Floristic analysis of Medicinal Plants from the Sholas of Nilgiris, Tamil Nadu, India

Vishnu Kumar S*, Jemima Danny Kingsley, Dharani S, Narayanan N, Thejan S.M.

Orbito Asia Diagnostics Private Limited Coimbatore – 641 045, India

I. INTRODUCTION

The unquenchable thirst of human beings to explore nature has made existence distinct among other species on the planet. Since the dawn of human civilization, bio-resources, particularly plant resources, have been utilized for his various life requirements. Vegetation is the most valuable gift that nature has provided human beings to meet the basic life requirements. It also plays a crucial role in sustainable management of the biosphere by maintaining the stability of biodiversity at its different levels of organization. The floristic wealth of a particular region is significant as it is considered an indicator in deciding the status of its ecological health. The first and foremost process in ascertaining the plant diversity of a particular geographical area is to subject them to a systematic taxonomic treatment.

The Western Ghats is one of the 34 global biodiversity hotspots of the world. It is a narrow stretch running approximately 1600 km from the hills near the border of Gujarat and Maharashtra, South of River Tapti in the North to Kanyakumari in South along the West coast of India covering the states of Maharashtra, Goa, Karnataka, Tamil Nadu and Kerala. The forests along the Southern Western Ghats are the most species-rich ecological region in peninsular India with respect to species diversity and endemism. About eighty percent of the flowering plant species of the entire Western Ghats are found in this ecological region. It is expected that intensive floristic studies giving due emphasis to correct identity, distribution, present status and extent of threat if any, endemism and the dynamism have tremendous significance to safeguard biodiversity of this fragile area.

II. SURVEY AREA

The Nilgiris are the most beautiful mountain range in southern India, and its Shola forests vegetation. The mountain range looks so beautiful with patches of forest in the grassland. The thick forest vegetation has high vegetation of endemic and endangered flora and fauna. In view of exploitation and conservation wild medicinal plants from the Sholas of Nilgiris an attempt has been made to take up the study.

III. MATERIAL AND METHOD

The present investigation was carried out in Shola forests of Nilgiri district to collect and document information about medicinal plants used by the tribal and local community living in Nilgiri district. The survey was conducted during September 2021 to September 2022. The medicinal plants growing in natural habitats of Shola forest were collected, identified and authenticated with the help of valid references. The same time plant species were collected and herbarium sheets were prepared by traditional method and were deposited in Department of Molecular Biology, Orbito Asia Diagnostics, Coimbatore. The details on vernacular name of the plant, family, mode of seed dispersal, fruit colour, status of the plants and mode of consumption were registered and these details were collected from various informants through direct interviews. The tribal and local community people inhabiting...
in the borders of Shola forest had a sound knowledge about the medicinal plants around their place and they regularly consume these plants for healthy and nutritious life style.

IV. RESULT AND DISCUSSION

4.1. Documentation of Medicinal Flora

A total of 42 species belonging to 28 families and 31 genera were collected from different areas of Nilgiris in and around Coonoor and Ooty (Table 1). The dominant families Rosaceae and Passifloraceae with 4 species each and similar the result was reported 9. Myrtaceae and Rhamnaceae with 3 species each, Berberidaceae, Elaeocarpaceae, Moraceae, Solanaceae were represented by 2 species and other families were represented with single species (Fig. 1). The dominant genera were identified, of which Passiflora were represented with 4 species, Ziziphus and Rubus were represented by 3 species, Eleocarpus, Smilax, Syzygium, Smilax and Ficus were represented with 2 species and other plants were represented with single genera (Fig. 2).

