

A New Species of Sponge Crab in South-West WA

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In mid-June 2022, a hairy crab was found by a family off the coast of Western Australia near the town of Denmark. It was sent to Dr Andrew Hosie, a local scientist working for the Western Australian Museum, for identification. It was identified as *Lamarckdromia beagle* by the Western Australian Museum due to its exceptionally shaggy coat covering its carapace. This species has been named after The HMS Beagle, the research vessel that Charles Darwin sailed on during one of his voyages to Albany in 1836. The genus was named after another important naturalist Jean-Baptiste Lamarck, who contributed to the knowledge of evolution. The reason for its especially thick hairy, shaggy coat is not entirely certain, and it has been speculated that it served as camouflage. *Lamarckdromia beagle* and its relatives engaged in cutting out a piece of sponge and placing it on its head (Barr & Dobson, 2022). This crab belongs to a group of crabs referred to as Sponge crabs.

What is a Sponge crab?

Sponge crabs collectively form a family known as Dromiidae, which cut out a piece of sponge using their claws so that they fit their dorsal shells perfectly and place them there. The crab's two hindmost pairs of legs are shorter than the rest and are bent upward to hold the sponge in place. Because the sponge is a living organism, it can grow with the host crab (Gay, 2022). Dromiidae is further sorted into 43 genera, spanning about 142 different species, give or take a few (Crab Database, 2016).



Lamarckdromia beagle with a sponge on its carapace (Supplied: WA Museum – Colin McLay) (Barr & Dobson, 2022)

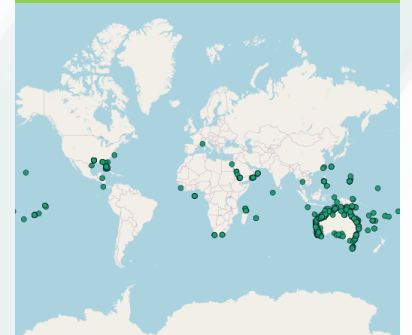
Like *Lamarckdromia beagle*, sponge crabs tend to be covered in relatively long hair on their carapaces such that they look like hairs. Most crustaceans have a hard exoskeleton that protects them from predation. However, over time predators have evolved sharper teeth and more powerful bites, so to increase their protection, the sponge crabs have evolved to use sponges and sea squirts as added protection. Research has found that some items they place on their backs are foul tasting and sometimes poisonous. When sponges are cut and put in place, they may spread by budding off. As a result, the pieces of sponge placed on the crab's shell survive and actively grow with the crab. This behaviour appears to be so ingrained that they even use man-made objects that superficially resemble sponges may be used (Severns, 2018).

Sponge crabs can range from 0.5 to 15cm in diameter. Most sponge crabs have an omnivorous diet, feeding on smaller animals and algae. They are nocturnal animals, performing most of their scavenging at night and resting in a small cave during the day, although some species are carnivorous (Sutton, 2017).



Image—Wikimedia

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This InSight provides information into the new species of Sponge Crab that was recently found in South West WA.



Distribution and habitat

Sponge crabs typically live in tropical and temperate waters throughout the Indo-Pacific. Australia currently has 30 species across 15 genera, and 31 if we include *Lamarckdromia globosa*. *L. globosa* has only been recorded through male specimens. In the waters off Western Australia, 23 species have been recorded, and their ranges extend from as far south as Albany and as far north as Broome. They only live in shallower waters, with many existing in intertidal zones, but the range can vary wildly depending on the species. One species, *Metadromia wilsoni*, has been recorded at a depth of 520m, the maximum recorded for an animal of the Dromiidae family in Australia (McLay & Hosie, 2022).



A different species of sponge crab. (Hosie, 2012)

Similar behaviours in other animals

Sponge crabs aren't the only animals to cover themselves in animal and algae parts to hide from predators. Decorator crabs (Majidae), a closely related family, have also been observed covering themselves in seaweed



A Decorated crab covered in algae. (Australian Museum 2023)

and other items to hide from predators. The *Naxia tumida*, which live in temperate intertidal waters around Australia, are known to cover themselves in seaweed. However, this is not universal to the family, which contains the Giant Japanese spider crab (*Marcocheira kaempferi*), which is the largest crab in the world and thus has no reason to hide (Australian Museum, 2023).

Another animal that engages in the use of animal parts is the hermit crab (Paguroidea). Like the sponge crab, the hermit crab's carapace is soft and vulnerable to predation. They have evolved behaviour that involves collecting shells left behind by dead snails. Unlike the sponge crab, however, the hermit crab's shell doesn't grow, so as the crab grows, it needs to seek out an increasingly large shell (Seattle Aquarium, 2023).

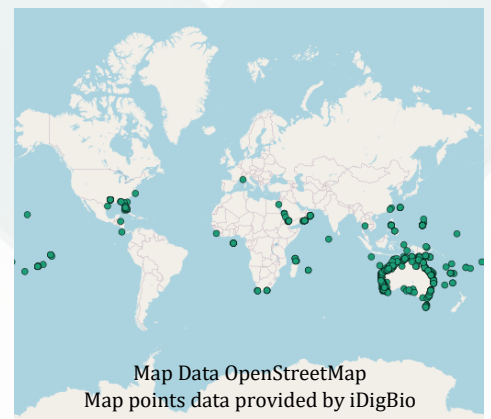
Scientific records

Despite *Lamarckdromia beagle* being described as a separate species in 2022, four specimens have been collected since 1925, with the recent discovery marking a fifth. To identify this specimen, Dr Andrew Hosie contacted Colin McLay, a retired marine biologist and former associate professor at the University of Canterbury in New Zealand, to confirm the specimen as a previously undocumented species (Lanese, 2022).

Together, the five known specimens collected suggest that *Lamarckdromia beagle* specifically lives in shallow, subtidal waters between Cape Naturaliste in the west and Albany to the east and is noted for having the longest, shaggiest coat of any of the sponge crabs documented to this date (Lanese, 2022).

Potential Impact to Tidal and Coastal Water

Sponge crabs live predominantly near coastal areas, including in tide pools. So, any activity or event that impacts these areas will also impact the crabs. This is not limited to sea level rise, and it can also include pollution from runoff, litter and over-tourism. People enjoying these waters should avoid physical contact with these crabs and sea creatures and are encouraged to raise awareness of these unique animals.



Map Data OpenStreetMap
Map points data provided by iDigBio



Management of Tidal / Coastal Water

The WA *Environmental Protection Act 1986* is the base from which the Environmental Protection Authority (EPA) and the Department of Water and Environmental Protection (DWER) derive their authority over the physical features of the sponge crabs' habitats (WA Government, 2023) (EPA, 2023) and the WA *Biodiversity Conservation Act 2016* is likewise for the Department of Biodiversity, Conservation and Attractions (DBCA) over the monitoring of biomass in coastal and tidal waters including the sponge crabs. (DBCA, 2022).

Integrate Sustainability Pty Ltd understand how urban development can impact wildlife conservation, so if you or your company want to minimise impacts to the Western Australian environment, please give us a call. For more information on sponge crabs, how your business may impact them, how you can protect them, or about the environmental laws in Western Australia, please call us on 08 9468 0338 or email us at enquiries@integratesustainability.com.au

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