

A RECONSIDERATION OF *STELLILABIUM* AND *DIPTEROSTELE*

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Abstract. There are four distinctive groups within *Stellilabium*, here treated as sections: *Stellilabium* and *Dipterosteale* in the Andes, and *Rhamphosteale* and *Taeniorhachis* in Central America. The features of these groups are discussed, but the relationships between them are yet unclear. The identity of *Stellilabium minutiflorum* is discussed, and four new species are described: *S. aciculare* Dressler, *S. butcheri* Dressler, and *S. morii* Dressler in Sect. *Taeniorhachis*, and *S. fortunae* in Sect. *Rhamphosteale*.

Keywords: Andes, Central America, *Dipterosteale*, Orchidaceae, Panama, *Rhamphosteale*, *Stellilabium*, *Taeniorhachis*, taxonomy.

In Central America, at least, the genus *Stellilabium* is something of a problem. Most plants are so tiny that they are rarely noticed, much less collected. Many plants have only one flower at a time, and if that flower is lost or damaged, the resulting specimen is nearly useless. Sometimes when a tree or branch is cut to prepare a specimen of the tree, the plants of *Stellilabium* may be found on the smaller branches. If there are a number of plants, a good specimen may be prepared, but such accidents are all too rare.

Garay and Romero (1998) have stressed the

differences in structure between *Stellilabium*, *s. str.*, and *Dipterosteale*, interpreting the latter rather more widely than did Braas and Lückel (1982). *Stellilabium* in the strict sense is a distinctive Andean group. However, there are two rather distinctive groups within *Dipterosteale sensu* Garay and Romero, and a few Central American species that fit none of the above. After going over the available material, I conclude that there are four complexes that I treat as sections of *Stellilabium*, at least until we have a clearer idea of relationships in this group. These sections may be distinguished by the following key.

KEY TO THE SECTIONS OF THE GENUS *STELLILABIUM*

- 1a. Inflorescence spiral or distichous; lateral margins of floral bracts not decurrent on rachis, rachis terete, triangular, or slightly flattened; leaves persistent. 2
- 2a. Column not at all 3-lobed; lateral lobes of lip usually spreading or antrorse Sect. *Stellilabium*
- 2b. Column distinctly 3-lobed; lateral lobes of lip retrorse basal angles Sect. *Dipterosteale*
- 1b. Inflorescence distichous; lateral margins of floral bracts decurrent, flowers thus borne on face of flattened rachis; leaves ephemeral. 3
- 3a. Column distinctly 3-lobed; lateral lobes of lip retrorse basal angles; stigma fleshy, adnate to lip Sect. *Taeniorhachis*
- 3b. Column elongate, not at all 3-lobed; lip entire; stigma porrect, free from lip Sect. *Rhamphosteale*

Stellilabium Sect. *Stellilabium*, Type species: *Telipogon astroglossus* Rchb.f.

Species: *S. alticolum* Dodson & R. Escobar, *S. andinum* (L. O. Williams) Garay & Dunsterv., *S. astroglossum* (Rchb. f.) Schltr., *S. boliviense* Vásquez Ch. & Dodson, *S. hirtzii* Dodson, *S. ibischii* Vásquez Ch., *S. pampatamboense* Dodson & Vásquez Ch., *S. peruvianum* D. E.

Benn. & Christenson, *S. pogonostalix* (Rchb. f.) Garay & Dunsterv., *S. pseudobulbosum* D. E. Benn. & Christenson.

Generic synonyms: *Cordanthera* L. O. Williams; *Darwiniella bergoldii* (Garay & Dunsterv.) Braas & Lückel is surely a robust member of this group; *Sodiroella ecuadorensis* is a synonym of *Stellilabium pogonostalix*,

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according to Dodson (1998: 50–51).

The diminutive pseudobulb of *S. pseudobulbosum* and the prominent lateral lobes of this complex suggest that this section may be most closely allied to *Trichoceros*, though others may be more closely allied to *Telipogon*.

