

**Dennis, A. B. and M. E Hellberg. 2010. Ecological partitioning among parapatric cryptic species. *Molecular Ecology*, in press.**

Geographic range differences among species may result from differences in their physiological tolerances. In the intertidal zone, marine and terrestrial environments intersect to create a unique habitat, across which physiological tolerance strongly influences range. Traits to cope with environmental extremes are particularly important here because many species live near their physiological limits and environmental gradients can be steep. The snail *Melampus bidentatus* occurs in coastal salt marshes in the western Atlantic and the Gulf of Mexico. We used sequence data from one mitochondrial (COI) and two nuclear markers (histone H3 and a mitochondrial carrier protein, MCP) to identify three cryptic species within this broad-ranging nominal species, two of which have partially overlapping geographic ranges. High genetic diversity, low population structure, and high levels of migration within these two overlapping species suggest that historical range limitations do not entirely explain their different ranges. To identify microhabitat differences between these two species, we modeled their distributions using data from both marine and terrestrial environments. Although temperature was the largest factor setting range limits, other environmental components explained features of the ranges that temperature alone could not. In particular, the interaction of precipitation and salinity likely sets physiological limits that lead to range differences between these two cryptic species. This suggests that the response to climatic change in these snails will be mediated by changes to multiple environmental factors, and not just to temperature alone.