



Systematic Review

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IUCN status of important ethno botanical plants of Udyavara village (Udupi, Karnataka)

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ABSTRACT

Introduction: 1/4th of all plant species in the world are at risk of being endangered or going extinct. The IUCN Red List is a critical indicator of the health of the world's biodiversity. It provides information about range, population size, habitat and ecology, use or trade, threats, and conservation actions that will help inform necessary conservation decisions. Hence the study was conducted to explore the status of plants of Udyavara village in IUCN red list of endangered species. **Method:** The Plant identification was carried in certain areas of Udyavara village by survey method. Authentication done by referring standard flora and experienced taxonomist. The enlisted drugs were studied for its status in IUCN red list. **Result:** The endangered plant species were explored from 276 identified plants of Udyavara village. Among them 80 evaluated species were identified with its category of endangered red list. **Conclusion:** The plants encountered under endangered species available in Udyavara Village of Udupi District will guide the practitioner for its judicial use in medicine. Moreover, the conservation of such plant species is possible by further cultivation of the same.

Keywords: Ethno botanical survey, Endangered species, Conservation.

INTRODUCTION

Western Ghats of Karnataka are one of the mega biodiversities of the world. This state is endowed with great diversity of climate, soil and topography. Karnataka's coast stretches for 320 kilometres along the three districts of Dakshina Kannada, Udupi and Uttara Kannada. Of these, 98 kilometres are in Udupi district. The coastal area is one of an important zone of the terrestrial ecosystem. The coastal habitats are typically known to harbor rich biodiversity¹. Udupi district having a land area that represents about 1/30 of 1% of India, it harbours about 6% of the indigenous plant species of India. Udyavara is an ancient port town located 5 km south of Udupi in the Indian state of Karnataka. The river *Papanashini* flows from east to west and turns north to separate Udyavara and Malpe². Medicinal Plants have been used as drugs for centuries in many traditional preparations. It is estimated that about 85% of traditional medicines used for primary health care globally are derived from medicinal plants.³

With the increasing demand for herbal drugs, natural health products, and secondary metabolites of medicinal plants, the use of medicinal plants is growing rapidly throughout the world.^{4, 5} A highly conservative estimate states that the current loss of plant species is between 100 and 1000 times higher than the expected natural extinction rate and that the earth is losing at least one potential major drug every two years.⁶

Herbal potential in India facilitated rapid growth of phyto-pharmaceuticals, perfumery and allied industries. Destructive harvesting has brought about depletion and scarcity of medicinal plants. The habitat loss by export of medicinal plants collected from wild sources finally lead to severe and irreplaceable loss of genetic stock of many of these species. For medicinal plants with limited abundance and slow growth, destructive harvesting generally results in resource exhaustion and even species extinction.^{7, 8} Hence the identified species were classified into different categories of red list.

METHODS

The plants were identified on the basis of daily survey conducted in certain areas of Udyavara Village. Authentication is done by referring standard flora and experienced taxonomist of Udupi District^{9, 10, 11, 12, 13} The Endangered category of 276 identified species was explored by referring to IUCN red list, the most authoritative guide of biodiversity.^{14, 15, 16}

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RESULT

The endangered plant species were explored from 276 identified plants of Udyavara village. The 80 plants were traced to have evaluated for its

status, out of which 60 were least concerned, 4 were endangered, 5 were vulnerable, 3 near threatened, 1 conservation dependant and 7 Data deficient.