***Stellilabium* Sect. *Dipterosteale* comb. et stat. nov.**
 Basionym: *Dipterosteale* Schltr., Repert. Spec. Nov. Regni Veg. Beih. 8: 106. 1921. Type species: *Dipterosteale microglossa* Schltr.

Species: *S. frymirei* Dodson, *S. hystrix* Dodson, *S. lueri* Dodson & R. Vásquez Ch., *S. microglossum* (Schltr.) Dodson, *S. morganiae* Dodson, *S. tanii* Dodson, *S. vasquezii* Dodson.

***Stellilabium* Sect. *Rhamphosteale*, Sect. nov.**
 Type species: *Stellilabium monteverdense* Atwood.

Rhachis alata, *columna teretia*, *lobulus ventralis stigmatis tenuis porrectus*.

Etymology: the name *Rhamphosteale* refers to the snout or beaklike appearance of the column, with the rostellum representing the upper jaw and the stigma the lower jaw.

Species: *S. barbozae* Atwood & Dressler, *S. campbelliorum* Atwood, *S. fortunae* Dressler, *S. lankesteri* (Ames) Dressler, *S. monteverdense* Atwood.

***Stellilabium* Sect. *Taeniorhachis*, Sect. nov.**
 Type species: *Stellilabium aciculare* Dressler.

Rhachis alata, *columna trilobata*, *stigma crassa labello adnata*.

Etymology: the name *Taeniorhachis* refers to the ribbonlike or tapeworm-like rachis. *Stellilabium aciculare* Dressler is chosen as type because of the relatively ample material in the type collection.

Species: *S. aciculare* Dressler, *S. boylei* Atwood, *S. bullpenense* Atwood, *S. butcheri* Dressler, *S. distantiflorum* Ames & C. Schweinf., *S. helleri* L. O. Williams, *S. minutiflorum* (Kraenzl.) Garay, *S. morii* Dressler, *S. standleyi* (Ames) L. O. Williams.

Some of the features of these sections are discussed below.

Leaves: vegetatively, the Central American sections, *Rhamphosteale* and *Taeniorhachis*, are similar in that the leaves are ephemeral and often lacking when the plants are in flower. In these groups, the distichous, flattened inflorescence appears to be the main photosynthetic organ. In the Andean sections, on the contrary, the leaves are persistent; in *S. vasquezii* the

leaves are described as fleshy.

Rachis: correlated with the leaf condition, the rachises of both Central American sections are markedly flattened, with relatively long internodes. The lateral margins of the floral bracts are decurrent on the rachis, so that the flower is borne on the flattened face of the rachis (somewhat concave on the internode above its attachment). In the Andean sections, the inflorescence ranges from subcapitate to racemose, but with relatively short internodes. In some cases the flowers are clearly spirally arranged. The inflorescences of some species of *Dipterosteale* are said to be slightly flattened, but the flowers appear to be borne on the edges or angles rather than on the face of the rachis. That is, it is the median keel of the floral bract that is decurrent on the rachis. Braas and Lückel (1982) illustrate the rachis of *Stellilabium (Dipterosteale) microglossum* as being very like that of *S. "standleyi"* (probably *S. aciculare*), but no such structure is evident in the material of *S. microglossum* at SEL.

Lateral lobes of lip: in several species of Sect. *Stellilabium* the lip has distinct lateral lobes that are antrorse. *Stellilabium astroglossum* and *S. alticolum* have rounded, spreading lobes, and the Peruvian species have prominent, retrorse basal lobes. *Stellilabium pampatamboense* has very small, rounded basal lobes. In Sect. *Dipterosteale* and Sect. *Taeniorhachis*, the lips have prominent basal angles, either retrorse or spreading, and in Sect. *Rhamphosteale* the lips lack lateral lobes.

