PF- - Psilocybe Cubensis growing techniques

Psylocybe Fanaticus, et al.

updated: August

Abstract

The PF- is basically a brown rice method with an improved formula by using vermiculite as a base and adding pulverised brown rice. The secret is in the vermiculite. When mycelium is cultured in just grain, the mycelium turns into a mass with little air space. But when grown with vermiculite, the mycelial threads stretch across space. The important thing about the PF- , is that it copies nature. Instead of the usual cloning of mushroom tissue and growing mushrooms from that, a mass spore inoculation is employed directly to the fruiting substrate. That way, the genotype remains complete. Senescence (mutating and ceased fruiting) is no longer a problem. The spores insure a never ending succession of fungus, with all the power of the spores reproductive ability intact.

Overview of techniques

. Brown rice powder, vermiculite and distilled water are mixed and loaded into a - pint (- L) jar, which is steam sterilized. The jar is then inoculated by the spore syringe.

. After the substrate cake in the jar colonizes and begins to show signs of fruiting, the cake is released from the jar and placed into the dual chambered terrarium to fruit.

. A mature mushroom is decapitated and spore printed in a jar.

. Spore syringes are prepared with the spore print jar to begin another life cycle.

The original guide called "PF-tek" is an invention from Psylocybe Fanaticus (PF), a scientist in growing fungi and spore seller. Due to laws in the USA which prohibited his activities, PF had to face legal consequences and had to quit selling spores and growing guides and he also had to shut down his web site.

This guide is more-or-less the original PF-tek from the PF web site. It only differs from the original one by additional material that can be found in the appendices.

Use this guide for your convenience, but be aware that activities forthcomming from this guide could have been made illegal by your local government.

Typeface: Adobe Garamond, scaled pt. *System:* LaTeX ε

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1 Basic materials list for cultivation

PF jar preparation and culturing (Stage one) (Domestic products - supermarket - department - drugstore - hardware store)

. Measuring cups and spoons
. Large pot for steaming
. Shoulderless half-pint jars with lids (Kerr or Ball)
. Organic brown rice flour (organic food stores)
. Horticultural vermiculite (medium or fine grade - not powdery)
. Distilled or filtered drinking water
. Heavy duty tin foil
. Heavy duty (professional grade) masking tape
. Ice pick (for punching needle holes in the culture jar lid)

Mushroom growing (Stage two) Pet shop - Hardware store

. gallon (L) aquarium
. Cut piece of transparent plastic (Plexiglas) - (terrarium chamber partition)
. Strips of wood with connectors and screws (terrarium lid)
. Plastic film and thumb tacks (terrarium lid)
. Small wall type thermometer
. "All purpose" water spray bottle with an adjustable nozzle (hardware and grocery stores). Procure one that gives a good strong spray for instant humidification. Avoid recycled kitchen product sprayers. This is a critical piece of equipment. Only a good quality sprayer (a couple of dollars at a hardware store) can immediately supercharge the dual chambered terrarium with high humidity.
. Wire screen - plastic containers - plastic bags - (drying mushrooms)
. Desiccant for drying mushrooms (scientific - chemical - lab supply)

Spore printing and spore syringe making (Stage three)

. Micro curved cuticle (finger nail) scissors (cosmetics - drug store)
. Denatured alcohol (fuel - hardware stores)
. Tequila shot glass and eye dropper (sterilizing and flaming)
. Glass stirring rod (Scientific supply)
. Plastic syringes (mL or bigger) and gauge – inch (cm) needles. Large sized syringes are good (mL - mL) as well as extra long needles if available. (Retail medical - health supply - pharmacies - drug stores - scientific and lab supply)

2 PF substrate formulation

Jars and glasses to be used with this technique are – pint capacity (ounces) - (mL). They must have tapered sides and no shoulders, otherwise the fungus cakes won't easily come out of the jars.

Appropriate jars; (source - super markets and hardware stores)

- K wide mouth half pint canning jar - preferable
- B wide mouth half pint (similar to the K wide mouth half pint) - preferable
- B regular mouth half pint canning jar
- B half pint jelly jar
- – pint (mL) capacity drinking glasses (tapered sides)

Note: even though the regular mouth B half pint and the regular mouth K half pint look similar, the K is not tapered.

. – cup of brown rice powder (Health food stores and co-ops)

. – – – cup of horticultural vermiculite (medium grade) (garden centers and hardware)

. - mL (cc) of water (or a little less than – cup, or & – ounces, or tablespoons + teaspoon)

Maximum fruiting formula:

. – cup of brown rice powder

. – cup of vermiculite

. - mL water

Note: The water is the crucial element that variates the results. The di erent brands of vermiculite varies creating di ering moisture levels. So as already stated in the PF- , one should always vary the water amount, take notes and compare results. The " " water content can really make a great fruiting and give several flushes when the balance between the substrate elements is good.

Not all vermiculite is the same. The coarseness varies quite considerably among di erent brands. The coarser type will hold less water than the finer type which will alter the water holding capacity. If the formulation (water content) results in a really wet or sloppy substrate, use less water. Keep notes on formulæ for replicating the substrate formula that fruits the best.

The above formulæ utilize the *finer type* of vermiculite. If the above maximum fruiting formula is used with the finer type of vermiculite, the jar lid should be loose during incubation (see section . "The canning jar lid (loose or tight)" on page). The *finer type* of vermiculite is recommended over the coarser type because it holds more water. To ascertain the size of the vermiculite particles, observe them under a photo magnifier next to a millimeter ruler. The finer type of vermiculite has particles averaging around millimeter across (some larger and some smaller). The coarser type has particles averaging around or millimeters across and up to millimeters. Stores usually carry one type. Plus, there will be regional di erences in the di erent brands of vermiculite. Shop around and try to get both types to compare.

To make homemade brown rice powder, place some regular brown rice in a small canister type co ee bean grinder and grind it to fine powder. Freshly ground brown rice is recommended over prepackaged type. The freshness sometimes makes a big di erence.

If the measuring cup specs aren't true, the formulæ will be o , setting up certain failure or diminished growth. Check the cup measures this way: cup is mL which is - pint or liquid ounces (English measurement). There are cups in a pint, pints in a quart and cups in a quart.

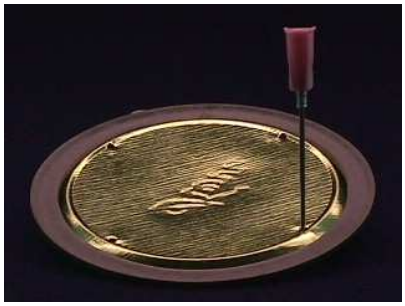

Figure : Preparing the canning lid

Prepare the canning lid by placing it with the rubber sealing edge upwards on a supporting surface and with a sharpened penny nail (held with vise grip pliers), punch holes inside the periphery of the rubber sealing edge (see figure).

When using two piece canning jar lids, the inner lid (with the rubber edges up) rests on the top of the jar and when the lid band is screwed o , the lid remains resting on the jar top. To make the lid and band act as one lid, place pieces of masking tape on the lid attaching the band to the lid. Then, the lid can be adjusted for air ventilation and looseness like an ordinary one piece jar lid.

2.1 PF substrate jar preparation

Steam sterilizing PF substrate jars with regular cookware is possible because there is no grain to cook up and the substrate is airy. Other regular jars (other than canning type) or small drinking glasses (with tin foil covering) can be substituted for these canning jars. To insure similar results, make sure the jars or glasses are tapered sided with no shoulder of any kind, and that they have a - pint (ounce - mL) capacity. It is important to note, that jars somewhat larger than - pint are unreliable for the PF- and fail easily. The low form K - pint canning jar is the most versatile (fits into tight spaces et).

