

Multifaceted importance of native dairy microorganisms

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Lactic Acid Bacteria (LAB) and yeasts are extensively employed in food production, preservation and numerous other industrial processes. In the absence of industrial microbial culture production in Sri Lanka, industries solely depend on imported freeze dried cultures. Hence, the objective of the study was to isolate, characterize and identify beneficial LAB and yeasts from Sri Lankan dairies. For the exploitation of beneficial strains, raw bovine milk and curd prepared with indigenous starters were collected from three different climatic zones of the country as per the SLSI: 1404:2010. From over 1045 and 780 different colonies grown on selective media for LAB and yeast respectively, 300 LABs and 246 yeasts were identified from physiochemical tests. Out of these 105 LABs and 56 yeasts possessed strong probiotic properties and 46 LABs and 46 yeasts were safe for live consumption. These isolates were genotypically identified by PCR amplification with universal primers of 16S rRNA gene of LAB (27F and 1495R) and 18S rRNA gene of yeast (ITS1 and ITS4). The pool of beneficial dairy species identified were: *L. plantarum* (n=26), *L. fermentum* (n=12), *L. pentosus* (n=5), *E. faecalis* (n=2) and *L. rhamnosus* (n=1). Advantageous yeasts were *Pichia kudriavzevii* (n=9), *Kluyveromyces marxianus* (n=7), *Clavispora lusitaniae* (n=5), *Diutina rugosa* (n=3), *Candida orthopsilosis* (n=4), *Lachancea thermotolerans* (n=3), *Candida parapsilosis* (n=2), *Debaryomyces hansenii* (n=1), *Wickerhamiella pararugosa* (n=2) and *Yarrowia lipolytica* (n=1) *Pichia* sp. (n=1) *Candida* sp. (n=1), *Candida rugosa* (n=1) *Candida aaseri* (n=2) *Candida tropicalis* (n=1), *Candida versatilis* (n=1) and *Diutina mesorugosa* (n=1). Sequences of the isolates were deposited in GenBank[®] of the National Centre for Biotechnology Information (NCBI). LAB and yeast isolates with antimicrobial, antioxidative and cholesterol lowering properties could be used as candidates for health food formulation. The LABs capable of utilizing complex carbohydrates and having amylolytic properties could blend with prebiotics to make synbiotic foods. A majority grew, fermented and survived in milk. These milk technological properties were favourable for fermented dairy food development. Number of LABs exhibited potentials to be used in exopolysaccharide (EPS), lactic and acetic acid, virgin coconut oil and bacteriocin production. Yeasts that grew at high osmotic pressures can be ideal candidates in bioremediation and single cell protein (SCP) production. Beneficial isolates obtained from the present study has laid foundation for the establishment of a dairy culture collection within ITI.

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