THE GENUS PHRAGMIPEDIUM IN BRAZIL: A JOURNEY TO A STRANGE WORLD

FRANK CERVERA

FOR THE *Phragmipedium* enthusiast, Brazil is a poorly understood place. Brazilian species are difficult to keep alive in cultivation and thus are rarely seen and rarely used in commercial and hobby hybridization. When was the last time you saw a *Phrag. vittatum* or a *Phrag. klotzschianum* at an orchid show? When was the last time you saw a *Phrag. lindleyanum* in all its glory with ten or more flowers open simultaneously? Where are all the *Phrag. vittatum* hybrids? The rarity of the Brazilian species outside of their natural habitats and the small sample size applied to prior attempts to classify them has led to persisting taxonomic questions.

What must we learn to grow these species effectively, clarify their taxonomy, and document their ecology?

In an effort to answer these questions, the known populations of Brazilian phragmipediums have been visited and studied for over twenty-five years. Specific ecology, species biology, and floral and vegetative characteristics were noted. Today, three known and accepted Brazilian species of *Phragmipedium* exist. Each species is known from a few isolated populations separated by great distances in different parts of the country. Although home to only three species of *Phragmipedium*, Brazil represents over 50% of the entire range of the genus.

There is a fourth species, *Phrag. brasiliense* that is alleged to come from Brazil or is a possible natural hybrid with one of the Brazilian species. I am intimately familiar with the plants used to describe *Phrag. brasiliense*. No natural population of phragmipediums has been encountered meeting the description of *Phrag. brasiliense* at the alleged type location nor anywhere else since the type plants were allegedly imported or formally described. This alleged species is a man-made hybrid.

During these twenty-five years, what was learned was surprising and reinforced that the popular conception of a one-size-fits-all cultural approach to the genus must be reevaluated. Also, an expanded sample size coupled with direct observations did not support the old taxonomic treatment.

Several factors separate the Brazilian *Phragmipedium* species from their Andean cousins. Unlike their Andean cousins, they are seasonal and inhabit fairly consistent ecosystems year-round. Additional factors include vast geographical distances and significant ecological distinctions. Each Brazilian species grows in an ecosystem unique and distinct from the other Brazilian species and their Andean cousins. Brazilian species have adapted to partially dry conditions, separating them from most species found throughout the Andes. Brazilian phragmipediums do not conform to the traditional

The range of all *Phragmipedium* species in Central and South America.

The three Brazilian *Phragmipedium* species' locations in Brazil.

culture of constant moisture, moderate light levels, and saucers of standing water.

Brazilian phragmipediums, consistent with the genus overall, are variable across multiple vegetative and floral characteristics. The flowers evolve after opening (anthesis) with color, shape, and ratio changes; specific ecology is tied to each species concept. Brazilian *Phragmipedium* species are ochlospecies—a taxonomic species concept characterized by large amounts of variation unrelated to geography or ecology. Our taxonomy needs to be adjusted. There is no evidence of natural hybridization in Brazil.

Applying what was learned to the culture and understanding the species concept allows us to cultivate the Brazilian species and make ex-situ conservation efforts more effective. Applying what we learned answers lingering taxonomic questions.

Different and Unique Habitats

What makes Brazil so different and unique for phragmipediums? The annual weather cycle is unlike that of the Andes. The Andes generally run north and south from Central America through South America along the continent's Pacific edge, where the majority of *Phragmipedium* species are found. The Andes do not pass through any part of Brazil. We find the Brazilian phragmipediums in the hills of the Atlantic seaboard, the Brazilian Central Plateau, and the Gran Sabana, where the climate and weather patterns are unique.

The Andes support phragmipedium habitats that are more consistent throughout the year. Brazilian *Phragmipedium* habitats cycle through distinct wet and dry seasons that impact all *Phragmipedium* habitats. These cyclical seasons result in two species of Brazilian *Phragmipediums* being seasonally dry, and a third has a distinct annual growth cycle that is weather-dependent.

