

Fraser Island Funnel Web Spiders

This FIDO Backgrounder looks at just one species of spider that adds to the outstanding natural values of Fraser Island — *Hadronyche infensa*. This race of spiders related to the Toowoomba Funnel-webs may have the most potent spider venom in the world. Funnel-webs amongst the most dangerous spiders in the world and are regarded by some to be *the* most dangerous. The venom of Fraser Island funnel webs is now being studied with a view to producing “natural” insecticides.

Fraser Island Funnel Web spiders are genetically homogeneous and have a distinctly different peptide profile to mainland *H. infensa* populations, often referred to as Toowoomba funnel-webs. This is a consequence of long genetic isolation.

Only four spider families have species with venoms that can kill or severely harm humans: Australian funnel-webs, widow spiders, recluse or fiddle-back spiders and Brazilian wandering spiders

Funnel-webs are regarded by some to be one of the three most dangerous spiders in the world. They spiders have fangs which point straight down the body, and are large, powerful, and capable of penetrating fingernails and soft shoes. There have been 26 recorded deaths in Australia in the last 100 years from spider bites.

There are an estimated 40 species of very venomous *Hadronyche* spp Australian funnel-web spiders and just one species of the genus *Atrax* — *A. robustus*, the notoriously dangerous Sydney funnel-web spider. However tests had shown that the venom of the male *Hadronyche infensa*, was up to six times as toxic as the female Sydney funnel-web, even though female funnel-webs generally were considered far more deadly than males. Despite the extreme toxicity of funnel-web spiders, no deaths have occurred in humans from any funnel-web species since an antivenene was developed in 1980.

The spiders were especially dangerous when males roam in search of receptive females, which generally stay within their underground burrows. The males are most active during damp, misty weather. Wandering males have caused a large majority of fatal bites to humans while wandering about looking for females during the warmer months of the year. Although extremely toxic to primates, the venom appears to be fairly harmless to many other animals

Symptoms of spider bite include severe local pain, superficial inflammation of the skin, sweating and nausea. These may be caused by several spider species, not all of them considered to be dangerous, but the characteristic sign of a funnel-web bite is a pair of distinct puncture wounds up to one centimetre apart.

First aid for funnel-web bites consists of applying a pressure immobilization bandage, wrapping of the bitten limb with a crepe bandage and splint. It was originally developed for snakebites but has been shown to be effective at slowing venom movement in funnel-web bites and may also slowly inactivate the venom

Inspiration for ‘natural’ insecticides:

After years of working in the US, University of Queensland’s Professor Glenn King was enticed back to Australia to work on an on spider venom seeking to discover and develop the compounds that control insects and other arthropod pests, with the aim of controlling the spread of insect-borne diseases. Although Prof King has previously used the Blue Mountains funnel-web spider *his* current and future studies are now to be focused on *Hadronyche infensa* collected from Fraser Island.

Professor King predicts that his research will lead to a commercial environmentally friendly insecticide based on spider-venom compounds within four years and anticipates that it will have a range of uses. He is hopeful his research will help control insects that destroy crops or spread human and animal diseases. He says that Fraser Island Funnel webs and may hold the key to developing safe, ‘natural’ insecticides because it includes compounds that specifically target insects, without affecting other animals.

Funnel-webs make their burrows in moist, cool, sheltered habitats—under rocks, in and under rotting logs, some in rough-barked trees (occasionally metres above ground). A funnel-web's burrow characteristically has irregular silk trip-lines radiating from the entrance. Unlike some related trapdoor spiders, funnel-webs do not build lids to their burrows.

Contrary to a commonly held belief, no funnel-web spider is able to jump, although they can run quickly



These spiders are medium-to-large in size, with body lengths ranging from 1 cm to 5 cm (0.4" to 2"). They are darkly coloured, ranging from black to brown, with a glossy carapace covering the front part of the body.