

NOTES ON NEOTROPICAL LIPARIDS (ORCHIDACEAE: MALAXIDAE)

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Abstract. Ongoing studies of taxa in *Liparis* section *Ramosae* reveal one more species whilst simultaneously defining the group more strictly. *Liparis rusbyi* is lectotypified. Furthermore, research into the allied genus *Crossoglossa* reveals six new species. A synopsis of the latter is also supplied. The new taxa proposed here are *Liparis* section *Retusae*, *L. schneideri*, *Crossoglossa chocoensis*, *C. garciana*, *C. harlingii*, *C. ospinae*, *C. santamartana* and *C. tillettii*.

Keywords: Neotropical *Liparis*, *Crossoglossa*, new species

This paper is in part a continuation of my previous work on *Liparis* section *Ramosae* (Ormerod 2012). Since then I have found that those species related to *L. retusa* Fawc. & Rendle possess obvious and distinct pseudobulbs as opposed to the seemingly bulbless species of the *L. ramosa* Poepp. & Endl. group. It therefore seems prudent to place *L. retusa* and its allies in a new section.

In loans of neotropical *Liparis* collections from US and NY some unidentified specimens of *Crossoglossa* were found. This led to a broader study of that genus and the recognition that at least six taxa were undescribed. My general impression is that many of the species are narrow endemics and it is likely there are more novelties still to be named.

Liparis section *Ramosae* Ridl., J. Linn. Soc., Bot. 22: 247, 257. 1886.

Type species: *Liparis ramosa* Poepp. & Endl.

Distribution: Thirteen species in Bolivia, Colombia, Ecuador, Peru and Venezuela.

This section may be defined by the long-creeping habit and lack of pseudobulbs. It is restricted to Andean South America. Most species are bifoliate but *L. serpens* Garay (a sister taxon of the bifoliate *L. elegantula* Krzl.) is unifoliate and *L. hirtzii* Dodson may be one or two leaved.

The accepted taxa are *L. caloglossa* Schltr., *L. ecallosa* Ormerod, *L. elegantula* Krzl., *L. hirtzii* Dodson, *L. nigrescens* Schltr., *L. nonatra* Ormerod, *L. ramosa* Poepp. & Endl., *L. rusbyi*

Rolfe, *L. schneideri* Ormerod, *L. schunkei* Ormerod, *L. serpens* Garay, *L. serratiloba* Ormerod and *L. wagneri* Rchb.f.

Liparis rusbyi Rolfe, Bull. New York Bot. Gard. 4: 454. 1907.

TYPE: BOLIVIA. Without locality, A.M. Bang 2565 (Lectotype here designated: NY 00009009; Isotypes: AMES, GH, K, LE [not seen], NY [3 sheets]).

Distribution: Bolivia; Peru; Ecuador.

Rolfe sent the only flower he studied back to NY (note on K sheet, Schuiteman pers. comm.). Of all the duplicates so far seen only the one chosen lectotype has a single flower, critical for identifying the species.

Liparis schneideri Ormerod, *sp. nov.*

TYPE: COLOMBIA. Cundinamarca: Municipio de Quetame, Corregimiento o Vereda de Guayabetal, 1550–1650 m, 15 December 1947, M. Schneider 419 (Holotype: AMES). Fig. 1.

Species nova singularis, labello obovatis, serrulatis, basi profunde concavis, callus linguiformis.

Terrestrial herb. Rhizome creeping, terete, producing a single root (0.75–2.00 mm thick) occasionally, 6–11 × 0.075–0.250 cm; internodes three, 0.5–0.9 cm long. Leaves in pairs, 2.8–3.5 cm apart on rhizome, broadly ovate-elliptic, shortly acuminate, petiolate, blade 5.0–5.2 cm long, 3.00–4.25 cm wide; petiole and sheath 2.2–3.0 cm long. Inflorescence erect, arising between the leaves, 6.8 cm long; peduncle

I wish to thank herbarium and library staff at the Harvard University Herbaria (A, AMES, GH) for their help and hospitality. Cal Dodson generously agreed to joint publication of *Crossoglossa ospinae* and *C. tillettii*. Andre Schuiteman (K) kindly checked *Liparis* type material at Kew. BM, NY and US loaned specimens for this study.

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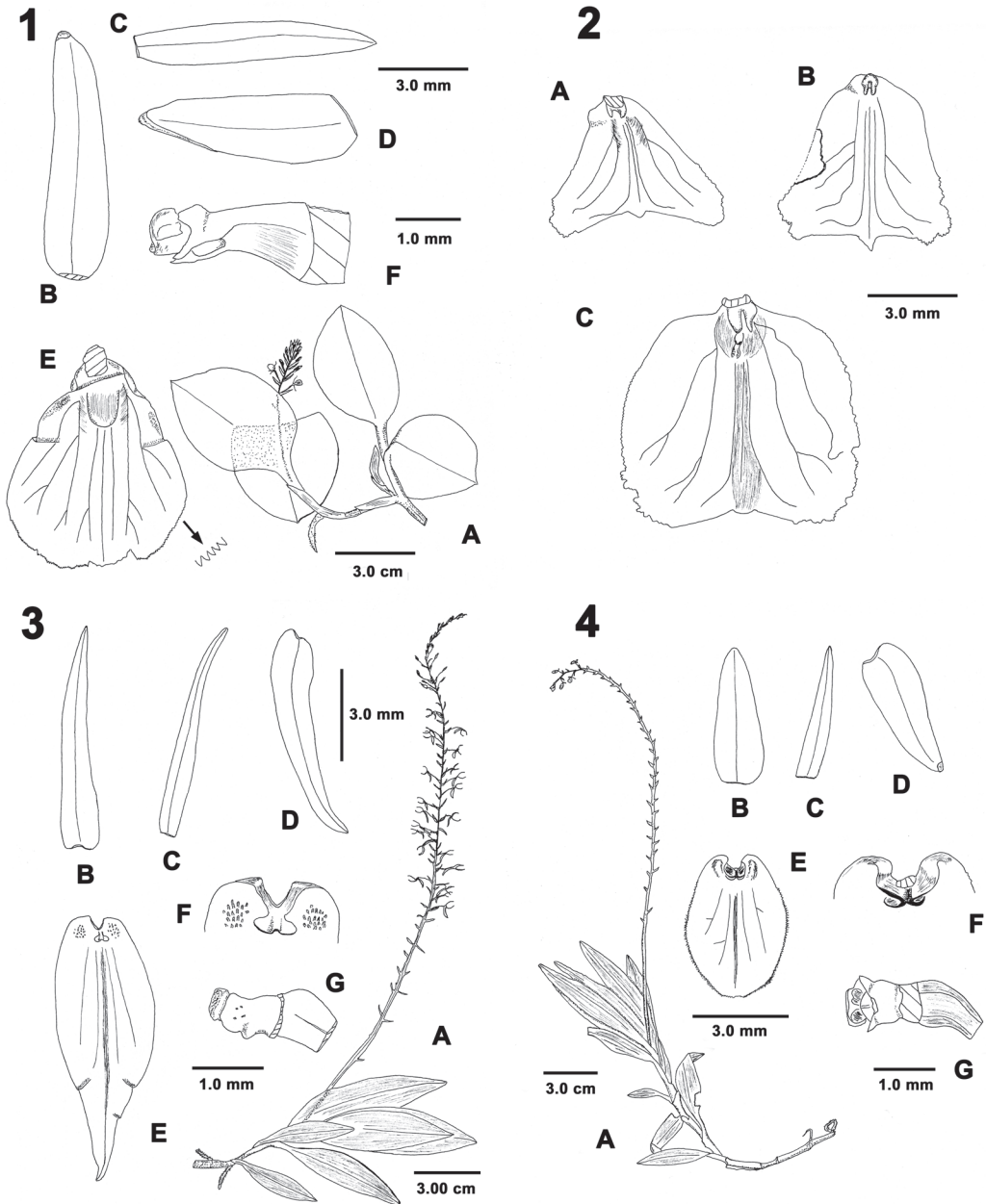


