

Changes in environmental stress tolerance of intertidal invertebrates throughout life: Does motility play a role?

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Marine invertebrates living along rocky shores experience a range of environmental conditions that can result in varying population abundance when lethal. Motility can play a role in tolerance of environmental stress; especially in juveniles which are more susceptible than adults to many mortality factors. This study investigated the role of motility on stress tolerance determining how tolerance thresholds to temperature and desiccation stress for six intertidal invertebrates change throughout life.

To determine a species' tolerance to air temperature and identify potential ontogenetic shifts in tolerance, juvenile and adults of four species of intertidal invertebrates (*Balanus glandula*, *Chthamalus dalli*, *Nucella ostrina* and *Mytilus trossulus*) were subjected to temperature treatments in the laboratory. In each of these four species, the temperature tolerance threshold increased by 2 – 7 % from early juvenile to adult, indicating a modest ontogenetic shift in temperature tolerance. Ontogenetic shifts in desiccation tolerance, however, were much more substantial; 6 species were tested in the desiccation experiment, and all of these demonstrated shifts in desiccation tolerance threshold from 30 – 280% throughout ontogeny. The magnitude of the ontogenetic shifts in temperature and desiccation tolerance differed among species, but these differences were not related to motility. Therefore, motility may not be a defining factor of ontogeny of intertidal invertebrates. However, juveniles of all species are more susceptible to stress than adults, suggesting that the early benthic phase is a distinct ecological phase from adults.