DNA Barcoding of Troglobitic Isopods from Groundwater Calcretes of Central Western Australia

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Background:

Recent discoveries in groundwater calcretes of the Yilgarn region of central WA have shown:

- An extraordinary diversity of subterranean invertebrates including both groundwater fauna (stygofauna) and terrestrial subterranean animals (troglofauna).
- Short-range endemic taxa, with species restricted to individual calcrete bodies, suggesting calcretes are equivalent to "subterranean islands" and raising conservation issues for environmental planning.

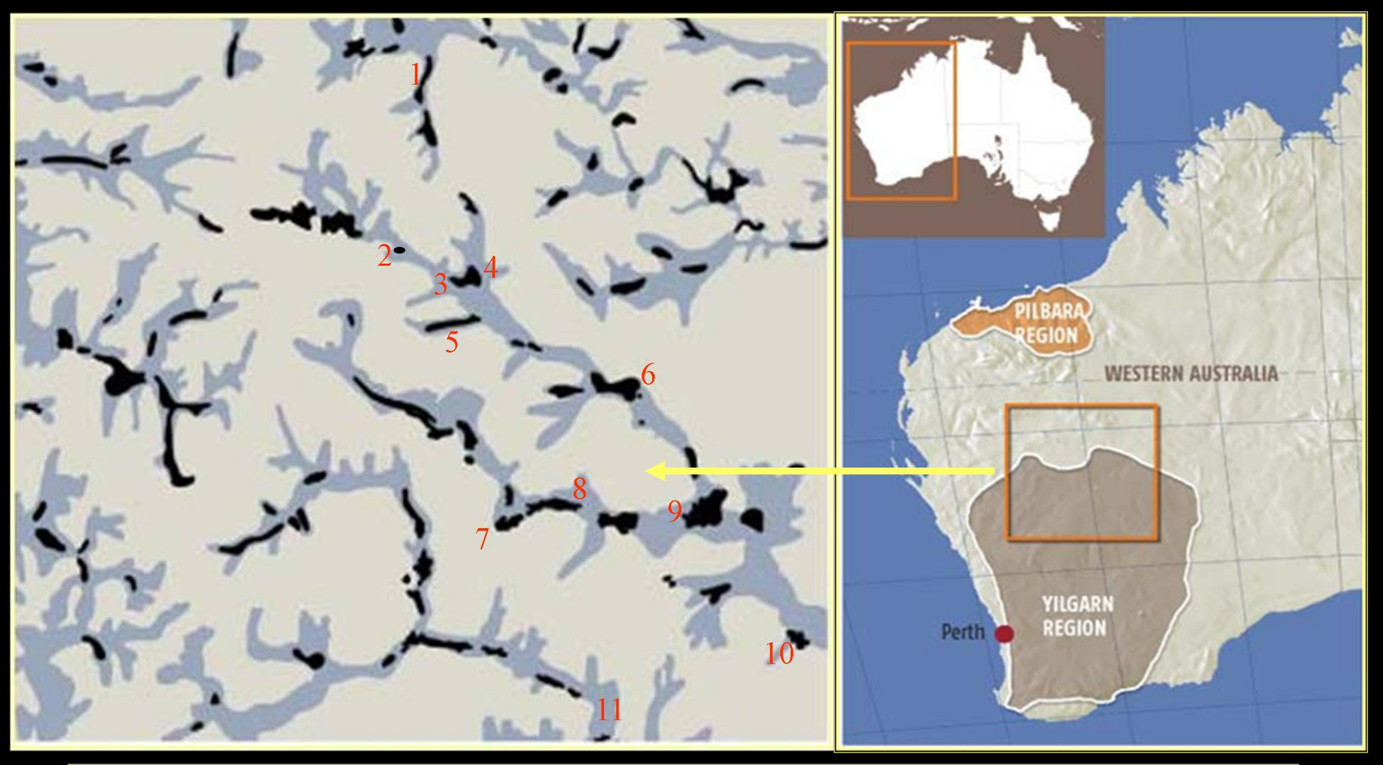
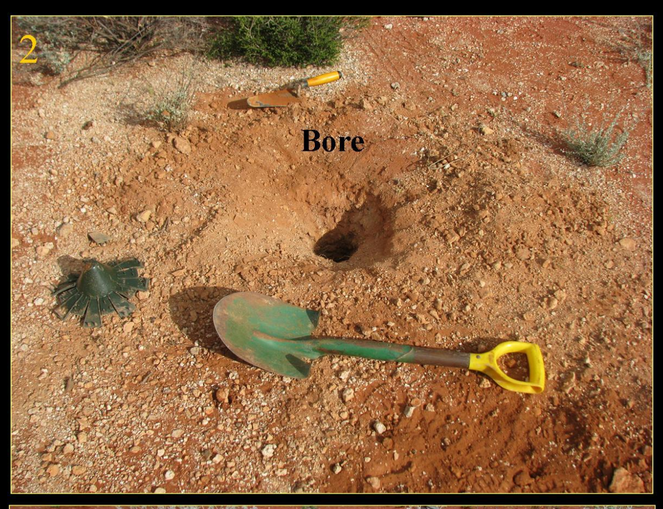
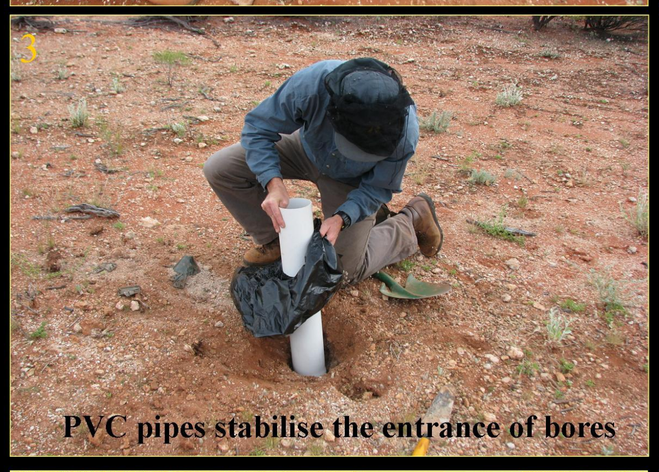


Fig1. Goundwater calcretes in central WA, Black: Groundwater Calcretes, Grey: Ancient Palaeodrainages.12 groundwater calcretes were investigated (numbers on the map show the calcretes studied).