FIGURE 1. *Liparis schneideri* Ormerod. A, plant; B, dorsal sepal; C, petal; D, lateral sepal; E, labellum. Drawn from holotype. FIGURE 2. *Liparis cardiophylla* Ames. A, labellum. *Liparis neuroglossa* Rchb.f. B, labellum. *Liparis retusa* Fawc. & Rendle. C, labellum. A from L.R. Holdridge 1795 (AMES), B from BM isotype, C from C. Vargas C. 4124 (AMES). FIGURE 3. *Crossoglossa chochoensis* Ormerod. A, plant; B, dorsal sepal; C, petal; D, lateral sepal; E, labellum; F, labellum base; G, column. Drawn from holotype. FIGURE 4. *Crossoglossa garciana* Ormerod. A, plant; B, dorsal sepal; C, petal; D, lateral sepal; E, labellum; F, labellum base; G, column, ventral. Drawn from holotype.

evaginate, 4 cm long; rachis subdensely 15 or more flowered, 2.8 cm long; floral bracts lanceolate, acute, 7.6 mm long, 1.95 mm wide. *Pedicellate ovary* slender, narrowly alate, to 6 mm long. *Flower* color unknown (appears to be green in dry material). *Dorsal sepal* oblong-lanceolate, apex subcalceolate-obtuse, 7.75 mm long, 2 mm wide. *Lateral sepals* obliquely oblong-lanceolate, subcalceolate-obtuse, paired under lip, 6.6 mm long, 2.2 mm wide. *Petals* linear-ligulate, acute, 7.3 mm long, 1 mm wide. *Labellum* obovate, apex weakly trilobulate, upper lateral margins minutely erose, base with a squarish concavity under join with column, 6 mm long, 5.5 mm wide; callus linguiform, obtuse, low and fleshy. *Column* dorsally straight, stout, 2.2 mm long (2.5 mm long with anther cap).

Distribution: Colombia.

Habitat: Open mossy wood, 1550–1650 m.

Eponymy: Named after Martin Schneider, collector of the type.

This distinctive species seems to lack close relatives. It may be recognised by its unique labellar features such as the weakly trilobed apex, deeply concave base under the join with the column and the low linguiform callus.

Liparis section *Retusae* Ormerod, *sect. nov.*

Type species: *Liparis retusa* Fawc. & Rendle.

Affinis sectio Ramosae sed planta pseudobulbosa differt.

Terrestrial *herbs*. *Rhizome* creeping, of two or more internodes between the leaves. Pseudobulbs hidden in expanded part of leaf petiole in early stages of anthesis, most evident and exposed post-anthesis, ovoid to oblongoid, often somewhat laterally compressed, often grooved on rhizome side, drying dark in color. *Leaves* single, arising from base of pseudobulb, blade ovate-cordate, thinly fleshy, drying green, petiolate. *Inflorescence* terminal, emerging from apex of pseudobulb, few to many flowered, racemose. *Sepals* similar. *Petals* much narrower, linear. *Labellum* elliptic to papilioform, subacuminate to widely retuse, basal callus small, entire to bilobed. *Column* relatively slender, often narrowed and curved in apical half.

Distribution: About six species in Bolivia, Ecuador, Peru, Venezuela and the Caribbean.

The species of section *Retusae* may be distinguished from those in section *Ramosae* by the possession of distinct (not rudimentary)

pseudobulbs. They also have in common that one green-drying leaf is produced per growth. The five known species are *L. cardiophylla* Ames, *L. dalessandroi* Dodson, *L. neuroglossa* Rchb.f., *L. retusa* Fawc. & Rendle and *L. vargasii* Ormerod. A beautiful drawing by Roberto Vasquez (in Dodson & Vasquez, 1982) of a Bolivian plant called *L. retusa* represents an undescribed species.

I supply some notes on *L. cardiophylla* and *L. neuroglossa* since these taxa have long been wrongly united.

Liparis cardiophylla Ames, *Orch.* 3: 92. 1908.

TYPE: JAMAICA. John Crow Peak, 1830 m, 1 December 1907, *W. Harris 9784* (Holotype: AMES; Isotype: BM [image seen]). Fig. 2A.

Synonym: *Liparis rotundifolia* Cogn., *Rep. Sp.*

Nov. Regni Veg. 6: 305. 1909, *nom. illeg.*

TYPE: JAMAICA. John Crow Peak, 1830 m, 1 December 1907, *W. Harris 9784* (Holotype: AMES; Isotype: BM [image seen]).

Distribution: Dominican Republic; Haiti; Jamaica.