Stigma: in Sect. *Stellilabium* the stigma may be simply a terminal concavity beneath the rostellum, but in several species it is a rounded, fleshy lobe that projects downward from the column, though this lobe appears in all cases to be free from the lip. In both Sects. *Dipterosteale* and *Taeniorhachis*, the stigma is a rounded, fleshy structure that is adnate to the surface of the lip. In Sect. *Rhamphosteale*, the stigma is a porrect, laminar lobe that, with the rostellum, simulates a beak or snout.

Dorsal clinandrial lobe: in Sect. *Stellilabium*, the dorsal lobe ranges from a slight angle to a prominent, acute lobe as in *S. ibis-chii*. In *S. boliviensis* and *S. alticolum*, the lobe appears to be a slight, fleshy outgrowth. In Sects. *Dipterosteale* and *Taeniorhachis*, the dorsal lobe is prominent, rather finger-like, and usually setose. In Sect. *Rhamphosteale*, the dorsal lobe is small, angular, and lacking in bristles, except in *S. lankesteri*, which has a

somewhat longer lobe.

Lateral bristle clusters: the "three-lobed column" of Sects. *Dipterostele* and *Taeniorhachis* seems to represent the dorsal clinandrial lobe and lobes that develop under the lateral bristle clusters. In Sect. *Stellilabium*, bristles are quite lacking in some species, whereas small bristle clusters are found in *S. pseudobulbosum* and some plants of *S. andinum*. Several other species have two distinct tufts of bristles, but without any notable outgrowth beneath them. In *S. ibischii* there are two longitudinal bands of bristles. In Sect. *Rhamphostele* the lateral tufts are quite lacking, except in *S. lankesteri*, which has prominent lateral bands of bristles, similar to those of *S. ibischii*. In Sect. *Dipterostele* the lateral lobes of the column appear to be flattened and winglike in *S. microglossum*. In most other species, the bristle tufts are borne either on rounded prominences or on finger-like structures. Similarly, in Sect. *Taeniorhachis* the lateral tufts range from slight, rounded prominences to prominent, flattened, winglike structures.

Clearly, the similar inflorescences of Sects. *Rhamphostele* and *Taeniorhachis* suggest a close alliance, and the similar column structures in Sects. *Dipterostele* and *Taeniorhachis* also suggest a close alliance. If these four groups are natural clades, then there has been convergence in one set of features or another. It may be difficult to imagine the parallel evolution of three-lobed columns in two distinct groups, yet some members of Sect. *Taeniorhachis* have only shallowly lobed columns, suggesting that the more bizarre structures might, indeed, have evolved independently in Central America and the Andes.

The Identity of Stellilabium minutiflorum
(Kraenzl.) Garay

This is one of the most used names in Central America and has been applied to a variety of small plants. Neither the Endres drawing at W nor Kränzlin's description is as detailed as one might wish. Endres's drawing clearly shows stellate bristles on the lateral lobes of the column, but the hairs on the median lobe are not so clearly shown, and Kränzlin's discussion speaks of two groups of bristles, implying that there is some difference between the stellate bristles of the lateral lobes and the shorter hairs of the median lobe. Thus, this species would appear to be one of those with shorter, simple hairs or bristles on the median lobe of the col-

umn. The closest approach to this drawing that I have seen is found in plants collected by Carmen Blanco in San Carlos, Costa Rica, in 1998. These plants have exactly the almost 3-lobed viscidium illustrated by Endres, and I tentatively identify them as *S. minutiflorum*. Kränzlin states that he was able to find a single usable flower in the type collection. If that flower still exists, it may be possible to fix the identity of *S. minutiflorum*. If not, in the absence of an exact locality, the identity of the original plant may remain forever in doubt.

A plant collected in Guatemala (*Dix 4055*, SEL) is very similar to the Costa Rican plants but is more robust and has more definite lateral veins in the petals. Adequate material from intermediate countries might well show this to be an unnamed species, but I am reluctant to name it without more convincing differences.

