Quito, Reserva Geobotanica del Pululuha, Cerro los Reales, 2200 m, 17 March 1992, *C.E. Ceron 18560* (MO); Chiriboga to Santo Domingo road, just below Chiriboga, 1900 m, 2 June 1979, *L.B. Holm-*

Neilsen 18122 (MO); Aloag to Santo Domingo road, San Ignacio, 2000 m, 4 March 1967, *B. Sparre 14686* (MO); Chiriboga, on the road from Quito to Santo Domingo, "La Favorita" Forest Reserve, Ministry of Agriculture, near the Rio Salaya, 1600–1800 m, 5 December 1989, *C.E. Ceron, G. Benavides & E. Guzman 7919* (MO); near Rio Salante and Finca Canchacato, 2000 m, 28 October 1979, *C. Luer, J. Luer & A. Hirtz 4412* (SEL); KM 18, Nono to Nanegal, 2000 m, 20 June 1967, *C.H. Dodson, N.H. Williams & R. Adams 3729* (SEL). Sucumbios: along road between Tulcan and La Bonita, 2100 m, 13 March 1996, *S. Dalstrom, S. Ingram & K. Ferrell-Ingram 2119* (SEL). Tungurahua: 5 km W of Banos, 1850 m, 28 May 1968, *G. Harling, G. Storm & B. Strom 9887* (AMES); road S of Banos toward Riobamba, on slopes of Volcan Tungurahua, above Rio Chambo, 2300 m, 20 January 1971, *B. MacBryde 118* (AMES); Caserio Runtun, 3–4 km from Banos, 28 April 1969, *H. Lugo S. 1219* (AMES, MO). COLOMBIA. Narino: W Andes of Tuquerres, 1500–2100 m, June/July, *F.C. Lehmann 8575* (AMES, NY). Narino/Putumayo: near Laguna de la Cocha, February 1942, *R.E. Schultes s.n.* (AMES). Putumayo: Paramo de Tambillo, NE of Valle de Sibundoy, 2700–2800 m, 13–14 December 1942, *R.E. Schultes & C.E. Smith 3094* (AMES). Cauca: Cabeceras de rio Palo, Quebrada de Santo Domingo, 2640–2740 m, 15 December 1944, *J. Cuatrecasas 19366* (AMES); to the N of Volcan Purace, around Laguna de San Rafael, paramo, 3350 m, 29 January 1947, *J. Cuatrecasas 23508* (F, US); cerro above the Alto de Mira, between Tabor and Carrizales, 2100–2350 m, 23 October 1946, *J. Cuatrecasas 22445* (F); Monte La Guarida, above La Carbonera, between Las Brisas and Alban, 1950–2000 m, 16, 18, 24 October 1946, *J. Cuatrecasas 22138* (F). Valle: Municipio La Elvira, Finca Zingara, 1600–1700 m, 20 April 1989, *J.L. Luteyn, J. Giraldo & R. Ruiz 12552* (NY); La Cumbre, 1800–2100 m, 14–19 May 1922, *E.P. Killip 5581* (AMES, GH, US). Tolima: Rio Toche to "Machin," old Quindio trail, 2000–2500 m, 3 August 1922, *E.P. Killip & T.E. Hazen 9567* (AMES, NY, US). Cundinamarca: between Tequendama Falls and Santandercito, 1675–2135 m, 12 July 1961, *L.A. Garay, C.E. McClellan & A. Kapuler 220* (AMES). Caldas: Rio Santa Rita, Salento, 1600–1800 m, 26 August 1922, *E.P. Killip & T.E. Hazen 10141* (AMES). Antioquia: near Porcesito, valley of the Rio Medellin, 1100 m, 16 April 1946, *W.H. Hodge 6813* (AMES, US). VENEZUELA. Tachira: along Quebrada Agua Azul, S of El Reposo, 14 km SE of Delicias, 2150–2300 m, 22–23 July 1979, *J.A. Steyermark & R. Liesner 118479* (MO).

This attractive, commonly collected species is easily recognised by its unifoliate pseudobulbs, sublux to dense racemes, small (0.5–5.0 mm long) floral bracts, white to yellowish, rarely greenish flowers spotted purple to maroon, the lip trilobed, with a fleshy oblong midlobe densely covered with papillae and verrucae.

Though there are more than ten sheets of *X. leontoglossum* in Herbarium Reichenbach, none that had material collected by Wagener could be located (Szlachetko, pers. comm.). Therefore, I suspect the type material may be lost. It is not fully certain that the "isotype" in G is original material *per se*: it probably derives from cultivated plants that were sent by Wagener.

Xylobium miliaceum (Rchb.f.) Rolfe, Orch. Review 20: 43. 1912.

Basionym: *Maxillaria miliacea* Rchb.f., Xenia Orch. 3: 22. 1878. TYPE: BOLIVIA. La Paz: Prov. Larecaja, near Sorata, Cerro de Iminapi, on rocks at the source of the Rio Cacique, 2650 m, December 1859, *G. Mandon 1148* (Holotype: W-R 40279; Isotypes: G, K, P, images seen).

Heterotypic synonyms: *Xylobium buchtienianum* Kraenzl., Orchis 2: 129. 1908 *syn. nov.* TYPE: BOLIVIA. La Paz: Prov. Sud Yungas, Sirypaya, near Yanacachi, 2300 m, 19 December 1906, *O. Buchtien 303* (Holotype: HBG; Isotypes: AMES, US, images seen). *Xylobium medinae* Szlach. & Kolan., Phytion (Horn) 54, 1: 74. 2014 *syn. nov.* TYPE: COLOMBIA. Putumayo: Valle de Sibundoy, Vereda La Cumbre, 2300 m, fl. in cult. 29 November 2012, *R. Medina 817* (Holotype: HPUJ; photo.: MEDEL, neither seen).

Distribution: Bolivia; Peru; Ecuador; Colombia.

Additional Specimens examined: BOLIVIA. La Paz: Prov. Morillo, 30.5 km N of (below) Lago Zongo dam, trail up Jachcha Cruz, 2200 m, 16–17 December 1982, *J.C. Solomon 9088* (MO, SEL). Cochabamba: Prov. Chapare, road between Cochabamba and Villa Tunari, near Hotel Caballeros at KM 94, 21 November 1980, *T.B. Croat 51354* (MO). Santa Cruz: Prov. Florida, Parque Nacional Amoro, slopes of Los Toros, 1800–2000 m, 29–30 April 1994, *I.G. Vargas 3174* (MO, NY). Yungas, 1830 m, 1885, *H.H. Rusby 2747* (AMES, US). PERU. Puno: Prov. Carabaya, near Ollachea, 3100 m, 31 December 1947, *C. Vargas C. 6989* (AMES). Cuzco: Prov. Calca, Vilcabamba, 2550 m, 7 January 1944, *C. Vargas C. 4010* (AMES); Prov. La Convencion, Distrito Huayopata, basin of the Lucumayo, Incatambo, 2290 m, 16 November 2004, *L. Valenzuela, V. Chama, J. Latorre, J. Tito & M. Luza 4340* (SEL); Distrito Santa Teresa, Yerbabuenayoc, 2420 m, 16 September 2005, *I. Huamantupa, N. Anaya, M. Callalli, J. Tito & L. Vargas 6578* (SEL); Prov. Urubamba, Machupicchu, 2300 m, 29 November 1966, *C. Vargas C. 18333* (AMES); Machupicchu, between Winayhuayna and Intipunco, 2900 m, 26 October 1987, *P. Núñez V. 8376* (MO, NY). ECUADOR. Tungurahua: Banos, 2300 m, 9 January 1970, *L.A. Garay 1032* (AMES); Banos, Rio Pastaza, 1750 m, 15 March 1939, *C.W. Penland & R.H. Summers 84* (AMES). Napo: just W of Baeza, 1960 m, 26 October 1971, *B. MacBryde 861* (AMES).

The records from Ecuador represent a new addition to the flora of that country. It is understandable that the authors of the Colombian *X. medinae* proposed that taxon, because *X. miliaceum* was unknown from nearby Ecuador, and the flowers of some Bolivian collections are rather small (sepals *c.* 12 mm long). However the two taxa agree in all characters, and furthermore, variation was found in flower size (sepals 12–23 mm long).

The lack of published illustrations of *X. miliaceum* has probably contributed to a poor understanding of the species. The only detailed plate available is that published by Bennett and Christenson (2001). However, this figure is a bit misleading, showing a relatively dense inflorescence,

and separately, a single resupinate flower. The flowers are never resupinate, and most often the flowers are erect with the mentum pointing to the rachis, or in var. *patens*, pointing upwards.

A misprint in the protologue of *Maxillaria miliaceum* wrongly gives the type number as *Mandon 1140*, it is correctly *Mandon 1148*. The collection *Mandon 1140* is the type number of *Amblostoma densum* Rchb.f.

This species may be recognised by its bifoliate pseudobulbs, tall, lax to subaxly flowered racemes, narrowly cymbiform floral bracts, erect (mentum pointing to rachis), white to brownish-yellow flowers, often with reddish spots, the trilobed lip similarly colored but with several reddish points or verrucae on the ovate to ovate-elliptic, obtuse midlobe.

Xylobium miliaceum (Rchb.f.) Rolfe var. ***patens*** Ormerod, var. nov. TYPE: PERU. Amazonas: Prov. Bongara, on the road to La Rioja, 5 km N of the N end of Lake Pomacocha, 2000 m, 8 October 1964, leg. P.C. Hutchison & J.K. Wright 6793, 5 October 1968, cult. Univ. Calif. Bot. Gard., Acc. No. 64.1634 (Holotype: NY). Fig. 3.

Usage synonym: *Maxillaria scabrilinguis* auct. non (Lindl.) Lindl., Lindl., Edwards's Bot. Reg. 30: misc. 71, no. 66. 1844.

