

The Beliefs in Supernatural Forces in Kitul (*Caryota urens* L.) Industry in Sri Lanka

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ABSTRACT. *Kitul (Caryota urens L.) industry, which is one of the oldest agro industries, is based on traditional knowledge enriched with beliefs. The traditional community involved in kitul industry believes supernatural forces including planetary influence, spirits, vicious qualities of persons, white and black magic. The objectives of the study were to identify beliefs among kitul tappers on supernatural forces, to study the logic behind the acceptance and to examine relationships between beliefs and practices.*

A questionnaire survey was conducted using 304 trappers from 101 villages covering all the 12 kitul growing districts in Sri Lanka. A multi-stage stratified sampling scheme was adopted for data collection and data were analyzed by fitting linear logistic models using SAS statistical package.

Based on the planetary influences, 84% of respondents chose a lucky day and 76% chose specific auspicious moment for performing crucial pre-seasoning activities. Eighty three percent of the respondents believed the effects of personal vicious qualities. The tappers who obtained higher yields and observed auspicious moment for tapping related activities significantly believed personal vicious qualities. Such tappers tapped kitul trees in less than four blocks at a time and showed a higher level of concern about an auspicious moment.

Risk, technical uncertainty, weather dependency, loss of sap due to consumption by mammalian pests, fast deterioration of sap, vulnerability of prosecuting by law enforcing officers were features of kitul industry. The beliefs in supernatural forces may have built the confidence among the tappers to undertake the job of tapping courageously.

INTRODUCTION

Sap of kitul (*Caryota urens* L.) palm is obtained by tapping the spadix (young inflorescence) to make treacle, jaggery, toddy and vinegar. In order to obtain quality sap for a long period of time, kitul inflorescence is seasoned before it is opened. The objectives of seasoning a kitul inflorescence are to delay its maturity so that potential length of sap

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collection is increased, to soften its texture for easy slicing and to orient its position to facilitate smooth drainage of the sap into the pot hanging on the inflorescence.

Kitul industry is based on traditional knowledge which is enriched with beliefs in supernatural power. A belief is a state of mind developed by members of a community in response to a set of circumstances or natural phenomenon around them. It is tested by experience and sanctioned by usage (Wijesekera, 1987). It is evident that even in the past the excessive production of sap has been linked to the supernatural power (Kehelpannala, 1898). The supernatural forces include spirits, planetary influence, lunar cycle, white and black magic. Magic is defined as the pretended art of influencing the course of events by occult control of nature or spirits without involving conscious agents. Magic is believed to produce results directly without the intervention of spirits or deities. Magic is therefore, a way of achieving certain ends beyond the knowledge and competence of ordinary people (Wijesekera, 1987). The two forms are called white magic and black magic or social and antisocial. White magic has been described as protective and productive whereas black magic is destructive.

In the analysis of beliefs one finds three classes of spirits comprising the world of supernatural beings. They are deities (*deva* or *devata*), demons (*yakkhas* and *rakahasas*) and spirits of dead ancestors (*pretas* or *neyaku*). The tappers and their family members believed in supernatural forces in the past and continue to believe the same. The first yield of sap is always reserved and offered to a *devale* (shrine) or *veddha-devil* ceremony (Kehelpannala, 1898). The purpose is to nullify any evil magic (*vas dos*), and ward off dangers from evil spirits, inspire confidence and give blessings (Wijesekera, 1987).

Most of the Sinhalese are believers of astrology and have absolute faith in the predictions of astrologers. Lucky days and times are sought before embarking on an important event to avoid evil consequences (Wijesekera, 1987). Kehelpannala (1898) reports that *kitul* tappers refrain from revealing the exact volume of sap due to fear of the evil eye. The tapper is ever vigilant to prevent all trespassers on the tree so that *kitul* related activities are done secretly. He knows of effective charms to keep out troublesome bees and to prevent the evil eyes of man (Amunugama, 2002).