The annual weather cycle, combined with habitat and ecological distinctiveness and isolation, produces *Phragmipedium* habitats that can be found nowhere else in the broader range of the genus. *Phragmipedium* habitats in Brazil are isolated from other species by great distances. This isolation is unlike the *Phragmipedium* habitats that we see throughout the Andes that, in many places, overlap other species,

Secondary roadside habitats are common throughout the Andes. In fact, several of the newer *Phragmipedium* species have been described based on secondary roadside populations of plants. Some Andean roadside populations have more than one *Phragmipedium* species growing intermixed. The author has seen and studied roadside populations from Panama south through Peru with no noticeable gaps. During this period, only one secondary population of Brazilian phragmipediums was seen and documented along an abandoned railroad cut. This makes finding and researching phragmipediums in Brazil challenging. The effort often requires airline flights, many hours of driving and walking, and some luck.

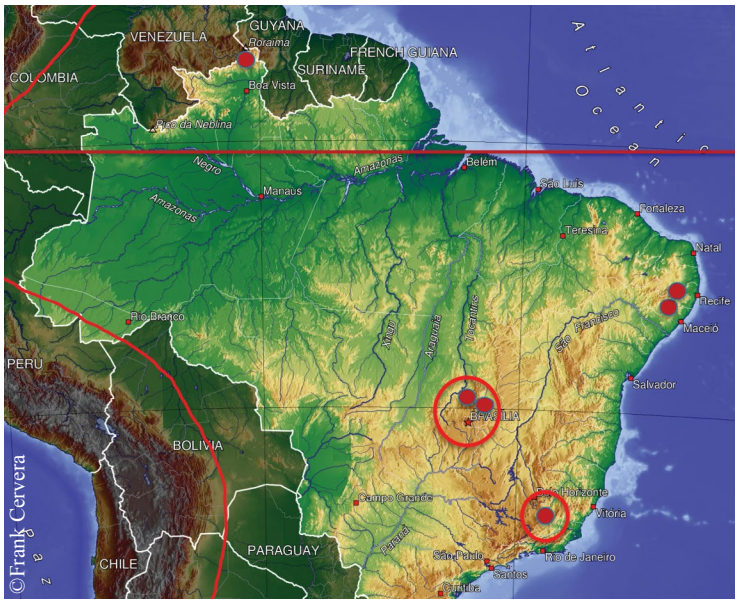
The Species

Phragmipedium vittatum (Vellozo) Rolfe, *Orchid Rev*. 4: 332 (1896).

Syn:

Cypripedium vittatum Vell., *Fl. Flumin*. 9: t. 62 (1831).
Selenipedium vittatum (Vell.) Rchb. f., *Ill. Hort*. 23: 57 (1876).
Cypripedium paulistanum Barb. Rodr., *Gen. Spec. Orchid*. 1: 203 (1877).
Cypripedium vittatum var. *breve* Rchb. f., *Gard. Chron*., n.s., 15: 656 (1881).
Cypripedium binotii Anon., *Ill. Hort*. 34: 19 (1887).
Paphiopedilum vittatum (Vell.) Stein, *Orchid.-Buch*: 491 (1892).
Selenipedium paulistanum (Barb.Rodr.) Rolfe, *Orchid Rev*. 1: 239 (1893).
Selenipedium vittatum var. *breve* Cogn., C. F. P. von Martius & auct. suc. (eds.), *Fl. Bras*. 3(4): 12 (1893).
Paphiopedilum paulistanum (Barb.Rodr.) Pfitzer, *Bot. Jahrb. Syst*. 19: 42 (1894).

Phragmipedium vittatum was first described by a Brazilian friar, Jose Mariano da Coneicao Vellozo, in the 1780s, making it the first *Phragmipedium* ever described. However, it was not until 1831 that the illustrations were published in Flora Fluminensis. Vellozo's original specimens have never been found; however, his illustrations in Flora Fluminensis have survived. Lindley does not mention Vellozo's *Phrag. vittatum* in his work on slipper orchids as late as the 1840s, but Reichenbach did in 1852. The type location listed by Vellozo is the Alps north of Rio de Janeiro. Since then, *Phrag. vittatum* has been found on the Brazilian central plateau, growing in peat bogs, exposed to bright light, mixed grasses, and low-lying shrubs. The habitats on the central plateau are surrounded by seasonally dry "cerrado," a vast tropical savannah.



The known habitats of *Phragmipedium vittatum*.

Phragmipedium vittatum

A peat bog on the Brazilian central plateau with *Phrag. vittatum*.

