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# New Natural Hybrids and Nomenclatural Novelties in *Catasetum* (Orchidaceae) from the Guianas, Ecuador, and Peru

Gustavo A. Romero

Oakes Ames Orchid Herbaria, Harvard University Herbarium,  
22 Divinity Avenue, Cambridge, Massachusetts 02138, U.S.A.

Rudolf Jenny

Moosweg 9, 3112 Allmendingen, Switzerland

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**ABSTRACT.** One new *Catasetum* natural hybrid from Guyana is described and illustrated, *Catasetum* × *guianense*, and two taxa previously described as species are shown to be hybrids, *Catasetum* × *soldiroi* Schltr. and *C.* × *violascens* Reichb. f. & Warz. The latter two are neotypified and lectotypified, respectively. In addition, a lectotype is designated for *Catasetum incurvum* Klotzsch.

An understanding of the pollination biology of *Catasetum* species assemblages and careful attention to reproductive isolation mechanisms have helped to distinguish species from natural hybrids (Dodson, 1962; Romero & Carnevali, 1992, and references therein). Here we present three natural hybrids from distinct geographical areas where species from *Catasetum* subg. *Catasetum* and *Catasetum* subg. *Pseudocatasetum* are found within euglossine bee flight range. The hybrids discussed encompass two of three possible combinations between these two groups: one between *Catasetum longifolium* Lindley (subg. *Pseudocatasetum*) and *C. macrocarpum* (subg. *Catasetum*, sect. *Catasetum*) from the Guianas; one between *Catasetum macroglossum* and *C. expansum* (both in sect. *Catasetum*) from Ecuador; and one between *Catasetum discolor* Lindley (subg. *Pseudocatasetum*) and *C. incurvum* Klotzsch (subg. *Catasetum*, sect. *Catasetum*) from Peru.

***Catasetum* × *guianense*** G. Romero & Jenny, nothosp. nov. TYPE: Guyana. Essequibo District, Dawa, Lake Tapakuma, 30 m, 18 Oct. 1974, C. H. Dodson, ex hort. Marie Selby Botanical Gardens *sub Dodson 4476* (holotype, SEL; holotype fragment, AMES). Figure 1.

Planta intermedia ad *Catasetum macrocarpum* Rich. ex Kunth vergens, sed ab eo floribus minoribus, columnae antennis parallelis brevioribus et clinandrio apiculo brevioris recedit.

Plant epiphytic, vegetatively indistinguishable from other members of the genus except for the pendent

habit and the generally longer, narrower, linear leaves (to 75 cm long and 4 cm wide). Staminate inflorescences pendent, racemose, to 10-flowered, to 30 cm long, developing from fully developed pseudobulbs at the base of the first internode. Staminate flower resupinate. Sepals and petals yellow, wine red, or greenish yellow spotted wine red. Dorsal sepal slightly concave, ovate, acute, 23–25 mm long, 11–13 mm wide; lateral sepals slightly concave, oblong-ovate, acute, slightly oblique, 25–27 mm long, 11–13 mm wide; petals broadly elliptic, acute to shortly apiculate, 18–19 mm wide, 28–29 mm long. Labellum greenish yellow to yellow, internally yellow with wine red spots toward the base or entirely wine red, saccate, the sac 15–17 mm deep, slightly constricted and internally thickened at the opening, the opening subcircular, 12–17 mm diam.; labellum shallowly trilobate apically, with a ridge inside near the apex uniting the lateral lobes behind the mid-lobe, the ridge separated from the mid-lobe by a shallow depression; lateral lobes erect patent, up to 10 mm wide, margins dentate, fimbriate toward the base; middle lobe 2–5 mm long, linguiform, the apex acuminate, acute, to truncate. Column light greenish white to gold, semiterete, straight, apically thickened, shortly rostrate, 16 mm long, 6 mm high, and 10 mm wide; clinandrium shortly apiculate; antennae tapering to a fine point, bilaterally symmetrical, 6–7 mm long, 1.25 mm diam. at the base. Anther orange to yellowish green, 8 mm long, 5 mm wide; viscidium semicircular, 6–7 mm diam.; stipe, before folding, cymbiform, 11–12 mm long and 5–6 mm wide; pollinia two, cleft, waxy, yellow, compressed, 4 mm long and 3 mm wide. Pistillate inflorescence and flower unknown.

