



A STUDY ON FREQUENCY AND ABUNDANCE OF MEDICINAL PLANTS FROM WAYANAD FOREST BOUNDARIES IN KERALA

Anjana N.S, Vasudha Ranjan*¹ and Divya.J²

¹Research Scholar, Department of Environmental Science, JSS Academy of Higher Education and Research,
Mysore – 15.

²Assistant Professor, Department of Environmental Science, JSS Academy of Higher Education and Research,
Mysore – 15.

***Corresponding Author: Vasudha Ranjan**

Research Scholar, Department of Environmental Science, JSS Academy of Higher Education and Research, Mysore – 15.

Article Received on 07/02/2023

Article Revised on 28/03/2023

Article Accepted on 18/04/2023

ABSTRACT

The present study involves the analysis of the abundance and frequency of medicinal plants. The study was conducted in the month of October 2022. The medicinal plants were collected from the forest borders of Wayanad district with the help of paniya tribals groups. The documentation was done through the collection of medicinal plants and questionnaires were used for data collection. The use of medicinal plants in the treatment of diseases was established thousands of years ago by the tribal people. Many tribal groups use a number of plant products for medicinal preparations. From the study, it was found that, tribal groups use local medicines for various ailments after centuries of use. Various parts of plants are used for medicinal preparations and they collect these plants from their surrounding habitat. It is observed that, a single plant can be used in many ways to cure. The study revealed that, many species of plants are used by the tribals for traditional medicinal purposes but, it was observed that, the reduction in the abundance of some of the plant species in the study area.

KEYWORDS: Medicinal plants, Paniya tribes, Traditional medicine, Wayanad.

I. INTRODUCTION

Medicinal plants and their preparations have been utilized for a variety of purposes. People have been employing various plant extracts and preparations for many centuries in an effort to treat illnesses and reduce their symptoms (Baleta et al., 2016). Medicinal plants are those that have one or more ingredients that can be utilized to treat illness. Herbal remedies can be made from the entire plant or from the leaves, roots, bark, seeds, berries and flowers. The biggest percentage of tribal people have been found in the state of Kerala's Wayanad district. Through documentation of data describing the edible plants used by various tribes and a simple listing of the therapeutic plants used by distinct tribes have been done (Madhavan Sreejit & Thomas, 2017). Herbal medicines are widely used in tribals because they are stable, naturally occurring, cheap and readily available with reduced side effects. Up to 80% of the native population still relies on traditional medical practices and medicinal plants for treatment, especially in developing nations (Baleta et al., 2016b). Traditional medical procedures play a significant role in the primary healthcare system in the poor nations. Due to the poverty and a lack of access to modern medication, the World Health Organization (WHO) estimates that 65–80% of

the world's population lived in developing nations depend primarily on plants for their main healthcare. Paniya tribal group is one of the communities found dispersed across the forest of the western Ghats. Based on their traditional knowledge, these tribes use several medicinal herbs for their main healthcare and other needs (Shyma T.B & Prasad, 2012).

Most of the plants have medicinal properties because of that, herbal medicine preparations or practices of plants. The majority of the therapeutic plants on this list are gathered from the edges of forests. A questionnaire is used in a survey to collect the data. The methods of use, preparation, and harvesting are documented. During the study, it was observed that, some plant species are rare and others are common, most medicinal plants have a limited ability to regenerate. In a number of ways, the environments where the majority of medicinal plants are often found are being destroyed. Many of these medicinal plants are now only found in forests. These plants have an important role in allopathy, herbal medicine, homeopathy and aromatherapy. Based on the above factor the present study has been under taken to study the frequency and abundance of the medicinal plants in border of Kerala.

II. MATERIALS AND METHODS

Description of study area: The study area was situated in Wayanad district, Kerala. Wayanad district is one of the potential areas having many important medicinal plants and also highest percentage of tribals in Kerala. In the

study, the medicinal plants collection was carried out at Panavally forest border located at Mananthavadi and Vakeri situated near Sulthan Bathery. It was also found that, many people are inhabited around the forests area.

