# Occurrence and toxicity of *Epichloë* endophytes in German grasslands

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*Epichloë* endophytes are symbiotic fungi colonising cool-season grasses, producing alkaloids potentially toxic to grazing animals. While numerous cases of livestock intoxication have been reported in New Zealand, Australia, and the United States, its prevalence and impact in European pastures remains poorly understood. This study investigates the distribution and toxicity of *Epichloë* endophytes in German grasslands to estimate possible livestock intoxication risks. Additionally, the research considers the role of *Claviceps* spp., a closely related fungal genus that can produce similar alkaloids and can cause symptoms potentially mistaken for *Epichloë* intoxication.

Grass samples were collected from 90 grasslands across two regions of Germany, including cattle pastures, horse pastures, pastures with previous cases of equine laminitis, semi-natural grasslands and football fields. This selection established a gradient from non-sown to intensively managed areas. Around 5,000 individuals of 15 grass species were collected between July and September 2024, with particular emphasis on *Lolium perenne* and *Festuca arundinacea*, key *Epichloë* hosts associated with livestock toxicity. Stems and inflorescences were collected for the detection of *Epichloë* and *Claviceps*, respectively. Detection of *Epichloë* was performed using Multiplex-PCR. Subsequently, the positive samples were analysed to quantify the concentrations of ten alkaloids, including lolitrem B and ergovaline, using HPLC-MS and GC-MS. It is hypothesised that since semi-natural grasslands have never been sown, they likely reflect the natural abundance of *Epichloë* endophytes in grasses, which might be lower than in sown grasslands. Sown grasslands may contain more *Epichloë* due to the potential use of endophyte-infected seeds in commercial mixtures. Moreover, the prevalence of *Epichloë* in turf grass, like sown football fields, could be even higher due to the endophyte's beneficial role in enhancing tolerance to environmental stressors like heat and trampling. Results are pending, but PCR detection has been successfully established and will be available soon, as well as preliminary analyses on alkaloid contents. This study will provide critical data on *Epichloë* and *Claviceps* prevalence and alkaloid profiles in German grasslands. The findings will have significant implications for grassland management and animal health in Germany. The study's relevance is heightened by the potential impact of climate change, which may favour *Epichloë*-containing grasses and alter future risks to livestock health, potentially making this issue increasingly important in Germany and Europe.

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