**Paratypes.** GUYANA. Essequibo District, Dawa, Lake Tapakuma, 30 m, 1 Dec. 1975, C. H. Dodson, ex hort. Marie Selby Botanical Gardens *sub Dodson s.n.* (SEL). FRENCH GUIANA. Without locality, 1 Nov. 1990, *Lafontaine s.n.* (AMES). SURINAME. Without locality, ex hort. G. Schiller, W (Herb. Reichenbach No. 24634).

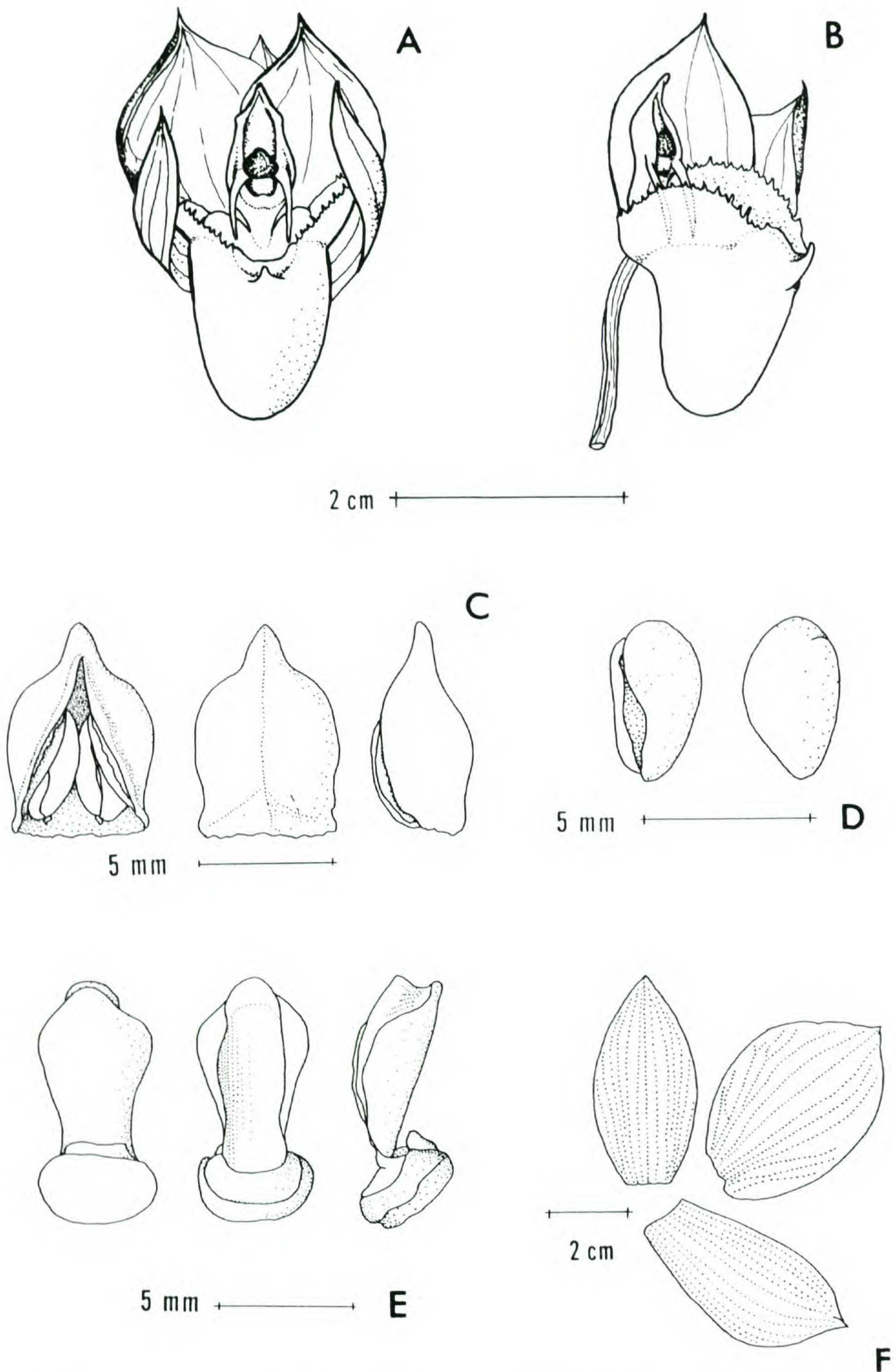


Figure 1. *Catasetum*  $\times$  *guianense* G. Romero & Jenny. — A, B. Front and side view of staminate flower. — C. Anther. — D. Pollinium. — E. Pollinarium (pollinia removed). — F. Sepals and petals. (A–F drawn from *Lafontaine s.n.*)

*Etymology.* Named after the Guianas, a region in northern South America encompassing Guyana, Suriname, and French Guiana, the known geographical range of this natural hybrid.

