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Development of ethically acceptable techniques for invertebrate wet-pit trapping

Biogeography

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Development of ethically acceptable techniques for invertebrate wet-pit trapping

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Context

Over the past 15 years the technique of invertebrate wet-pit trapping has become a standard practice in biological survey, biogeographic research and condition monitoring programs. Relatively small aperture pits with a preserving fluid are buried flush with the ground and left *in situ* for extended periods (several months) to sample terrestrial invertebrates. This has enabled an unprecedented insight into the temporal and spatial structuring of invertebrate communities - a highly significant but comparatively poorly understood component of the Western Australian biota.

However, a consequence of this sampling technique is the inadvertent capture of vertebrates, which creates an ethical issue. The combination of glycol and formalin used in these pits is likely to result in a distressing demise for vertebrates as they are able to swim and stay afloat in the solution for some time, and the chemical solution is likely to act as an irritant. Also, the quality of the subsequently preserved material is of limited use beyond initial species identifications.

Aims

- Establish wet-pit trapping chemistry that ensures rapid death to both target and non-target fauna with the least distress possible.
- Achieve a level of preservation in captured organisms suitable not only for species identification, but also for morphological and molecular taxonomic research.
- Solution requires minimal personal protective equipment for safe use and poses no environmental risk or hazard.
- Solution needs to be stable for several weeks or more under variable climatic conditions.

Progress

- DNA extraction and PCR amplification trials have been undertaken from a number of preserved specimens collected in the field with positive results.
- Reports have been provided to the Parks and Wildlife Animal Ethics Committee.
- Advice has been requested and provided to the Department's Animal Ethics Committee in relation to applications to use invertebrate wet pit traps.

Management implications

- An alternative to the ethylene glycol and formalin solutions used in invertebrate wet pitfall trapping that reduce or address existing ethical issues around vertebrate by-catch may allow for the continuation of this type of invertebrate sampling method. This is not only important for the Department of Parks and Wildlife's existing survey and monitoring programs but for other government agencies, tertiary institutions and environmental consultants that utilise this methodology for sampling ground invertebrates. Of particular relevance will be the increased value of preserved material for morphological and molecular examination, an area that is currently severely compromised by material collected using the conventional ethylene glycol and formalin solutions.

Future directions

- Receive feedback and results from operational work using new chemistry in different parts of the state and under different climatic regimes.

- Present findings to the Department's Animal Ethics Committee.
- Where the opportunity is available assess quality of molecular fixation for different target and non-target taxa from operational use of traps.
- Continue provision of advice to the Department's Animal Ethics Committee on the use of invertebrate wet pits.
- Produce a Science Information Sheet.
- Completion of final integrated report.