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Documentation of Ethno Medicinal Practices in a Forest Region of Kodagu, Western Ghats

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Abstract This study documents the ethnobotanical knowledge of medicinal plants used by the Girijana community in the Thithimathi forest region, Kodagu district, Karnataka. A survey was conducted from January to July 2024, employing semi-structured interviews with local informants, including traditional healers, to gather data on medicinal plant usage. A total of 32 plant species from 21 families were identified and collected, with Fabaceae and Solanaceae being the most dominant families (13% each). The plants were categorized based on their growth form, with shrubs representing 34.37% of the total species, followed by trees and climbers (25% each), and herbs (15.62%). Ethnobotanical analysis revealed that *Artemisia vulgaris*, *Capsicum annuum*, *Murraya koenigii*, and *Ruta graveolens* had the highest frequency of citation (FC = 1) and relative frequency of citation (RFC = 0.1), indicating their widespread use in treating various ailments. *Cyclea peltata* exhibited the highest use value (UV = 2.6), reflecting its cultural importance and diverse applications in traditional medicine. In contrast, *Pterocarpus marsupium* and *Tabernaemontana alternifolia* showed the lowest FC (0.1) and RFC (0.01), suggesting restricted usage. This study provides the first documentation of medicinal plant use by the Girijana community in the Thithimathi forest region and identifies *Raphiodophora pertusa* as a previously unreported ethnomedicinal species. Additionally, it applies quantitative ethnobotanical indices (FC, RFC, UV) to assess plant significance, highlighting the rich biodiversity and traditional knowledge present in the region, emphasizing the importance of preserving these ethnomedicinal practices for future generations.

Keywords Traditional Medicine, Cultural Importance, Traditional Healers, Frequency of Citation (FC), Relative Frequency of Citation (RFC), Use Value (UV)

1. Introduction

Ethnobotany, the study of the relationship between people and plants, has gained substantial attention in recent years, particularly in biodiversity-rich regions like the Western Ghats of India. This region, recognized as one of the eight “hottest hotspots” of biological diversity, is characterized by its unique flora and diverse ecosystems, making it a vital area for the study of medicinal plants. The Thithimathi forest region selected for the present study is located in the Kodagu district, and hosts a diverse array of plant species traditionally utilized by local communities for therapeutic purposes, playing an important role in supporting their health and well-being.

Traditional knowledge regarding the use of these plants in folk medicine is an invaluable resource that supports not only local health practices but also contributes to the preservation of cultural heritage [1]. Many indigenous communities have developed extensive knowledge about the medicinal properties of local flora, which is often

transmitted orally through generations. This ethnomedicinal knowledge is crucial in identifying plants with therapeutic potential and understanding their cultural significance [2]. Furthermore, the documentation of these plants can facilitate the identification of potential pharmaceutical compounds, thereby promoting the conservation of species that may be endangered or under threat from habitat destruction [3].

In the face of rapid environmental changes and biodiversity loss, understanding the role of local communities in the conservation and utilization of medicinal plants becomes imperative. By integrating traditional ecological knowledge with scientific research, this study aspires to enhance the recognition of the Thithimathi forest's ecological significance and promote the sustainable use of its resources. The preservation of ethnobotanical knowledge not only aids in biodiversity conservation but also fosters community empowerment and resilience against environmental changes. Ultimately, this research will contribute to the broader field of ethnobotany, offering a comprehensive overview of the medicinal plants found in the region and their relevance to local communities.

2. Materials and methods

2.1. Study Area

The survey was conducted in the Thithimathi forest region, located in the Kodagu district of Karnataka, India (Figure 1). The region lies within the Western Ghats, a globally recognized biodiversity hotspot [4]. The Thithimathi forest is characterized by dense mixed vegetation, including both evergreen and deciduous forests. The climate is typically tropical, with significant rainfall during the monsoon season, contributing to the region's rich biodiversity.

2.2. Ethnobotanical Survey

The ethnobotanical survey was carried out from January to July of 2024. The primary objective was to document the medicinal plants used by the local communities, particularly the indigenous tribes known as Girijanas, residing in and around the Thithimathi forest. A purposive sampling technique was employed, targeting knowledgeable informants such as traditional healers, elderly community members, and other locals with extensive knowledge of medicinal plants [5].

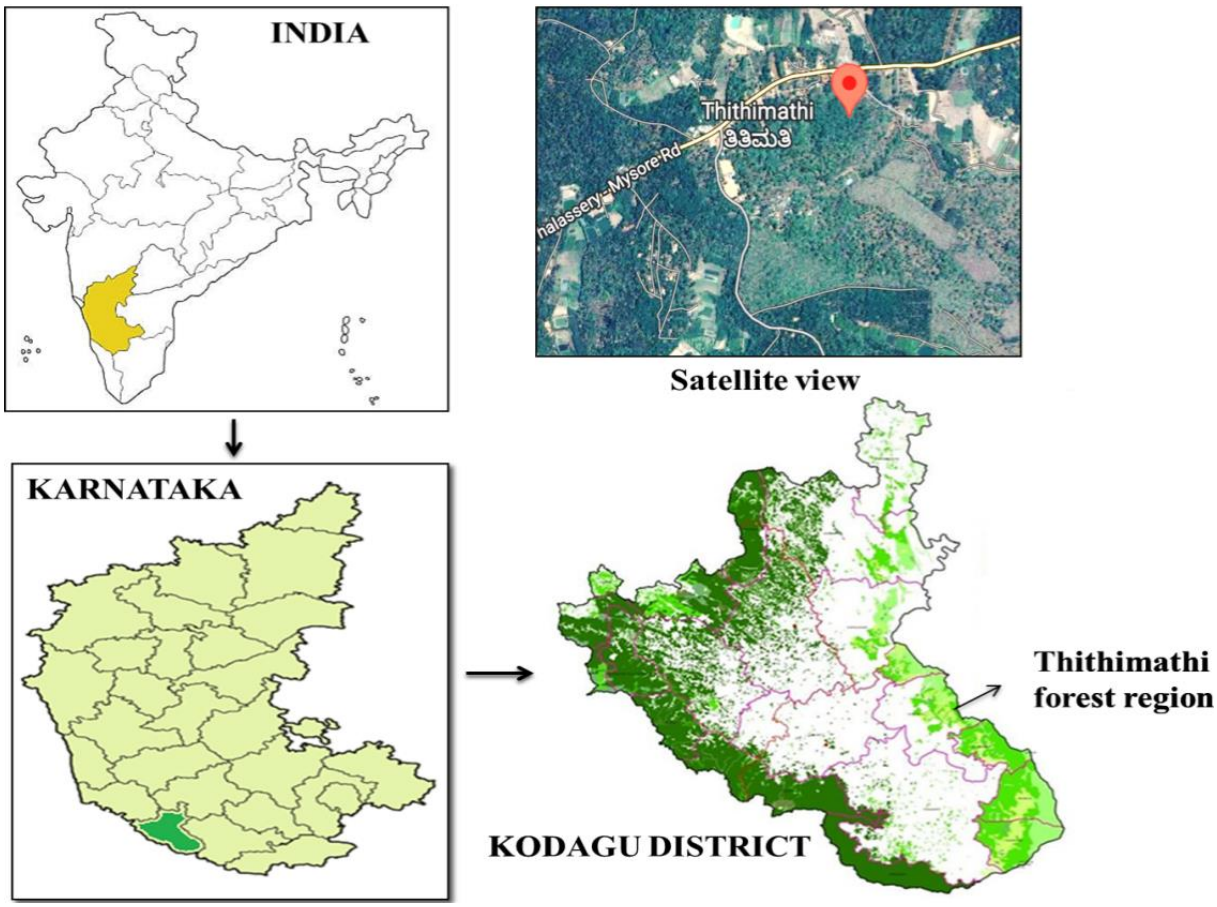

Figure 1. Map showing the location for documentation of Ethno medicinal plants

2.3. Data Collection

Semi-structured interviews and participatory observation methods were employed to collect data on ethnomedicinal practices. Informants were asked about the local names, parts used, preparation methods, and ailments treated by the medicinal plants. To enhance the accuracy of the data, plant specimens were collected with the help of the informants and later identified using standard floras [6, 7]. Additionally, two online plant databases, The Plant List (2010) [http://www.theplantlist.org] and World Flora Online [http://www.worldfloraonline.org], were used to verify the accuracy of botanical names and family classifications.

