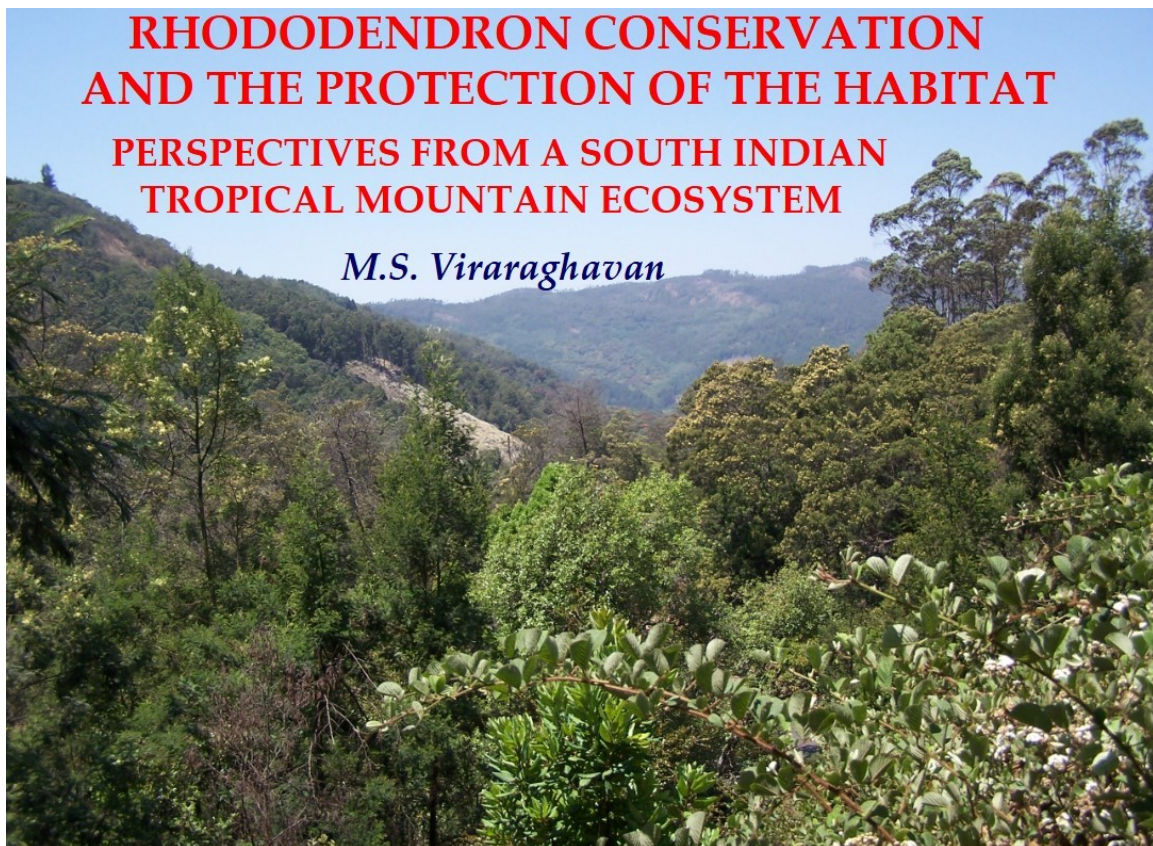


RHODODENDRON CONSERVATION AND THE PROTECTION OF THE HABITAT

PERSPECTIVES FROM A SOUTH INDIAN TROPICAL MOUNTAIN ECO-SYSTEM

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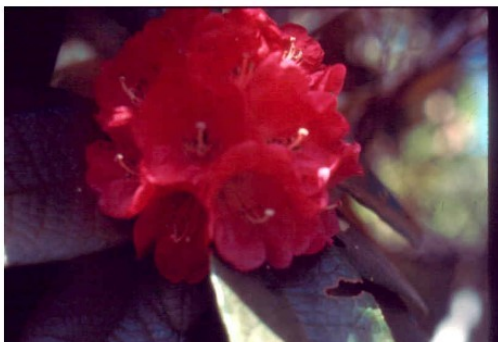
In this paper I attempt to highlight the current status of the rhododendron species endemic to the Palni Hills and adjacent areas of the Western Ghats in South India, and the impact of various developments on the habitat of the rhododendron.

