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