

119 - T112. Halo-Dash: The Deep and Shallow History of Aquatic Life's Passages between Marine and Freshwater Habitats

Monday, 10 October 2022

1:30 PM - 5:30 PM

[119-7: A FOSSIL AND PHYLOGENETIC PERSPECTIVE ON MARINE-FRESHWATER AND FRESHWATER-MARINE TRANSITIONS IN BRANCHIOPOD CRUSTACEANS](#) **HEGNA, Thomas, Ph.D.**, Department of Geology and Environmental Sciences, SUNY Fredonia, 280 Central Ave., Houghton Hall 118, Fredonia, NY 14063
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Abstract

Historically, branchiopod crustacean fossils have been used as an indicator of freshwater in the fossil record. However, the first stem group member of the clade was marine, the Cambrian *Rehbachella*. The transition to freshwater seems to have occurred at the base of the crown group radiation—as nearly all member of the group share adaptations to produce desiccation-resistant eggs or ephippia. This ability indicates specialization in bodies of ephemeral freshwater as marine environments don't evaporate and return with any predictability.

Anostracan branchiopods have two modern families (Artemiidae and Parartemiidae) which specialize in continental saline waters; their preference for saline waters is interpreted to be a derived characteristic. Amongst the anostracan fossil record, only *Branchipodites vectensis* from the Eocene Insect Bed, Isle of Wight, may have approached tolerance of brackish waters. Notostracans are only tolerant of fresh and, sometimes, brackish water. No evidence exists to suggest a greater tolerance of salinity in the past. Laevicaudatans have a poor fossil record, and amongst the extant species, only one is known to exhibit any tolerance of oligohaline waters. Spinicaudatans are more complicated. Modern species vary from freshwater to oligohaline tolerant. Several fossil sites are known that seem to preserve spinicaudatans with a marine fauna—however, some of these are interpreted as allochthonous assemblages. Whether or not spinicaudatans had an increased salinity tolerance in the past is unclear. Several groups of cladocerans have either conquered saline continental waters, or have made the transition to marine habitats. No fossils of marine cladocerans are known. Of the branchiopod clades, cladocerans have been the most successful in making the transition from freshwater to saline habitats (marine or continental). The ability to survive in saline continental water bodies may have been a precondition of their adaptation to true marine environments.

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