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The Genus *Systeloglossum*

ROBERT L. DRESSLER AND NORRIS H. WILLIAMS

THE COMPLEX OF GENERA which make up the subtribe *Oncidiinae* are notable for their great diversity of flower structure. It is not surprising that Schlechter grouped these genera into as many as ten different subtribes. How can one imagine close relationships between *Notylia* and *Trichopilia*, or *Quekettia* and *Odontoglossum*? In spite of their striking differences, we now group them all into the subtribe *Oncidiinae*, for two important reasons. First, crossing experiments, especially those of Mr. Moir, have shown that the whole group is closely tied together by interfertility. We may not be able to cross *Comparettia* with *Brassia*, but we can cross both with *Oncidium*. The second reason for grouping them together is that even the morphological differences do not hold up very well on close inspection. *Notylia* may seem very different from *Trichopilia*, but *Notylia* and *Macradenia* are surely closely related, and *Macradenia* and *Trichopilia subulata* are perhaps more similar to each other than *T. subulata* is to some of the other trichopilias. Such chains of interrelationships tie the whole group together and make the classification of these genera both rather difficult and very interesting.

Surely, one of the oddest genera in the whole complex is the somewhat obscure genus, *Systeloglossum*. At first glance, it reminds one more of *Bulbophyllum* or *Epidendrum* than it does of the subtribe *Oncidiinae*. The genus was described in 1923 by Schlechter, who suggested, quite doubtfully, that it might be related to *Odontoglossum*. Since then, three other species have been described from Central and South America, though only one of them was recognized as *Systeloglossum*. Another species of *Systeloglossum* has been found a few times in Panama, and we recently had the good fortune to find several plants of this species in the region of Cerro Jefe, northeast of Panama City. This has given us an opportunity to illustrate the genus from living material and to discuss its relationships. The plant has a number of peculiarities. The flowers are produced one by one on a slowly elongating, scaly peduncle. The flowers are not very showy, being green, brownish green or bronzy green, but they are odd enough to be interesting. Even before the flower opens, one sees that it must have a long column-foot, because the bud has a prominent "chin," a feature which is reminiscent of *Bulbophyllum* or *Dendrobium*. When the flower opens, one finds that the lip and column are united for almost the whole length of the column and column-foot, and the column forms a curious hood (the clinandrium) over the anther, these being features which remind one of some epidendrams. On cutting the lip away from the column (which only a botanist is likely to do), we find that the plant really does belong in the *Oncidiinae*. The pollinarium is definitely "oncidoid," though it is remarkable for the length of the viscidium and for the great width of the stipe. The other feature which we find only on dissection is a stigma which is divided into two lobes, similar to that of *Cochlioda*. We do not find this combination of features in any other oncidoid genus, which suggests that *Systeloglossum* is a "good" genus; indeed, it seems to be one of the most distinctive genera in the whole group.

We believe that the nature of the nectary is important in the classification of the *Oncidiinae*, though this feature has been somewhat neglected. The majority of the oncidiums and odontoglossums have no nectary, but many

