HONOURS PROJECT

Project Title: Validating eDNA techniques for detecting small desert vertebrates from soil samples

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Project

Surveying small vertebrate assemblages is an important aspect of ecological studies and environmental impact assessments. Techniques involve camera trapping, pit trapping, and more recently, analysis of environmental DNA (eDNA). Analysis of eDNA has ethical and logistical advantages over camera and pit trapping, but there has been little work validating the approach in terrestrial environments. Soil is not an ideal substrate for preserving and sampling eDNA, and therefore detection of species active in the environment can be haphazard and unreliable. This project will analyze the eDNA of soil samples taken from small vertebrate pit traps to determine rates of detectability of small mammals and reptiles known to be present in the pits for varying time periods. It will make an important contribution to our knowledge of the utility of eDNA for evaluating terrestrial vertebrate assemblages.

Funding: Equipment, materials and samples are already available.

Special requirements: The student will need to undertake training to work in the eDNA laboratories.

References:

Ryan E, Bateman P, Fernandes K, van der Heyde M, Nevill P. eDNA metabarcoding of log hollow sediments and soils highlights the importance of substrate type, frequency of sampling and animal size, for vertebrate species detection. Environmental DNA. 2022.

Newton JP, Bateman PW, Heydenrych MJ, Mousavi-Derazmahalleh M, Nevill P. Home is where the hollow is: Revealing vertebrate tree hollow user biodiversity with eDNA metabarcoding. Environmental DNA. 2022.

van der Heyde M, Bunce M, Nevill P. Key factors to consider in the use of environmental DNA metabarcoding to monitor terrestrial ecological restoration. Science of The Total Environment. 2022 25:157617