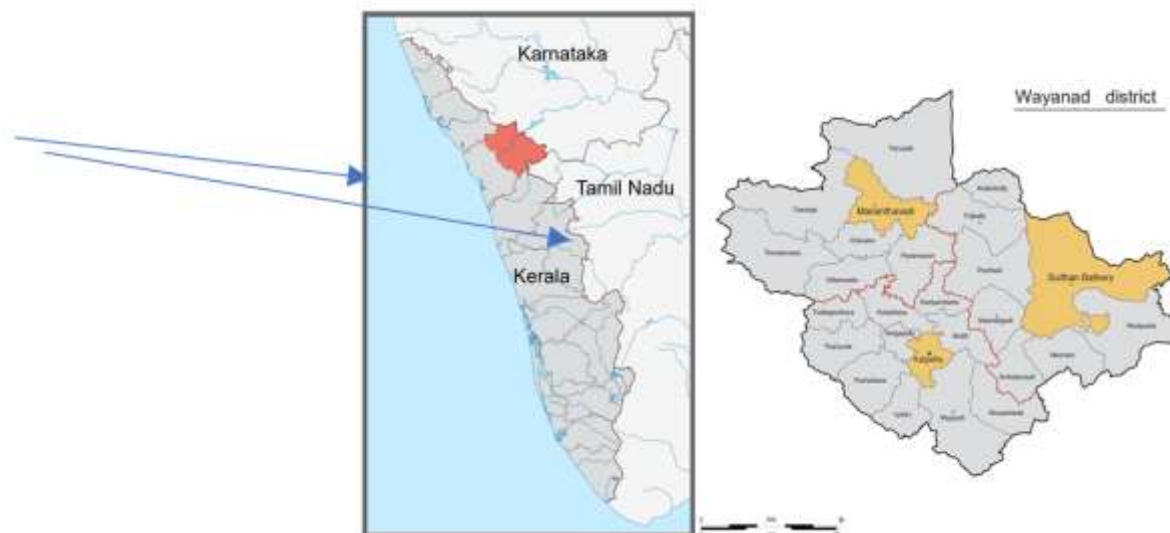


Figure 1: The location on the center.

Field work: In the present study Medicinal plant survey was conducted in selected forests borders of Vakeri and Panavally. In order to identify the particular region of the plant communities, a quadrat method is used to mark the forest boundaries. To investigate the various medicinal plant species, 10 randomly placed 2 m X 2 m quadrats per study site were used. In the specific-size region, a sampling unit of area was taken. Each quadrat's species

distribution was recorded, and a numerical count of each species was done. The formula is used to determine percentage of frequency and abundance after recording the names of the species and the number of distinct species present in each unit. species abundance is measured by how frequently they occur. Most often, a percentage is used to symbolize it.

1. Abundance = $\frac{\text{Total no. of individual of the species}}{\text{No. of quadrate per units in which they occur}} \times 100$
2. % Frequency = $\frac{\text{No. of units in which the species occurred}}{\text{Total No. of unit studied}} \times 100$

In this study, data were collected questionnaire survey method. The survey was conducted by interviewing the Paniya tribal people (Table 1). 16 individuals were involved in survey. These tribals belongs to the age groups 30 years. Apart from that, people are lived near the forest were interviewed (Table 2). The interview questionnaires are as follows.

1. Gender: (Male) ✓, (Female) ✓
2. Age: (20-30), (30-40), (40-60)✓
3. Education: (1-6)✓, (7-12)✓, (12th above)
4. Name of the plant you know for the treatment of diseases?
5. How did you diagnose the patient and what type of disease was cured with the plant?
6. Other uses of the plant?
7. Is the plant wild or cultivated
8. What part of the plant use?
9. Methods of preparation?
10. Is any part of the plant toxic

11. What type of medication you prepared?
12. Do you think traditional knowledge should be incorporated to hospitals?

The survey results are provided as follows:

III. RESULT AND DISCUSSION

Table 1: List of Medical plants collected from Wayanad Forest Boundaries.

