



## IUCN red taxa in the southern western ghats of Theni district, Tamil Nadu, India

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### Abstract

The floristic studies in the Southern Western Ghats of Theni district in Tamil Nadu has identified 292 IUCN red species belongs to 74 families in 185 genera comprising 7 critically endangered (CR), 25 endangered (EN), 29 vulnerable (VU), 17 near threatened (NT), 209 least concern (LC) and 5 Data deficient (DD) species. Some of the notable species are *Actinodaphne bourneae* Gamble, *Anaphalis beddomei* Hook. f., *Cinnamomum sulphuratum* Nees, *Dalbergia latifolia* Roxb., *Elaeocarpus gausseii* Weibel, *Fimbristylis crystallina* Govind., *Garcinia travancorica* Bedd., *Myristica dactyloides* Gaertn. and *Valeriana leschenaultii* DC. The results are disturbing with several species groups facing a severe threat of extinction.

**Keywords:** IUCN, Theni district, southern western ghats, *Elaeocarpus gausseii*, *Fimbristylis crystallina* and *Valeriana leschenaultia*

### Introduction

India is one of the mega diversity rich area and its varied agro-climatic conditions are helpful for the development of assortment of taxa. The Western Ghats hotspot, one of the best and major non-equatorial tropical evergreen forest of world regions in India, is one of the 34 global biodiversity 'hotspots' [1, 2]. It assigned for its high variety and endemism of plant species, is affirmed as an internationally critical focus of variety and endemism which is home to a portion of the world's most one of a kind greenery, fauna and growths. Albeit the Western Ghats covers just 6% of the all-out land space of India, it contains over 30% of the types of all significant taxa found in India. The Western Ghats is extremely wealthy in botanical variety with in excess of 5,000 types of angiosperms and endemism of plants (34%) [3, 4, 5, 6].

The IUCN Red List also provides basic information on species taxonomy, distributions, habitat and ecology, threats, population trends, use and trade, livelihood values, ecosystem services provided, and research and conservation priorities. The most noteworthy quantities of undermined species happen inside the Southern Western Ghats area of interest in Tamil Nadu with 1163 sp., Kerala with 1160 sp. and Karnataka with 940 sp. [7]. Floristically, the Western Ghats is perhaps the most extravagant region in the country. Nayar [8] detailed about 27% of the absolute plant species in India (around 4,000 species) are recorded from the Western Ghats, of which 51 genera and 1,600 species are endemic to the district. Out of the 51 endemic genera of flowering plants in the Western Ghats, 43 are monotypic [9]. Approximately, 63% of India's woody evergreen taxa are endemic toward the Western Ghats [10, 11, 12] and of the almost 650 tree species found in the Western Ghats, 352 (54%) are endemic [13, 14]. In Southern Western Ghats, tree species dominants with 63% of endemism which represents 1051 endemic species [15, 16] and 37 endemic species restricted to Megamalai wildlife sanctuary [17]. In this present study, aimed to carry out the documentation of the

IUCN red listed taxa in the southern Western Ghats of Theni district of Tamil Nadu.

### Materials and Methods

Theni district of Tamil Nadu lies at the foothills of Western Ghats and is diversified by several ranges and hills. In general, the average elevation varies from around 180m to 2400 metres. The district covers 2,889 km<sup>2</sup> (1,115 sq mi) district lies at the foot of the Western Ghats between 9° 39' and 10° 30' North latitude and between 77° 00' and 78° 30' of East location: 10°04'N 77°45'E. The forest area in Theni district is about 33.70%. There are 27 forest areas in Theni district constituting a total area of 795.81 km<sup>2</sup> (307.26 sq mi) which comprises the two varying forest divisions *i.e.* Megamalai Wildlife Sanctuary and Theni Forest division. A range of hills running parallel to the Western Ghats and nearly north to south separates the district from the neighbouring Kerala State.

The study area has been comprehensively explored by the frequent field visits from December 2015 to November 2020 covering every one of the seasons. The voucher specimens were collected and identified by using Flora [18, 19, 20, 21, 22] and deposited in the Department of Botany herbarium, Bharathiar University. Further, the specimens were checked for their IUCN categories in the IUCN version 2021-1 [7].

### Results and Discussion

The IUCN Red List is a rich compendium of information on threats, ecological requirements, and habitats of species on conservation actions that can be taken to reduce or prevent extinctions. It catalyse action for biodiversity conservation by providing information and analysis on the world's species, including threats, population status and trends. IUCN conveys the urgency of conservation issues to the public and policy makers, as well as help the international community to try to reduce species extinction. It provide scientific information on the status of taxa at a global level to the magnitude and importance of threatened biodiversity

[7]. In the present study, a total of 292 species belongs to 74 families in 185 genera (Table 1). Among these, 7 species critically endangered (CR), 22 endangered (EN), 29 vulnerable (VU), 17 near threatened (NT), 209 least concern (LC) and 5 species Data deficient (DD) species were mentioned under IUCN red listed category (Fig. 1). Life form analysis shows Herb to be dominant with 122 species followed by Tree (120), Shrub (37), Climber (8) and Liana 4 species (Fig. 2). In 75 families, Cyperaceae and Fabaceae with 31 species forms the dominant over the other families followed by Lauraceae 24 species, Poaceae 12 species, Linderniaceae 11 species, Asteraceae 10 species, Commelinaceae and Myrtaceae with 9 species, Euphorbiaceae with 8 species; Meliaceae with 7 species; Dipertocarpaceae, Lamiaceae, Malvaceae, and Rutaceae each with 6 species. Phyllanthaceae and Rubiaceae each with 5 species. Cannabaceae, Eriocaulaceae, Plantaginaceae and Polygonaceae with 4 species. Anacardiaceae, Araliaceae, Campanulaceae, Celastraceae, Lythraceae, Melastomataceae, Moraceae, Orchidaceae and Sapindaceae with 3 species. Acanthaceae, Apocynaceae, Burmanniaceae, Capparaceae, Cordiaceae, Droseraceae, Ebenaceae, Elaeocarpaceae, Lentibulariaceae, Magnoliaceae, Oranraceae, Primulaceae, Putranjivaceae, Rhamnaceae, Rosaceae, Solanaceae, Symplocaceae and Vitaceae each with 2 species. Achariaceae, Alangiaceae, Amarathaceae, Calophyllaceae, Caprifoliaceae, Clusiaceae, Colchicaceae, Combretaceae, Convolvulaceae, Hernandiaceae, Icacinaceae, Malpighiaceae, Menyanthaceae, Myristicaceae, Nyctaginaceae, Orobanchaceae, Podostemaceae, Proteaceae, Salicaceae, Salvadoraceae, Santalaceae, Sapotaceae, Staphylaceae, Scrophularaceae, Stemonuraceae, Theaceae and Urticaceae each with 1 species respectively.

