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RESEARCH ARTICLE

ETHNOBOTANICAL SIGNIFICANCE OF THE FLORA OF UPPER GUERNSEY AND LOWER GUERNSEY REGIONS IN COONOOR, THE UPPER NILGIRIS, TAMIL NADU

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ABSTRACT

A survey was conducted to collect information regarding medicinal and traditional uses of the plant resources from the study areas Upper Guernsey and Lower Guernsey Regions in Coonoor, Nilgiri District, and Tamil Nadu. 154 plant species belonging to 118 genera and 63 families. Among them 134 Dicotyledons (87%) and 20 Monocotyledons (13%) comprising 63 families. In dicotyledons Polypetalae, Gamopetalae and Monochlamydeae are represented by (59, 46&29) species. A fairly good number of 98 species about 64 % in this floristic list are recognized as ethno-medicinally valued. The dominant families in the study area which are used by Kurumba herbal healers are Asteraceae represented by 16 species, Geraniaceae represented by 6 species, Liliaceae represented by 5 species, Solanaceae, Polygonaceae and Lamiaceae each are represented by 4 species respectively. Majority of the medicines prepared by the medicinal plants were taken in raw, paste, powdered, decoction and infusion. In some cases, either fruit, leaves, stem or flowers are used as medicine

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INTRODUCTION

India is recognized as a country that is rich in all aspects of biodiversity like ecosystem, species and genetic diversity mainly due to its tropical location, disparate physical features and climatic types (Jain 1987). The continent has well-documented traditional knowledge, long standing practice of traditional medicine and the potential for social and economic development of medicinal and aromatic plants in primary health care and industrial scale production (Samyudurai *et al.*, 2012). India has a richness of ethnomedicine because the floral diversity and rich endemic taxa (Senthilkumar *et al.*, 2006). Plants used in traditional medicine have stood up to the test of time and contributed many novel compounds for preventive and curative medicine to modern science. Traditional medicine especially the folk herbal medicines have recently been receiving heightened interests the world over. Such age-old health care systems have been developed in different corners of the world where they were living in close interaction with the nature (Katewa and Galav, 2005).

Ethnobotany is a multidisciplinary science that deals with direct relationship between man and plants. The use of plants in curing and healing is as old as man himself (Hedberg, 1987).

Traditional medicine or ethnomedicine is a health care practice that has been transmitted orally from generation to generation through traditional healers with an aim to cure different ailments, and is strongly associated to religious beliefs and practices of the indigenous people (Hemant and Bharat, 2013). The use of medicinal plants in the treatment of diseases was conceived by tribal people thousands of years ago. Ethnic groups are the repositories of the knowledge of herbal medicine. Many tribal groups have been using several plant products for medicinal preparations and these medicines are known as ethno-medicine (Silja *et al.*, 2008).

In tribal medicinal practice, the tribal healers blend their inherited cultural knowledge of psychological, social belief system with cultic features (Sankar, 1993). In Nilgiri district Kurumbas are divided into five ethnic groups Alu (or) Palu Kurumbas, Betta Kurumbas, Jenu Kurumbas, Mullu Kurumbas and Urali Kurumbas. The Alu Kurumbas are found only in the taluks of Kotagiri, Coonoor and Kundah regions. Alu means milk and also it gives the meaning of sharing (Parthasarathy, 2003). The Alu Kurumbas use plant materials like flowers, roots, leaves, dry bark of the tree trunk, tender twigs, climbing tendrils, twining shrubs, seeds *etc.* To prepare medicine, depending upon the nature of the disease, they mix the plant materials with jaggery, breast milk, black goat milk, honey, jeeraga, small onion, casacasa, pepper, turmeric *etc.*

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They avoid strictly using ground nut oil, tamarind and stone salt. In early days, they were not supposed to store the medicines, only depending on green plants and herbs, but now-a-days they prepare powders as per their proportionate mixture of plant materials with other mixtures. Usually the Alu Kurumba healers select the times between 5:30 pm to 6:12 pm during sun set but before giving the medicine, the healers offer medicine to Gods, Kuribattraya as a god and Maasani as goddess. They also worshipped a round black stone kept inside the cave by the name of 'Hiriadeva'. Kurumbas in their extra ordinary spiritual powers in the disguise as healers by curing ailments of superior Toda people and Badaga people.