Dodson (1978) first reported this natural hybrid between *Catasetum macrocarpum* Rich. ex Kunth and *C. longifolium* Lindley without providing a formal name for the taxon. Photographs of the same hybrid swarm had previously been published by Tan (1971, fig. 8). Lafontaine (1990) recently identified the hybrid as *Catasetum blepharochilum* Schltr. However, this binomial (Schlechter, 1920, 1929) is a synonym of *C. maculatum* Kunth and is not the hybrid described here. According to Dodson (1978), the hybrid origin of *C. × guianense* “. . . was confirmed by later hybridization experiments.”

*Catasetum × guianense* is morphologically intermediate between the two parents. It differs from *C. longifolium* in the larger flower (dorsal sepal to 25 mm long in the hybrid vs. 15 mm long in *C. longifolium*) and longer antennae (to 7 mm in the hybrid vs. 3 mm in *C. longifolium*). It differs from *C. macrocarpum* in the orientation of the inflorescence (pendent in the hybrid vs. erect in *C. macrocarpum*) and the antennae (bilaterally symmetrical in the hybrid vs. bilaterally asymmetrical in *C. macrocarpum*). The hybrid is probably pollinated by the same euglossine bees that pollinate the parents: *Eulaema bombiformis*, *E. cingulata*, and *E. meriana*. Pollen flow between the parents of this hybrid, as in other *Catasetum* hybrids (e.g., *C. × dunstervillei*; Romero & Carnevali, 1989a), is unidirectional: only the pollinia of *Catasetum longifolium* can pollinate female flowers of *C. macrocarpum* (the pollinia of *C. macrocarpum* are too big to fit in the stigmatic cleft of female flowers of *C. longifolium*). This hybrid has been found on *Mauritia* palms (Dodson, 1978).

***Catasetum incurvum*** Klotzsch, Allg. Gartenzeitung 22: 178. 1854. *Catasetum saccatum* Lindley var. *incurvum* (Klotzsch) Mansf., Rept. Spec. Nov. Regni Veg. 30: 272. 1932. TYPE: Peru. Without precise locality, J. Warszewicz ex hort. Mathieu (holotype, B destroyed; lectotype, here designated, W (Herb. Reichenbach No. 24568, pro parte)). Figures 2, 3B.

*Catasetum stupendum* Cogn., J. Orchidées 6: 13. 1895. TYPE: Peru. Without precise locality, ex hort. L'Horticulture Internationale (type not located).

*Catasetum trautmanii* Senghas, Orchidee 41: 216. 1990. Syn. nov. TYPE: Peru. Without precise locality, Dec. 1986, G. Trautmann ex Hort. Botanischer Garten Heidelberg 643 (holotype, HEID not seen).

*Other specimens examined.* PERU. AMAZONAS: La Peca, 1,000 m, 21 Sep. 1963, *F. Woytkowski* 2 (AMES, F, K, MO, US), 20 Aug. 1964, *Woytkowski* 4 (AMES), 9 June 1966, *Woytkowski* 8 (AMES); canyon of the Río Marañon, below Milagro on the Mesones–Muro highway, Quebrada Aramango, 24 June 1966, *P. C. Hutchinson* 1547 (BR); canyon of the Río Marañon, between km 247 and 250 of the Mesones–Muro highway, 1959, *Hutchinson* 1559 (AMES); Río Utcubamba, 6 km E of Quebrada Honda, km 276 E of Olmos, 26 Aug. 1966, *Hutchinson & J. K. Wright* 6776 (AMES); Río Utcubamba Canyon, 1,800 m, 6 Apr. 1965, *F. Antich* s.n. (AMES); vicinity of Campamento Ingenio 1–3 km up road to Pomacocha (and Rioja), 1,300–1,400 m, 27 Jan. 1964, *Hutchinson & Wright* 3836 (AMES).