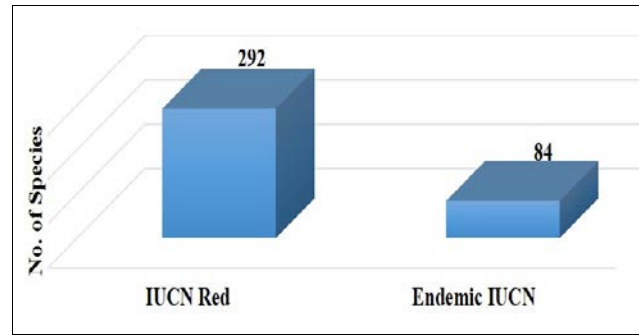


Fig 3: Endemics in IUCN Red taxa

From 185 species, *Cyperus* forms the dominant genus with 11 species followed by *Litsea* (10), *Syzygium* (7), *Fimbristylis* (6) and *Carex* with 5 species. *Actinodaphne*, *Cinnamomum*, *Crotalaria*, *Eleocharis*, *Eriocaulon*, *Lindernia*, *Murdannia* and *Persicaria* each with 4 species. *Anaphalis*, *Bonnaya*, *Celtis*, *Commelina*, *Cryptocarya*, *Dalbergia*, *Grewia*, *Hydrotyle*, *Lobelia*, *Torenia* and *Scleria* each with 3 species. *Antidesma*, *Bacopa*, *Burmannia*, *Capparis*, *Cyanotis*, *Diospyros*, *Dipterocarpus*, *Drosera*, *Elaeocarpus*, *Erythrina*, *Gmelia*, *Hopea*, *Indigofera*, *Ixora*, *Ludwigia*, *Magnolia*, *Mallotus*, *Memecylon*, *Neolitsea*, *Nothopogia*, *Shorea*, *Solanum*, *Symplocos*, *Tephrosia* and *Utricularia* each with 2 species respectively. *Abrus*, *Acacia*, *Acmella*, *Acronychia*, *Aegle*, *Agalia*, *Aeschynomene*, *Aglaia*, *Agrostistachyis*, *Alangium*, *Albizia*, *Alstonia*, *Alternanthera*, *Ammania*, *Anthoxanthum*, *Antiaris*, *Aphanamixis*, *Apodytes*, *Ardisia*, *Artocarpus*, *Azima*, *Bauhinia*, *Bischofia*, *Bombax*, *Brachycorythis*, *Buddleja*, *Butea*, *Calophyllum*, *Cayratia*, *Centranthera*, *Chloroxylon*, *Chukrasia*, *Cipadessa*, *Cleidion*, *Cleistanthus*, *Clerodendrum*, *Cordia*, *Debregeasia*, *Decalepis*, *Dentella*, *Desmodium*, *Dichrostachys*, *Dimeria*, *Dimorphocalyx*, *Dopatrium*, *Drypetes*, *Dumasia*, *Dysoxylum*, *Echinochloa*, *Eclipta*, *Ehretia*, *Elytrophorus*, *Emilia*, *Epaltes*, *Eragrostis*, *Eugenia*, *Euonymous*, *Euphorbia*, *Filicum*, *Firmiana*, *Flacourtia*, *Garciniq*, *Gardenia*, *Geissaspis*, *Glochidion*, *Gloriosa*, *Glycosmis*, *Glyptopetalum*, *Gomphandra*, *Gordonia*, *Gynura*, *Gyrocarpus*, *Heynea*, *Hiptage*, *Homonoia*, *Hydnocarpus*, *Hygrophila*, *Ipomea*, *Kyllinga*, *Lannea*, *Lawsonia*, *Leea*, *Lepisanthes*, *Limnophila*, *Limnopoia*, *Macaranga*, *Maesa*, *Melicope*, *Mimusops*, *Moonia*, *Mundulea*, *Myristica*, *Neonotonia*, *Nymphoides*, *Phoebe*, *Photinia*, *Phyllathus*, *Phyllodium*, *Pisonia*, *Pleurostyliya*, *Pogostemon*, *Pongamia*, *Premna*, *Prunus*, *Pterocarpus*, *Pterospermum*, *Psydrax*, *Putranjiva*, *Rhodomytrus*, *Rotala*, *Saccharum*, *Santalum*, *Schleichera*, *Schoenoplectiella*, *Scutia*, *Setaria*, *Sirhookera*, *Smithia*, *Sphaeranthus*, *Staphylea*, *Stenocarpus*, *Streblus*, *Strobilanthes*, *Swietenia*, *Terminalia*, *Trema*, *Valeriana*, *Vigna*, *Vitex*, *Xylia Yamazakia*, *Zanthoxylum*, *Zeylanidium* and *Ziziphus* each with single species.

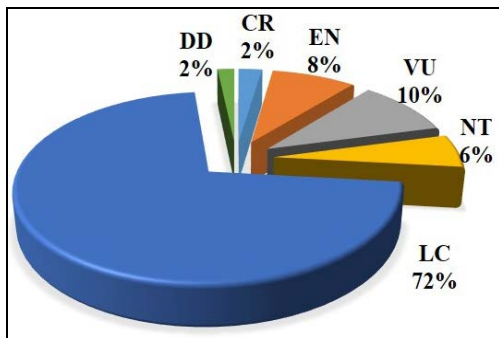


Fig 1: IUCN Red Species in Percentile

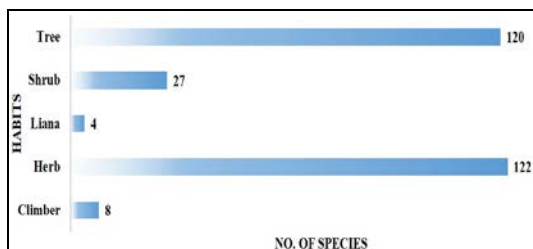


Fig 2: Life form analysis of IUCN Red Species

Table 1: List of IUCN RED species in Southern Western Ghats of Theni District, India.