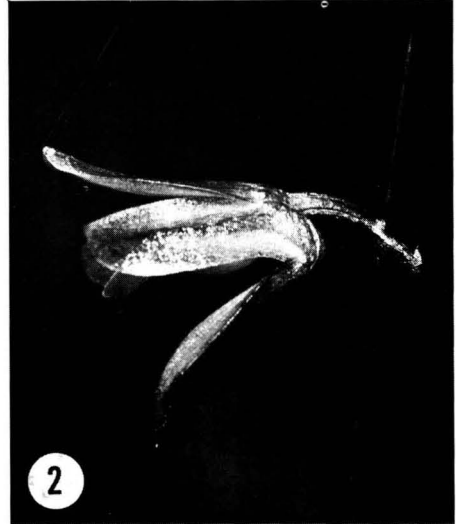
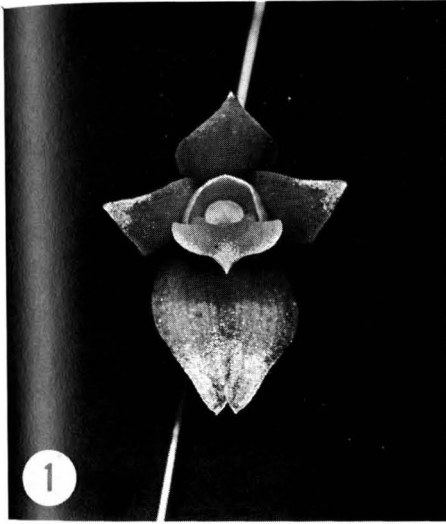
other genera do have nectaries, and these are very diverse in their form and function. Several genera, such as *Leochilus* and *Mesospinidium*, have rather simple nectaries at the base of the lip; the nectary is open and cup-like in *Leochilus* and some species of *Sigmatostalix*, while a more-or-less enclosed chamber is formed by the bases of the column and lip in *Mesospinidium* and *Bracthia*. Deep tubular structures are achieved by the *Oncidiinae* in several ways. In *Trichocentrum* we find a simple, tubular extension from the base of the lip, a classical "spur," like that of *Habenaria* or *Angraecum*. In *Comparettia* the tubular spur is an extension of the sepals, but it includes two slender extensions of the lip, which presumably produce the nectar. *Rodriguezia*, *Scelochilus* and *Neokoehleria* are similar in this respect. The odd genus *Saundersia* apparently has a deep tubular nectary which is embedded in the "stem" of the flower,* like the nectary of *Brassavola* and many species of true *Epidendrum*. This is unusual in the *Oncidiinae*, but it is found in at least one other group (see "Trichopilia dasyandra and its Allies," Dressler and Williams, in preparation). As far as we can determine, *Systeloglossum* is the only member of the subtribe which has a deep tubular nectary formed by a column-foot and the base of the lip, though very similar structures occur in other groups, such as *Dendrobium*. Some other *Oncidiinae*, such as *Cochlioda vulcanica*, have a distinct column-foot, but nothing that can be compared with that of most *systeloglossums*.

We may ask what the relationships are of such a bizarre genus. Every author who has mentioned *Systeloglossum* has made a different suggestion (or sometimes two): *Aspasia*, *Bracthia*, *Cochlioda*, *Diadenium*, and *Odontoglossum*, yet none of these seems to be very closely related. Mansfeld (*Rep. Sp. Nov.* 44: 57-58, 1938) suggested a relationship with *Diadenium*, and two species of *Systeloglossum* have been described as *diadeniums*, yet there are quite fundamental differences between these genera, especially in the structure of the nectary. In *Systeloglossum* the margins of the lip are united with the column and the column-foot to form a nectary. In *Diadenium* there is a distinct column-foot, but the lip is united to this along the midline, and the nectary is really a sepaline spur with an extension from the base of the lip extending into it (indicating the close relationship of *Diadenium* to *Neokoehleria* and *Scelochilus*). The structure of the pollinaria are also very different (see Williams, "Some Observations on Pollinaria in the *Oncidiinae*" *Amer. Orchid Soc. Bull.* 39: 32-43, 207-220, 1970). *Systeloglossum* shows a striking resemblance to *Oliveriana*, a relationship which earlier authors could not appreciate because *Oliveriana* was so poorly known (see Garay, *Amer. Orchid Soc. Bull.* 32: 18-24, 1963, and Fernández, *Orquideologia* 4: 85-89, 1969**). The all-important features of the pollinaria are almost identical in *Oliveriana* and *Systeloglossum*, as are the hooded clinandria and the nature of the nectary. At first glance, the long column-foot of *Systeloglossum* appears to be a good "key" character to separate *Systeloglossum* and *Oliveriana*. The feature has been somewhat overemphasized in orchid taxonomy, and does not

*Technically a "floral tube," but appearing to be part of the pedicel.

**A fourth species of *Oliveriana* from Peru is *Oliveriana brevilabia* (C. Schweinf.) Dressler & Williams, comb. nov. — *Odontoglossum brevilabium* C. Schweinf., *Amer. Orchid Soc. Bull.* 18: 578, fig. 1, 1949. This species differs from the other known species of *Oliveriana* in having two- or three-leaved pseudobulbs, a branched inflorescence and somewhat smaller flowers, but in all essential features it is *Oliveriana*. The cucullate clinandrium, the divided stigma, and especially the form of the pollinarium exclude this species from all groups of *Odontoglossum*.

give a clear distinction in this case, since *S. costaricense* has a relatively short column-foot and *O. brevilabia* (see footnote) also has a short but definite column-foot. Considering the column-foot in conjunction with the condensed inflorescence and the united lateral sepals of *Systeloglossum* and the differences in the callus of the lip and the form of the pollinia, the two genera seem reasonably distinct. The discovery of further new species, of course, may weaken the distinction between these genera. *Systeloglossum* and *Oliveriana*, together, are rather isolated within the subtribe, and we cannot indicate a special relationship with other genera which is comparable to the close relationship between these two genera.