*Catasetum incurvum* has been treated as a variety of *C. saccatum*. However, we believe this taxon should be recognized at the rank of species based on its larger size and the shape of the labellum (Lindley, 1855). Furthermore, *C. incurvum* is restricted to mid- to high-altitude rainforests (600–1,800 m) in the Peruvian Amazon, whereas *C. saccatum* is widespread in lowland forests (below 500 m) in the Guianas, Brazil, Ecuador, Peru, and Bolivia. The holotype of *C. incurvum* was presumably destroyed during the bombing of Berlin. Fortunately, Reichenbach made a drawing of one of the flowers described by Klotzsch during one of his visits to this important herbarium. This drawing is selected as lectotype (Fig. 3B).

***Catasetum macroglossum*** Reichb. f. Gard. Chron. n.s. 8: 552, 1877. TYPE: Ecuador. May 1877, ex hort. Strickland (lectotype, here designated, W (Herb. Reichenbach No. 38701)).

*Other specimens examined.* ECUADOR. LOS RIOS: km 56 Quevedo–Santo Domingo, Río Palenque Biological Station, 150–220 m, 6 Mar. 1974, *Dodson* 5491; Quevedo, 700 m, 5 June 1978, ex hort. Marie Selby Botanical Gardens, *Dodson* 3236 (SEL). GUAYAS: near Bucay, 150 m, 28 Aug. 1978, ex hort. Marie Selby Botanical Gardens, *Dodson* 3235 (SEL); El Progreso, Guayas, 14 Aug. 1940, ex hort. Puerto Rico Experimental Station, *A. G. Kerorian* 6199 (AMES).

Reichenbach included several “varieties” of *C. macroglossum* in his protologue (“I have had them ochre coloured, with green sepals and petals, quite light green, dark green, light yellow, dark yellow, and brownish purple. I have seen it rather frequently, first from Messrs. Veitch, at different times from Mr. Day, and then from Sir C. W. Strickland, and various other correspondents since last November”). Among these varieties were several representatives of the natural hybrid between *C. macroglossum* and *C. expansum*, as well as what we currently know as *C. macroglossum* (Dodson, 1962: 52, fig. 10; Dodson & Dodson, 1980; Arosemena et al., 1988:

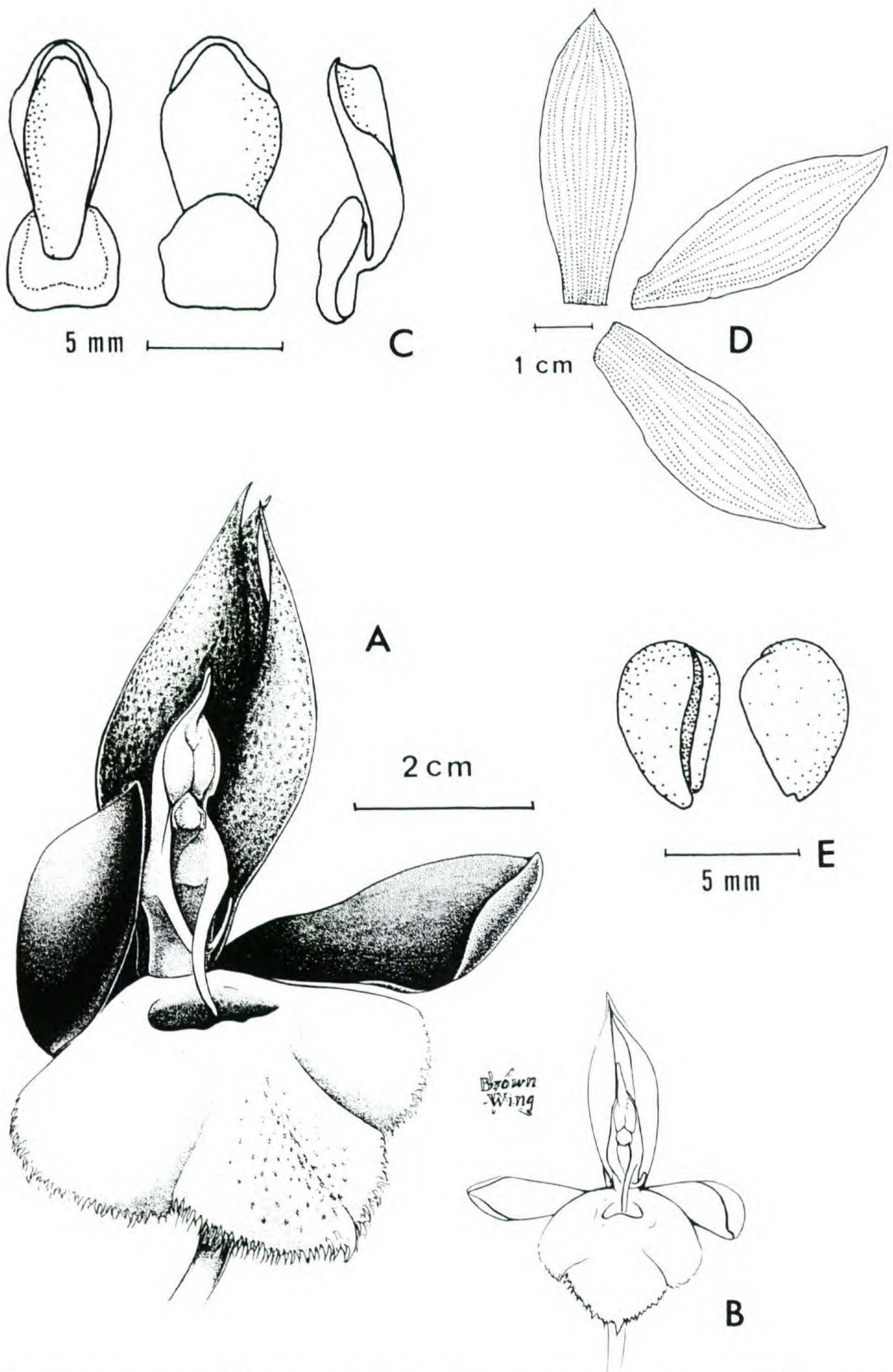


Figure 2. *Catasetum incurvum* Klotzsch. — A, B. Side and front view of staminate flower. — C. Pollinarium (pollinia removed). — D. Sepals and petals. — E. Pollinium. (A–E drawn from *Hutchinson & Wright 3836*.)

