

# toxicliniq

The official newsletter of Toxicology & National Poisons Information Centre, National Hospital of Sri Lanka

Toxicology Newsletter is an updated information collection for the healthcare practitioner that intended to enhance knowledge, stimulate research and promote

better management of patients with poisoning. The newsletter also publishes clinically relevant review articles, letters to the editor and commentaries.

Themes covers are of interest to clinicians, researchers, epidemiologists and other health care professionals.

## Asiatic or Oriental honey bee, *Apis cerana*



*Apis cerana*, or the Asiatic honey bee (or the Oriental honey bee), is a species of honey bee found in southern and southeastern countries including Sri Lanka. *Apis cerana* live in colonies. These colonies are known for building nests consisting of multiple combs in cavities containing a small entrance, presumably for defense against invasion by individuals of another nest. The diet of this honey bee species consists mostly of pollen and nectar, or honey. The individuals in this genus are defined by long, erect hairs that cover the compound eyes and assist in pollen collection. Adult *Apis cerana* are black or brown in color, with four yellow abdominal stripes. There are also distinctions between worker bees, queens, and drones. Worker bees are females, and characterized by a pollen press on the hind leg to transport pollen, as well as a stinger in the place of an organ for laying eggs. Queens, which are the

reproductive females, are typically larger than worker bees due to their enlarged reproductive organs. Drones, which are the males of the species, are defined by larger eyes, lack of a stinger, and a blunter abdominal shape. *Apis cerana* bees are domesticated and cultured for beekeeping (1).

## Bee and Wasp Stings: Health Issues and Management

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### Introduction

Fatal stings from bees and wasps result in an appreciable number of deaths worldwide. Bees and wasps

are broadly categorized into two families; Apidae (honeybees, bumblebees), Vespidae (hornets, wasps, and yellow jackets).

In Sri Lanka, there are three reported species of wasps belonging to the genus *Vespa* namely *V. affinis*, *V. tropica* and *V. mandarinia* (2).

The domesticated Asian honeybee, *Apis cerana* (“**Meemessa**”), the feral giant honeybee, *Apis dorsata* (“**Bambara**”), the feral dwarf honeybee *Apis florea* (“**Daduwel mee**”) and the stingless bee, *Trigonairidipennis* (“**Kaneyya messa**”) are common honeybees found in rural and urban areas in

Sri Lanka (3).

Female bees and wasps have a stinging apparatus (stinger) which is a modified ovipositor located at the tip of their abdomen and is associated with a venom gland (4). The stinging apparatus is used as defence if the insect is disturbed. The stinger is detached from the body after a single sting by the honeybee and it dies thereafter. But a single wasp is capable of stinging multiple times as the stinger is not separated from the body after sting. This finding is useful to differentiate honeybee from wasp as wasps do

not leave the stinger on the victim's skin (5). The sting is accompanied by the release of alarm pheromones. The smell of these pheromones signals the others (because many of these species live in colonies) and they continue to swamp the victim.

Venom glands of bees and wasps produce a variety of toxic substances including active amines (serotonin, histamine, tyramine, catecholamines), wasp kinins and histaminereleasing peptides (6).

Effects of bees and wasps stings can range from irritation to severe form of anaphylactic shock (7). Multi organ failure, rhabdomyolysis, electrocardiographic changes, acute kidney injury and myocardial infarction are well known complications of mass envenomation due to sting of bees and wasps.

### Bee and Wasp Stings Symptoms

The severity of a sting is determined by a number of factors. The type of insect, the location of the sting, the number of stings, and the allergic sensitivity of the victim can all affect the outcome. Most people do not have allergic reactions to bee and wasp stings.

Medical problems from bee and wasp stings are broadly broken down into two categories:

- **Local reactions**

Immediate pain, redness, swelling, and itching at the sting site may occur. A large

## Giant Honeybees or Rock Bees, *Apis dorsata*



Giant honey bees are mainly tropical and in most places they migrate seasonally. Colonies are capable of migrating great distances, sometimes up to 200 km, as they follow the wet and dry seasons. Colonies will travel for many months, resting in trees along the way, building combs and honey reserves and then moving on to new locations as the forage decreases, before setting up new nests for the mass flowering of the monsoon season. Some evidence suggests that the bees are capable of returning to the same nest sites as previous years, even though all of the original bees in the process may be replaced. This mechanism of memory retention within the honey bee colony remains a mystery.

