

# Crippling



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- [1] Normal flowers of *Rhyncholaeliocattleya* Golden Queen 'Regina' (Golden Crown x *C. Miguelito*). Grower: Rita Crothers.
- [2] *Rhyncholaeliocattleya* Golden Queen 'Regina' with crippled flowers. Grower: Rita Crothers.



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# A Genetic Problem in Yellow and Art-Shade Cattleyas

BY RON MIDGETT

AN ARTICLE REPRODUCED ON THE AOS Web site from an early issue of the *AOS Bulletin* (Noble 1949) discussed “crippled” flowers, which I refer to as deformed for reasons to be explained shortly. I decided that further discussion and a little history might be in order. The crippling to which I am referring appeared early in the breeding of yellow and art-shade cattleyas and alluded to a precise genetic problem. It was the bane of our efforts to breed good nonfading yellow cattleyas because the parents with the best color crippled.

This crippling, which caused a thickening of tissue in the petal, became worse with age (the older the plant, the worse the crippling). It would start as a slightly thickened line of tissue running more or less parallel to the long axis of the petal. It is thought that this tissue was an attempt to create another stamen because in the worst cases a knob of tissue would form at the distal end of the thickened tissue. Inside this knob, one could usually find poorly formed but unmistakable pollinia. In the two pictures of *Rhyncholaeliocattleya*<sup>1</sup> Golden Queen ‘Regina’ (Golden Crown × *C. Miguelito*), one shows a flower without crippling and the second, taken at a later blooming, shows severe crippling. This disfigurement of the flower was disheartening. Since crippling refers to a genetic problem, the kinds of flower anomalies discussed in Noble (1949) that tend to be sporadic and not genetic should be called deformities, not crippling, and some of these may be related to culture.

It was at the time and is still believed that the crippling came from the use of a particular clone of *Cattleya dowiana* (hort. var. *rosita*), a form with creamy white sepals and petals tinged with purple. Another theory posed that crippling was a result of breeding *C. dowiana* with *Cattleya bicolor* that resulted in *Cattleya Iris* (1901). There was some fluke in the way the genes from these two species interacted that caused the problem. I subscribe to the former theory, that *C. dowiana* var. *rosita* is the source of the crippling genes.

From the late 1950s through the 1980s, there was a concerted effort in California on the part of certain breeders to produce crippling-free large-flowered richly colored



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yellow cattleyas because few existed. Most notably, these breeders included Fred A. Stewart Orchids (Stewart Orchids) and Rita Crothers. Ernest Hetherington at Fred A. Stewart Orchids and Crothers had identified certain parent plants that tended to suppress or even prevent crippling. These two were *Rhyncholaeliocattleya*<sup>1</sup> Xanthette ‘Chartreuse’ (Mindenette × Xanthedo) and

[3] *Rhyncholaeliocattleya* Primate ‘Daffodil’, AM/AOS (Primrose × Heatonensis) was used by Rita Crothers as a parent to overcome crippling because it did not have any of the classic early yellow parents in its background. *Cattleya dowiana* appears only once as a great grandparent. Grower: Rita Crothers.

[4] *Cattleya Iris* (*dowiana* × *bicolor*) (1901), an early grex in the background of nearly all yellow cattleya hybrids. *Cattleya Iris* was remade in the 1960s. The range of colors was broad, ranging from green or yellow to the copper orange seen here. Grower: Rita Crothers.

<sup>1</sup>Formerly *Brassolaeliocattleya*.





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[5] *Rhyncholaeliocattleya* Fortune (Xanthette × *C. Memoria* Albert Heineke) is a fine hybrid. In the 1960s, its yellow flowers of good form and saturated color set the standard for quality yellow cattleyas. Plants from this grex did not show crippling in the first few years they bloomed. Unfortunately, as the plants grew older, crippling began to show up. However, *Rlc.* Fortune 'Golden Throne', AM/AOS, is one clone that does not appear to cripple. Grower: Fred A. Stewart Orchids.

