Psilocybe Fanaticus TEK

by

Robert McPherson aka Psylocybe Fanaticus

and others

QAL in one

original source: http://www.fanaticus.com/

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About

Latest news: Robert ' Billy' McPherson, creator of the PF TEK, has passed away. Here is a recreation of his fanaticus website about mushroom cultivation, which existed from 1995 to 2003.

The mind of Robert 'Billy' Mcpherson, once better known as Psylocybe Fanaticus, has succumbed to hepatitus C. He will not be with us in 2012. He is in coma since 11-11-11 and in his final hours before leaving his body. His techniques will survive forever.

I guess that still most psychonauts who cultivate Psilocybe cubensis for entheogenic and other purposes use his creation, the PF TEK, to do so

remember...

Over half a century has passed since Albert Hofmann identified psilocybin as the psychedelic (="mind manifesting") material in several species of Mexican mushrooms. One of those is Psilocybe cubensis.
Since then many hundreds similar psychedelics have been made. But psilocybine still stands out as nature's friendliest and best liked psychedelic. Today, over one hundred psilocybine producing mushrooms are known. From all of those, Psilocybe cubensis still is the largest, fastest, easiest cultivatable and third most potent one. Especially the PF Classic cubensis, known by some as penis mushroom.

Beginning in the nineteen sixties, myriad of methods have been published to grow Psilocybe cubensis. But only one technique can do without petri dishes, -pressure canner or other laboratory equipment. That is the Psylocybe Fanaticus Technique or PF TEK, created by Robert McPherson in 1991, which currently is the worlds most popular method to grow 'magic' mushrooms (downloaded, printed, distributed and practiced many millions of times).

The PF TEK is to the entheogenic experience what the hot water extraction is to the caffeine experience. People will be using it many centuries from now.

Levitate well Billy... you are now known by a small circle of friends but your practices are and will be followed by many for as long as mushrooms and mankind will coexist. The spores of your knowledge will be spread to the stars and beyond.

It was and is a pleasure to have grown with you!

Yachaj

The PF TEK magic mushroom revolution began in September 1991, with its introduction in High Times magazine. It is now the most popular magic mushroom growing technique of the world, and this is the undiluted original.

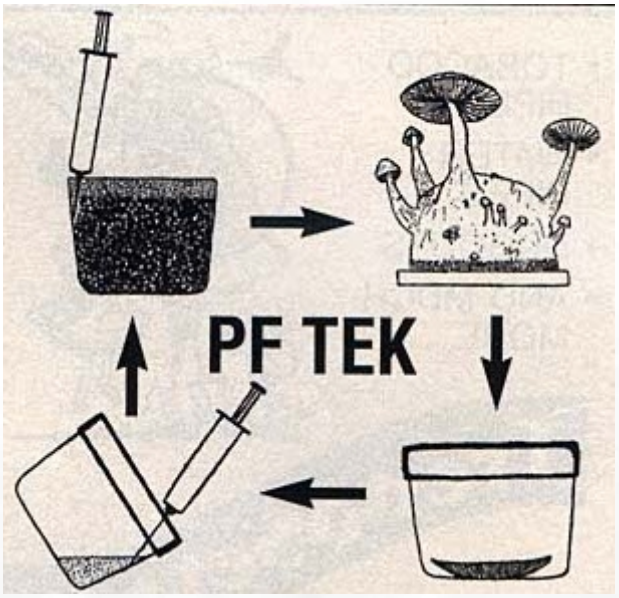
ESSENTIAL PF TEK DOCUMENT

INTRODUCTION

magic mushrooms, ala PF TEK

The PF TEK is basically a brown rice method with an improved formula by using vermiculite as a base and adding pulverized 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 TEK, 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 PF Techniques



1. Brown rice powder, vermiculite and distilled water are mixed and loaded into a 1/2 pint jar, which is steam sterilized. The jar is then inoculated by the spore syringe.
2. 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.
3. A mature mushroom is decapitated and spore printed in a jar.
4. Spore syringes are prepared with the spore print jar to begin another life cycle.

Basic materials list for cultivation

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

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

Mushroom growing (Stage two) Pet shop - Hardware store

1. 10 gallon aquarium
2. Cut piece of transparent plastic (Plexiglas) - (terrarium chamber partition)
3. Strips of wood with connectors and screws (terrarium lid)
4. Plastic film and thumb tacks (terrarium lid)
5. Small wall type thermometer
6. "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.
7. Wire screen - plastic containers - plastic bags - (drying mushrooms)

8. DESICCANT (drying mushrooms) (scientific - chemical - lab supply)

Spore printing and spore syringe making (Stage three)

1. Micro curved cuticle (finger nail) scissors (cosmetics - drug store)
2. Denatured alcohol (fuel - hardware stores)
3. Tequila shot glass and eye dropper (sterilizing and flaming)
4. Glass stirring rod (Scientific supply)
5. Plastic syringes (10cc or bigger) and 18 gauge 1 1/2 inch needles. Large sized syringes are good (20cc - 65cc) as well as extra long needles if available. (Retail medical - health supply - pharmacies - drug stores - scientific and lab

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CHAPTER 1 - PF SUBSTRATE FORMULATION AND JAR PREPARATION

PF Substrate Formulation

Jars and glasses to be used with this technique are 1/2 pint capacity (8 ounces) - (250 milliliters). 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)

1. KERR wide mouth half pint canning jar - preferable
2. BALL wide mouth half pint (similar to the KERR wide mouth half pint) - preferable
3. BALL regular mouth half pint canning jar
4. BALL half pint jelly jar
5. 1/2 pint (250 ml) capacity drinking glasses (tapered sides)

NOTE: Even though the regular mouth BALL half pint and the regular mouth KERR half pint look similar, the KERR is not tapered.

1/4 cup of brown rice powder (Health food stores and co-ops)
1/2 cup of horticultural vermiculite (medium grade) (garden centers and hardware)
1/4 cup of water

or - by volume - one part brown rice, one part water, two parts vermiculite.

The water amount is the crucial element that variates the results. The different brands of vermiculite varies in water holding capacity, creating differing moisture levels. So one can always vary the water amount (less or more than 1/4 cup), take notes and compare results. The highest water content can really make a great fruiting and give several flushes when the balance between the substrate elements is good.

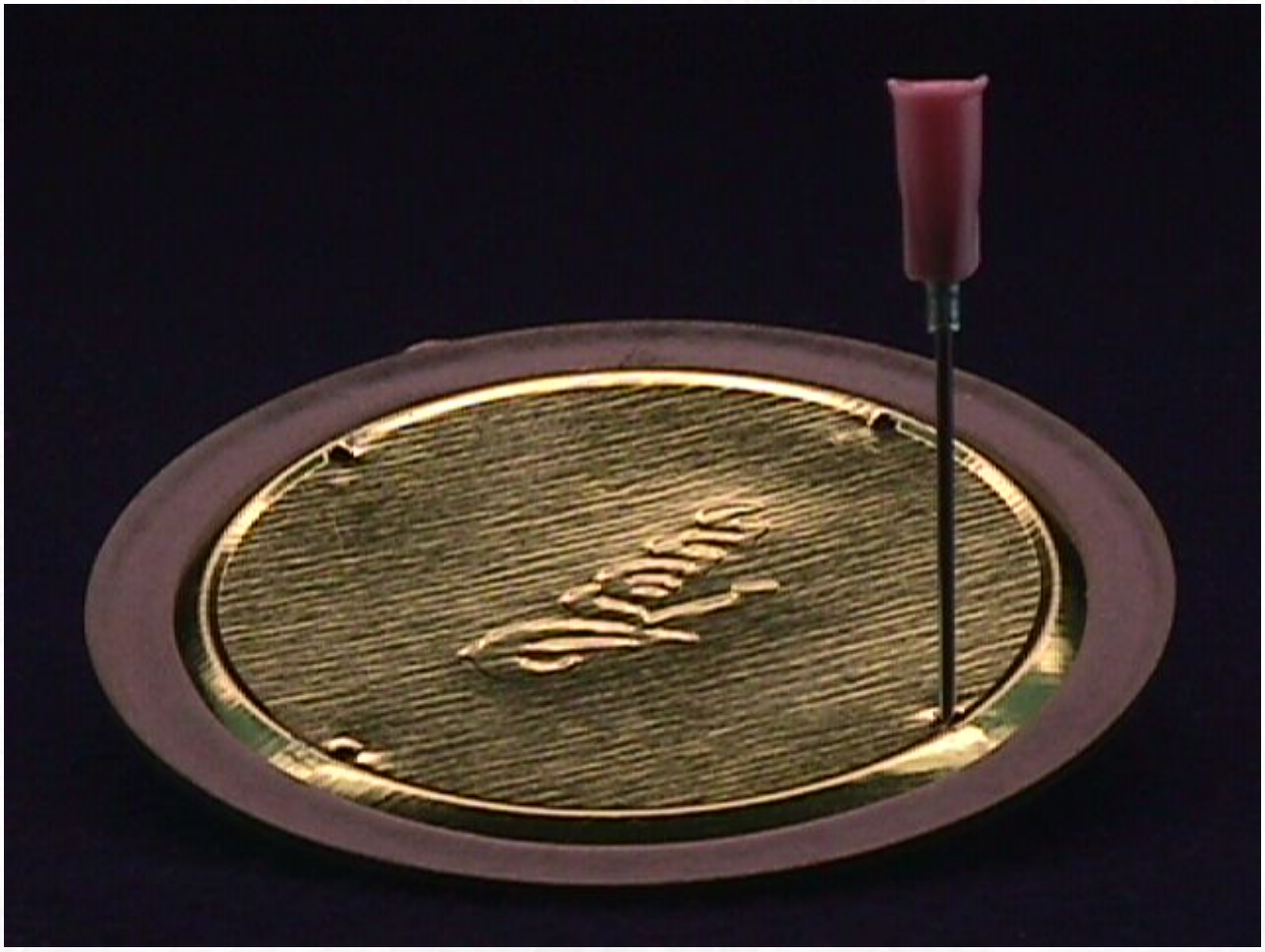
Not all vermiculite is the same. The coarseness varies quite considerably among different brands. The coarser type will hold less water than the finer type which will alter the water holding capacity. If the formulation (water content) results in a really wet or sloppy substrate, use less water. Keep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

The above formula utilizes "HORTICULTURAL" vermiculite - a medium grade. 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 1 millimeter across (some larger and some smaller). The coarser type has particles averaging around 4 or 5 millimeters across and up to 8 millimeters. Stores usually carry one type, the "horticultural grade".

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

A note on water: - 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 difference. I suppose that water seeping from an organic compost pile would be about the best.

If the measuring cup specs aren't true, the formulas will be off, setting up certain failure or diminished growth. Check the cup measurers this way: 1 cup is 237 milliliters which is 1/2 pint or 8 liquid ounces (English measurement). There are 2 cups in a pint, 2 pints in a quart and 4 cups in a quart.



Prepare the canning lid by placing it with the rubber sealing edge upwards on a supporting surface and with a sharpened 3 penny nail (held with vise grip pliers) (or ice pick), punch 4 holes inside the periphery of the rubber sealing edge.

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 off, 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 (after spore inoculation).

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 1/2 pint (8 ounce - 250 ml) capacity. It is important to note, that jars somewhat larger than 1/2 pint can be unreliable for the PF TEK and fail easily, unless the grower has experience with the PF TEK and compensates the formula. The low form KERR 1/2 pint canning jar is the most versatile (fits into tight spaces et).

A 3 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 off the pot bottom where the high temperature will crack the glass.

Step 1. Place 1/4 cup of bron rice powder into a mixing bowl. Add the water directly onto the brown rice powder and mix it up and give it a few minutes to soak in. Add the vermiculite on top of the brown rice slurry. Thoroughly mix the ingredients. An electric mixer works great for this and makes it quick and easy. If there is no electric mixer, a couple of table knives does the trick also. The mixture should feel damp and cohesive (sticks together well). 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 and the best possible fruiting.

Step 2. Fill the jar very loosely. Leave a 1/2 to 3/4 inch space at the top. Level the substrate. With a tissue or a fingertip, wipe the insides of the jar clear of substrate residue down to the top of the substrate (very important - prevents contamination at the top). Fill the top of the jar with plain dry vermiculite and level it off 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.

In the photo, 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 1/2" to 2/3" 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 1/2 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 1/2"-2/3" 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. 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 off during boiling. This water can get into the jars by entering under the jar lids

that aren't tight and soaking the substrate - throwing off the formula and setting up failure. To prevent this, wrap some tin foil around the cap to ward off 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.)

Step 4. Heat the pot of water to a boil first then 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) (begin the timing when the water begins boiling again). A good tight fitting pot lid is essential for successful steaming.

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 you are ready to inoculate them. As long as the lid is very tight, PF substrate jars can be kept for long periods before they are to be used. The only danger to this is water moisture loss.

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

1. 1/2 pint PF substrate jars - 12 p.s.i. for 30 minutes
2. Water bottles - 12 p.s.i. for one hour
3. Syringes and needles - 12 p.s.i. for 10 minutes

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 colored 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.

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CHAPTER 2 - INOCULATION OF THE PF SUBSTRATE JARS

Any jar to be inoculated must be cool to the touch before proceeding. Make sure the jar 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 off the tape covering the needle holes. Remove the needle guard and insert the needle through the lid hole. 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 1 cc per jar. This will allow the syringe to inoculate 10 jars. More spore solution per jar can be used (speeds colonization - I use 3 cc per jar), 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.

In this photo, 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.

Alcohol Flaming Technique

If the syringe needle is touched, flame the needle to sterilize it. An alcohol flame is a clean flame whereas a butane cigarette lighter leaves behind an undesirable soot residue. To produce a short burning alcohol flame, place a tequila shot glass 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.

Also, just wiping the needle with rubbing alcohol soaked cotton will sterilize the needle. Let the needle dry for several seconds to evaporate the rubbing alcohol (alcohol kills spores), or pass the needle through the flame for a couple of seconds to complete the evaporation of the rubbing alcohol.

Inoculation of PF Jars Without the Lids

This technique can also be used if canning jars are not available (1/2 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 (8 ounce - 250ml)

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 (with your finger tip). Replace the tin foil cover after inoculation.

Incubation of Inoculated Jars

After inoculation of the jars, tighten the lid bands and retape the needle holes. A tight lid preserves the water content of the substrate (very very important) and the growing and spreading mycelium will do fine with a tight lid all the way to the appearance of the primordia (using the air in the jar only). Place the jars in a safe place out of direct sunlight. Indirect light is all that is required. If the temperature is kept around 70 degrees, germination will begin within 3 to 5 days. Germinating spores appear as small white fuzzy spots, quickly growing and spreading with cottony white growth and strandy "rhizomorphs". 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 70 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.

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. Water condensing in droplets on the inside of the jar during incubation is normal and is to be expected. If puddling on the bottom of the jar occurs, 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.

An excellent way of depuddling the jar is to use a long syringe needle and syringe. Without disturbing the top

vermiculite layer, insert the long needle down to the bottom of the jar. Tilt the jar so that the water puddles down to the needle point and suction out the water. This works really great, but one needs an extra long needle to do it. Doing this can facilitate superb fruitings with the high water content without the puddling problems and possible deterioration of the substrate because of the water (drowning). With a high water content, there might be more than one depuddling procedure needed.

Also, there is another and even simpler way to depuddle the jar. One just simply inverts the jar and lets the water run down the side and is absorbed by the dry upper vermiculite layer. Most people do this and report excellent results.

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. But after many years of seeing all of this and all over the internet - web - the basic PF substrate formula as given rules.

After the substrate turns white with the mycelium (2 to 4 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 (cake appears all white), 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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CHAPTER 3 - THE BIRTHDAY CAKE

This photo is of a 1/2 pint PF substrate jar about 23 days after inoculation (done with 3 cc of spore water and incubated at 70 degrees Fahrenheit). 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. That is a good sign showing the healthy agressive nature of the mycelium. 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 (BIRTHDAY). What I usually do is hold the jar without the lid on (top down) in my hand and carefully wack the bottom of the jar with a rubber mallet - the cake births nicely. 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, place the cake with the vermiculite covered end down onto a preprepared soaked vermiculite (or perlite) filled saucer, old jar cap, petrie dish ect. It really makes no difference what end of the cake is down. Also, for some of the cakes, follow the PF casing technique (later in this chapter) as a way to make the fruiting max. Leave some cakes uncased for comparison. 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 (actually, this doesn't have to be done, because the freed cake drinks it up within several hours). Immediately after the birthday, place the cakes into the dual chambered terrarium for the fruiting cycle.

This is 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 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 - depending on the strain). 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 fruit bodies 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 (photography) 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.

Time Scale of the Mushrooms

1. Spore inoculation to spore germination - within a week, at 70 degrees Fahrenheit.
2. Spore germination to complete colonization of the cake - about 2 to 4 weeks or more.
3. Complete colonization to fruiting cycle start - within 2 weeks or more.
4. The fruiting cycle lasts about 2 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 4 - 6 weeks from spore inoculation to fruiting.

Contaminant Source Identification

Contaminant invaders appear in various colors 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 your hands after touching it. Bacteria can be dangerous.

Non-Germination of Spores

1. 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.
2. The substrate jars were not allowed to cool down after sterilization, killing the spores. Inoculate only when the jar feels cool to the touch.
3. 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.
4. Spore syringes can survive freezing, but extreme low temperatures are probably destructive to the spores.

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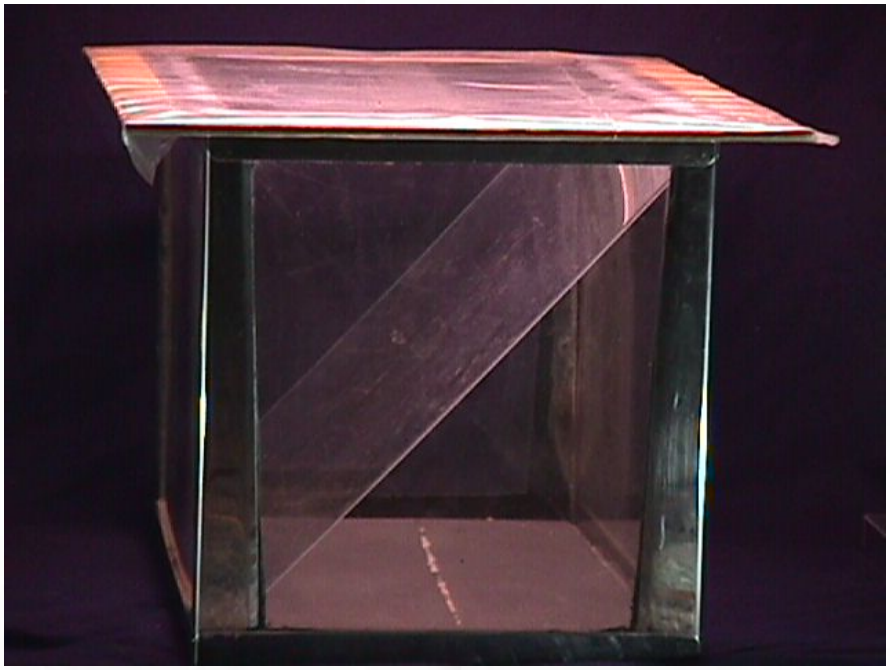
CHAPTER 4 - THE DUAL CHAMBERED TERRARIUM



Standard 10 gallon aquarium

The airtight aquarium lid (top)

24" X 14 1/2" outside dimensions
21 1/4" x 12" inside dimensions (dimensions variable).
The frame can be made of flat (unwarped) 1/4" thick board or 4 wood strips connected by screws.

The wooden lid frames' inner rectangular cutout must be LARGER 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.

The Spray Shield/Chamber Partition

(for a standard 10 gallon aquarium)
Use 1/8" thick clear acrylic (Plexiglas) window insulation available at most hardware stores. Have it cut around 15" x 18" (dimensions may vary - check the aquarium first). A loose fit is good as long as the cakes are protected from the direct spray.

Dual Chambered Terrarium Techniques

The mushrooms get water from 2 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. 100% 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 where as the shroom cakes are behind it. 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. Also, the spray shield adds more surfaces to the insides of the terrarium which increases the amount of moisture that can evaporate.

Spraying Procedure

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 5 seconds of spraying, immediately withdraw the sprayer nozzle and let down the lid to seal the swirling mist inside the terrarium. 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 very well in a properly set up dual chambered terrarium, with only one good spraying a day - and even less than that. This is one of the amazing features of the PF TEK. With the cake cased, I have seen great shrooms grown like this with little attention given to the terrarium. PF style cakes actually seem to need less humidity than any other way of growing shrooms as long as the double ended cake casing technique is employed. PF cakes, when birthed, don't need 100% humidity to fruit well. It is very true, that cased grain and such need the very high humidity, but PF cakes don't. And that is because the cakes themselves humidify the space around them because of the vermiculite content. Vermiculite holds a lot of water and will both absorb and release moisture.

Each time the terrarium is sprayed, the fungus should be ventilated. To ventilate, take off 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 positioned above the terrarium will make the phototropic mushrooms grow upwards. Leave it on all the time if desired.

Heating

The main rule is to not heat the dual chambered terrarium. Any direct heating works against the humidification andadds 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 60 degrees Fahrenheit. PF has even seen them growing perfectly at temperatures cooler than 60 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 65 and the upper 80's. A too hot terrarium will result in lots of spreading mycelium, but no fruiting. It has been reported by other authors, that these cubensis mushrooms will have a higher potency when grown at cool temperatures. They grow much slower, but they seem to be denser in their flesh then when grown warm.

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 high.
There are many ways to make a dual chambered terrarium. You can use straight toped (square) clear translucent storage containers, the kind you get at hardware stores or walmart. The top of the container must be straight or square to accomodate the lid as described above. This one I made out of plexiglass, a project that I probably wouldn't bother doing now. I presently have something like this made from a translucent tall storage box I got from walmart. You can get some really nice sized boxes with lots of room.

plexiglass mushroom machine

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CHAPTER 5 - THE RICH MANS' TERRARIUM

This is 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 $25. This is a covered food display tray.

It works great with perlite (and without) and holds 9 half pint cakes. The one above has 7 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 $75 (hence - the "richmans'"). Call the manufacturer (Cal-Mil) in California at 1 800 321 9069. They will tell you where you can order it (from one of their distributers 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:
314-15 -- the "connoisseur cover"
316-15 -- "Deep Tray" bottom half
The unit is 15 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 2 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 coffee 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 tiddyness of your domecile, and leave, little knowing that he just observed the food of the gods.

The Ultra Richmans' Terrarium

This terrarium 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 4 cakes tightly. The cake inside is a first flush PF spore race cake - typical of a first flush obtained with the pf tek.

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.

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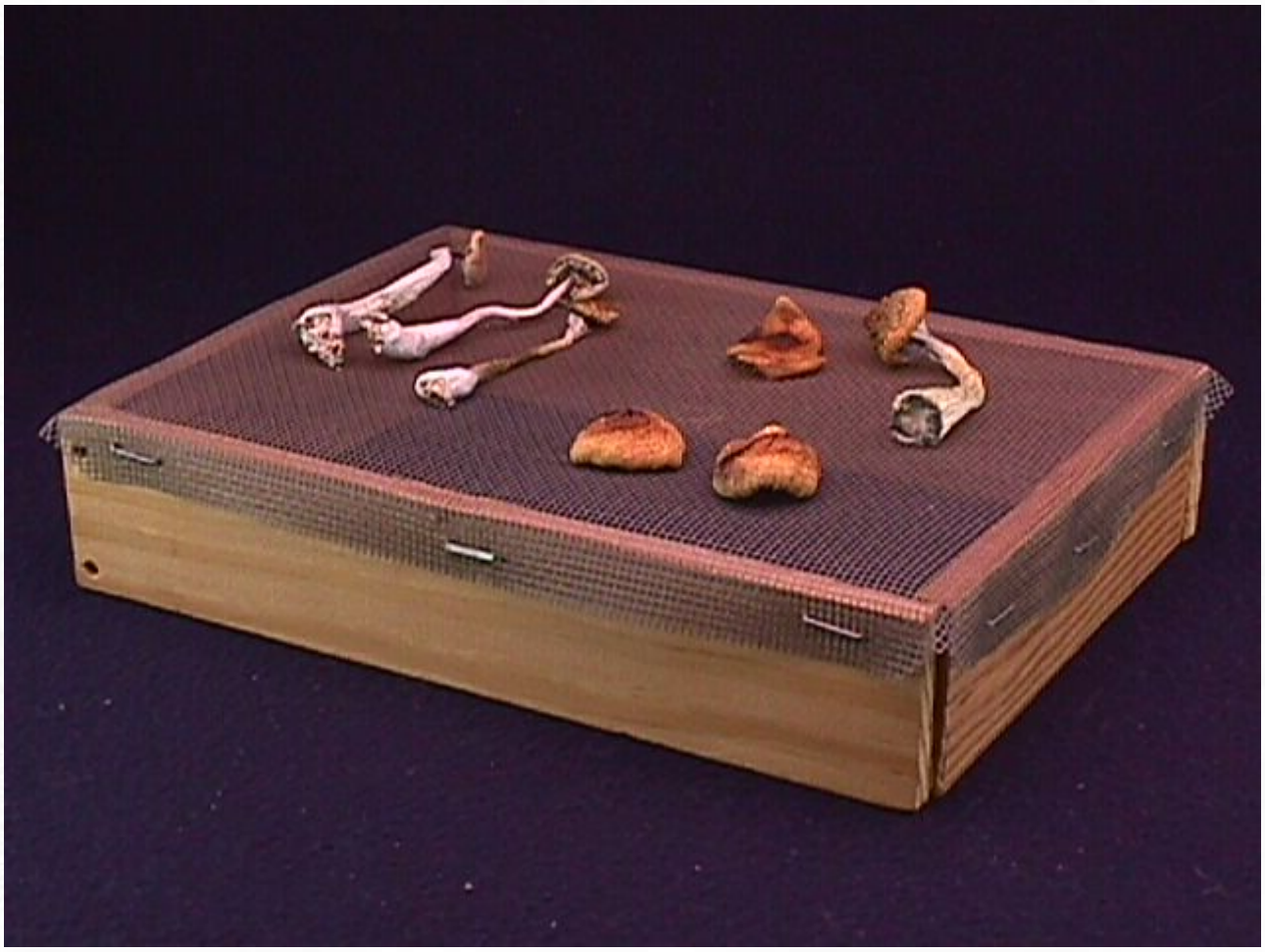
CHAPTER 6 - COOL DESICCATION (drying) OF MUSHROOMS

The immature specimens are the best in quality, digestibility and potency. They are characterized as being very light in color with white stems and light colored 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 color. The mushrooms will be conical shaped and sporulation hasn't really begun yet. These are the mushrooms that are the best for harvesting.



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

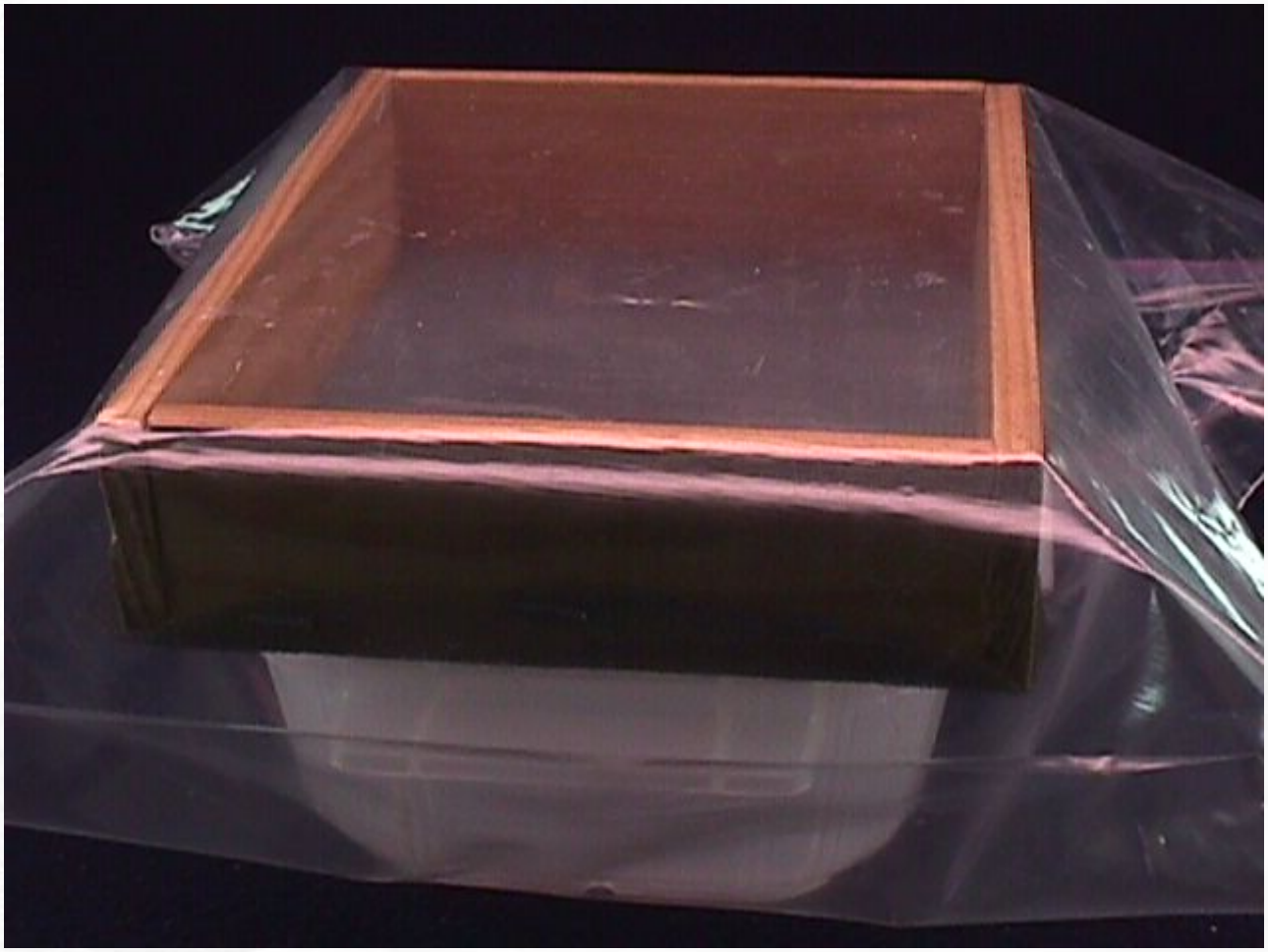
MATERIALS NEEDED - Desiccant - Wire screen - Plastic tub or container - Plastic bag with tie off.

DESICCANT SOURCES

1. "DRIERITE" desiccant. (chemical and science supply retailers). It is the universal lab desiccant.
2. Silica Gel granules - desiccant. (Chemical and science supply).

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. To be sure the desiccant is dry and ready to work, heat the desiccant in an oven as instructed by the manufacturer before its' first use. 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. Store it in an air tight container so that it stays dry and ready for use.



In drying a medium sized mushroom such as Psilocybe Cubensis, use a 1 to 2 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. Put the container with the shrooms and desiccant into a plastic bag. A garbage bag type wire tie is sufficient to close the bag. If a clear plastic bag can be found, use that to observe the drying process. After 24 hours, a little shriveling of the shrooms can be seen. About 4 or 5 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.

Actually, about the easiest and most effective way to dry the mushrooms is to pre dry the mushrooms in the air on a wire screen. This 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. So a combination of air drying and then desiccant drying is one of the best ways there is to dry the mushrooms.

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 the photo - 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.

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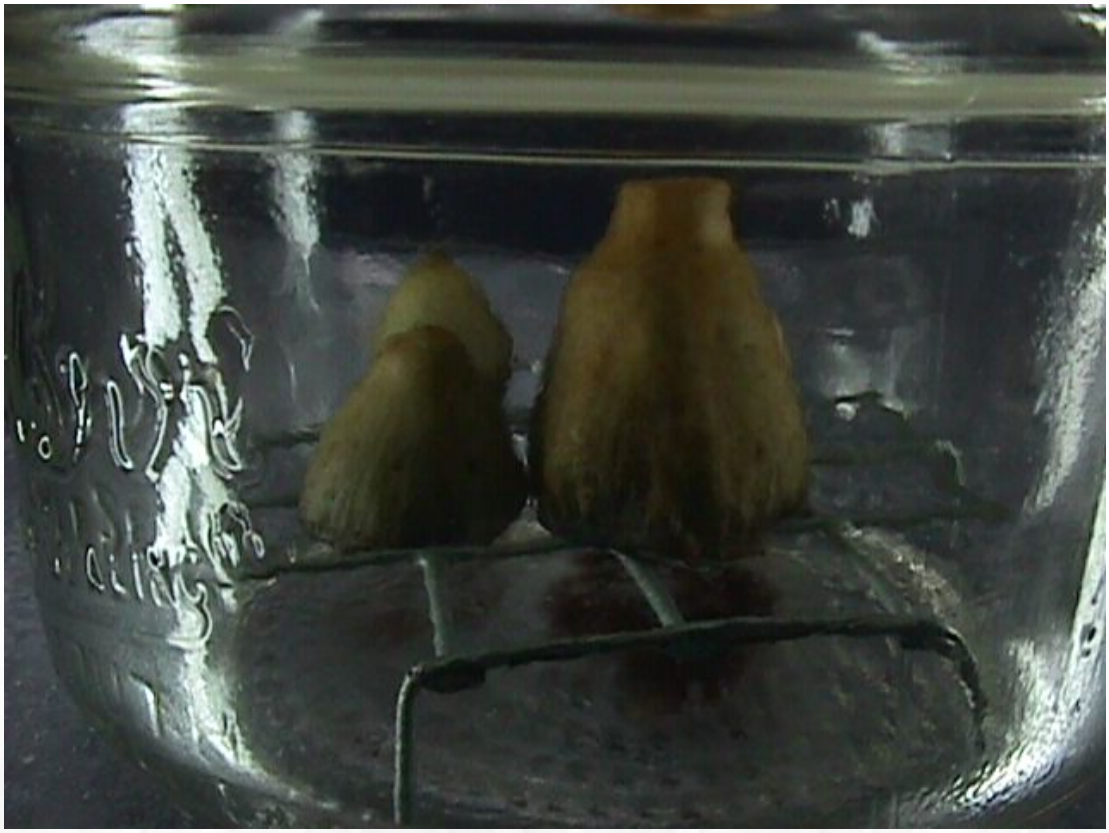
CHAPTER 7 - SPORE PRINTING AND SPORE SYRINGE PREPARATION



Shroom caps printing while sitting on a wire holder.

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 colors appearing on the caps and stems. The cap upturns and reveals gills darkening a deep brown color. 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 color of purple. As the spores fall and collect they will color 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.

Spore Printing Equipment

KERR 1/2 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.

1. Pre sterilize the jar and regular metal lid (rubber edge up) in a small toaster oven at around 300 degrees Fahrenheit 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 micro spore 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 HEPA air cleaner (99.97% rated efficiency - available at drug and department stores) for a few hours in a closed room to clean the air before doing sterile work.

2. Flame sterilize the scissors with an alcohol flame and snip off 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. With quick and sure movements, place the cap into the jar and place the lid on loosely. Pierce the top of the cap with a straight pin to pick it up and handle it.

3. 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 1 1/2 years, spore germination will be greatly reduced or won't occur at all. Germination is massive and quick when the spores are fresh.

Making a Spore Syringe

Materials list:

1. Spore print in jar.
2. Sterile syringe with water for injecting water into the spore print jar.
3. Empty sterile syringe for loading spore solution out of the jar.
4. A small Pyrex glass stirring rod (science - lab supply).
5. Alcohol, tequila shot glass and eye dropper.
6. 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 quard 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. Sterilze empty syringes also.
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.

A glass lab stirring rod is used to scrape spores off the bottom of the jar and into the water (they stick to the bottom when printed).

The syringe is inserted through the needle hole and suctions out spore solution.

1. Inject sterile water into the spore print jar through the needle hole.
2. 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.
3. 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.

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.

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CHAPTER 8 - CAKE CASING TEK

The Double Ended Cake Casing Tek

The photo on the top is a second flush off of a PF spore race cake. The cake under the first photo is a third flush.

First: In Vitro Primordiation
There are many ways to extend the life of a cake and get more shrooms. The essential pf tek is to always allow primordia to appear on the cake in vitro. But not only that, wait for more. So when you spot the first primordia, wait around 3 to 4 more days before birthing. This stimulates more of them, and then your first flush will be fat. This invitro primordiation works well with most all of the spore races (strains) available. A few of the strains don't primordiate well invitro so they need to be birthed after about a month invitro, and then given the casing treatment.

Second: THE CASING TEK
Another really good way to max fruitings, it to not wait for the invitro primordiation. As soon as the cake turns completely white, it can be birthed and then cased. Immediately after the cake is first birthed is the time for a

casing. fill a jar cap with vermiculite, soak it and drain it. Place the cake on top of the wet vermiculite.

Next, pour dry vermiculite onto the top of the cake until it starts to spill off. Flaten the top of the vermiculite with your finger to about 1/8 to 1/4 nch depth. With an eye dropper or old syringe, slowly drip water onto the top dry vermiculite layer until it is soaked completley.

