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Effects of nitrogen and phosphorus addition on photosynthesized carbon allocation in Spartina alterniflora-soil system

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13C pulse-labeling method was conducted and N and P addition experiments were set to analyze the effects of the photosynthetic carbon allocation in the Spartina alterniflora-soil system. The results showed that the abundance of 13C in each part of each treatment group increased significantly after four pulses. The 13C abundances declined in the order of stem, leaf, root, rhizosphere soil and soil, showing the same results as control group (CK). The total amount of fixed 13C was increased and less than that of CK after four times labeling. The average fixed 13C amount of N and P was higher than that of N or P; during the growing period, the allocation ratio of underground parts increased, indicating that the soil organic carbon was significantly enriched. In the N addition group, the allocation ratio of rhizosphere soil and soil increased with the increase of N addition level, which showed that N addition promoted the transfer of photosynthetic carbon into the soil. In the P addition group, the highest photosynthetic carbon content of plants was observed in the underground at the medium-level (P2) level. In the NP-addition group, the highest above-ground allocation ratio was observed at the middle-level NP addition level (NP2). The allocation ratio of the rhizosphere soil and soil increased with the increase of the NP addition level. N, P addition changed the photosynthetic carbon allocation in S. alterniflora-soil system, indicating that eutrophication has significant ecological effects on the carbon cycle of the salt marsh ecosystem.

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