



Under the Sea: Hyperiid Edition



Afanwi Neba | General Biology | aneba@umd.edu
College Park Scholars – Science & Global Change Program | CPSG359G
College Park Scholars Academic Showcase, May 1, 2026

Site Information

Smithsonian National Museum of Natural History
10th St. & Constitution Ave. NW, Washington, DC 20560
Supervisor: Dr. Karen Osborn
Mission: Study of deep sea invertebrates using evolutionary biology

Background

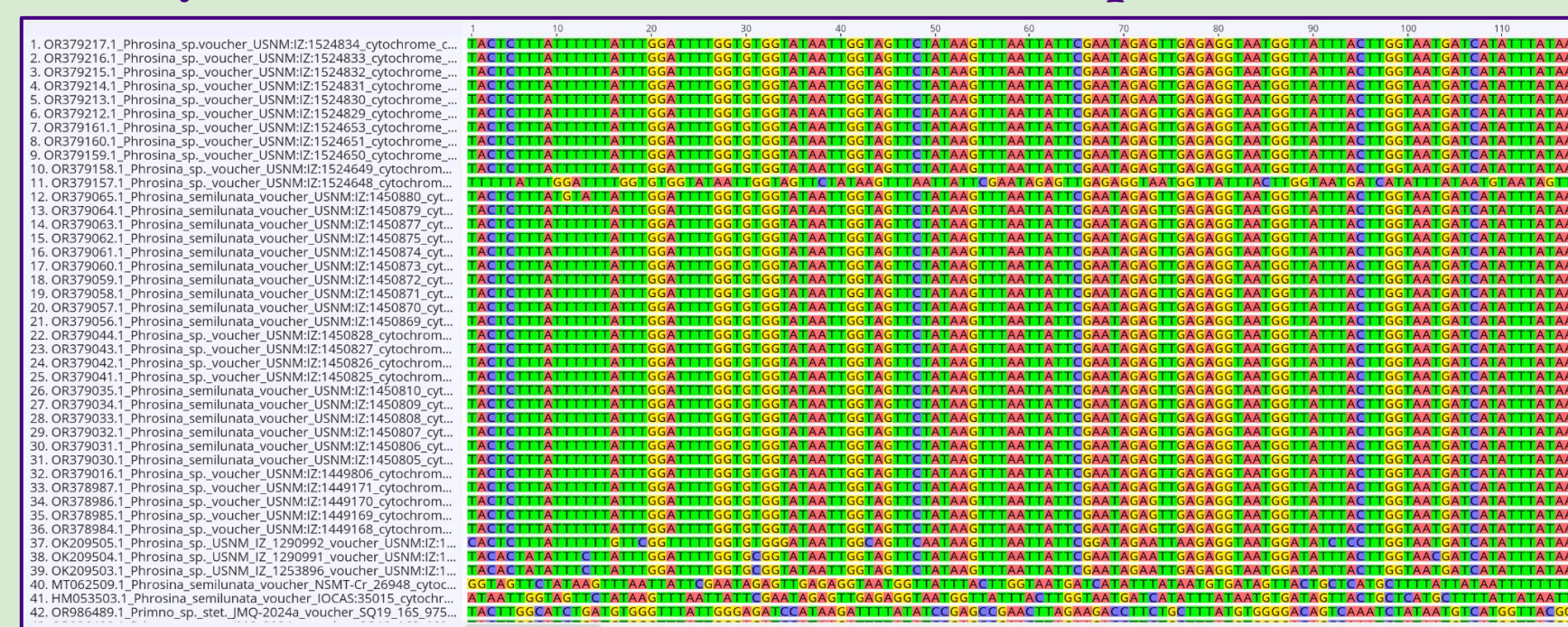
*Hyperiid*s are amphipods that live in the deep sea. Collecting specimens across the world for physiological evaluation can determine differences between species and define the existence of unknown species. Additionally, examining their structures helps us determine the kinds of conditions they endure in the sea.