Specimens examined: DOMINICAN REPUBLIC. Independencia: Sierra de Baoruco, 30 km to the S of Puerto Escondido a la Caseta no. 1 de Foresta, to the E of Charco Colorado, 1780–1800 m, 20 March 1985, *T. Zanoni, M. Mejia, J. Pimentel & R. Garcia 34033* (NY). HAITI. Morne La Selle des Commissaires, 1800 m, 24 October 1943, *L.R. Holdridge 1795* (AMES). JAMAICA. Cinchona: on the way to Buff Bay, January 1912, *Mrs. C.T. Brues s.n.* (AMES); steep wooded slope near Buzza, 23 December 1905, *W. Harris 9799* (NY); St. Andrew's Parish, St. Helen's to Morce's Gap, 1430 m, 22 January 1961, *C.D. Adams 8789* (AMES); below John Crow Peak, 1835 m, 25 November 1899, *W. Harris 7733* (NY).

Liparis cardiophylla is easily distinguished from *L. neuroglossa* by its distinctive obdeltate-flabellate labellum that has a vertically backed concavity under the callus (vs. cuneate, non-concave labellum). *Liparis dalessandroi* from Ecuador appears to be the taxon most closely related to *L. cardiophylla*.

Liparis neuroglossa Rchb.f., *Xen. Orch.* 3: 26. 1881.

TYPE: BOLIVIA. Larecacha: near Sorata, between Laripata and Cani, Queliquaya, 2700–3000 m, 7 April 1860, *G. Mandon 1136*

(Holotype: W-R 39762, drawing W-R 39761; Isotypes: AMES, BM, G, K, NY). Fig. 2B.

Synonym: *Leptorkis neuroglossa* (Rchb.f.) Kuntze, Rev. Gen. Pl. 2: 671. 1891.

Distribution: Bolivia.

The type material of this species consists of plants in late anthesis. The best available flower has a cuneate lip 5.7 mm long and 5.5 mm wide (vs. the subquadrate, 6.9 mm long, 7.5 mm wide lip in *L. retusa*, see Fig. 2 C). Observations that the sepals are biveined (Ormerod 2012, after Rendle mss.) are I believe an error due to misinterpretation of a crease in a dry flower. Thus it is quite possible that the characters separating *L. neuroglossa* and *L. retusa* (type in early to prime anthesis) are related to floral age, stage and artefacts of preservation.

I have for the time being maintained the two as distinct since *L. neuroglossa* seems to have a more cuneate lip that has only one (not two) veins each side of the median three.

Crossoglossa Dressler & Dodson, Nat. Ecuad. Orch. 1: 148. 1993.

Type species: *Microstylis blephariglottis* Schltr.

Distribution: 32 species in Nicaragua, Costa Rica, Panama, Colombia, Ecuador, Peru, Bolivia and Venezuela.

The species of this genus were previously placed in *Malaxis* Sol. ex Sw., *Microstylis* (Nuttal) Eaton, or more rarely *Liparis* L.C. Rich. The plants may be distinguished from their neotropical relatives by the combination of short to elongate, usually many-leaved stems, many-flowered, elongate inflorescences, flowers with a short column and basally auriculate labellum with a simple to complex basal callus. According to Salazar (in Pupulin and Karremans, 2010) *Crossoglossa* is most closely related to the neotropical species of *Liparis*, especially those in section *Decumbentes* Garay & Romero-Gonzalez and section *Ramosae* Ridl. Taxa in both those sections share with *Crossoglossa* the apparent lack (or suppression) of pseudobulbs. The relationship to the type species of *Liparis* [*L. loeselii* (L.) L.C. Rich.] is apparently much more distant. I have described some of the new taxa as having a rhizome but it appears from the herbarium material that this “rhizome” is formed by the previous stem or growth which has lost its leaves (sometimes one or a few linger on). This “rhizome” also then produces roots.

An enumeration of the genus is provided here. The only changes to previous accounts are the subsuming of *Microstylis lloensis* into *Crossoglossa caulescens*, and the suggestion that *C. eustachys* is probably distinct from *C. tipuloides*. Some likely misidentifications are also noted. I have not seen most of the types cited below, except obviously those of new taxa and those held in the Harvard University Herbaria.

Crossoglossa acuminatissima Noguera-Savelli & Carnevali, Brittonia 60, 3: 241. 2008.

TYPE: COLOMBIA. Santander del Sur, E of Bucaramanga toward Berlin, 2550 m, 7 May 1984, C. Luer, J. Luer, E. Valencia & R. Escobar 10196 (Holotype: MO).

Distribution: Colombia.

Crossoglossa aurantilineata Pupulin, Lindleyana 15, 1: 23. 2000.

TYPE: COSTA RICA. Cartago: Turrialba, road between Torito and Bonilla Arriba, 1480 m, 4 August 1998, fl. in cult. Jardín Botánico Lankester, Paraiso de Cartago, 15 May 1999, F. Pupulin, R.L. Dressler, K. Dressler, D.E. Mora & R. Dodero 990 (Holotype: USJ; Isotype: SEL, spirit).

Distribution: Costa Rica.

Crossoglossa barfodii Dodson, Orquideologia 19, 1: 84. 1993.

TYPE: ECUADOR. Carchi: N of San Marcos, 660 m, 17 January 1983, A. Barfod 41448 (Holotype: AAU).

Distribution: Ecuador.

Crossoglossa bifida Dressler, Orquideologia 20, 3: 255. 1997.

TYPE: PANAMA. Panama: Cerro Jefe, 22 September 1970, R.L. Dressler 3890 (Holotype: MO).

Distribution: Panama.

Crossoglossa blephariglottis (Schltr.) Dressler, Nat. Ecuad. Orch. 1: 148. 1993.

TYPES: COSTA RICA. Without locality, A. & C. Brade s.n. (Syntype: B, destroyed); PANAMA. Chiriqui: above El Boquete, Holcomb's Trail, upper caldera watershed, between camp 1 and the divide, 1650–1950 m, 23 March 1911, W.R. Maxon 5667 (Syntype: B, destroyed, drawing AMES; Isosyntype: US, drawings, photo's AMES).

Synonyms: *Microstylis blephariglottis* Schltr., Rep. Sp. Nov. Regni Veg. 12: 202, 1913.
Malaxis blephariglottis (Schltr.) Ames, Proc. Biol. Soc. Wash. 35: 84, 1922.

Distribution: Costa Rica; Panama.

Crossoglossa boylei Dodson, Orquideologia 19, 1: 85, 1993.

TYPE: ECUADOR. Esmeraldas: Lita to San Lorenzo, KM 17, 720 m, 13 May 1990, C.H. Dodson, A.L. Gentry & B. Boyle 18285 (Holotype: MO).

Distribution: Ecuador.

Crossoglossa caulescens (Lindl.) Dodson, Nat. Ecuad. Orch. 1: 148, 1993.