A piece vegetable steamer (pot, basket insert & lid) is used for the steam sterilizing stage. Also, the stainless steel vegetable steamers that fold out and stand on the bottom of the pot are good. Anything is good as long as it keeps the jar bottoms o the pot bottom where the high temperature will crack the glass.

Step 1 Place - cup of vermiculite into a mixing bowl. Place the brown rice powder on top of the vermiculite. Slowly add the water directly onto the brown rice powder, wetting it first. Thoroughly mix the ingredients. The mixture should feel damp and cohesive. More water (or less) can be

used if experimenting to improve the fruiting. Mix Each jars substrate individually for loading to insure accurate formula rendering.

A note on water: A recent update is worth mentioning. Water quality is indeed important. I have found out that "natural" water is the water to use. It makes for better cultivation of this mushroom on this simple substrate. Distilled water is good for making spore solutions and syringes and storing spore solution. But for growing, they seem to like the "natural" water such as: swamp, lake, stream, pond,river, ground or any water that is rich in organics. I have heard that "mineral" type drinking water is good and makes a di erence. I suppose that water seeping from an organic compost pile would be about the best.

Step 2 Fill the jar very loosely. Leave a - to – inch space at the top. Level the substrate. With a tissue or a fingertip, wipe the insides of the jar down to the substrate. Fill the top of the jar with plain dry vermiculite and level it o at the top. This upper layer will protect the wet substrate from air borne contaminants. It acts as a contaminant barrier. This is a Psylocybe Fanaticus original discovery. What this dry vermiculite layer does is protect the wet substrate from airborne contaminants and also absorbs and regulates moisture transpiration and condensation.

Figure : How to fill the jar

In figure , the black tape is the depth for the dry vermiculite. The masking tape shows where the PF substrate goes. The top layer of dry vermiculite must be between –" to -" deep to provide protection from contaminants entering from above.

Tamping down tek Getting the substrate level correct is very important. A slight tamping down is required. To get an accurate leveling of the substrate, loosely load the - pint jar and level the top of the mixture with the top of the jar. Screw a cap on the top to hold the mixture in. With one hand, hold the jar and lightly slam the bottom of the jar on the other palm a couple of times to lower the mixture level to around –" - –" from the top rim. Further level and adjust the substrate with a fork down to the proper height. Clean the inside of the jar down to the substrate level with your finger tip or a paper towel and fill the jar back to the top with dry vermiculite.

Step 3 Place the lid on the jar with the rubberized edge up (jagged edges of the needle holes down). Screw the lid band on. Place pieces of "professional" grade masking tape (holds on during steaming) over the needle holes. This is to protect the needle holes from contaminant entry.

Step 4 Heat the pot of water to a boil. Put the jars into the pot with the lid bands loose so that the steam can penetrate the jars quickly. The jars can sit in water but make sure boiling water can't slosh into the jars. Turn the heat down and *gently* steam the jars at the lowest possible boil for an hour in a *tightly* covered pot (gas stoves are the easiest to control). A good tight fitting pot lid is essential for successful steaming.

When steaming or pressure canning is performed, the jars must be protected from water dripping down from the underside of the pot lid caused by heavy condensation and drip o during boiling. This water can get into the jars by entering under the jar lids that aren't tight and soaking the substrate - throwing o the formula and setting up failure. To prevent this, wrap some tin foil around the cap to ward o the water. The tin foil can be removed after steaming (with the tape guarding the needle holes - or the tin foil can be left on until it is inoculation time.)

Be careful to not overheat the jars, this dries the substrate. Drying is evidenced by o.k. spore germination and halted growth. The fungus will spread but stop at a certain point depending on how dry the substrate has become. Generally, any halted growth (with no contamination) is a sign of dried substrate. This is an important concept that will enable diagnosis and correction of problems experienced with drying. The remedy is to increase the water content of the substrate formula in use. After the jars have cooled, tighten the lids and store them in a cool draft free place until ready to inoculate them.

2.2 Pressure canner use

PF jars and water bottles can be quickly sterilized with a pressure canner. For proper and safe use of the pressure canner, always refer to the manual that comes with it. If the canner is used and has no manual, try to get one from the manufacturer before using it. Pressure canners can be dangerous if used incorrectly.

Sterilization times

- - pint PF substrate jars - p.s.i. for minutes
- Water bottles - p.s.i. for minutes
- Syringes and needles - p.s.i. for minutes

3 Inoculation of the PF substrate jars

Figure : The inoculation

Any jar to be inoculated must be cool to the touch before proceeding. Make sure the lid is tight. Shake the syringe well and remove the tape from the syringe needle guard. This shaking of the syringe is important as to redistribute the spores in the water. Take o the tape covering the needle holes. Remove the needle guard and insert the needle through the lid hole (see figure). Tilt the syringe body back towards the center of the lid with the needle tip touching the glass. This distributes the spore water down the side of the jar, giving a good inoculation down the side of the substrate cake. Inoculate a few drops down each needle hole. As the syringe plunger is pressed, observe the needle tip against the inside of the glass. As soon as water appears around the needle tip, release the syringe plunger pressure. In between each hole inoculation, shake the syringe a little to keep the spores distributed.

Use mL per jar. This will allow the syringe to inoculate jars. More spore solution per jar can be used (speeds colonization), but fewer jars can be inoculated. If the syringe needle plugs up as it is inserted into the substrate, draw the needle back a little and it will unplug.

Figure : The position of the needle

In figure , the needle tip can be seen resting against the inside surface of the jar. Then, when the solution is injected, it will run down the side of glass, giving an even inoculation. It is also important to add, that the vermiculite in this jar photo is very course. This makes the needle more visible for the demo. This type of vermiculite is best avoided.

3.1 Alcohol flaming technique

If the syringe needle is touched, flame the needle to sterilize it. An alcohol flame is a clean flame whereas a butain cigarette lighter leaves behind an undesirable soot residue. To produce a short burning alcohol flame, place a tequila shotglass upside down. Using an eyedropper, put a few drops of denatured alcohol fuel (hardware store) on the hollow bottom of the glass and touch it with a match or lighter. The blue flame will cleanly and safely sterilize small stainless steel tools. Heat the needle in the flame for a few seconds to resterilize it. There might be a few "pops" of boiling water spurt out of the needle, but the spores within the syringe are safe. If there is some left over spore solution, replace the needle guard and store the syringe for later use. Resterilize the needle immediately before re-use. Store the syringe in a dark, cool place.

3.2 Inoculation of PF jars without the lids

This technique can also be used if canning jars are not available (- pint wide mouth canning jars are perfect and should be used at all cost). If regular drinking glasses are to be used - use regular tapered sided drinking glasses (ounce - mL)

Jars can be inoculated without using a lid with holes punched. Before trying this technique, inoculate with the punched lid first. That will show how it works without any problems (almost fail proof).

The only precaution to observe is to disturb the dry top vermiculite layer as little as possible, especially when removing the needle after the inoculation. The underlying substrate must not be exposed to the air. Carefully move any disturbed vermiculite back into place. If using a drinking glass or alternate container, cover the mouth with tin foil. Replace the tin foil cover after inoculation.

