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DNA impacts revealed as 'gloomy octopus' expands range to Tasmania

In a further sign of the impact of warming oceans on Tasmanian ecosystems, a species of octopus previously confined to eastern Australian waters is extending its range south, riding a new wave of warm water as ocean currents change.

In a [new study published today](#), researchers from Institute for Marine and Antarctic Studies (IMAS) and the [Centre for Marine Socioecology](#) (CMS) at the University of Tasmania worked with colleagues from [James Cook University](#) to examine the genetic processes associated with the gloomy octopus's range shift.

Dr Jorge Ramos, who led the study as part of his IMAS PhD research, said the octopus was first spotted in Tasmanian waters by local fishers and citizen scientists from the [Redmap](#) project.

"The octopus's real name is the common Sydney octopus, or *Octopus tetricus*, but it's known as the 'gloomy' octopus because it appears to have a rather downcast expression," Dr Ramos said.

"In recent years researchers have identified an increasing trend for both marine and terrestrial animals to shift their distributions, extending their ranges in response to climate change, as new areas become warm enough or other ecosystem changes take place.

"As citizen science projects such as Redmap are revealing, range shifts are one of the most common responses of marine species to oceanic warming.

"The gloomy octopus provided a good opportunity to examine what genetic process may allow marine range-shifting species to establish and persist in recently colonized areas due to oceanic warming," Dr Ramos said.

The study's senior author, Associate Professor Jan Strugnell from James Cook University, said the octopuses are drifting from their old East Coast range south to Tasmania on the East Australian Current (EAC).

"As the seas have warmed, the current has been transporting warmer waters than before into the temperate Tasmanian marine ecosystem and with it dozens of marine species that are new to the area," Associate Professor Strugnell said.

"Our study took the opportunity to look at the genetic make-up of the new arrivals."

The research found that populations along the range extension axis suffered genetic bottlenecks, which is the loss of genetic diversity and is likely to occur during range shifts.

“Surprisingly, even though genetic bottlenecks were detected, genetic diversity was moderate and comparable between populations from their usual home and the new place,” Associate Professor Strugnell said.

She said one of the possible reasons is that the bulk of the octopuses came from one location that is relatively similar to Tasmania in terms of temperature compared with other sites.

Associate Professor Strugnell said the study shed light on the genetic processes that may benefit range shifts associated with oceanic warming.

Published in the journal *Scientific Reports*, the study also involved researchers from the NSW Department of Primary Industries.

Downloadable content: [Dropbox](#)

- Photos and video of gloomy octopus

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