Basionym: *Microstylis caulescens* Lindl., Bot. Reg. 27: sub t. 1. 1841. TYPE: ECUADOR. Pichincha: Lloa Valley, 2440 m, Colonel F. Hall s.n. (Holotype: K-L, photo seen).

Malaxis caulescens (Lindl.) Kuntze, Rev. Gen. Pl. 2: 673, 1891, nom. illeg. [non (Blume) Rchb.f. 1861].

Synonym: *Microstylis lloensis* Schltr., Rep. Sp. Nov. Regni Veg., Beih. 8: 47, 1921. TYPE: ECUADOR. Pichincha: Lloa Valley, near Guayare, June 1873, L. Sodiro s.n. (Holotype: B, destroyed).

Malaxis lloensis (Schltr.) Dodson, Icon. Pl. Trop. ser. 2: t. 523, 1989.

Crossoglossa lloensis (Schltr.) Dodson, Nat. Ecuad. Orch. 1: 149, 1993

Distribution: Ecuador.

The plant illustrated as *Malaxis lloensis* by Dodson (1989) was later described as *Crossoglossa nanegalensis*. I have treated *Microstylis lloensis* as a synonym of *C. caulescens* since its description agrees closely with Lindley's type which also came from the Lloa Valley.

Crossoglossa chocoensis Ormerod, sp.nov.

TYPE: COLOMBIA. Chocó: Caldas to Quibdo road, KM 137, 900 m, 8 April 1973, M.T. Madison 1356 (Holotype: GH). Fig. 3.

Affinis *C. harlingii* Ormerod sed callus labello lobulis tenuis (non crassissimus) differt.

Rhizome fragment terete, rooting at nodes, 1.5 cm long, 0.1 cm thick. Stem erect, 6 leaved, ca. 3 cm long, 0.18–0.20 cm thick. Leaves lanceolate to oblong-lanceolate, obtuse to subacute, 3.5–8.5 cm long, 1.00–2.35 cm wide;

petiole and sheath 1–2 cm long. Inflorescence terminal, 28.4 cm long; peduncle 6.7 cm long; sheathing bract one, lanceolate, acute, 0.6 cm long; rachis subdensely many flowered, ca. 21.7 cm long; floral bracts lanceolate, acute, 6.0–7.1 mm long, 2 mm wide. Pedicellate ovary slender, 8.5 mm long. Flowers green. Dorsal sepal linear-lanceolate, acute, 6.95 mm long, 1.2 mm wide. Lateral sepals obliquely linear-lanceolate, subacute, 6.50–6.95 mm long, 1.6 mm wide. Petals linear-lanceolate, acute, 6.9 mm long, 0.8 mm wide. Labellum broadly oblong-lanceolate, acute, base shortly auriculate and papillose on upper surface, 7.8 mm long medially (8 mm long including auricles), 3 mm wide; callus transversely rhombic, medially with a rounded ridge, lobules ovate, obtuse, flat. Column semiterete, ca. 0.8 mm long (0.95 mm long with anther cap).

Distribution: Colombia.

Habitat: Exposed sites in montane rainforest, 900 m.

Etymology: Named after the Department of Choco, Colombia.

This species was found among material identified as *C. tipuloides*, but it differs from that taxon in having glabrous (not ciliate) lip margins. It is externally identical to the Ecuadorian *C. harlingii* but differs from it in the labellum callus having flat and thin (not thickened) lobules.

Crossoglossa dalessandroi (Dodson) Dodson, Nat. Ecuad. Orch. 1: 149, 1993.

Basionym: *Malaxis dalessandroi* Dodson, Icon. Pl. Trop. s.2: t.519, 1989. TYPE: ECUADOR. Loja: along Rio Yambala, 8 km upriver from Vilcabamba, 2100 m, 23 September 1981, D. D'Alessandro 171 (Holotype: MO).

Distribution: Ecuador.

Crossoglossa dalstroemii (Dodson) Dodson, Nat. Ecuad. Orch. 1: 149, 1993.

Basionym: *Malaxis dalstroemii* Dodson, Icon. Pl. Trop. ser. 2: t. 520, 1989. TYPE: ECUADOR. Zamora-Chinchipec: Quebrada Honda, SE of Vilcabamba, 1600 m, 6 April 1982, S. Dalstroem 186 (Holotype: MO).

Distribution: Ecuador.

Crossoglossa dodsonii R. Vasquez, Rev. Soc. Boliv. Bot. 2, 2: 155, 1994.

TYPE: BOLIVIA. Cochabamba: Chapare, El Sillar, KM 105, between Cochabamba and Villa Tunari, 1840 m, 22 January 1987, *R. Vasquez* 927 (Holotype: LPB; Isotype: Herbarium Vasquezianum).

Distribution: Bolivia.

Schlechter (1923) noted under *Microstylis blephariglottis* that Otto Buchtien had found material related to it in Bolivia. It is likely this collection represented the first known specimen of what would be described as *C. dodsonii*.

Crossoglossa eustachys (Schltr.) Dressler, Nat. Ecuad. Orch. 1: 149. 1993.

Basionym: *Liparis eustachys* Schltr., Rep. Sp. Nov. Regni Veg., Beih. 19: 91. 1923.

TYPE: COSTA RICA. San Jose: Carillo, 1400 m, June 1909, *A. & C. Brade* 1260 (Holotype: B, destroyed; drawing AMES).

Distribution: Costa Rica; Panama.

This species belongs to a group of taxa (e.g. *C. chocoensis*, *C. harlingii*, *C. tipuloides*) that are quite similar externally but differ in minute details of the labellum callus. I therefore think it is best to treat it as distinct from *C. tipuloides* until critical studies can be made of the type of the latter.

Crossoglossa exigua (Garay) Noguera-Savelli & Romero-Gonzalez, Brittonia 60, 3: 243. 2008.

Basionym: *Malaxis tipuloides* (Lindl.) Kuntze var. *exigua* Garay, Bot. Mus. Leaf. Harv. Uni. 18: 201. 1958. TYPE: COLOMBIA. Cundinamarca: Cordillera Oriental, Hato Grande, E side of Rio Muchindote, 13 km E of Gacheta, 2600 m, 14 June 1944, *M.L. Grant* 9456 (Holotype: AMES; Isotype: US).

Distribution: Colombia.

Specimen examined: Colombia. Cundinamarca: Cordillera Oriental, San Isidro, 8 km S of Gachala, 2450 m, 26 May 1944, *M.L. Grant* & *F.R. Fosberg* 9295 (US).

