

## Quantitative Ethnobotanical Report of Wild Flowers used by Tribes of Wayanad Forest Division, Kerala- India

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### ABSTRACT

The quantitative ethnobotany deals the computation and importance of the plants and vegetation to people. It helps quantification of qualitative data in the biological and social science. The traditional source of medicinal plants is an important way for daily curative uses in the rural area. A survey was carried out among the tribes of Munnar forest division, Idukki district, Kerala India. The present study identified traditionally using 47 species of ethnomedicinal plants distributed in 41 genera belonging to 29 families to treat various diseases. Moreover, among the plant studied habit wise analyzed they are 12 herbs, 13 shrubs, 12 trees, each one of climbing shrub, twining shrub, prostrate shrub, climber. The status of plants are analyzed and recorded as 26 common, 14 rare, 5 common & Cultivated and 2 sporadic are described under this study. In this communication, the information's got from the rural inhabitant were compared with the already existing literature. The data were collected randomly from tribal and healers of 85 informants the data were statistically analyzed by using suitable statistical tools such as Use Value (UV), Informant Consensus Factor (ICF), Fidelity Value (FL) and various ranking methods.



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### INTRODUCTION

A quantitative ethnobotany survey involves the use of quantitative techniques for direct analysis of the data on utilization of the existing plants. The quantitative methods were proposed by Philips

led to increasing awareness for ethnobotanical research [1]. Ethnomedicinal studies have proved significant in valuing and discovering contemporary drugs from indigenous medicinal plant resources. There are appropriate sources of information about useful medicinal plant species, which can be targeted for management and domestication [1, 2]. Flowers play an important role in our day to day life, directly or indirectly. Flowers are the sexual reproductive parts of plants. They have been an integral part of human beings since ancient times for various purposes like ornamental, decorations, medicine (fresh, distillates, decoction and powdered form), nutrients/foods (fresh garnishes, dried, in cocktails, canned sugar), during religious rites, to pray gods, culinary preparations, essential oils, and in beauty care products etc. The traditional pri-

mary health care system in India is embodied in a 'people's health culture'. This culture is based on very effective and sound, region-specific health practices involving 8,000 species of plants across the country, where flowers play a prominent role among them. For several centuries medical practitioners have long acknowledged the therapeutic properties of certain flowers. Flowers are matchless ornaments to the nature Queen. They are not only a source of beauty and delicacy but also fountain heads of health and joy. The kingdom of flowers is very vast as we can categorize them in general into four main classes depending upon the purpose for which they are grown, i.e. ornamental, commercial, medicinal and vegetable or edible flowers. Flower therapy uses essential oils, flower waters, flower juice, flower petals (fresh and dried), and aroma to heal the mind and body. Because of the medicinal properties of flowers, modern medicines use flower extracts. The significance of flowers are evaluated from the aspect of potential health benefits concerning mainly the influence of color, odor and flavor components in relation to antioxidant activity, scavenging activity of reactive oxygen radicals and against cancer [3].

Historically apart from medicinal usage, flowers are also used for edible purposes. Also, for example, in ancient Rome, various species of Roses were used in cooking different kinds of puree and omelettes; in medieval France, *Calendula Officinalis* in the preparation of salads; saffron (*Crocus sativus*) as a flavoring agent; *Viola odorata* for coloring of sugar, syrups and various potions; *Borago officinalis* and Roses as aromatic enhancers of pastry and dandelion (*Taraxacum officinale*) flowers for preparation of drinks and salads in Europe [4]. Flowers are an integral part of our lives and are associated with the most emotional moments of human experiences like praise celebrations or grieving. They are used not just for their aesthetic sense but also for nutritive and medicinal properties also.

Out of the total 422,000 flowering plants reported from the world, more than 50,000 plants are used for medicinal purposes. In India, more than 43% of the total flowering plants are reported to be of medicinal importance [5]. The utilization of plants for medicinal purposes in India has been documented in ancient Indian literature. Extensive information is available about flowers from Indian literature like *Vrukshayurveda*. In Indian traditional systems of Medicine, *Ayurveda*, *Siddha*, *Unani* and *Homoeopathy* systems (prevalent mostly in South India), flowers are used in the treatment of various ailments.

Flowers are directly eaten as petals or made as juice decoction, tincture or mixing them with some other ingredients and then administered. Different formulations of flowers are used as Juice, Powder, Syrup, *Arka*(Distilled extract), scents, soups etc. [6]. Popular flower vegetable includes cauliflower; expensive spices like saffron and cloves are also derived from flowers. The kingdom of flowers is very vast. In general, flowers can be categorized into four main classes depending on the purpose for which they are grown, i.e. Ornamental flowers, Commercial flowers, Medicinal flowers and Kitchen/Vegetable flowers [7].

