An efficient process for lactic acid production from wheat straw by a newly isolated Bacillus coagulans strain IPE22

A thermophilic lactic acid (LA) producer was isolated and identified as Bacillus coagulans strain IPE22. The strain showed remarkable capability to ferment pentose, hexose and cellobiose, and was also resistant to inhibitors from lignocellulosic hydrolysates. Based on the strain’s promising features, an efficient process was developed to produce LA from wheat straw. The process consisted of biomass pretreatment by dilute sulfuric acid and subsequent SSCF (simultaneous saccharification and co-fermentation), while the operations of solid–liquid separation and detoxification were avoided. Using this process, 46.12 g LA could be produced from 100 g dry wheat straw with a supplement of 10 g/L corn steep liquid powder at the cellulase loading of 20 FPU (filter paper activity units)/g cellulose. The process by B. coagulans IPE22 provides an economical route to produce LA from lignocellulose.