D-36: Biochemical and microbiological changes in natural fermentation of *Caryota urens* palm sap

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Biochemical and microbial changes that occur during fermentation of sap of *Caryota urens* were studied with a view to upgrading the local fermentation industry and developing new biotechnological processes.

Palm sap was collected in a flame sterilised pot and samples were withdrawn

aseptically at intervals of 3 h and 6 h for biochemical and microbiological analysis. The first sample was taken after keeping the pot for 10 h. Paper chromatographic studies revealed that the main type of sugar in the unfermented sap was sucrose, while glucose and fructose were in trace amounts. The reducing sugar content of unfermented sap, measured by the Lane and Eynon method, was very low (0.14% w/v) but started to increase after 24 h and reached a maximum value (14.1% w/v) after 48 h. The alcohol concentration, measured by ebulliometer, increased only after the formation of appreciable quantities of reducing sugars and reached a maximum value of 7% v/v on the 5th day. The pH of unfermented sap was around 7, which then decreased with time and reached a constant value around 4 after the 4th day.

Microbiological analysis of fermenting sap revealed that the type of organisms found in sap changed with time. Initially the fermenting sap contained mainly bacteria with a cell count of about 10^7 cell/ml. The yeast cell number increased after 24 h and reached a maximum of 8×10^6 cells/ml in 48 h. The yeast count dropped while the bacterial count increased again to 10^7 cells/ml. These results showed that, natural fermentation of *Caryota urens* sap was similar to coconut sap fermentation.