Hence the present study was made to list out the naturally growing wildflowers collected from forest areas to identification by the indigenous community tribes from Western Ghats of Wayanad district of Kerala for food, medicine and to conserve those plants for their future generations. A perusal of these reports suggested that the ethnopharmacological survey in the Western Ghats is incomplete and the traditional herbal healing knowledge of a large number of folk communities needs documentation. There is no previous report in the records of ethnopharmacological knowledge of wildflowers used for various ailments from tribals of Western Ghats. An attempt has therefore been made to collect and document the folk knowledge from tribals, local herbal healers and knowledgeable elder people of different castes and communities residing in the certain forest area of Western Ghats of Wayanad district of Kerala.

1. The objective of this study was to interact with local traditional healers and tribals and document their knowledge on the medicinal uses of flowers.
2. To collect scientific information and identify the flowers used by the tribal and rural people of the study area.
3. Documentation techniques for the recording of medicinal flora and traditional medical knowledge of local informants about the usages of the available indigenous Flowers for curing of various ailments and diseases.
4. The assemblage of data on the traditional treatments against various ailments forms the basis of consideration of any flowers of plant taxon. Thus, the evaluation of the data using various quantitative ethnobotanical indices for exploration of the most popular flowers species could be further subjected for the discovery of potential therapeutic Phyto molecule(s)

5. A large number of flowers are still unexplored regarding their uses as food and medicine. So one of the objectives of the present work was the preparation of a report on flowers used as nonformal food and medicinal resources by the tribal and rural people of Wayanad District of Western Ghats of Kerala.
6. To provide status and conservation strategies of the flower yielding plant in order to conserve the plants which are endangered, vanishing or on the verge of extinction.

## STUDY AREA

### Wayanad District

The Wayanad district lies between north latitude 11° 27' and 15° 58' and east longitude 75° 47' and 70° 27'. It is bounded on the east by Nilgiris and Mysore districts of Tamil Nadu and Karnataka, respectively, on the North by Coorg district of Karnataka, on the South by Malappuram and on the West by Kozhikode and Kannur district. The Western Ghats Mountains in the Wayanad are rich in flora and fauna and located at a distance of 76 km from the sea shores of Kozhikode. The altitude varies from 700-2100mts above sea level. The name Wayanad is believed that have been derived from the word Vayalnadu meaning the land of paddy fields. As for the forest, vegetation are concern with evergreen, semi-evergreen, shola, deciduous, and dry deciduous forests distributed all over the district. Annual rainfall is about 3000 to 4000 mm.

### Wayanad Forest Division

Two forest divisions are there in the Wayanad district the South Wayanad forest division comprises 3 forest ranges which is Kalpatta, Mepadi and Chedleth forest ranges. Particularly the forest areas Chambera, Attamalai and Manikunthmala in Mepadi range, Ladys smith, Bible land, and Padinarathra forest areas in Kalpetta range, Pampra, Pathiri South, and Kuruva, island forest areas in Chedleth range, are rich in floristic diversity. The forest areas such as Chemberapeak, Arunagiri, Attamala, Manikunthmala, Parapanpara, Soochipara and Vengaishola forest areas in Meppadi Range, Lady's Smith, Meenmutti, Bibleland, Thandiodu, West land, Kuricharmala, Suganthagiri and Mandamala forest areas in Meppadi Range and Kuruva island, Padiri North, Padiri South forest areas in Chedleth Range were surveyed and carried out plant exploration activities. During the Ethnobotanical survey programme, the climate in the study area was rainy, and the annual rainfall was recorded as about 3000-4000 mm in previous years. The tribal communities

such as Irular, Kadas, Paniyas, Kattunayakans and Kuruchiars are settled in different parts of the district. The survey team visited some of the tribal colonies such as Soochipara, Parapanpara in Mepadi Range, Kuttianvayal, Suganthagiri, Ampa in Kalpetta Range and Padiri South in Chedleth Range were surveyed. During the study, the researchers interacted with the tribal and local peoples and recorded information on folk medicinal plants and wild fruits.

## METHODOLOGY

A preliminary survey of tribal villages in the Wayanad district revealed that local communities used wild flowers as medicine for their healthcare extensively. Frequent field surveys were made in the Wayanad district. Each area was visited twice in different seasons in 2010-2011. Ethnobotanical data (Botanical name, local name, mode of consumption and ethnobotanical uses) were collected through interviews and discussion with the tribal practitioners in and around the study area. Data were also collected through questionnaires in their local languages (Malayalam and Tamil). Information were collected through interview with One hundred and twelve (112) persons aged between 40-80, who had traditional knowledge of wild fruit plants. In addition to the vernacular names, questions were also asked about each plant prescribed, such as part of the fruit used, medical uses, detailed information about the mode of preparation (i.e., decoction, paste, pills, powder and juice); from the usage, either fresh or dried and mixtures of other plants used as ingredients were also collected. The claims were compared with available important works on Indian ethnobotany and medicinal plants such as [8-10]. The medicinal fruit plants were identified (local names) and photographed, and sample specimens were collected for the preparation of herbarium documentation.

