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Improvement of xylanase production by *Bacillus pumilus* under submerged fermentation

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Xylanase production by the alkalophilic *Bacillus pumilus* was improved under submerged fermentation when commercial Birchwood xylan was used as the substrate. Initially the medium containing commercial Birchwood xylan 20gL^{-1} at pH 8.5 was used. When the commercial Birchwood xylan concentration was 5gL^{-1} highest xylanase activity [$61.3 (\pm 0.96) \text{UmL}^{-1}$] was obtained at 24 h. The media substituted with raw materials of local carbon sources and considerable amount of xylanase was produced in the media containing corncob [$24.9 (\pm 0.99) \text{UmL}^{-1}$], corn hull [$18.2 (\pm 0.92) \text{UmL}^{-1}$] and rice straw [$21.5 (\pm 0.86) \text{UmL}^{-1}$] and lowest amount of activity was obtained with rice bran [$4.7 (\pm 0.98) \text{UmL}^{-1}$]. Xylan was extracted from local carbon source such as corncob, corn hull and rice straw and these were used as the carbon source in the media and Birchwood xylan was used as the control.

The highest xylanase activity was obtained in the medium with Birchwood xylan [$62.6 (\pm 0.89) \text{UmL}^{-1}$] than in the media which contained the xylan (5gL^{-1}) extracted from corncob [$29.8 (\pm 0.97) \text{UmL}^{-1}$] corn hull [$20.2 (\pm 0.99) \text{UmL}^{-1}$] and rice straw [$17.6 (\pm 0.98) \text{UmL}^{-1}$]. Due to the amount of xylose present in the xylan, the highest activity was obtained with Birch wood xylan. With Fructose [$70.6 (\pm 1.01) \text{UmL}^{-1}$] in the medium with Birchwood xylan induced the xylanase production (2gL^{-1}) than arabinose [$45.6 (\pm 0.68) \text{UmL}^{-1}$], sucrose [$40.6 (\pm 0.92) \text{UmL}^{-1}$], glucose [$37.9 (\pm 0.85) \text{UmL}^{-1}$], and control [without sugars $60.61 (\pm 0.78) \text{UmL}^{-1}$]. The highest xylanase production was observed in the medium that contained Tween -80 [$73.5 (\pm 1.79) \text{UmL}^{-1}$] than in the media which contained SDS [$6.6 (\pm 1.63) \text{UmL}^{-1}$] and Triton -100 [$33.6 (\pm 1.47) \text{UmL}^{-1}$]. Based on this study the xylanase production from *B. pumilus* was better with commercial Birchwood xylan than that extracted from different local sources. Xylanase production was induced by fructose and this secretion was increased by Tween-80.

Key words: Corncob, corn hull, Rice straw, Tween- 80, xylanase and Xylan