ON THE SHOULDERS OF GIANTS: WHAT EPIZOIC DIATOMS ARE TEACHING US ABOUT DIATOM EVOLUTION

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Our knowledge and understanding of diatom diversity, diversification and evolution increases with every collection made from benthic marine habitats. In recent years, one such habitat has been the body surfaces of sea turtles and manatees. This habitat has yielded much new data, particularly on taxa historically associated with the Rhoicospheniaceae, For example, we have found both photosynthetic and non-photosynthetic species of the genus *Tursiocola* Holmes, Nagasawa & Takano. This is the first reported non-photosynthetic diatom which does not appear to be associated with the order Bacillariales. The morphology of *Tursiocola* suggests no affinity to the Bacillariales, and DNA evidence, collected by single-cell DNA amplification techniques, confirmed that the loss of photosynthesis in *Tursiocola* was novel and unrelated to losses in the Bacillariales. The DNA sequence data also question the placement of *Tursiocola* and the epizoic diatoms *Poulinea* Majewska *et al.* and *Chelonicola* Majewska *et al.* in the Rhoicospheniaceae, suggesting that these genera are quite distant genetically from other marine "gomphonemoid" (transapically asymmetrical) raphid diatoms. We are also exploring the potential of the epizoic habitat as a model system for benthic diatom diversification. Thus far, the ease and ubiquity of obtaining cultures of the monoraphid diatom genus *Achnanthes* Bory from manatees and multiple sea turtle species in the southeastern US suggests that this genus may be an ideal model to study not only the diversification of diatoms in the epizoic habit, but also across hosts.