

# Newly discovered fungus castrates male spruce flowers

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Microstrobilinia castrans: a–e On Picea smithiana: a P. smithiana tree at type location, two P. omorika trees in the background; b fresh infected pollen cone showing first symptoms like deformation and brown discoloration; c infected pollen cone with apothecia in the first year after infection; d, e several years old pollen cones overgrown with mosses and lichens with fresh apothecia and remnants of last year's apothecia. f–i On Picea abies: f P. abies at a typical habitat in the Swiss Alps; g infested pollen cones on twigs; h pollen cone with small immature apothecia; i pollen cone with mature apothecia. j Pollen cones of P. omorika with dry, mature apothecia. Credit: *Mycological Progress* (2023). DOI: 10.1007/s11557-023-01865-w

**A rare discovery during a midday walk: On a spruce tree, an employee of the Swiss Federal Institute for Forest, Snow and Landscape Research WSL discovered not only a new species of fungus, but also a genus previously unknown to science. The parasite feeds on the spruce pollen and destroys the male flowers in the process. It is unclear whether it is an introduced species.**

WSL fungi expert Andrin Gross made an extraordinary find in 2018, practically on the doorstep of his office: he saw small, gray-beige cupules on the male flowers of a Himalayan [spruce](#) in the WSL gardens. The WSL fungi team conducted an extensive search in worldwide fungal archives and genetic databases, which did not uncover any similar fungi.

This is not only a new species of [fungus](#), but also a new genus. The researchers christened it *Microstrobilinia castrans* and now presented it to the scientific community in the journal *Mycological Progress*. "It is rare to discover a new fungal genus in Switzerland or even in Europe," says WSL researcher Ludwig Beenken, who specializes in small fungi and is first author of the publication.



The species name *castrans* indicates the unusual way of life of the fungus: it decomposes the tissue of the male flowers and thus gets hold of the nutritious pollen. It does not occur on other parts of the trees. After the initial find on the Himalayan spruce, the WSL fungi experts launched a search, with volunteers also helping. "I even searched the spruces along the way during my hiking holidays," says Beenken, who works at the WSL advisory service Forest Conservation Switzerland.

The search operation has now detected the fungus at around 130 sites, both on planted Himalayan spruce (*Picea smithiana*) and Serbian spruce (*Picea omorika*) in settlement areas and on native spruce (*Picea abies*) in forest pastures and [mountain forests](#) in the Jura, the Alps and the Black Forest. It has not been found on other spruce species so far.

## **Imported or native?**

Researchers are still puzzling over the origin of *Microstrobilinia castrans*, which belongs to the tubular fungi, a large group of fungi that also includes molds, morels and truffles. Some assume that it has been overlooked so far. Beenken, however, rather suspects that it was introduced with park trees at some point.

The main reason he gives is that in the last 200 years, mushrooms have been searched for so assiduously in Europe that such a conspicuous, quite large cup fungus would hardly have remained undiscovered. Moreover, the Himalayan spruces, of which there are only a few specimens in parks in Switzerland, were all colonized with this fungus. "It may be that the fungus has jumped from this to native spruces, or, if it is native after all, that it has only recently become more widespread—favored by environmental changes."

What does this discovery of a new fungus mean? "Forest Protection Switzerland monitors diseases and parasites of forest trees. That's why

we want to keep an eye on as many organisms as possible that can damage forest trees," says Beenken. You never know if a fungus will suddenly cause bigger problems, for example if it spreads more widely with global warming. *Microstrobilinia castrans*, however, does not currently pose a threat to spruce trees, as the fungus only ever attacks a few flowers of a tree.

**More information:** Ludwig Beenken et al, *Microstrobilinia castrans*, a new genus and species of the Sclerotiniaceae parasitizing pollen cones of *Picea* spp., *Mycological Progress* (2023). DOI: [10.1007/s11557-023-01865-w](https://doi.org/10.1007/s11557-023-01865-w)

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