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Extraction of medicinal plants by tribals in Kerala

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Abstract

The present study was carried out in Khozikhode and Thiruvananthapuram Forest Circles of Kerala state to know the extraction of medicinal plants by tribals. A pre-tested interview schedule was used to collect data from tribals extracting medicinal plants from forests. The tribals extract medicinal plants in the notified forest areas which are specified by the Kerala Forest Department. *Phyllanthus emblica* (berry), *Sida hombifolia* (root), *Desmodium triquetrum* (root), *Terminalia chebula* (nuts/fruits), *Cocuma aromatica* (rhizome), *Asparagus racemosus* (tuber), *Alpinia galanga* (tuber) and *Symplocos cochinesis* (bark) are the important medicinal and minor forest products extracted by the respondents in the study areas. Except *Symplocos cochinesis* (bark), which is extracted by tribals throughout the year, all the other medicinal plants including minor forest products were extracted depending upon the season. The extracted medicinal plants and minor forest products by the tribals are marketed to the SC/ST Federation. Further, the SC/ST Federation sells the medicinal plants to pharmaceutical companies, wholesalers and retailers. The major constraints faced by the tribals in the extraction of medicinal plants from the forest areas include: (a) scattered distribution and seasonal availability of medicinal plants, (b) attack by wild animals, (c) perishable nature of medicinal plants, and (d) lack of training on sustainable extraction of medicinal plants.

Keywords: extraction, medicinal plants, SC/ST federation, tribals, constraints

Introduction

The collection and exploitation of medicinal plants including minor forest products from forests are closely intertwined with the life of tribals living either inside or on the periphery of the forests. The tribal communities live in abject poverty having very little access to capital assets, health and educational facilities. To a vast majority of tribal people, extraction, processing and marketing of medicinal plants including minor forest products is a source of employment throughout the year. Without much capital investment and with little skill it provides employment opportunities to all groups of tribals and the income generated by these products significantly contributes to household income in tribal areas. The medicinal plants including minor forest products in general, command a premium value for their novelty, intrinsic properties and their limited supply in the final market. But what the tribals receive at the first point of sale is a pittance in view of the unorganized system of marketing prevailing for majority of the medicinal and minor forest products. The lack of information among the collectors about the true worth of the product and their poor socio-economic status prevents them from realizing a fair return for their efforts and they are usually satisfied with whatever benefit they get. They are unable to organize their efforts and bargain for better price as they are in dire need for whatever cash income they can get readily. The economic weakness, social conservatism and uncertainty of market for medicinal plants including minor forest products have made tribal life vulnerable and prone for exploitation by middlemen or private traders. Tropical evergreen, tropical semi-evergreen, tropical moist deciduous, tropical dry deciduous, sub tropical broad leaved hill montane, wet temperate and littoral, and swamp forests are the seven types of forests present in Kerala. Five hundred species yielding medicinal and minor forest products are reported in Kerala forests. They are used as edible products, medicinal plants, toiletries, dyes, gums and resins etc. In 1970, the Government granted the right of collection of medicinal plants including minor forest products to the tribal people in the State. In 1978, the Tribal Service Co-operative Societies (TSCS) were started with membership reserved only for the tribal people in order to ensure a fair deal for their products and to free them from the clutches of middlemen and thereby, aiming at their improved welfare. In 1981,

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the Government of Kerala established an apex body of tribal societies viz., The Kerala State Scheduled Caste and Scheduled Tribe Development Co-operative Federation (SC/ST Federation – An Apex institution of TSCS) and it was entrusted with the right of monopoly in procurement and sale of 100 medical plants including minor forest products by the tribals through TSCS. In this backdrop, the present study was carried out with the following specific objectives:

1. To study the extraction pattern of medical plants including minor forest products by the tribals.
2. To know the profile of tribals engaged in extraction and marketing of medical plants including minor forest products.
3. To identify the problems encountered by tribals during collection processing and marketing of medical plants including minor forest products.

