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Oncidium cheirophorum

Text by Franco Pupulin/Watercolor by Sylvia Strigari

Tribe Cymbidieae
Sutribe Oncidiinae
Genus *Oncidium* Swartz

Oncidium cheirophorum Rchb. f., Bot. Zeit. Berlin 10: 695. 1852. TYPE: [Panama]. Chiriqui Vulkan, *J. Warscewicz s.n.* (holotype, W).

Heterotypic synonyms: *Oncidium cheirophorum* var. *exauriculatum* Hamer & Garay, Orquid. El Salvador 2: 176–177, t. 1974. *Oncidium exauriculatum* (Hamer & Garay) R. Jiménez, Orquídea (Mexico City), n.s. 12(2): 270–272. 1992. TYPE: Costa Rica: Guanacaste: Tilarán, *P. Standley & J. Valerio 46266* (holotype, AMES; isotype: US). *Oncidium dielsianum* Kraenzl., Pflanzenr. IV. 50(Heft 80): 197. 1922. SYNTYPES: Subäquatoriale andine Provinz. Costa Rica, *A.R. Endrés s.n.* (W); Costa Rica. San José. *Carmiol s.n.* (W). *Oncidium macrorhynchum* Kraenzl., Pflanzenr. IV. 50(Heft 80): 200. 1922. TYPE: Subäquatoriale andine Provinz. Costa Rica. San Juan de Candelaria, *A. R. Endrés s.n.* (holotype, W).

A small epiphytic, sympodial, densely caespitose herb to about 12 cm tall. *Rhizome* very short, such that the pseudobulbs form compact, intricate masses. *Roots* thin, flexuous, green at the apex, to 1.5 mm in diameter. *Pseudobulbs* broadly ovoid-pyriform to subspheric, slightly flattened laterally, smooth, pale green, suffused to boldly marked with purple-brown, to 3.5 × 2.0 cm, monophyllous (rarely diphyllous), covered at the base by 3–5 sheaths, the basal ones triangular, papery, brown, lacerate with age, the upper ones foliaceous, the cataphylls with prominent and strongly conduplicate petioles to 2.5 cm long. *Leaves* thin, shiny, prominently keeled abaxially along the midvein, linear to narrowly elliptic-lanceolate, acute, distinctly narrowed at the base into a strongly conduplicate petiole; blade 5–13 × 0.5–1.5 cm. *Inflorescence*, one or two, each a lateral, erect, many-flowered panicle produced from the base of the pseudobulb, from the axils of the upper sheaths, to 30 cm long; peduncle terete, slender, 10–18 cm long, with two or three lanceolate, acute, glumaceous bracts 5 mm long; lateral branches to 10 cm long. *Floral bracts* small, clasping, triangular, 3 × 2 mm. Pedicellate *ovary* terete, slender, much longer than the floral bracts, 7–10 mm long.

