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Title

Co-fermentation of the main sugar types from a beechwood organosolv hydrolysate by several strains of *Bacillus coagulans* results in effective lactic acid production.

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Highlights

- Batch cultivation of *Bacillus coagulans* using beechwood organosolv hydrolysate.
- Co-fermentation of glucose, xylose, and cellobiose in lactic acid production.
- Five strains of *B. coagulans* exhibited different abilities for cellobiose uptake.
- Growth performance evaluation using a Monod-type model.

Abstract:

Bacillus coagulans is an interesting facultative anaerobic microorganism for biotechnological production of lactic acid that arouses interest. To determine the efficiency of biotechnological production of lactic acid from lignocellulosic feedstock hydrolysates, five *Bacillus coagulans* strains were grown in lignocellulose organosolv hydrolysate from ethanol/water-pulped beechwood. Parameter estimation based on a Monod-type model was used to derive the basic key parameters for a performance evaluation of the batch process. Three of the *Bacillus coagulans* strains, including DSM No. 2314, were able to produce lactate, primarily via uptake of glucose and xylose. Two other strains were identified as having the ability of utilizing cellobiose to a high degree, but they also had a lower affinity to xylose. The lactate yield concentration varied from 79.4 ± 2.1 g/L to 93.7 ± 1.4 g/L (85.4 ± 4.7 % of consumed carbohydrates) from the diluted organosolv hydrolysate.

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