

Deflasking and Compotting Paphiopedilums

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When to Deflask



Paphiopedilum Final Replate

It is best to remove the flasklings from flask for compotting while they are in active growth. Ideally they will be nearly filling the flask, showing no yellowing of the leaves or browning of the leaf tips, and have active roots with white tips. Overgrown flasklings will do fine with care, but will be a little slower to establish themselves. The same is also true of smaller seedlings. If you can take them out while they are growing strongly, they will continue to grow with almost no setback while establishing in their new environment.

Obviously we cannot always take out the flasklings at the perfect time. They may be a little overgrown before you get them, or it may be a flask that jumbled in transit, or one that contaminated before you received it, or demands on your time may keep you from taking it out at peak. The flasklings should still do fine, they may just take a little more time to adapt and get growing again. Contaminated flasks should be taken out immediately if they are contaminated with mold (whitish, fuzzy appearance and generally covering the roots), or with a bacteria (slimy appearance covering the agar) that spreads quickly across the surface. Under these conditions the flasklings will almost certainly progress no further, and may actually be killed very quickly. Once in a

while you can get lucky and the contamination will be by a bacteria that can only grow where there is excess moisture on the surface, usually along the walls of the flask. In this case, you can usually let the flask grow on, but watch it carefully.

Types of Flasks



Various Flasking Vessels

We use the Zuma square polycarbonate flasks for final replate. The other type of flask used most commonly by professional growers is the 500 ml erlenmeyer flask. You may also encounter milk bottles, French Squares (similar to milk bottles but less rounded corners and wider mouths), canning jars, magenta vessels (square polycarbonate vessels with a slide top), Phytacons (round plastic containers with a snap lid), and baby food jars. We have found the latter three to be very unsuitable for growing Paphs, and would recommend that you be careful to scrutinize the quality of seedlings in them before buying flasklings in them. Milk bottles, French Squares, and canning jars allow for a good growing plant, but are difficult to ship intact. The Zuma flask has the advantages of allowing a significantly larger grower area (compared to the other best choice, the erlenmeyer) while taking up the same space, allowing light in from the top, and being easy to deflask from without destroying the flask.

Getting the Flasklings Out

With the Zuma flasks you unscrew and remove the lid, then slam the side of the flask against your open palm, turn the flask on its side (not the top) 90 degrees, slam again, repeating this on all sides until you see the agar matrix start to collapse. Then it is simply a matter of sliding the seedlings out of the wide opening sideways.

If you are dealing with a glass container with a narrow opening (milk bottle or erlenmeyer), we suggest you resist the temptation to try to ease the flasklings out through the narrow opening, which will almost always cause damage, even if it isn't immediately apparent, and instead break the bottle. However, contrary to the common advice to wrap in newspaper and hit with a hammer, which can embed minute slivers of glass into the agar, which can then be embedded into you when



Breaking the Flask With a Drift

you handle the agar, we suggest a different method. You need a "drift", which is sort of like a large metal rod or punch. You can make one out of a large bolt if you can't find one, but you should be able to get one, or



"Breaking" the agar in Zuma Flask

something similar at a hardware store. The drift needs to be longer than the flask is tall. Wrap the flask in newspaper several layers thick, keeping the opening clear. Carefully push the drift down through the root and agar mass near the center of the flask until it contacts the glass, and give the drift a tap with a hammer. This will gently break the glass out, with little splintering, and is much safer for you and the plants.

Remove the Plants With Agar

Remove the plants gently with the agar mass intact. If it breaks into a few pieces you can put them back together in the compot. Handle carefully and you should be able to keep the agar intact and on the roots.

Place in compot

Again, there are a vast number of possibilities for containers into which you can pot your seedlings. The key is to match the pot, and your growing mix, to your conditions, particularly with regards to temperature, humidity and air movement, which will affect the speed at which your compots need watering about every three to four days.



Removing the flasklings and agar

The medium you use should be able to anchor the plants securely, preventing wobbling, and yet



5x5" compot with mix ready for flask

allow for free draining of the irrigation water, and should be able to somewhat dry out within three to four days. We currently use a mixture of approximately six parts soaked fine fir bark to two parts extra course horticultural perlite (this is the small perlite, not to be confused with spongerock) to one part of New Zealand sphagnum moss chopped (cut with scissors) into half inch lengths. This is an easy mix to use, and to adjust to different conditions.

Place the entire mass, agar included, into an appropriate sized compot that has been filled to within 3/4" to 1" of the top with a seedling mix. Add mix around the sides and press down firmly. Finally, add a very small amount of plain seedling

bark to the top in between the seedlings, if possible. Do not force the issue here though. If you cannot add bark in between the seedlings right away because the seedlings are very close it is not a problem. On some of these flasks we have seen a very thin layer of blue mold develop initially, but it has caused no problems for the seedlings. Also, use care to place only a minimal one particle deep layer if you do, you do not want excess moisture trapped against the base of the seedlings.

The agar will disappear from under the mix over the next 4 to 5 weeks. Mold on the agar has not been a problem, perhaps because of the tanins from the bark. On some flasks you may need to add a bit more mix after the agar disappears, but generally we have not needed to.

Compots On the Bench



Place the flasklings with agar in the compot



Planting the 5x5 Compot

It is very important to keep the freshly deflasked seedlings in very subdued light initially, probably no more than 700 - 800 foot candles. They were grown in flask under similar lighting conditions, and the transition to higher levels should be made gradually over several weeks, or you will risk stunting or even killing them. We place them under our benches initially. Growing them under a two tube fluorescent fixture is another good possibility.

Compots are fed weakly but steadily; we use RO water for irrigation and Peter's Excel Cal-Mag fertilizer at a conductivity of 350 - 400 microsiemens and pH of 6.5 - 6.8. They are allowed to approach dryness but not completely dry out. It cannot be stated enough that the addition of any fertilizer to your irrigation water will change the pH, and very low or very high pH levels will render many nutrients completely unavailable to your seedlings.

It has been not necessary using this

technique to do any sort of fungicidal spraying. The flasklings establish very quickly and grow vigorously, gaining a 3 to 6 month head start over flasklings potted out with the agar removed.

Again, it is best to try to keep the seedlings quite warm through this early period, probably 75 to 78 degrees Fahrenheit would be ideal. Bottom heat is preferable.

We have used this procedure for approximately 1500 flasks now, and have found it to be the easiest and most successful technique for compotting we have tried. It virtually has eliminated the need for any post compotting fungicides, and seems to give the seedlings a quick and vigorous start. We have recommended the procedure to several other growers with varying conditions, and the feedback has been unanimously and enthusiastically favorable. This technique appears to allow the plants to acclimate to the harsher conditions outside the flask while still deriving some nutrition and



We place the compots in the greenhouse under extra shade. Each of the three covered benches hold 400 compots, so that they get to stay under the extra shade about 3 months before being moved out. The benches also have hot water heat at the benchtop (you can see the end loops) to keep the compots warm.

protection from the agar. We have been able to use it to rescue flasks that contaminated when the seedlings would have been too small to save using the normal procedure. We were doubtful at first (how often is something that is much quicker and easier actually also better?) but are now convinced it is by far the best way to compot.

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The view under the shade cloth of the compots.