Scientific Name	No. Of PlantS	Local Name	Part Used	MedicinalValue
<i>Lobelia inflata</i>	5	Wild tobacco, kattupukala	Leaves, seed	Asthma, cough
<i>Senna tora</i>	20	Thakara	Root, seed	Skin disease
<i>Solanum Nigrum</i>	14	Manithakkali	Leaves, fruit, root	Stomach treatment, ulcer
<i>Emilia sonchifolia</i>	25	Muyal cheviyan	Leaves, youngshoot	Fever, sore throat
<i>Terminalia bellirica</i>	14	Thanni	Leaves, fruit	Rasayanatreatment
<i>Cyclea peltata</i>	2	Padathali	Root, leaves	Digestive disorder
<i>Solanum trilobatum</i>	17	Chundanga	Root, fruit, leaves	Asthma, cold, cough
<i>Colocasia</i>	16	Kattuchembu	Leaves, root	Piles, liverailments
<i>Achyranthes aspera</i>	56	Kadaladi	Leaves, seed,flower	Scorpion, dogbites
<i>Centella Asiatic</i>	6	Kudangal	Leave	Minor wound
<i>Maranta neilgherrensis</i>	8	Kattu koova	Root, leaves,flower	Diarrhea
<i>Phyllanthus niruri</i>	34	Keezharnelli	Root, leaves	Urinary stones
<i>Curculigo orchoides</i>	4	Nilappana	Root	Cough, asthma
<i>Biophytum sensitivum</i>	13	Mukkootty	Leaves, root	Wound healing,asthma
<i>Mimosa pudica</i>	54	Thottavadi	Leaves, bark,flower	Intestinal cleaning
<i>Capsicum flutescens</i>	3	Kathari mulak	Leaves	Asthma
<i>Scoparia dulcis</i>	4	Kallurukki	Leaves, root, stem, flower, seed	Diabetes, kidneystone
<i>Santalum album</i>	3	Chandhanam	Wood, root	Liver prblm
<i>Cardiopermum halicacabum</i>	13	Uzhinja	Leaves, root,flower	Nervous diseases
<i>Grina trifloral</i>	4	Nilamparanda	Whole part	Diarrhea, skindisease
<i>Tragia involucrata</i>	100	Choriyanam	Leaves	Urinary infection,kidney stone
<i>Pterospermum canescens</i>	20	Idinjil	Bark	Fracture
<i>Chrysopogan zizanioides</i>	4	Ramacham	Vetiver	Dandruff, skin care
<i>Abrus precatorius</i>	26	Kunni	Leaves	Fever, cough, cold
<i>Amorphophalluspaconifolius</i>	17	Kattu chena	Corn, tube	Piles
<i>Hemidesmus indicus</i>	48	Naruneendi	Root	Diabetes, anemia
<i>Leucas aspera</i>	85	Thumba	Whole part	Headache, bronchial diseases

Fig 2&2.1 Tribes & their living place**Fig 2.2&2:** In the Study area**SUNBERRY****TICK TRESOIL****TORA****POISON BERRY****WILD TOBACCO****BIRD CHILLI****BALLOON WINE****WILD TARO****GOAT WEED****PENNYWORT****SENSITIVE PLANT****LEUCAS ASPERA****SARSAPARILL****WILD YAM****ROSSARY PEA****VETTIVER****CHAFF FLOWER****INDIAN ELM****BEEDA NUT TREE****LITTLE TREE PLANT****STONE BREAKER****STINGING NETTLE****SANDAL WOOD****LILIAC TASSLE**

Table 2: The summarized form of survey results obtained from the Paniya tribal group.

