

The guanophilic arthropods of Bat Cave, Naracoorte - an isolated community?

Timothy Moulds¹,

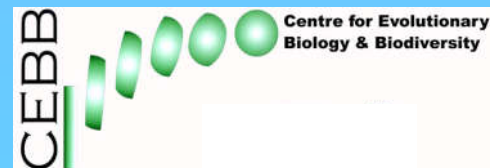
Mark Harvey², Terry Reardon³ & Mark Adams³

¹The University of Adelaide,

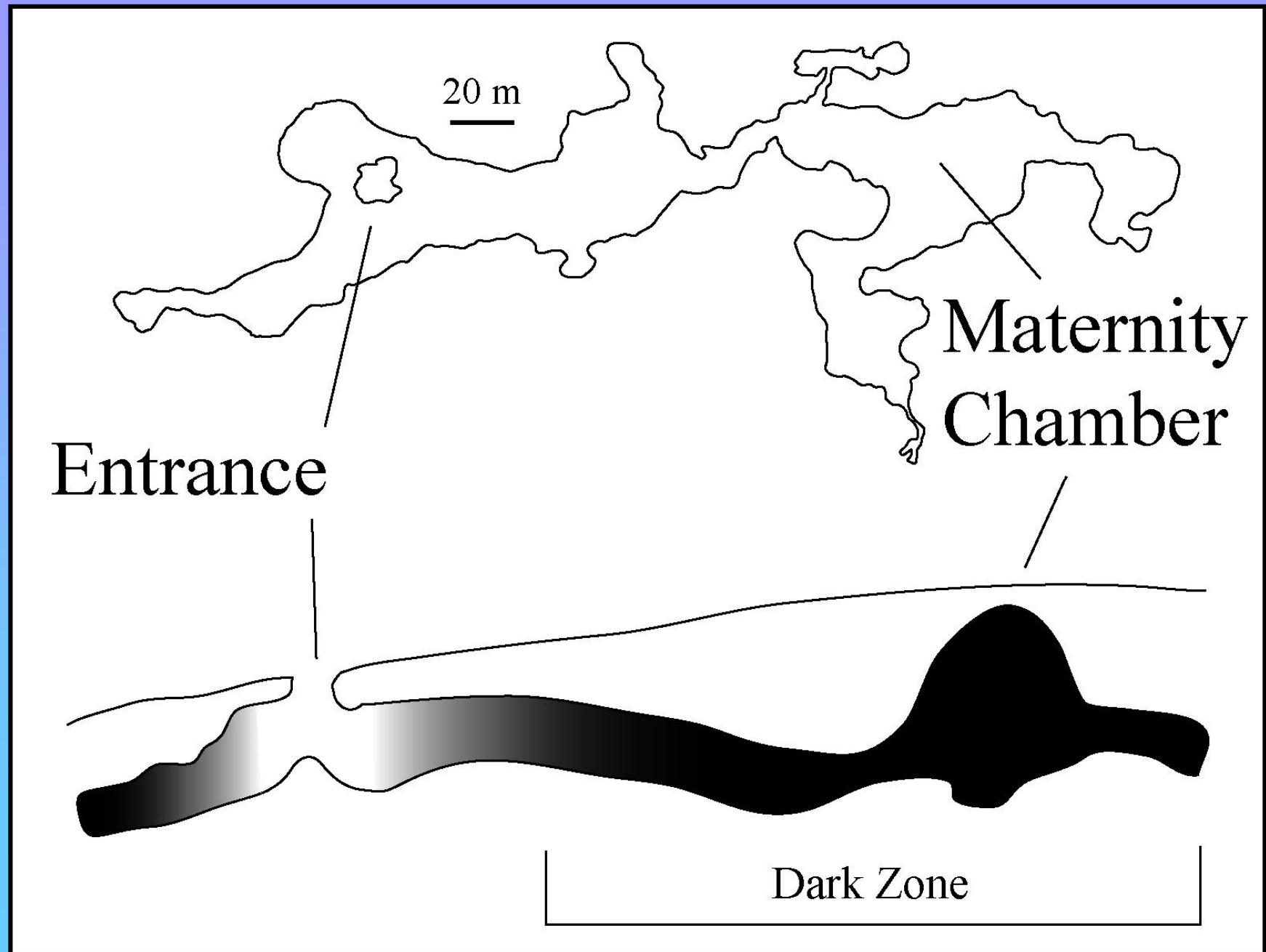
²Western Australian Museum,

³South Australian Museum

Centre for Evolutionary Biology and Biodiversity



Bat Cave



Miniopterus schreibersii bassanii
(large bent-wing bat)



Photo Tim McCullough

Maternity Chamber



Arthropods found in the Maternity Chamber



Endemic species in Maternity Chamber?

