

## Promotional web content writing sample

University of Florida Entomology and Nematology Department annual “BugWeek@UF” educational promotion, May 18–22, 2015. (<http://bugs.ufl.edu/>)

### **BugWeek Blog: Bug of the Day**

#### **Bumblebee**

You might think any bug called *Bombus* would have to be big and scary—or maybe something out of a Harry Potter story. In reality, though, *Bombus* is just the genus of the lovable old bumblebee.

The word *Bombus* is Latin for buzzing or humming, which perfectly describes the sound of the bumblebee in flight.

With its plump, fuzzy body, black-and-yellow bands of color, and characteristic buzz as it flies from flower to flower in search of nectar and pollen, the bumblebee is easy to recognize.

Bumblebees are bigger and rounder than honeybees. They have fewer stripes than honeybees, but those stripes are bold yellow and black. Honeybees, on the other hand, are smaller, sleeker, and are colored gold and black. Like honeybees, bumblebees form colonies, but they’re small, numbering anywhere from 50 to 400 individuals, depending on the species (a honeybee colony may contain 50,000 bees.)

There are more than 250 species of bumblebee found throughout the Northern Hemisphere and South America, although only five of those species are found in Florida. Bumblebees prefer a temperate climate, and Florida can get a little too warm for most of them.

Part of the reason for bumblebees’ climate preference is that long setae (hairs or bristles) cover their bodies. Setae give the bumblebee its “furry” appearance, and just like fur, the setae insulate the bumblebee against the cold—species from colder climates have longer setae.

The queen bumblebee hibernates in the ground through the winter. When spring comes, she will wake and look for a good site for a nest—usually a hole in the ground, a thicket of grass, or the space under a rock.

You may have heard an old myth that according to the laws of aerodynamics, bumblebees should not be able to fly. No one knows how this myth actually started, but it obviously isn’t true.

The bumblebee beats its wings 200 times per second. This is actually faster than nerves can fire, so instead of contracting its muscles, the bumblebee has developed a way of vibrating its muscles like a violin string. It is this vibration that makes the bumblebee’s buzz, not the actual beating of its wings.

Not only can bumblebees fly, they can fly fast—up to 15 meters per second. That’s more than 33 miles per hour!

Of course, you probably won’t ever see a bumblebee fly a mile all at once. They typically forage no farther than about a mile and a half from their nests, but most of that is darting from flower to flower while feeding. Bumblebees have a long, hairy tongue called a proboscis that they use to lap up nectar.

When female bumblebees feed they also collect pollen, which they take back to the nest to feed to the young. Only females collect pollen on purpose, but males often get it stuck to their bodies by accident (you can see yellow flecks of pollen all over the bumblebee in the photo above). In either case, this pollen also fertilizes other flowers that the bee visits. For this reason, bumblebees (like honeybees) are very important in human agriculture.

Bumblebees are the primary pollinators of tomatoes, eggplant, sunflowers, cranberries, and scarlet runner beans, and they also pollinate dozens of other fruit and vegetable crops.

Unlike honeybees, however, bumblebees produce only enough honey for themselves.

Another way bumbles differ from honeybees is that the bumblebee doesn't have barbs on its stinger. Without the barbs, the stinger doesn't get stuck in its victim, so the bumblebee can sting again and again. Fortunately, bumblebees aren't aggressive and only sting in self-defense. The best way to avoid being stung is to leave the bee and its nest alone!

By the way, an old-fashioned name for the bumblebee is “dumbledor.” J. K. Rowling chose this as the name for the Harry Potter headmaster because he loves music and she always envisioned him humming to himself as he wandered the hallowed halls of Hogwarts.

## Damselfly

People often get damselflies and dragonflies confused—or use the names interchangeably for both insects. Although there are many similarities between damselflies and dragonflies, they are separate and distinct suborders.

There are some noticeable difference between the two. For example, Florida's damselfly species are smaller than many of our dragonflies. Damselflies have thinner abdomens than dragonflies do, and they fold their four wings together above their bodies while resting, whereas dragonflies keep their wings extended all the time. In flight, damselflies tend to be slower and travel in more erratic paths than dragonflies.

One way to remember which is which is to think of the first part of their names. If you compared a damsel and a dragon, you would expect the damsel to be smaller and to have better manners, folding her wings primly when she sits down.

