



## Xylitol Production from isolated Acidophilic *Meyerozyma caribbica* CP02 using Rice Straw Hydrolysate

TECHNOLOGY AVAILABLE FOR TRANSFER

### UNMET NEED AND OPPORTUNITY

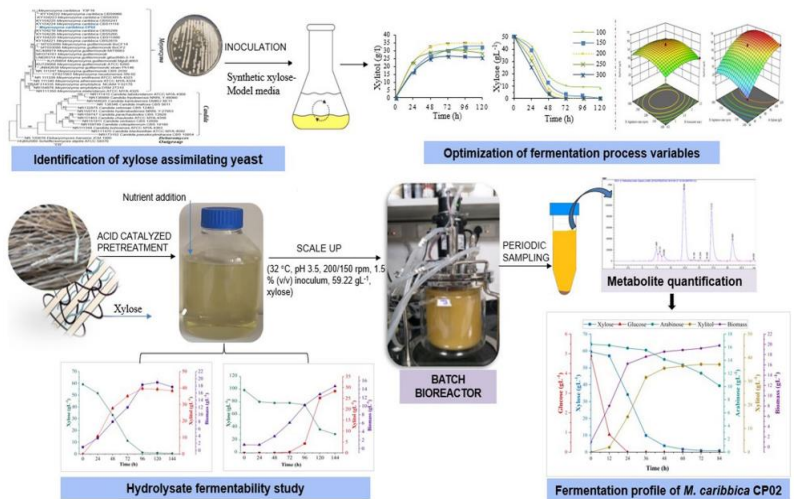
Xylitol is a five-carbon sugar alcohol, found diversely in many fruits and vegetables. The increasing commercial demand of xylitol is due to its unique properties such as absence of Maillard reaction, less calorific value, insulin-independent metabolism, anti-cariogenic and remineralization properties. This polyol sugar has shown tremendous applications in food, pharmaceutical, medical, and cosmetic sectors. The microbial method of xylitol synthesis is more preferred over chemical synthesis due to high product yield, cost-effectiveness and environment friendly process. Rice straw (RS), a lignocellulosic biomass (LCB), is a cheap source of xylose which can be utilized for microbial xylitol synthesis. However, aliphatic acids, furans and total phenols, produced during pretreatment of LCB, inhibits the microbial growth and product formation. **The current technology removed 77.9% of inhibitors from the Rice Straw Hydrolysate (RSH).** Till date, no sustainable method is available for delignification, detoxification, and decolorization of biomass in a single step. Hence, there is a dire need to develop scalable, sustainable, and cost-effective solution to valorize RS for the development of commercially relevant value-added products such as xylitol.

**The present groundbreaking technology offers a one-step solution for delignification, detoxification, and decolorization of RS biomass followed by microbial fermentation using newly isolated *Meyerozyma caribbica* CP02, thereby significantly reducing the cost of xylitol production.**

### TECHNOLOGY

#### The present technology comprises:

- One step delignification, detoxification, and decolorization of RS biomass using advanced oxidation process. A total 86% of xylose is extracted from Rice Straw Hydrolysate (RSH).
- A newly isolated acidophilic yeast strain *Meyerozyma caribbica* CP02 (optimum pH: 3.4) has been utilized for xylitol production.
- Xylitol production of 0.63 g<sub>xylitol</sub>/g<sub>xylose</sub> (65%) has been achieved using RSH as xylose substrate after 72 hours of fermentation in 3 Liter bioreactor.
- One step purification has been used followed by crystallization to purify xylitol from the fermentation broth. 60% xylitol crystals have been obtained from the broth.
- The purity of crystallized xylitol is 95%.





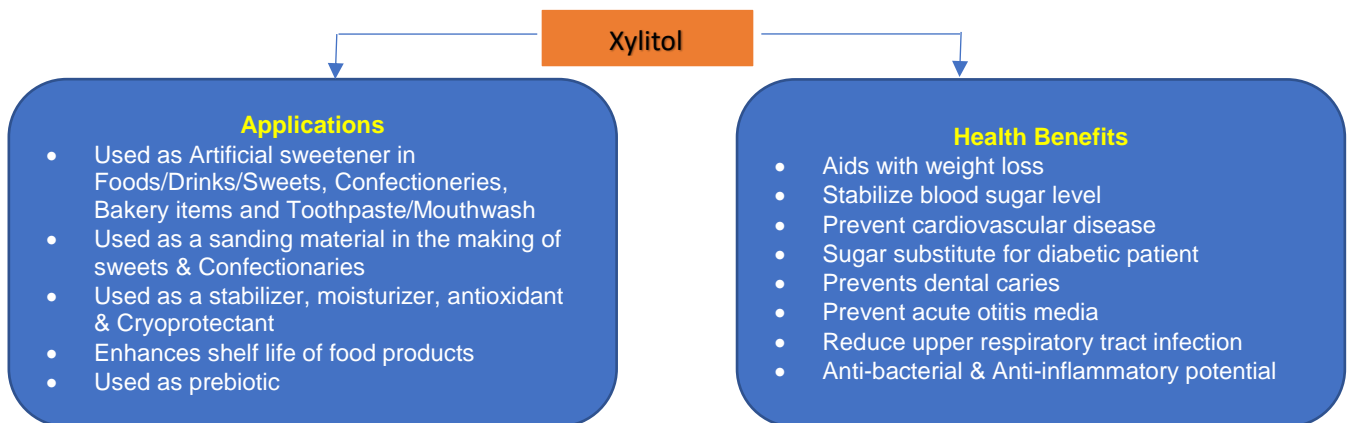
## STAGE OF DEVELOPMENT

TRL-5.

## UNIQUE SELLING PROPOSITIONS

- **Novelty-** Newly isolated *Meyerozyma caribbica* CP02, an acidophile, which works well for xylitol production under extreme acidic pH. Its activity is stable over a broad pH range. This robust strain is also inhibitor tolerant.
- **One-Step Pretreatment Efficiency-** It uses ozone, hydrogen peroxide, and activated charcoal in a single step, simplifying detoxification, decolorization, and delignification of RSH. It removes 77.9% inhibitors from RSH as compared to 72.54% inhibitors removed from RSH treated with the conventional method.
- **One-Step Purification Efficiency-** Xylitol is purified from the fermentation broth using a single step followed by crystallization. The purity of crystalized xylitol is 95% as compared to 92% purity of commercial xylitol crystals.
- **Cost effective-** Cost effective technology for pretreatment of RSH and production of xylitol.
- **Xylose Preservation-** Ensure minimal xylose loss and a slight increase in RSH xylose levels through this method, surpassing outcomes from common physical therapies.
- **Ease of use** – Easy to process, biocompatible.

## APPLICATION



## INTELLECTUAL PROPERTY

Indian patent filed

## LICENSING OPPORTUNITY

BCIL is looking for suitable industrial partner for commercialization of this technology.

### CONTACT:

Dr. Purnima Sharma, Managing Director

**BIOTECH CONSORTIUM INDIA LIMITED**

V Floor, Anuvrat Bhawan, 210, Deen Dayal Upadhyaya Marg,

New Delhi:110002 Phone: +91-11-23219064-67,

Fax: +91-11-23219063

Email: [tto.bcil@biotech.co.in](mailto:tto.bcil@biotech.co.in) & [info.bcil@biotech.co.in](mailto:info.bcil@biotech.co.in)

Website: [www.biotech.co.in](http://www.biotech.co.in)