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SAP YIELD VARIATION IN KITUL PALM (*Caryota urens*) IN MATARA DISTRICT

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ABSTRACT

Caryota urens is better known by its local name, the Kitul Palm (Wine Palm). It belongs to the family Palmae and plays an important role in the village economy of Sri Lanka. The most important non-wood forest product of Kitul palm is its sap. Sap yields were estimated from more than 200 palms in the Matara district during the period March to October, 1995. This was organized together with school teachers and students. The yield varied from 475.5 ml to 16,500 ml per day per palm. There are two main types of inflorescence in kitul: the compact type and the loose type. The compact inflorescences recorded significantly higher sap yields than the loose type. Two common types of kitul were identified. They are : a tall type having a straight and cylindrical trunk, identified as "Perimi Kitul" and a barrel type which has a greater diameter in the upper trunk than at ground level and is called "Gahanu Kitul". The yield data from these two types did not record appreciable differences. A third type which produces large amounts of phenolic compounds when the inflorescence is cut is not used for sap production. The shape of the inflorescences can be categorized into two major groups: elongate and compact types. The compact type produced more sap yield than the elongate type. The sap yield variation during the day and night was also examined. The night yield was measured early in the morning and the day yield was measured late in the evening. There were no significant yield differences between the day and night collecting periods. The most economical sap yields were obtained during the 2nd to the 5th weeks of tapping.

INTRODUCTION

Caryota urens, better known by its local name as the Kitul Palm, is a palm with an unbranched cylindrical trunk which can reach heights of 20 m. When the palm is full grown, flowering starts from the apex and proceeds downwards with a single, large inflorescence per leaf axil. Kitul palm is known as Hill Palm, Sago Palm, Jaggary Palm, Fish-tail Palm, Toddy Palm or Wine Palm. It is widely distributed in the mid and low country wet and intermediate zones up to 1200 m altitude. It is found as one

of the few wild palms in the wet zone forest region and also as voluntary plants in home gardens.

In some areas where the palm grows in abundance, it is of great economic value. The main products are toddy, jaggary and treacle produced from the sap collected by "tapping" the inflorescences. In addition to these products, the bark, roots and leaves have medicinal values and the stem is used in furniture and house building.

As the sap is the basis for the main commercial products, its yield variation is of special interest. The present study was undertaken with the objective of understanding the yield variation according to different tree types, inflorescence types and age of the inflorescence in selected areas of Matara District.

MATERIALS AND METHODS

To have a reliable estimate of sap yield variation in a voluntary plant such as Kitul, a large number of plants has to be sampled. For this reason, the participation of school children from the areas where Kitul tapping is practised widely was sought. A seminar was held at the Faculty of Agriculture for teachers in Agriculture/ Bioscience from selected schools. They were briefed on the objectives of the programme and those who volunteered to help were given questionnaires and forms for yield data collection by school children.

A maximum of 25 children from each school in the age group 13 to 16 years were selected and each student was asked to collect data from only one tapper and a single tree. A total of 200 students from 8 schools participated in the data collection which was constantly monitored by the researchers through visits to the schools and tappers.

Data collection was started in April 1995 and completed in November 1995. The data was tabulated using LOTUS 123 software in a personal computer, to facilitate analysis on the effect of different factors, such as day and night yields, age of inflorescence when tapping started and heritable characters of the palm such as trunk or inflorescence shape.

RESULTS AND DISCUSSION

There are two main types of inflorescences in kitul. The compact type commonly called "Backamuna mal" is short and stout. The elongate type called "Rana" is long and loose. The sap variation according to the type of inflorescence is shown in Figure 1. The results reveal that the common belief of tappers, that the compact type has better yielding capacity, does have an element of truth. This trend was obvious from the second to the last week of tapping.

