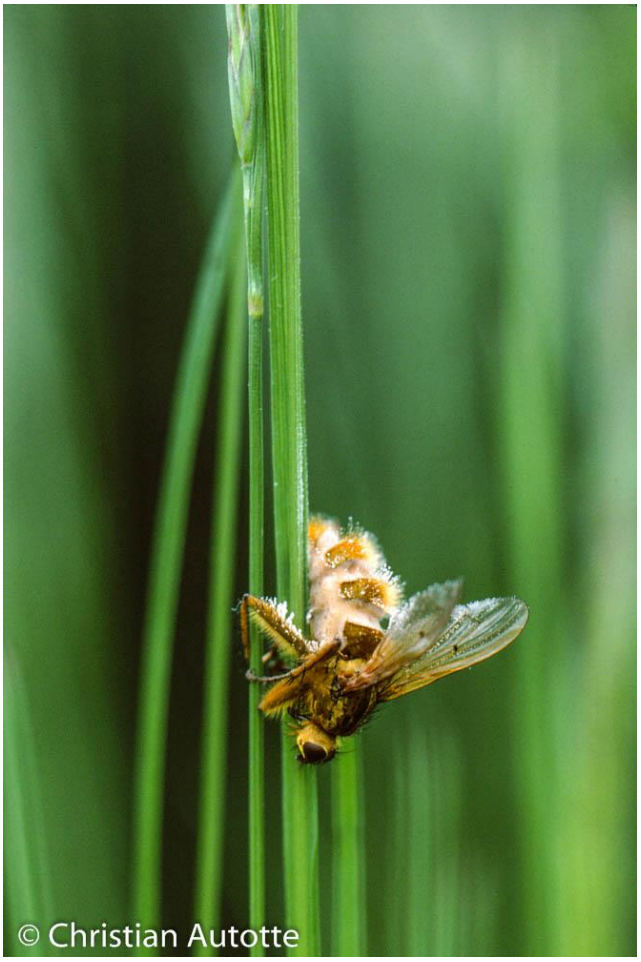
# DEAD FLY FUNGUS

You must have seen them at one time or another: gruesome dead flies stuck to windows and surrounded by a whitish dusty cloud. These flies have been killed by a deadly fungus infection reminiscent of the nasty alien invasion suffered by John Hurt in Alien…

Known as *Entomophthora muscae*, this parasitic fungus can invade the body of many species of flies, from fruit flies to *Musca domestica*. Once a spore has invaded a fly it grows inside, first consuming body fat and non-essential tissues, before taking over the fly's brain and nervous system. After four or five days, the fly stops feeding and fix itself to a support by extending its mouthpart and gluing itself with a kind of liquid glue. The wings stretch out, possibly as a way to spread the fungal spores more efficiently. Soon after the fly dies, white fungus starts to ooze out of its abdomen.

While the fungus spreads more easily at fall, with cooler temperatures, I have seen and photographed wild fly species infected in the summer time. However, spring and fall are the normal period of massive infestations that can kill large groups of houseflies that gather together in sheltered locations where they normally spend the colder months.