Phragmipedium vittatum is rare, if not the rarest of the *Phragmipedium* species. Habitats contain perhaps a few hundred plants and are subject to ever-present agricultural encroachment. Unlike other *Phragmipedium* species, *vittatum* is not fed by runoff from the surrounding jungle or excess rainfall. The peat bogs on the central plateau where this species is found are fed by underground springs that feed nearby streams. A keen eye can discern small holes in the ground throughout the habitats that feed spring water to the bogs. The constant, year-round flow of spring water from below the habitat keeps the roots of *Phrag. vittatum* constantly moist. The surrounding environment, immediately outside the bog area, is seasonally dry. Cattleyas are companion orchids, if that is an appropriate term, and are found growing on nearby rocks, as well as several species of *Cyrtopodium*, *Encyclia*, *Catasetum*, *Mormodes*, and *Epidendrums.* These species can be found close to, but outside, the bogs and are subject to long periods without rain. This dichotomy between the omnipresent flowing spring water at the roots and, at times, dry, arid air in which the vegetative parts live presents unique challenges to the grower. The uniqueness of the envi-

A streamside bog that is home to *Phragmipedium vittatum*.

ronment and ecology are part of what defines *Phrag. vittatum* as a species.

P*hragmipedium vittatum* is as variable as all other species in the genus, and flowers continue to evolve in color, shape, and ratios after anthesis or opening. Most flowers I have observed in natural populations have the fused labellum and generally rhombic staminode of *Phrag. vittatum*. The ratio of the length of the synsepal to the pouch length varies as the flower ages. The claw face, the area of the labellum (pouch) that forms the tube between the opening of the pouch and the escape hatch at the back close to the stigma and pollinia, has a somewhat triangular patch of closely spaced brown spots with a more or less vertical line of green spots up and down each side of the claw that is distinctive. The depth of color of the brown and green spots varies from plant to plant and with the age of the flower.

Phragmipedium vittatum's most closely allied cousin is *Phrag. longifolium*, with which *vittatum* shares commonalities in color, staminode, and general floral morphology. There are, however, three unique characteristics that separate *Phrag. vittatum* from *longifolium*. One is the distinct yellow-to-white margin to the leaves.

Soil in which *Phrag. vittatum* grows.

Phrag. vittatum staminode closeup showing the center ridge and the hairs along the top edge.

The margin is quite wide, measuring ~2 mm on mature plants, and can be seen through the grasses from a distance. If you have to look closely to discern the margin of the leaves, your plant is probably not *Phrag. vittatum*. This margin is equally obvious on small seedling plants (15 cm [6 inches]) I have seen *in situ*. Second are the differences in the pattern of brown and green spots on the claw face. While both have a vertical line of green spots on the sides opposite the center of the claw, brown spots are generally in a triangular arrangement on the claw of *Phrag. vittatum*, while the spots are spread across the entire *Phrag. longifolium* claw. The third is the distinct ecology and geography. *Phragmipedium vittatum* inhabits bogs along the Brazilian central plateau south of the equator that are subject to long periods of seasonal dryness. *Phragmipedium longifolium* habitat has fairly uniform weather throughout the year. It can only be found north of Ecuador in the Andes and grows on more or less vertical rock surfaces overhanging rivers and streams, along roadsides, and in open areas recently degraded by human activity.

Phragmipedium vittatum petal attitude is always low, with most flowers having petals that run parallel to the sides of the labellum, a characteristic not seen in *Phrag. longifolium*. The lateral petals of *Phrag. vittatum* tend to

Phrag. vittatum detail of the claw face and characteristics of the petals.

The distinctive yellow margin on the leaf of *Phrag. vittatum*.

be shorter and less twisted than those of *Phrag. longifolium*, however, petal length and the number of twists in the petals of *Phrag. longifolium* varies, and there can be some overlap in length and appearance.

Phragmipedium vittatum has a distinct growth and flowering season, whereas *Phrag. longifolium* can be found in flower all year; this significant biological difference should be noted. *Phragmipedium vittatum* exists in a larger ecosystem with a distinct dry season that it mirrors in its annual growth cycle. Generally, plants receive no rain from June through September. Plants are sustained by natural spring water from below during the dry season. The plants stop growing during the dry season, and those in natural populations do not produce flowers. The risk of rot is increased during the dry season if one tries to cultivate this species.

Light levels are intense year-round. The only protection from the tropical sun is the nearby grasses, but they don't provide much. In cultivation, the low light levels in the northern hemisphere during the winter result in rot or no or poor flowering. The pH has been recorded in situ as 7.0, 7.2, and 7.4; the latter followed a fire that recently destroyed one of the habitats. *Phragmipedium vittatum* is a warm grower.

