

Carbon Budget in Seagrass and Seaweed Meadows

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Summary

Dissolved organic matter (DOM) leached from coastal aquatic plants and decomposition by bacteria play key roles in coastal carbon biogeochemical cycles and contribute to marine carbon fixation. In this study, laboratory incubation experiments were conducted to investigate the quantity and quality of dissolved organic carbon (DOC) and chromophoric dissolved organic matter (CDOM) leached from seaweed (*Ecklonia cava*) and seagrass (*Zostera japonica*). DOC leached from *E. cava* and *Z. japonica* for 30 days were 6850 ± 1569 and 3417 ± 692 $\mu\text{molC/g}$ dry-wt. in the bacteria inhibited incubation experiments, respectively. In contrast, DOC leached 1978 ± 1115 and 354 ± 47 $\mu\text{molC/g}$ dry-wt. (28.1 ± 11.5 and $10.7 \pm 2.3\%$ of bacteria inhibited incubations; recalcitrant DOC component) in bacteria active incubation experiments, respectively. In the early incubation period, the fluorescent intensities of protein-like and polyphenol-like components sharply increased and after that rapidly decomposed by bacteria. In contrast, humic-like components were increased throughout the incubation periods both bacteria active and non-active incubations. Therefore, RDOC directly leached to the water from aquatic plants. In addition, DOC was probably produced by bacteria in bacteria active incubation with oxic condition.