SYSTELOGLOSSUM COSTARICENSE

1. Front view of flower, showing the hooded clinandrium and the united lateral sepals. 2. Side view of flower, showing the short column-foot and the broad sepals and petals. The flowers of this species do not open widely as the other species usually do. The flowers are about 10 or 12 mm. long (about one-half inch).

KEY TO THE SPECIES OF SYSTELOGLOSSUM

- 1. Lip shallowly lobed or apiculate at apex
 - 2. Column-foot much shorter than the column; sepals and petals obtuse or broadly acute (Costa Rica) *S. costaricense*
 - 2. Column-foot as long as the column or longer; sepals and petals acute to acuminate
 - 3. Petals linear-oblong, about 2 mm. wide at base of free portion, margins subparallel to near apex; lip 2.5-3 mm. wide (Colombia and Ecuador) *S. ecuadorensis*
 - 3. Petals deltoid-lanceolate, about 3 mm. wide at base of free portion, tapering evenly to apex; lip 3.5-5 mm. wide (Costa Rica) *S. acuminatum*
- 1. Lip deeply bilobed
 - 4. Sepals and petals obtuse, callus a transverse ridge (Peru) *S. bennettii*
 - 4. Sepals and petals acute or acuminate; two separate hemispheric calli at base of lip (Panama) *S. panamense*

1. *Systeloglossum acuminatum* Ames & Schweinf., Sched. Orch. 10: 105, 1930.

This species was described from Costa Rica, where several other collections have been made. It is similar to *S. costaricense*, but has a much longer column-foot and sharply pointed sepals and petals.

2. *Systeloglossum bennettii* (Garay) Dressler & Williams, comb. nov.—
Diadenium bennettii Garay, Orchid Review 75: 414, fig. 184. 1967.

We know this Peruvian species only through the description and illustration in *The Orchid Review*, but these leave no doubt of its being a *systeloglossum*.

3. *Systeloglossum costaricense* Schlechter, Rep. Sp. Nov. Beih. 9: 252, 1923.

This is the type species of the genus, and by chance it is the least peculiar, and presumably the most primitive, species so far known in the genus. There are some points in Schlechter's description which are incorrect, but these were later corrected by Mansfeld, who restudied the type material (*Rep. Sp. Nov.* 44: 57-58. 1938). We have a plant which was collected by Mr. Horich in the Cordillera Brunqueña, Costa Rica (see photograph).