This species was previously known only from the type. Another collection was found amongst unidentified *Liparis* at US.

Crossoglossa fratrum (Schltr.) Dressler, Nat. Ecuad. Orch. 1: 149. 1993.

Basionym: *Liparis fratrum* Schltr., Rep. Sp. Nov. Regni Veg., Beih. 19: 92. 1923.

TYPE: COSTA RICA. Alajuela: La

Palma, 1400 m, March 1909, *A. & C. Brade* 1132 (Holotype: B, destroyed; drawing AMES).

Distribution: Costa Rica.

Crossoglossa garciana Ormerod, *sp. nov.*

TYPE: COLOMBIA. Valle: El Silencio, Yanaconas, 1900–2200 m, 28 February 1939, *E.P. Killip* & *H. Garcia* 33775 (Holotype: AMES). Fig. 4.

Affinis *C. liparidoides* (Finet) Dodson *sed callus labello truncatis (non W-formis) differt.*

Terrestrial herb. Rhizome creeping, terete, rooting at various nodes, ca. 13 cm long, 0.25–0.45 cm thick; internodes 0.45–0.70 cm long. Stem decumbent in basal half, with up to 3 roots in lower half, upper half erect, 10 leaved, ca. 15.8 cm long, 0.25–0.30 cm thick; internodes 0.6–1.3 cm long. Leaves narrowly oblong-lanceolate, obtuse, margins undulate, drying blackish-green, 1.8–6.5 cm long, 0.6–1.2 cm wide; petiole and sheath 1.8–2.5 cm long. Inflorescence terminal, 27.6 cm long; peduncle evaginate?, 8 cm long; rachis many flowered, 19.6 cm long; floral bracts ovate-lanceolate, acute, to 6 mm long, 2 mm wide. Pedicellate ovary clavate, alate, 4 mm long. Flowers with green sepals and petals, lip white, column deep green. Dorsal sepal lanceolate, obtuse, 4 mm long, 1.6 mm wide. Lateral sepals obliquely lanceolate, subacute, 4 mm long, 1.8 mm wide. Petals narrowly lanceolate, acute, 4 mm long, 0.75 mm wide. Labellum obovate-elliptic, base shortly auriculate, margins papillose-ciliate, subacute, 4 mm long medially (4.3 mm long including auricles), 3 mm wide; callus of two transversely rectangular lobules, medially joined to a central ridge, widely truncate, hollow underneath. Column short, stout, ca. 0.75 mm long (ca. 0.85 mm long with anther cap).

Distribution: Colombia.

Habitat: Dense forest, 1900–2200 m.

Eponymy: Named after Hernando Garcia, co-collector of the type.

This species is related to *C. liparidoides* but differs from it in the labellum callus consisting of two transversely rectangular, widely truncate lobules (vs. two ovate, acute lobules forming an overall W-shaped callus).

Crossoglossa harlingii Ormerod, *sp. nov.*

TYPE: ECUADOR. Pichincha: Nanegal, 1200–1300 m, 25 January 1974, *G. Harling* & *L. Andersson* 11599 (Holotype: AMES). Fig. 5.