The collected wild fruit plant species were identified taxonomically using the Flora of Presidency of Madras [11]. And the Flora of Tamil Nadu Carnatic [12]. The identified plant specimens were then confirmed through a referral tour programme with herbaria of Botanical Survey of India, Coimbatore. The specimens were deposited in the herbarium of a survey of medicinal plant unit, Regional Research Institute of Unani Medicine, Chennai. The tribal information is also kept in the same institute; voucher specimens along with other details are given in Table 1.

The knowledge about medicinal plants is rather specialized and is limited to a few members in the tribal

community who are recognized as 'Vaidhyar' (also known as medicine men, informants and traditional healers). Traditional healers commonly begin their training as children or teenagers, working as assistants to their mothers, fathers and to other relatives who are recognized, healers. After having trained for a number of years, the apprentice will be ceremonially granted the authority to use a given treatment. This individual will be recognized by others in their culture as having the mystical power to heal, as well as having the power to train others in the use of medicinal plants.

## DATA COLLECTION

The ethnomedicinal information was collected through general conversations with traditional healers, and questionnaires were used to gather their knowledge. Details of medicinal plants used, mode of treatment, methods of preparation and types of administration were documented by interacting with them as well as through direct observations. The information got from the tribals was recorded in field notebooks and ethnobotanical data collecting proforma sheet and compared with the previously reported literature [8, 13, 14]. The collected medicinal plant species were identified by the local people with their vernacular names, photographed and sample specimens were collected for the preparation of herbarium. The Flora of Presidency of Madras [11] and the Tamil Nadu Carnatic [12] were used to ascertain the nomenclature. The voucher specimens were deposited in the herbarium at the Regional Research Institute of Unani Medicine, Chennai.

## Statistical Analysis (Quantitative analysis)

### Use Value (UV)

The relative importance of each plant species known locally to be used as a herbal remedy is reported as use value (UV), and it was calculated using the following formula [14]

$$UV = \sum U/n$$

Where UV is the use value of a species, U is the number of use reports cited by each informant for a given plant species, and n is the total number of informants interviewed for a given plant.

### Factor Informant consensus (FIC)

The ICF was used to analyse the agreement degree of the informants' knowledge about each category of ailments [15, 16]. The ICF was calculated using the following formula:

$$Fic = (Nur - Nt)/(Nur - 1)$$

Where Nur stands for the number of use reports of informants for a particular illness category, and Nt is the number of species used by all informants for a particular illness.

### Fidelity level (FL)

The FL was employed to determine the most important plant species used for treating certain diseases by the local herbal practitioners and elderly people living in the study area [17-19]. NFL was calculated using the following formula:

$$FL(\%) = Np/N \times 100$$

Where Np is the number of informants that mentioned the specific plant species used to treat certain ailments, and N is the total number of the informants who utilized the plants as medicine for treating any given ailment.

### Present knowledge on local folk medicine

Ethnobotanical knowledge has been documented from various parts of the Indian sub-continent [20]. In Kerala state, the ethnomedicinal value of wild fruit plants in possession of various tribal and rural folk communities for treating various diseases have been done to some extent [21-23]. A perusal of the literature reveals that several ethnobotanical studies among various tribals have been reported from the various district of this state except for the Wayanad district, which has not yet been studied from the quantitative ethnobotany point of view. Figure 1

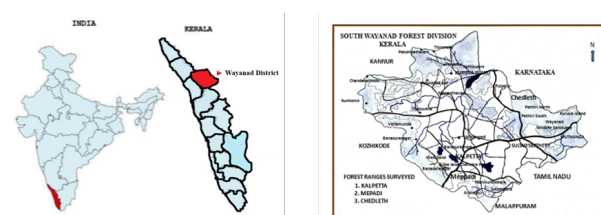


Figure 1: Map of Study Areas of Wayanad Forest of Western Ghats

## RESULT AND DISCUSSION

The art of herbal healing has a very deep root in Indian culture and folklore. Medicinal plants have been playing an important role in the survival at ethnic communities who live in remote villages and forests. Traditional folk medicine, which is mostly undocumented, has been handed down orally from one generation to another. Large sections of the Indian population still rely on traditional herbal medicine.

**Table 1: List of ethnobotanical report of wildflowers used by kanitribes of western ghats of Wayanad forest division, Kerala-India**

