

Helpline Hot Topic for October 2020

Witches or Fungus

By

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Why did the mushroom go to the party? Because he was a fungi!

This groaner of a joke has been going around for a lot of years. The truth is fungi can be pleasant stuffed party appetizers but many fungi are not so nice. They come in many shapes, sizes and colors.

In the kingdom of Fungi, there are about 144,000 known species of organisms. This includes yeasts, rusts, smuts, mildews, molds, and mushrooms. Some fungus we consume, such as yeast, mushrooms, and truffles. Some we use in the production of foods like cheeses, soy sauce, tofu, miso, and wine. Some are used medicinally such as penicillin as an antibiotic, mycophenolate for preventing tissue rejection and rosuvastatin to reduce cholesterol. Many are found in the garden. For example mycorrhizae is added to the soil to improve plant nutrition, soil biology and soil chemistry. Other fungi simply drive us crazy in the garden ruining our grass, ornamentals, and crops; black spot, powdery mildew, blight, rust, and wilt are some of the culprits. Toadstools are so poisonous they can kill.

If you've ever been to Salem, Massachusetts, particularly in October, you immediately recognize the influence of the historical witch trials. Last October I came across a tidbit of information about the trials in a paper that I picked up at the North Carolina State Fair. It seems that the history of Salem was seemingly changed forever by a fungus, *Claviceps purpurea*. As a gardener, this piqued my interest so I looked into it further.



In December of 1691, two young girls from the same family, 9 and 11 years old, started having "fits" where they appeared to have had hallucinations and convulsions, incomprehensible speech, trance-like states, odd skin sensations, threw things, screamed, vomited and other unusual symptoms. The doctors couldn't diagnose what was wrong. Eventually the villagers concluded that the girls were under a spell; bewitched by members of the community, a Caribbean-born slave and two elderly women considered of ill-repute. Eventually there were a total of eleven girls and young women displaying these symptoms. By September of 1692 over 200 people had been accused and 150 arrested with 20 executions; 19 were hanged and one crushed to death. By May of 1693, no more were charged or arrested for witchcraft and those remaining in prison were pardoned.

In 1976, two hundred and eighty-four years later, Linnda Caporael was lacking one history course to graduate from college. In the class she took she immediately had to write a paper. She chose Anne Putnam, one of the Salem accusers as her subject because she had seen Arthur Miller's play *The Crucible*. As she began researching she noticed a similarity between the symptoms of the bewitched accusers in Salem and French cases of ergot poisoning she had

read about as a kid. This was the beginning of an in-depth study of the possibility that fungus fueled the Salem witch trials.

Ergot is caused by *Claviceps purpurea*, a fungus, which affects rye, wheat and other cereal grasses. By invading the developing kernels of the grain, the fungus takes over with a network of filaments, turning the grains into purplish-black sclerotia which can be mistaken for discolored rye grains. People thought it was part of the plant because the fungus was so common in America and Europe. "They didn't think anything about grinding up [the fungus] and putting it in bread," says George Wong, an associate professor of botany at the University of Hawaii.

In the sclerotia there are ergot alkaloids, including lysergic acid (source of LSD) and ergotamine, both of which are potent chemicals. The central nervous system is affected by the alkaloids. Today, toxicologists know that eating foods that are contaminated by ergot can cause convulsive disorder - violent muscle spasms, vomiting, delusions, hallucinations, crawling sensations on the skin, and other symptoms – all of which were included in the records of the Salem witchcraft trials.

From the diaries of Salem residents, it was found that the spring and summer of 1691 had been warm, damp, and rainy. Salem was situated on swampy meadows; perfect conditions for ergot to thrive. At the time, rye was the primary grain in Salem and the crop that was used for bread in the winter of 1691-1692 could easily have been contaminated. The following summer of 1692 was dry; poor conditions for ergot development, and quite possibly the reason the "bewitchments" stopped so abruptly.

Since the first connection in 1976, ergotism has become an accepted theory as to the cause of manifestations along with hysteria that brought about the Salem witch trials. Today we are unlikely to encounter ergot in our own gardens or food sources. Still as gardeners, we are always coming in contact with new, unusual, and unique developments in our own gardens, and as we help gardeners in our community. Following clues and hunches and consulting scientific resources we are able to detect gardening problems with the possibility of a breakthrough similar to that of Linnda Carporael.

<https://www.trianglegardener.com/was-fungus-the-true-cause-of-the-salem-witches/>

Was Fungus the True Cause of the Salem Witches?

https://botit.botany.wisc.edu/toms_fungi/oct99.html

Tom Volk's Fungus of the Month for October 1999

<https://www.geoffreykayemuseum.org.au/ergot-and-the-salem-witchcraft-trials/>

Ergot and the Salem Witchcraft Trials

<http://customers.hbci.com/~wenonah/history/ergot.htm>

Ergot Poisoning – the Cause of the Salem Witch Trials

http://bioweb.uwlax.edu/bio203/2011/miedema_kait/diseases.htm

St. Anthony's Fire