Morel Booster™

Morel Mushroom News From Morel Mania, Inc.

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Paper, Plastic, or Mesh?

One of the most controversial subjects throughout Moreldom is whether morel hunters should use a mesh bag to bring their harvest home. The reasoning is that morels will release spores through the mesh and therefore create new areas for the morels to grow in the future. That's a possibility, but it's not the main reason to use a mesh bag. More on that later.

Notice the size of the pits in the above pictures. The morels on the left are not ready to release spores. The ridges that separate the pits are close together and thick so that some of the pits just look like lines on the cap. These morels didn't get a chance to release spores because I picked them right after the photo was taken. The spores are released when those pits open up and the ridges between the pits start to thin out as shown in the center photo. They will soon release the spores, if they haven't already done so. That honker on the right has definitely spored out already. Notice how wide open the pits are and how thin the ridges between the pits have become.

My best estimate is that 75% of the morels harvested each year are picked before they have gone to spore. So using a mesh bag may help spread spores, if the spores are ready to be released. I've had mesh bags with spores crusted on the mesh. Also, when the spores are released, they don't just drop to the ground. They shoot out like fireworks. They may also make a hissing sound. I've witnessed it only once in my 69 years. There's a link to a video in the following article of morels sporing out.

The main reason to use an "open" container? Notice I didn't say "mesh"? Most professional morel hunters use a basket. I prefer a mesh bag because it's not as cumbersome. An open container could be a basket, mesh bag, a bucket with holes drilled through it, or any container that lets air circulate through the mushrooms. If you use a plastic bag, air is trapped inside and the mushrooms start to spoil.

Some people have told me that they became ill from eating morels once and cannot consume them anymore. I wonder if the morels were gathered in a plastic bag and were starting to spoil even before they arrived home. A paper sack would at least absorb some of the moisture. But wouldn't allow air to circulate.

There are two other good reasons for using mesh. One is that any bugs and debris may fall through the mesh. The second is that the mesh will not tear as easily as plastic or paper. Using an onion or potato sack? That's better than plastic, but sometimes the mesh is made of thin strings and they are spaced widely. They're meant to carry larger, tougher items than morels. Thin strings can cut into the flesh of morels specially if they are more than 1/4th of an inch apart.

Of course I sell both baskets and mesh bags through the website:

http://www.morelmania.com/3Catalog/newtools.html

So naturally I think you should use them. But, you don't have to believe me. Stephen Russell explains it thouroughly in the next article beginning on page 2.

Stephen Russell is one of the most knowledgeable mushroom people I know. He's in charge of The Hoosier Mushroom Society. He was also the force behind the Indiana legislation to allow wild harvested mushrooms to be sold through an inspection process. Find them on facebook. And the society's website is:

http://hoosiermushrooms.org/

The following article is reprinted with permission from Mr. Russell. The original article with references is at:

http://mushroomfarm.com/blog/2013/01/should-i-use-a-mesh-bag/

Should I Use a Mesh Bag?

by Stephen Russell

The short answer is yes, but the long answer can get quite complicated.

Most people believe they need a mesh bag to spread the spores around the woods as they are hunting. This is true, but only to a point. Mushroom spores are not present throughout the entire life cycle of the mushroom. If you are hunting early in the year and choose to harvest a mushroom before it is mature, then it is very likely that the spores have not yet been generated, and none will be spread as you are walking. Thus, if you are truly interested in spreading spores, the best time to harvest is later in the life-cycle.

https://www.youtube.com/watch?v=w-85ICvmcrY

The video above is not mine, but shows morel spores being released. The process almost looks like the morels are smoldering, and puffs of smoke are whisping out. For most other types of edible mushrooms (other than morels – i.e. Oysters), as the mushroom begins to mature and starts releasing its spores, the rate of spore release starts off slow and increases as the mushroom continues to age.

Morels tend to work a bit differently than most other types of edible mushrooms. The spores of morels tend to be released over a very short amount of time – all at the same time – and once that event occurs, its life cycle is completed. There is only a small amount of time within the mushroom's life cycle where the spores are fully developed, and have yet to be released. If you are not harvesting during this window, then little is being done to spread the spores around.

Another type of spring mushroom that you are likely to encounter are called Devil's Urns – Urnula craterium. They are small black cup fungi that grow off the sides of logs. I bring them up because they release their spores in a very similar fashion to morels. In fact, with Devil's Urns as well as with many other types of cup fungi, if you take the time to bend down and blow into the cup, you are likely to trigger the spore release, assuming it has not already occurred. The release will even generate an audible hissing sound that you can hear in the video below.