S. No.	Binomial Name	Family	Habit	IUCN Status
1.	<i>Abrus fruticosus</i> Wight & Arn.	Fabaceae	Liana	DD (2010)
2.	<i>Acacia caesia</i> (L.) Willd.	Fabaceae	Tree	LC (2011)
3.	<i>Acmella paniculata</i> (Wall. ex DC.) R. K. Jansen	Asteraceae	Herb	LC (2011)
4.	<i>Acronychia pedunculata</i> (L.) Miq.	Rutaceae	Tree	LC (2018)

5.	<i>Actinodaphne bourneae</i> Gamble	Lauraceae	Tree	EN (1998)
6.	<i>Actinodaphne bourdillonii</i> Gamble	Lauraceae	Tree	NT (2019)
7.	<i>Actinodaphne lawsonii</i> Gamble	Lauraceae	Tree	VU (1998)
8.	<i>Actinodaphne madraspatana</i> Bedd. Ex Hook.f.	Lauraceae	Tree	LC (2019)
9.	<i>Aegle marmelos</i> (L.) Correa	Rutaceae	Tree	NT(2019)
10.	<i>Aeschynomene aspera</i> L.	Fabaceae	Herb	LC (2010)
11.	<i>Aglaiia elaeagnoidea</i> (A.Juss.) Benth.	Meliaceae	Tree	LC (1998)
12.	<i>Agrostistachys indica</i> Dalzell	Euphorbiaceae	Tree	LC (2020)
13.	<i>Alangium salviifolium</i> (L.f.) Wangerin	Alangiaceae	Tree	LC (2019)
14.	<i>Albizia procera</i> (Roxb.) Benth.	Fabaceae	Tree	LC (2018)
15.	<i>Alstonia scholaris</i> (L.) R. Br.	Apocynaceae	Tree	LC (1998)
16.	<i>Alternanthera sessilis</i> (L.) R.Br. ex DC.	Amaranthaceae	Herb	LC (2018)
17.	<i>Ammannia cordata</i> Wight & Arn.	Lythraceae	Herb	LC (2010)
18.	<i>Anaphalis beddomei</i> Hook.f.	Asteraceae	Herb	VU (2010)
19.	<i>Anaphalis leptophylla</i> DC.	Asteraceae	Herb	VU (2010)
20.	<i>Anaphalis wightiana</i> DC.	Asteraceae	Herb	VU (2010)
21.	<i>Anthoxanthum borii</i> S.K.Jain & Pal	Poaceae	Herb	NT (2010)
22.	<i>Antiaris toxicaria</i> (J.F.Gmel.) Lesch.	Moraceae	Tree	LC (2019)
23.	<i>Antidesma acidum</i> Retz.	Phyllanthaceae	Tree	LC (2018)
24.	<i>Antidesma ghaesembilla</i> Gaertn.	Phyllanthaceae	Shrub	LC (2018)
25.	<i>Aphanamixis polystachya</i> (Wall.) R. Parker	Meliaceae	Tree	LC (2018)
26.	<i>Apodytes dimidiata</i> E. Mey. ex Arn.	Icacinaceae	Tree	LC (2020)
27.	<i>Ardisia blatteri</i> Gamble	Primulaceae	Shrub	EN (1998)
28.	<i>Artocarpus hirsutus</i> Lam.	Moraceae	Tree	LC (2017)
29.	<i>Azima tetracantha</i> Lam.	Salvadoraceae	Shrub	LC (2020)
30.	<i>Bacopa floribunda</i> (R.Br.) Wettst.	Plantaginaceae	Herb	LC (2019)
31.	<i>Bacopa monnieri</i> (L.) Wettst.	Plantaginaceae	Herb	LC (2012)
32.	<i>Bauhinia purpurea</i> L.	Fabaceae	Shrub	LC (2010)
33.	<i>Bischofia javanica</i> Blume	Euphorbiaceae	Tree	LC (2018)
34.	<i>Bombax ceiba</i> L.	Malvaceae	Tree	LC (2018)
35.	<i>Bonnaya antipoda</i> (L.) Druce	Linderniaceae	Herb	LC(2010)
36.	<i>Bonnaya ciliate</i> (Colsm.) Spreng.	Linderniaceae	Herb	LC(2010)
37.	<i>Bonnaya oppositifolia</i> (Retz.) Spreng.	Linderniaceae	Herb	LC(2010)
38.	<i>Brachycorythis wightii</i> Summerh.	Orchidaceae	Herb	DD (2010)
39.	<i>Buddleja asiatica</i> Lour.	Scrophularaceae	Shrub	LC (2018)
40.	<i>Burmannia coelestis</i> D.Don	Burmanniaceae	Herb	LC (2011)
41.	<i>Burmannia pusilla</i> (Miers) Thwaites	Burmanniaceae	Herb	LC (2011)
42.	<i>Butea monosperma</i> (Lam.) Taub.	Fabaceae	Tree	LC (2020)
43.	<i>Calophyllum inophyllum</i> L.	Calophyllaceae	Shrub	LC (2018)
44.	<i>Capparis decidua</i> (Forssk.) Edgew.	Capparaceae	Shrub	LC (2020)
45.	<i>Capparis sepiaria</i> L.	Capparaceae	Shrub	LC (2007)
46.	<i>Carex baccans</i> Nees	Cyperaceae	Herb	LC (2010)
47.	<i>Carex flicina</i> Nees	Cyperaceae	Herb	LC (2010)
48.	<i>Carex lindleyana</i> Nees	Cyperaceae	Herb	LC (2010)
49.	<i>Carex longipes</i> D.Don	Cyperaceae	Herb	LC (2010)
50.	<i>Carex phacota</i> Spreng.	Cyperaceae	Herb	LC (2010)
51.	<i>Cayratia pedata</i> (Wall.) Gagnep.	Vitaceae	Liana	VU (2014)
52.	<i>Celtis philippensis</i> Blanco	Cannabaceae	Tree	LC (2017)
53.	<i>Celtis tetrandra</i> Roxb.	Cannabaceae	Tree	LC (2018)
54.	<i>Celtis timorensis</i> Span.	Cannabaceae	Tree	LC (2018)
55.	<i>Centranthera indica</i> (L.) Gamble	Orobanchaceae	Herb	LC (2010)
56.	<i>Chloroxylon swietenia</i> DC.	Rutaceae	Tree	VU (1998)
57.	<i>Chukrasia tabularis</i> A. Juss.	Meliaceae	Tree	LC (2017)
58.	<i>Cinnamomum malabatum</i> (Burm.f.) J.Presl	Lauraceae	Tree	LC (2019)
59.	<i>Cinnamomum keralaense</i> Kosterm.	Lauraceae	Tree	EN (2019)
60.	<i>Cinnamomum sulphuratum</i> Nees	Lauraceae	Tree	VU (2014)
61.	<i>Cinnamomum wightii</i> Meisn.	Lauraceae	Tree	EN (2014)
62.	<i>Cipadessa baccifera</i> (Roth) Miq.	Meliaceae	Shrub	LC (2018)
63.	<i>Cleidion javanicum</i> Blume	Euphorbiaceae	Tree	LC (2018)
64.	<i>Cleistanthus collinus</i> (Roxb.) Benth. Ex Hook.f.	Phyllanthaceae	Tree	VU (1998)
65.	<i>Clerodendrum phlomidis</i> L.f.	Lamiaceae	Shrub	LC (2020)
66.	<i>Commelina diffusa</i> Burm.f.	Commelinaceae	Herb	LC (2018)
67.	<i>Commelina erecta</i> L.	Commelinaceae	Herb	LC (2019)
68.	<i>Commelina imberbis</i> Ehrenb. Ex Hassk.	Commelinaceae	Herb	LC (2010)
69.	<i>Cordia sinensis</i> Lam.	Cordiaceae	Shrub	LC (2020)
70.	<i>Crotalaria albida</i> B.Heyne ex Roth	Fabaceae	Herb	LC (2010)
71.	<i>Crotalaria fysonii</i> Dunn	Fabaceae	Herb	LC (2010)
72.	<i>Crotalaria paniculata</i> Willd.	Fabaceae	Herb	LC (2010)

