

Production of Inulinase by *Geotrichum candidum* Using Leek (*Allium ampeloprasum* var. *porrum*) as Substrate Under Low Magnetic Field Application

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Objectives: The aim of this study was to investigate the effects of low magnetic field (LMF) application on inulinase production by *Geotrichum candidum* and look for the usability of leek as a new substrate.

Methods: Leeks were obtained from local markets in Erzurum and washed, sliced, dried in oven at 80°C and finally were milled to a fine powder with mill. Solid state fermentation (SSF) was optimized using leek powder concentration, initial moisture content (%), initial pH and incubation time using normal magnetic field grown-yeast using classical one variable-at-a time method. To expose *G. candidum* to LMF at the levels of 4 and 7 mT, two wooden cylindrical coils wrapped with copper wire were used. The whole sample of each flask was extracted by the addition of 100 ml sodium acetate buffer (0.1 M, pH 5.5) and after centrifugation the supernatant was used as crude enzyme. Inulinase activity was determined in the supernatant at 592 nm. One unit of inulinase activity is defined as the amount of enzyme catalyzing the liberation of 1 µmol of glucose per min under the assay conditions.

Results and Discussion: The results showed that the highest inulinase production (371.4 U/gds) was obtained using 65% moisture content at 5.5 pH and 72 h of the fermentation. After LMF application, it was seen that both LMF applications affected *G. candidum* and caused increment on inulinase activity. The highest inulinase activity (535.2 U/g of dry substrate [gds]) was carried out at 7 mT on the magnetic field grown *G. candidum* and on the contrary the least activity was carried out by the control (412.1 U/gds). This work has an importance considering application of LMF on inulinase production by *G. candidum* in SSF using leek as sole carbon source. The results showed that the application of LMF was effective in getting higher inulinase activity; besides, utilization of LP instead of expensive sucrose or inulin provided cost-effective inulinase production.

Conclusion: This study showed that leek could be evaluated as an alternative carbon source for inulinase production due to its high inulin content and easy and cheap availability when compared to expensive materials (inulin, sucrose etc.).

Keywords: *Geotrichum candidum*, inulinase, leek, solid state fermentation