

Área: ORG

Evaluation of the *in vitro* antifungal activity of plant extracts against phytopathogenic fungi

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Highlights

Plant extracts exhibit promising antifungal potential for sustainable crop protection against pests and diseases. *Piper* sp., *Vernonia* sp., and *Senecio* sp. demonstrated significant antifungal activity against several phytopathogenic fungi.

Resumo/Abstract

The intensive use of synthetic fungicides has raised environmental and social concerns, contributing to the search for more sustainable alternatives. In this context, the present study evaluated the *in vitro* antifungal activity of hydroalcoholic extracts from nine plant species collected in the western region of Paraná: *Achillea* sp., *Vernonia* sp., *Arrabidaea* sp., *Piper* sp., *Senecio* sp., *Bidens ferulifolia*, *C. punctatum*, *Ricinus communis*, and *Tabernaemontana catharinensis*.

The extracts were prepared from stems and leaves by cold maceration (ethanol:water, 80:20, v/v) for 48 hours. After filtration, the residue was remacerated three additional times under the same conditions. All filtrates were then combined, concentrated using a rotary evaporator, and stored at room temperature in amber bottles to prevent degradation.

The extracts were tested against several phytopathogenic fungi, including *Penicillium oxalicum*, *Ceratocystis paradoxa*, *Aspergillus fumigatus*, *A. niger*, and *Fusarium* spp., using PDA medium. The assays were performed at concentrations of 500 and 1000 ppm, with the commercial fungicides Fusão EC (IHARA) and Orkestra SC (BASF) used as positive controls. All the tests were carried out in triplicate.

The results revealed varying levels of antifungal activity among the tested extracts. The genus *Piper* exhibited the highest inhibitory potential, showing activity against *P. oxalicum*, *C. paradoxa*, *A. niger*, and *Fusarium* spp at both 500 and 1000 ppm. *Vernonia* sp. and *Senecio* sp. also demonstrated notable activity against *Fusarium* spp. and *A. fumigatus* at the same concentrations. In contrast, *Bidens ferulifolia* and *T. catharinensis* showed no significant antifungal effects. The commercial fungicides confirmed their efficacy, except for Orkestra SC, which was ineffective against *C. paradoxa*. These findings highlight the potential of plant extracts, particularly those from the *Piper* genus as promising sources of natural antifungal agents. Further studies are needed to optimize extract concentrations, evaluate synergistic effects, and determine MICs for developing sustainable biocontrol strategies.

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