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Antifungal activity of *Lessingianthus glabratus* extracts against *Corynespora cassiicola*

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Highlights

C. cassiicola compromises soybean crops. Synthetic fungicides show limitations. *L. glabratus* extracts act against the fungus. FRAE-LG inhibited 63.4%, emerging as a sustainable alternative.

Abstract

Phytopathogenic fungi are among the main agents responsible for agricultural losses worldwide, causing decreased productivity and significant economic damage[1]. *Corynespora cassiicola* stands out in this context due to its ability to infect more than 530 plant species. In soybean crops, this pathogen can cause severe defoliation and yield losses ranging from 18% to 42% in susceptible cultivars, establishing itself as a major threat to agriculture[2]. The traditional control of *C. cassiicola* relies on the use of synthetic fungicides which, although effective, present disadvantages such as toxicity, environmental impact, and the induction of resistance in fungal populations[3]. Given this scenario, interest in sustainable management alternatives has increased, particularly in the use of plant extracts. In the present study, the *in vitro* antifungal activity of extracts and fractions of *Lessingianthus glabratus* against *C. cassiicola* was evaluated. The assays were conducted on PDA medium supplemented with different concentrations of extracts (500, 1000, 2000, and 4000 µg mL^{-1}). The results showed that the ethyl acetate fraction (FRAE-LG) exhibited the highest efficacy, achieving 63.4% inhibition of mycelial growth at 4000 µg mL^{-1}. Even at intermediate doses, such as 1000 µg mL^{-1}, the fraction already demonstrated high activity (48.7%). Other fractions, such as the hexanic and hydromethanolic ones, showed lower performance, not exceeding 24% inhibition. UHPLC-HR-MS/MS and Molecular Networking analysis using GNPS2 revealed a molecular network indicating the presence of phenolic compounds and flavonoids, predominantly in FRAE-LG, suggesting that these metabolites contribute to the antifungal activity[4]. These results corroborate previous studies on species of the tribe Vernonieae, which highlight the use of plant extracts as a promising source of metabolites for the alternative management of agricultural diseases[5]. It can be concluded that the extracts of *L. glabratus*, particularly FRAE-LG, represent a viable alternative for the control of *C. cassiicola*, providing a significant contribution to the search for integrated management strategies that reduce dependence on synthetic fungicides and promote greater sustainability in agriculture. [1]CHÁVEZ-RAMÍREZ, B. *et al*. *Microbiological research*, **2020**, 230, 1-10. [2]DEAN, R. *et al*. *Molecular Plant Pathology*, **2012**, 13(4), 414–430. [3]POPP, J. *et al*. *Agronomy for sustainable development*, **2013**, 33, 243-255. [4]MEKAN, P. N. *et al. South African Journal of Botany*, **2019**, 127, 319-332. [5]SILVA, J. L. *et al. Revista Brasileira de Plantas Medicinais*, **2014**, 16(3), 539-544.

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