



## Biotech Consortium India Limited

### A STRESS-TOLERANT YEAST STRAIN FOR EFFICIENT ETHANOL PRODUCTION FROM HIGH-SUGAR CONCENTRATIONS

TECHNOLOGY AVAILABLE FOR TRANSFER

#### UNMET NEED AND OPPORTUNITY

The production of ethanol from high-sugar concentration solutions is critical for the biofuel and biochemical industries. However, yeast cells exposed to high sugar concentrations experience significant osmotic stress leading to reduced growth rates and ethanol yields, while increasing the formation of undesired byproducts such as glycerol. Thus, *developing robust microbial strains and optimized fermentation strategies is essential for enhancing ethanol fermentation efficiency, offering a critical alternative to current technologies.*

#### TECHNOLOGY

A robust yeast strain capable of fermenting high sugar concentration at very fast rates and very high fermentation efficiencies in the temperature range 25 to 40 °C or in presence of salt.

#### UNIQUE SELLING PROPOSITION

- **Robust non-GMO strain:** Efficient at wide temperature range (25-40 °C), Applicable in both freshwater and salt water
- **High gravity fermentation:** Works at sugar concentration up to 50% (w/v).

	Adapted novel strain
Ethanol yield	0.49 g/g
Ethanol titre	23.4% v/v
Ethanol production efficiency with 35% sugars	97%
By-products (Glycerol)	53 g/L

#### STAGE OF DEVELOPMENT

Technology is validated at 20 L bioreactor scale and ready for scale up.

#### STRAIN CHARACTERISTICS

Comparison between **control & adapted strain** in medium containing **35% (w/v) glucose, at 30 °C**

Cell type	Growth rate (h <sup>-1</sup> )	Biomass yield (g/g)	Ethanol yield (g/g)
Control	0.062 ± 0.007	0.166 ± 0.013	0.40 ± 0.01
Adapted	0.158 ± 0.009	0.123 ± 0.014	0.52 ± 0.01

**High temperature fermentation (40 °C)** of yeast in a medium containing only **30% (w/v) glucose**

Cell type	Ethanol titre (g/L)	Yield (g/g)	Biomass yield (g/g)	Residual glucose (g/L)
Control	96 ± 3	0.36 ± 0.02	0.172 ± 0.010	30 ± 3
Adapted	146 ± 6*	0.49 ± 0.01*	0.140 ± 0.008*	N.D.

**Note:** Similar performance was achieved when fermenting **molasses** (30 – 35% total sugars) at both 30 and 40 °C

#### INTELLECTUAL PROPERTY

Patent filed in India

#### LICENSING OPPORTUNITY

BCIL is looking for suitable licensees for transfer of this technology.

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