Tappers abstained from all impurities by practicing taboos, when they involved in tapping related activities. The supernatural power can be diminished and nullified by impure association, influence or contact (Wijesekera, 1987). The first flower (*mudun mala*) is never worked out, being thought sinful. The tapper does not work out a spathe that has already been handled by another (Kehelpannala, 1898). This is to avoid black magic performed by the former tapper against the present tapper.

All traditional knowledge cannot be accepted as scientifically proven. However, there seem to be logic in the acceptance of beliefs by the people (Wijesekera, 1987). The beliefs associated with the *kitul* industry have not been subjected to a detailed examination. Therefore, it is worthwhile to examine connections between beliefs and the practices and the outcome for the existence of *kitul* industry in Sri Lanka.

The objectives of the study were to identify beliefs among *kitul* tappers on supernatural forces and to study the logic behind the acceptance and to examine relationships between beliefs and practices.

MATERIALS AND METHODS

An open-ended questionnaire was administered for data collection. Variables considered for the study were: beliefs in vicious qualities of evil persons, beliefs in auspicious moments, observance of auspicious days for *kitul* tapping, source of income, nature of tappers descending from the families practicing *kitul* industry (traditional tappers or not), number of *kitul* blocks that are tapped at a time, mean daily sap yield, success rate of seasoning of flowers, *kitul* growing region, tapping experience of tappers, maximum duration of tapping, age of tappers, education level of tappers and ease of seasoning flowers. In addition to the questionnaire survey, in-depth discussions were also performed during visits.

Table 1. Distribution of Kitul growing villages and selected respondents in different districts.

District	Number of Kitul growing villages	Number of villages selected	Number of tappers selected
Kandy	106	15	43
Matale	101	14	42
Badulle	98	14	40
Matara	75	11	33
Nuwara Eliya	62	9	27
Kurunegala	53	8	24
Ratnapura	49	7	21
Galle	40	6	18
Kegalle	38	5	15
Moneragala	37	5	15
Hambantota	24	4	12
Kalutara	16	3	10
Total	699	101	304

Source: Seneviratne, *et al*, 2005.

Data collection was done between January and September 2004. It has been observed that practices related to obtain sap such as tapping methods vary from region to region. In addition the number of *kitul* villages also varies from region to region (Gunaratne *et al*; 1996). These variabilities were taken into account in sampling by defining two-strata as districts and villages within districts. A multi-stage stratified sampling scheme was adopted for data collection. Since the number of tappers per village was more or less the same in each region, it was accounted for, by having the number of villages proportional to number of tappers in the region. All *kitul* growing districts (Table 1) were considered as first stratum. The second stratum considered was villages and the number of villages from each district was selected randomly on proportional basis to the total number of *kitul* villages in each district (Table 1). The total number of *kitul* villages in the country as identified from the first phase of study is approximately 700 (Seneviratne, *et al*, 2005). Using this list three tappers from each selected village were also selected randomly. Accordingly 304 tappers were included in the sample.

According to the objectives, the response variables considered were beliefs in vicious qualities of evil persons and beliefs in auspicious moments. Since these two variables were recorded in the form of presence and absence, data analysis was done by fitting linear logistic models (McCullagh and Nelder, 1989).

The collected data were coded and the distributions and relationship were analyzed by using the SAS statistical package.

RESULTS AND DISCUSSION

Only 6.6% of the respondents were full-time tappers while the rest was part-time tappers. Of the part-time tappers about nine percent have carried out *kitul* tapping as a hobby. Over 70% of respondents had more than 10 yrs of tapping experience while 15.2% of them had less than five years experience. Approximately 75% of the tappers were between 21- 55 yrs. Approximately 7% of the respondents had no formal education. Nearly 43% had studied up to grade five. One-fifth of tappers have studied up to G.C.E. (O/L) or above. Approximately 73% were descendants from traditional *kitul* tapping families.