The Alu Kurumbas, before giving the medicine, the healers study the patients skin colour, eyes gestures, tongue rolling, corners of the fingers of hands and legs and the tightness of the head hair. Then the healers also observe the colour of the urine of the patient and the smell of the mouth and ears. They are giving medicines only during evening times after the mantra (Parthasarathy, 2006). The Coonoor occupies an altitude which is a transient zone between montane temperate forest and subtropical forest. Alu Kurumbas the tribes inhabiting near the locality utilizes the plant resource for healing.

MATERIALS AND METHODS

Ethno-botanical explorations were carried out during 2014-15 in 49 tribal settlements of the Kurumba tribes in the taluk Coonoor in Nilgiri District. The Ethno-botanical information related to various diseases were collected from the tribal healers belonging to these communities who practice herbal medicine and documented it with the help of semi structured interviews which consist of the information highlighting their expertise to cure the disease, plant part recommended as medicine, mode of application, drug preparation, dosage and duration, common names of the plants *etc.* During the process of documentation consistent explorations were carried out to the specific habitat for identification and collection of the particular therapeutic plant cited by the healer. The information gathered was confirmed by different tribal group's dwelling in different places of the study area.

RESULTS

A survey was conducted to collect information regarding medicinal and traditional uses of the plant resources, from the study areas Upper Guernsey and Lower Guernsey regions in Nilgiri district, Tamil Nadu.

The photographs showing the Kurumba tribal people settlements in the study area Guernsey



Temple in the study area Guernsey



The table check list of ethno-medicinally valued plants collected from the study area

