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Research Article

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

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Abstract

Medicinal plant documentation is a wide field of research to identify the chronicle of indigenous knowledge about plant its usage and scientifically validating the valuable species. Several field trips were carried out in Nilgiri hills between September 2021 – January 2022, covering different seasons, in order to know the phenology of the plants, Intensive and extensive field surveys was done in and around villages in Coonoor and Ooty. A total of 42 plant species belonging to 28 families and 31 genera. The majority of the documented plants were climber (13), tree (9), herb (7), shrub (6) and twiner (1). The part of the plant most frequently used was the fruit (22) followed by leaves (13), root (3), tuber (2), rhizome and bark (1). The main uses of the herbal drug have been reported to have several medicinal importance such as anti-diabetic, anti-inflammatory, anti-tumour, gastric ulcer, skin disease, cancer, alzhimer disease, parkinsons, anti-hypertensive, hypolipidemic, antifungal, arthritis, rheumatism, lumbago, anti-asmatic, diuretic, anti-septic, anti- analgesic, anti-proliferative, sedative, anti-microbial, antipyretic, anthelmintic. During this survey documentation of medicinal plants seems to be identified to have high medicinal importance. *Cayratia pedata*, *Fragaria nilgerrensis*, *Syzygium densiflorum* and *Syzygium grande* are some of the very commonly used medicinal plants. There is a need to document the threats which increase biotic interference and climatic change there is an urgent need to create awareness among the local people for the sustainable utilization as well as conservation of these medicinal plants in their original habitat.

Keywords: Documentation, Nilgiris, Medicinal Plants, Utilization

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 [1]. 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 [2]. 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 [3].

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 [4]. 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 [5].

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 [6,7,8]. At 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).

