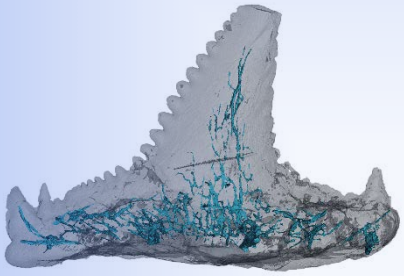
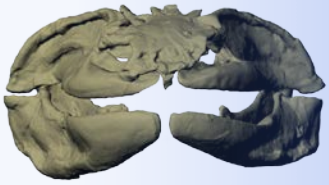
Biology Seminar

Biology Graduate Student Association and Department of Biological Sciences



Allison Bronson, PhD

Humboldt State University



FRIDAY, OCT. 26
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New Methods & Ancient Sharks: Fossil Cartilage from North America

Sharks and their relatives have been successful for over 400 million years, in part due to their streamlined cartilaginous skeletons. Traditionally, sharks were treated as primitive vertebrates, but today they are known to be a specialized group related to extinct acanthodians. Chondrichthyan phylogenetic relationships are still in question, and although cartilage provides a wealth of morphological characters, it is rare in the fossil record.

Allison's research utilizes new techniques, including high-resolution computed tomography (CT scanning), synchrotron tomography and x-ray fluorescence, and biomechanical modeling, to reconstruct extinct chondrichthyans and characterize the environmental conditions that preserve fossil cartilage. The talk is focused on fossil cartilage from three North American locations: the Fayetteville Shale of Arkansas (Upper Mississippian, Chesterian), Admiral Formation of Texas (Permian), and Niobrara Chalk of Kansas (Upper Cretaceous). Hypotheses of deposition and diagenesis in the Fayetteville Shale are re-assessed using XRF and XRD synchrotron analysis of phosphatic nodules. A maximum parsimony analysis of 46 gnathostome taxa, including Fayetteville Shale chondrichthyans, resolves a chondrichthyan stem group but does not support a holocephalan-symmoriiform clade.

The fossils highlighted in this seminar demonstrate the importance of well-preserved cartilage. Renewed interest in chondrichthyan skeletal anatomy, due largely to recent advances in technology, provides better estimates of divergence times, resolves phylogenetic relationships, and improves understanding of the evolution of key innovations within Chondrichthyes.

Biological Sciences Seminar Series venue is wheelchair-accessible. Persons who wish to request disability-related accommodations, including sign-language interpreters, should contact the Department of Biological Sciences, c/o **peb112@humboldt.edu**. Please request accommodations at least two days prior to the event. Some attendees may be sensitive to various scents from perfumes, shampoos, soaps, etc. Although optional, please consider refraining from wearing scented products to this event.