Checklist of Australian guano invertebrates identified only a single possible endemic species in Bat Cave (Moulds 2004):

Protochelifer naracoortensis

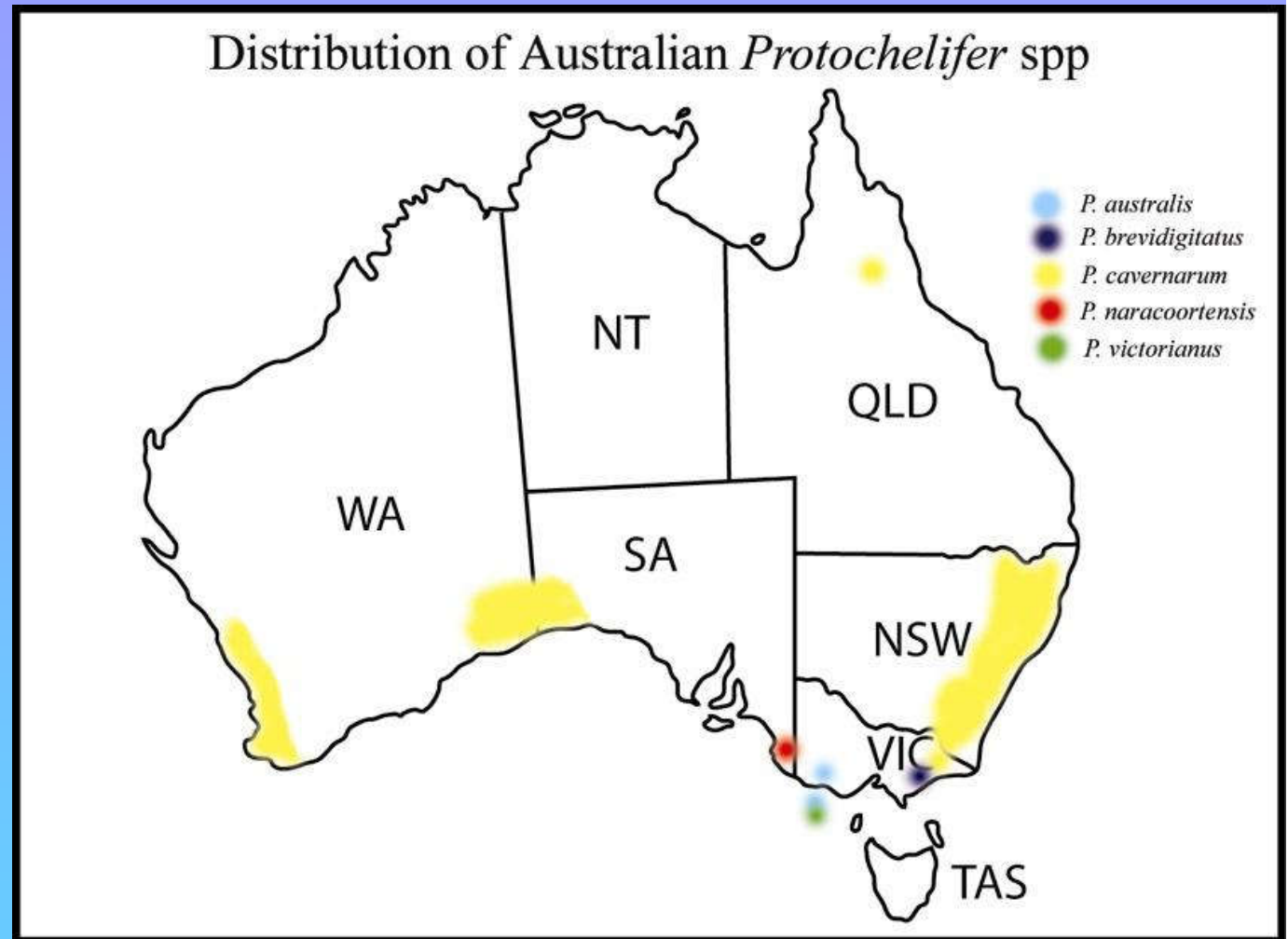


This Study

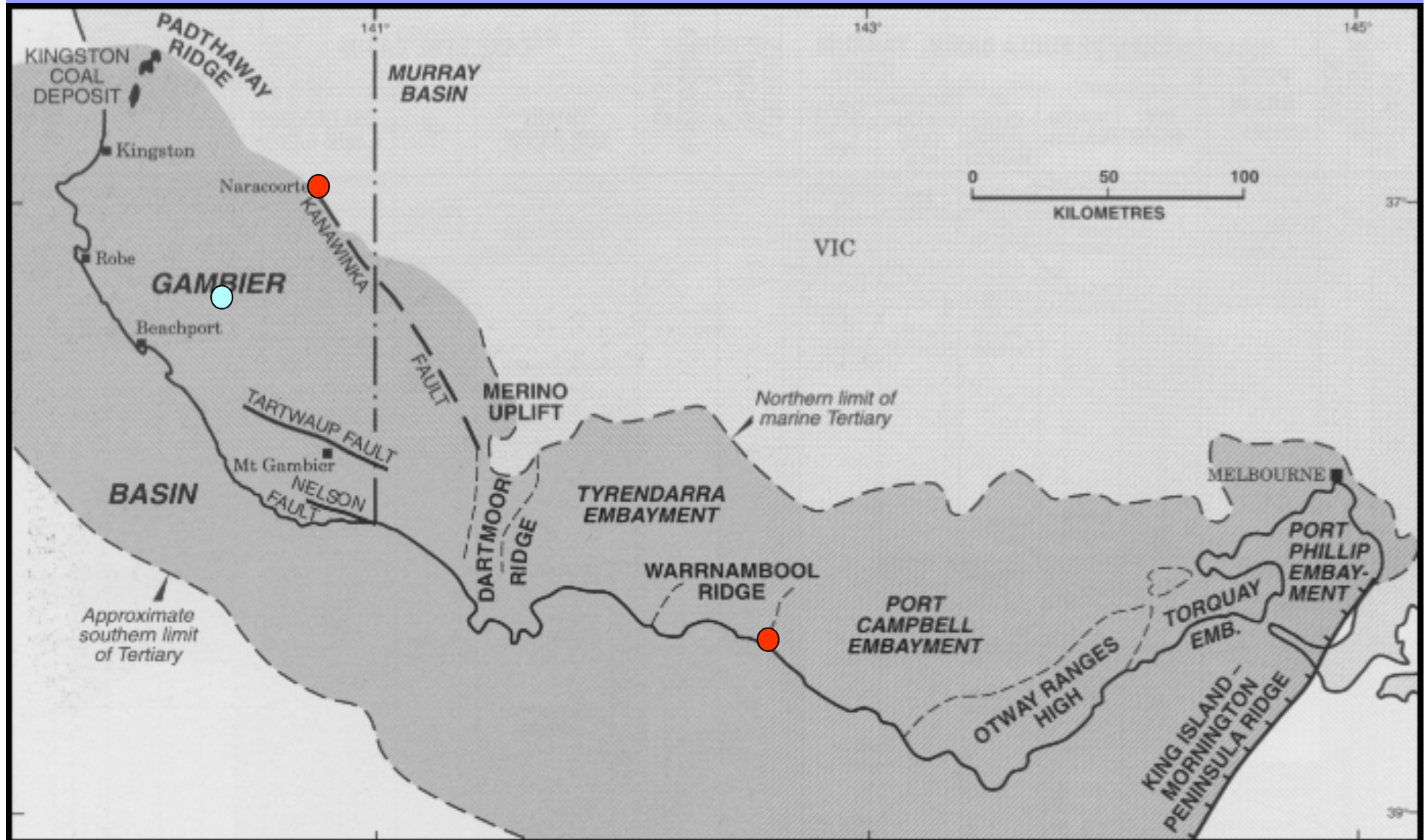
- ◆ Investigate degree of endemism within Bat Cave and surrounding caves of Naracoorte World Heritage Area
- ◆ Sample caves throughout the Gambier Basin to determine *Protochelifer* distribution
- ◆ Determine amount of genetic diversity and speciation of *Protochelifer* in 'Southeast' region

