



## FINDING OF ENDEMIC FLOWERING PLANTS IN THE NILGIRI BIOSPHERE RESERVE & THEIR BIOLOGICAL NAMES WITH THEIR HABITAT AND MEDICINAL USES

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### ABSTRACT

Historically, medicinal plants have been used to treat a variety of illnesses. The medico-ethno botanical data gathered from Nilgiri tribes is highlighted in this study. The Nilgiri is a well-known massif rising tall in South India's Western Ghats [1]. In the Nilgiri Biosphere Reserve in southern India, there are 3,300 kinds of blooming plants, 132 of which are indigenous. Parts of the Western Ghats and Nilgiri Hills in the states of Karnataka, Kerala, and Tamil Nadu are included in the reserve. We excluded the IUCN Red list of threatened, non-medicinal and extinct Species [13]. The findings of this study revealed different Ayurvedic and local medicinal uses for 32 flowering plants that have been incorporated into the Nilgiri abonies' traditional therapeutic regime of herbal treatment for a variety of common diseases. These discoveries are explored in the context of cross-cultural perspectives.

**Keywords:** Western ghats, indigenous, flowering, Ayurvedic, IUCN red list

### INTRODUCTION

The Nilgiris plateau spans roughly 800 kilometres. There are now at least 704,827 people living in this area, giving it a population density of 900 persons per km. At least 70% of these are immigrants from

the Coimbatore and Mysore plains. According to a recent analysis, the native:immigrant ratio in 1981 was about a third of what it was in 1891. The Nilgiris has seen a spike in human immigration as a

result [8]. The Nilgiri plateau, which makes up the Nilgiris district, is where human activity has the most impact on the biosphere reserve. This region is home to the three hill towns of Uthagamandalam, Coonoor, and Kotagiri. Due to their location on the hills, they could have a negative impact on the ecosystem [10].

Even though there were several tribes that survived solely by gathering food and hunting a few decades ago, Cholanaicken is currently the only one that does so today. Because they mixed their skills with food collecting, hunting, or shifting farming, tribal craftsmen differed differently from the artisans found among the Hindu peasantry [11]. For their food supply, pastoralists, like artists, must work closely with farmers. There were a small number of tribal pastoralists, though. Todas stands out among them all for continuing to work in their traditional profession and for being extremely exclusive [14].

The Todas rely heavily on their herds of buffalo. Oracles and firewalkers are Kanaladis of Wynaad (not a scheduled tribe). The Kota are accomplished craftspeople, whereas the Edanadan, Wayanadan, and Mandatan chettis are farmers. The main agriculturalists of Wynaad are Paniyas [7-10]. Due to their size, they serve as valuable agricultural labourers for the landowners. The majority of the other tribes also perform agricultural

labour while sporadically engaging in fishing, agriculture, and the harvesting of Minor Forest Products. Numerous tribe members labour with livestock, plantations, and forests. There are no longer any hunters or food gatherers. Some of them continue to gather tubers and leaves, but for such individuals, gathering minor forest produce for the private forest contractors serves as their primary source of income.

It is highly well-liked by herbalists due to its high level of biodiversity, which is characterised by diverse flora and fauna with significant medicinal potential as well as the area's numerous indigenous groups of people. Six anthropologically distinct ethnic groups, the Irulas, Kotas, Kurumbas, Kattunayakas, Paniyas and Todas [7] have been present in the territory since at least 1200 B.C. The ethnobiological profiles of indigenous tribes are highlighted in this research, along with their reliance on local flora and fauna for traditional medical needs.

The Nilgiri region, often known as "The Blue Mountains," is home to indigenous and exotic plants with significant medicinal potential, making it an important location for anthropological and ethnobotanical research in medicine. The district, which is located in the western ghats, spans 2542 square kilometres and is made up of the taluks of Udhagamandalam, Coonoor,

Kotagiri, and Gudalur [10]. This district experiences annual rainfall between 1600 and 1800 mm. This encourages the development of rain forests, producing a wide variety of medicinal plants and other fascinating floral components [11].

The Western Ghats are incredibly rich in medicinal resources. About 700 medicinal plants can be found in the forests and hills of this area, some of which are employed in traditional and folk medicine. Many are used for profit because of their useful principles and their monetary worth [12]. *Aegle marmelos* (Bael), for instance, contains coumarins, alkaloids, steroids, and essential oils throughout the entire plant. The Western Ghats' medicinal plant species include a wide range of annual to perennial life forms, including algae, fungus, herbs, shrubs, climbers, and trees [12]. Additionally, these plants are classified seasonally and are found from the canopy to the under storey.

