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Recovery and succession in a multi-species tropical seagrass meadow following experimental disturbance: the role of sexual and asexual reproduction

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Abstract

Recolonisation and succession in a multi-species tropical seagrass meadow was examined by creating gaps (50 × 50 cm) in the meadow and manipulating the supply of sexual and asexual propagules. Measurements of leaf shoot density and estimates of above-ground biomass were conducted monthly to measure recovery of gaps between September 1995 and November 1997. Measurements of the seeds stored in the sediment (seed bank) and horizontal rhizome growth of colonising species were also conducted to determine their role in the recovery process.

Asexual colonisation through horizontal rhizome growth from the surrounding meadow was the main mechanism for colonisation of gaps created in the meadow. The seed bank played no role in recolonisation of cleared plots. Total shoot density and above-ground biomass (all species pooled) of cleared plots recovered asexually to the level of the undisturbed controls in 10 and 7 months, respectively. There was some sexual recruitment into cleared plots where asexual colonisation was prevented but seagrass abundance (shoot density and biomass) did not reach the level of unmanipulated controls. Seagrass species did not appear to form seed banks despite some species being capable of producing long-lived seeds.

The species composition of cleared plots remained different to the undisturbed controls throughout the 26-month experiment. *Syringodium isoetifolium* was a rapid asexual coloniser of disturbed plots and remained at higher abundances than in the control treatments for the duration of the study. *S. isoetifolium* had the fastest horizontal rhizome growth of species asexually colonising cleared plots (6.9 mm day^{-1}). *Halophila ovalis* was the most successful sexual coloniser but was displaced by asexually colonising species. *H. ovalis* was the only species observed to produce fruits during the study.

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