Spraying and maintenance
Once the top layer is totally soaked, place the cake into the terrarium and leave it alone. Follow the Terrarium tek.

Casing and Recasing

The cake whitening phenomenon
One of the most interesting effects of this tek, is the revitalization of the cake. After the initial fruiting, if it is really fat, the cake will be a bit blued. One of the signs of old age in PF cakes is the bluing that will occur. Most likely, the cause of this overall bluing of the cake is moisture loss and thirst of the cake. When the PF double ended cake casing tek is employed, the cake will gradually turn white again. After about a week under the casing tek, the cake will be completely white again and on its way to a good second flush.

This casing tek seems to work better if you completely clean the cake after the first casing flush and recase with fresh vermiculite. After the flush occurs, the top and bottom vermiculite layers should be scraped off and replaced. A good way to do it is like peeling an apple. Hold the cake in your hand without squeezing, and with a knife, scrap the old vermiculite off the cake. Try to clean down to the surface of the cake. The scraping doesn't hurt the cake at all because these older cakes become "tougher". The mycelium tends to be "tighter" and less fluffy and the cake becomes contamination resistant. This "toughening up" and recasing of the mycelial cake is also reported in the old OSS and OERIC (McKenna brothers) mushroom cultivation book published in 1976.

After the cake is carefully cleaned (rather a painstaking procedure but not difficult), the cake is placed on a freshly soaked and drained bottom layer of vermiculite (on a plate or in a jar cap). Then, fresh dry vermiculite is poured over the top of the cake and smoothed down to a layer of 1/8 to 1/4 of an inch and the basic casing wetting procedure is employed. The spray bottle offers a good way to drip water onto the casing. By slowly squeezing the spray lever, the water will drip out in single drops. You can also use an eye dropper. Slowly wet the top layer. If you apply to much water and it over soaks the vermiculite, the cake can be tilted and excess water drained from the top vermiculite layer.
After every flush - reclean the cake and apply fresh vermiculite. What this does is prevent contaminants from building up. The cakes stay uncontaminated and fruitable for a good two to three months. You can get several flushes out of a properly cared for cake. This casing tek keeps the cake white and uncontaminated for its life duration.

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PF TEK add on techniques

CHAPTER 9 - THE INNER RESERVOIR TEK

by JK

original source: http://www.fanaticus.com/resevoir.htm

Mazatec fruiting - PF style - 1/2 pint with the inner reservoir tek. The shrooms are all growing from the lower vermiculite layer (upper contaminant barrier when invitro).

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

Mazatec cakes fruiting in a plastic storage tub ("Sterilite" - "Rubber Maid" - Walmart - Kmart - Home Depot - ect). Vermiculite was used on the bottom - moistened for humidity. PF uses seperate caps for the bottom layers, but this a bit bigger. Vermiculite might be better than perlite - period. One can conceivable become "perlite free" as so many now are "peat moss free".

The Inner reservoir tek

The cakes are regular 1/2 pint low form canning jar size. The shrooms are the Mazatec and the Treasure Coast (see below) spore races from PF.

To do this is extremely easy. Everything is done standard PF TEK 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 1/2 inch 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 10cc 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.

PF classic with inner reservoir tek

PF classic inner reservoir tek cakes on soaked vermiculite bed.

Treasure Coast shrooms - PF style with inner reservoir tek. The cakes are sitting on moist regular potting soil (peat moss - perlite and vermiculite mixtures).

This is PF's first attempt with the inner resevoir using the Hawaiian spore race shroom.

PSYLOCYBE FANATICUS June 2 2002

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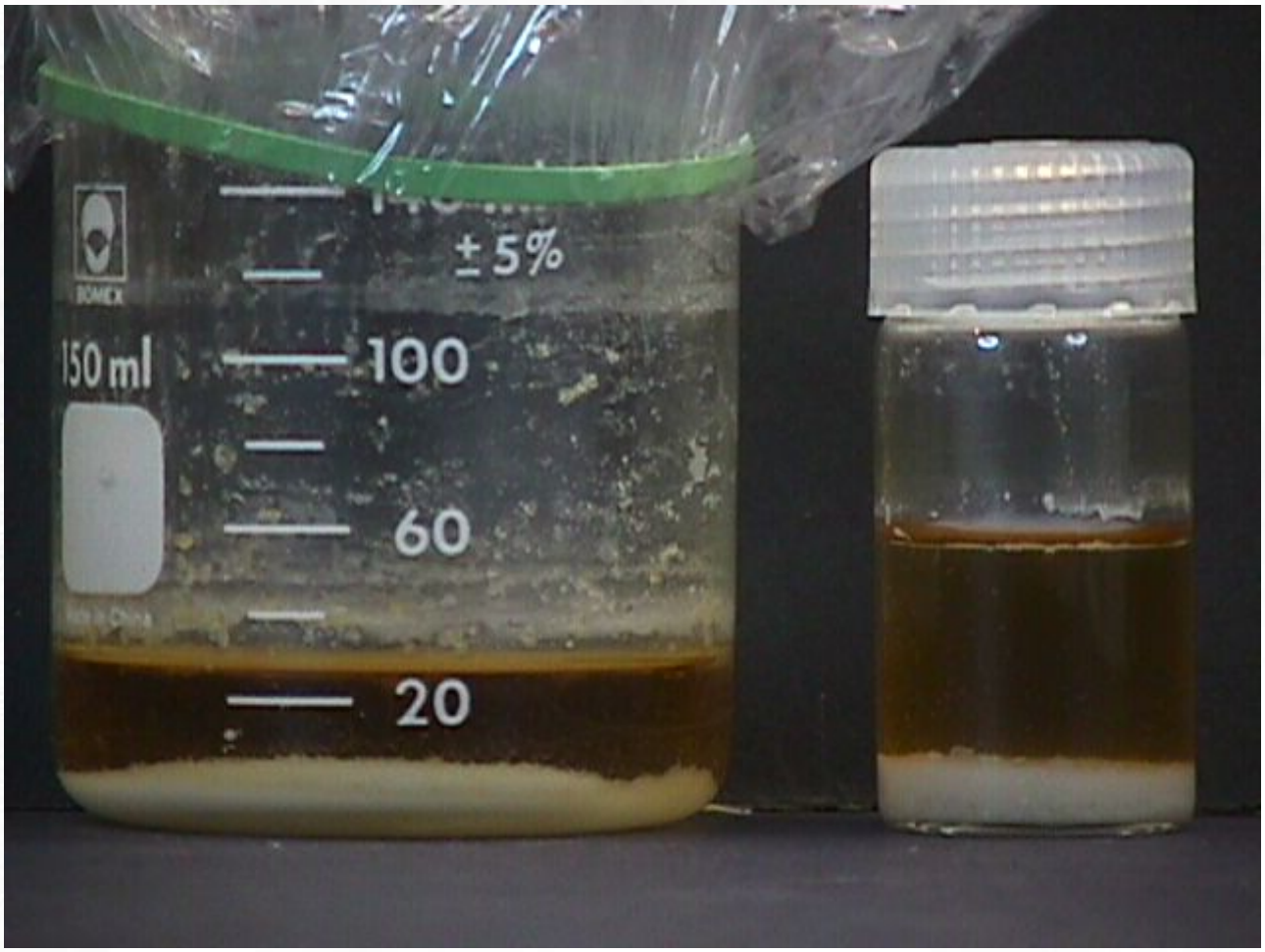
CHAPTER 10 - CRYSTALS OF THE GODS

original source: http://www.fanaticus.com/mycoalki.htm

The following alcohol extraction tek is what I consider to be almost the greatest discovery in the history of the religious use of the ancient entheogens. In all the records and reports around the world of the use of natural plant entheogens, there is a universal truth. And that truth is that the plant entheogens demand a serious price to pay for them to show their wonders, and that price is a very bad stomach reaction. Usually, vomiting is a part of the experience. And that is because one has to take a lot of the plant material to get the entheogenic power therein. But this tek has changed all of that. Now, the easy to grow little mushroom - psilocybe cubensis is now the king of the entheogens. This mushroom is acknowledged as one of the "weak" entheogens". But not any more. It is now the most powerful of them all, put together. So when one adds this tek to the PF TEK, the pinnacle of entheogenic life and experience is effortlessly in the hands of all.

PF Magic Mushroom Liqueur Tek - Crystals of the Gods



Crystalline extract precipitated in 190 proof alcohol "EVERCLEAR"
Left beaker - extract from 16 grams dried shrooms
Right tube - extract from 9 grams fungi

MAGIC LIQUEUR - the ultimate trip - update

Many years ago PF experimented with alcohol extraction of dried magic shroom material. To make the story short, PF found the crystals. But, PF didn't mention that when PF wrote the PF mushroom extraction tek and published it in the PF TEK book (1996) and posted it at this web site.

PF has monitored the WEB for all of these years and has seen no posts concerning this amazingly easy way to extract and seriously concentrate the shrooms magic. PF has always said that this extraction tek solves the "problems" of impotent or mediocre magic shrooms.

Then, finally, this post appeared on the WEB at an interactive myco hobbyist web site:

Excerpts from forums

SEARCHER

By Searcher (Novice) on Saturday, November 16, 2002 - 06:29 pm: Edit
My most exciting piece of beginner's luck came when I got rid of some cakes that seemed stalled in their development (and/or had really uneven surface colonization) by splitting up and drying the mycelium for use in place of mushroom dust to create the liqueur described in the following link:
http://www.fanaticus.com/liqueu~1.htm
By letting the resulting liqueur continue to dry out, I wound up with amber colored crystals that could be crushed and placed in gel caps. A few hundred milligrams of this extract sent a curious friend of mine into orbit, and now he's been bugging the shit out of me to butcher ALL of my cakes to concentrate on this extract and forget about trying to grow shrooms. He claims the trips he got were much "cleaner" (whatever that means) and that the stuff certainly tastes better than the shrooms themselves.

By Searcher (Novice) on Monday, November 18, 2002 - 05:05 am: Edit
As I recall, there were about 6 or 7 jars that seemed to have good mycelial development, but colonization was very uneven, or so slow, that I abandoned them to put better jars in my grow chamber. Rather than just tossing out the slow jars, I decided to break them up and try Prof. PF's extraction technique. By the way, the alcohol seemed to absorb a lot of water from the air - it no longer smelled of alcohol, and the drying process slowed down a lot just before the amber tar and then the crystals appeared. I used no heat, but kept a large fan blowing on the liquid over a large, shallow cookie sheet.

By Searcher (Novice) on Tuesday, November 26, 2002 - 12:53 pm: Edit
Behold, cystals - little white snowflakes - just using 99% isopropyl---
---

By Searcher (Novice) on Sunday, December 08, 2002 - 02:55 pm: Edit
Here are the results from my first methanol soak:
Yielded 3.85 grams of crystals from 8 ounces of mycelium. But wait, there's more! Remember we're doing three, consecutive soaks. Looks like we'll be getting even more residues out of soaks 2 & 3:
Miscellaneous notes on the methanol: You'll note that this residue us lighter in color than residue gleaned from the water soaks. Also, this residue comes out dryer - no intermediate "tar" stage.

When the Professor instigated dialogue about SEARCHERS enthusiastic posts above, others joined in and found SEARCHER to be on the money. And here they are.

By Techno-hippie (Technohippie) on Sunday, December 22, 2002 - 04:58 pm: Edit
I tested my 20g dried shroom, 24cc Solution. AWESOME is all i got to say I had one of the BEST trips ever. We started with 1cc each and started feeling the effects almost immediately. Within 10min we where having the

full level 1 experience. We decided to take another CC, Took us to level 2.... Within 10 min. By this time it was hard to keep track of time. But we did 1 more CC and that was all we needed.
NO unpleasent side effects... No upset stomach, or dizziness... nothing negative. It was VERY euphoric, very clear. We were tripping hard, yet we could think very clearly. Couldn't always speak clearly but the thoughts were profound and clear. The visuals where awesome.... everything was so alive and beautiful. The moon was full... so that made for a magical evening.
The greatest thing about the extract was the control we had over the dosage. Each dosage was equal with magic content. Unlike when you eat the shrooms themselves where the magical content will be different from shroom to shroom. So, dosage isn't quite as accurate. I've split a bag of shrooms with a friend before and got off way more than he did... on the same shrooms. With the extract we both knew we were getting the same amount.
I've had tea, chocolate shrooms, cooked with magic.. even psychedelic coffee, and this is by far the best method of consumption. I will be testing how long the extract lasts in potency.
I had this in the freezer for a week... and it was still very potent.
Anyway guys... there is my experience with the liquid. Freakin awesome!
Thank you PROF and Searcher for bringing that tech. out to us. I've never heard of liquid shrooms until now! WOW!
I'll post my other experiments with this in time.
Peace & Light to all!!
Techno-Hippie

By J. Clay Mcwilliams (Jclaymcw) on Monday, December 23, 2002 - 09:50 pm: Edit
I've done the extract, and yeah the trip is different. I felt happier on the extract. No bad side effects. It didn't come on that quick though it was just a little faster than a regular trip and the peak was hard to determine. my friends who have side effects like stomach discomfort, headaches and bellybutton discomfort said that they had none of the usual side effects. It was everclear evaporated down to 3 grms per 8 cc.

By Techno-hippie (Technohippie) on Monday, December 23, 2002 - 11:41 pm: Edit
Looks like we got a winner here. Last night I tested the extract on some VERY willing friends of mine and they had the same experiences. One of them gets BAD stomach cramps and usually the shits when he eats shrooms or drinks tea... but with the extract he had nothing to report but pure bliss! They both had an amazing trip VERY similar to the one that I had and reported earlier. I think that for the serious tripper this extract could be the preferred method... I know it is becoming mine Take care all... Have a wonderful holiday, remember: the tree looks awesome with a pair of magic goggles!! Peace Techno-hippie
---

By Searcher (Novice) on Sunday, December 22, 2002 - 07:46 am: Edit
Almost any liquid will extract something from the shrooms themselves or the mycelium. Even water will work, producing a brown syrup that can be dried into a sticky tar. Only the acetone was a bust in extracting the magic - but it does extract some other crud that might make it a good pre-wash for more serious extraction's. Recapping the results of the tests using other spirits, 99% isopropyl, 151 proof ethyl alcohol, and 99.9% methanol - methanol was the hands down winner for getting the crystals. Once the pretty white crystals have dried, they can be re-dissolved in grain alcohol for a potent elixir. The crystals tend to absorb water from the air unless they are kept in a heavily desiccated chamber.

By Roo (Tehuti) Posted on Saturday, May 22, 2004 - 11:30 pm:
has anyone tried soaking shrooms in alcohol to get the goodies out of them? PF used to have a great Tek on his site regarding this. I have done it, and it works wonderfully. Its a very clean trip.

By roger rabbit (Skyypilot) Posted on Sunday, May 23, 2004 - 07:53 am:
Agreed, the liquor is the way to go. I like to stop the process just before crystals form, as it's easier to measure for dosing. When I notice the solids begin to separate from the everclear, add just a bit more everclear and heat the mixture to dissolve the solids back in. This seems to give the most potent, measurable dose, and it's

dependable. 1cc of the liquid seems to match 2g of dried product. The best thing is NO stomach upset.

By Solly the Printman (Soliver) Posted on Tuesday, June 08, 2004 - 10:18 pm:
Good stuff -
I followed a combination of PF's extraction and the guidelines I gleaned from Rog Rabbit -
Took one OZ shrooms (I used last year's batch of PR's - still VERY potent, but in need of consumption - I wouldn't be heartbroken if they were toasted, etc, due to my incompetence)
Ground up shrooms in the 'ol coffee grinder, Put them in a quart jar Added one PINT of everclear (Rog says 2 oz to a fifth is good, but I wanted to start with a smaller batch...)
I put it all together, shook, put on the counter, and shook it whenever I walked by. I meant to strain it all the next day, but it ended up sitting in there for about three weeks - I'd say I shook it an average of twice a day...
While it was sitting in there, about 1/4 of the everclear evaporated out of the jar - strange... musta been an air leak or something?
Anywho, yesterday I strained it through a metal strainer, then through a coffee filter, then through 2 coffee filters and ended up with about 250 ml of liquid.
Just for continuity's sake, I added a few ml's of everclear to make it an even 280...
so now 10 mls of fluid = 1 gram dry ...
tried 10mls in some grape juice yesterday, clean trip, no tummy problems (yeah!!) and a good time had by all (me, myself, and I).
If you haven't tried this, you should!!
(second post)
NO stomach upset, no weird ramp-up - it removes all the negatives of shrooms and leaves you with a wicked hit that blows your top off...
The first 15 ml was put into a small glass of cranberry juice and consumed. I went upstairs and got in the shower, as is my custom, and before I even had my hair washed it was coming on. By the time I was out, dry, and dressed, I was tripping my nads off - less than 15 minutes.
My wife and I agree that this stuff is almost too good - shrooms have a downside (for me) that keeps me in check - but the liquor takes that all away.
I don't think I'll ever chew a shroom or choke back a handful of stinky powder again - I'm soaking all my shrooms in liquor from here on out.
If you haven't tried this, I'd strongly suggest it.
I really understand why PF said that this is the most important drug discovery since the PF tek - he's right!
Sol

By Hippie3 (Admin) Posted on Wednesday, June 09, 2004 - 12:30 pm:

> *quote:*
> Would one have to use any more alcohol to extract if, say, one were using some 80 proof vodka rather than some 200 proof? Is absolutely all the magic extracted?
> no and yes. and it doesn't take more than a few minutes either. i've made my friends magic shots by soaking chopped freshies in whiskey 5 minutes or so then straining off the liquor into shot glasses, works every time.

How long does an extraction like this remain potent, and what is the best way to store it to retain potency ?
as for storage, adding some Vit C to the solution will help slow the breakdown. then the extract should be stored in cold dark airless conditions, like in an opaque bottle in the freezer. fill it nearly full to eliminate the air and then seal, should be good several weeks at least, depending on initial potency.

By The Lone Printman (Soliver) Posted on Friday, July 02, 2004 - 01:53 pm:
I dosed my own "elixir" last night yet again, and I can say that it's kick-ass... Of course, it's always good to start with potent fruits, but what your friend plans on doing sounds AOK to me - Pretty much the exact same thing I did except I let mine soak longer (I don't think it matters).
I took a double dose last night - woof! Good stuff, comes on within 10-15 minutes and peaks about an hour later. After a while, I swear I could see right through the table I was sitting at - seemed to cross the space-time

continuum (sp?) with my eyeballs...
I usually take my standard dose, then bump it 2 hrs later, but decided to hit it all at once last night - the effects were devastating - I was a puddle - it was awesome.
(ps -mine's been in the freezer for 2 months now with no loss of potency)

By ShedTheMonkey (Shedthemonkey) Posted on Sunday, October 03, 2004 - 04:33 pm:
My monkey's brother ground up 48 grams of dry mushies and put them in a quart jar, covered the mushies with 153 proof grain alcohol (best he can find in these parts) and put it in a double boiler situation. After a half hour of letting the alcohol boil (without letting the water boil), the whole mess was filtered with 5 micron filter paper in a Buchner filter system using a vacuum cleaner for the vacuum source. The liquid was put aside, and the dry filtrate was put back in the jar, covered with alcohol again and boiled for another half hour. Repeated filtration. Mixed the two extract liquids together.
The wife and I did a bioassay. She said her trip felt about equivalent to a 30 gram freshie trip. I felt about somewhere between 40 to 45 grams fresh. It was weird that from dry mushies that definitely have a distinct feel from fresh, the extract felt more like fresh and THERE WAS ABSOLUTELY NO TUMMY UPSET!! This was about the strongest dose I can take and not end up talking to the goddess at the peak.

SHEDS CRYSTALS from 153 proof

Warning on Alcohol Shroom Extraction

By Thoth (Dr_hyde) Posted on Wednesday, September 15, 2004 - 01:29 am:
I finished off the last few mils of my last extraction. There was a bit of sediment in the bottom of the bottle. I did not think nothing of it, and drank it expecting a 4 gram type trip.
I got more of a 20 or 30 gram trip. The sediment must have been almost pure magic. I have done 20 grams dried before and it was many times more intense than that. It was totally freaking insane. Actually quite interesting, but not something I hope to do again in a few years or so.
This was about 200g of dry material to everclear, the BIG bottle. Its been in the freezer for 4 months, gave most of it away, guess I got the best part.
Stranger yet no bad stomach at all. I had to force myself to purge.
It just wore me out, very tired.

The Crystals of the Gods

(anonymous experimenter who followed the Professors 190 proof extraction TEK)

By Suckerfree (Suckerfree) Posted on Wednesday, August 18, 2004 - 07:26 pm:
March 5, 2003

Psilocybe Mushroom Extractions

Dear Dr. Shulgin:
A friend of mine performed a Soxhlet extraction of 12 grams of powdered Psilocybe cubensis, using 95% ethanol. When the 60 mL of extract cooled to room temperature, many small transparent, colorless crystals had formed on the bottom of the container and did not redissolve on agitation. Do you know what these crystals are? -- Journeyman

Dear Journeyman:
There is a fascinating report in the literature that gives a quantitative measurement of the efficiency of extraction of both psilocybin and psilocin from the mushroom Psilocybe bohemica. The citation to the article is Kysilka, R. and Wurst, M., Planta Med. Vol. 56 pp. 327-328 (1990). These Czechoslovakian scientists studied the efficiency of both methanol and ethanol as solvents, each containing varying amounts of water. The results were, to me, both unexpected and most provocative.
The isolation of psilocybin seemed to be quite reasonable. This alkaloid is reasonably soluble in boiling water from which it can be nicely crystallized. It is less soluble in boiling methanol, and almost insoluble in boiling ethanol. And the extraction efficiency is optimum with methanol and almost as good with ethanol. With both, the less water present, the better. The compound is, after all, a perfect example of a zwitterion, the internal salt of a phosphoric acid and an amine base.
But the numbers with psilocin are strange. With aqueous ethanol, the optimum extraction was with a 70% ethanol concentration, and the extraction efficiency dropped almost to zero when there was no water present. But methanol was extremely inefficient regardless of the amount of water present in it. These researchers were apparently surprised by these findings, as they explored further and uncovered other clues. Time is a factor. Psilocin is extracted at a much slower rate than is psilocybin because it is contained intracellularly in the plant, and thus slower to be gotten out. They conclude that many of the low psilocin assays of mushrooms are due to this difficulty of getting the alkaloid out of the plant and into the extracting solvent. Using this information they determined that the levels of psilocybin and psilocin are substantially the same in Psilocybe bohemica, in conflict with the published literature values where very small amounts of psilocin were observed.
Efficient extraction apparently requires patience.
As to the identity of the crystals that were drifting around in the cooled Soxhlet receiver, from their being insoluble in ethanol, and white, and transparent, I would guess that you are seeing pure psilocybin.
-- Dr. Shulgin

GOTTLIEB

Then, after a little interaction at the web sites, PF found this extraction tek taken from a book by Adam Gottlieb at the EROWID web site.

THE PSILOCYBIN PRODUCERS GUIDE
by Adam Gottlieb 1976

Extraction
Crumble and pulverize the dried mycelial material and combine each 100 mg of this material with 10 ml of methanol. Place the flask in a hot water bath for four hours. Filter the liquids with suction through a filter paper in a buchner funnel with Celite to prevent clogging. Collect and save the filtrate liquids. Heat the slurry (the mush in the filter paper) two more times in methanol as before, filter, and accumulate the liquids of the three extraction's. To be certain that all of the alkaloids have been extracted do a small extraction with a portion of the used slurry and test with Keller's reagent (glacial acetic acid, ferrous chloride, and concentrated sulfuric acid). If there is a violet indication, alkaloids are still present and further extraction is in order.

In an open beaker evaporate the liquids to total dryness with a hot water bath or by applying a hair dryer. Be certain that all traces of methanol have been removed. The remaining residue should contain 25-50 percent

psilocybin/psilocin mixture. Greater purification can be achieved, but would require other solvents and chromatography equipment and is hardly necessary.

Each 100 grams of dried mycelium should yield about 2 grams of extracted material. This should contain at least 500 mg of psilocybin/psilocin mixed or about fifty 10 mg doses. Theoretically psilocin should have the same effect upon the user as psilocybin. The only difference between the two is that the later has a phosphate bond which disappears immediately after assimilation in the body. In other words, in the body psilocybin turns into psilocin. Psilocybin is a fairly stable compound, but psilocin is very susceptible to oxidization. It is best to keep the extracted material in a dry air tight container under refrigeration. A sack of silica-gel can be placed in the container to capture any moisture that may enter.

Dosage
The standard dose of psilocybin or psilocin for a 150 lb person is a 6-20 mg dose. We will figure the average dose as 10 mg. The crude alkaloid extraction process given here yields a brownish crystalline powder that is at least 25 percent pure. Each mason jar should contain at least 50 grams of wet mycelium. After drying this would be about 5 grams of material. The crude material extracted from this should contain 25-30 mg of psilocybin/ psilocin or roughly 2-3 hits. This yield may very to some extent depending upon several factors. Many of these species contain less of these alkaloids than dose Psilocybe cubensis and the alkaloidal content of this species may very in different strains. Cultivation conditions have a lot to do with yield too. Higher temperatures (75 degrees F.) cause more rapid growth but lesser psilocybin content than do lower temperatures (70 degrees F.) One must test each new batch of extracted material to determine the proper distribution of dosages. Depending on the potency of the mycelia and how well the extraction was conducted the dose may range between 25 and 100 mg. Also bear in mind that the dose varies for different individuals.

STAMETS

Paul Stamets even mentions extraction in his 1996 book - "PSILOCYBIN MUSHROOMS of the WORLD". Quote - page 50-51 "Another method I have seen is to soak crushed mushrooms in 75+% ethanol. After two to three days, the roughage can be filtered, leaving a dark- blue elixir that can be decanted accordingly. For every fresh 5 grams of mushrooms, 25-30 milliliters of alcohol is recommended. Psilocybin and psilocin dissolve into this solvent, and the alcohol also acts as a preservative. I really don't have much experience with this technique, but have talked to people who say it is their preferred method. Some call this "blue juice."

Stamets tek is not very good for several reasons. He says to start with "fresh" shrooms. It is always the best way to first dry the material to be extracted. Water gets in the way of the solvent. "BLUE" is not good either. Bluing is evidence of the magic being broken down or compromised. I think it is the "fresh" material that does that. Dried material does not blue. Bluing is damage and occurs with bruising of the shroom flesh. Stamets again says on page 56 - "...the more the mushrooms are bruised (blued) the less potent they become."
But what is important about the Stamets quotes, is that he knows people that believe extraction is the superior way to go for the magic.

Mediocre Rating for Cubensis

The only criticism that has ever been directed towards the Psilcobye Cubensis specie is "On the psilometric scale of comparative potency, P.Cubensis gets a rating of "moderately potent," - P. Stamets. That is not the best. And it seems, that potency is the number one goal of all the seekers, accept the new cadre of shroom growers on the web that are more interested in the hobby of mushroom growing than any magic production.
This extraction technique is the answer to the serious seekers of the magic. What PF would recommend is to extract with easy to get liquor store 190 proof ethanol, and make magic shroom liqueurs and elixirs. The advantage of the liqueur is that it is a good way to preserve the magic crystals. Exposing magic crystals to the air is a quick way to breakdown. But in a freezer in an elixir of alcohol, the magic crystals can certainly last a lot longer. This way delivers potency far far beyond any natural magic shroom. When one considers the extract magic in doses of around .1 - .3 gram, no magic shroom can deliver that, unless extracted. So that puts the lowly Psilocybe Cubensis to the top, because of its one really great attribute - THE EASIEST TO GROW - by far.

This technique describes how to extract psilocybin from magic mushrooms with pure 190 proof ethyl alcohol and make a magic mushroom liqueur of concentrated psilocybin to effect a powerful psychedelic dose as potent as desired. The entire process involves only the shrooms and alcohol. The alcohol is untainted with chemicals and poisons because it can be easily acquired from a liquor store (United States) either over the counter (in some states) or with a special permit (most states - see end of article section - "procuring 190 proof ethyl alcohol from a liquor store").

Alcohol Extraction of the Magic Crystals

by Professor Fanaticus

Supply list:

1. Shrooms
2. 190 proof ethyl alcohol (GOLDEN GRAIN - EVERCLEAR ect)
3. Pyrex glass wide mouth slurry soaking vessel
4. Stove top boiling water pot (slurry vessel sits inside) "double boiler"
5. Funnel, and vacuum filtering set up or Dust-pollen masks
6. Small desk fan
7. Stirring tools - spatulas

Acquire quality psilocybe cubensis shrooms (harvested before or just as the veils open and cool dried with desiccant). The more shrooms used in the beginning, the more potent the concentration can be when finished. Use at least several grams of dried shroom material to make the process worthwhile and effective. The shrooms need to be thoroughly dry (rock hard) to allow pulverization. To pulverize the shrooms, put them into a small strong zip lock plastic bag (freezer bag), cover the bag with a magazine (for protection of the bag) and pound it with the rubber heel of a large shoe. Or, powder them in a small canister type coffee bean grinder.

In a heat resistant soaking vessel (Pyrex glass), combine the shroom powder with several times its volume with 190 proof Everclear (ethanol). This is the "slurry". Place the slurry steeping vessel in a pan of boiling water. Raising the slurry soaking vessel off the bottom of the hot water pan is a good idea for preventing serious sticking of the extracts. The slurry will start to boil. Turn the water boiling pan heat down and let the slurry simmer and steep for a few hours at a warm-hot temperature. Alcohol boils at a lower temperature than water. Watch the temperatures closely. Things can get totally out of hand and ruined very quickly without close attention paid. Stir the hot mixture periodically and often to keep things loose with no sticking.

After the hot steeping and while the slurry is still hot, filter it through filter paper. This is probably the most important part. A good filtration will be efficient and will keep most of the shroom material out, making for a clean extraction (clean of shrooms that is - but heavy on psilocybin). A small lab type vacuum pump powered bottle top filtering funnel with filter disk holder makes it all easy and fast, with little waste.

Collect and save the filtrate liquids. Heat the slurry (the mush in the filter paper) one or two more times with the 190 proof as before, filter, and accumulate the liquids of the extraction's. The photos at the top are of extraction's done twice.

If there is no vacuum filtering device at hand, inexpensive dust-pollen masks make good filters for the slurry. These are available at hardware, drug and paint stores. They are usually white or tan colored, fit over the nose and mouth and are held on to the face by a rubber band attached to the filter. Fashion the filter over the mouth of a drinking glass. Squeeze the filter and slurry to extract the alcohol. There are many details to deal with, but doing it once reveals them all. Experience is the best teacher. Store the extracted alcohol in a fresh bottle.

Evaporation and Concentration

Combine the filtered alcohol extracts into the Pyrex steeping vessel. Place a small electric fan near the vessel

and point the air flow directly down into the vessel until the surface of the alcohol ripples. This will speed the evaporation and concentration. The process will take several hours. The more alcohol extract - the longer the evaporation time. As the alcohol evaporates and the level recedes down into the glass, wash the residue that adheres to the inside of the glass back into the solution. Any fumes that are generated will be harmless because the alcohol is a non poisonous drinkable spirit. Keep flames away from the solution - pure alcohol is very flammable.

One can also use heat to evaporate and concentrate the liqueur. Use a double boiler type of set up to heat and evaporate off the alcohol to concentrate the liqueur. At this point, with hot concentrated liqueur (no crystal precipitate) it is best to go immediately to the storage tek (see Dosage and Storage at the end).

The concentrated shroom liqueur will have a pungent mushroomy aroma (like fungi perfume). Also, a white crystalline kind of precipitate will form in the alcohol liqueur (see above photo) as it cools. Store it in small screw cap bottles or vials in the freezer. Alcohol doesn't freeze solid and will remain liquid.

Important Guidelines

1. Use warm-hot temps when steeping the initial slurry (shroom-alcohol). Use a double boiler for the slurry vessel. Avoid direct heat to the bottoms of the slurry soaking vessels. The extract has a tendency to bake on and stick very easily.
2. A good filter is a must. Lab quality filter paper helps for a cleaner extract (less shroom stuff). A small bottle top vacuum filtering funnel with a hand squeeze vacuum pump and fine slow flow filtering papers is perfect for this small extraction tek (look for the 47 millimeter filter sized set ups).
3. When filtering the slurry, do it while it is hot.
4. When heated in the initial slurry, the psilocybin alkaloid extracts are free base molecules. In the final liqueur on cool down, the free base molecules will coalesce and form crystals. It takes a day or two for the process to be complete. The less the final amount of liquid is, the easier it is for the free base psilocybin molecules to meet each other and coalesce into the whitish crystalline substance.
5. The crystalline extract can be completely dried by placing the liqueur container in front of a small fan to get most of the liquid out. To complete the drying, desiccant is recommended. Place the small vessel of liqueur into a larger jar with quality desiccant. It takes several days to complete drying. The final crystalline substance can be weighed, worked with and experimented with.
6. TEK personalization through experience is what happens to anyone trying this. Extracting plant material is an ancient art, and the ways are myriad.

Dosage and Storage

On cooling and with time, the free base psilocybin molecules coalesce in the liqueur and precipitate into a whitish crystalline extract which falls to the bottom of the storage vessel. The freebase Psilocybin molecules come together fast in the cool alcohol.

Storage and dosage prep is the same. If the liqueur has already precipitated the crystals, heat the final concentrated liqueur (for example - 20 grams of dried shrooms can be extracted to 50-100 milliliters alcohol) in its storage vessel in a pot of hot water. Boil the liqueur and stir and scrape deposits from the glass as the liqueur boils lightly. Alcohol boils at a lower temperature than water. Keep the storage vessel off the bottom of the boiling water pot. Direct heat is very bad for the liqueur, making it stick. As the liqueur boils, the crystals and extract will remelt with time. The large particles of the crystals can be crushed with a long needle probe to hurry up the process. When the crystals are dissolved, administer the magic liqueur while it is HOT. Using a syringe enables uniformity and accuracy of the dosages. Keep the liqueur stirred up to keep it uniform. The hot liqueur quickly becomes cloudy (precipitate) on slight cooling. A hot temperature of the liqueur with remelted crystals is important for accurate dosage administration.

While it is hot, dispense equal portions of the liqueur (10cc-20cc) into small storage jars with watertight caps. Each small jar is allowed to cool, the cap is put on and the jar is placed into the freezer for storage. Each jar is equivalent to an exact fraction of the original dry shroom weight so that dosage can be accurately controlled and determined.

When it is time to trip, the desired liqueur jars (with potency ratings) are removed from the freezer, allowed to warm to room temps, the lids taken off, a small fan is set up blowing air across the jars mouths and the liqueur is evaporated off to a manageable "hit" (variable alcohol). The small jars then become administration vessels where the entire contents (alcohol-water-crystalline extract) can easily be completely consumed.

Procuring 190 Proof Ethyl Alcohol (Everclear - Golden Grain et) From a Liquor Store

First, call a well stocked liquor store and ask if they have 190 proof ethyl alcohol. Full service liquor stores supply hospitals and laboratories with 190 - 200 proof ethyl alcohol. If a permit is needed, call the state liquor board (usually in the State Capital) and ask for an application to get an ethyl alcohol permit. The fee is 5 or 10 dollars. On the application will be a question asking what the use of the alcohol will be. Write what they more or less want to hear. State that the use of the alcohol will be for "non-toxic surface sterilizing plus herb extraction - preservation - tincture - and perfume making" (or something to that effect).

Professor Fanaticus
2005

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CHAPTER 11 - PF INVITRO TEK

original source: http://www.fanaticus.com/invitro.htm

This is a photo showing a cake grown in a glass jar that was allowed to fruit invitro. It is the standard PF TEK but with a little difference in the approach.

From the beginning (since 1991) of the essential PF TEK, PF has shown the importance of the appearance of primordia while the cake is still in the jar. Invitro "primordiation" is one of the fantastic attributes of the PF TEK. This invitro "primordiation" is not a feature of any other growing tek, but it is with the PF TEK.
Letting the primordia grow inside the jar (invitro) is a great way to grow these shrooms on the simplest level. Birthing is eliminated (accept for harvesting) and terrariums are eliminated. One of the really excellent attributes of PF INVITRO growing is what is being called "STEALTH". Stealthy growing is becoming very popular because one can hide the grow op. There was a posting on the net that someone did where he put the jars in an old dirty 5 gallon white bucket and on top of the jars, he placed old microphone cords and speaker cables, totally concealing them. An interesting thing he did, was that he birthed the cakes before they fruited or formed primordia invitro and cut them in half (1/4 pint sized cakes). He then filled the jar caps with vermiculite, soaked the vermiculite, placed the small cakes on the wet verm and placed the jar over the verm filled jar caps and cakes. He got a decent yield of quality shrooms, and he did it while they were all concealed in the white 5 gallon bucket and in the paranoid days we all live in, smart.

