



A survey on the linkage between use of traditional medicinal plants and high life expectancy of communities living near the Sinharaja rainforest

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Abstract

Sinharaja is a tropical rainforest located between 6° 21' – 6° 26' latitude North and 80° 30' – 80° 34' longitude East. It sprawls across 11,187 hectares of land in the Galle, Matara and Ratnapura districts. Over the centuries, the communities living around the periphery of Sinharaja have interacted with the forest in many ways. Basically, their livelihood is dependent on the forest resources. One of the major forest resources gathered and used by them are medicinal plants. The primary objective of the research was to study the effect of traditional medicinal plants on the life expectancy of the population living near the Northwestern (NW) slope of Sinharaja forest's periphery. Other objectives were to study the types of medicinal plants used, exact locations from which medicinal plants were gathered, inhabitants' knowledge of medicinal plants, the food habits of the elderly people and to assess the current trend in the use of medicinal plants by the younger generation living in the same area. Two Grama Niladari divisions comprising six villages were selected for the study done in the NW slope of Sinharaja forest's periphery. These were Kudawa, Pethiyakanda, Pitakele and Buthkanda villages of Kudawa GN division and Suduwelipotha and Miyanapalawa villages of Weddagala North GN divisions, all of them situated in the Kalawana District Secretariat Division of the Ratnapura District. The total number of elderly persons (those over 60 years of age) was 60, and an age stratified random sampling of 82.0% was done; from the younger population (18-35 years of age) numbering 156, a sampling of 20% was done. All of these persons were inhabitants of the six villages. A house to house survey was conducted using a questionnaire, interviews, case studies and field observation to collect data for the study from the overall population, while in addition a focus group discussion was held with the younger group. The 18-35 age group sampling did not necessarily coincide with that of the older age group. The study was done over the period May-December, 2011. Results showed that the oldest respondent in the sample was 99 years old and in good health. The elderly population had regularly utilized the traditional medicinal plants. They said that 42.9% of the medicinal plants they gathered were from the forest, 30.6% were from their home garden, 16.3% from the village and 10.2% from the nearest market. According to the study, 43 medicinal plants have been commonly used by the elderly persons and these were mostly gathered from the forest. At present, the majority of younger persons get their medicines from the nearest market.

Keywords: Life Expectancy, Medicinal Plants, Elderly Population, Sinharaja Forest, Lifestyle.

Introduction

The Sinharaja forest reserve is one of the best preserved and biologically unique lowland rain forests in Sri Lanka. This forest covers an extent of about 11,187 hectares and straddles three districts. The length of the forest is about 21 km from East to West and the width from North to South is about 3.7 km. It was declared a Man and Biosphere Reserve (MAB) in 1978, as representing a tropical humid evergreen forest eco-system in Sri Lanka and recognized by UNESCO as part of its International Network of Biosphere reserves. It was declared a world heritage site in 1989. It is situated in the wet zone of the country in the southwest lowlands, which extend into the districts of Ratnapura, Galle and Matara¹⁻³.

The ageing process in humans is associated with regressive physiological, functional and pathological changes affecting

their physical, mental, emotional and social well-being. It manifests itself through negative changes in physical/psychological performance and functional ability, thereby affecting daily living; this is a result of the reduced mental and cognitive processing impacting on the productive aspect, and consequently, on the overall quality of life. These changes occur within a milieu of cultural and religious values, as well as shifts in the family and social structure. Life-long use of traditional medicinal plants, and particularly during illness, contributes to healthy living and high life expectancy. Medicinal plants have considerable healing power and cure illnesses without troublesome side effects. Ayurvedic cure, which is based on medicinal plants, can assure long life⁴⁻⁷.

Rationality: A healthy environment and traditional lifestyle can lead to long life. The periphery of the Sinharaja forest provides an environment that is conducive towards a high life expectancy

of the resident community. Studies encompassing the tropical rainforest, use of traditional medicinal plants and life expectancy of communities in that environment are scarce in Sri Lanka. This research gap prompted this study.

