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Phragmipedium longifolium

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Subfamily CYPRIPEIDIOIDEAE
Genus PHRAGMIPEDIUM Rolfe

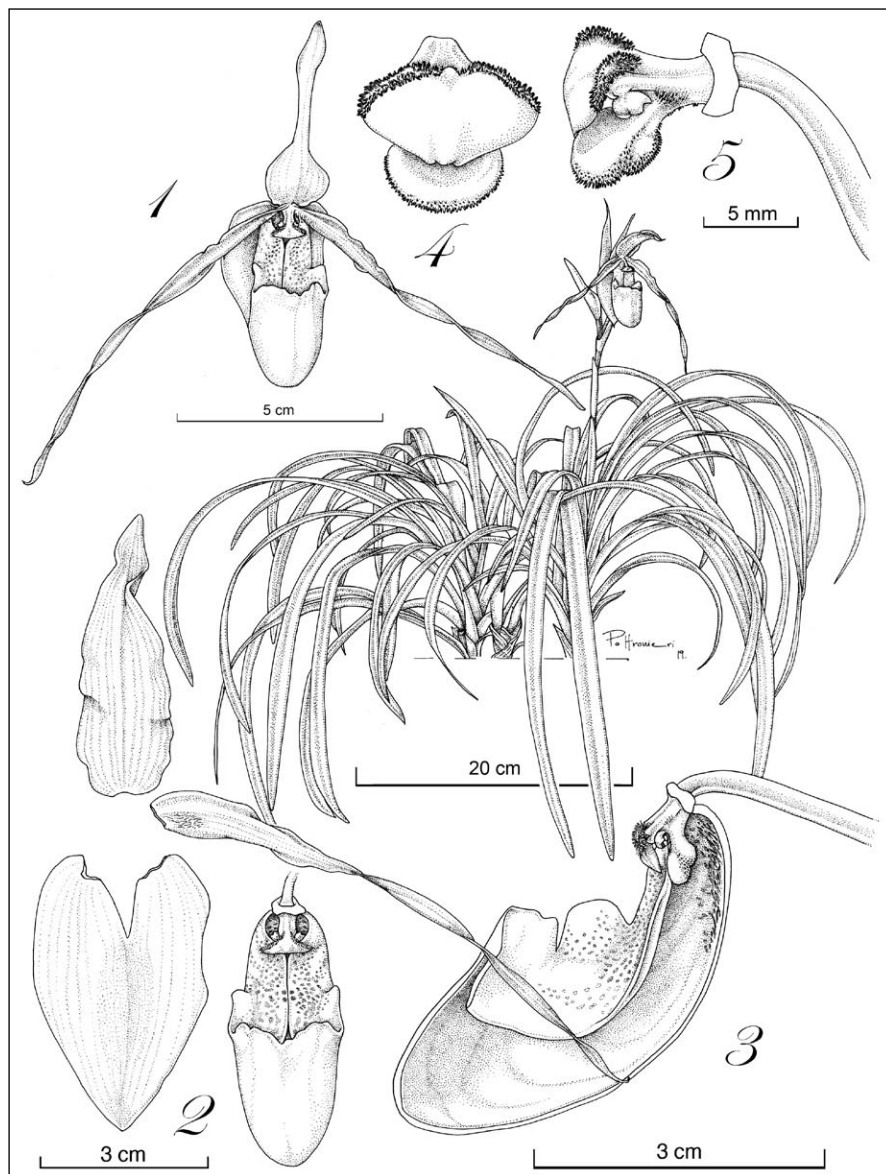
Phragmipedium longifolium (Warsz. & Rchb.f.) Rolfe, *Orchid Rev.* 4(47):332. 1896. *Cypripedium longifolium* Warsz. & Rchb.f., *Bot. Zeitung (Berlin)* 10(40):690. 1852. *Selenipedium longifolium* (Warsz. & Rchb.f.) Rchb.f. & Warsz., *Xenia Orchid.* 1:3. 1854. *Paphiopedilum longifolium* (Warsz. & Rchb.f.) Pftzer, *Pringsh. Jahrb. Wiss. Bot.* 2:6: 159. 1888. *Phragmopedilum longifolium* (Warsz. & Rchb.f.) Pftzer, *Bot. Jahrb. Syst.* 25:527. 1898. TYPE: Central America. *J. Warszewicz s.n.* (holotype, W). Heterotypic synonyms: *Phragmipedium christiansenianum* O. Gruss & Roeth, *Orchidee (Hamburg)* 52:76. 2001. TYPE: Colombia: *ex Hort.* Hans Christiansen Fredensborg, Denmark, *Roeth 083737*. *Cypripedium hartwegii* Rchb.f., *Bot. Zeitung (Berlin)* 10:714. 1852. *Phragmipedium hartwegii* (Rchb.f.) Pftzer in H.G.A. Engler (ed.), *Pflanzenr., IV*, 50(12):48. 1903. *Phragmipedium longifolium* var. *hartwegii* (Pftzer) Hallier, *Ann. Jard. Bot. Buitenzorg* 14:45. 1897. TYPE: Ecuador. Pichincha, *Hartweg s.n.* (K, W). *Selenipedium dariense* Rchb.f., *Nov. Actorum Acad. Caes. Leop.-Carol. Nat. Cur.* 35(2):8. 1869. *Phragmipedium dariense* (Rchb.f.) Garay, *Orchid Digest* 43:141. 1979. TYPE: Panama, near Cap Darién, *Seeman s.n.* *Selenipedium roezlii* Rchb.f., *Gartenflora* 20:164. 1871. *Phragmipedium roezlii* (Rchb.f.) Garay, *Orchid Digest* 43:145. 1979. TYPE: Brazil. *Roezl. s.n.* (W). *Cypripedium hincksianum* Rchb.f., *Gard. Chron., n.s.* 1:202. 1878. *Phragmipedium hincksianum* (Rchb.f.) Garay, *Orchid Digest* 43: 144. 1979. TYPE: Without locality, *T. C. Hinks s.n.* (W).

