

Production of Glycolipid Biosurfactants from Yeasts

Tech ID: 24093 / UC Case 2014-225-0

ABSTRACT

Method of using basidiomycetous yeasts to convert carbohydrates to glycolipid biosurfactants.

FULL DESCRIPTION

Sophorolipids are non-petroleum based biodegradable glycolipid biosurfactants used in household and industrial cleaners, as well as in agricultural pest control products. These molecules have surfactant activity because they consist of a hydrophobic fatty acid conjugated to a hydrophilic disaccharide. Currently, commercial production of sophorolipids involves an ascomycetous yeast, *Starmerella bombicola*, grown on a combination of sugar plus a hydrophobic substrate usually composed of glucose plus vegetable oil or purified oleic acid.

Researchers at the University of California, Davis have discovered a novel yeast species that is capable of synthesizing and secreting sophorolipids when grown on sugar alone, rather than on a sugar and oil combination. This allows for a solvent-free, more economical harvesting and purification of the product. This invention overcomes the three major obstacles of current production methods: the expenses of harvesting the cells from the media, lysing the cells, and extracting the oil using organic solvents. The yeast discovered by the UC Davis researchers secretes the desired oils extracellularly, allowing for the recovery of the oil without the need to lyse the cells. Harvesting the oil without the use of organic solvents makes the process significantly less costly and more environmentally friendly.

APPLICATIONS

- ▶ Low-foaming applications including laundry and dishwashing detergents
- ▶ Antifoam activity for industrial fermentations, petroleum recovery, cleansing processes, and more
- ▶ Surfactant activity for use as cleanser, detergent, dispersant, wetting agent, mixing/blending agent and/or emulsifier
- ▶ Cosmetic uses including emollient and humectant
- ▶ Industrial and consumer product use as an instantizer, viscosity modifier, lubricant, and/or release agent
- ▶ Agricultural use as potential biocontrol agent against insects, viruses, fungi or bacteria

FEATURES/BENEFITS

- ▶ Secretion of extracellular glycolipids allows recovery without lysing the cells
- ▶ Harvesting the glycolipids does not require use of organic solvents making it less costly and more environmentally friendly
- ▶ Improved production yields
- ▶ Synthesis without a hydrophobic substrate

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	10,196,663	02/05/2019	2014-225

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OTHER INFORMATION

KEYWORDS

biosurfactants,

sophorolipids, yeasts, oils,

glycolipids, cleaners, pest
control, detergents,

cosmetics, petroleum,

dispersant, wetting agent,

emulsifier, emollient,

humectant, instantizer,

lubricant, release agent,

biocontrol agent, viscosity
modifier

CATEGORIZED AS

- ▶ **Agriculture & Animal Science**
 - ▶ Chemicals
 - ▶ Other
- ▶ **Biotechnology**
 - ▶ Industrial/ Energy
 - ▶ Other
- ▶ **Materials & Chemicals**

RELATED CASES

2014-225-0, 2014-654-0

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

► Breast Milk as a Source, Incubation/Storage Medium, and Delivery System for Infant Mucosal Immunity Bacteriophage

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