2.4. Herbarium Preparation

Collected plant specimens were processed and prepared into herbarium sheets following the standard herbarium techniques described by Bridson and Forman [8]. The specimens were pressed, dried, and mounted on herbarium sheets with labels providing information such as the botanical name, family, local name, collection number, habitat, and date of collection. These specimens were deposited in the herbarium of Teresian College for future reference.

2.5. Data Analysis

The collected data were analyzed to determine the frequency of use of each plant species, the diversity of medicinal plants, and the range of ailments treated. To compare the uses and cultural importance of different plant species, standard quantitative ethnobotanical techniques were applied. The local importance of the each species was measured by the use-value (UV) [9]. The technique measures how many uses for a given species an informant knows relative to the average knowledge among all informants. A high use-value indicates a relatively important species.

$$UV = \frac{\sum \text{Number of uses mentioned by ench informant for a given species}}{\text{Total number of informants}}$$

The relative frequency of citation (RFC) for each use, is the ratio of the frequency of citation by informants to the total number of the informants in study [9].

$$RFC = \frac{\text{Frequency of citation}}{\text{Total number of informants interviewed}}$$

Frequency of citation is the number of informants mentioning the particular use of that species. The high agreement for a particular use indicates its genuineness for that cultural group [9].

$$FC = \frac{\text{Number oef informants mentioning the species}}{\text{Total number of informants}}$$

3. Results

This study documented 32 ethnomedicinal plant species belonging to 21 different families from the Thithimathi forest region in Kodagu district. The Fabaceae and Solanaceae families were the most dominating, each accounting for 13% of the total species. This was followed by the Apocynaceae, Acanthaceae, Rutaceae, Araceae, and Verbenaceae families, and each contributing 6% of the documented species. Several other families, including Polypodiaceae, Moraceae, Liliaceae, Asteraceae, Menispermaceae, Arecaceae, Sapindaceae, Lamiaceae, Magnoliaceae, Ranunculaceae, Rubiaceae, Myrtaceae, Amaranthaceae, and Lecythidaceae, were represented by 3% each. The therapeutic benefits of these species were also highlighted, emphasizing the rich biodiversity and traditional knowledge present in the region.

In the habitat-wise categorization of medicinal plants, shrubs are the most dominant, constituting 34.37% of the total. Trees and climbers each represent 25%, while herbs account for 15.62% (Figure 2). The higher prevalence of shrubs is indicative of their significant medicinal value, which contributes to their greater use in traditional medicine.

We have documented 32 medicinal plant species with the help of community people, which includes *Aglaomorpha fortunei*, *Artocarpus hirsutus*, *Asparagus racemosus*, *Acacia concinna*, *Artemisia vulgaris*, *Butea monosperma*, *Careya arborea*, *Cyclea peltata*, *Capsicum annuum*, *Caryota urens*, *Dysphania ambroisioides*, *Erythrina subumbrans*, *Hemidesmus indicus*, *Justicia adhatoda*, *Justicia wynaadensis*, *Lantana urticoides*, *Leucas aspera*, *Michelia champaca*, *Murraya koenigii*, *Naravelia zeylanica*, *Pothos scandens*, *Pterocarpus marsupium*, *Rubia cordifolia*, *Ruta graveolens*, *Rhaphidophora pertusa*, *Solanum nigrum*, *Syzygium cumini*, *Solanum torvum*, *Solanum capsicoides*, *Sapindus trifoliatus*, *Tabernaemontana alternifolia* and *Vitex negundo* (Figure 3).

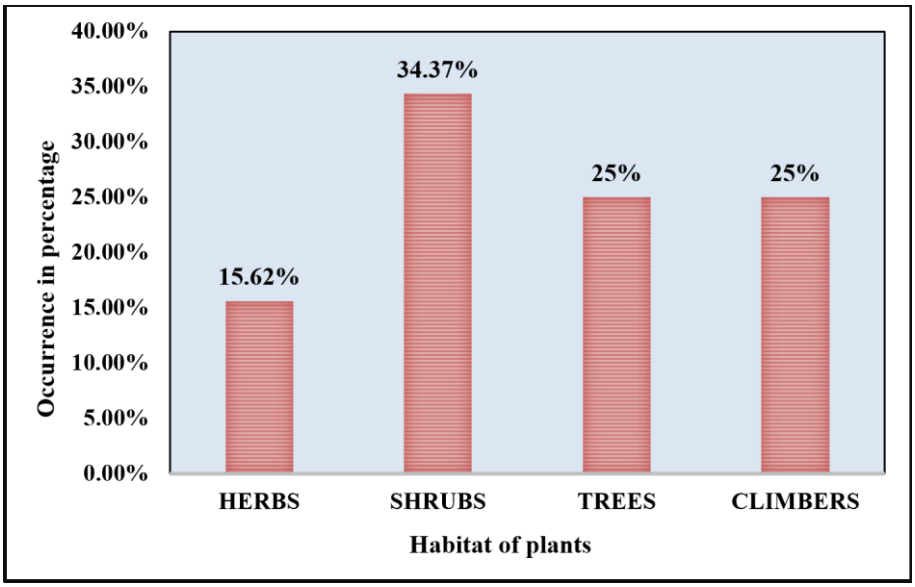

Figure 2. Habitat wise categorization of medicinal plants

Figure 3. 1a- Aglaomorpha fortunei (Kunze ex Mett.) Leaves; 1b- Stem; 2a- Artocarpus hirsutus Lam. Habit; 2b- Fruit; 3- Asparagus racemosus Willd.; 4. Acacia concinna (Willd.) DC; 5. Artemisia vulgaris Linn.; 6. Butea monosperma Lam.; 7a- Capsicum annuum L. Leaves; 7b. Fruits; 8a- Careya arborea Roxb. Stem; 8b- Leaves; 9- Caryota urens L.; 10a- Cyclea peltata Lam. Leaves; 10b- Fruits; 11- Dysphania ambrosioids L.; 12- Erythrina subumbrans (Hassk.) Merr.; 13- Hemidesmus indicus L.; 14. Justicia adhatoda L.; 15. Justicia wynaadensis (Nees).; 16a- Lantana urticoides Hayek. leaves;16b. Fruits; 17- Leucas aspera Willd.; 18-Michelia champaca L.; 19- Murraya koenigii L.; 20- Naravelia zeylanica L.; 21- Pothos scandens L.; 22- Pterocarpus marsupium Roxb.; 23a- Rubia cordifolia L.leaves; 23b- Fruit; 24- Ruta graveolens L. 25- Raphiodophora pertusa (Roxb.) Schott.; 26a- Solanum nigrum Linn. Leaves; 26b- Fruit; 27- Syzygium cumini L.; 28a- Solanum torvum SW. Leaves; 28b- Fruit; 29a-Solanum capsicoides All. Leaves; 29b- Fruits; 30a- Sapindus trifoliatus L. Habit; 30b. Fruits; 31- Tabernaemontana alternifolia L.; 32- Vitex negundo L.

