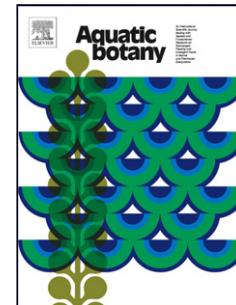


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Spatial and temporal patterns of seed dispersal in eelgrass *Zostera marina*: a case study in Moon Lake, Shandong, China

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Highlights

- Seed dispersal of *Z. marina* was studied using seed traps.
- A greater-than-expected eelgrass seed dispersibility was found in Moon Lake.
- Seeds might be dispersed by other agents other than tidal currents.

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Abstract: Seed dispersal plays an important role in the spread of eelgrass (*Zostera marina*). In order to study the temporal and spatial patterns of eelgrass seed dispersal in Moon Lake, Shandong, China, a continuous eelgrass meadow without outlying patches in a subtidal area was selected and assumed as the source of seed dispersal in the experiment. A square plot of 8 m by 8 m was set up inside the meadow and another two plots of the same size were also set up outside the meadow. Seed traps made of artificial turf were used to collect seeds transported by currents during the study period. Results showed that the potential seed production of the selected bed was $10,028 \pm 4,874$ seeds m^{-2} and seed dispersal lasted from July to September. In all experimental plots, the highest densities of seed rain during a half-month period were observed in July. After two months, the average density of seed rain across all transects inside the meadow was 154 ± 27 seeds m^{-2} , while outside the meadow, the density decreased nearly to zero. Over the entire study period, the average seed rain density across all transects inside the meadow was 1634 ± 94 seeds m^{-2} , while at a distance of 8 m away from the meadow either downstream or perpendicular to the main tidal current direction, the average accumulated density of seed rain was 515 ± 80 and 203 ± 42 seeds m^{-2} , respectively. Our results indicate that though most of the seed rain falls within the parent bed in Moon Lake, tidal currents can disperse the seeds at a distance of 8 m, and besides tidal currents, seeds might also be dispersed in other ways, such as seed predators, wind-driven waves and other processes.

Keywords: eelgrass *Zostera marina*; seed production; seed traps; seed dispersal

1. Introduction

Seagrasses are submerged marine angiosperms growing abundantly in intertidal and subtidal areas, and play crucial roles in stabilizing sediments, improving water quality, recycling nutrients, and providing food and shelter for a large number of commercially and ecologically valuable marine species (Hemminga et al., 1991;

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