Objectives: The primary objective of the research was to ascertain the influence that the traditional medicinal plants might have on the life expectancy of the communities inhabiting the Northwestern (NW) slope of Sinharaja forest’s outlying areas. Secondary objectives were to study the different varieties of medicinal plants in common use, the places from which medicinal plants were gathered, inhabitants’ knowledge of medicinal plants, the dietary habits of the elderly people and to assess the present trend in the use of medicinal plants by the younger persons belonging to those communities.

Methodology

Two Grama Niladhari Divisions (GN) comprising six villages were picked out for the study conducted in the NW slope of the Sinharaja forest’s outlying areas. These were Kudawa, Pethiyakanda, Pitakele, and Buthkanda villages coming under the Kudawa GN division, and Suduwelipotha and Miyanapalawa villages falling under the Weddagala North GN Divisions (Table-1). All of these GN divisions fall within the Kalawana District Secretary's Division of the Ratnapura District in the Sabaragamuwa Province. The total number of elderly persons (over 60 years of age) was 60, and an age stratified random sampling of 82.0% was done; from the younger population (18-35 years of age) numbering 156, a sampling of 20% was done. All of those who participated were inhabitants of the six villages. A door to door survey carried out by means of a questionnaire, interviews, case studies and field observations were used to collect the data for the study from the population, while a focus group discussion was also held with the younger group. The 18-35 age group sampling did not

necessarily coincide with that of the older age group. The study was done during the period from May to December, 2011. Simple statistical methods and standard statistical calculations were used to analyze and interpret the data.

Study area: The Kudawa and Weddagala West Grama Niladari Divisions were selected for the study. Both these GN divisions come under the Kalawana Divisional Secretariat of Ratnapura District in Sri Lanka. The majority of people in these areas are not educated and their main economic activities reflect that. They mostly engage in tea plantation work, toddy (kithul) tapping and gathering materials from the forest. The study area is practically adjoining the Sinharaja Rain Forest and as such the lives of the inhabitants there are closely intertwined with it. In fact, most of the people in that locality are highly dependent on the forest as it provides a wide array of valuable materials on which they subsist. One of the most important products they gather from the forest is medicinal plants. In addition, they also grow certain medicinal herbs in their home gardens. They have been using medicinal plants over generations, for treating various diseases and healing injuries. The village doctors (Goda Veda Mahaththayas) prepare various medications from the different parts of medicinal plants such as the leaf, root, bark, fruit, flower, seed, pod, stem etc. These are used to treat many diseases, ailments, injuries, fractures, snakebites, etc. A degree of specialization can be noted among the local doctors. For example, the Sarpa Veda Mahaththaya is the specialist doctor who treats snakebites with traditional medicines of plant origin. From all these we can deduce that a very close relationship has existed between medicinal plants and the communities in the study area.

Results and discussion

Table-1 shows the basic information of the population in the NW slope of the Sinharaja forest’s periphery.

Table-1: Basic information of the population living in the NW slope of Sinharaja forest’s outlying areas.

Village	Total Population	No. of persons in Age group		Selected Sample Number		Age (range)	
		(1)	(2)	(1)	(2)	(1)	(2)
Kudawa	237	15	41	08	08	65-83	18-33
Pethiyakanda	229	15	39	10	08	64-84	18-34
Pitakele	146	10	16	07	03	67-97	18-32
Buthkanda	66	07	15	08	03	63-68	18-35
Miyanapalawa	47	03	18	07	04	69-87	18-33
Sduwelipotha	139	10	27	09	05	60-99	18-34
Total	864	60	156	49	31	60-99	18- 35

(1) 60 – 99 years (2) 18 – 35 years

According to Table-1 the total population of the study area comprised 864 persons, of whom 60 were elderly and 156 were between 18-35 years. The age of the elderly people ranged from 60 to 99 years. The oldest subject was thus 99 years old. All the elderly persons in the sample had surprisingly good health and very good memory power.