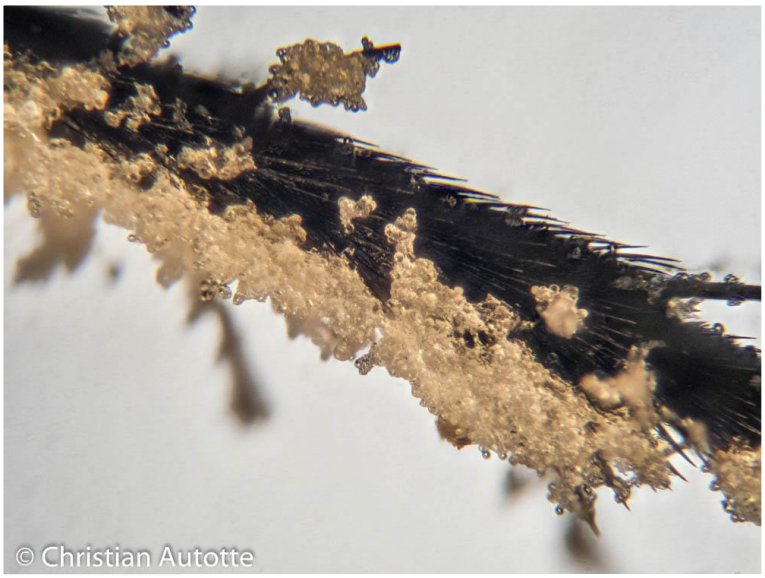




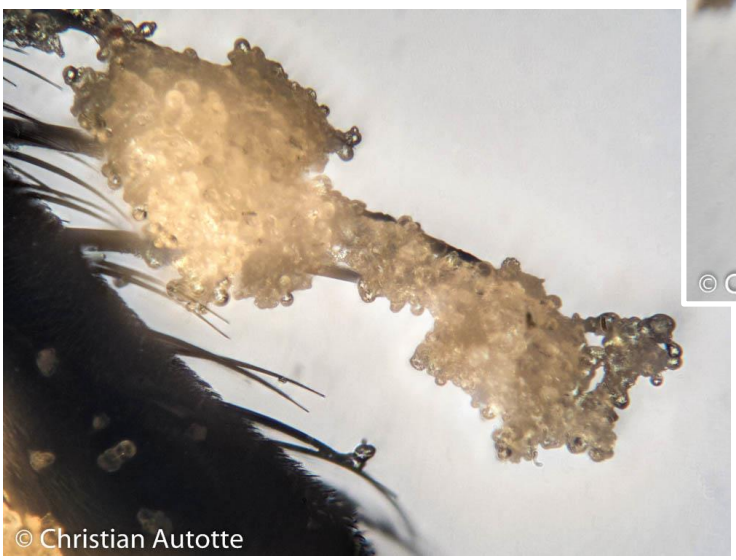
A dance fly (left) and a dung fly (above) fell victim to the deadly infection.


These flies died this fall and were found on window panes of my house. They are surrounded by a cloud of fungal spores.

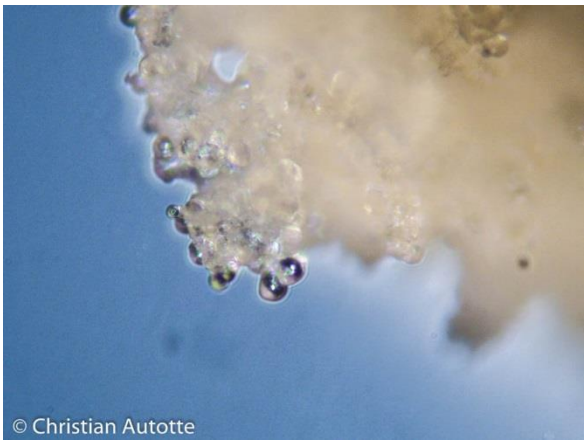

I picked one of the dead flies and with a fine pair of scissors removed a leg that was covered with spores. They seemed to grow in clumps, spreading all over the leg and even covering the longer setae.