This presentation deals with *R. arboreum* ssp. *Nilagiricum* and its habitat – the Palni Hills and other high altitude areas of the Western Ghat mountains of peninsular India



Our rhododendron, *R. arboreum* subspecies *nilagiricum*, is the only species which occurs over the Palni Hills, an eastern offshoot of the Western Ghats, as also in the Nilgiri Mountains to the north, as well as in some other high altitude portions of the main Western Ghats chain. This species is found only at altitudes in excess of 1500 meters, where a quasi-temperate climate prevails – strictly speaking, tropical mountain climate. In Kodaikanal, altitude 2000 m., the chief town of the hills, the temperature range is narrow - 25 degrees C. summer maximum and 4 degrees C winter minimum and this is typical of this type of climate.

Colour forms of *R. arboreum* ssp. *nilagiricum*



This species is distinguished as a subspecies of *R. arboreum* itself, which is the typical low altitude rhododendron of the Himalayas, but bears a surprisingly close resemblance to *R. arboreum* eco-types in India's north-eastern states.

When we look at problems of conservation, environmentalists have learnt (painfully!) that it does not pay to focus on a glamorous animal, like the tiger, or a glamorous plant, like the rhododendron – our conservation efforts have to be squarely on protecting the habitat.

Map of India showing Palni Hills (Kodaikanal), Nilgiri Mountains (Ooty), Western Ghats and Sikkim



The habitat I am talking about is the Palni Hills, an area of some 2000sq. kms., of which the upper plateau, about 400 sq. kms., with altitudes of 1500-2500m. is the habitat of this rhododendron. The unique feature of the Palni Hills is that, being an eastern offshoot of the Western Ghats, the species distribution is somewhat different from the main Western Ghats, and includes many species typical of the Eastern Ghats mountains of peninsular India.

A shola forest – the typical habitat of the rhododendron in the Palni Hills - an eastern offshoot of the Western Ghats.



Our conservation efforts have to focus on protection of the habitat, not on individual species.



Features of the Palni Hills include:

- a) Unique species distribution, including many typical Eastern Ghats species.**
- b) Rainfall from October – December after the main South West Monsoon is over.**

Another distinctive feature is that this area receives its maximum rainfall during October to December, i.e. during the retreating South West Monsoon, which is called the North East Monsoon. This is of vital importance as it provides much needed post South West monsoon supplementation of irrigation supplies during the crucial period before the main rice crop of the Tamil Nadu State plains is harvested, from January onwards.

The rhododendron habitat - the upper plateau is characterized by

- a) Shola forest** – unique evergreen quasi- temperate forests, with many broad leaved species.
- b) Grass lands**



It is indeed surprising that such an important eco-system is under threat from various factors. Before analyzing this I would like to describe the main features of the forests of the region which essentially, and especially in the upper plateau consists of 2 components;

1. The shola forests - the unique evergreen quasi-temperate forests, with many broad-leaved species, and
2. The grasslands.

This pattern had ensured that the area's vital role as the major water source for southern Tamil Nadu was adequately performed in the past.

Briefly, the shola forests with their deep leaf-litter retained as much as 1/3rd of the rain which fell on them and thereafter slowly released the stored water into the streams which originated from them, which were rendered almost perennial, and the grasslands provided erosion control, fodder for the animal species, and an immediate supply of water after rain.

Sadly, this pattern has been seriously disturbed by conversion of vast areas of grassland to commercial plantations, chiefly of wattle (*Acacia dealbata*), the bark of which is used by the tanning industry, and eucalyptus (*E. globulus*), as a source of raw material for wood-pulp based industries.

Another threat is unplanned urbanization.

