Vicilin-class globulins and their degradation during cocoa fermentation

ABSTRACT

Cocoa beans were fermented for 144 h using shallow wooden boxes at ambient temperature. Two major polypeptides were found to consist of the storage protein and an albumin fraction. The storage protein comprises two vicilin fractions with molecular weights of 47.1 and 39.2 kDa, and the albumin fraction has a molecular weight of 21.1 kDa. The degradation of vicilin fractions during the course of fermentation was visually detected by sodium docecyl sulphate-polyacrylamide gel electrophoresis. The albumin fraction was found to be the most resistant to proteolysis during fermentation. At the end of fermentation, the 39.2 kDa polypeptide was completely degraded but the 47.1 kDa polypeptide was still present at low intensity. The protein concentrations of 47.1 and 39.2 kDa polypeptides decreased from 1.74 to 0.03 εg and from 0.93 to 0.02 εg, respectively. The protein concentration of 46 and 46.5 kDa polypeptides increased from 0.06 to 0.34 εg and from 0.03 to 0.23 εg, respectively. This could be due to the result of the degradation products of the 47.1 kDa polypeptide.

Keyword: Vicilin-class globulins; Cocoa fermentation; Degradation