



## The Scottish Beekeepers' Association

### SBA Technical Data Sheet no. 28

#### Stings and Apiary Emergencies

Prepared by Dr John Durkacz

Honey bees, wasps and bumblebees possess stings and this will put many off beekeeping. Understandably, new beekeepers worry about how they may react to stings and have heard accounts of more severe reactions suffered by others. The good news is that most beekeepers develop a degree of immunity through time. As skills in managing and manipulating colonies improve they also attract fewer stings.

#### How does immunity happen?

Insect venoms are a complex mixture of proteins, peptides and enzymes. Bee, wasp and bumblebee venoms differ so it is possible to develop a sensitivity to one venom but not the other and vice versa. The normal situation is for the body to recognise the proteins in venom as 'foreign' and to respond by producing antibodies. These antibodies appear in the IgG fractions of the plasma (they are immunoglobulin G). This is a satisfactory state as the body is then able to then mobilise defences to neutralise the reaction to venom and the result is a minimal response with little pain or swelling at the site of the sting. Some individuals however react by producing excess of IgE (immunoglobulin E) and this often has a genetic basis as we know that allergic disorders can run in families. IgE will attach to mast cells in the body which contain histamine and other active substances. When presented with small quantities of venom proteins they bind to the IgE and the walls of the mast cells are altered and histamine and other active substances are released causing a generalised reaction or in the rare extreme case, anaphylaxis.

#### How does the honey bee sting work?

The sting apparatus is in a chamber at the end of the abdomen. Workers have stings which they use for colony nest defence; the queen also has a sting but she uses it only when trying to dispose of rival virgin queens. Drones do not have stings. The honey bee sting has barbed lancets either side of the tube where the venom flows from the sting chamber which has strong muscles. These can move independently and slide deeper into the skin and cannot be withdrawn and if left the worker bee will pull itself free tearing the whole sting, venom sac and pumping muscles from its body. She will soon die having sacrificed her life to defend the colony but the sting will continue to deliver the rest of the venom. Therefore you should remove the sting immediately, even while still attached to the bee, by scraping with the thumb nail in the direction opposite to the line of entry. There will be associated alarm pheromones which may attract other defenders to sting so a quick puff of smoke over the area will disguise this.

#### Types of reactions to stings.

If you have never been stung before the initial response may be more obvious. There would be some pain at the site of entry where the sting apparatus would be visible. After a minute a raised white bleb would appear and may be 1-2 cm across. Then a red swollen area 5-10 cm across with some swelling lasting for 48 hrs which would then gradually subside. The size of swelling would depend on skin toughness and elasticity so that the soft skin of the face would be most affected. Those who develop immunity will have little reaction or discomfort. Some individuals may develop a **large local reaction**; the red swollen area may show more quickly and be much larger. A few hours later a more extensive area of swelling may develop and last for a few days. This is usually a different degree of response to the same allergic process and may not mean a progression but care should be taken. **General reactions** will happen quickly after a sting and can be of different degrees depending on how allergic a person is. General flushing of the skin and an itchy rash would be classed as milder and wheeze, nausea, vomiting, abdominal pains and palpitations as serious especially if there is a rapid onset.

**Anaphylaxis** occurs in those highly sensitised to bee sting venom. There is a rapid onset of a severe general reaction with a fall of blood pressure and loss of consciousness. The outcome is potentially fatal and requires immediate medical help. Those who have experienced general reactions of lesser severity should also seek medical help and carry EpiPens in case of future incidents.

**Medical advice is required for anyone who has suffered more serious reactions to stings and informed decisions have to be made on carrying on with beekeeping or seeking investigation and possible desensitisation. EpiPens are strictly prescription only medicines used on medical advice.**

#### **Stings in the mouth or the eyeball.**

These should be treated with special care as there could be considerable swelling of soft tissues in the mouth with potential airways obstruction. A sting penetrating the eyeball could start significant inflammation with the potential to damage sight.

#### **Treatment of stings.**

Always remove stings as quickly as possible by scraping them out with a fingernail. Simple soothing lotions of calamine or cold compresses are all that is usually necessary; over counter preparations are available such as 'After Bite' from Boots but read instructions carefully. Anti-histamines orally where there is a pronounced itch may help. Those who have had serious reactions before should carry an EpiPen (auto-injector) and inform a friend how to assist if they might not manage themselves.

#### **General principles of safety in the apiary.**

- 1. Always wear a bee suit and make sure the veil is in good condition. Good quality marigolds should be worn until you have experience and confidence and know your bees and are able to assess their mood. Wellie boots are a good way of protecting against ankle stings.**
- 2. The apiary should have room to work in and lay hive parts down safely. The ground should be even to avoid stumbling. Beware of fire risks when using your smoker.**
- 3. Gently smoke hives before opening. Movements should be steady and gentle. You must have a plan of what to achieve for each examination.**
- 4. If the bees start to show unduly defensive behaviour try to close the hive up and walk away.**
- 5. Avoid siting hives close to public rights of way or where children or animals are nearby. Use hedges or fences to deflect bee flight upwards and away from where people are walking.**
- 6. Think of neighbours and vulnerable persons if you have to manipulate hives under less than ideal conditions.**
- 7. Many new beekeepers will 'pair' with others whilst gaining experience. Have a plan of action should you need help or something untoward should happen.**
- 8. Have spare smoker fuel ready and all you require to hand in your bee-box. A fine spray bottle with water can be useful to subdue angry bees. Never blow on bees to clear them on the frame as I saw one beekeeper regularly do. It infuriates them! Remember that over-smoking the bees can panic them and sometimes make things worse.**
- 9. Do not open hives in poor weather conditions. Sultry, thundery weather often means angry bees. The better the weather and around mid-day will see most of the older workers out foraging which means fewer guard bees at the hive entrance.**
- 10. Avoid perfumes when working with bees.**
- 11. Carry a charged mobile phone in case of emergencies and have a note of the apiary location including a What3Words or Ordnance Survey map reference (simple Post Codes are sometimes not too specific in rural areas).**

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#### **Reading guide:**

Insect Bites and Stings; a Guide to Prevention and Treatment  
Dr Harry Riches MD FRCP