Table 1: The IUCN status of Ethno botanical plants of Udyavara

BOTANICAL NAME	RED LIST CATEGORY
<i>Acacia auriculiformis</i> Benth.	LC, LR/Ic
<i>Adenantha pavonina</i> L.	LC, LR/Ic
<i>Alstonia scholaris</i> (L.) R. Br.	LC, LR/Ic
<i>Annona muricata</i> L.	LC, LR/Ic
<i>Annona squamosa</i> L.	LC, LR/Ic
<i>Artocarpus pubescens</i> Willd.	LC, LR/Ic
<i>Azadirachta indica</i> A.Juss.	LC, LR/Ic
<i>Bauhinia purpurea</i> L.	LC, LR/Ic
<i>Bauhinia tomentosa</i> L.	LC, LR/Ic
<i>Blumea lacera</i> (Burm.f.) DC.	LC, LR/Ic - Pan Africa; DD- Europe
<i>Borassus flabellifer</i> L.	EN
<i>Bougainvillea glabra</i> Choisy	LC, LR/Ic
<i>Breynia vitis-idaea</i> (Burm.f.) C.E.C.Fisch.	LC, LR/Ic
<i>Bridelia retusa</i> (L.) A.Juss.	LC, LR/Ic
<i>Butea monosperma</i> (Lam.) Taub.	DD
<i>Caesalpinia pulcherrima</i> (L.) Sw.	LC, LR/Ic
<i>Cajanus cajan</i> (L.) Millsp.	NT
<i>Capsicum annum</i> L.	LC, LR/Ic
<i>Carica papaya</i> L.	DD
<i>Caryota urens</i> L.	LC, LR/Ic
<i>Cassia fistula</i> L.	LC, LR/Ic
<i>Casuarina equisetifolia</i> L.	LC, LR/Ic
<i>Cayratia pedata</i> (Lam.) Gagnep.	C Pedata-VU; C Pedata var glabra-CR
<i>Centella asiatica</i> (L.) Urb.	LC, LR/Ic
<i>Ceiba pentandra</i> (L.) Gaertn.	LC, LR/Ic
<i>Citrus maxima</i> (Burm.) Merr.	LC, LR/Ic
<i>Colocasia esculenta</i> (L.) Schott	LC, LR/Ic
<i>Commelina benghalensis</i> Forssk.	LC, LR/Ic
<i>Crossandra infundibuliformis</i> (L.) Nees	C I- LC, LR/Ic; C I sub sp- eglandulosa-VU
<i>Croton oblongifolius</i> Sieber ex Spreng	LC, LR/Ic
<i>Curcuma longa</i> L.	DD
<i>Dalbergia latifolia</i> Roxb.	VU
<i>Delonix regia</i> (Hook.) Raf.	LC, LR/Ic
<i>Derris scandens</i> (Roxb.) Benth.	LC, LR/Ic
<i>Ficus benjamina</i> L.	LC, LR/Ic
<i>Ficus hispida</i> L.f.	LC, LR/Ic
<i>Ficus racemosa</i> L.	LC, LR/Ic
<i>Garcinia indica</i> (Thouars) Choisy	VU
<i>Gardenia gummifera</i> L.f.	LC, LR/Ic
<i>Gliricidia sepium</i> (Jacq.) Walp.	LC, LR/Ic
<i>Glycosmis pentaphylla</i> (Retz.) DC.	LC, LR/Ic
<i>Gmelina arborea</i> Roxb.	LC, LR/Ic

<i>Hopea ponga</i> Dennst.	EN
<i>Ipomoea batatas</i> (L.) Lam.	DD
<i>Ipomoea cairica</i> (L.) Sweet	LC, LR/Ic
<i>Jatropha curcas</i> L.	EN
<i>Lagerstroemia indica</i> L.	LC, LR/Ic
<i>Leea indica</i> (Burm. f.) Merr.	LC, LR/Ic
<i>Leucaena leucocephala</i> (Lam.) de Wit	CD
<i>Magnolia champaca</i> (L.) Baill. ex Pierre	LC, LR/Ic
<i>Mangifera indica</i> L.	DD
<i>Manihot esculenta</i> Crantz	DD
<i>Melia azadirachta</i> L.	LC, LR/Ic
<i>Mimosa pudica</i> L.	LC, LR/Ic
<i>Mimusops elengi</i> L.	LC, LR/Ic
<i>Nerium oleander</i> L.	LC, LR/Ic
<i>Pennisetum polystachion</i> (L.) Schult.	LC, LR/Ic
<i>Physalis minima</i> L.	P Minima- LC, LR/Ic; P minimaculata-VU
<i>Pithecellobium dulce</i> (Roxb.) Benth.	LC, LR/Ic
<i>Plumeria rubra</i> L.	LC, LR/Ic
<i>Pongamia pinnata</i> (L.) Pierre	LC, LR/Ic
<i>Psidium guajava</i> L.	LC, LR/Ic
<i>Pterospermum acerifolium</i> (L.) Willd.	NT
<i>Santalum album</i> L.	VU
<i>Saraca asoca</i> (Roxb.) Willd.	VU
<i>Senna alata</i> (L.) Roxb.	LC, LR/Ic
<i>Spathodea campanulata</i> P.Beauv.	LC, LR/Ic
<i>Streblus asper</i> Lour.	LC, LR/Ic
<i>Syzygium caryophyllatum</i> (L.) Alston	EN
<i>Syzygium cumini</i> (L.) Skeels	LC, LR/Ic
<i>Tabernaemontana alternifolia</i> L.	NT
<i>Tamarindus indica</i> L.	LC, LR/Ic
<i>Tecoma stans</i> var. <i>sambucifolia</i> (Kunth) J.R.I.Wood	LC, LR/Ic
<i>Terminalia catappa</i> L.	LC, LR/Ic
<i>Thespesia populnea</i> (L.) Sol. ex Corrêa	LC, LR/Ic
<i>Trema orientalis</i> (L.) Blume	LC, LR/Ic
<i>Vitex negundo</i> L.	LC, LR/Ic
<i>Zingiber zerumbet</i> (L.) Roscoe ex Sm.	DD
<i>Ziziphus mauritiana</i> Lam.	LC, LR/Ic
<i>Ziziphus oenopolia</i> (L.) Mill.	LC, LR/Ic

