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## GSA Connects 2024 Meeting in Anaheim, California

Paper No. 240-3

Presentation Time: 8:35 AM

### EXPLORING ECHINODERM HOMOLOGY THROUGH ONTOGENY (Invited Presentation)

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Homology, shared traits inherited from common descent, is the fundamental framework through which we build phylogenetic datasets and test hypotheses of evolutionary relationships. Identifying homologous traits, however, is challenging when studying fossil organisms. Due to the incompleteness of the fossil record, information about ontogenetic development and the character transformations that occurred through growth stages can be lost. This is especially true in fossil groups that do not have modern equivalents. Echinodermata, a rich and diverse clade that includes sea stars and crinoids, has been the focus of much recent study because of the challenges in identifying the homologous skeletal elements amongst its members. Many echinoderm groups, such as the stemmed blastozoans, are character rich, but have poor preservation of the character-rich portions of their body, no extant equivalents, and a lack of preserved ontogenetic sequences from which to study. Convergent evolution, heterochrony, and heterotopy also play a strong role in obscuring our ability to understand homology in these groups. Further complicating matters, many groups appear to have entirely different juvenile stages, with some being represented by numerous juvenile stages, and others are completely unknown with regards to their juvenile states. To best quantify the homologous elements of echinoderms, however, it is critical to study well-preserved specimens from a range of growth stages to best understand how specific skeletal features are altered throughout the life cycle of a taxon. This talk will highlight recent advances in studying the homology of Echinodermata through new understandings of ontogenetic change, while also examining some of the challenges that still remain.

[Recorded Presentation](#)

Session No. 240

[T128. Development in Deep Time: Ontogeny in the Fossil Record](#)

Wednesday, 25 September 2024: 8:00 AM-12:00 PM

204A (Anaheim Convention Center)

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[Back to: T128. Development in Deep Time: Ontogeny in the Fossil Record](#)[<< Previous Abstract](#) | [Next Abstract >>](#)