Polychaetes are segmented marine worms that inhabit various ocean depths. Appearances include bright colors, longer or shorter bodies, uniquely shaped parapodia, and bristles.

Activities

Primary project: building phylogenetic trees for hyperiids.

- Created FASTA files, aligned sequences in Geneious Prime
- Trimmed the ends, correct reading frame, genetic code
- Analyzed the distances between sequences

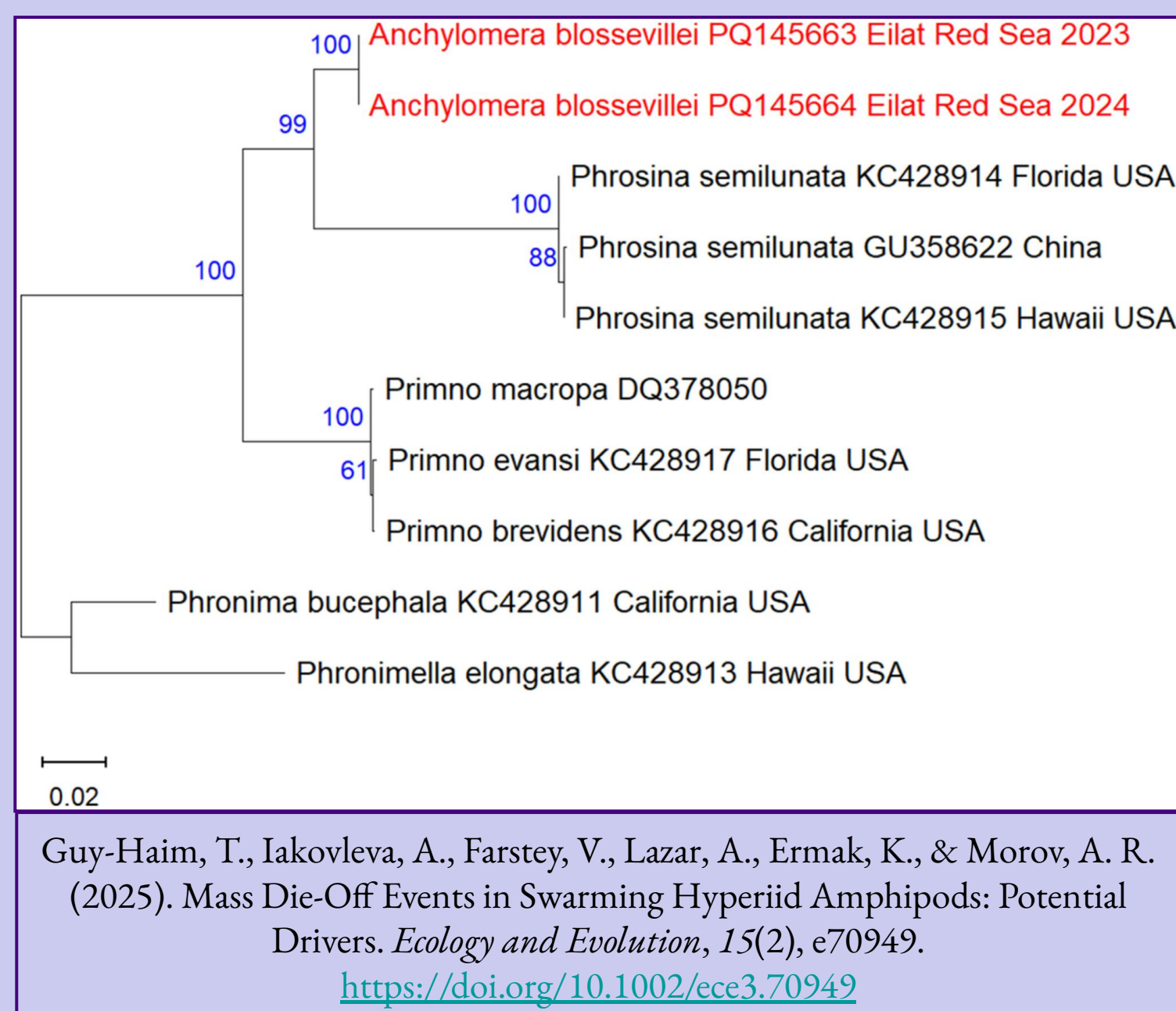


CO1 sequences of Phrosinidae family, pre-alignment, includes: *Phrosina semilunata*, *Primno sp.*, and *Anchylomera sp.*