The ineffective use of these resources is hampered by the untapped knowledge of the various medicinal plants' uses, their availability, and the scope of their distribution. Aside from that, there is a real risk that the priceless ethnobotanical knowledge that has been accumulated over many generations will be lost forever if proper documentation is not made due to the market economy's penetration, the collapse of community-based institutions,

acculturation, and the rapid degradation of forest resources [14].

There are 141 genera native to India, 50 of which are distributed over 25 families and 11 of which are native to the Western Ghats and the Nilgiris. In terms of species, the Nilgiris and surrounding regions are home to 818 of the estimated 2100 species of flowering plants that are indigenous to peninsular India. The Nilgiris is home to 132 species and 13 kinds of flowering plants, making up 4.0 percent of its entire angiosperm flora [9]. Of these, the Kundah Range in the Nilgiris area is home to 28 of them exclusively. The *Periplocaceae* family only includes the single species *nervosa* of the genus *Baeolepis* there. The families *Acanthaceae*, *Balsaminaceae*, *Poaceae*, and *Orchidaceae* in the Nilgiris exhibit endemism.

The preservation of natural resources, such as medicinal plants, implies the growth of local communities and provides a platform for the investigation of natural resource uses that might be appropriate for the area. Basic knowledge on the traditional knowledge of the relevant people is provided by earlier studies on herbal remedies of Kota tribes in the Nilgri Biosphere reserve on several indigenous tribes in Coimbatore and on many tribes of Nilgiris [13].

## METHODOLOGY

Interviews were conducted with elderly individuals who had actual knowledge of the plants utilised in traditional systems of treatment. The plants have been sorted Species-wise. Here is a condensed

overview of the plants, their family, synonyms names, common name, habitat and therapeutic uses for treating various maladies.

**Table 1: Endemic flowering plants in the Nilgiri Biosphere Reserve & their Biological names with their habitat and medicinal uses**

Biological Name	Second Name, Natural Habitat & Medicinal Uses
<i>Andrographis lobelioides</i>	Without blooms in the lower leaf axils, it can be recognised from Roundleaf False-Waterwillow. Nilgiri Hills is where you can find Lobelia False-Waterwillow. Today, it is used to treat headaches, inflammatory diseases including bursitis and tendinitis, and pain (especially low back pain and osteoarthritis).
<i>Rhinacanthus nasutus var. montanus</i>	This beneficial plant, which is native to India, is a 1-2 m tall, thin, upright, branching, somewhat hairy shrub. Ringworm and other skin conditions can be effectively treated in India with the fresh root and leaves that have been bruised and combined with lime juice. The seeds are effective against ringworm as well.
<i>Achyranthes aspera</i>	This plant has a reputation for being a potent talisman and is now widely believed to paralyse scorpions and snakes in order to protect against them. It can be found in tropical and subtropical Asia. When combined with honey, the ashes are used to treat coughs; one tola of the root is taken before bed to treat night blindness; and when mixed with water to make a paste, the root is applied as an anjan (eye salve) to treat corneal opacities.
<i>Arisaema auriculatum</i>	The Southern Western Ghats are home to the uncommon and endangered Nilambur Cobra Lily, which has a single compound leaf. The Southern Western Ghats are home to the Nilambur Cobra Lily. June to September. In Indian folk medicine, it is used to treat a variety of conditions linked to inflammation and stress.
<i>A. pulchrum</i>	Southern Western Ghats are home to the rare Kerala Cobra Lily. Flowering in July to September. It has historically been used to treat gonorrhoea, colitis, eczema, purging, piles, haemorrhoids, syphilis, roundworm, fistula, and sinuses in the Ayurvedic medical system.
<i>Caralluma nilagiriana</i>	Tamil Nadu, Maharashtra, and Karnataka all contain scalloped caralluma. Flowering: August to September. Today by Indian tribes a solution (extract) containing compounds extracted from the plant is used to reduce hunger in order to lose weight.
<i>Helichrysum wightii</i>	The Western Ghats are home to the Nilgiri Everlasting. November through April are the months of flowering. Skin healing may benefit from the anti-inflammatory, antifungal, and antibacterial characteristics of helichrysum essential oil. Arzanol, an anti-inflammatory compound found in helichrysum essential oil, aids in wound healing.
<i>I. denisonii</i>	In Tamil Nadu and Kerala, denison balsam is frequently found on damp rocks and tree trunks between 1000 and 1600 metres above sea level. It only grows on the western Nilgiris slopes. blooming: July to November. It has a long history of usage as a pain reliever and treatment for burns, sores, cuts, tumours, heart and chest aches, cancer, mucous membrane swelling (inflammation), colds, coughs, warts, and wounds.
<i>I. laticornis</i>	Nilgiris is home to the unique and threatened Wide-Horned Balsam. Wide-Horned Balsam is frequently found on damp rocks or tree trunks, as well as in other shaded locations exposed to rain and mist. September is flowering time. The flower is used to burns, while the leaf juice is used to heal warts and snakebite. In Asia, this species has been used for centuries as a herbal remedy for rheumatism, fractures, and other conditions.
<i>I. munronii</i>	In Tamil Nadu, Munro's Balsam, an endemic of the Southern Western Ghats, is often found at elevations of 1500–2000 m. flowering: November to January. The fruits are locally prescribed for the treatment of diarrhoea and dysentery, but the leaves are used to treat rheumatism and as a poison antidote.
<i>I. neo-barnesii</i>	Barnes Balsam is only found in the Nilgiri highlands (Kundah Range - Nilgiri Peak, Makurti), in Tamil Nadu and Kerala, where it grows on moss-covered tree trunks in damp shola forests at a height of about 2,200 m. flowering: July to September. Traditional treatments for illness and skin conditions involve various plant parts. The flower