Of course, this analogy falls apart when it comes to food. Damselflies are predatory insects, hovering over low vegetation and grass and snatching their prey off stems or even right out of the air with their sharp, spiked legs. Like the praying mantis, the damselfly can move its head on its neck, which helps it maneuver when flying and, in combination with its widely separated eyes, lets it spot prey easily.

Damselflies are beneficial insects because they eat up flies, mosquitos, gnats and other insect pests that are not only annoying but sometimes spread disease.

Damselflies are beneficial in another way, too. Because they're totally aquatic in the nymph stage, and adults rarely stray far from water, the presence of damselflies indicates that the fresh water nearby is relatively clean and healthy. So if damselflies suddenly start to disappear from an area, it could be an early indicator of water pollution.

Some species of damselfly have elaborate courtship rituals, but some simply mate in the air. No matter what, though, the female will find a suitable body of water and submerge her abdomen to lay eggs. She will make a slit in a plant stem with her ovipositor and deposit her eggs inside.

The nymphs look like adults without wings. They have three large, external gills, resembling fins, at the end of the abdomen. Nymphs will molt 10 or 12 times as they grow. When a nymph is fully developed, it will climb out of the water to undergo metamorphosis: the skin splits down the back, and the adult damselfly emerges and pumps a blood-like fluid called haemolymph into its wings to straighten them. As soon as the wings harden—which can take anywhere from 30 minutes to several hours depending on the air temperature—the damselfly flies away in search of a hearty meal.

There is a lot of frightening folklore about damselflies, but you shouldn't believe any of it. Because the ovipositor looks like a stinger, damselflies (and dragonflies) have gained nicknames such as “horse stinger” or “eye stinger.” But the damselfly doesn't sting or bite at all (unless you're a tiny flying insect).

In Florida, you may have heard damselflies called “snake doctors,” a nickname inspired by the belief

that damselflies follow snakes around and “stitch them up” if they are injured.

Perhaps the scariest nickname is “Devil’s darning needle,” which came from the very silly myth that if you fell asleep by a stream or pond on a summer afternoon, damselflies would use their long, thin bodies like needles to sew your eyes shut. We’re not at all certain where they were supposed to get the thread for this diabolical prank....

## Golden Silk Spider

Whether you love ’em or you hate ’em, if you live in Florida you definitely know the golden silk spider, *Nephila clavipes*—sometimes called a banana spider or golden web spider. During warm weather, they’re common wooded areas and even backyards, and easy to spot due to their huge, colorful webs.

Many people are scared of these spiders, but there’s really no reason to be afraid. Female golden silk spiders may be large—their bodies regularly grow to more than an inch and a half, with leg spans of several inches—and their webs can be bigger than a human, but the spiders are much more interested in catching small flying insects than they are in people.

Golden silk spiders are especially good at catching fruit flies and other garden pests, so they’re quite nice to have around.

The female spiders produce strong, yellow silk—this explains the name golden silk spider. Also, the female’s abdomen is mostly yellow and shaped sort of like a banana, which may explain another of this spider’s nicknames, the banana spider. That nickname may also arise from the fact that some people mistakenly believe that this species comes to the U.S. in bananas shipped from Central and South America, but it’s actually native to the eastern U.S.

Male golden silk spiders, by contrast, are very small and dull brown. Probably the only way you’ll notice them is if you look closely at a web—you’ll probably see one or more of them near the female.

The web has a large, round center, where the female usually sits upside-down while waiting for prey to become ensnared. The web often has clumps of silk, leaves, small twigs, and insect carcasses in it, which may serve to alert the spider of predators trying to make their way onto the web.

Immature golden silk spiders sometimes weave criss-cross stabilimenta (see yesterday’s Bug Word of the Day for an explanation) into their webs, especially when they’re getting ready to molt. Fortunately for us—not to mention smaller birds—this just makes the webs easier to see and avoid.

Those webs are big enough and strong enough that it can be frightening to walk into one—trust us, it can feel almost like someone has thrown a sheet over you. But there’s little chance of being bitten by the spider if you do blunder into her web. Despite their size and striking appearance, golden silk spiders aren’t dangerously venomous and almost always retreat from human incursions. Even if you blunder through a web so fast that the female doesn’t have a chance to flee and ends up on your body, she’s unlikely to bite—she’ll probably just crawl around, seeking a way to climb down from the strange, moving object that destroyed her home. (That fact doesn’t exactly make the experience stress-free for most people, we know.)