Materials and Methods

The study was conducted in Thiruvananthapuram and Kozhikode Forest Circles of Kerala state. Two hundred tribals (involved in the collection of medicinal plants including minor forest products), who were voluntarily willing to provide the required information, were randomly selected from Thiruvananthapuram (Thiruvananthapuram Forest Division) (100 Nos.) and Kozhikode (Waynad South Forest Division) (100 Nos.) Forest Circles. A pre-tested interview schedule was used to collect the relevant information. The collected data was scored, tabulated and analyzed using frequency and percentage.

Results and Discussion

1. Extraction pattern of medical plants including minor forest products by the tribals.

The tribals collect medical plants including minor forest products from the leased forest ranges/areas including National parks and Wild life sanctuary. Advance money is given to the tribals by TSCS for collecting medical plants including minor forest products from the forests. The collected medical plants including minor forest products will be used for self consumption by the tribals and the remaining

medical plants including minor forest products are supplied directly to the collection points of TSCS. The tribals do not grade or process the medical plants including minor forest products collected by them.

Of the 100 commercially important medical plants including minor forest products listed by the Kerala Forest Department for extraction by the tribals, only a few easily marketable medical plants including minor forest products are extracted by the tribals in Wayanad South (Kozhikode Forest Circle) and Thiruvananthapuram (Thiruvananthapuram Forest Circle) Forest Divisions. The major medical plants including minor forest products extracted by the tribals in the sampled forest divisions are presented in Table 1.

The important medical plants including minor forest products extracted by tribals in Wayanad South Forest Division includes *Acacia concinna* (nut), *Phyllanthus emblica* (berry), *Sida hombifolia* (root), *Desmodium triquetrum* (root), *Sapindus laurifolius* (fruit) and *Terminalia chebula* (nuts). *Terminalia chebula* (nuts), *Garcinia cambogia* (fruits), *Piper trichostachyon* (roots), *Vateria indica* (exudation), *Canarium strictum* (resin), *Cucurma aromatic* (rhizome), *Sterospermum colais* (roots), *Asparagus racemosa* (tuber), *Alpinia galanga* (tuber), *Symplocos cochinesis* (bark) and *Elettaria cardamom* (fruits) are the major medical plants including minor forest products extracted by the tribals in Thiruvananthapuram Forest Division.

Except *Symplocos cochinesis* (bark) which is extracted by tribals throughout the year, all the other medical plants including minor forest products were extracted depending upon the season. The factors which normally affects the variations in the collection of medical plants and minor forest products include: climate changes, forest fires, seasonal fluctuations in output, unsustainable and unscientific harvesting, lighting fire, allotment of forest ranges and excess collection of certain medicinal plants due to their high demand.

More or less similar findings were reported by Ganapathy (1998) [3], Thomas (1999) [5], Udayan *et al.*, (2005) [6] and Raghavendra *et al.*, (2015) [4].

Table 1: Extraction of medicinal plants and minor forest products by tribals

Sl. No.	NTFP items/Local Name	Botanical name	Part(s) used	Period of extraction	Economic use
A. Wayanad South Forest Division (Kozhikode Forest Circle)					
1.	Cheevakai	<i>Acacia concinna</i>	Nut/fruit	February-April	
2.	Nellikai	<i>Phyllanthus emblica</i>	Berry	September-February	Food, medicine
3.	Kurumthottveru	<i>Sida hombifolia</i>	Root	August-October	Medicine
4.	Orilla veru	<i>Desmodium triquetrum</i>	Root	August-November	Medicine
5.	Urunchiccai	<i>Sapindus laurifolius</i>	Fruits	September-February	Cleansing, detergent
6.	Thannicca thode	<i>Terminalia chebula</i>	Nuts/fruits	January-May	Medicine
B. Thiruvananthapuram Forest Division (Thiruvananthapuram Forest Circle)					
1.	Thannicca thode	<i>Terminalia chebula</i>	Nuts/fruits	January-May	Medicine
2.	Kudampuli	<i>Garcinia cambogia</i>	Fruits	June-August	Pickles
3.	Kattukurumulakat veru	<i>Piper trichostachyon</i>	Roots	March-July	Spice
4.	Kompuvella	<i>Vateria indica</i>	Exudation	January-April	Gums
5.	Kunthirikkam	<i>Canarium strictum</i>	Resin	January-June	Dye, paints
6.	Kattumanjal	<i>Cucurma aromatica</i>	Rhizome	May-September	Medicine
7.	Pathiri	<i>Stereospermum colais</i>	Flower & bark	May-October	Dye, paints
8.	Nellikai	<i>Phyllanthus emblica</i>	Berry	September-February	Food, medicine
9.	Urunchiccai	<i>Sapindus laurifolius</i>	Fruits	September-February	Cleansing, detergent
10.	Kurumthotti veru	<i>Sida rhombifolia</i>	Roots	August-October	Medicine
11.	Sathavarikizhangu	<i>Asparagus racemosa</i>	Tuber	July-December	Medicine
12.	Chittaratha	<i>Alpinia galanga</i>	Tuber	June-September	Medicine
13.	Pachotti	<i>Symplocos cochinesis</i>	Bark	Throughout year	Medicine
14.	Elam	<i>Elettaria cardamomum</i>	Fruits	June-December	Spice