Figure 1: Dominant families in the sholas of Nilgiris

Figure 2: Dominant genera in the sholas of Nilgiris
<table>
<thead>
<tr>
<th>S.No</th>
<th>Botanical Name</th>
<th>Family</th>
<th>Local Name</th>
<th>Habit</th>
<th>Status</th>
<th>Part Used</th>
<th>Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td><em>Ficus benghalensis</em> L.</td>
<td>Moraceae</td>
<td>Aalamaram</td>
<td>Tree</td>
<td>Common</td>
<td>Bark</td>
<td>Antidiabetic, anti-inflammatory, Antitumor, gastric ulcers, Skin diseases</td>
</tr>
<tr>
<td>3.</td>
<td><em>Passiflora edulis</em> Sims</td>
<td>Passifloraceae</td>
<td>Thatboot</td>
<td>Climber</td>
<td>Common</td>
<td>Fruit</td>
<td>Antioxidant, Anti-hypertensive, Anti-tumor, Hypolipidemic activities</td>
</tr>
<tr>
<td>5.</td>
<td><em>Capsicum frutescens</em> L.</td>
<td>Solanaceae</td>
<td>Sini milaga</td>
<td>Herb</td>
<td>Common</td>
<td>Fruit</td>
<td>Arthritis, Rheumatism, Neuralgia, Lumbago and Chilblains</td>
</tr>
<tr>
<td>8.</td>
<td><em>Rubus moluccanus</em> L.</td>
<td>Rosaceae</td>
<td>Sevapu Mullu Palam</td>
<td>Shrub</td>
<td>Common</td>
<td>Fruit</td>
<td>Anti-inflammatory, Antioxidant, Anticancer, Antimicrobial, and Anti-Alzheimer activities</td>
</tr>
<tr>
<td>9.</td>
<td><em>Annona reticulata</em> L.</td>
<td>Annonaceae</td>
<td>Seetha</td>
<td>Small Tree</td>
<td>Common</td>
<td>Fruit</td>
<td>Helminthic, insecticides, stptic epilepsy, tumor, toothache, dysentery</td>
</tr>
<tr>
<td>10.</td>
<td><em>Ziziphus oenoplia</em> (L.) Miller</td>
<td>Rhamnaceae</td>
<td>Kodi elanthai</td>
<td>Small Tree</td>
<td>Common</td>
<td>Fruit</td>
<td>antioxidant, hepatoprotective and cytotoxic activities</td>
</tr>
<tr>
<td>11.</td>
<td><em>Vaccinium leschenaultii</em> Wight</td>
<td>Ericaceae</td>
<td>Kalavu</td>
<td>Small Tree</td>
<td>Common</td>
<td>Fruit</td>
<td>Anti-inflammatory and Anti-analgesic activity</td>
</tr>
<tr>
<td>12.</td>
<td><em>Ficus racemosa</em> L.</td>
<td>Moraceae</td>
<td>Athi</td>
<td>Tree</td>
<td>Common</td>
<td>Fruit</td>
<td>Hepatoprotective, Chemopreventive, Antidiabetic, Antipyretic, Antitussive and Antidiuretic activity</td>
</tr>
<tr>
<td>13.</td>
<td><em>Garcinia gummi-gutta</em> (L.) Robs.</td>
<td>Clusiaceae</td>
<td>kudam puli</td>
<td>Tree</td>
<td>Common</td>
<td>Fruit</td>
<td>edema, delayed menstruation, ulcers, open sores, hemorrhoids, fever, rheumatism</td>
</tr>
<tr>
<td>14.</td>
<td><em>Fragaria nilgerrensis</em> Schltdl. ex J.Gay</td>
<td>Rosaceae</td>
<td>Kattu Strawberry</td>
<td>Herb</td>
<td>Endemic</td>
<td>Fruit</td>
<td>Cancer, diabetes</td>
</tr>
<tr>
<td>15.</td>
<td><em>Syzygium densiflorum</em> Wall. ex Wt. &amp; Arn.</td>
<td>Myrtaceae</td>
<td>Naval</td>
<td>Endemic</td>
<td>Fruit</td>
<td>Neuropathy, Cardiovascular diseases, Ulcers and Amputations</td>
<td></td>
</tr>
</tbody>
</table>
17. **Ziziphus rugosa** Lam. | Rhamnaceae | Kattu elanthi | Small Tree | Common | Fruit | Ulcer, Skin disease, Cough, Diarrhoea and Hypotension.
18. **Passiflora ligularis** A.Juss. | Passifloraceae | English thatboot | Climber | Common | Fruit | Mumps, relieve bruises, control infections, alleviate back pain, anti-diarrheal, and stomach
19. **Passiflora mollissima** (Kunth) Bailey | Passifloraceae | Kova Palam | Climber | Common | Fruit | Anti-inflammatory
20. **Rubus ellipticus** Smith | Rosaceae | Mullu Pazham | Climber | Common | Fruit | anti-inflammatory, analgesic, antipyretic, antiproliferative, antitumor, antioxidant, anticonvulsant
21. **Elaeocarpus variabilis** Zmarzty | Elaeocarpaceae | Peru Vikki | Tree | Common | Fruit | Anti-asthmatic, anxiolytic, anti-depressant, anti-diabetic
22. **Phyllanthus emblica** L. | Phyllanthaceae | Nelli | Tree | Common | Fruit | Anti-diabetic, anti-microbial, anti-inflammatory, analgesic, anti-mutagenic
23. **Rhodomyrtus tomentosa** (Aiton) Hassk. | Myrtaceae | Thavittu Koya | Tree | Common | Fruit | Diarrhea
24. **Rubus niveus** Wall. | Rosaceae | English Mullu | Climber | Common | Leaf | Antibacterial, anti-inflammatory and pain relief
25. **Smilax zeylanica** L. | Smilacaceae | kal thamarai | Climber | Common | Leaf | Antimicrobial, Cytotoxic, Analgesic, Anti-inflammatory, Antidepressant, Antitumor
26. **Toddalia asiatica** (L.) Lam. | Rutaceae | Sirusoori | Climber | Common | Leaf | Anti-inflammatory and Analgesic, Hemostatic Coagulation, Anti-tumor
27. **Zehneria maysorensis** (Wight & Arn.) Arn. | Cucurbitaceae | Naai Pagal | Climber | Common | Leaf | Gypenosides, Phingolipids, Sonhafouonic Acid with Antimicrobial and Antitumor activities
28. **Argemone mexicana** L. | Papaveraceae | Kudiyotti | Herb | Common | Leaf | Antimicrobial, Larvicidal. Chemosterilant, Nematicidal and Wound healing
29. **Oxalis corniculata** L. | Oxalidaceae | Puliyan | Herb | Common | Leaf | anti-diabetic, anti-inflammatory immunomodulatory effects,
30. **Phoenix loureiroi** Kunth | Areceaceae | Chiru Eecham | Shrub | Common | Leaf | Antitumorigenic, Antimicrobial, Anti-inflammatory, Gastroprotective and Immunostimulant activities
31. **Abutilon striatum** Dickson | Malvaceae | Thuthi | Shrub | Common | Leaf | Headache
32. **Berberis tinctoria** Leschen. | Berberidaceae | Oosikala | Shrub | Common | Leaf | Diarrhea and intestinal parasitic infections
33. **Ziziphus mauritiana** Lam. | Rhamnaceae | Elanthi | Small Tree | Common | Leaf | Anti-microbial, Anti-diarrheal, Anti-diabetic, Hepatoprotective and Anti-cancer
34. **Elaeocarpus munronii** (WL) Masters | Elaeocarpaceae | Rudraksham | Tree | Common | Leaf | Antidiabetic Antiarthritic
35. **Cayratia pedata** Vitaceae | Vitaceae | Gualilata | Climber | Endemic | Leaf | Antimicrobial, Anti-ulcer, Anti-
### Table 1: Antimicrobial and Pharmacology Activities of Each Plant

