

# Ethnobotanical Knowledge of Indigenous Tribes of the Andaman and Nicobar Islands with Special Reference to the Nicobarese

S. Jayakumar<sup>1</sup> and Priyanka Toppo<sup>2</sup>

1. Andaman College, Chakkargaon, Sri Vijaya Puram, Andaman and Nicobar Islands, India.
2. Department of Botany, Jawaharlal Nehru Rajkeeya Mahavidyalaya, Sri Vijaya Puram, Andaman and Nicobar Islands, India.

## ABSTRACT

This study documents the ethnobotanical knowledge of the Nicobarese tribe of the Andaman and Nicobar Islands, India, with particular emphasis on medicinal plant use and associated cultural practices. Field surveys were conducted in selected Nicobarese villages using semi-structured interviews, guided discussions and participant observation involving traditional knowledge practitioners (TKPs) and elderly community members. A total of 50 plant species belonging to 30 families were recorded for medicinal, nutritional, ritual and utilitarian purposes. Leaves were the most frequently used plant part, and remedies were commonly prepared as decoctions, pastes, infusions and poultices. Frequently cited species included *Morinda citrifolia*, *Centella asiatica*, *Phyllanthus emblica* and *Ocimum tenuiflorum*, which are used to treat ailments such as gastrointestinal disorders, skin infections, respiratory problems and metabolic conditions. Several plant species also play important roles in food security, housing materials and ritual practices, highlighting the close relationship between the Nicobarese community and their natural environment. However, traditional knowledge is increasingly threatened by environmental change, modernization and declining intergenerational transmission. Systematic documentation and community-based conservation strategies are therefore essential to preserve this ethnobotanical heritage and support the sustainable use of plant resources in the Andaman and Nicobar Islands.

## INTRODUCTION

The Andaman and Nicobar Islands, located in the Bay of Bengal, represent one of the most biologically diverse regions of India and support a wide variety of tropical ecosystems including evergreen forests, mangroves and littoral vegetation (Sinha & Malick, 1995; Basu et al., 2024). The archipelago comprises about 836 islands and islets, of which only small proportions are inhabited (Basu et al., 2024). Geographically, the islands are divided into two major groups—the Andaman Islands in the north and the Nicobar Islands in the south—separated by the Ten Degree Channel. Together they extend for nearly 800 km and cover a total land area of approximately 8,249 km<sup>2</sup> (Basu et al., 2024).

In addition to their rich biodiversity, the islands support several indigenous tribal communities whose traditional lifestyles are closely associated with natural ecosystems (Basu et al., 2024). The indigenous populations include the Great Andamanese, Onge, Jarawa and Sentinelese in the Andaman Islands, and the Shompen and Nicobarese in the Nicobar group (Basu et al., 2024). These communities are protected under the Andaman and Nicobar Islands (Protection of Aboriginal Tribes) Regulation, 1956, which restricts access to tribal areas and seeks to preserve their cultural heritage and traditional lifestyles.

Among these groups, the Nicobarese represent the largest tribal population in the Nicobar district and are distributed across islands such as Car Nicobar, Kamorta, Teressa, Katchal and Great Nicobar (Gupta et al., 2004; Verma et al., 2010). Traditionally dependent on agriculture, fishing and forest resources, the Nicobarese maintain extensive knowledge of plant diversity and natural resources (Dagar, 1989; Dagar & Dagar, 1991, 1996, 2003; Gupta et al., 2004; Verma et al., 2010; Chander et al., 2014, 2015a, 2015b; Chander & Vijayachari, 2018). Their livelihoods are closely linked with coastal ecosystems and homestead agroforestry systems that provide food, medicine and building materials (Gupta et al., 2004; Chander et al., 2014, 2015a, 2015b).



## Selection of participants

Traditional knowledge practitioners (TKPs), elder community members and individuals engaged in traditional healing, food processing, house building and ritual activities were purposively selected as key informants. Preference was given to practitioners recognised by the community for their expertise and to elders with long-term knowledge of local flora and cultural practices.