The Girijana community actively collected various medicinal plants for their therapeutic properties and traditional remedies, recognizing their significant health benefits. The community employed traditional methods, passed down through generations, to prepare medicines, thereby preserving cultural heritage and ensuring the efficacy of these natural remedies (Figure 4). The medicines were processed into different forms, including powders and decoctions for consumption (Figure 5).

Based on the extensive knowledge of the Girijana community members, they detailed the medicinal uses of various plants, identifying the specific parts of each plant most effective for treating different ailments. This highlights their deep understanding of the surrounding natural resources and their practical applications in traditional medicine.

Among the various parts of plants used, leaves were the most frequently utilized, accounting for 22.76% of the total reported uses. This indicates a significant preference for leaves in traditional medicinal applications, possibly due to their availability and the presence of various bioactive compounds. Following leaves, the root was the second most used plant part, comprising 17.23% of the total. Roots are often rich in essential nutrients and medicinal properties, which may explain their common application in herbal remedies. The fruits and flowers followed closely, with percentages of 16.09% and 15.93%, respectively. Both parts are known for their therapeutic benefits, contributing to their considerable use in ethno medicine. Stems accounted for 16.26% of the total plant part usage, reflecting their importance in traditional practices. Lastly, seeds were the least utilized part, representing only 11.70% of the reported uses, which suggest a more specialized application or limited availability compared to other parts (Figure 6).

To compare the uses and cultural significance of different plant species, standard quantitative ethnobotanical techniques, including Use Value (UV), Relative Frequency of Citation (RFC), and Frequency of citation (FC), were employed. *Artemisia vulgaris*, *Capsicum annuum*, *Murraya koenigii*, and *Ruta graveolens* exhibited the highest FC value of 1, indicating their significant therapeutic benefits and widespread use in traditional medicine. In contrast, *Pterocarpus marsupium* and *Tabernaemontana alternifolia* recorded the lowest FC value of 0.1, as their usage is restricted to certain native cultures. The highest RFC value of 0.1 was also recorded for *Artemisia vulgaris*, *Capsicum annuum*, *Murraya koenigii*, and *Ruta graveolens*, reflecting their frequent mention in the treatment of various ailments. Conversely, *Pterocarpus marsupium* and *Tabernaemontana alternifolia* had the lowest RFC value of 0.01, attributed to their limited recognition and lack of scientific validation. The highest UV was recorded for *Cyclea peltata* (2.6), due to its prominent traditional uses and cultural significance. In contrast, *Hemidesmus indicus* and *Pothos scandens* had the lowest UV of 1, reflecting their limited recognition and use among the community (Table 1).

Figure 4. Collecting medicinal plant samples and preparing traditional remedies by the Girijana community. A- Collecting bark from a medicinal tree; B- Harvesting medicinal leaves; C and D- Traditional grinding of medicinal plants by Girijana community

Figure 5. Formulations of medicinal plants prepared by Girijana community. A. *Aglaomorpha fortunei* stem extraction; B. *Asparagus racemosus* leaf extraction; C. *Artemisia vulgaris* leaf extraction; D. *Capsicum annuum* fruit extraction; E. *Careya arborea* stem extraction; F. *Cyclea peltata* root extraction. G. *Erythrina subumbrans* leaf extraction; H. *Hemidesmus indicus* leaf extraction; I. *Justicia adhatoda* leaf powder; J. *Lantana urticoides* leaf extraction; K. *Murraya koenigii* powder; L. *Naravelia zeylanica* leaf and stem extraction. M. *Pothos scandens* leaf extraction; N. *Rubia cordifolia* leaf and stem extraction; O. *Ruta graveolens* leaf powder; P. *Raphiodophora pertusa* leaf extraction. Q. *Solanum nigrum* leaf extraction; R. *Syzygium cumini* stem extraction; S. *Sapindus trifoliatus* fruit extraction

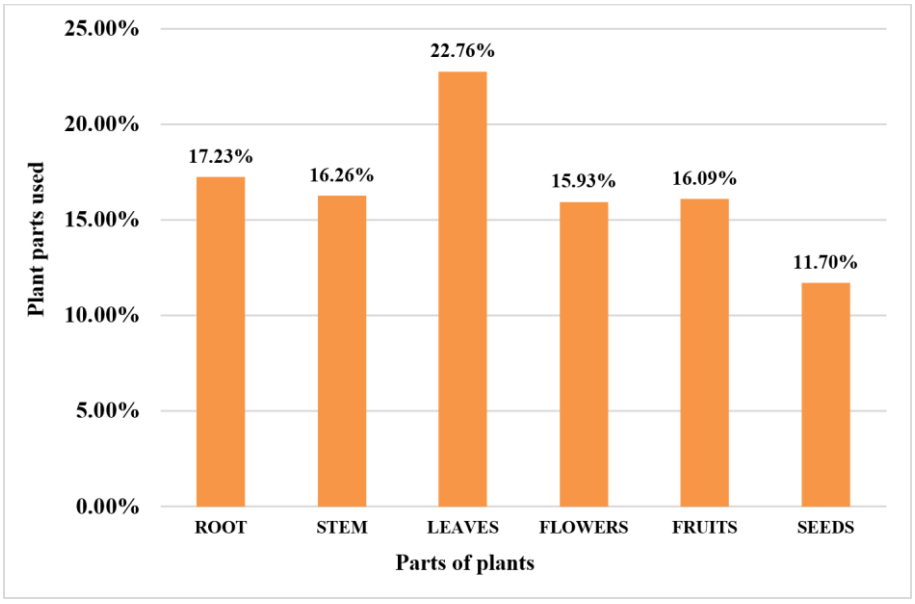

Figure 6. Utilization patterns of plant parts in ethno medicine preparation by Girijana community

Table 1. List of medicinal plants with their local name, part used, mode of usage, ethno medicinal values, scientific evidences and their respective FC, RFC and UV

Sl. No.	Botanical name of the plant	Family	Local Name	Part used	Mode of usage	Ethno medicinal uses	Scientific evidences	References	FC	RFC	UV
1.	*Aglaomorpha fortunei* (Kunze ex Mett.)	Polypodiaceae	Basingada gida	Root	The rhizomes were dried and used to prepare decoctions or powdered extracts.	Relieves pain, Headaches, Toothaches, and pain in the joints, and reduces inflammation in joints and muscles.	Bioactivity not authenticated		0.3	0.03	1.2
				Stem	Stem was dried and ground into powder and used as teas, tinctures or capsules.	Detoxifying properties. Helps to cleanse the toxins from body. Treats digestive issues and stomach pains.					
				Leaves	Dried or fresh leaves infused in hot water to make herbal tea.	Treats respiratory conditions like coughs and asthma.					
2.	*Artocarpus hirsutus* Lam.	Moraceae	Ajini chekke	Root	Roots were dried and powdered for use in herbal concoctions, or boiled to make decoctions.	Used to treat diarrhea and dysentery.	-		0.7	0.07	1.8
				Stem	Stem was boiled and used as decoction.	Used to treat urinary problems, fever and skin diseases.					
				Leaves	Leaves were brewed into teas or decoctions.	Treats ulcers, coughs, fever, and asthma.					
				Flowers	Flowers used in cooking.	Treats skin inflammations and infections.	Anti-acne activity, treats various skin infections	[27, 28]			
				Fruits	Fruits were consumed fresh or cooked.	Improves digestion, constipation, and clears worms from the body.	-				
				Seeds	Seeds were eaten after being cooked.	Helps to manage blood sugar levels in the body.					
3.	*Asparagus racemosus* Willd.	Liliaceae	Shatavari	Root	The roots were boiled in water to make a decoction. The dried root can be ground into a powder and mixed with milk, honey or water.	Used to promote overall health and well-being, used to enhance female reproductive health, improve digestion, boost immunity and increase breast milk production.	Improves physical stamina, immunity, and mental function, increases lactation, enhanced reproductive health and digestive health.	[29]	0.5	0.05	1.3

