

# Ice Fishing...



Quebec in winter can be very cold indeed. On a bad year, temperatures can drop to minus 20 or minus 30 a few times during the cold season. Even then, there are some areas in brooks and rivers which never freeze. The edge of some lakes can show some ice-free spots, possibly due to upwelling spring water or some warm underwater currents. One day, curiosity took the better of me and I tried to see what kind of microscopic beasties would still be alive under these conditions.

Taking samples can be problematic: you want your sample but the idea of going for a dip is not appealing... So I made myself a sampling stick with a more intelligent use of a selfie stick... At the end of it I fixed a plastic film canister with the help of a ¼ inch nut. It works like a charm. With my arm stretched, the fully extended selfie stick gives me a reach of about two metres. The collected samples are then transferred to clear film canisters, which I find ideal to carry wet samples; they are perfectly water-tight and quite resistant.



I took my first samples at a lake I used to visit regularly. Set among the mountains of a park two hours drive north of Montréal, it has given me some nice pictures of landscapes and interesting microscopic samples. In early March, with the mercury still below freezing, I found a small patch of open water at one edge. I had to be careful not to sink knee deep in freezing water, but with the help of my sampling stick a sample of water with some sediment was secured with no harm to the photographer.

As soon as I got home, the sample was placed in the refrigerator to keep it cool. I was afraid that warm temperature could kill whatever organisms were living in near-freezing temperature. I took a first look the next day.

A lot of what I saw was made up of dead cells and sediments, but a surprising number of critters were alive and kicking. Of course, as long as the water remains liquid they are not subjected to sub-zero temperature. A lot of them were common and well known. There were a lot of diatoms, such as *Tabellaria* and *Navicula*, and a few *Closterium*. But then I saw a few things I never saw before. The first one was later identified as a *Synura*, an algae colony. Like many microscopic plants, this one was moving frantically, going round and round. It's made up of individual cells attached together at one central point. Another algae colony was *Actinastrum*; like *Synura*, it is made up of cells attached together, but it has fewer elements and it didn't move as much.



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**Synura, an algae colony, 400x**



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**Actinastrum, another algae colony, 800x**



© Christian Autotte  
**Diatom, 200x**



© Christian Autotte  
**Empty diatom shell, 400x**



© Christian Autotte  
**Tabellaria (?), 400x**



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**Closterium, 200x (cropped)**



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Tabellaria, 400x, stack of 6 images

Like any other living thing, micro-organisms are found in specific environments. Some will be found either at the surface, in open water, or at the bottom. Some prefer living attached to solid surfaces, like rocks, others may prefer softer substrates, like large plants. And like larger animals, many micro-organisms will live within a narrow temperature bracket. So what is found in winter may never be seen in summer, when the water temperature is much higher.



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Another habitat I sampled was a lot less impressive. Near my new home, there is a small brook flowing in the woods. Here and there are a few openings through the ice and snow. More than ever, the trick is to get a sample without falling down the steep slope... Samples were taken in early December.