S. No.	Botanical name/ Family name/ Voucher Specimen no:	Local Name	Unani Name	No. of Users	Use value (UV)	Fidelity value (FL) (%)	Ethnobotanical Use	Habit/ Life form	Status
1	<i>Aervalanata</i> (L.) Juss. Amaranthaceae/ RRIUM-CH:12342	Pooli poo	Bisheributi	72	0.64	64.29	Kidney stone, Menstrual disorders	Herb	C
2	<i>Albizia lebbbeck</i> (L.) Benth./ Mimosaceae / RRIUM-CH: 9921	Vagai	Gul-E-Siras	30	0.26	26.79	Asthma	Tree	C
3	<i>Althaea officinalis</i> L./ Malvaceae/ RRIUM-CH: 9921	Semaithuthi	Gul-e-Khatmi	24	0.21	21.42	Dry cough	Herb	C
4	<i>Anogeissus latifolia</i> (DC.) Wallich ex Guill.&Perr. / Combretaceae/ RRIUM-CH: 12335	Vekkali	Gul-e-Dhawa	48	0.42	42.86	Piles	Tree	C
5	<i>Areca catechu</i> L./ arecaceae/ RRIUM-CH: 9856	Paku/Adika	Gul-e-Fufal	65	0.58	58.03	Menstrual disorders	Tree	C
6	<i>Azadirachta indica</i> A. Juss. / Meliaceae/ RRIUM-CH: 9107	Vambu	Neeb, Neem	58	0.51	51.79	Viral fever	Tree	C
7	<i>Borago officinalis</i> L./ Boraginaceae/ RRIUM-CH:9955	Kallutaitumapi	Gul-e-Gaozaban	35	0.29	31.25	Kidney stone	Herb	R

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Table 1 continued

S. No.	Botanical name/ Family name/ Voucher Specimen no:	Local Name	Unani Name	No. of Users	Use value (UV)	Fidelity value (FL) (%)	Ethnobotanical Use	Habit/ Life form	Status
8	<i>Butea monosperma</i> (Lam.) Taub. / Fabaceae/ RRIUM-CH: 9673	Porasu	Gul-e-Tesu	68	0.56	60.71	Joint pain	Tree	C
9	<i>Calotropis gigantea</i> (L.) R. Br./ Asclepiadaceae/ RRIUM-CH:12319	Eruku	Madar	55	0.49	49.10	Dry cough	Shrub	C
10	<i>Cananga odorata</i> (Lam.)Hook. f.&Thomson /Annonaceae /RRIUM-CH:10138	Karumukai/ Kattushanpagam	-	60	0.54	53.57	Malarial fever	Tree	R
11	<i>Carthamus tinctorius</i> L. Asteraceae/ RRIUM-CH:10027	Kusumbu chedi	Gul-e-Masafar /Qurtum	32	0.29	28.57	Fever	Herb	R
12	<i>Cassia auriculata</i> L./ Caesalpiniaceae/ RRIUM-CH:12273	Avaram	Tarwar	42	0.38	37.50	Contraceptive purpose	Shrub	C
13	<i>Cassia fistula</i> L./ Caesalpiniaceae/ RRIUM-CH:	Sarakonai	Amaltas	30	0.26	26.78	Intermittent fever, Cardiac disorders	Tree	C
14	<i>Chrysanthemum indicum</i> L./ Asteraceae/ RRIUM-CH: 12385	Chamandi	Gul-e-Dawoodi	46	0.041	41.07	Skin diseases, Vertigo	Herb	C

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Table 1 continued

S. No.	Botanical name/ Family name/ Voucher Specimen no:	Local Name	Unani Name	No. of Users	Use value (UV)	Fidelity value (FL) (%)	Ethnobotanical Use	Habit/ Life form	Status
15	<i>Crocus sativus</i> L./ Iridaceae/ RRIUM-CH: Museum Sample:No:52.	Kungamapoo	Gul-e-Zafran	25	0.22	22.32	Dysmenorrhoea (Painful menstruation)	Herb	R
16	<i>Datura metel</i> L./ Solanaceae/ RRIUM-CH:10511	Oomathai	Gul-e-Dhatura	67	0.59	59.82	Respiratory problems, Anaesthetic	Herb	C
17	<i>Erythrina variegata</i> L./Papilionaceae / RRIUM-CH:13848	Kalyanamuringai	-	48	0.43	42.85	Furunculosis (Boils)	Tree	R
18	<i>Gardenia gummifera</i> L.f. / Rubiaceae / RRIUM-CH:12118	Sirukambil	Dikaamaali	35	0.29	31.25	Boils in eyelid and ears	Small Tree	R
19	<i>Hibiscus rosa-sinensis</i> L. Malvaceae/ RRIUM-CH: 11768	Semparuthi	Gul-e-Gurhal	60	0.54	53.57	Hair tonic, Cardiac tonic	Shrub	C
20	<i>Hybanthusen-easpermus</i> (L.) F.Muell. / Violaceae / RRIUM-CH:13812	Orithalthamarai	-	53	0.47	47.32	Increase sperm counting	Herb	C
21	<i>Hedychiumspicatum</i> Sm. /Zingiberaceae/ RRIUM-CH:	Moolankizhangu	Kapoor kachari	48	0.42	42.86	Headache and fever	Herb	R
22	<i>Ipomoea bona-nox</i> L./ Convolvulaceae/ RRIUM-CH:13257	Naganamukkorai	Gul-e-Chandni	36	0.32	32.14	Eczema	Twiner	R