Table 2: Total number of species encountered

Total encountered	80 +4 (Variety/Habitat)=84 plants
LC or LR/Ic-Least Concern	60
VU- Vulnerable	05+(02-variety)=07
EN-Endangered	04
DD-Data Deficient	07+(01-Other Habitat)=8
NT-Near Threatened	03
CR-Critically Endangered	00+(01- Variety)=01
CD- Conservation Dependant	01
Total	84



Borassus flabellifer L.(EN)



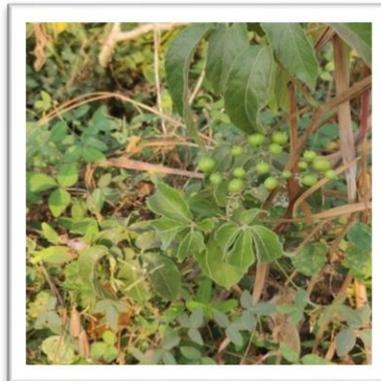
Hopea ponga Dennst. (EN)



Jatropha curcas L. (EN)



Syzygium caryophyllatum (L.)
Alston (EN)



Cayratia pedata (Lam.) Gagnep. (VN)



Dalbergia latifolia Roxb. (VN)



Garcinia indica (Thouars)
Choisy (VN)



Santalum album L. (VN)



Saraca asoca (Roxb.) Willd. (VN)



Caesalpinia pulcherrima (L.) Sw. (NT)



Pterospermum acerifolium (L.)
Willd. (NT)



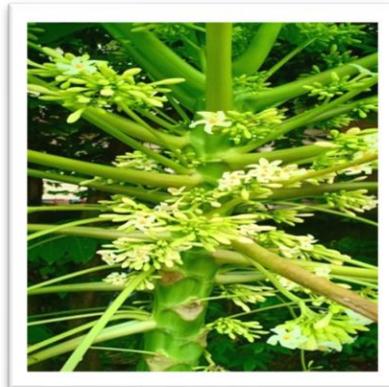
Tabernaemontana alternifolia L.



Leucaena leucocephala (Lam.)
de Wit (CD)



Butea monosperma (Lam.)
Taub. (DD)



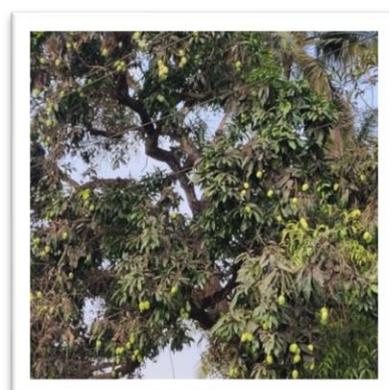
Carica papaya L. (DD)



Curcuma longa L. (DD)



Ipomoea batatas (L.) Lam. (DD)



Mangifera indica L. (DD)



Manihot esculenta Crantz (DD)



Zingiber zerumbet (L.) Roscoe ex Sm. (DD)

DISCUSSION

Endangered species

1. *Borassus flabellifer* L: Tree, Stem up to 30 m high, when young covered with the dry leaves or the bases of the petioles. Frequent near the seacoast. Leaves are used for thatching. Wood is used in hut construction for rafters, pillars and posts. The pulp of the tender fruit is edible. The sap of the peduncle yields toddy. Leaf decoction is used as a gargle for toothache.

2. *Hopea ponga* Dennst: A large trees. Common in forests, usually with spherical echinate axillary or extra-axillary galls. An excellent fuel wood. Timber is useful. Bark decoction and gum resin paste are used for rheumatism.

3. *Jatropha curcas* L.: A large glabrous shrub. Bark greenish-white, smooth, peeling off in thin flakes. A native of Tropical America, usually grown as a hedge plant. The seeds are externally applied in herpes, eczema and to cleanse the wounds, sores and ulcers.

4. *Syzygium caryophyllum* (L.) Alston: A small tree or large shrub. Common in forests. Fruits edible. It regulates production of insulin. The seeds have gastro protective activities. The fruit is antiscorbutic in action.