73.	<i>Crotalaria scabrella</i> Wight & Arn.	Fabaceae	Herb	LC (2010)
74.	<i>Cyanotis cristata</i> (L.) D.Don	Commelinaceae	Herb	LC (2010)
75.	<i>Cyanotis fasciculata</i> (B.Heyne ex Roth) Schult. & Schult.f.	Commelinaceae	Herb	LC (2010)
76.	<i>Cyperus cuperoides</i> (L.) Kuntze	Cyperaceae	Herb	LC (2010)
77.	<i>Cyperus distans</i> L.f.	Cyperaceae	Herb	LC (2017)
78.	<i>Cyperus dubius</i> Rottb.	Cyperaceae	Herb	LC (2010)
79.	<i>Cyperus rotundus</i> L.	Cyperaceae	Herb	LC (2017)
80.	<i>Cyperus paniceus</i> (Rottb.) Boeckeler	Cyperaceae	Herb	LC (2010)
81.	<i>Cyperus pilosus</i> Vahl	Cyperaceae	Herb	LC (2010)
82.	<i>Cyperus procerus</i> Rottb.	Cyperaceae	Herb	LC (2019)
83.	<i>Cyperus pubisquama</i> Steudel	Cyperaceae	Herb	LC (2010)
84.	<i>Cyperus richardii</i> Steud.	Cyperaceae	Herb	LC (2010)
85.	<i>Cyperus substramineus</i> Kük.	Cyperaceae	Herb	LC (2010)
86.	<i>Cyperus tenuispica</i> Steud.	Cyperaceae	Herb	LC (2017)
87.	<i>Cryptocarya anamalayana</i> Gamble	Lauraceae	Tree	EN (1998)
88.	<i>Cryptocarya beddomei</i> Gamble	Lauraceae	Tree	VU (1998)
89.	<i>Cryptocarya stocksii</i> Meisn.	Lauraceae	Tree	VU (1998)
90.	<i>Dalbergia latifolia</i> Roxb.	Fabaceae	Tree	VU (2020)
91.	<i>Dalbergia pinnata</i> (Lour.) Prain	Fabaceae	Tree	LC (2018)
92.	<i>Dalbergia sissoo</i> DC.	Fabaceae	Tree	LC (2019)
93.	<i>Debregeasia longifolia</i> (Burm. fil.) Wedd.	Urticaceae	Tree	LC (2018)
94.	<i>Decalepis hamiltonii</i> Wight & Arn.	Apocynaceae	Climber	EN (2014)
95.	<i>Dentella repens</i> (L.) J.R.Forst. & G.Forst.	Rubiaceae	Herb	LC (2011)
96.	<i>Desmodium adscendens</i> (Sw.) DC.	Fabaceae	Climber	LC (2010)
97.	<i>Dichrostachys cinerea</i> (L.) Wight & Arn.	Fabaceae	Shrub	LC (2009)
98.	<i>Dimeria ornithopoda</i> Trin.	Poaceae	Herb	LC (2010)
99.	<i>Dimorphocalyx glabellus</i> Thwaites	Euphorbiaceae	Shrub	LC (2020)
100.	<i>Diospyros barberi</i> Ramaswami	Ebenaceae	Tree	VU (1998)
101.	<i>Diospyros ebenum</i> J.Koenig ex Retz.	Ebenaceae	Tree	DD (1998)
102.	<i>Dipterocarpus bourdillonii</i> Brandis	Dipterocarpaceae	Tree	CR (1998)
103.	<i>Dipterocarpus indicus</i> Bedd.	Dipterocarpaceae	Tree	EN (1998)
104.	<i>Dopatrium junceum</i> (Roxb.) Buch.-Ham. ex Benth.	Plantaginaceae	Herb	LC (2019)
105.	<i>Drypetes porteri</i> (Gamble) Pax & K.Hoffm.	Putranjivaceae	Tree	EN (1998)
106.	<i>Drosera indica</i> L.	Droseraceae	Herb	LC (2018)
107.	<i>Drosera peltata</i> Thunb.	Droseraceae	Herb	LC (2010)
108.	<i>Dumasia villosa</i> DC.	Fabaceae	Climber	LC (2010)
109.	<i>Dysoxylum malabaricum</i> Bedd. Ex C.DC.	Meliaceae	Tree	EN (2014)
110.	<i>Echinochloa frumentacea</i> Link	Poaceae	Herb	LC (2018)
111.	<i>Eclipta prostrata</i> (L.) L.	Asteraceae	Herb	LC (2016)
112.	<i>Ehretia aspera</i> Willd.	Cordiaceae	Shrub	DD (2020)
113.	<i>Elaeocarpus gaussonii</i> Weibel	Elaeocarpaceae	Tree	CR (1998)
114.	<i>Elaeocarpus munroii</i> (Wight) Mast.	Elaeocarpaceae	Tree	NT (1998)
115.	<i>Eleocharis atropurpurea</i> (Retz.) J.Presl & C.Presl	Cyperaceae	Herb	LC (2019)
116.	<i>Eleocharis congesta</i> D.Don.	Cyperaceae	Herb	LC (2010)
117.	<i>Eleocharis geniculata</i> (L.) Roem. & Schult.	Cyperaceae	Herb	LC (2019)
118.	<i>Eleocharis spiralis</i> (Rottb.) Roem. & Schult.	Cyperaceae	Herb	LC (2010)
119.	<i>Elytrophorus spicatus</i> (Willd.) A.Camus	Poaceae	Herb	LC (2019)
120.	<i>Emilia zeylanica</i> C.B.Clarke	Asteraceae	Herb	LC (2010)
121.	<i>Epaltes divaricate</i> (L.) Cass.	Asteraceae	Herb	LC (2010)
122.	<i>Eragrostis japonica</i> Trin.	Poaceae	Herb	LC (2019)
123.	<i>Eriocaulon leucomelas</i> Steud.	Eriocaulaceae	Herb	LC (2010)
124.	<i>Eriocaulon nepalense</i> J.D.Prescott ex Bong	Eriocaulaceae	Herb	LC (2010)
125.	<i>Eriocaulon odoratum</i> Dalzell	Eriocaulaceae	Herb	LC (2010)
126.	<i>Eriocaulon pectinatum</i> Ruhland	Eriocaulaceae	Herb	VU (2010)
127.	<i>Euphorbia vajravelui</i> Binojk. & N.P.Balacr.	Euphorbiaceae	Shrub	VU (1998)
128.	<i>Erythrina crista-galli</i> L.	Fabaceae	Tree	LC (2018)
129.	<i>Erythrina variegata</i> L.	Fabaceae	Tree	LC (2010)
130.	<i>Eugenia rotleriana</i> Wight & Arn.	Myrtaceae	Tree	VU (1998)
131.	<i>Euonymus angulatus</i> Wight	Celastraceae	Shrub	VU (1998)
132.	<i>Euonymus indicus</i> B.Heyne ex Wall.	Celastraceae	Shrub	LC (2018)
133.	<i>Filicium decipiens</i> (Wight & Arn.) Thwaites	Sapindaceae	Tree	LC (2020)
134.	<i>Firmiana simplex</i> (L.) W. Wight	Malvaceae	Tree	LC (2018)
135.	<i>Fimbristylis argentea</i> (Rottb.) Vahl	Cyperaceae	Herb	LC (2010)
136.	<i>Fimbristylis crystallina</i> Govind.	Cyperaceae	Herb	EN (2010)
137.	<i>Fimbristylis dipsacea</i> (Rottb.) C.B.Clarke	Cyperaceae	Herb	LC (2019)
138.	<i>Fimbristylis salbundia</i> (Nees) Kunth	Cyperaceae	Herb	LC (2010)
139.	<i>Fimbristylis ovata</i> (Burm.f.) J.Kern	Cyperaceae	Herb	LC (2010)
140.	<i>Fimbristylis tetragona</i> R.Br.	Cyperaceae	Herb	LC (2010)

