

L-LACTIC ACID PRODUCTION BY BACILLUS COAGULANS DSM 2314 FROM EUCALYPTUS HEMICELULOSIC LIQUOR

Alberto Liguori^a, Eugenia Vila^a, Laura Camesasca^a, Florencia Cebreiros^a, Mairan Guigou^a,
María-Noel Cabrera^b, Mario Daniel Ferrari^a, Claudia Lareo^a

^a *Departamento de Bioingeniería, Instituto de Ingeniería Química, Facultad de Ingeniería, Universidad de la República;* ^b *Grupo de Ingeniería de Procesos Forestales Instituto de Ingeniería Química, Facultad de Ingeniería, Universidad de la República.*

Lactic acid is one of the main industrial bioproducts from commercial perspective. It is a highly versatile chemical that can be used in pharmaceutical, food and textile industries. The aim of this work was to study the L-lactic acid production from eucalyptus hemicellulosic liquor by *B. coagulans* DSM 2314.

Bacterial fermentations were carried out in 1-L Biostat A Plus (Sartorius) bioreactor with 350 mL of medium prepared from non-detoxified and detoxified eucalyptus hemicellulosic liquor at 55°C, pH 7, 150 rpm in anaerobiosis conditions. The pH was maintained at 7.0±0.1. Liquor detoxification was performed by resin Amberlite®-XAD-4. An assay was also performed with modified MRS media (xylose concentration, 20 g/L) as control. Liquor had (in g/L): xylose 29; glucose 3.4; furfural 0.1 and phenols 2.4. Detoxified liquor had (in g/L): xylose 24; glucose 0.3 and phenols 0.6.

In non-detoxified liquor, 12 g/L of lactic acid was obtained after 48 h with a yield of 0.56 g of lactic acid produced per gram of sugar (xylose and glucose) consumed, with a xylose consumption of 54%. The detoxification of the liquor improved the performance of *B. coagulans*, exhibiting a concentration of 16 g/L and a yield of 0.73 g/g after 24 h, with a xylose consumption of 92%. However, tests with liquor had a lower performance than MRS medium, which reached a lactic acid concentration of 19 g/L after 24 h with a yield of 0.95 g/g with complete xylose consumption.