Stellilabium aciculare sp. nov. TYPE: PANAMA. Prov. Panamá: Cerro Jefe (lower Cafetal); 12 March 1969; on smaller branches of tree near stream, inflorescence to 15 cm, unbranched; flowers wine-red; *R. L. Dressler 3617* (Holotype: AMES; Isotypes: MO, PMA). Fig. 1E-F.

Rhachis alata, columna leviter lobata setis longis simplicibus nec ramosis praedita.

Epiphytic, roots 1.0–1.7 mm wide, whitish; stem 4–19 cm, little branched. Leaves 10–14 × 2–3 mm, oblanceolate, membranous, ephemeral. Peduncular bracts 2.0–2.5 × 1.3 mm, narrowly triangular, acute; floral bracts 1.3 × 1.3 mm, triangular, acute, decurrent on stem, rachis c. 1.5 mm wide; ovary and pedicel 4 mm; sepals ovate, concave, narrowly obtuse or acute, 1.8–2.2 × 1.2–2.0 mm; petals elliptic or oblong-ovate, 2.0–2.2 × 1.3–1.6 mm, margin papillose-hispid, basal half papillose-hispid within, 3-veined; lip oblong-ovate, 2.4–3.0 × 1.2–1.4 mm, base cordate, acute, margin papillose-hispid; column ca. 0.8 mm long, 1.3 mm wide, 1.5 mm high, shallowly 3-lobed, with 3 tufts of long, simple, somewhat verruculose-torulose setae.

Additional specimen examined: COSTA RICA, Cartago: Dulce Nombre, alt. ca. 1400 m, 27 February 1924; *Standley 35954* (AMES).

This species shares simple, needle-like setae (whence the epithet) with *S. lankesteri*, but the shape of the column is quite different. In *S. lankesteri*, the short dorsal lobule of the clinandrium has a tuft of setae, and the sides of the elongate column each have a band of similar