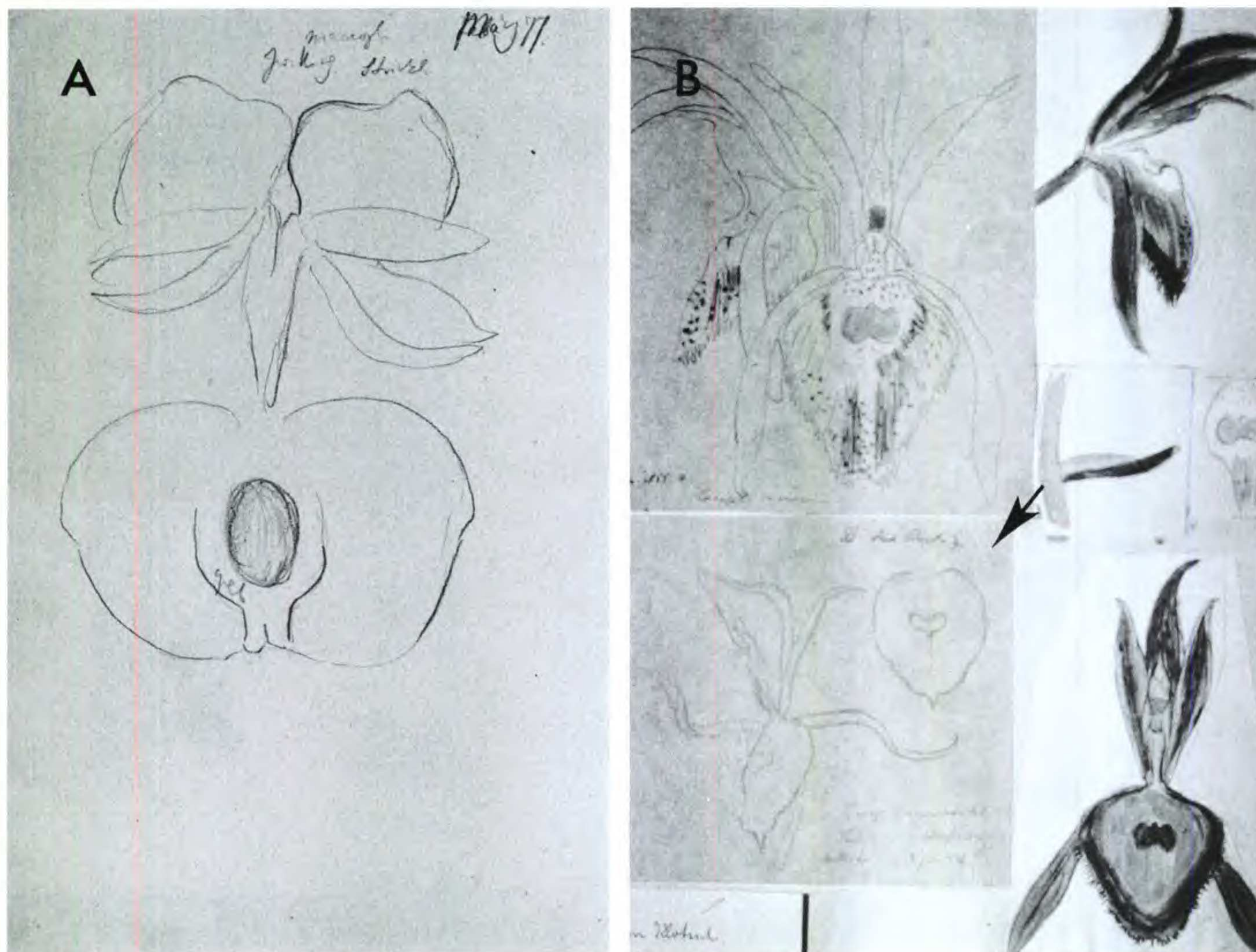


Figure 3. —A. Lectotype of *Catasetum macroglossum* (from Herb. Reichenbach 38701.) —B. Lectotype of *Catasetum incurvum* Klotzsch (from Herb. Reichenbach 24568).

37, fig. 38). Reichenbach annotated at least two specimens as *C. macroglossum* in his herbarium without designating a type. We have chosen a lectotype (Fig. 3A) that maintains the currently accepted concept of *C. macroglossum*. There are six paintings of “*Catasetum macroglossum*” in John Day’s scrapbooks (K). Of these, only one corresponds to our current concept of *C. macroglossum* (Book 20: 51, December 1876, as *Catasetum macroglossum* var. *viridi-pallens*). The other five depict different forms of *C. × sodiroi* (Book 20: 79, 1 Feb. 1877; Book 20: 81, 3 Feb. 1877; Book 21: 61, 18 Nov. 1879; Book 23: 13, 26 Dec. 1876; Book 23: 59, 22 Apr. 1878).

***Catasetum × sodiroi* Schltr. (pro sp.)**

*Catasetum sodiroi* Schltr., Repert. Spec. Nov. Regni Veg. Beih. 8: 91. 1921. TYPE: Ecuador. Chimborazo: in silvis tropicis, Puente de Chimbo (holotype, B destroyed). Ecuador. Road Guayaquil–Quevedo, ca. km 78, 30 m, 5 Apr. 1960, *Dodson 38* (neotype, here designated, SEL; isoneotypes, MO, SEL).

*Catasetum trilobatum* Senghas, Orchidee 41: 218. 1990. Syn. nov. TYPE: Ecuador. Cotopaxi: near Pucay-

acu, ca. 600 m, W. Rauh ex hort. Botanischer Garten Heidelberg 34459 (holotype, HEID).

*Other specimen examined.* ECUADOR. GUAYAS: Palestina, 70 m, 6 July 1978, ex Hort. Marie Selby Botanical Gardens, *Dodson 3234* (SEL).

Dodson (1962) proposed *Catasetum macroglossum* Reichb. f. and *C. expansum* Reichb. f. as the parents of this hybrid swarm, providing solid evidence to support his hypothesis. We selected *Catasetum sodiroi* as the earliest name because plants collected in the type locality of *C. sodiroi* Schltr. (currently known as Bucay) bear flowers that resemble the natural hybrid (*C. H.* Dodson, pers. comm.). A neotype was chosen because a search of those herbaria with known Sodiro’s collections (BP, BR, K, MO, NY, Q, QPLS, US) failed to produce authentic material of *Catasetum sodiroi*.