Fly leg with spores, 100x, stack of 19 pictures

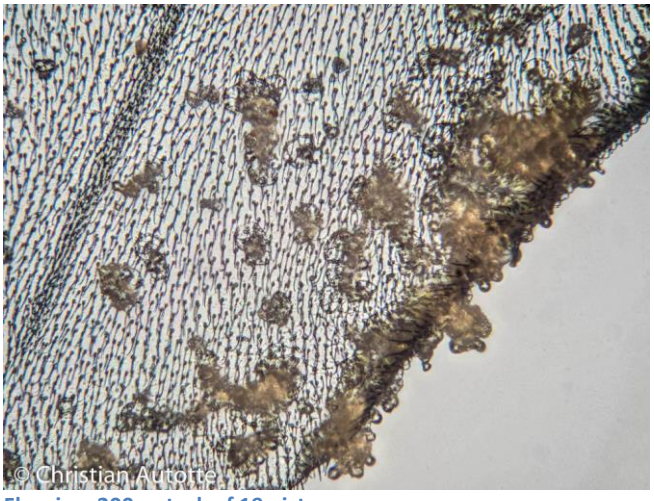


Setae on fly leg, with spores, 200x, stack of 39 pictures



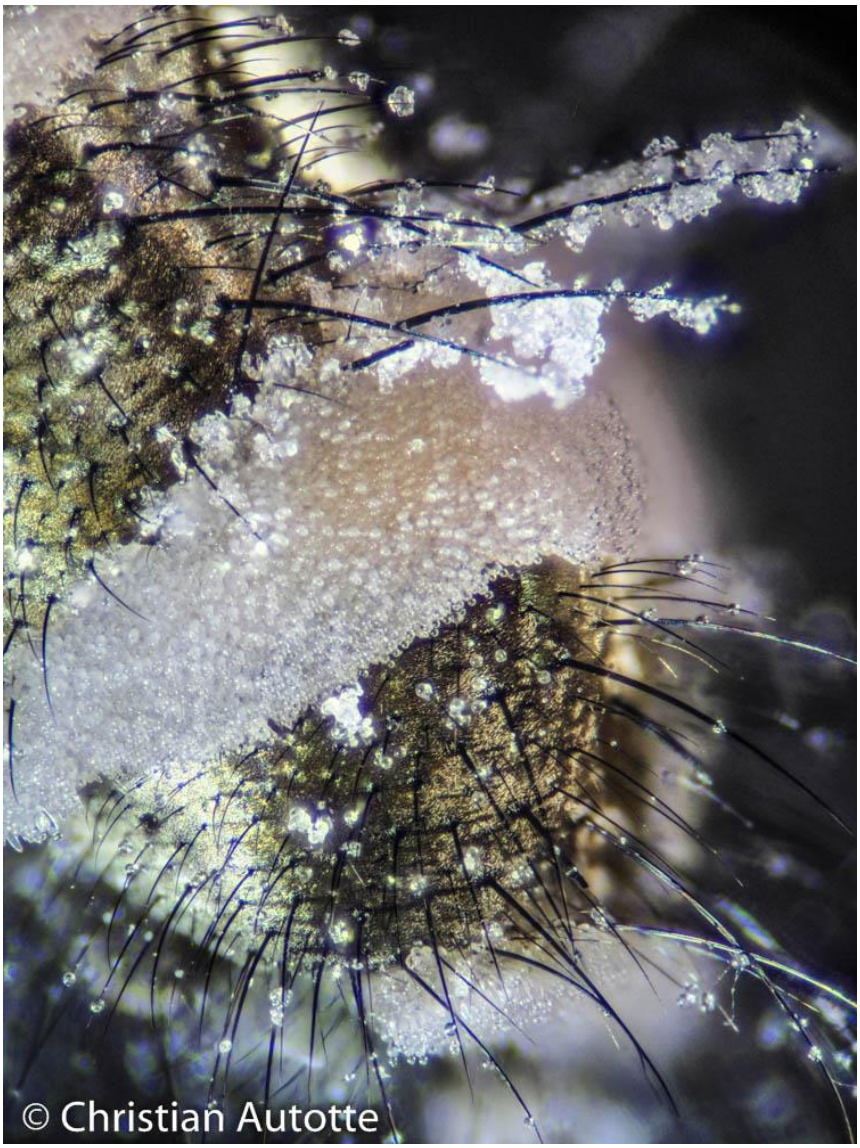
Spore details, 400x

Taking a look at the fly in good light, I could also see specs of fungus on the wings; they were all over them, but more seem to be at the very edge of them. A higher magnification shows the wing with “bulbs” of spores mixed with the setae at the edge.



