Conservation Assessment and Management Plan (C.A.M.P.) Workshop

Endemic Orchids of the Western Ghats

REPORT

2001

Authors
Participants

Editors
C. Sathish Kumar, B.V. Shetty, S.S.R. Bennet, T. Ananda Rao, Sanjay Molur and Sally Walker

Assisted by
A.R. Binu Priya

Publishers
Wildlife Information Liaison Development Society
Zoo Outreach Organisation

Organizers
Wildlife Information Liaison Development (WILD) Society
in collaboration with CBSG, India and Zoo Outreach Organisation (ZOO)

Host / Co-organizer
Institute for Forest Genetics and Tree Breeding, Coimbatore

Sponsor
Paignton Zoological and Botanical Gardens

Coimbatore 15-19 May, 2000
Conservation Assessment and Management Plan Workshop Report
Endemic Orchids of the Western Ghats

2001

Contents

Authors of the report i
Participating institutes ii
Sponsors and organizers iii
Acknowledgement iv
Executive summary 1-4
Report 5-33
Taxon Data Sheets 35-185
References 187-195
Acknowledgements

We gratefully thank the following individuals and institutions for the help and support rendered in the conduct of this CAMP workshop.

Dr. S.S.R. Bennet, Retd. Head, Division of Biodiversity, Institute for Forest Genetics and Tree Breeding was the Co-Coordinator and was an invaluable advisor and guide for the workshop.

Shri. K. Subramanian, IFS, Director, IFGTB, for his interest and providing adequate facilities.

Shri. Uday Pradhan, Chair, Indian Subcontinent Regional Orchid Specialist Group, who recognised the process as an integral part of the activities of the Specialist Group.

Dr. C. Sathish Kumar, Co-chair of the Indian Subcontinent Regional Orchid Specialist Group, for taking an active role in the workshop and making it a big success.

Members of the Orchid Special Interest Group of the CBSG, India for their cooperation and valuable inputs throughout the C.A.M.P. process.

The Paignton Zoological and Botanical Garden, Devon, UK, for sponsoring this workshop.

The Conservation Breeding Specialist Group, SSC, IUCN, for developing this process and training the facilitators Sanjay Molur and Sally Walker in conducting the workshop.

Dr. Ulie Seal and his staff at CBSG for all the support they have rendered.

The participants at the workshop without whom the report would have no value and the results heavily biased.

The enthusiastic non-participants who sent in Biological Information Sheets or sent information after the workshop that were utilized in deriving the assessments. They include:
Dr. R. Ansari, Malabar Botanical Garden, Kozhikode
Dr. R. Ganesan, Ashoka Trust for Research in Ecology and the Environment, Bangalore
Mr. K. Jayaram, State Bank of India, Coimbatore
Dr. S. Mahammad Khasim, Nagarjuna University, Nagarjuna Nagar
Dr. K.M. Matthew, The Rapinat Herbarium, Tiruchirapally
Dr. M.S. Muktesh Kumar, Kerala Forest Research Institute, Peechi
Dr. S. Paulraj, Tamil Nadu Forest Department, Udhagamandalam
Dr. V. Ramasundar, Government Botanic Garden, Udhagamandalam
Dr. K. Ravikumar, Foundation for Revitalization of Local Health Traditions, Bangalore
Dr. Sasidharan, Kerala Forest Research Institute, Peechi
Dr. G.K. Seetharamu, College of Horticulture, Mudigere
Dr. W.D. Theuerkauf, Gurukula Botanical Garden, Wayanad

The technical and clerical staff of the Wildlife Information and Liaison Development Society and Zoo Outreach Organisation invested much time and energy in the planning, conduct, review and reporting of the CAMP Workshop. This involved much overtime work and a “normal” staff could not have completed the project. We would like to particularly acknowledge them.
Smt. Latha G. Ravi Kumar
Kum. K. Padma Priya
Kum. Binu Arthur
Kum. J. Sheela
Dr. B.A. Daniel
Smt. Geetha Kannan
Kum. A. Jyoti Maler
Kum. S. Sudha
Sri. B. Ravichandran
Kum. Sonali Lahiri
Smt. Krishnaveni
Smt. S. Saroja
CAMP Workshop on Orchids of the Western Ghats

 Participating Institutions

Botanical Survey of India, TNAU Campus, Coimbatore
Centre for Advanced Studies in Botany, University of Madras, Chennai
Coimbatore Zoological Park, Anaikatty, Coimbatore
College of Forestry, Poonampet, Coorg
CROSS WAYS, Kotagiri Road, Coonoor
Forest Research and Training Institute, Bangalore
Foundation for Revitalization and Local Health Tradition, Anandnagar, Bangalore
Goa University, Talegaon, Goa
Indo American Hybrid Seeds (India) Pvt. Ltd., Bangalore
Institute of Forest Genetics and Tree Breeding, R.S. Puram, Coimbatore
Karnataka Association for Advancement of Science, Central College, Bangalore
Kongunadu Arts & Science College, Coimbatore
Mangalore University, Department of Applied Botany, Mangalagangotri, Mangalore
Manonmanian Sundaranar University, Alwarkurichi
Nilgiri Wildlife and Environment Association, Udhagamandalam
Salim Ali Centre for Ornithology & Natural History, Anaikatty, Coimbatore
Survey of Medicinal Plants & Collection Unit, Stone House Hills, Udhagamandalam
Tamil Nadu Forest Department, Wildlife Wing, Stuart Hill, Udhagamandalam
Tropical Botanic Garden & Research Institute, Thiruvananthapuram
University of Mysore, Manasagangotri, Mysore
Wildlife Information Liaison Development Society, Coimbatore
Zoo Outreach Organisation, Coimbatore
Sponsors
This project has been sponsored by the Paignton Zoological and Botanical Gardens, England.

Host / Co-Organizer
Institute for Forest Genetics and Tree Breeding, Coimbatore

Coordinators / Facilitators / Organizers
Wildlife Information Liaison Development Society, Coimbatore
Zoo Outreach Organisation/ Conservation Breeding Specialist Group, India, Organiser / Facilitators, Coimbatore

Collaborators
Indian Subcontinent Regional Orchid Specialist Group, SSC, IUCN
CBSG India Orchid Special Interest Group, Coimbatore

Special thanks
A special thanks to the Conservation Breeding Specialist Group, SSC, IUCN, which developed the C.A.M.P. process and provided advice, training, other technical support from time to time throughout the CAMP Workshop. Appreciation is also due to the Species Survival Commission of the World Conservation Union for developing the IUCN Red List Criteria, a sophisticated yet flexible system, providing a means of assessing the conservation status of all plant and animal groups.
The biodiversity of Western Ghats is among the richest in the world – one among the 25 hotspots along with Sri Lanka. The flora and fauna also represents some of the most highly threatened forms in the world, as a result of continuing loss of habitat, fragmentation and expanding human population and activities. The status of endemic orchids of the Western Ghats was assessed at a workshop in May 2000 as a combined effort of academics, field biologists and foresters. A Conservation Assessment and Management Plan (CAMP) workshop was held for five days from 15 to 19 May 2000, at the Institute of Forest Genetics and Tree Breeding, Forest Campus, Coimbatore. The workshop was initiated by Dr. T. Ananda Rao, Emeritus Scientist of the Karnataka Centre for Advancement of Science, Bangalore, who also networked orchid specialists before the workshop. The Wildlife Information Liaison Development (WILD) Society, Zoo Outreach Organisation (ZOO) and the Conservation Breeding Specialist Group, India (CBSG India) organised the workshop, which was sponsored by the Paignton Zoological and Botanical Garden, Paignton, Devon, United Kingdom. The Institute for Forest Genetics and Tree Breeding co-organised and hosted the workshop at their campus. The Conservation Breeding Specialist Group, India facilitated the workshop. The workshop and the process itself was supported by the Indian Subcontinent Regional Orchid Specialist Group (ISROSG) of the SSC, IUCN, by the attendance and active input of its Co-chair Dr. C. Sathish Kumar of the Tropical Botanic Gardens and Research Institute, Palode, Thiruvananthapuram.

Totally, 125 endemic orchids of the Western Ghats were assessed at the 5-day workshop of which 98 species were endemic only to the Western Ghats and 27 had their range extending to Eastern Ghats also. A total of 38 orchid specialists, botanists, conservationists and ecologists participated in the workshop.

The Conservation Assessment and Management Plan (CAMP) is a workshop process developed by the Conservation Breeding Specialist Group (CBSG) of the Species Survival Commission (SSC)/ The World Conservation Union (IUCN). The CAMP Process brings together a broad spectrum of experts and stakeholders to:
(a) evaluate the current status of populations and habitat in the wild;
(b) evaluate the current status of populations in captivity;
(c) assess degree of threat using IUCN Red List Criteria;
(d) make recommendations for intensive management action; and
(e) make recommendations for specific conservation-oriented research.