Threats to habitat :

- a) Conversion of grasslands to commercial plantations, chiefly of wattle (*Acacia dealbata* and *A.mearnsii*) and eucalyptus (*E.globulus*), and unplanned urbanisation.



Threats to habitat:

- b) Loss of grasslands and blocking of elephant corridors leading to intensification of man/animal conflicts-incursions by Gaur and Elephants.



Gaur (*Bos gaurus*) seen within town limitativ

The consequences of this conversion of grasslands are immediate and obvious. One very serious effect is that animal species like the gaur are deprived of fodder and therefore invade cultivated lands, thereby intensifying man-animal conflicts. This factor, along with unplanned agriculture expansion, cutting across elephant corridors, and increasing elephant attacks on farmlands has led to serious alienation of the local community from efforts to protect the forests. No conservation programme will be successful unless it has the whole-hearted support of the local community - and this is an entirely man-made dilemma. Such considerations have come in the way of a proposal to notify a Palni Hills Sanctuary, pending for more than 10 years.

Threats to habitat:

c) Climate change:

- i. Many species found below 1800m. have now climbed mountain tops.
- ii. Change in rainfall pattern with reduction in summer rains and especially reduction in number of rainy days.

Another factor threatening the habitat is the change in the climate of the hills, arising from local deforestation as well as climate change arising from global factors. Studies have shown that of the total rainfall of more than 1600 mm. in the Palni Hills, nearly 30% falls as summer rains, from March to May, and the quantum of this has reduced, and the intervals between successive showers increased, leading to predictable consequences. That the climate of the hills is changing is exemplified by the fact that species like *Tithonia diversifolia* and *Ipomea indica*, earlier found below 1800 m. are now climbing to mountain-tops within the last decade.

More on the rhododendron habitat



Our rhododendron is the typical inhabitant of the interface between shola forests and grasslands. At present it does not seem to be seriously threatened in our area, but the situation is certainly much worse in the Nilgiri Mountains, where the eastern parts especially have seen a substantial decline in rhododendron populations, consequent on the expansion of plantation crops and farming. It is significant to note that in the western parts, the rhododendron is better protected by the local tribe of the area, the pastoral Todas, who indeed, worship the rhododendron, which is an integral part of their culture, which again underlines the importance of local community participation in conservation.

Our rhododendron survives to a large extent because of the thick bark protecting it from forest fires which are a major hazard. But we should not be lulled into false complacency by the plant in focus being comparatively unthreatened. In the Palni Hills there are already many plants either extinct or gravely threatened, by over-collection or by climate change - for example, the orchid *Aerides crispum*, *Lilium neilgherrense*, *Hoya wightii* subspecies *Pulneyensis* and the tree fern,

Cyathea crinata. Even the folklore plant, the Kurunji (*Strobilanthes kunthianus*), which has the unique feature of flowering only every twelve years, is in sharp decline. This threat to other species is a clear pointer of habitat decline, which cannot be without an impact on the rhododendron.

The turn of the rhododendron will come unless the habitat is better protected. At present it is safe because of its thick bark, protecting it from forest fires.



Features of *R. arboreum* ssp. *Nilagiricum*

- a) Tree – like growth with brilliant red flowers. Though there are light to dark pink forms.



A few words on *R. arboreum* itself – the typical form is a plant of tree-like proportions with brilliant red flowers though there is a colour range in different plants, from light pink, dark pink and red.

- a) It is a plant of the interface between shola forest and grassland.
- b) At present **not** under serious threat in the Palni Hills, **but** numbers in decline.
- c) In the Nilgiri Mountains, the eastern areas have seen **decline** of this species due to expansion of **plantation crops** and **farming**.

One of the most interesting recent developments is the discovery of a white form of the species in an area called Avalanche in the Nilgiris by Dr Tarun Chhabra. The existence of this white form, which surprisingly escaped the quite intensive botanizing of the area before and after Independence, is entirely because Dr Chhabra is one of the few non-tribals to have gained the confidence of the Todas., who led the way to the discovery. This white form is indeed quite

d. In the western area of the Nilgiris, inhabited by the Toda tribals who worship rhododendrons, there is better protection.