3.3 Incubation of inoculated jars

Figure : After about a week

After inoculation of the jars, tighten the lid bands and retape the needle holes. Place the jars in a safe place out of direct sunlight. Indirect light is all that is required. If the temperature is kept around degrees, germination will begin within to days. Germinating spores appear as small white fuzzy spots (after approx. to days), quickly growing and spreading with cottony white growth and strandy "rhizomorphs". After about a week (depending on circumstances like temperature) the inside of the jars should look like figure .

Any room temperature is O.K. If it gets cold indoors, over head light shinning down on the tops of the jars is a perfect heating technique for this culturing stage. A clamping type light with a reflector works well for this. If this is done, keep the temperature around degrees (don't overheat the jars - monitor the temperature with a thermometer). A warm overall house temperature is fine. But in the overall view, cool temperatures are never a problem. The rule is to not overheat.

3.4 The canning jar lid (loose or tight)

There are two choices with the lids during incubation - tight or loose. With a very high moisture content (good for fruiting), a tight lid can cause water to collect in the bottom of the jar. This is to be avoided. If it happens, the lid should be kept on loose during incubation. Tape the canning jar lid to the band to make the lid act as a one piece lid for raising and lowering.

If the substrate is on the dry side, a tight lid will preserve the moisture content. It is all a matter of the balance between the water needs of the mycelium, the size of the jar, the available air space in the jar and the type of vermiculite used. Only by simple experimenting and comparison can the right balance be found for a given set of conditions. Take notes and go with what fruits the best.

After the substrate turns white with the mycelium (or weeks after inoculation), the jars are left to sit in *indirect* light. The mycelium will continue to infiltrate the substrate until it gets enough food to trigger the fruiting cycle. In less than a week to a few weeks after surface colonization of the cake, tiny white "pin" like structures begin to appear. This is called pinning. This is the beginning of the fruiting cycle. Soon after that, within the week, small round fungus growths appear that soon begin to turn yellow.

Lastly, "*primordia*" start to grow. These are tiny worm like structures with tiny reddish heads. These are the first mushrooms.

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often, a decrease in growth rate is witnessed. In that case, the tape on the holes should be removed, and the jar has to be turned upside down.

4 The birthday cake

Figure : Time to birth the cake

Figure is of a - pint PF substrate jar about days after inoculation. The primordia have appeared and it is now time to birth the cake. Wait until you see this, and the fruiting will be maximized. The fruiting is fairly relative to the primordia that appear.

The best time to remove the fungus cake from the jar is when the primordia (tiny worm like structures with reddish heads) appear on the cake while still in the jar. Be careful not to damage them in handling. The rule is to handle with care.

Remove the lid. With a clean fork, scrape away the majority of the dry top vermiculite layer. There will probably be seen some wispy mycelium here and there in the top layer. Place an old jar lid over the jar mouth and turn the jar upside down. Lightly slam the jar down on a table cushioned with a magazine. The fungus cake will slide out onto the old jar cap (!). The jar cap functions as a base for the cake. When handling the fungus cake, be careful as not to squeeze and bruise it. Bruising results in a bluish mark. This fungus is resilient and can tolerate a certain amount of handling, but handle it as least as possible. The aroma is distinctly mushroomy, very pleasant.

As soon as the fungus cake comes out of the jar, daub the cake with a piece of loose tissue paper to soak up any water droplets that may have deposited on the cake as it comes out of the jar. Immediately after the birthday, place the cakes into the dual chambered terrarium for the fruiting cycle.

Figure shows the cake a few days after the birthday. This is a healthy fruiting start. Some of these primordia will abort, but most will go on to full development.

Some of the first mushrooms to form are "aborts" (convoluted caps, gnarly stems and stunted growth), and ironically they are primo in magic alkaloids. They are even more powerful in magic than the stately beauties that will soon dominate the cake. The tiny "baby mushroom" aborts are likewise good. After witnessing the growth of the fungus, recognition of these aborts is easy. As long as the aborts are healthy and pure, they are primo. Also, another form of mutants will manifest, blobs of fungus with little or no cap, also good for harvesting. And along with these mutants, appear the perfect specimens, the sporocarps.

It has been reported that Psilocybe Cubensis is a "weak" mushroom. PF and

Figure : Start of fruiting

others have seen this to be not necessarily so. It all depends on how it is grown, on what medium and how it is harvested and preserved.

The secret to potent mushrooms is in their age when picked. It has been scientifically proven that the small immature specimens are significantly more potent than the larger mature specimens. Over half of the small primordia that first form will abort (cease growing, convolute and deform). Pick these before their heads turn black. A pointed knife blade works well for removing these high potency primordia. These are among the most potent. The abortive mushrooms are also high potency. Harvest them when they are young and before their heads turn black. When the fruitbodies are normal, harvest them before the veil under the cap breaks. The mushrooms will be smaller and their heads will be roundish. It is important to note that the mushroom cakes pictured in this book are all mostly well matured. While these mature specimens are beautiful and perfect, they are not as potent as the diminutive specimens. The mature specimens are good for spore collecting and showcasing but are weak in psychedelic potency.

Grow them on brown rice, harvest them when they are young and cool dry them with desiccant. When this is done, they are an entheogen of the highest order.

4.1 Time scale of the mushrooms

. Spore inoculation to spore germination - within a week, at degrees Fahrenheit (degrees Celsius).

. Spore germination to complete colonization of the cake - about to weeks.

. Colonization to fruiting cycle start - within weeks.

. The fruiting cycle lasts about weeks.

After the initial flush, the mycelium cake begins to turn blue and no more mushrooms form. If the cake is thoroughly cleaned of aborts and stray fungus blobs

after the initial fruiting and given the PF double ended cake casing tek, fruiting can be doubled or even tripled.

All in all, the process takes from - weeks from spore inoculation to fruiting.

4.2 Contaminant source identification

Contaminant invaders appear in various colours from pastels to black. If they appear, the culture is doomed. Bacteria contamination is detectable through the top dry vermiculite layer as a sour foul odor within two days after inoculation (and no spore germination). If the jar is bacteria contaminated, be careful in cleaning it. Keep a safe distance from the contaminated substrate. Don't inhale the bacteria and wash after touching it. Bacteria can be dangerous.

Control jar technique After the jars are steam sterilized, let them cool, tighten the lids and let them sit uninoculated for several days. Watch for any coloured growths or changes in the appearance of the substrate. The tell tale rancid odor of bacteria can be easily detected by loosening the jar lid and checking for the odor. If there is contamination at this stage, the sterilization technique needs to be checked. Most likely it will be a to short sterilization time. If there is a problem at this stage, lengthen the sterilization time. If the jars remain clean and unchanged, they are ready for spore syringe inoculation. If contamination occurs after inoculation, the syringe was contaminated or the dry vermiculite layer was breached during inoculation.

4.3 Non-germination of spores

. The spore solution was not inoculated deep enough down into the jar. Instead of running down the side of the jar and inoculating the substrate cake, the solution was absorbed by the non-nutritive top vermiculite layer. To avoid this from happening, make sure that the spore solution flows down along the sides of the substrate cake by inserting the syringe needle so that the tip is below the non-nutritive upper vermiculite layer.

. The substrate jars were not allowed to cool down after sterilization, killing the spores. Inoculate only when the jar feels cool to the touch.

. There is evidence now that syringe boxes can be exposed to killing heat during transit (a very rare occurrence). The possibilities are such as over heated airplane cargo holds during intense heat waves or a superheated mail truck parked all day in the sun. Another possibility is that on arriving at the mail box, the syringe package was allowed to sit inside a broiling sun heated mail box, killing the spores.

. Spore syringes can survive freezing, but extreme low temperatures are probably destructive to the spores.

