

Title: Wetland Assessment and Monitoring Tool for New Zealand: testate amoebae as palaeoindicators

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Abstract: Over 90% of New Zealand's wetlands have been lost since settlement. Those that remain are of high conservation priority. The environmental importance of peatlands has stimulated restoration efforts across the globe. Most New Zealand studies tend to focus on the response of vegetation in wetland restoration programmes, and although these have shown promising results, little is known about changes in microorganism communities. It has been recently found that testate amoebae (TA) (a polyphyletic group of shell building unicellular protists), commonly found in wetlands, provide more accurate information on microenvironmental conditions than vegetation, and that valuable ecological information can be obtained without knowing all the TA taxa. As the shells (tests) of these organisms tend to be resistant to decay in wetland environments, they can be preserved in peat layers for thousands of years. As current methods of assessing wetland condition lack a long-term baseline of natural variability, these microorganisms can be used as valuable palaeo-indicators of ecosystem health before human arrival. In this study, we will develop an advanced wetland assessment and monitoring tool by applying testate amoebae analysis and ancient DNA techniques to wetland surface and deposit cores. This will enable the identification of indicator taxa for wetland condition, detect tipping points, and allow quantitative ranking of wetlands for conservation purposes. We will also establish critical long-term baselines for ongoing monitoring and the restoration of New Zealand's wetlands.

