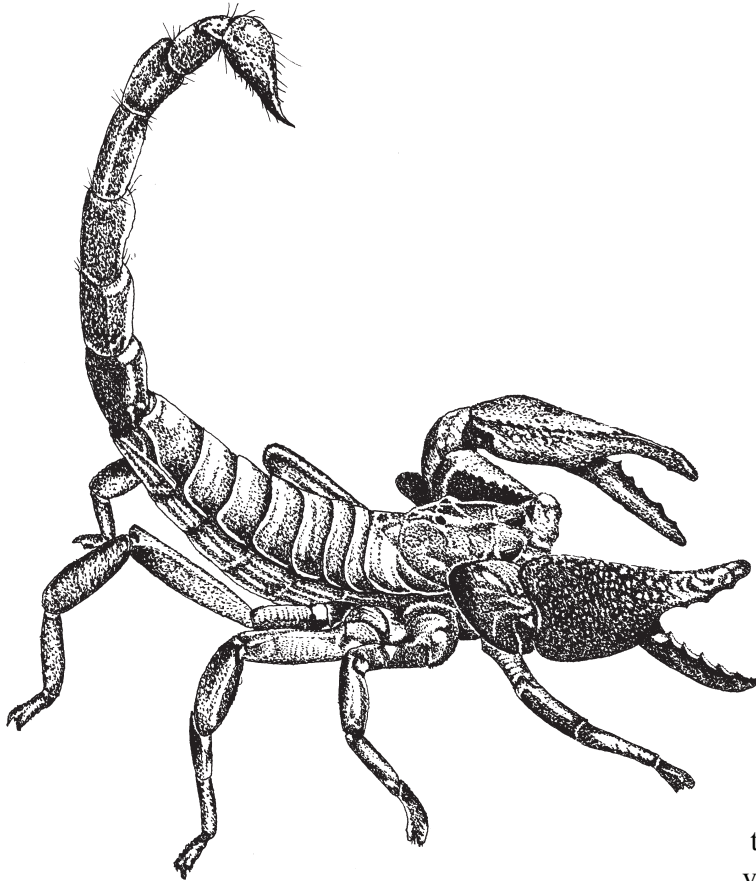


# Scorpions



Of all the creepy-crawlies on God's Earth, I suspect that scorpions are the most widely shunned, feared, misunderstood, and killed on sight. I have to admit to having had such reactions myself when younger, but over the years I have gradually changed my view of them, and my resultant behaviour.

I can't say that they are endearingly loveable, though some people in the West do keep them as exotic pets, but familiarity does at least evoke respect and admiration.

First point to make is that scorpions are not insects. They are a diverse and highly successful order of arachnids (the spider family, having eight legs and often up to four pairs of eyes). I say successful, because not only have they been around for well over 400 million years, from the time of a huge two-metre-long sea scorpion, but they have diversified into nearly 2,000 species, ranging in size from 12mm to 20cms, and come equipped with some remarkable characteristics.

## Habitat

Although mostly associated with and commonly found in dry desert-like environments, scorpions are also found in tropical forests (including in tree canopies and plants like bromeliads), caves (often blind species), inter-tidal zones and a variety of other habitats, from geographical locations as far north as England to as far south as Patagonia at the tip of South America. None exist, however, in the northern tundra or the polar regions. They prefer to live in areas where the temperatures range from 20°C to 37°C, but may survive from freezing temperatures to the desert heat. To illustrate this point, scorpions that live in high Asian mountains up to 7,000 feet, scorpions from Patagonia in South America, and small scorpions from Central Europe can all survive winter temperatures as low as -25°C, while in Turkmenistan there are even species able to tolerate temperatures ranging from -31°C to +50°C. Commonly they are found hiding during daytime under rocks or logs, but many species also create burrows, some in spiral form, as deep as 40cms into the ground. Burrowing to cooler layers reduces water loss, cuts down their metabolic needs, and also reduces the risk of predation.

## Predators

Regarding the last point above, it may come as a surprise to learn that no fewer than 124 vertebrates and 26 invertebrates are known to prey on scorpions. The list includes certain monkeys, foxes, rats, owls, shrews, lizards, spiders, crickets, beetles, ants, centipedes and other scorpions, to name just a few. The reason for their popularity as a dietary item is probably their relatively large nutrient-packed body, combined with their wide distribution, abundance and predictable ground behaviour. Their venomous sting (or telson) seems to have little effect on most such predators, though it is interesting to note that their larger attackers often 'neutralise' them first by biting off the tail.







## Diet

Regarding their own feeding habits, they normally take only live prey, though in laboratories adults occasionally accept freshly killed prey. They either lie in wait in their burrow entrance or in areas of open ground, or go out stalking. A few feed by day, though the vast majority feed only at night, emerging at dusk and remaining active for several hours until gorged. After feeding they then return to their lair and become very inactive, entering a sort of catatonic state in which they can even be attacked and killed by lesser creatures like certain crickets, beetles or centipedes. They can survive long periods between feeding, at least two weeks for most species, but there are some that can go for much longer, even for 6 to 12 months. In short, they are extremely tough and hardy.

