Growing Mushrooms with your ei2o Mycelerator & Starter Kit

Version 1.3 - 2/16/2023

Introduction

Mushrooms are fantastic!

They're good to eat (Maitake, AKA "Hen of the Woods"), great for your health (Lion's Mane, a popular nutraceutical), and bizarre (Cordyceps, a parasite that grows in insects).

This tutorial for ei2o's Mycelerator Fruiting Chamber and Starter kit describes an easy way to grow mushrooms directly from cooked organic rice bowls that you get from your grocery store.

The pictures of mushrooms shown in this tutorial are Oyster mushrooms, but a wide variety of mushrooms can be grown using the approach described in this tutorial. We'll take you through the steps that will transform your brown rice into a mushroom harvest!

Let's grow!

About This Tutorial

In this tutorial we go step by step through the process of growing mushrooms.
Sometimes a period of time between steps is needed and will be noted in that step.

Supplemental information has been added to this tutorial to address issues that are not required, but may be useful or interesting. They'll be shown in a box like so:

Mushrooms are members of the **kingdom** of **Fungi**. Other kingdoms are **Plants** and **Animals**. This was established rather recently by scientists in 1969. Before then, mushrooms were considered to be plants. Scientists use the word **Kingdom** to group organisms with similar characteristics.

Some boxes will display an alert signal. These boxes are intended to emphasize a detail in a particular step that may be tricky for some reason. Alert boxes will also o er information that is useful to owners with earlier models of the Mycelerator.

Mycelerators that shipped after Jan 1, 2023, use a humidifier strip instead of perlite to humidify the grow chamber. Follow the instructions appropriate to the version of the Mycelerator that you have.

Things you'll need

This tutorial has been made for beginners.

You don't have to be good with tools, or have a green thumb in your backyard garden.

You don't even need a backyard - just a spot on a kitchen counter or table will do fine.

This course is suitable for families and children learning about and growing mushrooms - as a science project or just for fun.

What we'll do

First, we'll make sure that we have everything we need to start.

Second, we'll grow mycelium, a kind of "root system" for mushrooms (although it's more like a computer network in some ways). We grow the mycelium by adding mushroom spores to a bowl of brown rice.

Third, we take the bowl, which now has mycelium and get it to grow (or "fruit") mushrooms by putting it into a special grow chamber.

Let's get started!