Fly wing, 200x, stack of 19 pictures

Edge of fly wing, 400x, stack of 14 pictures

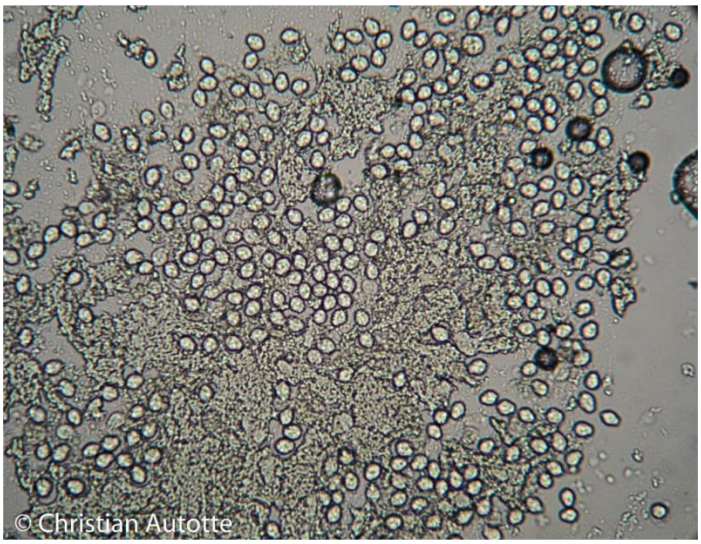



**Fly abdomen, 40x, stack of 17 pictures**

I had read that the white "fuzz" breaking through the abdomen was made up of globules at the end of a stalk. But knowing is not seeing… In Quebec, we have a saying: *Je ne veux pas savoir, je veux voir! (*I don't want to know, I want to see!). On one the flies I could see these white bands at the junction of the abdomen segments. The fly was placed on a slide and under a low magnification. While a single view was not quite enough to make out what I was looking at, a stack of pictures made it clear enough. In the immortal words of Mr. Spock: Fascinating!

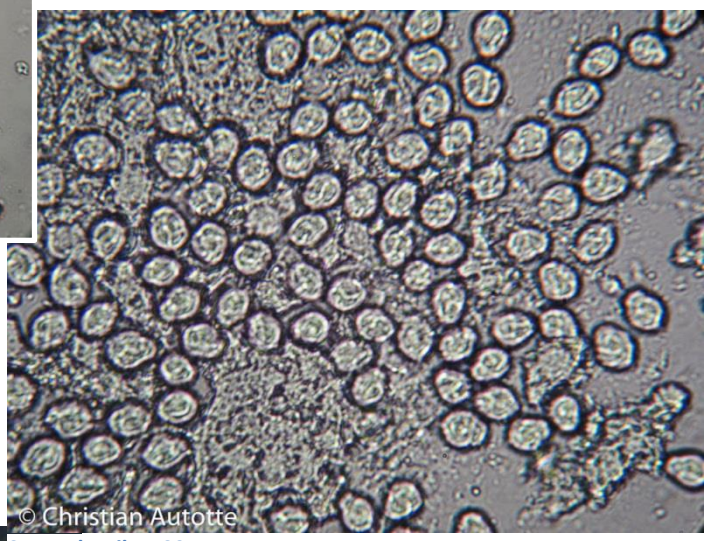

**The "shadow" of the fly was left behind in a cloud of spores on the slide**

Two days after photographing the fly, I found the slide was covered with fresh spores. Fortunately, while these spores are deadly to flies, they are harmless to human, so I won't have to decontaminate the lab…

