

## Expression of a thermostable xylanase gene from *Bacillus coagulans* ST-6 in *Lactococcus lactis*

### ABSTRACT

**Aims:** The aim of the study is to evaluate whether xylanase can be used as a potential reporter gene for cloning and expression studies in *Lactococcus*. **Methods and Results:** The 750 bp xylanase gene was amplified and subcloned into the unique *NheI* restriction enzyme site of pMG36e and subsequently transformed into competent *Escherichia coli* XLI-blue MRF cells and *Lactococcus lactis* cells. Bacterial culture containing pMG36e-Xy has an enzyme activity of 390  $\mu\text{g xylose ml}^{-1} \text{ culture } 30 \text{ min}^{-1}$ , respectively, when compared with 40  $\mu\text{g xylose ml}^{-1} \text{ culture } 30 \text{ min}^{-1}$  for the negative control (plasmidless strain). **Conclusions:** The thermostable xylanase gene was successfully expressed in both *E. coli* and *L. lactis*. The activity of xylanase can be easily detected by the formation of visible clearing zones around the transformed colonies on Remazol Brilliant Blue-Xylan (RBB-Xylan) agar media. However, there were some significant differences in the optimum growth temperature and plasmid stability in the new clones. **Significance and Impact of the Study:** The constructed reporter vector has the potential to be used as a reporter system for *Lactococcus* as well as *E. coli*, and it is an addition to the pool of lactococcal vector systems.

**Keyword:** cloning, expression, *Lactococcus*, xylanase