What to do with a spider in your fruit

APRIL 9, 2015 / 4 COMMENTS

Earlier this week, Liz Langley posted a great piece about finding spiders hiding in your fruit. My interview with her was a little longer than what was posted, so I decided to post the full text here...

OMG THERE's A GIANT VENOMOUS SPIDERS IN MY BANNANAS WHAT DO I DO????

Imagine you spot a spider, or spiders, or hundreds of baby spiders tucked in with the bananas you recently brought home from the grocery store, or perhaps a black widow in some grapes. The media reports on this phenomena all the time, and the headlines dazzle us with images of dangerous spider lurking amongst our fruits and veggies. And some stories are downright ridiculous.

This is largely an exaggeration: although it’s true that spiders sometimes get shipped around the globe with our produce, it’s relatively rare. Just think of the hundreds of times you bought spider-less bananas! Spiders do live in crops around the world, and generally do good things when they are living in proximity to the foods we like to eat, as they are often important predators of economically important pests occurring in agro-ecosystems. However, they are good at hiding, and sometimes end up being carried along with our bananas or grapes and in this way they hitchhike around the globe.
So... if you do find a spider alongside your fruit... here are some Do's and Don'ts:

1. **Don't** panic. The vast majority of spiders occurring in with our fruits are not dangerous, as a recent scientific study has shown.

2. **Don't** call the authorities or the media: There are bigger and more important things in the world than hitchhiking spiders. Spiders are our friends, doing good things in the world. They are not important enough to warrant notifying the authorities, or your local TV station. It’s easy to get carried away, especially if you see a spider with an egg sac, and perhaps the baby spiders all crowding around. But avoid the compulsion to feed the fires of arachnophobia. Stay calm, carry on. You may wish to call your grocery store, not to get angry, but rather to inform them that you found a spider with your fruits or vegetables. This will allow them to check for other critters in their produce section.

3. **Do** isolate your fruit: take a step back, relax, and assess the situation. Ideally, grab a plastic bag or plastic container, place it over your fruit and spider, and gently place your fruit in an isolated area. Do this gently as to avoid crushing the spiders or the bananas. If you stick this package in your fridge, this will ‘slow down’ the spiders (they are cold-blooded critters, and thus are less active when cooled down). You will want your critter to slow down before you get to step #4.

4. **Do** collect your spider: this may be beyond the comfort zone of many people, but it’s not that tricky to do, and it’s important. If the spider can be collected and/or photographed, it may be possible to get it identified properly. After your fruit has been cooled off in the fridge for a while, and the spider has been slowed down, you can collect the spider by ‘brushing’ it into a smaller container, perhaps a pill bottle or mason jar. Do this carefully, quickly and with confidence. You can also gently grab it with a smaller zip-lock bag (much like you would pick up dog feces). If you are very nervous, wear a pair of rubber gloves. If you are just too uncomfortable with ANY of this, you may just have to say goodbye to your bananas and stick them in the freezer along with their spider, and in that way you will kill the spider too.

5. **Do** document your adventure: One your spider is in a container or zip-lock bag, it may be possible to photograph the spider, or at least compare it to images on a reputable website, such as Rick Vetter's excellent website. However, be very, very cautious jumping to the conclusion that the spider is venomous. It’s tricky to identify spiders, and even arachnologists can struggle with the suite of species found in fruits. That being said, you could also contact your local museum, college or University and ask about whether someone there is willing to help you with your spider. There are also excellent resources...
6. **Don't** release your travelling spider into the wild: most likely you are dealing with a tropical species that just won't live in the climates outside your house. It’s also risky to release spiders into a new environment as you don’t want to potentially introduce something that doesn’t occur naturally in your backyard. And although it pains me to say this (as an arachnologist), the best course of action is to probably to kill the eight-legged cargo, and freezing it is probably the best strategy. Again, your local museum, college or university may want to see the specimens after the fact.

7. **Do** enjoy your fruit: The spiders have not laid eggs in the fruit and provided you did a good look, **everything is fine**: wash your fruit, as normal, and enjoy. The spider is gone.

