



# World's largest plant is found underwater in Shark Bay

*By Jane Edgeloe, Dr Elizabeth Sinclair  
and Dr Siegy Krauss*

*Posidonia seagrass meadow in Gathaagudu (Shark Bay).  
Photo – Rachel Austin.*



Seagrasses are marine flowering plants, meaning they produce flowers, fruit and seedlings. They also reproduce clonally through vegetative growth by horizontal rhizome extension. Globally distributed along coastlines and estuaries, seagrasses are important ecosystem engineers, modifying their abiotic environment in ways that also benefit other organisms and adjacent ecosystems by stabilising the sea floor, filtering sediments and nutrients, and reducing the speed of water flow in their canopies.

The [UNESCO World Heritage Area of Shark Bay](#) is home to 12 out of the 72 global seagrass species. Known to the Malgana people as 'Wirriya jalyanu nhurra' or 'seagrass mob', *Posidonia australis* appears as extensive meadows across Gathaagudu (Shark Bay). Here, the seagrass meadows provide habitat for fauna such as dugongs (wuthuga) and turtles (buyungurra) along the steep natural salinity gradient that increases almost two-fold from north to south.

Following a devastating marine heatwave in 2010–11, a total estimated area of 1,310km<sup>2</sup> of seagrass disappeared within Shark Bay, yet there have been [promising signs of recovery](#). We set out to investigate whether the *P. australis* meadows in Shark Bay will be able to persist under the increased frequency and severity of extreme climate events. We conducted a population genetic study to begin to answer this question, which required collecting shoot samples from ten meadows spread across the salinity gradient.

Using 18,000 genetic markers, we found shoots from [nine of the ten meadows were genetically identical](#), meaning a single plant (or clone) of *Posidonia* has expanded across 180km. We believe the clone originated from a single, colonising seed approximately 4,500 years ago – as old as the Egyptian pyramids and Stonehenge.

Our study revealed that this plant is [the largest known organism on earth](#). Its extent is equivalent to the distance between Perth

City and Bunbury! The plant has double the genome of its oceanic relatives (40 chromosomes rather than 20), making it a polyploid organism. Polyploids arise when diploid parent plants hybridise, and typically have greater vigour and hardiness than their diploid progenitors. We suggest this allowed the plant to colonise newly submerged habitats at Shark Bay following rising sea levels after the Last Glacial Maximum.

The giant clone appears to be highly resilient to its environment, experiencing a range of temperatures and salinities. Some meadows of this giant clone do produce flowers, but [fruits are rarely observed](#) meaning it may be sterile, with vegetative growth through rhizome extension largely responsible for its current distribution.

This research was supported with funding from the Australian Government's National Environmental Science Program and the Australian Research Council. Continuation of research into this hybrid plant will focus on untangling evolutionary processes that enable it to adapt to changing environments. This knowledge will benefit ecological restoration of degraded seagrass meadows, and aid in conserving the species for hopefully many generations to come.

## Acknowledgement of Country

Permission to conduct research on Gathaagudu, Malgana Land and Sea Country, was provided by the Malgana Aboriginal Corporation prior to making field collections. 'Wirriya jalyanu nhurra' comes from language shared by Malgana Elder Auntie Ada Fossa, *may she rest in peace*.

## Contact

**Jane Edgeloe**, PhD candidate  
The University of Western Australia  
email [jane.edgeloe@research.uwa.edu](mailto:jane.edgeloe@research.uwa.edu).



Jane Edgeloe on SCUBA sampling *Posidonia* shoots from a deeper water meadow (approximately 4m deep) in Shark Bay. Photo – Rachel Austin.