SECTION D

401/D

Effect of some inhibitory substances on fermentation of sweet sugary sap of Coconut

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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 Kith (*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*), leaves of Ankenda (*Achronychia laurifolia*) and the leaves of Kohomba (*Azadiracta indica*) in a clean pot before it is 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, to prevent fermentation taking place in the Coconut sap and to recommend the cheapest and easily available, efficient fermentation preventing substance.

Pieces of fresh bark of Hal, Kahata and leaves of Kohomba at the same rate (weight -100g / 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, number of yeast and bacterial cells. The pH of Coconut sap in Hal, Kahata, Kohomba and control showed significant difference separately with the pH values in Lime ($t = 0.05$). 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 very much lower initially and the growth rate gradually decreased with the time. Kahata and Kohomba also showed decrease in the bacterial population. Yeast cells were found in almost all treatments except lime. In Hal, yeast cells were very much lower initially but increased towards the end. In other treatments yeast showed a slightly slower growth rate when compared with the control. No alcohol was found in the limed pot. Hal and Kohomba 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 Coconut. Hal could be used as effectively as lime to preserve sweet toddy of Coconut, for 45 hours. Due to the difficulties in getting Hal bark and Kahata bark all over in Sri Lanka they are not recommended. Kohomba is also not recommended because of its poor ability to inhibit fermentation.

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