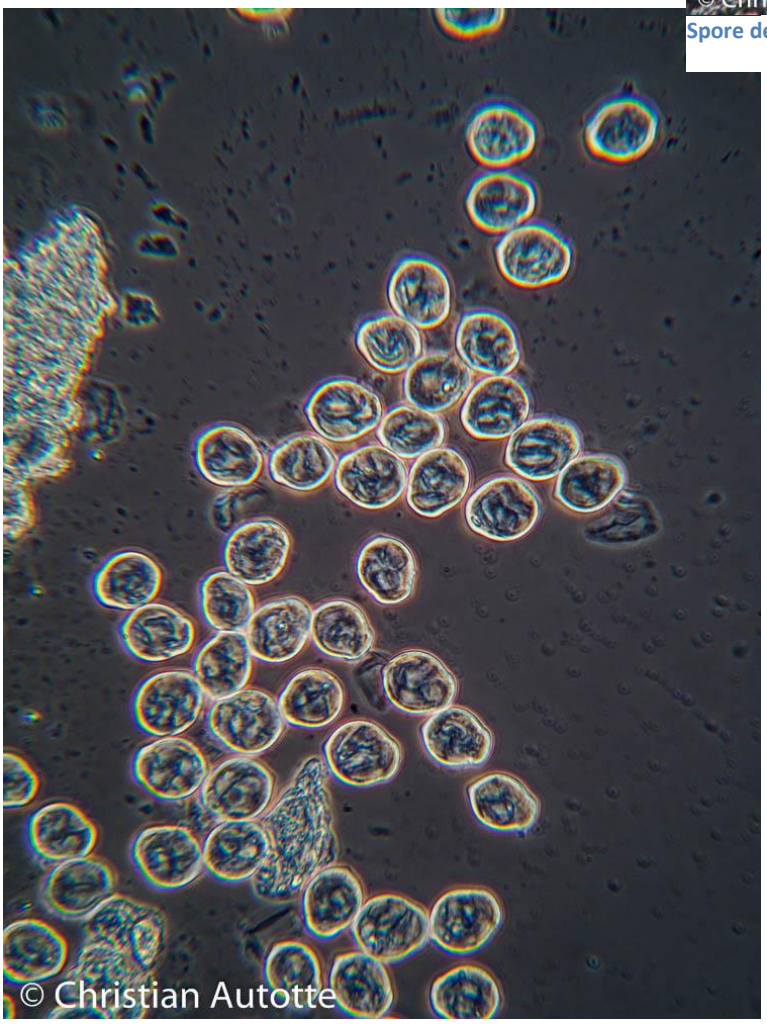



Spore details, 200x

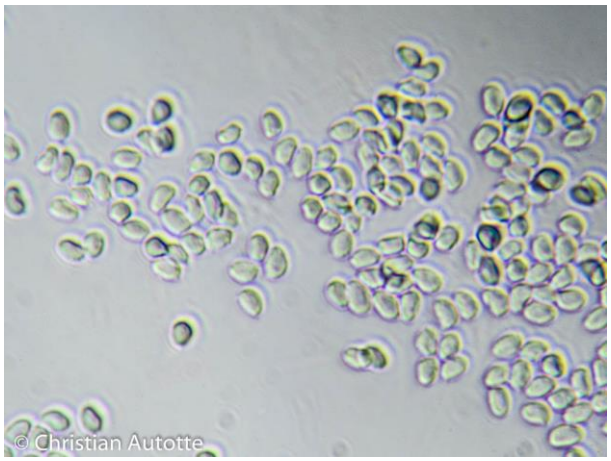
My first attempt of photographing the spores was made by scraping off a sample from the window pane and transferred it to a slide. A drop of water was added and the cover slide slightly pressed to spread the spores. They look like spores from many species of mushrooms, like the ones I photographed a few years ago.




