

DOMINATING MICROBIOTA DURING COCOA FERMENTATION

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Chocolate is made from fermented cocoa processing; thereby, this fermentation process is responsible of generating its flavor. Cocoa fermentation consists of well-defined microbial succession mainly dominated of yeasts, lactic acid bacteria and acetic acid bacteria. This work aims to isolate and characterize microorganisms present during cocoa fermentation of hybrid PS1319. Following, evaluate chemical parameters (carbohydrates, ethanol and organic acids) and sensory profile of chocolates. Samples of 20g were added to 180 ml of sterile peptone water (0.1%), homogenized for 10 min in a Stomacher. Serial dilutions were prepared. Microorganisms were counted using four different culture media: MRS, AN and GYC was used as general media for viable bacteria population and YPD was used for yeasts. After inoculation, plates containing YPD and GYC were incubated at 28 °C for 72h and plates containing MRS and AN were incubated at 35 °C for 72h. Passed incubation, the number of colony-forming units (CFU) was recorded. Morphological characterization was done and colonies were picked randomly, that is, a number of colonies derived from a square root of a total number of colonies present on counted plates. Bacterial isolates were submitted to different biochemical tests, such as, differential Gram staining, oxidase, catalase, motility and sporulation. Carbohydrates, organic acid and alcohol from cocoa pulp and beans were extracted and analyzed using HPLC. Sensory analysis was performed using check-all-that-apply (CATA) question. Out of 217 microorganisms isolated, 26 were isolated from MRS, 87 from AN, 49 from GYC and 55 were yeasts. From 207 bacterial isolates, 74.87% were classified as Gram positive, 25.12% Gram negative, 94.68% catalase positive, 5.31% catalase negative, 99.02% negative oxidase, 0.97% positive oxidase, 89 54% negative motility, 10.45% positive motility, 90.84% negative sporulation and 9.15% positive sporulation. Carbohydrates were consumed quickly at 24 h. 4.6 g/kg of ethanol content was obtained at 96 h. Bitter and coffee flavor attributes were the most strongly detected in chocolates. Microorganisms found in the fermentation of cocoa hybrid PS1319 influence consumption of carbohydrates, ethanol concentrations and sensory profile of chocolate. The microorganisms isolated from AN, GYC, YEPG and MRS may be identified as mesophilic bacteria, acetic acid bacteria, yeasts and lactic acid bacteria, respectively.

Keywords: chocolate, cocoa fermentation, microorganism.

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