Gender	Age	Education	Plant Name	Diagnose	cured	Other Uses	Wild or cultivated	Parts of the plant used	Method of preparation	Toxic	Type of medication prepared	Traditional Knowledge should be incorporated to hospitals
1	2	3	4	5	6	7	8	9	10	11	12	13
Female	48	8	Sickle senna	Itching, allergies	skin diseases, snake bites	Ring worm infection, liver diseases	Both	Whole part used	Leaves are cooked to eat and mix seed powder into water and consume, the leaf paste is applied on the affected skin to cure scabies.	stem	Traditional medicines	Yes, because Tora has commonly used medicinal plant so it is used as ayurveda hospitals
Male	50	4	Sunberry	Stomach pain, irritation in the stomach	Infections, intestinal diseases	Migraine, improve kidney functions,	Wild	Fruit, leaves, stem	The plants leaves and stem were cooked to eat and the fruit also edible	No toxicity	Traditional medicines	No
Female	47	4	Lilac Tassle flower	Temperature, infections	fever, sore throats, intestinal problems	Snake bites	Both	leaves, young shoot, flower	The leaves and flowers are edible with or without cooking	No toxicity	Traditional medicines	yes
Female	47	12	Stone breaker	Stomach pain, urine problems	Urinary stone	Ulcers, high blood sugar, liver disease	Wild	Leaves & root	The plant is grinded and mixed with salt then applied to fracture parts.	No toxicity	Ayurvedic, meditation, yoga	yes, pills and capsules also available
Female	45	10	Sandal wood	Stomach pain, urinal problem, headache	Stomach ache, skin disease, making oil, remove dark circle	Ash can be used for washing clothes, improve digestion	Both	Wood, root	Small piece of sandal wood is boiled and take another bowl & add coconut oil then using double boil method to extract the sandal oil. Dry in sunlight to three days. Grind it to make a powder & apply.	No toxicity	Home remedy	Yes, sandal oil and powder will get it from ayurveda medicals
Female	48	5	Poison berry	Respiration problems	Fever, Nausea, Asthma	Urination problem, painkiller	Both	Leave, fruit, roots	Commonly it is applied on outside of the body. The plant leaves or root is boiled and the liquid will be applied outside of the body. The fruits are edible.	All parts are poisons but they are using depending upon body	Traditional method	No

										reaction.		
Female	56	6	Arrow root	Irritation, Itching, dryness	Skin diseases, cough, urinary infection	Using as cosmetic, shampoo DIY deodorant	Both	Rhizome	Collected the rhizome of the arrowroot and dry it then make it powdered and applied to the skin by mixing it with water.	No toxicity	Home remedy	Yes, it is used as cosmetic product
Male	45	10	wild taro	body ache, swelling	piles, insect sting, liver enlargement	Used as a vegetable	Both	Roots& tender leaves	Leaves juice is used to stop bleeding. Cooked taro and roots are used for intestinal problem and piles.	Raw taro leaves are toxic	Traditional medicines	yes, it has an antifungal and microbial properties so it is used for hospitals.
Male	49	10	Penny wort	Minor wounds, skin irritations	Brain health improvement, skin problems	Increase immunity, used as a fruit, reduce anxiety and stress.	Wild	Leaves	Take penny wort extract twice a day and paste is applied to the affected part.	No toxicity but the pregnant women can't use.	Ayurveda medicine	Yes, because penny wort ointment is available it is used for skin problems.
Male	68	10	Sensitive plant	Stomach pain, urinal problem	Intestinal clearance, urinary infection	Diabetes, diarrhea, intestinal worm, high blood pressure	Wild	Leaves, bark, flower	Leaves are grinded to make paste form and directly applied the body. The plant roots are dried to make a powder form and half spoon of powder mixed with milk and consume.	No toxicity but in the case of pets it is toxic.	Home remedy	Ayurveda treatment

Table 3: The abundance and frequency distribution of medicinal plants.

