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ZINGIBERACEAE AND THEIR TRADITIONAL USES IN THE ANDAMAN AND NICOBAR ISLANDS, INDIA

Gautam Anuj Ekka¹, Pragya Sourabh² and Lal Ji Singh^{1*}

¹Botanical Survey of India, Andaman and Nicobar Regional Centre, Sri Vijaya Puram, Andaman and Nicobar Islands (INDIA)

²Faculty of Science, Mansarovar Global University, Sehore, Madhya Pradesh (INDIA)

*Corresponding author's E-mail: laljisingh1970@rediffmail.com, <https://orcid.org/0000-0003-3138-6148>
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ABSTRACT

The present study investigates the species diversity and their traditional uses of Zingiberaceae in the Andaman and Nicobar Islands, India by inhabitants in great detail for the first time, along with assessing the conservation status of species grown in natural habitats. A total of 24 plant species belonging to the family are identified here to possess traditional uses importance of them 03 species viz *Etilingera fenzlii* (Kurz) Škornick. & M. Sabu, *Globba pauciflora* King ex Baker, *Zingiber pseudosquarrosus* L.J. Singh & P. Singh are endemic to these islands.

Key words: Aromatic herbs, Conservation, Ginger, Tribes and traditional knowledge, Taxonomy

Introduction

Zingiberaceae Martinov is a well-recognized one of the largest family of the order Zingiberales of monocotyledonous plants and commonly known as ginger family, comprising 59 genera and about 1600 species, distributed globally in the tropics and subtropics (POWO 2025). Zingiberaceae plants are aromatic herbs with creeping horizontal or tuberous rhizomes are widely distributed throughout tropical Africa, Asia and the Americas (Theilade 1999, Theilade and Mood 1999, Larsen & Larsen 2006, Chaveerach *et al.*, 2007, Singh & Singh, 2016). Zingiberales usually have ephemeral flowers with a short flowering period and is well known for its immense economic values and aesthetic potential. The botanists have paid attention to the family since Linnean era because it has play important role for human beings to meet their daily need of food, spices, medicine, dyes, perfume cosmetics and ornamental plant (Kress *et al.*, 2005, Sinha & Malick, 1995, Singh & Singh 2016).

In India its traditional use has been known from since time of immemorial. The family Zingiberaceae comprises *ca.* 22 genera and about 178 species, occurs throughout the country whereas it is represented by *ca.* 10 genera

and about 38 species in the Andaman and Nicobar Islands (ANI). They are well known for their great economic potential in traditional use since immemorial time and also shows a significant diversity of traditional uses in different regions of the country (Singh & Singh, 2016).

The ANI known for its genetic resources and geographically distinct province worldwide, it is located between 6°45'-13°40' N latitude and 92°12'-93°57' E longitudes and is rich and unique in terms of plant diversity in India, with a high endemism (Singh *et al.*, 2020a, 2020b, 2021a, 2021b, 2025; Singh & Ranjan 2021). The ANI is a part of two-biodiversity hotspots, Indo-Burma and Sundalands (Singh *et al.*, 2024) & consists of two groups of islands (Andaman group and Nicobar group of Islands) with 572 Islands. Both groups are separated by 10° channel, a wide gap of 160 km with heavy tidal flows, making sea difficult for transportation. Andaman group of Islands comes under the Indo-Burma Hotspot & Nicobar group of Islands under the Sundalands.

This study aimed to find and make record of Zingiberaceae plants that are used for medicinal therapy by peoples living in the ANI. So for except for few notable exceptions like Singh *et al.*, 2016 there is no study has

documented the traditional uses of Zingiberaceae plants as a whole in the area of ANI. The traditional uses data were obtained through interviewing informants using semi-structured questionnaires and extracting information from peoples who inhabit in the islands. We also documented a number of ginger species used by the tribes of the islands.

Materials and Methods

Field surveys were carried out from 2023 to 2025 to gather information and document the traditional uses of Zingiberaceae species across islands. To verify the identity of taxa, we undertook a comprehensive review of the primary taxonomic literature and major research databases (Scopus, Web of Science, and Google Scholar) was conducted, alongside comparisons with digital images from Kew's Herbarium, the Kew Science website, and the Zingiberaceae Resource Center (<https://padme.rbge.org.uk/ZRC>) (accessed in 2025) and Indian herbaria (CAL, PBL).