CAMP workshop is an ideal methodology for involving national or regional specialists to assess the conservation status of a group of taxa, e.g. orchids, ferns, mammals, birds, algae, etc. Preparation for the CAMP workshop is extensive, involving identifying specialists on the group of taxa to be assessed, identifying the taxa to be assessed, and interacting with the specialists to expand and improve the lists. Descriptive CAMP material and a set of Biological Information Sheets (Appendix I) for species-specific questions are circulated to specialists. The Biological Information Sheet can be copied and filled out before the workshop or posted to the organisers if the specialist cannot attend. At the workshop, participants are divided into small to medium-size groups (6-12 persons) of either taxonomic group specialty or geographical area specialty. The groups are then provided the Taxon Data Sheets (Appendix II) on which they record information from (a) their discussion, (b) the Biological Information Sheets and (c) participating specialists. The Taxon Data Sheet consists of two parts, (a) the taxon information and (b) the management recommendations. All participants at the workshop correct and ratify their discussions and the data compiled in each Taxon Data Sheet during the final plenary session.

After the workshop the editors/facilitators undertake a review of the information compiled at the workshop by posting a draft report to all participants for corrections, modification and for details not submitted at the workshop.

The taxon assessments were based on the 1994 and 2000 IUCN Red List Criteria developed by the IUCN. The IUCN Red List Criteria have evolved over the last 30 years starting from a subjective perception in Red Data Books to the more sophisticated and objective Red Lists of today. The current categories and criteria ratified by the IUCN Committee in 1994 incorporates principles of population dynamics and conservation biology and is a product of nearly five years of revisions. The 1994 criteria is based on scientific rationale (principles of conservation biology) and has the advantages of being applicable to any taxonomic group, of being comparable across taxa and of transparency in its applicability. The 2000 IUCN Red List Criteria was ratified by the IUCN General Council in October 2000, which is a more developed version of the 1994 Criteria. In the Orchid CAMP workshop, the taxa were assessed using both the versions since information was available. Also, it was tried to test the applicability of the new version, which gave a positive.
The 1994 and 2000 IUCN Red List Criteria were adopted as a tool to assess the endemic orchids of the Western Ghats. The IUCN criteria include categories that determine whether a taxon is threatened, non-threatened, extinct, poorly known or is not to be evaluated, based on the information available for assessment.

Assessments at the workshop were made from information gathered from all the participating biologists, from their knowledge in the field, including unpublished information of range extensions, sightings, local threats, habitat changes, impact of changing ecology and other important information that does not normally get published but is available. Sources from literature are also sought in compiling this information, and museum records, if available, are included. After the initial compilation of data in a Taxon Data Sheet, the status is derived using qualifiers (or criteria) for the degrees of threat and the information is ratified after discussion at an open plenary in the workshop. The information in the Taxon Data Sheet is then typed up and a draft sent to all participants for further review, additions or minor modification of information.

Of the endemic orchid taxa of the Western Ghats (125 taxa), 106 were assessed meticulously by the participants at the workshop, while the rest were assessed by a team of five individuals including all the editors of this report. The decision to do so was widely accepted at the workshop by all the participants since not much information was available with the group. The status derived according to both the 1994 and 2000 Criteria indicated that more than 84.8% of the taxa are threatened in the Western Ghats. Four taxa are Data Deficient and three were Not Evaluated at the workshop. Figure 1a indicates the status of Western Ghats endemic orchids as assessed in the workshop and figure 1b that of the endemic orchids of Western Ghats extending to Eastern Ghats.

As evidenced by the assessments, much of which was done with limited information, more studies are required to truly understand the status of the orchids in the wild, a situation that is common in floral and faunal research in South Asia. Even though most of the assessments are made with reasonable data, or inferences, it is clear that direct observations are lacking for many taxa. Monitoring of species is extremely rare, and in many cases only sporadic sightings or accidental observations are the sole indicators of a species’ existence in a habitat. Various recommendations, therefore were suggested as part of the management planning of this exercise, whereby surveys, monitoring, habitat management, genetic studies, taxonomic studies, limiting factor research, limiting factor management, life history studies, captive breeding and other basic research and management recommendations were made. It was also suggested that this exercise be carried out again in 3-5 years to determine the status of Western Ghats orchids after some more information is collected.

Figure 1a. Status of Western Ghats endemic orchids according to the 1994 and 2000 IUCN Red List Criteria.

![Figure 1a](image1.png)

Figure 1b. Status of orchids of Western Ghats extended to Eastern Ghats according to the 1994 and 2000 IUCN Red List Criteria.

![Figure 1b](image2.png)
CONSERVATION ASSESSMENT AND MANAGEMENT PLAN
WORKSHOP FOR ENDEMIC ORCHIDS OF THE WESTERN GHATS
REPORT
The Western Ghats is one of the well-known wildlife centres in India, for its many protected areas, wild locations and beautiful scenery. The Western Ghats is also known as one of the richest areas in the world in terms of biodiversity, making it the one-among-25 Hotspots of the world (Mittermeier et al., 1998, 2000) along with Sri Lanka. Amongst the various components the biogeographical area can boast are high endemicity, taxonomic uniqueness, possibly yet-to-be-discovered flora and fauna, ca. 1,500 endemic angiosperm taxa (Nayar, 1996), 14 endemic mammals (Molur et al., 1998), ca. 100 endemic amphibia (Molur and Walker, 1998), ca. 100 endemic reptiles (Molur and Walker, 1998), 14 endemic birds (P.O. Nameer, pers. comm.), ca. 100 endemic freshwater fishes (Molur and Walker, 1998), ca. 25 endemic rattans (Renuka, 1992), innumerable invertebrates; the region is also known for its rich diversity of orchids. A total of 118 orchid taxa are found nowhere else in the world except the Western Ghats. The region also is home to about 190 taxa of orchids that occur in other parts of India and the world, making the total count of orchids around 310 in the Western Ghats.

The number of endemic orchid taxa listed does not indicate the entire diversity since quite a few unidentified taxa still remain, some of which are in the process of being described. The list of endemic orchids is therefore incomplete. Taxonomic confusion is evident in orchids of the region, which can be seen by the various nomenclature adopted by different authors of Floras of regions. Taxonomic inconsistencies are more pronounced in the subspecies level, with lack of proper surveys and studies adding to the complexity. Though there are quite a few botanists who are familiar with orchids, genuine orchid specialists (taxonomists) are very few, making the task of proper identification a challenging one. However, for the purposes of understanding the status of orchids or any flora or fauna, a first step is required to identify the lacunae in research, methodology, identity, etc. A workshop to do that was organised in mid 2000.

A Conservation Assessment and Management Plan workshop was planned in May of 2000 with the objective of assessing the conservation status of every described endemic orchid of the Western Ghats. The Institute of Forest Genetics and Tree Breeding (IFGTB), the Conservation Breeding Specialist Group, India, Zoo Outreach Organisation (ZOO) and Wildlife Information Liaison Development (WILD) Society organised and hosted the five-day workshop at the IFGTB campus, Coimbatore from 15 to 19 May 2000. The workshop was attended by 38 botanists, ecologists and conservationists from southern India, at the end of which 126 species and subspecies (taxa) of endemic orchids were assessed according to the IUCN Red List Criteria of 1994 and 2000. Conservation research and management recommendations were also made taxa-wise after the assessments were completed. The workshop was facilitated and coordinated by the Conservation Breeding Specialist Group, India (CBSG India) and supported financially by the Paignton Zoological and Botanical Garden, Paignton, Devon, United Kingdom. The Indian Subcontinent Regional Orchid Specialist Group (ISROSG), SSC, IUCN, was represented by its Co-chair, Dr. C. Sathish Kumar, a well-known orchid biologist and taxonomist, at the workshop. The workshop was initially suggested by Dr. T. Ananda Rao of the Karnataka Centre for Advancement of Science, Bangalore. He was also instrumental in keeping the interest alive with the networking of orchid specialists he conducted under the auspices of the CBSG India Orchid Special Interest Group.

Initial discussions with various potential participants and literature survey indicated the near impossibility of assessing all orchid taxa of the Western Ghats, since the numbers totalled 310. It was decided before the workshop that only endemic taxa would be assessed and the list was drawn up from Sathish Kumar’s list of orchids of the Western Ghats, plus the input from various participants at the workshop itself. In all, 102 endemic taxa were listed before the workshop and 16 more were added at the workshop. This Report represents the work generated at the workshop by orchid specialists, participants who are credited as authors of the Report, and at the end of every Taxon Data Sheet. The Editors of this report have compiled the information gathered at the workshop in a readable form. Mistakes in the report are due to oversight. The results in this report reflect the group process rather than information by any single individual.