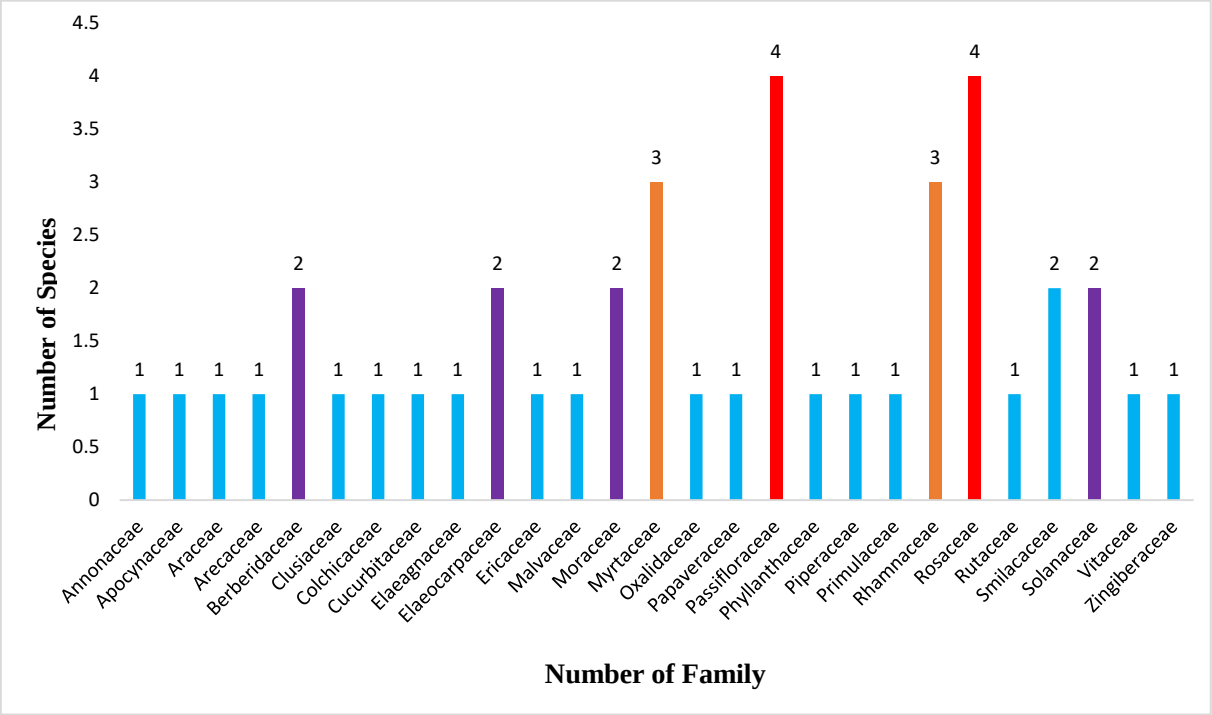

Figure 1: Dominant families in the sholas of Nilgiris

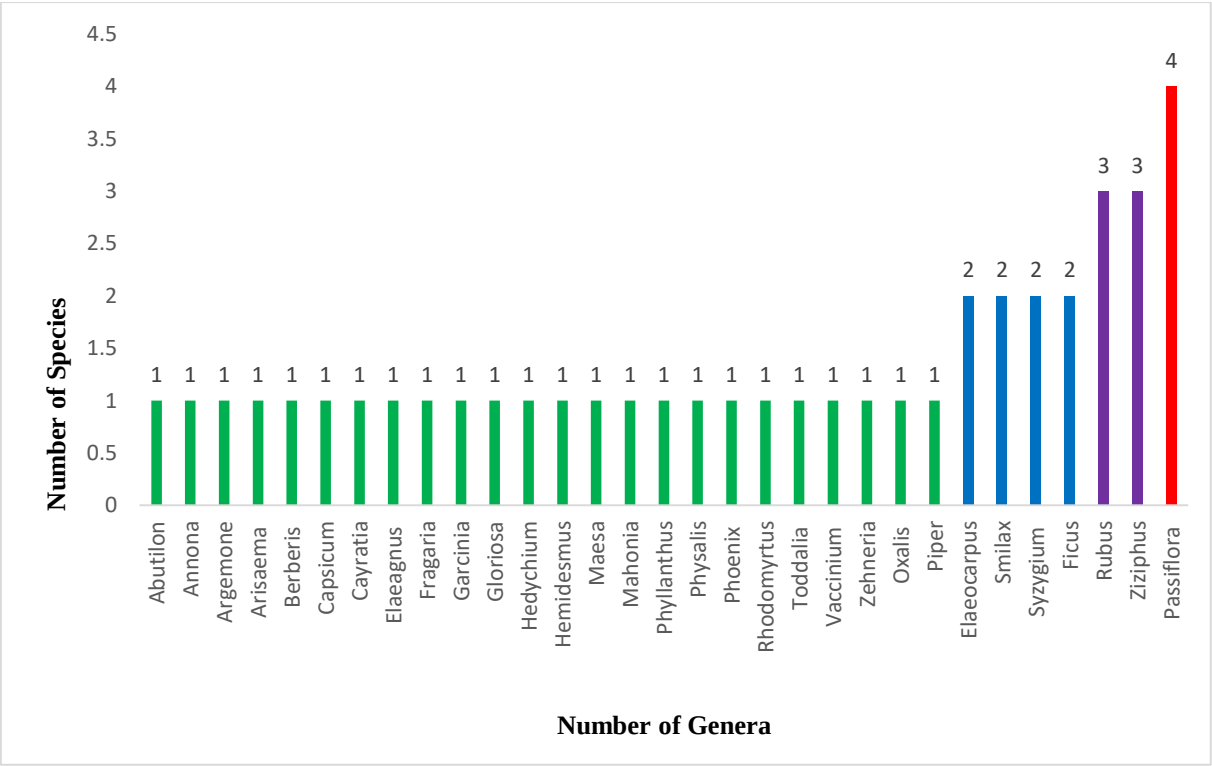

Figure 2: Dominant genera in the sholas of Nilgiris

Table 1: Documentation of medicinal species from the Sholas of Nilgiris.

