Isolation and Screening of Potential Probiotic Yeast Strains in Sri Lankan Dairies

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Yeasts are currently attracting increased attention from food, beverage, livestock feeding, veterinary, biomedical and pharmaceutical industries. Milk is a rich source of microorganisms, and different yeast species with diverse functional and industrial applications can be isolated from raw milk and dairy products. However, so far no functionally and industrially important yeasts in Sri Lanka have been reported from this source. As a result, native strains of yeasts of milk origin are not obtainable for commercial or basic research applications.

The aims of the present study were to isolate yeast strains from dairy sources and screen them for their probiotic potentials. Thirty two curd samples and 30 fresh milk samples collected from the three different climatic zones of Sri Lanka; wet zone, dry zone and intermediate zone were studied.

One hundred and ninety yeast strains were isolated by pour and spread plate techniques using yeast-peptone-dextrose-agar (YPDA) supplemented with 0.1 gl^{-1} chloramphenicol. Colonies with distinct morphological differences were selected and purified by streaking on potato-dextrose agar (PDA). Cell morphologies were microscopically observed by wet mounting technique. Forty five different yeast strains were selected and coded for convenience (Y001-Y045). Catalase test, lactose fermentative test, acid tolerance (pH 1.5, 3.0), temperature tolerance (37 °C, 45 °C) and bile tolerance (0.1%, 0.3%, 1%) tests, were performed for screening probiotic potentials.

Of the 45 stains studied, all were positive for the catalase test and only 5 were able to ferment sugar lactose (Y 005, Y 006, Y 007, Y 033, and Y 043). Fifteen yeast isolates were intolerant to acid, and survival ability of yeast strains at pH 3.0 was higher than that for pH 1.5 ($P<0.05$). Most yeast strains demonstrated tolerance to 37 °C and 45 °C temperatures except isolates Y031, Y032, Y034, Y037, Y040 and Y041. Isolates Y003, Y021, Y033, Y034, Y037, Y040 and Y041 were intolerant to bile.

Therefore, it could be concluded that the isolates Y 001, Y 002, Y 004, Y 005, Y 006, Y 007, Y 008, Y 014, Y 016, Y 017, Y 018, Y 022, Y 030, Y 035, Y 036, Y 039, Y 042, Y 043, Y 044 and Y 045 have a potential for use in probiotic applications. Molecular level identifications of the strains, further investigation of functional and technological potentials, and safety attributes will be carried out.

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References

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