

MAXIMIZING PROLIFERATION OF *Lactobacillus acidophilus* AND *Bifidobacterium animalis* SUBSP. *lactis* BB-12 *in vitro* BY INTEGRATING DIFFERENT SOURCES OF PREBIOTICS/

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Felicitating probiotics by prebiotics attribute to harvest the promised health benefits from probiotics. This study aims to produce an integrated prebiotic combination which consists of three different sources of plant extracts, capable of significantly increasing the growth of two probiotic species, *Lactobacillus acidophilus* and *Bifidobacterium animalis* subsp. *lactis* BB-12 separately *in vitro* and thereby optimizing 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 *Bifidobacterium 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 *Lactobacillus acidophilus*, while the treatment consisting 2% fibre, 0.6% polyphenolic extracts and 0.2% non-digestible polysaccharide extracts resulted in the highest proliferation for *Bifidobacterium animalis* subsp. *lactis* BB-12 *in vitro* which were significantly different ($p < 0.05$) from 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 of causing significant increase of *Lactobacillus acidophilus* biomass, while polyphenolic extracts of *Sesbania grandiflora* flower imposed significant effect on increasing the growth of *Bifidobacterium animalis* subsp. *lactis*-BB12 when considered as separate entities in liquid culture media.

Keywords: *L. acidophilus*, *B. animalis* subsp. *lactis* BB-12, *S. grandiflora*