

Ciaglo, James (1988). "Patterns of individual Size in *Cakile edentula*".

Growing on the beaches and among the sand dunes along the Maine coast, several species of annual plants can be found. At a single field site, for each species, the sizes of these plants vary greatly. Furthermore, what appears as a single plant is sometimes a clump of several plants. Other times, it is just a single plant. Many possibilities exist as to why they grow in clumps in some locations, as individuals in others and why such a size variance is found. The size of these plants also varies with location along the beach. For example, plants surrounded by *Ammophila breviligulata*, the beach grass, seem to have smaller canopy areas. Density may be one factor that affects the size of these plants (Zimmerman and Weiss, 1983). Competition with neighbouring annuals and the beach grass, separate from density, may also have an effect on growth.

One hypothesis as to why these annuals sometimes grow in clumps may be that when grouped together, the plants are better protected from the battering caused by blowing sand in the changing beach environment. If this is the case, clumped plants would be more likely to survive and be more successful reproductively than those growing as individuals. Using clumped and isolated individuals of *Cakile edentula*, one of the dominant sand dune annuals, part of this hypothesis was tested. In addition, other factors, such as location on the beach, the effect of *A. breviligulata*, and the distance to other annuals was investigated to examine the effect on plant size. Finally, the results were compared with the trends of other dune annuals, specifically *Salsola kali*.

With the data collected, we can analyze several questions about the growth patterns of *C. edentula* and other dune annuals. Some of these questions include (1). Do the plants tend to grow in clumps? (2). Does clumping affect plant size? (3). Does *A. breviligulata* affect growth? (4). Does location within the community (on the beach, in the grass) affect plant size (canopy area, height, stem diameter)? These questions will help us to draw conclusions regarding growth tendencies of dune annuals and the effect of competition on them.