The Heartbreak of mega cultivation

When one is experienced in the different styles of shroom cultivation, a similarity of results is seen. A pile of dried and shriveled shrooms from a mega beautiful elaborately set up shroom cultivation, looks no different than a pile of dried and shriveled shrooms from a less than mega beautiful shroom cultivation. In other words, the beautiful full sized perfect looking specimens from a mega cultivation (trays - compost - ect), dry down and actually look no different than the little "ugly" convoluted shrooms from such a TEK as the PF invitro tek. The real difference is the emotional impact of "destroying" a shroom fruiting that one has worked on for a couple of months. When the shrooms begin to attain full size, there are two choices, either to pick them before they reach maturity (full size) for max quality, or to let them grow to maturity for spore printing. Whatever the case, the shrooms are doomed to be picked and then they aren't so pretty anymore, but become a pile of shriveled shrooms.
The real difference in this interpretation of the PF TEK and a mega cultivation (traditional teks) is that there is no "heartbreak" when harvesting the shrooms from a micro tek where the shrooms don't attain the magnificent stature of mega cultivation (traditional ways). When the shrooms appear inside the jar (PF invitro tek), it is easy to just take them and dry them. There is no "destroying" months of work or "ruining" a magnificent stand of shrooms before you get to even know them. There is only the harvesting of powerful psychedelic fungus, APPEARANCES BE DAMNED. That is really what the invitro PF TEK is all about. But then, if good looking specimens are desired, the PF TEK with a good casing procedure (PF double ended cake casing tek recommended) delivers the goods there also.

Dunking the Cake

Another PF style grower added to the PF invitro style tek, and that is what is called "DUNKING". This is where the cake, after it is birthed and the invitro shrooms are harvested, is dunked in water for about a day or less. The cake will float and it has to be weighed down so that it goes under water all the way. The best way to do that, would be to take a cleaned cake (all shrooms and aborts harvested), fill the grow jar with water, put the cake in and put the lid on so that the excess water comes out. Let it sit for no longer than a day, and start the process over again by putting the dunked cake into a new jar for another flush. This can be repeated until the cake turns green with mold. Several flushes can be had this way and the yield can be about 6 dried grams total or more per invitro cake. This dunking technique is well established in the realm of growing normal shrooms. Shitake inoculated logs are routinely submerged in water to stimulate fruiting as well as other types of growing styles.
It is important to not let the shrooms grow to full size or even near full size invitro, but to take them before the caps TRY to open. Check the photo for what it can look like. It is not pretty, but the shrooms are of excellent quality and with good potency.

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CHAPTER 12 - THE DRINKING STRAW TEK

original source: http://www.fanaticus.com/7cakes.htm

This photo was sent to PF a few years ago and it was posted at the PF web site. It has also appeared at other web sites on the web. The sender was anonymous but I did know that the person used an ultrasonic humidifier with the straight PF TEK. This is an outstanding fruiting and I have never seen it bested. I have only seen this kind of fruiting at PF in large growing chambers with electric powered humidifiers in use.

Just recently I was notified about drinking straws being in the cakes. I looked harder, and there they were - drinking straws inserted into the cakes. (You can see one near the upper left coming out of a cake in the back) This is a TEK that has been going around the web for years, and even a good friend of mine said he did it and got great fruitings. I thought, great, but basically ignored it. What is done here, is that after the cake is birthed, an electric power drill is used and a clean hole is drilled into the cake in which the straw is inserted. And then during growth, water is injected into the straws which feeds into the cake, rehydrating it. That is why that fruiting is as good as it gets - casing or not, and only because of the pf substrates fruiting power and the growers water replenishment teks (humidifier and straws).

The number one element of any shroom fruiting is water availability. When the pf cake is birthed, the first thing that really starts to happen is moisture loss. That is because of the nature of vermiculite. Also, the fungi transpires plenty of water. So with two sources of water loss, evaporation and transpiration, cakes dry out. This reduces fruiting possibilites as it progresses.
So the answer is a way to input moisture to keep the cake fully LOADED with water as it gives off the water. It is clearly a kind of cycle - water in - water out - as the cake lives. It is apparant that many people are doing this various ways. Like--- burying the cakes in potting type soil mixtures. What this does is rehydrate the cake. Any type of moist soil like substance that can give off water can be used like this. It is a water feeding system. And that is exactly what the PF double ended cake casing tek is all about.

Here is a quote from the famous old cubensis growing book - "Psilocybin Magic Mushroom Growers Guide" by O.T.OSS & O.N. Oeric: page 49 - casing.

A variety of types of casing soils have been found to effectively promote fruiting. We have found the following mixture to be one of the best:

- 7.5 liters peat moss
- 3.5 liters fine vermiculite
- 4 liters washed fine sand
- 2 liters calcium carbonate (finely crushed oyster shell)

Powdered oyster shell is sold as a feed supplement by many feed companies. We have also found that a mixture of one part Mica-peat (50/50 vermiculite-peatmoss mixture) to one part potting soil will work, and even unadulterated rich garden loam has been found suitable, though its unsterile condition makes contamination a possibility.

There is room for further experimentation with other types of casing mixtures: one might try casing with finely granulated horse-dung or cow-dung, or a mixture of horse or cow dung and finely chopped wheat-straw. Casing with leaf-mold mulch might also effectively promote fruiting, and in fact might encourage the fruiting of smaller and more delicate species of psilocybe that do not seem able to fruit when the mixture given above is used. The object is to find a casing soil that is porous enough to allow air to reach the mycelium, and that at the same time is light enough to allow the young mushrooms to penetrate easily through the surface. Sterilization of casing soil is usually recommended but we found it unnecessary when relatively sterile commercially bagged materials were used.

This is the important sentence and idea of the Oss and Oeric info: "The object is to find a casing soil that is porous enough to allow air to reach the mycelium, and that at the same time is light enough to allow the young mushrooms to penetrate easily through the surface". And the purpose of it is to "effectively promote fruiting". What does "effectively promote fruiting" mean or why does it happen? What is it about the casing procedures that "effectively promote fruiting"? What PF has found is it is not the casing the promotes fruiting, but the substrate. That is where the fruiting power is. The casing is a water input system. It allows the cake to take in water as it is outputed and replace the moisture that was lost, providing the cakes with plenty of water that encourages the fruiting.

The SECOND important factor to be reckoned with is the shroom races gestation period. The TC has a real slow poke of a gestation period. The reason the pf double ended cake casing tek with plain vermiculite works for that one, is just that the cake is kept fully "LOADED" with water while old slow poke decides to come out.
casing soils (peat verm ect)
wet vermiculite
wet perlite
intense humidification
Drinking straw teks

All these teks accomplish the same end - reloading the cake with moisture as it waits for the spore race to complete its gestation. And then when the shrooms begin to fruit, the fully water loaded cake can deliver the shrooms number one need - water. Water recharging is the purpose of all of these teks, and they accomplish more or less the same thing.

Psylocybe Fanaticus January 16 2000

CHAPTER 13 - DECONTAMINATION OF SPORE SOLUTIONS

original source: http://www.fanaticus.com/antibiot.htm

Antibiotic means "anti-life". But interestingly, fungi spores can withstand powerful doses of antibiotics while bacteria succumb easily. That is why "athletes foot" can't be cured with antibiotic creams. It could be that antibiotics come from fungi in particular. When a spore solution is made it can easily be contaminated with bacteria, the most common life form. We are surrounded by them. But with antibiotics, they are very susceptible, especially when in a solution of water and spores. The technique is quite simple. The Antibiotic is put into the spore solution where the bacteria are stopped in a variety of ways, either by cell wall destruction or protein synthesis inhibition, depending on what kind of antibiotic is used. I am no expert in antibiotics, but I know that antibiotics in concentrated form kills them dead, while leaving the fungi spores just fine. And over time, the fungi spores remain viable. And previously, it was bacteria contaminated (no spore germination - just a rotten smell and slime appeared).

But it is important to use the spore solution immediately. Over time, the cultures will still germinate and give a clean culture but you can tell something is not good. The culture is weak and it won't fruit, even though it is clean of bacteria. So use the decontaminated spore solution immediately and your results will work.

Step one: Acquire antibiotics. This is the easiest part. The best place to get a wide variety from Penicillin to Tetracycline is at your neighborhood pet store which has a good fish tank supply and of course, live fish for sale. In a particular section of the store, you can find rack fulls of a variety of antibiotics that are used for fish tank populations. They come in capsule form and are to be used directly into the fish tank water. But for our purposes, this won't work because these antibiotics are not sterile by any means. They are actually heavy with mold. Even Ampicillin you get from your doctor is heavily loaded with mold. The mold spores don't hurt you or the fish but they will destroy your attempt to culture fungi spores.

The antibiotics must be first sterilized before use in spore solutions. Heating the antibiotics is not the way, because it destroys the antibiotics. The antibiotics must be cold sterilized. This is accomplished by a very common micro biological technique ubiquitous throughout the Bio science lab world. The antibiotic is taken out of the capsule, placed into a small jar, about 10cc of water is added, the powder is mixed into solution, the solution is sucked up into a syringe and then finally, the antibiotic water is pushed through what is called a "SYRINGE FILTER". This is a small 25 mm round plastic device that sOcrews on the end of a standard leur lock syringe like the ones the Professor sells. These small round filters come individually packaged in what is called "blister packs" where they are sterile and ready to use. The antibiotic solution comes out of the syringe filter and it is sterile. The filter takes out anything bigger than .2 microns and that includes all spores, bacteria and viruses. The antibiotic molecules get through and are clean of all mold spores plus the bacteria that was in the water is dead already.

The antibiotics that I have used to great success are all available at the pet store fish tank section. Tetracycline is a powerful toxic antibiotic that colors the spore solution orange yellow. Kanamycin is a powerful antibiotic that is clear and does not show up in the spore solution. Neomycin is another clear antibiotic that has worked well. I think Tetracycline might be the best, but Kanamycin and Neomycin work just great. Penicillin is not near as good and usually fails. I have tried Streptomycin which fails half the time and gentimycin which is very weak, fails all the time. Gentimycin is an antibiotic that can withstand autoclaving and is used in agar agar (by such myco supply houses as Fungi Perfecti), but in comparison to Tetracycline, it is weak. In fact, a Doctor friend of mine says they don't use Gentimycin anymore. It's obsolete. I have used chlorpromazine and a few others, and I have found Tetracycline to be about the best, and it is always available at the fish tank store. Plus, it is the only one that colors the water yellow orange (not pretty) and it is the most expensive (less than $10 per pack of a dozen or so pills at the fish tank store).

The Tek

There are two sides of the equation. The first side is basically non sterile and the second side is sterile. In the first side, the antibiotic is put into non sterile water (distilled), which is sucked up into the syringe ready for injection through the syringe filter into the targeted spore solution. The second side is the clean side, which is the syringe filter itself, the needle if used and the spore solution (which is as clean as possible prior to the antibiotic treatment).

Supply list - non sterile side of the equation:

1. Tetracycline - Kanamycin - Neomycin capsules
2. 10 cc syringe
3. Distilled water
4. small mixing jar
5. mixing rod

Supply list - sterile side of the equation

1. 0.2 micron syringe filter (25 mm around) - available from science supply catalogs.
2. syringe needle (optional)
3. spore solution in jar (clean as possible

On the non sterile side, just start clean. All the contaminants will be taken out by the syringe filter. You needn't autoclave anything except the needle if it is used on the syringe filter in the injection of the sterile antibiotic fluid. First, open the antibiotic capsule, and empty the entire contents into a waiting small clean jar. With the non sterile syringe, inject 10cc of distilled water into the jar and with a rod mix the antibiotic until dissolved. It might not dissolve completely, but that is OK. The syringe filter will do the rest.

Suck the antibiotic water into the syringe. Leave about one cc of air in the syringe for good control of the outflow.

Now we go into the sterile zone. If you don't have your own spore print taken PF style according to the PF TEK, you will have to use a print gotten from somewhere. When this is the task, you must use an isolation hand box and using sterile equipment like a forceps (to handle the spore print) and a sterile exacto knife blade (to scrape the spores off the print) and a waiting sterile PF style jar with a little water in it (based on the syringe making tek in the PF TEK book). Many books already written describe how to do it, but they are all really the same. It is self evident how to do it. One just has to get the spores off the print and into a waiting sterile jar with water in it. The jar lid has already been fixed with the proper sized needle or access holes that are covered with good tape or tin foil.

Once that is done, have the jar with the hydrated spores ready. Follow the PF TEK on that (PF spore syringe making tek). Next, with the syringe loaded with the antibiotic solution (non sterile), peel off the back of the syringe filter "blister pack" (kind of like preparing a bandage). With the back peeled off, hold the syringe filter in the blister pack (by the sides) and screw on the syringe with the antibiotic solution and remove the filter from the blister pack holder. If a needle is to be fixed onto the syringe filter, remove the sterile needle from its tin foil and fix it to the syringe filter. Don't touch the needle tip, but you can handle the needle by the hub if you want to. Don't touch anything that the solution will come in contact with. Next, remove the tape covering the needle or access hole in the lid of the spore print jar, insert the tip of the syringe filter (or optional needle) into the hole in the lid of the spore solution jar and slowly but firmly press on the plunger. There will be a short pause while the solution begins to move through the filter, but then it will start dripping out the end of the syringe filter and into the waiting spore solution in the jar. The fluid will be a clear orange color (Tet) or clear (Kana or Neo). There will be no particles in the antibiotic fluid as it comes out of the syringe filter. Once you do this, this is actually fun to do and very easy.

When the antibiotic fluid is emptied out of the syringe, withdraw the syringe filter tip or needle, put some fresh tape on the lid hole, swirl the spore solution around a bit and put it safely on a shelf for a couple of days. Actually, once the antibiotic goes into the spore solution, the spore solution is ready to use, but to be sure, give

it a couple of days of rest.

If the procedure is done correctly, and no mold contaminants are introduced during the procedure, the spore solution will be cured of bacteria.

To test the spore solution, inject a jar with an agar nutrient layer on the bottom or a slurry of brown rice powder. If the fungi appears a few days later and looks pure and clean, success is yours. But, there might be another problem, and that would be mold - green, blue etc.

If there is mold in your culture, it will be growing along with the pure white fungi mycelium, usually next to it. The next step is very easy. Go on to the PF micro peroxide brown rice cloning tek to clean up the mold through sub culturing with peroxide and on to the shrooms, PF style.

PF Peroxide and Brown Rice Cloning TEK

This photo is the PF albino mutant strain, cultivated PF style using the PF cloning tek (from anonymous experimenter).

The original idea comes from Rush Wayne's cultivation manual "GROWING MUSHROOMS WITH PEROXIDE". The following is a simplification of the idea down to the smallest degree, using brown rice powder, peroxidated water dilution's and small jars.

MATERIALS:

1. Small jars with lids
2. Brown rice powder
3. Regular store bought Hydrogen Peroxide (3%) antiseptic solution (usually in a brown bottle)
4. Dissection knife and long needle (exacto etc)
5. Living mushroom or fungus, or culture of fungus

If the previous antibiotic tek is used and there is mold growing along with the pure white good fungi, follow this tek using a small fragment of the desired fungi. The mold growing near the good fungi will shower it with spores, but this peroxide tek will usurp the contaminant spores and clean the good mycelium for further cultivation - PF style. This tek can be a follow up to the antibiotic tek, or can be used to clone a mushroom outright. Both purposes work just fine.

As a preliminary, start reasonable clean, but the following is to be done in the open air, without sterile implements or containers.

Mix the peroxide antiseptic and water at a 20% ratio. Example - 2cc peroxide and 8cc water. Place an amount of brown rice powder into the jar and add some of the peroxidated water to get a slurry, or very wet condition. The diluted peroxidated water sterilizes the medium. For extra experiments, you should try more potent peroxide contents in the brown rice peroxide slurry medium (30% - 40% - 50%). It is so easy, it can't hurt to experiment and you can benefit from it.

Tear the shroom apart and with an exacto knife, excise a small fragment about the size of a match head. With a long needle, knock or scrape the shroom fragment off the exacto blade and place the fragment on the surface of the peroxidated brown rice slurry. Or if you are using a culture of mycelium that may be contaminated with mold, cut out a small piece of the white mycelium with the exacto knife blade and do the same - scrape the fungi fragment of the blade onto the surface of the peroxidated brown rice slurry. If the culture grows back clean, that doesn't mean that it really is clean, because there will be contaminant spores in the mycelium (which is there anyway because of the open nature of this tek). When the culture is to be used PF style, when it is reslurried with fresh peroxide water, the contaminant mold spores and bacteria endospores will be killed while the growing fungi mycelium will survive to grow clean - PF style or any style you like.

Screw the lid tightly onto the peroxide slurry jar and put the jar in a warm place for growth. The culture can be opened and exposed for observation or experimentation without danger to the growing medium and culture.

Under magnification (10x), the fragment of mycelium appears to "melt". It also turns blue, as if it were killed. Within a few days, tiny white hair like tendrils (hyphae) will appear on the "melted blue" fungus. It will grow and fill the culture jar.

To use the culture for further inoculations, add 20% peroxidated water to the culture, mix the brown rice and fungus, and with a syringe, draw up water and inoculate PF jars, with the standard PF spore syringe technique. This is done nonsterily also because the peroxidated water will kill contaminant spores. But flame sterilize the needle before injecting into the sterile PF substrate. Instead of flaming the needle, an even better way to sterilize the needle (outside of the needle) is to wipe the needle with a tissue soaked with rubbing alcohol. Let the needle briefly dry of the alcohol before injecting. Use the culture well before it grows in. That way, it is much easier to get a usable slurry for the syringe without clogging.

As an addition, try more potent peroxidated water ratios. For instance, a 50% ratio works also. That would be half peroxide antiseptic and half water. Increase peroxide content until the mycelium doesn't survive. Then back off the amount of peroxide and use a near death peroxide load for guaranteed clean results. But a 20% peroxide to water ratio seems to be perfect.

If you are working with previously made plate or slurry cultures that have mold or bacteria slime growing along with the pure white good fungi, follow this tek using a small fragment of the desired fungi excised out of the culture. Make sure you don't have any growing mold or bacteria in the good mycelium because the peroxide won't kill it (as it doesn't kill the good fungi). If the culture grows back clean, that doesn't mean that it really is clean, because there will be contaminant spores in the mycelium (which is there anyway because of the open nature of this tek). When the culture is to be used PF style, when it is reslurried with fresh peroxide water, the contaminant mold spores and bacteria endospores will be killed while the growing fungi mycelium will survive to grow clean - PF style or any style you like.

TEK Problems

The only problem is syringe needle clogging. As a remedy, do not allow the culture to fully grow in or get thick. Keeping the culture "thin", allows a good breakdown of the mycelial fragments for use in a syringe. At first, doing the tek can be messy, but learning is quick and easy. Finding and using needles as big as possible is important.

But another route is very possible and actually preferable. Using long glass bulb pipettes are very good to use, but here, one must customize and "tweak" the teks a bit (one must be careful when injecting PF style jars with the bigger pipettes and not to breach the top vermiculite contaminant barrier). Also, flaming the glass pipettes can sometimes break the glass. In this case, always sterilize the outside of the pipette with the rubbing

alcohol. Also, when releasing the bulb, it will inflow air. Do this inside the jar where the air is clean and protected by the vermiculite contaminant barrier. Or, after injecting, keep the bulb squeezed and withdraw it, and then refill it with fresh peroxidated mycelium for another injection, resterilize the outside of the pipette with rubbing alcohol, and inject, and so forth. When doing this, use small calculated amounts of mycelium slurry to keep from over doing it. Bulb pipettes are actually better to use than needles and syringes because they don't have much problem with clogging as compared to needles and syringes with mycelial slurries. But if the tek is followed closely and the cultures are not allowed to grow in and get thick, the 18 gauge needles with 10cc syringes work OK.

Principles of the Peroxide TEKS

Hydrogen Peroxide is a powerful antiseptic. The solution of Hydrogen Peroxide bought in a drug store is 3% Hydrogen Peroxide and 97% water. Even at this low concentration, and with further dilution's, the germ killing is potent. But that germ killing power only works for micro fungi spores and bacteria endospores. A micro-organism that has germinated into its secondary form (mycelium), is safe from the antiseptic power of diluted Hydrogen Peroxide. But the ungerminated spores, bacteria endospores, and microbes are all susceptible. If there is bacteria that is growing (germinated), it will not succumb to the peroxidated water (just as the fungi mycelium is not succumbing). Also, any mold that is growing will survive. A clean fragment of shroom flesh or mycelium from a mold contaminated culture has germs all over it, but only in the spore or endospore form. They won't germinate in the peroxidated medium and water or on the recovering mycelia.

The tek is like a tightrope act. The mycelium that is cultured in the peroxide enriched medium can survive and grow, but it is not clean. Any spores or bacteria that are "piggy-backing" on the mycelium and not in contact with the peroxidated medium can come to life if given the opportunity.

After the culture of mycelium grows, it can be rehydrated with more peroxidated water. The spores and bacteria endospores that are "piggy-backing" on the mycelium will die. The mycelium in its fully secondary form, will survive the new peroxidated solution, "cleaned".

Professor Fanaticus

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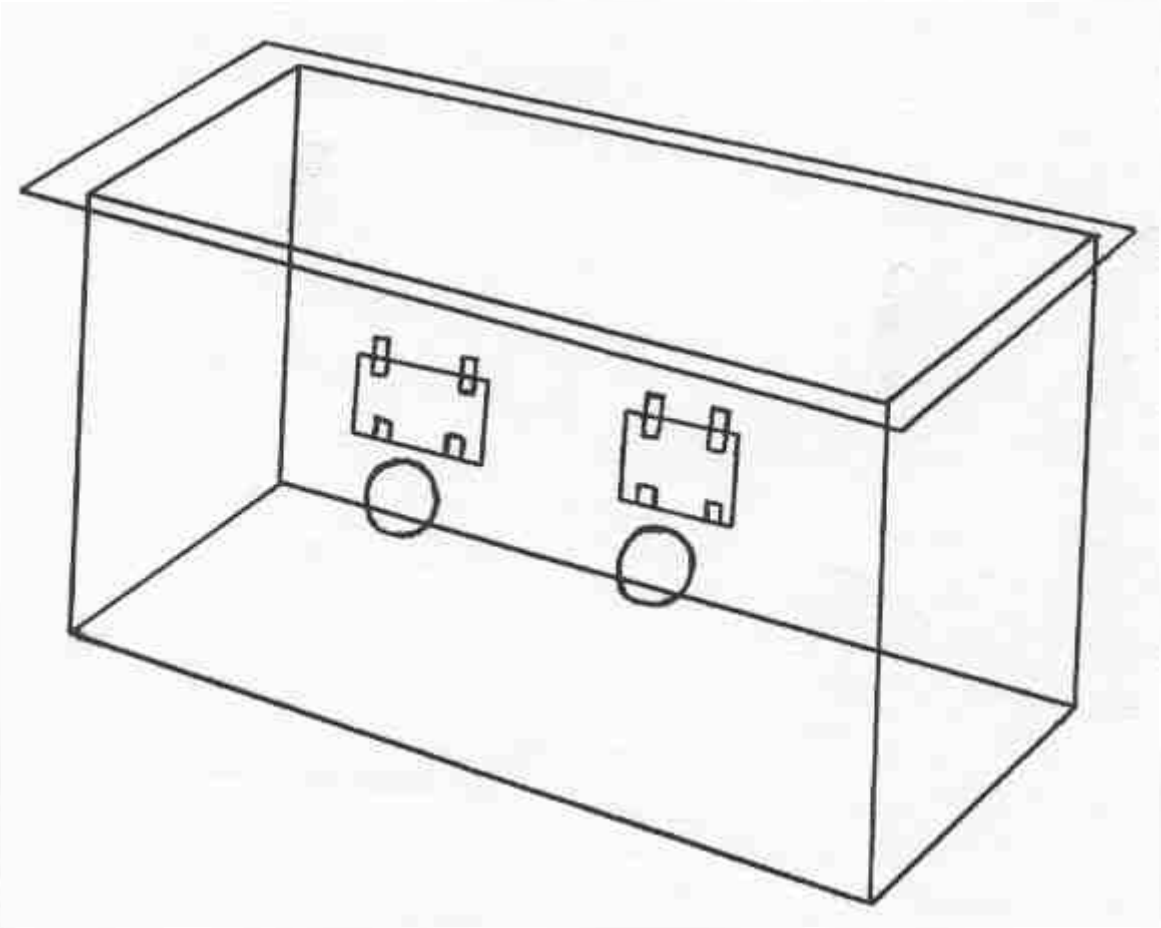
CHAPTER 14 - ISOLATION HAND BOX

original source: http://www.fanaticus.com/handbox.htm



Materials - plywood, plate glass and weather stripping. Be sure and make the box out of heavy enough wood so that it won't move excessively as you move your hands around. A little movement is OK.

This is the simplest design for a sterile air transferring hand box. It is four pieces of perfectly cut rectangular plywood, painted with a water resistant coating (preferably white enamel type paint). It has no top or bottom. The box sits on a flat table that serves as the work surface. A piece of plate glass (edged for safety!!) sits flat on top. The four panels of the box must be cut perfectly square so that when they are attached, the top and bottom of the box are flat and straight which insures draft free operation. The bottom of the box must sit squarely with the table with no leaks as well as the plate glass cover. If you want, you can line the top and bottom edges of the box with weather stripping for extra security against air drafts entering.

There are two round holes for your arms. When you cut the arm holes, determine your own particular movement needs (up, down, forward and sideways within the box) and place the arm holes to facilitate reaching and manipulating things. Cut the arm holes to size so that your arms (below the elbows) will close off and seal the holes to prevent contaminating air drafts from entering as you work. Cardboard squares are taped to the front of the box over the arm holes in order to cover the holes when the sterile spray is used to sterilize the interior air (shown in up position - undo the upper pieces of tape and the covers flip down).

How to Use the Isolation Box

Number one rule: Any surfaces or utensil's to be used in direct contact with the fungus are to be first covered or protected against the sterilant. You can cover closed dishes and jars with cut pieces of acrylic plastic.

To use the box, first place the things you will be working with into the box. Any surfaces or utensils to be used

in direct contact with the fungus are to be covered or protected from the sterilizing spray. You can cover petrie dishes and jars with cut pieces of acrylic plastic for extra protection if you want and then remove the covers when you want to work. Tape the cardboard squares to the front of the box to cover the arm holes which will prevent air from entering the box during sterilization.

Slightly lift the glass plate cover and spray the interior of the box with 10% laundry bleach and 90% water or some kind of Lysol spray, or for the max killing power, you can use rubbing alcohol in a spray bottle. Let the spray vapors settle a minute or two. You don't need gloves, just wash your hands and arms. Remove the tape from the bottoms of the cardboard hole covers, lift or remove cardboard hole covers and with a MINIMUM of air disturbance or draft creation, insert your hands.
Sterile jars full of media can be opened and transferred without fear of contamination. Scalpels and dissection implements can be taken into the just sterilized (sprayed) box in your hands as you insert your hands through the access holes.

Don't seal any containers after working on them in the chamber. This allows whatever chlorine gas, alcohol vapors, ect, that has gotten into the jar or dish to naturally dissipate with normal gas exchange. To accomplish this, just slightly loosen the jar lids. They can be left in the box for added protection while they are exchanging any vaporous gas with good air. After a few days, then the jars and containers can be sealed for later use.

To be sure, things can be awkward, but with a good air tight box, you can knock things around and be sloppy and still have no contamination. That is why there is no bottom to the box. After working in the box, there will be strewn all over the bottom (table top), bits of agar, fungus, grain kernels or whatever might drop off of your scalpel, spoon, fork or knife ect. With no bottom, just take off the glass plate top, lift off the box and clean the table.

You can customize the box any way your creativity allows. For instance, you can rig up little hooks and dowel hangers and nails inside the box in proximity to your hands (reach) so that you can have a safe spot to hang your dissection tools as you work (away from toxic chemical droplets of the sterilant).
The Professor has used this type of box for many years before he got a HEPA filter blower. The Professor's very first cultivation employed an old 20 gallon aquarium with a Plexiglas cover (fits in the top of the aquarium) with two arm holes. It worked great the first attempt. Then the aquarium got broke and the Professor made a big box like the one pictured above out of heavy weight particle board. It also worked great. Then the third one was made out of lightweight plywood painted with white bathroom enamel (easy to tote around the house) and that one served the Professor for years. Then the Professor got into the HEPA filter blower (high tech). But, for hobbyists, the hand box design works as well and a lot cheaper and basically fool proof (low tech) but the disadvantage is that it can be awkward, but it has its good points to be sure.

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CHAPTER 15 - PF SUBSTRATE FORMULA'S BIOLOGICAL EFFICIENCY

original source: http://www.fanaticus.com/ripsnort.htm

Photo and text from RipSnort
These are Treasure Coast spores from PF. I took a fully colonized cake, cut it in to 4 equal parts, and then cased the broken up cake quarters. Each one of thoes pans only has 1/4th of a cake in them.

Biological Efficiency (from Fungi Perfecti Catalog)

Biological Efficiency is a term frequently used in the mushroom industry to describe yield potentials of mushrooms from various agricultural by-products (straw, sawdust, sugar cane bagasse, banana fonds and coffee plant wastes, to name a few). This formula was first developed by the Button mushroom (Agaricus) industry.

Simply put, a yield of 1 lb. of fresh mushrooms from 1 lb. of dry substrate is considered to be 100% Biological Efficiency. Since mushrooms are approximately 90% water and the base substrate is typically raised to 75% moisture, 100% Biological Efficiency is equivalent to saying that 25% of the wet mass of the substrate is converted into fresh mushrooms.

Although such yield efficiencies are commonly achieved by experienced growers, many choose not to "chase the optimum", as their growing rooms can be better utilized by cycling in fresher material.

PF's comments

With some simple math and a little analysis, it can be readily seen that PF substrate is well over 100% "Biological Efficiency". RipSnort reports that his Treasure Coast shroom fruiting was had by quartering a PF cake and using the 4 pieces in seperate containers in which the quartered pieces were cased. This means that each fruiting tray above contains about 1/16 of a cup of brown rice powder and about twice as much vermiculite, plus the casing.

In a normal PF 1/2 pint cake, there is about 31 grams of brown rice powder (1/4 cup) and about 17-20 grams of vermiculite (1/2 - 2/3 cup) which adds up to about 50 grams dry weight. It can be conservatively stated that a properly cultivated PF 1/2 pint cake can produce (with several flushes) at least 10 grams of dry shrooms (100 grams wet weight). By using the above biological efficiency formula - this equals an easy 200% biological efficiency for that 1/2 pint PF cake (50 grams of dry substrate producing 100 grams of wet shrooms is twice efficiency - the wet shroom weight is twice the weight of the dry substrate, or in other words - 200%).

This amazing ability of cubensis shroom races to fruit on PF substrate has made the PF TEK the new fundamental of cubensis shroom cultivation. The PF TEK can be used straight PF style (mini culture) to get

great fruitings of diverse cubensis races, or can be utilized in more mega style cultivations with trays or larger containers with more massive substrate amounts (compared to PF style Mini culture). What is being demonstrated at various mycophile web sites is PF substrate being mixed with various grains, soils and substrates with impressive fruitings on display. A certain percentage of PF substrate with any kind of cubie substrate results in big fruitings. AND, when PF substrate is used in these mega cultivation teks without the additional grain, fruitings are just as good, if not better. The RipSnort Treasure coasts are proof of the magic of the PF formula (brown rice powder and vermiculite).

The Discovery of the PF magic formula

Many years ago, PF grew cubies on many substrates and found brown rice to be the best grain for fruiting. The problems associated with using brown rice was that it was sticky when cooked up and unshakeable in quart style spawn jars. This creates many problems which thwarts the fruiting power of brown rice. In 1978, Dr Stephen Pollock published his book "Magic Mushroom Cultivation" and it featured a brown rice cake method using quart jars and growing the shrooms inside the jar. This tek has many flaws but had great potential.

Then in late October 1981, PF attended the Paul Stamets and Jeff Chilton Myco Media shroom conference at Orcas Island Washington. During a Stamets lecture, Stamets mentioned mixing vermiculite or perlite into grain substrates to get a better and easier shakeability. It was like a lighting bolt that hit PF, as he busily scribbled down some notes about this substrate mixing concept.

PF went home and began a series of experiments combining these two ideas (Pollocks rice cakes and Stamets vermiculite mixtures) which resulted in the PF TEK magic substrate formula, which has become the new fundamental magic mushroom growing and culturing medium.

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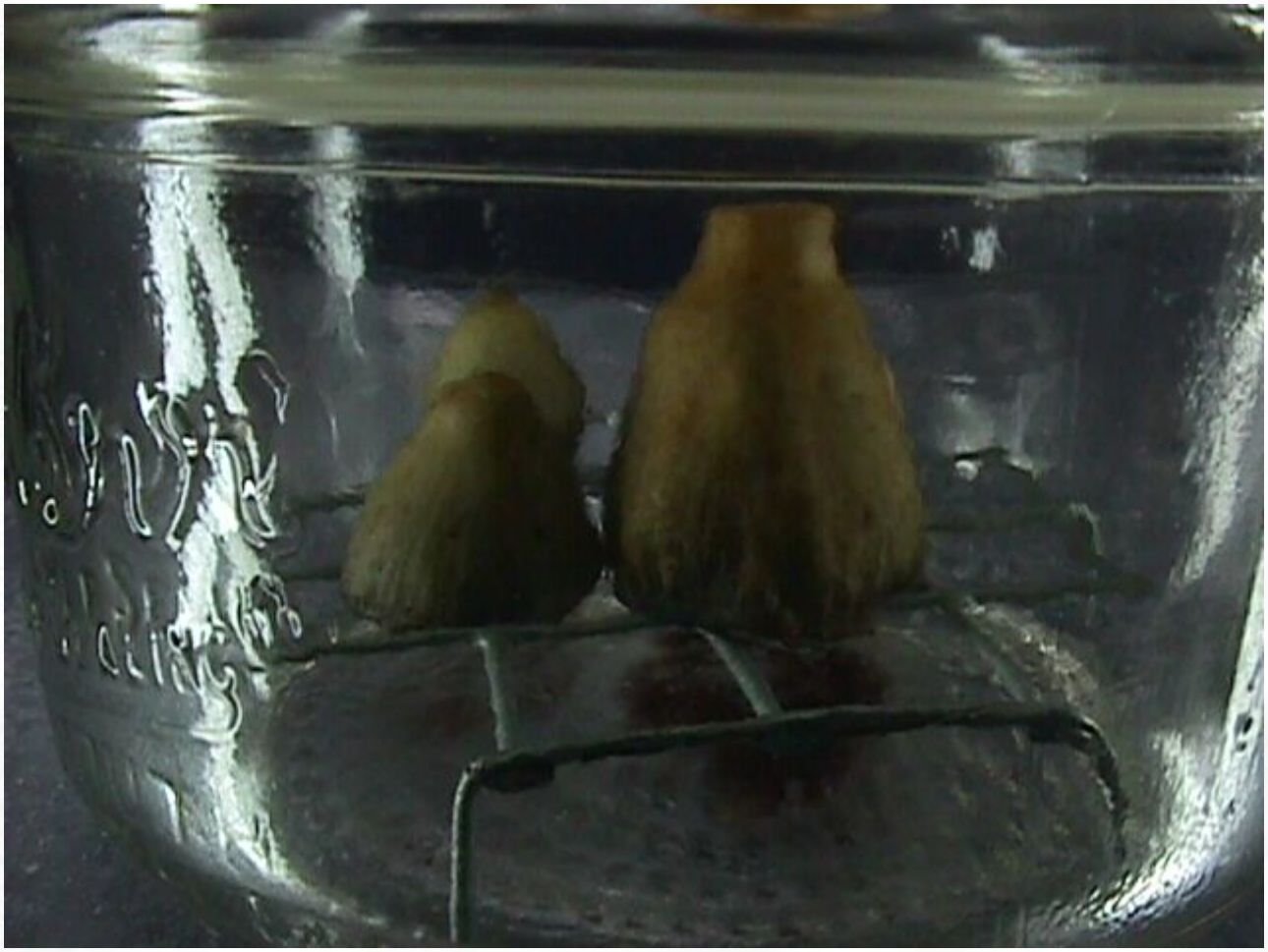
CHAPTER 16 - SPORE PRINTING IDEAS

original source: http://www.fanaticus.com/sporejar.htm



These are caps of psilocybe semilanceata (collected in the Olympic Rain Forest) in a 1/2 pint wide mouth canning jar.

The caps are resting on 1/2 inch galvanized wire screen. The 1/2 inch is related to the distance between the wire. The wire screen was cut up and fashioned into a screen support by cutting it with a wire cutter pliars and bending it into shape. The caps are above the glass surface which makes for a cleaner spore print (although printing directly on glass apparantly works as well).

The glass jar and wire support are presterilized in a pressure canner. Jars like this can also use the white sterile filter disks as lids held on by the canning jar lid bands. These are available from Fungi Perfecti in Shelton Washington. To find them on the web - just do a search with FUNGI PERFECTI.

Psylocybe Fanaticus
Seattle Washington USA

VARIOUS ARTICLES BY PROFFESOR FANATICUS

CHAPTER 17 - MAJOR PF TEK SNAFUS FOR THE NEWBIE

original source: http://www.fanaticus.com/pitfall.htm

Water inflitration of the jars during sterilzation

There have been many isolated posts concerning delayed or stopped colonization. This seems to always concern the lower half of the jar. The simple explanation is water infiltration into the substrate during steaming.