<table>
<thead>
<tr>
<th>Plant Name</th>
<th>Family</th>
<th>Common Name</th>
<th>Life Form</th>
<th>Part Used</th>
<th>Antimicrobial Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Wall.) Gagnep.</td>
<td>Primulaceae</td>
<td>Riti Peria-uni</td>
<td>Shrub</td>
<td>Leaf</td>
<td>Anti-inflammatory, Anti-arthritic, Anti-diarrheal, Anti-oxidant and Anti-nociceptive.</td>
</tr>
<tr>
<td>Maesa indica (Roxb.) A. DC.</td>
<td>Primulaceae</td>
<td>Poolaki zhangu</td>
<td>Herb</td>
<td>Rhizome</td>
<td>Analgesic, anti-inflammatory, cytotoxic, antimalarial</td>
</tr>
<tr>
<td>Smilax aspera L.</td>
<td>Smilaceae</td>
<td>Kizhanna</td>
<td>Climber</td>
<td>Root</td>
<td>Tonic, Relief, Inflammation or Irritation, have a Detoxifying effect, Increase frequent Urination and used as Stimulant</td>
</tr>
<tr>
<td>Mahonia lecshenaultii (Wallich ex Wight &amp; Arnott) Takeda</td>
<td>Berberidaceae</td>
<td>Manjanathi</td>
<td>Small Tree</td>
<td>Root</td>
<td>Anticancer</td>
</tr>
<tr>
<td>Hemidesmus indicus (L.) R. Br.</td>
<td>Apocynaceae</td>
<td>Nannari</td>
<td>Twiner</td>
<td>Root</td>
<td>Anti-atherogenic, Anti-spasmodic, Memory enhancing, Immunopotentiating and Anti-Inflammatory</td>
</tr>
<tr>
<td>Gloriosa superba L.</td>
<td>Colchicaceae</td>
<td>Kallappai Kilangu</td>
<td>Climber</td>
<td>Tuber</td>
<td>Diarrhea, Tonic, Anthelmintic and also feeds to cows and goats</td>
</tr>
<tr>
<td>Arisaema lecshenaultii Blume</td>
<td>Araceae</td>
<td>Pambucholam</td>
<td>Herb</td>
<td>Tuber</td>
<td>Urinary tract diseases, Colitis, Eczema, Purging, Gonorrhea, Piles and Haemorrhoids</td>
</tr>
</tbody>
</table>

