Biological Hazards

Stinging Insects - Working Safely

On this page

What are stinging insects?
Where will you find these insects?
Why worry about stinging insects?
What are the health hazards?
What precautions can you take?
What else can be done?
What should you do if you are stung?

What are stinging insects?

Stinging insects have a sting (or stinger) at the posterior end of their abdomen. This group of insects includes honey bees, bumble bees, wasps, hornets, yellow jackets, and ants. However, many ants do not have stings. A couple of species that do have stings are army ants, found in the southern U.S., and harvester ants, found in the southern U.S. and western Canada.

The sting (formally called an aculeus), which is connected to a venom sac, is a modified egg-laying tube (ovipositor). So if you are stung, it was a female insect that did it. In North America, yellow jacket wasps are involved in about 70% of the stings to humans. They are often mistaken for bees because of their yellow and black bodies. Most stinging insects can sting you more than once. One exception is the honey bee (worker bee), which has a barbed sting. When the worker bee escapes after stinging a person, the sting and attached venom sac are ripped out of the bee and stay in the victim's skin; the bee will die afterwards.

Where will you find these insects?

Depending on the species, insects feed on almost any source of energy, such as plants, wood, meat, blood, and other insects. For example, *Vespa mandarinia*, commonly known as the Asian giant hornet or sparrow wasp, will seek both plants and other insects such as beetles, caterpillars, and spiders as a source of food. (Note: this hornet was referred to as “murder hornet” in a newspaper article in 2020 because this insect will attack other insect colonies such as yellow jackets, paper wasps, and honey bees as a source of protein).

Nesting spots are often near these food sources. While each species may have a preferred type of nesting spot, in general, nesting places can be anywhere and include:

- Inside hollow trees, or in walls, attic, etc. (the entrance is usually a very small hole).
- Nests that hang from branches or overhangs, such as the eaves of a building.
- In shrubs, bushes, hedges, or on tree limbs.
- In rubber tires, crates, boxes, abandoned vehicles, etc.
- Under shrubs, logs, piles of rocks and other protected sites.
- Inside rodent burrows or other holes in the ground.

Note that some insects can chew through ceilings and walls to get into other rooms, while others can bore into wood or dirt to make tunnels or enlarge the hole for their nest.

To prevent these stinging insects from moving into buildings or other structures, keep holes and entry spaces caulked and screen any ventilation openings.

- Do not try to get rid of the nest or hive yourself. Each type of insect or situation will likely need different removal methods. It is best to call pest control professionals for this service.

Why worry about stinging insects?

It is important to be prepared for any possible effects from an insect sting, whether it happens at work or at home. Generally, most stings will only result in a temporary injury - pain, swelling, and skin redness around the sting. However, sometimes the effects can be more severe – even life-threatening, depending on where you are stung and what allergies you have.

If you are stung in the throat area of your neck, it may cause edema (swelling caused by fluid build-up in the tissues) around the throat and may make it difficult to breathe.

Remember, if you are startled or stung by a bee or wasp while you are driving, working with power tools or machinery, or are on a ladder, be aware of your surroundings – pull over, climb down the ladder, or stop working until you have assessed the situation and determined if it is safe to continue.

What are the health hazards?

While it is common to want to know what type of insect stung you, it is often hard to know for certain. Some insects do have a more toxic venom than others (such as the southern yellow jacket), while others are larger so they are able to carry more (but technically less toxic) venom (such as the Asian giant hornet).

Regardless, most people experience local effects like pain, swelling, itching, and redness around the sting site. Painful stings in the mouth and throat can result if you unintentionally swallowed a wasp or bee (e.g., drinking a soft drink from a can that a wasp had entered).

Some people will experience swelling in a larger area, not just immediately around the sting site. They may develop hives but no systemic effects (effects in the body away from sting site like effects on breathing and blood flow). This is a **mild allergic reaction** and can last a few days. **Large local reactions** can occur in an area around 10 cm (4 in) around the sting site. Swelling will increase in size for a day or two, but will resolve over 3 to 10 days. The area will be sore and uncomfortable, but one should not give in to the temptation to scratch the stung area. Scratching may cause a break in the skin, which could lead to an infection.

In rare cases, a **severe allergic reaction** can occur. This situation is serious and can cause "**anaphylaxis**" or anaphylactic shock. Symptoms of anaphylaxis can appear immediately (within minutes) or up to 30 minutes later. Symptoms to watch for include:

- Hives, itching and swelling in areas other than the sting site.
- Swollen eyes and eyelids.
- Wheezing.
- Tightness in the chest and difficulty breathing.
- Hoarse voice or swelling of the tongue.
- Dizziness or a sharp drop in blood pressure.
- Shock.
- Unconsciousness or cardiac arrest.

Although most deaths result from severe allergic reactions, some are caused by the direct toxicity of the insect venom. Of those who die from a severe allergic reaction to a sting, half die within 30 minutes, and three-quarters within 45 minutes.

This reaction can occur the first time you are stung or with subsequent stings. Watch for signs of this reaction.

- If you see any signs of reaction, or even if you are not sure, call or have a co-worker call emergency medical services (e.g., 911) right away. Also, get medical help if the sting is near the eyes, nose or throat.
- Stay with the person who has been stung to monitor their reaction.