Table 1 continued

				Stem	The fresh stem were juiced and taken as a tonic.	Helps in treating kidney problems, Rheumatism	-				
				Leaves	Fresh leaves were ground into a paste to treat skin diseases or steeped in hot water to prepare an herbal tea.	Used to treat skin diseases, fever and consumed as a general health tonic.	Cooling and calming properties				
				Flowers	Flowers were infused in hot water to create a mild herbal tea.	Improves digestion, and treats diarrhea.	-				
				Fruits	The fruits were used to prepare a decoction and can be eaten raw or cooked.	Treats constipation and diarrhea.					
				Seeds	Seeds were dried and ground into a powder, then mixed with other herbs or taken with milk or water.	Seeds support reproductive health and to treat some digestive disorders.					
4.	*Acacia concinna* (Willd.) DC	Fabaceae	Shigekai	Root	Roots were dried and used as powdered form.	Treats skin infections and wounds, cleanses and promotes healthy hair growth.	Antioxidant and antibacterial	[30, 31]	0.8	0.08	1.6
				Stem	Dried stems were grind into a powdered and mixed with water to form paste.	Treats digestion and gastrointestinal issues.	-				
				Leaves	Leaves were dried and powdered for use as hair masks or shampoos.	Treats skin infections and wounds. It is also used in hair care products to enhance hair strength and shine.					
				Flowers	The flowers were infused in oil (Coconut, Sesame) to make a hair oils.	It clears dandruff, scalps issues, and promotes hair growth.	-				
				Fruits	Fruits were dried and powdered to make natural shampoos.	It is used for hair cleansing, conditioning, and promoting hair growth. It is also used for skin care.					
				Seeds	Seeds were dried and used as a powdered form.	It is used to treat fungal infections, and also for hair health.					

Table 1 continued

5.	*Artemisia vulgaris* Linn.	Asteraceae	Gaali soppu	Root	Roots were dried and ground into a powder for use in herbal remedies and made into a tincture by soaking it in alcohol.	Treats digestive disorders, joint pain, muscle spasms.	Anti-spasmodic, anti-inflammatory	[32]	1	0.1	1.5
				Stem	Stems were boiled to make a decoction.	Treats fatigue and improves overall vitality.	Immunomodulatory, anti-oxidant				
				Leaves	Leaves were dried and used to make tea.	Relieves menstrual pain and regulates menstrual cycles. Treats wounds, insect bites and skin irritations.	Immunomodulatory, anti-septic, anti-inflammatory				
				Flowers	Included in teas and tinctures for their mild sedative properties.	Treats insomnia and anxiety.	-				
6.	*Butea monosperma* Lam.	Fabaceae	Kaadina jwale	Root	Roots were used in powdered form.	Treats night blindness, filariasis and elephantiasis.	Antioxidant	[33-35]	0.9	0.09	1.4
				Stem	Barks were dried and powdered.	Treats ulcers, skin diseases.	Antigenotoxic, antiproliferative				
				Leaves Flowers	Leaves used fresh or dried and made into powder or paste. Flowers used fresh form.	Treats diabetes, jaundice and liver disorders. Treats constipation and skin diseases.	Anti-hyperglycemic prospective, hepatoprotective activity				
				Fruits	Used as tonics.	Treats worm infestations and manage diabetes by controlling blood sugar levels.	Anti-hyperglycemic prospective				
				Seeds	Seeds were dried and powdered.	Treats fungal infections, managing fertility, acting as contraceptives.	Antiproliferative				
7.	*Capsicum annuum* L.	Solanaceae	Ghandari menasu	Root	Roots were dried and ground into a powder or used to make a decoction.	Treats inflammations and relieves pain.	Anti-inflammatory, analgesia, pain relief	[36]	1	0.1	2.0
				Stem	Stems were boiled to make decoctions.	Helps to cure digestive issues.	Digestive stimulant action, beneficial effects on gastrointestinal system				

Table 1 continued

				Leaves	Leaves were used as decoctions.	Treats skin inflammations, wounds, coughs and colds, cures digestion problems and relieves stomach pain.	Anti-inflammatory, Capsaicin has known effects on pain/inflammation and mucosal stimulation				
				Flowers	Flowers were used as decoctions.	Relieves stomach cramps, indigestion.	-				
				Fruits	Fruits were eaten as raw, cooked or dried.	Helpful in treating muscle and joint pains. Stimulates digestive juices and helps with digestive disorders. Improves blood circulation and used to treat circulatory issues and reduce inflammations. Believed to boost metabolism and aid in weight loss.	-				
				Seeds	Seeds were dried and cooked up.	Treats parasitic infections, stimulate digestion and for digestive health.	-				
8.	*Careya arborea* Roxb.	Lecythidaceae	Kaadu seebe	Root	Roots were dried and ground into powders, boiled to make decoctions, used fresh in tinctures.	Treats joint pains, muscle pains, treat inflammations. Treats rectal bleeding.	Anti-inflammatory	[37-39]	0.8	0.08	1.8
				Stem	Stems were used fresh or dried, boiled to make teas or decoctions.	Treats dysentery, diarrhea and other gastrointestinal issues.	Gastroprotective effect and antidiarrhoeal activity				
				Leaves	Leaves were used fresh or dried for teas.	Treats skin infections and inflammations, coughs and colds.	Anti-inflammatory				
				Flowers	Flowers were dried or used fresh in teas, tinctures, and essential oils.	Treats diarrhea and dysentery, treat coughs, cold, and fever.	Antidiarrhoeal activity and gastroprotective effect				
				Fruits	Fruits were consumed fresh, dried or made into juices or syrups.	Treats diarrhea, dysentery and digestive disorders.					

Table 1 continued

				Seeds	Seeds were consumed whole, ground into powders, or pressed to extract oils.	Treats bacterial and fungal infections, healing of wounds.	-				
9.	*Caryota urens* L.	Arecaceae	Bagani mara	Root	Roots were dried and ground into a powder, mixed with water or other liquids to make a decoction.	Treats urinary disorders, stomach pains, joint pains, muscle pains.	Bioactivity not authenticated		0.9	0.09	2.3
				Stem	The juice is extracted from the stem and consumed directly. It can be processed into jaggery, which can be used as a sweetener with medicinal benefits.	Cures fever, headaches, and inflammations, skin diseases.					
				Leaves	The leaves were ground into a paste and applied topically to wounds or inflammations.	Treats infections, wounds, cuts and burns, urinary tract issues.					
				Flowers	The flowers were dried and used in powdered form or as a decoction.	Cures heart problems and chronic diseases.					
				Fruits	The fruits were eaten raw, after ripened or dried and powdered to be consumed with water.	Treats diarrhea and dysentery.					
				Seeds	Seeds were ground and used in various formulations.	Helps to cure diabetes, inflammatory conditions, wound healing.					
10.	*Cyclea peltata* Lam.	Menispermaceae	Haade balli	Root	Roots were boiled in water to prepare decoctions. A paste made from the root can be applied topically to reduce inflammation pain.	Treats digestive disorders, fevers, coughs, kidney stones.	Gastric antisecretory and antiulcer activities, nephroprotective	[40-43]	0.8	0.08	2.6
				Stem	The stem juice were extracted and consumed. The stem can be soaked in water over night, and the infusion can be drunk in the morning.	Reduces inflammation and swelling. Cures infections caused by bacteria and fungi. Helps in wound healing.	Antitoxin activity				