Secondary project: building a three dimensional model of a polychaete. I used Dragonfly to fill in a scan of a worm, making sure to omit the hairs.

- Highlighted the ROI
- Outlined the slice
- Filled inner areas
- Interpolated between slices
- Cleaned up slices in between

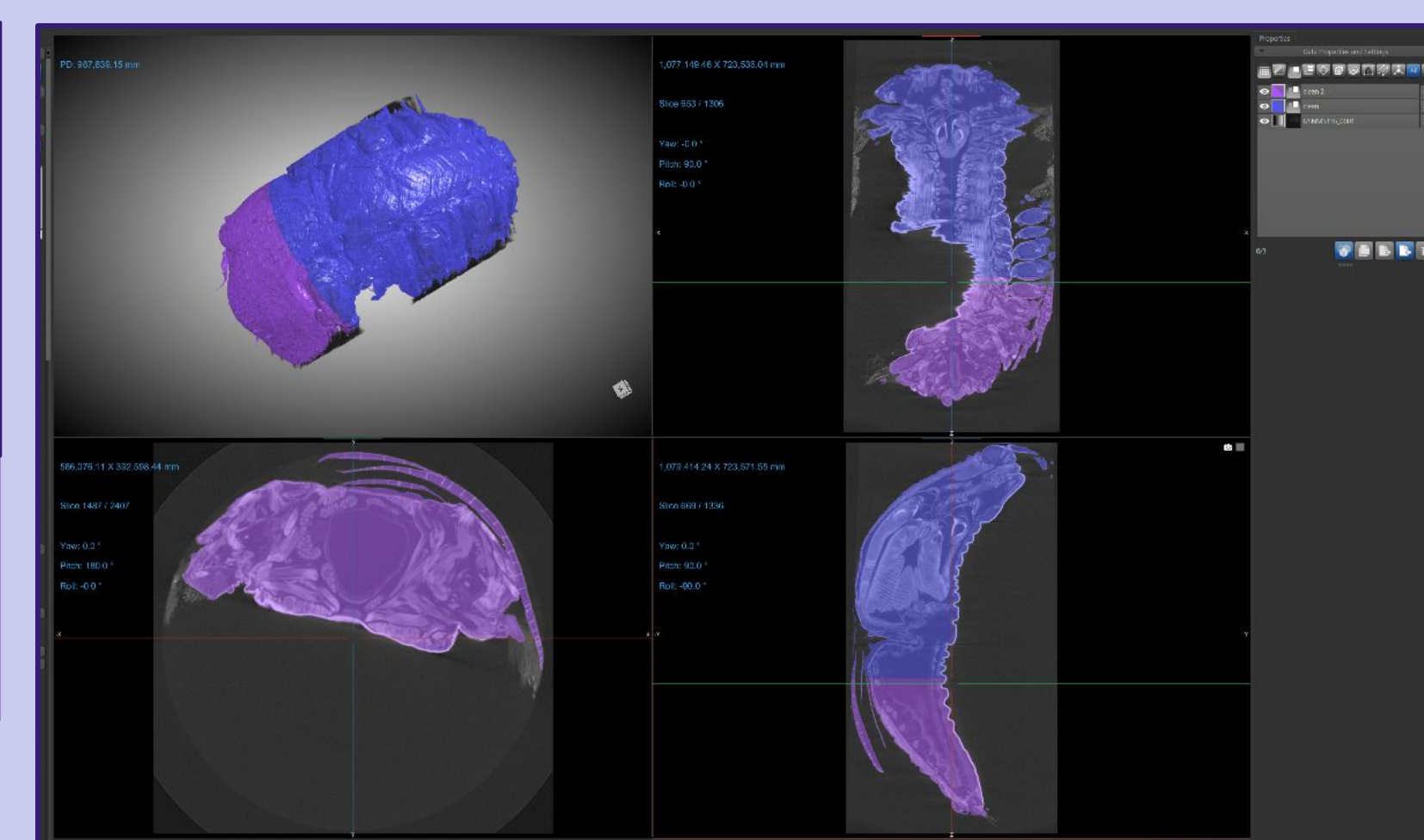
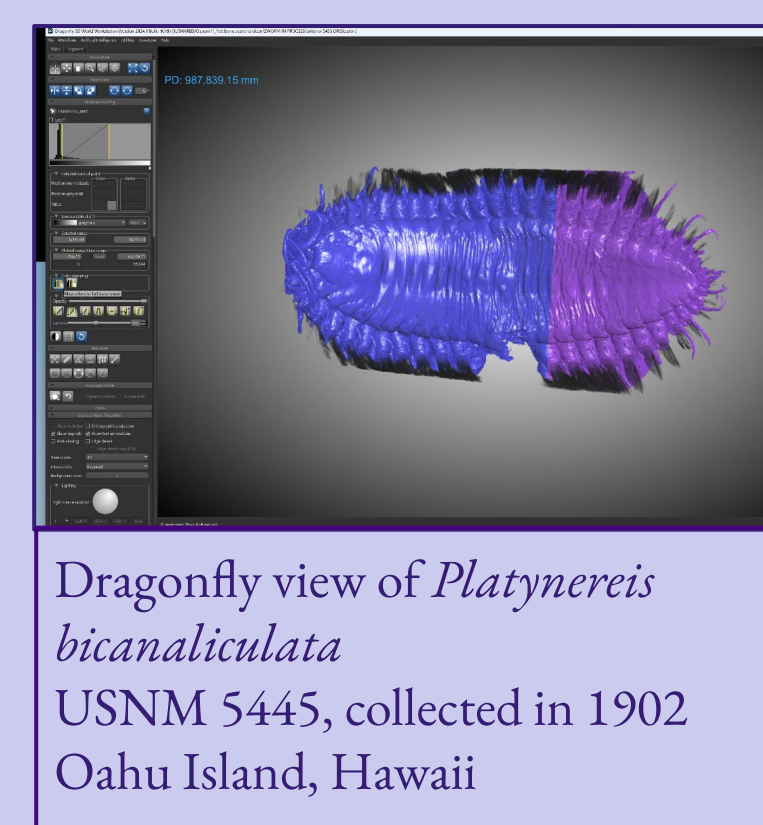


Impact

- ★ Phylogenetic trees are an important reference point for future hyperiid research. They provide excellent models for relationships between multiple genres and species within them. They also aid in the identification of unknown genetic samples.
- ★ 3D models of polychaete worms are essential for supporting evolutionary biology research and communicating discoveries to the public. Live and fixed specimens are often challenging to transport to world-wide institutions for analysis. Online models provide a fast, easy method of sharing data and comparing notes.

Final Thoughts

I learned multiple useful lessons through volunteering. A major part of my job required technological and computational skills. There was definitely a learning curve in using Geneious and Dragonfly, and I had to constantly adapt to roadblocks. The lab environment was extremely welcoming, and I had a great time interacting with fellow volunteers. I plan on pursuing a future in research, so witnessing the day to day tasks of Dr. Osborn was also very inspiring.



Acknowledgments

Special thanks to Drs. Holtz & Merck. I will treasure our time spent together these past two years deeply. I'm extremely grateful to have been a part of SGC. I would also like to sincerely thank Dr. Osborn for hosting me for the summer. Your guidance through this experience has been invaluable. Last but not least, thank you to Anna Clark for the troubleshooting help. You made the summer much more memorable!