Results and Discussion

Diversity of Zingiberaceae in respect to the traditional uses in the ANI: (Fig. 1)

ANI is one of the unique phytogeographical in terms of rich plant diversity with high endemism in India, located within Bay of Bengal region (Singh *et al.*, 2014, 2021, Singh & Ranjan 2021). At the same time, the plant richness and their traditional uses of this region has been poorly explored. The present investigation indicates that Islands plant diversity holds the potential of many novelties. The family Zingiberaceae is well known for its immense economic values and aesthetic potential. It is an important natural resource that provides many useful products for food, spices, medicines, dyes, perfume and aesthetics. The Zingiberaceae family in ANI exhibits remarkable diversity at species level, with a total of 38 taxa and genera viz 10 of them we recorded 24 taxa under 08 genera and their traditional uses (Table 1).

Based on the distributional range, many of the collected species grow in the agricultural areas as well as cultivated in the yard houses like *Curcuma caesia* Roxb. *Curcuma longa* L., *Curcuma zedoaria* (Christm.) Roscoe, *Etilingera elatior* (Jack) R.M.Sm., *Hedychium coronarium* J. Koenig, *Zingiber officinale* Roscoe., etc. The seven wild species of Zingiberaceae viz. *Curcuma mangga* Valetton & Zijp, *Curcuma petiolata* Roxb., *Curcuma roscoeana* Wall., *Etilingera linguiformis* (Roxb.) R.M. Sm., etc. recorded growing wild. We also recorded 03 endemic species of Zingiberaceae like *Etilingera fenzlii* (Kurz) Škornick. & M. Sabu, *Globba pauciflora* King ex Baker, *Zingiber pseudosquarrosus* L.J. Singh & P. Singh which have potential of economic

and aesthetic value. The result of present study showed 15 species used as medicinal plants, 05 species used as Spices, 07 species used as ornamental purposes.

Traditional Uses

Apart from the aspect of diversity, the Zingiberaceae plants are widely used by inhabitants including arborescent tribes. ANI is home to six tribes which have two evolutionary races like Andamanese, Jarawa, Onge, Sentinelese, which belongs to Negrito race & Nicobarese and Shompen of Mongoloid race. These tribe groups occupy different areas of islands, and each has their own culture and traditions in utilizing plants including household appliances, health care systems, complimentary materials for traditional ceremonies, clothing, food and construction.

Etilingera fenzlii (Kurz) Škornick. & M. Sabu, an endemic to Nicobar group of Islands is use as a bee repellent (Sudhakaran *et al.*, 2018) cure of various diseases & ornamental by Nicobarese and Shompen tribes. The paste of plants parts especially leaves applied on the body during honey bee collection. Its rhizomes, leaves and flower are used to cure fever and stomach disorder. Besides tribes, the settlers of these Islands also rely on the potential of Zingiberaceae plants like *Zingiber pseudosquarrosus* L.J. Singh & P. Singh used in various ways by the Ranchi Community settlers especially medicinal use such as tuberous roots use to cure abdominal troubles.

Medicinal Uses

Medicinal uses were recorded for the majority of species, with particularly strong representation in: *Curcuma longa* L.– for anti-inflammatory and antimicrobial properties (Emeka *et al.*, 2023), *Curcuma zedoaria* (Christm.) Roscoe – used for digestive issues and perfumery (Wardini & Prakoso 1999), *Zingiber officinale* Roscoe.– widely used for gastrointestinal ailments (Sutarno *et al.*, 1999), *Hedychium coronarium* J. Koenig – used in perfumes and garland-making with medicinal rhizomes (Ibrahim, 2001), *Zingiber pseudosquarrosus* L.J. Singh & P. Singh - used to treat abdominal pain & anthelmintic troubles (Singh & Singh, 2016).

Food and Spice Uses

Several species like *Curcuma longa* L., *Curcuma zedoaria* (Christm.) Roscoe, and *Zingiber officinale* Roscoe. are used as major spice crops and *Curcuma mangga* Valetton & Zijp and *Etilingera linguiformis* (Roxb.) R.M. Sm. provide edible shoots or inflorescences. *Alpinia conchigera* Griff. provides edible leaves and shoots.



Fig. 1: a-l: Zingiberaceae plants. a: *Alpina calcarata* Roscoe; b: *Alpina nigra* (Gaertn.) B.L. Burtt.; c: *Curcuma caesia* Roxb.; d: *Curcuma longa* L.; e: *Curcuma petiolata* Roxb.; f: *Etlingera elatior* (Jack) R.M.Sm.; g: *Etlingera fenzlii* (Kurz) Škornick. & M. Sabu; h: *Globba marantina* L.; i: *Globba pauciflora* King ex Baker; j: *Hedygium coronarium* J. Koenig; k: *Meistera aculeata* (Roxb.) Škornick. & M.F.Newman; l: *Zingiber pseudosquarrosus* L.J. Singh & P. Singh

Table 1: Traditional uses of Zingiberaceae plants in the ANI.

