

## Gal Science: On the Honeybee and Her Friends and Relations

By [Linda Lombardi](#) on February 11, 2014 in [GAL SCIENCE](#)

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As *The Toast* searches for its one true [Gal Scientist](#), we will be running a ton of wonderful one-off pieces by female scientists of all shapes and sizes and fields and education levels, which we are sure you will enjoy. They'll live [here](#), so you can always find them. Most recently: [Let's All Panic About Antibiotic Resistance!](#)

Honeybees have the best PR. Starting in kindergarten we learn to have a warm feeling about them, even though most bugs creep people out. But honeybees are kind of cute and fuzzy, they'll sacrifice themselves to protect their family, they're a metaphor for diligent hard work, they hang around with pretty flowers, they provide us with sweets. So aside from that little problem with the stinging, what's not to like?

And they're even more in news now, with the concern over the mysterious [Colony Collapse Disorder](#). Starting in 2006, North American beekeepers started to report that large numbers of the adult bees in their colonies were basically disappearing. Since then, most years the average losses have been about 33 percent, enough to threaten many of our food crops, which depend on commercially managed honeybee colonies for pollination. Scientists have considered everything short of alien abduction as a cause – disease, parasites, pollution, pesticides, environmental changes – but they're still not sure exactly

what's happening.

So the adorable and endangered honeybee is practically the giant panda of the insect world – except with the difference that pandas don't put food on our tables. What no one talks about, though, is that these furry invertebrates have a secret: They're basically an invasive foreign species. Our honeybees – like most Americans – are descended from immigrants, the hives full of bees brought to North America by European settlers.

But if bees are needed to pollinate plants, and honeybees are newcomers, how were plants reproducing before the Europeans got here? They weren't just waiting by the phone for centuries for a date.

“Prior to colonization, a mere five or six hundred years ago, the natural world was working just fine here in North America,” says Michael Raupp, professor of entomology at the University of Maryland and [Bug of the Week](#) blogger. “So the question is who was hauling the freight, and the answer is the native pollinators, many of which are solitary bees.”

While the sociable honeybee – like other extroverts – hogs the limelight, there are around [4,000 native species](#) of bees in North America, and the majority live the single life. Although they don't build communal hives, some do their own kind of architecture, and a few are even named for their trade skills. The plasterer bee coats its burrow with a thin layer of translucent “plaster” that it produces. Carpenter bees use their jaws to dig tunnels into soft wood. And the mason bee builds partitions out of mud in her nesting chamber. Others have simpler tastes and simply nest in holes they dig in the ground.

These solitary bees don't produce honey, but most do provide food for their offspring. (That's what honey is actually for – when we take it, we're basically stealing candy from babies.) The female mason bee gathers pollen and makes it into a cake, lays an egg on it, and seals it into a chamber with mud, and the yellow-faced bee makes “bee-bread” from a combination of nectar and pollen. A few are less diligent parents: The cuckoo bee – named after a bird with the same sneaky childrearing approach – lays its eggs in the nests of other bees. Its larvae eat the food intended for the victim's offspring, and sometimes eats the nestmates as well.

There's also a native bee that everyone is familiar with: the [bumblebee](#). The bumblebee is social, but its family life sounds so tragic that it might be better off alone. Bumblebees build nests in existing cavities like abandoned rodent burrows, where, like honeybees, they live in colonies with a queen and workers and make honey. You can't buy bumblebee honey, though, because they don't produce the huge stores that honeybees do. Honeybees produce so much because they need it to get through the winter, when there's no pollen and nectar to gather. Bumblebees have a different strategy: everyone dies off at the first frost, except the newly-hatched queens who will start new colonies in the spring.

So if we've got thousands of species of native bees, why did European settlers bring their own? It's because most of the crops we depend on have that same secret in their family history. Maybe the saying “as American as apple pie” actually makes more sense when you realize that apples aren't native to North America either. The reason Johnny Appleseed had to spread all those seeds, after all, was exactly because we didn't have any apples here before he did it. Those iconic Southern peaches originally came from elsewhere too, along with pears and cherries and cucumbers and many other foods it's hard to think of as exotic.

And exotic crops called for exotic bees, because pollinators are often adapted very specifically to specific plants. A classic example is an orchid with a foot-long nectar tube that Charles Darwin discovered in Madagascar.

“Darwin said that there must be an insect with a very long tongue that this thing is trying to attract as a pollinator,” says Raupp. “Some forty years later another scientist discovered a hawk moth in Madagascar with a thirteen-inch tongue that was the pollinator.”

This kind of specialization means that despite its central role in agriculture, there are a lot of things the honeybee isn't very good at. Native bees are still much better at pollinating the native plants that they've coexisted with all along, like pumpkins, cranberries, and blueberries. And honeybees [don't pollinate tomatoes](#) at all, because they can't get at the pollen in their flowers. But native bees (including solitary bees and the more social bumblebee) know the trick: the flowers need to be vibrated at a certain frequency to release the pollen. Tomatoes are also pollinated by the wind, but when the bees help, the plants set more and bigger fruit. There are also beloved flowers that depend on native bees: azaleas also need their flowers shaken to release the pollen, something honeybees don't know how to do.

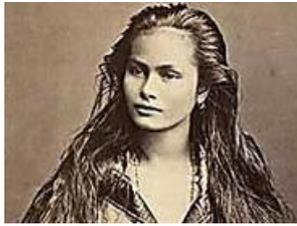
So before you jump on the urban beekeeper bandwagon and get yourself a hive full of those foreign producers of sugary syrup, consider this: you could be the real locavore in the neighborhood, and raise native bees instead. For example, you can attract mason bees to nest in [holes drilled in a wooden block](#), or build them nests made of [reeds](#) or [thin cardboard tubes or straws](#).