This happens two ways. The first is that there is to much water in the pot and the boiling water can slosh into the jars. Then the water builds up in the lower part of the jar and the soaked substrate will not colonize correctly (or not at all - and stall) The second way is water dripping from the top of the pot down onto the jars. If you use regular canning lids, these do not seal the jar and water dripping down can go into the jars.

In the first incident - use a safe amount of water so that sloshing into jars doesn't happen.

In the second incident - cover the lids with tin foil to ward off dripping water.

Premature cake birth

Observe the photo of the in vitro primordiation in the PF TEK photo files. This photo is all you need to time the whole thing. Primordia appearing in the jar usually starts around the begining of the 3rd week after spore inoculation. But don't stop here. When you see the new primordia appearing, delay birth. Doing that influences more primordia to form. After about 3 to 4 days, birth the cake. The initial flush will be highly influenced by how primordia form in vitro.

Newbie humidifier uncertainty

The usuall case here is inexperience. Humidity is invisisble and humidifiers do almost to good of a job of humidification. The rule here is to avoid humidifiers when you are a PF TEK newbie. The pf tek does not need the extreme high humidities that you might think these shrooms need. A small terrarium will produce excellently - equaling electronic humidification (and that is no matter what the humidifier fans say). But of course, if you want to do the humidifier technique, the humidifier tek in the PF TEK photo files is the best because it is the cheapest and simplest and there is no sacrifice in effectiveness. Cool sprays are under $20 - available in the baby care section of a decent drug store and easy to rig up.

Improper water content in the jars

To determine the best water content, When you first do the pf tek, make a batch of jars with the same substrate amounts but variate the water, take notes, observe and go with what works best.

Pint jars verses 1/2 pint jars

When I first published the PF tek papers in 1991, I included a Pint jar pf tek chapter. And of course it was eagerly copied (a few years later) by the MMGG author as if it was the cats meow (because I had dropped it from the pf tek papers already).
In the beginning, All the subsequent letters from the myco customers with problems had to do with the pint jar. It was causing lots of trouble. 1/2 pints seemed immune to problems.

I already knew of the pint "trouble". So I dropped the tek. The "trouble" was "premature" fruiting (like thats bad?). What would happen, is that Pint sized cakes would commonly have the tendancy to begin putting out primordia and screaming to be released from in vitro BEFORE complete colonization of the cake, mainly caused by not enough spore solution delivered all around making for an uneven colonization.
So there you would have a tear jerking disaster on your hands; primordia all dressed up with no place to go. Because, birthing the cake would expose the exposed uncolonized cake surface (which sometimes is about half the surface) and you will not only have shrooms growing, but plenty of contamination (hence the absolutely ingenious MMGG technique of branding the cake.)

What is causing this is that the vermiculite in the mixture is the fruiting catalyst which stimulates fruiting whether the food is used up or not. The fruiting is clearly related to a food threshold and nothing to do with CO2 or oxygen - temperatures ect. And this is Because these primordia will appear just the same in a jar in which the lid has been on tight since the get go. (NO OXYGEN) strange but true.
To see the truth of this in demonstration: Try a pint jar of plain pre cooked (quite wet and soft is the way) brown rice in comparison to an equal pint jar of pf substrate mixture. (you don't have to go to the trouble to do this, but read on and trust PF)

When a pint of plain rice is colonized, and left to sit in vitro, Primordia will not appear and then the jar starts to yellow - die ect. The neglected pint jar of pf substrate will put forth plenty of primordia hot to get it on while in vitro. It is like two completely different substrate mediums but basically it is brown rice.
In these two examples is clearly shown what the pf tek is all about. The vermiculite is the catalyst for fruiting - similar to casing grain (but without the casing tek) - sort of an internal automatic casing.
That is why all of this stuff about casing pf cakes to make them work the best is from people that have no idea about the pf tek and its inner workings.

Psylocybe Fanaticus
Seattle Washington
Decemember 27 1998

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CHAPTER 18 - PF ALBINO MUTANT

original source: http://www.fanaticus.com/albino.htm

ALBINO definition (Websters new world dictionary)
2. any animal or plant abnormally lacking in color

I once used a flourescent blacklight to grow PF strain shrooms. It seemingly worked as good as regular plant aquarium style flourescent lights. But something terrible happened as a result. The PF shrooms started to sprout out little white mushrooms without spores. Also along with the pure white sporeless mushrooms, normal looking PF's grew along with PF's that appeared to be part normal with albinoism traits (white patches and diminished sporulation).

The shrooms were grown under the blacklights 24 hours a day and the lights were hung very close to the terrariums. What happened was that the intense constant glare of the UV rich light damaged the spores and caused the albinoism. Basically said, the UV killed the shrooms because eventually they stopped fruiting.

These following links [content included below] have the story. UV rich light is considered instrumental in mutation formation and it is never good.

For some unknown reason, a PF style cake of PF race shrooms developed strange white primordia. They grew into shrooms I have never seen before. They apparantely are ALBINO mutants. The gills are pure white and sterile (no spores or reproductive system). The above photo is a close up of the third flush appearance of the Albino, growing from the base of the cake in the bottom vermiculite layer. This is a good example of what a "strain" is. To the left of the albino is a normal PF race shroom primordia (abhorted). These are two seperate strains. This is a clear representation of different strain manifestations on a single cake.

Cloned PF Albino Mutants

The shrooms on the left are a first flush of normal PF race shrooms. The shrooms on the right are the first flush of the Albino clone (taken from the single specimen in the above photo).

Albino Shroom Cloning Technique

As hoped for, the original PF Albino manifesting cake delivered a small third flush, and one Albino formed (the answer to a prayer to the great fungi from the beyond). This last appearing Albino was dissected and small fragments of inner flesh were excised and placed into a culture tube. As hoped for, it took and began to come to life. After the culture tube medium (Brown rice agar) was covered with the mycelium, sterile water was injected into the culture tube and the culture was broken up and mixed with a scalpel. The resultant mix was transfered to a small lab bottle (with a tight cap) and more water was added. The bottle was then violently shaken and with a 13 gauge syringe needle, mycelium rich water was injected into PF style jars. The Albinos invitro primordiated and grew like normal PF race shrooms. The bottle that was used for the injection solution was left with lots of remains. The bottle regenerated into a type of liquid culture with little floating "islands" of mycelium. This Albino is very resilient and spooks me. It looks like a ghost mushroom. The gills are sterile.

In this view, the sterile gills are shown.

PF Albino Mutant Strain

This is a photo of the PF Albino mutant strain. It is a cake that has been picked over. You can see tears where shrooms were picked for spore printing. The remaining shrooms are the stragglers in a first flush. The one on the far left is a pure Albino with a blue discoloration at the top of the cap and some purple spores from another shroom. The shroom in the center is a "half breed" in which some light sporulation is developing but the cap is strange in color - with light colors and greenish and blueish tints. The gills of this "half breed" are mixed up with some light colored gills that are lightly sporulating and white sterile gills. The shrooms on the right are more normal, but at closer inspection, there is something wrong with them also. The colors aren't "right" and they too have a greenish palor to them. The shrooms that were picked for sporulation (evidenced by tears in the cake), have definite GREENISH colors towards the center of the cap and an over all strange lightness in color. The sporulation is not spectacular, but they are giving plenty of purple spores.

This is a very unusual new creature. Very unusual in that it has never existed before. It came into being in the lab of PF. It can be said, that this shroom is truly PF's shroom - a creation of the PF TEK. What has happened, is that through reculturing and isolation of all the "normal" shrooms from the original Albino appearing cakes (pure Albinos at first), the Albinos have returned as a part of the spore race. What is happening is a first in mycology and after a little consultation, let it be known that this is a mystery of genetics and fungi reproduction. The only "explanation" that PF can come up with, is that PF shroom Albinoism is a kind of "refusing to grow up" syndrome. When primordia first appear, they are Albino and get color soon after. Pins (the precursors) of primordia are indeed pure white. So maybe the fact that pure Albinos don't sporulate or develope reproductive systems is related to not "growing up".

This a view from the top of the cake (above). The strange colors are a little easier to see, although the digital photo color rendition isn't perfect. The thing to do if one wants to explore the ultimate in growing the unknown, is to clone that pure Albino or any of them to see what will happen. The results of such an action has already shown to be astounding. And, according to a recent bio-assay, the pure Albinos are excellent potency (the strangest thing yet).

Disaster in San Diego Harbor Lagoons

Many years ago, a newspaper article described an alien plant invasion into San Diego Harbor lagoons in California. The plant has displaced the normal flora, making for an environmental degradation. Scientists have discovered that it is a common aquatic fern that is popularly used in home fish tank aquariums. The plant has mutated because of exposure to excess ultra violet light emanating from the low wattage fluorescent (15 watts) "plant & aquarium" lights. The lights are used in close proximity to the plants and the plants often float on the surface of the aquarium water making for a direct exposure. The plant escaped into the San Diego sewer system and wound up trapped and flourishing in the quiet inner lagoons of the harbor. They have taken over. UV (ultra violet) is well know in science to be a carcinogen and mutagen in plants and animals.

The Black Light Experiment

The disaster in San Diego harbor lagoons has a parallel with PF. Back in 2000, PF set up a phototropic experiment using 15 watt "black light" fluorescent tubes. The fungus cakes were growing in a simple terrarium. The lights were positioned almost touching the dome tops making the shrooms grow inches away from the lights. The lights were left on 24 hours a day. It is important to also mention that the plastic "richmans" domes are made out of polycarbonate clear plastic. UV does pass through the plastic.

The Albino Mutant Appearance

After a few months of fruiting under the blacklights, a couple of generations went by and then the PF Albinos appeared on two cakes. At first, PF didn't know what to make of them, but soon after, PF became worried, because Albinoism is a mutation, and mutations are a very bad sign genetically. PF then put away the blacklights knowing that the albinos and the blacklights are definitely connected in that they were synchronous. PF has never seen such a thing in over a quarter of a century of shrooming, plus, PF has never used blacklights - only plant type flourescents. PF remained worried.

The genetic mutation certainly occurred at the genesis of the spores, because the mutation changed the offspring that followed. The genes were damaged permanently and passed to the progeny. There were many cakes that seemed unaffected, so the two types; the Albino mutant spores and the "normal" spore race lines were separated. But unbeknownst to PF, invisible or unapparant damage did occur to the "normal" specimens.

The damage slowly crept into the spore race lines and by mid summer of 2001, PF had the sinking feeling of empending doom. The Hawaiian and Mazatec spore races were growing on the same PF formulations and in the same terrariums, but were doing great, with the customary excellent fruitings, but the PF which fruits at least equally as well, was doing frighteningly bad with no invitro primordiation, sparse fruitings, strange looking shrooms, off colors and a tendency for sterility (no spores or few forming). And in the worst case, no fruiting at all, even though the mycelium looked healthy. This degradation happened very gradually, over a period of several months. What happened, was that after the albino appearance and the cessation of blacklight use, PF continued to use PF spore race lines emanating from UV (blacklight) exposed specimens. Soon, all the PF spores PF was getting, were descended from the exposed and apparently damaged PF shrooms from the blacklight growing time. Or, the genetically damaged lines spread and gradually became dominant, taking over the PF race lines through spore mixing and spore solution making (PF's lab work).

PF knew exactly what to do - the obvious. PF then contacted a friend and got an old PF spore print from three years ago (not exposed to blacklight fluorescents) plus a fresh print that was propagated elsewhere. They were used with PF jars, and within two months, the proof was there. The "old" spores and the replacement spores were fruiting with total excellence - fast invitro appearing and big healthy (normal) flushes.
There is another recent experiment from TOKYO JAPAN with SHITAKE mushrooms that shows the power of UV (blacklight) light to mutate shrooms and make them sterile (not albino but sterile - no spores produced)).
Here are excerpts from a science paper from Japan describing mutating SHITAKE mushrooms with UV light to get sporeless strains (desirable in large mushroom farms to protect workers from spore allergies). What this means, is that what I did with the blacklight (UV intense) by accident is what these scientists did to SHITAKE on purpose.

Genetics and Breeding of Spore-Deficent Strains in Agrocybe Cylindracea and Lentinus Edodes

S. Murakami - The Tottori Mycological Institute, Tottori, Japan.

Dikaryotic hyphal fragments from a strain (2493) were irradiated with a Toshiba 10-watt germicidal lamp for 30-40 sec at a distance of 10cm. The irradiated fragments were then plated on CY-2 medium containing 20g glucose, 0.5g MgSO4, 7H2O, 0.46g KH2PO4, 1g K2HPO4, 2g polypeptone, 2g yeast extract and 20g agar per litre of water, and incubated at 25°C. The UV treatment and the incubation were performed in darkness. Lethal rate was more than 95%. Viable colonies were then isolated and transferred on to fresh CY-2 medium.

From 11,500 colonies treated with UV irradiation, 24 spore-deficient mutants and 233 strains with reduced sporulation were detected. Imbernon & Labarere (1989) reported that UV treated strains of Pleurotus ostreatus and P. pulmonarius exhibited some abnormality in morphology and yields of fruitbodies. In our experiment, pilei of the spore-deficient mutants were either very thin at the margin or small in size, or their stipes were slender and because bent.

Thus less than 4% of the geminated spores formed colonies. The reduction in compatibility, spore production and viability in the basidiospore progeny stated above, may have an important implications for microevolution in fungi.

Professor Fanaticus
2004 A.D.

Cloned PF Albino Mutants

Full grown Albino mutant clone on the PF TEK.

Blueing of the gills.

These are some of the shrooms from the second flush of the clone cake. Another strangeness occurred. The gills blued heavily. On the first flush, blueing occurred with age but not nearly to this extent. Apparantely, the blueing shows the shrooms are psilocybian. On regular PF shrooms, gills will bruize blue very easily but not like this.
For this second flush, the terrarium was placed away from the light. As can be seen, several shrooms have oriented upside down. Regular PF shrooms will do this also when deprived of light. It appears that the Albino mutants are fully photo tropic by growing in an upwards orientation when exposed to light from above and growing in all directions when no light is given.

Closeup of the blueing gills.

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CHAPTER 19 - PF RED SPORED MUTANT

original source: http://www.fanaticus.com/redspore.htm

Back when the Halle Bop comet was disappearing into the western sky (for a date only - nothing emplied), the Professor had a petrie dish with four normal looking PF shroom caps spore printing. After a few days, it was time to remove the caps and store away the spore prints. Three of the prints were normal purplish cubie spores but the fourth one was unique. The spores were a deep reddish brown color.

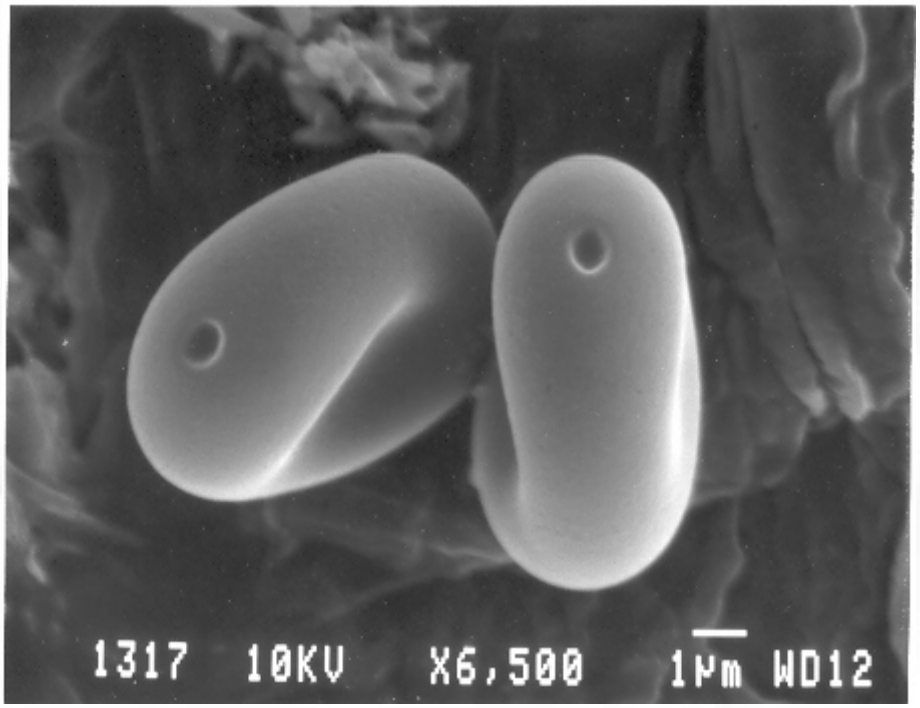
At first, the Professor thought that the reddish spore print was contaminated, but he let the dish dehumidify normally and then taped it up for storage. On close examination of the spores with a magnifier, the reddish spores were not contaminated but the color was with the spores themselves and nothing growing on them as first thought.

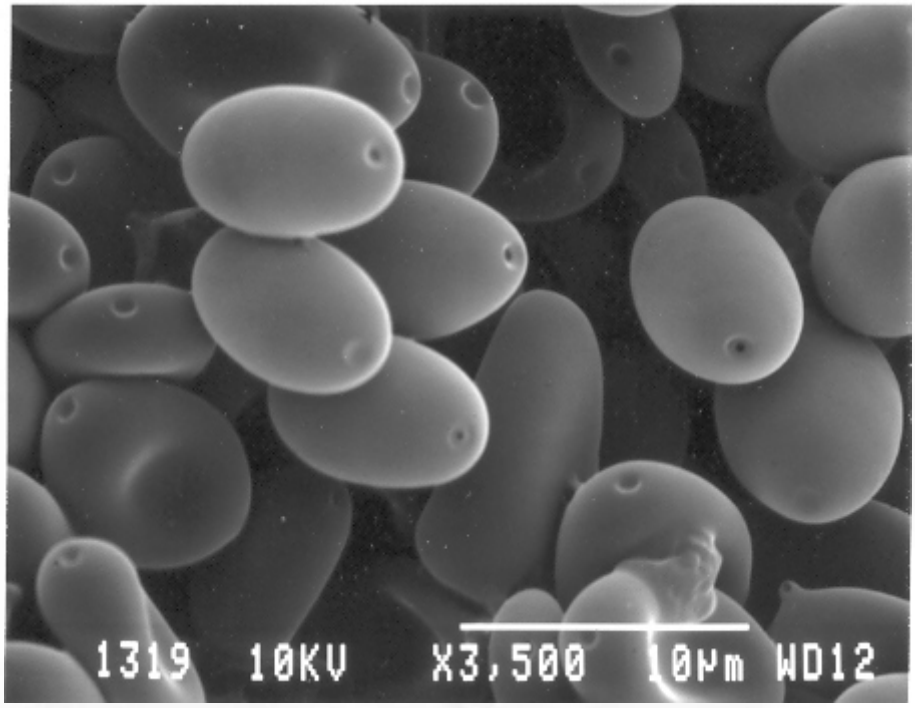
So next, the Professor made a spore solution with a streak of the red spores and injected a PF jar with them. They cultured normally and began to form primordia invitro just like a normal PF shroom. When the caps upturned, no spores were seen collecting around the shrooms. A couple of the caps were taken and placed in a petrie dish for printing. And as expected, the Professor hovered around the dish every few hours to see what would give. By the next day, color was detected around the periphery of the caps and low and behold, the color was RED! The Professor jumped with joy, a specie change! Spore color is one of the prime facets of what a specie is. In Mycology, if one has two mushrooms that look identical, grow identically and appear on the same substrate identically but have different colored spores, they are not the same specie.

Next, the Professor inoculated a PF cake on one side with normal PF purple spores and on the other side of the cake, the red spores. Fruiting occurred and on each side, the shrooms gave their respective colored spores. There was no mingling of the shrooms. They kept their own place. So as far as the Professor's opinion goes, the PF shroom some how and for some unknown reason split off into a new specie that ever since, has remained so - always giving the reddish spores and never any purple. Many cultivations of the red spore has been done, and it has remained the red spore - a new mushroom on planet earth.

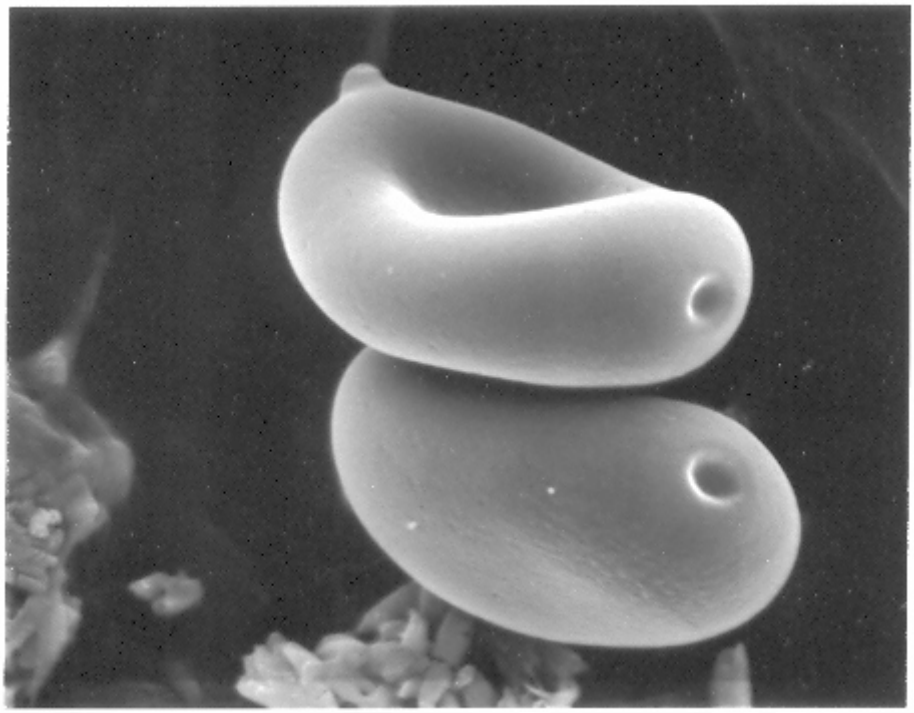
Yachaj Paye's photos of redspore and normal spore prints and caps.


PF Red Spored Psilocybe Spores & Normal Purple-Brown Spored P. cubensis
Photo by Yachaj Paye, © 2003 Erowid.org





Scanning electron microscope photo of normal PF purple spores by Professor Fanaticus



Scanning electron microscope photo of red spores by Professor Fanaticus

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CHAPTER 20 - DETECTING PSYCHOACTIVE DRUGS IN THE DEVELOPMENTAL STAGES OF MUSHROOMS

original source: http://www.fanaticus.com/forensic.htm
original source: http://bitnest.ca/external.php?id=%257DbxUbZZC%2560sgu%257Ex%2506%2500-

Chapter one

JOURNAL OF FORENSIC SCIENCES
American Academy of Forensic Sciences (1948)
Volume 45 - Number 3 - May 2000 - JFSCAS 45 (3)513-754 (2000)

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Forensic Scientist, Minnesota Forensic Science Laboratory, 1246 University Ave. St. Paul, Minnesota.
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Received 26 Feb. 1999: and in revised form 12 May 1999: accepted 23 Aug. 1999.
REFERENCE: Gross ST. Detecting psychoactive drugs in the developmental stages of mushrooms. J Forensic Sci 2000;45(3):527-537.
ABSTRACT: The following questions regarding the detection of psychoactive drugs in mushrooms are addressed: At what stage of the mushroom development can the psychoactive drugs psilocyn and psilocybin be identified, and what effect does light have on the growth of these mushrooms. To answer these questions, *Psilocybe cyanescens* Wakefield mushrooms were grown from their spores in a controlled setting. At various times of their development, samples were taken and analyzed for psilocyn and psilocybin. Knowing what stage of development the psychoactive drugs can be identified may be useful to law enforcement personnel and forensic chemists. Methanolic extracts of various samples were analyzed by TLC and by GC/MS. It was determined that the mycelium knot stage of the mushroom was the earliest stage at which the psychoactive drugs could be detected. It was observed that light affected the time of development and the appearance of these mushrooms.
KEYWORDS: forensic science. psilocyn. psilocybin. psychotropic mushrooms

Law enforcement agencies in Minnesota are beginning to see an increased number of mushroom growing operations. Knowing what stage of development the psychoactive drugs can be identitied may be useful to law enforcement personnel and forensic chemists. This information is important because in the state of Minnesota it is illegal to possess any material, compound, mixture or preparation which contain any quantity of psilocyn and/or psilocybin[1].

The word mushroom is a general term used to describe the relatively large and fleshy fruiting bodies of fungi, particularly all gill fungi. They are fungi that differ from plants in that these lack roots,stems, leaves, flowers, seeds and chlorophyll. Since mushrooms lack chlorophyll, they depend upon their surrounding medium for their nutrients. The vegetative portion of the fungus accumulates a reserve of food from the immediate surroundings in order to develop fruiting bodies[2-3].

Fungi are categorized as follows: kingdom, phylum, class, order, family, genus, and species. Mushrooms containing psychotropic drugs are classified in the kingdom Mycota, the phylum Basidiomycota, the class Hymenomycetes, and the order Agaricales. There are four families of mushrooms, Strophariaceae, Bolbitiaceae, Coprinaceae, and Cortinariaceae, that contain psilocybin, psilocyn, or related alkaloids with an indolic nucleus. The genus and species of Psilocybe mushrooms that were grown were identified as Psilocybe cyanescens. The pleurocystidia sizes noted in the keys describing the Psilocybe cyanescens mushroom varied slightly from the mushrooms grown. This may indicate a variant of this species (communication with Dr. David McLaughlin, Plant Biology Department, University of Minnesota)[2,4,5-8].

The four stages making up the life cycle of a mushroom are the spores, the mycelium, the primordia, and the mature fruit. The spores are the reproductive cells or "seeds" of the fungi (Fig. 1 - photo of spores under

magnification).

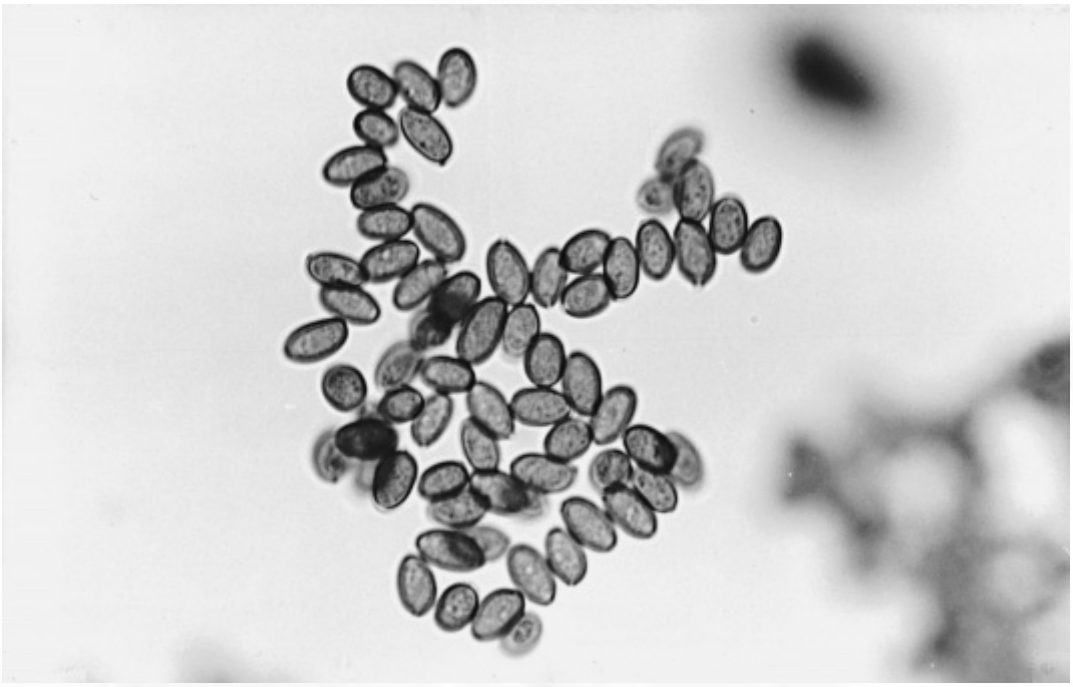

FIG. 1 - The aqueous spore solution viewed using a 1250x magnification microscope. The spores are the first stage of the mushroom's life cycle. One milliliter of spore solution was used to inoculate each 1/2 pint jar.

Germination of the spores takes place when a suitable substrate and correct environmental conditions are present. These spores grow outward seeking nutrients and branch out forming a complex "cob-like" system. This "cob-like" system is the vegetative portion of the fungus which is called the mycelium (Fig. 2 - photo of mycelium spreading in PF jar).

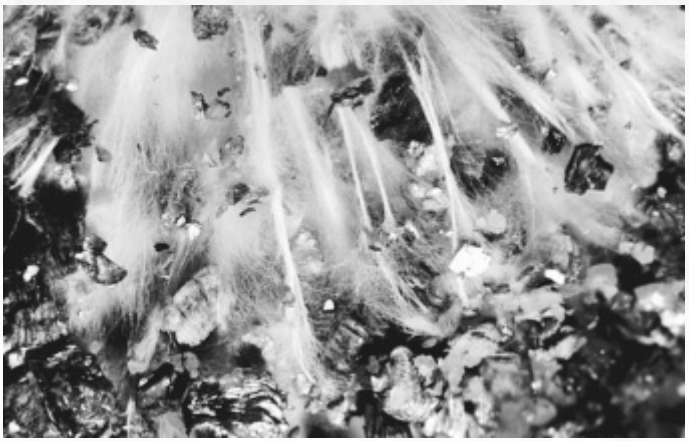

FIG. 2 - The vegetative portion of the fungus is called the mycelium. This is the second stage of the mushroom's life cycle. The first sign of mycelium growth appears 4 to 6 days after inoculation.

The mycelium absorbs water and nutrients from the substrate which is used in the production of the fruiting bodies. The ability of a fungus to begin fruiting is affected by genetic competence and various environmental factors including moisture, temperature, light, and aeration. The formation and growth of the fruiting bodies is known as primordia and has been referred to as "mycelium knots" and "pinheads." The "mycelium knot" is referring to the initial fruiting body that is formed when the mycelium clumps together and seems to form a "knot" (Fig. 3 - photo of birthed PF cake and pins).

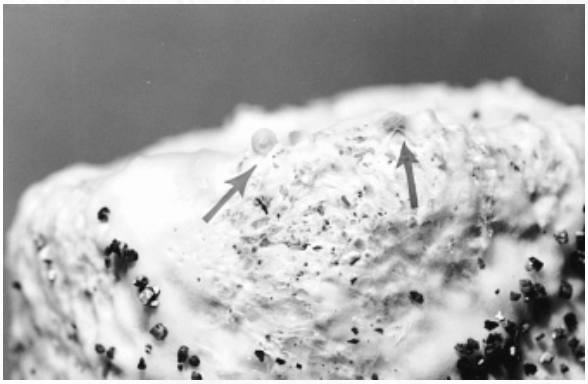

FIG. 3 - The third stage of the mushroom's life cycle is the primordia, and has been referred to as "mycelium knots" and "pinheads". The mycelium knots are the initial fruiting body that is formed when the mycelium clumps together and seems to form a "knot".

This knot eventually grows into the 'pinhead,' a plump growth, yellow in color and with a brown tip (Fig. 4 - photo of invitro primordia in PF jar).

FIG. 4 - The third stage of the mushroom's life cycle is the primordia, and has been referred to as "mycelium knots" and "pinheads". The pinheads are plump growths, yellow in color with a brown tip.

The fruit is considered mature when it is able to disperse spores and begin this life cycle over again (Figs. 5-6 - photos of mature PF race shrooms on cakes)[2,9].

FIG. 5 - The fourth stage of the mushroom's life cycle is the mature fruit. Mushrooms are considered mature once they are able to disperse spores and begin the life cycle over again. Mature Psilocybe cyanescens Wakefield mushrooms.

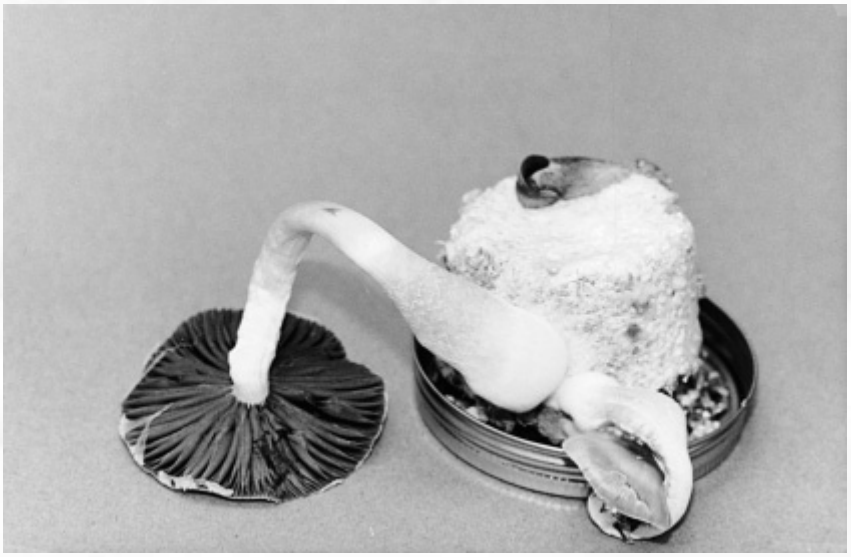

FIG. 6 - The fourth stage of the mushroom's life cycle is the mature fruit. Mushrooms are considered mature once they are able to disperse spores and begin the life cycle over again. Mature Psilocybe cyanescens Wakefield mushrooms.

Methods

The spores used in this experiment were obtained legally through an advertisement in High Times Magazine from Psylocybe Fanaticus (PFTek Seattle, WA). The spores were received in 10 mL syringes in an aqueous solution. The spore solutions were each viewed using a 1250X-magnification microscope.

Directions for preparing the growing media were received with the spores. Supplies used for the growing media were half-pint wide-mouth jars (KerrGroup, Inc. Jackson, TN), horticultural vermiculite (Schultz, St. Louis MO), brown rice powder and distilled water. The canning lids were prepared before the mixture was added to the jars. The rubber sealing edge of the canning lids were turned upwards and four holes were punched symmetrically around the outer edge. A mixture of one fourth cup brown rice powder, one half cup vermiculite and one fourth cup distilled water was prepared for each half pint jar. This mixture was placed into the jars and covered with dry vermiculite. The lids were screwed on tightly and aluminum foil was used to cover the lid to prevent additional water from entering the jars during sterilization.

Since growing media is susceptible to contamination, the top layer of dry vermiculite was used to keep airborne contaminants from the wet substrate and absorb and regulate moisture transpiration and condensation[10]. The jars with the growing media mixture were sterilized at 120°C for 20 minutes. The jars were cooled before inoculation. Contamination was detectable through various colors from pastels to black. The growing media that became contaminated was observed but was not analyzed.

Eight jars per week were inoculated with 10 mL of spore solution. This was done for 9 weeks for a total of 72 inoculations. In addition to the eight jars inoculated per week, one jar per week was not inoculated and was used as a control blank. During the first four weeks, all samples were allowed to grow under indirect light. The last five weeks, half of the samples were allowed to grow under indirect light while the other half were kept in the dark. The jars kept in the dark were exposed to light only when samples were taken. Each jar was covered with parafilm after inoculation to keep airborne contaminates from the substrate.

The samples were transferred to terrariums after the pinheads became too large for the jars they were growing in. Two different terrariums were used for this experiment. The first one consisted of a styrofoam cooler with a piece of plexiglas inside of it. The second terrarium consisted of a 2-liter pop bottle with the middle portion cut out. To maintain a high level of humidity, both terrariums were sprayed with distilled water two to four times a day. Fanning the chamber with the lids two to four times a day also kept the terrariums well ventilated.

The growth and colonization was monitored for the samples grown under indirect light. The mycelium was sampled 13 days after inoculation. Samples were also taken from each jar at various stages of growth of the mycelium, primordia and the mature fruit. The growth of the mycelium, primordia and the mature fruit was monitored and compared for the samples grown under indirect light and in the dark simultaneously.

Sample Preparation

Samples were allowed to soak in methanol overnight. The methanol was decanted into a shell vial which was then condensed to near dryness (<1/2 mL) using a stream of air. An aliquot was removed for thin-layer chromatography (TLC). The mycelium knot samples were analyzed by TLC and by gas chromatography with a mass spectrometer (GC/ MS) in this methanolic extract state without any clean-up.

The extracts were cleaned up with an acid solution for GC/MS analysis. A 0.2 N solution of sulfuric acid was used to resuspend and acidify the extract. This solution was washed twice with chloroform to remove the neutral organic compounds. The samples were made basic with sodium bicarbonate and the psychoactive drugs were extracted twice with chloroform. The chloroform was evaporated and the sample was reconstituted with methanol for GC/MS analysis.

Thin-layer Chromatography

TLC was carried out on 5 X 10 cm silica gel plates (Analtech Newar, DE). Psilocyn (Alltech State College, PA) and psilocybin (Alltech State College, PA) standards were spotted on each plate along with the sample extracts. The plates were developed to 6 cm at room temperature in a covered development tank with a 9:1 chloroform/methanol solution. A beaker containing 3 mL of ammonium hydroxide was placed in the tank to assist in development. The plate was dried with low heat and visualized with a para-dimethylaminobenzaldehyde (p-DMAB) spray reagent. (The p-DMAB reagent consisted of 2g of p-DMAB in 50 mL of ethanol and 50 mL of hydrochloric acid.) The relative R_f value of psilocybin is 0.00 and the relative R_f value of psilocyn is 0.85.