## Data collection

Ethnobotanical data were gathered through semi-structured questionnaires, guided interviews and informal discussions. Information recorded included local and scientific names (where available), family, parts used, preparation methods, modes of administration, distribution within Nicobar, brief morphological description and perceived efficacy for medicinal, culinary, ritual and construction uses. Field walks with practitioners were used to locate and observe species in situ, photograph plants and, where permitted, collect voucher specimens for later identification.

## Ethical considerations

Prior informed consent was obtained from local authorities (e.g. District Commissioner's office, Car Nicobar) and from participating communities and practitioners. All interactions respected tribal customs, taboos and restrictions related to sacred sites or sensitive knowledge. The work focused on documentation for conservation and educational purposes and explicitly acknowledged the intellectual property rights of indigenous communities, following best-practice guidelines from earlier Nicobarese ethnomedicinal surveys.

## Data analysis

Plant species were classified by primary use (medicinal, food, ritual, construction/utility) and, for medicinal plants, by ailment categories (respiratory, gastrointestinal, dermatological, metabolic and others). Descriptive statistics were used to summarise species numbers by use category, plant part and preparation method. Species cited by multiple informants were noted as culturally important taxa, and patterns of use were compared qualitatively with previous studies from Nancowry, Car Nicobar and Little Nicobar.

## RESULTS

A total of 50 plant species belonging to 30 families were documented during the study, reflecting the rich ethnobotanical knowledge of the Nicobarese community. The most represented families were Euphorbiaceae, Zingiberaceae, Moraceae, Rutaceae and Arecaceae, which together contributed a substantial proportion of the recorded medicinal plants. This diversity indicates a close relationship between the Nicobarese people and their surrounding natural environment, in which plant resources play an important role in traditional healthcare practices.

Analysis of plant parts used in remedy preparation showed that leaves were the most frequently utilized plant part, followed by fruits, roots and bark. The predominance of leaves may be attributed to their easy availability and the presence of high concentrations of bioactive compounds. Traditional remedies were commonly prepared in the form of decoctions, infusions, pastes and poultices, depending on the type of ailment treated. In most cases, water served as the primary solvent for extracting medicinal properties, reflecting the simplicity and practicality of traditional preparation methods.

**Table 1. Medicinal plants used by the Nicobarese tribe of the Andaman and Nicobar Islands.**

S.No.	Scientific Name	Family	Common/ Local Name	Plant Part(s) Used	Ethnomedicinal Uses
1	<i>Aegle marmelos</i> (L.) Corrêa	Rutaceae	Bael	Leaves, bark, fruit	Dysentery, digestive disorders, fever
2	<i>Aloe vera</i> (L.) Burm.f.	Asphodelaceae	Aloe	Leaf gel	Burns, skin diseases, insect bites
3	<i>Alstonia kurzii</i> Hook.f.	Apocynaceae	Devil's tree	Bark, fruit	Cardiac disorders, anthelmintic
4	<i>Amaranthus blitum</i> L.	Amaranthaceae	Amaranth	Leaves, stem	Anti-inflammatory, skin conditions
5	<i>Ananas comosus</i> (L.) Merr.	Bromeliaceae	Pineapple	Fruit	Constipation, digestive aid
6	<i>Andrographis paniculata</i> (Burm.f.) Nees	Acanthaceae	Kalmegh	Leaves	Hepatic disorders, jaundice
7	<i>Areca catechu</i> L.	Arecaceae	Areca nut	Seed	Stimulant
8	<i>Artabotrys nicobarianus</i> D. Das	Annonaceae	Nicobar champa	Leaves, fruit	Malaria, back pain
9	<i>Artocarpus altilis</i> (Parkinson) Fosberg	Moraceae	Breadfruit	Leaves, bark, root, fruit	Skin diseases, wounds, digestion
10	<i>Artocarpus heterophyllus</i> Lam.	Moraceae	Jackfruit	Leaves, fruit	Digestive disorders, skin diseases
11	<i>Averrhoa carambola</i> L.	Oxalidaceae	Star fruit	Leaves, fruit	Diabetes, hypertension
12	<i>Azadirachta indica</i> A. Juss.	Meliaceae	Neem	Whole plant	Antimicrobial, diabetes, ulcers
13	<i>Borassus flabellifer</i> L.	Arecaceae	Palmyra palm	Sap, fruit	Nutritive, beverage source
14	<i>Calotropis gigantea</i> (L.) Dryand.	Apocynaceae	Crown flower	Root bark, flowers	Skin diseases, ulcers
15	<i>Carica papaya</i> L.	Caricaceae	Papaya	Leaves, fruit, seed	Febrile conditions, digestive aid
16	<i>Ceiba pentandra</i> (L.) Gaertn.	Malvaceae	Silk cotton tree	Roots, leaves	Edema, cough
17	<i>Centella asiatica</i> (L.) Urb.	Apiaceae	Gotu kola	Leaves	Wound healing, anti-inflammatory
18	<i>Chromolaena odorata</i> (L.) R.M. King & H. Rob.	Asteraceae	Siam weed	Leaves, flowers	Wound healing, antimicrobial

