



An ethnobotanical study of medicinal plants traditionally used by the natives of Lakshadweep Islands, India

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Received: 22 April 2021

Accepted: 17 May 2021

Abstract

Lakshadweep archipelago is a small group of islands in the Arabian Sea consisting of 36 islands; only 10 islands are inhabited. The vegetation is typical Indo-Pacific atoll coral island flora. The present study is based on a survey among all inhabited islands to identify and document the area's ethnobotanical important and economic plants. Their ethnobotanical uses categorized the plants identified for the study. There are 70 different species of angiosperms found traditionally associated with island people. The people from the age group 40 and above are the stakeholders of the ethnic plant medicines. The traditional knowledge is circumscribed among the people of age group of 60 and above. Some exceptions were noticed among the people of age group 40-55 in some islands. It is noticed that the men are dominating in the traditional healing practices than the women. It is noted that the young generation of the islanders has very negligible knowledge of traditional healing practices. Most of the conventional practitioners are no more to share the ability with the younger generation. The study reveals that there is massive destruction of natural vegetation in the islands due to anthropogenic activities. Soil erosion is also very high in islands, which leads to the decline of coastal vegetation.

Keywords: Amindivi, Ethnomedicine, Laccadives, Traditional knowledge

1. Introduction

Lakshadweep, India's smallest union territory, is an archipelago consisting of 36 islands with 32 km² and located between 8°-12° 13' North latitude and 71°-74° 00' East longitude, 220 to 440 km away from the coastal city of Kochi, Kerala, India (Fig.1). This uni-district union territory comprises of 17 atolls, 3 reefs, 6 submerged banks and 10 inhabited islands. The Lakshadweep comprises the most extensive coral reef and atoll system in the Indian Ocean and the largest atoll system in the world (Anonymous, 2012). The vegetation is typical of Indo-Pacific atoll coral island flora. There is no declared forest in Lakshadweep, but 80% of its landmass is covered by green vegetation, mainly with coconut trees (Rao and Ellis, 1995). As per the 2011 census, the inhabited islands had a total population of 64,429 and population density is 2013 person per km²



Fig. 1. Location of study area (Source: www.lakshadweep.nic.in)

(Anonymous, 2011). 'Lakshadweep' earlier known as 'Laccadives and Amini Islands' has more than 93% of Muslims' indigenous population. A dialect of Malayalam called 'Jessry' is spoken in all the islands except Minicoy, where people talk 'Mahal', written in 'Divehi' script. The main occupation of the people is fishing and coconut cultivation. The entire ethnic population of Lakshadweep is classified as Scheduled Tribes because of socio-economic backwardness and geographical isolation (Mannadiar, 1977).

In earlier days, the people of Lakshadweep were entirely depended on plants for their food, medicine, shelter and other uses (Wadhwa, 1961). No detailed studies have been carried out in Lakshadweep on traditional knowledge associated with plants in the region. An ethnobotanical investigation focused on folklore medical practice and collected details of 28 medicinal plants using single-use (Bhat *et al.*, 1993). Ethnobotanical information of 23 plant species for medicinal and other uses was documented in the latest study in the region (Joseph *et al.*, 2018). Two mangrove ecosystems are found in south and south east areas of Minicoy Island. *Ceriops candolleana* is reported from the south and *Bruguiera cylindrica* from the southeast (Radhakrishnan *et al.*, 1998). The absence of detailed ethnobotanical study in the Lakshadweep Islands led us to conduct an ethnobotanical survey to explore and document these islands' ethnobotanical potential.

2. Materials and methods

The field survey was conducted among all the inhabited islands. The investigator visited all the inhabited islands during different seasons from the year 2016 to 2019 and stayed 2 to 7 days on an island depending upon the size of the island for documentation. Due to the geographical isolation of islands and the roughness of Sea in the Southwest Monsoon which starts from June to November is the barrier to carry out the visits among the islands. Though the islands are far away from each other by 0.5 km to 400 km, it depends on the ship conveyance to travel from one island to another. The Investigator visited the islands and stayed *viz.* 2016 October-December; Kavaratti (6 days), Minicoy (7 days) and Andrott (4 days), 2017 February-March; Agatti (4 days), Amini (7 days) and Kavaratti (3 days), 2018 January-May; Andrott (2 days), Kiltan (3 days), Chetlat (3 days), Bitra (2 days) and Kavaratti (5 days). 2019 November-December; Minicoy (3 days), Amini (3 days), Agatti (5 days), Andrott (7 days) and Kavaratti (2 days). Kalpeni is the native island of the investigator¹ so field work carried out in more days than any other islands. Extensive consultations among local, knowledgeable people and detailed documentation of plants' usage were carried out for the study. The collected plants were identified using standard floras and available literature (Joseph and Sivadasan, 1982; Joseph *et al.*, 2018)

and herbarium specimens at Calicut University (CALI). The collected data were tabulated in alphabetic order by the name of plants, local name, family and traditional knowledge.

