

CERF Galathean Phylogeography

(Crustacea: Decapoda: Anomura)



Where

The tropical to temperate continental margin of Western Australia (WA), where recent CSIRO collections (100- 1000 m) revealed over 800 nominal species of decapod crustaceans, thirty per cent of which are thought to be new to science

Who

Squat lobsters of the family Galatheidae, one of the most numerous and diverse groups of crustaceans commonly encountered on seamounts, continental margins and shelf habitats at all depths

Why

Galathean species exhibit high morphological diversity, believed to be the result of a relatively old radiation event. Yet, their origins, phylogenetic and phylogeographic relationships are not entirely clear

What

Squat lobsters constitute an exceptional model system for evaluating historical processes responsible for at the present observed distribution patterns of the Western Australian fauna

How

The mitochondrial COI and 16S genes were sequenced from taxa of WA origin and compared against East and South-Western Pacific relatives to validate morphological taxonomy, delineate evolutionary significant units (ESUs), evaluate genealogical and phylogeographic relationships

Conclusions

- Stable molecular and morphological phylogenies revealed: i) genera to be mostly monophyletic ii) new species & several cryptic morpho-species
- Co-generic taxa of WA origin formed monophyletic clades indicating independent genealogical trajectories
- Geophylogenies failed to resolve historical biogeographic patterns among species in global scale
- Frequency distribution of COI K2P distances and mismatch distribution within taxa of WA and SWP indicated similar old explosive radiation events
- Bayesian Coalescence suggested that evolution of WA taxa was independent and preceded diversification events occurred within SWP relatives