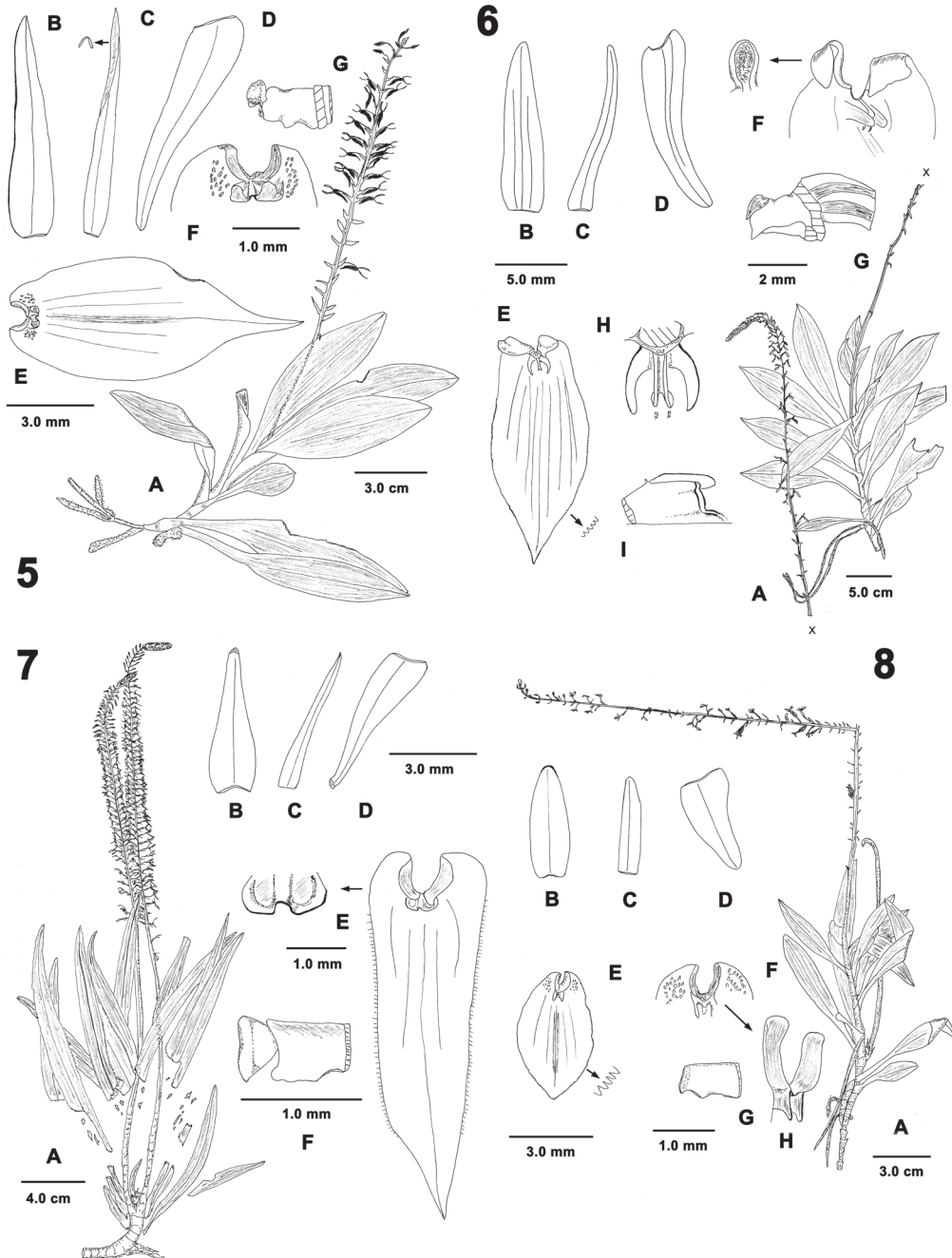


FIGURE 5. *Crossoglossa harlingii* Ormerod. A, plant; B, dorsal sepal; C, petal; D, lateral sepal; E, labellum; F, labellum base; G, column. Drawn from holotype. FIGURE 6. *Crossoglossa ospinae* Dodson & Ormerod. A, plant; B, dorsal sepal; C, petal; D, lateral sepal; E, labellum; F, labellum base (auricle arrowed); G, column; H, callus above; I, callus lateral (minus one arm). Drawn from holotype. FIGURE 7. *Crossoglossa santamartana* Ormerod. A, plant; B, dorsal sepal; C, petal; D, lateral sepal; E, labellum (callus arrowed); F, column. Drawn from holotype. FIGURE 8. *Crossoglossa tillettii* Dodson & Ormerod. A, plant; B, dorsal sepal; C, petal; D, lateral sepal; E, labellum; F, labellum base; G, column; H, "collar" and callus. Drawn from holotype.

Affinis C. chocoensis Ormerod *sed callus labello crassioribus (vs. tenuis) differt.*

Terrestrial herb. *Rhizome* creeping, terete, 6 cm long, 0.075–0.100 cm thick; internodes 0.6–0.8 cm long. *Stem* erect, terete, 10 leaved, 5–8 cm long, 0.15–0.20 cm thick. *Leaves* obovate to oblong-oblancheolate, obtuse, 2.2–12.0 cm long, 1.3–3.7 cm wide; petiole and sheath 1.4–2.2 cm long. *Inflorescence* terminal, 19.0–43.2 cm long; peduncle 5.8–6.2 cm long; sheathing bracts 1–2, lanceolate, acute; rachis subaxly many flowered, 13.2–37.0 cm long; floral bracts lanceolate, acute, 5–7 mm long, 2 mm wide. *Pedicellate ovary* clavate, narrowly alate, 8 mm long. *Flowers* with “upper three tepals green, lower three brown with brownish-green margins.” *Dorsal sepal* lanceolate, acute, 7 mm long, 1.70–1.75 mm wide. *Lateral sepals* obliquely lanceolate, subacute, 7.0–7.5 mm long, 1.9 mm wide. *Petals* linear-lanceolate, acute, 7.0–7.3 mm long, 0.9–1.0 mm wide. *Labellum* elliptic, subacuminate, auriculate basally with papillae on the auricles, 8.1–10.0 mm long medially (8.8–10.9 mm long including auricles), 3.95 mm wide; callus of two thickly fleshy lobules flattened on the upper surface, medially with a low ridge, weakly W-shaped, ca. 0.3 mm long. *Column* short, stout, 0.95 mm long (ca. 1 mm long with anther cap).

Distribution: Ecuador.

Specimen examined: Ecuador. Los Rios: Hacienda Clementina, Samama, 750 m, 17 March 1943, *G. Harling 489* (AMES, fragment; GB, photo seen).

Habitat: Virgin forest (*Harling 489*); mountain forest (type), 750–1300 m.

Eponymy: Named after Gunnar Harling (1920–2010) who first found this species and was later co-collector of the type. Professor Harling was the founder and Chief Editor of the *Flora of Ecuador* series. He participated in several collecting expeditions to Ecuador.

This species was first recognised as new by Dr. L.A. Garay, then secondly by Cal Dodson. However due to its superficial similarity to other taxa it was never published. *Crossoglossa harlingii* is most similar to the Colombian *C. chocoensis* but it differs from that in its fleshier (not flat) labellum callus lobules. In Ecuador its closest relative is perhaps *C. pichincha* but that taxon has a much longer (30 vs. 5.8–6.2 cm) peduncle and larger (tepals 14–15 vs. 7.0–7.5 mm) flowers with narrower labellum auricles.

Other similar taxa such as *C. neiryneckiana* and *C. tipuloides* have ciliate (not glabrous) lip margins. An obscure Colombian plant *C. longissima* differs in having longer (18–20 vs. 4.4–14.0 cm), broader (4–5 vs. 1.3–3.7 cm) leaves, longer (10–20 vs. 5–7 mm) floral bracts and a medially thickened (vs. unthickened) labellum. It is also a plant of higher (2600–2700 vs. 750–1300 m) altitudes.

Crossoglossa hirtzii Dodson, *Orquidologia* 19, 1: 87. 1993.

TYPE: ECUADOR. Zamora-Chinchipe: Zamora to Gualiquiza, Sumbi to Paquisha, 1450 m, 21 February 1986, *A. Hirtz 2876* (Holotype: MO).

Distribution: Ecuador.

Specimen examined: Ecuador. Zamora-Chinchipe: road from La Saquea to Yacuambi, 1 km N of Chapintza, 1100 m, 9 April 1985, *G. Harling & L. Andersson 23874* (AMES).

Crossoglossa kalbreyeriana (Krzl.) P. Ortiz, *Orquid. Colomb.* ed. 2: 252. 1995.

Basionym: *Microstylis kalbreyeriana* Krzl., *Notizbl. Bot. Gart. Berlin* 7: 413, 1920.

TYPE: COLOMBIA. Antioquia: without locality, on the paramos, 2700 m, July, *W. Kalbreyer 1794* (Holotype: B, destroyed).

Distribution: Colombia.

Crossoglossa liparidoides (Finet) Dodson, *Nat. Ecuad. Orch.* 1: 149. 1993.

Basionym: *Microstylis liparidoides* Finet, *Bull. Soc. Bot. Fr.* 45: 333. 1908 (*non* Schltr. 1919, *nom. illeg.*). **TYPE:** ECUADOR or PERU. Without locality, 1872, *N. Grisar s.n.* (Holotype: P, photo seen).

Synonym: *Malaxis liparidoides* (Finet) C. Schweinf., *Bot. Mus. Leaflet. Harv. Uni.* 9: 128, 1941 [*non* (Schltr.) Tang & Wang 1951, *nom. illeg.*].

Distribution: Ecuador or Peru.

It is possible the illustration published as *Malaxis liparidoides* by Dodson (1989) may represent an undescribed taxon since it seems to differ in showing an oblong-elliptic (not ovate) labellum with a larger “collar,” subquadrate (vs. W-shaped) callus, and longer column.

