Those Pesky Gnats! (Fungus Gnats)
2010, Year of the Fungus Gnat

Adult Fungus Gnats Stuck to Safer's Sticky Stik. Photo by Randall Prue. This may be a too-familiar sight to you, adult fungus gnats. Here we see them (where I like to see them) stuck to a Safer's Sticky Stik (any brand of yellow insect trap would work just as well). The gnats die quickly and cannot reproduce while stuck to the trap!

This "bonus" article is based on material reprinted from Keeping Them Alive, plus new material and illustrations. In the autumn of 2010, as we bring plants in from outside, I cannot help but notice that this is the worst year I can recall for fungus gnats (small enough to fly through most window screens looking for a warm winter home).

Adult fungus gnats measure approximately 1/50th to 1/32nd of an inch and resemble fruit flies. You will see them flying about or congregating near windows and lights, and of course hovering near your plants, and anywhere else they can find moisture (drains, for example). They like light, the color yellow, and moisture. The adults lay "eggs" (larvae) on soil, especially moist soil rich in organic matter (moss or leaf mold). They also love soil-less mix (like ProMix). Adult gnats appear to be almost suicidal. They are not hard to squish if you get close enough because they are not quick to flee. They just sit there. Squish, squish.
Here we see small beige non-toxic larvicide granules (bacillus thuringiensis subspecies israelesis) on the soil of a potted plant that is bothered with fungus gnats. The BTi that I used is Aqua Bac from AFA Environment Inc. The images on this page illustrate the two most important steps to ridding your home of fungus gnats: kill the adults (so they cannot lay more eggs); kill the larvae (so they cannot become adults).

At the same time, we want to discourage them from reproducing. The way to kill the adult is not the same as the way to kill the larva. And before we start, bear in mind that even though these gnats are without a doubt the most annoying of the common houseplant insects, they are also the least likely to cause harm. Most of the other common pests that your plants may encounter are able to devastate your plants without ever becoming visible enough for you to notice without a careful inspection.

I have gathered a lengthy list of ways to deal with both the adults and the larvae (preferably at the same time). My preferred method is to use the sticky traps to capture the adults (who cannot lay eggs while stuck to the trap, and who will soon die on the trap), and mosquito larvicide to deal with the larvae (1/4-inch white maggots with black heads, found just under the soil surface).
Absolutely, and if you have noticed the resemblance between mosquitoes and gnats (they breed in wet places, and hatch to become an annoying flying insect), that is because a mosquito is a gnat! Maybe the only thing to love about a fungus gnat is that they do not bite! When I noticed the gnats recently, I reached for the BTi (bacillus thuringiensis subspecies israelensis), sold for treating standing water where mosquito larvae are about to hatch. I sprinkled the soil of all my indoor plants with the granules shown above, and I began adding a Mosquito Dunk to my watering can. The dunk is also made of BTi, pressed into the shape of a small donut. I leave the dunk to soak in the watering can before I water any of my plants with it. The idea is to make contact between the BTi and the larvae of the fungus gnats. The larvae are within the top inch or so of soil. Watering with the BTi in the mix kills them. Watering the granules on top of the soil also releases a dose of BTi (with the same effect, killing the larvae). Maybe some water could get from the watering can to the soil without dissolving a granule on the way, so using both methods seems like insurance to me. Remember that any larvae that are killed will not hatch to become pesky flying adult gnats!

BTi is sold as Aqua Bac and as Knock-Out Gnats (and possibly some other brands).

Other Ways to Discourage Reproduction

The life cycle of the fungus gnat is 3 to 4 weeks long, and so you just may have to endure them for a few weeks. You definitely have to mount an all-out campaign if you want to be rid of these
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pests quickly (most of us do).

**Keep the soil dry!** That is the simplest and most effective method that I know of to kill off the larvae and discourage egg-laying on the dry soil. One problem that might occur to you is that plants need water, so there is a limit to how dry you can keep the soil. Until the infestation is gone, I water all plants from the bottom (by giving just enough water for the plant's needs, and by adding it to the saucer under the pot). The roots manage to get at the water and since I do not use much water, there is not enough to wick up to the top few inches of the pot and wet the only (top) layer of soil that the gnats can lay their eggs in!

