Phylogenetic relationships of the Australian carnivorous land snails (Rhytididae) using exon capture

Luisa Teasdale and Adnan Moussalli
- Carnivorous land snails
- Gondwanan distribution
- Taxonomy and systematics in flux
- 2010 - 60 sp and 15 new genera
  - Total: 78 sp (25 genera)
Rhytididae – previous work

• No previous phylogeny
  – Are the Australian Rhytididae monophyletic?
  – Is the current taxonomy supported?
  – How are the small snails (2-10mm) related to the large (2-5 cm) snails?

• Studies on South African and NZ taxa struggled with only a few genes

• Exon capture: >1000’s loci
• Existing ortholog set
  (Teasdale et al. 2016)
Rhytididae - probe design

• Based on 10 transcriptomes
  – Three species
  – Three sets of ancestral state sequences
• ~3500 exons
• 115 samples, 40% museum
• Ask me for details on data analysis
Capture results

Number of exons sequenced

Year specimen collected

DNA (ng)

- 500
- 400
- 300
- 200
- 100
Results

• Come see the poster for the tree!
• Backbone was unresolved
  – Multiple old clades
• Unrecognised diversity:
  – 13 of 25 genera were paraphyletic or polyphyletic
  – Shell based taxonomy hampered by convergence
  – Evidence for several new species
• Only one major clade contains both small and large snails – evolution of size driven by diet?
Thank you

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