The lower limit of detection was determined by serial dilutions of the psilocyn standard and spotting/developing it until the spot associated with the standard was not seen. The lower limit of detection for the TLC method was determined to be approximately 0.03 mg/mL.

Gas Chromatograph/Mass Spectrometer

The Hewlett Packard gas chromatograph 5890 Series II interfaced with the Hewlett Packard 5970 series mass selective detector (MSD) and the Hewlett Packard G1800A gas chromatograph detector system (GCD) were used for the detection of the analytes. These two instruments are equivalent and samples were run on specific instruments depending upon their availability. An HP-1 12 m column (film thickness 0.33 µm, column id 0.2 mm) was used for the gas chromatography (GC). The parameters for the GCD were as follows: injection port 250°C and detector temperature 280°C. Method SCAN70-Low mass 35, high mass 425, initial temperature 70°C, ramp rate 25°C/min and final temperature 300°C hold for 3.0 minutes. The parameters for the MSD were as follows: injection port 265°C and detector temperature 280°C. Method SCN90-Low mass 35, high mass 400, initial temperature 90°C, ramp rate 25°C/min, and final temperature 300°C hold for 4.0 minutes. Sample volume was approximately 3 µL with the split ratio of 30:1.

Lower Limit of Detection

The lower limit of detection for both instruments was determined by serial dilutions of the psilocyn standard and analyzing it until a peak at the correct retention time containing the prominent ions 44, 58, 77, 159, and 204 was not detected. The lower limit of detection was determined to be approximately 0.1 mg/mL for both instruments.

Results and Discussion

Identifcation of the mushrooms grown in this project was made by examination of the spores, fruiting bodies and the mature mushroom. Spores were examined for their color, shape, and size. The spores were purple to brown in color and elliptical to oblong elliptical in shape. They ranged in size from 6.7-8.2 µm by 12.6-15.0 µm. The fruiting bodies were examined mainly for color. The mature mushroom was examined for shape, size, color, texture, gill characteristics, and general appearance.

The original spore solutions were analyzed by TLC and by GC/MS. No psilocyn or psilocybin were detected in any of the spore solutions.

Mycelium growth was observed from 4 to 6 days. Fruiting bodies were observed from 24 to 48 days. The average amount of time for the primordia to appear was 32 days. Samples of mycelium were taken after 13 days of growth, 20 days of growth, and at various other days of growth. A total of 29 samples of the white mycelium growth were analyzed. No psilocyn or psilocybin was detected in any of these 29 samples. Nine of the 29 samples were confirmed by GC/MS, and again no psilocyn was detected.

Samples were analyzed after the first sign of growth of mycelium knots. A total of 22 mycelium knot samples were analyzed by TLC. Samples were considered to be consistent with a standard if their relative R_f value and their color matched the standard also spotted on the plate. Samples were considered to indicate a standard if their relative R_f value matched the standard but the color was not as dark as the standard spotted. Of the 22 mycelium knot samples, 17 were consistent with psilocyn. Of these 17 samples, 8 were also consistent with psilocybin and 1 indicated there was psilocybin in the sample. Four samples were consistent with the psilocybin standard spotted on the TLC plate, and one of these samples also indicated there was psilocyn in the sample. There was no psychoactive drugs detected in one of the samples.

Samples were analyzed after the first pinheads of the fruiting bodies were observed. A total of 25 samples of the pinheads were analyzed by TLC. All 25 samples were with the psilocyn standard spotted on the TLC plate. Of these 25 samples, 3 were also consistent with the psilocybin standard spotted and 3 indicated there was psilocybin in the sample (Table 1).

The 22 mycelium knot samples were also analyzed by GC/MS. In the inlet system of the gas chromatograph, thermal dephosphorylation of psilocybin occurs. As a result of this degredation of psilocybin to psilocyn, one is unable to differentiate the two by GC/MS. With this inability to differentiate psilocyn and psilocybin, it is unknown if the starting material contains psilocyn, psilocybin, or a mixture of both drugs. For this project, only

a psilocyn standard was analyzed by GC/MS (Figs. 7-9 see source). Samples were considered to be consistent with psilocyn if their retention time and mass spectral fragmentation pattern matched that of the psilocyn standard. Samples were considered to indicate psilocyn if their retention time was consistent with the psilocyn standard and contained the prominent ions, but were lacking ions in the total fragmentation pattern. Of these 22 mycelium knot samples, 12 were consistent with the psilocyn standard. Seven samples were found to indicate psilocyn, and there were three samples where psilocyn was not detected.

TABLE 1 - Results of thin layer chromatography (TLC).*

Sample Types	Total of Samples Analyzed	c/w Psilocyn and c/w Psilocybin	c/w Psilocyn and Indicates Psilocybin	c/w Psilocyn Only	c/w Psilocybin Only	c/w Psilocybin and Indicates Psilocyn	Not Detected
Spores	4						4
Mycelium	29						29
Mycelium knots	22	8	8	1	3	1	1
Pinheads	25	19	3	3			
Mushrooms	11	9	2				

* Results of thin layer chromatography (TLC) on the various stages of development of the *Psilocybe cyanescens* mushroom. TLC was carried out on 5 x 10 cm silica gel plates and developed with a 9:1 chloroform/methanol solution. Plates were visualized with p-DMAB spray reagent. Samples were considered to be consistent with (c/w) a standard if their relative R_f value and their color matched the standard also spotted on the plate. Samples were considered to indicate a standard if their R_f value matched the standard but the color was not as dark as the standard spotted.

The 25 "pinhead" samples were also analyzed by GC/MS. Of these 25 samples, 19 were consistent with the retention time and mass spectral fragmentation pattern as psilocyn. Three samples were found to indicate psilocyn and psilocyn was not detected in 3 samples (Table 2).

TABLE 2 - Results of gas chromatograph/mass spectrometer (GC/MS).*

Samples Types	Total # of Samples Analyzed	c/w Psilocyn	Indicates Psilocybin	Not Detected
Spores	4			4
Mycelium	9			9
Mycelium knots	22	12	7	3
Pinheads	25	19	3	3
Mushrooms	11	11		

* Results of gas chromatography/mass spectrometer (GC/MS) on the various stages of development of the *Psilocybe cyanescens* mushrooms. Samples were analyzed on Hewlett Packard gas chromatograph 5890 Series II interfaced with Hewlett Packard 5970 series mass selective detector (MSD) and the Hewlett Packard G1800A gas chromatograph detector system (GCD). Samples were considered to be consistent with (c/w) psilocyn if their retention time and mass spectral fragmentation pattern matched that of the psilocyn standard. Samples were considered to indicate psilocyn if their retention time was consistent with the psilocyn standard and contained the prominent ions, but were lacking ions in the total fragmentation pattern.

Samples of the mature mushroom were also analyzed. Eleven samples were analyzed by TLC and by GC/MS. All eleven samples were consistent with the psilocyn standard spotted on the TLC plate. Of these 11 samples, 2 also indicated psilocybin in the sample. All 11 samples analyzed on the GC/MS were consistent with the psilocyn standard (Figs. 10-12 see source).

There were some noticeable differences in the samples grown under indirect light versus the samples grown in the dark. All samples started to show mycelium growth at 4 days. The first signs of fruiting bodies were observed to be from 19 to 25 days in the samples that were grown under indirect light with the average being 21 days. The first signs of fruiting bodies were observed from 23 to 45 days for the samples that were grown in the dark, with the average being 26 days. The samples that were grown under indirect light had primordia which grew faster and larger. They were plump, yellow in color with brown tips. The samples that were grown in the dark had small white primordia that were skinny and long. The coloring was off-white with only a few

having dark brown tips. The mushrooms that were grown under indirect light had thick stipes with yellowish to chestnut colored caps. The mushrooms that were grown in the dark had lighter stipes that were much skinnier than the mushrooms grown in the light. The caps of the mushrooms grown in the dark were also lighter in color than the mushrooms grown under indirect light. Psilocyn and/or psilocybin was detected in the mycelium knots, the pinheads and the mature mushrooms of all samples grown either in the dark or the light.

Conclusion

The psychoactive drugs psilocyn and psilocybin were not detected in the mycelium, the earliest stage of development of the mushroom. These drugs were identified in the mycelium knots, the earliest stages of the fruiting body of the mushroom.

Light affects the growth of the Psilocybe cyanescens mushroom. This affect is apparent in the time of development and the appearance of the mushroom. Light affected the color and size of both the fruiting bodies and the mature mushroom. Light did not affect the presence of psilocyn or psilocybin in the early stages of the primordia or the mature mushrooms, nor did it affect the ability to detect these psychotropic drugs. It appears that the Psilocybe cyanescens mushrooms are not photosynthetic, but are photosensitive.

Acknowledgments

The author wishes to acknowledge Dr. David McLaughlin, Plant Biology Department, University of Minnesota for his time and assistance in identifying the mushroom, and his explanations about the classifications of fungi and the development of the mushroom. This project was supported by the Federal Bureau of Investigation, Minneapolis Office which generously provided the supplies.

References

1. Minnesota Statues Chapter 152.02. Schedules of conlrolled substances; Subdivision 2, Schedule I. The following items are listed in Schedule 1:(3) Any material, compound, mixture or preparation which contains any quantity of the following hallucinogenic substances, their salts, isomers and salts of isomers, unless specifically excepted, whenever the existence of such salts, isomers, and salts of isomers is possible within the specific chemical designation: 3,4-methylenedioxyamphetamine; 4-bromo-2,5-dimethoxyamphetamine; 2.5-dimethoxyamphetamine; 4-methoxyamphetamine; 5-methoxy-3,4-methylenedioxyamphetamine; Bufotenine; Diethyltryptamine; Dimethyltryptamine; 3,4,5-trimethoxyamphetamine; 4-methyl-2.5-dimethoxyamphetamine; Ibogaine; Lysergic acid diethylamide; Marijuana; Mescaline; N-ethyl-3-piperidyl benzilate; N-methyl-3-piperidyl benzilate; Psilocybin; Psilocyn; Tetrahydrocannabinols; 1-(1-(2-thienyl) cyclyohexyl) piperidine; N-ethyl-1-phenyl-cyclohexylamine; 1-(1-phenylcyclohexyl) pyrrolidine.
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Photo and Chart Descriptions (figures and table-charts)

There are 6 black and white photos and 8 table charts in the published article. They are not included in this file. [In this *QAL in one* version BW pictures and tables are included, except charts (to see it, follow second original backup link given at the beggining of this section).]
FIG. 1 - microscope photo of spores
FIG. 2 - mycelium invitro
FIG. 3 - birthed PF cake with fungal pins
FIG. 4 - PF jar with invitro primordia
FIG. 5 - PF race shrooms on cake
FIG. 6 - PF shrooms on cake
FIG. 7 - 12 - GC/MS readout charts
Table 1 - TLC chart
Table 2 - GC/MS chart

PF comments

There are several interesting points in the first article, "Detecting Psychoactive Drugs in the Developmental Stages of Mushrooms".

1. The article was the result of a full FBI investigation of PF in 1998. What saved PF was this; "The original spore solutions were analyzed by TLC and by GC/MS. No psilocyn or psilocybin were detected in any of the spore solutions". If these drugs would have been detected, PF would certainly be history and the new spore syringe phenom would be over.
2. The article gave PF credit for the source of the spores, "The spores used in this experiment were obtained legally through an advertisement in High Times Magazine from Psylocybe Fanaticus (PFTek Seattle, WA)". This is quite amazing because the FBI did not have to give any credit for this research, but they did. Most likely, it was because a lot of money was invested for the research and they achieved valid results. They even spelled Psylocybe Fanaticus correctly incorrect with a Y, and not an I. Also, the FBI performed the PF TEK exactly as written (credit given in the references section and footnotes) and because they followed the PF TEK, even they were able to get a first time success, making their research project and money spent, successful.
3. The paper identified the shroom grown (PF race) as a Psilocybe Cyanescens. Everyone knows that the PF race is Psilocybe Cubensis and not Psilocybe Cyanescens. Why then identify it as a wrong specie? The clue is here, "The genus and species of Psilocybe mushrooms that were grown were identified as Psilocybe cyanescens. The pleurocystidia sizes noted in the keys describing the Psilocybe cyanescens mushroom varied slightly from the mushrooms grown. This may indicate a variant of this species (communication with Dr. David McLaughlin, Plant Biology Department, University of Minnesota) (2,4,5-8)". For the last few years, PF has taught the concept of "spore race". What the scientists did was to ignore what PF said about the identity of the shroom and went to the books and keys to do an objective ID, and what they obviously saw was that the PF race shroom looks more like a Psilocybe Cyanescens than a Psilocybe Cubensis. They refer to it as a "variant of the species". This is more vindication of PF's new concept of spore race as opposed to the common designation - "strain", which falls short of describing these various races that do not mate, but stay unique and separate.
4. They found no drugs in the young mycelium. This is very surpising, because after ingestion of "tea" made from boiling down mycelium engulfed grain, a slight "psilocybian buzz" can be felt for a brief time. The answer is that the lab equipment could not detect an amount of psilocybin that the human psyche can!

Chapter two

Potency comparisons of 4 species of "Dutch over the counter" Magic Mushrooms excerpt from The Forensic Science International journal. 113 (2000) 389-395

HALLUCINOGENIC MUSHROOMS ON THE GERMAN MARKET - SIMPLE INSTRUCTIONS FOR EXAMINATION AND IDENTIFICATION

"The cultivation or possession of whole Psilocybe mushrooms and its spores are restricted by German law since 1998"

Psilocybin and psilocin measurements (%) for 18 specimens of Psilocybe Cubensis, 9 specimens of Ps. Semilanceata, 6 specimens of Paneaolous cyanescens and 4 specimens of Ps.Tampanensis.

Psilocybe Cubensis		Psilocybe Semilanceata		Panaeolous Cyanescens		Psilocybe Tampanensis	
psilocybin	psilocyn	psilocybin	psilocyn	psilocybin	psilocyn	psilocybin	psilocyn
none	0.14	0.01	0.48	0.02	0.56	none	0.02
none	0.05	0.16	0.13	0.44	0.14	0.01	0.03
none	0.10	0.25	0.08	0.47	0.22	0.03	0.03
none	0.10	0.27	0.24	0.51	0.64	0.19	0.01
none	0.11	0.30	0.03	0.54	0.09		
0.01	0.05	0.42	0.04	1.15	0.90		
0.02	0.09	0.51	0.12				
0.17	0.09	0.72	0.01				
0.31	0.23	0.91	0.90				
0.50	0.12						
0.87	0.04						
0.98	0.03						
1.07	0.01						

PF comments chapter two

Extreme variations in potency of a given collection of magic shrooms has been reported ever since reports have been done about these shrooms. And similarly, this report also shows the extreme variability of psilocybin content amongst the dried samples. So if one wants potent and satisfying Cubensis magic shrooms, they should be grown for potency. And that is done by harvesting them in their young stage, before sporulation begins. When that is done, even the most different appearing spore races look about the same. When the caps aren't fully expanded, all of the races look similar. The visual differences emerge when the shrooms mature, but then when they mature, they are only good for spore printing. These are weak in potency and unsatisfying for tripping. So the word of wisdom is, grow them PF style, harvest them when they are young and cool dry them with desiccant. When this is done, they are an entheogen of the highest nature.

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PSYLOCYBE FANATICUS MUSHROOM MUSEUM

original source: http://www.fanaticus.com/museum2.htm

All of these shrooms in the PF Shroom museum were grown identically - PF style in the "Richmans terrarium" - basically the PF neglect tek. No humidifiers or perlite layers were used to increase humidity. Only a couple of airings and mistings were done per day and sometimes less (neglect tek). Some have vermiculite casings on the tops and some are without. All have a "bottom" casing of wet perlite covered with vermiculite (in a jar cap) which keeps the cakes hydrated and adds to the humidity of the terrarium.

PSYLOCYBE FANATICUS
November 2000

CHAPTER 21 - PSYLOCYBE FANATICUS RACE PHOTOS AND DESCRIPTIONS

Psilocybe cubensis - Matias Romero

This is the PF spore race. It is also called "Matias Romero" at other spore sellers sites or Amazonian. It lately has picked up the name "PF CLASSIC". This photo is of a second flush. The first flush was done and the cake was cleaned with a very sharp hunting knife (like peeling an apple - only with a very sharp large blade). The cleaned cake was placed on a jar cap of soaked and drained fresh perlite and vermiculite. Then a fresh dry vermiculite layer was applied to the top and soaked by dripping water on it from an eye dropper.

DESCRIPTION:

1. CAP (size - shape stages - colors)
   The primordia start dark reddish. The cap is a fairly dark reddish (deep colors) and thick. It starts dome like and goes to plane at maturity and continues to grow until it is upturned and convoluted, with the gills a very deep brown, with streaks of purple (spore deposits) across and around the cap.

2. STEM (length - girth - flesh - colors)
   It can be short and fat or long and hefty. It depends on the air and humidity. The PF race responds to this seriously. With lots of air and humidity, the PF stem is long, slender, thick fleshed and white. The flesh of the PF race is unique amongst all the races. It is very much like soft moist BREAD. But sometimes there can be a bit of fibrousness here and there.

3. VEIL (deliquescent - partly deliquescent - persistant anulus)
   The PF race has a definitely deliquescent veil. When the veil breaks during growth of the shroom, it usually breaks off from the stem and breaks up around the gills, leaving veil remnants all over the gills and mainly on the edges. But, sometimes there is a veil that becomes like an anulus (around the stem) but at close inspection, the veil will not be attached securely and usually might just hang in part. Also, there is serious differences amongst the races at how the gills attach to the stem under the cap. The PF gills attach closely. Whereas the Malaysian gills have a rather large gap where the gills attach to the underside of the cap. Gill stem and cap attachment is a definite trait of races, but unfortuneatly, further observations and notes are required for any in depth descriptions. But note that all these races have distinct gill attachment traits that adds to the differences!

4. SPORULATION (at what developement stage does it begin?)
   The PF race is a slow maturing shroom. It can grow large and the cap expand, but the gills will still be biege or light colored. Then, after about a day or two, the purple deposits of the spores will appear on the stem, and the gills will be darker brown. But sometimes, sterile specimens will appear. These are shrooms that don't develope spores and the gills remain distinctly light colored (biege - tan - yellowish). They have no spores. I once knew someone who cloned this type of sterile strain and claimed it to be the best in potency, overall. This fits with the observation that potency diminishes as sporulation developes. So without sporulation ever starting, the potency doesn't diminish in relation.

5. TENACIOUSNES (Strength of attachment of the stem base to the cake)
   The PF is the champ at this. Usually the PF shroom has a large base (big foot). In fact, "BIG FOOT" should be the sur name of the PF race. This makes the PF race the most tenacious to the substrate of them all. When harvested, it is common to pull off large chunks of cake in the process.

6. SHAPE SHIFTING (shapes and changes of flush to flush - strain to strain)
   The PF race is the champ in this also. It goes from ugly little abhorts and convoluted dwarfs, to tall robust white thick stemed specimens with large deep reddish colored caps that go to plane and then wildly upturn at full maturity.

7. SIZE TENDANCIES (overall size of the mushroom at maturity)
   Small to about as big as they get.

8. GESTATION PERIOD (generalized time of primordia appearance after inoculation)
   The PF might be the champ here also. It is the first of any of these shrooms observed to form primordia invitro. The others can, but the PF is a speed demon in comparison. And the PF invitro primordiation is far more numerous if allowed to develope and not birth so quick. But also, many if not most of the primordia will abort. The PF shroom is the champ at aborting shrooms also. That is why it has such a love hate relationship with the hobbiests.

9. POTENCY (This simply comes down to how fast the shroom loses its latent potency - relating to the advent of sporulation)
   The PF potency gets a big thumbs up from everywhere. Its advantage is that is a slow maturer, so it

gives a wider envelope for the shroom to be harvested in its peak potency. A lot of hobbiests rate the PF race number one in potency. But that is not written in stone.

10. FLUSHING (Ability to repeat flush)
    The PF race usually flushes rather poorly on the first flush, giving mostly abhorts. And it can flush nicely the first time. But with a recasing treament. The second flush will be totally different and be excellent. The third flush is always decent and one can squeeze the lemon for nice looking healthy third flush stragglers. But all in all, it is good for three interesting flushes, PF style.

It appears that the PF spore race garners a love hate affair. People either hate it or love it. Even after enduring a severe flogging from the 1999 spore wars (PF copy cats and spore sellers claimed that it was actually a poisonous mushroom - which was believed by the unitiated for a short while). Now, it has regained its favored position amongst a host of mycophiles as either their favorite or at least near the top of the list. Interestingly, there are many who claim that the PF race is the most potent. But then there are many who don't. But whatever the judgement call would be, it is not a bad cubie, so that makes it as good as any, and in my opinion, DAMN good.

Psilocybe cubensis - Hawaiian

This is a photo of a first flush PF style. The cake was birthed without invitro primordiation, given the PF double ended cake casing treatment, and delivered to the basic PF neglect Tek. This spore race actually should be called the "classic". From what PF knows, it was the number one Cubensis cultivar in Holland for many years. There was a fiasco in Holland having to do with a grower (Tim Cyanse - psuedonym) who was supplying shrooms to Dutch head cafes but he went to far. He made cakes and candies with shroom powder (left over from harvesting and drying). This didn't go over to well with the Dutch authorities and a big bust and scandel erupted, even involving the famous German mycologist, Dr. Jochen Gartz.

DESCRIPTION:

1. CAP (size - shape stages - colors)
   Dome shaped to plane. This one doesn't upturn much in extreme maturity. The colors are the usuall flesh (caucasion) color, deep.

2. STEM (length - girth - flesh - colors)
   Slender to thick - whitish when young and mature. It is fibrous and sturdy with a medium length.

3. VEIL (deliquescent - partly deliquescent - persistant anulus)
   The veil is persistant leaving a well defined Stropharia type of anulus. It breaks clean off of the gills and forms a "turtle neck sweater" type of anulus.

4. SPORULATION (at what developement stage does it begin?)
   Sporulation is rampant and begins soon after the veil breaks. And it might even begin as the veil breaks leaving a decidedly purple colored anulus. This shroom is a fast maturer.

5. TENACIOUSNES (Strength of attachment of the stem base to the cake)
   Good tenaciousness, stable during growth and easily picked clean of substrate hanging on.

6. SHAPE SHIFTING (shapes and changes of flush to flush - strain to strain)
   The Hawaiian is a serious shape shifter. From large thick stemed specimens to small petite delicate stemed shrooms.

7. SIZE TENDANCIES (overall size of the mushroom at maturity)
   Small to almost as big as they get.

8. GESTATION PERIOD (generalized time of primordia appearance after inoculation)
   Slower than the PF race. Invitro primordiation is usually unsatisfactory, and birthing and casing are required about after a month.

9. POTENCY (This simply comes down to how fast the shroom loses its latent potency - relating to the advent of sporulation)
   As long as this shroom is picked before any purple is observed, it is a good shroom.

10. FLUSHING (Ability to repeat flush)
    The Hawaiian might be the champ at this. First second and third flushes are easy and always look great. They change radically from strain manisfestaion to strain manisfestation, flush to flush. Very few aborts develope with the Hawaiian.

PF got it from a hobby mycologist in Holland (PFE) who was supplying it as a spore sample to Amazing Nature and Smart Botanics (Dutch Weed folks and items for sale). PFE named it "Golden Teacher". He did this because sometimes right before the veils break when the primordia are at their largest size before becoming mature, the entire shroom can have a golden yellowish color which vanishes when maturity starts to set in.

Strangely, the "Golden Teacher" being sold by other spore sellers is being claimed to be different from PF's "Golden Teacher". PFE claims that the Dutch growers got it from Pacific Exotic Spora in Hawaiia. It really doesn't matter where it came from. The reallity of it is that it is a superb Cubensis cultivar, one of the best ever found. It does look like the Cubensis used in the old OSS and OERIC (Mckenna brothers) shroom growing book.

So given the confusion about PES and the so called PES Amazon, PES Hybrid, or PES Hawaiian (all supposedly different), PF is dropping the "PES" from the title and just leaving it, "HAWAIIAN". Actually, Cubensis does not appear in Hawaiia (according to certain "experts"), so then it makes sense for PF just to call it the "Hawaiian", because after all, it is the only shroom spores marketed under a title having anything to do with HAWAIIA. So "Hawaiian" it will be.

This is a second flush of the Hawaiian. Notice the smaller and thinner stems on this flush as compared to the large white stems on the flush pictured at the front. This could be a cause of the silly confusion about what the "PES Hawaiian" or the "PES GOLDEN TEACHER" or the "PES HYBRID" really is. Methinks they are the same. The Hawaiian is a mighty shape shifter. All in all, PF considers this Hawaiian to be the best cultivar of all (no darts please).

Psilocybe cubensis - JLF Amazon

This spore race was sent to PF on a trade and the sender said it was JLF's "AMAZON". It looks and acts just like the HAWAIIAN of PF. It probably is. This is an example of how these excellent spore races wind up everywhere with different names. But it keys out to the Hawaiian by all of its distinctions. It has the distinct persistant anulus and it is attached "turtle neck sweater" like. It has a white fibrous stem, and the cap and gills look identical.

Psilocybe cubensis - Equador

This is one of the best cultivars. It has appeared for many years. Its first appearance is a cover photo. Paul Stamets first book, "Psilocybe mushrooms and their allies" has the Equador on the cover. This is a very nice second flush and this shroom is a fav of many because of its incredible stature and growing ability.

DESCRIPTION:

1. CAP (size - shape stages - colors)
   dome shaped - doesn't go to plane at maturity but becomes convex. It never upturns. The primordia caps are sometimes a deep purple reddish with white spots.

2. STEM (length - girth - flesh - colors)
   Fibrous, sturdy, thick and whitish.

3. VEIL (deliquescent - partly deliquescent - persistant anulus)
   The veil is persistant, leaving a skirt like anulus attached to the stem.

4. SPORULATION (at what developement stage does it begin?)
   It begins quickly, maturing fast after veil break.

5. TENACIOUSNES (Strength of attachment of the stem base to the cake)
   Moderately attached and easy to pick cleanly.

6. SHAPE SHIFTING (shapes and changes of flush to flush - strain to strain)
   Very little shape shifting - a very stable appearing shroom from strain to strain.

7. SIZE TENDANCIES (overall size of the mushroom at maturity)

From small to about as big as they get.

8. GESTATION PERIOD (generalized time of primordia appearance after inoculation)
   Like the Hawaiian, longer than the PF, and not a very good invitro primordiator. It can primordiate and give some perfect specimens, but it does better to birth after about a month and give it the PF double ended cake casing treatment.

9. POTENCY (This simply comes down to how fast the shroom loses its latent potency - relating to the advent of sporulation)
   This is a fast maturer, so the specimens must be picked in advanced primordia stage right before veil breakage for good potency.

10. FLUSHING (Ability to repeat flush)
    It is a great flusher, giving three really good PF style flushes and more if the lemon is to be squeezed.

And, like the Hawaiian (Golden Teacher from PFE), it glows a yellowish hue from top to bottom right before the veil breaks. Then it quickly loses the gold color.

False Mexicana

This mushroom started a real fury in the beggining of 1999. On the alt.drugs.mushrooms newsgroup, a spore seller appeared called FOGGY MOUNTAIN FARMS. They advertised a PSILOCYBE MEXICANA spore syringe and prints. Along with PANEOLOUS TROPICALIS and others, they offered the absurd "Azurescens Cubensis B+ hybrid". PF posted that it was a rip, and then the beginning of the 1999 spore wars took off. It turns out to have been a cubensis (as PF insisted). Then it was named MEXI-CUB.
This is an interesting little cubensis. That is exactly what it is, a small cubie. That is what they call it in Europe. The PF style flushes are small, but they are numerous over time. It likes to flush several times and each flush is incredibly different then the last. This is a surprising little shroom. Sometimes, it looks just like a pan cyan with no anulus, smooth slender white stem and dome like cap. But then, it can be medium sized with a large cap that goes to plane at maturity. The larger appearing strains have a cap color that is light with an orangish center. With PF style growing, this shroom never seems to want to get very big.

This is the photo PF uses for the PF ad in High Times magazine. As can be seen, this flush is much different from the above flush. It's a shape shifter.

Psilocybe cubensis - B+

This cubie has been around the web for a few years. It is the favorite of certain spore peddlers. The original is called "Herbens B+ strain". From what I have seen, B means big and the + means very (very big).

Also, this shroom is the most hyped cubensis in history. There are many youthfull pop mycologists around the internet that are still debating about this shroom being some kind of Psilocybe Azurescens cubensis "HYBRID". And there have been various spore sellers that advertise it as that. But of course, it is just a cubensis. The shroom in the photo is growing on a 1/2 pint PF cake. The cultivation procedure was identical to the others. Temperature ranges are the same and it likes to be birthed and cased. Invitro primordiation seems fairly nil.

In comparing this one to the others, its size can be determined by using the cakes as a reference (all 1/2 pint size). Its veil becomes a persistant anulus, attached to the stem "turtle neck sweater" style. It has a fibrous slender long stem, and large cap that doesn't seem to go to full plane and never upturns. It seems to clearly to be the champ at long stems and specimen height. It is not tenasciously attached to the substrate, so it has a tendancy when grown PF style, to grow tall and fall over (tip the cake or just break off from the substrate when in the wrong position). It is the tallest growing cubensis around, and it has many fans. But just because it is the biggest, doesn't mean it is the best. It had a fierce reputation as being the most potent, but after time has passed and this shroom got around, it turns out to be no better than any other Cubensis in potency. And since this too is a fast maturing shroom, it must be picked presporulation for max potency. It should be picked in its advanced primordia stage, with the veil still unbroken.

Psilocybe cubensis - Treasure Coast

Psilocybe cubensis - Cambodian

This spore race was sent to PF on a trade and the sender said it was MYCO TECH (Seattle) Cambodian.

DESCRIPTION:

1. CAP (size - shape stages - colors)
   Becoming plane in age and not upturning. The cap seems to have dark colors in it as well as the usuall purplish streaks from wandering clouds of spores.

2. STEM (length - girth - flesh - colors)
   Whitish, fibrous and hefty slender with a medium length.

3. VEIL (deliquescent - partly deliquescent - persistant anulus)
   The veil is decidedly deliquescent.

4. SPORULATION (at what developement stage does it begin?)
   Not a real fast maturer, just a little slower than the EQ or HA.

5. TENACIOUSNES (Strength of attachment of the stem base to the cake)
   Well secured to the cake. It is not big enough to want to fall over.

6. SHAPE SHIFTING (shapes and changes of flush to flush - strain to strain)
   Stable.

7. SIZE TENDANCIES (overall size of the mushroom at maturity)
   From small to as big as they get.

8. GESTATION PERIOD (generalized time of primordia appearance after inoculation)
   Similar to the EQ or HA.

9. POTENCY (This simply comes down to how fast the shroom loses its latent potency - relating to the advent of sporulation)
   Probably as good as any. Just pick it presporulation.

10. FLUSHING (Ability to repeat flush)
    Unknown, but probably as good as any.

Psilocybe cubensis - Thailand

This spore race was sent to PF on a trade and the sender said it was MYCO TECH (Seattle) THAILAND.

DESCRIPTION:

1. CAP (size - shape stages - colors)
   It goes to plane on maturity and doesn't seem to want to upturn. It is lighter than a lot of cubies.

2. STEM (length - girth - flesh - colors)
   Slender white and fibrous. Medium length at most.

3. VEIL (deliquescent - partly deliquescent - persistant anulus)
   Veil is deliquescent.

4. SPORULATION (at what developement stage does it begin?)
   The Thai is kind of like the Treasure Coast. It is a slow maturer and a weak sporulator.

5. TENACIOUSNES (Strength of attachment of the stem base to the cake)
   Moderate with good stability PF style.

6. SHAPE SHIFTING (shapes and changes of flush to flush - strain to strain)
   Appears stable.

7. SIZE TENDANCIES (overall size of the mushroom at maturity)
   Tiny to moderate.

8. GESTATION PERIOD (generalized time of primordia appearance after inoculation)
   Average - like the HA.

9. POTENCY (This simply comes down to how fast the shroom loses its latent potency - relating to the advent of sporulation)
   Due to its late maturing, the envelope is wide to get quality potency before maturing.

10. FLUSHING (Ability to repeat flush)
    Unknown but probably as good as any.

Psilocybe cubensis - Malaysian

This spore race was sent to PF on a trade and the sender said it was MYCO TECH (Seattle) MALAYSIAN.

DESCRIPTION:

1. CAP (size - shape stages - colors)
   It doesn't upturn at full maturity, but goes to plane. The colors are the usuall.

2. STEM (length - girth - flesh - colors)
   Whitish, fibrous and hefty slender.

3. VEIL (deliquescent - partly deliquescent - persistant anulus)
   This one is a combo. It has a fully deliquescent veil and also can leave behind an EQ style "skirt" persistant anulus. Very mystifying.

4. SPORULATION (at what developement stage does it begin?)
   Not an early maturer.

5. TENACIOUSNES (Strength of attachment of the stem base to the cake)
   Moderate.

6. SHAPE SHIFTING (shapes and changes of flush to flush - strain to strain)
   Stable - few aborts.

7. SIZE TENDANCIES (overall size of the mushroom at maturity)
   Tiny to moderate.

8. GESTATION PERIOD (generalized time of primordia appearance after inoculation)
   Similar to the EQ or HA - moderate.

9. POTENCY (This simply comes down to how fast the shroom loses its latent potency - relating to the advent of sporulation)
   Pick presporulation.

10. FLUSHING (Ability to repeat flush)
    Looks good and probably will flush several times with proper care.

Psilocybe cubensis - Australian

Psilocybe cubensis - India

Psilocybe cubensis - Mazatec

This cubensis race looks like a cross between the Mexi-cub (false Mexicana) and the Equador. When the stem is cut, it seems to consistantly bruize deep azure. The Maz yields very well. This is one of the best PF has tested. The Mazatec is a small but refined cubie with whitish smooth stem flesh, apparantly more "dense" and less watery than the larger growing races (Equador, B+, Cambodian ect). A big thumbs up for the Maz!

Psilocybe cubensis - PF Stropharia

Yachaj describes the PF Stropharia

The PF Stropharia combines a great sporulation capacity with an easily printable cap (no slimey veil remnants hanging from it), an extremely agressive mycelium, strong blueing of the flesh, a solid stem and a top notch harvest on PF Substrate (usually in bouquets of smaller potent mushrooms instead of a few weak large ones). It is a winner on all qualities which are important for a cubie except for its pinning speed (PF Classic is faster).

Please help to preserve this unique Psilocybe cubensis race. Spread its spores as prolific as possible but - do not change the name PF Stropharia. This genotype was a present from me to PF. Everybody may distribute its spores, but the name stays. - do not change the substrate. This is a PF TEK / hippie tek only cubie!

The origin of the PF Stropharia

At this moment there are two versions of the story. According to my notes the PF Stropharia was born in January 1997. It came up in a jar of PF Substrate which was gamma ray sterilized instead of steam sterilized. The difference between cold and hot sterilization is that in cold sterilizations (with gamma flash) the substrate remains raw. The mycelia have a slight difficulty in colonizing it and pinning is delayed. This is not an advantage so I terminated the gamma flash experiments, but according to my notes the PF Stropharia came up from one of those jars - from PF Classic spores obtained from PF in 1995.

But as anyone can see, the PF Stropharia looks very different from the PF Classic. It has scales on the cap while the PF Classic is smooth. It has a ring around the stem, the mycelium is much denser. It doesn't look like a PF Classic offspring at all.

So PF's explanation of this that I made a mistake. That the PF Stropharia is a genotype I received from someone else and that I mislabeled the jars.

When I look at the mushroom I would say that PF is right. His explanation is the most simple one and in science the simplest explanations are usually right. The Stropharia is too different from the Classic to be offspring. But at the same time this explanation is difficult for me to accept because I didn't have so many different cubies back then. I had only 2 cubies which liked PF Substrate (the PF classic and the 'Amazonian' from the Hawaiian vendor Pacific Exotic Spora which PF now distributes under the name 'Hawaiian'). So if I mislableled the jar then still the origin of the PF Stropharia is a mystery.

The meaning of PF "Stropharia"

The name PF refers to Psylocybe Fanaticus, the inventor of the substrate which this cubensis race seems to like best. Stropharia refers to the appearance of it. The veil which protects the spores during the first stage of the mushroom growth sticks to the stem when the cap unfolds, leaving a ring. This looks like a belt. Stropharia means Swortbelt in Greek.

Yachaj (RENE of Perfect Fungi Europe - PFE)

PF Style Shitake

I lost my photos of shitake on BRF cakes (B is brown, R is rice, and F is flour) - aka PF TEK cakes. Here is a post and photo by a dude called Bluecat, someone who I have talked to on the Mycotopia web site. The photo follows the post. They are pretty ugly huh? That is the mycelium with the ugly discolorizations, but it isn't contaminated. That's the way the shitake mycelium acts. Bluecat uses half the amount of brown rice flour (1/8 cup) instead of the usual 1/4 cup. 1/8 cup of brown rice flour (BRF) works very well with the magic shrooms.