Beliefs based on Astrology

Art of astrology was developed by relating human affairs and happenings in the lives of men to the movements of planets (Wijesekera, 1987). According to the respondents, most of the tapping related activities were performed on auspicious days and times. The important activities were fixed having regard to an auspicious moment of a lucky day. The action commenced by looking in the proper direction to avoid the presence of *maruwa* (demon of death) (Wijesekera, 1987).

Eighty four per cent of the respondents were found to have performed the important pre-tapping preparations such as tearing of spathe of flower to expose to the sun, placing the seasoning mixture into the flower stalk, cutting of candle of spikes and hanging of pots on an auspicious day of the week, while others (16%) have ignored auspicious days in doing activities related to the *kitul* industry. According to the respondents, the order of importance of the constituent days of the week for the *kitul* industry was: Sunday (59.5%), Tuesday (44.4%), Thursday (43.1%), Friday (28.3%), Saturday (16.4%), Wednesday (11.2%) and Monday (2.2%).

Sunday belongs to sun. Therefore, it is an active day. *Kitul* tappers expected a good flow of sap during the tapping cycle. Seasoning flowers on Sunday was supposed to fulfill this task.

The second important day for *kitul* related activities was Tuesday. Tuesday was considered as an active day. When an activity is initiated on Tuesday it can be completed fast. Tuesday is regarded as a bad day for burying the dead or bathing for mothers. Demons and evil spirits are free to move about on this day (Wijesekera, 1987). However, this day is good for antisocial activities such as the production of toddy (Devanarayana, 2004). Therefore, Tuesday can be regarded as ideal for toddy making.

It is generally accepted that Thursday is good for any sort of activity irrespective of its nature. Therefore, this day was considered as the third important day of the week for *kitul* related activities. Monday is a calm day and the progress made of the work initiated on this day is slow. Therefore, the least importance was given to Monday in performing activities of the *kitul* industry.

There was a tendency of averting seasoning of flowers on Wednesday and Saturday. These two days are regular meeting days of gods (Wijesekera, 1987). These are days on which *devale* (shrine) priests conduct their worship (*thevava*) to gods of the *devale*. The respect of tappers to deities was reflected through not adhering to *kitul* related activities on Wednesday and Saturday.

Observing of auspicious moments

The Sinhalese believe in a sort of luck and rely on astrology to ascertain lucky or auspicious moments and days to avert misfortune. Among the causes for misfortune were wrath of gods, envy of men and acts of demons and evil spirits (Wijesekera, 1987). The influence of astrology in the affairs of men is remarkable, not only with regards to the predictions but also to the good and evil caused by the planetary deities (Wijesekera, 1987).

Seventy-six percent of the respondents believed in auspicious times when engaged in activities of the *kitul* industry while the rest (24%) had not. The auspicious moment was mainly observed for pre-seasoning and seasoning activities. The order of importance of the activities is given in Table 2.

Table 2. The activities done at an auspicious moment.

Activity	Percentage of respondents
Placing of seasoning mixtures	50.7
Fixing a ladder on to the tree	39.5
Cutting of spike clusters to obtain sap	7.9
Removing of spathes before seasoning mixtures are placed	5.9
Decapitation of the terminal portion of the tree	3.3
Coiling of flower	1.3
Hanging sap collecting pot on the tree and first boiling of sap	0.6

When a virgin *kitul* tree was tapped, the tappers exercised stringent measures to perform important activities of an auspicious moment. The important events in the process of tempering a flower are tearing off of spathes, placing the seasoning mixture in a hole made on the flower stalk and cutting the spike-bundle of the inflorescence (Dissanayake, 1977; Redhead, 1989). The most important activity in *kitul* tapping is seasoning the flower. Correct seasoning determines the sap yield and longevity of sap flow. The strength and quantity of the seasoning mixture, its constituent ingredients, and the extent of removing tissues to make a hole for depositing the mixture all affect on the correct seasoning provided that sunny weather prevailed. The response of the tree for seasoning mixtures is also varied according to tree characteristics. According to Abeyasinghe (1974) 20% of *kitul* trees in our country are non-productive. Besides, there are some trees which are difficult-to-season.