S.No	Name of the species	Family	Part used	Mode of application
1.	<i>Abutilon indicum</i> G.Don.	Malvaceae	Whole Plant	Powder
2.	<i>Achyranthes aspera</i> L.	Amaranthaceae	Root	Decoction
3.	<i>Ageratum conyzoides</i> L.	Asteraceae	Whole Plant	Decoction
4.	<i>Anona squamosa</i> L.	Annonaceae	Whole Plant	Decoction
5.	<i>Artemisia nilagirica</i> (Clarke).	Asteraceae	Leaves	Juice
6.	<i>Artemisia Parviflora</i> B.-Ham.	Asteraceae	Leaves	Decoction
7.	<i>Arisaema leschenaultii</i> Blume.	Araceae	Whole Plant	Decoction
8.	<i>Arisaema tortuosum</i> Schott .	Araceae	Root, Tubers, Seed.	Powder
9.	<i>Asparagus racemosus</i> Willd.	Liliaceae	Root	Powder
10.	<i>Asparagus subulatus</i> Steud.	Liliaceae	Root, Tubers.	Raw Material
11.	<i>Bauhinia purpurea</i> L.	Mimosaceae	Bark, Flowers, Root.	Powder
12.	<i>Berberis tinctoria</i> Lesch.	Berberidaceae	Wood, Root, Root bark.	Paste
13.	<i>Biophytum intermedium</i> Wight.	Geraniaceae	Stem	Extract
14.	<i>Bidens pilosa</i> L.	Asteraceae	Leaves, Root, Seed.	Powder
15.	<i>Bupleurum mucronatum</i> Wt & Arn.	Apiaceae	Seeds	Decoction
16.	<i>Cardamine africana</i> L.	Brassicaceae	Leaves, Flowers.	Extract
17.	<i>Celtis wightii</i> Planch.	Ulmaceae	Bark	Powder
18.	<i>Celtis tetrandra</i> Roxb.	Ulmaceae	Seeds	Juice
19.	<i>Centella asiatica</i> (L.).	Apiaceae	Whole Plant	Powder
20.	<i>Cinchona officinalis</i> L.	Rubiaceae	Bark	Powder
21.	<i>Cleistanthus collinus</i> Benth.	Malpighiaceae	Leaves	Extract
22.	<i>Conyza japonica</i> Less.	Asteraceae	Aerial Parts	Paste
23.	<i>Commelina clavata</i> C.B.Clar.	Commelinaceae	Shoots, Leaves.	Paste
24.	<i>Crepis japonica</i> Benth.	Asteraceae	Whole Plant	Decoction
25.	<i>Cyperus rotundus</i> L.	Cyperaceae	Tubers	Decoction
26.	<i>Dendrophthoe neilgherrense</i> Wt.	Loranthaceae	Leaves	Extract
27.	<i>Dicrocephala latifolia</i> DC.	Asteraceae	Flowers, Shoots, Leaves, Stem.	Decoction
28.	<i>Disporum leschenaultianum</i> D. don.	Liliaceae	Tubers	Paste
29.	<i>Dodonaea viscosa</i> L.	Sapindaceae	Bark	Paste
30.	<i>Drymaria cordata</i> Willd.	Caryophyllaceae	Whole Plant	Juice
31.	<i>Dysoxylum malabaricum</i> Bedd.Ex.Hiern.	Meliaceae	Wood, Seeds.	Decoction
32.	<i>Elaeagnus latifolia</i> L.	Elaeagnaceae	Fruit	Juice
33.	<i>Elaeocarpus oblongus</i> Gaertn.	Elaeocarpaceae	Fruit	Juice
34.	<i>Elaeocarpus munroii</i> (Wl.)Masters.	Elaeocarpaceae	Fruit	Decoction
35.	<i>Elatostemma lineolatum</i> Wight.	Urticaceae	Leaves	Extract
36.	<i>Embelia ribes</i> Burm. f.	Myrsinaceae	Whole Plant	Decoction
37.	<i>Emilia sonchifolia</i> (L.) DC.	Asteraceae	Whole Plant	Decoction
38.	<i>Euphorbia pulcherrima</i> Willd.Ex.Klotzsch.	Euphorbiaceae	Leaves (White Latex).	Paste
39.	<i>Euphorbia milii</i> Des Moul.	Euphorbiaceae	Leaves (Red Latex).	Paste
40.	<i>Evodia lunu-akeda</i> (Gaertn.) Merr.	Rutaceae	Whole Plant	Drug Form
41.	<i>Fagraea obovata</i> Wall.	Gentianaceae	Leaves	Decoction
42.	<i>Garcinia cambogia</i> L.	Clusiaceae	Whole Plant	Extract
43.	<i>Galinsoga parviflora</i> Cav.	Asteraceae	Whole Plant	Drug Form/ Juice.
44.	<i>Gnaphalium luteo-album</i> Linn.	Asteraceae	Leaves, Flowers.	Paste
45.	<i>Gordonia obtusa</i> Wall.	Ternstroemiaceae	Leaves	Extract
46.	<i>Gynura nitida</i> DC.	Asteraceae	Rhizome	Decoction
47.	<i>Helichrysum orientale</i> (L.) Gaertn.	Asteraceae	Flower	Decoction
48.	<i>Hydrocotyle javanica</i> Thunb.	Apiaceae	Leaves	Extract
49.	<i>Impatiens scapiflora</i> B.Heyne.	Geraniaceae	Leaves	Extract
50.	<i>Impatiens leschenaultii</i> Wall.	Geraniaceae	Whole Plant	Decoction
51.	<i>Jacaranda mimosifolia</i> D.Don.	Bignoniaceae	Leaves, Bark.	Juice
52.	<i>Kirkia wilmsii</i> Engl.	Simarubiaceae	Leaves	Juice
53.	<i>Knoxia mollis</i> Wight & Arn.	Rubiaceae	Root	Paste
54.	<i>Lantana camara</i> L.	Verbenaceae	Whole Plant	Paste / Extract
55.	<i>Leucas hirta</i> (Heyne ex Roth) Spreng.	Lamiaceae	Leaves	Extract
56.	<i>Leucas aspera</i> Willd&Spr.	Lamiaceae	Flower	Juice
57.	<i>Lycopersicon esculentum</i> Mill.	Solanaceae	Fruit, Root.	Decoction
58.	<i>Macaranga indica</i> Wt.	Euphorbiaceae	Fruit.	Paste / Decoction
59.	<i>Melothria perpusilla</i> Cogn.	Cucurbitaceae	Whole Plant	Decoction
60.	<i>Michelia nilagirica</i> Zenk.	Magnoliaceae	Flowers	Powder / Decoction
61.	<i>Neolitsea zeylanica</i> (Nees)Merr.	Lauraceae	Whole Plant	Decoction
62.	<i>Oxalis corniculata</i> L.	Geraniaceae	Whole Plant	Decoction
63.	<i>Oxalis latifolia</i> Kunth.	Geraniaceae	Whole Plant	Decoction
64.	<i>Oxalis pes-caprae</i> L.	Geraniaceae	Whole Plant	Eaten as raw or Boiled
65.	<i>Passiflora edulis</i> Sims.	Passifloraceae	Fruit	Eaten as raw
66.	<i>Physalis peruviana</i> L.	Solanaceae	Leaves	Juice
67.	<i>Piper brachystachyum</i> Wall.	Piperaceae	Stem, Fruit.	Paste
68.	<i>Piper schmidii</i> Hook.f.	piperaceae	Aerial Parts	Extract
69.	<i>Picris hieracioides</i> L.	Asteraceae	Leaves	Paste
70.	<i>Plectranthus mollis</i> Spreng.	Lamiaceae	Leaves	Extract
71.	<i>Plantago major</i> Hk.f.	Plantaginaceae	Leaves	Decoction / Paste
72.	<i>Polygonum alatum</i> Ham.	Polygonaceae	Rhizome	Paste
73.	<i>Polygonum chinense</i> Linn.	Polygonaceae	Whole Plant	Decoction
74.	<i>Polygonum strigosum</i> R. Br.	Polygonaceae	Leaves	Paste
75.	<i>Populus deltoides</i> W. Bartram ex Marshall.	Salicaceae	Leaves, Bark.	Decoction / Powder

