

Little Desert National Park Bush Blitz ***Terrestrial and Freshwater Mollusca***

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Nomenclature and taxonomy used in this report is consistent with:

The Australian Faunal Directory (AFD)

<http://www.environment.gov.au/biodiversity/abrs/online-resources/fauna/afd/home>

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List of contributors

List of contributors to this report.			
Name	Institution/affiliation	Qualifications/area of expertise	Level/form of contribution
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1. Introduction

The malacofauna of the Little Desert region represents a major knowledge gap as there are very few records in state collections. To date, only two records of two widely distributed native species and two records of the introduced common garden snail exist for this region. It is unknown whether this is due to the lack of survey effort or that the environment simply harbors low diversity and/or densities, due either to ecological constraints or biogeographic history. A principle aim of this survey is to undertake a systematic appraisal across the region to qualify this apparent lack of diversity.

2. Methods

2.1 Site selection

Within the Little Desert National Park priority was given to sites with the greatest period of recovery since last recorded fire. A total of 15 sites were surveyed within the national park. Opportunity was also taken to survey sites outside the national park (a total of nine sites), with a particular focus on nearby habitats not represented within the national park (e.g. the rocky outcrops at Mount Arapiles-Toosan State Park).

2.2 Survey techniques

To maximise the inventory of all species at a particular site, both post-mortem shells and live specimens were collected. The principle survey method was active search, targeting suitable micro-habitats such as logs, rock crevices and leaf litter accumulation at the base of trees. All recorded sites were surveyed for a minimum of one hour, one person equivalent. Live specimens were first drowned for 24-48 hours before preservation in 70% ethanol.

2.2.1 Methods used at standard survey sites

The equivalent of two hour, one person active searches was conducted at both standard survey sites.

2.3 Identifying the collections

Reference to the Australian Museum and Museums Victoria collection databases, in conjunction with two field guides (Smith & Kershaw 1979, Stanisc *et al.* 2018) and the Zoological Catalogue of Australia for Non-Marine Molluscs (Smith 1992) were the principle sources used to identify the specimens collected.

3. Results and Discussion

Appendix 1 lists all terrestrial and freshwater snails recorded during the Bush Blitz. A total of five native terrestrial species, and three native freshwater species were recorded during the survey. Two introduced land snails and one introduced freshwater snail were also recorded. Collections made during this Bush Blitz will result in 28 specimens, including 26 new records, being added to public collections and publicly accessible databases. Images of specimens will also be added to the collections and publicly accessible databases.

3.1 Un-named or not formalised taxa

A yet undescribed charopid belonging to the genus *Scelidoropa* Hyman and Stanisc 2005 was collected from Mount Arapiles-Tooan State Park. There exists four records of this taxa in the state's collection. All are from sites at or in close proximity to Mount Arapiles, with the most recent collected in 1975 by the museum's previous malacologist, Brian Smith. Designation of these earlier records was restricted to the genus level (*Scelidoropa*, previously *Pernagera*), principally because it was recognised as a new species yet to be formally described. This determination remains the case.

Closely related species, *S. gatliffi*, *S. officeri* and *S. tamarensis* are generally found in relatively wetter forests in southern parts of Victoria. Hence, this undescribed species represents both a geographic and environmental outlier, most likely relictual, and persisting in the semi-arid environment because of the favourable microclimate afforded by the rocky outcrops. In this regard, the southern facing rocky slopes at Mount Arapiles represent critical habitat. While additional survey effort is necessary for confirmation, it is believed that this species is highly restricted to the Mount Arapiles region. We believe a more detailed assessment of its conservation status is warranted.

Table 1. Putatively un-named or not formalised taxa

Taxon	Comment
<i>Scelidoropa</i> sp.nov.'BBLD2019'	

3.2 Putative new species (new to science)

No new species were found during this survey.

