

Proteolytic and nematicidal activity of *Pleurotus* sp.

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Biochemical pest control using enzyme-producing microorganisms is a promising strategy for the agricultural sector. Edible mushrooms of the genus *Pleurotus* are not toxic and produce these metabolites. However, investigations into the potential of these enzymes are limited. This study investigated the nematicidal effect of a cell-free crude extract containing enzymes from *Pleurotus* sp. on the control of *Panagrellus* sp. at different fermentation times. For this, the fungus was fermented in wheat seeds over 45 and 75 days. After this period, enzymes were extracted from the solid medium using a 1:5 (solid: liquid) of water. The proteolytic enzymatic activity occurred at the following pH values (5, 7, and 9). The nematicidal activity of the crude extract on *Panagrellus* sp. was evaluated in three groups: control, active, and denatured. Each group consisted of six replicates. The results showed that the proteolytic activity of the crude extract was 3.5 ± 0.3 and 6 ± 1 U mL⁻¹ at pH 5 and 7 during the 45 days. In the 75 days, the proteolytic activity was 15 ± 1 and 10 ± 1 U mL⁻¹ at pH 5 and 7. At pH 9, the extract did not have detectable proteolytic activity in the two time periods studied. The results of the nematicidal assay showed that the active, crude extract of *Pleurotus* sp. showed a significant difference compared to the control group and the denatured crude extract ($p < 0.01$) in both fermentation times. In addition, there was no significant difference ($p > 0.05$) between the control and denatured groups for each fermentation period. The percentage reduction of *Panagrellus* sp. relative to the control group was 27 and 63% at the fermentation time of 45 and 75 days, respectively. With the increase in fermentation time, the proteolytic activity and the percentage reduction of nematodes increased. The evidence suggests that in addition to the toxins produced by the fungi, the proteases present in the crude extract also have a nematicidal effect.

Keywords: Biochemical control; Edible mushroom; Enzymes.

Atividade proteolítica e nematicida de *Pleurotus* sp.

O controle de nematoides por meio do extrato bruto livre de células do cogumelo, *Pleurotus* sp. foi avaliado em tempos de fermentação de 45 e 75 dias. A atividade proteolítica aumentou com o tempo de fermentação, de 3,5 a 15 U mL⁻¹ para o pH 5 e de 6 a 10 U mL⁻¹ para o pH 7. A atividade nematicida foi superior ao grupo controle em ambos os tempos de fermentação ($p < 0,01$) com redução de 27 e 63 % para 45 e 75 dias, respectivamente. Os resultados sugerem que as proteases presentes no extrato possuem efeito nematicida.

Palavras-chave: Controle bioquímico; Cogumelo comestível; Enzimas.

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