The Conservation Assessment and Management Plan Process
Conservation Assessment and Management Plans (CAMPs) provide strategic guidance for assessing priorities for intensive management, within the context of the broader conservation needs of threatened taxa. The CAMP Workshop was designed and developed by the Conservation Breeding Specialist Group initially to assist zoos to prioritise species for conservation breeding. Over the years, as a result of the careful manner in which the workshops have been planned and conducted, and also modified to reflect evolving scientific methodologies related to requirements of the Convention on Biodiversity, CAMPs have been and are being increasingly used as a means of assisting the regional and national biodiversity planning process and for contributing far greater numbers of species to the Red List of Threatened Animals.

Because of the importance of the tasks currently being undertaken with CAMP workshops, it is crucial that the methodology established by CBSG, which is continuously evolving and improving, be rigorously followed. CAMP workshops are intended to reflect the opinions and collect the knowledge of a wide variety of stakeholders while preserving scientific integrity and providing a uniform standard.
The CAMP process brings together a broad spectrum of experts and stakeholders to:

a. evaluate the current status of populations and habitats in the wild;
b. evaluate the current status of populations in captivity;
c. assess degree of threat using IUCN Red List criteria;
d. make recommendations for intensive management action; and

e. make recommendations for specific conservation-oriented research.

The CAMP process workshop is intensive and interactive and facilitates objective and systematic prioritization of research and management actions needed for species conservation, both in situ and ex situ. Workshop participants assess the risks to a group of taxa and formulate recommendations for action using a Taxon Data Sheet. The Taxon Data Sheet serves as a compendium of the data on the status of population and its habitat in the wild as well as recommendations for intensive conservation action. They also provide documentation of reasoning behind recommendations, as well as details of other species-pertinent information.

The CAMP process is one of prioritization, assembling 10 to 40 experts (e.g., wildlife managers, biologists, representatives of the academic community or private sector, researchers, government officials and captive managers) to evaluate threat status of all taxa in a broad taxonomic group (e.g., Orchids), geographical region or country (e.g., Western Ghats).

Information gathering is focused on the most recent available data, estimates, informed guesses and identification of needed knowledge that allow:

1. assignment to IUCN Category of Threat;
2. broad-based management recommendations;
3. specific conservation-oriented research recommendations useful to generate the knowledge needed to develop more comprehensive management and recovery programs in situ and/or ex situ.

The results of the initial CAMP workshops are reviewed:

1. by distribution of a preliminary draft to workshop participants who volunteer to serve as preliminary editors;
2. by distribution to all workshop participants.

CAMP workshops are part of a continuing and evolving process of developing conservation and recovery plans for the taxa involved. The CAMP review process allows extraction of information from experts worldwide. Follow-up workshops will be required to consider particular issues in greater depth or on a regional basis or as the populations and habitat undergo the inevitable process of change. Follow-up is necessary to monitor the implementation and effectiveness of the recommendations resulting from the workshop also.

The CAMP process is unique in its ability to prioritize intensive management action for species conservation in the wild and in captivity, if required. CAMP documents can be used as guidelines by national and regional wildlife agencies as well as regional captive breeding programs as they develop their own action plans. It is the intent that the CAMP process will ultimately contribute to the wise worldwide use of limited resources for species conservation.

The IUCN Red List Criteria

The CAMP workshop process employs the IUCN Red List Criteria as a tool in assessing species status in a group. The IUCN Red List Criteria were revised in 1994 and ratified by the IUCN for use in threat categorisation at the global level (IUCN, 1996). The structure of the categories includes extinct, threatened, non-threatened, data deficient and not evaluated divisions; the first three divisions are further split into subcategories (Figure 1). Since 1991, the old Red Data Book categories have undergone successive changes to accommodate general guidelines for across taxonomic groups. To make application of the Criteria more universal, numerical values were attached to the different criteria for threat categories. The 1994 version also includes a purely quantitative criterion, which involves computation of the probability of extinction (such as in a population viability analysis) over a time frame for a taxon. The 1994 version of the Red List threatened categories are derived through a set of 5 criteria based on which the threatened category is assigned. The term “threatened” according to the 1994 IUCN categories means Critically Endangered, Endangered or Vulnerable. The 5 criteria for threat categories (IUCN, 1994) are

(A) Population reduction
(B) Restricted distribution
(C) Population restriction and fluctuation
(D) Restricted population
(E) Probability of extinction

For a taxon to be categorised as threatened, it needs to qualify for any one of the above 5 criteria only. Not qualifying for any of the above criteria could mean that a taxon is either not threatened or is data deficient.
With the popularisation of the 1994 IUCN Red List Criteria and its application around the world, a more serious look at the criteria was suggested by various specialists and taxonomic groups. The IUCN formed a Red List Review Committee to suggest changes to the 1994 Criteria and after nearly 2 years of workshops and deliberations, the 2000 IUCN Red List Criteria were drafted, which was finally accepted by the IUCN in Amman, Jordan in October 2000. Since the draft version of the guidelines were available during the Orchid CAMP workshop, it was decided to gather information for the revised criteria. Hence the assessments made at the workshop includes both 1994 and 2000 Red List Criteria. The changes in the 2000 Criteria can be referred in IUCN (2000) but the overall change in the structure of the Categories is shown in figure 2. The changes in the structure of the categories include the upgrading of Lower Risk near threatened and least concern to fulfil categories Near Threatened and Least Concern. The subcategory of Lower Risk conservation dependant is removed completely from the new structure.

Figure 1. The structure of the 1994 IUCN Categories
Results and Discussion

The 2000 IUCN Red List of Threatened Species lists 23 orchid taxa from around the world, of which 20 are threatened (6 Critically Endangered, 11 Endangered and 3 Vulnerable). Three taxa are near threatened. The categorisation followed by the IUCN is based on the 1994 Red List Criteria. There is not a single Indian orchid mentioned in the list, even though the most popular of Western Ghats ground orchids, *Paphiopedilum druryi*, is one of the world’s most threatened orchids. The assessment made at this workshop and the results derived herein will provide the basis for inclusion of more than 80 endemic orchids of the Western Ghats to be categorised as threatened in the next iteration of the IUCN Global Red listing.

The information gathered at the workshop made it possible for the orchid taxa to be assessed using the 1994 as well as the 2000 IUCN Red List Criteria, based on which Table 2 is listed. More than 80 taxa were assessed as threatened according to either criteria, with the 1994 listing showing 5 orchids more in a higher threat category than the 2000 listing. This is because 5 orchids were assessed as Vulnerable based on population reduction, which, according to the new 2000 criteria has higher threshold values and therefore do not include these taxa. Table 1a and 1b are a summary of orchids assessed at the workshop.

The guidelines for applying IUCN Red List Criteria suggest the importance of data quality and uncertainty regarding information during assessment. The quality of data determines the quality of the assessment. The more research conducted on a species and its habitat, ecology, behaviour, population structure and dynamics, demography, threats etc., the better the assessment. Such studies have not been conducted consistently for many orchid taxa, but the Criteria have been established so as to permit inferences from some information for the species in the wild. The guidelines for applying the IUCN Criteria also support the validity of inference based on habitat, distribution, threats and indirect evidence but warns against making assessments for species that lack any information at all. The assessments for all orchids were made keeping in mind the level of confidence in the available information.
The above table is a stark indicator of the level of threat faced by the endemic orchids of the Western Ghats. One endemic orchid is already thought to be Extinct. Botanical surveys over the years has not lead to the rediscovery of these taxa and hence the participants of the workshop were very sure of their status as completely extinct in the wild as well as in captivity (unfortunately, the taxa is not in cultivation). The reasons for 80% of the endemic orchids having been assessed as threatened are due to threats acting directly or indirectly on them affecting either the habitat or population. Only a very small proportion of the taxa is “relatively safe”, those that are classified under near threatened and least concern categories. However, the status of seven endemic orchids is not known because not much information is available or the taxa were not assessed at the workshop. The categories Data Deficient (DD) and Not Evaluated (NE) do not mean that the taxa are safe in the wild. In the case of DD, it simply means that there is not enough information to make an assessment, or, in the case of NE, the taxa were not assessed at all in the workshop. The results of near threatened should not be read as “safe”, rather the taxa are facing some threats whose continuation could eventually propel them into the threatened status of either Vulnerable (VU), Endangered (EN) or Critically Endangered (CR). Only one taxon, *Eria polysystachya* is categorised as Least Concern, because of its ability to adjust to the rapidly changing environment.

