

**FORMULATION AND DEVELOPMENT OF PREBIOTIC
CAPSULE**

**BY
FATHIMA HAJARA ASLAM**

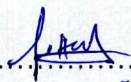
Thesis submitted to the university of Sri-Jayewardenapura for the
award of the Degree of Master of Science in Food Science and
Technology on 24th of July 2015

Declaration

"The work described in this thesis was carried out by me under the supervision of Dr. Jagath Wansapala and a report on this has not been submitted in whole or in part to any university or institution for another degree/diploma".

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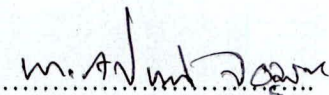
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AKNOWLEDGEMENT

This is to express my deep sense of gratitude to all those, who helped me to complete this research project successfully. I would like to express my sincere gratitude and heartfelt thanks to my supervisor Dr. Jagath Wansapala, Head of department of Food Science and Technology and coordinator for Food science and Technology program, University of Sri-Jayewardenepura for his irreplaceable generosity, inspiring, guidance and encouragement made me successful on this work.

I wish to express my sincere thanks to the Managing Director of MicroChem Laboratories Manel Perera and other staff members for their interest and valuable assistance toward this research project.

I am grateful for Samanthi Udayangani and Anusha Kaneshapillai who gave massive support in completion of this project.

Countless thanks goes to Dr. Rupika Perera, Assistant coordinator for Food Science and Technology programme from Department of Food Science and Technology University of Sri-Jayewardenepura, for her assistance and generous support during the laboratory session of this research project.

I also wish to thanks all the members of the laboratory of the Food Science and Technology for their kind cooperation and warm friendship.

I greatly appreciate Mr. Dias, Senior Lecturer of the Statistic Department from University of Sri-Jayewardenepura for his immense support in statistical analysis of the data obtained.

I would like to take this opportunity to express my sincere thanks to Mr. Ahamed Aslam and Abdus Sammad Ibrahim who funded this project. Last but not least support goes to Ms. Mufeeda and my family members for their sustained support and encouragement.

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ABSTRACT

Felicitating probiotics by prebiotics attribute to harvest the promised health benefits from probiotics. This study aims to produce an integrated prebiotic combination which consists three different sources of plant extracts, which is capable to significantly increase the growth of two probiotic species, *Lactobacillus acidophilus* and *Bifidobacterium animalis* subsp. *lactis* BB-12 separately *in vitro* and thereby optimize health benefits. The three different sources of prebiotics considered in this experiment were fibre, polyphenolic extracts and non-digestible polysaccharide extracts which were isolated from *Musa* sp pseudostem, *Sesbania grandiflora* flowers and *Artocarpus heterophyllus* seeds. Eight treatments were designed by integrating three sources of prebiotics at two different levels i.e; fibre (0.2% and 2%), polyphenolic extracts (0.2% and 0.6%) and non-digestible polysaccharide extracts (0.2% and 1.2%). Three treatments were designed by including only one ingredient at a time i.e; fibre 0.2%, polyphenolic extracts 0.2% and non-digestible polysaccharide extracts 0.2%. The effect of all eleven treatments were assessed against the growth promoting ability on *L. acidophilus* and *B. animalis* subsp. *lactis*-BB12 in liquid culture media and analysed using Minitab-16 Statistical software. The treatment which consisted 2% fibre, 0.2% polyphenolic extract and 0.2% non-digestible polysaccharide extract was able to produce a peak proliferation for *L. acidophilus*, while the treatment consisting 2% fibre, 0.6% polyphenolic extracts and 0.2% non-digestible polysaccharide extracts resulted in the highest proliferation for

B. animalis subsp. *lactis* BB-12 *in vitro* which were significantly different ($p < 0.05$) than rest of the treatments. Test probiotic organisms supplemented with integrated prebiotic combinations, showed higher growth rate than, when grown with treatments with one prebiotic ingredient at a time. *Musa* sp fibre isolate showed higher potential to cause significant increase of *L. acidophilus* biomass, while polyphenolic extracts of *Sesbania grandiflora* flower imposed significant effect on increasing the growth of *B. animalis* subsp. *lactis*-BB12 when considered as separate entities in liquid culture media. The integrated treatments which showed the highest growth promoting effect on *L. acidophilus* and *B. animalis* subsp. *lactis* BB-12 were encapsulated by hand filling to be administrated orally on daily basis.