3. Results and discussion

The present study was conducted on people from the Lakshadweep islands. Ten inhabited islands were visited during the research and documented the data by an in-depth interview with local, knowledgeable people. Seventy angiosperm species belonging to 42 families found medicinally used by the islanders. Among the families, Asteraceae, Fabaceae, and Malvaceae have four species each and thus most dominated. Amaranthaceae, Euphorbiaceae, Lamiaceae, Moraceae and Verbenaceae have three species each. Mostly, the plants are used to cure wound healing, cough, fever, swellings, rheumatism, gastric problems and skin and eye diseases (Plate 1). In the study, we found that major forms of preparation methods for herbal drugs were paste, followed by juice, decoction and whole fresh part. The mode of preparation and application against diseases were found almost similar in previous studies (Bhat *et al.*, 1993; Joseph *et al.*, 2018).

The people from the age group 40 and above are the stakeholders of the ethnic plant medicines. Total number of 187 people between the age group 40 to 95 was interviewed for the study. Among them 110 were males and 77 were females. The age group from 60 and above are very rich in traditional knowledge but in some islands like Amini, Andrott and Minicoy where the traditional healers share their ancestral knowledge to their younger generations of age the group ranging from 40 to 55. Though the aged group is the more knowledgeable persons about medicinal plants, the practitioners are limited to few families of some islands like Amini, Andrott, Kavaratti, Minicoy, etc. It is also noted that generally the young generation of the islanders has very little knowledge of traditional healing practices. Other everyday uses of plants by the islanders other than food are shampoo, insect repellent, green manure, fodder, making utensils, furniture and boat building. In the study, it was observed that due to the loss of natural habitat by settlement and erosion, most indigenous plants are at the peak of endemism. The loss of natural vegetation and their habitat also reported in the region by detail (Rao *et al.*, 1995). A consolidated account of the vegetation, landscape analysis and plant diversity of Lakshadweep provides an overview on the plants in the region (Reddy and Roy, 2011). The plants are grouped and tabulated in alphabetic order by their scientific names, followed by local names, family and ethnobotanical use-the detailed data on ethnobotanical aspects given in the Table 1.

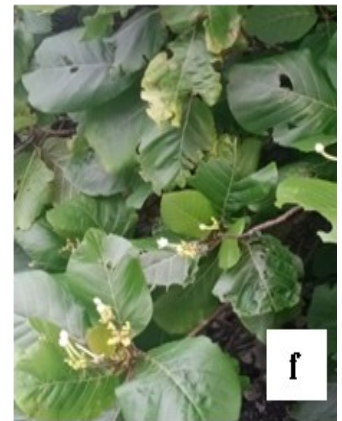


Plate 1. a. *Cyperus javanicus* Houtt.; b. *Ochrosia oppositifolia* (Lam.) K. Schum; c. *Suriana maritima* L.; d. *Ipomoea pes-caprae* (L.) Sweet; e. *Tournefortia argentea* L.f.; f. *Guettarda speciosa* L.; g. *Artocarpus altilis* (Parkinson ex F. A. Zorn.) Fosberg; h. *Cassytha filiformis* L.; i. *Calotropis gigantea* (L.) Dryand.

Table 1. Ethnobotanical properties of native plants by the people of Lakshadweep Islands

