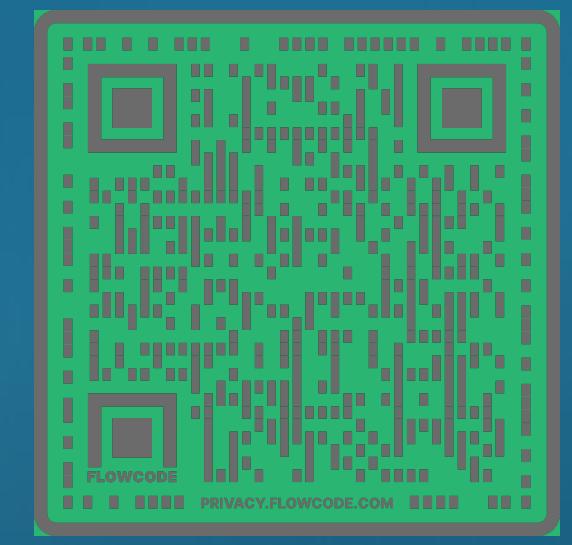


Resolution of Cephalopod Phylogeny using Targeted Enrichment Phylogenomic Data



Alexandra Tew, Theresa Iglesias, Dan Warren, Brant Faircloth, Jan Strugnell, Rob Lanfear, Jeff Jolly, Alex Dornburg

Introduction

Cephalopods (squids, octopuses, cuttlefishes, and nautiluses) comprise over 800 species that have diversified across the world's oceans and exhibit a staggering level of morphological and behavioral complexity.

However, understanding the evolutionary success of cephalopods is challenged by the lack of a well-resolved phylogeny.

Here we estimate the first phylogeny of cephalopods using a costume set of ultra-conserved element loci and a suite of phylogenomic approaches.

What is a Cephalopod?