The list of endemic orchids of Western Ghats and their status can be refered from Table 2a.
<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>IUCN</th>
<th>Criteria</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>12. Bulbophyllum mysorense</td>
<td>1994</td>
<td>EN</td>
<td>B1+2bcde</td>
</tr>
<tr>
<td>2000</td>
<td>EN</td>
<td>B1a+b(i,ii,iii,iv,v), 2a+b(i,ii,iii,iv,v)</td>
<td>Restricted distribution and continuing decline</td>
</tr>
<tr>
<td>13. Bulbophyllum prudhoei</td>
<td>1994</td>
<td>EN</td>
<td>B1+2bde</td>
</tr>
<tr>
<td>2000</td>
<td>EN</td>
<td>B1a+b(i,ii,iii,iv,v), 2a+b(ii,iv,v)</td>
<td>Restricted distribution and continuing decline</td>
</tr>
<tr>
<td>2000</td>
<td>EN</td>
<td></td>
<td>Very small population</td>
</tr>
<tr>
<td>15. Bulbophyllum tremulum</td>
<td>1994</td>
<td>EN</td>
<td>B1+2de</td>
</tr>
<tr>
<td>2000</td>
<td>EN</td>
<td>B1a+b(iv,v), 2a+b(iv,v)</td>
<td>Restricted distribution and continuing decline</td>
</tr>
<tr>
<td>2000</td>
<td>CR</td>
<td>B1a+b(iii), 2a+b(iii)</td>
<td>Restricted distribution and continuing decline</td>
</tr>
<tr>
<td>17. Chiloschista glandulosa</td>
<td>1994</td>
<td>EN</td>
<td>B1+2bcd</td>
</tr>
<tr>
<td>2000</td>
<td>EN</td>
<td>B1a+b(i,ii,iii,iv,v), 2a+b(i,ii,iii,iv,v)</td>
<td>Restricted distribution and continuing decline</td>
</tr>
<tr>
<td>18. Disperis neilgherrensis</td>
<td>1994</td>
<td>EN</td>
<td>B1+2bcd</td>
</tr>
<tr>
<td>2000</td>
<td>EN</td>
<td>B1a+b(i,ii,iii,iv,v), 2a+b(ii,iv,v)</td>
<td>Restricted distribution and continuing decline</td>
</tr>
<tr>
<td>19. Dendrobium barbatulum</td>
<td>1994</td>
<td>VU</td>
<td>A2ce; B1+2bcde</td>
</tr>
<tr>
<td>2000</td>
<td>VU</td>
<td>B2a+b(i,ii,iii,iv,v)</td>
<td>Population reduction; Restricted area and continuing decline</td>
</tr>
<tr>
<td>20. Dendrobium heyneanum</td>
<td>1994</td>
<td>EN</td>
<td>B2a+b(i,ii,iii,iv,v)</td>
</tr>
<tr>
<td>2000</td>
<td>EN</td>
<td>C1+2a</td>
<td>Small population and continuing decline</td>
</tr>
<tr>
<td>21. Eria pratensis</td>
<td>1994</td>
<td>NT</td>
<td>-</td>
</tr>
<tr>
<td>2000</td>
<td>NT</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>22. Eria exilis</td>
<td>1994</td>
<td>VU</td>
<td>B1+2bode; C1+2a</td>
</tr>
<tr>
<td>2000</td>
<td>VU</td>
<td>B2a+b(i,ii,iii,iv,v)</td>
<td>Restricted area and continuing decline; Small population and continuing decline</td>
</tr>
<tr>
<td>23. Eria microchilos</td>
<td>1994</td>
<td>VU</td>
<td>B1+2bce;</td>
</tr>
<tr>
<td>2000</td>
<td>VU</td>
<td>B2a+b(i,ii,iii,iv,v)</td>
<td>Small population and continuing decline</td>
</tr>
<tr>
<td>24. Eria neilgherrensis</td>
<td>1994</td>
<td>EN</td>
<td>B1+2bcd</td>
</tr>
<tr>
<td>2000</td>
<td>EN</td>
<td>B2a+b(i,ii,iii,iv,v)</td>
<td>Restricted distribution and continuing decline</td>
</tr>
<tr>
<td>25. Eria tiagii</td>
<td>1994</td>
<td>NT</td>
<td>-</td>
</tr>
<tr>
<td>2000</td>
<td>NT</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Scientific Name</td>
<td>IUCN</td>
<td>Criteria</td>
<td>Reason</td>
</tr>
<tr>
<td>----------------</td>
<td>------</td>
<td>----------</td>
<td>--------</td>
</tr>
<tr>
<td><em>Habenaria flabelliformis</em></td>
<td>1994</td>
<td>CR</td>
<td>B1+2c; D</td>
</tr>
<tr>
<td><em>Habenaria gibsonii</em> var. <em>foetida</em></td>
<td>1994</td>
<td>CR</td>
<td>D</td>
</tr>
<tr>
<td><em>Habenaria gibsonii</em> var. <em>foliosa</em></td>
<td>1994</td>
<td>VU</td>
<td>A1ce; B1+2e; D</td>
</tr>
<tr>
<td><em>Habenaria gibsonii</em> var. <em>gibsonii</em></td>
<td>1994</td>
<td>CR</td>
<td>A2cd; C2a; D</td>
</tr>
<tr>
<td><em>Habenaria pallideviridis</em></td>
<td>1994</td>
<td>CR</td>
<td>B1+2e; D</td>
</tr>
<tr>
<td><em>Habenaria panchganiensis</em></td>
<td>1994</td>
<td>CR</td>
<td>B1+2a+b(v,iii,iv,v); D</td>
</tr>
<tr>
<td><em>Habenaria periyarensis</em></td>
<td>1994</td>
<td>CR</td>
<td>B1+2c; D</td>
</tr>
<tr>
<td><em>Habenaria perrottetiana</em></td>
<td>1994</td>
<td>EN</td>
<td>B1a+b(iii), 2a+b(iii); D</td>
</tr>
<tr>
<td><em>Habenaria suaveolens</em></td>
<td>1994</td>
<td>B1+2bcde</td>
<td>Restricted range and continuing decline</td>
</tr>
<tr>
<td><em>Hetaeria ovalifolia</em></td>
<td>1994</td>
<td>EN</td>
<td>B1a+b(ii,iii,iv,v); D</td>
</tr>
<tr>
<td><em>Ipsea malabarica</em></td>
<td>1994</td>
<td>EN</td>
<td>B1a+b(iii), 2a+b(iii); D</td>
</tr>
<tr>
<td><em>Kingidium mysorense</em></td>
<td>1994</td>
<td>EN</td>
<td>B1a+b(ii,iii,iv,v); C2a(1); D</td>
</tr>
<tr>
<td><em>Liparis platyphylla</em></td>
<td>1994</td>
<td>DD</td>
<td>-</td>
</tr>
<tr>
<td><em>Luisia abrahamii</em></td>
<td>1994</td>
<td>CR</td>
<td>B1+2c; C2a; D</td>
</tr>
<tr>
<td><em>Luisia evangelinae</em></td>
<td>1994</td>
<td>EN</td>
<td>B1a+b(iii,iv,v); 2a+b(iii,iv,v); D</td>
</tr>
<tr>
<td><em>Luisia macrantha</em></td>
<td>1994</td>
<td>EN</td>
<td>B1a+b(ii,iii,iv,v); 2a+b(ii,iii,iv,v); D</td>
</tr>
<tr>
<td><em>Oberonia agastyamalayana</em></td>
<td>1994</td>
<td>CR</td>
<td>D</td>
</tr>
<tr>
<td><em>Oberonia anamalayana</em></td>
<td>1994</td>
<td>CR</td>
<td>B1+2c; D</td>
</tr>
<tr>
<td><em>Oberonia balakrishnanii</em></td>
<td>1994</td>
<td>CR</td>
<td>B1+2e; D</td>
</tr>
<tr>
<td><em>Oberonia brachyphylla</em></td>
<td>1994</td>
<td>EN</td>
<td>B1a+b(iii,iv,v); 2a+b(iii,iv,v); C2a(1); D</td>
</tr>
<tr>
<td><em>Oberonia chandrasekharanii</em></td>
<td>1994</td>
<td>CR</td>
<td>B1+2cd</td>
</tr>
<tr>
<td><em>Oberonia josephi</em></td>
<td>1994</td>
<td>CR</td>
<td>B1+2c</td>
</tr>
<tr>
<td><em>Oberonia nayani</em></td>
<td>1994</td>
<td>VU</td>
<td>D2</td>
</tr>
<tr>
<td><em>Oberonia playcaulon</em></td>
<td>1994</td>
<td>EN</td>
<td>D</td>
</tr>
<tr>
<td><em>Oberonia sebastian</em></td>
<td>1994</td>
<td>VU</td>
<td>D2</td>
</tr>
<tr>
<td><em>Oberonia seidenfadeniana</em></td>
<td>1994</td>
<td>CR</td>
<td>B1+2c</td>
</tr>
<tr>
<td><em>Oberonia wightiana var. nigrescens</em></td>
<td>1994</td>
<td>NE</td>
<td>-</td>
</tr>
<tr>
<td><em>Oberonia wynaadensis</em></td>
<td>1994</td>
<td>EN</td>
<td>D</td>
</tr>
<tr>
<td><em>Pachystoma hirsutum</em></td>
<td>1994</td>
<td>VU</td>
<td>D2</td>
</tr>
</tbody>
</table>
Scientific Name | IUCN | Criteria | Reason
--- | --- | --- | ---
79. *Paphiopedilum druyi* | 1994 CR | B1+2c + d + e + f | Restricted distribution, continuing decline and extreme fluctuation
2000 CR | B1+a+b(iii, iv, v) + c(iii), 2a+b(iii, iv, v) + c(iii) |
80. *Peristylus brachyphyllus* | 1994 DD | - |
2000 DD | - |
81. *Peristylus lancifolius* | 1994 EN | B1+2c | Restricted area and continuing decline
2000 EN | B2a+b(ii) |
82. *Peristylus stocksii* | 1994 EN | B1+2b + de | Restricted area and continuing decline
2000 EN | B2a+b(iii, iv, v) |
83. *Rhytionanthus nodosus* | 1994 EX | - |
2000 EX | - |
84. *Rhytionanthos rheedii* | 1994 EN | B1+2b + cd | Restricted distribution and continuing decline
2000 EN | B1a+b(iii, iv, v), B2a+b(iii, iv, v) |
85. *Peristylus lancifolius* | 2000 DD | - |
86. *Seidenfadeniella rosea* | 1994 EN | B1+2cde | Restricted area and continuing decline
2000 EN | B2a+b(iii, iv, v) |
87. *Seidenfia crenulata* | 1994 CR | B1+2c | Restricted area and continuing decline
2000 CR | B2a+b(iii), D |
88. *Seidenfia intermedia* | 1994 EN | B1+2b + cd; D | Restricted area and continuing decline; Very small population
2000 EN | B2a+b(iii, iv, v); D |
89. *Seidenfia stocksii* | 1994 EN | B1+2bc | Restricted area and continuing decline
2000 EN | B2a+b(iii) |
90. *Smithsonia maculata* | 1994 EN | B1+2cd | Restricted distribution and continuing decline
2000 EN | B1a+b(ii, iv, v), 2a+b(ii) |
91. *Smithsonia straminea* | 1994 EN | B1+2c | Restricted distribution and continuing decline
2000 EN | B1a+b(ii), 2a+b(ii) |
92. *Smithsonia viridiflora* | 1994 EN | B1+2c, D | Restricted distribution and continuing decline; Very small population
2000 EN | B1a+b(iii), 2a+b(iii), D |
93. *Spiranthes sinensis var. wightiana* | 1994 NE | - |
2000 NE | - |
94. *Spiranthes dengshanensis var. ctenantha* | 1994 CR | D | Very small population
2000 CR | D |
95. *Thrixspermum musciflorum var. nilagiricum* | 1994 VU | B2 | Very restricted distribution
2000 VU | B2 |
96. *Trias bonaccordensis* | 1994 CR | B1+2b + cde | Restricted area and continuing decline
2000 CR | B2a+b(iii, iv, v) |
97. *Trias stocksii* | 1994 CR | B1+2b + cde | Restricted area and continuing decline
2000 CR | B2a+b(iii, iv, v) |
98. *Vanda wightii* | 1994 VU | B1+2b + cde | Restricted area and continuing decline
2000 VU | B1a+b(ii, iii, iv, v), 2a+b(iii, iv, v) |
99. *Xenikophyton smeeanum* | 1994 EN | B1+2c | Restricted area and continuing decline
2000 EN | B1a+b(ii, iii, iv, v), 2a+b(iii, iv, v) |