19	<i>Citrus limon</i> (L.) Osbeck	Rutaceae	Lemon	Fruit	Cold, cough, digestion
20	<i>Citrus maxima</i> (Burm.) Merr.	Rutaceae	Pomelo	Leaves, fruit	Cough, fever, digestive disorders
21	<i>Cocos nucifera</i> L.	Arecaceae	Coconut	Fruit	Nutritional, general health
22	<i>Colocasia esculenta</i> (L.) Schott	Araceae	Taro	Leaves, corm	Food, skin ailments
23	<i>Crinum asiaticum</i> L.	Amaryllidaceae	Crinum lily	Leaves, bulb	Wound healing
24	<i>Curcuma longa</i> L.	Zingiberaceae	Turmeric	Rhizome	Anti-inflammatory, wound healing
25	<i>Curcuma petiolata</i> Roxb.	Zingiberaceae	Hidden ginger	Rhizome	Skin diseases, digestive disorders
26	<i>Cycas rumphii</i> Miq.	Cycadaceae	Sago palm	Seed, bark, sap	Sores, food source
27	<i>Cymbopogon citratus</i> (DC.) Stapf	Poaceae	Lemongrass	Leaves	Fever, digestive disorders
28	<i>Dioscorea alata</i> L.	Dioscoreaceae	Yam	Tuber	Nutritional
29	<i>Euphorbia hirta</i> L.	Euphorbiaceae	Asthma plant	Leaves, stem	Asthma, dysentery
30	<i>Glochidion calocarpum</i> Kurz	Phyllanthaceae	Cheese tree	Bark, seed	Gastrointestinal disorders
31	<i>Ipomoea batatas</i> (L.) Lam.	Convolvulaceae	Sweet potato	Tuber	Nutritional, eye health
32	<i>Ipomoea pes-caprae</i> (L.) R. Br.	Convolvulaceae	Beach morning glory	Roots, flowers	Anti-inflammatory, anti-malarial
33	<i>Jatropha curcas</i> L.	Euphorbiaceae	Physic nut	Seed, leaves	Topical applications
34	<i>Mangifera nicobarica</i> Kosterm.	Anacardiaceae	Nicobar mango	Leaves, fruit	Skin disorders
35	<i>Manihot esculenta</i> Crantz	Euphorbiaceae	Cassava	Tuber	Nutritional
36	<i>Manilkara zapota</i> (L.) P. Royen	Sapotaceae	Sapodilla	Fruit, bark	Digestive aid
37	<i>Mentha spicata</i> L.	Lamiaceae	Mint	Leaves	Indigestion
38	<i>Morinda citrifolia</i> L.	Rubiaceae	Noni	Fruit	Diabetes, infections
39	<i>Ocimum tenuiflorum</i> L.	Lamiaceae	Tulsi	Leaves	Respiratory disorders
40	<i>Orophea katschallica</i> Kurz	Annonaceae	—	Leaves	Insect repellent
41	<i>Pandanus leram</i> Jones ex R. Millar	Pandanaceae	Screw pine	Fruit, bark	Construction, food
42	<i>Phyllanthus emblica</i> L.	Phyllanthaceae	Amla	Fruit	Antioxidant, digestive
43	<i>Phyllanthus amarus</i> Schumach. & Thonn.	Phyllanthaceae	Stone breaker	Leaves, fruit	Liver disorders
44	<i>Piper betle</i> L.	Piperaceae	Betel leaf	Leaves	Digestive aid

