# SPIDERS – PLAYING A VITAL ROLE IN THE WEB OF LIFE

By Stephanie Jackson

Wherever you travel you're sure to encounter spiders in the bush, in parks and gardens, or in buildings, and perhaps you'll shudder with revulsion or scream in fear. If one dares to invade your personal space you might reach for a can of Mortein, or eliminate the tiny creature with a well aimed swat with a rolled newspaper or other convenient weapon. But do spiders really deserve to die? Are they really a threat, or just uninvited but harmless intruders?

A fear of spiders and a compulsion to destroy them has been instilled in most people since birth, yet spiders are among the world's good guys, heroic little critters without which the world as we know it simply would not exist.

That might sound like a grave exaggeration, but British researchers have estimated that these inconspicuous creatures consume some 120 kilos of insects per hectare daily. Without them, or with their numbers significantly reduced, there would be a massive escalation of the insect population resulting in the widespread destruction of crops which would inevitably lead to famine and starvation on a global scale.

There are approximately 2,000 species in Australia, but only a few are capable of inflicting a bite that may cause significant pain or prove fatal to humans.

Unlike some insect species, spiders do not carry or spread diseases, cause no damage to crops or native vegetation, or to buildings or fabrics, and are not parasitic. They are, in fact, one of the most essential and beneficial creatures within every eco-system, and play a crucial role throughout the world, with the exception of the Antarctic, as regulators of insect populations.

From their origins as simple ground dwelling hunters some 360 million years ago, spiders have evolved in ways that enable them to survive in diverse climatic conditions and environments including caves, swamps, forests, deserts, and mountains. Some thrive among coastal rocks where they hunt in saline pools for small marine creatures, utilise discarded sea shells for the protection of their eggs and young, and cover their seaside retreats with a sheet of silk to retain a bubble of air. Others live underground in burrows with hinged lids, and some have been found on Mount Everest at an altitude of 6,700 metres.

Spiders shared the lives of early cave dwelling humans, and dined on the insects that infested primitive homes, and as insects developed the ability to fly, and proliferated in man's continually changing artificial environment, spiders developed new and innovative ways to catch their prey. And silk is the prime weapon in their arsenal.

Most spiders have three pairs of spinnerets at their abdomen, each with 100 or more minute spinning tubes from which the silk is drawn, with the coarsest of the several types of silk produced being five times finer than the thread spun by silk worms.

Spider silk is reputedly the world's strongest natural fibre. Its strength exceeds that of steel wire of similar dimensions, and its elasticity allows it to be stretched more than 20 percent beyond its original length. And believe it or not, researchers at the US industrial chemical company Dupont claim that a rope made from spiders' silk would have the strength to halt a jumbo jet at take off.

More than a third of Australia's spider species are web builders, spinning snares of intricate geometric designs that are visible in their hundreds in bushland when lavishly decorated with dew or raindrops. Moonlight, temperature, seasons, and wind all influence the flight patterns of insects, and spiders, taking these factors into account, construct their webs exactly where the majority of insects will pass or congregate.

Most spiders have at least eight eyes which enable them to see in all directions simultaneously, and ensure those that do not build webs are cunning and efficient predators.

Net casting spiders snare their prey with a sticky net. Leaf curling spiders hide in leafy tubes glued with silk, and whenever their web vibrates, they leap out to attack an unsuspecting insect. Freshwater spiders hunt in streams and swamps where they dive in pursuit of tadpoles or aquatic insects while breathing air from bubbles trapped in hairs around their lungs. Yellow, white, or green flower spiders silently snatch butterflies, bees, or other unsuspecting insects from petals or leaves that offer perfect camouflage.

Stick spiders lay trip wires, and when an insect stumbles across them, the spider releases the tension, and a sticky trap is sprung, leaving the victim helplessly entangled. Fishing spiders catch their prey by twirling a lie of silk with a sticky blob at its end; spitting spiders spit out a sticky fluid to immobilise their victims; jumping spiders leap on unsuspecting insects; and huntsman spiders, with outstretched legs that measure up to 160mm across and bodies up to 45mm in length, run down their prey on the ground.

Food is seldom on the minds of mature male spiders when their hunger for a mate becomes insatiable, but females are always hungry, and often attack a prospective mate with speed and ferocity - and devour him. But some males have developed cunning survival strategies. They perform a mating dance to signal their amorous intentions; wrap the female in silk before she realises what is happening; or present her with a gift, a dead fly or other appealing delicacy, and get down to the business of mating while she's eating it instead of him.

Some spiderlings, when they emerge from their silken egg sac, receive a helping hand from a parent. Female huntsman spiders share their prey with their offspring by regurgitating food and feeding individual spiderlings, and if threatened, gather the tiny spiderlings beneath their large bodies like a protective hen until danger has passed.

Wolf spiders fasten their egg sacs to their bodies and carry them with them until two hundred or more minute spiderlings ultimately emerge and scramble onto their mother's back. Wolf spiders with young may become extremely aggressive towards one another, even fighting to the death, but the spiderlings, having abandoned their mothers as the duel begins, surge onto the back of the victor who then carries both broods for several months.

When the time comes for spiderlings to launch themselves into the big wide world, they emit silken threads which, when caught on even a feeble breeze, form parachutes that carry their tiny passengers to diverse locations. With this method of dispersal, spiders can rapidly recolonise areas devastated by floods or bushfires, and are one of the first life forms to reappear after an environmental disaster.

The toxin of the daddy-long-legs is the most potent of any spider, but fortunately its fangs are too small to bite humans, and its poison sac holds only enough to kill minute prey. The Sydney funnel web which has occasionally caused fatalities, the mouse spider, the red-back which can inflict a painful, although rarely lethal bite, and wolf spiders that are suspected of causing slow healing skin sores are undoubtedly creatures to be avoided, but most spiders pose no danger to humans.

Remember to be cautious when moving rocks, logs, timber, old tyres, sheets of iron, or anything that has been unused for a considerable amount of time, for that is where many spiders lurk. An ability to identify various species is the key to knowing which may pose a threat, and once armed with a little knowledge, and with irrational fear and loathing replaced by respect and understanding, your first response may no longer be to reach for the Mortein, or to bring some harmless spider's life to a premature end with a stomp of your boot.

Long after the human race has passed into extinction spiders will inevitable continue their evolutionary progression, oblivious to our absence. But we, reliant on their continuing existence for the preservation of our modern lifestyle, cannot afford to ignore or undervalue the critical role they play within our fragile environment.



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