INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS

Name of the Student	:	Rwivoo Baruah
Roll Number	:	126106028
Programme of Study	:	Ph.D.

Thesis Title: Production and characterization of dextran and prebiotic isomalto-oligosaccharides from *Weissella cibaria* RBA12 isolated from Pummelo (*Citrus maxima*) for functional food applications

Name of Thesis Supervisor(s)	:	Prof. Arun Goyal
Thesis Submitted to the Department/ Center	:	Biosciences and Bioengineering
Date of completion of Thesis Viva-Voce Exam	:	03-11-2017
Key words for description of Thesis Work	:	*Weissella cibaria*, Dextransucrase, Dextran, Isomaltooligosaccharides

SHORT ABSTRACT

Dextran producing lactic acid bacteria was isolated from the pulp of pummelo (*Citrus maxima*) and was phenotypically and biochemically characterized. Its was identified to be *Weissella cibaria* with the strain name given as RBA12 by 16S rRNA gene sequence analysis. The production conditions of enzyme dextransucrase was optimized from *Weissella cibaria* RBA12 and the enzyme was purified and characterized for the synthesis of isomalto-oligosaccharides. The production of dextran by *Weissella cibaria* RBA12 was optimized and the dextran production was scaled up to 2.5 L in batch fermentation followed by studies in dextran production in fed-batch fermentation. The dextran produced by *Weissella cibaria* RBA12 was also structurally and physico-chemically characterized. The functional food applications of the synthesized isomalto-oligosaccharides (IMO) and dextran were explored. The IMOs were purified by Bio-Gel P-2 chromatography and characterized by HPLC-RI and ESI-TOF MS analyses. The prebiotic IMOs and di-saccharides were produced by dextransucrase acceptor reaction using mango and pineapple juices utilizing their native sugars which acted as acceptors. The in vitro studies using simulated gastric juices, α-amylase and intestinal fluid were carried out on dextran for characterizing its prebiotic potential. The in situ production of dextran by *Weissella cibaria* RBA12 in whole wheat flour, wheat bran and rye bran was carried out in order to assess its application in the sourdough fermentation.