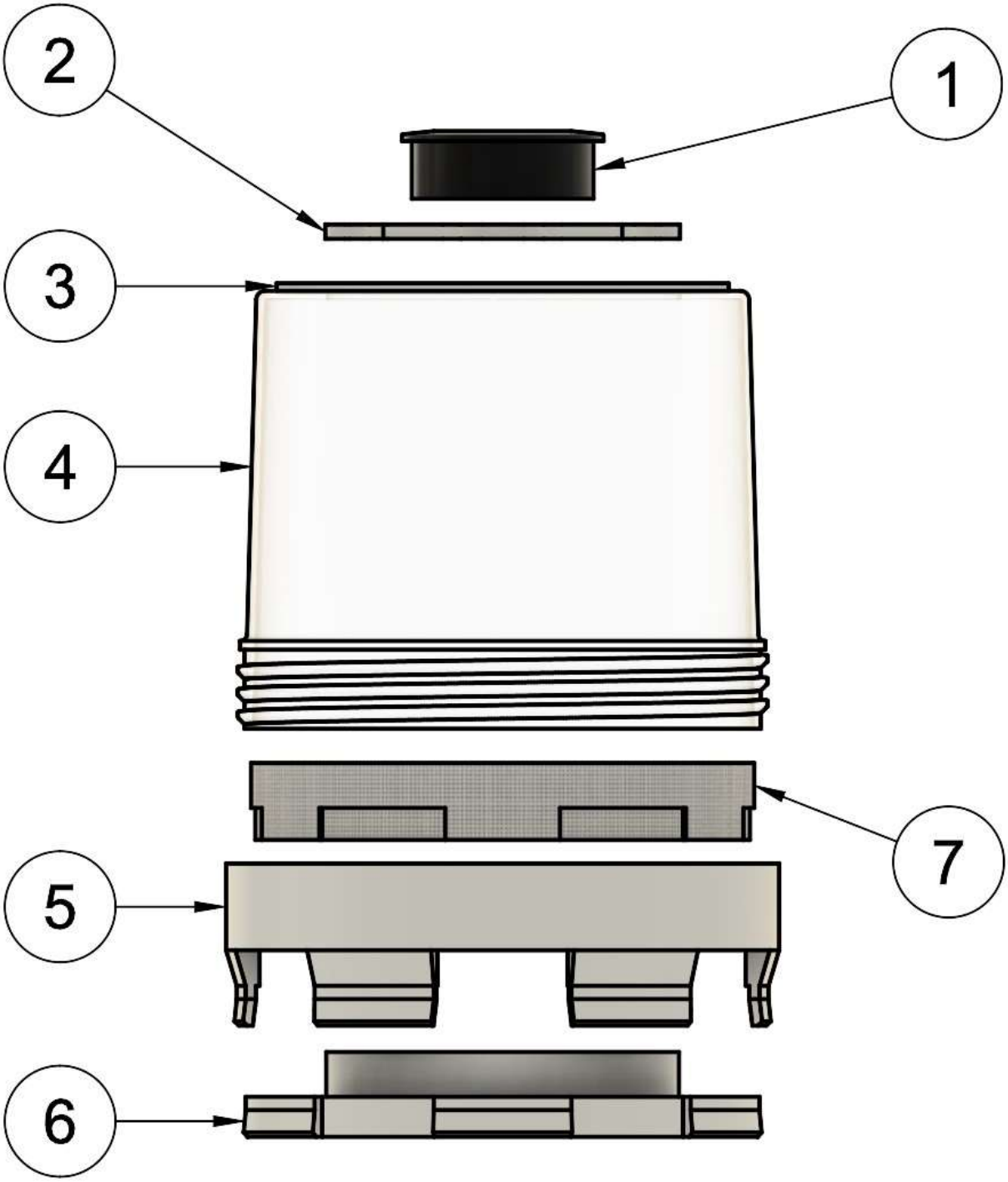
Parts and Supplies

Mycelerator Chamber & Starter Kit

Each ei2o Grow Kit contains the Mycelerator Chamber and a Starter Kit that includes consumable items for each batch of mushrooms that you grow. You'll need a new Starter Kit for each new batch.

Mycelerator Chamber

Mycelerator Chamber. This is a chamber that controls the environment for growing mushrooms. Here's a breakdown of the Mycelerator parts:



Mycelerator Parts

This container is designed to manage mushroom growth in the fruiting phase.

Sensor (1), Vent (2) and Damper (3)

The top center of the Fruiting Chamber has a Sensor (1) that measures temperature and humidity. Surrounding the sensor is a Vent (2) that can be **turned** to adjust the level of air exchange within the chamber. It works with the Damper (3) which is attached to the Fruiting Jar (4).

Fruiting Jar (4), Fruiting Jar Adapter (5), Humidifier Tray (6) and Wick (7)

The Fruiting Jar (4) is where you'll be growing your mushrooms. The Adapter (5) and Humidifier (6) are attached to the bottom of the Fruiting Jar and connect the Mycelerator to the rice bowl described in the Starter Kit below. The Wick (7) is a reusable filtering strip that maintains humidity when placed in the Humidifier (6).

Spray Bottle

The Mycelerator ships with a **spray bottle** so that you can mist your mushrooms regularly as they get closer to fruiting. Use clean water.

Adjusting the Sensor. Turn the Fruiting Chamber upside down so that you can examine the other side of the sensor. You'll see two buttons: an **On/O button** and a button that allows you to **select** whether the temperature is displayed in **Celsius** or **Fahrenheit (°C or °F)**. If the display is blank, use the On/O button to display temperature and humidity.

The Sensor uses a **LR44 battery** that should last you a year or longer. Replacements are available in local stores or online.

Note. **Do not spray water directly onto the sensor or submerge it**, as it will stop working. If this does occur, **dry** the sensor o and remove the battery from the sensor's battery compartment. Once the sensor and the battery compartment are dry, re-insert the battery and use the On/O button to display temperature and humidity again.

Clean the Fruiting Chamber with alcohol wipes between grows.

Starter Kit

The Starter Kit is a package that includes all of the consumable items necessary for you to grow a batch of mushrooms with the Mycelerator. The parts consist of the following items: a **bowl of brown rice**, a **syringe of mushroom live culture**, a **hot stamp** and **candle** to introduce the live culture to the rice, and **microfilters** to seal your bowl for colonization.

1 Bowl of Brown Rice

This is the growing medium for your mushrooms. Each starter kit includes one 7.4 ounce bowl of brown rice. We currently ship either the Nishiki or the Minsley brands depending on price and availability.

1 3mL Syringe of Mushroom Live Culture

Each starter kit includes a syringe of mushroom spores for your grow. Most starter kits include an Oyster mushroom variety, although other types are available. This tutorial focuses on growing Oyster mushrooms. The appendix to this tutorial includes references that will help you adapt your growing procedure for the variety that you choose.

1 Hot Stamp and Candle

This is a tool that you'll use to prepare your rice bowls for infusing them with the live culture.