As to how they catch and immobilise their prey, this is done using their pincers, though some, but not all, may also use their sting to subdue or kill larger prey. The victim is then crushed or torn open with their jaws, following which – because they can only ingest food in liquid form – it is injected with a digestive fluid i.e. digestion occurs outside their body. The resulting liquid is then sucked up for internal absorption. They can temporarily increase their body weight by anything from 10 to 30% at a single feeding. Prey may include insects, spiders, snails, small vertebrates, termites, lizards, frogs, young snakes and other scorpions, depending on habitat and species. Usually they don't emerge to feed if it is raining or for a day or two after rain. Emergence is also affected by humidity, temperature, moonlight and courtship cycles.

## Toxicity

The toxicity of scorpions varies considerably. In some 30-40 species (none in India) their sting can be lethal. By far the most painful and dangerous of the ones found in the Coromandel region is the small earth-coloured species, the Indian Red Scorpion or Eastern Indian Scorpion (*Buthus tamulus*), commonly found under bricks and stones. The huge black one, the Asian Rock Scorpion (of the genus *Heterometrus*, to honour it with a Latin tag), which can hiss ominously when provoked and is one of the world's largest scorpions, is apparently less painful. The venom, which in deadly species may be as powerful as a cobra's, is neurotoxic and paralyses the heart and respiratory muscles of victims. Altogether there are probably no more than 4 or 5 species of scorpion in the Coromandel region. Nowhere in the world are more than 8 species known to co-exist. (The black so-called 'Whip Scorpions', which are not in fact scorpions at all, are covered in a separate profile at the end of this 'Other creatures' section.)

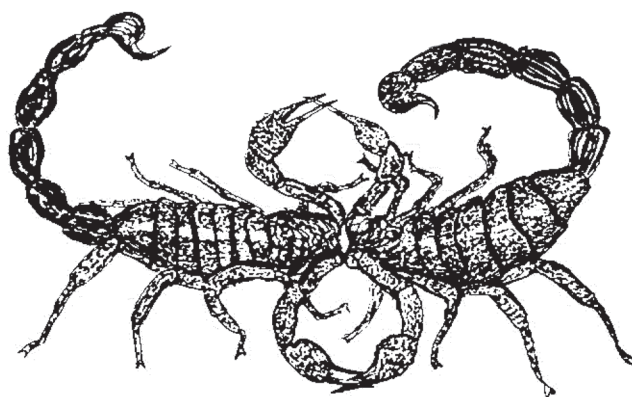
## Breeding / reproduction

Most scorpions reproduce sexually, which means that most species have male and female individuals. However, some species (including delightfully named *Hottentotta hottentotta*) reproduce by parthenogenesis, a process in which a female's unfertilised eggs develop into living embryos.

Where normal male-female reproduction occurs, one of the most fascinating behavioural characteristics of scorpions is their elaborate courtship ritual. Normally this occurs on moonless nights in an area of open ground, and typically begins with the male and female locating and identifying each other using a mixture of pheromones and vibrational communication. Once they have satisfied each other that they are of opposite sex and of the correct species (*good vibes?*), which can take up to 15-20 minutes, mating can commence.

First, the male confronts the female face to face, seizes her pincers in his own, and begins a "promenade à deux". Back and forth they dance and shuffle, stings raised high in the air and sometimes touching each other. In reality what is happening is that the male, who has no means of directly inseminating the female, is leading the female around while he searches for a suitable place to deposit his sperm packet alias spermatophore. The ritual can involve several other behaviours, such as juddering and a "kiss" in which the male's claw-like mouthparts grasp the female's in a lesser, more intimate version of his grasping her pincers.

When the male has identified a suitable location, or they have made one by clearing away debris from where they are dancing, he deposits his elongated spermatophore, usually gluing it lightly to a firm surface, and then guides the female over it. In a quick 30-second movement she takes it up into her body, triggering



*Drawing courtesy of Bombay Natural History Society*

**Mating scorpions**

release of the sperm, which then fertilise her. Once the mating is complete the two separate and go their individual ways, the male normally retreating quickly to avoid the possibility of being cannibalised by the female, though sexual cannibalism is actually quite rare among scorpions. Essentially the whole process, which can take from 1 to 24+ hours, depends on the ability of the male to find a suitable place to deposit his spermatophore, because if mating goes on for too long the female may eventually lose interest and break off the process.

It all sounds quite romantic, but a more sanguine possibility behind the male's opening grip on the female's pincers may be that she could otherwise grab him and make a meal of him at that stage, in the same way that female spiders and praying mantises often do with their mates.

### Scorpion mothers

Perhaps the most endearing quality of scorpions is their behaviour towards their young, which they bring forth alive. Unlike most arthropods, females, which normally have just one litter a year (some species may have several), show genuine maternal association. Gestation periods generally vary from two to four months, though certain species may require longer (up to a year).