Therefore, seasoning a flower is an unpredictable operation, hence the tappers seemed to have given due consideration to this activity.

Fixing a ladder on to a tree is the initial activity that is performed to facilitate reaching the flower. A tapper has to climb at least twice a day for slicing the flower and collecting sap. The frequency of tapping has to be increased until the sap flow is sustained at the initial stage of tapping. Similarly, when the production is decreasing additional turn of tapping is practiced to resort the sap flow. Additional tapping turns are done mostly at night. Since tapping is practiced according to a schedule, the tapper has to climb a tree even in rain. Therefore, climbing a tree is a risky operation. The risk increases with the strings and vines used for making nodes of cross-bars of the ladder get loosened and subjected to attack by rats. The consequences can be a death or permanent disability. In the southern region a plant or a branch of a latex secreting tree is attached to a *kitul* tree even before it attain the reproductive phase with dual objectives. One is to reveal possession of the tree to a particular tapper and other is to attract supernatural power for the tree. Latex secreting branch signifies prosperity. Kehelpannala (1898) reports that the existence of a practice of tying a bamboo on to the tree on an auspicious day. Subsequent change of the ladder was considered unwelcome resulting in the complete cessation or reduction of the sap flow.

After seasoning a flower the cluster of spikes has to be cut for collecting sap. The determination of the length of the left portion is a question. If the tree is of a high yielding type, the length can be increased while it should be shortened for the low yielding type. Therefore, the decision on the length that should be left seems to be a difficult decision that would determine tapping duration. This difficulty may have caused tappers to pay extra attention to perform cutting of a cluster of spikes at an auspicious time in order to secure the activity.

The initial pre-seasoning activity is removing spathes and clearing the area at which the seasoning mixture is placed. The removing of spathes allows flower to be exposed to the sun and produce chlorophyll. This is the first signal sent to the tree for secretion of sap and considered to be important.

The preceding paragraphs explain the important pre-seasoning activities associated with difficulty, uncertainty and failure. In order to secure and bring success, the tappers tended to observe an auspicious moments.

The tappers try to avoid bad (*rahu*) period of the day when important tapping related activities are done. The bad period lasts about two hours a day and night. Hence two *rahu* periods are included in a day. This time period varies on different days of the week.

The lunar cycle was also considered in performing important seasoning activities. The pre-full moon period of the month is said to be most suitable while post-full moon period is unsuitable. However, on the full moon day seasoning of flowers was avoided due to incidents of breaking of flowers at the place where a cavity was made to deposit seasoning mixtures. It was also saided that flowers were subjected to red weevil attack on this particular day. The fact is that the water content of the flower is high on the full moon day due to the influence of the moon.

The incidents of evil eye, mouth and thought (personal vicious qualities)

Certain ill effects can be caused by human beings, some of whom are born with certain vicious qualities such as *aswaha* (evil eye), *katawaha* (evil speech) and *howaha* (evil thought). In course of time certain persons come to acquire these evil characteristics. Such men and women are feared as antisocial and are often avoided. The expression is spontaneous and results from feelings of unbearable jealousy of another's success, happiness, looks or sweetness and the inability to bear it (Wijesekera, 1987).

Approximately 83% of the respondents believed in the effects of personal vicious qualities. Tapping related activities and processing of sap were done secretly. The production process of treacle and jaggery was not allowed to be witnessed by a stranger. The tappers in the southern region believed that tasting and selling of treacle products until a flower was fully tapped to receive the highest potential sap volume would cause reduction of sap yield. Therefore, treacle products were stored until the flower was fully exploited. Until a three- month period after first menstruation, a girl was not allowed to taste treacle products. The girl was considered undergoing a state of impurity in this period (Wijesekera, 1987).

