

Pennings, S. C., and R. M. Callaway. 1992. Salt marsh plant zonation: the relative importance of competition and physical factors. *Ecology* 73:681–690.

Questions

1. What three factors did the authors investigate in this study?
2. Summarize the design used for the two *Salicornia* experiments. Describe the predictor variables, including their treatment levels, response variables, and number of replicates used in each experiment. Explain how randomization was incorporated into the study. Provide a visual diagram of the experimental design.
3. The authors state that as marsh elevation increases, stress from flooding decreases, while stress from salinity increases. Did their results support this assertion? Which figures (number and letter) present the results for flooding (soil waterlogging) and salinity (soil water potential)?
4. The authors state that one potential problem with the transplant experiment is that transplanting itself may have an adverse effect. Did transplanting affect mortality? If yes, provide documentation from the paper. Did transplanting affect growth? If yes, provide documentation from the paper.
5. What evidence (cite relevant figures—number and letter) supports the author's contention that competition with *Salicornia* limits *Arthrocnemum* in the high *Salicornia* zone? What evidence (cite relevant figures—number and letter) supports their contention that competition with *Arthrocnemum* limits *Salicornia* in the *Arthrocnemum* zone?
6. Do the authors support their contention that multiple factors, both physical stresses and interspecific competition, influence the zonation patterns observed in the salt marsh?