ARACHNIDS · BIOLOGY & SAFETY

Scorpions

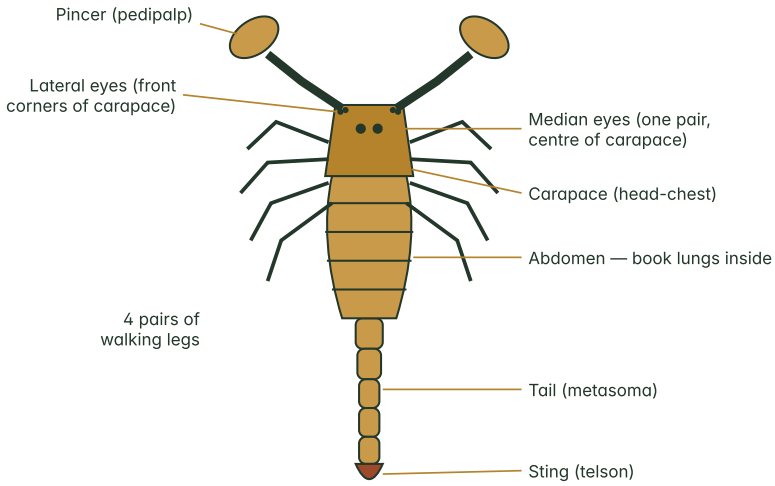
Pincers, tails and venom, why they glow under a UV torch, and how to tell a dangerous scorpion from a harmless one.

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> Scorpions are an ancient group, with fossils about 437 million years old, and most guests are both fascinated and a little afraid of them. A UV torch, a little knowledge and one simple rule of thumb can turn that fear into one of the best night-time talks in the bush.

01 What is a scorpion?

Scorpions are venomous **arachnids**, related to spiders, mites and ticks. Two features together set them apart from other arachnids: large **pincers** (pedipalps) and a long, segmented **tail** ending in a sting.



Simplified scorpion seen from above.

SPECIAL FEATURES

- **Pincers.** The pedipalps are the second pair of appendages. In most arachnids they are small, but in scorpions they are large, powerful claws for grabbing and holding prey.
- **Two kinds of eyes.** One pair of large **median eyes** sits in the middle of the carapace. These are the main eyes, with relatively sharp vision and good spatial discrimination. Several small **lateral eyes** sit

along the front corners. They are less sharp and are thought to work mainly as very sensitive light detectors.

- **Book lungs.** Scorpions breathe through book lungs: stacks of thin, hollow plates like the pages of a book. Their "blood", called **haemolymph**, flows through the plates and exchanges oxygen and carbon dioxide by diffusion. The haemolymph uses **haemocyanin**, a copper-based pigment, to carry oxygen.

02 Courtship and birth

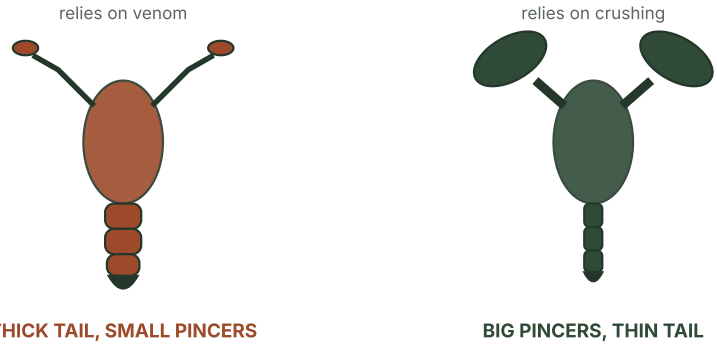
In most species the male starts courtship by gripping the female's pincers. The pair then move back and forth in a "dance". When he finds a suitable surface, the male deposits a **spermatophore** (a packet of sperm) and steers the female over it so that she picks it up.

Scorpions give birth to **live young**. The young climb onto their mother's back and ride there until after their first moult, then disperse.

03 Is it dangerous? The rule of thumb

REMEMBER THIS

Thick tail and small pincers: treat it as dangerous. Big pincers and a thin tail: painful, but generally not dangerous.



Scorpions with big pincers crush their prey. Those with small pincers rely more on the venom in their tail.

The African Snakebite Institute calls the pincer-to-tail ratio the best way to judge how dangerous a scorpion is. It also warns about two common mistakes:

- **Size doesn't tell you much.** A small thicktail can give a far worse sting than a large rock scorpion.
- **Colour is no guide.** There is no reliable way to judge danger from colour alone.

GROUP	LOOK	STING
Thicktails (*Parabuthus*)	Thick tail, small pincers	All very painful; a few species potentially life-threatening. The medically important group in southern Africa
Lesser thicktails (*Uroplectes*)	Small, thick tail, small pincers	Very painful, but not life-threatening
Burrowing scorpions (*Opistophthalmus*)	Large pincers, medium to small tail	Comparable to a bee or wasp sting; can pinch hard

GROUP	LOOK	STING
Rock scorpions (*Hadogenes*)	Very flat, large pincers, thin tail; can exceed 20 cm	Sting barely noticeable; will pinch if upset

Group descriptions from the African Snakebite Institute's guide to identifying potentially dangerous scorpions.

04 Stings: what happens, and what to do

Thicktail venom is **neurotoxic**, meaning it acts on the **nervous system**. The **Transvaal thicktail** (*Parabuthus transvaalicus*) occurs in Zimbabwe. It is one of the largest members of its family, growing to about 14 cm. In South Africa, *P. granulatus* and *P. transvaalicus* are the species of greatest medical concern. In Zimbabwe, *P. transvaalicus* and *P. mossambicensis* have both caused severe stings.

