Original Article

Survey Of Critically Endangered Flora Of Western Ghats Of India

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Abstract

The Mountains of the Western Ghats are the second most significant haven on the planet for compromised species. The ongoing paper is an endeavor to concentrate on the protection evaluation of intriguing, jeopardized furthermore, compromised species (RET) of the southern Western Ghats. When a species is in danger of extinction, it is considered endangered. Since before recorded history, innumerable species have become terminated from normal cycles. The current review was directed to recognize the uncommon, imperiled and undermined endangered plants in Western Ghats of Tamil Nadu, India. Concerns about the growing number of threatened species worldwide have increased. Formative tasks, and expanded reliance on woodlands both for food and job have delivered numerous species compromised. More than 150 species in India are in danger of extinction and require immediate intervention to maintain their populations. Various plant species are horrendously removed exclusively from the woods. Aside from anthropogenic dangers, a few animal varieties are undermined due to obtrusive species and environmental change. The only viable option for saving many species from extinction is species recovery in light of growing and ongoing threats. Here, we audit the current recuperation programs in the nation and propose a complete move toward in the protection and recuperation of large numbers of the fundamentally imperiled species. We feature issues that should be tended to and talk about techniques for recuperating the fundamentally imperiled species in the country. Between 2021 and 2022, the Western Ghats RET-listed climbing species were collected and identified. The assortment and distinguished RET plant species from the review were chosen from various slopes (woodland) of Western Ghats. During the work they chose concentrate on locales were visited, plant examples were gathered and methodicallly squeezed, put away for recognizable proof.

Keywords: Endangered plants, ecological interactions, genetic enrichment, niche modelling, species recovery, western ghats

INTRODUCTION

Concerns about the growing number of threatened species worldwide have increased. Many species are in danger due to development projects and an increasing reliance on forests for food and income. More than 150 species in India are in danger of extinction and require immediate intervention to maintain their populations. Several plant species are only harvested destructively from forests. Invasive species and climate change also pose a threat to a number of species, in addition to those caused by human activity. In the radiance of expanding and proceeded with dangers, species recuperation is the main feasible choice for reestablishing a significant number of them from elimination. Here, we survey the current recuperation programs in the nation and propose a thorough methodology in the preservation and recuperation of a considerable lot of the fundamentally imperiled species. We feature gives that should be tended to and examine methodologies for recuperating the fundamentally imperiled species in the country.

Background

India is regarded as one of the world's mega-diversities due to its abundance of flowering plants. One-third of the 18,000 flowering plant species discovered in India are thought to be endemic to the Western Ghats. Among the 5,000 species that were reported, there were nearly 1600 endemic species of trees, shrubs, climbers, and herbs. The Western Ghats are home to 54 monotypic genera. In terms of the concentration of endemic taxa and floristic composition, the southern Western Ghats are by far the richest region. Rain forests frequently contain climbers. There are more species in climbing plant taxa than in non-climbing taxa. It is believed that highly diversified clades should exhibit greater genetic differentiation between populations. There are more species in climbing plant taxa than in non-climbing taxa. The majority of lianas can only be found in tropical forests, where they can make up to 45 percent of the woody stems and 35 percent of the total number of woody plant species. Climbing plants can be found in any forest and anywhere else on earth. Endemic species are more helpless against annihilation than additional inescapable species on account of their restricted geographic reaches and consequently have become one of the best proxies for distinguishing preservation needs.

Priority areas or hotspots where biodiversity is most in danger must be identified when conservation resources are limited. An important insight into the biogeography of a country or geographical region can be gained from the endemism of its flora, as well as from its diversity centers and centers of adaptive evolution.

In India, as in many other tropical regions, intense developmental activities over the last few decades have left behind forests that are highly fragmented and noncontiguous. It is estimated that in India about 1052 species are Red-listed, which also includes several hundreds of medicinal plants. Among these, eight species are already extinct, and 75 animal and 77 plant species are critically endangered. In the Western Ghats alone, more than 100 tree species of high economic importance are threatened and critically endangered. For many of these critically endangered species, the major threat is their extremely small population sizes, far below the size that can sustain them (due to inbreeding and loss of genetic variability). Thus, unless urgent conservation action is taken up in terms of recovering these species, many of them may be completely lost. A species is critically endangered when its population size reaches a critical lower limit and unless measures are taken to restore the species, it would become extinct. Recovery is the process by which the decline of a threatened species is arrested or reversed and threats removed so that its survival in the wild can be ensured.