Squid



Cuttlefish



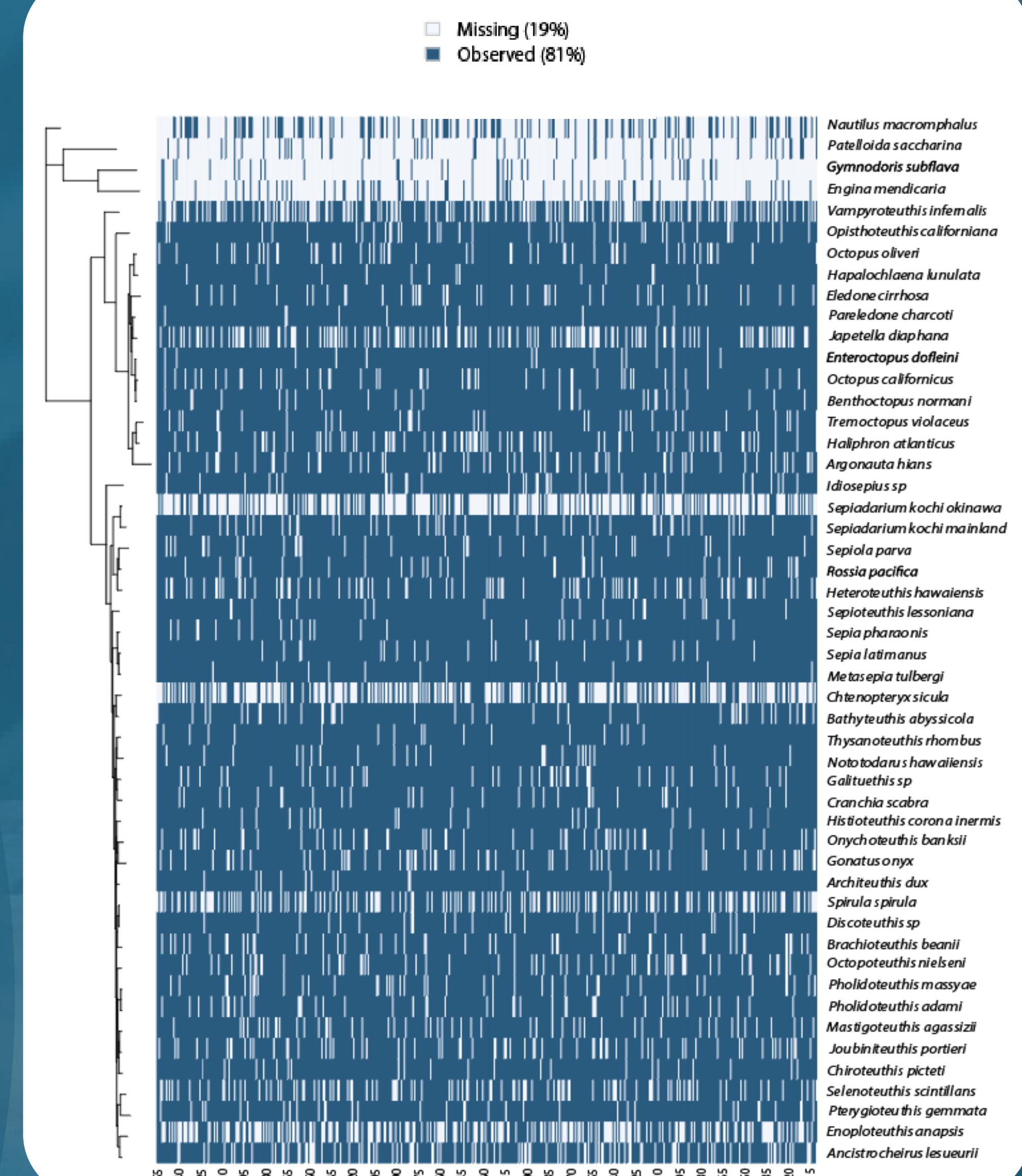
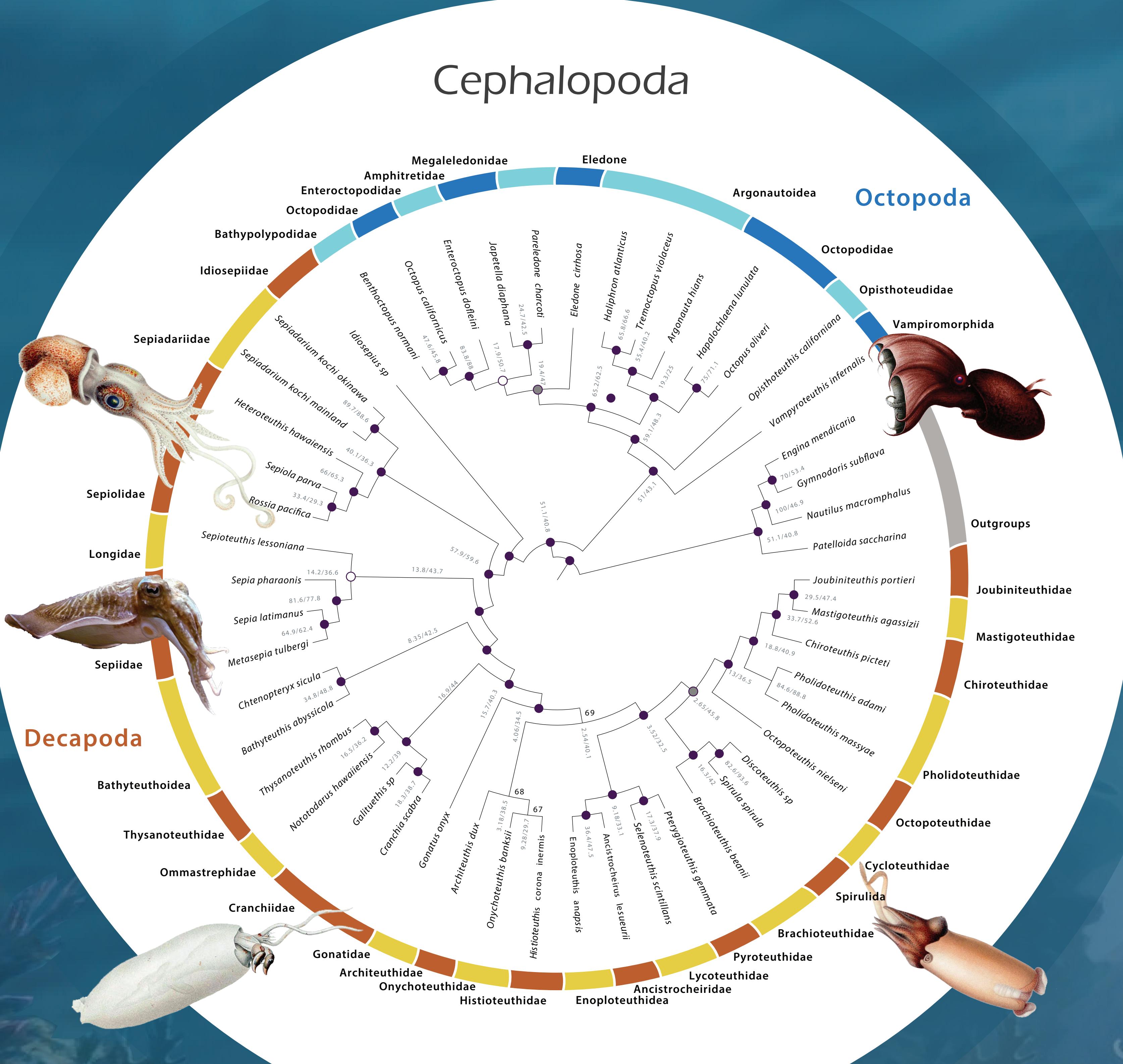
Nautilus



Octopoda



Octopus



Methods

- Custom probes were designed using the *Octopus bimaculoides* genome.
- Sequenced UCE loci were assembled using Phyluce.
- Alignments were visualized using ALV and gene trees were created using IQTree and visualized with FigTree.
- Loci were inspected and screened for contamination, assembly error, and overlap using toast.
- Partitioned phylogenetic analyses were conducted using IQtree2.
- Species Tree was estimated using Astral-II.
- Concatenation, partitions, and missing data map with toast
- gCF/sCF were quantified in IQtree2 and visually combined with other graphical elements in Adobe Illustrator.

Conclusion

- This phylogeny supplements existing research providing support and enhanced resolution to studies that have focused mainly on the Mollusca phylum or a specific subset of cephalopod species.
- Coupled with a molecular clock analysis, this phylogeny will serve as a framework from which to investigate trait evolution and diversity throughout this lineage.