

Coculturing cellulolytic fungi: A method for enhancing cellulase production

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Cellulase enzyme from fungi has applications in many industries including biofuel, textile, paper and pulp etc. Therefore, the production of this enzyme is important. The aim of this study was to find out the effect of coculturing on cellulase production by cellulolytic fungi. The best cellulolytic fungal isolate which was morphologically identified to be *Trichoderma viridae* and other 19 isolates were cultured in two, three, four and five possible combinations in a randomly selected way to determine the cellulase production. Modified cellulase production medium described previously, was inoculated with fungal spore suspensions of concentration adjusted to 10^7 - 10^8 /ml in selected combinations. The inoculated flasks were incubated at 25 °C for a seven day-period at 120 rpm in a shaking incubator. The crude enzyme extracts were obtained from each coculture. Total cellulase assay was conducted using Whatman No.1 filter paper as the substrate. The reducing sugars formed were measured colourimetrically using UV-Visible spectrophotometer at 540 nm against glucose standards. Xylanase activities were measured by a previously published method modified slightly. Reducing sugars formed were measured by the same colourimetric method, using xylose standards. According to the results, out of all the cocultures a combination of four isolates (F1F2F3F4) had given the highest total cellulase activity of 0.69 FPU/ml and xylanase activity of 10.6 U/ml which was also the highest. This coculture combination included 4 fungal isolates *T.viridae*, *Gliocladium* sp and two other *Trichoderma* spp. The monoculture of *T.viridae*, isolate showed 0.492 FPU/ml of total cellulases activity. Accordingly, total cellulase activity had been significantly increased in coculture than in monoculture.

Keywords: Cellulase, Cellulolytic fungi, Coculturing