	is used to burns, while the leaf juice is used to heal warts and snakebite.
<i>Eriocaulon christopherei</i>	Peninsular India, including the states of Andhra Pradesh, Karnataka, Kerala, Maharashtra, Tamil Nadu, and Sri Lanka, is home to the endemic Fragrant Pipewort. flowering: November to January. The traditional medicinal plant <i>Eupatorium odoratum</i> is well known for its ability to heal wounds. Particularly, the various components of this herb have been utilised to treat skin infections, burns, and wounds.
<i>Dalechampia velutina</i>	The climber known as Velvety Spurge-Creeper tri-lobed, Tamil Nadu is home to the Velvety Spurge-Creeper. blooming: December to March. Aids in treating eye conditions like conjunctivitis and throat infections.
<i>Swertia lawii</i>	Law's Swertia is a 2 foot tall upright herb. Peninsular India is home to Law's Swertia. flowering: November to January. Traditional medicine use Swertia Lawii to cure a wide range of conditions, including diabetes, malaria, and liver diseases.
<i>Anisochilus dysophylloides var purpureus</i>	The 1-2 m tall Erect White Lavender shrub has a hairy, grooved stem. The Western Ghats are home to erect White Lavender. Flowering: September to December. This versatile essential oil has a wonderful perfume and is kind to skin. It is frequently applied to calm inflamed skin, treat cuts, and scrapes.
<i>Leucas pubescens</i>	The prostrate-branching herb Angular Leucas has velvet-hairy stems and branches that are many feet long and straggly. Sri Lanka and South India both contain Angular Leucas. The plant has historically been employed as a pesticide and antipyretic.
<i>Litsea stocksii f. var. glabrescens</i>	A little tree called Joseph's Laurel can be found in the Western Ghats. Except for the velvety inflorescences, it is hairless. Litsea is famous for its essential oil, which protects against a number of germs, has antioxidant and antiparasitic effects, exerts acute and genetic toxicity as well as cytotoxicity, and can even stop a number of malignancies from developing.
<i>D. neelgherrensis var clarkei</i>	The Nilgiri Mistletoe is a sizable parasitic woody plant. Branches lack hair and are transversally wrinkled. Sri Lanka and South India both contain Nilgiri mistletoe. March through July are the months of flowering. Mistletoe has been linked to a host of health advantages, including bettering cardiovascular health, reducing stress and anxiety, and boosting the immune system to ward off colds and respiratory issues.
<i>Loranthus recurvus</i>	The parasitic plant known as "Curved-Flower Mistletoe" grows on trees and has rusty branchlets. Western Ghats are home to the indigenous Curved-Flower Mistletoe. Blooming: October to December. This parasitic shrub's decoctions have typically been used to treat digestive issues and high blood pressure.
<i>M. lawsonii</i>	Lawson's Memecylon is only found in the Western Ghats, occasionally in the South Sahyadri, and in Central Sahyadri from Palakkad to Wayanad. It has been used to cure stomachaches, toothaches, haemorrhoids, cuts, and wounds as well as diarrhoea, dysentery, and haemorrhoids.
<i>Sonerila versicolor</i>	Violet-colored throughout, the colourful Sonerila is an upright woody undershrub. Southern Western Ghats are home to the vibrant Sonerila plant. June to December. It is ingested to boost immunity and combat free radicals the body produces.
<i>B. aureum</i>	Southern Western Ghats is the only place where Golden Bulbophyllum is found. November to December are the months of flowering. Relaxing and reducing stress not only lifts your mood but also lowers your chances of cardiovascular disease and other chronic illnesses.
<i>B. fusco-purpureum</i>	The orchid known as the tongue orchid can be found on trees. Tongue Orchid is indigenous to Southern Western Ghats. blooming: April to May. It is regarded as having anti-hypertensive properties and the capacity to guard against vascular disorders.
<i>B. kaitiense</i>	The Bulb-Leaf Ketti A far located orchid with a pseudobulb oval shape. Southern Western Ghats are home to the endemic Ketti Bulb-Leaf Orchid. flowering: August to September. Rheumatism, sciatica, and nerve pain are all treated with it.
<i>Coelogyne odoratissima var. angustifolia</i>	A small-sized, cool-to-cold growing orchid that grows on trees is called Fragrant Coelogyne. Southern India and Sri Lanka include subtropical lower and upper montane forests at elevations of 1000-2700 m, which are home to fragrant Coelogyne. Air purifier, working in herbal medicine creating fragrances, creating sweet-smelling oils, Oil is used in aromatherapy, perfume, soap, creams, and other products.
<i>Corymborkis veratifolia</i>	A monopodial herb and terrestrial orchid, the white cinnamon orchid. White Cinnamon Orchid can be found in the Eastern Himalayas in Arunachal Pradesh, Assam, Meghalaya, Mizoram, Sikkim; Bhutan, Cambodia, Laos, Myanmar, Nepal, Sri Lanka, Vietnam; and, most likely, the Southern Western Ghats as well. June to July are the months of flowering. It is a fantastic metabolism booster after white tea. Additionally, it aids in the management of diabetes, high cholesterol, and blood sugar.

