Orchid Propagation --Carol Bayles and Pete O'Connell

Introduction
How an orchid is propagated depends on the growth habit of the orchid as well as the goals of the propagator. A grower might want plants identical to his/her best plants or may want to create new, even better plants. Here are the different methods that are generally used and the types of plants they produce.

Divisions
Many orchids, such as Cattleyas, Dendrobiums, Oncidiums, etc are sympodial, growing new stalks (called pseudobulbs) from the base of the previous pseudobulb. These types of orchids can be divided into several plants, and some can be sold or given to friends. This is a common way to propagate many garden plants and house plants.


A Cattleya growth ready to be divided off


Tolumnia that can be divided into two plants

The divisions are all **exactly** the same as the original (they are clones) and if the original plant had an AOS Quality award, such as HCC, AM, or FCC, (which are a part of its official name), this follows the divisions. Cultural Awards, for how well the plant was grown, such as a CHM for species or a CCM or CCE for hybrids, can still be awarded to excellently grown plants. These plants cannot be submitted for the same AOS awards but can be entered for Cultural Awards and on rare occasions, if considerably superior, can be considered for a higher Quality Award. All plants can receive ribbon awards at a show.

Other orchids, such as Phalaenopsis and Vandas, are monopodial, and in most cases, they do not grow new stalks or points where they can be divided. Older Phals and some Vandas do form basil shoots or basil kikis that can be divided off. If you have an award-winning monopodial plant, it may be unique, but not necessarily.



Basil Keikis on Phalaenopsis that could be divided off


Vanda type that can be basally divided

Cuttings

A stem section may be cut off a mother plant and grown into a new plant. This is very true of vining orchids, such as vanilla, but many vandas grow very tall with roots along the stems. These top growths with roots can be cut from the plant and grown on. The mother plant will simply send out a new growth from a residual bud along the stem. This must be done in a clean environment and some orchids do not grow from such cuttings. Like divisions, the new plants are identical to the mother plant.


Vanilla that can be grown from stem cuttings


Vanda that can be grown from a stem cutting below the top roots

Keikis

A keiki is a small plantlet that may develop on a flower stem or at the nodes of pseudobulbs. In rare cases, some plants put out root keikis as well. Basil Keikis ar covered in “Divisions” Some orchids, such as Phalaenopsis and Dendrobiums, form keikis spontaneously. Others can be induced to form keikis with a hormone treatment (keiki paste). Once a Keiki develops strong roots and a few leaves, it can be removed from the plant and potted up. Like a division, the keiki is a clone of its parent.

Phal Keiki

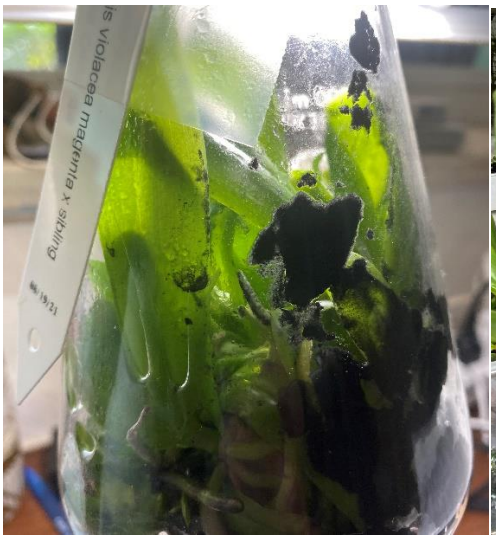
Seeds

The other common way to propagate orchids is through seeds. Breeders choose the parents for various characteristics and apply pollen from one to the stigma of the other (or vice versa) to cross them. The seeds are collected and sent to a lab. Orchid seeds are very small and do not have stored nutrients. In nature they require a relationship with a particular fungus to help them grow.

Labs grow them with special nutrients under sterile conditions in 'flasks' which may be the glass Erlenmeyer flasks that all chemistry students know or today may be clear, wide mouth plastic containers like you use at the olive bar at Wegmans. Once the seedlings, which could be in the thousands of plants in one flask, put out a few roots and leaves, they are replated into new flasks to spread them out and grown on until they are large enough to survive outside the flask. Then they are sent back to the grower who plants them out. There is likely about 30 plants per replate flask. From the flask they normally go into "compots" (community pots) as they survive better when grown in a group of about 15-20 plants. When they are established plants, they may be sold.