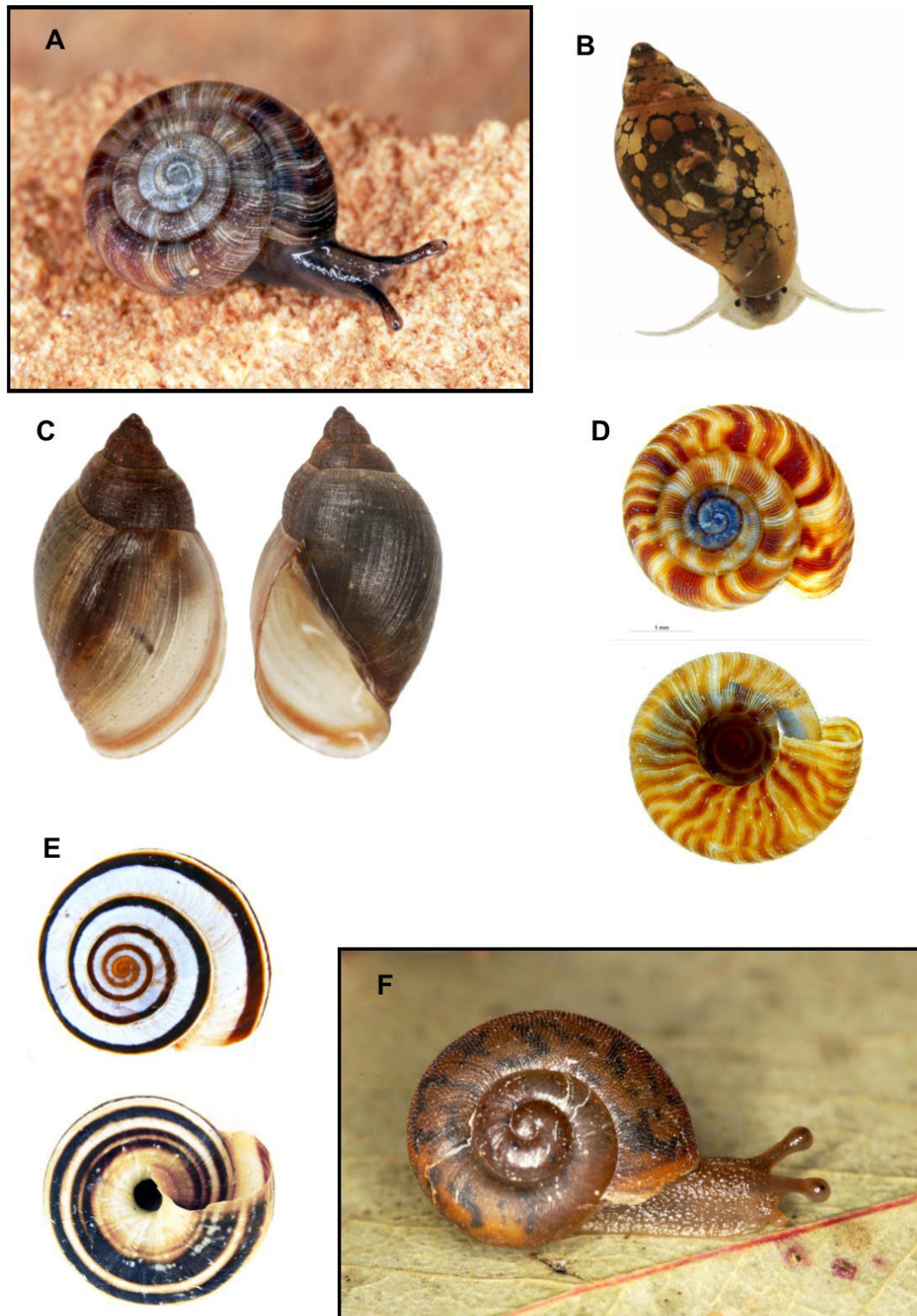


Figure 1. A) *Scelidoropa* sp.nov.'BBLD2019' (BBLD 2019 261), B) *Physa acuta* (BBLD 2019 242), C) *Glyptophysa gibbosa* (BBLD 2019 242), D) *Scelidoropa* sp.nov.'BBLD2019', E) *Cernuella virgate* (BBLD 2019 244), F) *Chloritobadistes victoriae* (BBLD 2019 260).

3.3 Exotic and pest species

Three introduced species, two terrestrial and one freshwater, were recorded during the survey. While the two terrestrial species, *Microxeromagna lowei* and *Cernuella virgata*, were not recorded in the national park, it is highly likely that they are established at sites along the eastern boundary, particularly in riparian habitat along Wimmera River. Additional surveys would be needed to confirm this.

During this survey *M. lowei* was only recorded in riparian habitat at Jeparit, and *C. virgata* at the basecamp and Loch Iel (Pink Lake) L.R., both at very high abundance. Both species are regarded as serious agricultural pests, especially for grain crops.

The freshwater snail, *Physa acuta* is well established in most Victorian waterways, as is the case in the Wimmera River. The species is highly invasive, tolerates a wide spectrum of environmental conditions and is typically found at very high densities. The study of Zukowski and Walker (2009) showed that this species competitively suppressed growth rate in the native species *Glyptophysa gibbosa*, and suggested similar consequences for other natives.