141.	<i>Flacourtia indica</i> (Burm. fil.) Merr.	Salicaceae	Tree	LC (2018)
142.	<i>Garcinia travancorica</i> Bedd.	Clusiaceae	Tree	CR (2020)
143.	<i>Gardenia gummifera</i> L.f.	Rubiaceae	Tree	LC (1998)
144.	<i>Geissaspis cristata</i> var. <i>tenella</i> (Benth.) M.R.Almeida	Fabaceae	Herb	LC (2010)
145.	<i>Glochidion zeylanicum</i> (Gaertn.) A.Juss.	Phyllanthaceae	Tree	LC (2018)
146.	<i>Gloriosa superba</i> L.	Colchicaceae	Climber	LC (2008)
147.	<i>Glycosmis pentaphylla</i> (Retz.) DC.	Rutaceae	Shrub	LC (2018)
148.	<i>Glyptopetalum lawsonii</i> Gamble	Celastraceae	Tree	VU (1998)
149.	<i>Gmelina arborea</i> Roxb. ex Sm.	Lamiaceae	Tree	LC (2019)
150.	<i>Gmelina asiatica</i> L.	Lamiaceae	Shrub	LC (2019)
151.	<i>Gomphandra tetrandra</i> (Wall.) Sleumer	Stemonuraceae	Tree	LC (2018)
152.	<i>Gordonia obtusa</i> Wall. Ex Wight & Arn.	Theaceae	Tree	LC (2017)
153.	<i>Grewia flavescens</i> Juss.	Malvaceae	Shrub	LC (2018)
154.	<i>Grewia tenax</i> (Forssk.) Fiori	Malvaceae	Shrub	LC (2018)
155.	<i>Grewia villosa</i> Willd.	Malvaceae	Shrub	LC (2019)
156.	<i>Gynura travancorica</i> W.W.Sm.	Asteraceae	Herb	NT (2010)
157.	<i>Gyrocarpus americanus</i> Jacq.	Hernandiaceae	Tree	LC (2018)
158.	<i>Heynea trijuga</i> Roxb. ex Sims	Meliaceae	Tree	LC (2018)
159.	<i>Hiptage benghalensis</i> (L.) Kurz	Malpighiaceae	Liana	LC (2018)
160.	<i>Homonoia riparia</i> Lour.	Euphorbiaceae	Shrub	LC (2010)
161.	<i>Hopea parviflora</i> Bedd.	Dipterocarpaceae	Tree	LC (2017)
162.	<i>Hopea ponga</i> (Dennst.) Mabb.	Dipterocarpaceae	Tree	EN (1998)
163.	<i>Hydnocarpus pentandrus</i> (Buch.-Ham.) Oken	Achariaceae	Tree	VU (2014)
164.	<i>Hydrocotyle conferta</i> Wight	Araliaceae	Herb	EN (2011)
165.	<i>Hydrocotyle javanica</i> Thunb.	Araliaceae	Herb	LC (2010)
166.	<i>Hydrocotyle sibthorpioides</i> Lam.	Araliaceae	Herb	LC (2010)
167.	<i>Hygrophila erecta</i> (Burm.f.) Hochr.	Acanthaceae	Herb	LC (2010)
168.	<i>Indigofera linifolia</i> (L.f.) Retz.	Fabaceae	Herb	LC (2010)
169.	<i>Indigofera trita</i> L.f.	Fabaceae	Herb	LC (2010)
170.	<i>Ipomoea cairica</i> (L.) Sweet	Convolvulaceae	Climber	LC (2017)
171.	<i>Isachne elegans</i> Dalzell	Poaceae	Herb	LC (2010)
172.	<i>Isachne globosa</i> (Thunb.) Kuntze	Poaceae	Herb	LC (2012)
173.	<i>Ixora johnsonii</i> Hook.f.	Rubiaceae	Shrub	CR (1998)
174.	<i>Ixora saulierei</i> Gamble	Rubiaceae	Shrub	EN (1998)
175.	<i>Kyllinga brevifolia</i> Rottb.	Cyperaceae	Herb	LC (2012)
176.	<i>Lannea coromandelica</i> (Houtt.) Merr.	Anacardiaceae	Tree	LC (2020)
177.	<i>Lawsonia inermis</i> L.	Lythraceae	Shrub	LC (2019)
178.	<i>Leea indica</i> (Burm.f.) Merr	Vitaceae	Tree	LC (2019)
179.	<i>Lepisanthes tetraphylla</i> (Vahl.) Radlk.	Sapindaceae	Tree	LC (2018)
180.	<i>Limnophila indica</i> (L.) Druce	Plantaginaceae	Herb	LC (2019)
181.	<i>Limnopoa meeboldii</i> (C.E.C.Fisch.) C.E.Hubb.	Poaceae	Herb	EN (2010)
182.	<i>Lindernia hyssopioides</i> (L.) Haines	Linderniaceae	Herb	LC (2010)
183.	<i>Lindernia parviflora</i> (Roxb.) Haines	Linderniaceae	Herb	LC (2018)
184.	<i>Lindernia rotundifolia</i> (L.) Alston	Linderniaceae	Herb	LC (2018)
185.	<i>Lindernia viscosa</i> (Hornem.) Bold.	Linderniaceae	Herb	LC (2010)
186.	<i>Litsea beddomei</i> Hook.f.	Lauraceae	Tree	EN (2019)
187.	<i>Litsea bourdillonii</i> Gamble	Lauraceae	Tree	NT (2019)
188.	<i>Litsea coriacea</i> (B.Heyne ex Nees) Hook.f.	Lauraceae	Tree	NT (2019)
189.	<i>Litsea floribunda</i> (Blume) Gamble	Lauraceae	Tree	NT (2019)
190.	<i>Litsea glutinosa</i> (Lour.) C.B. Rob	Lauraceae	Tree	LC (2020)
191.	<i>Litsea laevigata</i> (Nees) Gamble	Lauraceae	Tree	NT (2019)
192.	<i>Litsea ligustrina</i> (Nees) Fern.-Vill.	Lauraceae	Tree	NT (2019)
193.	<i>Litsea nigrescens</i> Gamble	Lauraceae	Tree	VU (2019)
194.	<i>Litsea stocksii</i> Hook.f.	Lauraceae	Tree	NT (2019)
195.	<i>Litsea wightiana</i> (Nees) Wall. ex Hook.f.	Lauraceae	Tree	NT (2019)
196.	<i>Lobelia alsinoides</i> Lam.	Campanulaceae	Herb	LC (2010)
197.	<i>Lobelia heyneana</i> Schult.	Campanulaceae	Herb	LC (2010)
198.	<i>Lobelia zeylanica</i> L.	Campanulaceae	Herb	LC (2010)
199.	<i>Ludwigia hyssopifolia</i> (G.Don) Exell	Onagraceae	Herb	LC (2019)
200.	<i>Ludwigia perennis</i> L.	Onagraceae	Herb	LC (2019)
201.	<i>Macaranga indica</i> Wight	Euphorbiaceae	Tree	LC (2018)
202.	<i>Maesa indica</i> (Roxb.) Sweet	Primulaceae	Tree	LC (2018)
203.	<i>Magnolia champaca</i> (L.) Baill. ex Pierre	Magnoliaceae	Tree	LC (2012)
204.	<i>Magnolia nilagirica</i> (Zenker) Figlar	Magnoliaceae	Tree	VU (2014)
205.	<i>Mallotus philippensis</i> (Lam.) Müll.Arg.	Euphorbiaceae	Tree	LC (2018)
206.	<i>Mallotus resinusus</i> (Blanco) Merr.	Melastomataceae	Tree	LC (2018)
207.	<i>Memecylon flavescens</i> Gamble	Melastomataceae	Shrub	EN (1998)
208.	<i>Memecylon grande</i> Retz.	Melastomataceae	Shrub	VU (1998)

