Project Summary

W18 Taxonomy and distribution of *Austrogammarus* amphipods in the Port Philip and Westernport region.

Objective(s)

This project will undertake research using genetic and morphological approaches to better understand the taxonomy, distribution and conservation status of *Austrogammarus* haasei, *A. australis* and other *Austrogammarus* species in the Port Philip and Westernport (PPWP) region. It will: identify species and populations most at risk; provide management recommendations to mitigate risks to species and populations; and develop qDNA primers and markers for *Austrogammarus* species to be used for future surveys using water samples.

Why this research is important

As part of Melbourne Water's Healthy Waterway Strategy objectives (Melbourne Water Corporation, 2018) and Rivers Monitoring and Evaluation Plan (Melbourne Water, 2020) the protection of the threatened Dandenong amphipods (*A. haasei* and *A. australis*), were identified as a key performance objective in the Dandenong Creek and Olinda Creek catchments. However, COI DNA barcoding of *Austrogammarus* (Tsyrlin, 2023) has revealed 10 genetic lineages of *Austrogammarus* which may represent additional species with three of these lineages found outside the Dandenong Ranges

While the distribution and ecological requirements of *A. haasei* appear to be wider than previously thought, the identity and distribution of A. australis based on COI DNA barcoding has become ambiguous as A. australis appear to form six distinct lineages (A.sp1-6, Figure 3). If there are cryptic species within A. australis this could affect Melbourne Water's management strategy for these species.

To better understand this, *A. australis* requires more genetic data, like nuclear markers, and morphological examination. Revision of the taxonomy and distribution of *Austrogammarus* will allow re-evaluation of the conservation status and enable more targeted management of each *Austrogammarus* species.

Contribution to Melb. Water research priorities

- MWRPP-19: increase our understanding of the distribution of threatened aquatic species

Approach

This project will be conducted over six months, and involve the following steps:

- Collation of existing data and available specimens
- Field work: including specimen collection and habitat assessment
- DNA barcoding and morphological analysis: up to 150 specimens from 30 different sites
- eDNA assay and testing: design and test species-specific qDNA markers.
- Population and species prioritisation, conservation status reassessment

Key Outputs

- Technical Report on revision of *Austrogammarus* taxonomy using COI and 18S (or other nuclear marker) sequences and morphological traits
- Assessment of vulnerability to specific threats and ranking of species and populations in order of conservation priority
- COI region DNA Barcodes for recognised *Austrogammarus* species in the PPWP region
- Management recommendations
- qDNA primers and markers

Expected benefits

- Increased reliability to identify species, which will aid the assessment of their distribution, abundance and conservation status.
- Knowledge of different species distribution and threats, which will inform management recommendations.
- Understanding of the exposure to known threats and conservation status, which will inform new obligations of Melbourne Water.
- Development of species-specific primers and markers can be used for the analysis of water samples to detect species in question with high degree of certainty.

For more information

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