Distribution of *Protochelifer*

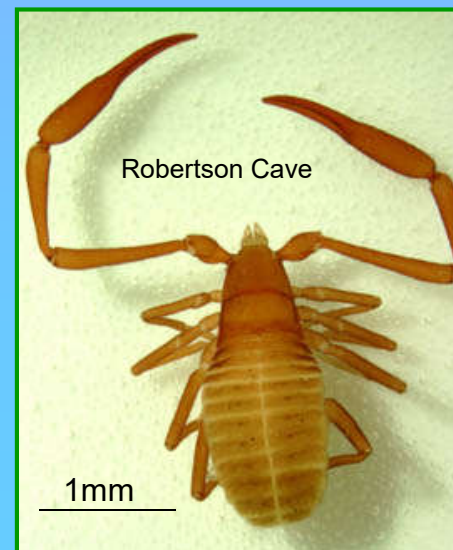
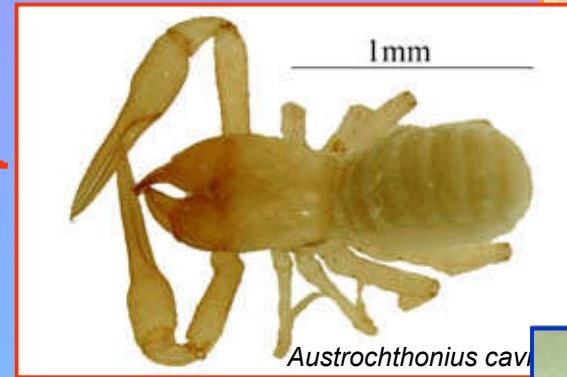
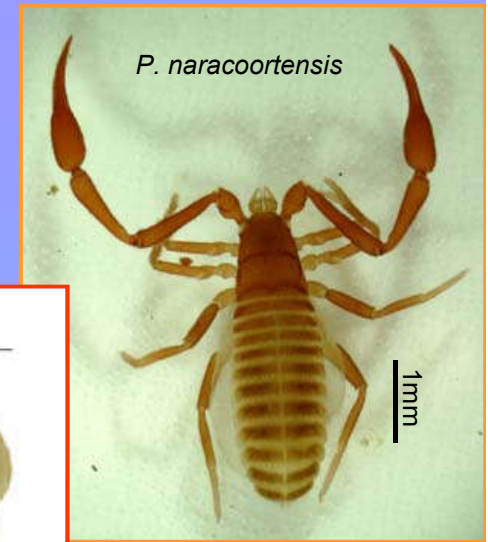
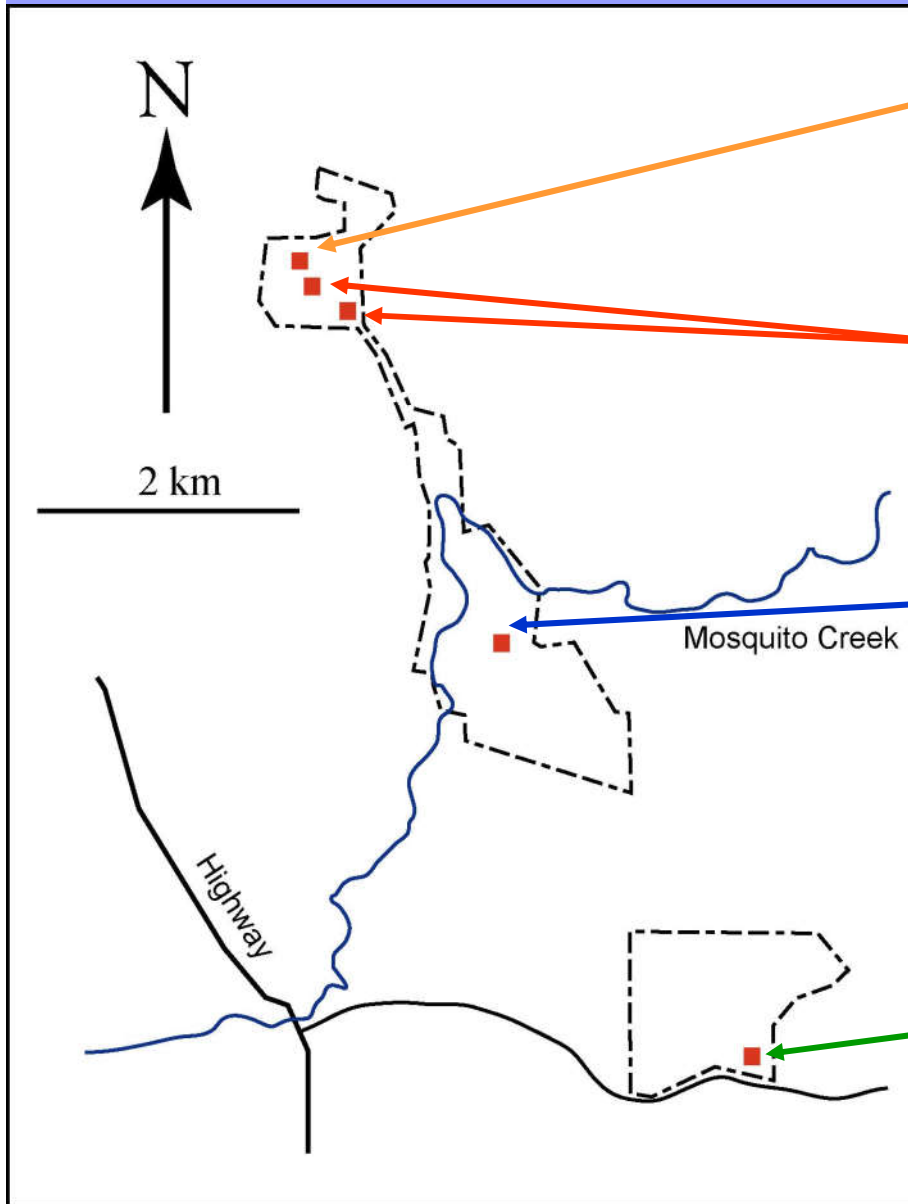
- 7 species described
- Australia and New Zealand
- Epigeal and hypogean species



