

Production of cellulase by a wild strain of *Chaetomium globosum* using delignified oil palm empty-fruit-bunch fibre as substrate

ABSTRACT

Studies on the feasibility of using delignified oil palm empty-fruit- bunch (OPEFB) fibres as a substrate for cellulase production by *Chaetomium globosum* strain 414 were carried out in shake-flask cultures containing different types and concentrations of nitrogen source. Peptone, as nitrogen source, gave maximum production of all the three main components of the cellulase complex (endoglucanase or carboxymethylcellulase, cellobiohydrolase or filter-paper-hydrolysing enzyme and α -glucosidase), followed by yeast extract, urea, KNO₃ and (NH₄)₂SO₄. The maximum specific growth rate (μ (max)) of *C. globosum* strain 414 grown in medium containing OPEFB and peptone was 0.038 h⁻¹. In all the fermentations, the fungus was able to produce all the three cellulases with significant amounts of α -glucosidase, except when using (NH₄)₂SO₄ as nitrogen source, where α -glucosidase was not produced. With 6 g/l peptone and 10 g/l delignified OPEFB fibres, the fungus produced maximum concentrations of FPase, carboxymethylcellulase and α -glucosidase: 1.4, 30.8 and 9.8 U/ml, giving productivities of 10, 214 and 24 U l⁻¹ h⁻¹ respectively. The cellulase mixture, partially purified by ammonium sulphate precipitation, was able to hydrolyse delignified OPEFB fibres, converting about 68% of the celluloses to reducing sugars after 5 days.

Keyword: Oil palm empty-fruit-bunch fibre; Cellulase production; *Chaetomium globosum*