As in the case of *Catasetum × tapiriceps* Reichb. f. (Romero & Carnevali, 1989b, 1990), *C. × sodiroi* exhibits a wide range of variation in flower morphology, resupination, and color. It should be emphasized, however, that “. . . a nothotaxon is circumscribed so as to include all individuals (as far as

they can be recognized) derived from the crossing of representatives of the stated parent taxa (i.e., not only the  $F_1$ , but subsequent filial generations, and also back-crosses and combinations of these)" (Greuter, 1988: 83, article H.4.1). Thus, the name *Catasetum*  $\times$  *sodiroi* Schltr. applies to the entire hybrid complex, regardless of its morphological variability. The hybrid differs from *C. expansum* in the labellum that is generally trilobate (vs. entire in *C. expansum*) or hooded (vs. open, cup-shaped in *C. expansum*). It differs from *C. macroglossum* in the resupinate flowers (vs. nonresupinate in *C. macroglossum*), the presence of a conspicuous, triangular callus in the labellum (vs. a semicircular callus in *C. macroglossum*), and the yellow spotted with red to orange color of the flowers (vs. green to greenish yellow in *C. macroglossum*). Both the hybrids and the parents are pollinated by *Eulaema cingulata*, *E. meriana*, and *E. speciosa* (Dodson, 1962). Color photographs of the hybrids may be seen in Arosemena et al. (1988, cover and pp. 27–36).

***Catasetum*  $\times$  *violascens*** Reichb. f. & Warsc. (pro sp.)

*Catasetum violascens* Reichb. f. & Warsc., Bonplandia 2: 97. 1854. TYPE: Peru. Sources of the Marañon, May 1853, *J. von Warscewicz* 14, (lectotype, designated here, K). Figure 4.

*Other specimen examined.* PERU. Moyobamba, G. Monnier 1030 (AMES).

In 1854, Josef von Warscewicz sent several shipments of plants collected in Peru to horticultural houses in Europe. As in the case of *Catasetum macroglossum*, some of the collections included a *Catasetum* natural hybrid and one of its parents. The parent was first described as *Catasetum incurvum* by Klotzsch from a plant cultivated in Germany (see *C. incurvum* above). Lindley used the name *Catasetum secundum* in his herbarium and in one of Warscewicz's catalogs, but the binomial was never validly published. Reichenbach and Warscewicz later described this collection as *C. violascens*. *Catasetum*  $\times$  *violascens* is similar to *C.*  $\times$  *dunstervillei* G. Romero & Carnevali, a natural hybrid between *C. pileatum* and *C. discolor* (Romero & Carnevali, 1989a, 1991). This similarity reveals a well-established pattern in the inheritance of certain characters in *Catasetum* hybrids: crosses between species in subgenus *Pseudocatasetum* (with minute antennae, usually under 3 mm long) and species in section *Catasetum* (with bilaterally asymmetric, long antennae, usually over 15 mm long) produce progeny with short, stout, bilaterally symmetric antennae. We propose *C. incurvum* (Fig. 2) and *C. dis-*

*color* as putative parents based on the following evidence: (1) the morphology of the hybrid (intermediate between the proposed parent species) including the shape of the antenna mentioned above; (2) they are the only possible species in the known range of the hybrid capable of producing such an intersubgeneric hybrid.

*Catasetum*  $\times$  *violascens* differs from *C. discolor* in the conspicuous antennae (vs. inconspicuous in *C. discolor*) and the resupinate staminate flowers (vs. nonresupinate in *C. discolor*). It differs from *C. incurvum* in the parallel, stout antennae (vs. long, slender, bilaterally asymmetrical antennae in *C. incurvum*) and the much smaller flowers (compare Figs. 2 and 4). Plants of *Catasetum*  $\times$  *violascens* were found on the side of a road, growing with grasses in clay soils (G. Monnier, pers. comm.). This growth habit is probably inherited from *C. discolor*, also a terrestrial species: *Catasetum incurvum* is always epiphytic. Little is known about the pollinator(s) of the hybrid or the putative parents except that in Venezuela and the Guianas *C. discolor* is pollinated by *Eulaema bombiformis*, *E. cingulata*, and *E. meriana* (Dodson, 1978; G. A. Romero, unpublished data).

A single flower of Warscewicz's original material found at K is here designated as lectotype for *Catasetum violascens*; a tracing of this flower was found in Vienna (Herb. Reichenbach No. 24609, upper right corner). What appears to be the original of Warscewicz's drawing 14 is at W (Herb. Reichenbach No. 24628) and a tracing of it at K.