Table 1 continued

				Leaves	Fresh leaves were crushed and applied. Leaf juice can be consumed or applied topically.	Wound healing, fever, cures respiratory problems like cough and asthma. Cures joint pain and muscle pain.	Antitoxin activity, antidiabetic				
				Flowers	Flowers were infused in water and can be consumed.	Diuretic	-				
				Fruits	The dried fruits were powdered and consumed with honey or water.	Helps in treating respiratory issues. Cures fever, dysentery, diarrhea, skin diseases.	Antitoxin activity				
				Seeds	Seeds were used as same as fruits	Treats fever, dysentery and stomach pains.	-				
11.	*Dysphania ambrosioides* L.	Amaranthaceae	Kaduoma	Root	Roots were boiled to make a tea or decoction, consumed orally.	Treats digestion, relieving gas, bloating.	Antioxidant, anti-inflammatory	[44-47]	0.6	0.06	1.9
				Stem	Stems were consumed as roots.	Treats gastrointestinal problems like indigestion, intestinal parasites.	Antiparasitic				
				Leaves	Leaves were consumed fresh, cooked, or dried. They are brewed into a tea, added to soups, or used as a seasoning in cooking.	Treats stomach pains, clears intestinal worms. Cures headaches, cold and fever.	Antiparasitic, Antiviral / Anti-inflammatory				
				Flowers	Flowers were included in teas or infusions.	Treats minor skin infections and wounds.	Antibacterial, antioxidant and antifungal activities				
				Fruits	Fruits were consumed fresh or incorporated into herbal preparations.	Clears intestinal worms and parasites. It is believed to help digestive issues such as indigestion, bloating, and gas. Helps to relieve muscle spasms and cramps.	Antiparasitic, vasorelaxant agent				
				Seeds	Seeds were ground into a powder and taken orally, sometimes mixed with water or other liquids.	Treats respiratory issues such as asthma, bronchitis, coughs. Regulates menstrual cycles and menstrual cramps.	Antiviral, antibacterial, vasorelaxant agent, anti-inflammatory				

Table 1 continued

12.	*Erythrina subumbrans* (Hassk.) Merr.	Fabaceae	Kadu parivala	Root	Roots were boiled in water to make a decoction.	Helps in pain relief and to reduce inflammations.	-	[48]	0.5	0.05	1.4
				Stem	Stems were prepared as an infusion or decoction.	Reduces inflammation.					
				Leaves	Fresh leaves were crushed and applied directly to wounds or skin. Leaves can be also be boiled and used as a wash for wounds.	Promotes the healing of wounds. Helps in skin infections.	Antimycobacterial activity				
				Flowers	Flowers were dried and brewed as a tea.	Reduces inflammations. cures headaches, fever and cold.	-				
				Fruits	Fruits were used as decoction.	Expels parasitic worms.	Antiplasmodial activity				
				Seeds	Seeds were dried, ground into a powder, and taken with water or mixed into food to use as sedative.	Helps to calm anxiety and lowers blood pressure level.					
13.	*Hemidesmus indicus* L.	Apocynaceae	Nannari	Root	Roots were consumed internally as a decoction or powder.	Treats skin diseases, rheumatism, syphilis, and urinary disorders.	Anti-inflammatory, antimicrobial, renoprotective	[49, 50]	0.5	0.05	1
				Stem	The stem was used similarly to the root, either internally or externally.	It is believed to have cooling and diuretic properties and is used in the treatment of urinary disorders.	Renoprotective				
				Leaves	Leaves were used as pastes.	Used to treat various skin infections like bacterial and fungal infections.	Antimicrobial				
				Flowers	Flowers are crushed and applied.	Has cooling effect.	Antipyretic				
14.	*Justicia adhatoda* L.	Acanthaceae	Adu soge	Root	The roots were dried and powdered, then consumed in the form of a decoction or tea.	Treats respiratory disorders, relieves stomach pain and improves digestive health.	Antispasmodic, antibacterial	[51]	0.6	0.06	1.5
				Stem	The stem was used in the form of decoctions, infusions, or extracts.	Reduces inflammations, helps in wound healing. Treats fever, coughs, and cold.	Anti-inflammatory, antibacterial, antioxidant				

Table 1 continued

				Leaves	Leaves were dried and powdered for consumption or used to prepare teas, decoctions, or herbal extracts.	Treats respiratory disorders like asthma, bronchitis, and cough.					
				Flowers	The flowers can be dried and used in herbal formulations alongside other parts of the plant.	Helps in treating and preventing infections. Helps in reducing fever, cough and cold.	-				
				Fruits	Dried and powdered for use in teas or decoctions.	Used to cure cough and cold.					
				Seeds	The seeds were used to make infusion by steeping them in hot water.	Helps to clear worms in the body, and to treat Asthma.					
15.	*Justicia wynaadensis* (Nees).	Acanthaceae	Maddu soppu	Root	Roots were boiled and used in decoctions.	Treats digestive disorders and stomach pains.	Antibacterial	[52]	0.7	0.07	1.3
				Stem	The stem was used in decoctions or teas.	Reduces swelling and pain. Treats infections caused by bacteria and fungi.					
				Leaves	Soaking leaves in hot water to extract medicinal properties, similar to making tea.	Treats wounds, skin diseases, and respiratory ailments.					
				Flowers	Flowers were steeped in hot water to make an infusion. A decoction made by boiling the flowers in water.	Aids in the healing of wounds and skin conditions. Helps in improving digestion and treats digestive disorders.					
16.	*Lantana urticoides* Hayek.	Verbenaceae	Chitrangi gida	Root	Roots were boiled and used as decoctions. Crushing or grinding the roots into paste form.	Treats infections and wounds. Used to treat inflammations, aid digestion, and treat gastrointestinal issues.	Bioactivity not authenticated		0.4	0.04	1.8
				Stem	Stems can be crushed into a paste form.	Treats skin conditions like rashes, burns, or insect bites					

Table 1 continued

				Leaves	Decoction of the leaves by boiling them in water. Crush or grind fresh leaves to make a paste.	Treats infections and wounds, reduce inflammations and swelling. It cures coughs, cold, and bronchitis. Treats rashes and infections.					
				Flowers	Infusion was prepared by steeping fresh or dried flowers in hot water.	Treats wounds, and skin infections. Cures respiratory disorders.					
17.	*Leucas aspera* Willd.	Lamiaceae	Thumbe	Root	They were sometimes made into a decoction or powdered and taken orally.	Treats various ailments such as diarrhea, dysentery, and stomach disorders.	Antimicrobial activity	[53]	0.9	0.09	1.5
				Stem	They were crushed and applied topically as a poultice or in the form of a paste.	The stems have been used to treat skin diseases and wounds.	Antimicrobial activity, anti-inflammation and analgesia				
				Leaves	The leaves were crushed and the juice extracted, which is then consumed orally. They can also be made into a paste.	They are used to treat coughs, colds, asthma, and other respiratory ailments.					
				Flowers	Flowers are boiled and used as decoctions.	It reduces stress and anxiety.	-				
				Fruits	Consumed raw or prepared as a decoction.	It is used to treat digestive issues such as indigestion and bloating.	-				
				Seeds	Powdered and consumed orally.	Treats urinary disorders and kidney stones.	-				
18.	*Michelia champaca* L.	Magnoliaceae	Sampige mara	Root	Roots were boiled to make decoctions or infusions for oral consumption.	Treats diarrhea, dysentery, and fevers.	Antimicrobial activity, antipyretic activity	[55-57]	0.5	0.05	1.6
				Stem	Crushed and made into paste.	Treats inflammations and wounds and cuts.	Antimicrobial activity, antioxidant activity				
				Leaves	Boiled to make decoctions.						
				Flowers	Infusions or decoctions consumed orally. This can involve inhaling the fragrance directly from the flowers.	Used in aromatherapy to alleviate stress, anxiety, or depression. Helps to cure digestion problems.	Antidepressant activity, anxiolytic activity				