Sl. No.	Botanical name	Local name	Family	Traditional knowledge
1	<i>Abutilon indicum</i> (L.) Sweet	<i>Bedippul, Mabula</i>	Malvaceae	Leaves used against Piles and scabies on head.
2	<i>Aerva lanata</i> (L.) Juss.	<i>Arippul, Hudufaippila</i>	Amaranthaceae	Whole plant used as medicine to destroy urinary stone.
3	<i>Alternanthera ficoidea</i> (L.) P. Beauv.	<i>Minicoy cheera</i>	Amaranthaceae	Leaves used as vegetable, decoction made from leaves with other ingredients used against urinary stone.
4	<i>Amaranthus blitum</i> L.	<i>Vella Cheera, Massagu</i>	Amaranthaceae	Leaves used as vegetable, root juice applied on forehead to get relief from headache.
5	<i>Annona squamosa</i> L.	<i>Athachakka, Atha</i>	Annonaceae	Fruits are edible and used to cure dysentery.
6	<i>Argemone mexicana</i> L.	<i>Fonnummathiram, Zaggoom</i>	Papaveraceae	Crushed leaves used to heal bleeding wound.
7	<i>Artocarpus altilis</i> (Parkinson ex F.A. Zorn) Fosberg	<i>Shakka</i>	Moraceae	Fruits used as food, Latex used to treat ear and stomach ache. Bark also used to treat digestive problems. Wood used to make catamaran and other utensils.
8	<i>Azadirachta indica</i> A. Juss.	<i>Beyppu, Hitiugus</i>	Meliaceae	Leaves and tender bark used as medicine to cure headache and tooth ache. Also used to lower the blood pressure (BP).
9	<i>Bacopa monnieri</i> (L.) Wettst.	<i>Burmi, Brahmi</i>	Scrophulariaceae	Whole plant is used as medicine against insomnia and to increase memory power.
10	<i>Boerhavia diffusa</i> L.	<i>Thaluthama, Oodiavally</i>	Nyctaginaceae	Whole plant is used to cure rheumatism and stomach ache.
11	<i>Calotropis gigantea</i> (L.) Dryand.	<i>Erikku, Ruva</i>	Apocynaceae	Leaves used as medicine against back pain and hydrocele.
12	<i>Calophyllum inophyllum</i> L.	<i>Shettal, Phunna</i>	Clusiaceae	Latex is used to treat Rheumatism. Decoction from roots used to treat ulcers and boils. The wood is used for building boats and furniture.
13	<i>Carica papaya</i> L.	<i>Karmoosa, Koppakka,</i>	Caricaceae	Fruits are edible, leaves used as poultry feed. Unripe fruit used to treat helminthiasis. Fruit also used for dysentery and constipation.
14	<i>Cassytha filiformis</i> L.	<i>Fashakka, Muthiveyu</i>	Lauraceae	Whole plant used as medicine against skin diseases. Cattle fodder to enhance milk production.
15	<i>Catharanthus roseus</i> (L.) G. Don	<i>Shakanari, Hutumougus</i>	Apocynaceae	Leaves used to cure wound healing, diabetes and hypertension.

16	<i>Cayratia trifolia</i> L. Domin	<i>Oonjatakka</i>	Vitaceae	Ripe fruits are edible and juice used to make pen-ink. The leaves and roots were used to cure fever and inflammation.
17	<i>Clerodendrum paniculatum</i> L.	<i>Kudappoog, Shaithanappoo</i>	Lamiaceae	Flowers used as ornamental on special occasions.
18	<i>Cocos nucifera</i> L.	<i>Thengu, Divehiruva</i>	Areaceae	All parts of the plants are used in variety of ways like medicine, food, shelter, etc.
19	<i>Colocasia esculenta</i> (L.) Schott	<i>Shymbu, Ala</i>	Araceae	Tubers are edible and leaves used for packing meat and fish in the market. Leaf decoction used to facilitate menstruation.
20	<i>Colubrina asiatica</i> (L.) Brongn.	<i>Baagha, rabeberi</i>	Rhamnaceae	Leaves used as hair shampoo and against inflammations.
21	<i>Cordia subcordata</i> Lam.	<i>Nadan Theykku</i>	Boraginaceae	Wood is used for building boats and other household utensils.
22	<i>Cucumis prophetarum</i> L.	<i>Kaippakka</i>	Cucurbitaceae	Ripe fruits are edible, raw fruit used as emetic.
23	<i>Cyanthillium cinereum</i> (L.) H. Rob.	<i>Poovamkurundal, Theyyappullu</i>	Asteraceae	Leaves are used to cure eye diseases.
24	<i>Cynodon dactylon</i> (L.) Pers.	<i>Karuka, njar-karuka</i>	Poaceae	Whole plant used to cure urinary stone and used as cattle fodder.
25	<i>Cyperus rotundus</i> L.	<i>Muthanga, Gokkaladuru</i>	Cyperaceae	Whole plant use against dispels weariness.
26	<i>Datura metal</i> L.	<i>Kariummathiram, Orheni</i>	Solanaceae	Leaves used against inflammation and flowers used against asthma.
27	<i>Erythrina variegata</i> L.	<i>Murikku, Berebedi</i>	Fabaceae	Decoction made from leaves and bark used treat dysentery and fever. Wood used for making utensils and leaves as cattle fodder.
28	<i>Ficus benghalensis</i> L.	<i>Faalalam</i>	Moraceae	Ripe fruits and tender leaves eaten by people in earlier days. Leaves given to cattle to enhance milk production. Leaves and latex used to treat dysentery and toothache.
29	<i>Ficus racemosa</i> L.	<i>Athimaram</i>	Moraceae	Fruit and flower buds used as medicine.
30	<i>Flacourtia indica</i> (Burm. f.) Merr.	<i>Kattu cherry, Thatthalambu</i>	Salicaceae	Ripe fruits are edible, leaf extract used to treat asthma and gynecological problems.