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Table 1 continued

S. No.	Botanical name/ Family name/ Voucher Specimen no:	Local Name	Unani Name	No. of Users	Use value (UV)	Fidelity value (FL) (%)	Ethnobotanical Use	Habit/ Life form	Status
23	<i>Jasminum grandiflorum</i> L./ Oleaceae/ RRIUM-CH:10579	Kattumalligai	Shagufa Yasmin	65	0.58	58.04	Chest pain	Shrub	C
24	<i>Lawsoniainermis</i> L./ Lythraceae/ RRIUM-CH:9950	Maruthani	Gul-e-Hina	70	0.62	62.50	Hair growth, Good sleep	Shrub	C
25	<i>Leucas aspera</i> L. / Lamiaceae/ RRIUM-CH:13699	Kasithumbai	Thumba	64	0.57	57.14	Headache, Bleeding nose, Skin disease	Herb	C
26	<i>Madhuca longifolia</i> (J.Konig) J.F.Macbr./ Sapotaceae/ RRIUM-CH:10634	Elupai	Gul-e-Mahuwa	52	0.46	46.43	Headache, Expectorant	Tree	C
27	<i>Matricaria chamomilla</i> L. / Asteraceae/ RRIUM-CH:10200	Mukuthi poo	Gul-e-Baboona	50	0.45	44.64	Inflammation, Wound healing	Herb	R
28	<i>Mesua ferrea</i> L. / Gut-tiferaceae/ RRIUM-CH:13872	Karunagu	Naarmushk	32	0.29	28.57	Urinary Disorders, Reduce fever, Leprosy, Itching	Tree	R
29	<i>Micheliachampaca</i> L. / Magnoliaceae / RRIUM-CH:13979	Senbagampoo	Chamba	71	0.63	63.39	Leprosy, Gonorrhoea	Tree	R
30	<i>Mimusopse-lengi</i> L. / Sapotaceae/ RRIUM-CH:8651	Magizhampoo	Gul-e-Mulsari	62	0.55	55.36	Asthma, Menstrual disorders	Tree	C

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Table 1 continued

S. No.	Botanical name/ Family name/ Voucher Specimen no:	Local Name	Unani Name	No. of Users	Use value (UV)	Fidelity value (FL) (%)	Ethnobotanical Use	Habit/ Life form	Status
31	<i>Mirabilis jalapa</i> L./ Nyctaginaceae/ RRIUM-CH: 12496	Andhi Mandarai	Gul-e-Abbas	48	0.43	42.86	Inflammation	Herb	C
32	<i>Moringa oleifera</i> Lam./ Moringaceae/ RRIUM-CH:10021	Murungai	Gul-e-Sahajana	82	0.73	73.21	Diuretic, Chololith (gallstones)	Tree	C
33	<i>Musa paradisiaca</i> L. / Musaceae / RRIUM-CH:13564	Vazhamaram	Gul-E- Moz	72	0.64	64.28	Diabetic, painful menstruation	Tree	C&C
34	<i>Nelumbo nucifera</i> Gaertn./ Nelumbonaceae / RRIUM-CH:13392	Senthamarai	Kanwal Gatta	68	0.61	60.71	Viral fever	Aquatic C Herb	
35	<i>Nymphaea alba</i> L./ Nymphaeaceae/ RRIUM-CH:12757	Alli (Water Lilly)	Gul-e-Nilofer	32	0.29	28.57	Leucorrhoea	Aquatic C Herb	
36	<i>Nyctanthes arbor-tristis</i> L. / Oleaceae / RRIUM-CH:12757	Pavazhamalligai	Harsinger	48	0.43	42.86	Sciatica, Skin diseases, Hair tonic	Shrub	R
37	<i>Pandanus odorifer</i> (Forssk.) Kuntze/ Pandanaceae/RRIUM-CH:13252	Thazhampoo	Kewra	54	0.48	48.21	Convulsion, Carminative, Headache	Shrub	R
38	<i>Pentapetes phoenicea</i> L./ Malvaceae/ RRIUM-CH: 11853	Nagappu	Gul-e-Dopaharya	33	0.29	29.46	Emollient in tumours	Herb	R

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Table 1 continued

S. No.	Botanical name/ Family name/ Voucher Specimen no:	Local Name	Unani Name	No. of Users	Use value (UV)	Fidelity value (FL) (%)	Ethnobotanical Use	Habit/ Life form	Status
39	<i>Plumbago zeylanica</i> L./ Plumbaginaceae/ RRIUM-CH:12324	Kodiveli	Sheetraj Hindi	56	0.50	50.00	Headache	Herb	C
40	<i>Pongamia pinnata</i> (L.) Pierre/ Fabaceae/ RRIUM-CH:13777	Pungan	Gul-e Karanji	50	0.45	44.65	Diabetic, Leprosy	Tree	C
41	<i>Pterocarpus marsupium</i> Roxb. / Fabaceae/ RRIUM-CH:9078	Vangai	Gul-e-Bijasar	48	0.43	42.86	Chronic fever	Tree	S
42	<i>Punica granatum</i> L. / Punicaceae/ RRIUM-CH:9011	Madhulai	Gul-e-Anar Farsi	67	0.60	59.82	Asthma pain, Uterine disorders	Shrub	C
43	<i>Rosa alba</i> L. / Rosaceae / RRIUM-CH:8957	Vellairoja	Gul-e-Sewti	60	0.54	53.57	Chest pain	Herb	C
44	<i>Rosa damascena</i> Mill./Rosaceae/ RRIUM-CH:8942	Rojappu	Gul-e-Ward	63	0.56	56.25	Skin irritation	Herb	C
45	<i>Rosmarinus officinalis</i> L. / Lamiaceae / RRIUM-CH:8942	Marikozhinthu	Iklylaljabal	54	0.48	48.21	Anti-inflammatory, Circulatory disorders	Herb	C&C
46	<i>Saracaasoca</i> (Roxb.) Willd./ Fabaceae/ RRIUM-CH:11240	Asogam	Ashoka	68	0.61	60.71	Bleeding piles, Headache	Tree	R