The Chinese *Microstylis liparidoides* Schltr. is now treated as a synonym of *Crepidium purpureum* (Lindl.) Szlach.

Crossoglossa longissima (Krzl.) P. Ortiz, *Orquid. Colomb.* ed. 2: 252. 1995.

Basionym: *Microstylis longissima* Krzl., *Notizbl. Bot. Gart. Berlin* 7:413. 1920.
TYPE: COLOMBIA. Antioquia: near Monale, 2600–2700 m, *W. Kalbreyer 1754* (Holotype: B, destroyed).

Distribution: Colombia.

Crossoglossa nanegalensis Dodson, *Orquideologia* 19, 1: 88. 1993.

TYPE: ECUADOR. Pichincha: Nono to Nanegal, 1700 m, February 1985, *A. Hirtz 2210* (Holotype: MO; Isotype: QCNE).

Distribution: Ecuador.

Crossoglossa neiryneckiana Szlach. & Margonska, *Ann. Bot. Fenn.* 38: 91. 2001.

TYPE: ECUADOR. Napo: Mera, 15 March 1940, *M. Lugo 63* (Holotype: B; Isotypes: AMES, GB).

Distribution: Ecuador.

Examination of the AMES isotype shows that the labellum of this species has papillose-ciliate margins and that the upper surface near the auricles has two patches of papillae. These features were overlooked in the protologue.

Crossoglossa ospinae Dodson & Ormerod, *sp. nov.*

TYPE: COLOMBIA. Putumayo: going over the first ridge of the Cordillera on the route from Mocoa to Sibundoy, W slope, 8 January 1957, *M. Ospina-Hernandez & J.M. Idrobo 125* (Holotype: AMES). Fig. 6.

Species nova singularis, callus labello tripartitis, brachia lateralis ligulatis, parte medio compresso-rectangularis, supra sulcatis.

Terrestrial herb. Roots terete, pubescent, emerging from old stems, to 0.2 cm thick. Stem erect, tetragonous, 10 leaved, 10.5 cm long, 0.7 cm thick. Leaves oblanceolate to oblong-oblanceolate, subacuminate, 5–13 cm long, 1.4–3.6 cm wide; petiole and sheath 3.0–5.3 cm long. Inflorescence terminal, 71.2 cm long; peduncle evaginate, 19.7 cm long, 0.35 cm thick; rachis many flowered, 51.5 cm long; floral bracts ovate-lanceolate, acute, 9.0–13.5 mm long, 2–5 mm wide. Pedicellate ovary slenderly clavate, narrowly hexalate, 11 mm long. Flowers with green sepals, petals

green with an orange tint towards the base, lip orange-green, column brown, anther cap yellow-brown. Dorsal sepal lanceolate, obtuse, 10.5 mm long, 2.8 mm wide. Lateral sepals obliquely ligulate-lanceolate, obtuse, biveined, 11.5 mm long along upper margin, 10.7 mm long medially, 2.8 mm wide. Petals linear-lanceolate, subacute, 10.7 mm long, 1.7 mm wide. Labellum oblong-elliptic, subacuminate, margins minutely dentate, auriculate basally, auricles densely pubescent inside, 12.9 mm long medially (14.1 mm long including auricles), 6.3 mm wide; callus tripartite, middle part narrow, rectangular in lateral view, sulcate above, side arms ligulate, truncate-obtuse. Column short, stout, 1.8 mm long.

Distribution: Colombia.

Habitat: Hidden amongst ferns (in rainforest?), altitude unknown.

Eponymy: Named after Mariano Ospina-Hernandez, co-collector of the type.

This rather robust species seems to lack any close relatives. It may be recognised by its tripartite labellum callus which has a compressed, rectangular (in lateral view) central part with a ligulate arm on each side.

Crossoglossa pichincae (Schltr.) Dodson, *Nat. Ecuad. Orch.* 1: 149. 1993.

Basionym: *Microstylis pichincae* Schltr., *Rep. Sp. Nov. Regni Veg.* 14: 118. 1915.
TYPE: ECUADOR. Pichincha: without locality, March 1900, *A. Sodiro 137B* (Holotype: B, destroyed).

Distribution: Ecuador.

Crossoglossa polyblephara (Schltr.) Dodson, *Nat. Ecuad. Orch.* 1: 149. 1993.

Basionym: *Microstylis polyblephara* Schltr., *Rep. Sp. Nov. Regni Veg., Beih.* 27: 22. 1924.

TYPE: COLOMBIA. Putumayo: E slopes of the E Cordillera, between Pasto and Mocoa, 2000 m, September 1922, *W. Hopp 166* (Holotype: B, destroyed).

Distribution: Colombia.

Crossoglossa santamartana Ormerod, *sp. nov.*

TYPE: COLOMBIA. Magdalena: Sierra Nevada de Santa Marta, Sierra del Libano, 1675 m, May 1898, *H.H. Smith 2843* (Holotype: NY). Fig. 7.

Affinis C. fratrum (Schltr.) Dressler *sed foliis ligulato-lanceolatis* (vs. *ellipticis ad oblanceolatis*), *angustioribus* (0.7–1.1 vs. 1.6–2.8 cm) *et labello angustioribus* (1.90 vs. 3.25–4.60 mm) *differt*.

Rhizome creeping, terete, ca. 4 cm long. *Stem* erect, terete, densely 12 leaved, ca. 7.5 cm long, 0.3–0.4 cm thick. *Leaves* ligulate-lanceolate, acute to obtuse, margins undulate, midvein drying dark brown to form a 0.1 cm wide stripe, 5 veined with numerous cross-veins, 8.5–16.0 cm long, 0.7–1.1 cm wide. *Inflorescence* terminal, 27.3–29.4 cm long; peduncle 7.3–9.9 cm long; sheathing bracts 1–2; rachis many flowered, 19.5–20.0 cm long; floral bracts lanceolate, acute, to 6 mm long, 1.3 mm wide. *Pedicellate ovary* narrowly clavate, narrowly alate, 6 mm long. *Flower* color unknown. *Dorsal sepal* lanceolate, apex shortly thickened-subcalceolate, subacute, 4.5 mm long, 1.5 mm wide. *Lateral sepals* obliquely lanceolate, apex thickened-subcalceolate, obtuse, 4.9 mm long, 1.4–1.5 mm wide. *Petals* linear-lanceolate, subacute, 4.75 mm long, 0.75 mm wide. *Labellum* oblong-lanceolate, subacuminate, base auriculate, margins ciliate, 5 mm long medially (5.5 mm long including auricles), 1.9 mm wide; callus transversely rectangular, medially with a rounded ridge, lobules foveolate. *Column* short, stout, 0.9 mm long (including anther cap).

