

FUNGAL ENDOPHYTES OF GRASSES – OUR ENEMIES OR ALLIES?

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Summary

Fungi of the genus *Epichloë* are so-called facultative endosymbionts of many grasses species. However, in the sexual stage fungus parasitizes on the plant; it creates specific structures, called stromata, on the blades of the grass inhibiting its flowering and seed production. Additionally, stromata formed on vegetative shoots diminish intensity of photosynthesis. In the asexual stage, *Epichloë* is an endophyte and its presence in the plants' tissues does not give any visible symptoms of the disease. Still, it involves production of alkaloids which have toxic effect on herbivores – it is particularly important from an economic point of view in the case of pasture grasses and livestock. Mycotoxins cause to cattle such conditions as diarrhea, respiratory problems, lack of appetite, tissue necrosis or miscarriages. This leads to large economic losses. Intensification of research on the endophytes has started at the turn of the 80's and 90's. Knowing details of the biology of these organisms, scientists began to be more aware of their properties. On the one hand, beneficial for the host (at least in certain circumstances): grasses with the fungus in the endophytic stage often have greater biomass, produce more seeds, cope better in extreme environmental conditions (e.g. during drought) and are more resistant to herbivores (thanks to alkaloids) than uninfected plants. On the other hand, the risk that endophytes can be dangerous for farm animals has become more evident. From that moment the studies on the possible practical deployment of these microorganisms and the substances they produce have been intensified and some of the results obtained found application in medicine, biotechnology and in plant's protection. At the same time researchers try to redress the adverse effects of fungi presence in the pasture grasses. By selection and genetic manipulation they search for nonpathogenic strains that neither cause disease to cattle, nor inhibit plant growth.