The ultimate goal is the recovery of threatened species and the ecosystems on which they depend. Several countries worldwide have initiated national plans to address the resurrection of rare, endangered and threatened (RET) species. Species recovery programmes have been systematically carried out in countries like the United States, Canada, Great Britain and Australia. In most of these countries, special legislation like the Endangered Species Act, 1973, United States of America (ESA) has been implemented to carry out species recovery programmes. The ESA, which was put into force in 1973, has provisions for listing the species as endangered, developing recovery plans for each species and designating critical habitats. Thus, in the US, 1158 species have special recovery programmes3. In the past few years, populations of 47 species have been stabilized through various recovery processes and are now de-listed from the recovery programme. The bald eagle, for example, had reduced to just 450 individuals in 1967 and was declared as endangered. However, captive breeding of individuals and subsequent release into the wild resulted in the population bouncing back to about 4500 individuals. Subsequently, the bald eagle has been delisted from the endangered list in 2007. Many other critically endangered species in the US such as California condor, black-footed ferret, peregrine falcon, grey whale, whooping crane, red wolf, etc. have also been saved from extinction. Through recovery programmes there has been either an increase in the population size (green pitcher plant), habitat restoration (Aleutian Canadian goose), captive breeding (black footed ferret, bald eagle, etc.) or population stabilization (fringed orchid). In this article, we discuss the status of the threatened species in India and potential issues in recovering them, and suggest possible steps in carrying out species recovery in the country.

Biogeographers have been very interested in finding out why areas of endemism exist, whether it's because of a unique combination of ecological factors or because of vicariance and speciation in isolation and continued range restriction. Some reports on floristic studies of the Western Ghats region have appeared in recent years. To the extent that RET climbing plants of the Southern Western Ghats are concerned, no point by point stock was attempted previously. Therefore, it is imperative that every RET climbing plant species be conserved immediately. It's possible that some species will disappear without receiving any attention. Human disturbance in these forests is steadily rising due to the fact that the majority of the southern Western Ghats are situated close to human settlements. Considering the above aspects, the current review was recognize the uncommon, imperiled and compromised climbing plants in southern Western Ghats of Tamil Nadu, India.

Methods and Setting of the Study

The Western Ghats, one of 34 globally recognized biodiversity hotspots, also make up a large portion of the state. Truth be told, Tamil Nadu is the main state with both slope ranges, Western Ghats and Eastern Ghats, both meet at the Nilgiri slopes. Practically the whole western line of the state is involved by the Western Ghats with Kerala. The highest point in Tamil Nadu is Doddabetta, which is in the Nilgiris district of the Western Ghats. It is 2637 meters high. The current review was led in Southern Western Ghats woods area of Tamil Nadu. It is a hilly region in the Sathyamangalam Tiger Reserve Forest that meets the Eastern Ghats mountain range. Present review covers seven regions viz. Coimbatore (CBE), Theni (TN), Dindugul (DG), Viruthunagar (VN), Kanyakumari (KK), and Tirunelveli (TVL) are the Nilgiris. Due to the enormous variety of climate, altitude, and edaphic factors, the Western Ghats of Tamil Nadu are home to a wide variety of plant species. Vegetation can extensively be arranged into two significant classifications, in particular Vegetation of the inside fields and Vegetation of the slopes and mountains and every vegetation classification might be additionally isolated into different woodland kinds of the current review region viz. Dry Deciduous Woods, Bush wilderness Woodland, Soggy Deciduous Timberland, Tropical Wet Evergreen Backwoods, Tropical Semi Evergreen Backwoods, Tropical Evergreen Timberland, Shola woodland and Mangrove woodland in light of "A modified study of woodland sorts of India".

Methodology

From the current study area, rare, endangered, and threatened plants were recorded. The plant assortment and distinguishing proof of the RET recorded climbing species were chosen from various slopes (timberland) of the Southern Western Ghats, Tamil Nadu from 2021 to 2022. The collected specimens were placed in a herbarium for conventional identification. The essential ID of plant examples finished with assistance of neighborhood and local Greeneries and the similarity of distinguishing proof contrasted and real herbarium stored. Using RET data books and standard publications like, as well as the IUCN Ret list, the plants' threatened status was confirmed. A database was created from the botanical data, which included the binomial name, family, mode of dispersal, collection source, morphology of the useful part, and conservation status.

Results and Discussion

From various forest types in the Southern Western Ghats of Tamil Nadu, 285 climbing plant species from 125 genera and 41 families were identified. In India's tropical forest, the taxonomic diversity of lianas was relatively high. Similar outcomes have been reported by numerous studies conducted in various tropical forests. Out of the 285 species, 33 taxa were gathered under RET classification. Lianas families in Asian forests are dominated by *Apocynaceae, Fabaceae, Anonaceae, Combrataceae, Loganiaceae, and Rutaceae,* among others. The most species-rich family was *Convolvulaceae,* with nine species, followed by *Asclepiadaceae*, with five species.