A *X. miliaceum* var. *miliaceum floribus patentibus* (vs. *erectis*) differt.

Terrestrial herb (?). Pseudobulbs ovoid to narrowly ovoid, bifoliate, 3.5–7.0 cm long, 1.2 cm thick. Leaves petiolate, blade narrowly to broadly oblong-lanceolate, acute, prominulously 5-veined below, 29.0–69.5 × 3.2–9.0 cm; petiole 6–29 cm long. Inflorescence erect, 24.5–32.0 cm long; peduncle 14.5–18.0 cm long; sheathing bracts 3–4, lax, slightly inflated, 2.7–3.7 cm long; rachis laxly 12–16 flowered, 10–14 cm long; floral bracts narrowly cymbiform, acute, 20–21 × 4–6 mm. Flowers with sepals pale brown externally, green internally, petals and lip green with fine brown dots, densest on lip, column white. Pedicel plus ovary clavate, 16–20 mm long. Dorsal sepal broadly oblong-cymbiform, obtuse, 5–7 veined, 19.5 × 6.0–6.5 mm. Lateral sepals obliquely broadly oblong-lanceolate, subacute, weakly falcate, 7–9 veined, 19.0–19.5 × 8–9 mm, forming with the columnfoot a right-angled, obtuse, 5–6 mm long mentum. Petals oblong-lanceolate, obtuse, 3–5 veined, 16.2–17.5 × 4.2–4.5 mm. Labellum trilobed, 13.0–13.2 × 7.3–8.0 mm; hypochile obovate; nerves inside adorned with a few verrucae, each side either truncate with an irregular apical margin, or produced into short, semi-elliptic, obtuse lobes, 8.0–8.5 × 7.3–8.0 mm; medial callus obscurely tricarinate, thickest in the upper half; epichile oblong to ovate, obtuse, upper margins raised slightly, fleshy, upper surface covered by c. 7 lines of verrucae, with some verrucae on the exterior, carinate below tip, 4.5–5.0 × 2–3 mm. Column very stout, 4.3–4.5 mm long, 3 mm wide laterally; columnfoot 4.3–4.5 mm long.

Distribution: Ecuador; Peru.

Additional specimens examined: ECUADOR. Loja, K. T. Hartweg 1172 (K-L, image seen). PERU. Junin: Prov. Satipo, Cordillera Vilcabamba, N part, E slope, upper Rio

Puyeni watershed, 2090 m, 26 June 1997, B. Boyle, M. Arakaki & H. Beltran 4682 (F).

Habitat: Wet cloud forest at base of a cliff. All surfaces heavily covered with epiphytes. Cyclanthaceae numerous in understory, 2000–2090 m (Boyle et al. 4682).

Etymology: From the Latin *patens*, meaning open, in reference to the flowers spreading away from the rachis.

I had intended to describe this plant as a new species since it seemed so different from *X. miliaceum* in its spreading (not erect) flowers. There are however no differences in the flowers. This variety was first discovered in Ecuador by Theodor Hartweg and sent to England where it was cultivated at the Royal Horticultural Society. According to Lindley (1844) this plant had dull purplish-yellow flowers. Lindley's drawing of the lip closely matches the type of var. *patens* in having produced sidelobes and a narrow midlobe.

I have only used the color notes given on the other Peruvian collection since those on the type number ("flowers cream, spotted or flecked purplish-red") probably apply to *X. leontoglossum* because the duplicate of Hutchison & Wright 6793 in AMES is clearly that taxon, easily recognised by its unifoliate pseudobulbs and small floral bracts. Duplicates of the type number should be checked first to see which taxon is present.

Xylobium pallidiflorum (W.J. Hook.) G. Nicholson, III. Dict. Gard. 4: 225. 1887.

Basionym: *Maxillaria pallidiflora* W.J. Hook., Bot. Mag. 55: t.2806. 1828. TYPE: SAINT VINCENT. Cult. Glasgow Bot. Gard., L. Guilding s.n. (Holotype: K, image seen).

Homotypic synonyms: *Colax pallidiflorum* (W.J. Hook.) A. Spreng., Tent. Suppl. Syst. Veg.: 29. 1828.

Onkeripus pallidus Raf., Fl. Tellur. 4: 42. 1838, nom. illeg.

Heterotypic synonyms: *Maxillaria stenobulbon* Klotzsch, Index Sem. Hort. Berolin. (App. Sp. Nov.): 1. 1853. TYPE: VENEZUELA. Without locality, leg. H. Wagens, fl. in cult. October 1853, Hort. Berolin. Bot. Gard. s.n. (Holotype: B, destroyed).

Xylobium latifolium Schltr., Rep. Sp. Nov. Regni Veg. 27: 66. 1929. TYPE: BOLIVIA. La Paz: Hacienda Casana, on the road to Tipuani, 1400 m, 27 January 1923, O. Buchtien 7224 (Holotype: B, destroyed; Isotype: HBG, image seen).

Distribution: Nicaragua; Colombia; Ecuador; Peru; Bolivia; Brazil; Suriname (?); Venezuela; Grenada; St. Vincent; Dominica.

Additional specimens examined: NICARAGUA. Jinotega: Mt. Kilambe, 1300 m, May 1971, A.H. Heller 11831 (SEL). COLOMBIA. Cauca: highlands of Popayan, 1500–2000 m, F.C. Lehmann B.T. 110 (NY). Cesar: Sierra Nevada de Santa Marta, between Finca Risaralda and Finca Los Arroyitos, 1700–1900 m, 30 September 1972, J.H. Kirkbride 2288 (NY). ECUADOR. Carchi: around Maldonado, 1450–1650 m, 2 June 1978, M.T. Madison, T.C. Plowman, H.A. Kennedy & L. Besse 4924 (SEL); along crest of mountain behind Rio Blanco, KM 78 along railroad from Ibarra to San Lorenzo, 1400–1500 m, 14 December

1961, *C.H. Dodson & L.B. Thien 1599* (SEL). Napo: along Archidona to Coca road, KM 16, 1000–1200 m, 17 February 1990, *S. Dalstrom & L. Arnby 1355* (SEL). Pichincha: along river above Tandapi, 1500 m, no date, *C. Luer, J. Luer & A. Hirtz 2451* (SEL). Pastaza: Banos to Puyo, 1500 m, April 1991, fl. in cult., *A. Hirtz 5413* (SEL). Zamora: near KM 33, 1600 m, 11 June 1958, *C.H. Dodson 233* (SEL). Loja: KM 55, road from San Lucas to pass, near pass, 2700–3000 m, 27 September 1961, *C.H. Dodson & L.B. Thien 750* (SEL). PERU. Amazonas: Prov. Bongara, KM 350, Olmos to Jumbilla, 10 July 1957, *D.E. Bennett 1962* (SEL). Cajamarca: Prov. San Ignacio, Distrito Huarango, Caserio el arenal, 1100 m, 20 May 2006, *J. Perea & V. Flores 2246* (MO); La Palma, 10 km NW of Chirinos, *Podocarpus* forest remnant, 1780 m, 5 February 1980, *C. Diaz & C. Blaney 61189* (MO); Distrito Huarango, El Covento, 1200–1600 m, 1 July 1996, *J. Campos & E. Rodriguez 2852* (MO). San Martin: Zepelacio, near Moyobamba, 1100 m, May 1934, *G. Klug 3619* (AMES, F, MO, NY, SEL); Prov. Rioja, along Rioja to Pedro Ruiz road, 1170 m, 23 March 1998, *H. van der Werff, B. Gray, R. Vasquez & R. Rojas 15516* (MO). Huanuco: Muna, 2135 m, 23 May to 4 June 1923, *J.F. MacBride 4047* (F); near Muna, 1620 m, no date, *D.E. Bennett s.n.* (SEL); Prov. Leoncio Prado, Distrito Hermilio Valdizan, La Divisoria, 1600 m, 18 April 1980, *J. Schunke V. 11319* (MO). BOLIVIA. La Paz: Prov. Nor Yungas, 4.6 km below Yolosa, then 19.1 km on road up the Rio Huarinilla, 1700 m, 12 November 1982, *J.C. Solomon 8850* (MO, SEL). Cochabamba: San Omogre, 2000 m, fl. in cult. 24 November 1981, *M. Foster s.n.* (= *SEL 79–1970*) (SEL). VENEZUELA. Monagas: Cerro de la Cueva de Dona Anita, S of and bordering valley of Caripe, 1100 m, 7 April 1945, *J.A. Steyermark 61889* (F). DOMINICA. Valley of Pegoua River, 19 April 1940, *W.H. Hodge & B. Hodge 2973* (AMES). SAINT VINCENT. Without locality, *H.H. Smith & G.W. Smith 1422* (NY).

I am not sure this species occurs in Suriname or the Guianas, though it could be expected to occur there. Material (and also online images) so far seen has proven to be either *X. foveatum* or *X. wilhelminae*.

Xylobium pallidiflorum is easily recognised by its slender, unifoliate pseudobulbs, lax, 3–12 flowered inflorescences, yellowish to greenish flowers, with a weakly lobed white lip, the medial callus 3–5 keeled, and an oblong, elliptic to suborbicular midlobe lacking any keels or marginal thickening.

Xylobium palmifolium (Sw.) Benth. ex Fawcett, Prov. List Fl. Plants Jamaica: 39. 1893.

Basionym: *Epidendrum palmifolium* Sw., Nov. Gen. Sp. Pl. Prodr.: 123. 1788. TYPE: JAMAICA. Without locality, *O. Swartz s.n.* (Lectotype, designated by Fawcett & Rendle 1910: 115 as “Type:” BM, not seen; Isolectotypes: G, not seen; S, image seen).

Homotypic synonyms: *Dendrobium palmifolium* (Sw.) Sw., Nov. Act. Reg. Soc. Sc. Ups. 6: 82. 1799.

