




EGG BANKS AS BIODIVERSITY ARCHIVES: Using desiccation-resistant eggs to monitor assemblage structure in a salt lake ecosystem

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Background




Salt lakes are dynamic and often ephemeral ecosystems that support diverse assemblages of aquatic invertebrates



These egg banks act as biodiversity archives, preserving a record of assemblage composition through time




Many species survive harsh dry phases as desiccation-resistant eggs buried in sediment




This study investigates the potential to use egg banks to monitor invertebrate assemblage structure in the Lake Way salt lake system in Western Australia

Methods




Sediment samples were collected from replicate sites in multiple years during dry periods (2021, 2022, and 2024)



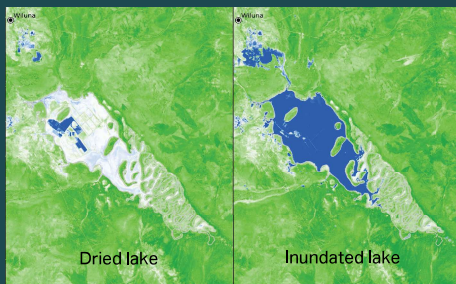
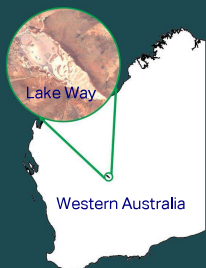
Invertebrate sweep netting was conducted at the same replicate locations when the lake was inundated (2020, 2023, and 2024)



Laboratory rehydration trials were conducted on the sediments collected to hatch viable resting-stage eggs



Emerged specimens were identified and compared between years and against invertebrate assemblages that were collected by sweep netting when the lake was inundated



Sampling location



Sweep netting



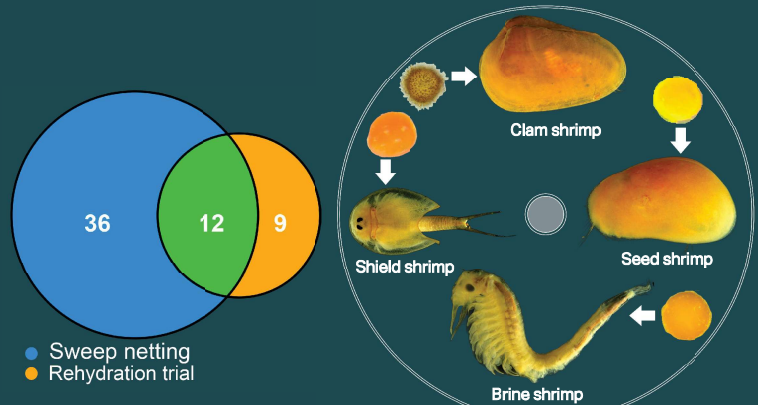
Sediment collection



Sediment rehydration trials

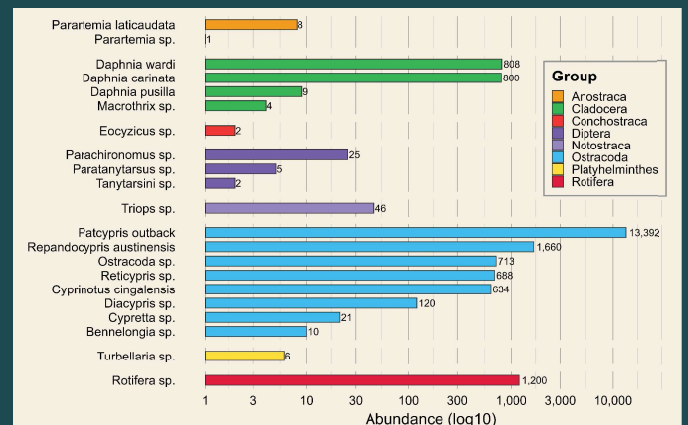
Main Findings

- Sediment rehydration was successful in all years, yielding 6–13 taxa in each year
- Nine taxa were recorded only in rehydration trials, while 36 taxa were recorded from sweep samples only. 12 taxa were common to both methods
- Crustacea, especially ostracods, dominated the emerging assemblages from sediments
- Daphnia wardi*, *Sida* sp., *Bennelongia* sp., *Cypretta* sp. and *Diacypsis* sp. were only recorded via the rehydration trials
- Sweep netting recorded 26–34 taxa, detecting additional groups such as Coleoptera, Hemiptera, Odonata and Annelida



Invertebrate taxa detected by rehydration and sweep netting

Desiccation resistant eggs and corresponding adult stages of key taxa



Invertebrate taxa hatched in rehydration trials

Conclusion

- Both sediment rehydration and sweep netting methods detected common as well as unique taxa
- Rehydration trials proved valuable for detecting species overlooked by conventional active sampling
- Incorporating rehydration trials provides a more comprehensive assessment of invertebrate assemblages and improves long-term ecological monitoring