Algae growth double-edged sword for Swan River biome

Wednesday, 04 April 2012 06:00

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ALGAE that are harmful for seagrasses may be beneficial for invertebrates that live in or under the seagrass, new research suggests.

The study, conducted in Perth's Swan River estuary, observed the effects the macroalga *Gracilaria comosa* had on the seagrass *Halophila ovalis* and its associated macroinvertebrates over a period of a month.

When researcher Mads Thomsen, recently at the UWA School of Plant Biology, and his team exposed the seagrasses to the macroalgae, the seagrass leaf densities decreased by 20 to 40 per cent depending on the amount of macroalgae added.

This negative effect indicates the seagrasses had to compete with the macroalgae for light and nutrients, says Dr Thomsen.

This negative effect indicates the seagrasses had to compete with the macroalgae for light and nutrients.—Dr Thomsen. Image: Ria Tan

"The seaweeds [algae] form a canopy on top of the seagrass, shading out the light by 90 to 95 per cent," he says.

"The seagrass has to, at the same time, deal with less nutrients because the seaweed blocks water flow, and it also has to tolerate lower levels of oxygen and increased levels of sulphide in the sediment due to the decomposing algae."

For many invertebrate species living in the seagrass, however, the effects were positive.

The abundance of crustaceans, isopods, and amphipods increased with algal density, and the gastropod *Batillaria australis,* a type of sea snail native to Australia, was most greatly affected, increasing five times in number.

"Many of the critters live in seagrass, but when you suddenly add the structurally complex seaweed on top, it creates more habitat and more food," Dr Thomsen says.

"The critters will eat the seaweed and hide between the branches, so in most of the species we found there was a positive effect."

The number of organisms that have three-dimensional habitats—such as amphipods, isopods, and crustaceans—continued to increase with algal density as more algae provided more living space.

But molluscs and B. australis, which have two-dimensional habitats on the sediment, saturated [stopped growing in number] when too much algae was added, indicating the competition for space on the sediment had reached capacity.

"They don't like climbing on top of each other so no matter how much food [algae] you add, at very high densities they become space-limited on the sediment surface," Dr Thomsen says.

Future research for the team may involve extending the length of the experiment to observe whether decomposing algae will create anoxic conditions after several months, potentially harming or reversing the positive effects on the invertebrates.

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Published in Fisheries & Water

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