Like several other species in the genus, it is strongly suspected that *Phrag. vittatum* self-pollinates. However, more field study is needed to confirm this.

Phragmipedium klotzschianum (Rchb. f.) Rolfe, *Orchid Rev*. 4: 332 (1896).

Syn:

Cypripedium klotzschianum Rchb. f., *Linnaea* 22: 811 (1850).

Selenipedium klotzschianum (Rchb. f.) Rchb. f., *Xenia Orchid*. 1: 3 (1854)

Cypripedium schomburgkianum Klotzsch ex M. R. Schomb., *Bot. Remin. Br. Guiana*: 59 (1876).

Selenipedium schomburgkianum (Klotzsch ex M. R. Schomb.) Desbois, *Monogr.* Cypriped.: 141 (1888).

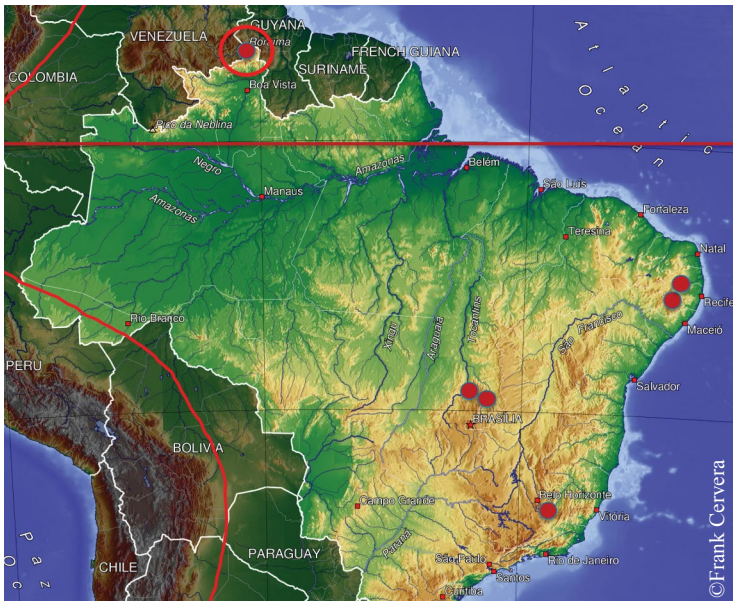
Paphiopedilum klotzschianum (Rchb. f.) Stein., *Orchid.-Buch*: 473 (1892)

Phragmipedium klotzschianum is a small species vegetatively and ecologically similar to *Phrag. pearcei*, *Phrag. hirtzii, Phrag. cabrejosii*, and *Phrag. caricinum*. When out of bloom, it is difficult to differentiate the species in this subsection. Each species inhabits a similar ecological niche, on the rocks and boulders inside the confines of rivers large and small below the high-water line. *Phragmipedium klotzschianum* is the only species from this group not found in the Andes.

Phragmipedium klotzschianum has long, stoloniferous (horizontal and above the ground) rhizomes up to 10 cm (4 inches). Flower spikes can range from 20 to 40 cm (8 to 16 inches), but most plants in natural populations and cultivation have flower spikes closer to the shorter end of the range. Spikes can carry up to four flowers blooming sequentially. The claw face is white with

Phragmipedium klotzschianum

In this ravine, *Phrag. klotzschianum* is found on the rocks.



The only known habitat of *Phragmipedium klotzschianum* in Brazil.

brown and green spots on the labellum. In this species, the brown and green spots, quite common in the genus, are on the rim of the pouch (labellum) and not in the middle of the white claw face. The labellum is obovate (generally egg-shaped), with the broadest part just below the middle of the pouch. The shape of the pouch is unique and does not overlap with other species in the same subsection. Other differentiating characteristics are the dense, hairy ovary and the staminode. The staminode is very close to the caudatum group staminode in general shape. There are two side lobs with darker reddish-brown tips. When in flower, this species is easy to recognize.

Phragmipedium klotzschianum is limited to a small range for the genus. Several large populations are along the edges of rivers throughout the Gran Sabana in Venezuela, Guyana, and northern Brazil. The range overlaps with the range of *Phrag. lindleyanum*. However, the two species have not been observed nor reported to cohabitate, nor are there any natural hybrids. The Gran Sabana is another area that experiences a long dry season. *Phragmipedium klotzschianum* subsists on the tops of rocks within the confines of the river in an area similar to the other Brazilian phragmipediums. It starkly contrasts the Andes ecology, which is seasonally dry and consists mainly of grassland.

