

A FLORISTIC SURVEY OF MARINE TUBE-FORMING DIATOMS IN CANADA
EMPHASIZING *BERKELEYA RUTILANS*

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Marine tube-forming diatoms along the rocky intertidal form macroscopic colonies that are often mistaken for filamentous brown algae. These diatoms have been understudied with only a few floristic surveys completed and those available are based purely on morphological features. Many of the morphological features used to identify these diatoms, such as valve shape, are qualitative, making species difficult to identify. This is further complicated by the fact that these 'species' are described based on the overall colony morphology with little attention to the constituent cells. Molecular techniques can be used to distinguish species more objectively. Limited molecular data for this group of diatoms are available currently and this study provides the first molecular survey of these taxa. Our study focuses on using the *rbcL*-3P, LSU D2/D3, and ITS2 regions to identify marine tube-forming diatoms in Canadian waters. The *rbcL*-3P analysis included colonies identified as *Parlibellus delognei* var. *elliptica*, *Parlibellus berkeleya*, *Navicula ramosissima*, and *Nitzschia tubicola*. This analysis also revealed a group of eleven closely related genetic species groups previously described as *Berkeleya rutilans*, indicating this taxon is a complex of species. We sequenced the ITS2 for representatives of the *Berkeleya* species complex and these data were consistent with the *rbcL*-3P genetic clusters for 90% of the colonies tested. The remaining 10% were in conflict possibly indicating that more than a single *Berkeleya* species was present in each macroscopic colony. To investigate this hypothesis further, we developed 'species-specific' ITS2 primers and confirmed the heterogeneity of *Berkeleya* species in 60% of the macroscopic colonies tested. Therefore, a taxonomic assessment of tube-forming species that were originally described on the basis of colony morphology (e.g., *Berkeleya rutilans*), and for which the type collections likely consist of a heterogeneous colony, must be investigated using clonal cultures or single cell analysis. Consequently, currently accepted names and types on which they are based may be of limited taxonomic utility.

ORAL PRESENTATION