



NATURALIST'S CORNER

What I Need Is a Spider!

I walk into the downstairs bathroom, where I keep my worm bin for the winter, and find the tiny room swarming with fruit flies. Clinging to the ceiling, pendants, the night-light — they're everywhere! This massive emergence must have resulted from feeding my worms too many kitchen scraps at one time and not burying them sufficiently. In my years of managing a worm bin, this is a first.

A confounding factor was that I had company arriving the previous weekend and in preparation, I busily vacuumed up the unsightly webs and their makers. I tend to tolerate spider webs because I like the little buggers and they perform this insect-catching duty for me, but I felt a compunction of propriety at the time. I recall wondering, even as I did so, if I'm going to regret this. Indeed I do.

I began by setting four fruit fly traps. These are simply a cup with an inch or so of either cider vinegar - which the buggers have a penchant for; or Tom's home brew - which they can't resist. The flies are attracted to the liquid so much so that they eventually drown. Some sources suggest a drop of dish soap to prevent the flies from escaping. This may produce even higher results, but for me, the liquid sufficed. I experimented with placing plastic over the cup's rim with a hole in the center lower than the rim. This guides the flies in but they have trouble getting out. But, I'd like a more organic solution. I want to get my bathroom ecosystem functioning again. I need an efficient insect catcher to make me a web! So, I admit that I did a crazy thing. I went outside looking for a spider to invite back into my house to take care of my fly problem. It has been getting rather cold lately and I wonder if I can find a spider at all. When I am outside with students conducting a 'critter search,' I ask them, "Where would you hide if you were a spider?" They know: under bark; under leaf litter; within decaying logs. I now ask myself this question, and wish I had a kid or two to search with me. Peering behind the peeling bark of a few of my black birch trees I find a couple of candidates, but they are tiny. I usher them into my petri dish and bring them inside. I deposit them on the branch I hung over the bathroom sink. The fruit flies are four times their size. This just won't do.

A big, beautiful black and yellow garden spider - *Argiope* - with its magnificent orb web would be a perfect solution for me. Unfortunately, the adult of this species dies before winter, leaving the next generation to overwinter in silken sacs. I suspect that the adult garden spiders are, by now, all dead. I find silken cases tucked under the eave of my roof, each well-insulated with layer upon layer of tough silk. Whether it is of my intended quarry or another species, I'm not sure. Spider eggs don't overwinter well so often orb-weaving spiderlings hatch within their silken case and overwinter as juveniles, ready to chew their way out when spring beckons. Letting a legion of spiderlings disperse in my house is going way overboard, even for me. This just won't do.

Here in the Northeast, about 85% of the spider species enter diapause for the winter. This is a state of dormancy in which their bodily functions slow considerably. On a fall Naturalists' Club hike a couple years ago, I turned over a big piece of bark on the ground to find a silken tent, which curiosity provoked me to unveil. Inside was not eggs or juveniles, but an adult spider who cringed in the unbroken corner of his silken pod. After we all had a look at how this fellow intended to overwinter, I returned the bark and hoped that he would get back to work repairing the damage I caused.

With or without a silken encasement, most overwintering spiders produce substances that make them freeze-resistant. Ice crystallization in a living organism causes death by piercing cell membranes thereby destroying cells. But certain spiders, insects, bacteria, fungi and plants have a super power. At the first sign of a cold snap, they manufacture anti-freeze proteins (abbreviated AFP) in their bodies. These compounds bind to developing ice crystals and halt their growth. Because of this, spiders can withstand temperatures well below freezing. Scientists have documented a house spider who survived -4 degrees Fahrenheit. There is a species of jumping spider (my favorite spider!) that lives - permanently - on Mount Everest! Other antifreeze compounds have been "invented" by nature as well. Scientists continue to unravel the mystery of these important compounds that have promise in medicine and other applications.

I go back outside and turn my attention to the ground, and search under leaves and a couple of rotting logs. Interestingly, a very small handful of spiders stay active all winter in the subnivean zone. Here they slowly navigate that very thin layer between ground and snow hunting for springtails or other prey. Maybe one would like to hang out in my bathroom sink concealed by a few leaves so he can pounce on unsuspecting fruit flies for a time. He might get one or two. This won't put a dent in my fly population. This too, just won't do.

I further lament my fastidious cleaning actions. I sucked up spiders who were perfectly comfortable in my home. A study found that of the spiders in your house in winter, only 5% were ever outside. Yes, scientists have studied this! Most spiders have been there all along without notice.

My saga, alas, is not solved by spiders. Two cups of apple cider vinegar and two of Tom's special brew (Thank you Tom!) eliminated the buggers within a week. I set the worm bin outside in the cold for a few hours on three occasions to rid it of flies, but not freeze my worms, and my problem abated.

If you come visit me don't be surprised to see a few webs of my fly-fighting friends decorating my house here and there. I'm not a bad housekeeper, I'm just spider-friendly.

~ Nancy Condon