Here, we see another species that seems to exist in two different worlds. The roots are densely packed, with occasional mosses and river sand. The roots of the plants remain moist and are sustained by the humidity of the passing water. The vegetative parts of the plants exist above this moist mat in an arid environment that can go for long periods without rain. The species grows on rocks, in full sun, and accumulated river sand during an extended dry season. No large trees are overhanging the rivers in the Gran Sabana, as we see in the Andes.

The *Phrag. klotzschianum* growing environment would not appear to be an ideal location for any species of *Phragmipedium* and is contrary to the one-size-fits-all approach to cultivating this genus. *Phrag. klotzschianum* is very difficult to maintain in cultivation. The species needs bright light since plants have limited protection from the sun. Near equatorial light levels, without little, if any, shade protection, are vastly different from the substantial variations in light levels seen in northern latitudes. Add shade cloth and a saucer of water, resulting in plants that quickly decline. Also, *Phrag. klotzschianum* is a warm grower. The author knows only one commercial nursery with prolonged success with this species. Most hobbyists see their plants quickly decline in traditional phragmipedium growing conditions. *Phragmipedium klotzschianum* inhabits a strange and unique world. Our culture needs to adapt to have prolonged success with this species.

It is strongly suspected that *Phrag. klotzschianum* self-pollinates. However, more field study is needed to confirm this.

Phrag. klotzschianum flowering on a rock below the high-water line.

Phragmipedium lindleyanum (R. H. Schomb. ex Lindl.) Rolfe, *Orchid Review* 4: 332. 1896.

Syn:

Cypripedium lindleyanum R. H. Schomb. ex Lindl., *Gen. Sp. Orchid. Pl.*: 53 (1830).

Selenipedium lindleyanum (R. H. Schomb. ex Lindl.) Rchb. f., *Xenia Orchid*. 1: 3 (1854).

Paphiopedilum lindleyanum (R. H. Schomb. ex Lindl.) Pfitzer, *Bot. Jahrb. Syst*. 19: 41 (1894).

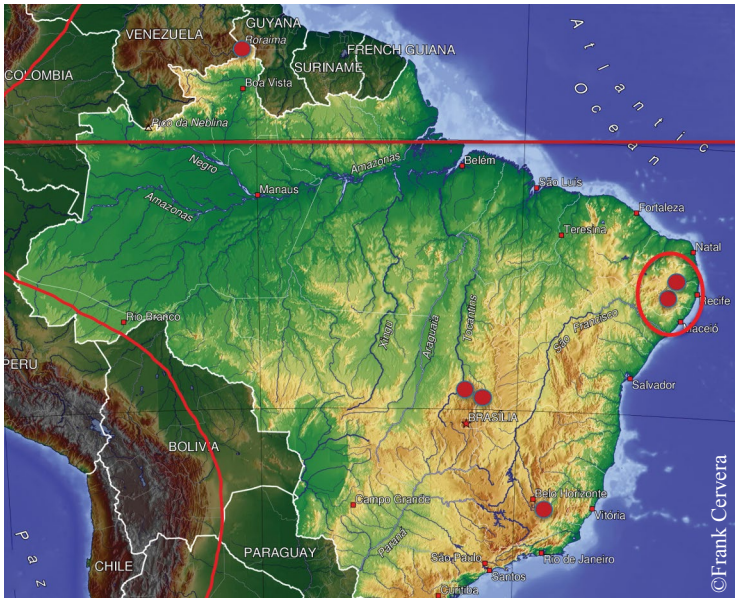
Phragmipedium sargentianum (Rolfe) Rolfe., *Orchid Review* 4: 332 (1896).

Phragmipedium kaieteurum (N. E. Brown) Garay. *Orchid Digest* 43: 136. 1979.

Phragmipedium lindleyanum has a wide distribution range, with most populations scattered throughout Venezuela, Guyana, Suriname, and French Guiana. There is a single area in Pernambuco State, Brazil, along the Atlantic seaboard, south of the equator, where several populations are found.

Phragmipedium lindleyanum is a distinct species and is not easily confused with other species in the genus. Like all species of *Phragmipedium*, *Phrag. lindleyanum* is variable across multiple vegetative and floral characteristics, including the inflorescence and hairy flower parts. However, it is not without its confused taxonomic past, and like other species in the genus, natural

Phragmipedium lindleyanum



The known habitats of *Phrag. lindleyanum* in Brazil.

