The Invasion of *Spartina alterniflora* Alters Carbon Dynamics in China's Coastal Wetlands

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Ecosystem processes are tightly linked to the structure and functioning of plant communities. Large-scale invasion of *Spartina alterniflora* on unvegetated intertidal mudflats is expected to reduce atmospheric CO_2 through an increase in the carbon storage of coastal ecosystem.

In China, Yancheng Natural Reserve, plant carbon storage (PCS), soil total organic carbon storage (SCS), as well as CO_2 and CH_4 fluxes, were compared between *Spartina* invaded marsh and adjacent native marshes. PCS of *Spartina* marsh was 16.9 and 1.4 times higher compared to those of *Suaeda* and *Phragmites* marshes, whereas relatively larger aboveground PCS but smaller belowground PCS were found in the newly settled seaward margin of the *Spartina* marsh. SCS in *Spartina* marsh was also 1.5 times higher than that in unvegetated mudflat. Although *Spartina* vegetation assimilated a substantial amount of CO_2, mass emission of CH_4 from the invaded marsh was also noticed, especially in summer, it was 9–16 times higher than those from native marshes.

Our study indicates that instead of CO_2 being simply incorporated into PCS and SCS, carbon dynamics following *Spartina* invasion are more complicated. Detailed studies of CH_4 emissions are needed before ascertaining whether, and to what degree, the invasion of *S. alterniflora* may affect the global warming process.

Key words: biogeochemistry; carbon dynamics; coastal wetland; natural reserve; plant invasion