
Laboratory and field studies on the interaction between kelps and filamentous algal endophytes

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Abstract

The marine brown macroalga *Saccharina latissima* is an important primary producer in temperate to cold northern hemisphere shores and fundamental in the formation of marine habitats. Also known as sugar kelp, it is an economically relevant seaweed with high industrial potential. Morphological changes- such as dark spots, twisted stipes and deformation of the blades - have been observed in wild populations and seaweed farms. The putative cause for the occurring symptoms is the filamentous endophytic brown alga *Laminarionema elsbetiae*, which is highly prevalent in European *Saccharina* populations but has also been found in its secondary host, the brown alga *Laminaria digitata*. *L. elsbetiae* is known to invade stipes and fronds of its hosts, however nothing is known about the molecular mechanisms of the interaction. To get further insight into the host-endophyte relationship and possible defence mechanisms, a co-cultivation bioassay was developed in order to monitor the impact of the endophyte on growth of laboratory-raised individuals of both kelp species and to test the pathogenicity of the endophyte according to Koch's postulates. First results revealed that co-cultivation of *L. elsbetiae* with *S. latissima* juveniles does not induce changes in growth or morphology of its primary host. On the contrary, growth of *L. digitata* significantly decreased within less than a week when co-cultured with the endophyte. Ongoing experiments, including field surveys, aim to decipher these mechanisms and will help to better understand the bases of the biotic interaction between the endophyte and its hosts.

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