

Selection of potential fungi for production of cellulase-poor xylanase from rice straw

ABSTRACT

Recently, xylanase has attracted attention in the pulp and paper industry because of its bleach-boosting properties, which reduces chemical consumption during the bleaching process. Four fungi species, namely *Penicillium oxalicum* T3.3, *Aspergillus niger* ATCC 6275, *Colletotrichum gloeosporioides*, and *Pycnoporus sanguineus*, were studied to select which fungi can best produce cellulase-poor xylanase using rice straw as a substrate. The fungi were screened for xylanase production based on the clear zone formation on a malt extract agar (MEA) plate containing xylan. *P. oxalicum* T3.3 and *A. niger* ATCC 6275 showed greater clear zone formation on the agar plate than the other two studied fungi. These fungi were grown in a liquid medium containing rice straw as the substrate. *P. oxalicum* T3.3 showed the highest xylanase activity (65.89 U/mL) with lowest carboxymethyl cellulase (CMCase) (1.88 U/mL) and filter paperase (FPase) activity (0.16 U/mL) after four days of fermentation at 30 °C. *P. oxalicum* T3.3 produced higher xylanase activity when rice straw was used as a substrate compared to commercial xylan. Thus, cellulase-poor xylanase produced from *P. oxalicum* T3.3 has high potential for biobleaching application in the pulp and paper industry in terms of technical and biological performance and economical aspects.

Keyword: Xylanase; *Penicillium oxalicum* T3.3; Rice straw; Biobleaching; Pulp and paper