Although they are siblings, each of these seedlings is totally unique, as genetic mixing varies for each seed. Even if you put the pollen on the stigma of the same flower (selfing) you do not necessarily get the same flower (though it is likely to be very similar). You can never be sure what a seedling flower will look like, which is exciting to some hobbyists, but could be disappointing in the long run. It usually takes 3-7 years to flower from seed, but can take up to 15 years for some species. These seedlings do not have a name, they are just known by their parent's names. If you have a seedling that produces a spectacular flower, you can register and name the cross, or if awarded, name it and either divide it (eventually) or if you are a breeder, Mericlone or use it as a parent for another cross. If the flower is both spectacular and different from all others of its type, you can submit it for a possible award. Because they are unique, all seedlings are eligible for AOS awards and if awarded, the award name follows this plant.

Laelia species in replate flask. Note date sown, date replated. Media contains charcoal. These are October 2021 photos. Seeds to harvest 8 months




Phal species in replate flask. About 15 plants of various sizes. Similar flask now in compot.


Compot planted out

Mericlones

The problem, though, is getting more clones of spectacular plants. Divisions, if even possible, only produce a few plants at a time. Same with keikis. Eventually, someone figured out how to propagate orchids from meristems. The meristem is the growing point of a plant and is located deep in the growing tip (leaf or pseudobulb) begore the tip is even visible to us. The meristem is a small group of cells, probably in the hundreds (these cells are very small, a few microns at most) and each of these cells has the capacity to become an entire plant (sort of like stem cells in mammals). These cells are cut out of the plant and cultured under sterile conditions with a particular hormone regime. Each cell divides many times into a small mass, which is divided, and then each begins to produce roots and shoots. This is done for many horticultural plants, but each plant has its own requirements and meristem culture is difficult until the process has been worked out. Not all orchids can be grown from meristems yet.

The important point is that each new plant is **identical** to the parent (a clone or mericlone). If the parent is an award-winning plant (which it likely is, otherwise why bother?) all the meristem-cultured plants will retain that award in their name. These plants cannot be entered for a future AOS award (although again, they may receive ribbon awards at your local show).

Meristem culture is also used to eliminate viruses from orchids with some success.

Species vs Hybrids

While not about propagation per se, I thought this topic might be useful to include. An orchid species is one that grew in nature (probably not that actual plant) and does not have any ancestry that can be traced back. Hybrids are crosses of species or of other hybrids, they will have a family tree that may be quite long.

Intergeneric hybrids are crosses between different genera of orchids, hence Brassocattleya (Brassavola x Cattleya), Odontonia (Odontoglossum x Miltonia) and even three genera, Brassolaeliocattleya (Brassavola x Laelia x Cattleya). Hybrids with three or four genera in their background can also end with -ara. The genus name is derived from the originator's name (or choice of name) with an -ara suffix, Potinara (Brassavola x Laelia x Cattleya x Sophronitis) or Vuylstekeara (Miltonia x Odontoglossum x Cochlioda).

AOS awards (another, related topic)

Flower quality awards
The AOS grants three levels of awards for flower quality based on a 100 point scale.

- Highly Commended Certificate (HCC/AOS) - 75 to 79 points
- Award of Merit (AM/AOS) - 80 to 89 points
- First Class Certificate (FCC/AOS) - 90 to 100 points

Other awards for plants

- Judges Commendation (JC) - possessing distinctive characteristics but cannot be scored customarily
- Award of Distinction (AD) - for a worthy new direction in breeding
- Award of Quality (AQ) - one in a group of at least twelve that are an improvement over former type
- Certificate of Botanical Recognition (CBR) - a rare and unusual species with educational value (must pass taxonomic verification)
- Certificate of Horticultural Merit (CHM) - possessing characteristics that contribute to the horticulture of orchids

Awards for exhibitors

- Certificate of Cultural Merit (CCM) - robust well flowered specimen in care of exhibitor for at least 12 months prior, score of 80 to 89 points
- Certificate of Cultural Excellence (CCE) - robust well flowered specimen in care of exhibitor for at least 12 months prior, score of 90 to 100 points

Ribbon Awards
These are unofficial awards (blue, red, or white ribbons) given to orchids at shows that are fine examples of their types. This award is never part of the orchid name. But it is nice to get one at a show.
Many thanks to Pete O'Connell who provided the photos as well as valuable edits and additions.

Ribbons!