Caulerpa taxifolia in Moreton Bay

Effects on Moreton Bay seagrasses

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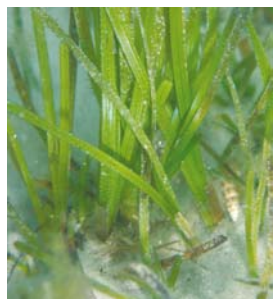
Caulerpa taxifolia is a green macroalga that has gained notoriety in the last two decades as an invasive species following its introduction and subsequent invasion of large areas of the north-western Mediterranean Sea, where it out-competes native seagrasses. In 2000, new colonies were discovered off the coast of California in the U.S.A., and in several locations in New South Wales and South Australia. It is native to Moreton Bay in south-east Queensland, where it shares its soft-sediment niche with seven species of seagrass. While the Moreton Bay populations do not currently exhibit the invasiveness of the Mediterranean strain, research has indicated that *C. taxifolia* has expanded its range in Moreton Bay over the last five years. *C. taxifolia* contains a suite of toxins which may function in allelopathic competition. To investigate the effect of *C. taxifolia* extract on three Moreton Bay seagrass species, the tidal tanks at the Moreton Bay Research Station were modified to accommodate the subtidal seagrasses.

Caulerpa taxifolia

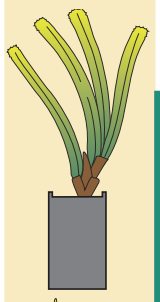
Seagrass Species Tested

Cymodocea serrulata

Syringodium isoetifolium



Zostera capricorni



Methods

Cores of seagrass were collected near North Stradbroke Island and placed in the planthouse tanks. *C. taxifolia* cores were collected and ground into a homogenous paste. This paste was applied to the sediment surface in three concentrations: A. Control; B. One core of *C. taxifolia* biomass per seagrass core; and C. Three cores of *C. taxifolia* biomass per seagrass core.

Variables measured were seagrass shoot density, photosynthetic response, maximum leaf length, number of leaves per shoot, chlorophyll concentration and biomass.

The seagrass *Zostera capricorni* treatments:

A. Control

B. Low dose of *C. taxifolia* extract

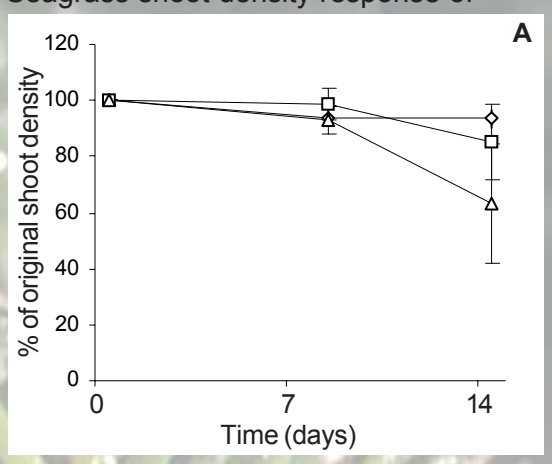
C. High dose of *C. taxifolia* extract.

Outcomes

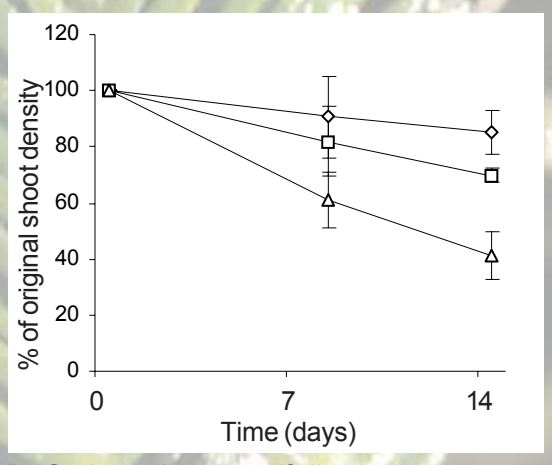
All three seagrass species showed a decline of shoot density after exposure to the high *C. taxifolia* treatment, when compared with the control. *Syringodium isoetifolium* was the seagrass species most affected by the high *C. taxifolia* treatment. This result combined with the increase in distribution of *C. taxifolia* in Moreton Bay in the last five years may suggest that *C. taxifolia* could pose a threat to Moreton Bay's unique seagrass ecosystems.

Caulerpa taxifolia growing with the seagrasses *Zostera capricorni*, *Halophila ovalis* and *H. spinulosa* in Moreton Bay.

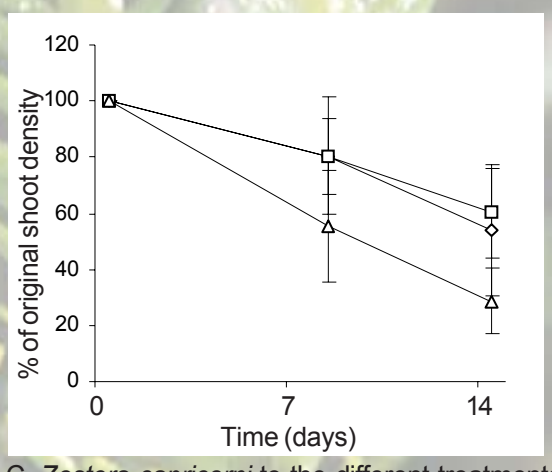
Seagrass shoot density response of



A. *Cymodocea serrulata*



B. *Syringodium isoetifolium*



C. *Zostera capricorni* to the different treatments.

Control
Low *C. taxifolia* dose
High *C. taxifolia* dose

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