Responses of aquatic invertebrate communities in Western Australia's Pilbara river pools to invasive redclaw crayfish

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Biography:

Dr Laurence Dugal is a research scientist in ecosystem genomics based at Western Australia's Department of Biodiversity, Conservation and Attractions (DBCA). She has a background in marine science and biomonitoring using environmental DNA, obtained through a PhD in molecular ecology at the University of Western Australia. She is currently working on the application of eDNA and metabarcoding techniques for biodiversity surveys, targeted species detection and monitoring forest and ecosystem health.

Abstract:

Redclaw crayfish (Cherax quadricarinatus) are a freshwater crustacean native to Queensland, the Northern Territory and Papua New Guinea, but they have been translocated and introduced to many locations both within Australia and overseas, resulting in numerous wild populations being established. The freshwaters of the Pilbara region of Western Australia (WA) lack a native crayfish or any other large crustacean, thus redclaw is an invasive keystone species capable of inducing biodiversity loss and impacting ecosystem functioning. Recent research on the benthic and aquatic invertebrate communities in and around Karijini and Milstream-Chichester National Parks found that redclaw presence caused significant shifts in faunal and floral assemblages in the river pools, through the complete loss of macrophyte cover and a resulting change in invertebrate communities. However, these findings were limited to only one river pool, and thus questions remain regarding how far-ranging the invasive species' impacts on the region's aquatic macroinvertebrate communities are. The research presented here combined CO1 DNA metabarcoding of zooplankton and morphological taxonomic identifications to characterise the impact of C. quadricarinatus on aquatic faunal assemblages, using samples collected from river pools in the Pilbara region in 5 sites known to have redclaw and 5 sites where the species was believed to be absent. Recent surveys have shown that redclaw have expanded their distribution to more locations in WA, making understanding the species' ecological impacts on aquatic freshwater systems, including remote and pristine water bodies, even more timely.

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Our mission is promoting science and industry collaboration across Australia and New Zealand to advance best practice eDNA methods and adoption in government, private and community sectors.

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