By bluecat (Bluecat) Member Username: Bluecat Post Number: 34 Registered: 05-2003 Posted on Tuesday, May 11, 2004 - 01:24 am:
I tried the same experiment hundreds of times.the regular pf half pints with no sawdust are always the best.both faster,and more productive.you really only need one plug per jar,right down the middle.i get the best results with just over 1/8 cup brf.if you use much more than that,they get sticky and grow slower.good luck,have fun.

This is the "gourmet" edible mushroom - SHITAKE (Lentinus Edodes). It was cultivated with the straight PF TEK. Instead of spores, SHITAKE spawn "plugs" were inserted into the jars substrait. After about 3 months,

the cake turned black and the mushrooms formed. The black looking cake is actually just the outer surface. This is where the mycelium dies back but under the black "skin", the cake was a normal whiteish colored mycelium.

Stropharia Melanosperma

This is a mushroom from ISRAEL. Spores of it were sent to me and I cultured it with an altered PF substrate formula. Instead of brown rice powder, I used wheat grain powder. All the ratios were the same as in the standard PF formula. It is not a magic shroom but it is considered to be an edible. I couldn't get any spores from this mushroom. It doesn't grow normally with this tek, but it sure looks strange.

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EXTERNAL UPDATES

PF-Tek for Simple Minds

original source: http://www.fungifun.org/English/Pftek

Introduction

The PF-Tek was developed and first made public in 1992 by www.fanaticus.com (mirror).
This tek made the cultivation of mushrooms at home feasible for complete beginners utilizing commonly available materials.
The growing method I describe here is based on the PF-tek but includes a few modifications that are time tested, and are in my opinion superior to the original PF-tek.
I **strongly** recommend you to read the original PF-Tek, if you haven't done so already, to see a different approach to some steps.
The PF-Tek for Simple Minds is as simple and as foolproof as it gets, but is not completely foolproof of course. Following it will give you good chances of succeeding and a good idea on the general process and time line and prepare you for higher yielding teks, like using whole grains and dung.

The PF-Tek for Simple Minds uses ½ pint (~240ml) canning jars or drinking glasses and a growing substrate made of vermiculite, brown rice flour and water. The substrate is mixed, filled in jars, sterilized and inoculated with mushroom spores. After the substrate is fully colonized the substrate cakes fruit in a humid container.

On the subject of cleanliness

By growing mushrooms indoors on a nutritious substrate you create conditions than not only favor the growth of the mushrooms, but also the growth of a large number of other organisms (molds, bacteria), many of them potentially hazardous to the health. To ensure that only the desired mushroom is grown, it is very important to assure cleanliness in all of the cultivation related procedures.

Before you work, wash your hands with (antibacterial) soap and warm water. Afterwards, wipe them dry and rub with Lysol or isopropyl alcohol (iso-propanol). Keep the place where you do the inoculation and fruiting dust free and clean and don't bring in dirty clothing or shoes. Personal hygiene is equally important. Dirty hands and even dirty hair are a hotbed for all kinds of unwanted microorganisms which can destroy your cultivation project.

Materials

Most materials are easily avaliable at the local shops.

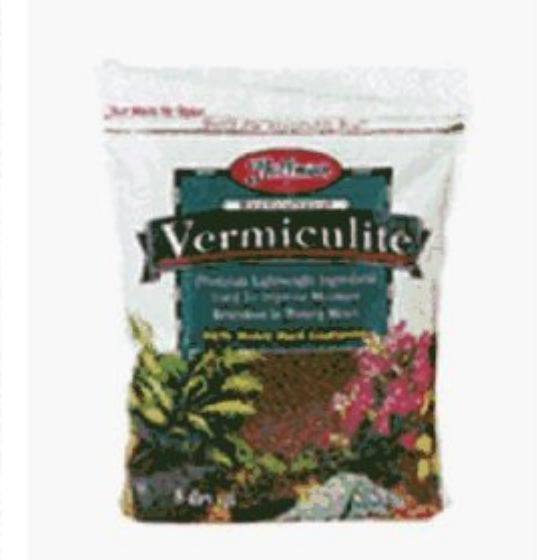
Vermiculite

Vermiculite is made from a naturally occurring mineral - mica.
Crushed mica containing water is heated and expands to a volume several times greater than that of the untreated mica.
Vermiculite is able to hold several times its own weight in water and it gives the substrate an airy structure.
Vermiculite is available in several grades, the middle and the middle-fine grade are most suitable for cultivation purposes.

Online sources for vermiculite

USA

Amazon



Hoffman A H #16002 8QT Vermiculite

Espoma VM8 8-Quart Organic Vermiculite

Ebay:

Canada - www.auroralighting.ca

United Kingdom - www.gro-lite.co.uk

Australia - users.bigpond.net.au/nutriflo/

Generally you can get vermiculite in garden and hydroponic stores, in some regions also in pet shops.

Brown rice flour (BRF)

BRF is available in health food shops either already ground, sometimes though there is only whole brown rice available. In this case you can grind the rice either in the shop or if this option is not available, grind your own using an electric coffee grinder.

Bob's Red Mill Rice Flour Brown

BRF is also available at Ebay:
BRF is best kept cool and dry for prolonged periods of time, since it can easily become rancid because of the fat content of its husk.
If you are unable to find BRF you can also use whole rye flour, ground millet or ground millet based birdseed with similar results.

Water

Water used for the substrate preparation should have drinking water quality. Tap water is usually OK, but if you're not sure about it, better use bottled drinking water or mineral water.

Spore syringe

A plastic syringe with needle attached containing 10cc-12cc suspension of mushroom spores in water.
The color of the suspension varies from completely translucent to slightly violet depending on the quantity of the spores in the solution.
Spores are microscopic so as long as you see at least a few specks in more or less clear water the syringe should have plenty of spores.

Available through the internet, for instance
www.sporeworks.com
www.thehawkseye.com
and many more.

Jars

The jars should have a content of around ½ pint (~240ml).
You can use either canning jars (Ball, Kerr...) or drinking glasses, the only requirement is that they are tapered and without shoulders, so you can slide the cake out of it in one piece once it's colonized. Bigger jars take much longer to colonize and are not recommended.

Kerr 0500 wide mouth mason jar
half pint, 8oz

Shroomery FAQ: Where can I find supplies in the USA?
Shroomery FAQ: Where can I find supplies in the UK?

Substrate preparation

For **one ½ pint jar**(~240 ml) you will need:
=> 140 ml vermiculite
=> 40 ml brown rice flour
=> some vermiculite to fill the jar to the top (app. 20 ml)
=> water

For **6 jars**, this amounts to:
=> 3.5 US cups vermiculite
=> 1 US cup brown rice flour

Note:
½ pt (US pint) = 1cp (US cup) = 236ml (milliliter) = 236cc (cubic centimeter) = $^{1}/_{4}$ qt(US quart)

Put the required amount of vermiculite for all the jars of one batch (for instance 6 jars: 6 x 140 ml = 840 ml ~ 3.5 US cups) 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. Stir it well so all the vermiculite is uniformly soaked with water.

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. If there is too much water in the bowl, pour the wet vermiculite in a strainer and let the excess water drain for a minute. Then the vermiculite will be at the field capacity, which is perfect.



Now put the required amount of the BRF (for instance 6 x 40 ml = 240 ml = 1 US cup) into the wet vermiculite at once and mix it in with the spoon. The goal is to uniformly coat the wet vermiculite particles with a layer of BRF.



Fill the mixture in jars $^{1}/_{2}$ inch (1cm) 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 underlying substrate in case they manage to come in during the inoculation and incubation.




Take a 5in(12cm) wide stripe of aluminium foil and fold it in the middle.
Put the foil over the opening of the jar as shown in the pictures. If you're using jars with metal lids, you can poke 4 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 aluminium foil lid.



Then take a piece of foil measuring 5in x 5in in and put it over the first two layers (respectively the metal lid if you're using lids) leaving the edges of the foil reaching down, since it has to be lifted again during the inoculation.
So now you have 3 layers of foil over the opening. The top layer is lifted during the inoculation.

Sterilization




Pour approximately 1in (2.5cm) 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 (15 psi = 1atm over atmospheric pressure) slowly over a period of 15 minutes on a medium flame.

If you heat up 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 45 minutes.

Depending on the pressure cooker model the cooking procedure works a bit different so if you're not familiar with pressure cooking consult the instruction manual or someone who used pressure cookers before.
After 45 min take the cooker from the flame and let cool for at least 5 hours or even better over night.
If you never used a pressure cooker before check out this document about the correct pressure cooker use.

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 1.5 hours in a pot lid on. Use only approximately 1 inch of water at the bottom.
You might have to add some water to the pot during steaming due to evaporation.

Inoculation


After the cooker is cold to the touch take the jars out and place them on a clean surface, have an alcohol lamp or a lighter and the spore syringe ready. Shake the spore syringe to break up the spore clumps.

To be able to shake it it's necessary that there is a small bubble of air in the syringe. If this is not the case, then you can suck approximately 1cc of sterile air into the syringe by placing the tip of the needle into the flame and slowly pulling the plunger back.

Loosen the foil from all of the jars so it can be lifted easily when you inoculate.

Take the cover from the needle and heat it over the flame until glowing red. Let cool for a few seconds.

Take the upper foil layer off and put aside upside down.

Pierce the foil at the edge of the jar with the needle app. 1 in (2.5cm) deep and inject the spore suspension towards the inner jar surface. You should see a small drop running down the inner surface of the jar towards the bottom. Each jar is inoculated on 4 equally spaced points. You should use 1 - 1.5 ml of the spore suspension per jar so one 10 ml syringe is sufficient for 6-10 jars.

Put the foil on again. Flame sterilize the needle again after inoculating 3 jars to prevent cross contamination just in case a jar wasn't properly sterilized.
When all of the jars are inoculated fold the foil edges up and press them firmly together so you get a nice aluminium foil lid. Write the inoculation date and the species/strain information on the foil with an all surface felt tip pen. If you touch something other with the needle during the inoculation procedure except the foil surface of the bottom foil layer immediately flame sterilize the tip again.

I made a video of the PF-Tek for Simple Minds substrate preparation and inoculation.

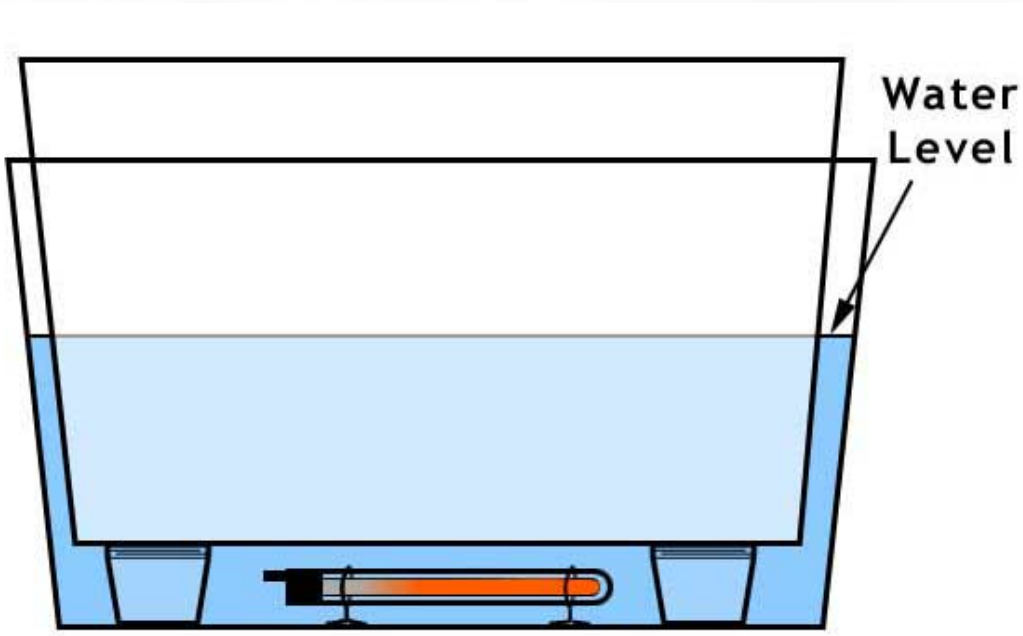
Incubation

The jars should be stored at 21-27°C (70-81°F), the warmer the better, but not exceeding 27°C. If you don't have these temperatures at home you can build an incubator to accommodate the jars.

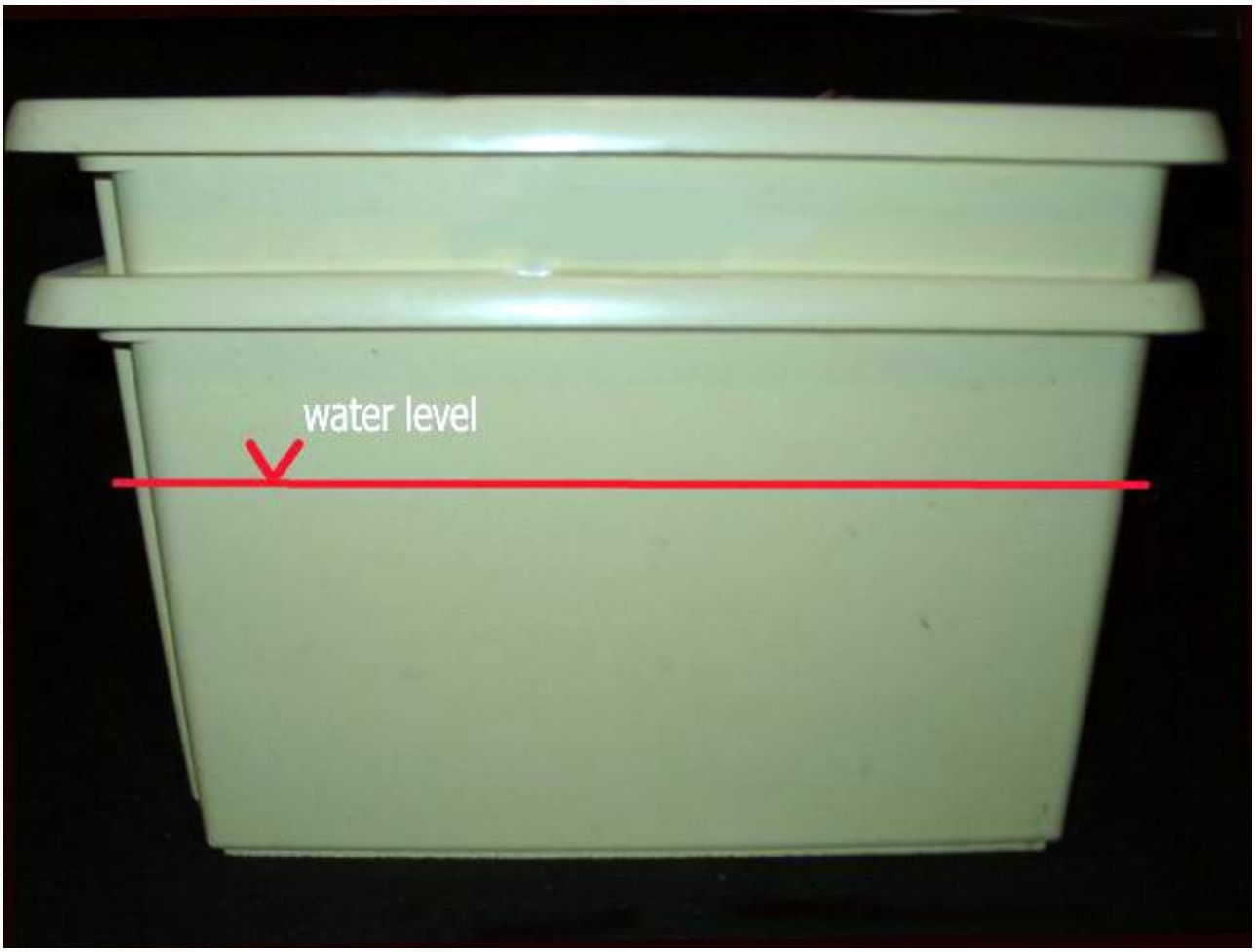
Incubator

The inoculated jars develop fastest if they are stored at a temperature of 27°C (80°F) (According to Stamets the best incubation temperature for *P. cubensis* would be 86°F, but since the jars themselves are a few degrees warmer than the surroundings (mycelium emits heat when growing) 80°F is a good and safe incubator temperature).

You can build an effective incubator by using two plastic boxes of the same size and an aquarium heater.
There are several types of aquarium heaters. When you're buying a heater, make sure that it is of the "fully submersible" type.
Attach the heater to the bottom of the first box and pour in as much 27°C warm water that the heater is completely submerged.
Adjust the heaters thermostat so that the heater just shuts itself off at 27°C.
Put some spacers on the bottom of the box, they carry the second box and prevent it from touching the heater.
In the above picture 4 jars are used. You could also use bricks, stones or something similar.



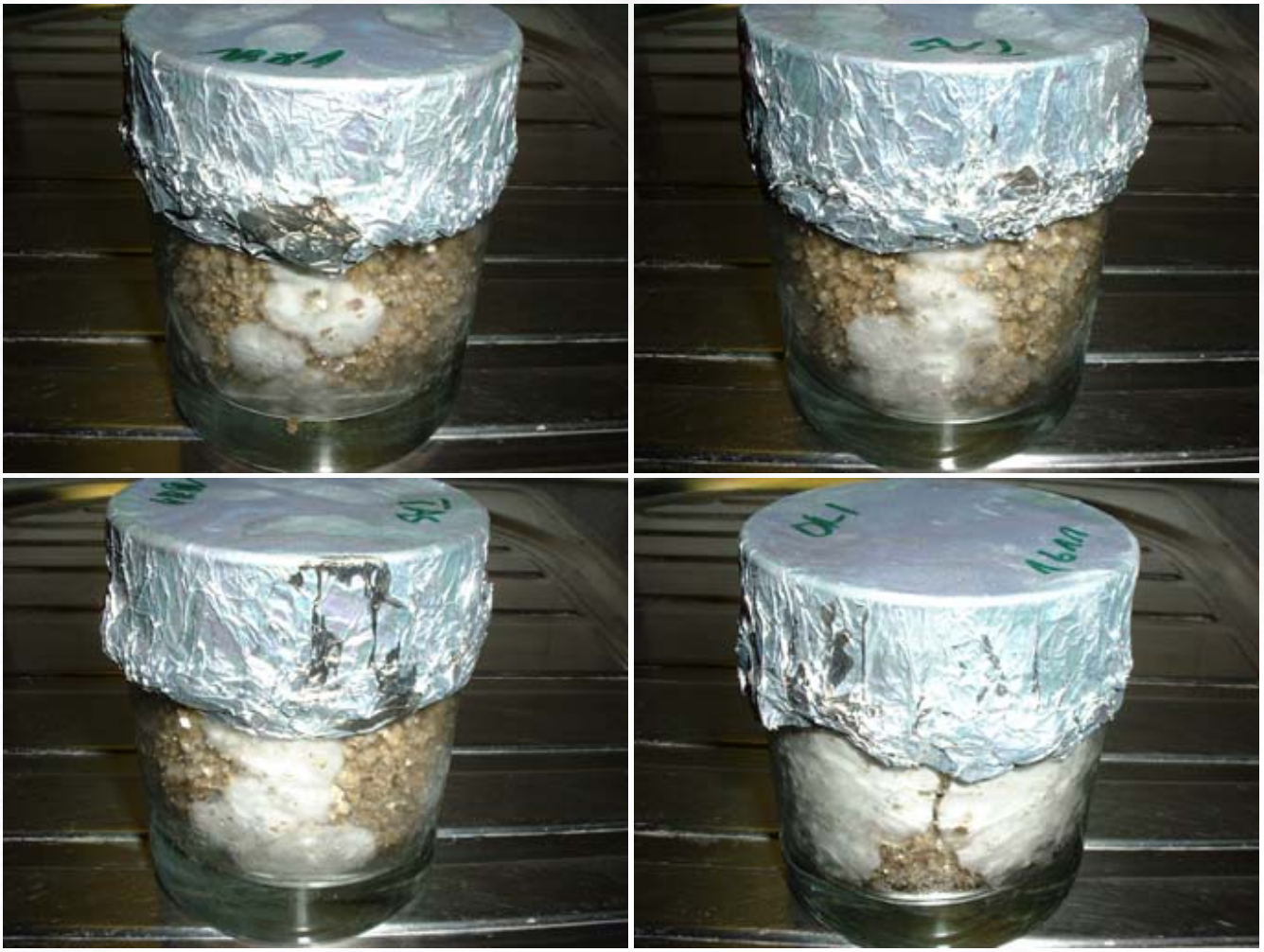
Put the second box in the one containing water.
After a few hours measure the temperature again and adjust the heater if necessary so the water temperature is 27°C.



When the box is empty, it will float on the water.
The water level in the lower box should reach app. 2/3 the height of the box, supposing the upper box is in place loaded with jars and resting on the spacers.

Now you can put the inoculated jars into the box.

Cover the jars with a blanket to keep the heat escaping and to keep the jars dark. Note: the water level drops in some weeks by evaporation. Therefore you have to fill some fresh water in from time to time to keep the water level high enough. Never let evaporate so much water that the heater isn't submerged in water anymore!



Providing the jars are kept warm you should see the first sign of germination after 3-5 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.

Check the Shroomery Contamination FAQ for more information on possible contamination in mushroom culture.

Depending on the temperature and the viability of the spore syringe it takes 14-28 days for the mycelium to colonize the whole jar.
Once colonized store the jars at normal room temperature, about 21°C (70°F) to initiate pinning.
Don't expose the jars to direct sunlight. Indirect sunlight (= the natural light that lights up a room because at day time out) or a low wattage lamp (cool white fluorescent lamp is ideal, incandescent lamp is less suitable) for 4-12 hours a day is sufficient.

Within 5-10 days (with certain mushroom strains it can however take up to 30 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. When this is the case 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 then proceed to fruiting next day, even if the cake doesn't show pins yet. This cold shocking usually helps trigger pinning somewhat.

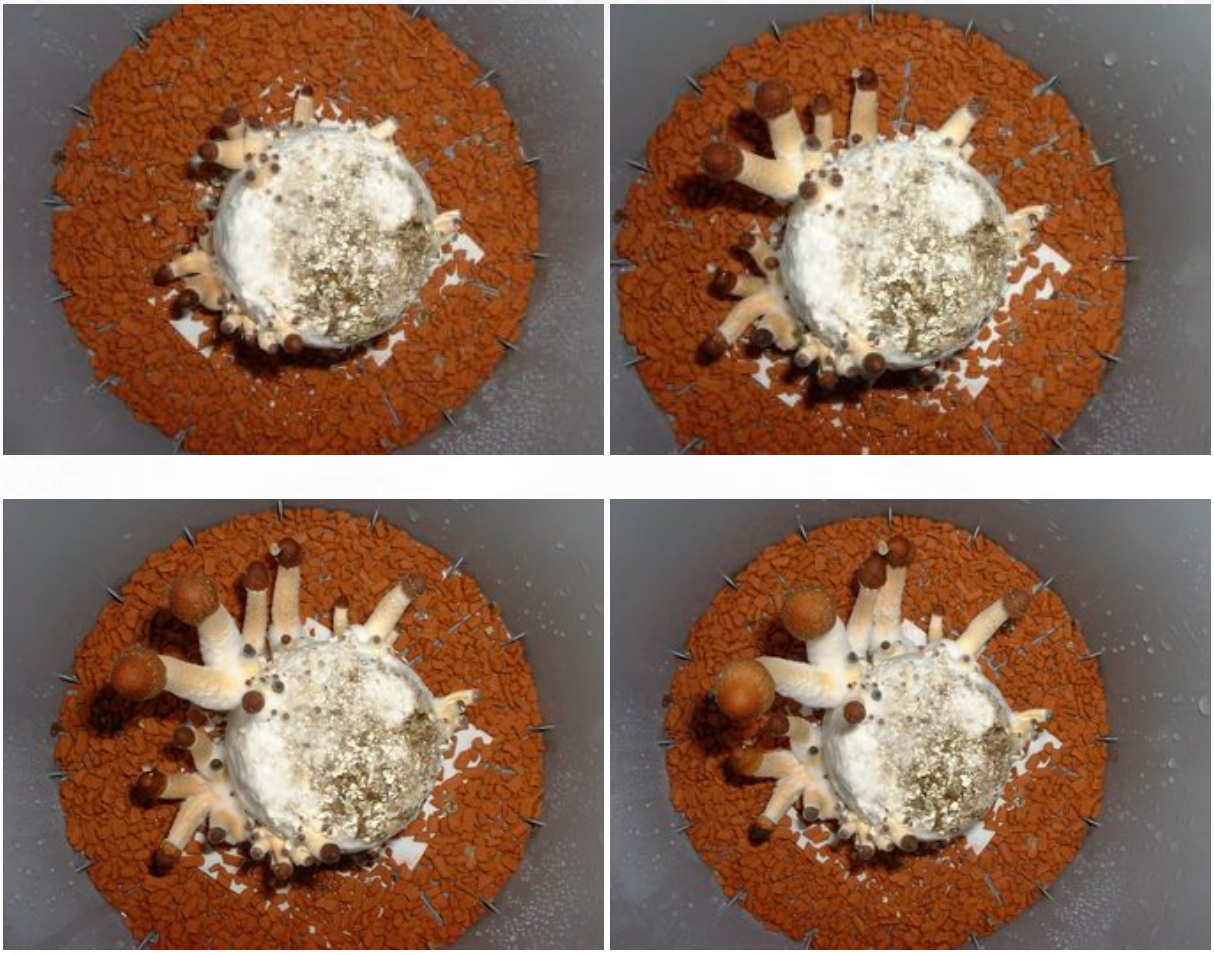
Fruiting

The fruiting of the cakes can be accomplished in any sort of container that can be loosely sealed and has at least one translucent side, preferably on the top. Suitable containers are a plastic bucket, Rubbermaid container, terrarium, aquarium...

Put an 1/2 inch layer of moistened perlite or expanded clay pellets or even a wet paper towel at the bottom of the container and birth the cakes onto this layer by letting them slide from the jar upside down.

Alternatively one can first apply a casing layer.

Sometimes the cake doesn't slide out of the jar easily by itself.
You just need to turn the colonized jar upside down in your hand and slam the hand lightly against the palm of the other hand. This will make the cake slide against the lid and it can be birthed with ease.




If you have a bigger fruiting chamber (a bigger plastic container or a terrarium) you can of course put in more than one cake to fruit.
The distance between the cakes should be at least 2" (5cm) for the mushrooms have room to grow. Put a sheet of translucent plastic over the opening of the fruiting container. Take this sheet off once a day and fan the air out with a piece of cardboard. If the bottom layer begins to dry out, spray it with some water to keep it moist since this layer provides moisture for the air to stay very humid. Don't spray the cakes directly.
Handle the cakes as little as possible but when you do it always wash your hands thoroughly beforehand.
Over a course of the next 7-14 days the cakes will begin to pin (if they haven't began to pin in the jars yet) and the small mushrooms will grow big in a matter of 2-5 days and as soon the caps begin to open they can be harvested.
This simultaneous maturation of all mushrooms is called a flush.

After the mushrooms have grown big there are usually a few small, stunted mushrooms left over, they are called aborts. They can be recognized by their blackish heads and the fact that they stopped growing at some point. Still they are good to use unless they are rotten.

It's crucial that you harvest all mushrooms, also the aborts, after the flush. This is most easily accomplished if you harvest the mushrooms off by gently twisting and tearing them off the cake with clean hands. Optionally you can dunk the cakes after each flush, this can increase the flush size significantly.

After approximately one week small mushrooms begin to form again and mature during the next days.
This cycle can repeat itself up to 4 times sometimes even more. After that the cake is exhausted it produces no more mushrooms and can be discarded. They can be also used to start outdoor beds.


Sometimes green mold attacks the cakes even before they are completely exhausted. If this is the case remove and discard the contaminated cakes immediately to prevent the spreading of the contamination.


3rd flush:

3rd flush:

3rd flush:

4th and final flush:

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Casing PF-Cakes

original source: http://www.fungifun.org/English/Casing

This document describes a simple casing procedure involving the PF-Tek cakes.

You are going to need:

- colonized PF-Tek cakes
- peat or peat based potting soil (for instance Jiffy Mix)
- vermiculite
- limestone flour
- potable water

Limestone flour is chemically mostly Calcium carbonate ($CaCO_3$), so you can take also pure $CaCO_3$ or any other material that is in powder form and contains high amounts of $CaCO_3$.

First we are going to prepare the casing mix.
Combine **60% peat, 30% vermiculite and 10% limestone flour by volume**, mix well, and under stirring add as much water to it, that when you take a handful of the casing material and *lightly* squeeze it in your hand some water begins to drop from it.

Then put this mix into a covered plastic bowl or a plastic bag, and put it into the microwave for 5-10 minutes, depending on the amount of the casing material. The goal is to get the casing boiling hot (~200°F), and when this is the case, take it out, stir the mixture in the bowl or shake the bag to redistribute the hotter parts and let it cool completely (several hours) in a clean place.

After the casing mixture is **completely** cool we can go to the next step, casing the cakes.
Prepare a dish that will accommodate your casing. This can be from any material: plastic, any metal, ceramics...
Ideally it should be opaque, if it is translucent, you will get pins inside the casing itself, which can lead to problems. If the container is not opaque, apply some aluminum foil and cover all the outer walls with it to keep the light out. Alternatively cover the inside of the container with the foil.

How big of a container you are going to use depends on how many cakes you are going to case.
In this example, I use 6 cakes, which perfectly fit into the pictured plastic container. I painted the walls of the container black to keep out the light (in order for the paint to stick on plastics, you will need to apply a primer first, otherwise paint won't stick...)

The depth of the container should be $^1/_2$ to 1 inch larger than the cakes are tall. If you only have a lower container, you can cut the cakes in half, or even put them into a clean plastic bag and crumble them from the outside, so you end up with pieces the size of a marble. I prefer the taller containers because it is simply less work.

Once you have the containers, loosen the fully colonized cakes by bumping them slightly top down on the palm of your hand, or directly into the container. Arrange the cakes in the container.

Apply some casing material between the cakes.

Loosely apply around 1/2 inch on the top of the cakes. Don't press the casing material down, it should stay lose and the surface should have hills and valleys.
Give the casing layer a good spray with clean water and cover with a piece of aluminium foil. Put in the incubator or leave at room temperature for 3-7 days. After the day 4 check on the progress by lifting the foil a bit and peeking underneath. Alternatively use polypropylene wrap instead of aluminium foil.

As soon you see first strands of mycelium starting poking through the casing layer take off the aluminium foil, give it a good spray with water and put into your fruiting chamber.
The humidity should be kept at 95-100°RH at this phase, and temperature maintained at around 70-75°F.
After 5-10 days the pins should appear.

After the pins are visible, lower the humidity to around 90°RH.
If the casing layer seems dry, lightly mist the casing layer with water. The casing should remain moist at all times but not soaking wet.

The pins will grow into fully grown mushrooms over the next couple of days.

The same casing procedure can also be done with colonized grain.
More info on casings: http://www.shroomery.org/5105/Casing

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PF Block Tek

original source: http://www.shroomery.org/11388/PF-Block-Tek

My goal was to find or create a method that has the simplicity of PF TEK while adding the benefits of more complicated bulk methods while being extremely contaminate resistant.

Supplies needed:

- Large Spawn bags with filter patch.
- 100% pure silicone
- 8" or larger impulse sealer.
- Large Pressure Cooker.
- Vermiculite (my recipe is based on COARSE vermiculite)
- Grain Flour (any type will do, I recommend blends)
- Gypsum
- Spend Coffee Grounds
- Alcohol wipes (or alcohol + paper towels)

Supplies recommended by not required:

- Large amount of liquid culture. (I recommend 10-30cc per bag)
- Alcohol Lamp (just makes things easier)

Step 1: The Injection Port
Apply a quarter sized blob of silicone and smear it around for a moment. If you just leave the blob as is it will often dislodge very easily.

I recommend placing the port just below the filter patch for easiest access.

Wrong Way.

Right Way.

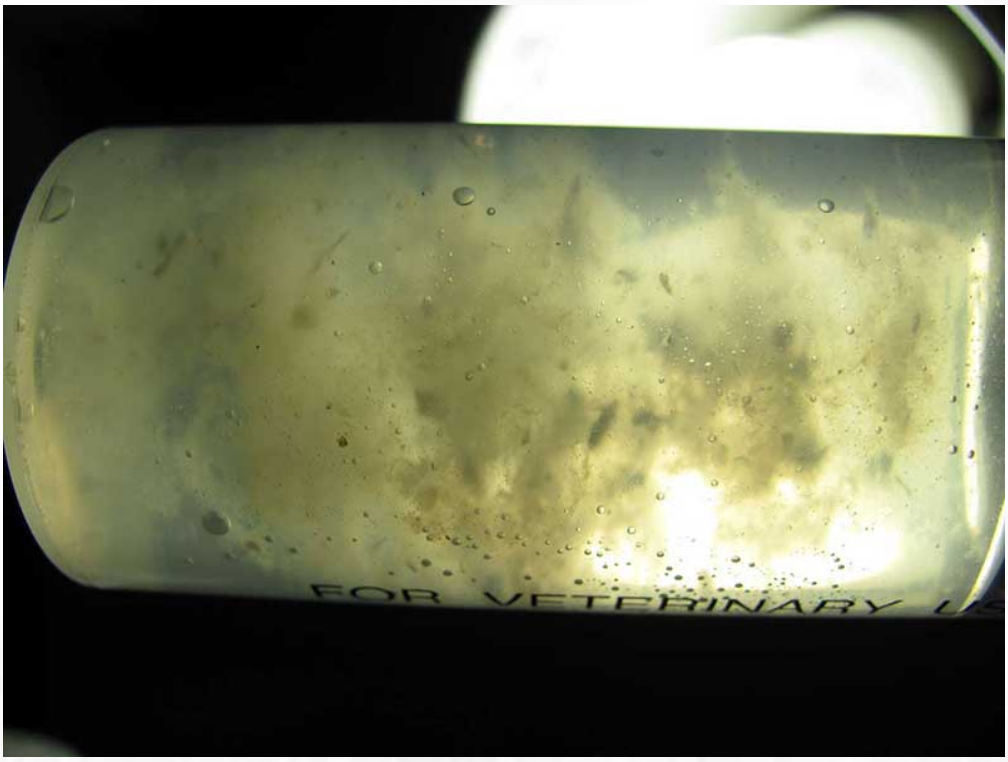
Allow the silicone time to set. Several hours at minimum.

Step 2: The modified PF Mix (SpongiMix?!)
3 Quarts Coarse Vermicute
1 Quart Water (add 1 half cup gypsum and 1-3 tablespoons of spent coffee grounds to the water and mix WELL first!)
Mix this together and let sit for 1 minute then mix again before adding dry ingredients.
1.5 Quarts Grain Flour (Any grain will do, I recommend mixtures of multiple grains).
Mix well then dump into bag. Try not to get any on the filters.
This recipe creates about 5 quarts by volume and a bit on the dry side.
Seal the bag using your awesome handy dandy impulse sealer.

Should look about like this when you're done.

Step 3: Sterilization
My AA 75x sterilizer handles up to 41.5 liquid quarts and can hold 6 bags of this size. Your mileage may vary. Fold the tops down leaving room for the filter to breath as you don't want your bags assploding in the cooker. Pressure cook @19-21 PSI for 90 minutes or @15 PSI for 120 minutes.

Step 4: The Inoculation
Grab your LC syringe and get to work. Inoculate with 10-30cc's of nice thick mycelium laden liquid culture.



I recommend spraying as much of the surface area as you can reach.

Step 5: The Incubation
Incubate on an open shelf in normal lighting at 70-75F for 7-14 days until you have a good thick fuzzy covering of mycelium similar to this:

Step 6: Break, Shake & Roll
Using your hands break up every single chunk in the bag. Continually roll the bag to expose new chunks until you can find none. This will take up to 5 minutes per bag.
Once you've got all the chunks shake and roll the bag for at least 2 minutes.
Set back on the same shelf and allow to continue colonization.

IMPORTANT: At this stage I recommend dropping the temperatures to about 70F. Growth will explode at this point creating a large amount of internal heat. I've recorded up to 12.5F over ambient temps externally. So if you're incubating at 80F you're bags may stall, not properly colonize the center and increased risk of contamination (contams like high temps, cubes don't).
Once the bags appear to be fully colonized allow 1 week to consolidate unless you intend to spawn to bulk, in which case go ahead and do it.

Step 7: Fruiting
Carefully cut away the bag using something sharp. Often little bits will get torn off from the bottom, do not worry about them.
You should end up with something like this:

(note the sad little half pint jar there, dwarfed by these awesome blocks)

Dunk for 18-24 hours in cool water.

Takes about 7.5 lbs to hold these down, in case you were wondering.
I've tried with and without rolling these and the results were similar therefore I recommend the simplicity of not rolling since it doesn't seem to serve a good purpose.
Pop these into a standard shotgun style fruiting chamber - you can fit 4 cakes in a 66 quart fc or 6 in a 108 quart fc.

