

Strategy for biological co-production of levulinic acid and polyhydroxyalkanoates by using mixed microbial cultures fed with synthetic hemicellulose hydrolysate

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Hemicellulose hydrolysates (HH), which could be an interesting carbon source to feed mixed microbial cultures (MMC) able to accumulate high value-added compounds. This research focused on the evaluation of a culture strategy to achieve the simultaneous biological production of Levulinic Acid (LA) and Polyhydroxyalkanoates (PHA) by MMC fed with a synthetic HH (SHH). The culture strategy involves the use of sequential batch reactors (SBR) to select microorganisms capable of producing LA and PHA. This work proved that the cultivation strategy used allowed the biological production of LA, reaching 37%w/w when the SHH was composed of 85% pentoses. In addition, the simultaneous biological production of LA and PHB was possible when the SHH was enriched with acetate (45% pentoses + 50% acetate). Finally, this study showed that the composition of the SHH impacts directly on the selected microorganism genus and the type and quantity of the value-added compounds obtained. © 2020 Elsevier Ltd

Hemicellulose hydrolysate

Levulinic acid biological production

Mixed microbial cultures

Polyhydroxyalkanoates and levulinic acid co-production

Batch reactors

Microorganisms

Organic acids

Biological co

Biological production

Carbon source

Hemicellulose hydrolysates

Levulinic acid

Mixed microbial culture

Polyhydroxyalkanoates

Sequential batch reactors

Cellulose

acetic acid

carbohydrate derivative

dissolved oxygen

hemicellulose

hemicellulose hydrolysate

levulinic acid

pentose

polyhydroxyalcanoate

polyhydroxyalkanoic acid

polymer

unclassified drug

levulinic acid

polysaccharide

acetate

biological production

bioreactor

biotechnology

cellulose

hydrolysis

microbial activity

organic acid

Article

biomass production

biotechnological procedures

biotechnological production

carbon source

chemical composition

evaluation study

microbial community

microbial culture

microbiological examination

microbiological phenomena and functions

nonhuman

priority journal

reactor operation

renewable resource

bioreactor

Cellulose

Evaluation

Feeds

Levulinic Acid

Microorganisms

Organic Acids

Pentoses

Production

Bioreactors

Levulinic Acids

Polyhydroxyalkanoates

Polysaccharides