209.	<i>Melicope lunu-ankenda</i> (Gaertn.) T.G.Hartley	Rutaceae	Tree	LC (2017)
210.	<i>Mimusops elengi</i> L.	Sapotaceae	Tree	LC (2018)
211.	<i>Moonia heterophylla</i> Arn.	Asteraceae	Herb	NT (2010)
212.	<i>Mundulea sericea</i> (Willd.) A.Chev	Fabaceae	Tree	LC (2018)
213.	<i>Murdannia esculenta</i> (Wall. ex C.B.Clarke) Abeyw.	Commelinaceae	Herb	LC (2010)
214.	<i>Murdannia lanceolata</i> (Wight) Kammathy	Commelinaceae	Herb	VU (2010)
215.	<i>Murdannia pauciflora</i> (G.Bruckn.) G. Bruckn.	Commelinaceae	Herb	LC (2010)
216.	<i>Murdannia semiteres</i> (Dalzell) Santapau	Commelinaceae	Herb	LC (2010)
217.	<i>Myristica dactyloides</i> Gaertn.	Myristicaceae	Tree	VU (2014)
218.	<i>Neolitsea fischeri</i> Gamble	Lauraceae	Tree	VU (1998)
219.	<i>Neolitsea zeylanica</i> Nees & T. Nees	Lauraceae	Tree	LC (2020)
220.	<i>Neonotonia wightii</i> (Wight & Arn.) J.A.Lackey	Fabaceae	Climber	LC (2010)
221.	<i>Nothopegia castaneifolia</i> (Roth) Ding Hou	Anacardiaceae	Tree	CR (1998)
222.	<i>Nothopegia heyneana</i>	Anacardiaceae	Tree	NT (1998)
223.	<i>Nymphoides hydrophylla</i> (Lour.) Kuntze	Menyanthaceae	Herb	LC (2011)
224.	<i>Oryza officinalis</i> Wall. ex Watt	Poaceae	Herb	LC (2017)
225.	<i>Persicaria attenuata</i> (R.Br.) Soják	Polygonaceae	Herb	LC (2010)
226.	<i>Persicaria lapathifolia</i> (L.) Delarbre	Polygonaceae	Herb	LC (2012)
227.	<i>Persicaria dichotoma</i> (Blume) Masam.	Polygonaceae	Herb	LC (2010)
228.	<i>Persicaria pubescens</i> (Blume) Hara	Polygonaceae	Herb	LC (2010)
229.	<i>Peristylus aristatus</i> Lindl.	Orchidaceae	Herb	LC (2016)
230.	<i>Phoebe cathia</i> (D.Don) Kosterm.	Lauraceae	Tree	LC (2020)
231.	<i>Photinia integrifolia</i> Lindl.	Rosaceae	Tree	LC (2018)
232.	<i>Phyllanthus indofischeri</i> Bennet	Phyllanthaceae	Shrub	VU (2014)
233.	<i>Phyllodium pulchellum</i> (L.)Desv.	Fabaceae	Shrub	LC (2010)
234.	<i>Pisonia aculeata</i> L.	Nyctaginaceae	Tree	LC (2018)
235.	<i>Pleurostyliia opposita</i> (Wall.) Alston.	Celastraceae	Tree	LC (2018)
236.	<i>Pogostemon wightii</i> Benth.	Lamiaceae	Herb	LC (2011)
237.	<i>Pongamia pinnata</i> (L.) Pierre	Fabaceae	Tree	LC (2010)
238.	<i>Premna tomentosa</i> Willd.	Lamiaceae	Shrub	LC (2018)
239.	<i>Prunus ceylanica</i> (Wight.) Miq.	Rosaceae	Tree	EN (1998)
240.	<i>Pterocarpus marsupium</i> Roxb.	Fabaceae	Tree	NT (2017)
241.	<i>Pterospermum diversifolium</i> Blume	Malvaceae	Tree	LC (2020)
242.	<i>Psydrax ficiformis</i> (Hook.f.) Bridson	Rubiaceae	Shrub	EN (1998)
243.	<i>Putranjiva roxburghii</i> Wall.	Putranjivaceae	Tree	LC (2020)
244.	<i>Rhodomyrtus tomentosa</i> (Aiton) Hassk.	Myrtaceae	Tree	LC (2018)
245.	<i>Rotala ritchei</i> Koehne	Lythraceae	Herb	EN (2010)
246.	<i>Saccharum spontaneum</i> L.	Poaceae	Herb	LC (2019)
247.	<i>Santalum album</i> L.	Santalaceae	Tree	VU (2018)
248.	<i>Schleichera oleosa</i> (Lour.) Oken	Sapindaceae	Tree	LC (2018)
249.	<i>Schoenoplectiella senegalensis</i> (Steud.) Lye	Cyperaceae	Herb	LC (2019)
250.	<i>Scleria terrestris</i> (L.) Fassett	Poaceae	Herb	LC (2011)
251.	<i>Scleria lithosperma</i> (L.) Sw.	Cyperaceae	Herb	LC (2018)
252.	<i>Scleria terrestris</i> (L.) Fassett	Cyperaceae	Herb	LC (2011)
253.	<i>Scutia myrtina</i> Kurz	Rhamnaceae	Liana	LC (2018)
254.	<i>Setaria punctata</i> (Burm.f.) Veldkamp	Poaceae	Herb	LC (2011)
255.	<i>Shorea robusta</i> C.F.Gaertn.	Dipterocarpaceae	Tree	LC (1998)
256.	<i>Shorea roxburghii</i> G.Don	Dipterocarpaceae	Tree	VU (2017)
257.	<i>Sirhookera lanceolata</i> (Wight) Kuntze	Orchidaceae	Herb	LC (2016)
258.	<i>Smithia hirsuta</i> Dalzell	Fabaceae	Climber	LC (2010)
259.	<i>Solanum betaceum</i> Cav	Solanaceae	Shrub	DD (1998)
260.	<i>Solanum giganteum</i> Jacq.	Solanaceae	Shrub	LC (2018)
261.	<i>Sphaeranthus indicus</i> L.	Asteraceae	Herb	LC (2010)
262.	<i>Staphylea cochinchinensis</i> (Lour.) Byng & Christenh.	Staphyleaceae	Shrub	LC (2018)
263.	<i>Stenocarpus salignus</i> R.Br	Proteaceae	Tree	LC (2019)
264.	<i>Streblus asper</i> Lour.	Moraceae	Shrub	LC (2018)
265.	<i>Strobilanthes ciliata</i> Nees	Acanthaceae	Shrub	VU (2014)
266.	<i>Swietenia mahagoni</i> (L.) Jacq.	Meliaceae	Tree	NT (2018)
267.	<i>Symplocos anamallayana</i> Bedd.	Symplocaceae	Tree	EN (1998)
268.	<i>Symplocos oligandra</i> Bedd.	Symplocaceae	Tree	EN (1998)
269.	<i>Syzygium caryophyllatum</i> (L.) Alston	Myrtaceae	Tree	EN (1998)
270.	<i>Syzygium densiflorum</i> Wall. ex Wight & Arn.	Myrtaceae	Tree	VU (1998)
271.	<i>Syzygium jambos</i> (L.) Alston	Myrtaceae	Tree	LC (2018)
272.	<i>Syzygium myhendrae</i> (Bedd. ex Brandis) Gamble	Myrtaceae	Tree	EN (1998)
273.	<i>Syzygium parameswaranii</i> M. Mohanan & A.N. Henry	Myrtaceae	Tree	EN (1998)
274.	<i>Syzygium travancoricum</i> Gamble	Myrtaceae	Tree	CR (1998)
275.	<i>Syzygium zeylanicum</i> (L.) DC.	Myrtaceae	Tree	EN (1998)
276.	<i>Tephrosia villosa</i> (L.) Pers.	Fabaceae	Herb	LC (2010)