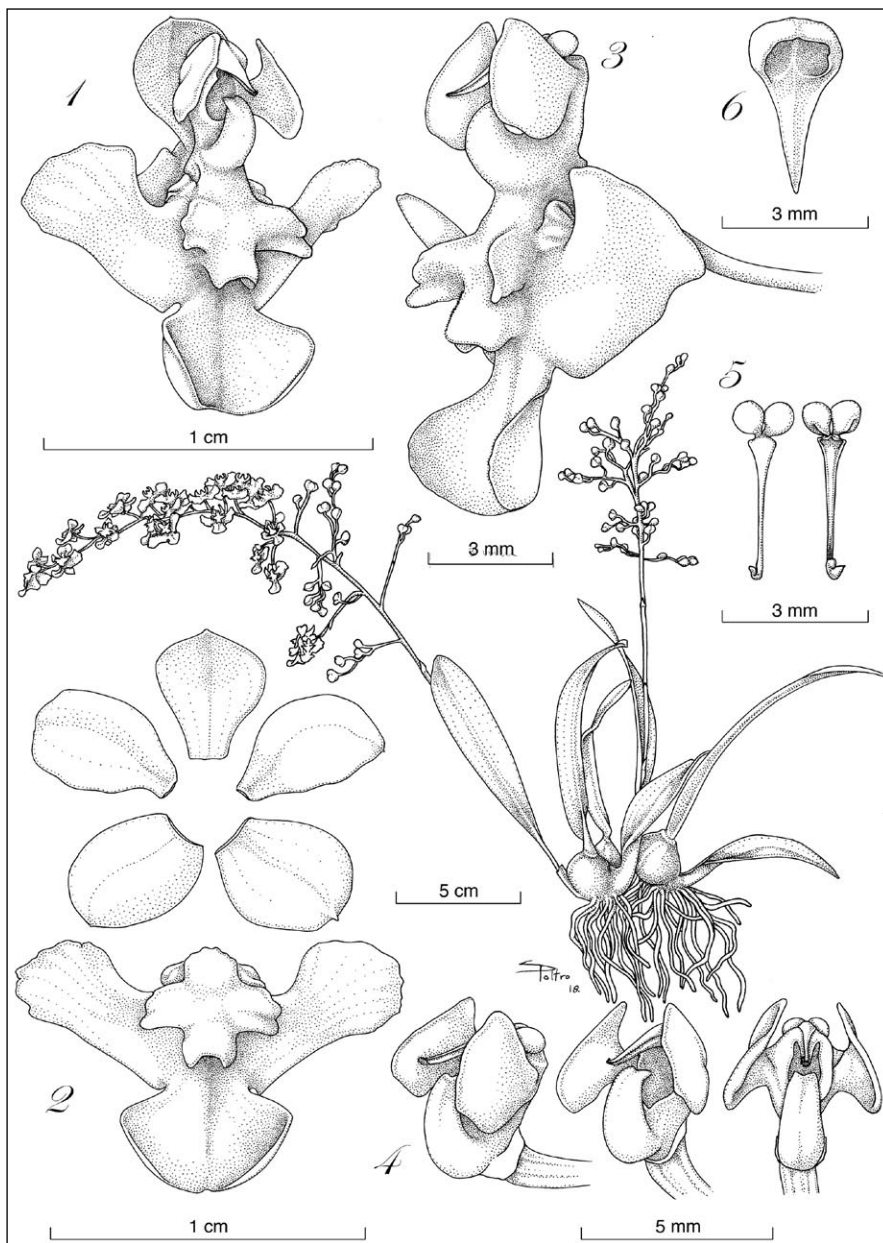
Flowers fragrant, opening in succession but reaching simultaneous anthesis, spreading, with the sepals and petals free, bright yellow to greenish yellow, the apex of the lateral calli pale yellow to almost white, the osmophores pale brown. *Dorsal sepal* obtrullate, shortly clawed, broadly obtuse with a small apicule, strongly concave, 5–6 × 3–4 mm. *Lateral sepals* shortly connate at the base, suborbicular, rounded to retuse, minutely apiculate, strongly keeled abaxially, concave, reflexed, 5–6 × 3–4 mm. *Petals* obovate, shortly clawed, broadly obtuse, apiculate, completely reflexed, 5–7 × 4–5 mm. *Lip* adnate to the base of the column, trilobed, narrowly pandurate, 10–12 mm long, 12–14 mm long across the lateral lobes; the lateral lobes oblong-subrectangular, subflabellate at the truncate to rounded apex; the midlobe transversely elliptic-reniform, emarginate, the margins sometimes undulate; disc with a complex, cruciform callus, formed by a thick pad projecting laterally into thin, flabellate-bilobed wings, apically protruding into a verruculose-granular, rectangular cushion flushing into the lip isthmus; the basal sinuses of the lateral lobes provided with knoblike, tuberculous elaiophores. *Column* ca. 2 mm long, basally provided with a tabula infrastigmatica extending in front into a thick, terete-conical, erect, upcurved, truncate to minutely bilobed horn; the gynostemium elliptical, rounded in cross-section, with a broad, elliptic stigma and a long, narrowly triangular, beaked, bent rostellum, provided with broad, obovate-subquadrate, porrect wings in var. *cheirophorum*, with thickened margins in var. *exauriculatum*. *Anther cap* cucullate, narrowly triangular, apically acuminate, two-celled. *Pollinia* two, subspherical-pyriform, cleft, the ventral groove prominent, on a narrowly, obtriangular, hyaline stipe, constricted basally, and a small, ovate-elliptic, brown to dark red viscidium.