Pseudoscorpions from the Gambier Basin

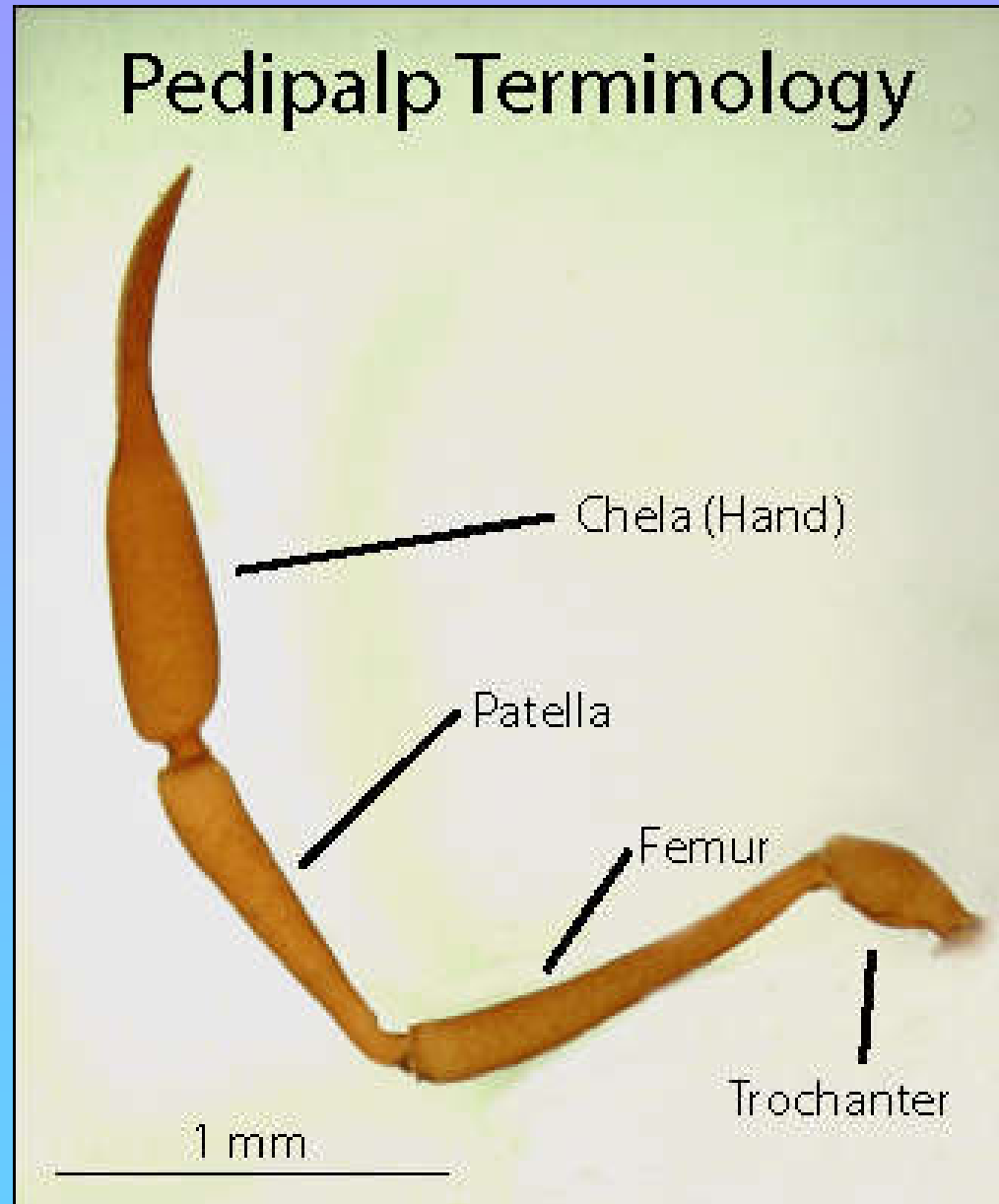


Caves near Bat Cave with pseudoscorpions

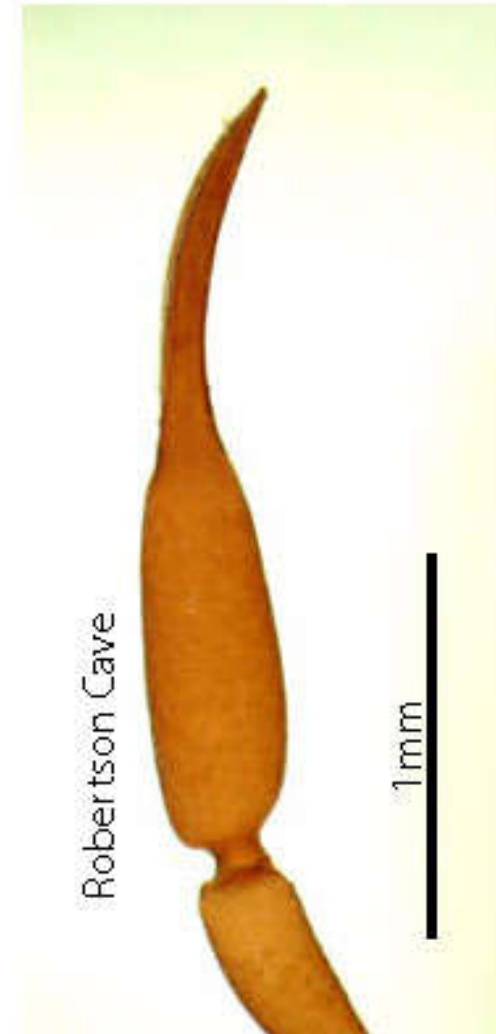