[6] *Rhyncholaeliocattleya* Xanthette 'Chartreuse' (Mindenette × Xanthedo) belongs in the Hall of Fame for influential parents. In spite of its relatively poor form, it produced flowers of excellent form and saturated colors. *Rhyncholaeliocattleya* Xanthette 'Chartreuse' also did not cripple, although crippling was evident in both sides of its parentage. Grower: Fred A. Stewart Orchids.

*Rhyncholaeliocattleya*<sup>1</sup> Primate 'Daffodil', AM/AOS (Primrose × Heatonensis). What is extraordinary is that *Rlc.* Xanthette had one of the most notorious parents for crippling (*Cattleya*<sup>2</sup> Mrs. Medo [Luminosa (1901) × Venus (1908)]) on both sides of its parentage. *Rhyncholaeliocattleya* Primate 'Daffodil', AM/AOS, which has a rather interesting pedigree, had none of the suspect parent plants in its background. Both *Rlc.* Xanthette and *Rlc.* Primate were heavily influenced by *Rhyncholaelia*<sup>3</sup> *digbyana*. The thinking at that time (which was borne out by observation) was that *Rl. digbyana* could suppress the crippling tendency coming from other parents.

Stewart Orchids used *Rlc.* Xanthette 'Chartreuse' to make a number of success-

ful yellow and art-shade crosses. These include *Rhyncholaeliocattleya*<sup>1</sup> Memoria Helen Brown (× *C.*<sup>2</sup> Ann Follis), *Rhyncholaeliocattleya*<sup>1</sup> Fortune (× *C.*<sup>2</sup> Memoria Albert Heineke) and *Rhyncholaeliocattleya*<sup>1</sup> Destiny (× Primate), to name three successful grexes. Other crosses are listed in Table 1.

Stewart Orchids' effort with *Rlc.* Xanthette 'Chartreuse' to produce noncrippling yellow cattleyas was problematic. *Rhyncholaeliocattleya* Fortune was a sensation when first introduced, with several cultivars being awarded. This cross is particularly noteworthy for the richness of its color. However, as the plants aged, crippling started to occur. This is why some of the early clones largely disappeared. Only a

few have shown little or no crippling (i.e., *Rlc.* Fortune 'Golden Throne', AM/AOS). However, a number of other excellent crosses were made with *Rlc.* Xanthette that do not show signs of crippling after several years in cultivation.

Stewart Orchids cultivated the best advanced amateur/professional hybridizers to breed for them. Thus, any cross registered by Fred A. Stewart Orchids with *Rlc.* Primate was done by Crothers or with pollen supplied by Crothers because the plant was closely held by Herb and Rita and never meristemmed; few divisions were ever sold. (Divisions sold in the 1980s for \$1,000, even though the plant was well known to be virused.)

Rita bred *Rlc.* Primate 'Daffodil', AM/AOS, to a number of different yellow and art-shade parents to produce some excellent crosses that have in turn yielded some superb parents. These are listed in Table 2.

The value of *Rlc.* Primate to overcome the crippling problem cannot be overstated. *Rhyncholaeliocattleya*<sup>1</sup> Mamie Fouraker 'Herbrita', AM/AOS (*C.*<sup>2</sup> Grandee × Primate), is not known to cripple nor have I ever seen it cripple in the 20-plus years I have grown this plant. This is rather amazing because *C. Grandee* 'Jules Furthman', AM/AOS, is one of the most notorious cripplers of all time. No one I knew had ever seen it not cripple in the years it was in cultivation except for the time it was awarded its Award of Merit. However, *C. Grandee* 'Jules Furthman', AM/AOS, gave rise to a number of excellent hybrids, almost all of which, with the exception of *Rlc.* Mamie Fouraker 'Herbrita', eventually crippled.

