P-254 - CO-CULTURE FERMENTATION OF AFRICAN NATIVE SORGHUM AND MILLETS WHOLE GRAINS - TECHNOLOGICAL AND BIOCHEMICAL POTENTIAL OF PROBIOTIC AND INDIGENOUS STRAIN COMBINATION

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Background

Probiotic strains co-cultured with microbial strains isolated from indigenous cereal-based foods can be used as starter cultures for the production of potentially probiotic beverages. This combined culture might contribute to improve texture, by *in situ* production of exopolysaccharides (EPS), and nutritional properties but may also exert beneficial health effects. Millets and sorghum, with high nutritional value and richness in phytochemicals, are promising substrates for the development of new fermented cereal-based products. Hence, this study aimed to evaluate the technological/biochemical potential of single and co-cultures on the fermentation of dry-milled *Sorghum bicolor* (Sorghum), *Eleusine coracana* (Finger Millet) and *Pennisetum glaucum* (Pearl Millet) cereals, obtained locally in Kenya and Burkina Faso, respectively.

Method

Lactobacillus plantarum 299v was used as the probiotic strain.The three indigenous strains (C2, 32LABPT05 and 2LABPT05), were previously isolated from traditional Kenyan and Burkinabé cereal-based products and identified as *Weissella* strains producers of EPS. Both strain types were inoculated at 1% (1:1 ratio) and fermentation was performed at 30 °C/200 rpm in an orbital incubator. Samples were taken at different fermentation time points (in the presence of 10% sucrose) until pH≈4.5-5.0 was reached and monitored for microbial growth (lactic acid bacteria and contaminant bacteria), pH, sugars/organic acids concentration (HPLC) and total phenolics concentration (spectrophotometry).

Results & Conclusions

In general, acidification and growth capacities were more clearly observed during each millet's fermentation than during sorghum's. EPS production (based on visual assessment) was only observed during millet's fermentation. The single culture with indigenous strains reported higher acidification rate, and higher EPS production when compared with the co-culture. The growth of C2/32LABPT05/2LABPT05 appeared to be unaltered by the addition of the probiotic strain. On the other hand, the growth of *L. plantarum* 299v was affected by the presence of the indigenous strain during the eight-hour fermentation; on average, viable cell numbers of *L. plantarum* 299v were 0.65 fold lower than the indigenous strain. In terms of fermentation capacity, glucose was the most consumed sugar, while lactic acid was the mostly produced acid. Moreover, increased levels of total phenolic compounds were observed in fermented sorghum-based products. Overall, the best co-culture behaviour was observed in the corresponding cereal from which they had been originally isolated. Studied co-cultures presented good potential for development of new probiotic beverages.

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