EARLY

Immediate burning pain

This is the most obvious first sign, and it can last more than 24 hours.

SYSTEMIC

Usually within 4 hours

In adults, signs can be delayed up to 8 hours. Pins and needles spreading through the body, muscle pain and cramps, twitching, agitation, visual disturbances, marked weakness, difficulty swallowing, drooling and difficulty breathing.

CHILDREN ARE MOST AT RISK

Children are more vulnerable to severe envenomation. Signs include extreme restlessness, uncontrolled jerking of the limbs and abnormal posture. Breathing can fail within one to two hours of a serious sting.

FIRST RESPONSE (FROM AMPATH, THE AFRICAN SNAKEBITE INSTITUTE AND SOUTH AFRICAN MEDICAL SOURCES)

- **Treat a sting by a thicktail, or by any scorpion you can't identify, as a medical emergency.** Get to a hospital with intensive-care facilities as quickly as possible. Children and other high-risk patients should go to hospital.
- Keep the casualty still and calm. Don't use a tourniquet, cut or suck the sting site, or apply ice or very hot water.
- Watch the casualty's breathing. Supporting breathing is the priority.
- If it can be done safely, bring the scorpion (or a photo) for identification.
- Stung patients should be closely observed for 12–24 hours, even if they seem well at first. Doctors give scorpion antivenom to patients who show signs of systemic envenomation.

This note is not medical training. Follow your first-aid course and local medical advice.

05 Why do scorpions glow under UV?

Shine a UV torch on a scorpion and it glows a bright **blue-green**. The glow comes from the **hyaline layer**, a very thin layer in the cuticle of the exoskeleton. Compounds identified in the exoskeleton include **β-**

carboline and **7-hydroxy-4-methylcoumarin** (also called hymecromone). They absorb short-wavelength, high-energy UV light and give off longer-wavelength, visible light.

This is fluorescence, not the chemical light of a firefly. The scorpion only glows while UV is shining on it.

- **Newly moulted scorpions don't glow** until their new exoskeleton hardens.
- **Even some fossil scorpions** have been found to fluoresce.

WHAT IS IT FOR? STILL DEBATED

ONE IDEA

A whole-body light sensor

Gaffin and colleagues (2012) found that scorpions react to UV about as strongly as to blue-green light. They suggest the cuticle converts dim UV from the night sky into the blue-green light the eyes see best, which might help scorpions find shelter.

OTHER IDEAS

Recognition, protection or chance

Other suggestions include helping scorpions recognise each other, protection from parasites, or simply a by-product with no purpose. None has been settled. Some insects actually avoid fluorescent scorpions, which counts against a prey-luring role.

06 Scorpions recorded in Zimbabwe

A selection of species recorded in Zimbabwe. The definitive reference is the Natural History Museum of Zimbabwe's arachnid checklist.

BUTHIDAE (THICKTAILS AND RELATIVES)

- *Hottentotta trilineatus*
- *Afrolychas burdoi*
- *Parabuthus granulatus*
- *Parabuthus mossambicensis*
- *Parabuthus raudus*
- *Parabuthus transvaalicus*
- *Uroplectes flavoviridis*
- *Uroplectes olivaceus*
- *Uroplectes carinatus*
- *Uroplectes planimanus*
- *Uroplectes vittatus*
- *Uroplectes chubbi*
- *Afroisometrus minshullae*

ROCK SCORPIONS AND RELATIVES (HORMURIDAE)

- *Hadogenes troglodytes* group*
- *Hadogenes granulatus*
- *Cheloctonus asper**
- *Cheloctonus lamorali**

BURROWING SCORPIONS (SCORPIONIDAE)

- *Opistophthalmus glabrifrons*
- *Opistophthalmus carinatus*
- *Opistophthalmus wahlbergii*
- *Opistophthalmus boehmi*

**Names follow the 2026 classification of scorpion genera (Prendini 2026, as listed by The Scorpion Files). The southern African species formerly in Opisthacanthus are now placed in Cheloctonus, and several former Hadogenes troglodytes subspecies are listed as full species, including H. matoppoanus, recorded from Bulawayo.*

AROUND THE FIRE WITH A UV TORCH — HOW TO SAY IT

"Look at the pincers and the tail. This one has huge pincers and a skinny tail: it crushes its food, and its sting is about like a bee's. If you ever see one with a fat tail and little pincers, that's a thicktail, and that's the one to respect. And watch what happens under the UV light… it glows. Scientists still argue about why, and one idea is that the whole body works like an eye."

07 Key terms

Pedipalps	Second pair of appendages; in scorpions, the large pincers.
Metasoma / telson	The tail / the bulb and sting at its tip.
Book lungs	Stacks of thin plates where gas exchange takes place.
Haemocyanin	Copper-based oxygen-carrying pigment in the haemolymph.
Spermatophore	Packet of sperm that the male deposits and the female picks up.
Neurotoxic	Acting on the nervous system.
Fluorescence	Absorbing UV and re-emitting it as visible light.

In summary

- **Thick tail and small pincers = treat as dangerous**. Size and colour are not reliable guides.
- *Parabuthus* thicktails are the medically important scorpions. Their venom is **neurotoxic**, and children are most at risk.
- A serious sting is a **medical emergency**. Get to hospital fast and watch the casualty's breathing.
- Scorpions glow blue-green under UV because of compounds in the exoskeleton. Why they do is still debated.

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