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Table 1 continued

S. No.	Botanical name/ Family name/ Voucher Specimen no:	Local Name	Unani Name	No. of Users	Use value (UV)	Fidelity value (FL) (%)	Ethnobotanical Use	Habit/ Life form	Status
47	<i>Sphaeranthus indicus</i> L./ Asteraceae/ RRIUM-CH:12505	Kottaikaran-thai	Gul-e-Mundi	56	0.50	50.00	Skin disease, Cough	Herb	C
48	<i>Spilanthes-cmella</i> (L.) R.K. Jansen. / Asteraceae / RRIUMCH:13671	Palvalipoondu	-	70	0.63	62.50	Toothache	Herb	R
49	<i>Syzygiumaromaticum</i> (L.) Merr. et Perry./Myrtaceae/ RRIUM-50CH:12558	Kirambu	Gul-e-Qaranfal	47	0.42	41.96	Gastric ulcer, Toothache.	Tree	C
50	<i>Syzygiumcumini</i> (L.) Skeels/ Myrtaceae/ RRIUM-CH:11393	Naval	Gul-e-Jamun	53	0.43	47.32	Contraceptive purpose	Tree	C
51	<i>Syzygiumjambos</i> L. (Alston) / Myrtaceae/ RRIUM-CH:11241	Jambu	Gul-e Gulab Jamun	49	0.44	70.54	Jaundice	Tree	R
52	<i>Toona ciliate</i> M.Roem./ Meliaceae/ RRIUM-CH:12544	Madhakari Vambu	Gul-e-Tun	34	0.30	30.36	Irregular menstruation	Tree	C
53	<i>Viola odorata</i> L. /Violaceae/ RRIUM-CH:/8861	Orilaithamarai	Gul-e-Banafsha	45	0.40	40.18	Jaundice	Herb	R
54	<i>Woodfordiafruticosa</i> (L.) Kurz / Lythraceae/ RRIUM-CH:8972	Velakkai	-	54	0.48	48.21	Piles, Wound healing, Skin diseases	Shrub	R

Even today, in most of the forest, tribal are depending on local traditional healing systems for their primary health care. Their reliability on only healing plants is still more for the tribal people inhabiting the deep forest of Western Ghats of Kerala in India, where it is difficult for them to get modern medical facilities for their day to day problems. So keeping all these things in mind, the present study was taken into account. The paper focus on the flowers used by tribals and rural peoples of the Study area. The ethnic community lives in the Western Ghats of Wayanad district of Kerala. These hills forests have a variety of medicinal plants and their flowers which are used by the tribals for their primary healthcare.

The present study identified that the traditional healers used 54 species of flowers (distributed in 50 genera belonging to 36 families) ethnomedicinally to treat various diseases such as dry cough, menstrual disorders, piles, Viral fever, Kidney stone, Joint pain, Jaundice, Skin diseases, Contraceptive purpose etc., (Table 1). Moreover, life forms of medicinally used flowers are 20 herbs, 21 trees, 9 shrubs, 2 aquatic herb, one twiner and one small tree are recorded, and statuses of flowers are 32 in commonly available, 19 are rare, 2 are common & cultivated and one is sporadic in the study area.