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76.	<i>Rauwolfia verticillata</i> (Lour.) Baill.	Apocynaceae	Leaves	Extract
77.	<i>Rhodomirtus tomentosa</i> W.	Myrtaceae	Whole Plant	Decoction
78.	<i>Rhododendron nilagiricum</i> Zenk.	Ericaceae	Flower, Leaves.	Powder
79.	<i>Rubus ellipticus</i> Sm.	Rosaceae	Roots, Shoots.	Juice / Paste
80.	<i>Rubus racemosus</i> Roxb.	Rosaceae	Leaves, Fruits.	Extract
81.	<i>Rubus moluccanus</i> L.	Rosaceae	Fruit	Eaten as Raw / Paste
82.	<i>Rubia cordifolia</i> L.	Rubiaceae	Whole Plant	Decoction
83.	<i>Rumex nepalensis</i> Spreng.	Polygonaceae	Leaves	Extract
84.	<i>Salvia leucantha</i> Cav.	Lamiaceae	Whole Plant	Decoction
85.	<i>Senecio polycephalus</i> (DC.) Clarke.	Asteraceae	Whole Plant	Extract
86.	<i>Sida rhomboidea</i> Roxb.	Malvaceae	Leaves, Stem, Root.	Extract / Powder
87.	<i>Smilax wightii</i> A.DC.	Liliaceae	Whole Plant	Decoction
88.	<i>Smilax aspera</i> L.	Liliaceae	Whole Plant	Paste
89.	<i>Solanum xanthocarpum</i> Schrad&Wendl.	Solanaceae	Fruit, Root.	Decoction / Raw
90.	<i>Solanum verbascifolium</i> L.	Solanaceae	Root, Leaves.	Decoction / Paste
91.	<i>Stephania japonica</i> (Thunb.) Miers.	Menispermaceae	Root, Leaves.	Decoction / Powder
92.	<i>Ternstroemia japonica</i> (Thunb.).	Ternstroemiaceae	Root, Leaves, Stem.	Decoction / Powder
93.	<i>Toddalia asiatica</i> (L.) Gamb.	Rutaceae	Root, Leaves.	Extract / Paste
94.	<i>Toddalia aculeate</i> (Sm.) Pers.	Rutaceae	Root, Leaves, Bark.	Powder / Extract
95.	<i>Trema orientalis</i> (L.) Bl.	Urticaceae	Leaves, Bark.	Decoction
96.	<i>Urena lobata</i> L.	Malvaceae	Leaves, Root.	Extract
97.	<i>Ventilago maderaspatana</i> Gaertn.	Rhamnaceae	Rhizome, Root, Seeds.	Powder
98.	<i>Zenkeria elegans</i> Trin.	Poaceae	Leaves	Extract