5 The dual chambered terrarium

Figure : The dual chambered terrarium

5.1 The airtight aquarium lid (top)

(For a standard gallon aquarium, see figure)

" × -" outside dimensions -" × " inside dimensions (dimensions variable). The frame can be made of flat (unwarped) -" thick board or wood strips connected by screws.

The wooden lid frames' inner rectangular cutout must be than the top of the aquarium. Clear polyethylene plastic film is tacked to the underside (or upper side) of the frame so that the frame holds it tightly onto the aquarium top. The frame essentially hangs by the plastic film. A simpler alternative is to cover the aquarium top with saran wrap or something similar. The most important point to be stressed is that the aquarium must be sealable with no air leaks, for humidity retention.

5.2 The spray shield/chamber partition

(for a standard gallon aquarium)

Use -" thick clear acrylic (Plexiglas) window insulation available at most hardware stores. Have it cut around " × " (dimensions may vary - check the aquarium first). A loose fit is good as long as the cakes are protected from the direct spray.

5.3 Dual chambered terrarium techniques

The mushrooms get water from sources; the substrate they grow on and the air that surrounds them. The surrounding air must be highly humidified. The fungus needs to bathe in a shroud of floating water molecules. % humidity is where there is the maximum number of water molecules floating amongst the air atoms. The dual chambered terrarium easily achieves these conditions.

It all starts with the spray from the hand sprayer. The first rule is to never directly spray the fungus. This initial spray is comprised of water droplets that are giant ponds of water in relation to the fine mycelial networks of the fungal threads. In culture, the droplet of water will drown the micro world of the fungal structures and thereby inhibit or contaminate growth. But the airborne molecularized water floats into the fine structures and gives the fungus humidity

as needed. Molecularized water is another way of describing water that has evaporated into the air.

The spray that comes out of the spray bottle must be molecularized for the fungus. The spray shield and the primary chamber accomplish this. The primary chamber receives the initial spraying. As the spray strikes the shield, it is broken down into a finer mist which flows around the sides of the spray shield into the secondary chamber where the fungus is bathed in the fine humidity safely away from water droplets. In a matter of time, this humidity will condense out onto surfaces inside the terrarium and drip down. The spray shield is slanted and therefore acts as a drip shield and roof, so the more condensation the better.

5.4 Spraying procedures

First, before placing the cakes into the terrarium, spray all the inside surfaces of the terrarium, including the spray shield and lid. Insert the fungus cakes and put the spray shield and lid in place. Then, slightly lift up the lid and insert the nozzle of the water spray bottle in between the lid and the top of the aquarium and vigorously spray downwards into the middle of the shield. After about seconds of spraying, immediately withdraw the sprayer nozzle and let down the lid to seal the swirling mist inside the terrarium. Come back after a few minutes and give it another spraying if desired and a third if the terrarium is to be left untented until the evening. To maintain a high humidity try to spray times a day, and the more the better. Compensate for a lack of spraying during the day by spraying several times in the evening. Make sure that all the inside surfaces of the terrarium are foggy or dripping with water. This in itself helps generate humidity.

It has been seen that mushrooms will grow in a properly set up dual chambered terrarium, with only one good spraying a day - and even less than that!

Each time the terrarium is sprayed, the fungus should be ventilated. To ventilate, take o the lid, and while holding the spray shield vertically, fan the chamber with a piece of cardboard, and then spray as above. Also, the water that collects in the bottom of the terrarium must be siphoned out (prevents bacteria buildup). This can be easily done using a rubber bulb battery filler (auto parts store) or a rubber bulb type enema bottle.

Expose the terrarium to normal room light (indirect sunlight). A small low wattage fluorescent plant light will make the phototropic mushrooms grow upwards. Leave it on all the time if desired.

5.5 Heating

The main rule is to not heat the dual chambered terrarium. Any direct heating works against the humidification and adds a drying influence. Do not use heating cables, heat pads or blankets. Don't shine light directly down into the terrarium. Keep any plant grow light (low wattage only) a safe distance from the terrarium. These fungi grow well at degrees Fahrenheit (degrees Celsius). PF has even seen them growing perfectly at temperatures cooler than degrees. They grow slowly when they are cool. When warm or at heated room temperature, they grow very fast. Strive for a growing temperature between and the upper 's (- degrees Celsius). A too hot terrarium will result in lots of spreading mycelium, but no fruiting.

5.6 Symptoms of low humidity

When the humidity is a bit low, but not low enough to stop fruiting, the mushrooms can have fuzzy white mycelium growing on the tops of the caps. When this occurs, the cap looks like it has a crown of white hair. This is not contamination. This white fuzzy mycelium is perfectly good and does not detract from the mushrooms quality.

Deformed, convoluted, and withering mushrooms and primordia are signs of low humidity. For the best growth, the humidity has to be very high.

5.7 The Rich Mans' Terrarium

Figure : The cropdome

Figure shows the terrarium that was used in the perlite and terrarium tests. I found it at a new and used resteraunt supply store in Seattle for $. This is a covered food display tray.

It works great with perlite (and without) and holds half pint cakes. The one in figure has cakes. The cakes are post initial flush and the fruitings are secondary fruitings. The fruitbodies that appear late are always superb in form.

If you can't find one of these in your local town, you can order one for around $ (hence - the "richmans'"). Call the manufacturer (Cal-Mil) in California at . They will tell you where you can order it (from one of their distributors near your town).

Unfortunately, sometimes a distributer will require a minimum of an order for two. But fortunately, the terrarium they will send you for the above price is bigger than the one pictured. It has room for several more cakes, making for a goodly capacity. All the shrooms pictured at this site were grown in one of these.

The catalog numbers are: - – the "connoisseur cover" - – "Deep Tray" bottom half The unit is inches in diameter and about that tall.

To use this terrarium, first spray the insides. Place the cakes in. Hold the cover above the tray and spray a fine mist into the air about feet above the cakes in the tray and immediately lower the cover down onto the tray - trapping mist. Air and mist once a day. But what is so cool about this, is that neglect goes a long way! (set it up and leave it).

Yeah, I know it costs, but it works so nicely, and it makes a nice co ee table display. If your landlord comes by to inspect, he will see it, look down and say, "hey, nice shrooms, what kind are they"? Then you say, "I got it from a science catalog company and it is a new miniature fungi growing kit and the shrooms are not edible - just wild". (or something absurd like that). Then your landlord will look approvingly around, notice the neatness and tidyness of your domicile, and leave, little knowing that he just observed the food of the gods.

5.8 The Ultra Richmans Terrarium

Figure : The best terrarium

This terrarium (figure) was made by a plastics fabrication expert. It isn't cheap (like a poor mans Whalmart plastic storage box) but if you can find the right person - the cost is a bit more than the richmans dome above. It is made out of acrylic clear plastic. It is one piece, with a removable spray shield. At the top, is a spray hole with a rubber stopper. It is designed to hold one fruiting cake to maturity, but it can hold cakes tightly. The cake inside is a first flush PF spore race cake - typical of a first flush obtained with the PF- .

The terrarium is open bottomed so it fits over the cakes that sit on a tray. This is the most fool proof terrarium one can have. And it can be made bigger - as big as a ten gallon aquarium or larger. The plastics expert can make one just by looking at the photo and you giving him the dimensions that you want or by giving him the tray that you have to fit the terrarium to it. Very tricky - but it isn't hard to find someone (a professional) who can do it if you live in any kind of large town.

