Behind the Kernels II: A Reevaluation of Fungal Endophytes as Biocontrol Agents against the Common Maize Pathogen Ustilago maydis

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The fungal pathogen Ustilago maydis is responsible for maize crop losses worldwide. It affects 2% of maize crops, causing a over $1 billion annual loss in the U. S. alone by producing tumor-like growth on the cob or thallus of the plant. Fungal endophytes, or fungi that reside in the tissue of a plant without causing symptoms, are found to have a defensive mutualism with their host plant. They protect their host by providing biological control of potentially harmful pathogens, predators, and pests, making them promising candidates as an eco-friendly biocontrol agent. In this experiment, four fungal endophyte of various genera and the maize pathogen Ustilago maydis were inoculated, (introduced with the purpose of growth) both in planta (in the plant) and in vitro (on artificial media). The objective was to discover if any of these fungi exhibited traits of biological control of Ustilago maydis, for potential use in an agricultural setting. In planta, no significant results were found, most likely due to flawed inoculation procedure. In vitro, however, all of the tested fungal endophytes were found to be successful biocontrol agents, significantly reducing the growth of Ustilago maydis.

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