You can also fan and mist manually or use my automated shotgun technique for equally awesome results.
I recommend 2 flushes then toss them as the risk of contaminates is very high after the 2nd flush and not worth the trouble of having to de-con your FC's / Fruiting Rooms.
Yields will average between 2.5 oz and 6 oz dry weight PER block.
Provided you use proper conditions you can expect about 1 flush per week.
Here's a few pictures of Albino Penis Envy grown using this technique.

Enjoy!

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Scotsman's Beginner's Cake Tips

by scotsman1

original source: http://www.shroomery.org/8413/Scotsmans-Beginners-Cake-Tips

Some useful tips for a successful cake grow.

I always always seem to get good flushes on my cakes and for the life of me I don't know what I do that's different from anyone else, or do I? Well here in a few simple tips and I will give all my little secrets, well they ain't exactly secrets, more must do items, items that if you follow you will also end up with bigger flushes, maybe.

I always stick to what I know best and what gives me the best results, and that's straight Brown Rice Flour cakes done the old-fashioned way, PF style cakes.

These tips may help, they may not but if one person shows an improvement in Flush sizes we have a winner, so here's my simple tips.

Quarter cup of BRF. As I said already Organic Brown Rice ground to a fine flour in the coffee grinder.

Vermiculite I use half a cup. Arthur Bowers Silverperl Vermiculite Horticultural Grade. It's not the fine vermiculite because we only get the one type here. I don't think the fine vermiculite would be as good because when this gets to the bottom of the bag its all smaller pieces which to me don't give as good a cake mix.

Quarter cup of water, this is one of the few times I just use tap water. I don't know how your tap water is but ours is not to bad.

When mixing the cakes I like to do my cakes 1 or 2 at a time it gets the mix better more even, so your waters right through the whole mix.

First Flush

Second Flush

Third Flush

The cups you measure the vermiculite etc with, well when you fill them make sure you don't go over the line; you don't want the cup full to the brim that way the rest of the mix will be off resulting in to dry a mix, I admit I fell for this one when I started.

Brown Rice. Well I go for organic brown rice for the simple reason the shop nearest me sells it and if I changed maybe I would get lower yields, maybe I would get higher? I've never seen brown rice flour in Scotland so I settled for the rice ground in a coffee grinder and make sure its ground to a fine flour. Now i clean them and scrape with a fork and both are under water in the fridge for 18 hours.

1st the strain in the pics is Ecuadorian why? because they give great flushes and are no problem to print from and are easy to maintain. My grow tank is the standard Rubbermaid type, bought cheaply from the local diy store. 1.5 inch perlite pre soaked and spread evenly over the bottom. Fanning differs because it just depends if I am in or my wife is in. If I am in they get fanned up to 6 times a day, but if both of us are out they can go 8 hours without being fanned. Normally they can get by with 3 or 4 air exchanges a day but I like to give them more. If i am growing in winter i use a fish tank heater but its OK here at the moment so i am not using one right at this moment. They get misted every time the sides of the tank seem to be drying. Light, the tank has I clear lid and is at a window so they get natural sunlight. Even though I only spray when it looks dry I still water and spray the casing every day.

My Grow Tanks.

DBL end case after every flush.
Saving a Partially Colonized Cake.
Some of my cakes start OK then slows down to almost stopping. When this happens you don't have to throw the cake out, a small operation can save the cake and even though the flush will be reduced you still get a gram or two.
The Procedure.
First pic shows a cake I cut, notice how full the cut is, you should use as sharp a knife as you can. Prepare an area for working by washing with bleach and spraying Lysol on the surface and wear gloves. The idea is to cut

the uncolonized part of the cake off, leaving you with a cake with 1 small part removed.

Remove the cake from the jar and wash under running water. Get a sharp knife and plan where to cut the uncolonized part of the cake off, cut the part off with 1 cut no sawing or gouging, 1 cut. Next dunk for 18 hours.

Dbl end case your cake and make sure you pile plenty over the cut part of the cake this helps prevent contaminations.

A small flush but better than nothing and if you have a few cakes that go in this direction then a few grams is better than total failure.

Happy Shrooming and good luck.

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PF-Tek - Dunk and Roll

original source: http://www.shroomery.org/10253/PF-TEK-Update-Dunk-and-Roll

Explaining the method of dunking your cakes in water and then rolling them in vermiculite to improve your flushes

Why Dunk and Roll?

Mushrooms are basically 90% water. Dunking and rolling will increase your yields dramatically with hardly any work. You are essentially replacing the water lost by the cakes and allowing them to produce more fruits. Normally the water runs out way before the nutrients in the cake do, so as long as you are replenishing the water the substrate will keep on producing fruits for at least a few more flushes.

When Should I Dunk and Roll?

- Immediately after birthing a cake and before placing it in the fruiting chamber you should always dunk and roll. A lot of water has been lost during the weeks the substrate has been colonizing.
- Between flushes. Once you have picked all the fruits off the cake or none have been growing for a few days you know your flush is over. Now is the time to dunk again, preparing the substrate for the next flush.

The procedure is divided in two parts:

The Dunk

In this step you will be replacing the water lost by the substrate.

1. Rinse off your cakes under the tap, rubbing them softly do dislodge any loose material or bits of mushroom material left over from picking the fruits. Be careful not to break off any pins (little immature mushrooms) as they will be your next crop. Pins will survive the dunk and roll no problem, so no need to take them off. Just be delicate with them.
2. Submerge the cakes under cold tap water for 12-24h inside a clean container. Try and avoid dunking for much longer than 24h but the closer you get the better as cakes are very dense and need a long time to absorb all the water . You can use the pan you sterilized you cakes in, a clean tupperware container a bucket, whatever is available. You will notice that the cakes actually bob about like corks so you will need to put something heavy ontop to keep them fully submerged. This is important as it seems that the extra bit of water pressure that comes from being totally submerged aids the rehydration process.
3. There is no need to dunk inside a fridge. As long as your water stays cool (below 40°F) you will be fine. The cool temperatures of the fridge prevent bacterial bloom while you are dunking (it has nothing to do with cold shocking the mycelium, as this procedure is not required for Psilocybe Cubensis) but unless you are pretty clean your fridge probably harbors a lot of contaminants, so it can be counterproductive. Use ice, running water (can be costly) or the fridge to keep your water below 40°F.
4. Once your dunk has finished, re-rinse your cakes under the tap and proceed to...

The Roll

Rolling your cakes increases the water holding capabilities of the cake. It essentially acts as a mini casing layer.

1. Roll your cakes in dry vermiculite so they are evenly coated with it. You can optionally bake your vermiculite in the oven for an hour at 350°F if you think it might not be clean (the bag has been opened for a long time for example) but it is not necessary if the vermiculite is out of a new bag.
2. Place the cakes inside your fruiting chamber (not in direct contact with the perlite, use a circle of foil or an old jar lid as a coaster) and wait for an hour or so.
3. Mist your cakes thorougly making sure you wet all the vermiculite.
4. Maintain fruiting conditions as usual.

Extra Tips

- While dunking between flushes is a must, re-rolling between flushes is optional. You will see that the mycelium colonizes the vermiculite slightly so it does not all come off during the succesive dunkings. There is no need to get it all off. Either do not re-roll, just patch up the bald areas or roll again. Whatever looks best to you.
- Letting the cake dry out between flushes. By not misting for a few days after the flush has finished and then dunking you are imitating the natural cycle of drying out followed by sudden rehydration. In nature this rehydration will stimulate rapid fruit formation. Also, the drying out protects your cakes from molds during the waiting period as the drier surface is not as prone to contamination.
- Extra vermiculite reservoir: Put a spoonful of vermiculite on the top of the cake when you place it in the fruiting chamber. Once wetted when you mist, it will act as an extra water reservoir.
- Try and create a good microclimate. By dunking and rolling all your cakes and packing them close together you will be creating a microclimate among your cakes where humidity is at its max. This is an invaluable aid for good flushes. These pictures show how well dunked and rolled cakes can perform.

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Hippie3's Dunk Tek

by Hippie3

original source: http://www.shroomery.org/5185/What-is-the-dunk-tek

The cake is dunked in water overnight to rehydrate and enable bigger and more flushes.

Hippie's Dunk tek is a simple yet effective way to extend the useful lifespan of cubensis cultures such as PF cakes.

This tek should be used whenever the cakes/casings dry out. Also it can be given after full colonization to replace water lost so far.

The tek itself is quite simple. It essentially consists of submersion of the cake/casing underwater for 12 to 24 hours. Don't worry, that will not harm your cakes/casings.

One can even dunk cakes/casing that already have small pins safely. Just don't overdo it, by 48 hours underwater they will be dead.

As for what kind of water to use, natural spring water is best but you can even use it straight from your faucet if need be.

Temperature during the dunking should be be cool but not cold, refrigeration is not recommended.

Time spent dunking should be not less than 6 hours for minimal benefits. 12 hours is about right for dunking in between flushes and at birth but 24 hours is the maximum for full rehydration of nearly spent cakes.

There are at least 2 options for how to dunk. My prefered method is to dunk each cake individually by placing it in a jar, filling with water, then screw on the lid to keep the cake submerged. This way is good for small batches, and has the advantage of keeping each cake isolated so no contaminants are spread from cake to cake.

For larger batches, you can simply place several cakes in a large pan or bucket, cover with water and weigh down the cakes by placing a weighted down lid, plate, etc. on top of the cakes.

After dunking, drain well, gently pat dry with paper towels, etc. and return it to the fruiting environment.

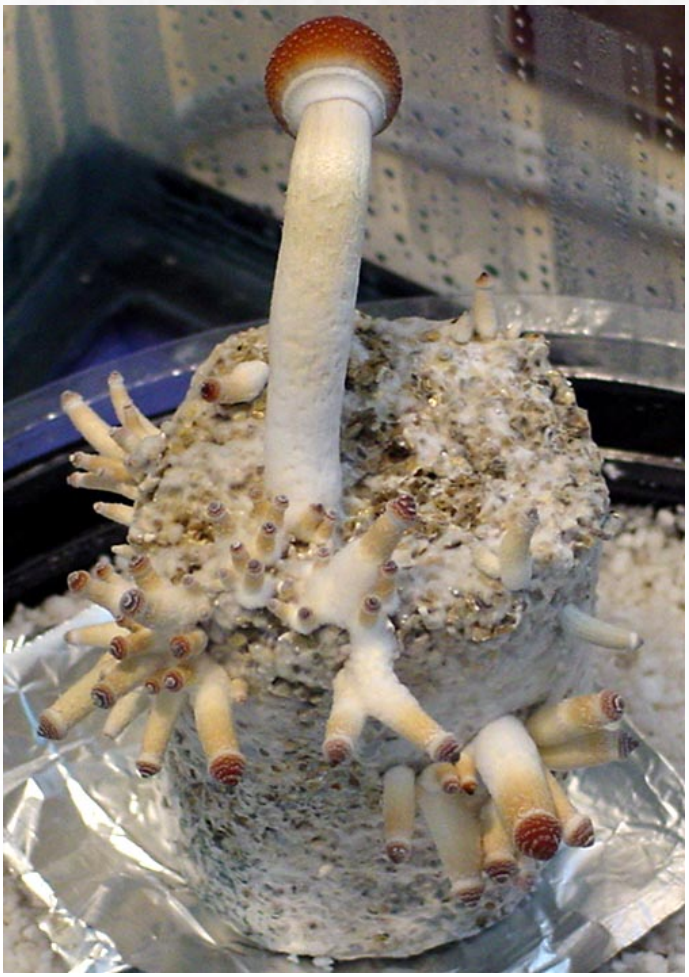

Photo of dunked cake pinning.

originally posted at *Mycotopia*

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Shotgun Terrarium

How to build a simple, low maintenance, fruiting chamber.

The Shotgun Terrarium is an easy to make and easy to maintain fruiting chamber. It has no moving parts, needs no electricity and does away with shields and other complications.

How does it work?

The principle behind the shotgun terrarium is that of using perlite to increase air humidity. This is by no means an innovation as before the shotgun terrarium was developed it was already used. Here is a closeup picture of a piece of perlite. Notice how perlite is covered with ridges and bumps. Once you wet your perlite, this increases the surface area of water exposed to the air thus dramatically increasing evaporation rates over the same volume of water on its own. More evaporation means higher humidity.

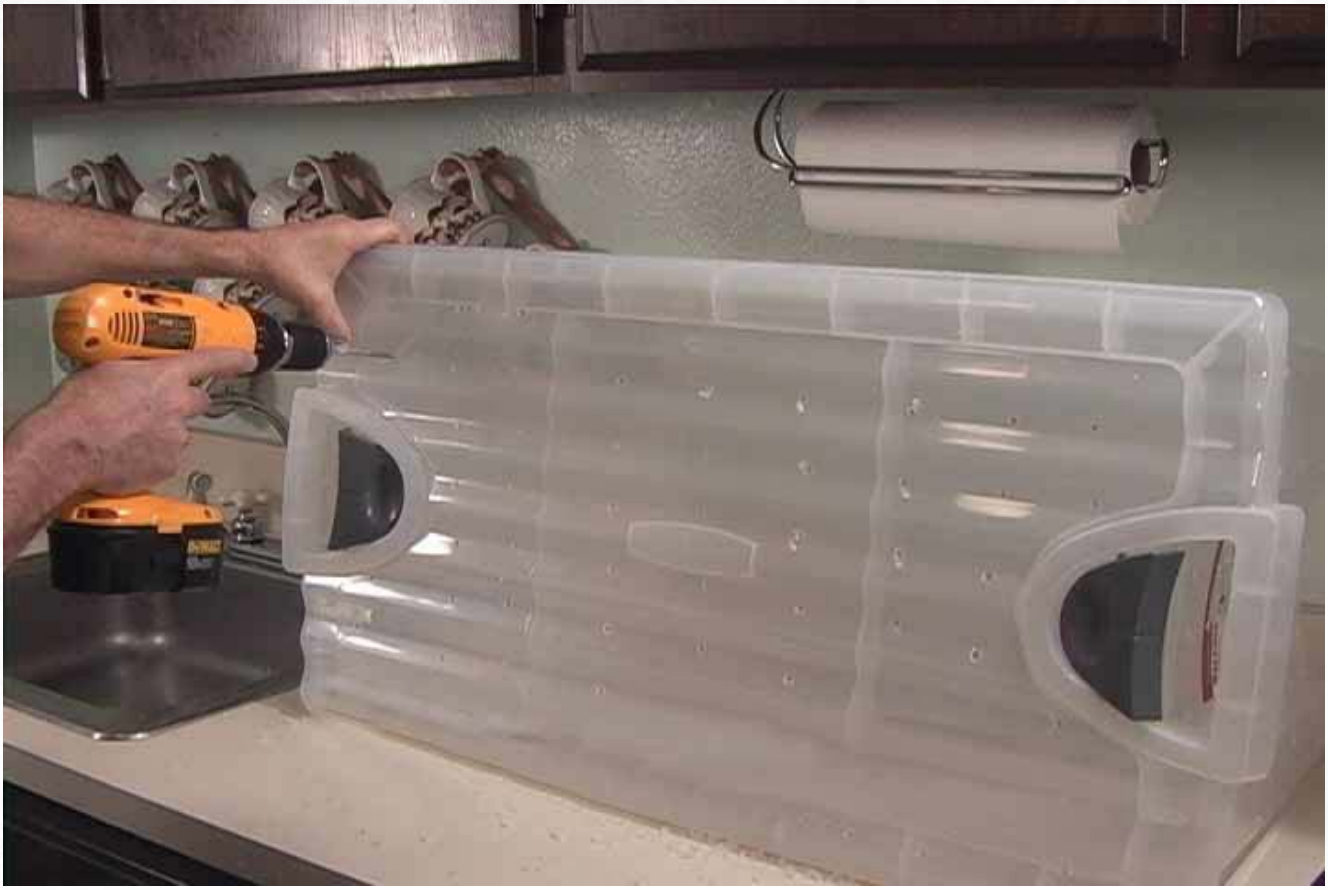
Building a Shotgun Terrarium

You will need:

- A transparent/translucent plastic storage container. The lid does not have to be transparent but if you have the choice, go with the transparent top. Mushrooms grow towards the light and if they get no light at the top they will grow sideways.
- Electric drill with a 1/4 inch drill bit
- Perlite. Enough to fill 3-5 inches of the bottom of the container.
- Pasta strainer or similar.

Step 1 - Drill the holes

Drill holes in all six sides of the container. Space them out evenly, with about two inches between holes. Now you know why it is called a shotgun terrarium :D



Drill holes in all six sides.

Step 2 - Prepare your perlite

Fill your strainer with perlite and wash it thoroughly under the tap. This both cleans the perlite of any dust and covers all the surfaces with water. Drain the perlite well.

Allow perlite to drain well.

Step 3 - Place perlite in the fruiting chamber

Fill up your terrarium with the moist perlite. It should fill 3 to 5 inches of the bottom of the container. Spread it out evenly, keeping it as light and fluffy as possible. Your fruiting chamber is now ready.

Use 3 to 5 inches of damp perlite (7cm - 12cm)

Step 4 - Put your cakes into the fruiting chamber

It is now time to put your fully colonized cakes into the terrarium and put the lid on. Do not place them directly on the perlite. Use old jar lids or pieces of tin foil as coasters to avoid direct contact.

Now, all you have to do is open up the lid twice a day and fan some fresh air into the fruiting chamber. You can use the actual lid of the terrarium as long as you keep it clean. We do this to introduce extra fresh air into the chamber.

While a lot of fresh air gets in through the holes you can never really have enough fresh air (as long as the humidity stays in the high 90%s) as it is a very important pinning trigger and also hinders the growth of contaminant molds. Before fanning (30 seconds is enough) give the cakes a good thorough mist with your water mister to keep them nice and hydrated.

Extra Tips & Tricks

- Use a hygrometer to measure the humidity inside your fruiting chamber. It should be as close to 100% as possible. If on its own this terrarium does not achieve over 95% relative humidity, tape up some of the holes to slow down air exchange and that should increase your humidity levels.
- Expose your terrarium to light for at least a few hours each day. Light shows the mushrooms which way to grow and ensures even and prolific pinning (if all other conditions are correct). Indirect sunlight is good (avoid direct sunlight) or if you can't have it, use a compact fluorescent (energy saving bulb) or standard fluorescent bulb that gives off light in the daylight range. The packaging will say something like daylight or white light or 6000K (somewhere around that number). Good results have been obtained with a 12 hour on 12 hour off cycle. Stay away from incandescent (regular) lightbulbs as they do not emmit the right kind of light and produce a lot of heat
- Keep your terrarium slightly elevated. Use a couple of bricks or something to elevate the terrarium off the floor. This keeps it away from the dust and muck on the floor and more importantly lets air go through the holes you have drilled on the bottom.
- Here is a video describing the process and also another document (see below) describing the science behind the shotgun terrarium in greater depth. This site has also got some great videos explaining many other procedures, including the PF Tek.

Nibin 2009. Special thanks to RogerRabbit for letting me use his pictures and video.

Constructing Your Terrarium/Fruiting Chamber

This page explains the construction of a simple terrarium, also known as a fruiting chamber, for growing mushrooms. The function of a mushroom fruiting chamber, or terrarium as they're sometimes referred to, is to provide an environment with near saturation humidity, while allowing plenty of fresh air to enter and circulate. My terrarium design has become widely referred to as the *shotgun terrarium* due to the abundance of holes on all six sides. The ideal mushroom fruiting chamber will be constructed in such a way that stale CO2 laden air can exit, or be forced out, while a constant supply of fresh moving air is allowed to enter. While the terrarium needs to provide this supply of fresh air, it also needs to maintain a humidity level at or above 95% to promote mushroom formation and growth.

Over the years, I've seen many mushroom fruiting chamber designs come and go. Those that hold a high humidity often get saturated with stale air, and the mushrooms develop fat, tough stipes (stems) and tiny caps. Since with many species of mushrooms, it's the cap that we eat, the entry of fresh air is vitally important. Other terrarium designs use complicated systems of humidifiers and fans, and while these often provide the fresh air that's required, they sometimes fail to keep the humidity levels high enough, resulting in dry substrates and poor mushroom fruitbody formation. In addition, the use of mechanical or electrical devices introduces the possibility of failure, either by over saturation or drying out, due to equipment malfunction. That's why I advise to keep it simple. The terrarium I present here can be left unattended while you're at work all day, and you won't have to worry about losing your mushrooms.

The terrarium system that I designed and demonstrate here is what I consider to be the best combination of easy construction, excellent function, and low maintenance. To watch a video of the terrarium under construction, see part 3 of the BRF/PF tek video. It's been dubbed the *shotgun terrarium*, and the name seems to have stuck. The name comes from the appearance of up to a few hundred holes that are drilled into the plastic storage bin.

Shotgun Terrarium Theory of Operation

The theory of operation for the shotgun mushroom fruiting chamber is that natural air currents travel from areas of high pressure to areas of low pressure. Cool air has the molecules closer together than warm air, thus cool air is at a slightly higher pressure than warm air. When we put several inches of damp perlite in the bottom of our terrarium, we create an area with a slightly cooler temperature than the air above, which is exposed to lights that create heat, and our mushroom substrates, which are often at up to a few degrees

warmer than the surrounding air due to thermogenesis.

This temperature differential, however slight, results in enough of a pressure gradient that it causes air to flow up through the perlite, absorbing moisture as it travels, and into the relatively lower pressure air within the fruiting portion of our fruiting chamber.

This air then exits through the holes in the upper section of the terrarium, carrying the excessive CO2 produced by our mycelium out with it. With this design, no electrical or mechanical equipment is required. Regular misting helps to keep our brf cakes or other substrates moist, and also serves to replace the moisture that evaporates from the perlite.

When using this system, drill holes as shown in the pictures and video clip on all six sides. I use a 1/4" (6mm) drill bit. Use of a larger drill bit is not recommended. It must be remembered that a 1/2" hole has four times the area of a 1/4" hole. (A 12 mm hole has four times the area of a 6 mm hole) If the holes are too large, your terrarium will not be able to maintain the high humidity necessary for growing mushrooms.

This system also requires an ambient humidity in your house of 30% or above, which incidentally will ensure your own comfort as well. In desert climates, and especially in cold climates during the winter months, indoor humidity is often very low. If you get shocked from touching another person, or a light switch, etc., after walking across the carpet in your home, it means your humidity is too low. The answer is to run a cool mist humidifier 24/7 in your home. Moist air holds heat much better than dry air, so you'll actually lower your utility bills by doing so. If you'll ensure that the humidity in your growing room is at least 30%, this design terrarium will easily maintain 95% humidity on the inside where your mushrooms need it.

Of course, it should go without saying that for this system to work properly, the terrarium must be elevated at least 1" above the table it's sitting on. Use blocks of wood, shot glasses, or whatever you have around the house to raise the terrarium off the table so air can circulate under it. It should also be noted that 90% of all airborne contaminants in a room are located near the floor, so make sure your terrarium has a home on a table or shelf.

Lighting Requirements of Mushrooms

Some mushrooms, such as the *Agaricus* species commonly found in grocery stores require no light at all. However, those commonly grown by hobbyists, such as *Pleurotus ostreatus* (Oyster Mushrooms), *Lentinus enodes* (Shiitake), *Psilocybe cubensis*, a hallucinogenic mushroom, and *Hericium erinaceus* (Lion's Mane) all require light to produce abundant, normal sized fruits. Experience has taught us that the light best suited for primordia formation and the development of fruitbodies is bright light with a color temperature of 5,000 Kelvin to 7,000 Kelvin. Fortunately, this type of light is easily obtainable at your local home improvement center in the form of fluorescent fixtures. For a small terrarium as described in this chapter, a single CFL (compact fluorescent) that screws into a standard light bulb socket will work very well. These can often be found in grocery and drug stores in every neighborhood. 15 watt CFLs will do the job well, but the package will probably have a large 60 stamped on it, indicating they produce light "equivalent" to a 60 watt incandescent light bulb. They're referring to lumens of output, not the frequency. Incandescent light bulbs are the worst possible choice for growing mushrooms, since they emit a 'red' light in the 3,000 Kelvin color temperature range.

The higher the color temperature, expressed in Kelvin, the closer to the 'blue' end of the spectrum the emitted light is. The lower the color temperature the 'redder' the light is. If you have a choice of fluorescent lamps, purchase those labeled 'daylight' since these have a somewhat higher color temperature than cool white. Daylight, sometimes called 'natural daylight' fluorescent tubes generally emit light in the 6,500 Kelvin range, while cool white fluorescent emits light at around 5,000 Kelvin.

If you have several terrariums stacked or otherwise near each other, you can use larger 2 to 4 tube fluorescent fixtures. These come in 48" and 96" lengths. Place the fluorescent lamps as close as you can get them to your terrariums without causing excessive heating. Species such as Shiitake and Oyster mushrooms prefer to fruit at temperatures in the upper 50's to mid 60's Fahrenheit (15C to 20C), while *Psilocybe cubensis* prefers to fruit at a temperature in the mid 70s to about 80 Fahrenheit (23C to 27C). Most mushroom species don't mind

a slightly warmer temperature during daytime than at night, so if your grow room is a bit colder than the temperature ranges given above, a little warming from your lights during the daytime won't hurt at all, provided you don't let the air in your terrarium get too dry. For cakes, try to keep the humidity above 95%.

Cased substrates are a bit more forgiving, but still try to keep your humidity above 90%. 12 hours on, 12 hours off has proved to be a great combination over a wide range of species. Of course, if you have a bright window near your terrarium, that will suffice, but direct sunlight for more than a few minutes per day should be avoided.

Disregard outdated advice in old books which is constantly repeated on the internet to colonize mushroom substrates in total darkness. Experience and rigorous peer reviewed studies have proved that exposure to low level ambient indoor lighting during spawn run and substrate colonizing will speed up the process, leading to full colonization up to a few days earlier than the same substrate would if colonized in darkness. In addition, mushroom mycelium develops a day/night circadian rhythm, so exposure to light from day of inoculation sets this process in motion, leading to earlier fruiting and harvest.

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Pf tek done right TEK

by Shea25

original source: http://www.shroomery.org/forums/showflat.php/Number/11585613

PF tek
Things needed

- 1/2 pint wide mouth canning jars
- Pot/Pressure cooker
- Vermiculite
- Perlite
- Brown rice/Brow Rice Flour
- Tin foil
- 70% Iso alcohol
- Plastic Tote
- 6500K fluorescent bulb
- 1/4 inch drill bit/Drill
- Hammer/Nail
- Mixing bowl and spoon
- Gypsum
- Spore syringe
- Latex gloves
- Dust mask
- Lighter

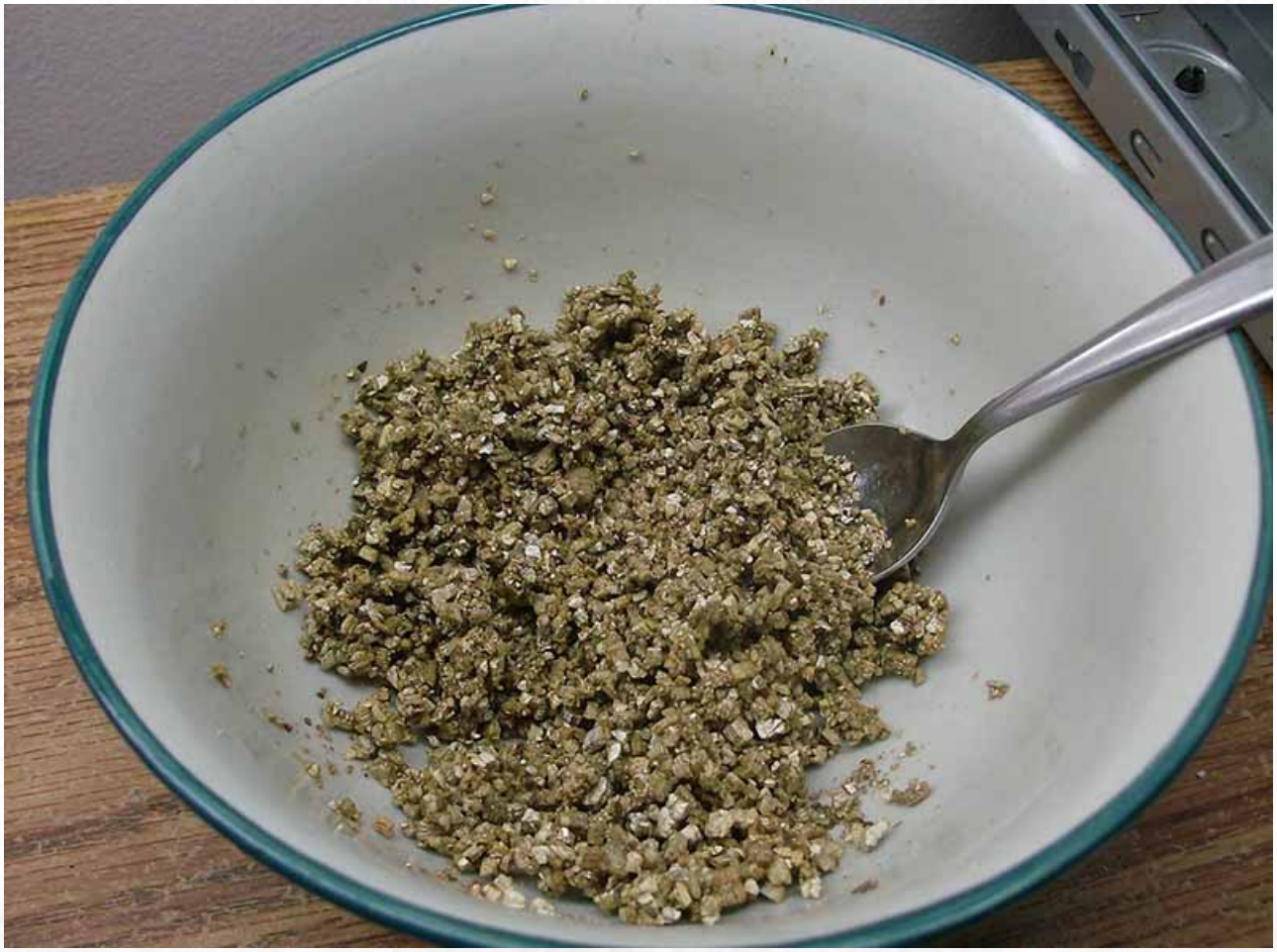
Preparing the jar

Take the lids and using a nail and hammer or a 1/8 drill bit, drill 4 holes near the rim of the lids nicely spaced out. Depending what way you use you lids i use mine rubber side down just punch the holes so they don't leave burrs pointing towards you.

The basic recipe for 5 PF jars is this 2 parts vermiculite 1 part water and 1 part BRF (additionally you can add 1 tablespoon of gypsum for 5 jars)

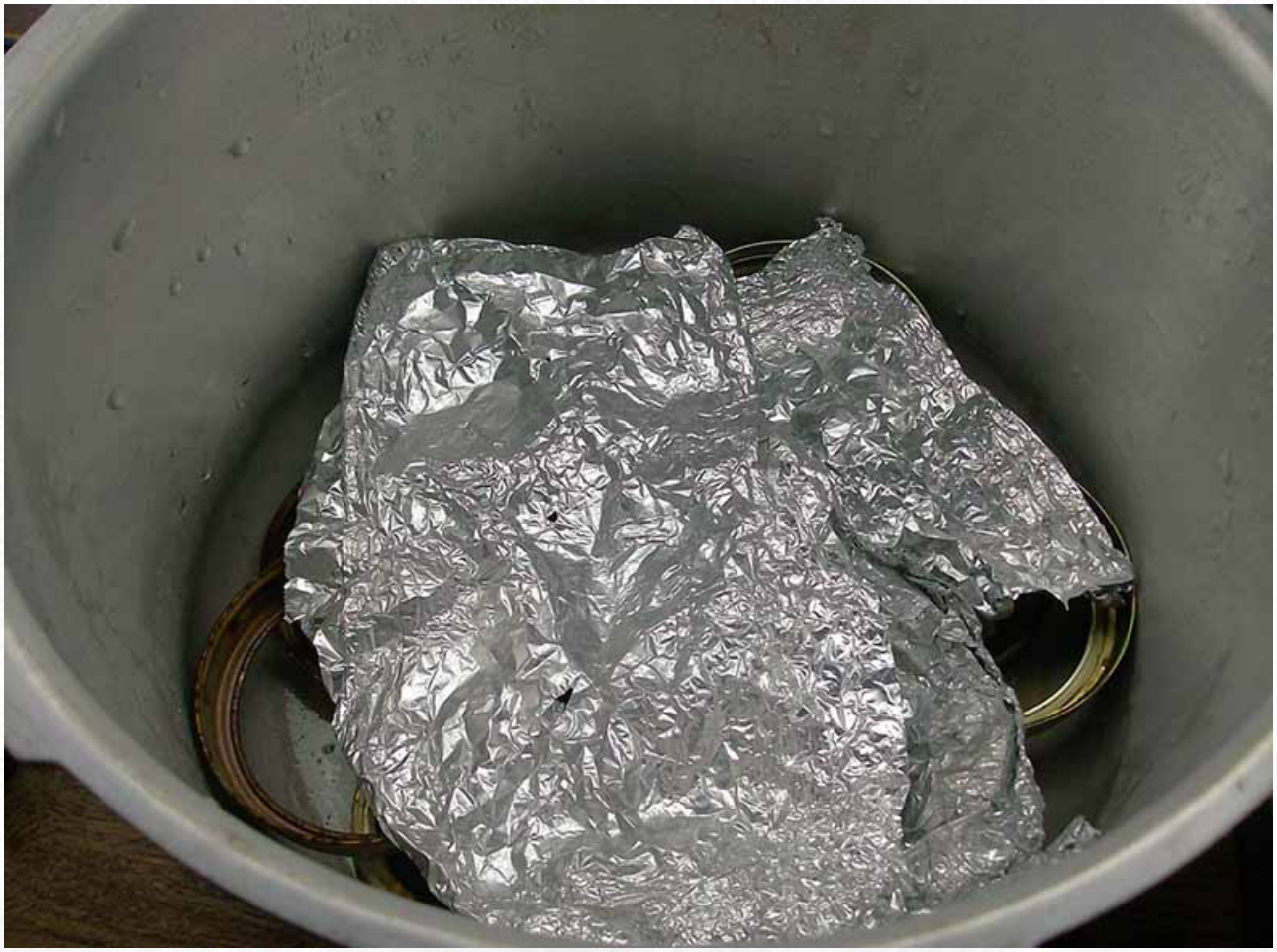
In a bowl add the 2 cups of vermiculite (and gypsum if you use it) now add the 1 cup of water, mix really well. Now add the 1 cup of Brown rice flour (you can make your own by grinding brow rice in a coffee grinder). Mix this really really well. Now load this into the 5 canning jar equally, making sure not to compress the mixture in the jars you want it nice and airy. You will be leaving a 1/2 inch space at the tops of the jars for the dry vermiculite layer.

Take a paper towel and wipe the 1/2inch space you left at the tops of the jars making sure to wipe away any BRF mixture or moisture away. Now top off the jars with dry vermiculite, screw on the lids and cover the tops the lids with tin foil. The tin foil is there to keep any moisture from entering the jars while there sterilizing.



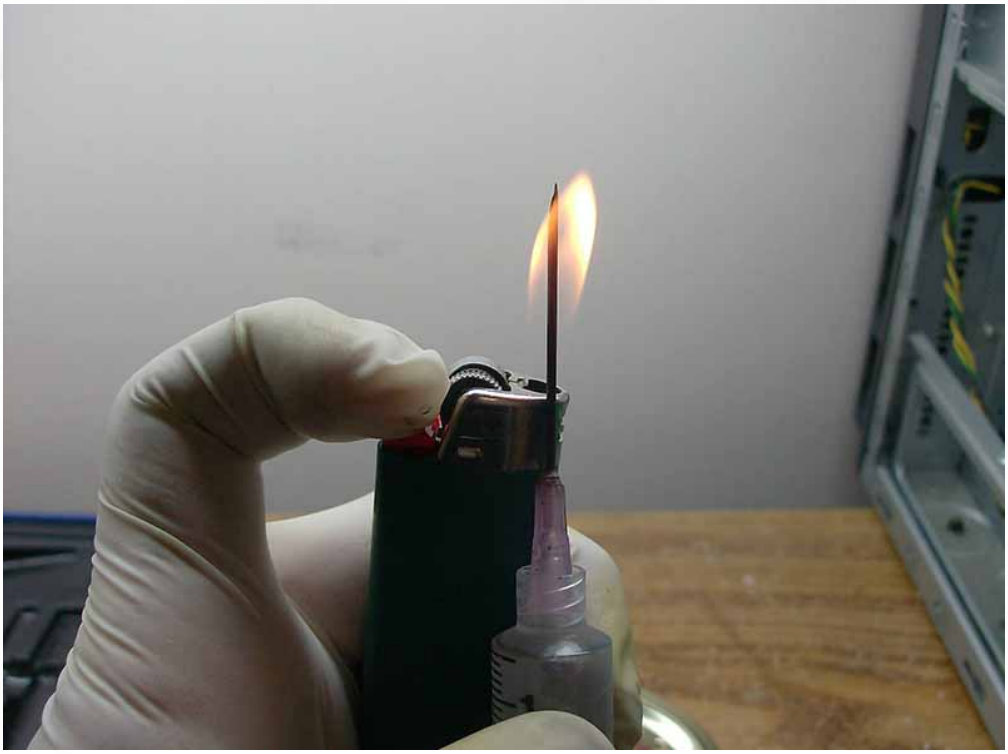
Sterilizing

Now you want to take you PC (or pot with a tight fitting lid) and fill the bottom of it with jar lid rings and tin foil this is to keep the bottom of your jars off the bottom of the PC/Pot so they don't burn. Some PC's come with trays to keep the jar already off the bottom use that if you can. Once that is done put the jars into the PC/pot and fill it with cold water just almost to the bottom of the jars. Now put on the lid of the PC/Pot and put the heat on High. Once the rocker on top of the PC starts to rock turn the heat right down to just keep it to a slight rock and start your 60 minute count down. If you're using a pot once it come to a boil turn it down to a slight simmer and start your 90 minute count down. After the 60(PC) or 90(Pot) minutes are up turn off the heat and walk away let them cool down over night or for 8 hours.