Maxillaria palmifolia (Sw.) Lindl., Bot. Reg. 11: sub t.897. 1825.

Colax palmifolius (Sw.) Lindl. ex Spreng., Syst. Veg. ed. 16, 3: 727. 1826.

Heterotypic synonyms: *Maxillaria decolor* Lindl., Edwards’s Bot. Reg. 18: t. 1549. 1832. TYPE: JAMAICA. Without locality, January 1831, *imp. & cult. J. Lee s.n.* (Holotype: K-L, image seen).

Pentulops discolor Raf., Fl. Tellur. 4: 42. 1838 *nom. illeg.*

Xylobium decolor (Lindl.) G. Nicholson, Ill. Dict. Gard. 4: 225. 1887.

Usage synonym: *Xylobium variegatum auct. non* (Ruiz & Pav.) Garay & Dunsterv., Stewart & Stearn, Orch. Paint. Franz Bauer: 150. 1993.

Distribution: Cuba; Jamaica; Haiti; Dominican Republic.

Additional specimen examined: JAMAICA. Mt. Moses, *JP 2315* (NY).

The figure in Stewart and Stearn (1993: 150) misidentified as *X. variegatum* is somewhat problematic in that Bauer’s careful painting clearly shows a bifoliate plant with swollen pseudobulbs much like that of *X. foveatum*, whilst the inflorescence and flowers are clearly referable to *X. palmifolium*. Since the latter two species are both known from Jamaica, it is possible the figure is an amalgam of the two. A record of *X. palmifolium* from Trinidad (Schultes, 1960) is erroneous, the specimen is *X. colleyi*.

Xylobium palmifolium may be recognised by its unifoliate, 2.5–5.0 cm tall pseudobulbs, laxly 4–12 flowered inflorescences, whitish to pale yellow flowers, with a white, entire to weakly trilobed, oblong-oblancoleate, rounded, apically recurved lip, a 5–7 ribbed medial callus, and a narrowly conical, 7–8 mm long mentum.

Xylobium stanhopeifolium Schltr., Rep. Sp. Nov. Regni Veg., Beih. 27: 84. 1924. TYPE: COLOMBIA. Putumayo: near Mocoa, 550 m, May 1921, *W. Hopp 79* (Holotype: B, destroyed).

Distribution: Colombia.

This taxon remains unknown and awaits rediscovery. It is very similar to *X. subpulchrum* but differs in having a long-petiole leaf (20 vs. up to 5 cm). The characters of *X. stanhopeifolium* are its unifoliate pseudobulbs, long-petiole leaf, shortly peduncled inflorescence with a short, dense raceme, and trilobed lip with a fleshy verruculose midlobe.

Xylobium subpulchrum Dressler, Orquideologia 21, 3: 310. 2000. TYPE: PERU. Huanuco: Tingo Maria, fl. in cult. June 1999, *R.L. Dressler s.n.* (Holotype: MO; Isotypes: FLAS, SEL, USM, images seen).

Usage synonyms: *Xylobium colleyi auct. non* (Batem. ex Lindl.) Rolfe, C.H. & P.M. Dodson, Icon. Pl. Trop. s.2: t. 600. 1989; R. Escobar R., Nat. Colomb. Orch. 4: 600, ph. 700. 1992; Bennett & E.A. Christenson, Icon. Orch. Peruv.: t.198. 1993; Zelenko & Bermudez, Orch. Sp. Peru: 372. 2009.

Xylobium hyacinthinum auct. non (Rchb.f.) Schltr., Fernandez, Orq. Nat. Tachira: 237. 2003.

Distribution: Peru; Ecuador; Colombia; Venezuela.

Additional specimen examined: ECUADOR. Napo: Aguarico, Reserva Etnica Huaaurani, road and oil pipeline of Maxus in construction, KM's 75–76, between Rio Tivacuño and Rio Yasuni, 250 m, 17–20 February 1994, *M. Aulestia* & *O. Gunti* 1760 (MO).

The protologue lists an isotype for AMES but no such specimen has been recorded as being lodged there, nor was it found after a thorough search. I add Venezuela to the distribution based on a photograph identified as *X. hyacinthinum* in Fernandez (2003).

The species is characterised by its unifoliate pseudobulbs, sessile to shortly petiolate leaf, shortly peduncled inflorescences with a short, dense raceme of white flowers with a red to yellowish midlobe, the lip is trilobed in its upper third, with an ovate-elliptic midlobe densely covered in verrucae.

Xylobium sulfurinum (Lemaire) Schltr., Beih. Bot. Centralbl. 36, Abt. 2: 493. 1918.

Basionym: *Maxillaria sulfurina* Lemaire, Fl. des Serres 4, 3: 330–b. 1848, non Josst 1851. TYPE: GUATEMALA. Without locality, *imp.* & *cult.* *L. B. van Houtte s.n.* (Holotype: W-R 40251, image seen).

Heterotypic synonyms: *Maxillaria hypocrita* Rchb.f., Hamb. Gart.-Blumenz. 16: 15. 1860, *syn. nov.* TYPE: Origin unknown, *cult.* *E. Stange s.n.* (Syntype: W-R 40255, image seen); *cult.* *F.W.G. Lauche s.n.* (Syntype: W-R 40255, image seen).

Xylobium hypocritum (Rchb.f.) Rolfe, Orch. Review 20: 43. 1912.

Xylobium powellii Schltr., Rep. Sp. Nov. Regni Veg., Beih. 17: 66. 1922. TYPE: PANAMA. Prov. Chiriqui, without locality, 1220 m, no date, *C.W. Powell* 117 (Holotype: B, destroyed; Lectotype [designated by Christenson, 1991: 132: AMES; Isolectotypes: K, image seen; MO [not seen]).

Xylobium sublobatum Schltr., Rep. Sp. Nov. Regni Veg., Beih. 19: 51. 1923. TYPE: COSTA RICA. San Jose, 1100 m, no date, *cult.* *Madame Amparo de Zeledon*, in *A. Tonduz* 50 (Holotype: B, destroyed; drawing AMES).

Xylobium tuerckheimii Kraenzl., Ann. Naturh. Mus. Wien 44: 325. 1930. TYPE: GUATEMALA. Alta Verapaz: road from Tactic, in the Polochictal, 2925 m, July 1878, *H. von Tuerckheim* 163 (Holotype: W-R 12948, image seen; drawing AMES).

Maxillaria pallens A. Rich. ex Soto, Icon. Orch. 10: t.1100. 2008 *pro syn.* BASIS FOR NAME: MEXICO. Veracruz: without locality, 915 m, August 1840, *H.G. Galeotti* 5148 (P, not seen).

Distribution: Mexico; Guatemala; Nicaragua; Costa Rica; Panama.

Additional specimens examined: MEXICO. Oaxaca: near Chiapam, 1160–1370 m, 29 July 1894, *E.W. Nelson* 909 (AMES). Vera Cruz: SW of Orizaba, 12 August 1937, *G.P. de Wolf* 888 (AMES); Jalapa region, Coatepec, 1000 m, 16

August 1933, *K.E.M. Oestlund* 1621 (US); near Coatepec, 1300 m, 12 August 1932, *K.E.M. Oestlund* 1046 (AMES). Chiapas: E of Ocasingo, near Finca Quexil, 1500 m, 14 July 1937, *H. von Schmelting* in *K.E.M. Oestlund* 5741 (AMES, US). GUATEMALA. Alta Verapaz: Rio Frio, 1220 m, 20 September 1920, *H. Johnson* 733 (AMES). Huebuetenango: Yalambohock, 22 August 1896, *E. Seler* 2305 (GH). Chichabae, near Tecpam, 2590 m, August 1932, *W.R. Hatch* 501 (AMES). COSTA RICA. Cartago: Santa Cruz on Volcan Turrialba, 1525 m, 26 July 1947, *G.P. de Wolf* 430 (AMES). San Jose: Tarbaca, central valley, 1400 m, 12 July 1925, *A. Alfaro* 144 (AMES). PANAMA. Chiriqui: near Boquete, Finca Collins, 1675 m, 24 July 1959, *W.L. Stern*, *K.L. Chambers*, *J.D. Dwyer* & *J.B. Ebinger* 1110 (AMES); Finca Lerida to Pena Blanca, 1750–2000 m, 9 July 1940, *R.E. Woodson* & *R.W. Schery* 534 (AMES); valley of the upper Chiriqui Viejo, near Monte Lirio, 1300–1900 m, 27 June to 13 July 1935, *R.J. Seibert* 223 (AMES); same data, *R.J. Seibert* 135 (AMES). ORIGIN DUBIOUS: (“Venezuela”), *cult.* *Missouri Bot. Gard.*, *G.H. Pring s.n.* (MO).

A fairly commonly collected Mesoamerican species characterised by having narrowly ovoid to fusiform, unifoliate (occasionally bifoliate) pseudobulbs, erect, lax-flowered racemes, the flowers yellow, with an entire or barely lobed white lip, the apex of which is narrowed into a blunt, slightly thickened triangle, the median callus is very low, tricarinate, and easily overlooked. The lip is 7–9 veined, and in rehydrated flowers these veins can appear raised, and can thus be mistaken for low keels.

The later *Maxillaria sulfurina* Josst (Besch. Cult. Orch.: 261. 1851) is not to be confused with Lemaire's plant, the former entity is Brazilian and a synonym of *Bifrenaria racemosa* (W.J. Hook.) Lindl. *Maxillaria hypocrita* is not any different from *Xylobium sulfurinum*, and is here reduced to synonymy. A later plate by Regel (1881) of *Maxillaria hypocrita* correctly depicts a flowering plant, but the figure of the lip (f.2) which shows a four-lobed callus, belongs to another orchid. This figure may have misled later workers into thinking that *M. hypocrita* had differences in the labellum, but this is not the case.

Xylobium undulatum (Ruiz & Pav.) Rolfe, Orch. Review 20: 43. 1912.

