

MYCELIUM UNEARTHED:

Opportunities for Artists



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So—what’s with fungi in an art exhibit?

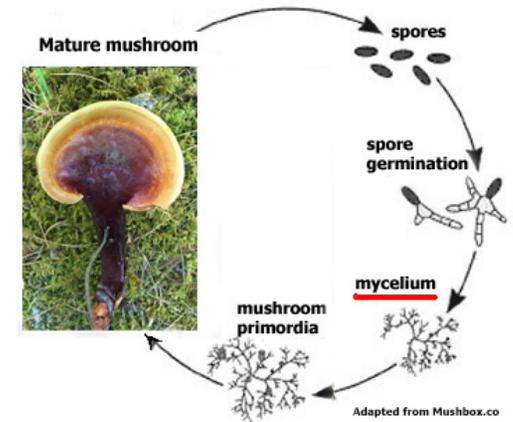
Artists, stretching back through their earliest creative expressions in pre-history, have used natural substances to produce their work. Though turning more recently to artificial, man-made materials—and recycled versions of everything—the use of raw matter for form, colors, texture, platforms, and inspiration has always been a primary thrust.

In the past two decades artists primarily in America and Europe—alongside scientists and engineers—have begun exploring mycelium, one of nature’s most ubiquitous though well-hidden substances.

What is *mycelium*?

Mycelium is the network of rootlike filaments of most fungi that grow and fuse together. It is the food-gathering part of a fungus which lives, most commonly, beneath the surface of the ground, appearing as a frost-like web growing into a dense mesh for sprouting mushrooms (Johnson 2016). Consisting of fine hair-shaped fibers, when laced together into a continuous mat that can cover acres, mycelium holds together large amounts of the planet’s top soil. Mycelium represents an essential phase in the life of most fungi which comprise a Kingdom of their own in the biological taxonomic system, distinct from plants and animals.

How does mycelium grow?



The mature mushroom—the “fruit” of the fungi—disperses its spores (the basic reproductive unit) in the air; in its natural habitat, most spores end up on the forest floor. When moisture, temperature, and nutrients are right (and in the absence of competing molds) the spores germinate into threadlike fungal cells which mate and produce mycelium—the network of cells. In nature these delicate white threads are often visible under old logs.

If conditions are satisfactory, the mycelium continues to grow while producing enzymes that help metabolize its food, called “substrate”: the wood, leaves, and other material in and on forest soil. Mycelium grows in all directions digesting the substrate, creating random patterns between multiple germinated spores, and forming a strong interwoven matrix.

In its next phase (“primordia”), the mycelium produces pinheads—little mushrooms. When these mature above ground into fleshy mushrooms, the cycle is completed.

Range of uses of mycelium

It is the strength of the interlaced mycelium threads, bound together and united with the substrate —“nature’s glue” in the words of one researcher—that offers the most significant advantage to creative minds seeking ways to use this largely neglected natural substance. But other attributes of mycelium are also attractive: the fungal material is a renewable resource and fast growing, light weight and buoyant, fire retardant, and inexpensive. Mycelium is compostable but also water repellent; its cell walls are mostly made from the biopolymer chitin, a carbohydrate—the same material that makes up the shell of lobsters and crabs.

Research is exploring a range of potential uses of mycelium. Paul Stamets (2005), an American pioneer mycologist, reports on studies and US patents regarding the medicinal (e.g. anti-bacterial and anti-viral) qualities of mycelium. He also explains that mushroom varieties can be coaxed to provide invaluable environmental contributions: consuming unwanted agricultural by-products, plastics and toxic waste. Engineers and architects are developing building materials from mycelium; interior designers are using it to create furniture. A company (Ecovative Design) already produces it as a protective packaging material (with claims that it will replace Styrofoam). And artists—often among the first to explore new substances—are using mycelium not just as inspiration for paintings and photography, but as a possible new raw material to replace or augment ceramic sculpture, leather- and woodwork, and textiles.

Logistics of making art with mycelium

The natural process can be artificially recreated in a reasonably sterile laboratory-like environment by cultivating mushroom spores on a substitute nutritional substrate. A common alternative substrate is sawdust; agricultural waste products such as hemp, cotton fibers, corn stalks and rice husks are also used.

A shortcut in the growth process is available for those who want to work with mycelium but are unprepared to deal with the entire life cycle of the mushroom. Local mushroom growers and online sellers offer bags with already growing mycelium (called “spawn”) of several mushroom species.

There are 11,000 named mushrooms in North America, but the mycelium of only a handful of varieties is used by artists, including the oyster mushroom (*Pleurotus ostreatus*), the reishi (*Ganoderma lucidum*), and the turkey tail (*Trametes versicolor*). The reishi mushroom is often a favorite because for thousands of years this species has been valued in Asia for its medicinal and health benefits, and much background research has been published.

When mushroom spores have begun to transform into spawn on a substrate bed— that is, when the mycelium is emerging—the artist’s creativity can be unleashed. The mycelium/substrate material can be formed using molds and/or hand-building. It needs then to grow in a protected environment (e.g., a plastic bag or box) and left alone for 5-6 days to grow. Longer growth time can result in actual mushrooms emerging on the form, and it increases the risk of contamination with mold.

How does the artist stop the living creation from continuous growth and biological expansion? When a decision is made that the form is finished, the piece is simply dried in an oven at 200 F for several hours. This dehydration process stops further growth of the live organisms. Once dried, the mycelium material can be sanded, painted, oiled, or left alone. When the piece is no longer needed, the material can easily be composted.

References:

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A local provider of mushroom spawn:

Sharondale Farm, Keswick, VA
www.sharondalefarm.com

For further references and video links:

www.crikarsmarshall.com/mycelium