Table 3. Exotic and pest species recorded

Exotic/pest species	Location sighted/observed	Indication of abundance	Comments
<i>Microxeromagna lowei</i>	Jeparit	Very high	
<i>Cernuella virgata</i>	Basecamp, Loch Iel	Very high	
<i>Physa acuta</i>	Little Desert, eastern Boundary, Wimmera River.	Very high	

3.4 Threatened species

No state or federally listed species of conservation concern was recorded during the survey, but see section 3.1.

3.5 Range extensions

No major range extension was recorded for any of the indigenous species found during this survey.

3.6 Genetic information

Tissue samples for molecular work were collected from live specimens of punctids and charopids. These samples will be processed for high throughput sequencing and exon-capture work as part of a project led by the senior author, one focused on the phylogenetics and systematics of the families Charopidae and Punctidae.

4. Information on species lists

With the exception of *Scelidoropa* sp.nov.'BBLD2019', all species recorded during the survey are formally recognised and confidently identified.

5. Information for land managers

As noted above, *Scelidoropa* sp.nov.'BBLD2019' is a highly restricted species, most likely endemic to the rocky outcrops centred on Mount Arapiles. In general, rocky outcrops harbor greatest diversity and densities of terrestrial invertebrates at the base of southern facing slopes. We observed some damage to vegetation at the base of southern slopes at the two sites surveyed, primarily due to rock climbing activity. This was evident at both sites surveyed,

but was most notable at the site in close proximity to the Melville Caves track. Limiting this impact would be highly beneficial to the local biota.

6. Conclusions

Overall, the malacofauna of the Little Desert National Park is highly depauperate, with only two species of native punctids found within the park during this survey. With additional survey effort the Southern Ambersnail, *Austrosuccinea australis* is also likely to be found along drain-lines and in riparian habitat within the park boundary. All three species are common and widely distributed across Victoria. Of the 23 sites systematically surveyed for a minimum of one person hour, either live snails or post-mortem shells were found only at eight sites. Such low diversity and abundance cannot be attributed to the semi-arid climate as notably higher diversity has been recorded in other regions having comparable climate. The most likely explanation is the lack of topographic relief in conjunction with the region being relatively young given that cessation of aeolian activity and stabilisation of the Mallee Dunefields is dated to only 12-6Ka (Pell *et al.* 2001).

In contrast, the rocky outcrops centred on Mount Arapiles represents an important long term refugium for the broader region, harbouring either relictual populations (evolutionary significant units, ESUs) or local endemics. In addition to the charopid *Scelidoropa* sp.nov.'BBLD2019' recorded during this survey, there exists a second not yet formally described charopid recorded at Mount Arapiles, one currently designated to the genus *Pilomena* Iredale 1937. As was the case for *Scelidoropa*, members of the genus *Pilomena* are generally found in wet forests and woodlands in southern coastal and/or eastern Gippsland regions of Victoria. Given this preliminary insight, undertaking a more comprehensive survey at Mount Arapiles would be considered of high priority, not only for the malacofauna, but for terrestrial invertebrates of low-vagility in general.

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Appendix 1. List of terrestrial and freshwater snails recorded during the Little Desert Bush Blitz						
Family	Species	Common name	Putative new species	Threatened (EPBC Act)	Threatened (State / Territory Act)	Exotic / pest
Camaenidae	<i>Chloritobadistes victoriae</i>	Southern Hairy Red Snail	No	No	No	No
Charopidae	<i>Scelidoropa</i> sp.nov.'BBLD2019'		No	No	No	No
Hygromiidae	<i>Ceruella virgata</i>	Vineyard Snail	No	No	No	Yes
Hygromiidae	<i>Microxeromagna lowei</i>	Citrus Snail	No	No	No	Yes
Punctidae	<i>Magilaoma penolensis</i>	Penola Pinhead Snail	No	No	No	No
Punctidae	<i>Paralaoma mucoides</i>	Waxy Pinhead Snail	No	No	No	No
Succineidae	<i>Austrosuccinea australis</i>	Southern Ambersnail	No	No	No	No
Physidae	<i>Physa acuta</i>	Acute Bladder Snail	No	No	No	Yes
Planorbidae	<i>Glyptophysa aliciae</i>	Alice's Pouch Snail	No	No	No	No
Planorbidae	<i>Glyptophysa gibbosa</i>	Swollen Pouch Snail	No	No	No	No
Planorbidae	<i>Isidorella hainesii</i>	Haine's Pouch Snail	No	No	No	No