Fieldwork:





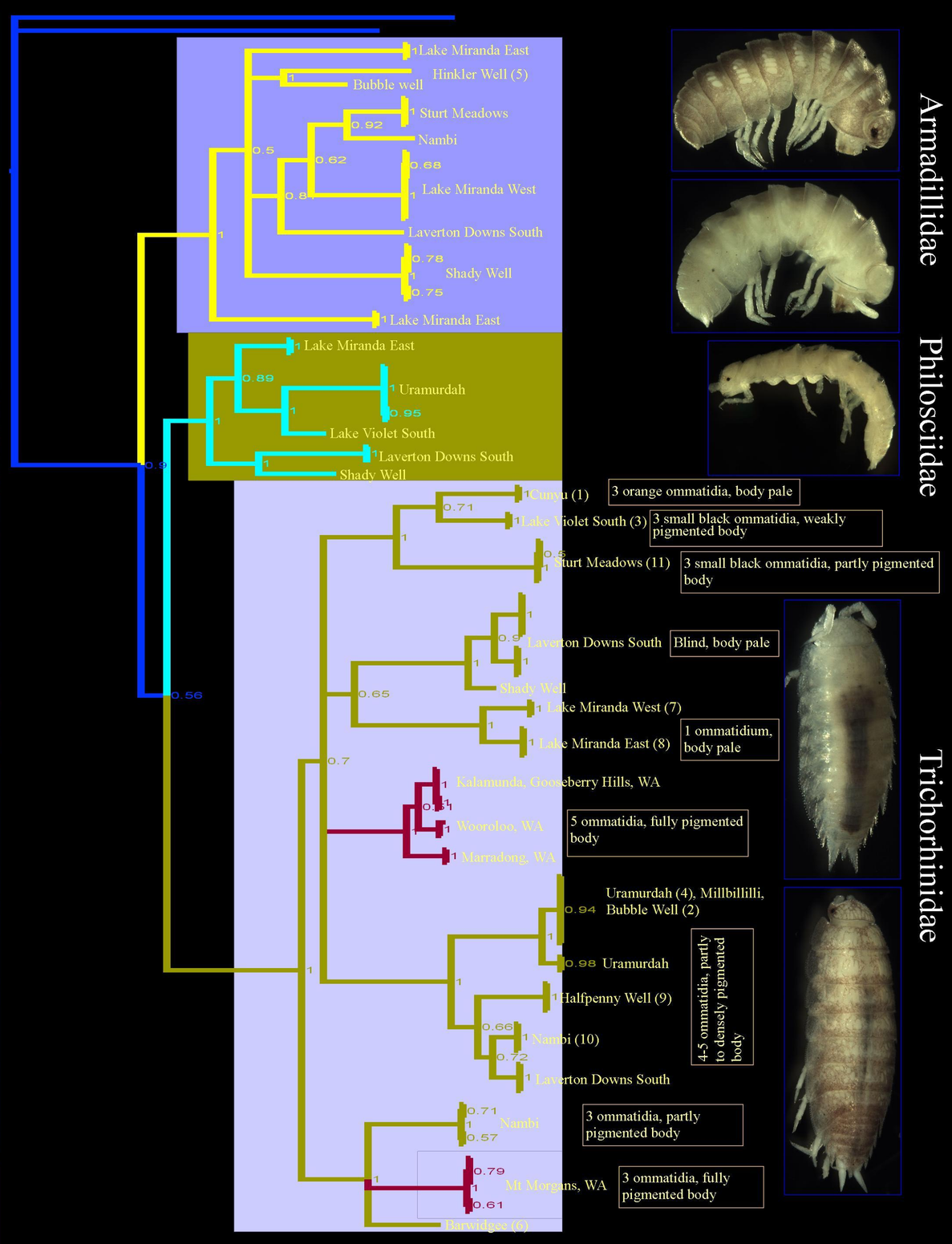


Fig2. Bayesian phylogenetic tree of troglobitic oniscidean isopods based on *COI* gene (Red clades indicate surface species of genus *Trichorhina*). Posterior probabilities in front of the nodes. Numbers in parentheses show calcretes localities on the map.

Results :

- A significant diversity of mtDNA lineages (~28) of troglobitic oniscidean isopods.
- Inter-lineage p-distance of between 3.36% & 28.3%
- Existence of three monophyletic groups corresponding to three oniscidean isopod families including Trichorhinidae, Armadillidae and Phylosciidae
- Generally, each lineage restricted to an individual calcrete body (only one exception).

Discussion:

- Significant phenotypic diversity from completely eyeless and pale body to presence of eyes and dense body pimentation .
- Subterranean island hypothesis is supported with little or no dispersal between calcretes.
- Evidence for colonisation of underground habitats by multiple ancestral surface species.

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