A set of norms has to be followed when consuming toddy in order to escape from personal vicious qualities. Toddy is not offered to individuals who have these evil characteristics and to a layman who eagerly drinks toddy. Offering pure toddy without adding water, offering toddy with sediments, dripping down toddy along the chin when it is being consumed, smacking lips while drinking toddy, failure to spit out soon after drinking toddy, failure to provide toddy to someone adequately while he is drinking it willingly are regarded as practices that are subjected to evil effects of the consumers, indicating eagerness can surface evil characteristics. Some individuals have been identified in their villages that have vicious qualities.

Associations between belief in personal vicious qualities and other variables

The associations between the variable belief in personal vicious qualities and other variables: observance of an auspicious moment, source of income, nature of tapping profession (traditional or not), number of *kitul* blocks that are tapped at a time, mean daily sap yield, success rate of seasoning of flowers, *kitul* growing region, tapping experience of tappers, maximum duration of tapping, age of tappers, education level of tappers, and ease of seasoning flowers, observance of auspicious days for *kitul* tapping were examined by fitting the linear logistic model and the resulted maximum likelihood ANOVA table is given in Table 3. The corresponding parameter estimates are given in Table 4.

Table 3. Maximum likelihood analysis of variance table for personal vicious qualities.

Source	DF	Chi-Square	Probability
Intercept	1	60.88	<0.01
Observance of an auspicious moments	1	6.38	0.01
Mean daily sap yield	1	7.83	0.01
Likelihood ratio	1	1.25	0.26

According to Tables 3 and 4, those tappers who adhered to auspicious moments for tapping related activities believe in personal vicious qualities ($p=0.01$). Similarly the tappers who obtained higher yields (>16 bottles/ day) also believed in personal vicious qualities ($p=0.01$). According to Premakumara (2000), mean sap yield of 16 bottles/ day can be regarded as a satisfactory yield of a tree.

Table 4. Maximum likelihood estimates of the linear logistic model on personal vicious qualities.

Parameter	Estimate	Standard Error
Intercept	1.72	0.220
Auspicious moments	0.42	0.167
Mean daily sap yield	-0.61	0.217

As shown in Table 4, odds of observance of auspicious moments (*nakath*) is $\exp[(2) (0.42)] = 2.31$ times more than that of no belief, indicating those who believe in personal vicious qualities look for auspicious moments significantly when practicing tapping related activities. Odds of sap yield is $\exp [(2) (0.60)] = 3.32$. This indicates those tappers who receive daily sap yield more than 16 bottles believed in evil forces significantly than those who obtained fewer yields. This quantity of sap of a *kitul* tree was considered satisfactory and it substantially contributes to the income of a tapper.

Associations between observance of auspicious moments (*nakath*) and other variables

The association between observance of auspicious moments and other variables; beliefs in vicious qualities of evil persons, source of income, nature of tapping profession (traditional or not), number of *kitul* blocks that are tapped at a time, mean daily sap yield, success rate of seasoning of flowers, *kitul* growing region, tapping experience of tappers, maximum duration of tapping, age of tappers, education level of tappers, ease of seasoning flowers and observance of auspicious days for *kitul* tapping were examined by fitting the linear logistic model and the resulted maximum likelihood ANOVA table is given in Table 5. The corresponding parameter estimates are given in Table 6.

According to Tables 5 and 6, those tappers who believed in personal vicious qualities have concerned about auspicious moments for tapping related activities ($p = 0.02$).

Table 5. Maximum likelihood analysis of variance table for auspicious moments.

Source	Degree of freedom (DF)	Chi-Square	Probability
Intercept	1	17.55	<0.01
Belief in personal vicious qualities	1	5.21	0.02
Nature of tapping profession	1	0.06	0.80
Number of tapping blocks	1	3.86	0.05
Tapping experience	1	0.41	0.52
Nature of tapping profession Tapping experience	1	2.76	0.09
Likelihood ratio	10	21.47	0.02

Similarly those tappers who tapped *kitul* trees less than four number of blocks at a time also have considered auspicious moments for *kitul* related activities ($p = 0.05$) and may be hoping to get higher possible yield from the limited number of trees.

Table 6. Maximum likelihood estimates of the linear logistic model on auspicious moments.

