BCIL Biotech Consortium India Limited

Genetically engineered *Candida tropicalis* K2M strain for enhanced production of Xylitol via efficient corncob-based xylitol-ethanol biorefinery

TECHNOLOGY AVAILABLE FOR TRANSFER

UNMET NEED AND OPPORTUNITY

Sugar is a form of carbohydrate which has extensive use as sweetener in food, confectionaries and many other industries. However, use of excess sugar may leads towards health hazards, especially affects dental health. Thus, the use of sugar substitutes like Xylitol has a great market potential and is of utmost importance because its tastes sweet but doesn't cause any tooth decay. The production of Xylitol can be done by chemical synthesis method or biological production. Although the biological production is always having a positive edge over chemical production as it minimizes any toxicity concerns. The biological production is mainly performed by fermentation method for industrial production.

In the present invention, we provide an integrated biorefinery system for enhanced production of Xylitol (Sugar substitute) and ethanol by mutated Candida tropicalis K2M strain, with the use of corn cob as substrate which causes minimum waste generation.

TECHNOLOGY

The present invention provides a genetically engineered strain of *C. tropicalis* for the production of Xylitol which is a sugar alcohol. Microbial xylitol production reduces the risk of contamination and is considered as environment friendly and sustainable as compared to the chemical method. The present invention also eliminates the requirement of co-substrate for corn-cob based xylitol-ethanol biorefinery by employing random mutagenesis and genetic engineering approaches to develop *C. tropicalis* strain. This corncob based biorefinery leads to the production of 32.6 g/L xylitol from hemicellulosic fraction, 32.0 g/L ethanol from cellulosic fraction and 13.0 g/L animal feed (Fig 1A).

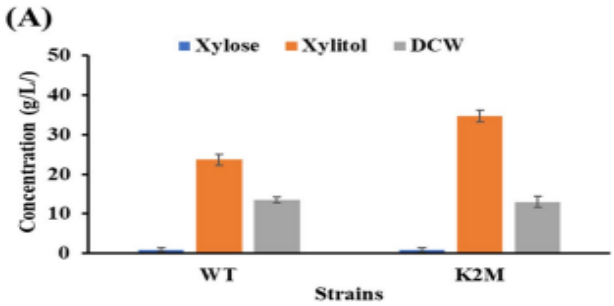

Fig. 1A shows xylose consumed, xylitol produced and dry cell weight (DCW) of selected yeast mutant

K2M and WT during fermentation using 5% w/v xylose.

UNIQUE SELLING PROPOSITIONS

- **Quality** – Biocompatible and biodegradable.
- **Enhanced efficacy** – Development of K2M strain of *C. tropicalis* by random mutagenesis eliminates the requirement of co-substrate for corn-cob based xylitol-ethanol biorefinery and enhances efficacy for Xylitol production.
- **Cost effective** –High productivity and better optimization leads towards minimum waste generation. Hence, highly cost effective.

APPLICATION

Pharmaceuticals, cosmetic, food and beverage industry.

LICENSING OPPORTUNITY

BCIL is looking for suitable industrial partner for commercialization of this genetically engineered *C. tropicalis* strain for enhanced production of Xylitol through corncob based Xylitol-ethanol biorefinery system.

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