% Abundance (N/A) x 100	% Frequency (A/B) x 100)
1	50
3.33	60
2.8	50
3.57	70
2.33	60
1	20
3.4	50
3.2	50
9.33	60
1.5	40
1.33	60
4.85	70
1	40
2.6	50
9	60
1	30
1.33	30
1.5	20
2.6	50
4.93	30
11.11	90
3.33	60
1	40
4.33	60
2.83	60
6.85	70
10.62	80

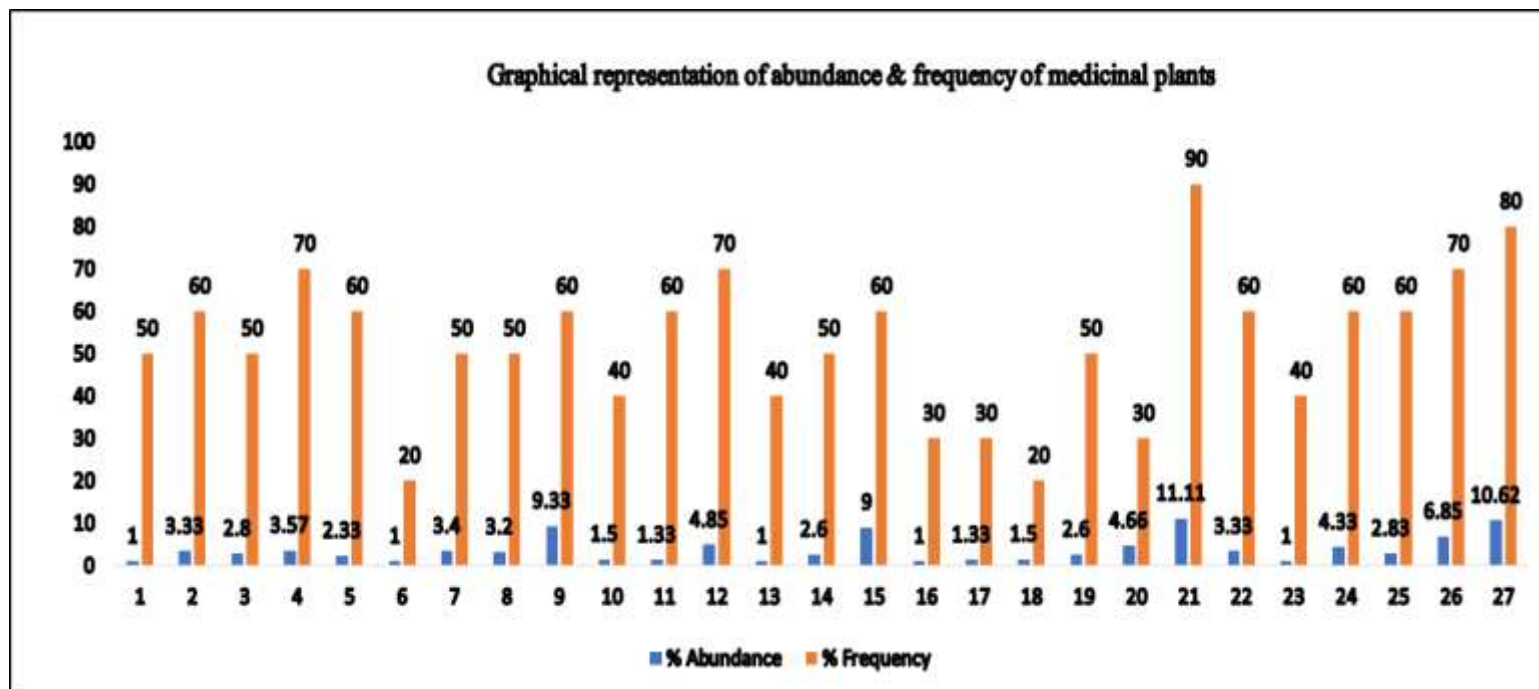


Table 4: The abundance status of the medicinal plants

Abundance status	Medicinal Plant Species	% of the species
Very abundant	<i>Achyranthes aspera</i> , <i>Phyllanthus niruri</i> , <i>Mimosa pudica</i> , <i>Tragia involucrata</i> , <i>Hemidesmus indicus</i> , <i>Leucas aspera</i>	22.22 %
Abundant	<i>Solanum nigrum</i> , <i>Emilia sonchifolia</i> , <i>Terminalia bellirica</i> , <i>Solanum trilobatum</i> , <i>Colocasia</i> , <i>Biophytum sensitivum</i> , <i>Cardiopermum halicacabum</i> , <i>Pterospermum canescens</i> , <i>Amorphophallus pacoifolius</i> , <i>Senna tora</i> , <i>Abrus precatorius</i>	40.74 %
Scarce	<i>Lobelia inflata</i> , <i>Cyclea peltate</i> , <i>Curculigo orchioides</i> , <i>Capsicum flutescens</i> , <i>Scoparia dulcis</i> , <i>Santalum album</i> , <i>Grina trifloral</i> , <i>Chrysopogan zizanioides</i> , <i>Centella Asiatic</i> , <i>Maranta neilgherrensis</i>	37.03 %

IV. SUMMARY AND CONCLUSIONS

In the present study, 27 medicinal plants are identified and its uses were documented, medicinal value, methods of preparations, number of plants, plant parts used were collected and recorded. Most of the tribal peoples will use medicinal plants for headache, urinary problems treatment. The common health Ailments are skin