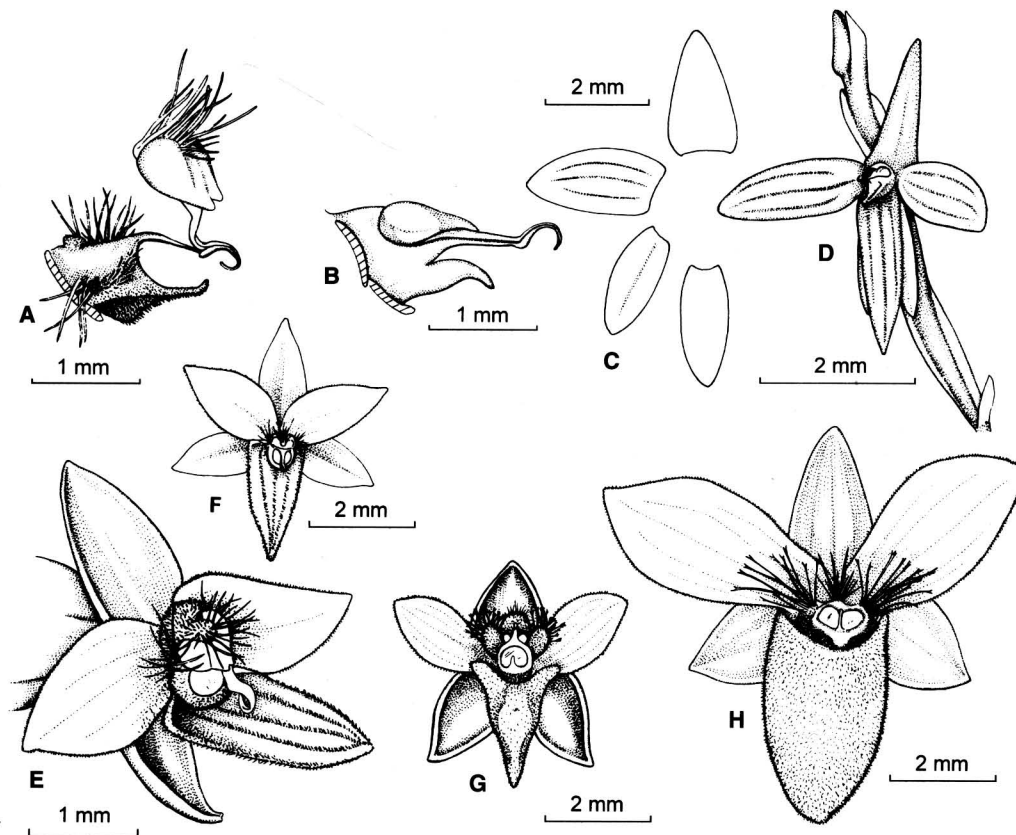


FIGURE 1. *Stellilabium*. A, *S. lankesteri*: lateral view of column; the dorsal tuft of bristles has broken away and is attached to anther (above); most bristles have been lost from the near lateral line (*Lankester 361*). B–D, *S. fortuneae*. B, lateral view of column; C, perianth parts, flattened; D, flower and adjacent rachis, from a photograph (*Dressler 3617*). E–F, *S. aciculare*: two views of flower (*Dressler 3465*). G, *S. butcheri*: flower. H, *S. morii*: flower (*Dressler 5085*).

setae; the lower lobe of the stigma is porrect and free from the lip (Fig. 1A). In *S. aciculare*, in contrast, the dorsal lobule of the clinandrium is much more prominent, the lateral lobules of the column have tufts of setae, and the lower lobe of the lip is thick and adnate on the lip. This is probably the species illustrated by Braas and Lückel as *S. standleyi*. Similarly, the plant from Guerrero, Mexico (Salazar and Hágsater, 1991), is more similar to *S. aciculare* than to *S. standleyi* but may well represent a distinct species.

Stellilabium butcheri sp. nov. TYPE: PANAMA. Chiriquí. Epiphytic on orange tree about 1/2 mile SW of highway near Cuesta Piedra; 9 April 1961; flowers dull purple; *H. P. Butcher 654* (Holotype: SEL). Fig. 1G.

Rhachis alata, *labellum hastato-triangular*, *setosum*, *columna trilobata*, *lobulis lateralibus*

setis stellatis praedita, *lobulo medio hispidopapilloso*.

Epiphytic, roots 1–2 mm wide; stem 6–12 cm; leaves to 5 × 2 mm, oblong, membranous, ephemeral; peduncular bracts 1.5–3.0 × 0.8 mm, narrowly triangular, acute; floral bracts ca. 1 × 1 mm, triangular, acute, decurrent on rachis, rachis ca. 1 mm wide; ovary and pedicel ca. 2.5 mm; dorsal sepal ovate, concave, acute, 2.0–2.3 × 0.9–1.7 mm; lateral sepals similar, carinate, 1.9–2.0 × 1.3–1.5 mm; petals elliptic, 2.0 × 1.1 mm, margin papillose-hispid, 3-veined; lip hastate-triangular, 2.5–2.6 × 0.8 mm, margins papillose-hispid, surface hispid, convex, basal lobules ca. 1 mm; column ca. 1 mm long, 1.5 mm wide, 1.6 mm high, 3-lobed, lateral lobes with tufts of stellate bristles ca. 0.5 mm long, mid-lobule hispid-papillose.

This species is distinctive in the hastate-

triangular lip and the very bristly lip. It is named in honor of Henry P. Butcher, who collected the unusually good specimen. Butch had an outstanding knowledge of the Panamanian orchids. The collection number may have been added by Louis O. Williams, who received the specimen from Mr. Butcher. Butch had a phenomenal memory and usually saw no need to keep records or to number specimens.

