A Discussion on Media for Epiphytic Orchids (updated version 2017)

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From what I have seen on my travels, very few orchids grow in pots in nature - orchids grow on trees, rocks, and in the ground. We put orchids in pots purely for our own convenience, which brings us to the need to provide a medium in the pot. It is impossible to reproduce an orchids natural root environment in a pot or any other way but what we can do, in our artificial growing houses, is to provide a benign root environment with an appropriate balance of air, moisture, and mechanical support. Luckily for us, orchids are very adaptive little devils and most will take to our pot culture without too much fuss.

The balance of air and moisture in the pot seems to be the critical factor. They will all put up with being saturated temporarily when we water them but they need excess water to be shed pretty quickly. As the pot then dries out in the days following watering, the medium needs to provide an airy but moist environment in which the roots can live and thrive. The need for moisture hardly needs explanation but keep in mind that air is an equal necessity. Roots are a living organ of the plant and they have to breathe as they function. In a well functioning medium, fresh air will be drawn into the pot as the medium dries out, and will be exchanged evenly throughout the pot. There will be no stale pockets of air.

Different plants require different rates of drying out and it is this that we design into the various mixes we use. Any number of the commonly used potting materials will do the job provided that :

- you get the air/water balance within bounds acceptable to the plant concerned,
- you give the plant regular food and water,
- the mix provides a reasonable pH in which the roots can live and grow.

The latter point is very important. The recommended pH range for orchids is 6.0 to 6.5 as this optimizes the availability of the nutrient elements in the fertilizer you provide. Orchids will of course tolerate a much wider range of pH than this but some kinds of orchids are touchier than others in this regard. In my experience, the roots of some, like Paphiopedilum and Odontoglossum, decline rapidly as the mix ages and I think this is because it gets too acid.

As I said above, many different combinations will serve adequately if other factors are right, but to improve on 'adequate' I think you need to focus on the root system. Roots are the key to maximizing growth. The bigger and more vigorous the root system, the bigger and more robust will be the rest of the plant. Fine tuning the potting medium is the way to maximize root growth and to do that you need options with your potting materials.

When you take your car to a garage for repairs you expect the mechanic to have a full set of whatever tools are necessary for the repair. Why then, do we think we can grow orchids to their potential if we only keep two kinds of bark in the potting shed. For any reasonably sized, mixed orchid collection, the range of environmental needs will be far too wide for any medium to suit all. It is my contention that we need more tools in our shed than that.

There are 4 basic potting medium components that I recommend you keep on hand. These are bark, sphagnum moss, perlite (with peat moss or coco-peat), and coconut fibre. Each has different characteristics and its own strengths and weaknesses. There are a range of other materials that are useful, such as styrene foam, pebbles, sand, etc) but I consider these fringe additives as opposed to major components and I am sure you can succeed without them.

The challenge in a mixed collection is that the plants are usually all jammed together. Watering often takes place for all at the same time regardless of the needs of some plants for different moisture requirements and different drying times. Some differences can be accommodated through choice of microclimates in your growing area. eg hanging plants higher, placing them in the bright end versus the shady end, or nearer the fan etc, but beyond that, adjusting the potting medium gives us a mechanism that can have a multiplier effect on microclimate differences.

1 – Bark medium bark (coins are 5, 10, 20cents)

Bark is readily available, relatively cheap, and comes conveniently graded by the size of the bark pieces. One brand calls the bark fine, medium, or course, another by approximate particle size in millimetres. There are also more specialised mixes such as Miscellaneous Mix (a combination of sizes and components perfect for natives) and Cymbidium Mix (in its various brands and forms) . Some of the bark quality isn't what it was 20 years ago but it is still a very useful medium. I use medium and coarse barks for *Laelias, Cattleyas, Vandaceous*, and other coarse rooted dryer growers, and a blended mix of sizes and components for more general miscellaneous orchids.

