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SOME CHEMICAL STUDIES ON COCOA SEED PULP

E. V. Packiyasothy, E. R. Jansz, G. R. Liyanage
(Natural Products and Food Technology Sections,
Ceylon Institute of Scientific and Industrial Research, Colombo 7)

and

A. Bamunuarchchi
(Chemistry Department, Sri Jayawardenapura University, Nugegoda)

Cocoa seed pulp whose main constituents are sugars and mucilaginous albuminoids ferments naturally during cocoa processing and is an essential part of the cocoa flavour development process. The pulp ferment is a waste and these studies are directed towards its utilization. Mature cocoa pulp (pH, 4.0) was found to contain Starch (1-2%), Glucose (9-11%) and Sucrose (1-2%). Amino acid analysis (JOEL JLC/6AH amino acid analyser) showed the presence of 16 free amino acids (total 106.6 mg%) the major ones (in mg%) being serine, (14.5), glutamic acid (17.7), arginine (19.0), alanine (8.4), proline (7.9) and lysine (7.8). Quantitative paper chromatography showed that the major organic acid was citric acid (1%). On fermentation (DCL yeast), 8-10% (w/v) ethanol and 0.5 to 1.0% acetic acid was produced together with traces of methanol n-propanol, acetaldehyde and ethyl acetate (GLC analysis). The total amino acids declined to about 1% the level original in which only 11 amino acids were detected; arginine being present in the largest quantity (0.8 mg%). Citric acid content of the ferment declined to 0.3% and malic acid (0.2%) was detected. Alcohol and acetic fermentation was nearly completely inhibited by the addition of $Na_2S_2O_5$ to the drip tank but the major feature of interest was that tartaric acid (0.6%) was present in addition to citric acid (0.35%) and malic acid (0.1%).

Introduction of *Vateria copallifera* (Hal) bark resulted in only 50% inhibition of fermentation and the presence of oxalic acid (0.30-0.35%) in the ferment. The identity of the organic acids were confirmed by preparative paper chromatography followed by IR spectroscopy. It is concluded that utilization of cocoa pulp should proceed in the direction of alcoholic fermentation rather that sugar-based products. The significance of the changes in chemical constituents during fermentation will be discussed.

This work is a part of the MSc thesis (Sri Jayawardenapura University) of E. V. Packiyasothy.