Phrag. lindleyanum leaves with a yellow margin.

populations do not support the contentions made in support of breaking *Phrag. lindleyanum* out into multiple species.

In 1979, Garay stated that *Phrag. kaieteurum* could be differentiated from *Phrag. lindleyanum* based on "the shape and color of the leaves that lack a yellow margin, the color of the flowers, and the shape of the staminode." However, the leaves of the type material used for Garay's description have the same cells on the leaf margins as plants throughout the range, the difference being that they are difficult to see on the small plants he used. The lack of a yellow leaf margin has also been used to support *Phrag. sargentianum*. The leaves of Phrag. lindleyanum have a yellow margin that varies from subtle to obvious. The leaves can be brittle, shiny, and stiff, indicative of the partially xerophytic nature of the species.

A red-flowered *Phrag. lindleyanum* with a triangular staminode.

Phragmipedium kaieteurum was also proposed to have more glabrous (less hairy) sheaths and floral bracts and different colored flowers. Plants from the type population demonstrate varying degrees of pubescence, with those with shorter hairs being more prevalent. However, the amount and length of the hairs on the flowers are variable throughout all known populations from Venezuela to Pernambuco, Brazil. They cannot be used as a distinguishing taxonomic characteristic.

Phragmipedium sargentianum was originally differentiated from *Phrag. lindleyanum* based on "the presence of a pair of small white tubercles [a small, rounded projection] on the inner margin of the side lobes of the lip." It is unclear if the herbarium specimens of the two previously described species, *Phrag. lindleyanum* and *Phrag. kaieteurum* were examined as both have the small, white tubercles used to justify *Phrag. sargentianum*. Some authors also cite the considerable distance between the populations in Pernambuco, Brazil, and those in Venezuela, Guyana, Suriname, and French Guiana.

Other authors have attempted to differentiate *Phrag. sargentianum* based on the shape of the staminode as being triangular rather than square, a dull, yellow flower versus a greener flower, larger floral bracts, and a taller inflorescence. There is no mention of the color red, although that color is present in varying degrees in all flowers. Based on observations, a dull, yellow color does not predominate in Brazilian populations. The Brazilian populations do have plants with a yellow margin to the leaves.

Phrag. lindleyanum flowers with both triangular- and quadrangular-shaped staminodes.

The claw face of *Phrag. lindleyanum*.

Phrag. lindleyanum inflorescences heights vary.

Phrag. lindleyanum roots on the granite surface.

Phrag. lindleyanum roots during the dry season

The author has seen large plants of *Phrag. lindleyanum* in private gardens near the habitats in Pernambuco that flower in subsequent years with smaller floral bracts and shorter inflorescence than the same plants did in their natural habitats (phenotypic plasticity). Plants in Pernambuco, Brazil, have a quadratic staminode alongside plants with triangular staminodes. Flower color is highly variable and can change with cultural conditions. The claw face is also heavily spotted, with small brown spots across the entire surface with two green spots at the center of the claw. The inflorescence height varies depending on the size and age of the plant. The commonalities and ecological consistencies are often overlooked by authors focusing solely on minute differences in small sample sizes.

Phragmipedium lindleyanum, like its Brazilian cousins, inhabits ecosystems that cycle through an annual wet and dry season. *Phragmipedium lindleyanum* is a partially xerophytic species. The species has a distinct dry season, generally from December through March. However, even in the dry season, the humidity remains between 50 and 60 percent as the habitats are all close to the Atlantic seaboard. Companion genera include *Catasetum*, *Encyclia*, *Cyrtopodium*, *Epidendrum,* and *Brassavola*, each requiring a distinct dry season. In some locations, plants of *Phrag. lindleyanum* can be found sharing their root mass with *Catasetum* bulbs. *Phragmipedium lindleyanum* can be found along the margins of small groups of trees atop large granite hills and in more exposed locations at the edges of low-lying shrubs. During the wet season, surrounding shrubs and trees are green and lush and provide some shade.