An epiphytic, caespitose, fan-shaped herb, 25–100 cm tall including the inflorescence, the mature plants vegetatively highly variable in size. Leaves linear to narrowly lanceolate, mostly coriaceous, medium green to dark green, margins finely revolute, acute, 15–50 × 3–5 cm. Inflorescence a spicate raceme, erect, successively flowered, mostly 30–40 cm long, but occasionally reaching a length up to 2 m; peduncle terete, dark green, up to 30 cm long, enclosed in the midportion by two ovate, conduplicate,

loose, glumaceous-fibrose, green bracts, 6–8 × 2–3 cm. Floral bracts conduplicate, ovate, acute, glumaceous-fibrose, green to dark purple with maturity, 7–8 × 2.0–2.5 cm. Flowers green to yellow with purple veins in the sepals, the base of the petals green, becoming purple toward the apices, the margins white in the basal half, the lip green spotted with brown. Dorsal sepal ovate, reflexed, undulate, obtuse, 4.5 × 2.0 cm, 16-veined, the veins dark red and green. Lateral sepals fused into a broadly ovate, undulate, obtuse, convex synsepal, 5–6 × 2.5–3.0 cm, glabrous. Petals linear, obtuse, undulate at the base, curled towards the apices, 75–80 × 7.0–7.5 mm, covered with purple trichomes on the base of the adaxial surface, densely covered with minute trichomes on the apex of the adaxial surface. Pouch trilobed, 5.0–5.7 × 2.0–2.5 cm, the lateral lobes infolded, flat, the midlobe calceolate, auriculate, the rim truncate, glabrous on the abaxial surface, with white trichomes on the base of the adaxial surface. Column ca. 6.5 mm long, the staminode deltoid, approx. 7.5 × 9.0 mm, covered with dark purple trichomes on the lateral margins; stigma ca. 5 × 6 mm, hidden by the staminode, covered by small papillae. Anthers bilocular, 2.5–3.0 mm long. Pollen masses granulate, 1.5–2.0 mm long.

Phragmipedium longifolium is the most broadly distributed species of the genus. It can be found from Costa Rica to Ecuador and, as most species of *Phragmipedium*, it grows from middle to high elevations but can also grow near sea level (Cribb and Purver 2017). The species is recognized by its terrestrial and lithophytic habit, growing mostly in wet rocks close to creeks or waterfalls, in streambeds, and on steep slopes (Cribb and Purver 2017). We can hardly add anything else to a summary description of the typical characters of this species, because its variability — both among different populations as well as within the same population — extends practically to all of its characteristics. Whoever was confronted with one of those specimens growing in the humid and shady slopes of the pre-mountain forests of Costa Rica and which measure up to a meter in width between the tips of the leaves, and one