Orb-weaver spiders like the golden silk spider belong to the *Nephila* genus, the oldest surviving spider genus in the world. A fossilized *Nephila* specimen has been dated to at least 165 million years old, and it looked remarkably similar to several species still alive today—except it had a leg span of six inches! Imagine running into that spider’s web!

## Yellow Fly

If you've ever gone to the pool or to a cookout or a ballgame or a park—if you've ever done anything outdoors in Florida during the summer—then you probably are acquainted with the yellow fly. And you probably wish you weren't.

The yellow fly has a vicious, painful bite. Its scissor-like jaws easily cut through human skin, penetrating deep in search of blood. And, unlike its cousins the deer fly and the horse fly, the yellow fly is more than willing to enter buildings in search of a blood meal. To make matters worse, the yellow fly is relentless in its pursuit of your blood—once it has found you, it's very hard to escape.

If this sounds like something out of a horror movie, well, if you've ever been bitten by a yellow fly, you know it pretty much is.

Although the name “yellow fly” is commonly used to describe any of a dozen or so different biting flies in the *Tabanidae* family, only the *Diachlorus ferrugatus* is the true yellow fly.

The adult is about 3/8 inch (1 cm) long, and has a yellow abdomen with black hair on the sides. The forelegs are predominantly black, the other pairs yellow. The wings are mostly colorless, with brown patches toward the tips. Yellow flies and deer flies look very similar, but yellow flies have a single yellow stripe down the back and dark purple eyes with fluorescent green bands, whereas deer flies have several yellow and black stripes and mottled purple and yellow eyes.

Not that you're likely to stop and take a close look if either one is attacking you....

As with mosquitoes, only the female yellow fly bites—she needs blood in order to produce eggs. Males feed on pollen and nectar. Yellow flies are active in Florida between March and November, although the peak season is during the hot weather of May-September.

Unlike deer flies and horse flies, yellow flies are not known to carry any diseases, but keep in mind that any open wound can become infected. So treat a yellow fly bite like any other cut or puncture wound: keep it clean and covered.

## Pseudoscorpion

Don't be alarmed by that picture! The pseudoscorpion may look—and sound—terrifying, but it's also one of our smallest Bugs of the Day. It's also completely harmless (to humans, anyway) and it eats lots of other kinds of bugs, so you should actually be happy to find this bug in your house.

Pseudoscorpions are less than 5 mm (0.2") long with flat, brown bodies and pincers that resemble those of scorpions, which is where they get their name (*pseudo* means false or not genuine). They are arachnids, with eight legs and a body divided into two parts, so they are related to scorpions and spiders, but obviously are much, much smaller—no matter how big those pincers may look.

Pseudoscorpions live all over the world, and they have been around for a very long time—the oldest known pseudoscorpion fossil dates from the Devonian period, 380 million years ago! There are more than 3,300 species of pseudoscorpion, but *Chelifer cancelloides*, the house pseudoscorpion, is the only one you're ever likely to see, as they like to live indoors—especially in books.

They are predators, but they can't bite humans because their mouths are just too small and weak. Instead, they feed on book lice, caterpillars, dust mites, and other tiny invertebrates, so they are very beneficial. Pseudoscorpions catch prey in their pincers (called “pedipalps”), which have venom glands in them—the pseudoscorpion injects venom and digestive juices into its victim and then sucks out the liquefied insides. Yikes!

Some species of pseudoscorpions have a very strange way of mating, too. When a male house pseudoscorpion attracts a female, he will deposit a sac containing his sperm in the middle of his mating

territory and then start an elaborate mating dance to guides the female over the sac, where she then picks up the sperm. This can take as much as an hour to accomplish.

Once this ritual is over, the female carries 20 to 40 fertilized eggs beneath her abdomen. The young pseudoscorpions look like small adults. They stay with the female for several days, sometimes riding on her back, before dispersing.

The young house pseudoscorpions spin silk from a gland in their jaws to make disk-shaped cocoons for protection when they molt, which they do three times over the course of a year or two before they finally reach adulthood. Adults can live for a further three or four years.

And in case you're wondering how something so small managed to make itself at home all over the world, it turns out that the pseudoscorpion has one last trick up its sleeve (Science Note: pseudoscorpions do not wear clothes, and therefore do not actually have sleeves)—hitchhiking. In a process technically known as "phoresy," pseudoscorpions will simply grab onto another animal, such as a fly or a beetle, and go for a ride, letting the other animal do all the work. Depending on your point of view, that's either very sneaky or very smart.