Most species of Oncidiinae have flowers that either produce an oil reward from specialized glands or mimic flowers of the Malpighiaceae that do produce oil (Powell 2008). These flowers attract a variety of female bees of the family Apidae in the tribes Centridini, Tapinostapidini and Tetrapediini, which collect the oils to be used as provisions for larval cells and nest construction (Roubik, 1989). Oncidiinae

species that are mimics of Malpighiaceae flowers usually have bright yellow or purple flowers, oil-secreting glands on the lateral lobes of the lip, and a *tabula infrastigmatica*, or fleshy cushion, just below the column that is grasped by the mandibles of the bee (Neubig et al. 2011). In oil-deceiving species of *Oncidium*, the flowers exhibit malpigh-mimicking color and shape (Powell 2008), as well as a tabula infrastigmatica, but they lack elaiophores. Using models of color vision applicable to hymenopterans, Powell (2008) and Papadopulos and colleagues (2013) have shown that the average difference in floral UV-absorption patterns between these yellow orchids and their potential models in the Malpighiaceae is less than the difference detectable by the pollinators. Mapping color and morphological traits onto an Oncidiinae phylogenetic tree, Powell (2008) estimated that the putative malpigh-mimicry syndrome originated independently at least 14 times within the subtribe.

Among the genera of Oncidiinae that display mimicry of yellow Malpighiaceae are *Erycina*, *Fernandezia*, *Gomesa*, *Grandiphyllum*, *Lockhartia*, *Nohawilliamsia*, *Oncidium*, *Otoglossum*, *Psychopsiella*, *Rossioglossum* (*Chelyorchis*), *Tolumnia*, *Trichocentrum*, and *Vitekorchis*. Secretion of oils from specialized glands (aleaiophores) are known at least in the genera *Lockhartia*, *Cyrtochilum*, *Oncidium*, in species of *Oncidium* of the Sigmatostalix clade, *Ornithocephalus*, and *Phymatidium*, belonging to quite unrelated clades within the subtribe. This suggests that there is possibly a continuum in the syndrome of attraction of oil collecting bees, with species of *Oncidium* ranging from those that mimic malpigh flowers in color but offer no reward to others that actually produce enough oil to reward a pollinator. Biochemical, physiological and behavioral evidence confirm that the pollination of orchids with oil-secreting flowers is truly based on a floral-lipid reward system rather than an attraction-deception system (Silvera 2002).

It is not surprising that the convergence on a stereotypical syndrome of floral traits and mimicry in flower shape and color, associated with pollination by oil-collecting bees, has made difficult the traditional understanding of the relationships among



Oncidium cheirophorum. The plant.

1. Flower.
2. Dissected perianth.
3. Column and lip, lateral view.
4. Column in lateral, three-quarters and frontal views.
5. Pollinarium, two views.
6. Anther cap.

All drawn from JBL-02071(JBL-spirit) by Sara Poltronieri.

the groups of Oncidiinae, and the same circumscription of *Oncidium* (Chase et al. 2009, Neubig et al. 2011). From the point of view of its evolutionary relationships, however, *Oncidium cheirophorum* leaves no doubt about its generic placement, as it is embedded within the main spine of *Oncidium* (Neubig et al. 2011). In the phylogenetic tree based on combined DNA datasets, it is grouped into a highly supported clade together with the similar *Oncidium sotoanum*, sister to a large assemblage of mostly Central American species of the genus.

The oil-production syndrome is responsible of the waxy, shining appearance of the flowers of *Oncidium cheirophorum*, which results from the presence of lipids on the flower surface (Pacek & Stpiczyńska 2007). These lipids are produced by

secretory structures situated at the base of the labellum, along the sides of the callus. In *Oncidium cheirophorum*, oils are secreted from the bud stage until the flower eventually fades some three weeks after. As the oil accumulates beneath the cuticle, this becomes distended and wrinkled, and eventually the oils are secreted on the surface of the flower to attract *Paratetrapedia* bees (Pacek & Stpiczyńska 2007).

Oncidium cheirophorum is known from Chiapas in Mexico (var. *exauriculatum*), through the Central American isthmus, to Colombia in South America. The form without prominent wings on the column is the more frequent from central Costa Rica to the north, while toward the south only the var. *cheirophorum* has been recorded so far. Locally known as “botón de oro” (golden button), it is a fairly common species in cool to cold rain and wet forest at 1,000–2,500 meters. The deep buttery color of the flowers gave rise to its common name in English, Colombian buttercup. In their natural habitat, the plants of *Oncidium cheirophorum* are frequently found exposed to full sun at the tops of large trees or at the ends of spreading branches.

In the original protologue, Reichenbach (1872) did not specify the origin of the specific epithet, from the Greek *keiros*, hand, and *phorein*, to bring, but he was perhaps alluding to the shape of the complex callus.

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