Parameter	Estimate	Standard Error
Intercept	0.79	0.188
Belief in personal vicious qualities	0.38	0.166
Nature of tapping profession	0.04	0.156
Number of tapping blocks	0.29	0.148
Tapping experience	0.10	0.156
Nature of tapping profession, Tapping experience	-0.26	0.156

The odds of belief in personal vicious qualities is $\exp[(2) (0.38)] = 2.13$ times more than that of those tappers who do not believe. This means the tappers who adhere to auspicious moments also significantly believe in personal vicious qualities. The odds of tapping less than four number of blocks is $\exp [(2) (0.29)] = 1.78$ times more than that of five blocks or more. This implies that those tappers who tapped less than four blocks significantly believed in auspicious moments in tapping related activities than who tapped more than five *kitul* blocks. Tapping of more than five blocks means that the tapper can receive a substantial quantity of sap even if the trees are low yielding. The low sap yield of trees would have been compensated by the higher number of blocks that were tapped.

An interaction between nature of tapping profession and tapping experience was observed in relation to observance of auspicious moment ($p = 0.09$). However, this relationship was not strong enough to prove statistically.

Observance of taboo

It is an essential prerequisite for the absence of any kind of defilement (*kili*) in any form or degree when rituals are performed (Wijesekera, 1987), resulting to the strict observance of prescribed taboos. Any failure to produce results was attributed to deficiencies of ritual or violations of taboos. On the day of making a flower the tappers should refrain from taking meals containing yams with high astringency. This may be to prevent intoxicating effects. Applying perfumes or fragrant soap was also undesirable on the day of tapping a flower. The body is attracted by devils when it is perfumed (Wijesekera, 1987). Offering of betel with *Hingurupiyali* (*Kaempferia galanga*) to someone was also regarded as a practice that should not be done on that particular day. This may be attributed to the fragrance emanated by *Hingurupiyali* that might welcome devils.

It was a general belief that tappers should not eat the tender shoots of *kitul* plants either in raw form or cooked form. They should abstain from felling *kitul* trees and using them for firewood. These taboos were to respect the *kitul* tree which looked after their livelihood. One reason for the presence of a substantial number of *kitul* trees without being properly used to fulfill the requirement of timber may be attributed to this taboo. Tapping of two flowers on the same day and the use of one chisel to tap two flowers on the same day were considered objectionable. Seasoning a flower at a time was advisable to get

full attention of the tapper for the most crucial job. The sharpness of the chisel was also important to ensure neatness of the incisions made.

After tapping a flower, two tappers meeting each other was regarded as unwelcome. Discussion about the activity may be useless since the seasoning is associated with uncertainty. Therefore, the tappers resorted to see their own faces through a mirror or a water pot as soon as a flower was seasoned.

When an unclean situation (defilement) prevailed in the house, tapping flowers was said to be difficult. Attending a funeral and shouldering a corpse were two conditions of defilements. It is believed that *kili* affecting a person visiting a funeral can be removed by washing oneself with lime and water (Wijesekera, 1987). A girl or a woman having menstruation was regarded as unclean. The Sinhalese firmly believe that a woman in *kili* is an agent of destroying the moral force of anyone close to her sight or touch (Wijesekera, 1987). When a *thovil* ceremony is held at home, it is believed that tapping of flowers is difficult. This may be attributed to summoning of demons and spirits for the occasion.

The removed parts of the flower, especially the spike fragments and slices of cut-surface are disposed of carefully into flowing water in order to avoid someone using them for black magic to harm the flower and the tapper.

Rituals conducted in the *kitul* industry

A reasonable knowledge on the rituals that are performed in *kitul* related activities is required in order to understand and make improvements in the industry. There are gods who produce luck and fertility. The same deities are capable of bringing death, disease and destruction on those who displease and dishonor them (Wijesekera, 1987). Tapping a *kitul* tree is a hazardous venture. Confidence is the most desirable virtue before embarking upon hazardous ventures (Wijesekera, 1987). Vows are made to deities with the promise of making offerings in kind. The offering is given voluntarily but in the expectation of favors and blessings. There are some regional deities who look after activity in their jurisdiction. For example, *Kohomba Bandara* deity is responsible for Deraniyagala area and deity in *Gatabaru devol* looks after the southern region.

