SALINITY, LIGHT, AND TEMPERATURE EFFECTS ON RUPPIA MARITIMA GERMINATION IN FLORIDA BAY

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ABSTRACT

Ruppiaceae is a ubiquitous aquatic angiosperm group that provides a critical foundation for many Florida Bay habitats. Despite its ecological importance, little is understood about the life cycle of Ruppiaceae in Florida Bay. This paper has been identified as a lack of knowledge of specific conditions required for successful establishment with difficult estimation. Although Ruppiaceae species are known to germinate in a variety of conditions, their ideal conditions have not been fully identified. This investigation aimed to identify the conditions required for germination and early plant establishment using field studies and controlled experiments.

RUPPIA MARITIMA DEVELOPMENT STAGES

Stage 1: Seed Development
- Ruppiaceae seeds are large, hard, and require a period of dormancy before germination.
- After dormancy, seeds germinate under specific environmental conditions.

Stage 2: Seedling Emergence
- Germination is triggered by a combination of light, temperature, and moisture.
- Seedlings emerge from the substrate and begin to develop roots and shoots.

Stage 3: Seedling Growth and Development
- Seedlings continue to grow and develop, becoming established in the substrate.
- Establishment is critical for the success of Ruppiaceae species in Florida Bay.

EXPERIMENTAL RESULTS

Total Recovery of Seeds and Percent Germination

Germination Pattern

No germination occurred in the sediment or water column post-plant establishment until day 1. After this phase, germination was continuous for 136 days without a clear pattern. Thus, seed germination was continuous rather than pulsed post-plant establishment.

METHODS

STUDY SITE

METHODS

MESOSCOPE EXPERIMENTAL DESIGN

Seed Collection, Stratification, and Planting

Seed Collection, Stratification, and Planting:
- Seeds were collected from a natural population in southern Florida Bay and stratified in a cold environment to simulate the natural conditions required for germination.
- Stratified seeds were planted in the greenhouse and monitored for germination.

Mesocosm Design and Salinity Treatment - Experiment 1

Mesocosm Design and Salinity Treatment - Experiment 1:
- A mesocosm experiment was conducted to assess the effect of salinity on Ruppiaceae seed germination.
- Two salinity levels were tested: 15‰ and 35‰.

Seed Recovery Post-Salinity Treatments - Experiment 2

Seed Recovery Post-Salinity Treatments - Experiment 2:
- A second experiment was conducted to assess the recovery of Ruppiaceae seeds after exposure to different salinity levels.
- Seeds were exposed to 15‰ and 35‰ for 30 days and then returned to 15‰ for recovery.

CONCLUSIONS

Future Research

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REFERENCES

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REFERENCES