31	<i>Gloriosa superba</i> L.	<i>Saithanabala, Vihalangondi</i>	Colechicaceae	Leaves used as shampoo against lice. Plant juice used as abortifacient.
32	<i>Guetarda speciosa</i> L.	<i>Shemmal, Unigas</i>	Rubiaceae	Leaves, bark and roots used against skin diseases.
33	<i>Hernandia nymphaeifolia</i> (J. Presl) Kubitzki	<i>Fatty, Kandu</i>	Hernandiaceae	Wood used for making catamaran and leaves used for making 'ada'.
34	<i>Hibiscus rosa-sinensis</i> L.	<i>Shembarathy, Saima</i>	Malvaceae	Leaves used as hair shampoo to remove dandruff and for smooth and shiny hair. Flower is used for contraception.
35	<i>Indigofera tinctoria</i> L.	<i>Avary, Kudihiti</i>	Fabaceae	Leaves and roots used as medicine against edema and vomiting
36	<i>Justicia adathoda</i> L.	<i>Adalodakam</i>	Acanthaceae	Leaves and flowers used to cure asthma.
37	<i>Lantana camara</i> L.	<i>Arippokka, Shimminikka</i>	Verbenaceae	Ripe fruits and flowers are edible, dried flowers used to treat tuberculosis. Decoction made from the plant parts used to treat fever, asthma and cough.
38	<i>Launaea sarmentosa</i> (Willd.) Sch. Bip. ex Kuntze	<i>Fappul, kadafai</i>	Asteraceae	Whole plant used as food, leaves used to cure gas trouble.
39	<i>Lawsonia inermis</i> L.	<i>Moulanchi, Heenafai</i>	Lythraceae	Leaves used as medicine against headache, dandruff and tattooing by girls and children on special occasions.
40	<i>Leucas aspera</i> (Willd.) Link	<i>Thumba</i>	Lamiaceae	Whole plant used as medicine against fever, cough, cold, Jaundice and skin diseases.
41	<i>Mimosa pudica</i> L.	<i>Thottabaadi</i>	Fabaceae	Crushed roots applied on boils and also used to cure mild skin ailments.
42	<i>Mirabilis jalapa</i> L.	<i>Asarppoo, Asarfolaymoungas</i>	Nyctaginaceae	Leaves and roots are medicinally used against swellings and bruises.
43	<i>Morinda citrifolia</i> L.	<i>Molookka, Ahi</i>	Rubiaceae	Flower and fruit are used against eye diseases and diabetes.
44	<i>Moringa oleifera</i> Lam.	<i>Muinga, Muranga</i>	Moringaceae	Leaf, bark and fruit are medicinally Used to cure redevy, premature ejaculation, blood pressure and giddiness.
45	<i>Musa paradisiaca</i> L.	<i>Bala, Donkeo</i>	Musaceae	Whole plants used in various manners like food, fodder and animal medicine.