Table 2b. Checklist of endemic Western Ghats Orchids extending to Eastern Ghats assessed at the workshop

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>IUCN</th>
<th>Criteria</th>
<th>Reason</th>
</tr>
</thead>
</table>
1. *Anoectochilus elatus* | 1994 EN | B1+2abcd | Restricted distribution and continuing decline
2000 EN | B1a+b(i, ii, iii, iv, v), 2a+b(i, ii, iii, iv, v) |
2. *Cirrhopetalum neilgherrense* | 1994 VU | B1+2c | Restricted area and continuing decline
2000 VU | B2a+b(ii, iv) |
3. *Dendrobium anamalayanum* | 1994 EN | B1+2abce | Restricted area and continuing decline
2000 EN | B2a+b(i, ii, iii, v) |
2000 NT | - |
5. *Dendrobium microbulbon* | 1994 EN | B1+2abcd; C2a | Restricted area and continuing decline; Small population and continuing decline
2000 EN | B2a+bi(i, ii, iii, iv, v); C2a(i) |
6. *Dendrobium nanum* | 1994 EN | B1+2abcd | Restricted area and continuing decline
2000 EN | B2a+b(i, ii, iii, iv, v) |
7. *Dendrobium wighti* | 1994 VU | B1+2d | Restricted distribution and continuing decline
2000 VU | B1a+b(iv), 2a+b(iv) |
8. *Eria nana* | 1994 EN | B1+2b + cde | Restricted area and continuing decline
2000 EN | B2a+b(iii, iv, v) |
9. *Eria pauciflora* | 1994 LR | - |
2000 LC | - |
10. *Eria polystachya* | 1994 LR | - |
2000 NT | - |
11. *Flickingeria nodosa* | 1994 VU | B1+2b + cde | Restricted distribution and continuing decline
2000 VU | B1a+b(i, ii, iii, iv, v), 2a+b(i, ii, iii, iv, v) |
12. **Habenaria decipiens**  
   1994 EN B1+2be  
   2000 EN B1a+b(i,ii,iii,iv), 2a+b(ii,iii,iv)  
   Restricted distribution and continuing decline

13. **Habenaria grandifloriformis**  
   1994 VU A1ac, B1+2abde  
   2000 VU B2a+b(ii,iii,iv, v)  
   Population decline; Restricted area and continuing decline

14. **Habenaria heyneana**  
   1994 LRnt -  
   2000 NT -  

15. **Habenaria longicorniculata**  
   1994 LRnt -  
   2000 NT -  

16. **Habenaria longicornu**  
   1994 EN B1+2cd, D  
   2000 EN B2a+b(ii,iii,iv), D  
   Restricted area and continuing decline; Very small population

17. **Habenaria multicaudata**  
   1994 VU A1c+2c, B1+2bde  
   2000 VU A2c+3c; B1a+b(ii,iii,iv, v), 2a+b(ii,iii,iv, v)  
   Population reduction; Restricted distribution and continuing decline

18. **Habenaria ovalifolia**  
   1994 VU A1c+2c  
   2000 VU A2c+3c; B1a+b(ii,iii,iv, v), 2a+b(ii,iii,iv, v)  
   Population reduction

19. **Habenaria rariflora**  
   1994 VU A1ac  
   2000 VU A2c+3c; B1a+b(ii,iii,iv, v), 2a+b(ii,iii,iv, v)  
   Population reduction

20. **Habenaria heyneana**  
   1994 LRnt -  
   2000 NT -  

21. **Oberonia brunoniana**  
   1994 VU A1ac  
   2000 VU A2c+3c; B1a+b(ii,iii,iv, v), 2a+b(ii,iii,iv, v)  
   Population reduction

22. **Oberonia proudlockii**  
   1994 EN B1+2abde+3c  
   2000 EN B2a+b(ii,iii,iv, v)+c(iii)  
   Restricted area, continuing decline and extreme fluctuation

23. **Oberonia santapaui**  
   1994 VU C1  
   2000 VU C1  
   Small population and continuing decline

24. **Oberonia verticillata**  
   1994 EN B1+2bcde  
   2000 EN B2a+b(ii,iii,iv)  
   Restricted area and continuing decline

25. **Robiquetia josephiana**  
   1994 VU B1+2bc, C1  
   2000 VU B1a+b(ii,iv), 2a+b(ii,iv), C1  
   Restricted distribution and continuing decline; Small population and continuing decline

26. **Schoenarchis jerdoniana**  
   1994 EN B1+2bcde  
   2000 EN B2a+b(ii,iii,iv), B2a+b(ii,iii,iv)  
   Restricted distribution and continuing decline

27. **Vanila wightiana**  
   1994 EN B1+2bcde  
   2000 EN B2a+b(ii,iii,iv)  
   Restricted area and continuing decline

The highly restricted nature of the Western Ghats endemic orchids is a major contributor to the threat status in the wild. According to the 1994 and 2000 Red List Criteria, factors in addition to restricted distribution of a taxon, such as severe fragmentation, limited locations and/or continuing decline in area, extent, quality of habitat, mature individuals, locations and/or extreme fluctuations in the above, can qualify a taxon as threatened. Hence, as seen in figure 3, 65 threatened orchids (74%) qualify for criterion B (for restricted distribution and fluctuation). A few (10 taxa, 11%) are affected by population declines and hence qualify for Criterion A (for population reduction), though the numbers differ with respect to 1994 and 2000 Red List Criteria (table 3). Information through extensive field surveys is available for some orchid taxa for which the number of mature individuals is estimated, making them threatened due to Criterion C (restricted population and fluctuation) (8 taxa, 9%) or Criterion D (restricted population) (21 taxa, 24%).