FIGURE:1: THE CHART SHOWING THE DICOTYLEDONS AND MONOCOTYLEDONS FOUND IN THE STUDY AREA

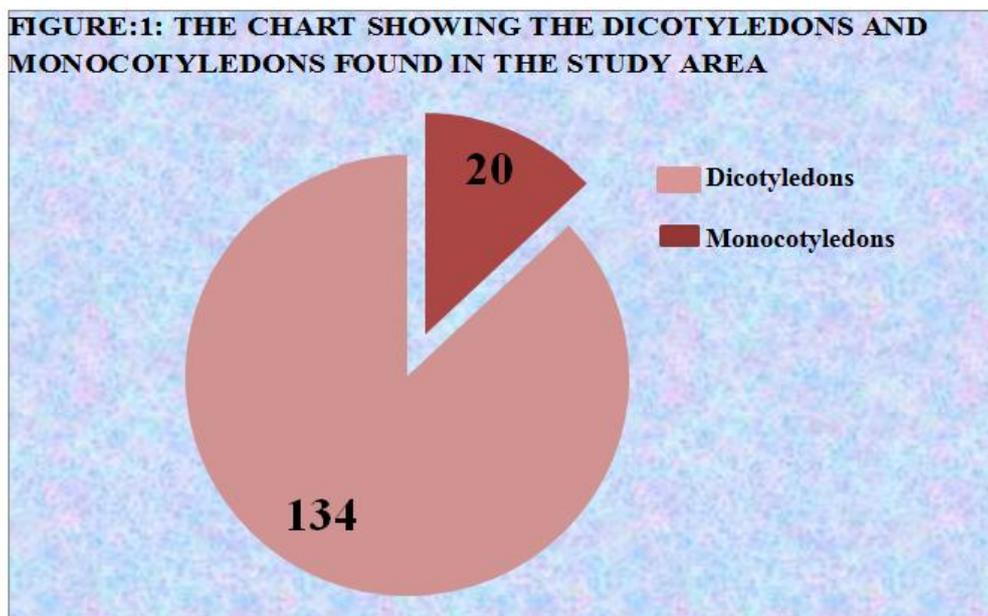
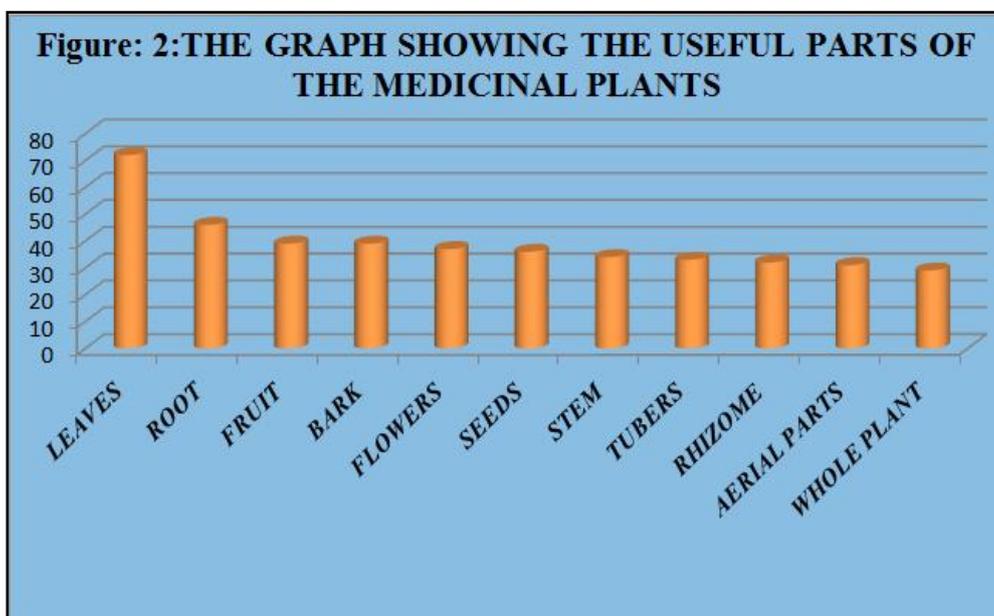


Figure: 2: THE GRAPH SHOWING THE USEFUL PARTS OF THE MEDICINAL PLANTS



A fairly good number of 98 species about 64 % in this floristic list are recognized as ethno-medicinally valued plants. The dominant families which are used as herbal medicinal plants used by Kurumba herbal healers in the study area are Asteraceae represented by 16 species, Geraniaceae represented by 6 species, and Liliaceae represented by 5 species, Solanaceae, Polygonaceae and Lamiaceae each are represented by 4 Species respectively.