If you have experienced a severe allergic reaction to an insect sting in the past, you will likely experience a similar or worse reaction if stung again. Doctors will prescribe a bee sting kit (self-injectable syringe containing epinephrine) to allergic people so they can carry the medication with them at all times. For people who are hypersensitive to stings, wearing a medical alert bracelet will enable first aiders to respond promptly and appropriately to a sting victim who is unconscious.

People who have been stung multiple times (such as when fleeing from a swarm or nest) can sometimes suffer serious health effects. While rare, death may occur. If you have been stung many, many times at once, stung severely, or are experiencing health effects, talk to your doctor. You may need to have your health monitored over the next few days or weeks.

Employers should be notified if a worker, especially one who works outdoors, has allergies to insect stings. Co-workers should be trained in emergency first aid, be aware of the signs of a severe reaction, and know how to use the bee sting kit (self-injectable epinephrine).

- Always carry a cellular phone in case you need emergency medical help.

What precautions can you take?

The best way to prevent stings is to avoid the insects. Leave the area, if possible. If there is a travelling swarm, they will likely leave within a few days.

Note that insect repellent ("bug spray") does not affect these stinging insects. Avoidance and awareness are the keys to not being stung.

Before working at a site:

- Take a look around. Check to see if there are any visible signs of activity or a hive or nest. If you see a number of insects flying around, check to see if they are entering/exiting from the same hole or place. If so, it is likely a nest or a source of food.
- Wear long-sleeve shirts, long pants, and closed-toed boots or shoes. If you cannot avoid working near bees or wasps, wear a bee-keepers style hat with netting to cover your head, neck and shoulders. Tape your pant legs to your boots or tuck into your socks, and your sleeves to your gloves. You may also wish to wear an extra layer of clothing since wasp stings are long enough to reach through one layer of clothing.
- Power tools such as lawnmowers, weed eaters and chainsaws will aggravate the insects. When using these tools, be aware that the tools may provoke the insects or in some cases, cause the insects to swarm.

If you find you are working near stinging insects, here are some tips.

- Most bees and wasps will not sting unless they are startled or attacked. Do not swat at them or make fast movements. The best option is to keep your distance, move away from the nest, or let the insects fly away on their own. If you must, walk away slowly, or gently "blow" them away. The only exception is if you have disturbed a nest and hear "wild" buzzing. Protect your face with your hands and run from the area immediately. Seek shelter in a closed vehicle or building, entering in a way to keep the insects outside.
- Wear light coloured clothes such as khakis, beige, or blue. Avoid brightly coloured, patterned, or black clothing.
- Tie back long hair to avoid bees or wasps from getting entangled in your hair.
- Be careful when shaking out clothing or towels, as the insects could be inside the folds.
- If you find a bee or wasp in your car, stop and leave the windows open. You may also take a thick cloth and cover the insect before it gets frightened. Carefully, let the insect back outside through an open window.

What not to do:

- Do not wear perfumes, colognes, scented soaps, or powders as they contain fragrances that are attractive.
- Do not go barefoot or wear sandals, especially in areas where there is clover or other flowering plants that attract bees.

What else can be done?

Management of outdoor food sources is very important. Some insects, such as the yellow jacket, look for different types of food at different times of the year. In the spring, they require more protein for the new larvae and may be more attracted to other insects but also to meat and pet food. By late summer, they are more interested in high-sugar foods such as fruit, candy, and pop (soft drinks).

- Empty and wash out garbage cans regularly. Fit garbage cans with a tight lid.
- If there will be a lot of people present during the day (such as at an amusement park, fair or sporting event), empty the cans or dumpsters in the morning.
- When the garbage will have "attractive" properties (such as pop cans, or candy wrappers), empty the garbage several times a day.
- Locate the food areas away from where crowds of people are.
- Clean the drink dispensing machines regularly.
- Screen-in food stations where possible.

- Locate trash cans away from the food dispensing windows and eating areas.
- Minimize the time where the food is available by keeping it tightly covered. Clear away any scraps and dirty dishes right away.
- Serve sweet drinks in containers with lids and straws. Wasps will often crawl into pop cans and can be "drunk" unintentionally. Keep your thumb over the can opening if a container with a lid is not available.
- If there are fruit trees nearby, clean up any fallen fruit.
- Keep pet food inside the house.

What should you do if you are stung?

Wasps and hornets do not leave their sting in you, so they can sting repeatedly. Honey bees can sting only once and will leave the sting (and venom sac plus some other parts) stuck in the skin at the sting site.

The sting, if present, should be removed right away since the venom can still be injected for up to a minute after the bee detaches from its sting.

Try removing the sting by scraping sideways with your fingernail, a credit card or other stiff card. Try **not** to squeeze the bee venom sac as that action will release more venom. However, you might have to use tweezers if the venom sac breaks off leaving the sting in the skin.

All stings hurt. A normal (or "localized") reaction to the venom from a sting is redness of the skin, swelling, severe itching (pruritis), and a burning or stabbing pain. The longer the sting is in the skin, the more will be the effect of the venom being injected. An application of ice (wrapped in a towel to prevent freezing the skin), anti-itch cream and/or an antihistamine pill can help reduce the effects of the sting.

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