277.	<i>Tephrosia tinctoria</i> (L.) Pers.	Fabaceae	Herb	LC (2010)
278.	<i>Terminalia chebula</i> Retz.	Combretaceae	Tree	LC (2020)
279.	<i>Trema orientale</i> (L.) Blume	Cannabaceae	Tree	LC (2017)
280.	<i>Torenia anagallis</i> (Burm.f.) Wannan, W.R.Barker & Y.S.Liang	Linderniaceae	Herb	LC (2010)
281.	<i>Torenia bicolor</i> Dalzell	Linderniaceae	Herb	LC (2010)
282.	<i>Torenia crustacea</i> (L.) Cham. & Schtdl.	Linderniaceae	Herb	LC (2019)
283.	<i>Utricularia striatula</i> Sm.	Lentibulariaceae	Herb	LC (2019)
284.	<i>Utricularia praeterita</i> P.Taylor	Lentibulariaceae	Herb	NT (2010)
285.	<i>Valeriana leschenaultii</i> DC.	Caprifoliaceae	Herb	CR (2014)
286.	<i>Vigna dalzelliana</i> (Kuntze) Verdc.	Fabaceae	Climber	LC (2010)
287.	<i>Vitex negundo</i> L.	Lamiaceae	Tree	LC (2018)
288.	<i>Xylia xylocarpa</i> (Roxb.) W.Theob.	Fabaceae	Tree	LC (2018)
289.	<i>Yamazakia pusilla</i> (Willd.) W.R.Barker, Y.S.Liang & Wannan	Linderniaceae	Herb	LC (2010)
290.	<i>Zanthoxylum ovalifolium</i> Wight	Rutaceae	Shrub	LC (2018)
291.	<i>Zeylanidium subulatum</i> (Gardner) C.Cusset	Podostemaceae	Herb	LC (2010)
292.	<i>Ziziphus jujuba</i> Mill.	Rhamnaceae	Tree	LC (2007)