of those growing in full sun in Panama, in the midst of grasses in stony soils, with hard and narrow leaves of just about 15 cm, or those anchored to the rocks along the streams, which spend part of the year submerged by the rushing water, would certainly believe to observe three distinct species. Also driven by the desire to propose to the horticultural market new species of a genus that has historically inflamed the minds of collectors, botanists, collectors and horticulturists of the past have tried to identify “discrete” entities in the continuum of variation of *Phragmipedium longifolium* and to give them names, both at the species and variety level. The long and incomplete list of synonyms that opens this chapter of the *Refugium Botanicum* perhaps provides an idea of how many intermediate “forms,” defined for one or more aspects of the floral and vegetative morphology of *Phragmipedium longifolium* have gained taxonomic recognition. We have not gone into detail here with respect to other formal names, such as var. *coloratum*, var. *gracile*, var. *splendidum*, forma *minutum*, and probably also *Phragmipedium chapadense*, as the list of synonyms or possible synonyms of this species would have consumed all the space available for our presentation. Most authors are now in agreement on the fact that the characters used to circumscribe these variations in a formal way are generally inconsistent and in turn variable not only between one individual and another of the same region or population, but also in successive blooms of the same individuals, showing a mixture of variations across multiple taxonomic features. In a recent, annotated checklist of the genus *Phragmipedium*, Frank Cervera (2020a) well summarized the inherent impossibility “to classify this species in anything other than broad terms,” and the taxonomic necessity to treat *Phrag. longifolium* using a broad, versus narrow, species concept. Even though the concept of “ochlopecies” as proposed by Cronk (1998) to define a species of such complex pattern as to defy formal classification, has not gained broad consensus and use among biologists, it seems reasonably useful to understand the highly polymorphic species



382(2):167–181.

Phragmipedium longifolium. The plant.

1. Flower.
2. Dissected perianth.
3. Dissected lip, lateral view.
4. Column, frontal view.
5. Column, lateral view.

All drawn from Warner 22 by Sara Poltronieri.

of *Phragmipedium*. Even though variation in *Phragmipedium* is partly correlated with ecology and geography, the connections between taxonomic characters and specific locations is weak in the genus, with potentially diagnostic taxonomic characteristics present across the entire range of a given species (Cervera 2020b). In a companion paper to its taxonomic treatment, Cervera also presents an interesting account of the main habitats where the species is found, also showing in this case a broad array of suitable ecological niches, in part accounting for the extreme variation of *Phrag. longifolium* as to vegetative morphology. To quote him textually, the species can be found “in natural populations growing in bright light and low light under the jungle’s dense canopy. Natural plants with an overall leaf span over two meters have been seen growing a few meters from

plants not bigger than 30 centimeters” (Cervera 2020c).

Given its broad distribution, *Phrag. longifolium* is sometimes found growing sympatrically with other closely related species of the genus, which promotes the formation of natural hybrids; for example, *Phragmipedium* × *talamancanum* — a hybrid between *longifolium* and *humboldtii* — in Costa Rica and Panama, and *Phragmipedium* × *roethianum* — a hybrid between *longifolium* and *hirtzii* — in Ecuador (Gruss and Kalina 1998, Pupulin and Díaz-Morales 2018).

The pollination of *Phrag. longifolium* involves a brood-site deceptive mechanism in which syrphid flies act as the pollinators. The insect is attracted to the flower by visual and chemical cues that mimic the presence of aphids. Some species of syrphid flies typically oviposit on places with the presence of aphids because when developed, the larvae feed on the aphids. When the fly approaches the flower, it falls inside the calceolate lip and the only way it can escape is through the lateral openings where the pollen masses are located. The departing insect, carrying pollen, then visits a new flower where the pollen masses are transferred to the stigma when the insect tries to escape from that new flower (Pemberton 2013, Díaz-Morales et al. 2019).

This species is not difficult to flower and is not demanding with regarding to its potting mix. A mix of different substrates can be used including bark, perlite, charcoal, pumice, gravel and moss. Because this species naturally grows in humid areas, sometimes even in running water, what the plants mostly need is a substrate that holds enough moisture to emulate such conditions. As with many other species of *Phragmipedium*, *Phrag. longifolium* grows better when exposed to fresh air and air movement. During the spring and summer it can be kept outside as long as the temperatures are not below 50 F (10 C) or above 77 F (25 C), the temperature range that this species experiences in its natural habitat. The species is successive blooming meaning that after a flower drops the next bud will open although it is not uncommon to sometimes have two flowers open at the time. In exceptional cases, and depending on the growing conditions, some plants have presented up to six flowers open at the same time. Under suitable conditions the plants can bloom throughout the year. Due to its sympodial growth habit, it is important to repot the plant so it always has enough space.

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