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**Taxonomist envy and the importance of names**

MARCH 19, 2015 / 1 COMMENT

Imagine: **seeking, finding, watching, sampling, measuring, comparing, analyzing, imaging and... naming.**

These goodies are all part of taxonomy. As Wikipedia defines it, taxonomy "**is the science of defining groups of biological organisms on the basis of shared characteristics and giving names to those groups.**"

**Taxonomists are the true explorers at the foundation of biodiversity science: they are to be appreciated, and I’m envious of their discoveries.**

I’ve always been a collector and sorter and feel some kinship towards taxonomists: although when I was young I engaged more in the process of categorizing 'non-living' things such as sticks, stamps, coins or rocks. But there were comparisons of shared characteristics: some rocks were pink, with lightening-strikes of white crystal; some rocks were angular and sharp, some were smooth, shaped by time and oceans. Perhaps it’s not surprising that during my PhD I thoroughly enjoyed sorting and identifying almost 30,000 spiders from Canada’s boreal forest. It brought back good memories from my childhood: it felt right.
It matters that this is *Alopecosa hirtipes* instead of "Wolf spider species X"

I think my experiences are shared with some of my ecology colleagues, especially those who also call themselves ornithologists, mammalogists, or entomologists: many of us like 'species', and their names. We think about interesting species in our study systems, and think about similarities and differences, about a place's history with its species, and the relationship to other species or spaces nearby, upstream of downstream.

But I, like most of my ecology colleagues, are not taxonomists. Instead we exploit and repurpose the good work done by taxonomists (and often not citing their work – oops!). For a concrete example from my own experience: without the taxonomic expertise of great Canadian arachnologists such as Charles Dondale, and colleagues, who described species and then wrote accessible taxonomic keys, my work would be of much lower value. The keys allowed me to get names on things. These names increase the value of the work tremendously.

Despite being retired for many years, Charles Dondale still has an office at the Canadian National
Let’s look closely at this value: Surely it would be possible have the same main results from my ecological work without having the actual species names? Surely I could have called everything by my own pretend name – a secret code that I could develop – a series of ‘morphospecies’. And, these days, I could have a long code to represent a barcode. Isn’t that enough? In truth, the broad community patterns that I sometimes publish about don’t depend on the names. Rather, these community patterns depend on recognition of different types of things, but the names themselves don’t drive the patterns.

While it’s true that names are only one part of my ecological research, they are a very important part. They provide an important common ground for understanding our biodiversity – they allow us to compare apples to apples in all the right ways. The names are a doorway into a rich history, a life story that perhaps goes back hundreds of years in the literature. It means more to know that *Alopecosa hirtipes* is running around the Arctic tundra than it does to know it is ‘Wolf spider species X’.

But the name comes at a cost: it means that someone spent their time searching, watching, measuring and comparing; looking at shared characteristics, and putting the species in an evolutionary framework, and perhaps producing a valuable taxonomic key so free-loading ecologists like me can stick a name on ‘Wolf spider species X’. The cost is worth it: taxonomists are as valuable to science as are ecologists, molecular biologists, or physicists.

Taxonomy is a science that is relevant and important, and despite increased availability of molecular tools, names still matter. We need taxonomists to be our quality control, and bring sense and order to strings of code in GenBank, and help us compare and connect across systems, or among similar habitats. We need the full package figured out for a species: specimens, meta-data, barcodes and names. After that, we need to go further and assess evolutionary history and test hypotheses about relationships among species.

Today is Taxonomist Appreciation Day, but let’s make sure it’s more than one day. Let’s make it something we think about every day: every time we see a *Corvus corax* fly by, or see a *Chelifer cancroides* on the wall of our bathroom, let’s remember that every name has a story, and the narrative is brought to life because of
Under the influence: how insecticides affect jumping spider personalities (Part 2)
February 18, 2015 / 4 Comments

This post is written by former PhD student Raphaël Royauté, and is a plain-language summary for our most recent article titled: Under the influence: sublethal exposure to an insecticide affects personality expression in a jumping spider

It’s well known that personalities can shift and change when we are ‘under the influence’ of chemicals, be it drugs or alcohol. As entomologists, we also consider this question for the insects and spiders that live among us: although we assume arthropods can similarly be affected by chemicals in their environment, it’s less clear how these chemicals may affect the personalities of these arthropods. We tested the effects of insecticide residues on the personalities of a jumping spider known to live in apple orchards. We found that individual-based personality shifts occurred when spiders were exposed to sub-lethal doses of an insecticide. This mean that even before we might see ‘population-level’ effects of insecticides on an important predator in agro-ecosystems, individual spiders themselves get, um, sort of messed up when under the influence.