problems, wound, toothache, abdominal pain, piles, asthma, skin problems etc. In Table 1, the botanical name, local name, parts used, number of plants, medicinal values are presented. In Table 2, the gender, age, education, plant name, diagnosis, cured, other uses, wild or cultivated, part of the plant used, methods of preparation, toxicity, type of medication and traditional knowledge should be incorporated to the hospital. Since most of the interviewed peoples were tribals, they have a lot of knowledge about medicinal plants. In their daily life they collect plants and use them to treat different diseases. The Table 4, indicates the abundance of the medicinal plants with three classifications. The most abundant plants are identified as *Achyranthes aspera*, *Phyllanthus niruri*, *Mimosa pudica*, *Tragia involucrata*, *Hemidesmus indicus*, *Leucas aspera*. Most scarce species are *Lobelia inflata*, *Cyclea peltate*, *Curculigo orchoides*, *Capsicum flutescens*, *Scoparia dulcis*, *Santalum album*, *Grina trifloral*, *Chrysopogan zizanioides*, *Centella Asiatic*, *Maranta neilgherrensis*. The major reason for the decline more medicinal plant abundance is human activity. Climatic conditions also depend upon the growth of the plants. Based on the study conducted, in comparison with the precious literature in the Wayanad forest boundaries a decreased medicinal herb population was observed. So, one has to focus more attention to initiate appropriate conservation strategies to protect the existing precious medicinal plant species.