6 Cool desiccation (drying) of mushrooms

The immature specimens are the best in quality, digestibility and potency. They are characterized as being very light in colour with white stems and light coloured caps. The cap will spread out after the veil breaks. Just before or right after the veil breaks is a good time to harvest. The gills on the underside of the cap will be light in colour. The mushrooms will be conical shaped and sporulation hasn't really begun yet. These are the mushrooms that are the best for harvesting.

Figure : Drying the mushrooms

- The easiest way to dry the fungi is to place them on a wire screen with air available to all sides (figure). Never dry them in an oven or use hot air dryers. The heat leaches the chemical constituents and reduces their quality.
- Using a frost free (dehumidifying) refrigerator works but it is time consuming and then everyone doesn't have a frost free fridge.
- Using desiccant to cool dry mushrooms is overall, the best drying technique.

Materials needed:

. Desiccant
. Wire screen
. Plastic tub or container
. Plastic bag with tie o .

Desiccant sources:

- "D " desiccant. (chemical and science supply retailers). It is the universal lab desiccant.
- Silica Gel granules - desiccant. (Chemical and science supply)
- "D " - (looks like kitty litter - for drying closets and damp places in the home) - available at well stocked hardware stores. This is inexpensive desiccant but works as well as any.

Note: These products might have toxicity warnings - (don't breathe the dust and try not to touch it directly - it dries skin.). Follow those rules, but know that desiccant in an airtight box and under a screen will do nothing to the fungi except dry them. It is completely safe for this use.

What desiccant does, is absorb moisture out of the air. As the fungus transpires moisture, the moisture is immediately absorbed back into the desiccant, drying the fungi. Desiccant can be reused and lasts indefinitely. After use, the desiccant is heated, dried and stored for future use. Store it in an air tight container so that it stays dry and ready for use. Heat the desiccant in an oven as instructed by the manufacturer. This preheating should be done before the desiccant is used because when it is purchased - it is usually somewhat damp which will thwart its function for drying air.

Figure : A drying box

In drying a medium sized mushroom such as Psilocybe Cubensis, use a inch layer of desiccant on the bottom of the container, under the mushrooms. Place the mushrooms on a wire screen and lay them on the desiccant that is in the container (fig.). Put the container with the shrooms and desiccant into a plastic bag. A garbage bag type wire tie is su cient to close the bag. If a clear plastic bag can be found, use that to observe the drying process. After hours, a little shriveling of the shrooms can be seen. About or days later, the shrooms will be dried rock hard. To check the drying - the stem should snap cleanly when bent.

For the best alkaloid preservation technique, the desiccant box can be put into the refrigerator and the mushrooms dried at near freezing temperatures.

Pre drying the mushrooms in the air on a wire screen works very well if the the room humidity is not high. After a couple of days, the shriveling fungus can be quickly and completely dried in the desiccant box.

Mushrooms dried in this way lose hardly any chemical constituents and their truly desiccated state preserves them in their prime for months.

Store them by sealing them in plastic bags or keep them in canning jars with the rubber edged canning lid on tight (as in figure : dried shrooms in little bags stored on top of desiccant). The freezer is a good place for preservation, but make sure the fungi are tightly sealed in their containers to protect them against the moisture in the freezer.

Figure : Storing the dried mushrooms

7 Spore printing and spore syringe preparation

The mature specimens are good for spore production, but are not as good for consumption (weaker potency). They are characterized as becoming darker, with dark bluish colours appearing on the caps and stems. The cap upturns and reveals gills darkening a deep brown colour. The mushroom will look like an umbrella that has turned up edges. On the stem can be seen the purple deposits of the dropping spores. Mature adult mushrooms release spores by the millions. In the area around the mushrooms can be seen a deepening colour of purple. As the spores fall and collect they will colour deep purple. This is the signal that the mushroom has matured and is now in its sporulation cycle. This is the time to take their spores.

7.1 Spore printing equipment

- Kerr – pint wide mouth (low form)
- Canning jar (any suitable jar is OK)
- Finger nail cuticle scissors (cosmetics - drug stores)
- Alcohol, tequila shot glass and eye dropper.

. Presterilize the jar and regular metal lid (rubber edge up) in a small toaster oven at around degrees Fahrenheit (degrees Celsius) for around a half hour. Keep the lid loose during the sterilization cycle. When the jar has cooled down, tighten the lid until it is time to use the jar for a spore print. The rubberized edge will be a bit melted, but that won't be any problem in this technique.

Note: What follows is a sterile technique. The first rule that must be always followed is to wash hands prior to sterile work. Hands are a prime source for bacteria and microspore contaminants. Sterilize all the work surfaces with rubbing alcohol. Minimize drafts. Try for a still air environment. Don't breathe on the work. Run a small home appliance style air cleaner (. % rated e ciency, available at drug and department stores) for a few hours in a closed room to clean the air before doing sterile work.

. Flame sterilize the scissors with an alcohol flame and snip o the mushroom cap. Cut the top of the stem as far up into the cap as possible so that the gills of the mushroom will sit flat on the surface of the jar bottom.

Figure : Making a spore print

With quick and sure movements, place the cap into the jar and place the lid on loosely (see figure). Pierce the top of the cap with a straight pin to pick it up and handle it.

. Leave the jar with a loose cap for a couple of days in a draft free area away from direct sunlight. After the print is taken, quickly and with as little air disturbance as possible, remove the jar cap and extract the mushroom cap from the jar. With a loose jar cap, let the jar sit in a draft free place to dehumidify for a few days before sealing it up (with tape) because there will be some residual moisture left behind on the spores and glass. Store the spore print jar at room temperatures in a dark place away from sunlight. Don't store it in a refrigerator.

Psilocybe Cubensis spores begin to degrade a few months after they are taken. After approximately – years, spore germination will be greatly reduced or won't occur at all. Germination is massive and quick when the spores are fresh.

7.2 Making a spore syringe

Materials list:

. Spore print in jar.

. Sterile syringe with water for injecting water into the spore print jar.

. Sterile syringe for loading spore solution out of the jar.

. A small Pyrex glass stirring rod (science - lab supply).

. Alcohol, tequila shot glass and eye dropper.

. Lid with two holes. Prepare this lid by drilling a hole in the center of the lid to fit the Pyrex glass stirring rod. Punch the second hole near the edge of the lid (rubberized edge up) to fit a syringe needle.

Syringe preparation Boil a pot of water. Draw boiling water into a syringe and squirt it out several times. Refill the syringe with boiling water, replace the needle guard and wrap the syringe in tin foil. Prepare several syringes like this. Drop the syringes into the boiling water and boil them for one hour. Let them cool before using.

The main point of this technique would be to expose the interior of the jar to as little room air as possible. Always protect the holes in the lid by placing tin foil or sterile surgical tape over the holes before and after this procedure.

Figure : Making a syringe

. Inject sterile water into the spore print jar through the needle hole.

. Flame sterilize the glass stirring rod and let it cool a minute. Insert it through the center lid hole and with the rod end, scrape spores into the water (figure left).

. Insert the sterile syringe needle through the small hole at the edge of the lid. Tilt the jar until the water comes up to the needle tip and draw the spore water into the sterile syringe (figure right).

Store the syringe at cool temperatures in the dark. A properly prepared spore syringe will be good for several months and even up to a year or more.

A Units of measure

- pint = , L
- gallon (UK) = , L
- gallon (US) = , L
- cup = , L
- ounce = , g
- inch (") = , cm
- T (°C) = , × T (°F) - ,
- T (°F) = , × T (°C) +

B The inner reservoir TEK

The cakes are regular – pint low form canning jar size. The shrooms are the Mazatec and the Treasure Coast (see below) spore races from PF.