Insecticides are often used in agriculture for various reasons, but can have negative effects on the ‘non-target’ fauna living in our agricultural fields. One of the most important challenges in evaluating their toxicity is that these chemicals can persist at low concentration in the environment. These concentrations are unlikely to kill exposed organisms but may substantially alter behaviours. Most of our evidence of the toxicity of insecticides on behaviours comes from studies on pollinators and research has shown decreases in spatial memory and learning capacities.

There remain gaps in our knowledge about how other types of organisms respond to these compounds. Studies on insecticide toxicity may be also limited because they tend to ignore how insecticides shape variation in behaviour. This is important because individuals differ in their behavioural tendencies and may not have the same weight in ecological processes: some individuals are more active, show more aggressiveness or consume more food. Personality traits can also be inter-related and form “behavioural syndromes”: clusters of behavioural traits that are correlated and evolve as a package. If personality traits are interconnected, any insecticide modifying one trait is likely to alter the whole syndrome. We’ve shown previously that behavioural
 syndromes differed between populations exposed and unexposed to insecticides in the Bronze Jumping Spider, a species common in apple orchards and known to prey on several economically important pests. But those populations could be different for a variety of reasons: for example, perhaps the insecticides affect spider behaviours because there is simply less food available in insecticide-exposed areas for example.

We wanted to test if insecticides could be directly responsible for the shifts in personality and behavioural syndromes we noticed. In other words, when a spider is "under the influence" of insecticides, is it still behaving according to its personality type?

The similarities between insecticides and drugs is fascinating: Both types of compounds target the nervous system, both can affect behaviours and both can kill above a certain lethal dose. In fact caffeine and nicotine evolved as natural plant defenses against insect herbivory and the latter was one of the first insecticides ever used. As crazy as it sounds, the effect of psychoactive drugs has been investigated in spiders in the past! The legend goes that, back in 1948, zoologist H. M. Peters was annoyed by his garden spiders spinning webs at “such ungodly hours” (2 am-5am). He wanted to found a compound that would shift the spinning behaviour to more a "decent" schedule, and he asked pharmacologist Peter N. Witt for help. Witt tried different psychoactive compounds on the spiders, including caffeine, LSD and marijuana but couldn't produce the desired effect. What he found was in fact much more interesting: each compounds produced a distinct type of “drug web”, altering its shape, size or regularity! (from Foelix’s "Biology of Spiders") More recent research has shown that some commonly used insecticides affect web building in the same way drugs do.

We focused on how activity and prey capture capacities were affected by exposure to a widely used insecticide (phosmet) in the Bronze Jumping Spider. We tested activity and prey capture before and after exposure the insecticide and compared the amount of behavioural variation with that of a control group. Doing research in ecology sometimes requires using original equipment. In our case we found that the best way to expose our spiders to the insecticide was to use a hotdog warmer! We applied the insecticide solution on test tubes and used the rotation of the hotdog machine to get a homogeneous surface coated with dry insecticide residues. This allowed us to have a more precise control of the dose that each spider received while simulating field exposure conditions.

Unusual research equipment: hot-dog warmer. (photo by R. Royaute)
We did not find any effect of the insecticide on average behaviour between treatments but the ranking of individuals was strongly affected after insecticide exposure. In general spiders exposed to the insecticide were more variable in their behavioural tendencies. This suggests that the effects of insecticides on personality differences may manifest before any effects on the population as a whole are detected, in which case scientists may be frequently underestimating the toxicity of insecticides. Another puzzling result was that males and females did not respond in the same way to insecticide exposure. Males were most affected in the way they explored their environment but their capacity to capture prey remained intact. Females instead showed a decrease in the strength of the activity-prey capture syndrome.