2. Profile of tribals engaged in extraction and marketing of medical plants including minor forest products

It is observed from Table 2 that a majority of the tribals (60-70%) engaged in collection and marketing of medical plants including minor forest products have studied up to primary school. A majority of them have less than five members per family (60-70%) and possess lands (70-80%) for cultivation. Two to three members in a family are engaged in the extraction of medical plants including minor forest products. The average number of man days annually engaged by a tribal family in Wayanad South and Thiruvananthapuram Forest Divisions is 141.5 man days and 159.6 man days, respectively. Out of which, 48-49 per cent of the total man days are spent in the extraction of medical plants including minor forest products.

The average annual family income of the tribals in Wayanad South and Thiruvananthapuram Forest Divisions is Rs. 8310 and Rs.8861, respectively. Out of which, more than half (51-

57%) of the annual family income is derived from the collection of medical plants including minor forest products of Wayanad South and Thiruvananthapuram Forest Divisions. The income derived by a tribal in Wayanad South and Thiruvananthapuram Forest Divisions is Rs.78.5 and Rs 74, respectively per visit to the forest.

The distance travelled by the tribals for extraction of medical plants including minor forest products is in the range of 1-20 km, while the distance travelled by them to market the medical plants including minor forest products is in the range of 2-6 km. The study findings of longer distance travelled by the tribal people for the collection on medical plants including minor forest products and the wide variations in the quantity collected by the tribals suggests that the species yielding medicine and minor forest products are sparsely distributed in the forests. Similar findings were reported by Bhaskar *et al.*, (2003) ^[1] and Devi Prasad *et al.* (2013) ^[2].

Table 2: Profile of tribals engaged in extraction and marketing of medicinal plants

Sl. No.	Problems	Tribal (%)	
		Wayanad South Division	Thiruvananthapuram Division
1.	Education		
	• Illiterate	60%	70%
	• Primary	20%	10%
	• Middle	10%	10%
	• Matriculation	10%	10%
	• Higher secondary	-	-
2.	Number of family members		
	• Less than 5 member	60%	70%
	• Five & more members	40%	30%
3.	Type of family		
	• Nuclear	60%	60%
	• Joint	40%	40%
4.	Number of family members involved in the collection of medicinal plants and minor forest products	2-3	2-3
5.	Number of families owning land for cultivation	80%	70%
6.	Average annual income (Rs./annum/family)	8310	8861
	• Agriculture & allied activities	2078 (25%)	2038 (23%)
	• Medicinal plants and minor forest products	4737 (57%)	4519 (51%)
	• Wage labour	1495 (18%)	2304 (26%)
7.	Average number of man days employed in a year (man days family)	141.5	159.6
	• Agriculture & allied activities	39.0 (28%)	44.5 (28%)
	• Medicinal plants and minor forest products collection	69.5 (49%)	77.1 (48%)
	• Wage labour	33.0 (23%)	38.0 (24%)
8.	Distance travelled (to & fro) for collection & marketing of NTFPs & medicinal plants		
	• Collection of medicinal plants and minor forest products	2-18	1-20
	• Marketing of medicinal plants and minor forest products	2.5	2-6