**Table 3. Threat assessments of endemic Western Ghats orchids based on (a) 1994 criteria and (b) 2000 criteria.**

<table>
<thead>
<tr>
<th>Red list Criteria</th>
<th>Western Ghat Endemics</th>
<th>Endemic to Eastern and Western Ghats</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (Population reduction)</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>B (Restricted distribution and fluctuation)</td>
<td>70</td>
<td>70</td>
</tr>
<tr>
<td>C (Restricted population and fluctuation)</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>D (Restricted population)</td>
<td>27</td>
<td>28</td>
</tr>
</tbody>
</table>

The factors resulting in more than 80% of the endemic orchid taxa threatened in the wild are many. The most common of them are loss of habitat, human interference, biotic pressure and many other perceptible or subtle changes. Table 3 lists in brief the threats that affect orchid taxa in the Western Ghats.
Table 4a. Threats to the habitat of orchids in wild

<table>
<thead>
<tr>
<th>Threat to habitat</th>
<th># taxa affected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Habitat loss</td>
<td>87</td>
</tr>
<tr>
<td>Trampling</td>
<td>22</td>
</tr>
<tr>
<td>Human interference</td>
<td>43</td>
</tr>
<tr>
<td>Decline of host species</td>
<td>13</td>
</tr>
<tr>
<td>Damming</td>
<td>5</td>
</tr>
<tr>
<td>Plantation</td>
<td>11</td>
</tr>
<tr>
<td>Grazing</td>
<td>24</td>
</tr>
<tr>
<td>Habitat fragmentation</td>
<td>26</td>
</tr>
<tr>
<td>Road construction</td>
<td>6</td>
</tr>
<tr>
<td>Fire</td>
<td>15</td>
</tr>
<tr>
<td>Landslide</td>
<td>11</td>
</tr>
<tr>
<td>Vandalism</td>
<td>4</td>
</tr>
</tbody>
</table>

Table 4b. Threats to the population of orchids in wild

<table>
<thead>
<tr>
<th>Threat to population</th>
<th># taxa affected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trade for market or medicine</td>
<td>6</td>
</tr>
<tr>
<td>Damming</td>
<td>7</td>
</tr>
<tr>
<td>Overexploitation</td>
<td>7</td>
</tr>
<tr>
<td>Edaphic changes</td>
<td>9</td>
</tr>
<tr>
<td>Harvest for medicine</td>
<td>4</td>
</tr>
<tr>
<td>Pollution</td>
<td>6</td>
</tr>
<tr>
<td>Propagation difficulties</td>
<td>7</td>
</tr>
</tbody>
</table>

The above table (3) shows clearly the number and diversity of threats to which the Western Ghats orchids are exposed. Though quite a few areas in which orchids are recorded fall under protected areas, the level of protection given does not necessarily relate to the protection of the taxa. For example, the threats outlined in the workshop indicate the status of the habitat over many years, which when compared across taxa, clearly shows a decline either in the area of habitat, extent of habitat or quality of habitat. The threats also directly or indirectly affect the population structure. Many studies are conducted in protected areas, where such a situation is prevalent. The status of orchids outside of protected areas can be inferred to be more threatened than those in protected areas, due to unhindered threat factors. Table 4 lists the threats affecting or afflicting orchids in the Western Ghats, either to the habitat or to the population. Habitat loss, a major threat is the most perceptible threat to orchids apart from fragmentation and human interference. Other threats such as those caused by biotic factors (trampling, grazing), by man-made fires and other kinds of human interference (plantations, firewood, minor forest produce collection) can cause either direct harm or change the quality of habitat available for the orchids. Felling of host trees is identified as one of the major threats. Trade is not a major contributor to the threats orchids face in the wild. Only 7 taxa are in any form of trade, mainly in local trade. Due to the rarity of the taxa and the difficulty in finding them, trade seems to be highly restricted.

Table 4a. Threats faced by endemic orchids of the Western Ghats.