Spiders play an important role in agricultural fields as they help regulate pest outbreaks. By altering personality differences and their syndromes, insecticides may limit spiders’ capacity to provide this important ecosystem service in subtle ways. As usual, this research leads to more questions than answers. At the organism’s level, it is important to understand how long these personality shifts last for. Do these shifts vary depending on how frequently spiders get exposed to insecticide or to what types of insecticides they are exposed to? How do they ultimately affect a spider’s capacity to escape predators, capture prey or reproduce depending on the individual’s personality? At the ecosystem level, prey get exposed to insecticides too, what happens to the predator-prey dynamics when the personality of both prey and predator is affected? How does that translate into biocontrol services? These are all important questions that I hope to contribute to in the future. Stay tuned!
A male bronze jumper (*Eris militaris*). Photo by C. Ernst, reproduced here with permission.

References:


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Spider Book!

WE are excited. The “We” is me and Eleanor Spicer Rice, of Buzz Hoot Roar fame, and author of the incredible e-books about ants.
Here's the really big news...

We are teaming up with The University of Chicago Press, and **writing a book about spiders!**

There are already some really amazing spider books out there – one of our favourites is Rich Bradley’s gem, *Common Spiders of North America*: it’s beautifully illustrated, rich and in-depth. For those looking to cuddle up with a microscope, there is "Spiders of North America: an identification manual": that book can unleash your inner taxonomist and help you identify (to genus) most spiders of the region. There are also some regional field guides about spiders, photography books, and detailed books about spider silk, or about general spider biology.

However, **more books about spiders are needed!** There is so much to say! These amazing arachnids are one of the most diverse groups of animals on the planet, with about 40,000 known species. They have the most unusual courtship and mating behaviours, and are often misunderstood, eliciting fear and loathing due to unwarranted fears about spider bites. Fundamentally, spiders are our friends and our goal with this project is to help share a fascination and love of these eight-legged marvels. We want all people to be familiar with the spiders they most commonly encounter, and when they bump into spiders as they move about the world, they’ll see friends and familiar faces instead of fangs. We want our book to be a non-technical primer of spiders and our goal is to bring awe and wonder, dispel myths, and help create an entire generation of arachnophiles. We hope to reach as broad an audience as possible, and teaming with University of Chicago Press will certainly help with this.

Our project will share stories about some of the most common spiders you will find in North America. Much like *Eleanor’s ant books*, we will research (using the primary literature) the life history and biology of common spiders in North America, and weave the science into a narrative about the species. We will unpack their biology, and write about spiders using accessible language. We’ll team up with our favourite photographers, and stunning images will accompany the text. Our hopes are that this book will complement the other books out there, and provide readers an accessible and fun-filled glimpse into the fascinating world of spiders.
Calling all Arachnologists!

We can't do this project alone and WE WANT YOU! This project will be bigger and better with your help. Although we would love to include ALL the common spiders in our backyards, local forests and fields, this would make the project a little too big... so we need to narrow down to a reasonable number of species. So, we would like to know what species you want to read about.

Do you want a chapter about the glorious Black-and-yellow garden spiders?

What about the Zebra spiders?

Surely you would like to hear more about black widows?

Please provide us some feedback in the comment section, below. Tell us what you want to read about, and what aspects of spider biology must be included in our book. We will take your feedback seriously and try to include your suggestions.
Needless to say, we are SUPER excited about this project, and those of you that know us are already aware that we super-enthusiastic people to begin with, so this project has taken things to a **WHOLE NEW LEVEL OF EXCITEMENT!!!** We are so thankful for University of Chicago Press for the opportunity to tackle this project, and are already quick out of the starting gate: we have an upcoming writing retreat planned in March, and have already drafted some chapters. And in the coming months, we will certainly keep you updated on progress. We do hope you are as eager as us to see the finished project hit the bookshelves.

Spiderly, yours,

Chris & Eleanor

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**Congratulations to the new Doctor of spider behaviour**

MARCH 18, 2014

I’m delighted to announce that lab member Raphaël Royauté successfully defended his PhD yesterday.... and he did it with grace, maturity, and poise. The defence was fair, but tough, and Raphael was able to show his breadth and depth of expertise on the broad topic of behaviour in arthropods.