The families Malvaceae, Apiaceae, and Rubiaceae are represented by 3 species, Euphorbiaceae and Rutaceae each are represented by 3 species. Family Rosaceae represented by 3 species. The families Urticaceae and Ternstroemiaceae each are represented by 2 species and Araceae, Ulmaceae and Elaeocarpaceae are represented by 2 species. The remaining families Amaranthaceae, Mimosaceae, Anonaceae, Convolvulaceae, Berberidaceae, Brassicaceae, Malpighiaceae, Commelinaceae, Cyperaceae, Sapindaceae, Loranthaceae, Caryophyllaceae, Myrsinaceae, Myrtaceae, Meliaceae, Elaeagnaceae, Clusiaceae, Poaceae, Verbenaceae, Bignoniaceae, Cucurbitaceae, Magnoliaceae, Lauraceae, Passifloraceae, Salicaceae, Apocyanaceae, Ericaceae, Gentianaceae, Plantaginaceae, Rhamnaceae, Simarubiaceae are represented by a single species.

Various plant parts used by Alu Kurumbas such as leaves represented by 72 species (47%), roots represented by 46 species (30%), fruits represented by 39 species (25%), bark represented by 39 species (25%) respectively. Flowers represented by 37 species (24%), seeds represented by 36 species (23%). Aerial parts represented by 31 species (20%) and whole parts of the plant represented by 29 species (19%) respectively.

The medicinally valued plants used by the local tribal communities based on their traditional folkloric knowledge. The herbal medicines are prepared in different forms such as decoction of herbal medicine was prepared by 39 species (25%). Extract of herbal medicine were prepared by 25 species (16%), paste of herbal medicine were prepared by 20 species (13%) respectively. Powder form of herbal medicine were prepared by 17 species (10%). Juice of herbal medicine was prepared by 10 species (6%). Raw material such as edible fruit, leaves which is represented in 6 species (4%).

DISCUSSION

In Indian traditional medicine, herbs are used as an integral part of healthcare systems. Besides healthcare, herbs are also used for beautification of the body and for preparation of various cosmetics (Sharma *et al.*, 2003). Herbal medicine has been widely practiced from time immemorial to the present day, all over much more attention than allopathic drugs because of their without side effects, adverse cost efficacies throughout the world (Ayyanar and Ignacimuthu, 2005). Ethno-medicine refers to the study of traditional medical practice which is concerned with the cultural interpretation of health, diseases, illness and also addresses the healthcare seeking process and healing practices of people (Krippner, 2003). The practice of ethno-medicine is a complex multi-disciplinary system constituting the use of plants, spirituality and the natural

environment and has been the source of healing for people for millennia (Lowe *et al.*, 2000, Abu-Rabia, 2005). Here the plants are playing a vital role in every ethnic community. In India it is reported that traditional healers use 2500 plant species as medicine (Pei, 2001). The documentation of indigenous knowledge on the utilization of local plant resources by different ethnic groups or communities is one of the main objectives of ethno-botanical research (Shrestha, 1998). The Western Ghats of Nilgiris is very rich in its medicinal wealth. The forests and hills of this region are a treasure house of about 700 medicinal plants, out of which some are used for traditional and folk medicinal practices (Babu *et al.*, 2006). Many are exploited commercially for their active principles and their commercial value (Kala, 2005).

Kurumba folk and the medicinal man use a variety of plant products like leaves, barks, roots, fruits etc in different combination to cure various diseases. They use two or more remedies for the same disease indicating that one is superior to the other. As the local environment is subjected to degradation the non availability of certain species also force them to find an alternative. In conclusion, the shola forests of the upper plateau of the Nilgiris are a unique ecosystem that harbours many plants endemic to the Western Ghats. Most of the species are abundant and widely distributed among sholas, indicating their tolerance to a stressful environment.

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