Basionym: *Maxillaria undulata* Ruiz & Pav., Syst. Veg. Fl. Peruv. Chil. 1: 221. 1798. TYPE: PERU. Huanuco: forests of Chinchao and Muna, August/September 1786, *H. Ruiz* & *J. Pavon s.n.* (Holotype: MA; Iconotypes: MA, 2 paintings, images seen). Fig. 4–5.

Homotypic synonym: *Dendrobium undulatum* (Ruiz & Pav.) Pers., Syn. Pl. 2: 524. 1807, non R. Br. 1810.

Heterotypic synonyms: *Dendrobium squalens* Lindl., Bot. Reg. 9: t.732. 1823, *syn. nov.* TYPE: BRAZIL. Rio de Janeiro area, 1822, *leg. J. Forbes s.n.* (Holotype: lost). NEOTYPE: BRAZIL. Rio de Janeiro area, 1824, *leg. J. Forbes s.n.* (Neotype, here designated, K-L, image seen).

Xylobium squalens (Lindl.) Lindl., Bot. Reg. 11: sub t. 897. 1825.

Maxillaria squalens (Lindl.) W.J. Hook., Bot. Mag. 56: t. 2955. 1829.

Maxillaria squalens (Lindl.) W.J. Hook. var. *genuina* Mutel, Mem. Soc. Hist. Nat. Strasb. 3, 1: 16. 1840, *nom. illeg.*

Dendrobium squalens Lindl. var. *houttei* Ch. Morren, Hort. Belg. 2: 193. 1834. TYPE: BRAZIL. Without locality, *imp. & cult.* *L.B. van Houtte s.n.* (Holotype: lost).

Xylobium houttei Makoy ex Mutel, Mem. Soc. Hist. Nat. Strasb. 3, 1: 16. 1840, *pro syn.*

Maxillaria houttei (Ch. Morren) Josst, Besch. Cult. Orch.: 247. 1851.

Maxillaria supina Poepp. & Endl., Nov. Gen. Sp. 1: 39. 1836. TYPE: PERU. Huanuco: Pampayaco, November 1829, *E. Poeppig 1511* (Holotype: W, image seen).

Xylobium supinum (Poepp. & Endl.) Schltr., Orchis 7: 24. 1913.

Maxillaria squalens (Lindl.) W.J. Hook. var. *taffinii* Mutel, Mem. Soc. Hist. Nat. Strasb. 3, 1: 16. 1840. TYPE: BRAZIL. Without locality, *cult., sine coll. s.n.* (Holotype: lost).

Xylobium taffinii Makoy ex Mutel, Mem. Soc. Hist. Nat. Strasb. 3, 1: 16. 1840, *pro syn.*

Xylobium squalens (Lindl.) Lindl. var. *taffinii* (Mutel) Cogn., in Mart., Fl. Bras. 3, 5: 469. 1902.

Maxillaria truxillensis Rchb.f., Bonplandia 2: 17. 1854. TYPE: VENEZUELA. Trujillo: without locality, *H. Wagenser s.n.* (Holotype: W-R 40263, image seen).

Xylobium truxillense (Rchb.f.) Rolfe, Orch. Rev. 20: 43. 1912.

Maxillaria squalens (Lindl.) W.J. Hook. var. *stenopetala* Regel, Index Sem. Hort. Petrop.: 20. 1856. TYPE: BRAZIL. Without locality, *cult. Hort. Bot. Petrop. s.n.* (Holotype: lost).

Xylobium squalens (Lindl.) Lindl. var. *stenopetalum* (Regel) Cogn., in Mart., Fl. Bras. 3, 5: 469. 1902.

Maxillaria squalens (Lindl.) W.J. Hook. var. *obscura* Regel, Index Sem. Hort. Petrop.: 20. 1856. TYPE: BRAZIL. Without locality, September 1856, *cult. Hort. Bot. Petrop. s.n.* (Holotype: LE, image seen).

Xylobium squalens (Lindl.) Lindl. var. *obscurum* (Regel) Cogn., in Mart., Fl. Bras. 3, 5: 469. 1902.

Xylobium dusenii Kraenzl., Kongl. Sven. Vet. Akad. Handl. 46, 10: 65. 1911. TYPE: BRAZIL. Parana: coastal regions, March 1909, *P. K. H. Dusen 8022* (Lectotype, here designated: HBG 502092; Isolectotype: S, images seen).

Xylobium squalens (Lindl.) Lindl. var. *majus* Hoehne, Relat. Commiss. Linhas Telegr. Estrateg. Matto Grosso Amaz. 5, Bot. 9: 38. 1919, as "*major*." TYPE: BRAZIL. Mato Grosso: near waterfall of Sao Lucas, upper Rio Tapajoz, January, *J.G. Kuhlmann 111*

(Syntype: R?, not seen); same data, *J.G. Kuhlmann 112* (Syntype: R?, not seen).

Xylobium serratum D.E. Bennett & E.A. Christenson, Icon. Orch. Peruv.: t.799. 2001 *syn. nov.* TYPE: PERU. Pasco: Oxapampa, 8 km N of Villarica, 1525 m, August 1993, *leg. J. Campoverde, cult. D.E. Bennett 6030* (Holotype: lost). NEOTYPE: PERU. Pasco: Oxapampa, 8 km N of Villarica, 1525 m, August 1993, *leg. J. Campoverde, cult. D.E. Bennet 6030-1* (Neotype, designated by Trujillo, 2014: 79, as "Lectotype:" MOL spirit, image seen; Isoneotype: NY).

Xylobium ortizianum Szlach. & Kolan., Phytion (Horn) 54, 1: 78. 2014, *syn. nov.* TYPE: COLOMBIA. Meta: Parque Nacional Natural Tinigua, Rio Duda, Serrania Chamusa, Centro de Investigaciones Ecologicas La Macarena, 350 m, April 1997, *P. Stevenson 2044* (Holotype: COL, not seen; Isotype: NY).

Distribution: Costa Rica; Colombia; Ecuador; Peru; Bolivia; Brazil; French Guiana; Suriname; Guyana; Venezuela.

Additional specimens examined: COSTA RICA. Cartago: Pejivalle, 15 May 1920, *C.H. Lankester 858* (AMES); Turrialba, 1906, *cult. New York Bot. Gard., leg. W.R. Maxon 171* (NY). COLOMBIA. Valle: Cordillera Central, La Marina, 1400 m, March 1941, *E. Dryander 2487* (US); San Marco to Sevilla, 1100 m, February 1946, *E. Dryander 2861* (F); above La Cumbre, 1800–2200 m, 14–19 May 1922, *E.P. Killip 5581* (NY); Cordillera Occidental, Pavas, 1500–1800 m, 24 & 29 September 1922, *E.P. Killip 11574* (AMES, GH, NY); same data, *E.P. Killip 11572* (AMES). Norte de Santander: Cordillera Oriental, Sarare region, El Banco, confluence of the Rio Cubugon and Rio Cobaria, 320 m, 15 November 1941, *J. Cuatrecasas 13140* (US). ECUADOR. Tungurahua: Banos, Rio Pastaza, 14 March 1939, *C.W. Penland & R.H. Summers 79* (AMES); Caserio Runtun, 3–4 km from Banos, 28 April 1969, *H. Lugo S. 1219* (AMES, MO). Morona-Santiago: W of Mision Bomboiza, road to Gualaquiza, 840 m, 30 January 1971, *B. MacBryde 172* (AMES). Pichincha: Quito, Reserva Geobotanica del Pululuhua, Cerros Los Reales, 2200 m, 17 March 1992, *C.E. Ceron 18560* (MO); Chiriboga to Santo Domingo road, just below Chiriboga, 1900 m, 2 June 1979, *L.B. Holm-Nielsen 18122* (MO); Aloag to Santo Domingo road, San Ignacio, 2000 m, 4 March 1967, *B. Sparre 14686* (MO); Chiriboga, Reserva Forestal "La Favorita," near Rio Salaya, 1600–1800 m, 5 December 1989, *C.E. Ceron, G. Benavides & E. Guzman 7919* (MO). PERU. Cajamarca: Prov. San Ignacio, Distrito Namballe, La Colmena, Paschall Tipode forest, 800–900 m, 18 December 1996, *J. Campos, P. Diaz & J. Pezantes 3169* (GH, MO, SEL); road to Caserio "Tamana," 780 m, 9 December 1977, *J. Campos & A. Pena 4793* (MO); Vega del Toro, 800–1000 m, 7 December 1997, *R. Vasquez, R. Rojas, A. Pena & E. Chavez 25102* (MO, SEL). Amazonas: near Huampami, 245 m, 18 July 1974, *R. Kayap 1213* (MO). San Martin: Zepalacio, near Moyobamba, 1200–1600 m, December 1933, *G. Klug 021* (AMES, GH, NY); Moyobamba, 1100–1600 m, July 1937, *G. Klug 10123*