<table>
<thead>
<tr>
<th>Scientific names</th>
<th>Threats to Habitat</th>
<th>Threats to Population</th>
<th>Trade</th>
<th>IUCN 1994</th>
<th>IUCN 2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aenhenrya rotundifolia</td>
<td>Trampling by wild ungulates, elephants</td>
<td>Demographic instability</td>
<td>No</td>
<td>EN</td>
<td>EN</td>
</tr>
<tr>
<td>Aerides crispa</td>
<td>Human activities, human interference, damming, vandalism</td>
<td>Trade for market or medicine, decline of host species, demographic instability</td>
<td>Local trade of flowers</td>
<td>VU</td>
<td>VU</td>
</tr>
<tr>
<td>Aerides maculosa</td>
<td>Industrialisation, human interference, urbanisation, habitat loss, habitat fragmentation</td>
<td>Trade of parts, and overexploitation</td>
<td>Local, domestic, commercial, ornamental trade</td>
<td>EN</td>
<td>EN</td>
</tr>
<tr>
<td>Brachycorythis splendida</td>
<td>Habitat loss, grazing, human interference</td>
<td>-</td>
<td>No</td>
<td>CR</td>
<td>CR</td>
</tr>
<tr>
<td>Brachycorythis wightii</td>
<td>Eucalyptus plantations, Grazing</td>
<td>-</td>
<td>No</td>
<td>CR</td>
<td>CR</td>
</tr>
<tr>
<td>Bulbophyllum acutiforum</td>
<td>Harvest for timber</td>
<td>Decline of host species</td>
<td>No</td>
<td>EN</td>
<td>EN</td>
</tr>
<tr>
<td>Bulbophyllum albium</td>
<td>Habitat loss</td>
<td>-</td>
<td>No</td>
<td>EN</td>
<td>EN</td>
</tr>
<tr>
<td>Bulbophyllum aureum</td>
<td>Human habitation, habitat loss</td>
<td>-</td>
<td>No</td>
<td>EN</td>
<td>EN</td>
</tr>
<tr>
<td>Bulbophyllum elegantulum</td>
<td>Human interference, Habitat loss</td>
<td>Decline of host species</td>
<td>No</td>
<td>CR</td>
<td>CR</td>
</tr>
<tr>
<td>Bulbophyllum fimbinatum</td>
<td>Habitat destruction, human interference, habitat loss, harvest for timber, fire</td>
<td>Reproductive problems, decline of host species</td>
<td>No</td>
<td>EN</td>
<td>EN</td>
</tr>
<tr>
<td>Bulbophyllum fuscopurpureum</td>
<td>Habitat loss, plantations, habitat fragmentation</td>
<td>Edaphic changes, harvest for medicine, pollution</td>
<td>No</td>
<td>EN</td>
<td>EN</td>
</tr>
<tr>
<td>Bulbophyllum mysorense</td>
<td>Construction of roads, tourism and human interference, habitat fragmentation, fire</td>
<td>Reproductive problems, propagation difficulties, decline in the host species</td>
<td>No</td>
<td>EN</td>
<td>EN</td>
</tr>
<tr>
<td>Scientific names</td>
<td>Threats to Habitat</td>
<td>Threats to Population</td>
<td>Trade</td>
<td>IUCN 1994</td>
<td>IUCN 2000</td>
</tr>
<tr>
<td>------------------</td>
<td>--------------------</td>
<td>-----------------------</td>
<td>-------</td>
<td>-----------</td>
<td>-----------</td>
</tr>
<tr>
<td>Bulbophyllum proudlockii</td>
<td>Habitat loss, human interference</td>
<td>-</td>
<td>No</td>
<td>EN</td>
<td>EN</td>
</tr>
<tr>
<td>Bulbophyllum sikkimtaiensis</td>
<td>No change</td>
<td>Unknown</td>
<td>No</td>
<td>EN</td>
<td>EN</td>
</tr>
<tr>
<td>Bulbophyllum tremulum</td>
<td>Vandalism, habitat loss, habitat fragmentation, human interference</td>
<td>-</td>
<td>No</td>
<td>EN</td>
<td>EN</td>
</tr>
<tr>
<td>Cheirostylis seidenfadeniana</td>
<td>Tourism activity, habitat loss</td>
<td>-</td>
<td>No</td>
<td>CR</td>
<td>CR</td>
</tr>
<tr>
<td>Chiloschista glandulosa</td>
<td>Human interference, tourism, developmental activities</td>
<td>-</td>
<td>No</td>
<td>EN</td>
<td>EN</td>
</tr>
<tr>
<td>Chrysoglossum hallbergii</td>
<td>-</td>
<td>-</td>
<td>No</td>
<td>CR</td>
<td>CR</td>
</tr>
<tr>
<td>Coelogyne glandulosa var. bourei</td>
<td>Coffee plantations, habitat loss</td>
<td>-</td>
<td>No</td>
<td>CR</td>
<td>CR</td>
</tr>
<tr>
<td>Coelogyne glandulosa var. glandulosa</td>
<td>Landslides, fire, habitat loss</td>
<td>-</td>
<td>No</td>
<td>EN</td>
<td>EN</td>
</tr>
<tr>
<td>Coelogyne glandulosa var. sathyaranarayanae</td>
<td>Plantations, habitat loss</td>
<td>-</td>
<td>No</td>
<td>CR</td>
<td>CR</td>
</tr>
<tr>
<td>Coelogyne mossiae</td>
<td>Plantations, habitat loss, habitat loss due to exotic plants, landslides</td>
<td>Edaphic changes, harvest for medicine, trade for market or medicine, overexploitation</td>
<td>No</td>
<td>EN</td>
<td>EN</td>
</tr>
<tr>
<td>Coelogyne nervosa</td>
<td>Habitat loss, plantations, habitat fragmentation, grazing, fire,drought</td>
<td>Demographic instability</td>
<td>No</td>
<td>EN</td>
<td>EN</td>
</tr>
<tr>
<td>Dendrobium barbatulum</td>
<td>Habitat loss, vandalism, human interference</td>
<td>Hybridization, harvest, pollution</td>
<td>No</td>
<td>VU</td>
<td>VU</td>
</tr>
<tr>
<td>Dendrobium dioxion ssp. kodayarenensis</td>
<td>Decline in host species, habitat loss, habitat fragmentation</td>
<td>Edaphic changes</td>
<td>No</td>
<td>CR</td>
<td>CR</td>
</tr>
<tr>
<td>Dendrobium heyneanum</td>
<td>Habitat loss, habitat loss due to exotic plants</td>
<td>Decline of host species</td>
<td>No</td>
<td>EN</td>
<td>EN</td>
</tr>
<tr>
<td>Dendrobium jerdonianum</td>
<td>Human interference, habitat loss</td>
<td>-</td>
<td>No</td>
<td>EN</td>
<td>EN</td>
</tr>
<tr>
<td>Dendrobium ovatum</td>
<td>Habitat loss,</td>
<td>Harvest, demographic instability, trade of parts</td>
<td>Local, domestic, ornamental trade of flowers, scientific collections</td>
<td>VU</td>
<td>VU</td>
</tr>
<tr>
<td>Disperis neilgherrensis</td>
<td>Habitat loss, grazing, deforestation, trampling, drought, landslides</td>
<td>Edaphic changes, nutritional disorders, pesticides, propagation difficulties</td>
<td>No</td>
<td>EN</td>
<td>EN</td>
</tr>
<tr>
<td>Eria albiflora</td>
<td>Habitat loss, human interference, habitat fragmentation</td>
<td>-</td>
<td>No</td>
<td>VU</td>
<td>VU</td>
</tr>
<tr>
<td>Eria dalzellii</td>
<td>Landslides, habitat loss</td>
<td>-</td>
<td>No</td>
<td>LRNT</td>
<td>NT</td>
</tr>
<tr>
<td>Eria exilis</td>
<td>Loss of habitat, human interference, habitat fragmentation</td>
<td>-</td>
<td>No</td>
<td>VU</td>
<td>VU</td>
</tr>
<tr>
<td>Eria microchilos</td>
<td>Habitat loss, human interference</td>
<td>-</td>
<td>No</td>
<td>VU</td>
<td>VU</td>
</tr>
<tr>
<td>Eria muscicola var. brevilinguis</td>
<td>Unknown</td>
<td>Unknown</td>
<td>No</td>
<td>DD</td>
<td>DD</td>
</tr>
<tr>
<td>Eria myroseris</td>
<td>Habitat loss, human interference</td>
<td>-</td>
<td>No</td>
<td>EN</td>
<td>EN</td>
</tr>
<tr>
<td>Eria pseudoclabaculis</td>
<td>No change</td>
<td>No threat</td>
<td>No</td>
<td>VU</td>
<td>VU</td>
</tr>
<tr>
<td>Eria tajagi</td>
<td>Stable</td>
<td>None</td>
<td>No</td>
<td>VU</td>
<td>VU</td>
</tr>
<tr>
<td>Eulophia cullenii</td>
<td>Habitat loss, human interference, grazing, habitat fragmentation, trampling</td>
<td>Harvest for medicine, overexploitation</td>
<td>Local trade</td>
<td>CR</td>
<td>CR</td>
</tr>
<tr>
<td>Eulophia pratensis</td>
<td>Habitat loss, human interference, habitat fragmentation, trampling, drought</td>
<td>-</td>
<td>Local trade</td>
<td>LRNT</td>
<td>NT</td>
</tr>
<tr>
<td>Gastrochilus flabelliformis</td>
<td>Habitat loss, habitat fragmentation, harvest for timber</td>
<td>-</td>
<td>No</td>
<td>EN</td>
<td>EN</td>
</tr>
<tr>
<td>Habenaria barnesi</td>
<td>Habitat loss, fire</td>
<td>-</td>
<td>No</td>
<td>EN</td>
<td>EN</td>
</tr>
<tr>
<td>Habenaria cephalotes</td>
<td>Habitat loss, trampling</td>
<td>-</td>
<td>No</td>
<td>EN</td>
<td>EN</td>
</tr>
<tr>
<td>Habenaria elliptica</td>
<td>Road construction, grazing, damming</td>
<td>Over exploitation and trade for market or medicine</td>
<td>No</td>
<td>EN</td>
<td>EN</td>
</tr>
<tr>
<td>Habenaria elwesii</td>
<td>Habitat loss, human interference, habitat fragmentation</td>
<td>Harvest, Not known</td>
<td>CR</td>
<td>CR</td>
<td></td>
</tr>
<tr>
<td>Habenaria flabelliformis</td>
<td>Stable</td>
<td>Perennating tuberoids are eaten away by wild boars etc</td>
<td>No</td>
<td>CR</td>
<td>CR</td>
</tr>
<tr>
<td>Habenaria gibsoni var. foetida</td>
<td>Habitat loss, trampling</td>
<td>-</td>
<td>No</td>
<td>CR</td>
<td>CR</td>
</tr>
<tr>
<td>Habenaria gibsoni var. foliosa</td>
<td>Habitat loss, trampling, habitat fragmentation</td>
<td>-</td>
<td>No</td>
<td>VU</td>
<td>NT</td>
</tr>
<tr>
<td>Habenaria gibsoni var. gibsoni</td>
<td>Habitat loss, forest fires, grazing, human interference, trampling, forest</td>
<td>Edaphic changes, overexploitation, grazing, trade for market or medicine, medicinal trade</td>
<td>CR</td>
<td>CR</td>
<td></td>
</tr>
<tr>
<td>Scientific names</td>
<td>Threats to Habitat</td>
<td>Threats to Population</td>
<td>Trade</td>
<td>IUCN 1994</td>
<td>IUCN 2000</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------</td>
<td>-----------</td>
<td>-----------</td>
</tr>
<tr>
<td>Habenaria pallideviridis</td>
<td>Habitat loss</td>