When the mother is ready to deliver she stands high above the ground on her two pairs of hind legs, forms a basket-like cradle with her two pairs of front legs, and catches the young – sometimes referred to as “scorplings” – as they emerge (in most species tail first), usually at the rate of 10 per hour. She may have anything from an observed 6 to over 100 per litter (average 8-10) depending on species. The young then climb onto her back, adopt random positions (except in one species, where they all line up nose to tail like lines of railway wagons), and remain there for the next week or more until their first moult. Before that they cannot survive naturally without the mother, as they depend on her for protection and to regulate their moisture levels. Especially in species which display more advanced sociability, the mother-with-young association can continue for quite some time, for two weeks or more.

The young generally resemble their parents. Growth is achieved by periodic shedding of the hard outer body casing or exoskeleton. A scorpion's developmental progress is measured in instars (how many moults it has undergone). They typically go through 5-7 moults/instars to reach maturity in about a year's time, though one species is known to mature in under six months, and others can take as long as 2-3 years. They may increase in size by anything from 20 to 40% at a moult, though once fully mature no further moults occur.

Immediately after each moult their new exoskeleton is soft, making them especially vulnerable to attack. Meanwhile, they must constantly stretch themselves while the new exoskeleton hardens to ensure that they can move freely when the hardening is complete.

During the period of carrying the young, most females are inactive, though in some species they remain active and forage for food. Except in one rare observed case they don't directly feed the young, but occasionally the latter will descend from the mother's back while she is eating, take a quick snack, and re-mount. Scientists also believe that mothers secrete certain nutritional substances to their mounted brood



Wikipedia photo by Chris Huh - Licensed under CC

*Asian Forest Scorpion*

through their body casing/‘skin’, but this has yet to be proven. Their lifespan is usually around 3-4 years, though some species may live for up to 25 years.

### Scorpions as pets

Now, before you all start turning over bricks and stones searching for these adorable new pets, let me add a few last words. Firstly, although some are ‘sociable’ and will live together, others are quite definitely not and need separate housing (*like some humans do* ☺). Secondly, as pets they can be overfed, so you need to limit the availability of whatever you decide to feed them on. Next, scorpions are absolute Houdinis. They can walk up walls and the sides of a wooden box, and can easily push off a lightly capped lid. Their tails are especially strong. Not only can they “stand” up against a slippery surface on the tip of their tail, thereby reaching higher than you would expect, but when held by the last segment/sting/telson (the recommended grip) they can arch their whole body back and upwards to grab at you with their pincers, so use long tweezers. Meanwhile, there is no truth in the stories about their stinging themselves to death when surrounded by fire, so please don’t expect them to perform that trick for you should you decide to get rid of them. Just let them go somewhere well clear of human habitation. In contrast, it is true that they can be frozen into a block of ice, melted out again, and walk away as though nothing had happened.

### If you get stung...

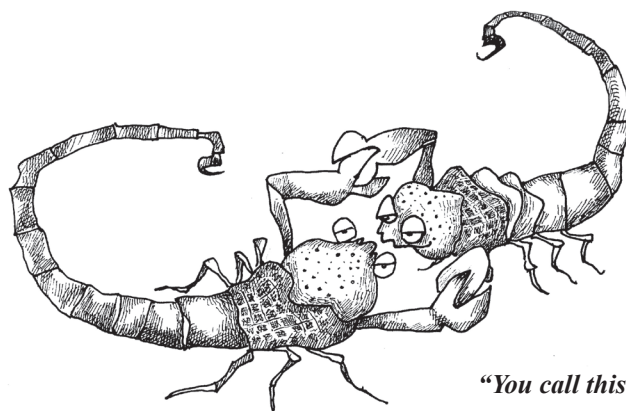
Finally, if you happen to get yourself stung, first point to note is that fatalities from scorpion stings are generally rare. Of the 4 or 5 species found in the Coromandel region, only the small reddish-brown Indian Red Scorpion is known to very occasionally take human life, but in almost every case you will find the victim was a child or someone allergic to the venom. The risk for the vast majority of normal healthy adults can be considered minimal, but still it might be advisable to consult a doctor, especially if you start to develop symptoms other than pain. Meanwhile, please remember that the sting was a defensive action on the scorpion’s part; meditate on the good they do eating termites and other insects, and their dietary value to a wide range of animals and other creatures; then sweat it out, or – if you believe in homeopathy – consider taking a homeopathic remedy for the sting. Left untreated the worst is over in 6-12 hours, and you will feel fine – if a bit more respectful – at the end of 24 hours. Alternatively, you might like to try the village way described on page 3 of the opening introduction to this book.



Photo: Wikipedia - Licensed under (CC)

### Additional miscellanea

- \* As scorpions are known to glow when exposed to certain wavelengths of UV light, a hand-held UV lamp is a standard tool for nocturnal field surveys of these creatures.
- \* Scorpion toxins are put to a variety of medical uses, in ailments ranging from rheumatoid arthritis, inflammatory bowel disease and multiple sclerosis to dermatology.
- \* Culturally, the scorpion is a significant animal which appears as a motif in North African and South Asian art, and especially in Islamic art in the Middle East. It is seen both as an embodiment of evil and as a protective force which counters evil.
- \* In ancient Egypt the goddess Serket, one of several goddesses who protected the Pharaoh, was often depicted as a scorpion.
- \* In China, where they eat scorpions, fried scorpion is a traditional dish.



“You call this a tango?”