

ORANGE, MANGO, AND ACEROLA BY-PRODUCTS FERMENTATION BY *Escherichia coli* AND *Clostridium perfringens*: A PRELIMINARY TEST FOR THE DETERMINATION OF THEIR FUNCTIONAL PROPERTIES

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Fruit by-products are rich in dietary fiber, bioactive compounds and other functional compounds. An important mechanism of action of dietary fiber involves its fermentation by colonic bacteria and the modification of the intestinal microbiota. A prerequisite for a dietary fiber to be considered a prebiotic fiber involves its selective stimulation of growth and/or activity of intestinal bacteria potentially associated with health and well-being, such as strains of *Lactobacillus* spp. and *Bifidobacterium* spp. Additionally, the prebiotic fiber may inhibit the growth of potential harmful bacteria as strains of *Escherichia coli* and *Clostridium* spp. Therefore, we evaluated the fermentability of orange (OG), mango (MA) and acerola (AC) by-products powder by *E. coli* ATCC 8739 (EC) and *Clostridium perfringens* ATCC 13132 (CL). For this purpose, overnight cultures of EC and CL were diluted at concentration of approximately 4 at 5 log cfu/mL and inoculated in modified MRS broth plus phenol red (as indicator) supplemented with 1% (w/v) of each fruit by-product as unique source of carbon. The growth of each strain on specific selective medium was determined after 0, 24, and 48 h of incubation in anaerobic (CL) and aerobic (EC) conditions at 37 °C. Factorial analysis of variance (Factorial ANOVA) was used to determine significant difference among samples ( $P < 0.05$ ), followed by the Tukey post-hoc test. In general, there was a significant increase in EC (from 3.2 to 4.0 log cfu/ml) and CL (from 1.6 to 3.1 log cfu/ml) populations after 24 h of incubation in the presence of OR, MA, and AC ( $P < 0.05$ ). The populations of EC and CL differed significantly ( $P < 0.05$ ) from each other and each residue. EC and CL populations in OR by-product after 24 h were 7.8 and 7.3 log cfu/mL, respectively, and they were significantly higher ( $P < 0.05$ ) than CL in MA and EC and CL in AC. Moreover, EC and CL populations were 7.9 and 6.3 log cfu/mL, respectively, after 24 h of incubation in the presence of MA and 7.0 log cfu/mL in the presence of AC. Comparing 24 h and 48 h of incubation, only EC population had a significant increase (approximately 1.2 log cfu/mL) in the presence of AC. Although the tested fruit by-products have significantly increased the population of EC and CL, AC was the by-product that showed the lowest growth stimulation compared to other by-products.

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