

## Abstract

**Cocoa** quality depends on several parameters, such as cocoa variety, environmental growth conditions, cultivation technique, and post-harvest treatments applied to cocoa beans. In this work, we studied the impact of cocoa post-harvest processing on both microbial communities structure and volatile composition. Cocoa beans samples were fermented in wooden boxes in Ivory Coast at different time intervals with turning and without turning, and derived from pods stored for two different duration times. Cocoa beans were analyzed using a molecular fingerprinting method (PCR-DGGE) in order to detect variations in microbial communities' structure; this global analysis was coupled to SPME-GC-MS for assessing cocoa volatile profiles. The results showed that the main parameter that influenced microbial communities structure was fermentation time, followed by turning, whereas, pods storage duration had a minor impact. Similar results were obtained for aromatic profile, except for pods storage duration that significantly affected volatile compound production. Global statistical analysis using Canonical Correspondence Analysis (CCA), showed the relationship between microbial communities and volatile composition. Furthermore, this study allowed the identification of discriminating microbial and chemical markers of cocoa post-harvest processing.