Table 1 continued

				Seeds	Crushed and used.	Seed extracts or oils might be used externally for skincare purposes, such as moisturizing or soothing dry or irritated skin.	Antioxidant activity				
19.	*Murraya koenigii* L.	Rutaceae	Karibevu	Root	Boiled and used as a decoction.	Treats gastrointestinal disorders.	Anti-inflammatory, antioxidant, antiviral (helps gut health and mucosal healing)	[58-60]	1	0.1	1.9
				Stem	Crushed and used it as powdered form.	Treats diarrhea and dysentery.	Antidiarrhoeal, antimicrobial/antiviral				
				Leaves	Leaves were chewed or consumed raw, or it can be prepared by grinding fresh leaves and extracting the juice, which can be consumed or applied topically or boiling leaves in water to make medicinal tea.	Treats inflammation, helps in killing of microorganisms, and helps in reducing blood sugar levels.	Anti-inflammatory, antidiabetic, antiviral, antioxidant				
				Fruits	It can be consumed raw or incorporated into dishes for its medicinal benefits.	Treats digestive disorders, constipation, and stomach pain.	Anti-inflammatory, antioxidant, antidiarrhoeal				
				Seeds	Seeds were crushed and used as powdered form.	Regulates blood sugar levels, helps in weight loss, and improves metabolism. Treats inflammatory bowel diseases and joint inflammations.	Antidiabetic, antioxidant, anti-inflammatory, neuroprotective				
20.	*Naravelia zeylanica* L.	Ranunculaceae	Vathakotti	Root	Dried and used as powdered form.	Treats cuts, wounds. Cures headache, fever and cold.	Anti-inflammatory	[61]	0.3	0.03	1.8
				Stem	The stem can be processed into juice or extracts.	Promotes overall health and well-being.					
				Leaves	Brewed into tea.	Treats bacterial, fungal infections.					
				Flowers	Boiled in water to extract their medicinal properties.	Treats fever, headaches, cough and asthma.					

Table 1 continued

				Fruits	Consumed fresh or juiced.	They are rich in vitamins, minerals which is helpful in overall health and treating various ailments.					
				Seeds	Ground into powder or processed into oils for medicinal purposes.	Treats wounds and cuts.					
21.	*Pothos scandens* L.	Araceae	Arakade beru	Root	Crushed or boiled to extract their purported medicinal properties.	Treats skin diseases, wounds and respiratory issues.	Peritoneal mast cell stabilization, antioxidant and antipyretic	[62, 63]	0.2	0.02	1
				Stem	Crushed or ground into a paste.	Treats minor infections and cuts, digestive disorders, stomach pain.	Antioxidant and antipyretic				
				Leaves	Boiled and used as a decoction.	Treats skin allergies, rashes and redness.	-				
22.	*Pterocarpus marsupium* Roxb.	Fabaceae	Honne	Root	Decoctions or extracts made from the roots can be consumed orally as a medicinal tea or tonic.	Treats conditions like diarrhea, dysentery and various gastrointestinal disorders.	Antimicrobial, anti-inflammatory and analgesic activities	[64-67]	0.1	0.01	1.4
				Stem	Boiled and used as decoctions.	Cures digestive problems and respiratory disorders.					
				Leaves	Crushed leaves can be applied topically as poultices or in the form of herbal pastes.	Treats wounds, skin infections and inflammation.					
				Flowers	Flower petals can be dried and used to make herbal teas or infusions.	Reduces stress, anxiety.	Cardiotonic activity				
				Fruits	Consumed orally as such	Manages conditions like diarrhea and dysentery.	Antimicrobial				
				Seeds	Seeds were processed into powders or extracts for oral consumption.	Management of diabetes and obesity	Anti-diabetic activity, antidiabetic, anti-glycation, antioxidant				

Table 1 continued

23.	*Rubia cordifolia* L.	Rubiaceae	Manjista	Root	Boiling the roots in water. Dried root powder can be consumed with water or other liquids.	It is believed to purify the blood and detoxify the body. It is used to treat inflammation-related conditions. Helps in promoting urine flow, aiding in detoxification. Helps in treatment of stroke.	Antioxidant, analgesic and anti-inflammatory, anti-diarrheal, anti-thrombotic and pro-angiogenic effects	[68-71]	0.4	0.04	2.2
				Stem	Boiling the stems to prepare a medicinal infusion. Consuming the stem powder with warm water or milk.	Treats liver health, regulating menstrual cycles, digestive health. Helps to reduce oxidative stress and protect cells from damage.	Antioxidant, anti-diarrheal and anti-inflammatory				
				Leaves	Steeping fresh or dried leaves in hot water to make a medicinal infusion.	Promotes the production and excretion of urine, this can aid in detoxification and support kidney health.	Antioxidant				
				Flowers	Boiled or steeped in hot water.	Alleviates inflammation-related conditions. Cures common cold and fever.	Analgesic and anti-inflammatory				
				Fruits	Dried fruits were powdered and consumed orally with water or other liquids.	The fruit may be used as a general health tonic, supporting overall well-being. Treats liver related problems.	Antioxidant				
				Seeds	The seeds were boiled or steeped in hot water to extract their medicinal properties.	Seeds used to support digestive health, aid in digestion, and relieve gastrointestinal discomfort.	Anti-diarrheal and anti-inflammatory				
24.	*Ruta graveolens* L.	Rutaceae	Naagadali	Root	The dried roots were ground into a powder.	Treats respiratory issues such as coughs and bronchitis.	Antimicrobial, antiviral and antiparasitic, anti-inflammatory	[72]	1	0.1	1.9
				Stem	Herbal extracts or decoctions.	Treats digestive issues, menstrual disorders, and respiratory conditions.	Antimicrobial, antioxidant, contraceptive and abortifacient effects				

Table 1 continued

				Leaves	Steep the leaves or stems in hot water for several minutes and then strained before drinking.	Treats nervous system disorders, cures menstrual cramps, relieves muscle spasms and inflammation. Inhaling the leaves extracts can cure headache, fever.	Neuroprotective, anti-inflammatory, contraceptive and abortifacient effects				
				Flowers	Tea or infusion preparation by steeping dried flowers in hot water for several minutes.	Used in traditional medicine for their calming and digestive benefits. Helps with menstrual irregularities and respiratory conditions.					
				Fruits	Dried fruits were boiled and consumed along with hot water.	Cures digestive problems and stomach pains.	Antimicrobial, antioxidant				
				Seeds	Tea or decoction.	Including digestive health and respiratory conditions.	Antimicrobial, Antioxidant, Anti-inflammatory				
25.	*Raphiodophora pertusa* (Roxb.) Schott.	Araceae	Kandadapana balli	Root	The roots may be mashed or ground into a paste. The roots can be boiled in water to make a decoction.	Treats digestive issues such as indigestion, bloating and stomach discomfort. The roots are used to treat respiratory problems such as coughs, colds, and asthma.	Bioactivity not authenticated		0.4	0.04	1.9
				Stem	The stems could potentially be boiled to create a decoction.	It is beneficial for conditions involving inflammation.					
				Leaves	Leaves were dried and brewed into a tea. Crushed or mashed leaves may be applied externally as a poultice to wounds.	Aids in digestion and alleviate gastrointestinal discomfort such as bloating, gas, or indigestion. Helps to treat bacterial or fungal infections. They may be used topically on wounds or skin infections.					