Raphaël’s thesis was titled "**Factors influencing behavioural variation in apple orchard populations of the jumping spider *Eris militaris* (Araneae: Salticidae)**" and the during the defence, he was asked (not by me, remarkably!) to offer a ‘tweet’ of the his thesis. Here it is, coming in at almost exactly 140 characters.
So, his research looked at behavioural syndromes in this remarkable jumping spider: Raphaël collected spiders in apple orchards, maintained them in a laboratory and ran them through a battery of behavioural tests. He defined behaviours, looked at correlations among these behaviours (sometimes called ‘personality’), and how these traits varied during the development of individuals, consistency of these behaviours and whether behaviours differed depending on whether the spiders came from insecticide-free or insecticide-treated orchards. Raphaël also looked at the direct effect of sub-lethal effects of insecticides on behaviour and will soon be publishing the ways that insecticides mess up their personalities.

Raphaël has really done incredible work – but looking back, I should not be surprised. Soon after he arrived in the lab we worked together on a short project about the activity of spiders right after snowmelt, and at that point, I was impressed with his intellectual curiosity, drive and motivation, and overall approach to scientific research.

After that first project, Raphaël came back to McGill to work on a PhD with me and Dr. Charles Vincent as co-supervisors. And now, many years later, he is now successfully defended a PhD. What a marvellous journey, and I can honestly say that I’ve learned far more from Raphaël than he could have learned from me.

Good luck Raph! (And you’ll be missed in the lab)
Last week I had a terrific discussion with a twitter friend, and he suggested that many/most of the links on Expiscor are ones that were VERY frequently discussed over various social media sites – i.e., a re-distribution of commonly viewed stories. Of course, that is part of the objective of Expiscor, but I also want to be a provider of stories people haven’t heard about previously. So, **CHALLENGE ACCEPTED!** This week my goal is to provide links to things that are so weird, and obscure that you will totally surprised. **It’s the obscure edition**.... Please take the poll at the end of this post to let me know if I succeeded!

- In the spirit of Halloween (last week), [here’s four spooky videos of spiders weaving webs.](#)

- **Fact:** Spiders are adorable....

- **RECLUSE SPIDERS NOW IN CUBA!** (gotcha... but you don’t need to panic... [this paper describes new Loxosceles from the West Indies](#))

- Look if you dare...[Ancient spider family album.](#)

- A feel-good story about spiders: the "[spider queen" brings tarantulas back to a wilderness area.](#)

- Be glad you live in this century. The process of ‘de-infestation’ was not pretty.
- Aha ha. It’s a species of Australian sphecid wasp. This is a simply WONDERFUL list of curious zoological names.

- Steampunk, clockwork Goliath Beetle. I want this. Available from BrazenDevice (thanks, Evan, for allowing me to post the photo here. Ento-geeks will love it!)

![Image of a clockwork Goliath Beetle]

- On the theme of amazing beetles, these beetles show there is such a thing as a free lunch.

- History on a pin: An insect from 1702.

- Biodiversity: it’s the box that we can’t even imagine the outside of. A nifty post Pxay eyaye si ayioang fpfio.

- The Echinoblog...check out this blog description: Echinodermata! Starfish! Sea Urchins! Sea Cucumbers! Stone Lilies! Feather Stars! Blastozoans! Sea Daisies! Marine invertebrates found throughout the world’s oceans with a rich and ancient fossil legacy. Their biology and evolution includes a wide range of crazy and wonderful things. Let me share those things with YOU! ...The question is: How did I ever miss this blog. Awesome.

- Silken wonders: We talked about webspinners in my Entomology class last week. That lecture took me to this informative post. These animals are lovely.

- #SixSecondInsects. A big bug.

- A story of two bugs. Ha ha... fooled you... not the bugs you were thinking of.

- Ecosystem Services ... from beyond the grave.

- More on Halloween. Including MAGGOT ART!!

- From the Biodiversity Heritage Library, and also in the spirit of Halloween, a beautiful bat for you:
• Read here: the most amazing University Libraries.

• Interpersonnel Botany: intersection between people, print and botany, 1700-1900. WOW!

• Of lice and men: an itchy history.

• How about lice and elephants? These are truths not lice.

• Fitting animals on Noah’s Ark. Fascinating story about a 17th century scholar.