46	<i>Ocimum tenuiflorum</i> L.	<i>Thulasi, Gandhakoligas</i>	Lamiaceae	Whole plant used as medicine against fever, cold and body aches.
47	<i>Oldenlandia biflora</i> L.	<i>Thasamarunnu, Bimmagu</i>	Rubiaceae	Leaves used to cure eye diseases.
48	<i>Pemphis acidula</i> J. R. Forst. & G. Forst.	<i>Sheruthalam, Kuredi</i>	Lythraceae	Wood used to make various fishing equipment and other tools used for agriculture. Leaves given as cattle fodder.
49	<i>Peperomia pellucida</i> (L.) Kunth	<i>Bellatthand</i>	Piperaceae	Whole plant used as medicine against kidney disease. Children used the stem to erase slate.
50	<i>Phyllanthus amarus</i> Schumach. & Thonn.	<i>Keelanelli, Kuidrugoundi</i>	Euphorbiaceae	Whole plant used as medicine against Jaundice.
51	<i>Phyllanthus emblica</i> L.	<i>Nellikka, Gonbili</i>	Phyllanthaceae	Fruit used to make pickle and as ingredient of curries.
52	<i>Phyla nodiflora</i> (L.) Greene	<i>Shiragappul, Humigodithila</i>	Verbenaceae	Whole plant used to cure urinary blocks and used as cattle fodder.
53	<i>Piper betel</i> L.	<i>Bettila</i>	Piperaceae	Leaves used to chew with areca nut, with tobacco and lime stone. Stem and leaves are used for digestive problems.
54	<i>Physalis minima</i> L.	<i>Kurumotta, Muraki</i>	Solanaceae	Ripe fruits are edible, leaves are used to cure headache and ear ache.
55	<i>Punica granatum</i> L.	<i>Hurumampalam, Annaru</i>	Lythraceae	Fruits are used to cure diarrhea and dysentery.
56	<i>Ricinus communis</i> L.	<i>Avanakku, Amanakka</i>	Euphorbiaceae	Seed oil used for curing scabies and contraception.
57	<i>Rauwolfia serpentina</i> (L.) Benth. ex Kurz	<i>Kolimaram</i>	Apocynaceae	Leaves used for skin diseases and roots used against rheumatism.
58	<i>Sesbania sesban</i> (L.) Merr.	<i>Balam</i>	Fabaceae	Leaves and roots are used to treat insect stings and boils. Leaves also used as green manures.
59	<i>Scaevola taccada</i> (Gaertn.) Roxb.	<i>Kanni, Maagh</i>	Goodeniaceae	Leaves used as fodder, ripe fruit juice used to cure eye disease.
60	<i>Suriana maritima</i> L.	<i>Sholom</i>	Surianaceae	Wood used to make hooks and other small objects. Leaves and bark used for bath to cure arthritis and other skin diseases.

61	<i>Tacca leontopetaloides</i> (L.) Kuntze	<i>Ithala, Khuvva</i>	Dioscoreaceae	Tubers used to make starch which is used to cure diarrhoea.
62	<i>Talipariti tiliaceum</i> (L.) Fryxell	<i>Fararathi, Diggae</i>	Malvaceae	Leaves used as fodder and used for making 'ada'. Leaves and bark used to cure cough and sore throat. Wood used for making furniture and utensils.
63	<i>Terminalia catappa</i> L.	<i>Aalam, Akkumaram</i>	Combretaceae	Ripe fruits and dried seeds are edible. Wood used for making household utensils and furniture.
64	<i>Thespesia populnea</i> (L.) Sol. ex Correa	<i>Sheerani, Theerani</i>	Malvaceae	Leaves used as fodder, bark used to cure swellings. Wood used to make boats and other furniture.
65	<i>Tridax procumbens</i> (L.) L.	<i>Murikooty, Venalppacha</i>	Asteraceae	Leaves used to cure small cuts and minor wounds.
66	<i>Tournefortia argentea</i> L.f.	<i>Thamara</i>	Boraginaceae	Roots used to repel insects and other pests, make utensils. Decoction from leaves used to treat ciguatera.
67	<i>Tylophora indica</i> (Burm.f.) Merr.	<i>Foybettilla, Fadala</i>	Apocynaceae	Roots are used to cure gas trouble mediated stomach pain and rheumatism.
68	<i>Vitex negundo</i> L.	<i>Karinochi, Naachil</i>	Lamiaceae	Leaves used to treat epilepsy and wood used to make fishing equipment.
69	<i>Wollastonia biflora</i> (L.) DC.	<i>Erichil</i>	Asteraceae	Leaves are used to heal fresh wound.
70	<i>Ziziphus jujuba</i> Mill.	<i>Mullippalam, Elandhappalam</i>	Rhamnaceae	Fruits are edible, leaves used as fodder. Wood used for making furniture. Fruit and leaves are used to improve immunity and hair growth.

4. Conclusion

The ethnobotanical investigation of the Lakshadweep Islands has revealed that the traditional knowledge is circumscribed among the people of age group of 60 and above. Some exceptions were noticed among the people of age group 40-55 in some islands. It is found that the men are dominating in the traditional healing practices than the women. The knowledge on plant-based medicine is restricted to few families in some islands, and it is very shocking that these people are not willing to share their traditional knowledge with an outsider of their family. Due to this kind of approach, their information on traditional uses of plants is slowly getting eroded. Therefore, it is significant to study and record ethnobotanical information's of the Lakshadweep Islands at most priority for the future generations. This study may also point out the extinction of plant diversity among islands due to anthropological activities.

Acknowledgements

The authors are thankful to all the informants who accompanied in field surveys and the traditional healers of Lakshadweep Islands for their kind cooperation and support in exploring medicinal plants.

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