Table 1 continued

				Flowers	Infused in hot water to create herbal infusion or tea.	Improves respiratory health and also used in herbal remedies aimed at coughs, colds, or respiratory congestion.				
				Fruits	Fruits were consumed raw or processed into juices, smoothies, or culinary dishes.	Contributes to overall health.				
26.	*Solanum nigrum* Linn.	Solanaceae	Ganike gida	Root	Ground into a paste and applied topically or ingested as a decoction.	Treats conditions like toothaches, coughs, and asthma.	Anti-inflammatory, antioxidant and antibacterial	[73- 75]	0.9	0.09	1.9
				Stem	Prepared as infusions, decoctions, or poultices for topical application or ingestion.	Treats conditions like inflammation, wounds and skin diseases.				
				Leaves	They are commonly prepared as infusions or decoctions. Crushed and ground into paste.	Treats cuts, wounds. Treats eye disorders, overall health.				
				Flowers	Prepared as infusions or decoctions.	Treats bacterial infections, cough and indigestion.				
				Fruits	Prepared as a decoction or syrup.	Treats dysentery, diarrhea, and respiratory infections.				
				Seeds	Ground into a powder and ingested, mixed with other herbs or liquids.	Treats infections caused by fungi or bacteria.	Antioxidant and antibacterial, cytotoxic activities			
27.	*Syzygium cumini* L.	Myrtaceae	Nerale	Root	Boiled in water to prepare a decoction.	Treats diarrhea, dysentery, and other gastrointestinal issues, skin conditions.	Antidiarrhoeal, antimicrobial, anti-inflammatory, antioxidant	[76]	0.8	0.08	2.3
				Stem		Treats diabetes, digestive disorders and skin diseases.	Antidiabetic, antioxidant, anti-inflammatory, antimicrobial			
				Leaves	Decoction or in powdered form.	Clears worms in the body, treats fungal and microbial infections.	Antimicrobial, antimalarial			

Table 1 continued

				Flowers	Ground into a fine powder and used as a dietary supplement. The powder can be added to smoothies, juices, or other beverages for consumption.	Beneficial for joint pains, muscle pain or inflammatory skin conditions, and alleviate digestive issues like indigestion, bloating or diarrhea.	Anti-inflammatory, gastroprotective, antidiarrhoeal, antioxidant				
				Fruits	Jamun fruit can be eaten fresh when ripe. Simply wash the fruit, remove the seeds if desired, and enjoy the juicy flesh. It can also be used to make jams, jellies, or preserves, salads and juices.	Regular consumption of Jamun fruit contribute to overall health. Promotes healthy digestion and prevents constipation. It also helps to treat diarrhea and other gastrointestinal issues.					
28.	*Solanum torvum* SW.	Solanaceae	Chundekkayi	Root	Boiling the root in water to prepare a medicinal tea or infusion and consumed orally.	Treats joint pains, muscle pain, and reduces body temperature during fever	Antioxidant	[77, 78]	0.3	0.03	2.4
				Stem	Crushed or mashed into a paste and applied topically	Reduces inflammation, soothes irritation, and promotes wound healing.					
				Leaves	Tea or infusion.	Promotes digestive health and treats gastrointestinal issues such as indigestion, bloating, and constipation. Treats coughs, colds and asthma.	Antifungal, antioxidant and liver-protective				
				Flowers	Flowers can be inhaled through steams.	Cures cold, cough and fever.	-				
				Fruits	Boiling the fruits in water to prepare a medicinal tea or infusion and then be consumed orally. Dried fruits are ground into powdered form.	Promotes digestive health and treats gastrointestinal issues such as indigestion, bloating, and constipation. Treats skin conditions such as eczema, rashes, and wounds.	-				
				Seeds	Ground into a powder and incorporating it into culinary dishes or beverages.	Treats joint pains and muscle catch.	-				

Table 1 continued

29.	*Solanum capsicoides* All.	Solanaceae	Chundekai	Root	Roots were boiled and used as decoctions.	Digestive issues	Antidepressant-like effect (possible aid via gut-brain axis)	[79-81]	0.2	0.02	2.2
				Stem	Prepared as teas, infusions, decoctions. Crushed or mashed stems were applied topically to the painful area to alleviate discomfort.	Reduces inflammation associated with conditions like arthritis or muscle strains. Helps in fighting bacterial or fungal infections. The stem might be used to treat minor skin conditions such as rashes, insect bites, or dermatitis.	Anti-Inflammatory				
				Leaves	Processed into teas, poultices, or extracts for external or internal use.	Relieves different types of pains, treats headaches, and reduces inflammations.					
				Flowers	Decoctions or infusions and consumed orally to potentially treat inflammation internally.	Treats inflammation, cold, cough and fever.					
				Fruits	Ripe fruits were consumed or prepared as teas, infusions, decoctions.	Reduces inflammation and pain associated with conditions like arthritis or muscle strains. Berry has been used to aid digestion and relieve gastrointestinal discomfort. Treats minor skin conditions like insect bites or rashes.					
				Seeds	Ground into a powder and consumed orally as a treatment for parasitic infections. It can also be brewed into a tea or infusion and consumed orally to promote diuresis.	Treats intestinal parasites, promotes urine production and helps to eliminate toxins from the body.	Antiproliferative (possible broad link to detox and parasite control)				
30.	*Sapindus trifoliatus* L	Sapindaceae	Antolakai	Root	Dried, powdered, and applied as a paste to the affected area.	Treats skin conditions and joint pains.	Anti-inflammatory activity	[82-85]	0.5	0.05	1.3
				Stem	Stems were boiled to prepare a decoction for drinking.	The extracts were used to gargle for throat infections.	Antimicrobial				

Table 1 continued

				Leaves	Fresh leaves were crushed and applied directly to wounds.	Treats skin infections, wounds, and boils.	Antimicrobial, anti-inflammatory activity				
				Flowers	Fresh or dried flowers were used to prepare a calming tea.	It is used traditionally for anxiety and insomnia.	Neuroleptic				
				Fruits	The fruits were soaked in water overnight and the liquid used as a shampoo.	Used as natural remedy for dandruff, lice, and as a general hair tonic.	Antimicrobial, antispermatogenic and antiandrogenic				
				Seeds	Seeds were ground into a powder and used in small quantities as part of medical formulations.	Treats digestive issues.	Antinociceptive activity				
31.	*Tabernaemontana alternifolia* L.	Apocynaceae	Kokke kai, Nagara kuda	Root	Roots dried and powdered, the powder can be mixed with honey or water.	Relieves fever, pain, and inflammation.	Anti-bacterial	[86]	0.1	0.01	1.9
				Stem	The stem were cut, dried, and used to make decoctions.	Treats digestive issues and skin diseases.					
				Leaves	Fresh leaves were crushed to extract juice, which is then applied to wounds or skin infections.	Leaves were used to cure snake bites, insect bites. Used to treat fungal and bacterial infections. They have wound healing properties.					
				Flowers	It can be crushed to make a paste.	Helps in wound healing, treating infections and preventing the growth of harmful bacteria.					
				Fruits	The fruits were dried and powdered.	Treats swelling and inflammations, diarrhea and gastrointestinal issues. It is also helpful in improving the heart health.					
				Seeds	Seeds were dried and ground into a powder, then can be used internally, mixed with water or honey.	Helps in pain relief and inflammation reduction.					