3. Problems encountered by tribals during collection, processing and marketing of medical plants including minor forest products

Low collection charges/wage rate, lack of training and proper equipment to extract medical plants and minor forest products and seasonal availability of medical plants/ minor forest product, long distance, remote areas, attack by wild animals and scattered distributed of medical plants/ minor forest products are the problems encountered by a majority of 55 per cent of the tribals during collecting of medicinal plants and minor forest products (Table 3). Less than one-fourth of the tribals faced problems such as: lack of financial facilities, restrictions from forest authorities and lack of demand for the medical plants and minor forest products. It is also observed

from Table 3 that a vast majority of over 80 per cent of the tribals faced problems like lack of training on processing technologies and lack of processing facilities (equipment etc.)

Majority of over of 75 per cent of the tribals felt that the perishable nature of medical plants /minor forest products is the major marketing problem faced by the tribals. Exploitation from middlemen and long distance travel for procurement or to marketing points were the other problems encountered by less than one-third of the tribals of Wayanad South and Thiruvananthapuram Forest Divisions.

High wage rate, imparting training on scientific and sustainable harvest of medical plants including minor forest products and the processing of medical plants and minor forest products, supply of proper equipments for extracting

and processing of medical plants/ forest products and legal action against middlemen (who interfere in the collection of medical plants and minor forest products from tribals) by the Forest Department are the important suggestions expressed by

the tribals of Wayanad South and Thiruvananthapuram Forest Divisions to overcome the problems in the collection, processing and marketing of medical plants including minor forest products.

Table 3: Problems encountered by tribals during collection, processing and marketing of medicinal plants and minor forest products

Sl. No.	Problems	Tribals (%)	
		Wayanad South Division	Thiruvananthapuram Division
A.	Collection problems		
1.	Low collection charge/wage rate	60	60
2.	Attack by wild animal	80	80
3.	Long distance to collect medicinal plants and minor forest products	90	90
4.	Remote areas	70	60
5.	Lack of training to extract medicinal plants and minor forest products	60	70
6.	Scattered distributions of medicinal plants and minor forest products /depletion of flora	80	70
7.	Inadequate availability of medicinal plants and minor forest products	80	70
8.	Seasonal availability of medicinal plants and minor forest products (shorter period)	80	70
9.	Lack of financing/credit facilities	10	10
10.	Restriction from the forest authorities	20	10
11.	Lack of demand for medicinal plants and minor forest products	10	20
12.	Lack of proper equipments for extraction of medicinal plants and minor forest products	60	60
	B. Processing problems		
1.	Lack of training on processing technologies	80	90
2.	Lack of processing facilities (equipments etc.)	80	80
	C. Marketing problems		
1.	Exploitation from the middlemen	10	10
2.	Perishable nature of medicinal plants and minor forest products	70	80
3.	Long distance of procurement/marketing points	30	20

Conclusion

The tribals lack full knowledge about the utilization, quality aspects, market demand and scientific extraction methods. Therefore, the Kerala Forest Department and SC/ST Federation need to educate the tribals about the utilization of medical plants including minor forest products, quality aspects, market demand and scientific extraction methods of medical plants including minor forest products. Proper extension measures need to be taken through audio and video aids by highlighting the uses and importance of scientific and sustainable extraction methods.

Steps should be taken up by the Kerala Forest Department to check the illicit collection and traffic of medical plants including minor forest products. Strict and legal actions against the middlemen or private collectors who are engaged in illegal collection of medical plants and minor forest products from the tribals should be taken by Forest Department to prevent the exploitation of tribals. The Forest Department should also undertake enrichment planting of minor forest products and medicinal plants, besides overexploited and endangered minor forest products and medicinal plants should be protected and propagated. The minor forest products and medicinal plants should necessarily be mixed species so that it will help in obtaining one or the other products all the year round and to provide additional income and employment to the tribals.

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