If you are a heavy waterer, bark can tend to go off in the pot as quickly as even one or two years, staying wetter and wetter after each watering. Judicious use of a little garden lime or dolomite, sprinkled over the top of the mix once a year, can extend the life of bark in the pot and aid in balancing the pH but dont overdo it. With bark, the pH in the pot is a serious factor and can also eventually sink down to as low 4 unless you are very clever with the addition of lime.

When you use bark, make sure you feed the plants regularly and watch the wetness of the pot. If they look too wet they probably are so either try to water less often or place the plants where they will dry out more quickly.

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2 - Sphagnum Moss - Sphagnum Moss is an amazing medium. It has terrific remedial properties for sick plants and there is nothing better for striking backbulbs and divisions. It can be obtained as live moss, or dried, and both work well. The dried product keeps well and the amount you need can be rehydrated as needed.

Every grower should have at least a small supply available. Even for healthy plants it is a very good medium in its own right but like all media, it has its drawbacks. It is expensive and it is getting harder and harder to obtain fresh, good quality moss. Good moss lasts about 12 months in the pot but much less if it gets regular fertilizer. Once the sphagnum moss has "gone off", you need to get the plant out of it quickly because all of its positive qualities are reversed and roots quickly die.

3 – Peat and Perlite ("P&P") - Perlite is an expanded volcanic glass that is completely inert & pH neutral. The perlite most growers use comes from Chillagoe in Queensland and comes graded in particle sizes called "coarse", "super coarse", and "jumbo" where jumbo is the largest (particles up to at about pea size). Perlite on its own it doesn't provide any organic interchange buffer for fertilizer and once it starts to dry out, perlite alone goes from moist to dry very quickly. It is usually used in combination with peat moss, to provide the organic ion interchange, and the basic formula most people use is 1 part peat to about 5 or 6 parts jumbo perlite. I have experimented with ratios of 12, 16, and then 20:1 but I concluded that it doesn't work properly with less and less peat.

P & P mixes are very stable. The perlite is inert and the peat has already reached a point of almost nil decay over thousands of years in the ground. The combination has a slightly acid pH around 6.0 (perfect for most orchids) and lasts virtually forever. However, you still need to repot relatively regularly because plants outgrow pots and because dead roots eventually accumulate in the pot and need to be cleaned out.

Be Aware – peat and perlite mixes are generally wetter than fresh bark mixes. Reduce your overall watering for best results. Varying the P : P ratio, choosing the grade of perlite you use, adding styrene foam, and/or mixing perlite grades together, can also give you some control over how quickly the mix dries. I use P&P mainly for *Pleurothallids, Dendrochilums, Dendrobiums*, and a few others.

4 - Coconut Fibre

Although commercial nurseries here and overseas have been using it for quite a few years, coconut fibre is a relatively new medium to most of us. It obviously has great potential. As a medium it is long lasting, slow to bio-degrade, and depending on the brand and the washing process, has a pH of about 6.0 – 6.5. The material comprises two natural materials which form the husk of the coconut. A coarse, stiff, woody, thread like material we call coir, which is the same fibre used to make coir doormats etc., and a peat like material that fills the spaces between the coir fibres.

The commercial orchid potting material is basically the chopped up fibrous husk off coconuts, a byproduct of the copra production plantations in India and Sri Lanka among other places. It comes in dried, compressed blocks of more or less cubed chunks pre-cut into specific sizes to different grades of fineness. There are various brands available - one used to be available from Bunnings hardware stores but I am not sure that source is still available. I believe that Ray Clement's 'Tinonee Orchids' still markets another type.

The material needs to be soaked and rinsed before you use it. Stories are told that some supplies are contaminated with sea salt from the discarded coconut husks being stored too close to the ocean before they are processed and compressed for horticultural use. Hence the need to wash and rinse.