The following plant's flowers are used for various ailments they are *Aervalanata* (L.) Juss. (Bisheributi) used for menstrual disorders, *Althaea officinalis* L. (Gul-e-Khatmi) is used for dry cough. *Anogeissus latifolia* (DC.) Wallich ex Guill.&Perr. (Gul-e-Dhawa) used for Piles, *Areca catechu* L. (Gul-e-Fufal) used for Menstrual disorders, *Azadirachta indica* A. Juss. (Neeb, Neem) used for viral fever, *Borago officinalis* L. (Gul-e-Gaozaban) used for kidney stones, *Butea monosperma* (Lam.) Taub. (Gul-e-Tesu) used for joint pain, *Calotropis gigantea* (L.) R. Br. (Madar) used dry cough, *Carthamus tinctorius* L. used for fever, *Cassia auriculata* L. (Tarwar) used for contraceptive purposes, *Chrysanthemum indicum* L. (Gul-e-Dawoodi) used for skin diseases. *Hibiscus rosa-sinensis* L. (Gurhal) used for hair tonic, *Ipomoea bona-nox* L. (Gul-e-Chandni) used for eczema. *Jasminum grandiflorum* L. (Shagufa Yasmin) is used for chest pain, and *Lawsoniainermis* L. (Gul-e-Hina) is used for hair growth and good sleep *Madhuca longifolia* (J.Konig) J.F.Macbr. (Gul-e-Mahuwa) used for cough, *Matricaria chamomilla* L. (Gul-e-Baboona) used for inflammation, *Mimusopselengi* L. (Gul-e-Mulsari) used for menstrual disorders, *Mirabilis jalapa* L. ( Gul-e-Abbas) used for inflammation, *Moringa oleifera* Lam. (Sahajana) used for forchololith, *Nymphaea alba* L. (Gul-e-Nilofer) used for leucorrhoea, *Pentapetesphoenicea* L. ( Gul-e-Dopaharya) Used for tumours, *Plumbago*

*zeylanica* L. (Sheetraj Hindi) used for headache, *Pterocarpus marsupium* Roxb. (Gul-e-Bijasar) used for chronic fever, *Punica granatum* L. (Gul-e-Anar Farsi) used for asthma pain, *Rosa alba* L. (Gul-e-Sewti) used for chest pain, *Rosa damascena* Mill. (Gul-e-Ward) used for skin irritation, *Sphaeranthus indicus* L. (Gul-e-Mundi) used for Cough and Skin disease, *Syzygiumaromaticum* (L.) Merr. et Perry. (Gul-e-Qaranfal) used for gastric ulcer, *Syzygiumcumini* (L.) Skeels (Gul-e-Jamun) used for the contraceptive purpose, *Syzygiumjambos* L. (Alston) (Gul-e Gulab Jamun) used for Jaundice, *Toona ciliata* M.Roem. (Gul-e-Tun) used for irregular menstruation.

In the present study statically analyzed the 54 plant species of wildflowers (Only Flowers parts of the plant) used by 112 informants aged 40-80 for ethnomedicines and the data were collected in the study area. The commonly used flower species *Moringa oleifera* Lam. (Moringaceae), Popularly known as Murungai (Gul-e-Sahajana), with the highest UV of 0.73 by 82 informants used for Diuretic, Chololith (gallstones). Followed by *Musa paradisiaca* L. (Musaceae) Vazhamaram (Gul-E- Moz) with UV of 0.64 by 72 informants used for Diabetic & Painful menstruation and *Aervalanata* (L.) Juss. (Amaranthaceae) Pooli poo (Bisheributi) with UV of 0.62 by 72 informants is used for Kidney stone and Menstrual disorders. *Micheliachampaca* L. (Magnoliaceae) Senbagam poo (Gul-e-Chamba) with UV of 0.63 by 71 informants which is used for Leprosy & Gonorrhoea. *Lawsoniainermis* L. (Lytheraceae) Maruthani (Gul-e-Hina) with UV of 0.62 by 70 informants used for Hair growth & Good sleep where analyzed. (Table 1).

The species with the lowest Use Value was observed *Althaea officinalis* L. (Malvaceae) Semaithuthi (Gul-e-Khatmi) with a UV of 0.21 by 24 informants used for Dry cough. *Crocus sativus* L. (Iridaceae) Kungamapoo (Gul-e-Zafran) with UV of 0.22 by 25 informants used for dysmenorrhoea (Painful menstruation) disorders. *Albizia lebbek* (L.) Benth. (Mimosaceae) Vagai (Gul-E-Siras) with UV of 0.26 by 30 informants used for Asthma disease. *Carthamus tinctorius* L. (Asteraceae) is used for fever, and *Mesua ferrea* L. (Guttiferaceae) is used for Urinary Disorders, Reduce fever, Leprosy & Itching. *Nymphaea alba* L. (Nymphaeaceae) Alli (Gul-e-Nilofer) was used for leucorrhoea; these three plants was analyzed with UV of 0.29 by 32 informants. (Table 1)

In order to analyze the general usage pattern of plants, the informant's consensus factor (Fic) was used to highlight the plant use in particular ailments categories and agreement with the use of

**Table 2: Informant Consensus Factor (FIC)**

S. No.	Aliments Category	No. of uses report	No. of Species used	Informant Constant Factor
1	Determetalological Infection	519	11	0.98
2	Dandruff / Hair fall	108	2	0.99
3	Wound healing	207	4	1.00
4	Sexual disorders / Genitourinary ailments	765	14	0.98
5	Circulatory/Cardiovascular disease	269	5	0.98
6	Gastro intestinal ailments	101	2	0.99
7	Skeleton-muscular and Neuro system disorders	170	3	0.98
8	Oral and teeth disorders	117	2	0.99
9	Endocrinal disorders	122	2	1.01
10	Respiratory system disorders	456	9	0.98
11	Liver/Jaundice	94	2	1.01
12	Fever/Chronic Fever	624	12	0.98
13	Exocrine disorder	82	1	1.00
14	Piles	122	2	0.99

