Estimation of contribution rate of Submarine Groundwater Discharge to *Ulva pertusa* using nitrogen stable isotope ratio analysis

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In recent years, the influence of Submarine groundwater discharge (SGD) has attracted attention as a source of nutrient that supports biological production in the coastal area. However, the information about the direct influence of SGD on biological production is poor. In this study, in order to examine how much the groundwater contributes to primary production, we collected the primary producer *Ulva pertusa* in Yuza, Yamagata Prefecture, where the groundwater is abundant. On August 27, 2018, we collected sea water, ground water and ambient water around *Ulva* at five sites in the Yuza Coast and simultaneously measured salinity, water temperature, ^{222}Rn concentration which is the indicator of undergroundwater. We also analyzed the nutrient concentration, of sampled water and of *Ulva*. Finally, we estimated the contribution of groundwater to Ulva using two source Bayesian Mixing model. The value of nitrate nitrogen derived from SGD was low. In the high SGD sites (^{222}Rn concentration 427 ~ 22000 Bq/m^3) and the low SGD sites (^{222}Rn concentration 38.1 to 210.6 Bq/m^3), the of *Ulva* was 2.1 to 3.6 and 5.4 to 6.9, respectively. It was suggested that nutrient derived from SGD contributed to the production of *Ulva* in Yuza.

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