

McGovern, T. M. and M. E. Hellberg. 2003. Cryptic species, cryptic endosymbionts, and geographical variation in chemical defences in the bryozoan *Bugula neritina*. Mol. Ecol. 12: 1207-1215.

Molecular markers often offer the only means to discriminate between species and to elucidate the specificity of many community interactions, both of which are key to the understanding of ecological patterns. Western Atlantic populations of the bryozoan *Bugula neritina* vary in the palatability of their larvae to predators: individuals south of Cape Hatteras produce chemical deterrents to fish predators that are absent in more northern individuals. We use mitochondrial cytochrome oxidase *c* subunit I (COI) sequences to show that the differences in palatability between populations correlate with the geographical distributions of two cryptic species within *B. neritina*. Furthermore, these cryptic species differ in their associations with bacteria that may confer chemical resistance to predation. Small subunit rRNA primers specific to a subset of gamma-proteobacteria amplified only the bacterium *Endobugula sertula* from the southern cryptic species. *Endobugula sertula* produces a family of chemical compounds (bryostatins) that may deter predators of its animal host. In contrast, the same primers amplified an array of gamma-proteobacteria from the unprotected northern cryptic bryozoan species, but never *E. sertula*. In combination, these findings suggest that the geographical variation in palatability observed in the larvae of *B. neritina* is not the result of local adaptation of a single species to regions of differing predation pressure, but rather results from the comparison of cryptic species that differ in the presence or absence of a bacterium that may provide protection against predators. The ability to identify the cryptic *Bugula* species and their differing relationships with bacterial associates provides an example of the important role molecular techniques may play in addressing ecological questions.