Table 1 continued

32.	*Vitex negundo* L.	Lamiaceae	Lakki gida	Root	Dried and powdered.	Treats joint pains, muscle pains, muscle catch, and improves bone health.	Anti-inflammatory, anti-nociceptive, anti-osteoporotic	[87, 88]	0.8	0.08	2.0
				Stem	Boiled to create a decoction used for cleaning wounds.	Treats wounds, cuts. Extracts from the stem were used for general health and well-being.	Antioxidant, antimicrobial				
				Leaves	Crushed and applied. A decoction or tea made from the leaves can be taken internally.	Treats fever and respiratory disorders, headaches and other aches. Relieves joint pain and inflammations.	Anti-nociceptive, anti-inflammatory, bronchodilator activity				
				Flowers	Dried and powdered or used fresh in decoctions.	Treats digestive issues, stomach aches, and constipation.	Hepatoprotective and anti-hyperglycemic activity				
				Fruits	Dried and used in teas or powders.	Treats respiratory disorders. Increases the flow of a mother's milk.	Bronchodilator activity (for respiratory),				
				Seeds	Ground into a powder and taken with water to treat intestinal worms.	Clears worms in the body.	Insecticidal				

Note: '–' indicates lack of documented scientific validation for the traditional use

4. Discussion

Traditional healthcare practices are deeply ingrained in the cultural traditions of rural communities, where they play a crucial role in addressing health concerns. The present study focuses on the Girijana tribe in the Western Ghats of Southwestern Karnataka, who rely heavily on medicinal plants sourced from the Thithimathi forest in South Kodagu. Our documentation of 32 plant species across 21 families reveals a strong alignment with previous ethnobotanical studies.

Several plants documented in this study, such as *Asparagus racemosus*, *Hemidesmus indicus*, *Justicia adhatoda*, *Leucas aspera*, *Syzygium cumini*, *Murraya koenigii*, *Solanum nigrum*, and *Vitex negundo*, were also recorded by Raj [10] in Northern Bengal. Additionally, *Butea monosperma* has been similarly noted by Meena and Yadav [11] from the tribal communities of Southern Rajasthan, indicating the widespread use of these species across different tribal communities in India. Bhat [12] also documented *Careya arborea*, *Cyclea peltata*, *Naravelia zeylanica*, and *Sapindus trifoliatus* in the central Western Ghats, reinforcing the ethnomedicinal significance of these plants. Our study also documented *Solanum nigrum*, *Solanum torvum*, and *Vitex negundo*, which align with the findings of Ariharan and Revathi [13] from the Kurangani forest of Tamil Nadu. Similarly, the presence of *Acacia concinna*, *Artemisia vulgaris*, *Careya arborea*, and other species in our study mirrors the research by Ashitha Ganesh and Devi Prasad [14] in Kodagu, while species like *Justicia adhatoda* and *Vitex negundo* were also documented by Rathod and Pratima [15] in Kalaburagi district, Karnataka.

In our study, we identified certain plants, such as Raphiodophora pertusa, which have not been previously documented in other ethnomedicinal studies, contributing novel insights into the medicinal flora of the Thithimathi region. This discovery adds to the existing ethnobotanical knowledge from this region. On the other hand, species like Aglaomorpha fortunei, Artocarpus hirsutus, Naravelia zeylanica and Pterocarpus marsupium, which were recorded in our survey, were notably absent in similar studies from Belgaum [16] and other regions of Karnataka. This suggests potential regional variations in the use and distribution of medicinal plants, even within the same state. The absence of these species in Belgaum could be attributed to differences in local ecological conditions, cultural practices, or varying reliance on medicinal plants in different communities.

Additionally, families like Fabaceae, Solanaceae, and Lamiaceae were dominantly recorded in our study, which aligns with prior research by Rao [17] in Jammu and Kashmir and Kumar [18] in Srinagar. These families' prevalence underscores their pharmacological significance across different geographic and cultural contexts.

Medicinal plants in our study, such as *Solanum nigrum*, *Justicia adhatoda*, and *Vitex negundo*, are known to treat various ailments like fever, cough, urinary diseases, and asthma, findings similar to Sarkar [19] in the Darjeeling Himalayas. Moreover, our documentation of plants used to treat skin diseases, snake bites, stomach disorders, and intestinal worms correlates with ethnobotanical records from Bangladesh [13, 20].

The highest utilization of leaves (22.76%) is consistent with several studies conducted in different geographical regions. Khajura [21] reported that leaves were the most frequently used plant parts among indigenous communities in Uttarakhand, India, accounting for 30% of the total usage. This preference can be attributed to the rich diversity of phytochemicals found in leaves, which often possess significant medicinal properties, including antioxidant, anti-inflammatory, and antimicrobial activities.

The second most utilized part, the root (17.23%), is also supported by Ayyanar [22] in the Eastern Himalayas that highlighted that roots were extensively used, accounting for 18% of the total plant part usage. Roots are often valued for their nutritional and medicinal properties, making them a critical component in herbal remedies. Flowers and fruits, representing 15.93% and 16.09% respectively, also demonstrate a common trend with Akinmoladun [23] indicating that flowers were frequently used by local healers in Nigeria, primarily for their aromatic and medicinal qualities. Fruits, similarly, were noted for their nutritional and medicinal benefits, reinforcing their significant role in traditional medicine across cultures. In contrast, the lower percentage of seed usage (11.70%) is noteworthy. While some studies [24] found seeds to be utilized more frequently, this disparity may reflect regional differences in plant availability, cultural preferences, and the specific medicinal knowledge of local populations. The specialized applications of seeds, often in less common treatments, may contribute to their lower overall usage.

The calculated Use Value (UV), Frequency of Citation (FC), and Relative Frequency of Citation (RFC) of the medicinal plants provide deeper insights into their ethnobotanical importance. The highest UV value recorded in our study was 2.6 for *Cyclea peltata*, while the lowest was 1 for *Pothos scandens*. These results are consistent with findings from other regions, such as the Palamalai region of the Eastern Ghats [25] where UV values varied significantly among medicinal plants. Similarly, our FC and RFC values reflect the frequency with which these plants are utilized by the local community, echoing trends reported by Gogoi and Sen [26] in Assam.

The variation in plant species and their ethnobotanical metrics, such as UV, FC, and RFC, can be attributed to environmental conditions, cultural practices, and regional availability. Communities like the Girijanas rely on locally available plants for their therapeutic efficacy, which is also influenced by the transmission of traditional knowledge and the perceived medicinal value of these species.

5. Conclusions

This study provides a comprehensive account of 32 ethnomedicinal plant species belonging to 21 families from the Thithimathi forest region in Kodagu district, highlighting the rich biodiversity and traditional knowledge of the Girijana community. The dominance of Fabaceae and Solanaceae families, along with the prevalent use of shrubs (34.37%) in traditional medicine, underscores the community's reliance on locally available plant species for therapeutic purposes.

This study presents novel findings by documenting the ethnobotanical knowledge of an underexplored tribal community and contributing previously unreported data on medicinal plant usage in this region. Notably, *Raphiodophora pertusa* has been documented for the first time in this area for its medicinal properties, expanding the existing ethnobotanical database. Additionally, *species such as Aglaomorpha fortunei*, *Artocarpus hirsutus*, *Naravelia zeylanica*, and *Pterocarpus marsupium* were recorded in this study but were absent in previous reports from other regions of Karnataka, highlighting regional variations in traditional plant use. Furthermore, this study employs quantitative ethnobotanical indices, including Use Value (UV), Frequency of Citation (FC), and Relative Frequency of Citation (RFC), to systematically assess the medicinal importance of these species. The highest UV recorded for *Cyclea peltata* (2.6) emphasizes its cultural and medicinal significance among the Girijana community.

The findings align with previous ethnobotanical studies from other parts of India, reaffirming the therapeutic importance of many of these plant species across diverse ecological and cultural landscapes. The traditional knowledge preserved by the Girijana community, particularly in the preparation and utilization of medicinal plants, plays a crucial role in sustaining their healthcare practices. Given the effectiveness of these plants in treating pain, inflammation, infections, digestive disorders, respiratory issues, and chronic conditions such as diabetes, they serve as a low-cost, sustainable alternative for communities with limited access to modern healthcare. Future research incorporating more comprehensive field studies, laboratory analyses, and in-depth cultural research would significantly enhance the ethnobotanical insights presented here.

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