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Diversity and Functional Properties of Lactic Acid Bacteria Isolated from Philippine Burong Mustasa (*Brassicajuncea* L.)

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Recently, whole genome studies of certain lactic acid bacteria (LAB) described genes that encode for functional properties including production of enzymes and immunomodulation molecules and probiotic properties. However, most research reports focus on LAB from meat- or milk-based fermented foods. Fermented foods are an important part of human diet, containing lactic acid bacteria (LAB), which turn carbohydrates into lactic acid and other beneficial products. Since the Philippines is a home to numerous plant-based fermented foods, this study aims to discover the functional benefits that we derive from them. The bacterial diversity of Philippine burong mustasa was assessed by PCR-denaturing gradient gel electrophoresis (PCR-DGGE) of the 16S rRNA gene (16S rDNA). Resulting sequence analyses revealed that lactic acid bacteria (LAB) were dominant in the food samples. The LAB identified included *Lactobacillus fermentum*, *Lactobacillus plantarum*, *Lactobacillus panis*, *Lactobacillus pontis* and *Weissella cibaria*. Among these, *L. fermentum*, *L. plantarum* and *W. cibaria* are established probiotic bacteria, while *L. panis* and *L. pontis* are potential probiotic bacteria. Putative LAB isolates were also selectively isolated using GYC agar plates shown as colonies with surrounding halos and were confirmed using Gram stain and Catalase test. Functional properties including production of exopolysaccharide, cellulase and amylase as well as hydrophobicity and probiotic properties were conducted for all 334 LAB isolates using standard procedures. Probiotic properties include antimicrobial activity, production of bacteriocin-like inhibitory substances (BLIS) and acid and bile tolerance. Three LAB isolates were shown to have promising functional properties. Two of them were identified as *Lactobacillus fermentum* (P4-1 and P4-2) while the other was identified as *Staphylococcus carnosus* (P4-3) using 16S rDNA sequencing. Overall, this study showed the potential of plant-based fermented foods such as our Philippine burong mustasa, that harbors LAB with beneficial functional properties.