Kelsey Cook Student Research Conference Abstract

An Inquiry into the Boundaries Between Species and their Hybrid: The Case of *Polypodium* x *incognitum*

This study examines the leaf morphology and stomata size of two New England fern species and their hybrid in the genus *Polypodium*. While some morphological differences between the three, such as frond size, leaf tip shape, and spore size, have been previously described, they are often difficult to distinguish. Because no clear morphological boundaries exist between these taxa, an investigation was undertaken to determine whether previously understudied characters in leaf morphology could aid in identification. Leaves from plants collected from three sites in Vermont were pressed and landmarks were placed evenly along the outlines of each leaf. This was also done within a single leaflet. Each plant was identified using measurements of stomata to infer ploidy, which varied between the three taxa. These measurements were compared to stomata measurements from herbarium vouchers of species of known ploidy. Observations of spore irregularity were also used to identify the hybrids. Landmark positions and their variability between the species and hybrid were analyzed using Principal Components Analysis. Hybrids tended to be intermediate between the two parent species, but sometimes exhibited novelties. While no single leaf characteristic was found that could conclusively differentiate the species and hybrid, the results provide insights into how different genomes may interact within hybrids and contribute to their morphology.