V. REFERENCE

1. A. G. Devi Prasad and T. B. Shyma (2013) - Medicinal plants used by the tribes of Vythiri taluk, Wayanad district (Kerala state) for the treatment of human and domestic animal ailments, 7(20)
2. Abdulaziz Bashir Kutawa (2020)-Relative Abundance and Medicinal Values of Some Plant Species Found in Federal University Dutsin-ma Take-off Site, 1: 119-121.
3. Adnan, M., Holscher, D., 2011. Medicinal plants in old-growth, degraded and re-growth forests of NW Pakistan. Forest Ecology and Management, 261: 2105–2114.
4. Balakrishnan V, Ratheesh Narayanan, M.K. and Anil Kumar N., 2001. Ethnotaxonomy of Dioscorea Case study on Kattunayakan tribes of Wayanad District, Kerala,135.
5. Baleta F, Donato J, Bolanos J (2016) Awareness, utilization and diversity of medicinal plants at Palanan, Isabel, Philippines, 265-269.
6. Bem AA, Bashir KA, Anakaa TM. Relative abundance and ethnomedicinal uses of some plant species found in Federal University Dutsin-ma Permanent Site. International Journal of Forest, Animal and Fisheries Research, 2020; 4(3): 37-45.
7. Chittiyath Madhavan sreejit and Perakathusseril Mathew Thomas (2017) - Quantitative approach on medicinal plant use data by four indigenous tribes of wayanad district, kerala, india, 8(3): 111–118
8. Gabriel K, Zipporah K, Evangeline N, Bernard W Wilson K. Ethnomedical survey of the plants used by traditional healers in Narok county, Kenya, 2019; 20(19): 1-8.
9. Gillani, S.A., Fujii, Y., Shinwari, Z.K., Adnan, M., Kikuchi, A., Watanabe, K.N., 2010. Phytotoxic studies of medicinal plant species of Pakistan. Pakistan Journal of Botany, 42: 987–9.
10. Gujwarni Anwar, Oktariani, Agus Susatya, Putranto BAN, Wiryono (2019) - Abundance and Distribution of Medicinal Plants Madapi Forest Kerinci Seblat National Park, 13: 510-516.
11. Jaya DS, Soumya., Diversity of medicinal plants and pollution stress indicator plants in kariavattom south campus, university of Kerala. Biodiversity Int J, 2017; 1(1): 8-13.
12. Laldingliani, T.B.C., Thangjam, N.M., Zomuanawma, R., Ethnomedicinal study of medicinal plants used by Mizo tribes in Champhai district of Mizoram, 2022; 18, 22.
13. Magurran AE, Hendriks PA. Explaining the excess of rare species in natural species abundance distribute World Health Organization (WHO). WHO Traditional Medicine Strategy. 2002; 2002-2006. WHO/EDM/TRM/2002.1
14. Mudasir Nazir Bhat, bikarma singh, opender surmal, et el., (2021) Ethnobotany of the Himalayas: Safeguarding Medicinal practices and traditional uses of Kashmir regions,10(9): 851.
15. Muhammad Zahid, Akash Jamil, Din Muhammad zahid et al (2021) Diversity of Medicinal Plants among Different Tree Canopies,13(5): 2640.
16. Prasant Kumar Singh, Santosh Kumar Prajapati, Kumari Sunita and Ravi Kant Chaturvedi (2021), Disturbance Induced Changes in Diversity of Medicinal Plants in a Dry Tropical Forest of India, 4: 718930.
17. S. Vedavathy, A. Sudhakar and V. Mrdula (1996) tribal medicinal plants of Chittoor vol no xvi 4, pages 307-331
18. Salisu M. Ethnobotanical Survey of Medicinal Plants in Metropolitan Kano, Nigeria. International Journal of Public Health Research, 2015; 3(6): 345-351
19. Sasidharan N (2004). Biodiversity Documentation for Kerala Part 6: Flowering plants. Kerala Forest Research Institute, Kerala. P 702.
20. Shyma T.B. and Devi Prasad A.G (2012) traditional use of medicinal plants and its status among the tribes in Mananthavady of Wayanad district, 2278-9871, volume 1, issue 2,
21. Szymon Zubek, Janusz Baaszkowski, Katarzyna Seidler- aoiykowska, Wojciech Bąba , Piotr Mleczko (2013) Arbuscular mycorrhizal fungi abundance, species richness and composition under

the monocultures of five medicinal plants, 12(5): 127-141

22. Udayan PS, Harinarayanan MK, Tushar KV, Balachandran I (2008). Some common plants used by Kurichiar tribes of Thirunelli forest, Wayanad district. 7(2): 250-255.
23. Vedavathy S., Mrudula V. & Sudhakar A. 1997. Tribal Medicine of Chittoor District, A. P. Herbal Folklore Research Centre. 16(4):307-331
24. Yasodharan K, Sujana KA (2007). Ethno medicinal knowledge among Malamalasar tribe of Parambikulam wildlife sanctuary Kerala. Ind. J. Tradit. Knowl, 6(3): 481-485.