TITLE: QUALITATIVE PRODUCTION OF CELLULASE BY ENDOPHYTIC FUNGI

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ABSTRACT:
Endophytic fungi colonize living tissues of various plants, establishing mutualistic relationship without causing any symptom of disease and have been reported to reduce the growth of the different phytopathogenic fungi, and are also known to produce enzymes of biotechnological interest with the possibility of isolating species that can be used for industrial scale production. This production of enzymes by endophytic fungi is related to the specificity between the host plant and the fungus. Cellulases are enzymes that are part of a highly specific multienzymatic complex, acting in synergy to promote the hydrolysis of cellulosic materials into sugars, and are classified according to the site of the substrate they act, and can be classified as endoglucanases, exoglucanases and β-glycosidases. This study aimed to evaluate the qualitative production of cellulase by endophytic fungi from forage grasses and *Eremanthus* sp. The CMC (Carboxymethylcellulose Agar) medium was used to evaluate the production of total cellulases in solid medium ($NaNO_3$, 2 g, K_2HPO_4, 1 g, $MgSO_4$ 0.5 g, KCl, 0.5 g, CMC 2.0 g, Bacterial peptone, 0.2 g ; Agar, 17.0 g). Endophytic fungi were cultured in triplicate and maintained at 28°C for 7 days. Enzymatic hydrolysis was evidenced by the formation of a clear halo around the colony using Lugol reveal solution (0.67% KI, 0.33% iodine w/v). The calculation of the enzymatic index (EI) was performed by ratio of degradation halo diameter average and colony diameter average. All 21 endophytic fungi evaluated in this study grew in CMC medium. However, five fungi did not produce a halo of enzymatic hydrolysis, 15 fungi produced a halo of enzymatic hydrolysis < 2, and only one fungus (*Peniophora* sp.) produced halo with EI ≥ 2. Studies will be performed with *Peniophora* sp. to evaluate the specific activity of the enzyme cellulase, since this result does not allow us to infer that there is production of all the enzymes of the complex.

Keywords: carboxymethylcellulose, endophytes, enzymatic hydrolysis, enzymatic index

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