Table-2 shows the previous occupations of the elderly people on the NW slope just outside the Sinharaja forest.

As indicated in Table-2, the elderly population had been engaged in chena cultivation, collecting forest materials, cutting kithul flowers (toddy tapping), and hunting in their younger days. 38.8% had been engaged in chena cultivation and 30.7% engaged in gathering forest materials. All these occupations (100%) show that they have been closely linked to the forest environment. Group discussions revealed that about 80.0% of the younger persons have taken to tea plucking and the remaining 20.0% working as forest guides, three wheeler drivers and in other minor occupations. This indicates that the younger generation has distanced itself from the forest, except when acting as mere forest guides.

Table-3 shows the type of food consumed by the elderly people in the NW slope of the Sinharaja forest's periphery.

According to Table-3 the assortment of food in their daily meals must surely comprise a balanced diet as that includes fruits, vegetables, green leaves, yams, cereals and other items, all of which are free from modern day agro-chemicals. It also reflects their indigenous knowledge regarding the variety of foods available in the forest. The sharpness of their memory that allows them to recall over 100 forest food items provides an

indication of the anti-ageing effects that some of these foods might possess.

Table-4 shows the changes in the types of food consumed by the younger persons living around the Sinharaja forest.

According to Table-4 the number of local food items consumed by the younger generation has decreased (i.e. food items gathered from the forest, home garden and village). Items marked in italics in Table 03 are no longer consumed by the younger persons. 38 items have permanently disappeared from the list of foods consumed earlier by the older generation.

Table-5 shows the sources of medicine taken during illnesses by the elderly and younger persons living on the NW slope just outside the Sinharaja forest.

According to Table-5, 42.9% of the medicine was collected from the forest, 30.6% from the home garden and 16.3% from the village indicating that about 90.0% of it originated directly from the nearby locality. Venival, jatamansha, hatharavariya from the forest; pavatta, welpenela, rasakinda from the home garden; vadhakaha and thora from the village were the most popular medicines used by the elder residents. This shows that all the medicines used by them throughout their lives have been purely natural products. The table further shows that the usage by the younger age group of medicines gathered from the forest has drastically fallen to 3.2% while their usage of medicines purchased from the nearest market has increased to 58.1%.

Table-6 shows the source of medicines and changes in medicine usage during illness by younger people.

Table-2: Former occupations of elderly persons (60-99 years) of the NW Sinharaja forest periphery.

Village	Cutting kithul flowers	Chena cultivation	Collecting forest materials	Hunting	Total
Kudawa	02	03	03	00	08
Pethiyakanda	03	04	03	00	10
Pitakele	01	03	02	01	07
Buthkanda	02	03	03	00	08
Miyanapalawa	02	03	02	00	07
Suduwelipotha	03	03	02	01	09
Total	13	19	15	02	49
%	26.5	38.8	30.6	4.1	100

Table-3: Types of food consumed by the elderly people living on the NW slope of the Sinharaja forest’s periphery.

