

Is Species Richness of Macroalgae Related to Wave Exposure and Water Temperature in Arikawa Bay?

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ABSTRACT

With ongoing changes in the global climate, seaweed communities are in transition and a number of studies have been reported from various sites. Water temperature and wave exposure are some of many important environmental factors determining the structure of seaweed communities. This is because these environmental factors affect the photosynthetic rate, induce physical stress in the thallus, and can also play a role in reproduction. As a result, only those seaweed species that have appropriately adapted can remain in certain types of environments. The relationships between these environmental factors and seaweed communities have been examined by many investigators on relatively large spatial scales. However, how does water temperature and wave exposure vary within small spatial scales, and will such variation affect the structure of seaweed communities? We are studying how small variations in water temperature and wave exposure affect the structure of seaweed communities on a small spatial scale. Seven stations within a 200 m distance were established in Arikawa Bay, Nagasaki, Japan. We identified seaweed species found at each site, and measured the water temperature, wave exposure, sedimentation rates, and depth at each station. Then, we developed a model to describe how species richness is related to each environmental factor and hypothesized that species richness and environmental factors are related. Thus far, our observations support the hypothesis even within a small spatial scale.

Keyword: Seaweed/ Species richness/ Wave exposure/ Water temperature/ Nagasaki/ Japan

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