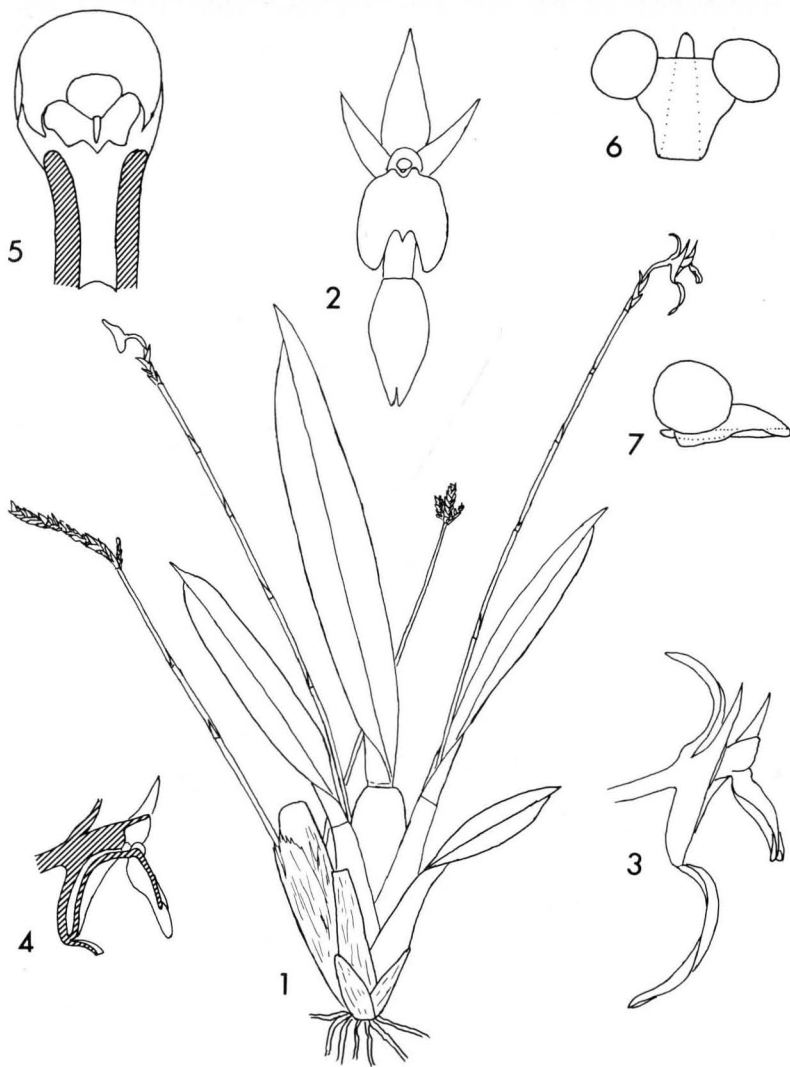
4. *Systeloglossum ecuadorensis* (Garay) Dressler & Williams, comb. nov.—
Diadenium ecuadorensis Garay, Arq. Jard. Bot. Rio de Janeiro 13: 44, pl. 2. 1953-54.

This species is known from Ecuador and Colombia; a color photograph of a Colombian plant was published in *Orquideologia* (4: 32. 1969). It is very similar to *S. acuminatum*, but has differently shaped petals, a smaller lip and a more markedly triangular peduncle.

5. *Systeloglossum panamense* Dressler & Williams, sp. nov.

Pseudobulbis oblongis, fortiter compressis; foliis ellipticis, acutis; pedunculo communi gracillimo, dense multifloro; sepalis acutis, dorsali lanceolato, lateralibus usque ad apicem connatis, carinatis; petalis triangularibus, acutis, basi in pedem columnae decurrentis; labello unguiculato, limbo quadrato-oblongo, profunde emarginato bilobato, apiculato, disco basi bicalloso; columna crassa, basi in pedem longum producta; clinandrio membranaceo, cucullato.

Rhizome short, ca. 4-8 mm. between pseudobulbs; pseudobulbs monophyllous, oblong, strongly compressed, 3-6 cm. long, 1-1.8 cm. wide, partly concealed by 5 or 6 conduplicate sheaths, of which 4 are leaf-bearing; sheaths to 5.5 cm. long and 11 mm. wide (folded); leaves narrowly elliptic, asymmetrically acute, midrib carinate beneath, sheath leaves 3.8-15 cm. long, 1.1-2 cm. wide, central leaf (on pseudobulb) 9-20 cm. long, 1-2.2 cm. wide; inflorescence axillary, commonly 2 from each pseudobulb, sometimes branching from upper nodes with age; peduncle wiry, somewhat flattened, 8.5-22 cm. long, with 4 or 5 narrowly triangular, clasping bracts 6-7 mm. long; raceme elongating gradually (flowers produced serially), internodes 0.7-3 mm. long, bracts narrowly triangular, carinate, 3-4 mm. long; flowers green or bronzy green; ovary with pedicel 12-15 mm. long; dorsal sepal narrowly oblong-ovate (lanceolate), acute, slightly carinate near apex, 11-15 mm. long, 3-4 mm. wide; lateral sepals united, strongly carinate, together narrowly ovate (lanceolate), ca. 15-18 mm. long, 6-7 mm. wide, the acute apices free for ca. 1.8 mm.; petals



SYSTELOGLOSSUM PANAMENSE

1. Habit, x $\frac{1}{2}$; 2. Flower, front view, x 2; 3. Flower, side view, x 2; 4. Section through column, column-foot and lip, to show nectary, x 2; 5. Column, ventral surface, to show hooded clinandrium (above) and the deeply divided stigma, x 7; 6. Pollinarium, dorsal view, x 13; 7. Pollinarium, lateral view, x 13.