Professional honey hunters harvest honey seasonally from *Apis dorsata* colonies in spite of the colony's effective defensiveness and hard-to-reach location high in trees or on cliffs.



*Apis dorsata*, nest at Sigiriya, Sri Lanka



(greater than four inches across) local reaction may develop over the next 12-36 hours. A bacterial skin infection, although uncommon, may also begin during the first 12-36 hours (or even after the first few days). These may cause an enlarging area of redness at the sting site. It may be difficult to tell a local skin reaction and a local bacterial skin infection apart.

• **Systemic or allergic reactions**

Hives (raised itchy bumps on the skin) and itching all over the body.

Swelling of the mouth or throat or both.

Wheezing

Shortness of breath or other difficulty breathing.

Nausea

Vomiting

Anxiety

Chest pain




Low blood pressure (weakness or fainting)

In severe cases, marked difficulty breathing, unconsciousness, and even death may occur.

**Bee and Wasp Stings Treatment**

Treatment will depend on the severity of the condition. It is important to note that no specific antivenom is available to counteract this poison. The majority of problems requiring medical treatment result from the allergic reaction to the sting. Many of the complications from an allergic reaction respond well to various medications-when given in time.

- A single sting with no allergic symptoms, require only local wound care (such as cleaning and antibiotic ointment). Itching may be treated with an oral

<b>Wasps in Sri Lanka</b>	
 <p><i>Vespa affinis</i> 1st and 2nd segment yellow Queens: ~30mm Workers and male: 20mm-27mm</p>	<p>Three specie of wasps (as shown in the figure) are found in Sri Lanka. Among these <i>Vespa affinis</i> or <b>Debara</b> is more common and widely distributed in Sri Lanka. Some common characteristics of them include; no hairs on bodies, simple, and unmodified legs, narrower waist than bee, all are social wasps (live in colonies, consists of a reproductive / non stinging queen, non stinging males and stinging workers). The stinging apparatus in the workers represents the modified ovipositor (egg-laying apparatus) and hence the sting ability is present only in females. The stinging apparatus is connected to a venom gland and the sting is used as an offensive or a defensive weapon. A wasp can inflict multiple stings because the stinger has no barbs unlike bees and does not get detached when stinging. The venom of a wasp contains a mixture of histamine-releasing factors, enzymes, haemolysins, neurotoxins, vasodilators, vasospastic amines and phospholipase A (8). Feed on insects, nectar and pollens.</p>
 <p><i>Vespa tropica</i> 2nd segment yellow Queens: ~35 mm Workers and male: 23mm-30mm</p>	
 <p><i>Vespa Mandarinia</i> Queens: ~55 mm Workers and male: 27mm-45 mm</p>	

diphenhydramine (Benadryl). Pain may be treated with medicine such as ibuprofen (Motrin), acetaminophen (Tylenol), or both. Also tetanus immunization will be given as indicated.


- Mild allergic symptoms (such as a rash and itching all over the body but no problems breathing), may be treated with an antihistamine. Steroids also may be given. In some cases, an epinephrine (adrenaline) injection may also be given.
- More moderate allergic reaction (such as rash all over the body, and some mild problems breathing), may be treated with injections of antihistamines, steroids, and epinephrine. And those need to be observed for a prolonged period of time.
- Severe allergic reaction (such as low blood pressure, swelling blocking air getting into the lungs, and/or other serious problems breathing) treatments may include placement of a breathing tube, injections of antihistamines, steroids, and epinephrine. IV fluids may also be given. And those need to be closely monitored.
- Multiple stings (more than at least 10-20 stings) but no evidence of an allergic type reaction, sometimes may require prolonged observation.
- Stung inside the mouth or throat, may simply require observation.
- Stung on the eyeball, require evaluation by an ophthalmologist.

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