S.No	Botanical Name	Family	Local Name	Habit	Status	Part Used	Uses
1.	*Ficus benghalensis* L.	Moraceae	Aalamaram	Tree	Common	Bark	Antidiabetic, anti-inflammatory, Antitumor, gastric ulcers, Skin diseases
2.	*Elaeagnus kologa* Schltdl.	Elaeagnaceae	Poolanpazham	Climber	Common	Fruit	Anti-cancer, Antidiabetic,, Alzheimer's disease, and Parkinson's
3.	*Passiflora edulis* Sims	Passifloraceae	Thatboot	Climber	Common	Fruit	Antioxidant, Anti-hypertensive, Anti-tumor, Antidiabetic, Hypolipidemic activities
4.	*Piper schmidtii* Hook. fil.	Piperaceae	Kattu Milagu	Climber	Common	Fruit	Antioxidant, Antimicrobial, Anti-cancer, Antifungal, and Anti-inflammatory
5.	*Capsicum frutescens* L.	Solanaceae	Sini milaga	Herb	Common	Fruit	Arthritis, Rheumatism, Neuralgia, Lumbago and Chilbains
6.	*Physalis peruviana* L.	Solanaceae	Thopli Palam	Herb	Common	Fruit	Anti-asmatic, Diuretic, Anti-septic, Anti-inflammatory, Anti-proliferative, Sedative, Analgesic and Anti-diabetic
7.	*Passiflora leschenaultii* DC.	Passifloraceae	Passion fruit	Shrub	Common	Fruit	Anti-microbial, Analgesic, Anti-nociceptive, Anti-inflammatory and Antipyretic
8.	*Rubus moluccanus* L.	Rosaceae	Sevapu Mullu Palam	Shrub	Common	Fruit	Anti-inflammatory, Antioxidant, Anticancer, Antimicrobial, and Anti-Alzheimer activities
9.	*Annona reticulata* L.	Annonaceae	Seetha	Small Tree	Common	Fruit	Helminthic, insecticides, styptic epilepsy, tumor, toothache, dysentery
10.	*Ziziphus oenoplia* (L.) Miller	Rhamnaceae	Kodi elanthai	Small Tree	Common	Fruit	antioxidant, hepatoprotective and cytotoxic activities
11.	*Vaccinium leschenaultii* Wight	Ericaceae	Kalavu	Small Tree	Common	Fruit	Anti-inflammatory and Anti-analgesic activity
12.	*Ficus racemosa* L.	Moraceae	Athi	Tree	Common	Fruit	Hepatoprotective, Chemopreventive, Antidiabetic, Antipyretic, Antitussive and Antidiuretic activity
13.	*Garcinia gummi-gutta* (L.) Robs.	Clusiaceae	kudam puli	Tree	Common	Fruit	edema, delayed menstruation, ulcers, open sores, hemorrhoids, fever, rheumatism
14.	*Fragaria nilgerrensis* Schltdl. ex J.Gay	Rosaceae	Kattu Strawberry	Herb	Endemic	Fruit	Cancer, diabetes
15.	*Syzygium densiflorum* Wall. ex Wt. & Arn.	Myrtaceae	Naval	Tree	Endemic	Fruit	Neuropathy, Cardiovascular diseases, Ulcers and Amputations
16.	*Syzygium grande* (Wight) Walp.	Myrtaceae	Puli naga	Tree	Endemic	Fruit	Jaundice, Abscesses, Hypertension, Fever Cold, Polydipsia, and Abdominal Pain

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, antidiarrheal, 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 Palm	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,
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	Arecaceae	Chiru Eecham	Shrub	Common	Leaf	Antimutagenic, 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	Gualilata	Climber	Endemic	Leaf	Antimicrobial, Anti-ulcer, Anti-

