

Survival of probiotic lactic acid bacteria (LAB) in bee products incorporated bio-yoghurts

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Introduction and Objectives: Bee products incorporated bio-yoghurts possess functional properties due to the presence of probiotics, prebiotics and bioactive compounds. Therapeutic minimum of 6-7 log CFU/ g of viable probiotic bacteria should be sustained in the food product for effective health benefits. Inclusion of bee products such as honey, pollen and royal jelly to dairy products potentially exert distinct positive effects on the activity of key lactic acid bacteria (LAB). The current study was focused to evaluate the survival of probiotic LAB species in the bee product incorporated bio-yoghurt to confirm the therapeutic minimum during storage

Methods: The study was designed to incorporate three bee variants as treatments [0.6% royal jelly (T1), 5% bee honey (T2), 0.5% bee pollen (T3) and control (C)]. Dairy yoghurts were prepared following standard procedures. Probiotic starter culture (2% ABT-5) was added after cooling the yoghurt mixture at 45 °C and incubated at 42 °C for 4-5 hours and refrigerated. Samples were drawn from each treatment and the control with replicates and diluted up to eight levels, inoculated on MRS media and incubated at 37 °C for 72 hours under anaerobic conditions. The colony forming units of LAB were determined using the standard plate count technique on MRS agar and the pH was measured at one-week intervals for 28 days. Bacterial colonies were confirmed as LAB by conducting Gram staining, spore staining, and catalase tests.

Results: Bio-yoghurt enriched with bee honey exhibited significantly ($P < 0.05$) higher survival number (log10 values 9.25 to 6.58) compared to control yoghurt which showed the lowest survival, (log10 values 8.14 to 5.56) from first to 28 days of storage period. It was observed that there was a significant ($p < 0.05$) decrease in LAB counts during storage in all treatments, possibly linked to the formation of lactic acid and decline in pH during this period.

Conclusion: The improved bacterial survival in bio-yoghurts highlights the potential prebiotic benefits of bee products which maintained the survival of probiotic LAB conceivably within the therapeutic minimum range throughout the storage period.

Keywords: Yoghurt, bee products, lactic acid bacteria , survival

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