



BIO-FUNCTIONAL CHARACTERIZATION OF SOME PROBIOTIC LACTIC ACID BACTERIA ISOLATED FROM FERMENTED FLOUR OF SELECTED FINGER MILLET VARIETIES GROWN IN SRI LANKA

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ABSTRACT

Due to proven health benefits, food containing probiotic lactic acid bacteria (LAB) have gained high market revenue and expected to reach 64.02 billion USD by 2022. Majority of probiotic food are of dairy origin, considering several health risks associated with consumption of dairy based probiotic foods, i.e intolerance to milk sugar lactose, allergy to milk proteins, high fat and cholesterol content in the milk have led scientists to pursuit alternative substrates to produce non-dairy probiotic food. Finger millet (*Elucine coracana*) is abundant, low-cost, highly nutritive ingredient; rich in prebiotics is an ideal substrate for non-dairy probiotic food. This study aims to evaluate the *in vitro* bio-functional characteristics of probiotic LAB previously isolated from fermented flour of selected finger millet varieties, *ravi*, *raavana* and *oshadha* grown in Sri Lanka. Selected LAB was investigated for their anti-bacterial activity against both drug sensitive and multi drug resistant human pathogens using agar well diffusion method. The intracellular cell free extract (ICCE) of LAB was evaluated for anti cancer activity using MTT assay in colon carcinoma cell lines. The LAB ICCE was investigated for their anti-oxidant potential by DPPH free radical scavenging activity. Further their ability to assimilate water soluble cholesterol was evaluated. Five isolates including two isolates, *Lactobacillus plantarum* MF405176.1 and *Lactobacillus fermentum* MF033346.1 isolated from *ravi*, two isolates, *Lactococcus lactis* MF480428.1 and *Enterococcus faecium* MF480431.1 isolated from *raavana* and *Pediococcus acidilactici* MF480434.1 isolated from *oshadha* varieties respectively, exhibited *in vitro* bactericidal activity against both drug sensitive and multi drug resistant pathogens. *P. acidilactici* demonstrated the lowest IC₅₀ values against cell lines. Significant differences ($P < 0.05$) in DPPH free radical scavenging activity was observed in the ICCE of LAB isolates at 500 $\mu\text{g/ml}$ concentration. Isolate *L. lactis* exhibited the highest DPPH free radical scavenging activity of $54.33 \pm 0.88\%$. None of the LAB isolates could assimilate $> 10\%$ cholesterol *in vitro*.

Keywords: Bio-functional characteristics, Finger millet flour, Lactic Acid Bacteria, Probiotics