What is the current state of crippling in yellow cattleyas? Stewart Orchids promoted a bold and revolutionary step when it introduced *Rhyncholaeliocattleya*<sup>1</sup> Goldenzelle (Fortune × *C. Horace*). Most people credit Stewart Orchids with making the cross that was actually registered by John Hanes. *Rhyncholaeliocattleya* Goldenzelle produced flowers in a variety of colors, including a number of fine yellows. None of these are known to cripple.

Unfortunately, Stewart Orchids is gone. However, its legacy lives on. Two superb hybrids from Southeast Asia have 75 percent of their parentage from Stewart's breeding efforts. These are *Rhyncholaeliocattleya*<sup>4</sup> Haw Yuan Gold 'O-2', AM/AOS (Lemon Tree × Tassie Barbero) and *Rhyncholaeliocattleya*<sup>1</sup> Memoria Srivilas

Table 1. Some crosses with *Rhyncholaeliocattleya*<sup>1</sup> Xanthette 'Chartreuse' as one parent.

Grex	Other Parent
<i>Rlc.</i> <sup>1</sup> William Stewart	<i>Rlc.</i> <sup>1</sup> Golden Slippers
<i>Rlc.</i> <sup>1</sup> Golden Galleon	<i>Rlc.</i> <sup>1</sup> Camilla
<i>Rlc.</i> <sup>1</sup> Sheer Melody	<i>Rlc.</i> <sup>1</sup> Helen Morita
<i>Rlc.</i> <sup>1</sup> Cadmium Light	<i>C. forbesii</i>
<i>Rlc.</i> <sup>1</sup> Green Giant	<i>C. guttata</i>
<i>Rlc.</i> <sup>1</sup> Oregon Pine	<i>Rl.</i> <sup>2</sup> <i>digbyana</i>

<sup>1</sup>Formerly *Brassolaeliocattleya*.

<sup>2</sup>Formerly *Brassavola*.

<sup>3</sup>Formerly *Laeliocattleya*.

<sup>4</sup>Formerly *Brassavola*.

<sup>5</sup>Formerly *Potinara*.

Gold 'Bangprom', HCC/AOS (Fortune × Haadyai Delight). The family trees reaching back three generations of these two hybrids are in Figures 1 and 2.

*Rhyncholaeliocattleya*<sup>1</sup> Memoria Srivilas Gold 'Bangprom', HCC/AOS, has *Rlc.* Fortune as a parent and *Rlc.* Destiny as a grandparent. The clone of *Rlc.* Destiny used was most likely 'Sundrop', AM/AOS. This fine cultivar of *Rlc.* Memoria Srivilas Gold will certainly receive a higher award when shown again. The color of this cultivar is a rich and saturated yellow becoming a deep apricot orange as the flower ages. I have grown and bloomed this cultivar and it does not appear to cripple.

*Rhyncholaeliocattleya* Haw Yuan Gold has incredibly large concolor yellow to yellow-orange flowers more than 7 inches (18 cm) in natural spread. This fine hybrid is spectacular. Miyamoto made *Rlc.* Tassie Barbero by crossing *Rlc.* Fortune with *Rhyncholaeliocattleya*<sup>1</sup> Faye Miyamoto. The large size of *Rlc.* Haw Yuan Gold certainly comes in part from its grandparent, *Rhyncholaeliocattleya*<sup>1</sup> Jane Helton. In 2009, my plant put forth 17 flowers during a period of four months. Unfortunately, this year (2010) I have one flower that appears to show crippling. It will bear watching over the next few years to see if this is going to be a problem.

Before we leave *Rlc.* Haw Yuan Gold, *Rlc.* Lemon Tree has an interesting parentage worthy of discussion. I mentioned *Rlc.* Jane Helton as one side of *Rlc.* Lemon Tree; the other parent was *Cattleya*<sup>5</sup> Paprika 'Golden Delight'. The most famous cultivar and the one most growers associate with the name *C.* Paprika is the red clone 'Black Magic'; however, the cultivar used to make *Rlc.* Lemon Tree was a yellow flower.