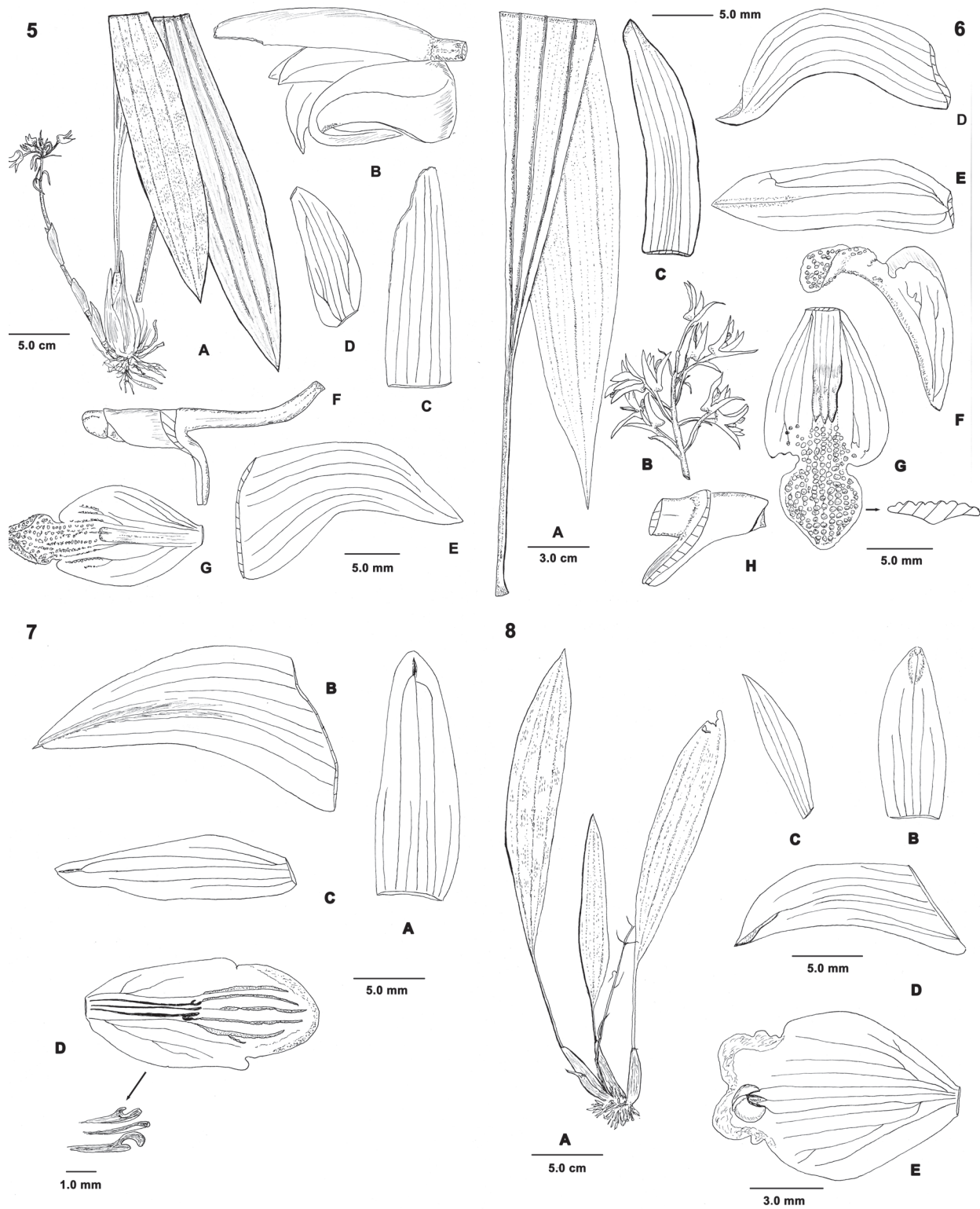


FIGURE 5. *Xylobium undulatum* (Ruiz & Pav.) Rolfe var. *undulatum*. A, plant; B, flower; C, dorsal sepal; D, petal; E, lateral sepal; F, column; G, labellum. Drawn from Killip 11574 (AMES). FIGURE 6. *Xylobium undulatum* (Ruiz & Pav.) Rolfe var. *portillae* Ormerod. A, leaf; B, rachis; C, dorsal sepal; D, lateral sepal; E, petal; FG, Labellum; H, column. Drawn from holotype. FIGURE 7. *Xylobium varicosum* (Rchb.f.) Rolfe. A, dorsal sepal; B, lateral sepal; C, petal; D, labellum (detail of callus arrowed). Drawn from Micklow s.n. (SEL). FIGURE 8. *Xylobium wilhelminae* Ormerod. A, plant; B, dorsal sepal; C, petal; D, lateral sepal; E, labellum. Drawn from holotype.

(AMES); Prov. Mariscal Caceres, Tocache Nuevo, Palo Blanco, SE of Puente, 600–700 m, 6 December 1972, *J. Schunke V. 5680* (NY). San Martin/Loreto: near Aguaytia, 2 km E of Funda Chela, KM 209, 5 July 1959, *M.E. Mathias & D. Taylor 3609* (MO). Loreto: Ramon Castilla, Pevas, 105 m, 14 October 1987, *R. Vasquez & N. Jaramillo 9809* (MO). Huanuco: Tingo Maria, bank of the Rio Huallaga, 19 July 1940, *E. Asplund 12355* (AMES). Pasco: Prov. Oxapampa, Distrito Pozuzo, Zona de amortiguamiento del Parque Nacional Yanachaga-Chemillen, Parte Alta de Puesto de Control Huampal, 1300 m, 21 July 2006, *A. Monteagudo, J.L. Mateo & R. Francis 12471* (SEL); Gran Pajonal, trail between Chequitavo and Shumahuani, 1200–1300 m, 30 March 1984, *D.N. Smith 6585* (MO, SEL). Ayacucho: Aina, between Huanta and Rio Apurimac, 750–1000 m, 7 & 17 May 1929, *E.P. Killip & A.C. Smith 23165* (AMES); same data, *E.P. Killip & A.C. Smith 22591* (AMES). BOLIVIA. La Paz: Tumupasa, 305–455 m, 10 December 1921, *O.E. White 1105* (AMES); same data, 8 December 1921, *O.E. White 1841* (AMES); Prov. Sud Yungas, basin of Rio Bopi, Asunta, near Evenay, 690–750 m, 27–31 July 1939, *B.A. Krukoff 10696* (AMES, MO, NY). Beni: Prov. Ballivia, lower slopes of Serrania Pilon Lajas, 14.3 km N of the bridge over the Rio Quiquibey, 700 m, 10 June 1985, *J.C. Solomon 13956* (MO). Cochabamba: Ayopaya, 1000 m, 21 July 2001, *I.G. Vargas 6336* (MO). BRAZIL. Parana: Serra do Morretes, Usina Electrica Marumbi, 25 May 1966, *G. Hatschbach 14461* (US). VENEZUELA. Anzoategui: near Estado Sucre border, near confluence of Rio Leon with Rio Zumbador, NE of Bergantin, 400–500 m, 26 February 1945, *J.A. Steyermark 61205* (AMES). Aragua: Parque Nacional Henry Pittier, steep wet forest slopes between trail to Periquito and Finca la de Periquito, along upper slopes of tributary to Quebrada Palo Vaco, on side towards Lago Valencia, opposite Rancho Grande Biological Station, 1300–1400 m, 25 October 1961, *J.A. Steyermark 89908* (AMES). Miranda: rainforests of the Guatope, 400–600 m, 28 November 1956, *A.L. Bernardi s.n.* (NY).

The accepted facies of the species long known as *X. squalens*, then *X. variegatum*, is of a plant with ovoid, bifoliate pseudobulbs, an inflorescence peduncle shorter or longer than the pseudobulb and covered with three relatively large inflated sheaths, topped by a dense raceme of whitish, often purplish suffused or marked flowers with a whitish to yellowish trilobed lip, and a fleshy, verrucose, purple-red midlobe. In this regard the herbarium material that forms the type of *X. undulatum* perfectly agrees with the above characters. But looking at the paintings (reproduced in Pupulin 2012b) of *X. undulatum* by Isidrio Galvez one could be forgiven for thinking that a different taxon is at hand due to the way the sheaths on the peduncle are depicted, and that the floral bracts are only faintly pencilled in. Indeed Pupulin (2102b) accepted that *X. squalens* was a separate taxon also occurring in Peru, reproducing a painting by J.G. Rivera showing the “typical” features listed above.

However the type material of *X. undulatum* matches “typical” *X. squalens*, and therefore the paintings of Galvez only look different due to artistic interpretation and do not represent another taxon. Examination of numerous Peruvian specimens also bears this conclusion out.

The variability of *X. undulatum* includes the length of the peduncle (up to 22 cm long, but generally half as short or less), the disposition and size of the peduncular sheaths, density of the raceme, flower color (white to purple, lip white, yellow to purple, with a red-purple, sometimes yellowish midlobe), and mentum length (4–9 mm long).

To the synonymy of *X. undulatum* not only have I added *X. squalens*, which does not differ in any way, but also *X. serratum* and *X. ortizianum*.

The type sheet of *Dendrobium squalens* in herbarium Lindley at Kew contains four elements, namely on the lower left an inflorescence of a plant from Forbes, flowering in 1824; on the lower right a small undated sketch of a lip, column, and pollinia; on the upper left is plate 2955 from Curtis’s Botanical Magazine of 1829; and on the right-hand side an inflorescence of *A. Mathews 1877* (this was probably collected in the 1830’s in Peru, and is likely referable to *X. bractescens*). Since no original material survives, and the plate accompanying the protologue is rather inadequate since it lacks an analysis, I have chosen the 1824 collection of Forbes as neotype. This specimen probably represents a later flowering of the type plant.

Maxillaria truxillensis was based on material collected by Wagener in Venezuela. Dariusz Szlachetko studied the type in Vienna, and his drawings, which he kindly shared, show that it is not separate from *Xylobium undulatum*. The reduced sidelobe tips (giving the appearance of an elliptical hypochile) agree quite well with material from El Valle, Colombia. Plants later called *X. truxillense* (e.g., Dunsterville & Garay, 1979) do not agree with the type, and therefore presumably represent another taxon, material of which has not been available for study.

Xylobium serratum was described from a plant that appears to have suffered in culture, and thus has a somewhat poorly developed inflorescence. I have treated Trujillo’s (2014) lectotypification as a neotypification since the collection *Bennett 6030-1* is not given in the protologue. The flowers of the isoneotype in NY show no differences from *X. undulatum*, and it is also apparent that the original drawing is not quite accurate in its depiction of the midlobe and the so-called serrate processes that gave the species its name.