Toda temple



Toda elder

distinctive, flowering in late autumn rather than in late winter, like the typical species, and with foliage closely resembling *R. arboreum* of the Himalayas. It has been registered with the International Registration Authority as *R. arboreum* ssp. *nilagiricum*. 'Tarun'.

b) Unique white form- *R. arboreum* ssp. *nilagiricum* 'Tarun' discovered by Dr. Tarun Chhabra with the help of Toda tribals.



Red and White forms



'Tarun'

But the occurrence of such a variant, perhaps even a new species, is a pointer to the need to intensify our efforts at locating desirable ecotypes which deserve special attention in our conservation programme. We cannot talk of conservation of rhododendron species without singling out important ecotypes. To illustrate this we may note that of the various ecotypes of *R. yakushimanum*, so extensively used in modern hybridization, it is the dwarf form which inhabits the top of Mount Yakushima which is the one employed in breeding. Similarly, the Lachung form of *R. arboreum* is an eco-type very distinct and attractive. Other examples include the forms of *R. wightii* with well shaped trusses, and talking of Vireyas, the *R. zoelleri* form which occurs nearly at sea level in Papua New Guinea. These are a few examples which illustrate the vital need to ensure that desirable eco-types are part of the focus on species conservation.

Again, in the context of global warming, we have to reassess our conservation strategies. Of the two methods of species conservation – in situ conservation and ex situ conservation, the latter may perhaps become increasingly important in a situation of climate change. There is talk of melting Himalayan glaciers at an increasing rate. Without going further into this question on which there seems to be some conflict of views, we may note that there are some disturbing trends – for example, the decline of the apple crop in Himachal Pradesh area of the

Himalayas, which is attributed to the fall in the number of hours of chilling in recent years.

Rhododendron conservation programmes have to focus not only on species protection but protection of desirable eco-types within each species. For e.g., *R.yakushimanum*, dwarf form.

The need for intensifying ex situ conservation has come precisely at a stage at which the zeal to protect genetic resources has led to increasing problems in access to indigenous species even by reputed non-commercial organizations. A change in policy is indeed required.

In the context of climate change, ex situ conservation will become increasingly important.

A change in policy required to ensure access to indigenous species by reputed non- commercial organizations.

Aspects of conservation

- a) Protection efforts should be based on **careful scientific observations**, for e.g., in the Valley of Flowers National Park prevention of cattle grazing had led to over- running of Himalayan Blue Poppy population by *polygonum* species.
- b) Promotion of **ecotourism** has to be strictly controlled to prevent unsustainable increase in demand for scarce resources, like water.

Two additional points on habitat protection and conservation are relevant. The first is the need to base protection efforts on careful scientific observations lest our efforts become counter productive. A typical case is the Valley of Flowers National Park in central Himalayas where the creation of the park led to the over-running of the *meconopsis* (Himalayan Blue Poppy) population by the overwhelming increase in *polygonum* species, which had earlier been kept under control by grazing.

The second issue is eco-tourism. This is by no means free of hazards and unless strictly regulated, could lead to unsustainable increase in the demand for scarce resources, especially water. I have in mind the instance of a proposal to tap a major stream in our hills to cater to the needs of tourism, much to the detriment of the habitat.

Even in the Palni Hills the habitat is **threatened**. Many plants are endangered. For e.g., *Aerides crispum* (orchid), *Lilium neilgherrense*, *Cyathea crinata* (woolly tree fern), and even the folklore plant, the “kurunji” (*Strobilanthes kunthiana*), which flowers once in 12 years .

Problems of the Palni Hills habitat are an indication of possible similar situations in other tropical mountain ecosystems e.g., in Sri Lanka, Malaysia, Indonesia, Papua New Guinea.

May I conclude by noting that the problems of the Palni Hills habitat are likely to be an indicator of similar situations in many tropical mountain ecosystems- in Srilanka, Malaysia, Indonesia and Papua New Guinea which are home to a host of rhododendron species.

Farewell



Kodaikanal