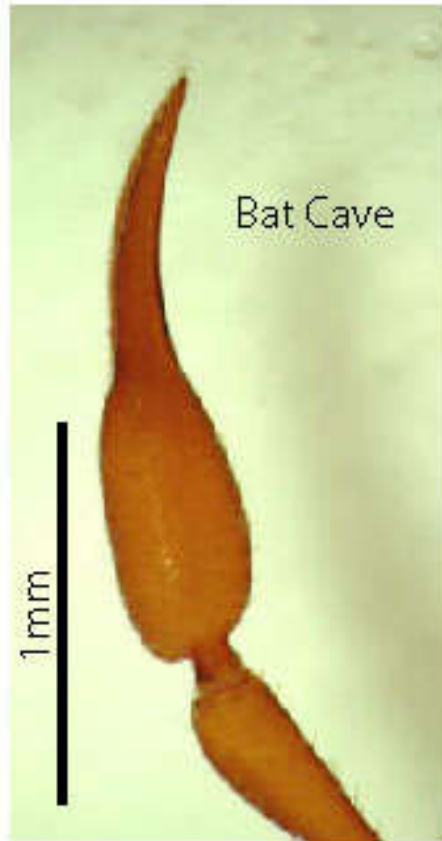


Morphological differences?

- Chela shape
- Position of trichobothria
- Vestiture on body
- Morphometrics...

