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Molecular characterisation of Lactobacilli isolated from fermented idli batter and evaluation for probiotic potential

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Lactic acid bacteria (LAB) are non pathogenic organism widely distributed in nature. LAB has an important role in the preservation of foods and fermented products and is designated as GRAS (Generally regarded as safe). They are commercially used as starter cultures in the manufacture of dairy products, fermented vegetables, fermented dough, alcoholic beverages and meat products. In this study, molecular characterization was performed by RAPD, 16S rRNA analysis, 16S ARDRA and Multiplex PCR for species identification for the eight isolates from fermented idli batter. RAPD was carried out using the primer R2 and M13 which resulted in five different clusters. 16S rRNA analysis showed 99 to 100 % homology towards Lactobacillus plantarum. The restriction digestion pattern was similar for all the isolates with the restriction enzyme Alu I. The subspecies were identified by performing Multiplex PCR using species specific primer. The clusters were clearly identified as Lactobacillus plantarum subsp. plantarum, Lactobacillus pentosus and Lactobacillus plantarum subsp. argentoratensis. The isolates were able to tolerate up to 0.3% of bile for 4- 6 hours and pH 2.5, 3.5, 4.5, 6.5, 7.5 and 8.5. The isolates were able to resist growth against gastric and intestinal fluid. The isolates exhibited good levels of auto-aggregation, co-aggregation and hydrophobicity. The isolates showed resistance towards antibiotics like gentamycin, ciprofloxacin, nalidixic acid and norfloxacin. The isolates showed bilesalt hydrolase activity indicating cholesterol lowering capacity and β- galactosidase activity. Thus the different Lactobacillus plantarum isolates exhibited probiotic potential which would attribute beneficial effect to mankind.

Keywords: Lactobacillus plantarum, characterisation, probiotic.

Biography

Jayaprabha Agaliya P is 27 years old, pursuing PhD (Biochemistry & Molecular Biology) under the guidance of Dr. K. Jeevaratnam, Professor & Co-ordinator (Microbiology), Department of Biochemistry & Molecular Biology, Pondicherry University. She completed her B.Sc (M. L. T) from JIPMER and M.Sc (Biochemistry & Molecular Biology) from Pondicherry University. Her research is on isolation and characterisation of antimicrobial substances from lactic acid bacteria and evaluation of probiotic potential of the producer strains.

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Amniotic fluid stem cells in buffalo (Bubalus bubalis): Identification of pluripotency (Oct-4 Nanog and Sox-2) markers, characterization and chemical induced guided differentiation into neurogenic, adipogenic and osteogenic lineages

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Amniotic fluid cells are obtained from amnion for prenatal analysis and can be cultured in vitro. Heterogeneous amniotic fluid contains various cell types and it is believed that some of these cells possess the stem cell properties. Pluripotency (Oct-4, Nanog and Sox-2) markers were identify for characterization of chemical induced guided differentiation into neurogenic, adipogenic and osteogenic lineage by RT- PCR expression, staining and immunofluorescence in amniotic fluid stem (AFS) cells of buffalo (Bubalus bubalis). Expression of Oct-4, Sox-2, Nestin, FGF-5, Nanog, ALP, 18s rRNA, SCF, cyclin A, β-actin, GAPDH and GATA-4 were observed from the amniotic fluid stem cells in different passages with RT-PCR amplicon of 314, 277, 307, 210, 317, 180, 162, 216, 421, 178, 180 and 334bp respectively. In a quantitative real-time PCR analysis of AFS cells, Oct-4, Nanog, Sox-2, SCF, nestin and FGF-5 positively showed their expression. Amniotic fluid stem cells strongly expressed Oct-4, Nanog, Sox-2, SSEA-1, SSEA-4, TRA-1-60, TRA-1-81 and ALP markers by immunofluorescence staining. AFS cells were chemically induced guided characterized by into neurogenic, adipogenic and osteogenic cells. The cells were found to have a normal karyotype at different passages. We conclude that amniotic fluid cells may contribute towards establishing non-embryonic pluripotent stem cells for various therapeutic and reproductive biotechnological applications in this species and in human too.

Keywords: Amniotic fluid, buffalo, differentiation, immunofluorescence, Stem cells.

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