### 4.2. Life Form Analysis

Analysis of habit form indicates that 13 plants were climber, 9 plants were trees and 7 plants were herbs, 6 plants were shrubs and 1 twiner (Fig. 3). Several authors have reported that Herbs are primary source of medicine (40%) followed by trees species (28%), shrubs (15%) and climbers (17%) were most of the indigenous communities inhabiting in the forest environment completely depend on these plant species. The worked on Yercaud hills which harbours more herbaceous plants when as compared to trees, shrubs and climbers. The rate of growth of woody plants are slow and are long lived than herbaceous plant species. Plant taxa are very high at the end of October and are very low at May especially at summer. It has been identified that climbers are plants which depend on other plants for their support and growth as per the present study climbers are dominant life form which holds on the trees, herbs and shrubs.

### 4.3. Life form and Parts Used

More than 9500 wild plants are used in India by the rural people for various purposes like medicine, food, fodder, fuel, fibre and other miscellaneous purposes. As per the present study medicinal preparation play a major role in living system were the major plant parts used are fruits (22%) followed by leaves (13), root (3), tuber (2), rhizome and bark (1). Many indigenous communities throughout the world have reported that leaves are mostly utilized for medicinal preparation were leaves (56%) were most frequently used for the preparation of medicine as separate medicine and combination drugs which is followed by bark and whole plant (7%) each, roots (6%), fruit and seeds (5%) each, stem, flowers and latex (4% each) and bulb (2%) . Mostly leaves are preferred since it has been identified to have high antioxidant potential it can be collected easily than the other plant parts (Fig. 4.)

![Figure 3: Life form analysis](image-url)
4.4. Medicinal Importance

The data of the collected plants showed that 42 species were medicinally important that are used to treat various diseases such as antidiabetic, anti-inflammatory, anti-tumour, gastric ulcer, skin disease, cancer, Alzheimer disease, Parkinsons, anti-hypertensive, hypolipidemic, antifungal, arthritis, rheumatism, lumbar, anti-astmatic, diuretic, anti-septic, anti-analgesic anti-proliferative, sedative, anti-microbial, anti-pyretic, anthelmintic. The rural community in and around the study area have reported plants have high medicinal importance and several authors have reported the same. Among the tribal community paste preparation are highly used in treatment of various ailments. Aboriginal community tribes mostly use medicinal plant species in treatment of various diseases like anemia, diabetes, malaria, tuberculosis, whooping cough, diuretic, jaundice, HIV, asthma, purgative, fever and headache.

The ethnomedical plants in Tamil Nadu has reported the use of various plant parts on several diseases and medicinal preparation such as decoction, paste, raw, cooked, powder, inhalation, burn ash etc. for various diseases. Such documentations are to be taken seriously for further scientific validation.

V. CONCLUSION

Many species in tropical regions are seriously threatened by human development because of consequent deforestation, fragmentation, hunting and the illegal pet trade. The reason stated behind that is the huge communication gap and lack of knowledge in between urban and indigenous population, where the ethnic people survived with the animals in wild without harm. Now recently new generations have taken steps in searching and documenting the traditional knowledge and have started to learn the mutual relation in between them. Thus documenting the knowledge and identifying the relationship is in urgent need to survive in a healthy environment.

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