<i>Eria nana</i>	Tiny Eria is a tree-dwelling orchid with pseudobulbs that are spherical-discoid and 2-4 mm in diameter, covered in a fibrous sheath. The little Eria is a Southern Western Ghats endemic. blooming: July to October. <b>It helps older persons' memory and cognitive abilities.</b>
<i>E. polystachya</i>	An orchid that grows on trees and blooms with numerous flower spikes is called the Many-Spike Eria. The Southern Western Ghats are home to the Many-Spike Eria. It is a well-known medicinal herb in India that treats a variety of illnesses like fever, diarrhoea, rheumatism, and even minor complaints like insect stings in addition to serving as a tonic and aphrodisiac. <b>It is intended to increase fertility.</b>
<i>Habenaria cephalotes</i>	A terrestrial orchid with a stem 6–20 cm high is called Compact Habenaria. Peninsular India is home to compact Habenaria. flowering: July to September. This herb is typically used to cure conditions including fever, coughing up blood, scorpion stings, and snake bites. Additionally, it is used to treat liver conditions, jaundice, asthma, cough, colds, etc.
<i>Liparis biloba</i>	The sepals are pointy and oblong-lanceshaped. Straight, two-lobed, wedge-shaped lips have short claws. Nilgiri Hills is home to the two-lobed liparis. Stems are used to cure fractures, fever, poisoning, and coughing. Hernias are treated using roots.
<i>Spiranthes sinensis var. wightiana</i>	The word "Spiranthes," which refers to the spiral arrangement of flowers, is derived from the Greek words "speira," which means spiral, and "anthos," which means flower. Flowers are aromatic, usually rose or rose-purple, and infrequently white. The lip and thinner petals on the dorsal create a tube with the lance-shaped sepals, which can be up to 5 mm long. blooming: May to September. It is helpful in relieving chronic headaches that make the head feel heavy. Its use can also be used to treat digestive problems such discomfort, nauseousness, and vomiting.
<i>Symplocos microphylla</i>	The 7 m-tall Large-Leaf Sapphire Berry tree has curled, woolly-rusty juvenile branches. Southern Western Ghats are home to the endemic Large-Leaf Sapphire Berry. blooming: from February to April. To make Ayurvedic formulations to treat a range of illnesses, including dental diseases, gynaecological issues such female infertility, gastrointestinal disorders, and skin diseases, the bark is dried and powdered.

## RESULT AND DISCUSSION

The therapeutic potential of various medicinal applications including 32 flowering plants species to cure various diseases is revealed by this medico-ethnobotanical study conducted on diverse Nilgiri tribals (**Table 1**).

To find and isolate pharmacologically active phytochemical elements that may one day open up new vistas in the modern medical system, one must have a comprehensive understanding of folk beliefs and ancient curative methods based on herbal therapies.

Prior research, however, did not adequately document the ethnobotanical expertise of the irula tribes within the Nilgiri Biosphere

reserve. As a result, the current study's main goals were to identify the study area's key ecosystems and endangered flowering medicinal plants as determined by the International Union for Conservation of Nature (IUCN) status, as well as to record the medical plants used by local tribes.

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