

38300 Lycopodium, lycopodium spores, witch flour

engl.: earth moss seeds, vegetable sulphur

french: spores de lycopode, soufre végétal

other names: Sprinkle powder, earth sulfur, lightning powder.

Lycopodium are the spores of *Lycopodium clavatum*. Lycopodiums are related to ferns and mosses and are among the oldest plants in the history of the earth. They are found in northern latitudes, often on heaths or in forests.

They look like moss plants, but feel bristlier and can form long stolons. Lycopodium is collected mainly in Finland, Estonia and in Russia.

Lycopodium spores are very small, only about 35 µm in diameter. They have tetrahedral shape and irregular surface. The powder is very easily mobile due to these characteristics. Impurities with sulfur or pollen dust of hazel or spruce occur, but are easy to detect under the microscope. Substances that sink in water are also considered impurities, since pure Lycopodium powder floats on water. Inside the spores there is a liquid oil, which makes up about 50% of the weight. In addition, the spores contain a lot of protein and are even eaten in some countries. The oil can escape from the pores by rubbing, which destroys the smoothness of the powder.

When using Lycopodium, the property of the spores not to stick together is exploited. As a release agent, Lycopodium was used both in pharmacy in tablet production and in molding, for example, to separate wet sand surfaces. Nowadays, however, other water-repellent powders, often containing wax, made of rosin, starch, chalk, talc and other materials are used for this purpose.

Lycopodium spores are very flammable, for which reason they are popular with fire breathers and for table fireworks. In rural areas, lycopodium was used to set fire to food and chimneys. The following dust explosion cleared the chimneys from soot. Sometimes, however, the houses burned down in the process.

Lycopodium spores were hardly used as a dye. In a recipe for dyeing red with leaves of the wild apple tree it is said that lycopodium spores as well as wild dast should be added.

Lycopodium is the scientific name of the lycopodium family. It is a very light, pale yellow, odorless and tasteless powder. The fine powder dissolves very easily and floats on the water.

Objects powdered with the powder will not be wetted when immersed in water. In the vernacular Lycopodium is also called witch herb, drude herb, devil's claw. Fossil findings from the Devonian period (ca. 405 - 350 million years B.C.) prove that Lycopodium herbs were about the size of trees at that time. Today, Lycopodium is distributed worldwide with about 400 subspecies and is a protected species in Europe.

The spore capsules of Lycopodium contain a fine, yellow spore dust, which is popularly known as witch powder, or lightning powder. Already in the Middle Ages it was known that lycopodium spores, scattered in a fire, produce a bright flash flame.

Origin, quality and Lycopodium substitute

Today, Lycopodium is cultivated on a large scale, mainly in China and Nepal. For pyrotechnics, the spore flour obtained there is the most interesting, because of the high content of essential oils and the pure quality, an excellent burning behavior is achieved. Due to the ever-emerging discussion about a possible import ban (species protection agreement) and the sometimes high prices, pyrotechnicians have been experimenting with so-called Lycopodium substitutes for years.

However, so far there is no synthetic or natural substitute that even comes close to Lycopodium in its burning behavior. In most cases, comparably larger quantities of substitute are required, which cancel out the more favorable purchase price. On the other hand, all these substances require a greater ignition energy. In practice, this can mean that a large part of the substitute remains unburned. Cork powder is usually sold as a Lycopodium substitute. But experiments are also being carried out with various grinding dusts, coal dust, flour and even coffee powder. It is important to warn against experiments with metal dusts, which are so energy-rich that their use in stage pyrotechnics, for example, is almost self-explanatory.

Dangers

Although, as mentioned above, Lycopodium is quite safe to use, there are some precautions that should be followed:

1. lycopodium does not belong in the hands of children or adolescents.
2. before using Lycopodium at events, theater or film productions, make an application to the appropriate authorities.
3. airborne Lycopodium is explosive - no smoking during repacking or filling operations.
4. lycopodium spores may cause a reaction in allergic persons - provide good ventilation for indoor use.
5. if Lycopodium is used several times in succession, remember that unburned Lycopodium residues can form a fire bridge and lead to uncontrolled fire spread.
6. never use pure oxygen to swirl Lycopodium - risk of explosion.
7. always keep a safe distance from people and flammable objects.
8. never direct flames at people or animals.
9. when spitting fire, be aware that the flame could blow back (e.g. by turning the direction of the wind).

Source: www.mikuttasfx.de