Spore details, 400x

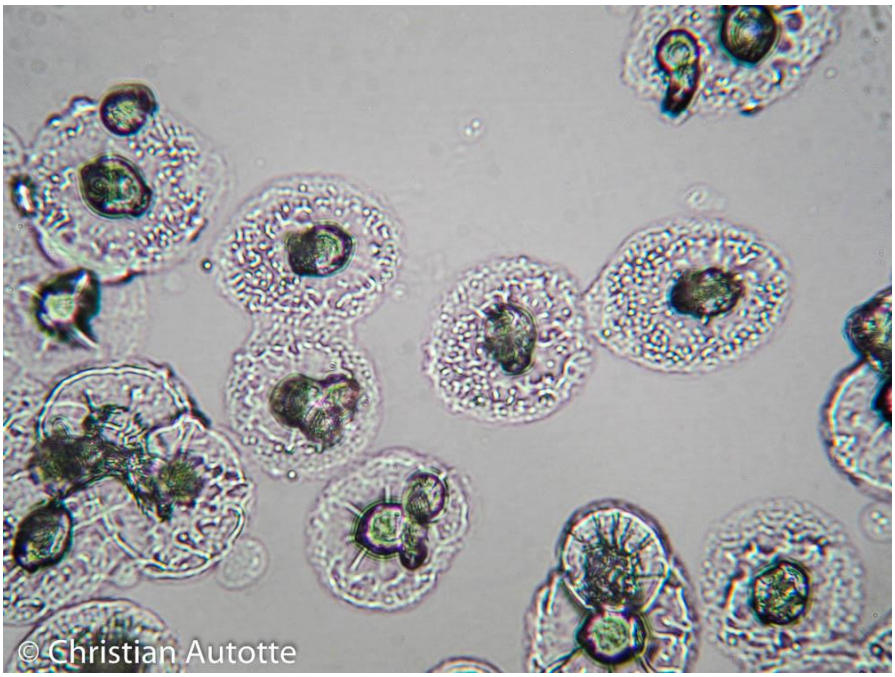



*Entomophthora muscae* spores, 400x, phase contrast




Mushroom spores, 400x

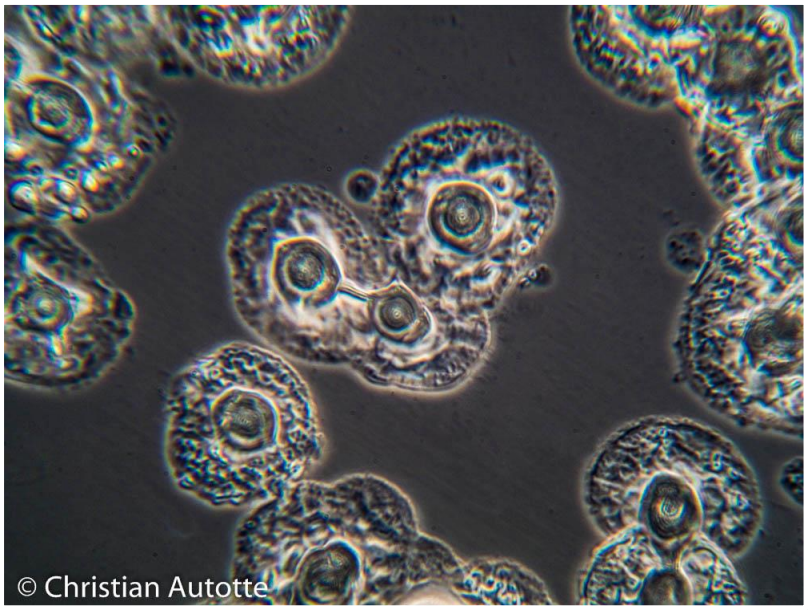
A phase contrast microscope resulted in more interesting pictures.



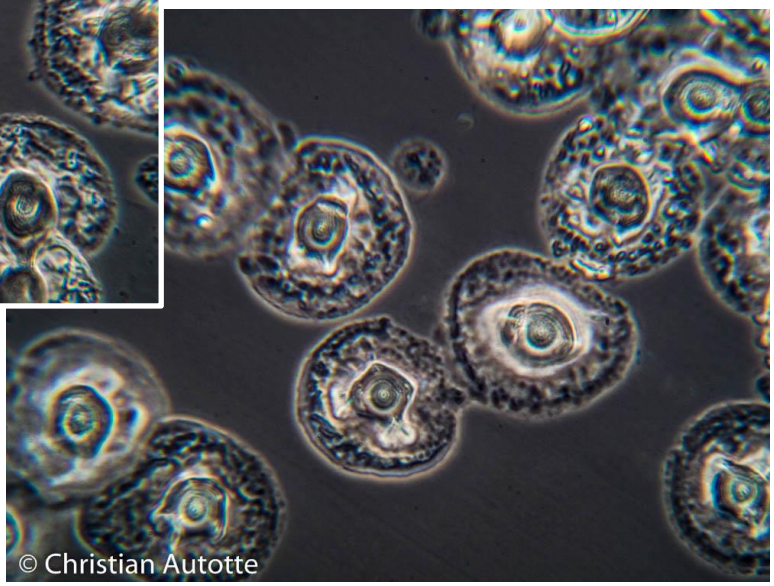
Spores, 400x

When I found the slide full of spores I decided then and there to take another shot at the spores. This time I did not bother to place a cover slide and photographed the spores directly. The results were startling. The spores now look like a nucleus surrounded by jelly, giving them the appearance of fresh frog eggs.

As before, the use of phase contrast did result in more interesting pictures.



Spores, 400x, phase contrast



Spores, 400x, phase contrast

Attempts have been made to use *Entomophthora muscae* as a biological insecticide; so far, they have failed but research continues. The fungus proved to be difficult to cultivate and to spread. It does not work well in warmer weather. Besides, easier ways to get rid of flies do exist, like the rolled up sport section of your local newspaper…

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