• Tweet of the week goes to Leonard Nimoy (Ok this is NOT at all obscure, but it sure is funny):

  ![Leonard Nimoy](https://example.com/leonard-nimoy.jpg)
  Today I was told that Spock has 3 ears. The left ear, the right ear and the final front-ear. LLAP

  …if you are in love—that’s a good thing—that’s about the best thing that can happen to anyone. Something from Steinbeck.

• Just look at this HUGE periodic table for your wall.

• Some pretty powerful poetry, from a Canadian spoken word poet.

• Hey looks – A to Z of Entomology... featuring Simon Leather!
Welcome to Expiscor! All sorts of discoveries... at your fingertips.

- So much hype about **deadly spiders** in the UK – thankfully **BUG GIRL TO THE RESCUE**. Go read her post, folks.

- Here's another **measured and rational post about false widow spiders** in the UK.

- **Monstrous verminous** – some thinking about why we fear bugs.

- **Jumping spiders** – an evolutionary love story.

- The Entomological Society's annual meeting ended last week – here's **Sean McCann's wrap-up post** (and photos)

- Here's **Crystal Ernst's take on post-conference excitement**, and an honest portrayal of struggles in grad school. An important read (you're not alone).

- At that conference, David Shorthouse put together a really amazing tool – a **twitter capture tool that links bugs to literature**.

- Just prior to that conference there was a photo workshop hosted by **Alex Wild**. **Here are some of the stunning images from that workshop**.

- Speaking of images from that workshop, here's a black widow for you, taken by **Alex** (thanks for the permission to use your photos here, Alex!)
Neat paper by Nash Turley et al. Habitat patch shape determines herbivory and fruit production in an annual plant.

Tick collector – expect the unexpected... up your nose.

Comic Ant-thology. Very awesome.

Roll that poo. Dung beetle game awaits...

You will BEE amazed at these SEM images from the Smithsonian magazine blog.

A must-have t-shirt for Entomologist – Eat. Sleep. Collect.

Good luck, Sam.


Pronunciation of biological latin names. Wow – I make a lot of mistakes. (thanks, Ted for that link)

The latin name discussion came in part from the best hashtag I've seen in a while – #ReplaceWordsWithBugs. This also made it difficult to highlight a tweet of the week. Even though there is debate about how to pronounce ".....dae" at the end of family names, this is still a winner, from Adrian Tchaikovsky:

#replacewordswithbugs Sunshine on Araneidae. Seriously have been waiting 10 yrs to make that joke.

VRAK. How to sound like a frog in 10 languages. (thanks Heidi for that link!)
Creepy and cool science art: Trilobite boy.

Heat a house or a body? My colleague and friend Murray Humphries recently published a paper about city-scale human thermoregulation – bottom line: put on a sweater!

I love this post by Derek Hennen about the value of twitter to a young scientist. Well said, Derek.

Liz Neely writes about ‘warmth’ in scientists and in science communication – very thought provoking.

In the spirit of Halloween... BLOODY FINGERS! Yum yum.

Students text a lot during class. In my opinion, this means there’s also a problem with the content and/or instructor. Students need to engage, but Profs must also adapt. Right -so I will have to write blog post on this (stay tuned)

The irrational fear of GM foods.

McGill is entering the world of MOOCs —> first up, Food for Thought.

How professors are using social media – nifty infographic.

Speaking of nifty – turn your i-phone into a microscope!

Darwin’s son draws some pretty lovely pictures!

Here's a Halloween-themed "Simon's Cat", featuring a spider:
Pages in category "Arthropod ecology". This category contains only the following page. This list may not reflect recent changes (learn more).

D. Diapause. Retrieved from "https://en.wikipedia.org/w/index.php?title=Category:Arthropod_ecology&oldid=766827071". Categories: Arthropods. Protostome ecology. It is almost impossible to generalize about the ecology and life history of arthropods; they are simply too diverse. Arthropods first appeared in the sea; trilobites were all marine. Most crustaceans are also marine, but one crustacean group has successfully invaded the land, the Isopoda, a.k.a. "pillbugs" or "roly-poly". The vast majority of living arthropods belong to groups that are...