© Christian Autotte  
Looks like a ciliate conjugation, 800x



© Christian Autotte  
Unidentified ciliate, 800x

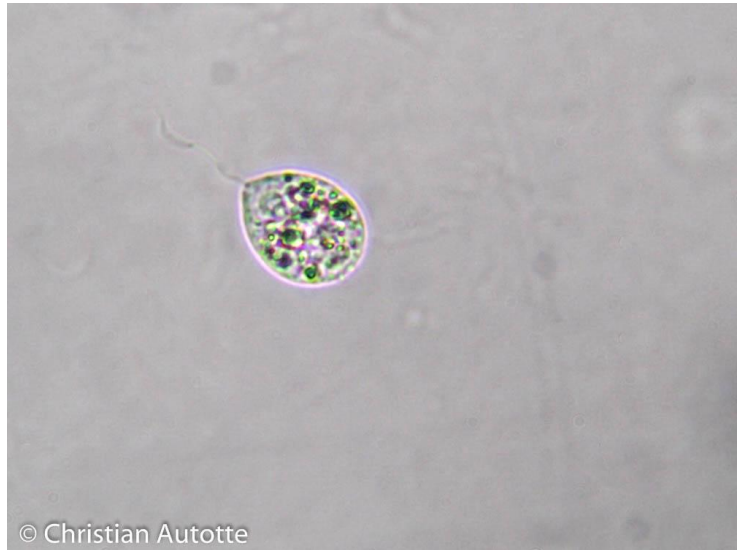


© Christian Autotte  
Unidentified ciliate, 800x



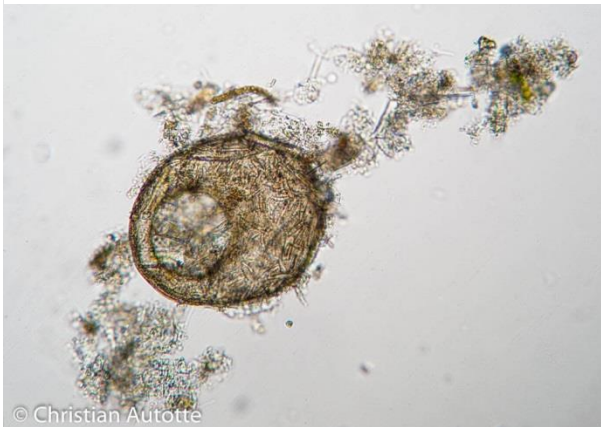
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Diatom, 800x



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Ciliate? Algae? Whatever it is, it shows a single flagellum, 400x (cropped) possibly Chlamydomonas



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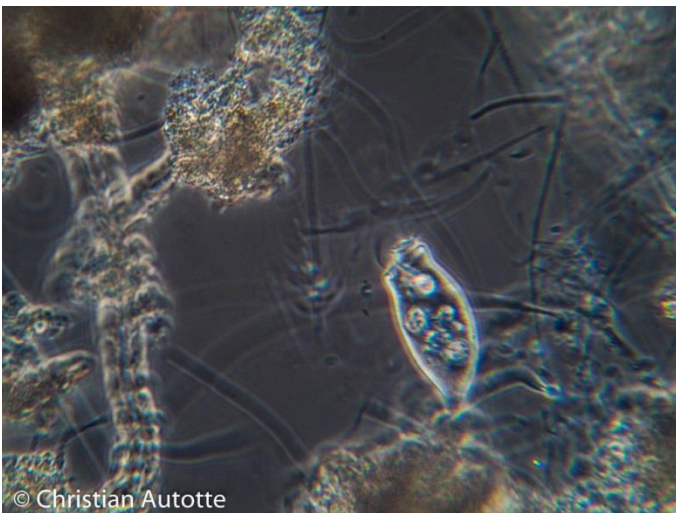
Egg? 200x



© Christian Autotte

Mayfly larva, 40x

A lot of people don't realize that many arthropods continue to live their life even during the cold winter months. Their metabolism may slow down and many of them don't need to eat at all, but quite a few are still there and active, either in water or under the snow cover.



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Rotifer, phase contrast, 400x

Behind my house flows a small river, little more than a big brook. In December, I took a sample in which were found a few rotifers that were actively feeding.

Of course, winter subjects are not limited to water environments. A few days before Christmas, I found an area free of snow under some evergreen trees. A few handfuls of dried leaves were picked up and shoved in a plastic bag. Back in the lab, they were placed in a Berlese funnel. After a few days, I had collected half a dozen springtails (including the biggest one I have ever seen), nearly as many micro spiders, one weevil, and two lace bugs. The big springtail could not fit in a single picture done at 40x; it had to be photographed four times and assembled as a panoramic picture to get a whole image!



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One tiny spider, 30x



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Springtail, 40x



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Lace Bug, about 6x



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Springtail, composite of 4 pictures at 40x

So while cold winter months in Quebec may not seem ideal for the small critters, in reality there is still plenty of activity out there!

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