Distribution: Colombia.

Etymology: Named after the Sierra Nevada de Santa Marta, an isolated mountain range in eastern Colombia.

This species is superficially similar to the Costa Rican *C. fratrum* but differs from it in having narrower (0.7–1.1 vs. 1.6–2.8 cm), ligulate-lanceolate (vs. oblanceolate to elliptic) leaves and flowers with a narrower (1.90 vs. 3.25–4.60 mm) lip.

Crossoglossa sotoana Pupulin & Karremans, *Lankesteriana* 9, 3: 444. 2010.

TYPE: COSTA RICA. Alajuela: San Ramon, Angeles, Alberto M. Brenes Biological Reserve, banks of the Rio San Lorencito, near the Terciopelo Trail, 800–900 m, 22 May 2004, fl. in cult. Lankester Botanical Garden, University of Costa Rica, 5 April 2005, *D. Bogarin 817* (Holotype: USJ; Isotype: JBL).

Distribution: Costa Rica.

Crossoglossa steinii (Dodson) Dodson, *Nat. Ecuad. Orch.* 1: 149, 1993.

TYPE: ECUADOR. Morona-Santiago: about 3 km above Plan de Milagro, on Limon to Cuenca road, 1900 m, 18 May 1985, *B. Stein 2812* (Holotype: QCNE; Isotype: MO).

Malaxis steinii Dodson, *Icon. Pl. Trop.* s.2: t.527, 1989.

Distribution: Ecuador.

Crossoglossa tillettii Dodson & Ormerod, *sp. nov.*

TYPE: PERU. Amazonas: Provincia Pongara, Distrito Yambrasbamba, [above Cpto. Buenos Aires, across Rio Chiriaco from Yambrasbamba, ca. 40 km N of Jumbilla; and partially completed road past Cpto. Esperanza, around a ridge; or along the freshly cut right of way], 1860–2000 m, 2–26 March 1967, *S.S. Tillett 673-352* (Holotype: GH). Fig. 8.

Affinis C. liparidoides (Finet) Dodson *sed floribus leviter majoribus* (5 vs. 4 mm *latis*) *et callus M-formis* (non *W-formis*) *differt*.

Terrestrial herb. *Rhizome* creeping, terete, occasionally rooting at nodes, to 16 cm long, 0.05–0.30 cm thick; internodes 0.1–0.6 cm long. *Roots* terete, pubescent, to 0.15 cm thick. *Stem* erect, terete, 7 leaved, producing 1–2 roots in lower half, ca. 3 cm long, 0.3 cm thick. *Leaves* narrowly oblong-oblanceolate to lanceolate, obtuse to acute, very thin, margin slightly undulate, 2.3–7.5 cm long, 0.90–1.15 cm wide; petiole and sheath 1.5 cm long. *Inflorescence* terminal, ca. 31.5 cm long; peduncle ca. 6.5 cm long; sheathing bracts 1–2, lanceolate, acute, ca. 0.4 cm long; rachis subdensely many flowered, ca. 25 cm long; floral bracts lanceolate, acute, to 4 mm long, 0.8–1.0 mm wide. *Pedicellate ovary* clavate, narrowly alate, to 4 mm long. *Flowers* translucent green, lip with brown midrib, scentless. *Dorsal sepal* oblong-lanceolate, obtuse, 3.5 mm long, 1.2 mm wide. *Lateral sepals* obliquely ovate-lanceolate, obtuse, 3 mm long, 1.6 mm wide. *Petals* ligulate, obtuse, 3 mm long, 0.75 mm wide. *Labellum* obovate-elliptic, subacute, margin minutely dentate, base auriculate, with papillae on auriculae, 3.5 mm long medially (3.95 mm long including auricles), 2.3 mm wide; callus M-shaped, lobules subquadrate, obliquely truncate-acute, lamellate. *Column* short, stout, ca. 0.75 mm long (minus anther cap).

Distribution: Peru.

Habitat: Humid montane forest, 1860–2000 m.

Eponymy: Named after S.S. Tillett, collector of the type.

This species is related to *C. liparidoides* but differs from it in having a longer (6.5 vs. 3.0–3.5 cm) inflorescence peduncle, larger (sepals 3.0–3.5 vs. ca. 2 mm long) flowers and an M-shaped (vs. W-shaped) callus with subquadrate, lamellate, erect (not ovate-elliptic, prostrate) lobules.

Another close relative is the Bolivian *C. dodsonii* which differs in having a prominently ciliate-dentate (vs. minutely dentate) labellum with the same type of W-shaped (not M-shaped) callus as *C. liparidoides*.

Crossoglossa tipuloides (Lindl.) Dodson, Nat. Ecuad. Orch. 1: 149, 1993.

Basionym: *Microstylis tipuloides* Lindl., Ann. Mag. Nat. Hist. 15: 256, 1845. TYPE: COLOMBIA. Cauca: on the declivity of the Andes of Popayan towards the Pacific, *K.T. Hartweg s.n.* (Holotype: K-L, photo seen).

Synonyms: *Malaxis tipuloides* (Lindl.) Kuntze, Rev. Gen. Pl. 2: 673, 1891.

Liparis tipuloides (Lindl.) Schltr., Rep. Sp. Nov. Regni Veg., Beih. 19: 91, 1923.

Distribution: Colombia.

Critical studies of the type of this species are needed to establish its exact identity (see note under *C. eustachys*).

Crossoglossa topoensis (Mansf.) Dodson, Nat. Ecuad. Orch. 1: 149, 1993.

TYPE: ECUADOR. Tungurahua: valley of the Rio Pastaza, on the Rio Topo, 13 September 1933, *F.L.E. Diels 1009* (Holotype: B, destroyed).

Microstylis topoensis Mansf., Biblioth. Bot. 116: 72, 1937.

Malaxis topoensis (Mansf.) Dodson, Icon. Pl. Trop. s.2: t.528, 1989.

Distribution: Ecuador.

The plant depicted as *Malaxis topoensis* in Dodson (1989) disagrees with the protologue in such details as having longer (11 vs. 3.5 cm) leaves, shorter (3 vs. 8 cm) peduncle, smaller (sepals 2 vs. 4.5 mm) flowers and a broadly elliptic (vs. ovate-lanceolate) lip. It probably represents an undescribed taxon.

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