Almost the opposite approach, and one that I am reluctant to do very often, is to wait until the plant needs water and then immerse the entire pot in water to above the soil and allow it to soak overnight (to drown the maggots). You may have guessed why I am reluctant to do this. Imagine how many buckets, bathtubs, and sinks you might need to be able to soak a large collection of plants! You could add to the water any of a number of mild or non-toxic pesticides (rotenone, pyrethrum, or the synthetic look-alike pyrethrins). One of the problems with this approach is that rotenone (banned in Quebec in some of its forms) kills fish. That means that you would not want to flush the water down a drain afterwards, so what would you do with it? I am told (but I have not tried this) that ammonia will kill gnats.

Related methods of preventing egg-laying and hatching include (where space permits) adding a layer of sand (1 to 3 inches deep) on top of the soil. There is no moist organic matter in sand, and so any eggs laid should not hatch. If you are keeping the soil on the dry side (especially in the top inch or three), you can spread a layer of diatomaceous earth on top of the soil. D.E. is entirely non-toxic (they are tiny creatures from oceans), but to an insect, its texture acts like a layer of broken glass, and has the same effect: physical destruction by the death of a thousand cuts. I like this method, but D.E. is only effective when dry, so you would have to replace it every time it gets wet (don't get it wet).
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**Lethal Potato**: Here is a simple method that I did try, and with some success. Lay slices of fresh potatoes on top of the soil (dry soil is ideal for this, since the potato becomes the most inviting environment available). In theory, when you gather and discard the potatoes (in the compost pile, of course), you throw the unhatched larvae away with them. The instructions I found said to leave the potato overnight. I saw no larvae in the potatoes the next day, but a week later I did, highly visible. I think that the potatoes may attract some of the larvae, whereas the BTi is good at killing all of them! That said, I see no harm in using as many methods as are available to you.

**Pickled Gnat Trap**: This method involves attracting the gnats to fruit juice or apple cider vinegar inside a trap with small entry holes that they can crawl into easily (because their wings fold to enter a small hole) but from which they cannot escape easily (because their wings spread in flight, making them too large to exit through the small holes). There are several variations of this type of trap. I laid out open bowls of apple cider vinegar mixed with dish soap and that simply evaporated with no dead gnats in it. A little more effort is required in the making of the trap! Two types of trap can be made easily from items you would likely have in your kitchen (a bowl, a plastic bottle, some plastic wrap).

**Using a Bowl**: I used a small serving disk (similar to a ramekin) with an inch or so of apple cider vinegar to which I added some fruit juice. I covered that with clear plastic wrap. With a toothpick, I poked a dozen tiny holes into the plastic wrap. I placed the dish where I see the gnats flying around.

**Ways to Kill the Flying Adults**
Today the stores are full of very mild sprays for flying insects (mild when compared to DDT, malathion, chlordane, and some of the other powerful sprays that were once sold and displayed like candy). I have seen formulas of Raid with nothing more potent than pyrethrum/pyrethrin and/or rotenone in them. Just about any insect spray would kill a gnat. If they are driving you to desperation, get some relief with a mild formula of insect spray. Please, please, bear in mind that you, your pets, and your children do not want to inhale too much of even the mildest insecticides. Pay attention to ventilation and to all warnings on the product label. If you enclose an area (with plastic, like a tent), you could spray only inside the enclosure. I have done this but only in desperate circumstances.

The yellow sticky traps work well, and so does plain old fly paper (inexpensive, and easy to find in stores in any season). At 1/20th the price of the gold trap, fly paper is worth considering!

**Summary**

- Fungus gnats are extremely annoying but mainly harmless.
- Fungus gnats are easy to kill, but it can take 3 to 4 weeks of effort to get rid of all of them.
- My favorite way of killing fungus gnats is with BTi and yellow sticky traps. BTi is bacillus thuringiensis subspecies israelensis.

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