Recently, I bloomed a plant of *Rhyncholaeliocattleya*<sup>1</sup> Taiwan Yellow Ball (Gold Ho Hsing × Apricot Flame) that exhibited crippling of the type discussed in this article and shown in the accompanying photographs. This cross can be traced to the Stewart Orchids and Hawaiian lines, including *Rlc.* Fortune and *Rhyncholaeliocattleya*<sup>1</sup> Waikiki Sunset (Walter Abe × *C.* Waianae Sunset). Both of these contain crippling genes. Crippling has not been in the minds of most hybridizers since it seemed to be a thing of the past, so it is no surprise that it should again begin surfacing. We will need to be diligent and breed back into the plants, such as *Rlc.* Goldenzelle, that suppress this problem.

#### Reference

Noble, M. 1949. Amateur Potpourri. *AOS Bulletin* 18(9):560-561.

<sup>5</sup>Formerly *Sophralaeliocattleya*.



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[7] *Rhyncholaeliocattleya* Destiny (Xanthette × Primate) shows a remarkable mixing of genes from two of the foremost yellow cattleya parents of the late 1960s. The result is a hybrid that is not known to cripple. Grower: Ron Midgett.



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[8] *Cattleya* Grandee was one of the most notorious for causing crippling in the breeding of yellow cattleyas. However, when bred to *Rhyncholaeliocattleya* Primate to make *Rhyncholaeliocattleya* Mamie Fouraker 'Herbrita', AM/AOS, this cultivar does not cripple. Grower: Ron Midgett.

Table 2. Some crosses with *Rhyncholaeliocattleya*<sup>1</sup> Primate 'Daffodil', AM/AOS, as one parent.

Grex	Other Parent
<i>Rlc.</i> <sup>1</sup> Buttercup	<i>Rlc.</i> <sup>1</sup> Golden Myth
<i>Rlc.</i> <sup>1</sup> Destiny	<i>Rlc.</i> <sup>1</sup> Xanthette
<i>Rlc.</i> <sup>1</sup> Living Legend	<i>Rlc.</i> <sup>1</sup> Memoria Helen Brown
<i>Rlc.</i> <sup>1</sup> Trojan Gold	<i>Rlc.</i> <sup>1</sup> Golden Slippers
<i>Rlc.</i> <sup>1</sup> Fortumate	<i>Rlc.</i> <sup>1</sup> Fortune

<sup>1</sup>Formerly *Brassolaeliocattleya*.





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### Acknowledgments

This article is dedicated to the memory of Rita Crothers who sought to give us cripple-free yellow cattleyas. I am deeply indebted to her and Ernest Hetherington for their kind mentoring and many discussions in which they freely gave of their insights and knowledge.

*Ron Midgett, PhD, began growing orchids in 1969 in Southern California. He has also grown orchids in Pennsylvania, Louisiana, the Caribbean, New England and, currently, New Jersey. He has growing experience on windowsills, under lights and in greenhouses. He is a breeder with an emphasis on cattleyas, paphiopedilums and the Oncidiinae. He has served as an officer in the Riverside–San Bernadino Counties Orchid Society, the Orchid Society of Western Pennsylvania, the New Orleans Orchid Society and the North Jersey Orchid Society. He also served as the show chair for the Massachusetts Orchid Society for three years and currently serves in the same position for the North Jersey Orchid Society. He initiated and ran the New England Orchid Fair from 1999–2002. He is an accredited AOS judge in the Northeast Judging Center and the founder of New Earth Orchids. 193 Country Road 628, Sussex, New Jersey 07461 (e-mail ron@newearthorchids.com; Web site www.newearthorchids.com).*