2 Round Microfilters

These microfilters are used to seal your rice bowl after infusion. We include an extra filter as a spare.

You'll need a new Starter Kit for each new grow. Please see our website at www.ei2o.com for details.

Growing Mycelium from Rice

What you'll do

First we'll grow mycelium. We'll do that by introducing mushroom spores (live culture) to a bowl of brown rice. The spores will colonize the rice bowl by turning the rice into a white block of mycelium.

Add your Mushroom Live Culture to the Rice

Adding mushroom live culture to your brown rice bowl

Place the **rice bowl**, the **live culture syringe**, an **alcohol wipe**, your **hot stamp**, and a **candle** or **lighter** on a clean, flat surface, preferably away from air currents. Your kitchen counter or table should be fine.

Follow these steps:

Place the **rice bowl** in front of you. Orient the position of the **transparent window** to the right side.

Use an **alcohol wipe** to clean o the part of the bowl **opposite** the transparent viewing area of the rice bowl.

Heat your **hot stamp** by holding the metal end above the candle or lighter flame **for around 20 seconds**. Then apply the hot stamp to the rice bowl lid to stamp a hole on the cleaned area. Place the alcohol wipe on top of the hole to keep it sanitized.

Remove the **stopper** from the **mushroom live culture syringe** and **place the tip of the syringe** into the **hole you made in the lid of the rice bowl** (move the alcohol wipe out of the way first). Some vendors include a needle with the live culture syringe for di erent protocols. You won't need it.

Using the syringe, **infuse 3mL** of the **live culture** into the **rice**.

The syringe from our starter kit **holds 3mL, so infuse all of the liquid** in the syringe, then dispose of the syringe. If you're using a syringe from another vendor, examine the side of the syringe to determine how to **only inject 3mL**. Put the stopper back into the syringe after infusing the rice and store the syringe in your refrigerator if you plan to infuse more rice bowls.

Place the alcohol wipe back over the hole when you've completed infusing the rice.

Remove one synthetic filter, wipe it with the alcohol wipe, and place it over the hole.

You're done! Put your hot stamp and candle or lighter away. You should clean the syringe - you'll be using it later. The easiest way to clean your syringe is to put the tip into clean water and draw and plunge it a few times.

Waiting for Colonization

Now place the rice bowl out of direct sunlight and not too close to a radiator or other heat source. Some good places are a shelf in your kitchen, or on your desk.

In this step, the mushroom live culture converts the brown rice in the bowl into mycelium – a solid block of white material that enables mushrooms to "**fruit**" or grow. This phase is called **colonization**.

Finishing colonization takes as little as **one or two weeks** for some varieties (**oysters** are a good example) to a **month** or more (e.g., **reishi**).

During colonization, the major hazard to your mushrooms is **doing too much**. You don't need to water or fertilize the bowl, or put it into the sunlight, like plants need.

Judging Colonization Progress

When you begin this process, you'll be able to see the rice in the small transparent window. Normally you'll see something like this:

This probably won't change for a few days, although moisture may appear in the window. That is ok.

Generally in a week or less, the rice will change composition. The rice will turn whitish and individual grains will start to disappear:

This process will continue until the window is mostly white and the individual grains will be gone.

Confirming Colonization

In order to prepare for the next step, you need to learn how to tell when your rice bowl has **completely colonized**. As described above, examine the bowl's transparent window every few days. Initially, you'll see brown rice, but as the rice is colonized, it will turn white and you won't be able to see individual grains any more.

Try this: hold the bowl in both hands and gently push down on the top of the lid with your thumbs (don't push down where you put the hole, though). At the beginning, you should feel a squishy sensation that fits what cooked brown rice will feel like.

Generally, in a week or so, that sensation should firm up and resist the pressure of your thumbs.

Once the rice you can see in the substrate pod display window turns **totally white**, and the bowl **strongly resists the pressure** wherever you apply it, your bowl should be ready for fruiting.

NOTE: Colonization speed is dependent on many factors, including the temperature inside your home. Most mushrooms are comfortable colonizing around 75 degrees, but some varieties may prefer significantly higher or lower temperatures. For more information, see the Paul Stamets book in the **References** section.

Warning Signs. There are a few warning signs that indicate that your colonization is not working properly. If you don't see the grains change to white, that's one sign, but there are two other signs: If you see the grains change to a **dark or green color**, or if, when you push down on the rice bowl, it remains soft, or liquidy, you need to start over. If these things occur, throw away the brown rice bowl and **try again** with another starter kit. If you get the kit from ei2o, we'll send you a new kit for the cost of shipping.