The first sap or toddy obtained from a newly tapped *kitul* tree was poured on to a leaf stalk to thank the deities who helped in the success of tapping. Treacle and jaggery collected from their initial sap were reserved to pay vows to their devoted gods. The jaggery was preserved in the attic for this purpose called *kotta hakuru*. A fraction of their income derived from the *kitul* industry was set aside to make offerings to the gods. The purpose of alms giving is to thank all the deities for the mercies and benefits received during the year and to seek protection and help during the coming year (Wijesekera, 1987). On the other hand tappers were generous to offer their *kitul* products for religious activities and for sick people who were in need of genuine products.

Risks and uncertainty associated with *kitul* industry

Approximately 93% of respondents had experienced ceasing of sap production abruptly of a tapping inflorescence without resumption. Therefore, obtaining of sap until the flower was fully tapped, seemed to be a difficult task and not within the control of the

tapper. This situation in *kitul* industry agrees with the argument of Webster (1948) that magical rites are attended for the activities whose outcome is regarded as not within the human capacity such as fishing, gardening and cattle rearing.

The success of tapping of over 75% can be considered satisfactory. This success rate was achieved by only 40% of the respondents. The methods of seasoning seemed not reliable. Magic is involved in unreliable methods and magical rites intensify and acquire confidence of the activities performed (Webster, 1948).

Seasoning of flowers was difficult during the rainy season. A difficulty of seasoning flowers during rains was observed by 40% of the respondents. This difficulty can be attributed to inability of exposing flowers for the influence of the sun. Magical rites reinforce the efforts taken to cope with the calamity and resort to a hopefulness and equanimity (Schapera, 1934). Sap yield is highly variable (Dissnayake, 1977; Redhead, 1989; Kithsiri and Pathirana, 1995). The occurrence of unproductive *kitul* trees in our country is 20% (Abeyasinghe, 1974). Among the population of *kitul* trees are difficult-to-season trees. Therefore, a clear picture on the productive capacity of the trees could not be obtained until a tree is tapped.

The long gestation period of about 10-15 yrs (Kehelpannala, 1898, Abeyasinghe, 1974) is uneconomical to the tapper, hence he has to seek for another source of income. Though *kitul* has a long gestation period, its productive period is appreciably low about five years. The total number of flowers produced during a lifetime of a tree is in the range of 13-15. However, all the flowers could not be tapped mainly owing to inclement weather (Abeyasinghe, 1974). The emergence of flowers during rains is frequent while it is delayed in dry periods (Kehelpannala, 1898). Lack of watchfulness also leads to opening the flowers so that it is wasted without tapping.

The duration of tapping varied from two months to one year. Approximately one-fourth of respondents practiced tapping up to three months. Only one-fourth of respondents had exceeded the satisfactory duration of tapping over six months. The above description shows that seasoning a flower and sustaining the sap yield is unpredictable. Therefore, a tendency is there to rely on supernatural forces expecting better results.

Kitul tapping is done early in the morning and late in the evening to avoid sights of the evil persons. Approximately 59% of respondents had adhered to a tapping frequency of two times a day while the remaining 41% adapted to a tapping frequency more than two times a day. The additional turn or turns definitely fell in the night, mostly around 9.00 pm or 12.00 mid-nights. There are special hours during day and night fixed by the devils in their search for human victims. The four watches (*yaama*) fixed by the devils are morning, noon, evening and midnight (Wijesekera, 1987). These watches coincided with tapping turns so that tappers were likely to attack by devils.