## Fiery Searcher

Perhaps the glamor of BugWeek is going to the fiery searcher's head—this glitzy, shimmering Bug of the Day is dressed to the nines and ready for its close-up!

The fiery searcher, or *Calosoma scrutator* (cal-OH-so-ma SCREW-tuh-TOR), is one of the largest beetles in North America, and also one of the showiest. Growing up to 35 mm (1.4") long, it has a metallic deep blue, green, or gold head, legs, and pronotum (the plate that covers the back of the thorax) and brilliant metallic green wing covers with red margins. Kind of like a hot-rod with flames painted on the sides (okay, not really).

Those fire-red edges give the fiery searcher the first part of its common name. The second part comes from its voracious appetite—it is always searching for caterpillars or grubs for its next meal. In fact, the fiery searcher is also sometimes called the caterpillar hunter beetle.

Fiery searchers have a preference for the caterpillars of some of the most destructive garden pests—aphids, asparagus beetles, cabbage worms, cutworms, gypsy moths, and potato beetles, to name just a few—so these would be good bugs to have around even if they weren't so beautiful!

Fiery searchers are nocturnal, hunting at night (when caterpillars are most active) and sleeping under leaf litter or mulch by day. They lay their eggs in the soil, and when the larvae emerge (looking, ironically, like caterpillars or worms themselves) they start eating right away. When winter comes, the adults burrow into the ground to survive the cold weather, emerging in late spring just in time for the peak caterpillar season. They can live for up to three years.

Although fiery searchers can fly, they don't fly well, and prefer to remain on the ground or in trees so they can hunt caterpillars, relentlessly. And though they may look rather cumbersome, fiery searchers are scorching fast and very nimble—think of them as the cheetahs of the insect world.

If you ever do manage to catch one, though, be careful. Their large mandibles are strong enough to pierce human skin, and they can give you a nasty little bite. They have no venom, so there's no real danger—but, like many beetles, they also can emit a very foul odor (it smells a little like road kill) to ward off predators. So it's best to leave them alone and let them go about their business of keeping your yard and garden free of pests, because that's what they do best.

## Big-eyed bug

Pseudoscorpion, fiery searcher—we've met some bugs with pretty impressive names so far. But we're going to finish up BugWeek with what is perhaps the best bug name ever: the big-eyed bug.

Not to be confused with the “bug-eyed monster” of science fiction, big-eyed bugs are true bugs (order *Hemiptera*) comprising the genus *Geocoris*. They are the smallest of our bugs this week—even *Geocoris bullatus*, the so-called large big-eyed bug, is barely the size of the tiny house pseudoscorpion—but relative to the size of their small, triangular heads they have *enormous*, bulging eyes.

Those eyes provide a wide field of vision when the big-eyed bug hunts its prey. The big-eyed bug is an important beneficial predator, feeding on aphids, mites, insect eggs, small caterpillars, bollworms, fleahoppers, lygus, thrips, and whiteflies. Like all true bugs, the big-eyed bug feed by stabbing its prey with its sharp, straw-like mouthparts and sucking out the dissolved juices, leaving behind the empty husk. Nymphs can eat as many as 1600 spider mites before reaching adulthood, and adults can eat as many as 80 mites per day. If big-eyed bugs run out of insects to eat they may resort to sucking nectar from plants, but this generally is not a concern.

Big-eyed bugs resemble some destructive insects such as chinch bugs, false chinch bugs, and pamera bugs, so you should learn to identify them to be sure you aren't trying to rid your garden of the good guys. The easiest distinguishing feature is, of course, those big, big, buggy eyes.

The eggs of the big-eyed bug look like tiny grains of rice with of two red eyespots near the tip. The larvae develop through five instars, each lasting only a few days; there is no pupal stage. Nymphs look rather like the adults but lack wings. They are just as predatory as adults, though, so welcome them in your garden.

Big-eyed bugs only live for about a month, but as noted above they can eat plenty of pests in that time, and a female can lay up to 300 eggs, ensuring there will be plenty more big-eyed-bugs to help you with your gardening.

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### **BugWeek Blog: Bug Word of the Day**

#### **Scutellum**

The scutellum is the shield-like plate found on the backs of insects. In fact, the word scutellum (pronounced “skew-TELL-um”) is Latin for “small shield.”