Xylobium ortizianum was separated on account of its five-keeled median callus ending in a four-lobed mass. Upon studying the NY isotype I find a three-keeled callus overlaying five veins, whilst the apex gives the appearance of terminating in four teeth, this is because the middle tooth is divided or apically sulcate. I have observed the latter state occasionally in some other Colombian and Peruvian specimens and place no value on it.

Xylobium undulatum (Ruiz & Pav.) Rolfe var. ***portillae*** Ormerod, var. nov. TYPE: ECUADOR. Morona-Santiago: Macas, 1000 m, cult. at Ecuagenera, April 2001, *A. Hirtz 7689* (Holotype: SEL). Fig. 6.

A *X. undulatum* (Ruiz & Pav.) Rolfe var. *undulatum inflorescentiis laxioribus, sepalis lateralis falcatis et verrucae labello rotundatis differt.*

Rhizome, roots, and pseudobulbs not seen. *Leaf* petiolate, blade oblong-lanceolate, acute, prominulously 3–5 veined

below, 43.8 x 5.8–6.0 cm; petiole 13 cm long. *Inflorescence* incomplete; rachis subclaxly 11–12 flowered, 5.7 cm long; floral bracts narrowly oblong-lanceolate, acute, 23 x 3.8 mm. *Flowers* with semi-spreading segments, white, lip light yellow. *Pedicel plus ovary* clavate, 18–25 mm long. *Dorsal sepal* oblong-lanceolate, acute, 7 veined, 20 x 4.5–5.0 mm. *Lateral sepals* broadly oblong-lanceolate, acute, falcate, 5 veined, midvein low carinate toward apex, 20 x 6 mm, forming with the columnfoot a slightly retrorse, obtuse, 4.5–5.0 mm long mentum. *Petals* obliquely oblong, subacute to obtuse, 3 veined, 15.5 x 4.5 mm. *Labellum* trilobed, 15.5 x 8.5 mm; hypochile obovate, with obtuse to truncate apices, the inside of which with some scattered verrucae, 9.5–10.0 x 8.5 mm; medial callus low tricarinate, thickest in upper half; epichile ovate-cordate, obtuse, densely covered by 7–9 rows of rounded verrucae (except for the very edge), the underside laxly adorned with rounded verrucae, 5.5–6.0 x 4.8 mm. *Column* short, stout, 3 mm long, 2 mm wide laterally; columnfoot straight, slightly retrorse, 4.0–4.3 mm long.

Distribution: Ecuador.

Eponymy: Named after Jose Portilla, founder of Ecuagenera, and at whose facility this variety was cultivated.

Unfortunately the material available of this distinctive variety consists only of a leaf and the upper part of an inflorescence. It differs from typical *X. undulatum* in having a laxer inflorescence, falcate lateral sepals, and rounded verrucae on the lip.

Xylobium undulatum (Ruiz & Pav.) Rolfe var. ***variegatum*** (Ruiz & Pav.) Ormerod, *comb. nov.*

Basionym: *Maxillaria variegata* Ruiz & Pav., *Syst. Veg. Fl. Peruv. Chil.* 1: 222. 1798. TYPE: PERU. Huanuco: Muna, June & September 1786, *H. Ruiz & J. Pavon s.n.* (Holotype: MA, 2 sheets; Iconotype: MA, images seen).

Homotypic synonyms: *Dendrobium variegatum* (Ruiz & Pav.) Pers., *Syn. Pl.* 2: 524. 1807.

Xylobium variegatum (Ruiz & Pav.) Garay & Dunsterv., *Venez. Orch. Ill.* 2: 342. 1961.

Heterotypic synonyms: *Dendrobium carnosum* Presl, *Reliq. Haenk.* 1: 102. 1827, *non* Teijsm. & Binn. 1853, *nec* (Blume) Rchb.f. 1861. TYPE: PERU. Huanuco: without locality, *T. Haenke s.n.* (Holotype: PR, 2 sheets, images seen).

Xylobium carnosum (Presl) Schltr., *Rep. Sp. Nov. Regni Veg.*, *Beih.* 9: 160. 1921.

Cyrtopera scabrilinguis Lindl., *Gen. Sp. Orch. Pl.*: 189. 1833. TYPE: PERU. Without locality, *H. Ruiz & J. Pavon s.n.* (Holotype: BM, image seen).

Maxillaria scabrilinguis (Lindl.) Lindl., *Edwards's Bot. Reg.* 30: misc. 71, no. 66. 1844.

Xylobium scabrilingue (Lindl.) Rolfe ex Gentil, *Pl. Cult. Serres Jard. Bot. Brux.*: 194. 1907.

Distribution: Peru.

This variety differs from typical *X. undulatum* in generally having rather taller inflorescences, due to the longer peduncle (25–30 cm vs. up to 22 cm, but with an average of 9–13 cm) and rachis (14–24 cm vs. 4–11 cm). It appears to be endemic to the Department of Huanuco.

Szlachetko et al. (2012) lectotypified *X. variegatum* with a sheet in MA, but failed to indicate which one of the two sheets present they had chosen. It would therefore seem necessary to take a second step and choose one of the sheets, but I prefer to postpone such a choice at this time. They also mention an “isolectotype” in BM, but this is actually the holotype of *Cyrtopera scabrilinguis*. The BM type of the latter does not seem to be of the same facies as the type material of *Xylobium variegatum*, so it is possible this collection represents a separate find by Ruiz and Pavon during their time in Peru.

Pupulin (2012b) reproduced the original painting of *Maxillaria variegata* by J. Brunete. Perhaps the plant illustrated was just beginning to flower because the rachis is very short, unlike the much longer ones in the type specimens.

Xylobium varicosum (Rchb.f.) Rolfe, *Mem. Torrey Bot. Club* 4: 263. 1895.

Basionym: *Maxillaria varicosa* Rchb.f., *Gard. Chron.* n.s., 20: 392. 1883. TYPE: BOLIVIA. Without locality, *leg. M. Bang, cult. T. Christy s.n.* (Holotype: W-R 41335, image seen; drawing AMES). Fig. 7.

Heterotypic synonyms: *Xylobium flavescens* Schltr., *Rep. Sp. Nov. Regni Veg.* 12: 493. 1913, *syn. nov.* TYPE: BOLIVIA. Santa Cruz: near Tres Cruces, 1500 m, February 1911, *T. Herzog 1608* (Holotype: B, destroyed; Lectotype, designated by Christenson 1996: 25; L; Isolectotypes: S, Z, images seen).

Xylobium subintegrum C. Schweinf., *Amer. Orch. Soc. Bull.* 12: 350. 1944 *syn. nov.* TYPE: PERU. Cuzco: Prov. Quispicanchis, Marcapata, Hacienda Itio, 2000 m, 27 January 1943, *C. Vargas C. 3120* (Holotype: AMES).

Distribution: Bolivia; Peru; Ecuador (?).

Additional specimens examined: BOLIVIA. La Paz: Cordillera Real Okara, 2285 m, 26–29 April 1926, *H.H. Tate 929* (NY); Yungas region. 1890, *M. Bang 573* (AMES, NY). Santa Cruz: 15 km E of Zandipata, 1500 m, fl. in cult. 24 November 1981, *F. Micklow s.n.* (= *SEL 80-976*) (SEL). PERU. Amazonas: Prov. Bongara, Distrito Sipabamba, Shilla [Shillac?], 1900 m, 5 May 1981, *K. Young & M. Eisenberg 353* (MO, SEL); above Quebrada Chacuaico, 1900 m, 7 May 1981, *K. Young, G. Eisenberg & D. La Torre 402* (NY). Cajamarca: San Ignacio, San Jose de Lourdes, base of Cerro Picorana, 2010 m, 20 January 1999, *C. Diaz, J. Yactayo, E. Palomino, C. Vargas, D. Portocarrero, M. Medina, O. Diaz & E. Zurita 10379* (GH, MO, SEL). Junin: Chanchomayo Valley, 1200 m, February 1930, *C. Schunke 1302* (F); same data, September 1924–1927, *C. Schunke 525* (F); same data, 1500 m, December 1929, *C. Schunke 1089* (F); Prov. Tarma, above La Merced on Cumbre Yucunay, near summit, 2000 m, 17 August 1957, *P.C. Hutchison 1879* (AMES); Utcuyacu, fl. in cult. Univ. Calif. Berkeley, *leg. F. Woytkowski 61* (AMES); Utcuyacu, 1900 m, 26 February 1948, *F. Woytkowski 35386* (AMES). Pasco: Prov. Oxapampa, between Oxapampa and Villa Rica, KM 7, 2100 m, 4 January 1984, *R. Foster, M. Chanco, D.N. Smith & J. Alban 7789* (F, MO, SEL); 5 km SE of Oxapampa, 1850 m, 1 February 1983, *D.N. Smith 3195* (MO, NY); Distrito

Huancabamba, Parque Nacional Yanachaga-Chemillen, Quebrada Yanachaga, 2100 m, 21 January 2005, *E. Beccera, R. Vasquez, C. Arias & A. Pena 0405* (SEL). Cuzco: Rio Marcapato, 60 km above Quincemil, 1880 m, 17 January 1973, *M.T. Madison 1009* (GH).

This species is listed from Ecuador by Dodson (2004) as *X. subintegrum*. I have not yet seen Ecuadorian material of *X. varicosum*, but it likely occurs there.

As noted above, *X. varicosum* is closest to *X. bractescens*, under which the differences are discussed. Sometimes *X. varicosum* is considered an ally of *X. pallidiflorum*, but the latter generally has longer, stick-like pseudobulbs, and its midlobe lacks lamellate keels.

Analysis of the protologue, and of images of the surviving type material of *X. flavescens* leaves no doubt it is a synonym of *X. varicosum*. However, the published illustration (Schlechter, 1930) is very misleading, showing a rhombic-oblongate, subacute lip with an elongate, thickened medial callus, and smooth keels in the upper half. Another taxon, *X. subintegrum*, is also no different from *X. varicosum*.

