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Extracellular enzymatic profiles and taxonomic identification of endophytic fungi isolated from four plant species

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ABSTRACT. Plants of medicinal and economic importance have been studied to investigate the presence of enzyme-producing endophytic fungi. The characterization of isolates with distinct enzyme production potential may identify suitable alternatives for specialized industry. At Universidade Estadual de Maringá Laboratory of Microbial Biotechnology, approximately 500 isolates of endophytic fungi have been studied over the last decade from various host plants, including medicinally and economically important species, such as *Luehea divaricata* (Martius et Zuccarini), *Trichilia elegans* A. Juss, *Sapindus saponaria* L., *Piper hispidum* Swartz, and *Saccharum* spp. However, only a fraction of these endophytes have been identified and evaluated

for their biotechnological application, having been initially grouped by morphological characteristics, with at least one representative of each morphogroup tested. In the current study, several fungal strains from four plants (*L. divaricata*, *T. elegans*, *S. saponaria*, and *Saccharum* spp) were identified by ribosomal DNA typing and evaluated semi-quantitatively for their enzymatic properties, including amylase, cellulase, pectinase, and protease activity. Phylogenetic analysis revealed the presence of four genera of endophytic fungi (*Diaporthe*, *Saccharicola*, *Bipolaris*, and *Phoma*) in the plants examined. According to enzymatic tests, 62% of the isolates exhibited amylase, approximately 93% cellulase, 50% pectinase, and 64% protease activity. Our results verified that the composition and abundance of endophytic fungi differed between the plants tested, and that these endophytes are a potential enzyme production resource of commercial and biotechnological value.

Key words: Endophytes; Fungi; Phylogenetic analysis; Enzymes