plants. This will helps in the selection of plants for pharmacological and phytochemical studies. Moreover, the Informant consensus Factor (FIC) was analyzed with 67 Diseases divided into 14 ailments categories. Among them highest value was observed in Endocrinal disorders and Liver & jaundice as Fic Value:1.01 at the same the Lowest value was observed in Determetalological Infection, Sexual disorders / Genitourinary ailments, Circulatory/Cardio, vascular disease, Skeleton-muscular and Neuro system disorders, Respiratory system disorders, Fever/Chronic Fever. as Fic Value:0.98 (Table 2). Similar research has been reported by other ethnobotanists [24, 25].

This is consistent with other general observations which have been reported and recorded earlier in relation to medicinal uses of flowers studies by the Indian system of medicines like Siddha, Ayurvedha and Unani [26–28]. Most of the flowers, mainly used as food, also have medicinal importance. Many flowers are used for skin and hair care. Essential oils impart benefits in perfumery, shine or conditioning effects [29]. In India, thousands of flower species have been used as food and medicine in folk, ayurvedic, unani, siddha and other systems recorded since 1000 BC [30, 31].

Antioxidant activities of indigenous foods and plant medicines that are necessary for health culture as well as economic stability of village people are being explored in different parts of the globe. Village people, women and children gather the flowers and

deciduous petals as food, and also a number of flower species are consumed by them. Flowers are rich in phenolic compounds and have antioxidant potential. Among floral whorls, the corolla is generally deciduous. The collection of deciduous petals rich in phenolic compounds is an eco-friendly practice and better than incineration in forests.

### Ailments categories

#### 1. Dermatological Infection

- a. Inflammation
- b. Skin Diseases
- c. Antiseptic
- d. Skin Rashes
- e. Skin Irritation

#### 2. Dandruff/Haircare

- a. Hair fall
- b. Dandruff

#### 3. Wound Healing

- a. Wound Healing

#### 4. Sexual disorders/Geneto Urinary Ailments

- a. Increase sperm count
- b. Menstrual bleedings
- c. Urinary Irritation
- d. Sexual depelety/disorders
- e. Birth control

**5. Obesity**

- a. Obesity

**6. Circulatory/Cardiovascular diseases**

- a. Anemia
- b. Heart Diseases

**7. Gastrointestinal Ailments**

- a. Stomach Pain
- b. Stomach Ulcers
- c. Indigestion
- d. Constipation
- e. Intestinal Worm
- f. Dysentery

**8. Edible and General Health**

- a. Piles
- b. Edible food

**9. Skeleton - Muscular and Nervous System Disorders**

- a. Neuro disease
- b. Paralysis
- c. Joint Pain
- d. Rheumatic Swelling
- e. Rheumatic Pain

**10. Oral and Tooth Disorders**

- a. Swelling Gum
- b. Toothache
- c. mouth Ulcers

**11. Endocrinal disorders**

- a. Diabetic
- b. Kidney stone

**12. Respiratory System disorders**

- a. Cough and Cold
- b. Asthma
- c. Cough

**13. Liver**

- a. Jaundice

**14. Fever**

- a. Chronic Fever

**CONCLUSION**

Flowers are playing an important role in our day to day life, directly or indirectly. From time immemorial, flowers have been used as a restorative agent

for a variety of ailments. They are the natural drugs used to regain the alterations made in the normal physiological system by foreign organisms or by any malfunctioning of the body. It is essential to have proper documentation of medicinally used flowers and their potential for the improvement of health and hygiene through an eco-friendly system. The available literature regarding the pharmacological properties of these flowers are very impressive. The present study showed that traditional healthcare systems using medicinal plants is still prevalent in the studied areas, and it underlines the importance of the documentation of traditional ethnomedicinal knowledge before losing this diverse resource. To the best of our knowledge, this is the first quantitative ethnomedicinal study in the study area indicating UV, ICF and FL. The present study records new ethnomedicinal species with their therapeutic uses, which can potentially lead to the development of new therapies and may represent novel bioresources for phytochemical and pharmacological studies, notably *Aervalanata* (L.) Juss. Which have been claimed for kidney stone effects and *Micheliachampaca* L. is used for Leprosy by the healers of all studied indigenous communities in the study area.

**ETHICS STATEMENT**

The study was carried out in accordance with the recommendations of the Code of Ethics of the International Society of Ethnobiology. Ethics approval was not required by the Institutional Ethical Committee. Verbal informed consent was obtained from each informant prior to all interviews. During this discussion, the research objectives and interview procedure were explained to each informant and confidentiality was assured. Consent for photos was also taken and kept in the Herbarium of Survey of Medicinal Plants Unit, Regional Research Institute of Unani Medicine, No. 1, West Madha Church Road, Royapuram Chennai-13.

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### Conflict of Interest

The authors declare that they have no conflict of interest.

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