Vulnerable species

1. *Cayratia pedata* (Lam.) Gagnep: A large climber with forked tendrils. Occasionally seen along hedges. Whole plant except roots is used for cough, asthma and joint pain.

2. *Dalbergia latifolia* Roxb: A large tree. Heart wood is one of the most valued timbers. Bark decoction is recommended for urinary disorders, rheumatism and also as wound healer.

3. *Garcinia indica* (Thouars) Choisy: A slender tree with dropping branches. Frequent in evergreen and deciduous forests and also cultivated. The rind is used to prepare cooling beverages. It is also dried and used in curries. An edible fat called kokum butter is extracted from seeds.

4. *Santalum album* L: A small, glabrous, evergreen tree, occasional in forests. The scented heartwood is used in carving, distillation of oil and in religious ceremonies. Chandana heartwood mixed with sugar and honey along with rice water one become free from burning sensation, thirst, diabetes and hemorrhage.

5. *Saraca asoca* (Roxb.) Willd: A small evergreen tree. Frequently cultivated in gardens. Bark is used in leucorrhoea, menorrhagia and complaints of menopause. Also as uterine tonic, used for dyspepsia, colic & burning sensation.

Near Threatened species

1. *Caesalpinia pulcherrima* (L.) Sw: A large shrub or small tree, branches unarmed or armed with small prickles. Probably a native of tropical America, extensively cultivated in gardens for their showy flowers. Oil prepared from leaf juice is used for burns and rheumatism.

2. *Pterospermum acerifolium* (L.) Willd: A large tree, cultivated in gardens. Flower relieves headache immediately. Charred flowers and

bark mixed with powder of *Mallotus philippinensis* are applied to small pox eruptions.

3. *Tabernaemontana alternifolia* L: A small deciduous tree. Common in distributed forests. The wood and stem bark showed CNS depressant and hypotensive activity.

Conservation Dependant species

1. *Leucaena leucocephala* (Lam.) de Wit: A large shrub or small tree. A tropical American species, often cultivated for fuel and forage. The roasted seeds are emollient. A decoction of the root and bark is abortifacient.

Data Deficient species

1. *Butea monosperma* (Lam.) Taub: A deciduous tree. Not common, sometimes cultivated in the parks, called flame of the forest. Bark decoction is given for menstrual problems. Flower extract or decoction is given as blood purifier.

2. *Carica papaya* L: A rapidly growing soft-wooded tree, stem up to 9 m high, usually unbranched but sometimes divided in to several erect stems bearing crown of leaves. A native of South America, usually cultivated in gardens for its edible fruits. Green fruits are used as vegetables.

3. *Curcuma longa* L: A tall herb, rhizome large, aromatic, bright-yellow within. This is the source of commercial turmeric. It is used as a condiment. Rhizomes are employed as stimulant, tonic and carminative.

4. *Ipomoea batatas* (L.) Lam: A creeping herb with tuberous roots, stems somewhat fleshy, rooting at the nodes. Often cultivated for its edible tubers. The roots are used in constipation, renal and vesical calculi, diabetes and general weakness.

5. *Mangifera indica* L: A medium to large tree. Extensively cultivated for its delicious fruits. Found wild in semi-evergreen forests and along roadsides. Wood is used for construction purposes. Stem bark in haemorrhages, diarrhoea and rheumatism.

6. *Manihot esculenta* Crantz: An herbaceous shrub, with elongate tuberous roots. The plant is used for treating scabies and weeping skin.

7. *Zingiber zerumbet* (L.) Roscoe ex Sm: Plant with Rhizome, horizontal, aromatic, yellow inside. Leafy stem up to 2 m high. Often cultivated and naturalised in the area of the present study. Zerumbone inhibits the growth of micrococcus pyogenes and mycobacterium tuberculosis.

The Deforestation, pollution and urbanization combine to form a circumstance where plan become endangered or extinct. The more and more land cleared for urbanizing the living space which shrinks the habitat for plant organism which in turn gives major impact for sustenance of animal living as well. An effort was made on Udyavara village of Udupi, resulted in 80 evaluated drugs categorized into further different status. Around 60 were under Least Concern. The plants encountered under endangered species will guide the practitioner for its judicial use in medicine. Moreover the conservation of such plant species is possible by further cultivation of the same. The habitat base cultivation is more encouraged.

CONCLUSION

The resulted report provides objective guidelines in further propagation of habitat based plants in different places of the village. The scientific awareness created thereafter brings about judicial use of plant in medicinal and other purpose. Acting locally at the village and conserving the plant will surely bring about global health.

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Conflict of Interest

None declared.

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