Using land snails from archaeological sites as palaeoenvironmental proxies: A northern Australian case study

Introduction
Land snails are acutely sensitive to fluctuations in moisture levels and have taxa-specific environmental tolerances (Hugall et al. 2002; Stanisic et al. 2010). As such, they have been shown to be important indicator species for monitoring habitat change (Hugall et al. 2002; Stanisic et al. 2010). There are numerous examples of the use of land snails in archaeological research around the world. However, there are only a few examples in Australia (David and Stanisic 1991; McNiven et al. 2008; Rowe et al. 2001).

Materials and Methods
Midden material from Square B, XU1-XU6 (0-17 cm below ground surface), was analysed (Fig. 2-3). The midden samples were identified to taxa with reference to field guides (Stanisic et al. 2010). They were then quantified, using MNI and weight. Habitat preference and environmental tolerances were determined for each taxon, using descriptions in the literature.

Results
Three families of land snail were identified in the assemblage: Pupillidae, Subulindae and Microcystidae. Four different species were identified: Pupoides pacificus, Pupisoma circumlitum, Eremopeas tuckeri and Liardetia doliolum (Fig. 4-8). XU4 contained two partial shells (most likely Liardetia doliolum), which have been labelled as ‘unidentified’.

Each family was found to have different habitat preferences and environmental tolerances (after Stanisic et al. 2010).

- **Pupillidae** – *P. pacificus*, *P. circumlitum* – Most abundant in dry areas, many are drought resistant. Coastal dunes and littoral environments are favoured.
- **Subulindae** – *E. tuckeri* – Generally, terrestrial litter dwellers and can be found living in a range of different conditions (semi-arid, coastal vine thicket, dry rainforest).
- **Microcystidae** – *L. doliolum* – Both ground-dwelling and arboreal, found in coastal rainforests and vine thicket, living on shrubs and in leaf litter.

The dominant taxa present in XUs 1-3 (*E. tuckeri* and *L. doliolum*) are tolerant of dry environmental conditions. This is in direct contrast to XUs 4-6, which included a single species (*L. doliolum*), requiring higher levels of moisture.

Conclusion
Results of this study can be used to identify general environmental conditions at specific points in time at Thundiy (Table 1). It is hypothesised that environmental reconfigurations on the sacred islet of Pulu, western zenadh Kes (Torres Strait), are associated with changes in environmental conditions at specific points in time at Thundiy.

Recommendations
To confirm and augment these preliminary results, it is recommended that analysis of other samples (the basal XUs of Square B and the nearby Squares A and C) at Thundiy, be carried out to expand the sample. If the assemblages reflect the same findings as Square B, the findings of this research could be extrapolated to include the broader environment of Thundiy.

Acknowledgements
We would like to acknowledge and thank the Kaiadilt traditional owners and our archaeological colleagues at James Cook University. This research project was undertaken as part of his PhD research subject AR3008 Peoples of the Coast and Sea at James Cook University.

Aims and Objectives
This study identifies and analyses the land snail assemblage of a coastal shell midden deposit, excavated from Thundiy on Bentinck Island, southern Gulf of Carpentaria (Fig. 1) to create a diachronic picture of the environment during the period of site occupation. The research highlights the usefulness of including land snail analysis in Australian archaeological projects.

References

Table 1. Age-Span of Excavation Units (XUs) at Thundiy

<table>
<thead>
<tr>
<th>Square</th>
<th>Age Span (Years cal BP)</th>
<th>Max. Depth (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>551-313</td>
<td>18.6</td>
</tr>
<tr>
<td>A</td>
<td>390</td>
<td>15.4</td>
</tr>
<tr>
<td>C</td>
<td>313</td>
<td>12.6</td>
</tr>
<tr>
<td></td>
<td>211</td>
<td>12.6</td>
</tr>
<tr>
<td></td>
<td>135</td>
<td>9.4</td>
</tr>
</tbody>
</table>

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