Fruits	Vegetables	Green Leaves	Yams	Cereals	Others
Gaslabu	Batu	<i>Miyana</i>	Bathala	Kurakkan	Hal
Annasi	<i>Thiyambara</i>	Magnnokka kola	Magnnokka	<i>Meneri</i>	Beralia
Rambutan	Dambala	Gotukola	Kiriala	<i>El hal</i>	Tholol
<i>Atamba</i>	Bandakka	<i>Peshion kola</i>	Demas ala	<i>Amu</i>	Hatavaria
Dodam	Mekaral	<i>Dambala kola</i>	<i>Raja ala</i>		Kithulbada
Naran	Wambatu	Muguna	Innala		Katukithul
Amba	Karavila	Kankun	Kondol		<i>Dothalubada</i>
Pera	Thakkali	Sarana	<i>Gahala</i>		<i>Mee peni</i>
Veldodam	Kesel	Kathurumurunga	<i>Dandeena</i>		<i>Kithulbada</i>
Kesel	Kekiri	<i>Girapala</i>	<i>Habarala</i>		<i>Bendurudalu</i>
<i>Dan</i>	Wetakolu	Thebu	Katuala		
<i>Himbatu</i>	Wattakka	<i>Gonika kola</i>	Kohila		
<i>Kaju</i>	Alukesel	<i>Kirianguna</i>			
Anoda	<i>Labu</i>	Paththara			
Alipera	Nivithi	<i>Kekatiya</i>			
Jambu	Mathdamina	<i>Kebelladalu</i>			
<i>Uk</i>	Pipingna	<i>Heenbovitia</i>			
Veralu	Kos	Koppan kola			
<i>Mora</i>	Del	<i>Thora</i>			
<i>Keena</i>	<i>Heenveliahathu</i>	<i>Mussenda</i>			
<i>Sidaran</i>	Athuruhathu	Diyahabarala			
Mangus	<i>Kirihathu</i>	<i>Thelatiya kola</i>			
Ambarella	<i>Uruhathu</i>	Kohila leaves			
Uguressa	Piduruhathu				
<i>Kaudukekiri</i>	<i>Lena hathu</i>				
<i>Katuboda</i>	<i>Kandanhathu</i>				
Waraka					

Table-4: Differences in food consumption habits of the younger persons and the older persons living in the NW peripheral slope of Sinharaja forest.

Fruits		Vegetables		Green Leaves		Yams		Cereals		Others	
(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
27	17	26	19	23	11	12	08	04	01	11	08

(1) 60 – 99 Years (2) 18 – 35 Years.

Table-5: Source of medicines used for treating illness.

Village	Forest		Home garden		Village		Nearest market		Total	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Kudawa	03	01	04	01	01	02	00	04	08	08
Pethiyakanda	05	00	03	02	01	01	01	05	10	08
Pitakele	03	00	02	00	01	01	01	02	07	03
Buthkanda	03	00	03	00	02	01	00	02	08	03
Miyanapalawa	03	00	02	01	01	01	01	02	07	04
Suduwelipotha	04	00	01	01	02	01	02	03	09	05
Total	21	01	15	05	08	07	05	18	49	31
%	42.9	3.2	30.6	16.1	16.3	22.6	10.2	58.1	100.0	100.0

(1) 60 – 99 Years (2) 18 – 35 Years

Table-6: Types of medicine used for treatment by the younger people living in the NW slope just outside the Sinharaja forest.

Forest	Home Garden	Village	Nearest market
Hathawariya	Pawatta	Wadakaha	Panadol
Gonika kola	Kirianguna	Kumburueta/ dalu	Paracetamol
	Kuppameniya	Banwel geta	Vitamin C
	Inguru	Gotukola	Amoxycillin
	Elabatu dalu	Eramusu	Samahan
	Endaru	Heen bowtiya	Lakpeyawa
	Dehi	Mee eta	Paspanguwa
	Polpala	Eth thora	Nahalle oil
	Erabadu kola	Pinna dalu	Siddhalepa
	Dehi dalu		
	Kopi dalu		

Table-6 shows that hathawariya and gonika kola are the only medicines of forest origin that are being taken by the younger persons at present. Western drugs like Panadol, paracetamol, amoxicillin, vitamins and proprietary ayurvedic products are

more popular among them currently. None of these products were mentioned by the elderly persons.

Table-7 shows the source of medicines and changes in medicine taken during an illness by the elderly persons.

Table-7: Traditional medicines extracted from plant sources and used for treatment of various ailments by the elderly persons (60-99 years) in the NW Sinharaja forest's outlying areas.