narrowly triangular, acute, slightly carinate at apices, 9-11 mm. long, 3-3.5 mm. wide, the base decurrent on the column-foot for about 7 mm.; lip unguiculate, the claw united with the column-foot and column by its margins, blade quadrate-oblong, deeply bifid (for ca. 3 mm.), apiculate, 7-9 mm. long, 5.5-7 mm. wide, callus of 2 fleshy knobs near base of lamina (beneath clinandrium); column ca. 5 mm. long, including clinandrium (ca. 2 mm.), clinandrium forming a membranous hood, column-foot ca. 6.5 mm. long, 2.5 mm. wide at apex; anther thin, shortly oblong, ca. 1.2 mm. wide; stigma transverse, deeply

bilobed; viscidium narrowly triangular, ca. 0.6 mm. long, stipe broadly quadrate-obdeltoid, ca. 0.6 mm. long, 0.5 mm. wide; pollinia subspheric, compressed, ca. 0.4 mm. in diameter.

PANAMA: Prov. Panama, La Eneida, region of Cerro Jefe; pressed 25 June 1969; epiphyte in tall forest; flowers bronzy green, *R. L. Dressler & N. H. Williams 3642* (US, Holotype); Region of Cerro Jefe; 26 August 1967; epiphyte, flower brownish green, *R. L. Dressler 3038* (US).

In the form of the lip this species is very similar to the Peruvian *S. bennettii*; in the form of the sepals and petals, however, it closely resembles *S. acuminatum*, of Costa Rica. The inflorescence of *S. panamense* is more strongly condensed than that of either of the above species. The leaves of *S. panamense* are somewhat narrower than those of other species which we have seen, and the narrowly acute apex of the leaf is markedly asymmetric. One of the plants from Cerro Jefe is heavily suffused with anthocyanins, giving the foliage a wine-red color, but all the others are dark green.

A COMPARISON OF SOME FEATURES OF SYSTOLOGLOSSUM, DIADENIUM AND OLIVERIANA

| | <i>Diadenium</i> | <i>Systeloglossum</i> | <i>Oliveriana</i> |
|------------------------|---|--|---|
| Rhizome | short | short | elongate |
| Pseudobulbs | short, ovoid | oblong, strongly compressed | oblong, compressed |
| Leaves | coriaceous | thin | thin |
| Inflorescence | much-branched panicle | raceme or panicle, condensed | raceme or panicle, not condensed |
| Color of flower | pink | green or bronzy green | green, bronzy or yellow |
| Texture of flower | thin | fleshy | fleshy |
| Column-foot | conspicuous | conspicuous | short or none |
| Lateral sepals | united | united | free |
| Nectary | sepaline spur extending beyond tip of column-foot | formed by column-foot and claw of lip | formed by column and claw of lip |
| Base of lip | extended into sepaline spur | attached to tip of column-foot | attached to base of column |
| Claw of lip | attached to column-foot along median line | attached to column and column-foot by margins | attached to column by margins |
| Callus | thin, laminar | low, fleshy, at base of lamina | low, fleshy, in center of lamina |
| Apex of lip | obtuse | retuse or apiculate | retuse or apiculate |
| Clinandrium | truncate, not hooded over anther | membranous, hooded over anther | membranous, hooded over anther |
| Stigma | elongate, not divided | transverse, partly divided by viscidium | transverse, divided by viscidium |
| Viscidium | small, ovoid | large, narrowly triangular | large, narrowly triangular |
| Stipe | long, narrow, extended beyond pollinia | short, broad, truncate or retuse | short, broad, retuse or shallowly bifid |
| Attachment of pollinia | median | marginal, widely separated | marginal, widely separated |
| Pollinia | slender, clavate, no ventral groove | subspheric, flattened laterally, no ventral groove | subspheric, flattened laterally, small ventral groove |

It will be seen that there are many similarities between *Systemoglossum* and *Oliveriana*, and several quite fundamental differences between *Systemoglossum* and *Diadenium*. *Oliveriana* and *Systemoglossum*, together, form a very distinct group without very close relatives within the *Oncidiinae*.—*Smithsonian Tropical Research Institute, P.O. Box 2072, Balboa, Canal Zone.*