Inoculation done right

Once the jars are cooled down put them in a draft free room along with the 70% Iso, Lighter, spore syringe. Make sure the rooms windows are shut and AC or heater turned off. Wash your hands and arms really good. Now put of the gloves and mask. Take the foil lids off the jars you won't need them anymore. Now rub your hand down with the 70% ISO wait a few seconds for it to evaporate. Now shake the syringe really well, using the lighter heat the needle of the syringe till its red hot now proceed to inoculate the jars using a 1/4 cc of solution per hole inoculating towards the glass. That's 1 cc per jar. After every jar heat the needle back till its red hot and repeat.



Incubation done right

Now put the jars away in a closet of shelf at room temp they will start to colonize in a few days. Keep an eye on them every 4 days or so. Once they appear to be 100% colonized let them sit for another week to consolidate.

Birthing and dunk

Once the cakes are finished their 1 week consolidation it's ready to get them out of the jars. Open the jars get rid of the dry vermiculite layer now slap the jars (upside down) onto a wood cutting board or counter top, trying to coax the cakes out of the jars. Once out rinse them off and submerge in cool water for 24 hours making sure they stay submerged. After 24 hours rinse them again and now roll the cake in dry vermiculite making sure to cover the cake well tops and bottoms.
I find busting up some of the verm for the dry roll up alittle finer helps.

Fruiting done right

Build one of these Shotgun terrarium.

I personally use a PMP.

Mist your cakes 3-4 times a day and fan right after, fan 5-6 times a day. Water evaporating off your cakes is a major pinning trigger. Give them a 12/12 light schedule using a 6500K Florescent bulb (daylight or cool blue). Once they have pinned and grown and all picked, dunk them for 24 hours again this time no dry roll in vermiculite and put back in the Shotgun Fruiting Chamber.

Good Luck

Tips

Gypsum really helps the development of the fruit bodies I recommend using it.
Room temp 70-75 is perfect for incubation and fruiting.
There's no need to keep the dunking cakes in the fridge.
Mist and Fan Mist and Fan.
Use short wide mouth 1/2 pint jars.
Dont cover the lids after inoculation with anything example, foil/tape.
Give them love.

Results in this Golden Teacher.

This was 2 cakes first flush, came just under 19 grams dry. Oak Ridge.

Heres another set of cakes.

Results may vary.

Sterilizing a syringe

Here is a How to on sterilizing a syringe to make up a spore syringe.

How to sterilize a syringe with just a pot water and syringe.

Thing needed.

- A pot
- Empty Syringe
- Water (tap can work)

Fill the pot with cold water. Turn the burner on High and wait for the water to come to a full boil. Now start a 10 minute countdown and keep the water at a full boil.

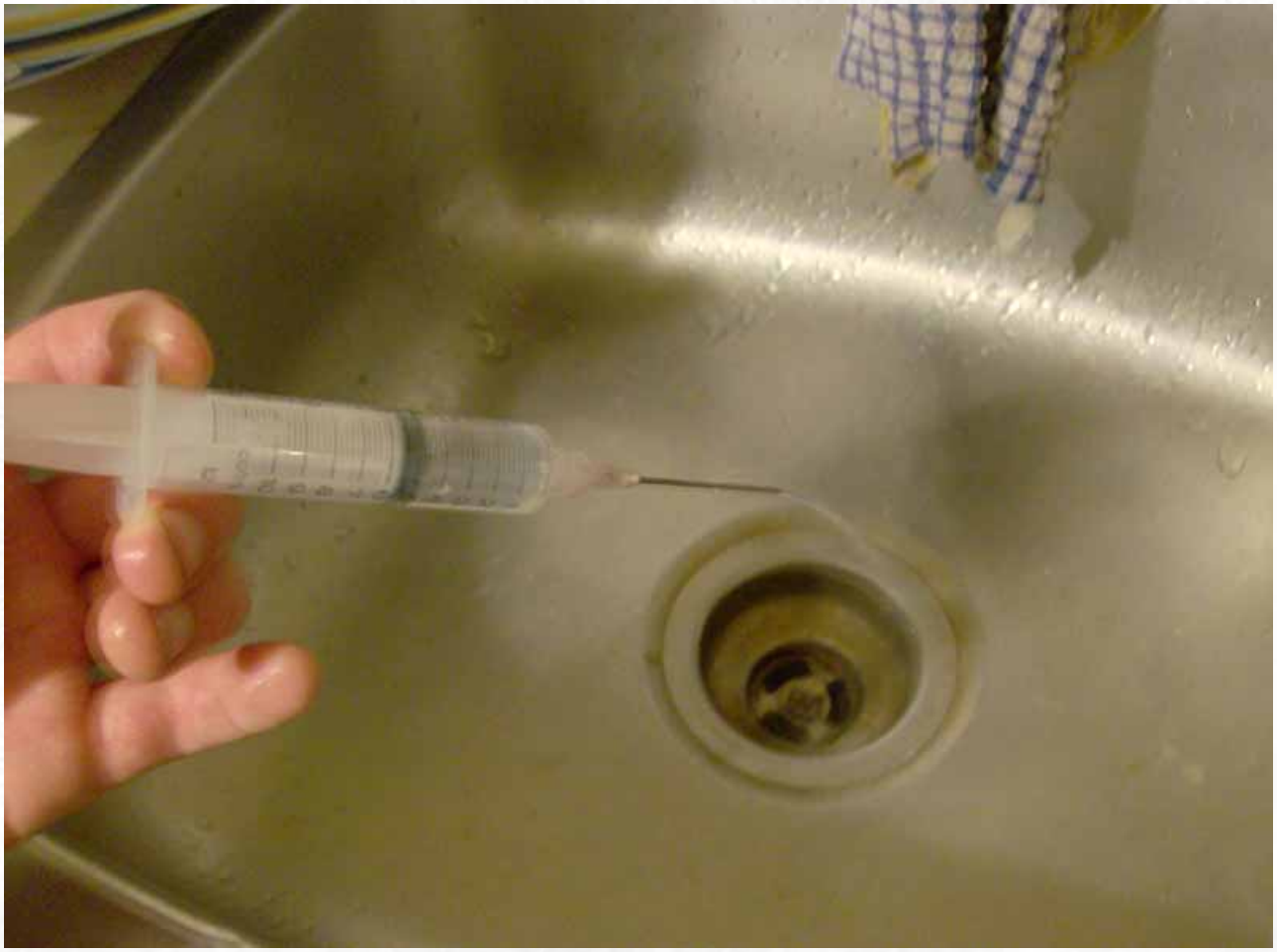
After 10 minutes take the empty syringe and suck back the boiling water and let it sit in the syringe for 1 minute then expel the water in a sink (not back in the pot).

Repeat 4 more times on the last time keep the water in the syringe cap it and let it cool down.

Hope this helps.


HI
HI


Hotpoint




SINGLE USE ONLY

Notes:
Use a Q-tip and 70% alcohol to clean the inside of the cap.
I have found even after months and months they will stay sterile.
No need to store in the fridge.
Never try to cool them down fast in the fridge.

Table of Contents

PF-Tek F.A.Q (Shroomery)

Recipes through Inoculation

original source: http://www.shroomery.org/8515/Recipes-through-Inoculation

What is a PF cake?

A "PF cake" is named after its "creator", psylocybe fanaticus.
It is a mushroom growing substrate prepared of brown rice flour (BRF), vermiculite, and water, spooned loosely into a glass 1/2 pint jar, and inoculated with a spore syringe.
It is often referred to as the "PF style," "PF method," etc. Generally these terms refer to the substrate recipe and the style of inoculation (the creation of the colonized/colonizing substrate).
Please refer to the Basic Cultivation Guides for detailed overviews of the "PF" method, including substrate recipes, inoculation methods, colonization parameters, and the like.

What is the point of each step in the recipe?

PLEASE read the getting started Q&A before reading this overview, otherwise it won't make sense!

Using 1/2 pint mason jars.
1/2 pint jars are ideal for the PF-tek for various reasons. First and simply, they have been "tried and true" for quite a long while now. But, there are better answers than that, of course. Glass jars have been used for the (edible) mushroom cultivation for quite a while, for spawn production as well as fruiting. Glass jars are easily sterilized, as they can be safely autoclaved/pressure cooked/boiled without damage to the jar, and while maintaining internal water content of the jars. The 1/2 pint size is ideal as well, since jars can "finish" colonizing within 3-4 weeks. The reason why this is ideal is because you want the substrate to colonize as quickly as possible - so it can ward off any potential contaminants that may settle in the substrate through a vector you have not discovered, through inadequate sterilization of the substrate, etc.
Using 1 pint jars or larger with the PF-tek means the time to colonize is increased to a point where it is no longer worth it when weighing in the added colonization time as well as the additional risk of potential contamination (in its slower colonization times). It is more generally regarded as "the law of diminishing returns." There have been reports of successful PF-tek recipes used in 1 pint jars, but this is the exception and not the norm. Glass also serves a utilitarian purpose - you are able to see the progression of the mycelial growth (and any possible contaminants as well). Glass cups can also be used, but are not as "plug and play" as mason jars are. They also don't seal as well. But, mason jars can be hard to find in some areas, and their substitution can be necessary for the PF-tek.

Using 1/4 cup BRF, 1/2 cup vermiculite, and 60ml water.
To adequately colonize, mycelia needs food, water, air, and proper temperatures. The brown rice flour is the "food", and the vermiculite makes the entire mixture airy enough for air to reach throughout the substrate (and hence, all the mycelia forming in the middle of the cake that you can't see). So why not up the food, and make colonization quicker? Because, too much food can be a bad thing. The "food" which mycelia loves so much also attracts contaminates, and more food means more of a possibility of contamination. And if mycelia likes air, why not increase the amount of vermiculite in the mix, making it more airy? Once you mix a batch, you will see that the recipe as provided is about as "airy" as vermiculite will get in the mixture. Also, the addition of one element will mean less of another. Water content should also be kept as close to the ratio provided as well. Too much water and too little water both can slow the colonization of substrate to a halt. Plus, too much water will make the mix pasty and muddy - so that the mycelia will have a hard time colonizing through it.

Using a dry vermiculite "seal" on top of the substrate.
The vermiculite seal has 2 purposes.

- It stops airborne contaminants from settling on non colonized substrate.
- It also acts to provide some air exchange to the jar.

Air exchange can boost the rate at which mycelia grows, so it is important to have some measure of fresh air passively able to reach the substrate. Also, mycelia and mushrooms create CO_2, while using a small amount of O_2. Allowing for some gas exchange can help speed colonization. Many people whose PF jars have slowed "flip" their jars, so that the lid is on the bottom - which allows for more air to circulate to the non colonized bottom of the PF cake (the top part generally colonizes more quickly than the bottom).

Lift the jars up from the bottom of the pot.
The heat from the burners on the stovetop transfers directly to the bottom of the pot, which transfers the concentrated heat to whatever is sitting at the bottom of that pot (your jars). Lifting the jars by placing them on the cooking rack that comes with the pressure cooker, or placing a washcloth on the bottom of the pot, will create a more even disbursement of heat. This means the bottom of your jars won't be "cooked" by the heat emanating from the burner. Remember, you're sterilizing by steaming the jars, not by cooking them. A jar whose bottom has been cooked will oftentimes not colonize on the bottom, as the resulting overcooked cake becomes hard and impenetrable for mycelia. Overcooking can also occur if your water level runs too low, so be sure to maintain water in the pot for the entire sterilization time. AND DO NOT ADD COLD WATER TO THE BOILING JARS, otherwise they will crack and be unusable.

What is the difference between brown and white rice?

The difference between brown rice and white rice is not just color. A whole grain of rice has several layers. Only the outermost layer, the hull, is removed to produce what we call brown rice. This process is the least damaging to the nutritional value of the rice and avoids the unnecessary loss of nutrients that occurs with further processing. If brown rice is further milled to remove the bran and most of the germ layer, the result is a whiter rice, but also a rice that has lost many more nutrients. At this point, however, the rice is still unpolished, and it takes polishing to produce the white rice we are used to seeing. Polishing removes the aleurone layer of the grain - a layer filled with health-supportive, essential fats. Because these fats, once exposed to air by the refining process, are highly susceptible to oxidation, this layer is removed to extend the shelf life of the product. The resulting white rice is simply a refined starch that is largely bereft of its original nutrients.

Why do we boil the jars of substrate?

We boil the jars in order to sterilize them in order to destroy all forms of life in the jars. (molds and bacteria, spores and bacterial endosporse). This is done, so we can inoculate the now sterile substrate with the desired fungus.
These organisms which live in the soil, in water, etc. can invide and digest a food source like the one we are providing with the PF-tek recipe. This we call contamination.
Boiling water reaches a temperature of 212° F, which is adequate to kill molds and spores which may reside in the water, vermiculite and the brown rice flour.

Can I substitute any ingredients in the PF recipe?

Vermiculite:
Coco coir has been tested as a replacement for vermiculite in the PF-tek substrate, but it colonizes more slowly and is more apt to contaminate than vermiculite is. It needs to be sterilized longer. It performs poor in comparison with vermiculite.
Perlite holds far less water than vermiculite, you will to lower the water content. It has been used, but the results pale compared with vermiculite.
Grow wool (a hydroponic medium) has been shown to work:
By Starter:
"An alternative (in my fun so far) is growool. It's 100% inert and pH neutral.

It's a glass fiber material. Same as insulation, but pH neutral and horticultural grade i.e. contains no fire retardants like monoammonium phosphate.
Holds 1/3 more water than vermiculite.

Colonises much the same as standard PF vermiculite cakes. Just pack it loose, as you do with regular PF vermiculite cakes -- a high air filled porosity profile is a must in any cake.
The top layer can be growool too. 100% vermiculite free cakes. Can be dunked after birthing like a regular

cake. They weigh noticeably more."

Brown Rice Flour:
Dark rye flour has been reported to have favorable to excellent results when used to replace BRF (1:1 ratio) in the PF-tek, also other ground grains can be used like ground millet or ground millet based birdseed. Also corn flour. Wheat flour is not as good since it makes the substrate very greasy and clumpy, difficult to mix.

Water:
In addition to any water suitable for human consumption (including mineral water) clean water from natural sources (river, pond) can be used.

What are the different ways to sterilize a PF jar?

You can sterilize the jars by boiling (steaming) them in a pot with boling water or using a pressure cooker which guarantees a better sterilization.

What precautions should I be aware of when inoculating?

In the open air, you should take care to be as clean as possible, as the air itself contains contaminants which would love to colonize your lovely PF substrate and kick your mycelia's ass. So, spray an anti-bacterial spray in the air around you, work as quickly and efficiently as possible, and be sure the only thing that touches the needle is the substrate, which is sterile (if your procedures are correct). You do face the off chance of a contaminant landing on the needle, which is then introduced to the sterilized substrate. When using a sealed glovebox or flow hood, there is minimal to no chance of contamination through inoculation procedures. Basically, the more time and effort you put into keeping your procedure sterile, the less chance you will encounter of contamination.

****NOTE**** Open air inoculation is never recommended. Spend the time to make yourself a glovebox and follow sterile technique. You will have much better results.

Is is it ok to use the syringe right out of the fridge or should it warm up some?

It's ok to use it right out of the fridge.
The small amount of the inoculum warms up to the substrate temperature immediately upon inoculation.

Just remember to shake up the spores, and flame sterilize the needle red hot before inoculation.

How much spore suspension from my spore syringe should I use?

PF recommends using 1ml per jar, which, for 4 holes is $^1/_4$ ml per hole. The more spore suspension you have, the quicker colonization will occur. But, that's not to say that using an entire syringe will make your jars finish in a week. It just means that using more suspension will make the initial colonization of mycelia occur more quickly, which *may* mean it has a better hold against potential contaminates. But, using too much spore solution can be detrimental - as is upsets the water ratio balance within the jars. Too much water is not good, and can actually hinder growth by making the rice flour too "pasty" to be colonized effectively. Also, using more spore suspension means it is less cost effective in the long run - $^1/_4$ ml per hole means 10 jars, while 1 ml per hole means 2.5 jars. Economically speaking, and especially if you buy spore syringes and not make them, it becomes less and less cost-effective for using more solution (to eventually achieve the same result). $^1/_4$ ml per hole will result in colonization, given that all of the parameters are met. So, using anywhere from 1ml - 4ml per jar ($^1/_4$ ml - 1ml per hole) should be safe.
Remember, some times less is more.

How long should the jars cool before inoculating?

Jars need to cool before inoculation because spores are killed by excessive heat (such as the temperature inside a PF-tek style jar after being boiled for 45 minutes to an hour). So, you need to let the jars cool on their own, preferably for at least 6 hours, and hopefully overnight. It is recommended to cool jars directly in the pot in which you boiled them, since this will reduce the chance of airborne contaminants landing on the lids of your jars (contaminants can't land on jars that are kept cooling in a covered pot). A jar cool to the touch may still be too hot inside for spore life, so do not judge the internal temperature of the jars by touching the glass. And do not open the jars for obvious reasons. FINALLY, DO NOT COOL JARS UNDER COLD WATER OR IN THE REFRIGERATOR. Cold water/air + hot glass = cracked glass and unusable substrate. Trust us on this one, the glass WILL break if made too cool too quickly. A mantra in this hobby - "patience, young jedi."

What methods are there to inoculate PF jars?

PF jar ingredients, once sterilized properly, are completely sterilized inside the sealed jar. So you do not want to introduce any possible contaminants to the jar from the outside -in.
The PF-tek provides for inoculation using a spore syringe guided through the pre-stamped holes in the lid and directly into the substrate. Since you would not want to open a PF-tek jar (and risk airborne contaminates), this is the most foolproof way to inoculate PF jars. Now, if you had a sterile environment, such as a glove box or flow hood, you could simply open the sealed jar and inoculate with a spore syringe directly onto the substrate. But, there would be no point in this - as inoculation of the substrate is achieved by using a spore syringe.
You should not attempt to scrape a print directly onto PF-tek substrates. First, the spores may not rehydrate themselves adequately using the moisture content in the substrate, and hinder colonization. Second, opening the lid of the jar defeats the purpose of the PF-tek - to create a completely sterile environment within the glass jar. Opening a jar in a glove box or a flow hood would also render pointless, as you should have a vermiculite seal to ward off contaminates - spreading spores on the dry vermiculite layer will produce nothing (vermiculite is non nutritive and should have very little water in it - eliminating the requirements for colonization).

Can I use coarse grade vermiculite for substrate?

Yes, you can. Both types, the finer type, individual particles measuring around 1-2 mm, and the coarser type, with particles measuring around 5-8 mm are suitable for substrate.
The coarser type will hold a little less water, so make sure to adjust the amount of water used.

Does fine vermiculite hold more water than coarse?

It has been a consent among the users of the PF-Tek, that the fine vermiculite can hold more water than the coarse variety. I wanted to quantify this, and made a test:
120 ml of vermiculite were measured, weighed and then water was added to it until the vermiculite was saturated. (according to the PF-Tek for Simple Minds).
The 2 varieties used are the ones in this photo:

Test results:

Fine variety:
120 ml vermiculite, weighs ***14*** g, can hold **54 ml** water.
Coarse variety:
120 ml vermiculite, weighs ***14*** g, can hold **46 ml** water.

As you can see, the water holding ability varies **considerably** between the 2 varieties. If you don't take this into account when preparing substrate, it will be either too wet or too dry.

Should I sterilize the needle, and how?

When you buy a syringe from a vendor, most vendors attempt to keep the needle as sterile as possible when they create the syringe. When you create the syringe yourself, you also should try to avoid contamination of the needle (which can occur as easily as handling the needle with unclean hands, etc.) Syringes can and do leak as well during shipment through the mails, leading to spore water dripping on the needle and in the needle sheath. That being said, it is probably a good idea to sterilize your needle before inoculation.
Flame sterilizing is just that - applying an open flame to a needle until red hot. This method will kill any spores that may be inside the needle (the 1.5" space between syringe and tip of the needle), so take that into account when inoculating your jars. Flame sterilization also may lead to a char build-up on the needle (a blackening of the metal's surface), which is attributable to using a butane lighter (bic lighters, etc.) The char can be avoided by using a "torch" style lighter. Remember, when using flames, use common sense. The needle will be hot after, don't touch it and let it cool before inoculating.

You should sterilize the needle between each jar. This is advised as it helps stop cross contamination.
After flame sterilising, you can let one or two drops out of the syringe to cool the needle down before inoculation.

What recipe should/can I use for PF cakes?

The basic PF recipe is 1/4 cup brown rice flour (measure the flour itself, not the brown rice if you grind it yourself), 1/2 cup vermiculite (fine is prefered), and 60ml (4 tablespoons) of water per jar.
For 5 jars, you use the 2:1:1 recipe. Thats 2 cups of verm, 1 cup water, and 1 cup of brown rice flour. 1 cup is 240ml.

Depending on the vermiculite used, the amount of water needed can vary. To prevent a overly dry or wet mixture you can prepare the substrate this way:
Put the required amount of vermiculite in a bowl (all at once, NOT for each jar separately!). Use a spatula or spoon to mix in enough water to saturate the vermiculite to the field capacity, mix well.

The field capacity is reached when a small puddle, barely visible, forms at the bottom of the bowl when you tilt it. Then add the appropriate amount of BRF and mix together. (This works best if you use 1/2 cup vermiculite and 1/6 cup BRF per 1/2 pint jar).
The idea is to coat the wet vermiculite particles with the dry powder as you stir the mix with the spatula.

Can I mix different cubensis strains in a PF cake?

Yes, you could.
But there is not really a reason to. Most likely one strain will prevail, if you inoculate the jars each on 1 side you might get 2 strains fruiting from 1 cake.
But in general it's better to inoculate each jar with its own strain.
Besides, when it comes to harvest time and you want to make your own spore prints, you wont know what they are. And no they wont be a new strain you created. Its a whole lot more complicated than just that.

Can I use a non-organic brown rice flour or white rice flour for the substrate?

The amounts of pesticides in anything sold for human or animal consumption are so minute that they don't affect fungal growth, especially not the one of higher fungi. The pesticides used in grain cultivation are mostly highly specialized herbicides and fungicides (for molds).
White rice flour *can* be substituted for brown rice flour, but healthier and faster growth has been observed with brown rice flour.
See also What is the difference between brown and white rice?

How many jars will a spore syringe inoculate?

A spore syringe containing 10cc of spore-water suspension can be used to inoculate around 10 jars.

Common mistakes

This document will briefly touch upon the common mistakes made by newbies when using the pf tek.

Note: One of the biggest reasons people fail is because they skip steps or change this or that in the tek. Some parts of the process are concrete and others you can experiment with. It is best to first come to grips with the process before innovation :)

Did I make a poor choice of jar?
A wide-mouth half-pint (~234ml) is recommended for vermiculite and brown rice flour cakes (PF TEK). Larger jars will take longer obviously and with Vermiculite BRF this could lead to contamination.

Is my mixture too wet?
You must gradually add water until saturated, then add the flour. If you saturate the mix too much, either add more substrate to account for this or alternatively microwave for a minute or two uncovered.

My mixture is not airy/looks like sludge?
Use large chunk vermiculite, and don't shake or compress the substrate by squashing it down. You will learn throughout the process that fresh air is important to healthy mycelium growth, the more you pack the substrate the less air is available to it.

Water gets in during sterilization?
Make sure to cover your jars with foil! Don't fill your pressure cooker up too high; most pressure cookers only require about an inch of water for more than an hour of cook time.

Incomplete Sterilization?
Give it an extra bit of time to be sure. A stitch in time saves nine. If you are forced to sterilize at a lower setting, always add more time. Remember, if using a pressure cooker, read the directions! If they are not available, a general rule is to let the cooker come to pressure, then start your timer;)

Inoculating Too Soon?
Let the jars get to room temperature after boiling/pressure cooking. Mycelium has a thermal death around 106°F (41.1°C). Your hands are not great temperature gauges, so do not inject until you are absolutely sure they have cooled.

No pins even 10 days after birth?
Check your three triggers (light, temp, air exchange) and inspect for contaminations and pests. And make sure you have a pinning strategy! Try to control every factor and you will succeed.

The 86-degree myth
Too often I see people posting that they keep their jars at 86F and are having problems. This is because 86F is too warm for jars.

The explaination - the original experiment was done on agar plates. Growth was measured at different temperatures, and it was found that the mycelium grew fastest at 86F.
The problem is, that was in an agar plate and not a jar. On the flat plane of mycelium in the agar plate, temperatures remain constant. In a jar environment, the interior of the jar becomes warmer than the exterior due to heat generated by the growing mycelia. So if you keep a jar at 86F, the interior of the jar could get to 90F and above, more if the jars are stacked tightly.
Keeping the jars between 70 and 75F avoids this overheating, and produces the best results in jars.

How long will my colonized jars live?

Ideally you should schedule your grow so you are able to birth your cakes a week after 100% colonisation.
If you wait too long the cakes will begin to dry out and sometimes fruit in the jars, diminishing future yields.
In a pinch you can wait up to a week or two extra, but any longer may lead to stunted flushes. If you're going to invest the time and money in growing mushrooms, it is recommended that you plan to be available so you can attend to your setup.

Incubation through Birthing

original source: http://www.shroomery.org/8516/Incubation-through-Birthing

How long does it take to see signs of mycelium growth?

First mantra of the hobby - "Patience."
Germination can occur as early as 2-3 days, but it may take up to a week or more for the first signs of germination to show.

Please note that some have had to wait up to 3 weeks to see growth in some jars.
It depends on a multitude of factors - some of which are: temperature, substrate, spore concentration, age of the spores, etc. There are so many different relevant factors it is very hard to determine within the 1st 2 weeks why you have not shown germination. Give it at least a week before you worry, and at least 2 weeks before you panic. All you need are 2 spores to germinate and take over the entire jar - and luck is on your side when proper procedures are followed.
Please be patient and do not panic after only 2 days, no matter how fast you've read other people's colonization was. Their setup, factors, everything varies just slightly from yours. Now, after a period of time with no germination, analyze all of the possibilities (such as temperature, water content, sterilization procedures, etc.) that would hinder growth. This is your best bet on learning the life cycle, and also learning the peculiarities of your personal setup (as far as variations go).

How important is gas exchange during the colonization?

Shroomery thread: How important is gas exchange during the colonization?

There's rust on the lids of my PF jars, is that okay?

Don't worry, a little rust won't do any harm.

How come my jars started growing mycelia, but for some reason have stopped?

Mycelia can stop or slow to a halt for various reasons. Some can include: drying of the substrate, an overly wet substrate, internal temperatures in and out of the recommended ranges, substrate that may have been "cooked" by direct heat during the sterilization process, etc. Generally, the bottoms of jars colonize much more

slowly than the tops. So if you have slowed growth around the bottom/bottom sides of the jar, an easy method to help kick-start the mycelia is to "flip" jars. Simply place them on their lids, resting on the dry vermiculite layer. This should act as a vacuum, forcing CO_2 out and fresh O_2 in the jar (as CO_2 can build up in jars). The cake will slide down, forcing air out and, by the laws of physics, drawing it back in as well. (Can't have a negative space of air, the jar itself is not sealed). Other factors that are not so easily "cured" are the ones listed prior. Generally, you cannot add materials to colonizing substrate without risking contamination by opening the jar/breaching the vermiculite layer. Avoid these possibilities by mixing your substrate as evenly as possible (to avoid over-/under- water content), keeping the jars incubating in a not too dry environment, keeping the jars stored in a warm area (not hot, not cold), and also making sure water does NOT splash on your jars if you elect to boil to sterilize. Water splashing into the jars can make them too wet for the mycelia to colonize.

How long does full colonization take?

Full colonization of a PF jar can take anywhere from 2 to 5 weeks, depending on your own factors. It can vary widely, so don't use these as scripture when evaluating your own setup. A good rule of thumb to determine full colonization is the time it takes for all the sides of the jar to become covered with mycelium, and wait 1 week after the outside is fully colonized. This will allow for the inside (which has less access to CO_2 release/fresh air) than the outside layer does, and takes longer.

What if I need to birth before the jar is fully colonized?

There are many reasons why you shouldn't birth a jar before it is fully colonized. Non colonized substrate outside of the sterile mason jar environment is very susceptible to contamination from outside, and should be avoided at all costs. Don't birth cakes that aren't fully colonized because the other jars you have are already done. (Remember: "patience".) If you do deem it necessary to pre-birth (there really isn't a very good reason; there are reasons, but more often than not the one you may have is not a good one) it is possible. Birth the cake, and remove the non colonized substrate from the colonized part of the cake with a sterile instrument, like a spoon. Be sure and remove all of the non colonized part, otherwise the colonized part becomes more susceptible to contamination when the non colonized part becomes contaminated.

Is condensation inside the incubating jars harmful?

To some extent water vapor condensing to small drops inside the jar is normal. As long as the condensation isn't so strong that the water begins to accumulate at the bottom of the jar, there's nothing to worry.
If you experience excessive condensation, the incubation temperature might be to high, also try to use a tad less water with the recipe.

What are those little brown/red dots pushing into the glass of the jar from the cake?

Those are pins, and are good things. They look like "red headed worms". PF has some nice, illustrative pictures of what primordia (pre-mushrooms) look like.

What if I can't get the cake out of the jar in one piece?

If you are growing from cakes, it is best to remove the entire cake in one piece. This is why "tapered" mason jars (the types detailed on PF's page) are better than straight or shouldered jars. If you are crumbling your cakes to inoculate a bulk substrate, you can simply use a spoon to remove pieces of the substrate - this will serve as your crumbled spawn.

What if I can't get all the vermiculite seal off of the cake?

The vermiculite seal doesn't need to be totally removed. It can be attached to the cake when growing from cakes.
What ever comes off while birthing, rinsing before the dunk, during the dunk, and the rinse after the dunk should be just fine.

What is "birthing," and how do I do it?

The term "birthing" refers to the removal of the fully colonized PF cake from its glass jar. This can be achieved very simply. If you are going to keep the cake intact (growing as a cake) be sure to be careful and not break the cake (its hard to break if it's fully colonized, so don't be too gentle). You'll need a fork (or something to scrape the dry vermiculite layer off with), a wastebasket, and perhaps a large ziploc bag. Unscrew the jar lid, and turn the jar upside down (on its lid) while supporting it with your hand. The cake should slip down and fall onto the lid being held by your hand. Slide the glass jar off of the cake. Remove the excess vermiculite into the wastebasket, and handle the cake as little and as gently as possible. Overhandling can cause a bruising and bluing of the mycelium. Alternately, you could birth the cake into a ziploc to reduce waste - unscrew lid, place upside down lid and jar in bag. Simply open the jar up in the ziploc, where all of the vermiculite and excess will fall into the bag - instead of having to hold it over a wastebasket.

Which way should cakes be birthed, vermiculite side up or down?

They are birthed the vermiculite side down.
This way they can be birthed without handling them and risking contamination through dirty hands.

See also CHAPTER 3 - THE BIRTHDAY CAKE.

Birthing through Harvest

original source: http://www.shroomery.org/8517/Birthing-through-Harvest

What is an easy way of humidifying my fruiting chamber?

Probably the easiest way is using a layer of moist perlite at the bottom of the fruiting chamber along with manual fanning several times a day.

Read more about using perlite in conjunction with a Shot Gun Fruiting Chamber here.

What conditions are optimal for pin formation?

The relative humidity should be from 95%-100%, temperature between 70°F and 75°F, the fruiting chamber should be vented 2-3 times a day at least to displace the CO_2. They should receive 12 of hours of either indirect sunlight or fluorescent light.

What are the optimum conditions for a cake to fruit in?

Cakes like and need a high humidity environment, however it is provided. You need about 95% RH (relative humidity) for cakes to produce optimally. They need more humidity because they do not produce as much RH themselves (as casings and bulk runs do), and because you cannot easily supplement their moisture content (without having some inner reservoir or wet vermiculite on top and bottom). The humidity must be provided either by means of a passive humidification like moist perlite or clay in a sealed terrarium or an active humidification like a setup where fresh moist air is provided by a cool mist or ultrasonic humidifier.

The appropriate fruiting temperatures for *Psilocybe cubensis* (TMC) are 74 -78 °F but temperatures as cold as 68 should work out.

Can a PF cake become contaminated after birthing?

Yes, it can. The most frequent contaminant to encounter at this stage is green mold and it seems to happen more often if the cake wasn't colonized throughout, the cake was already contaminated during the incubation phase or if the cakes are handled at birthing with dirty hands or tools.

Usually though the cakes only contaminate after a few flushes when they are exhausted.

Make sure to separate a contaminated cake from the others as soon as possible and to discard it outside of the room you use for growing to prevent the mold spores from spreading.

Why do my cakes get fluffy mycelium growth and delayed pinning after birthing?

Lack of fresh air exchange. Fan more.

What do primordia/pins look like? I don't know...

The growing of the mushroom from the cake starts as a tiny accumulation of mycelium, called hyphal knot, which then develops to primordium, and this further develps to pinheads.

In the picture of a casing surface underneath, the primordia are the small white bumps scattered across the casing surface, and the pinheads can be seen bottom left and bottom middle. They already have small brown caps.

How long does it take for a pin to grow into a fully grown fruitbody?

It takes anything from 2-5 days for a *Psilocybe cubensis* pin to mature. This depends on the strain, substrate, humidity and temperature.

Why is there mycelium growing on the stems?

Lack of fresh air exchange. Fan more. Generally it doesn't do any harm. You can try to lower the humidity a bit by providing more fresh air, but in general the condition isn't something you should be too concerned about.

When should I harvest?

Harvest can occur when the veil breaks, up until full maturity when the cap becomes almost convex and already drops its spores.
You should wait this long if you want to take spore prints.
There are conflicting reports as to when to harvest the mushrooms for highest potency.
Some reports suggest that the mushroom reach their peak potency right before the veil breaks. Others report the potency of full grown mushrooms to be the best.
There is no real evidence though for either of these claims.

How do I recognize an abort?

Aborts are fruitbodies that for some reason cease to grow and never reach maturity.
They can be recognized by their blackish heads and the fact that they stopped growing at some point. Still they are good to use unless they are rotten.
When the cap is roten, it is very soft, sometimes smelly and detaches very easily from the stem. If the aborts are in such condition, discard them.
Allways pick all aborts after a flush is over.
The aborts in the picture are still good to use.

What is the "dunk tek"?

The cake is dunked [or dunked2] in water overnight to rehydrate and enable bigger and more flushes.

How much does 1 PF cake yield?

This question cannot be answered accurately because it depends on a number of factors including - but not limited to - the recipe used, the mushroom strain, enviromental conditions and luck. If you absolutely must have an answer, a PF tek fruited directly can yield anywhere from 3-7 gram dry per half pint cake. Yield can be increased by using the PF cake as spawn or by crumbling it up and casing it.

Why do cakes and bulk substrates require different humidities?

Cakes have no casing to keep them from drying out! That is the only reason they need a higher humidity then bulk substrates during the MATURATION stage of mushroom developement.
Both need a high humidity to form PINS. But pins require a good evaporation rate to mature. This is why the humidity is lowered after buttons have formed with casings. Ideally, cakes should have there humidity lowered below 100% also during the Maturation stage, but NOT at the expense of cake moisture content. You can't have them dry up.
The humidity reccomendations are ranges! 95 for pinning, and anything below that for fruiting. Fruits will develope alot faster at 85% humidity then at 90% humidity, but only if casing moisture content can be maintained.
It is the difference between mushroom moisture content and air moisture content that enables mushroom expansion. It is a concentration gradient, from high to low. As the surface area of the mushroom increases with maturation, this process speeds up.
If you are growing with cakes, cover them with wet vermiculite, and allow the humidity to drop a little during the maturation stage. Don't keep it at 100% at least get it down a little, your mushrooms will get larger, and they will grow faster.

What is "Dunk and Roll"?

This is in no way meant to take the place of casing but it can help cakes put out a little more for those who don't want to case or are just starting out.
Take a fully colonized cake and do a dunk [or dunk2] before birthing. When done dunking simply roll the cake in dry vermiculite, or coco coir. Use a mister and mist the dry vermiculite or coir till it's moist.
This allows the cake to fruit from all sides a little easier.