Figure : Mazatec fruiting - the cake is still bright white with this first flush. Without the inner reservoir, the cake would be blueish (natural drying process - caused by water transpiration from the fungi).

To do this is extremely easy. Everything is done standard PF T and when the substrate is loaded into the jar, use the end of a pen (a "sharpie" ink pen is perfect) and insert it into the middle of the substrate and make a hole all the way to the bottom. Any rod no more than –" around is good for making the hole. A proper sized wooden dowel can be bought at any hardware store for cheap. If the substrate collapses around the hole or if the hole doesn't keep its shape, that means the substrate is to dry. Properly wet substrate works easy and the hole does not collapse.

Fill the jar with dry verm, proceed as usual and inoculate as usual. When the cake is birthed, inject mL of sterile water into the inner reservoir through the top (previously the bottom of the cake invitro). This is more proof, that casing PF style cakes is not what makes a great PF style fruiting, but the water that is made available to the mycelium. Many beginner cultivators that experience great success with casing cakes, usually credit the casing mixture. But here is a fruiting that equals any cased cake, without a casing. It is the water that does it in conjunction with the potent fruiting potential of PF substrate.

This adaption originates from Psilocybe Fanaticus

C PF-Tek for Simple Minds

Credits

The PF-Tek was first made public in by Psylocybe Fanaticus. This tek made the growing of mushrooms at home feasible for complete beginners utilizing commonly available materials. The growing method presented here is based on the PF-tek but includes a few modifications that are time tested, and are, as I think, superior to the original PF-tek.

The tek presented here uses - pint (mL) canning jars or drinking glasses and a substrate made of vermiculite, rice flour and water. The substrate is mixed, sterilized and inoculated with mushroom spores. After the substrate is fully colonized the fruiting takes place in a plastic container.

C.1 Substrate preparation

For one - pint jar (mL) you will need:

- mL vermiculite
- mL brown rice flour ( )
- some vermiculite to fill the jar to the top (app. mL)
- water

Put the required amount of vermiculite for all the jars of one batch (for instance jars: × mL = mL) in a bowl.

Pour water slowly over the vermiculite while stirring with a spoon. Be careful to only put that much water in as it can be absorbed by the vermiculite.

When you tilt the bowl you should see just a little water starting coming from the vermiculite. This is when the correct water content is achieved.

Now put the required amount of the (for instance × mL = mL) into the wet vermiculite at once and mix it in with the spoon. The goal is to coat the wet vermiculite particles with a layer of .

Fill the mixture in jars - inch (cm) under the top. It's very important to fill the substrate in the jars without tapping it down at all. It should stay very airy and loose to provide optimum conditions for the growth of mycelium. Be careful not to leave any substrate on the upper edge of the jar. If you weren't careful enough and there are some substrate specks at the edge, take a clean moist cloth and wipe the upper portion of the jar clean. Otherwise contaminants can start at those spots and work their way down into the jar.

Fill up the jar with dry vermiculite to the top. This layer hinders airborne contaminants reaching the underlaying substrate, in case they manage to come in during the inoculation.

Take a inch (cm) wide stripe of aluminum foil and fold it in the middle. Put the foil over the opening of the jar.

If you're using jars with metal lids, you can poke holes at the very edge of each lid with a small nail and hammer and screw the lid on. The holes should be slightly bigger than the diameter of the syringe needle.

Fold the foil edges up and press them together so you get a nice aluminum foil lid.

Then take a piece of foil measuring " × " and put it over the first two layers (respectively the metal lid if you're using lids) leaving the edges of the foil

This appendix only covers adaptions to the *substrate preparation* and the *incubation*. The unabridged "PF-T for Simple Minds" can be found at `www.fungifun.com`.

reaching down, since it has to be lifted again during the inoculation. So now you have layers of foil over the opening, only the upper layer is lifted during the inoculation.

Pour approximately " (. cm) of water into the pressure cooker. Don't put in too much water, otherwise it will come into the jars and alter their water content. Then stack the jars into the pressure cooker. The use of a rack to keep the jars from directly touching the bottom of the cooker is strongly recommended. Put the lid on and bring the cooker to the required pressure (psi = atm over atmospheric pressure) slowly over a period of minutes on a medium flame. If you heat the cooker too fast this can cause the jars to crack. As soon as the steam begins to escape the rocker or the vent at the top of the pressure cooker, turn the heat back so only a very small, steady steam flow persists from the vent. From this point on, pressure cook for minutes. Depending on the pressure cooker model the cooking procedure works a bit di erent so if you're not familiar with pressure cooking consult the instruction manual or someone who used pressure cookers before. After minutes, take the cooker from the flame and let cool for at least hours or even better over night. If you are unable to find or buy a pressure cooker, you can also sterilize the jars using a big pot with a lid. In this case, steam the jars for . hours in a pot lid on. Use only approximately inch of water at the bottom. You might have to add some water to the pot during steaming due to evaporation.

C.2 Incubation

The jars should be stored at - °C (- °F), the warmer the better, but not exceeding °C. If you're unable to provide these temperatures you can build an incubator.

Dependent on the temperature it takes – days for the mycelium to colonize the whole substrate. After this is accomplished, store the jars at normal room tempereature, about °C (°F). Don't expose the jars to direct sunlight. Indirect sunlight or a low wattage lamp at least a few hours a day is su cient.

Providing the jars are kept warm, you should see the first sign of germination after – days as bright white specks. This is mycelium. If anything grows that is not white, for instance green, black or pink, then the jars are contaminated and their content must be discarded and your clean procedures need some improvement. After the jars are emptied and the jar is washed with detergent and hot water it can be used again.

Within – days (with certain mushroom strains it can however take up to days) pinhead-size accumulations of mycelium should form. These so called pins represent the beginning of mushroom growth. In the following days also small mushrooms with brown heads become visible. Now it's time to birth the cake into the fruiting container where the mushrooms can develop to maturity. Some strains don't easily develop pins. In this case put the colonized jar wrapped in a plastic bag in the fridge over night and birth next day, even if the cake doesn't show pins. This cold shocking usually helps triggering pinning.

D Perlite humification

Credits

The information contained in this appendix has been culled from a variety of sources. As far as I know, the idea to humidify with perlite first started being tossed around early in . It's a pretty simple idea once you understand how perlite and water interact. Many of the details of the process have been filled in by adventurous netizens who tried the process, modified it, and posted their details to various newsgroups, web boards, or mailing lists. The actual collection of information, writing and layout of the , were done by Erowid.

Revision History

1.0 / / - Created the basic html

1.1 / / - Added credit information and health concerns section

1.2 / / - Added info about how long it takes for the perlite to initially humidify the chamber, and a note about the possibility of mason jar lids rusting if they're used to hold the cakes up o the perlite.

1.3 / / - Added Links section

1.4 / / - Made a few minor clarifications

D.1 Introduction

The theory behind the Perlite Humidification Technique is that instead of trying to humidify your growth chamber with a complex humidifier set-up. . . you use a layer of perlite to keep the humidity high. In addition to requiring less daily care, some people say the perlite method can sometimes provide up to or flushes. Many people seem to have great luck with this method! If you have any information about using perlite that isn't included here. . . please let us know.

D.2 What is perlite and how does it work?

