

XYLOSYL-XYLITOL OLIGOMERS AND THEIR MICROBIAL AND ENZYMATIC PRODUCTIONS

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OTHER INFORMATION

CATEGORIZED AS

- » **Agriculture & Animal Science**
- » Chemicals
- » Nutraceuticals
- » Transgenics
- » **Biotechnology**
- » Food

RELATED CASES

2014-162-0

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	9,670,515	06/06/2017	2014-162

BRIEF DESCRIPTION

Lignocellulosic biomass derived from plant cell walls is the most abundant raw material for biofuels and renewable chemicals production. Hemicellulose comprises about 30% of the total weight of lignocellulosic biomass. In contrast to cellulose, hemicellulose components are readily depolymerized into short oligomers and released into the liquid phase during pretreatment. It is of great interest to convert the released hemicellulose components into fuels or other value-add chemicals for building an economical biomass conversion process.

There are ten times more microorganisms than human cells in a healthy adult. The symbiosis between the microbiome and human organs is increasingly recognized as a major player in health and well-being. Xylooligosaccharides and xylitol, both derived from hemicellulose, can benefit gut flora and oral flora, respectively.

Xylooligosaccharides (XOS, also called xylodextrins) are naturally occurring oligosaccharides, found in bamboo shoots, fruits, vegetables, milk and honey. Industrial scale production of XOS can be carried out with much less expensive lignocellulosic materials by hydrothermal treatment or enzymatic hydrolysis. A broad range of applications of XOS have been demonstrated, including as functional food, prevention and treatment of gastrointestinal infections, animal feed for fish and poultry, agricultural yield enhancer and ripening agent, and as active agents against osteoporosis, pruritus cutaneous, otitis, and skin and hair disorders. In the current market, the most important applications of XOS correspond to ingredients for functional foods as a prebiotic, or formulated as synbiotics. XOS has been shown to promote beneficial bacteria *Bifidobacterium adolescentis* growth *in vitro* and *in vivo*. It has been estimated that the prebiotics market will reach \$4.8 billion by 2018.

Xylitol is another hemicellulose-derived compound beneficial to human health. For many bacteria and yeasts, the uptake of non-utilizable xylitol interferes with hexose utilization, which helps the human body to rebuild a healthy microbiome. Xylitol has been used to prevent middle ear infections and tooth decay. In addition, xylitol possesses 33% fewer calories but similar sweetness compared to sucrose and has been widely used as a substitute sweetener. While chemical hydrogenation of xylose remains the major industrial method of xylitol production, microbial fermentation has become more popular in the newly built plants due to lower conversion cost. There exists a need for improved methods of producing xylooligosaccharides and related compounds, such as xylooligosaccharides with xylitol components.

UC researchers discovered a new set of fungal metabolic intermediates, named xylosyl-xylitol oligomers and developed the enzymatic and microbial fermentation method to produce such compounds. The detection and purification methods have also been developed.

SUGGESTED USES

- 1. Sweetner
- 2. Prebiotic
- 3. Anti-infection medicine

ADVANTAGES

Improved methods and less costly reagents.

RELATED MATERIALS

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- [Modulation Of Engineered Immune Cell Receptor Translation Using Noncoding Sequence Elements](#)



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