Sr.	Name of the species	Parts used	Medicine	Used for	Spices	Food	Orna-mental	Other uses
1.	<i>Alpinia calcarata</i> Roscoe	Rhizome	✓	Indigestion, throat inflammation, blood impurities.				
2.	<i>Alpinia conchigera</i> . Griff	Rhizomes, young shoots, leaves	✓	Pain relievers		✓		
3.	<i>Alpinia luteocarpa</i> Elmer	Inflorescence					✓	
4.	<i>Alpinia malaccensis</i> (Burm. f.) Rosc.	Rhizome	✓	Treating wounds, vomiting and nausea	✓			
5.	<i>Alpinia nigra</i> (Gaertn.) B.L. Burt	Leaves			✓	✓		
6.	<i>Amomum maximum</i> Roxb.	Fruits and seeds	✓	Cure digestive disorders and stomach problems				
7.	<i>Curcuma caesia</i> Roxb.	Rhizome and leaves	✓	Treating wounds, bruises and toothache				
8.	<i>Curcuma longa</i> L.	Rhizome	✓	Anticancer, anti-diabetic, anti-diarrheal, cardio-protective, anti-oxidative, neuro-protective,	✓			
9.	<i>Curcuma mangga</i> Valeton & Zijp	Rhizome, young shoot, inflorescence	✓	Abdominal illness		✓		
10.	<i>Curcuma petiolata</i> Roxb.	Rhizome, flowers	✓	Treatment of fever, colic and anorexia				
11.	<i>Curcuma roscoeana</i> Wall.	Inflorescence					✓	
12.	<i>Curcuma zedoaria</i> (Christm.) Roscoe	Rhizome, young shoot, leaves	✓	Stomach-ache, indigestion and colds		✓		perfumery
13.	<i>Etilingera elatior</i> (Jack) R.M.Sm.	Inflorescence					✓	
14.	<i>Etilingera fenzlii</i> (Kurz) Škornick. & M. Sabu (Endemic)	Leaves, flower, roots	✓					Bee repellent
15.	<i>Etilingera linguiformis</i> (Roxb.) R.M. Sm.	Rhizome, young shoot			✓	✓		
16.	<i>Globba marantina</i> L.	Roots and leaves	✓	Asthma, rheumatoid arthritis, cough, cold, snakebite				

Continue ...1

17.	<i>Globba pauciflora</i> King ex Baker (Endemic)	Inflorescence					✓	
18.	<i>Hedychium coronarium</i> J. Koenig	Stem, Rhizomes	✓				✓	Perfume production, flower garlands
19.	<i>Meistera aculeata</i> (Roxb.) Škorníek. & M.F.Newman	Inflorescence					✓	
20.	<i>Zingiber odoriferum</i> Blume	Stem						Bee repellent
21.	<i>Zingiber officinale</i> Roscoe.	Rhizome	✓	Used against migraine, colic and to relieve menstrual cramps.	✓	✓		
22.	<i>Zingiber pseudosquarrosus</i> L.J. Singh & P. Singh (Endemic)	Rhizome	✓	Treat abdominal pain				
23.	<i>Zingiber spectabile</i> Griff.	Rhizome	✓	Inflammation and wound healing			✓	
24.	<i>Zingiber squarrosus</i> Roxb.	Petioles						The petioles are chewed when feeling thirst

Ornamental Value

Few of the species are valued for ornamental beauty which includes *Etilingera elatior* (Jack) R.M.Sm., *Zingiber spectabile* Griff., *Hedychium coronarium* J. Koenig, *Curcuma roscoeana* Wall., *Globba pauciflora* King ex Baker etc.

Other uses

Hedychium coronarium J. Koenig & *Curcuma zedoaria* (Christm.) Roscoe are used in the production of Perfumes. Petioles of *Zingiber squarrosus* Roxb. used by Onge tribe for thirst relief (Sinha & Mallick, 1995).

Conclusion

ANI is rich and unique sources of plants with properties of multiple values especially medicinal properties. We provide here basic information on the traditional uses of Zingiberaceae plants that can aid further study to conduct additional research dedicated to conservation aspects and pharmacological analysis with the greatest significance. The present study revealed that those ethnic groups of these islands and their settlers have different knowledge systems which need more extensive study to record a comprehensive account. In the ANI Zingiberaceae plant are widely used for their

aromatic rhizomes in culinary spices, traditional medicines, perfumes, and ornamental horticulture.

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