This study also demonstrates the *Apocynaceae and Fabaceae* dominance of liana families in extensive tropical forests. *Operculina turpethum (Linn.)* is one of the endangered species. *Ceropegia mannarana Umam, Silva Manso, and Daniel and Grewia heterotricha Mast, Gloriosa superba L.* were gathered from the area under study. *Smilax wightii A. DC.* was listed as an endangered species despite the fact that the species *Gloriosa superba L*. In previous studies, the IUCN classified it as rare; however, this study found that it is the most common species in all types of forests. *Celastrus paniculata Willd.* one of the rare species, *Cymosa aganosma G.Don. Smilax zeylanica L., Corallocarpus gracilipes Cong., Argyreia nellygherrya Choisy, Argyreia pomacea (Roxb.)*

In the Southern Western Ghats, *Choisy and Coscinium fenestratum (Gartn) Colebr* were gathered. Some of the identified taxa, according to the current study, only occur in a small number of samples and have a narrow distribution. It suggests that additional research on climbers' flora in the Western Ghats is required. The species *Cucumis dipsaeceus Enherb. Cong., Corallocarpus gracilipes Bauhinia vahalli Wt Arn., phoenicea Bauhinia Wight & Arn., Passiflora foetida var.* It was discovered that *Ipomoea ellisonii Vander, Ipomoea mulleri Benth, and Ipomoea rumicifolia Choisy* are among the rarest species and have a restricted distribution in these forest areas. Site-specific conservation strategies are required for these species. The current review recorded different climbing systems. The types of the families *Convolvulaceae, Menispemaceae and Combrataceae* move by twining around the host plants, ringlet climber is the second prevailing components of the current review. Various tropical forests were the locations of similar studies. Numerous species are extensively exploited for therapeutic or other purposes in the research field. Locals were observed to use 15 of the 33 RET plants for medicinal purposes, including *G. Don.'s Aganosoma cymosa, Argyreia nervosa Dalz., Aristolochia tagala Cham., phoenicea Bauhinia Wight & Arn., Umam. & Ceropegia mannarana Daniel and Goetgh's Coscinium fenestratum Colebr. etc*. These plants are being used to treat skin conditions like cough, fever, headache, diabetes, rheumatism, asthma, dysentery, and poison ivy, among other conditions. and nine edible plants, including *Cucumis dipsaceus Ehrenb, Passiflora leschenaultii DC., Rubus racemosus Roxb, Piper longum L.* furthermore, *Solena amplexicaulis (Lam.)* Gandhi, et al. These plants were continually collected and overpriced by locals in the study areas, which concerned officials should be aware of to ensure their sustainability. *Ipomoea cairica (L.) Sweet.*, the total number of invasive species, *Ipomoea muelleri Benth, Celastrus paniculatus Willd, and Lantana camara L. furthermore, Rubus racemosus Roxb*.) In every part of the study area, Lantana camara L. were the most common. These invasive species are ready to colonize disturbed areas and harm natural areas' ecosystems significantly. According to the findings of this study, some species of climber fruits that lianas produce in order to maintain their population *(Solena amplexicaulis (Lam.)*) Gandhi, *Smilax zeylanica L., Rubus racemosus Roxb., Leschenaultia Passiflora DC and Piper Longum L.*, among other) likewise support various birds and different creatures species. Hence, indiscreet use of lianas could fundamentally affect the woodland variety. The backwoods of the Western Ghats are inclined to assorted dissemination like attack of outsider species, unlawful lumber

extraction, assortment of non-wood timberland items, human settlement, expulsion of minerals, slope development, steers brushing and the travel industry. The development of practical conservation strategies for RET plants in the Southern Western Ghats is an urgent requirement that may lead to their effective protection. End The current review proposes that RET species could gives essential data about the specialties and amplitudes of uncommon endemic, jeopardized and compromised species in a local scale. In order to prioritize conservation of critical habitat and habitat sites, this report can assist in locating areas and habitats with high concentrations of these species.

CONCLUSION

Overexploitation of natural resources and other human-caused activities are two examples of threatened factors that have a negative impact on the existing ecosystem and may eventually result in the extinction of many species. In order to effectively protect endemic plants in the southern Western Ghats, practical conservation strategies must be developed immediately. When the factors that initially led to a species' listing are resolved and protection is no longer required, the species is said to have been "recovered." For many threatened species, the Forest Department (state governments) and private parties (forest fringe communities and other stakeholders) must work together to enact laws and regulations and reach agreements to protect them. Just when sufficient lawful components are carried out to deal with a recorded animal varieties whose populaces have recuperated could the species at any point be genuinely said to never again require insurance and in this manner be considered for delisting. Definition of a public plan including the security and recuperation of an animal groups could help in orderly recuperation of imperiled species. For an effective recuperation program, various elements should be thought of. Identifying the extrinsic and intrinsic factors that drive species to threatened status (identification of the extent and type of threat), assessing the genetic variability of the species, and identifying genetic hotspots ecological niche of the species in order to locate the possible places for reintroduction would be part of a comprehensive approach to recovery. This would include documenting the threatened status of plant species as thoroughly and scientifically as is possible. Surveying all known populations of the species and mapping their locations would also be part of In view of these variables, fitting methodologies for the reclamation and recuperation of the jeopardized species should be figured out and explicit administration conventions (for monetarily significant species) should be produced for usage of these compromised species. In order to possibly remove the species from the Red-list, long-term monitoring programs must also be developed to periodically evaluate the population changes.

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