It typically forms a small triangle at the base of the folded wings, pointing toward the tip of the abdomen. The scutellum is easy to see on insects belonging to the order *Hemiptera* (true bugs) and some members of the order *Coleoptera* (beetles), but it’s smaller on most other insects and sometimes is hidden by other body parts.

It isn’t only bugs that have scutella, though. Plants like grasses, grains, etc. have a structure on the cotyledon (seed-leaf) that botanists call the scutellum—but in that case, it’s a large, thin mass of tissue that absorbs nutrients during germination. It also happens to be shaped like a small shield, hence the name.

#### **Mycangia**

Mycangia (pronounced “mike-AN-gee-uh,” from Greek *myco* ‘fungus’ + *angeion* ‘vessel’) are specialized recesses on the bodies of bugs such as bark beetles where they carry symbiotic fungi.

“Symbiotic” means mutually beneficial, or good for one another. In this case, beetles bore into wood, which creates a suitable environment for the fungi to grow—and the beetles then eat the fungi. In fact, some types of bark beetles, called ambrosia beetles, eat nothing but the fungus in their mycangia!

Though it might seem smart to carry your food with you, some fungi carried by ambrosia beetles can be deadly to trees. One fungus carried by the redbay ambrosia beetle, *Xyleborus glabratus*, causes laurel wilt disease, which can infect and kill trees in the laurel family, including red bay and also avocado. That’s bad news if you like guacamole, and it’s also bad news for Florida’s commercial avocado industry. Florida is the second-largest avocado producer in the U.S., earning about \$30 million each year. Scientists with UF/IFAS are pursuing many options to try to manage the threat to the avocado industry and the environment.

#### **Stabilimentum**

A stabilimentum is a structure that a spider builds in the middle of its web.

Perhaps the best-known examples are the thick patches of silk spun into the middle of their webs by some species of orb weaver spiders—including the Golden Silk Spider common to Florida. Also called a web decoration, a stabilimentum (plural: stabilimenta) can be crosses, spirals or zig-zagging ribbons of silk; silk tufts, ladders, or orbs; or even egg sacs, bits of plants, or the remains of prey.

No one is sure why spiders weave stabilimenta into their webs. As you might guess from the word itself, scientists once thought they help make webs more stable, but this theory has since been disproven. Two of the most popular theories today are that stabilimenta either lure prey into the web or help camouflage the spider to keep it from becoming prey.

Whatever the reason for them, stabilimenta can be beautiful. And maybe even more important, they can make a web easier for you to see—and avoid!

## Holotype

A holotype is a single physical specimen (or illustration) of an organism that has been designated as the official type of a species.

When a new species of bug (or any other animal or plant) is discovered, an individual specimen is collected and declared to be the holotype. (With large animals and plants, the specimen usually is not collected—for example, a rare new species of leopard would be left alive in the wild. And can you imagine trying to “collect” a tree?) This ensures that scientists always have a single reference point when studying a particular organism.

Ideally, the holotype is typical of the organism, although this is not always the case. After all, if a new species has just been identified for the first time, from just one specimen, how can you know for sure they all look like that?

And to make things even more complicated, sometimes a holotype isn't even the complete animal or plant. This usually happens with fossils, where there may be only one bone (or even just a small piece of one bone) that serves as the holotype.

Still, because the holotype is an important and official designation, that specimen will remain the holotype even if a better example is found later. There are very specific rules that have to be followed in order to change a holotype.

Because of its importance, a holotype usually is kept in a major museum or other well-known public collection, so that it is available for examination by other biologists. A holotype is identified in a collection by a special red tag. Look for them next time you visit a museum!

## Plumose

“Plumose” is an adjective form of the word plume, or feather. It can mean either “having feathers” or “looking like a feather.” Obviously the first meaning doesn't apply to bugs—bugs only have feathers in really bad science fiction movies—so for BugWeek we will only look at the second definition.

But what looks feather-like on an insect?

Look closely at the picture of the polyphemous moth at the top of this page. Those aren't feathers on its head—those are the moth's antennae.

All insects have antennae, which function as organs of touch and smell, not only for feeding but also for finding a mate. Antennae take different forms in different insects, but flies, moths, and mosquitoes have plumose antennae—the segments of their antennae have many very fine branches, giving them a feathery appearance. These branches increase the surface area of the antennae, making room for many more sensors. Some *Saturniidae* (such as our polyphemous moth above) have so many olfactory sensors on their plumose antennae they can smell a female more than 2 kilometers away!