Xylobium varicosum may be characterised by having small (3.0–4.5 cm long), unifoliate pseudobulbs, the leaf shortly to long petiolate, the inflorescence with a 7–18 cm long peduncle, with a short (3.7–4.8 cm long), 3–8 flowered rachis, the flowers yellow-green, the entire to weakly lobed lip white to pale pinkish-orange, with brown to purplish lines on the midlobe, the medial callus is often indistinct and consists of three low keels that are most prominent apically, that are then superseded by 5–7 well-separated, irregularly dentate, low lamellae that radiate out onto the broadly rounded to emarginate midlobe.

Xylobium wilhelminae Ormerod, *sp. nov.* TYPE: SURINAME. Wilhelmina Range, near summit of hill, West Rivier, 4 km S of Juliana Top, 700 m, 1 September 1963, *H.S. Irwin, G.T. Prance, T.R. Soderstrom & N. Holmgren 55297* (Holotype: NY). Fig. 8.

Species nova singularis, pseudobulbis unifoliatis, inflorescentiis paucifloro, flores pallide lutescens, labello late obovatis, leviter trilobatis, callus subterminalis, semiglobosis.

Terrestrial herb. Rhizome short. Pseudobulbs caespitose, unifoliate, narrowly ovoid, 4.8 x 0.8 cm. Leaves petiolate, blade ligulate-lanceolate, acute, prominently 3 veined below, 14.5–21.7 x 2.0–3.5 cm; petiole 2.0–7.2 cm long. Inflorescence basal, erect, 13.5 cm long; peduncle 9 cm long; sheathing bracts 3, lax, to 1.8 cm long; rachis laxly

5–6 flowered, 4.5 cm long; floral bracts linear-lanceolate, acute, 8–14 mm long. Flowers pale yellow. Pedicel plus ovary clavate, 15 mm long. Dorsal sepal oblong-lanceolate, subacute, 5 veined, 11 x 4 mm. Lateral sepals obliquely oblong-lanceolate, acute, weakly falcate, 5–7 veined, 12 x 7.5–8.0 mm, forming with the columnfoot a c. 4.5 mm long mentum. Petals rhombic-lanceolate, acute, 3 veined, 9 x 2.5 mm. Labellum weakly trilobed, 10 x 7 mm; hypochile broadly obovate, 7.7 x 7 mm; medial callus subterminal on lip, hemispherical, singly keeled on front side; epichile transversely oblong-reniform, emarginate, 2.3 x 4.7–5.0 mm. Column short, broad, 3 mm long; columnfoot ca. 4.0–4.5 mm long.

Distribution: Suriname.

Habitat: Known to occur on a granite cliff, at 700 m.

Etymology: Named after the Wilhelmina Range, origin of the type collection.

Xylobium wilhelminae is the only species in the genus in which the medial callus is found on the epichile, rather than on the hypochile. The type material has only a single remaining flower with a fragmentary lip (part of the midlobe is missing). Because of the way this flower was pressed it has not been possible to accurately state the shape of the mentum, or decide if the ovary is circular or triquetrous in section.

The species may be recognised by its unifoliate pseudobulbs, laxly 5–6 flowered inflorescence, light yellow flowers, weakly trilobed lip with a broadly obovate hypochile, transversely oblong-reniform epichile, upon which is placed the hemispherical medial callus.

Xylobium zarumense Dodson, *Icon. Pl. Trop. s. 1, 4: t. 358*. 1980. TYPE: ECUADOR. El Oro: near Zaruma, 1300 m, 10 October 1979, *C.H. Dodson & A.L. Gentry 9234* (Holotype: SEL, image seen). Fig. 9.

Distribution: Ecuador.

Additional specimen examined: ORIGIN UNKNOWN: *ex Hort. Herrington*, 1900, *cult. New York Bot. Gard.*, 30 June 1908, *G.V. Nash 3423* (NY).

This species may be recognised by its bifoliate pseudobulbs, long-peduncled, arching to pendent, densely many-flowered inflorescences, short (4–7 mm long) floral bracts, yellowish-green to reddish-brown flowers with a whitish to yellowish lip with some yellow and red ornamentation, the sepals and petals are shortly and finely pubescent on the inner halves, their tips subacuminate, the lip strongly trilobed with a thickly fleshy, ovate, rugulose midlobe, the medial callus is 3–5 keeled, and superseded by five well-separated lines of verrucae.

EXCLUDED SPECIES

The list below is arranged in alphabetical order by basionym, and the currently accepted name is in bold print.

Bifrenaria pickiana Schltr., *Orchis* 6: 8. 1912. TYPE: COLOMBIA. Without locality, December 1910, *cult. Konigl. Berggart. Herrenhausen (Hanover) s.n.* (Holotype: B, destroyed).

Xylobium pickianum (Schltr.) L.O. Williams, *Ceiba* 4: 271. 1955.

= ***Teuscheria pickiana*** (Schltr.) Garay, *Rhodora* 61: 41. 1959.

Dendrobium longifolium Kunth, *Nov. Gen. Sp.* 1: 360. 1816. TYPE: COLOMBIA. [Cauca]: Province of Popayan, between Pitatumba and the towns of Guayacan and Almaguer, 2525 m (1380 hexap.), November, A. *Humboldt & A.J.A. Bonpland s.n.* (Holotype: lost; Neotype, here designated: VENEZUELA. [Bolivar]: Angostura [= Ciudad Bolivar], Trapiche de Don Felix Farreras, 21 April to 20 May 1800, A. *Humboldt & A.J.A. Bonpland 1067*: P 00669685; Isonotype: B-W 16988-010, images seen).

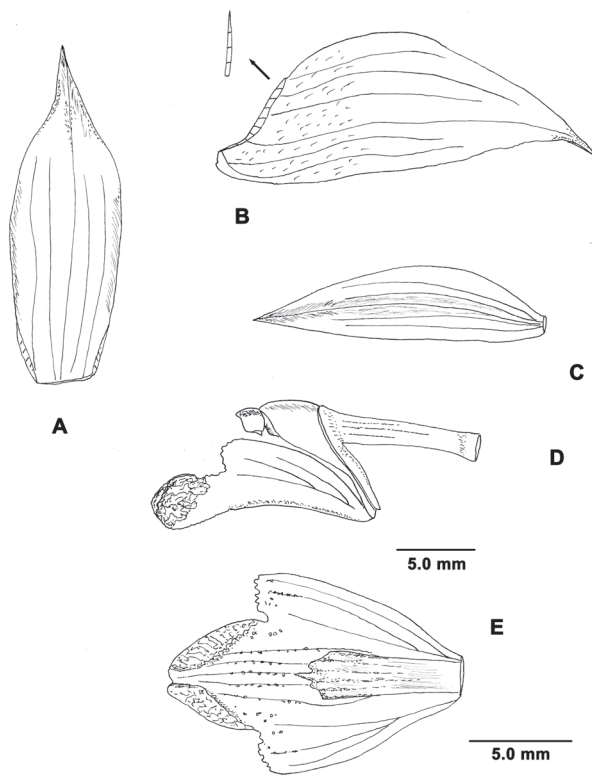


FIGURE 9. *Xylobium zarumense* Dodson. **A**, dorsal sepal; **B**, lateral sepal (trichome arrowed); **C**, petal; **D**, flower minus tepals; **E**, labellum. Drawn from Nash 3423 (NY).

Xylobium longifolium (Kunth) Lindl. ex Spreng., Syst. Veg. ed. 16, 3: 732. 1826.

Maxillaria longifolia (Kunth) Lindl., Edwards's Bot. Reg. 18: sub t.1549. 1832.

Cyrtopera longifolia (Kunth) Rchb.f., Ann. Bot. Syst. 6: 668. 1863.

Eulophia longifolia (Kunth) Schltr., Die Orchideen ed. 1: 347. 1914.

= ***Eulophia alta*** (L.) Fawc. & Rendle

Type material from Colombia of this name has not been located, and it is possible an error occurred and that the wrong locality data was published in the protologue. This is suggested by the rather high altitude given for the Colombian type, since *Eulophia alta* is generally a plant of lower altitudes (0–1300 m, rarely higher). Furthermore, the neotype proposed here has been annotated *Dendrobium longifolium* by Kunth, and it is probably the true type of the name. The ‘trapiche’ of Don Felix Farreras mentioned in the type locality is a sort of press for extracting juice from sugar cane.

Maxillaria alata Ruiz & Pav., Syst. Veg. Fl. Peruv. Chil. 1: 223. 1798. TYPE: PERU. [Junin]: on rocks near Huassa-Huassi, October & November 1779, *H. Ruiz & J. Pavon s.n.* (Holotype: lost).

Dendrobium alatum (Ruiz & Pav.) Pers., Syn. Pl. 2: 524. 1807.

Xylobium alatum (Ruiz & Pav.) Mend.-Tinc., Molinari & Carpio, Weberbauerella 1, 9: 2. 2016.

= ***Cyrtochilum bicolor*** (Ruiz & Pav.) Ormerod

Among the orchids described by Ruiz and Pavon this taxon was the only one based on fruiting material. The reason for this is likely because the pseudobulbs were edible (“edulis”) and therefore the plant had some possible use. Thus it fell under the remit of “useful knowledge” to be obtained by the Spanish in their colonies (Pupulin, 2012 a).

It seems evident that the unique edibility of this plant was pointed out by the indigenous people (see under *Maxillaria bicolor* below). Other characters mentioned in the protologue such as the lithophytic habit, compressed pseudobulbs, foot long, racemose inflorescences, and trigonous, winged capsules clearly identify this plant as a fruiting collection of *Cyrtochilum bicolor*.