Stellilabium fortunae sp. nov. TYPE: PANAMA. Chiriquí: Camp Hornito, Fortuna dam site, 8° 44' N, 82° 18' W, 1000–1200 m; 24 September 1976; epiphytic, flowers wine-red; R. L. Dressler 5464 (Holotype: MO). Fig. 1B–D.

Rhachis alata, columna glabra, ut in S. campbellioro sed floribus minoribus, petalis patentibus.

Epiphytic; roots 0.7–1.3 mm in diameter; stems 2–12 cm; leaves to 4.0 × 1.5 mm, oblong, thin, ephemeral; peduncular bracts to 2 mm, triangular; floral bracts to 1.0 × 1.2 mm, triangular, decurrent on rachis, rachis 1.0–1.5 mm wide; ovary and pedicel 1.5–2.0 mm; dorsal sepal triangular-elliptic, 1.9 × 0.8 mm; lateral sepals similar, 2.0 × 0.8 mm; petals elliptic, obtuse, 2.5 × 1.2 mm; lip elliptic to ovate, 2.3 × 1.0 mm; column glabrous, cylindrical.

Additional specimens examined: Same data as holotype, *Dressler 5463* (PMA); Cerro Colorado, ca. 50 km N of San Félix, elev. ca. 1450 m; 20 September 1977; *Dressler 5726*, (MO); 1300–1450 m, 15, 16 February 1977; *Dressler 5618*, (MO).

At both Fortuna and Cerro Colorado, there were purple or wine-red forms that set few fruits, whereas other collections (*Dressler 5463* and *5618*) are much smaller plants that set many fruits and had yellow flowers. These were apparently self-pollinating. Named for the type locality, this species resembles *S. campbelliorum* Atwood in color. The flowers are much smaller and the petals spread, rather than curving downward over the lateral sepals. Adequate samples between Monteverde and western Panama may well show them to be part

of a single variable species. With such sparse material, it is difficult to evaluate variation, especially in this curious group without bristles on the column.

Stellilabium morii sp. nov. TYPE: PANAMA. Chiriquí: N of San Félix at Chiriquí-Bocas del Toro border on Cerro Colorado copper mine road along continental divide, lower montane rain forest (cloud forest, trees to 5 m tall), 5000–5500 ft alt.; 3 May 1977; epiphyte, leaves absent, flowers purple, nonresupinate; *S. Mori & J. Kallunki 5813* (Holotype: MO). Fig. 1H.

Rhachis alata, flores magni, petala 5-venosa, columa leviter trilobata, transversaliter elliptica, tribus cristis setis pauciramosis praedita.

Epiphytic, roots 0.8–1.4 mm wide, whitish; stems to 4.5 cm; leaves 3–6 × 2.5 mm, membranous, ephemeral; peduncular bracts ca. 2 × 1.5 mm, narrowly triangular; floral bracts ca. 1.2 × 1.6 mm, triangular, acute, carinate, decurrent on rachis, rachis ca. 1.5 mm wide; ovary and pedicel ca. 2.3 mm; dorsal ovate, narrowly obtuse, 3 × 1.8 mm; lateral sepals similar, concave, carinate, 2.8 × 2 mm; petals obovate, concave, 3.5 × 2.2 mm, margin papillose-ciliate, 5-veined; lip oblong-ovate, base hastate-ovate, lateral lobules ca. 1 mm, surface hispid, margin fimbriate; column ca. 1.7 mm long, 2 mm wide, 1.5 mm high, elliptic in face view, with 3 tufts of few-branched setae to 1.5 mm long.

Additional specimen examined: same locality as holotype, 17 August 1975, *Dressler 5085* (flowers in alcohol, MO).

The flowers of this species are the largest known in Central American *Stellilabium* and the only species known with a transversely elliptic column (as seen in face view). In our area, all other species with bristles (except *S. lankesteri*) have the column more or less deeply 3-lobed. The 5-veined petals are also distinctive. *Dressler 5085* is from the same area as the type. A pressed specimen must have been collected, but that scrap of material apparently has been lost.

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