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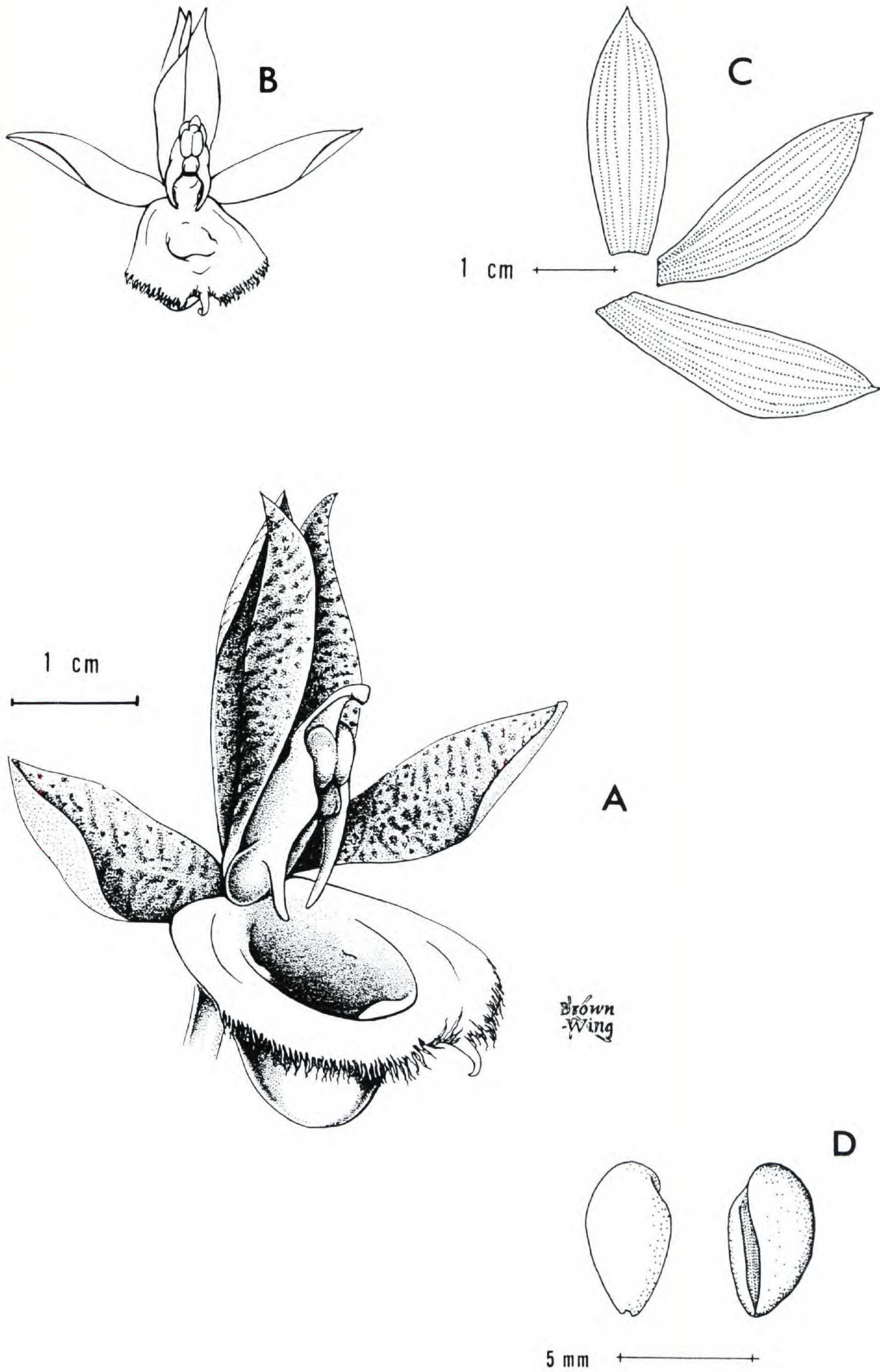


Figure 4. *Catasetum*  $\times$  *violascens* Reichb. f. & Warsc. —A, B. Side and front view of staminate flower. —C. Sepals and petals. —D. Pollinium (A–D drawn from *G. Monnier 1030*.)

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