Optimization of chitinase production by *Metarhizium anisopliae*

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Chitinases are enzymes that catalyze the degradation of chitin, a polysaccharide that is the main component of the cuticle of insects and arthropods. *Metarhizium* spp. are entomopathogenic fungi that produce chitinases as part of their infection process. The chitinases produced by *Metarhizium* spp. are important for the penetration and virulence in the cuticle of the insect and arthropod, and for its subsequent colonization and death. Studies on *Metarhizium anisopliae* chitinases have the potential to lead to the development of new biopesticides that are effective in pest control and that are safe for the environment and human health. However, chitinase production by *M. anisopliae* can be variable, depending on the culture medium used. An appropriate medium can help to improve chitinase production by *M. anisopliae*, which could lead to the development of more efficient and economical biopesticides.For this reason, the objective was to evaluate the commercial isolates *M. anisopliae* IBCB 425 and *M. anisopliae* ESALQ E9 in different solid and liquid culture media for chitinase production. *M. anisopliae* IBCB 425 was provided by Nitro as Metarriz® and *M. anisopliae* ESALQ E9 was acquired from the Koppert company as Metarril®. These isolates were cultivated in potato dextrose agar (BDA) 2.0 % (m/v), at 25 ± 1 °C, in the dark, for 10 days, with a concentration of 10^7 conidia/mL. Then, the conidial suspension was used for inoculation in liquid media (Soluble starch with yeast extract, Synthetic, SDY broth, YPG) and solid media (Rice with silkworm chrysalis flour (*Bombyx mori*), Rice with whey). Tukey's test at 1% probability was used for statistical analysis. As a result, it was found that the *M. anisopliae* ESALQ E9 isolate in the rice-whey culture medium produced the highest amount of chitinase, showing a significant difference ($p < 0.01$) with a value close to activity of (0.60 U/mg), in relation to the other culture media tested, including those evaluated for *M. anisopliae* IBCB 425. The use of an appropriate culture medium can help to improve chitinase production from entomopathogenic fungi, which could lead to the development of more efficient and economical biopesticides.

Key words: Chitinase; Biopesticides; Culture medium; Entomopathogenic fungi.

Produção de quitinase pelos isolados comerciais de *Metarhizium anisopliae*

Metarhizium spp. produzem quitinase, uma enzima de degradação da quitina importante para a infecção e morte dos organismos-alvo. O objetivo deste estudo foi avaliar a produção de quitinase de *M. anisopliae* IBCB 425 e ESALQ E9 em diferentes meios de cultura. Foram inoculados 10^7 conídios/mL em cada meio de cultura. O isolado ESALQ E9 apresentou diferença estatística ($p<0,01$) maior quantidade de quitinase (0,60 U/mg) no meio de arroz com soro de leite em comparação com os outros meios de cultura avaliados. Trata-se de uma opção promissora para a produção de quitinase, poderá levar ao desenvolvimento de biopesticidas mais eficazes e econômicos.

Palavras-chave: Quitinase; biopesticidas; meio de cultura; fungos entomopatogênicos.

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