

What are we missing about marine invasions? Filling the gaps with evolutionary genetics and genomics

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Research on invasion biology has been dominated by studies on the ecological effects of invasion events, however it has been known for sometime that evolutionary processes are important for invasion success, but are rarely studied. The development and application of genetic and genomic approaches now provide the tools necessary to unravel the natural history, taxonomy, and invasion pathways of invasive species, as well as the genetic basis of adaptive traits that allows them to expand within and beyond their native range. Using a combination of genetic, transcriptomic and experimental approaches we test for rapid evolutionary change in the Northern Pacific seastar, *Asterias amurensis* by comparing patterns of genetic divergence between native and introduced populations. Additionally, we show rapid behavioural change in a native prey species, suggesting they have evolved novel anti-predatory responses to the Northern Pacific seastar over a relatively short period of time. These data highlight the importance of understanding evolutionary processes for determining invasion success, range expansion and the response of native fauna to invasive species.