A 1979 research article on morels describes this exact same spore release and a 2-4 second audible hiss for a morel that the researcher put under a faucet of water (Schmidt 1979).
I tell you about this phenomenon too see how many of you I can get to start dipping down to the ground and blowing on your morels as you find them – as if we do not do enough strange things in the woods already. The video link shows cup fungus audibly releasing its spores:

https://www.youtube.com/watch?v=CxGaHUax-MU

Overall, having a mesh bag does not automatically mean the spores are going to be released as you are hunting in the woods. Timing of the harvest has much more to do with it. But you are still likely to hit a certain percentage of your mushrooms at the right time, so this is good reason number 1 to use a mesh bag, but it is not the primary purpose.

The primary reason to use a mesh bag is to keep your mushrooms fresh.

If you place your mushrooms in a plastic bag, you are cutting off their ability to breathe, to respire. This is necessary for the mushrooms to maintain their original texture and consistency. This is usually as far as I would go in a morel lecture, but lets take the process a couple steps further. Even after they are harvested, mushrooms have active biological processes occurring. They are still living long after harvest. Mushroom cultivators know that even with store bought mushrooms that are over a week old, you can still clone any part of the mushroom to produce a viable culture of living and healthy mycelium. Though the mushroom has been harvested long ago, it is still very much alive.

Respiration in harvested mushrooms is much higher than for vegetables, and the shelf life of harvested mushrooms is directly related to their respiration rate (Ares et al. 2007). So without fresh air, harvested mushrooms cannot continue to break down their stored energy reserves, and they will no longer be able to survive. This means their original firm texture will begin to change and become soft. A mesh bag is a critical step to allow for continued respiration.

Another reason mushrooms begin to lose quality are the enzymes they produce. The enzymatic reaction that occurs requires oxygen, enzymes, and phenolic compounds within the mushroom to proceed and begin producing color changes – usually the brown coloration you see on aging mushrooms – a result of melanin production. A mesh bag cannot help with this problem, as it is a normal process for most fruits and vegetables. Fresh air only speeds the enzymatic reaction, but a lack of fresh air reduces the respiration rate, and can cause cellular death. Without continued respiration, the cell walls will begin to rupture, and is one of the reasons for the texture change we discussed a moment ago. A second effect is it will also allow more enzymes to become active within the mushroom that were once trapped within the cells, accelerating browning even further (Jolivet et al. 1998).

So putting your mushrooms in a plastic bag will decrease respiration rates which changes the texture of the mushrooms, and it will increase the rate of browning of the mushrooms. But there are other effects as well. Another result of putting your mushrooms in a plastic bag is that it will cause water to become retained within the mushroom.

As mushrooms respire, water is able to freely go into and out of the mushroom at its desired rate. If mushrooms are placed in a plastic bag, the humidity levels are raised, and the mushrooms will not be able to transfer water away as freely. These increased

*-Continued , see **Mesh Bag?** on page 3*

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water levels, combined with a lack of fresh air, create the perfect environment for bacteria to flourish. As these bacteria grow, they produce toxins that damage the cells of mushrooms. This process breaks open the cells, changing the texture even more, and once again releases more of the enzymes the cells contained, resulting in an even faster rate of enzymatic browning (Brennan et al. 1998). It will also produce exudates that make the mushrooms begin to appear slimy. The combination of increased water, decreased airflow, and bacteria, create a "plastic bag trifecta" that completes the devastation of the mushrooms.

Cooling mushrooms is the final step that should be taken to increase their longevity. Cooler temperatures slow down the rates of bacterial growth and makes the active enzymes that cause browning in mushrooms less reactive. It will also slow down the active biological processes within the mushroom, meaning that they will require less respiration, and live a longer, healthier life.

There is one myth regarding mesh bags that tends to appear with some frequency. It is that mesh bags are used so that monomethylhydrazine, a poisonous volatile hydrazine compound can escape. According to Andary and Privat (1985), this chemical is not found in morels. It is, however, a component of false morels in the genus Gyromitra, and is the primary reason why they should not be consumed. These mushrooms contain the chemical Gyromitrin, a chemical that turns into monomethlyhydrazine when the mushrooms are cooked or in the body when the mushrooms are consumed. This chemical is a known cancer causing agent.

If you made it through this process, I congratulate you, and you can surely now explain to people why they should use a mesh bag when harvesting mushrooms. Or the other option is to just give a simple "NO!" when someone reaches for their plastic bag.

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