From Forest			
Mudumahana	All diseases (for kasaya)	Kudumirissa	sprain
Tholabo	body pain	Hathawariya	neutralizes body heat
Palol	injury (for paththu)	Gonika Kola	stomach ache
Kekiriwara	poisonous snake bite	Kiriwel	fracture
Thotila	fracture	Ankenda	fracture
Bandura	whooping cough		
From Home Garden			
Kuppameniya	worm treatment	Inguru	influenza, fever, stomach ache
Pawatta	phlegm (for paththu)	Elabatu Dalu	phlegm
Dehi	stomach ache & vomiting	Polpala	urinary disease
Iraweriya	body pain	Alukesel	stomach ache
Kurakkan	diabetes	Aba	injury (to foment)
Dehi dalu	stomach ache, influenza	Penera	strength
Karapincha	poisonous snake bite	Gammiris	stomach ache, injury (to foment)
From Village			
Wadakaha	stomach pain	Kumburu eta dalu	worm treatment, stomach ache of children
Kiri anguna	worm treatment	Kalanduruala	fever, broken bones
Gotukola	headache, catarrh	Bewila	neutralizes body heat, cuts
Eramusu	phlegm, body heat neutralizer	Heen bowitiya	body pain, hepatitis
Endaru	injury (to foment)	Erabadu kola	stomach ache
Sadikka	vomiting	Pinnadolu	wounds
Mee eta	injury (to foment)	Ath Thora	injury (for paththu)
Araththa	poisonous snake bite		
From Nearest Market			
Katuwelbatu	influenza	Walangasal	stomach ache
Koththamalli	influenza, fever		

Table-7 shows the traditional medicines obtained from plant sources and their use based on indigenous knowledge of the plant by the elderly persons. These applications are time tested and have been used throughout their lives. Further, it shows that most of the medicines are forest based and purchases from the nearest market are minimal. Even the purchases from the market are of medicinal plants and not manufactured western drugs unlike in the case of the younger persons in the forest periphery.

Discussion: Communities that live in a forest environment, consuming natural food and using herbal medicines for the various ailments to which the human body is prey, often enjoy long life expectancy and freedom from debilitating illnesses like diabetes, cardiovascular diseases and such. Their occupations, which are directly linked to the forest often entail a lot of walking and exposure to fresh air and these activities are also conducive to a healthy lifestyle. This is in sharp contrast to the results of a study done by Grey⁸ on 680 persons in the age group 51-97 years. The subjects were long term residents of a city environment that suffered serious air pollution caused by factories and traffic. These people scored lower marks in tests designed to measure their cognitive ability and memory power. The effect that atmospheric pollution had on these faculties was equivalent to an additional two years of ageing.

From this it is clear that an unpolluted forest or wooded area would constitute an environment conducive to leading a healthy life. A simple lifestyle free of tension and stress, in conjunction with the use of natural forest products, especially food and traditional herbal medicine, could contribute significantly towards a higher life expectancy. The study population's overall good health, both physical and mental, attests to this. Most of the elderly persons had high life expectancy, as reflected by their ages, and they also demonstrated their sharp memories by being able to recall the names of about 100 different varieties of food and around 43 types of medicinal plants available in their locality. According to Abeykoon⁹ the majority of the rural women hardly reported ill and this compares well with the elderly people of the Sinharaja community. On the other hand, the younger generation has distanced itself from the forest culture. This is bound to have a negative impact on the hitherto high life expectancy these communities have enjoyed in the past.

Conclusion

It is noted that communities in the study area have gathered very important medicinal plants from forest, their village and home garden. The medicinal plants caused to contribution healthy life style for them from ancient time. All the peoples of study area, they have used plants for their healthy life in the study area. From recently that relationship has been reduce due to their

busy life style and as results of the establishing some development projects such as Tea plantation, developing on road system etc. According to our study, even in the surrounding areas of Sinharaja rain forest, most of the young people may do not know the medicinal plants in future when we refer to table 05, there are 58.1 % of young people have taken their medicinal at town comparing elderly people only 10.2 %. Therefore, community based awareness program will suggested to introduce the best ancient health practice of study area among young personals.

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