To prepare the material for use, I soak a **half of a block** in a garbage bin for 3 or 4 days to let it thoroughly stew, then tip it out into foam boxes fitted with a couple of layers of shadecloth in the bottom. A half a block fills 2 foam boxes after soaking. I then give the boxes a thoroughly rinse with a hose to wash out any salts released by the soak. Be careful when you rinse it however. All these coconut fibre products include a significant proportion of fine peaty material and you need to retain a decent proportion of these fines as an integral part of the mix. If you remove too much of the fines by washing or sieving, the mix dries faster than is practical for most orchids and doesn't retain sufficient water. A dry mix can be a useful trick for one or two oddball orchids, but it isn't suitable for most.

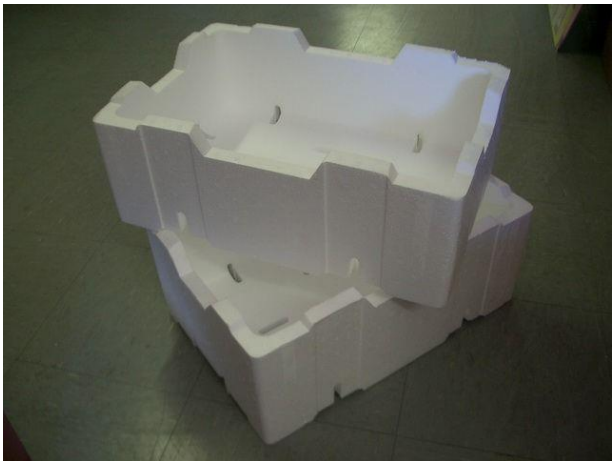
As with bark and perlite mediums, you can adjust the moisture content of your coconut fibre potting medium by choosing the coarse or fine grades, reducing the peaty component, or by adding other components like styrene foam. I experimented with mixes of 4 parts fine or medium coir, 4 coarse coco-fibre, 1 and 2 perlite, 1 styrene foam. I was very impressed with results in the first 6 months or so but after that I began to experience rots killing off some plants and others just suddenly stopping their forward progress. I am not sure why, but I think part of the problem was that the finer, peaty materials may wash out from between the coir strands and accumulate in the bottom of the pot creating a bog zone which leads to root decline.

At present, I have cut back my use of coco-fibre to just use it as a smaller additive to some of my specialist mixes to deliberately retain a little more moisture – such as for Paphs. However, I know many nurseries and other growers are still getting excellent results in coco-fibre dominant mixes so the problem may just be the way in which I was using it.

Fringe Materials - As I mentioned earlier, there are dozens of side components that experienced growers use as additives or even as major components. For example: shellgrit, charcoal, pebbles or stones, wine corks, crumbled cork. Over the years, I have tried just about all of them as each waves of "new discovery" swept the orchid grower world. I probably still have half bags of some of the stuff stashed away in the shed somewhere.

Many are useful, and have their place, but none are the new magic potting material that they were once thought to be.

However, there is one 'side material' I do use in nearly every blend, and that is crumbled styrene foam. I use it in quantities from 10% to 25% in nearly every combination and I am convinced it provides a substantial positive benefit - mainly in



However, before you rush off to smash up one of those white foam boxes you carry your plants in, or to buy a bag of bean bag balls, let me stress that there are many types of styrene foam. The boxes we all use are very dense, strong foam and unsuitable for this purpose, nor do I like bean bag balls either. Their roundness makes them too hard to blend with other components and they seem to have a hardened surface that repels water.

The foam I use is the softer more easily crumbled type that is often used as packing material in glassware, or electrical equipment. However, even this more easily crumbled type of foam can vary a lot. I search out the types made from 'larger' rather than 'finer' bubbles of styrene, and that can be fairly easily broken up by hand, or shredded on a cheese grater etc.

Electrostatic attraction is somewhat of a problem when handling styrene foam, or when smashing up blocks or sheets of styrene, but this can be managed reasonably if you do it directly into a tub of whatever bark or potting mix you are adding it to. The mix needs to be moist and you need to keep mixing the foam into the moist mix as you shred or crumble the styrene. Just take your time.