**Note:** CR – Critically Endangered, DD – Data Deficient, EN – Endangered, LC – Least Concern, NT – Near Threatened, VU – Vulnerable.

Among the 291 species, 82 are endemic plants of the study area (Fig. 3). *Dipterocarpus bourdillonii*, *Dysoxylum malabaricum*, *Elaeocarpus gaussonii*, *Fimbristylis crystallina*, *Fimbristylis dauciformis*, *Garcinia travancorica*, *Ixora johnsonii*, *Nothopegia castaneifolia*, *Syzygium travancoricum* and *Valeriana leschenaultia* are critically endangered (CR) endemics. *Actinodaphne bourneae*, *Ardisia blatteri*, *Cinnamomum wightii*, *Cryptocarya anamalayana*, *Cynometra travancorica*, *Decalepis hamiltonii*, *Dipterocarpus indicus*, *Drypetes porter*, *Fimbristylis crystallina*, *Hopea ponga*, *Hydrocotyle conferta*, *Ixora saulierei*, *Limnopoia meeboldii*, *Litsea beddomei*, *Memecylon flavescens*, *Psydrax ficiformis*, *Rotala ritchiei*, *Syzygium myhendrae*, *Syzygium parameswaranii*, *Symplocos anamallayana* and *Symplocos oligandra* are endangered (EN) endemics.

*Actinodaphne lawsonii*, *Anaphalis beddomei*, *Anaphalis leptophylla*, *Anaphalis wightiana*, *Cleistanthus collinus*, *Cinnamomum sulphuratum*, *Chloroxylon swietenia*, *Cryptocarya beddomei*, *Cryptocarya stocksii*, *Dalbergia latifolia*, *Diospyros barberi*, *Eriocaulon pectinatum*, *Eugenia rottleriana*, *Euonymus angulatus*, *Euphorbia vajravelui*, *Glyptopetalum lawsonii*, *Hydnocarpus alpinus*, *Hydnocarpus pentandrus*, *Litsea nigrescens*, *Magnolia nilagirica*, *Memecylon grande*, *Murdannia lanceolate*, *Myristica dactyloides*, *Miliusa nilagirica*, *Neolitsea fischeri*, *Phyllanthus indofischeri*, *Santalum album*, *Strobilanthes ciliate* and *Syzygium densiflorum* are vulnerable (VU) endemics.

*Actinodaphne bourdillonii*, *Anthoxanthum borii*, *Elaeocarpus munroii*, *Gynura travancorica*, *Litsea bourdillonii*, *Litsea coriacea*, *Litsea floribunda*, *Litsea laevigata*, *Litsea ligustrina*, *Litsea stocksii*, *Litsea wightiana*, *Nothopegia heyneana* and *Utricularia praeterita* are near threatened (NT) endemics. *Actinodaphne madraspatana*, *Aglaia elaeagnoidea*, *Cinnamomum malabratum*, *Cinnamomum sulphuratum*, *Crotalaria fysonii*, *Dimeria ornithopoda*, *Eriocaulon leucomelas*, *Gordonia obtuse*, *Hopea parviflora*, *Litsea glutinosa*, *Pogostemon wightii*, *Smithia hirsute*, *Sirhookera lanceolate* and *Torenia bicolor* are least concern (LC) endemics.

Nayar and Sastry<sup>[20]</sup> listed 620 species as Red listed Plants of India. Rao *et al.*,<sup>[23]</sup> compiled 1233 species from the 1997 IUCN Red List of Threatened Plants as a Red Listed Threatened Vascular Plant Species of India. Forest loss in the Western Ghats has been so rapid that out of the original 182,500 km<sup>2</sup> of primary vegetation only 12,450 km<sup>2</sup> (i.e.

6.8%) remains<sup>[24, 25]</sup>. The Western Ghats have been under the influence of forestry activities for close to two centuries with most of the areas clear felled or logged at least once during that time. Currently, most remaining forests in the Western Ghats are in protected areas or reserve forests, managed by the forest departments, and a few patches of forests that are managed by local communities<sup>[26]</sup>.

### Conclusion

The IUCN red taxa outcomes are alarming with several species groups facing a severe threat of extinction. An extensive taxonomic base to species assessments will support better conservation and strategic decisions. Species are the structure squares of life. The deficiency of species decreases the nature of our lives and our fundamental monetary security. By saving species we save biodiversity and the biological systems that give the regular assets we need to live.

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