

What do we know about these creatures that we share a space with?

Scorpions are ancient animals and fossil records indicate that they were already in existence about 425 – 450 million years ago during the Silurian period and evolved from an amphibious ancestor. They occur in habitats ranging from forest to deserts but it is in the arid areas that they are most common and diverse. Like the insects and spiders, scorpions belong to the phylum Arthropoda and like the spiders they belong to the Arachnida but belong to a different order, Scorpiones.

Habits and behaviour

Scorpions are mostly nocturnal and they hunt insects, other arachnids and small reptiles and mammals. During the day they can be found under rocks, bark, ungulate-pats and rock crevices. Often they are attracted to insect activity around lights. Many people leave lights on during the night and these attract insects that in turn attract the scorpions. Scorpions also inhabit thatch roofs, ala Ingwelala!

When aggravated, scorpions seem to make a hissing sound. This sound is produced differently by differently scorpions. One species scrapes its sting along a granulated area on the upper surface of the first two segments of the tail while another vibrates its pincers together.

Prey capture

Scorpions either ambush unsuspecting prey that wanders close to their retreats, or they wander about actively hunting for prey. They detect prey by air movement over the trichobothria (long sensory setae) and when the tarsal sense organs detect the prey, within about 150 mm. This induces a dash to capture the prey. The prey is caught with the chelae (also pincers). Buthids, the thick tail scorpions, have strong venom and small chelae so they sting almost instantly killing their prey and therefore do not require large chelae to hold onto prey. Other, non Buthid species, the thin tail scorpions, have weak venoms but have large powerful chelae that enable them to either secure the prey until it dies from the sting, or to simply crush the prey. The prey is orientated specifically and is eaten head first. Scorpions do not eat every day and even if conditions are ideal, that is warm, windless nights, only a small percentage will feed. Some scorpions can survive 6 to 12 months without food. Prey includes insects, centipedes, millipedes, snails, spiders, soilfugids, other scorpions and even small reptiles and mice.

Scorpion reproduction and development

In most species (not all) the male initiates the courting. He grips the female pedipalps (chelae) and leads her in a mating dance that usually lasts about 30 to 60 minutes, but can vary from 5 minutes to 2 days and they can cover a distance of about 25 metres. Once a suitable substrate is found, the male deposits a spermatophore from his genital aperture and the female is then guided over the spermatophore that is taken up into her genital opercula. The sperm uptake lasts from a few seconds to 6 minutes.

Scorpions are viviparous (carry the eggs inside the reproductive tract and give birth to live young). After a 3 to 18 month gestation period, 1-105 live young are born, the average numbering approximately 26. The female, in most species, forms a basket with her first or first and second pairs of legs to catch the newborn at birth. They then climb up her legs onto her back where they will moult for the first time. The birthing rate varies from 1 per minute to 1 per hour and can continue from 12 hours to 10 days depending on the species. The young disperse after 3 to 14 days before they become a meal for their own mother. Food supply and temperature seems to influence the litter size and gestation period and the latter can double in cold conditions. Embryos are reabsorbed if there is a lack of food.

Scorpions moult 6 times before maturity and that varies from 6 months to 8 years. Their life expectancy varies with the different species and ranges from 2 years to as much as 10 to 25 years.

How to prevent being stung by a scorpion

1. Preferably, wear protective footwear especially at night.
2. Use a torch if moving around barefoot in the dark
3. Exercise caution when lifting rocks, logs and when collecting firewood.
4. Do not handle scorpions with bare hands.
5. When camping try not to sleep directly on the ground.
6. Shake out footwear, clothing and bedding to expel unwanted creepy crawlies.
7. Learn how to distinguish a highly venomous scorpion from less harmful types and the area they occur in.

Signs and symptoms of scorpionism

The severity of envenomation depends on various factors such as the health and age of the victim, the sting site and species, size and degree of agitation of the scorpion. A person with heart or respiratory problems will be at greater risk. Some or all of the following signs and symptoms may result.