It rains daily during the rainy season, and habitats receive copious amounts of water. This necessitates a mechanism for removing that water as quickly to keep everything in the ecosystem from rotting. That mechanism is the granite hill itself, being round, smooth, and with exposed rock. *Phragmipedium lindleyanum* spreads its roots out along the surface of the granite, roots that are covered in a thin, transient layer of passing organic material no more than one centimeter thick. In places, the roots can be seen without any organic material making their way across the surface of the granite, exposing the roots to light and air. During the rainy season, small waves of water can be seen leaving the immediate areas where *Phrag. lindleyanum* grows.

Light levels are reduced due to ever-present rain clouds and an overcast sky. During the dry season, the rain stops, the clouds disappear, surrounding vegetation drops its leaves and *Phrag. lindleyanum* waits, under almost full sun, for the dry season to end.

Conclusion

For the *Phragmipedium* enthusiast, Brazil is a journey to a strange world. "Xerophytic" and "*Phragmipedium*" have always been considered antithetical. However, as a visit to the habitats of phragmipediums in Brazil shows, there are indeed species in this genus that inhabit landscapes far removed from our preconceptions of the genus. The amount of light the Brazilian species require for long-term successful cultivation is not the low light and partially shaded confines of greenhouses and windowsills in the northern hemisphere.

I propose the reason we see so few of these species in cultivation is that we have been cultivating the Brazilian species under the preconceptions of the one-size-fits-all approach. That doesn't work for these species. When we do see these species in the background of our hybrids, it is more often than not mixed with one of the moisture-loving, year-round species such as *besseae*, *schlimii*, or *longifolium*, which give our hybrids a high tolerance and adaptability to year-round high levels of moisture, low light, and a constant twelve-month culture regimen that the Brazilian species lack in their natural habitat.

Unlike the populations of phragmipediums we find throughout the Andes, from Southern Mexico south through Peru and into Western Bolivia, vast distances separate Brazilian phragmipediums, and they do not cohabitate, making accidental natural hybridization extremely unlikely. Not only is natural hybridization between and with Brazilian phragmipediums highly un-

likely due to the significant ecological disconnect with the Andean species, but natural hybridization between an Andean species and a Brazilian species is also, in the opinion of the author, a biological, ecological, and physical improbability. Postulations to the contrary would need strong evidentiary support.

Taxonomically, we see adaptive vegetative characteristics, progressive floral attributes, and ratios, not static characteristics as previously supposed. There is a high probability of self-pollination in both *Phrag. vittatum* and *Phrag. klotzschianum*. We see highly variable floral and vegetative characters within each species concept that define the Brazilian phragmipediums as ochlospecies (a taxonomic species concept characterized by large amounts of variation unrelated to geography or ecology). We also see commonalities in the dispersion and placement of brown and green spots on the face of the claw. These commonalities must be accounted for in any future attempt to break these species into more species. The author proposes that it is the face of the claw, with its brown and green spots, that is the lure for pollinators and not the staminode, which is then free to vary in form. Natural populations do not support the old taxonomic treatment of *Phrag. lindleyanum*.

The plants and other species of orchids we find nearby are not what one would expect to see as neighbors for phragmipediums. In our greenhouses, windowsills, and under lights, we typically keep cattleyas, encyclias, and catasetum on the other side of the growing area, or we avoid those genera altogether as incompatible with phragmipediums. During the dry season, being near the *Phragmipedium* habitats is like being on Mars when expecting to be in a lush jungle. The Brazilian species of *Phragmipedium* have adapted to survive in their strange worlds, their unique ecological niches outside the Andes. These adaptations should be respected in cultivation if we are to be successful.✾

About the Author

Frank Cervera is a biologist who has studied the ecology, biology, and taxonomy of the genus *Phragmipedium* throughout natural populations for the past twenty-five years. His journey with *Phragmipedium* started in the 1980s when one of his ecology professors introduced him to orchids, which led him to buy a plant of *Phrag. longifolium*. After many years of trying to understand which *Phragmipedium* species were which and why he was killing so many plants, Frank decided to take the matter into his own hands. He has spent twenty-five years traveling to the jungles of Mexico, Guatemala, Panama, Columbia, Ecuador, Peru, Venezuela, Guyana, and Brazil, studying the genus *Phragmipedium*, its taxonomy, ecology, and culture. Frank has met some of the most well-known names and personalities in the *Phragmipedium* community along the way. He has been to some of the most famous and infamous orchid nurseries in South America at critical times in the history of the genus and asked them to retell their stories. Frank has had the unique opportunity to go to the source and examine plants and flowers. Frank currently works in the Financial Services industry and resides with his family and his orchids in New York.