Perlite is made of small pieces of extremely porous volcanic rock. If you look at is closely (microscopically) you'll see that it looks like swiss cheese with (relatively) huge holes. When water is added, it is wicked into these pores of the perlite. This porous structure then serves to slowly evaporate the water back into the air. The huge surface area in the micropores of the perlite helps the water evaporate forming a vapor of tiny droplets which tend to stay well in the air, as opposed to the bubbler and humidifier methods which have large droplets which tend to condense. This evaporation process takes a while, which is perfect for our purposes, since we want to prolong the evaporating process as long as possible.

Perlite can be purchased from most gardening supply stores. It's generally kept in the same area as bags of dirt, manure, fertilizers etc. A small bag is about $ and a large bag is about $. Apparently perlite can also be purchased in automotive stores for use in helping clean up oil spills. . . best to avoid this variety as some sources suggest it is treated with chemicals which may not be good for growing mushrooms.

The original location of this appendix can be found at
`www.erowid.org/plants/mushrooms/mushrooms_cultivation_perlite.shtml`

D.3 Health issues with perlite

Inhaling perlite dust is not recommended. Think of it as inhaling tiny pieces of glass into your lungs. The problem is, when you buy a bag of perlite, it's often quite dusty. One good solution is to pour a bunch of water, about & of the volume of the perlite, into the bag when you first open it. This can significantly help reduce the dust levels. Some bags of perlite even have this suggestion printed on them.

D.4 Can I use vermiculite instead of perlite?

Not recommended. Though some people have used vermiculite successfully, the perlite technique relies on the porous structure of perlite to work. Unlike perlite, vermiculite actually absorbs water. . . and creates a big mush in your grow chamber. It's smaller surface area is significantly less e cient at re-releasing the water back into the air.

D.5 What do I do with the perlite?

Basically, you're going to cover the bottom of your grow chamber with a layer of wet perlite. The grow chamber should be fairly well sealed and shouldn't have any holes in it. Then, you put your fully colonized cakes in on top of the layer of perlite. The perlite should maintain just about the right level of humidity without any help. Other than daily airing of the grow chamber to reduce CO levels, there's very little maintenance with this method.

D.6 Is there a problem with contamination of the perlite?

An obvious concern with the perlite technique is sterilization. Intuitively, it just doesn't seem right that one would work so hard to make sure the grow chamber is sterilized correctly, and then dump a big wet pile of unsterilized perlite in the bottom. But generally, there doesn't seem to be much of a problem with contamination of the perlite. Apparently expanded perlite is produced by a process which brings it to - degrees Celsius, therefore it is certainly sterilized when it goes in the bag. Obviously storing an open bag, especially if it's wet, could introduce contaminants to the perlite, but an unopened bag of perlite should be relatively contaminant-free.

Most people simply use perlite out of the bag, though some swear by boiling or baking the perlite first to sterilize it. It's also possible to add a small amount of liquid sterilizer to reduce contamination.

Hydrogen Peroxide

If you've tried the perlite method and had problems with contamination, or if you'd just like to be extra careful, you might want to try mixing a small amount (. % solution) of Hydrogen Peroxide into the water. In theory, this low level is enough to help reduce contamination in the perlite layer, but isn't enough to hurt the mycelium since the cakes aren't in direct contact with the liquid. Some people suggest pouring the hydrogen peroxide directly onto the perlite layer before adding the cakes, but I might recommend mixing it directly with the water before adding the water to the perlite so there's no change of the cakes coming directly into contact with any significant amount of the hydrogen peroxide. Either method should work fine.

Chlorine

Though many people recommend using bottled water in order to keep your grow chamber as sterile as possible, others suggest that using tap water adds just enough chlorine into the system to keep unwanted contamination down. You could possibly get the best of both worlds by using bottled water and adding a tiny amount of chlorine bleach to it. This seems to be a matter of personal preference. Whichever works for you.

D.7 How much water do I add to the perlite?

There are slightly di erent methods you can use. The first is to put about . - inches of perlite in the bottom of your grow chamber then add about - - - inch of water. The water level needs to be well *below* the top of the perlite. Only the perlite that is exposed to the air will wick up the water and release it into the air over time. It will take a few hours (depending on the external humidity and size of the chamber) after adding the water to the perlite before the grow chamber will be humidified.

The other method is to put your perlite in a big bowl and add water. You want the perlite to be pretty wet, without having any extra, so fill then pour o the excess. Once the perlite is wet, cover the entire bottom of the grow chamber with a . - inch thick layer. With this method, some people like to place thin layers of dry perlite under and on top of the wet perlite layer.

With either method, as the perlite dries, you can occasionally add a bit more water (weekly or so). You should add just enough to keep the perlite wet, but not enough to create any standing water which would increase the chances of contamination. Be careful not to overfill.

D.8 Can I put the cakes directly on the perlite?

Your cakes can sit either directly on the perlite layer, or they can be placed on something like upside-down mason jar lids (including the ring). There's no real agreement as to which is best, but there are a few issues to consider when deciding which method to use:

Directly on perlite

It's theorized that some amount of water is fed directly into the cake through absorption if the cake is placed directly on the perlite. Some think this may increase contamination, but others say the only noticeable e ect is that the mushrooms growing near the base of the cake will often be a bit bulbous and overly wet (sometimes this only happens on the nd or rd flush), though this is also where some people find the largest mushrooms growing. Cutting the wet mushrooms in half before drying will help with this problem.

On lids

Growing on lids will prevent direct contact between the cakes and the perlite. If you're using hydrogen peroxide and you're worried about the mycelium being hurt, lids may be in order. If the cakes are being grown on lids, you can remove the lids after one or two flushes, or at any point that the cakes seem too dry, in order to get a humidity boost. Others recommend removing the lids for a few days after each flush in order to rehydrate the cakes. The main problem

with using metal lids is the possibility that they will rust. Ideally one would use something non-metal.

D.9 Temperature

Just as with most growing methods, the temperature in your grow chamber should be between - degrees Fahrenheit.

D.10 Humidity

Humidity should be as high as you can get it without causing standing water on the cakes. You'd like to be above % humidity. If the humidity is too low, you may have problems getting the mycelium to flush, and also may see mycelial growth on the mushroom itself.

D.11 CO Reminder

Make sure to open your grow chamber and fan it out frequently to disperse excess CO . Some people do this a couple of times a day and others once every few days.

D.12 How long before I can harvest?

After fully-colonized cakes are birthed onto the perlite layer, it will take - weeks for the cakes to pin and then another week or so until the mushrooms are ready to harvest.

You can keep the same perlite in the grow chamber for as long as the cakes continue flushing. Once your cakes are finished flushing, and before adding new cakes, clean and disinfect the grow chamber and use new perlite.

D.13 Other perlite options

Small Perlite Shroomariums (by Bacchus)

If you're using the PF-T formula (rice flour and vermiculite), instead of a using a large humidified aquarium, try making individual shroomariums. Each one is a gallon jar with - inch of wet perlite at the bottom. When the cake is ready to be birthed, it is placed in the jar on a plastic lid or something similar.

This method may not yield quite as many or as large shrooms as a fancier, larger, more expensive setup, but it should be more than adequate for most appetites. This may still benefit from an occasional misting from a spray bottle, but is otherwise pretty maintenence free.