45	<i>Piper longum</i> L.	Piperaceae	Long pepper	Root, fruit	Respiratory disorders
46	<i>Psidium guajava</i> L.	Myrtaceae	Guava	Leaves, fruit	Diarrhea, digestion
47	<i>Ricinus communis</i> L.	Euphorbiaceae	Castor	Seed	Laxative, anti-inflammatory
48	<i>Scindapsus officinalis</i> (Roxb.) Schott	Araceae	Gajapippali	Fruit	Lactation support
49	<i>Syzygium cumini</i> (L.) Skeels	Myrtaceae	Jamun	Seed, fruit	Diabetes
50	<i>Zingiber officinale</i> Roscoe	Zingiberaceae	Ginger	Rhizome	Nausea, digestion

## DISCUSSION

The Nicobarese of the Andaman and Nicobar Islands maintain a multifaceted and dynamic relationship with their environment, in which native plants serve as a foundation for healthcare, nutrition, material culture and ritual life (Dagar, 1989; Dagar & Dagar, 1991, 1996, 2003; Gupta et al., 2004; Verma et al., 2010; Chander et al., 2014, 2015a, 2015b; Chander & Vijayachari, 2018). The present documentation of 50 medicinal plant species complements earlier studies that reported 34 species in Little Nicobar and 132 species across the Nancowry group, indicating substantial intra-archipelagic variation and a rich pharmacopeia that remains incompletely explored (Chander et al., 2015a, 2015b).

### Medicinal practices and healthcare

Consistent with previous surveys, the Nicobarese rely heavily on plant-based remedies for primary healthcare, particularly for respiratory diseases, gastrointestinal disorders, skin conditions and febrile illnesses (Dagar, 1989; Dagar & Dagar, 1991, 1996, 2003; Gupta et al., 2004; Chander et al., 2014, 2015a, 2015b; Verma et al., 2010). Leaves constitute the most commonly used plant part, and remedies are prepared as decoctions, pastes, poultices or infusions, usually with water as the main solvent, reflecting both practicality and long-standing empirical knowledge (Chander et al., 2014, 2015a, 2015b; Chander & Vijayachari, 2018). TKPs act as custodians of this knowledge, diagnosing ailments and prescribing mono- or multi-herbal preparations, often combining species such as *Morinda citrifolia*, *Ocimum tenuiflorum* and *Glochidion calocarpum* that have been identified as high-use-value taxa in quantitative ethnobotanical analyses (Chander et al., 2014, 2015a, 2015b).

The uses recorded here for species such as *Morinda citrifolia* (for infections, ulcers, metabolic and hepatic disorders), *Phyllanthus emblica* and *P. amarus* (for digestive and hepatic ailments) and *Centella asiatica* (for skin and inflammatory conditions) are broadly congruent with pharmacological studies and wider ethnomedicinal literature (Wang et al., 2002; Aremu et al., 2024; Ralte et al., 2024a; Ralte & Singh, 2024; Kureshi et al., 2025). Such convergence underscores the potential of Nicobarese herbal medicine as a source of bioactive compounds for future phytochemical and clinical investigations (Aremu et al., 2024; Kureshi et al., 2025).

### Food security and agroforestry

The Nicobarese diet is heavily influenced by the availability of cultivated and wild edible plants, many of which are integrated into homestead agroforestry systems (Gupta et al., 2004; Verma et al., 2010; Chander et al., 2014, 2015a, 2015b). Species such as *Cocos nucifera*, *Dioscorea alata*, *Colocasia esculenta*, *Ipomoea batatas* and *Manihot esculenta* provide staple carbohydrates, while fruits such as *Ananas comosus*, *Carica papaya*, *Mangifera nicobarica* and *Psidium guajava* contribute vitamins, minerals and dietary fibre (Dagar & Dagar, 1991, 1996, 2003; Gupta et al., 2004; Singh et al., 2025). These multifunctional agroforests support both subsistence needs and ecological functions, including soil protection and habitat continuity (Sinha & Malick, 1995; Basu et al., 2024).