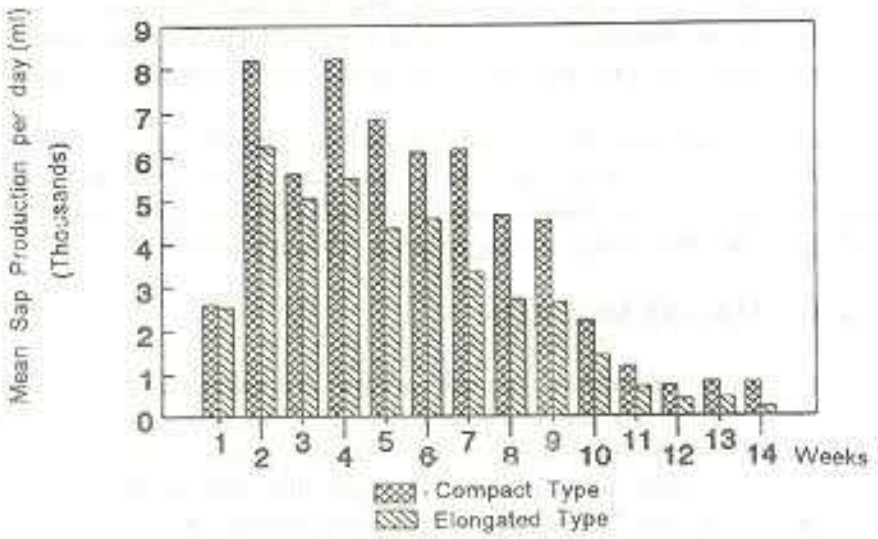

Figure 1 - Yield variation of Kitul according to inflorescence type

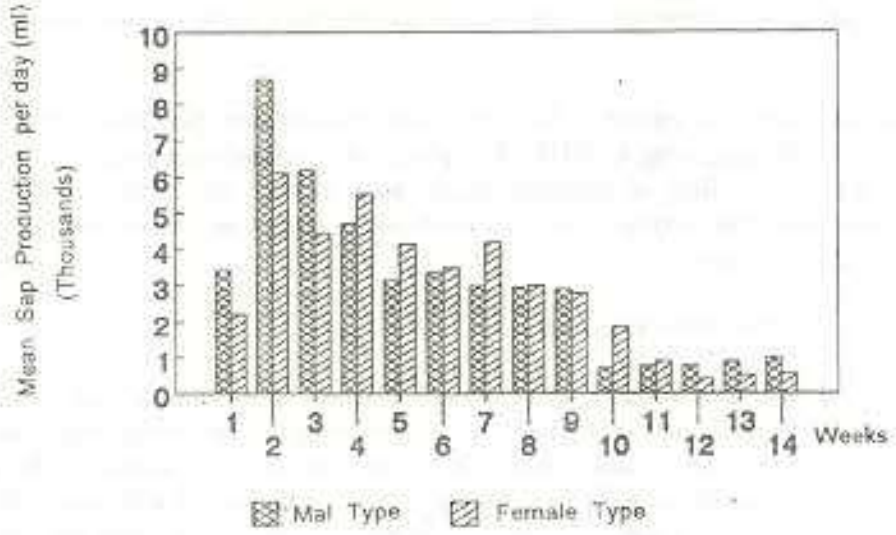

Figure 2 - Yield variation of Kitul according to tree type

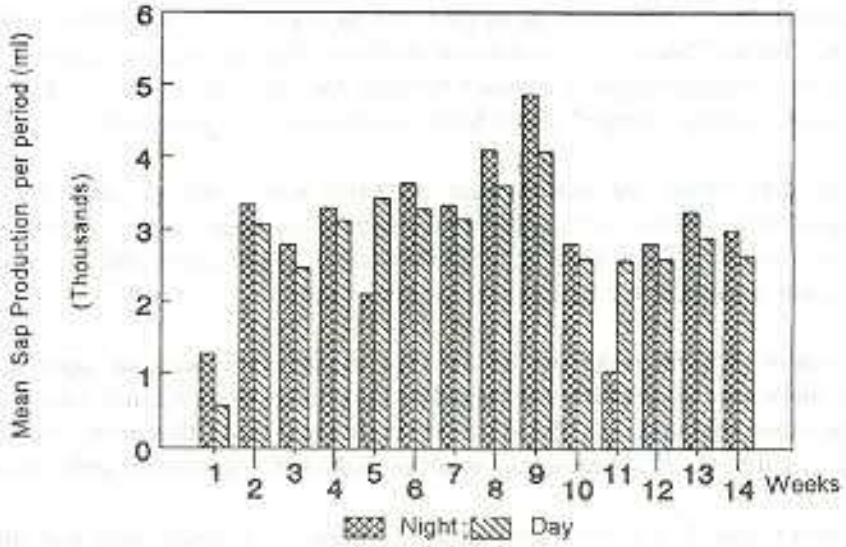

Figure 3 - Yield variation of Kitul according to night and day period

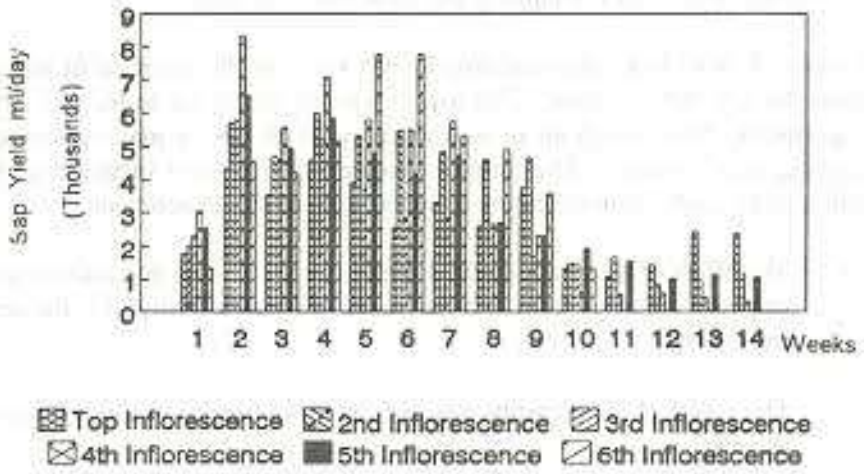

Figure 4 - Effect of inflorescence age and location (from apex downwards) of sap yield

There are 3 types of palms that can be distinguished and identifies by the morphological characteristics of the trunk. The short barrel shape palms are called "female palms" and the tall cylindrical type are called "male palms" by the tappers. A third type, which produces large amounts of phenolic compounds when cut, is not tapped due to difficulties in tapping and its poor yield. Therefore only the "male" and "female" types were used in this analysis. Results given in Figure 2 indicate that there is no significant difference between the two types. However, some tappers believe that the "female" palms have the potential for higher yields.

The data on the sap yield at each collection was tabulated separately. This gave yield variation data for the period of collection i.e. night or day. Figure 3 shows that these yields did not show much difference and both night and day collections are equally important for the total sap yield of Kitul.

Usually, farmers make use of the first six inflorescences for tapping. The first inflorescence is generally not tapped as they believe that it can reduce the yield from the other inflorescences due to an extremely high yield. However, results reveal that the yield of the 1st inflorescence is not as high as the subsequent inflorescences.

From Figure 4, it can be seen that the 2nd to the 5th inflorescences had almost similar yields - these started declining after the 8th to 14th weeks of tapping. Therefore, it is concluded that the 2nd to the 5th inflorescences are the most important for tapping.

The variation of sap production from an inflorescence can be due to many reasons. The yield of the Kitul population studied in the present experiment was satisfactory for the first nine weeks of tapping and thereafter it declined.

Farmers believe that continued tapping can result in the decrease of sap production from the next inflorescence. This aspect was not tested due to the time frame of the experiment. However, from an economical point of view, it may be desirable to stop tapping after 9 weeks. The following aspects of sap yield variation of Kitul palm will also be analyzed in the future using the data of this experiment:

1). The effect of the environmental factors on yield. For this, meteorological data has been collected from different areas of Matara District for the period of the experiment.

2). The effect of the maturity stage of the inflorescence at the commencement of tapping.

3). The effect of different chemical methods of treating the inflorescence on the sap yield.