ORAL PRESENTATION

BARCODING DIATOMS: EXPLORING ALTERNATIVE MARKERS TO COI.

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DNA barcoding is a molecular technique that uses sequence comparisons of a short region of DNA, often the 5' region of the mitochondrial COI gene, to distinguish species. This marker has been used successfully to identify species of *Sellaphora*, but has not displayed wide utility in diatom taxa. Despite testing many primer combinations (25 in total), amplification of the COI from many collections has failed, possibly due to the presence of introns. Therefore, our study has focused on sequencing alternative barcoding markers including: the variable D2 region of the 28S rDNA (LSU); the large subunit of RUBISCO (*rbc*L); and the Universal Plastid Amplicon (UPA). The LSU and *rbc*L regions are often used to investigate relationships among species of diatoms. The UPA is a short region (ca. 330 bp) of the 23S plastid rDNA and is being promoted as a universal species identification tool for algae. A group of closely related *Sellaphora* species was studied to determine each marker's ability to discriminate among sister pairs of species. Culture collection material was utilized to further explore the benefits and limitations of LSU, *rbc*L, and UPA including the ease of developing universal primers, ease of amplification, and resolving power of each marker. The LSU region was amplified and sequenced using universal primers and can distinguish between 96% of species pairs. The *rbc*L region has the power to discriminate *Sellaphora* species, but the primers are not universal among protists. The UPA region, while easy to amplify using universal primers, could distinguish between only 20% of species pairs. Therefore, *rbc*L should be considered a primary marker for diatom barcoding and LSU should be sequenced as a secondary marker to compare diatoms to other protists in biodiversity surveys.