## Material culture and ritual significance

Ethnobotanical practices extend beyond subsistence and medicine, encompassing construction, craft and ritual domains (Dagar, 1989; Dagar & Dagar, 1991, 1996, 2003). Plant materials used for house building, canoe making and fishing gear—particularly from *Pandanus leram*, *Cocos nucifera* and selected timber species—reflect detailed ecological knowledge of mechanical properties, durability and resistance to marine conditions (Dagar & Dagar, 1991, 1996; Gupta et al., 2004; Chander et al., 2014). Ritual uses of plants, such as cycad leaves in ceremonial gates, areca nut and betel leaf in social exchanges and sacred trees in fertility and healing rites, highlight the role of flora in maintaining social cohesion and cultural identity (Verma et al., 2010; Chander et al., 2014, 2015a; Chander & Vijayachari, 2018).

## Threats to traditional knowledge and plant resources

Despite its richness, Nicobarese ethnobotanical heritage faces multiple threats, including environmental degradation, deforestation, infrastructure development, climate-related events and cultural change (Sinha & Malick, 1995; Basu et al., 2024). Younger generations often show reduced interest in traditional practices, accelerating the risk of knowledge loss as elder TKPs pass away (Gupta et al., 2004; Verma et al., 2010; Chander et al., 2014). Natural disasters—most notably the 2004 Indian Ocean tsunami—have also altered coastal habitats and affected the distribution of some useful species, underscoring the vulnerability of island ecosystems (Basu et al., 2024; Chander & Vijayachari, 2018).

Recent work has emphasized the importance of systematic documentation and community biodiversity registers in Nicobarese villages as a strategy to safeguard plant-use knowledge and link it to conservation initiatives (Dagar & Dagar, 2003; Gupta et al., 2004; Ralte & Singh, 2024). Integrating traditional herbal medicine into local primary healthcare programmes, while respecting intellectual property rights and customary laws, may further incentivize the conservation of both knowledge and the plant species on which it depends (Aremu et al., 2024; Ralte et al., 2024a, 2024b).

## Implications for conservation and future research

The Nicobarese case provides an instructive example of how indigenous knowledge systems can support sustainable resource use and biodiversity conservation when given adequate recognition and institutional support (Aremu et al., 2024; Basu et al., 2024). Priorities for future research include detailed phytochemical and pharmacological studies of high-use-value species such as *Morinda citrifolia*, *Glochidion calocarpum* and *Ocimum tenuiflorum* (Wang et al., 2002; Kureshi et al., 2025); participatory mapping of critical habitats for heavily used and endemic plants (Dagar & Dagar, 1996; Singh et al., 2025); and longitudinal studies on the transmission of ethnobotanical knowledge in the context of education, migration and socio-economic change (Ralte et al., 2024a, 2024b; Luikham & Bhattacharyya, 2025).

## CONCLUSION

This ethnobotanical study of the Nicobarese tribe in the Andaman and Nicobar Islands reveals a complex and integrated relationship between indigenous communities and native plants, spanning medicinal, nutritional, material and ritual domains. A total of 50 medicinal plant species from 30 families were documented, complementing and extending earlier surveys in Nancowry, Car Nicobar and Little Nicobar and confirming the central role of herbal medicine in Nicobarese primary healthcare.

Traditional knowledge associated with these plants is predominantly transmitted orally and is largely concentrated among a diminishing number of traditional knowledge practitioners, making it highly vulnerable to loss due to demographic and cultural changes. At the same time, environmental pressures—including habitat alteration, climate variability and development activities—pose risks to both plant diversity and the ecological settings that sustain Nicobarese livelihoods.

To ensure long-term preservation of this biocultural heritage, future work should prioritise: (i) systematic documentation and community-owned databases of plant uses; (ii) in-depth phytochemical and pharmacological validation of key species; (iii) integration of validated traditional remedies into culturally sensitive primary healthcare strategies; and (iv) community-based conservation programmes that align local livelihoods with habitat protection. By adopting such a comprehensive approach, it will be possible to protect the ecological integrity of the Andaman and Nicobar Islands while sustaining the cultural identity and traditional knowledge of the Nicobarese people.

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