SYSTEMATIC POSITION OF THE GENUS *RHOICOSPHENIA* GRUNOW IN THE DIATOM TREE OF LIFE

Evan W. Thomas and J. Patrick Kociolek
Museum of Natural History and Department of Ecology and Evolutionary Biology, University of Colorado at Boulder, 80309 USA

Based on valve morphology, cytoplasmic features, and sexual reproduction, several hypotheses for the systematic position of the genus *Rhoicosphenia* Grunow have been proposed. One hypothesis, advocated by several including Grunow, Hustedt, and most recently, Patrick & Reimer, place the genus in the Achnanthaceae Kützing, mainly due to valve flexure and the heterovalvate nature of the frustules – one bearing a complete raphe, and the other with a reduced raphe system. A second hypothesis, set forth by Cleve, supported by a cladistic and phenetic study by Kociolek & Stoermer, and adopted by Round, Crawford, & Mann, allies *Rhoicosphenia* Grunow more closely with the Gomphonemataceae Kützing, due to cuneate valve shape and chloroplast structure. Two additional evolutionary scenarios have been described by Mann. The first suggests that *Rhoicosphenia* is the primitive ancestor of the Achnanthaceae and Gomphonemataceae. The other scenario places *Rhoicosphenia* outside of these two lineages at an unknown position within the raphid diatoms.

In the 1980's, *Rhoicosphenia* was the subject of several taxonomic and systematic studies, but to date has not been included in any published molecular systematic studies. The addition of *Rhoicosphenia* to the molecular Diatom Tree of Life will allow testing of past hypotheses based on a variety of morphological characters. A preliminary molecular phylogeny using two populations of *Rhoicosphenia* and additional raphid taxa does not support any of the aforementioned phylogenetic hypotheses. Instead, the results indicate that *Rhoicosphenia* occupies a unique position within the Cymbellales, reflecting a closer relationship to the Gomphonemataceae rather than the Achnanthaceae. These results are consistent with the phenetic and cladistic results of Kociolek & Stoermer. We will increase the taxon sampling of *Rhoicosphenia* in future research in order to answer questions of monophyly within the genus as well as biogeographic questions in regards to the ubiquitously reported *R. abbreviata* (*curvata*).

POSTER