Maxillaria aurantiaca A. Rich. & Galeotti, Ann. Sci. Nat. s. 3, 3: 25. 1845. TYPE: [Not cited]. Without locality, July 1844, *cult. Bot. Gard. Paris s.n.* (Holotype: P, image seen; drawing P, not seen).

Xylobium aurantiacum (A. Rich. & Galeotti) Schltr., Beih. Bot. Centralbl. 36, Abt. 2: 492. 1918.

= ***Bifrenaria aurofulva*** (W.J. Hook.) Lindl.

This species is based on material cultivated in the Botanical Garden of Paris, and was thought to have been collected by H.G. Galeotti in Mexico. However it is clearly a synonym of the Brazilian endemic *Bifrenaria aureofulva*, as already noted by the late Miguel Angel Soto on the type sheet. Galeotti did not collect in Brazil, but because he sent so many plants to the Paris Botanical Gardens, some unlabelled plants from other places were wrongly assumed to have been collected by him in Mexico. Another example is *Maxillaria galeottiana* A. Rich. & Galeotti, which is not from Mexico but a member of the endemic Brazilian *M. picta* W.J. Hook. alliance.

Maxillaria bicolor Ruiz & Pav., Syst. Veg. Fl. Peruv. Chil. 1: 224. 1798. TYPE: PERU. [Junin]: on rocks near Huassa-Huassi, November & December 1779, *H. Ruiz & J. Pavon s.n.* (Holotype: lost).

Dendrobium bicolor (Ruiz & Pav.) Pers., Syn. Pl. 2: 524. 1807, *non* Lindl. 1830.

Xylobium bicolor (Ruiz & Pav.) Mend.-Tinc., Molinari & Carpio, Weberbauerella 1, 9: 2. 2016.

= ***Cyrtochilum bicolor*** (Ruiz & Pav.) Ormerod, *comb. nov.*

Ruiz & Pavon (1798) recorded the indigenous name *zaca-zaca* (or *shaca shaca*) for this orchid, noting that the juicy pseudobulbs formed densely packed aggregations on rocks, and were frequently chewed and sucked on by local people in Huassa-Huassi. M. Arias Silva (in Zelenko & Bermudez, 2009) confirmed that the name *shaca shaca* was still applied to this species (as *Oncidium aureum* Lindl.), that the pseudobulbs were eaten, and considered a delicacy, and were now a part of Christmas celebrations.

Further information about *Maxillaria bicolor* can be gleaned from Ruiz's diary (Dahlgren, 1940: 48) of his travels in Peru. Thus “*M. bicolor*... which is called *cacca*, that means pavement, because the land is so covered with its

bulbs that it looks like a pavement placed there on purpose. These bulbs are so juicy and tender that they can be chewed very easily, and they give so much tasteless juice that six of them are sufficient to quench the thirst; the Indians do this very frequently when they pass through those places in order not to go out of their way to drink in the depths of the quebradas.”

The following excerpt from Ruiz’s diary (Dahlgren, 1940: 58) also likely refers to *M. bicolor*: “On November 24 th [1779] I went with Senor Dombey to a place called Lanco, a league and a half [= c. 15 km] from Huassa-Huassi; in this place there are so many species of orchids, and in such abundance, that it is astonishing even to look at the patterns they form on the ground with the peculiar structure of their flowers, leaves and bulbs . . . of which there are some bulbs of which we chewed and drank the juice to relieve our thirst, as did the Indians who came with us, without the need of going down to the river to drink, because their taste was pleasant and we noted no suspicious flavor.”

Thus the Quechua name, indigenous use, habitat, habit, and bicolored flowers allow *Maxillaria bicolor* to be identified as the earliest binomial for the species that has been known as *Oncidium aureum* Lindl., *Odontoglossum bicolor* Lindl., *O. dichromum* Rolfe, *O. festatum* Rchb.f., and *O. hemichrysum* Rchb.f. & Warc. As noted above, I also regard *Maxillaria alata* to be a synonym too.

No type material appears to survive of *Maxillaria bicolor*. There is however in Madrid one herbarium specimen of the species, but it is from Palca and dates from 1794. A colored drawing of this specimen [no. 112 by F. Pulgar (reproduced by Pupulin, 2012 b)] formed the types of *Odontoglossum bicolor* and *O. festatum*. The drawing accurately captures of the aspect of this species, showing the caespitose habit, bicolored flowers, and winged, trigonous capsules.

Maxillaria brachypus Rchb.f., Bot. Zeit. 10: 734. 1852. TYPE: GUATEMALA. Without locality, *J.R. Warcewicz* (Holotype: W-R 41348 image seen; drawing AMES; Isotype: K-L, image seen).

Xylobium brachypus (Rchb.f.) Hemsl., in Godm. & Salv., Biol. Centr.-Amer., Bot. 3: 252. 1883.

The identity of this species is unclear, but it does not seem to belong in *Maxillaria* or *Xylobium*. It has been treated as a synonym of *Xylobium colleyi*, which may be correct for the vegetative element of the type. However the floral element (represented by a sketch on the holotype in W-R, and a single flower in K-L, with the origin “Nicaragua” on the latter) is of an entirely different entity. It has so far not proved possible to identify the generic place of this flower, which has characters such as a rounded mentum, a lip with a relatively long, narrow, bicarinate claw that is expanded into a rather broad blade.

Maxillaria cuneiformis Ruiz & Pav., Syst. Veg. Fl. Peruv. Chil. 1: 223. 1798. TYPE: PERU. [Huanuco]: Prov. Tarma, steep places near Acobamba and Picoy, July and August, *H. Ruiz* & *J. Pavon s.n.* (Holotype: lost).

Dendrobium cuneiforme (Ruiz & Pav.) Pers., Syn. Pl. 2: 523. 1807.

Xylobium cuneiforme (Ruiz & Pav.) Mend.-Tinc., Molinari & Carpio, Weberbauerella 1, 9: 2, 2016.

According to Pupulin (2016), Ruiz has annotated the fair copy manuscript of this species in Madrid with the comment that neither a drawing was made of it, nor was any material preserved. Whilst the type locality is in the Department of Huanuco, Ruiz (see Dahlgren, 1940) also mentions that *Maxillaria cuneiformis* was found near Huassa-Huassi [Dept. Junin] in 1779.

Regardless, knowledge of this taxon thus can only be gleaned from the brief diagnosis in the protologue, and the more extensive descriptions found in the manuscripts in MA. Possibly the plant at hand is a member of the Oncidiinae since it has cuneiform petals, an entire, cordiform lip, and ensiform, canaliculate leaves.

Maxillaria racemosa W.J. Hook., Bot. Mag. 54: t.2789. 1827. TYPE: BRAZIL. Rio de Janeiro, June 1827, *imp.* & *cult.* *R. Harrison s.n.* (Holotype: K, not seen).

Colax racemosus (W.J. Hook.) A. Spreng., Tent. Suppl. Syst. Veg.: 29. 1828.

Xylobium racemosum (W.J. Hook.) Sweet, Hort. Brit. [Sweet] ed. 2: 489. 1830.

Adipe racemosa (W.J. Hook.) Raf., Fl. Tellur. 2: 101. 1837.

Adipe fulva Raf., Fl. Tellur. 2: 101. 1837, *nom. illeg.*

Stenocoryne racemosa (W.J. Hook.) Kraenzl., Xenia Orch. 3: 142. 1896.

= ***Bifrenaria racemosa*** (W.J. Hook.) Lindl., Edwards’s Bot. Reg. 29: 52, sub misc. 67. 1843.

Xylobium crassifolium Kraenzl., Rep. Sp. Nov. Regni Veg. 17: 389. 1921. TYPE: Not Cited [February 1921, *cult.* *Bot. Gard. Hamburg s.n.*] (Holotype: HBG, image and drawing seen).

= ***Xiphosium roseum*** (Lindl.) Griff.

Analysis of the original description, images of the holotype, plus drawings of a floral dissection kindly provided by Dr. Dariusz Szlachetko, leave no doubt this taxon is a synonym of the Chinese species long known as *Eria rosea* Lindl. Its current generic place is debatable, but I have preferred to place it in Griffith’s genus *Xiphosium*.

Xylobium insolitum Szlach. & Kolan., Phytom (Horn) 54, 1: 73. 2014. TYPE: COLOMBIA. Norte de Santander: Municipio La Playa de Belen, Quebrada la Teneria, Area Natural Unica los Estoraques, 1600 m, 14 April 2002, *R. Galindo-Tarazona 805* (Holotype: COL; Isotype: UIS, images seen).

= ***Sudamerlycaste insolita*** (Szlach. & Kolan.) Ormerod, *comb. nov.*

The fascicled, uniflorous inflorescences, broad, bilobed labellum callus, erose epichile, and elongate column are all characters of the genus *Sudamerlycaste* Archila. In *Xylobium* the inflorescences are never fascicled, or uniflorous, the labellum callus is never bilobed, and the column is never elongate. Though the authors of *Xylobium insolitum* say it is 1–3 flowered, I have been unable to see this on images

of the holotype (the isotype is sterile). Though it should be noted that though *Lycaste* Lindl. and *Sudamerlycaste* are usually uniflorous, they can have two, and rarely three-flowered inflorescences.

Xylobium steyermarkii Foldats, Noved. Cient. Contrib. Ocas. Mus. Hist. Nat. La Salle, Bot. 35: 1. 1970. TYPE: VENEZUELA. Bolivar: 125 km to the S of El Dorado, 1155 m, 25 December 1963, J. A. Steyermark, G. C. K.

Dunsterville & E. Dunsterville 62185A (Holotype: VEN, image seen).

Homotypic synonym: *Bifrenaria steyermarkii* (Foldats) Garay & Dunsterv., Venez. Orch. III. 6: 56. 1976.

This is a very rare plant. The holotype in VEN is wrongly provided with a label stating it is a paratype.

According to G. A. Romero (AMES) and G. Carnevali (CICY), it is a species of an undescribed genus, which they will describe shortly.

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