Suman Singh et al., Oral Health Dent Manag 2016, 15:7(Suppl)
http://dx.doi.org/10.4172/2247-2452.C1.039

Study of extracellular enzymes of *Pediococcus acidilactici:* An approach towards understanding of action molecules of Probiotics

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Pediococcus acidilactici is a Gram positive lactic acid bacteria (LAB) being used as a starter culture in dairy and meat industry to balance the microflora. It's *in vitro* studies confirmed all the basic probiotic attributes. A range of proteolytic activites and β-galactosidase activity confer probiotic as well as industrial significance to *P. acidilactici*. It's resistance to lysozyme suggest its usefulness for new born and infants being fed on mother's milk. Recent studies were focused on extracellular enzymes of *Pediococcus acidilactici*. Peptidoglycan hydrolyses (PGHs) were partially purified and characterized. Spectrum of PGHs was studied in renaturing SDS-PAGE by varying substrates (*Bacillus cereus, Staphylococcus albus* and *Micrococcus lysodeikticus*). PGH band intensity decreased in the presence of NaCl whereas additional lytic bands appeared in the presence of EDTA. PGHs also exhibited broad growth inhibiting spectrum against both Gram positive and Gram negative bacteria. They can be used in controlling harmful and pathogenic bacteria. PGHs studied under different conditions ranged within 11 to 50 KDa which was also confirmed by genome mining studies using bioinformatics. DPP-II, an exopeptidase was purified and characterized. This was 38.7 KDa homodimer that worked optimally at pH 7.0 and 370 C and retained more than 90% activity at 500C. TLC and HPLC analysis of DPP-II treated collagen revealed release of free amino acids and different metabolites of biological significance. Microscopic analyses of DPP II treated chicken's chest muscles (meat) revealed change and hydrolysis of myofibrils thereby suggesting the possible role of this strain in affecting the flavor and texture of meat. Being protein of LAB, it is also expected to be safe. Future studies are in progress for gaining insight in mechanism of action of this probiotic as well as biochemical, molecular and metabolic characterization of this strain.

Biography

Suman Singh is presently working as an Associate Professor, Dept of Biochemistry Kurukshetra University, Kurukshetra. She did her master's from National Dairy Research Institute, Karnal (India) and subsequently did Ph.D. in Biochemistry from Kurukshetra University, Kurukshetra. For the last 13 years, she is teaching at post graduate level and guiding research. She has also worked at the German Institute of Human Nutrition, Potsdam-Rehbrucke, Germany. She has completed two research projects and currently running a Young Scientist Award cum research project funded by Department of Science and Technology, New Delhi India. She has published more than 30 research papers in accredited scientific Journals. She is working on Pediococcus species for exploring its probiotic potential and probioceuticals which can also be used in dairy, food and meat industries. Her focus is to find out action molecules and biomarkers of probiotics.

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