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Characteristics of free endoglucanase and glycosidases multienzyme complex from *Fusarium verticillioides*

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Abstract

A novel multienzyme complex, $E1_C$, and a free endoglucanase, E2 (GH5), from *Fusarium verticillioides* were purified. The $E1_C$ contained two endoglucanases (GH6 and GH10), one cellobiohydrolase (GH7) and one xylanase (GH10). Maximum activity was observed at 80 °C for both enzymes and they were thermostable at 50 and 60 °C. The activation energies for $E1_C$ and E2 were 21.3 and 27.5 KJ/mol, respectively. The K_M for $E1_C$ was 10.25 g/L while for E2 was 6.58 g/L. Both $E1_C$ and E2 were activated by Mn^{2+} and $CoCl_2$ while they were inhibited by SDS, $CuSO_4$, $FeCl_3$, $AgNO_4$, $ZnSO_4$ and $HgCl_2$. $E1_C$ and E2 presented endo-β-1,3-1,4-glucanase activity. $E1_C$ presented crescent activity towards cellopentaose, cellotetraose and cellotriose. E2 hydrolyzed the substrates cellopentaose, cellotetraose and cellotriose with the same efficiency. $E1_C$ showed a higher stability and a better hydrolysis performance than E2, suggesting advantages resulting from the physical interaction between proteins.

Key words: multienzyme complex; endoglucanase; cellobiohydrolase; xylanase; purification; *Fusarium verticillioides*.