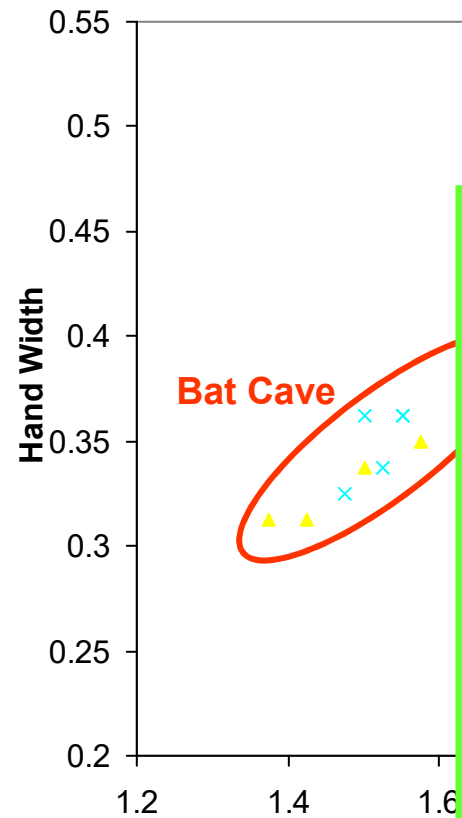


Chela differences between caves

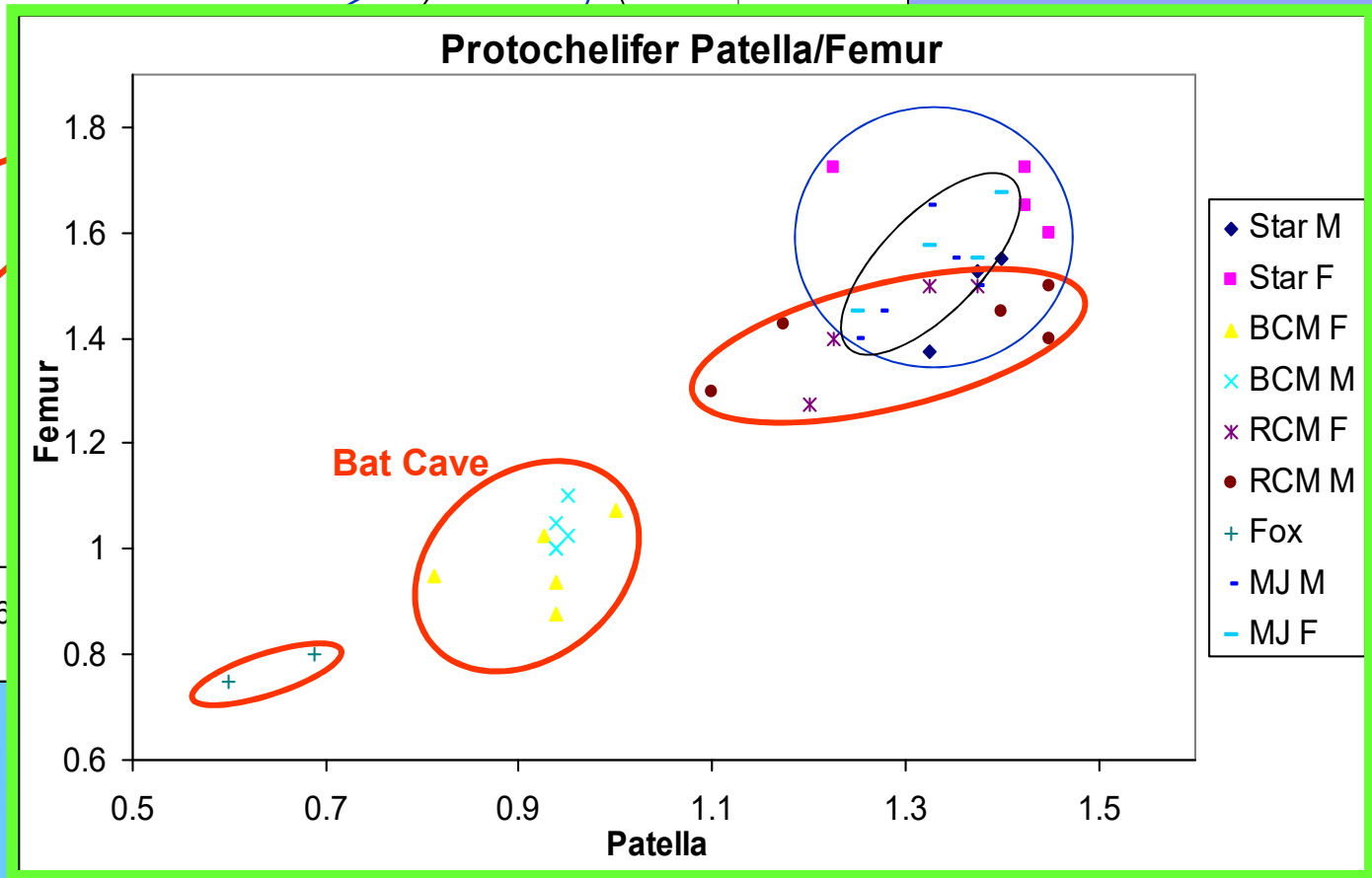


Morphometrics

Protochelifera pedipalps

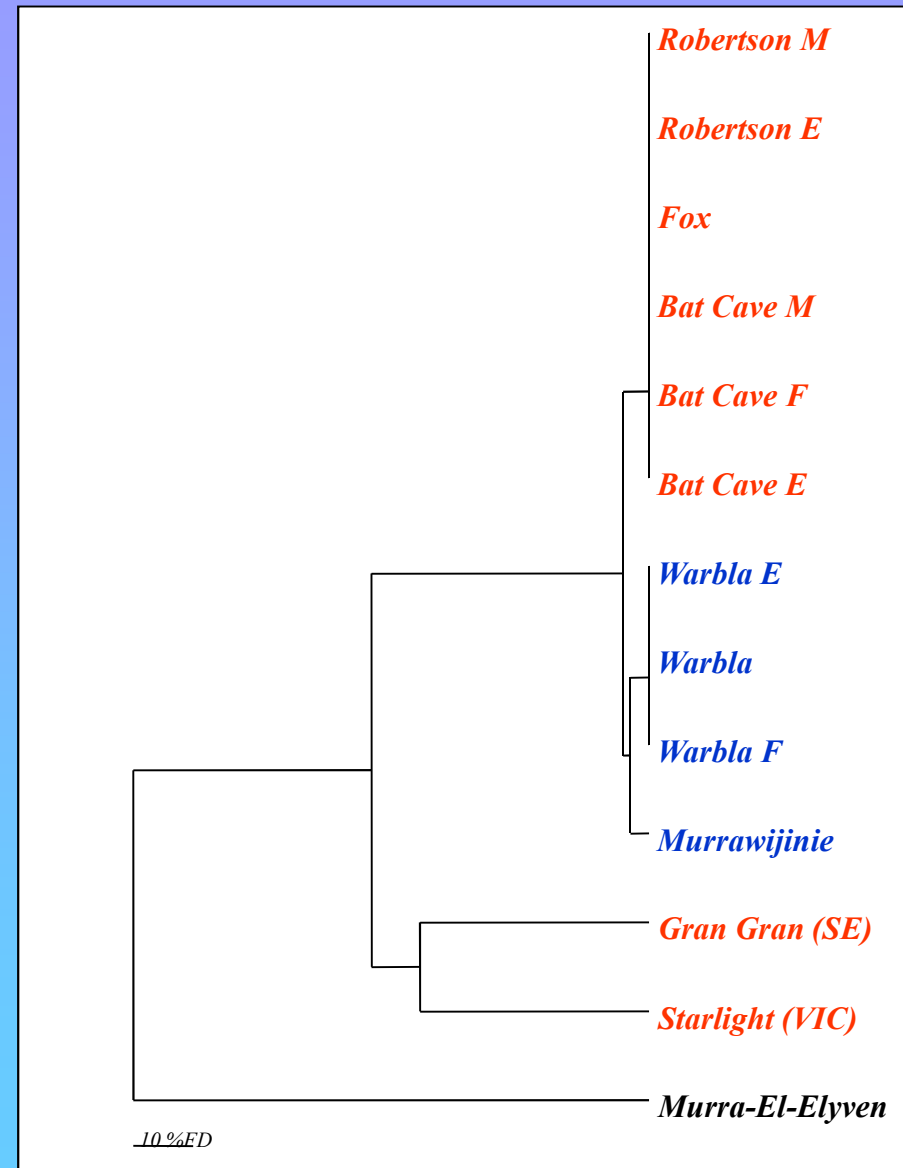


Protochelifera Patella/Femur



Are the *Protochelifer* populations in Fox and Robertson Caves genetically different?

- Allozyme electrophoretic data suggests populations show some level of structuring.
- No fixed differences between alleles
- Some variation in allele frequency
- Larger numbers needed



Are the *Protochelifer* populations from Naracoorte Caves different species?

- Unknown at present
- Preliminary morphometric data separates Bat Cave and Robertson/Fox Caves
- *P. naracoortensis* still presently endemic to Bat Cave
- Mt DNA analysis currently being undertaken

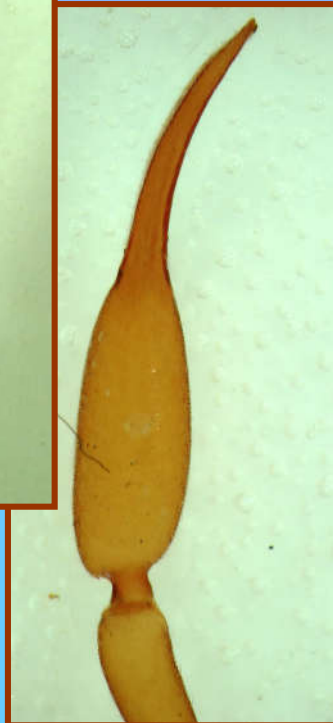