[9] *Rhyncholaeliocattleya Memoria Srivilas Gold 'Bangprom', HCC/AOS (Fortune × Haadyai Delight), a relatively new hybrid from Southeast Asia, owes its existence to the plants bred by Fred A. Stewart Orchids in the 1960s and 1970s. Grower: Ron Midgett.*

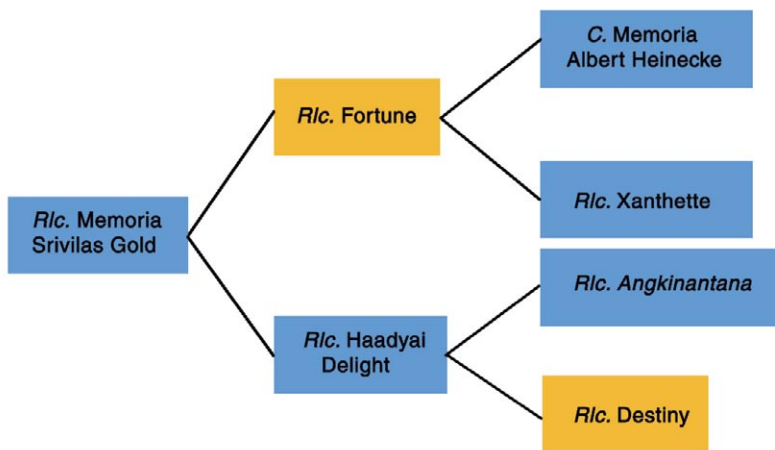


Figure 1. Family tree for *Rhyncholaeliocattleya Memoria Srivilas Gold*. Hybrid names in yellow blocks are plants bred by Fred A. Stewart Orchids.



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[10] *Rhyncholaeliocattleya* Haw Yuan Gold (Lemon Tree × Tassie Barbero) is a hybrid from Taiwan that owes its background to the breeding done at Fred A Stewart Orchids and Miyamoto in Hawaii. These flowers are of an incredible size and intense color. We are using this in our own breeding to produce compact yellow cattleyas. Grower: Ron Midgett.

[11–14] This series of photographs illustrates the presence of crippling as described in this article in a relatively new hybrid from Taiwan, *Rhyncholaeliocattleya* Taiwan Yellow Ball (Gold Ho Hsing × Apricot Flame): [11] shows a normal flower and [12] a crippled flower, while [13] and [14] show close ups from the front and back. Grower: Ron Midgett.

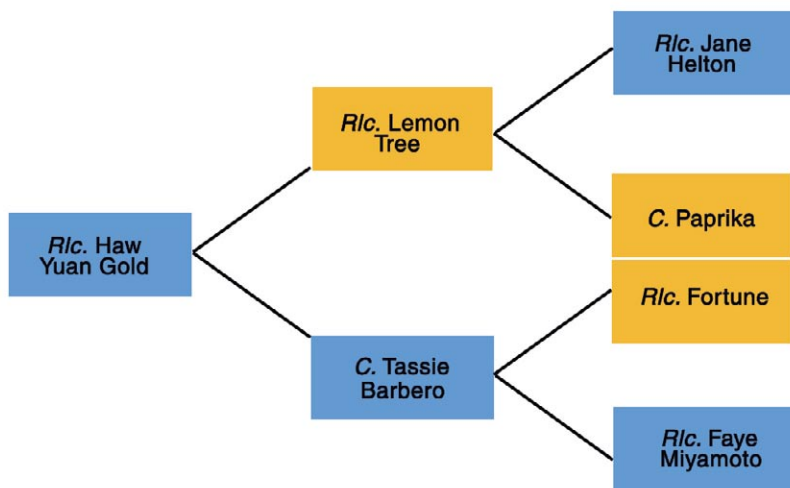


Figure 2. Family tree for *Rhyncholaeliocattleya* Haw Yuan Gold. Hybrid names in yellow blocks are plants bred by Fred A. Stewart Orchids.