	(Wall.) Gagnep.						inflammatory, Anti-arthritic, Anti-diarrheal, Anti-oxidant and Anti-nociceptive.
36.	*Maesa indica* (Roxb.) A. DC.	Primulaceae	Riti Peria-unni	Shrub	Common	Leaf	Joint pain, swelling, anti-inflammatory
37.	*Hedychium spicatum* Sm.	Zingiberaceae	Poolaki zhangu	Herb	Common	Rhizome	Analgesic, anti-inflammatory, cytotoxic, antimalarial
38.	*Smilax aspera* L.	Smilaceae	Kizhanna	Climber	Common	Root	Tonic, Relief Inflammation or Irritation, have a Detoxifying effect, Increase frequent Urination and used as Stimulant
39.	*Mahonia leschenaultii* (Wallich ex Wight & Arnott) Takeda	Berberidaceae	Manjanathi	Small Tree	Common	Root	Anticancer
40.	*Hemidesmus indicus* (L.) R. Br.	Apocynaceae	Nannari	Twiner	Common	Root	Anti-atherogenic, Anti-spasmodic, Memory enhancing, Immunopotentiating and Anti-Inflammatory
41.	*Gloriosa superba* L.	Colchicaceae	Kallappai Kilangu	Climber	Common	Tuber	Diarrhea, Tonic, Anthelmintic and also feeds to cows and goats
42.	*Arisaema leschenaultii* Blume	Araceae	Pambucholam	Herb	Common	Tuber	Urinary tract diseases, Colitis, Eczema, Purging, Gonorrhea, Piles and Haemorrhoids

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 theses plant species [10,11,12]. The worked on Yercaud hills which harbours more herbaceous plants when as compared to trees, shrubs and climbers [13]. The rate of growth of woody plants are slow and are long lived than herbaceous plant species [14]. 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 [15].

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 [16]. 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%) [17,18]. 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.) [19].

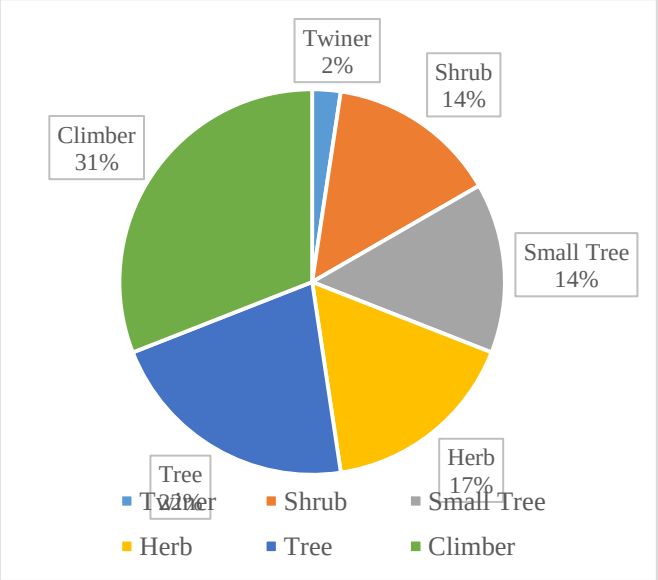

Figure 3: Life form analysis

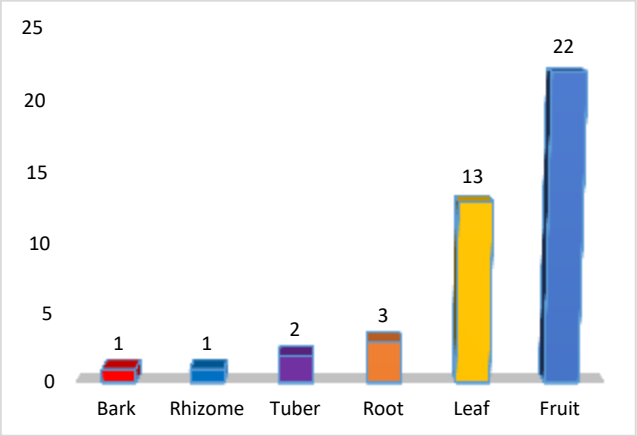

Figure 4: Parts Used

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, skindisease, cancer, alzhimer disease, parkinsons, anti-hypertensive, hypolipidemic, antifungal, arthritis, rheumatism, lumbago, anti asmatic, 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 [20,21,22]. The ethanomedicinal plants in Tamil Nadu and 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 [21,23].

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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