TITLE: FERMENTATIVE PERFORMANCE OF BACTERIA IN CULTURE MEDIUM CONTAINING COFFEE PEEL AND PULP

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Bacteria are the main group of microorganisms present in wet fermentation of coffee. Among them lactic acid bacteria showed an important influence on the final coffee quality. However, mesophilic bacteria have the ability of producing enzymes such as pectinases. 131 bacterial isolates from wet fermented coffee were obtained from Culture Collection of Agricultural Microbiology (CCMA, Federal University of Lavras). The microorganisms had been previously isolated and identified from coffee. The potential of 96 mesophilic bacteria and 35 lactic acid bacteria was evaluated for their fermentative performance. The fermentations were carried out in a medium called coffee peel and pulp media. The strains were growth until reaching the population of 10^7 CFU/ml and transferred to the fermentation medium (30 °C for 24 hours). The pH, carbohydrate and organic acid values and enzymatic activity (pectin lyase [PL] and polygalacturonase [PG]) was determinate. The initial pH of the medium was 5.5, with best results for lactic acid bacteria being the final pH around 3.5, and for mesophilic around 4.5. Twenty-three strains showed a positive result for PL and 4 showed a positive result for PG. The largest halo (5 mm) for pectin lyase (PL) was produced by *Rhizobium pusense* and *Bacillus subtilis*. Species of *Bacillus cereus, B. subtilis, B. pumilus, Paenibacillus konsidenses, Pantoea agglomerans, Pantoa dispersa, Arthrobacter korensis,* and *Enterobacter asburiae* also showed positive results. To select the strains in relation to acid production (malic, citric, lactic, and succinic) and substrate consumption (fructose, glucose, and sucrose), a threshing production of above 50% of the desirable acids and a consumption of 50% of the sugars were considered as good results. *Lactobacillus plantarum, Leuconostoc mesenteroides, B. subtilis, P. dispersa,* and *Microbacterium testaceum* were selected by high acid production and substrate consumption. Not all bacterial species shoed high PL and PG activity, and therefore not all species would improve the hydrolysis of pectin. However, the bacteria tested showed high production of desirable acids and sugars conversion when grown in coffee medium. In addition, specific strains of lactic acid bacteria showed good potential to be used as starter cultures to standardize and accelerate fermentation improving the quality of coffee.

Keywords: coffee, fermentation, bacteria, pectinases.

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