The tapping related activities are single-handed, done in isolation. Therefore, there is a tendency of attacking tappers by the devils. *Kitul* trees are mostly present in jungles, woods, watersheds, mountains and canal banks where devils haunt (Wijesekera, 1987). The lonely persons are likely to be attacked by devils in such places (Wijesekera, 1987). *Kitul* sap is consumed by mammalian pests such as bats, wildcats, squirrels and human beings while on the tree. Its quality can be deteriorated by licking serpents and geckos. Besides, low

quality sap is an inherent characteristic of some trees. Tapping at an initial stage and towards the cessation of production will give rise to more watery and less sweet sap. The sap cannot be kept long without fermenting. Effective measures have to be taken to prevent fermenting. Therefore, the sap quality can also be considered as a variable character. Production of jaggery is impossible and boiling of treacle is difficult from the low quality sap.

CONCLUSIONS

Risk, technical uncertainty, weather dependency, loss of sap due to consumption of sap by mammalian pests, fast deterioration of sap, vulnerability of prosecution by law enforcing officers are features of the *kitul* industry. Among the causes, technical uncertainty in seasoning a flower leads to a failure which cannot be easily rectified. Therefore, it is likely to attribute failures to evil influence of planetary deities, evil spirits and persons with vicious qualities.

Tapping is done early in the morning, late evening and night, enabling evil spirits to attack the tappers. This situation is more favored since it is done in isolation. Therefore, stakeholders in *kitul* industry including tappers resorted to seek blessings from supernatural forces for protection, production and security in the activities they do. Taboos and rituals are performed to prevent nullifying the results of the magical performances and strengthen the same.

The beliefs in supernatural forces may have built the confidence among the tappers to undertake the job of tapping courageously. This too has indirectly caused the existence of the *kitul* industry in Sri Lanka.

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REFERENCES

- Abeyasinghe, A. (1974). *Kitul cultivation, processing and marketing in Sri Lanka*. Crop Studies No.12. Ministry of Plantation Industries, Colombo.
- Amunugama, S. (2002). High on devil's brew. *Sunday Observer*, 29th September.
- Dewanarayana, W. (2004). Cosmic Influences on Healthy crop production: Eastern and western astrological and astronomical concepts. (In press).
- Dissanayake, B.W. (1977). Use of *Caryota urens* in Sri Lanka. *In: First International Sago Symposium*. Tan K. Sarawak (ed). The Equatorial Swamp as a Natural Resource. East Malaysia, Kuching 1976. Kuala Lumpur. pp. 84 - 90.

- Gunaratne, W.D.L, Premakumara, K.V.S. and Heenkenda, A.P. (1996). *Kitul (Caryota urens L)*: A popular multipurpose plant among the rural community. Proceedings of the seventh multipurpose tree species workshop. pp. 226 - 233.
- Kehelpannala, T.B.P. (1898). The *kitul* and its uses. George J.A. Skeen, Government Printer, Colombo, Ceylon.
- Kithsiri, M.K.U. and Pathirana, R. (1995). Sap yield variation of *Caryota urens*. Forestry and Environment Symposium.
- McCullagh, P. and Nelder, J.A. (1989). Generalized Linear Models. 2nd edn. Chapman and Hall. London.
- Premakumara, K.V.S. (2000). A survey and germ plasm collection of fish tail palm or *Kitul (Caryota urens. L.)*. Final Report. CARP Project-12/369/286.
- Redhead, J. (1989). Utilization of tropical foods: trees. *In*: FAO Food and Nutrition Paper No 47: 3. FAO, Rome, Pp. 52.
- Schapera, I. (1934). Herding Rites of the Bechuanaland Bakxatla. *American Anthropologist* 36: 564.
- Seneviratne, M.A.P.K., Wanigasundara, W.A.D.P. and Wijeratne, M. (2005). Use of seasoning mixtures for enhancing flow of sap of *Kitul (Caryota urens L.)* in Sri Lanka. *Trop. Agric. Res.* 17: 264 - 270.
- Webster, H. (1948). *Magic A Sociological Study*. Stanford University Press. Stanford, California.
- Wijesekera, Nandadeva (1987). *Deities and Demons Magic and Mask*. M.D. Gunasena and Company. Colombo.