And if you're not convinced, here's one more point in their favor: they don't sting. Who's the sweeter bee now?

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**Linda Lombardi** is a writer, unemployed zookeeper, and recovering academic. She is the author of the book and blog **Animals Behaving Badly** and you can **follow her on Twitter**.



**Comments (58)**

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 Lu3 · 206 weeks ago

+18

OH, thank god for this article. I mean, thank you, Linda Lombardi! It's exactly what I've been reading about lately. Why do people think that honeybees are the only kind of bees--or pollinators, for that matter--that count the most? I maintain it's because, yes, they're pretty and interesting and their social life is fascinating, but I think most of all it's because they make things we can take from them and use, not to mention make money from. It's not nearly so glamorous or simply satisfying to make native-bee-friendly environments or drill holes in a piece of wood for solitary bees?

Well done. I really liked this article. :)

[10 replies](#) · active 206 weeks ago

 GreenGrasses · 206 weeks ago

+4

Raising native bees? Sounds awesome! Do you think that one could raise both honeybees and native bees if one had a large yard, or are the the two types generally bad at co-existing?

[1 reply](#) · active 206 weeks ago

 EPWordsnatcher · 206 weeks ago

+6

Weeping for the bumblebee, and am slightly horrified by the thought of the hawk moth.

This article is great, and that's coming from a recovering bee-phobic. Yes to bees!

So are ALL native bees sting-free? Or just the masons?

[5 replies](#) · active 206 weeks ago

 D\_e\_x · 206 weeks ago

+4

I can't really tell if the article is saying not to worry about colony collapse disorder or is just sort of agnostic about it as it relates to honey bees. I guess I thought we should still be worried about it because I would expect at least some other animals in the affected ecosystems to be susceptible either directly or indirectly to the same things that are killing off the honeybee colonies. (I haven't read the most recent science, but I seem to hear most often about various combinations of culprits including neonicotinamide pesticides [e.g., Roundup] making the bees susceptible to fungi, viruses and or mites.)

[2 replies](#) · active 206 weeks ago

 AmazingSandwich · 206 weeks ago

+3

Bees are cool. I quite like them.

Except for killer bees. They sound horrific.

[2 replies](#) · active 206 weeks ago

 MilesOfMountain · 206 weeks ago

+2

My parents got on the native bee train two years ago, and now my dad spends time trying out different mason bee houses to see which they like best. We're not sure how to judge survival, though; a lot of times the little mud plug just sits there

and we're assuming that means the larvae died (potentially as the result of substandard housing) but we're not actually sure.



**katienaum** · 206 weeks ago

+5

"hawk moth in Madagascar with a thirteen-inch tongue"

Oh good, I needed some new nightmares.

Seriously though, awesome and fascinating read!

[5 replies](#) · active 206 weeks ago



**Jess Davis** · 206 weeks ago

+11

This is so great and informative -- love all the Gal Science posts, but the biology/zoology ones especially! All we need now is an enterprising group of motivated scientists to go around and attach labels to all of the non-stinging bees so I know which ones to be down with.



**amanita** · 206 weeks ago

+23

Reading through this comment thread, I just made up a song called "LADIES talkin' 'bout BEES" and it is one part cold medicine and one part my love of ladies + bees, but it's a really good song, and thank you, Toast, for making this happen.

[3 replies](#) · active 206 weeks ago



**Jizzcliner** · 206 weeks ago

+22

Honestly, why do you need a one true scientist, when this series of one-offs is so good?

[5 replies](#) · active 206 weeks ago



**renegadeoboe** · 206 weeks ago

+33

I HAVE A BEE ANECDOTE TO CONTRIBUTE

My granddaddy was a beekeeper until quite recently, which is in and of itself a delightful thing to be. (So many jars of real honey! Having to buy it in a squeezey bottle for the first time when I moved out was culture shock.) So Granddaddy's a beekeeper, but my grandmother (to whom he is married) is allergic - like anaphylactically allergic - to bee stings. One time, early in their marriage, she was in the studio audience for a radio show, and was called up on stage for something. They asked her about herself, and she explained that she was married to a beekeeper, but that "I swell up when I get stung by a bee." She was 8 months pregnant.

[2 replies](#) · active 206 weeks ago



**tubatoothpaste** · 206 weeks ago

+2

Unrelated but this just reminded me of those Nasonex commercials with the Pepe LePew-style bee that were soooooo annoying!

[3 replies](#) · active 206 weeks ago

 [shahea](#) · 206 weeks ago

+1

(That's what honey is actually for – when we take it, we're basically stealing candy from babies.)

Oh. Oh... no. I go through a LOT of honey in the winter because I drink a lot of tea. I'm now horrified.

[4 replies](#) · active 206 weeks ago

 [bumbleblu](#) · 206 weeks ago

+4

Bees!

Bees are great! Particularly bumblebees, aw. Though, okay, they are all best enjoyed from afar.

Also I don't care how "cute" the hawk moth is, anything that is a moth is awful.

 [Brunhildenburg](#) · 206 weeks ago

+2

Related: I listened to the *Wickerman* episode of the "How Did This Get Made" podcast yesterday and had forgotten about how bee-centric that weird island was.

 [Beaks](#) · 206 weeks ago

+1

Apropos of not much at all, the natural history museum on KU's Lawrence campus has a honeybee exhibit where you can watch the bees fly in and out and climb around in their hive. It's pretty much fascinating. (They also have a seriously killer fossil collection, too)



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