D.14 Links

- Basic Facts About Perlite – From the Perlite Institute
  `www.perlite.org/bfacts.html`
- Porosity Info – Cornell University
  `www.cals.cornell.edu/dept/flori/growon/media/poros2.html`

Last Modified - Fri, Jan ,

E Own experiences *Under construction!*

While the information in this tek mainly consists of theoretical writings I have found on the web and considered useful, this appendix describes my own experiences; how I did it, what I found useful, what didn't work for me and why I do it the way I do it. Up to now, I've two years of experience, about cakes inoculated (and mushrooms harvested from these cakes) and a lot of wonderful experiences from my own home-grown mushrooms. The method I use to grow my 'shrooms is derived from this tek (in fact: I made a printable version of the PF-tek (this) because it worked better for me to have something on paper than to read something from internet directly). I made some ingenious modifications to the original PF-tek (the one this guide starts with) that made the work a lot less time consuming.

E.1 Inoculation

I learned that it isn't necessary to inoculate in holes. While I did for most of the cakes; for five cakes I didn't have enough spore solution, and I decided to inoculate only in one hole per cake. Astonishing fact was, that the colonization process wasn't slower than with for holes inoculated. After about weeks, the cakes were completely colonized and some weeks later, the cakes were ready to be birthed. Now, I use inoculation in two holes only.

E.2 The terrarium

Some main improvements I made where of the terrarium. Two of the main problems with growing mushrooms seem to be the humidity that has to be kept high, and the CO level that has to be kept low (with a high O level). To meet this conditions, one has to ad moist and fresh air on a daily basis, which makes growing very time consuming. More over, if you decides to go away for a week or so, you will have to ask someone to take care of your cakes.

I found a way to make the growing of mushrooms that less time intensive, that I only had to intervene when it was time to harvest. First, I built a terrarium out of a clear acrylic (Plexiglass) sheet. It's possible to have sawn the acrylic sheet at the market where you buy it, otherwise it's quite easy to saw it using a pad saw. I glued it using silicone glue, which was specified for acrylic plexiglass.

For maintaining high levels of humidity and oxygen, I used an aquarium pump. The tube that comes from the pump goes through a little hole in the acrylic sheet and ends in a jar that is filled with wet Seramis clay or wet hydro grains (perlite will also do, but I couldn't find that). To get the humidity even higher (- %), I used a layer of hydro grains on the ground of the terrarium. On top of that grains, the cakes were placed on saucers with vermiculite. For a systematic drawing of the situation see figure . On the opposing side regarding to the jar with grain, I made a hole in the acrylic sheet with a diameter of about cm. This hole is covered with speaker canvas, to prevent flies from getting into the terrarium.

E.3 Old spores

It seems that, when the spores are too old, the strain becomes weaker. While the mycelium grew as normal, the mushrooms were abnormally misformed, and I

By 'Oldrick'

See appendix D about perlite humidification

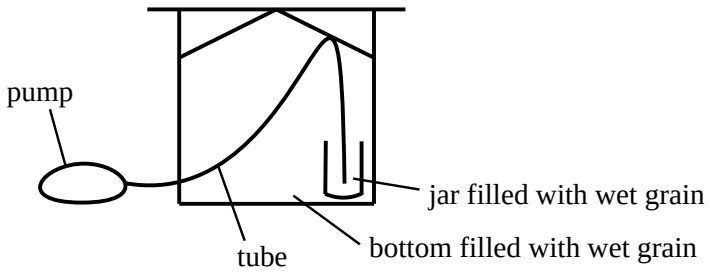

Figure : Automated system

couldn't harvest that much as with the same but fresher spores. This happened after the spore syringe was about one and a halve year old (to be more correct: I owned that syringe for that time, I don't know how old it was before it was sold to me). On the other hand, I had a spore suspension I made myself, that was about as old as the just mentioned syringe, that did fine.

If you run into this kind of problems, the spores might just be too old.

E.4 Flies and other annoyances

One of the most annoying things when you grow mushrooms, is the presence of fruit flies (Drosophilidae). This is not a big problem in the colder seasons, but becomes annoying in the summer. At first, there are only a few, but since they seem to like sex a lot, they really colonize the cakes in a short time. Maybe, they can be killed with appropriate pesticides (not tried, yet), but I would be careful to not contact the cakes with the poison.

E.5 Contamination

At last, I want to write something on this, not at least important, subject. While contamination is no problem generally (provided you meet the sterility conditions as they are mentioned in this guide), they can occur. It has to be mentioned, that I never had any serious contamination. It seems that when all sterility conditions are met, and when the spore syringes are OK, contamination can be avoided very easily.

I first experienced some kind of contamination that may be of bacterial kind. It struck me, that some inoculated cakes just won't start to colonize the cake, or stopped somewhere, and started to grow very faint. When I removed the tape on the holes on the lid, and used my nose to taste the smell, it wasn't the odour I was used. It smelled a bit di erent (more 'fruit-like'). I had the association of bacterial or maybe yeast-like contamination, that used all available oxygen. When I removed the tape and thus made it possible for the cake to 'breathe', I saw that the mycelium started to grow again. The strange smell disappeared, and healthy cakes where the result. They fruited normally, and the experience after eating the mushrooms was as pleasant as usually.

In one other occasion, the vermiculite layer between the cake and the lid was too thin, and because I had removed the tape from the holes too early, a green mold started to grow (*Penicillium*?). I decided to not throw it away and just see what would happen. Figure shows the competition between the two fungi in time.

As can be seen in the figure, the cubensis wins clearly.

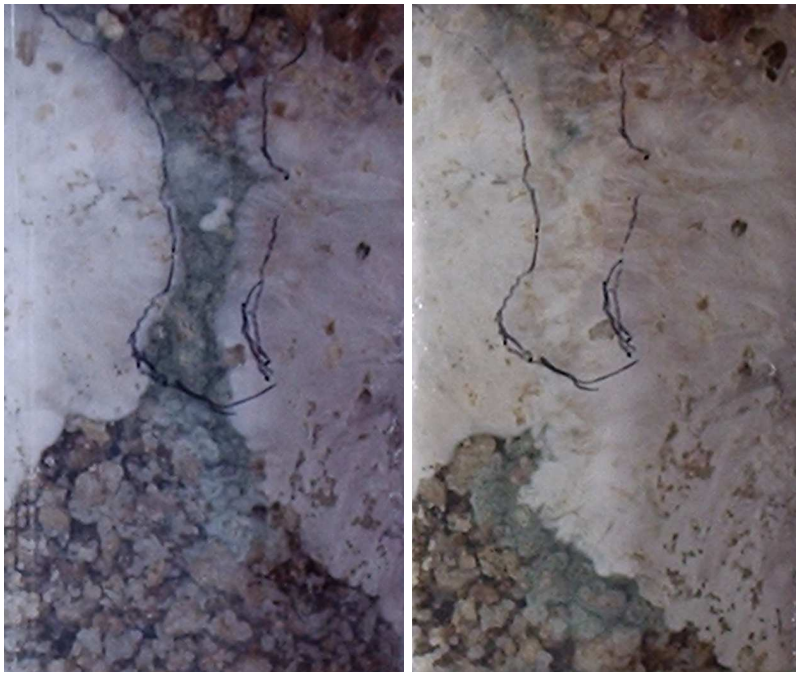

Figure : The race between two fungi

On other occasions, the cubensis is not the winner. I have this situation when the cake is exhausted and the cubensis is su ering severe under-nourishment. This happens after several fruiting cycles, and shows black spots which are growing slowly. The odour of the cake changes then, and smells really bad. Time for a fresh cake!

Bluish spots that show up typically after a growing cycle, is no contamination but dehumidification. Psylocibine is changed in some other chemical substance, with a dark-blue colour. Just put the cake for one or two days in a jar with water (drown the cakes), and everything will be fine for a second fruiting cycle.

Under construction!

Last Modified - Sun, April ,