

Effect of diet on green sea urchin, *Strongylocentrotus droebachiensis*, growth and gonad development.

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Non-indigenous species can affect ecological interactions and have multi-trophic level consequences. As herbivores, sea urchins play an essential role in controlling algal abundance, although the effects of urchin grazing on non-native species are poorly known. We examined how a diet of non-native algal species affects green sea urchin (*Strongylocentrotus droebachiensis*) growth and gonad development relative to native algal species. Individual urchins were placed in containers with 15.0g samples of the native algae *Chondracanthus sp.* (n=10) and two non-native algae species *Mazzaella japonica* (n=10) and *Sargassum muticum* (n=10). The remaining three treatments were a mixed diet, where urchins received equal amounts of all three algal species (n=10); a negative control, where urchins received no algae (n=10); and a control for seaweed degradation where containers had all three algae species but no urchins (n=5). The response variables were mass of seaweed consumed, urchin wet mass, test diameter, and gonad mass. Average initial and final gonad sizes were determined for each treatment. Urchin growth (all metrics) was significantly greater for urchins grazing on *Chondracanthus*. Results suggest that *Sargassum* is not an optimal food source for green sea urchins. Urchins eating *Mazzaella* allocated a significant proportion of their mass into gonads and showed an efficiency (grams of seaweed to gain one gram urchin mass) similar to *Chondracanthus*. A diet of the non-native *Mazzaella* resulted in growth, suggesting that urchins might graze on this non-native species, and thus, may provide an alternative food source.