Gambier Basin Karst area



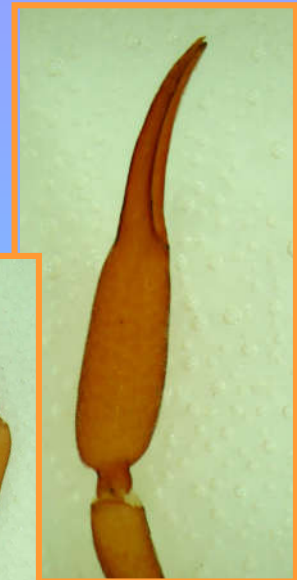
- *Protochelifer australis* collected from Starlight Cave, Warrnambool
- No other *Protochelifer* spp recorded from Gambier Basin caves
- Selection of bat over wintering sites sampled for invertebrates but no pseudoscorpions...
- More sampling needed

Other areas?

- Kangaroo Island SA
 - Kelly Hill Caves



- Flinders Ranges (SA),
Nullarbor Plain (SA/WA),
Perth (WA)

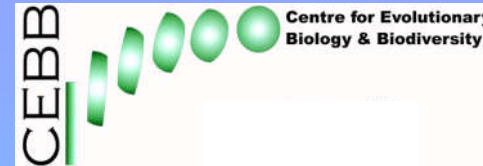


Conclusions

- ◆ Populations of *Protochelifer* appear different in Bat, Fox and Robertson caves
- ◆ Further work needed to determine genetic variation between Bat and other caves at Naracoorte
- ◆ Currently using Mt DNA sequencing of CO1 genes

Acknowledgements

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