SECTION D

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Effect of different inhibitory substances on fermentation of sweet sugary sap of kithul in Jaffna

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The main source of crude sugar in Sri Lanka is the sweet sugary sap obtained from the tapped inflorescence of the Coconut (Cocos nucifera), Palmyrah (Borassus *flabellifer*) and Kithul (Caryota urens) palms. This sap is sterile and highly charged with sugar, but unless special precautions are taken, fermentation by yeast and bacteria leads to accumulation of alcohol and acids. Lining the inside of the pot with fresh lime, placing Hal bark (*Vateria copallifera*), Kahata bark (*Careya arborea*) and the leaves of Ankenda (*Achronychia laurifolia*) in a clean pot before used for collecting sap, are the most common methods used to reduce fermentation. The objective of the study was to study the effect of various substances used in Jaffna, to prevent fermentation taking place in the Kithul sap and to recommend the cheapest and easily available, efficient fermentation preventing substance. Pieces of fresh bark of Hal, Kahata and leaves of *Ankenda* at the same rate (weight -10g / pot) were put into each collecting pot before use. Another pot was lined with lime. Control was also maintained with out any materials. The samples of sap were collected at equal time intervals and analyzed for reducing sugars, total sugars, pH, alcohol content, number of yeast and bacterial cells. The pH of Kithul sap in Hal, Kahata, Ankenda and control showed significant difference separately with the pH values in Lime ($p = 0.05$). The pH was very high (12 -13) in lime and remained the same throughout the experiment. Bacterial cells (in order of $10^7 – 10^8$ cells / ml) were found after 15 hours in all the treatments except in the one with lime. Number of bacterial cells was much lower initially and the growth rate gradually decreased with the time. Kahata and Ankenda also showed decrease in the bacterial population. Yeast cells were found in almost all treatments except lime. In Hal, yeast cells were much lower initially but increased towards the end. In other treatments yeast showed a slightly slower growth rate when compared with control. No alcohol was found in the limed pot. Hal and Ankenda showed significantly lower percentage reduction in the amount of sugar as compared to that of control. Lime is the most effective, cheapest and easily available substance that prevents fermentation taking place in the sweet sugary sap of Kithul. Hal could be used as effectively as lime to preserve sweet sap of Kithul, for 45 hours. Due to the difficulties in getting Hal bark and Kahata bark in Jaffna they are not recommended. Ankenda is also not recommended because of its poor ability to inhibit fermentation.

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