We're getting closer! In as little as a week, you'll start the final stage of growing mushrooms by putting the colonized mycelium in the Mycelerator for the environment needed to fruit mushrooms from the mycelium.

Growing Mushrooms from your Mycelium

What you'll do

In the previous section, you converted the rice in the rice bowl to mycelium. Before we move to the next step, check how complete the process is:

What you need

You'll need all the parts for the Mycelerator described in the Parts section at the beginning of this tutorial.

Placing your Bowl in the Mycelerator

Adding your bowl of mycelium to the Mycelerator

Follow these steps to prepare your bowl of mycelium for fruiting.

Carefully remove your rice bowl lid. You should see a solid or nearly solid white surface of mycelium.

Get out your Mycelerator. You'll need the **Wick**, **Humidifier**, **Adapter** and the **Fruiting Jar** for this step.

Place the **Humidifier** into the bowl, on top of the mycelial surface. It should **seat firmly** within the bowl.

Next, snap the **Adapter** on top of the **Humidifier** by gently pressing down on the sides of the **Adapter**. The Adapter and Humidifier will **interlock**.

Remove the **Wick** from the **Humidifier** and place the Wick into a bowl of clean water until it is thoroughly soaked. Then, put it back into the Humidifier. The Wick will maintain high humidity for two or three days (or more, depending on external temperature and humidity).

Mycelerators purchased in 2022 included a bag of **perlite** instead of the **Wick**. If you received perlite, use these instructions:

+ Empty the bag of perlite into the reservoir in the humidifier tray. Remove perlite if it falls into the mycelium.

+ Water the perlite with a spoon (or you can use the syringe). **Don't water the mycelium directly**. Stop adding water when it begins to puddle beneath the perlite.
Your system is now ready to use.

Finally, screw the fruiting chamber into the humidifier tray.

Note that this rice bowl was colonized with **Cordyceps**, not an **Oyster** variety. You can see the di erence from Oyster mycelium. **Both are healthy**!

Also **Cordyceps**!

You're ready for the final phase – fruiting!

Waiting for Fruiting

At this stage you might be just a couple of days from fruiting, but the mycelium may take longer to fruit, or it may refuse to fruit indefinitely, if the environment in the fruiting chamber isn't correct.

Here's how to **maximize** your chances for your mycelium to fruit.

1. **Water** and **mist** the mycelium in your Mycelerator as needed. Do this as follows
2. **Unscrew** the fruiting chamber from the **fruiting chamber adapter**.
3. **Remove** the **white humidifier strip** from the humidifier tray and place it into a bowl of clean water until it is thoroughly soaked. Then, put it back into the humidifier tray. The humidifier strip will maintain high humidity for two or three days (or more, depending on external temperature and humidity).
4. You should occasionally mist inside the fruiting chamber. To do this, fill the spray bottle with clean water. Spray across the top of the humidifier tray (not into the mycelium). This will cause a mist to fall into the mycelium.
5. Put the fruiting chamber back on the humidifier tray when you are done watering and misting your mycelium.
6. Confirm that the vent (the "dial" on the top) on the fruiting chamber is initially closed. If your bowl is a well colonized block, without visible rice grains, you can go ahead and open the vent. If you feel that you opened the bowl a little early, keep the vent closed for 3-5 days. Open the vent if you're not seeing pinning (details below).

Mycelerators that use **perlite** instead of the **humidifier strip** should use this version of Step 3 above:

Water the perlite with a spoon (or you can use the syringe) every few days. **Don't water the mycelium directly**. Stop adding water when it begins to puddle beneath the perlite. Your system is now ready to use.

All other steps are the same.

Fruiting

In a few days, you should see tiny bumps on the top of the mycelial layer. That's known as **pinning**. Once visible, you may be just a few days away from your first harvest.

Continue the watering and misting process described in the previous step. As soon as you see significant pinning, you should open the vent at the top of the fruiting chamber.

Now, just watch it grow!

When your mushrooms look healthy, it's time to harvest! Remove the fruiting chamber and pull o mushrooms one at a time. You may find that twisting them as you pull may be more e ective. Alternatively, you can use scissors to cut each mushroom at their base.

Now that you have a harvest, you can make yourself an omelet, dehydrate them for tea or supplements and make tinctures.

Preparing for Your Next Grow

When you've picked them all, you should disassemble the Mycelerator and clean each piece with an alcohol wipe. Then, you'll be ready for the next rice bowl.

References

Growing Gourmet & Medicinal Mushrooms, by Paul Stamets. Available at https://fungi.com/products/growing-gourmet-and-medicinal-mushrooms.

Mushroom Terminology. North Spore post here: https://northspore.com/pages/mushrooms101