1. Immediate and intense, burning pain at the sting site that lasts about 30 minutes. Mild inflammation may be present, with the sting mark not always visible.
2. Signs and symptoms only develop after 30 minutes and sometimes only after 4 to 12 hours, increasing in severity over the following 24 hours. The pain can be local as well as distal with abdominal cramps.
3. Paraesthesia, an abnormal sensitivity, includes a burning sensation and pins and needles usually in the hands, feet, face and scalp.
4. Hyperaesthesia, an excessive sensitivity of the skin to clothing and bedding with the patient even sensitive to noise.
5. Ataxia, a lack of muscle coordination with a stiff legged or drunken walking action. Involuntary movements, tremors and muscle weakness.
6. Tachycardia, an increased pulse rate of 100 to 150 bpm for *Parabuthus granulatus* and below 55 bpm for *Parabuthus transvaalicus*.
7. Raised blood pressure in *Parabuthus granulatus*. Normal in children but raised in some adults in *Parabuthus transvaalicus* cases.
8. Dysphagia, a difficulty in swallowing especially with *Parabuthus transvaalicus* and excessive salivation.
9. Dysarthria, a speech difficulty.
10. Excessive perspiration in *Parabuthus transvaalicus* cases.
11. Headaches, nausea, vomiting and diarrhea.
12. Ptosis, patient has droopy eyelids.
13. Restlessness and anxiety is a prominent feature seen in children with *Parabuthus granulatus*. Hyperactivity and infants crying for unexplained reason.
14. Urine retention.
15. Respiratory distress is a major complication and can result in death.

Differential diagnosis

The following possibilities must be considered when making a diagnosis: Alcohol withdrawal, Botulism, Diphtheria, Drug overdose, Encephalitis, Guillain-Barré syndrome, Hysteria, Meningitis, Myasthenia gravis, Myocardial infarction, Organophosphate poisoning, Poliomyelitis, Subdural

haematoma, Tetanus.
Scorpionism management

Do's.

1. First aid treatment is the application of a cold compress, if the hyperaesthesia will allow and an analgesic (Asprin, Paracetamol) to relieve pain and transport to a hospital.
2. Monitor cardiac and respiratory functions and treat as required.
3. Patient with systemic symptoms, especially children and the elderly must be hospitalized for 24 to 48 hours.
4. Immobilize and clean wound.
5. Antivenom must only be administered in the case of severe systemic envenomation.
6. Antihistamine and steroids only to be administered in cases of allergic reaction to antivenom. In the event of anaphylactic reaction, which must always be anticipated, administer adrenaline.
7. Atropine may be administered in cases of confirmed *Parabuthus transvaalicus* envenomation to control excessive secretions.
8. Intravenous administration of 10 ml of 10% calcium gluconate IV over 10 to 20 minutes may provide relief from pain and cramp, but is only effective for 20 to 30 minutes.
9. Administer a tetanus toxoid to prevent infection.
10. Envenomation of the eyes must be flushed with water or any bland fluid (milk, urine). In severe cases antivenom can be diluted 1 to 5 or 1 to 10 with water.

Don'ts

1. Do not use traditional remedies such as incisions, suction, tourniquet or the application of ointments.
2. Do not use alcohol as it will only mask any symptoms.
3. Do not administer antivenom if no signs or symptoms of severe envenomation presents itself.
4. Do not administer spider or snake antivenom.
5. Do not administer atropine to reduce salivation in the case of *Parabuthus granulatus* stings as it may lead to unopposed adrenergic reaction.
6. Do not administer barbiturates, opiates, morphine or morphine derivatives as this could greatly increase convulsions and cause respiratory distress.

Dangerous scorpions: how to identify them

Highly venomous:

Thick-tail scorpions, they have thick tails and thin pincers.



Parabuthus transvaalicus

Non-venomous

Thin-tail scorpions, they have thin tails and broad, well developed pincers



Cheloctonus



Parabuthus granulatus



(Unnamed)



Parabuthus capensis



Opisthophthalmus adustus



Uroplectes lineatus.

Painful sting but not life-threatening.



Opisthophthalmus capensis

In southern Africa, 20 species of *Parabuthus* are distributed throughout the sub region, predominantly diverse in the arid and semi-arid regions.

These large scorpions are the most venomous scorpions in southern Africa. Lengths range from 70mm to 180mm. Their distribution is influenced by rainfall, generally occurring in areas receiving less than 600mm of annual rainfall. Most species inhabit sandy regions.

All members of this genus except *P. distridor* have rough areas on the upper surface of the first tail segment. In many species the second tail segment is also characterised by a second rough area on its upper surface. These scorpions scrape their sting on these rough areas, thus producing a 'chick-chick' sound. Their tails are extremely thick, strong with keels. Their pincers are smooth and weak. Many species are able to produce large amounts of venom from their large venom glands.