<td>Grazing, habitat loss and trampling</td>
<td>scientific collections</td>
<td>No CR CR</td>
<td>CR CR</td>
</tr>
<tr>
<td>Habenaria panchganiensis</td>
<td>Grazing, trampling, tourism, human interference, sustainable utilisation</td>
<td>-</td>
<td>No CR CR</td>
<td>No CR CR</td>
<td>CR CR</td>
</tr>
<tr>
<td>Habenaria penyarensis</td>
<td>Habitat loss, grazing, trampling</td>
<td>-</td>
<td>No CR CR</td>
<td>No CR CR</td>
<td>CR CR</td>
</tr>
<tr>
<td>Habenaria perrottetiana</td>
<td>Habitat loss, human interference, grazing, trampling</td>
<td>-</td>
<td>No EN EN</td>
<td>No CR CR</td>
<td>EN EN</td>
</tr>
<tr>
<td>Habenaria polyodon</td>
<td>Habitat loss, grazing, human interference</td>
<td>-</td>
<td>No CR CR</td>
<td>No CR CR</td>
<td>EN EN</td>
</tr>
<tr>
<td>Habenaria richardiana</td>
<td>Tourism, habitat loss</td>
<td>-</td>
<td>No CR CR</td>
<td>No CR CR</td>
<td>CR CR</td>
</tr>
<tr>
<td>Habenaria suaveolens</td>
<td>Urbanization, human interference, tourism, grazing, trampling</td>
<td>-</td>
<td>No EN EN</td>
<td>No EN EN</td>
<td>EN EN</td>
</tr>
<tr>
<td>Habenaria travancorica</td>
<td>Unknown</td>
<td>Unknown</td>
<td>Not known</td>
<td>DD DD</td>
<td></td>
</tr>
<tr>
<td>Hetaonia ovatifolia</td>
<td>Stable</td>
<td>None</td>
<td>No VU VU</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ipsea malabarica</td>
<td>Invasion of trees, habitat loss, habitat fragmentation, fire, landslides, grazing</td>
<td>Fruit predation by insects, natural or man-induced threats</td>
<td>No EN EN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kingdium myrosporese</td>
<td>Habitat loss, forest operations</td>
<td>-</td>
<td>No EN EN</td>
<td>EN EN</td>
<td></td>
</tr>
<tr>
<td>Kingdium niveum</td>
<td>Stable</td>
<td>None</td>
<td>No EN EN</td>
<td>EN EN</td>
<td></td>
</tr>
<tr>
<td>Liparis platyphylla</td>
<td>Unknown</td>
<td>Unknown</td>
<td>No DD DD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Luisa abrahamii</td>
<td>Development, habitat loss, human interference</td>
<td>-</td>
<td>No CR CR</td>
<td>No CR CR</td>
<td>CR CR</td>
</tr>
<tr>
<td>Luisa evangelina</td>
<td>Road construction, traffic, tourism, habitat loss</td>
<td>-</td>
<td>No EN EN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Luisa macrantha</td>
<td>Habitat loss, deforestation, fire</td>
<td>Decline of host species</td>
<td>No CR CR</td>
<td>No CR CR</td>
<td>CR CR</td>
</tr>
<tr>
<td>Oberonia agasthayalavayana</td>
<td>Stable</td>
<td>Unknown</td>
<td>No CR CR</td>
<td>No CR CR</td>
<td>CR CR</td>
</tr>
<tr>
<td>Oberonia anamalayana</td>
<td>Habitat loss</td>
<td>Decline in host species</td>
<td>No EN EN</td>
<td>No EN EN</td>
<td>EN EN</td>
</tr>
<tr>
<td>Oberonia balakrishnani</td>
<td>Human interference, tourism, developmental activities</td>
<td>-</td>
<td>No CR CR</td>
<td>No CR CR</td>
<td>CR CR</td>
</tr>
<tr>
<td>Oberonia brachyphylla</td>
<td>Habitat loss</td>
<td>Decline of host species</td>
<td>No EN EN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oberonia chandrasekharanw</td>
<td>Human interference, developmental activities</td>
<td>-</td>
<td>No CR CR</td>
<td>No CR CR</td>
<td>CR CR</td>
</tr>
<tr>
<td>Oberonia josephi</td>
<td>Human habitat, habitat loss</td>
<td>-</td>
<td>No CR CR</td>
<td>No CR CR</td>
<td>CR CR</td>
</tr>
<tr>
<td>Oberonia nayani</td>
<td>Human interference, fire</td>
<td>-</td>
<td>No VU VU</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oberonia playcaulon</td>
<td>Forest degradation, tree felling, habitat loss, fragmentation</td>
<td>-</td>
<td>No EN EN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oberonia sebastiana</td>
<td>Stable</td>
<td>None</td>
<td>No VU VU</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oberonia seidenfadeniana</td>
<td>Habitat loss, human activities</td>
<td>-</td>
<td>No CR CR</td>
<td>No CR CR</td>
<td>CR CR</td>
</tr>
<tr>
<td>Oberonia wightiana var. nitreensis</td>
<td>-</td>
<td>-</td>
<td>No VU VU</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oberonia wynaadensis</td>
<td>No change</td>
<td>None</td>
<td>No EN EN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pachystoma hirsutum</td>
<td>No change</td>
<td>None</td>
<td>No VU VU</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paphiopedilum druyi</td>
<td>Habitat loss, trampling, habitat fragmentation, drought, fire, landslides</td>
<td>Disease, edaphic changes, harvest, overexploitation, trade for market or medicine, reproductive problems, propagation difficulties</td>
<td>Domestic, commercial, international and ornamental trade, scientific collection, cultivation of hybrids</td>
<td>CR CR</td>
<td></td>
</tr>
<tr>
<td>Peristylus brachyphyllus</td>
<td>Unknown</td>
<td>Unknown</td>
<td>No DD DD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peristylus lancifolius</td>
<td>Habitat loss, grazing, trampling, habitat fragmentation</td>
<td>-</td>
<td>No EN EN</td>
<td>EN EN</td>
<td></td>
</tr>
<tr>
<td>Persylius stocksii</td>
<td>Habitat loss, grazing, trampling, habitat fragmentation</td>
<td>-</td>
<td>No EN EN</td>
<td>EN EN</td>
<td></td>
</tr>
<tr>
<td>Rhynonanthus nodosum</td>
<td>Unknown</td>
<td>Unknown</td>
<td>Unknown</td>
<td>EX EX</td>
<td></td>
</tr>
<tr>
<td>Rhynonanthus rheedei</td>
<td>Habitat loss, landside, flood</td>
<td>-</td>
<td>No EN EN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seidenfadeniella rosea</td>
<td>Habitat loss, developmental projects</td>
<td>-</td>
<td>No EN EN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seidenfia crenulata</td>
<td>Human activities, tourism, developmental activities</td>
<td>No</td>
<td>Not known</td>
<td>CR CR</td>
<td></td>
</tr>
<tr>
<td>Seidenfia intermedia</td>
<td>Habitat loss, trampling</td>
<td>-</td>
<td>No EN EN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seidenfia stocksii</td>
<td>Human interference, habitat loss</td>
<td>-</td>
<td>No EN EN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smithsonia maculata</td>
<td>Human interference, habitat loss</td>
<td>-</td>
<td>No EN EN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smithsonia straminea</td>
<td>Habitat loss</td>
<td>-</td>
<td>No EN EN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smithsonia viridiflora</td>
<td>Human interference</td>
<td>-</td>
<td>No EN EN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spiranthes sanisima var. wightiana</td>
<td>-</td>
<td>-</td>
<td>No VU VU</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taeniophyllum scaberulum</td>
<td>No change</td>
<td>Unknown</td>
<td>No CR CR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thrixopodium muscoflorum var.</td>
<td>No change</td>
<td>Unknown</td>
<td>No CR CR</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Conservation Assessment and Management Plan Workshop Report for endemic orchids of the Western Ghats 2001
<table>
<thead>
<tr>
<th>Scientific names</th>
<th>Threats to Habitat</th>
<th>Threats to Population</th>
<th>Trade</th>
<th>IUCN 1994</th>
<th>IUCN 2000</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Trias bonaccordensis</em></td>
<td>No change</td>
<td>Unknown</td>
<td>No</td>
<td>CR</td>
<td>CR</td>
</tr>
<tr>
<td><em>Trias stockar</em></td>
<td>Habitat loss, plantation, road construction, human activities, habitat fragmentation, grazing</td>
<td>Harvest</td>
<td>No</td>
<td>VU</td>
<td>VU</td>
</tr>
<tr>
<td><em>Vanda wightii</em></td>
<td>Unknown</td>
<td>Unknown</td>
<td>Unknown</td>
<td>VU</td>
<td>VU</td>
</tr>
<tr>
<td><em>Xenikophyton smeearum</em></td>
<td>Habitat loss, coffee plantation, habitat fragmentation</td>
<td>No</td>
<td>EN</td>
<td>EN</td>
<td>EN</td>
</tr>
</tbody>
</table>

Table 4b. Threats faced by endemic orchids of the Western Ghats extending to Eastern Ghats

<table>
<thead>
<tr>
<th>Scientific names</th>
<th>Threats to Habitat</th>
<th>Threats to Population</th>
<th>Trade</th>
<th>IUCN 1994</th>
<th>IUCN 2000</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Anoectochilus elatus</em></td>
<td>Habitat loss, industrialisation, construction of roads, grazing</td>
<td>-</td>
<td>No</td>
<td>EN</td>
<td>EN</td>
</tr>
<tr>
<td><em>Cirrhopetalum neilgherrense</em></td>
<td>Habitat loss, human interference, developmental activities</td>
<td>-</td>
<td>No</td>
<td>VU</td>
<td>VU</td>
</tr>
<tr>
<td><em>Dendrobium anamalayanum</em></td>
<td>Habitat loss, plantations, human interference</td>
<td>Demographic instability, decline of host species</td>
<td>No</td>
<td>EN</td>
<td>EN</td>
</tr>
<tr>
<td><em>Dendrobium aqeeum</em></td>
<td>Habitat loss, timbering, vandalism, coffee plantations, harvest for timber, human interference</td>
<td>Decline of host species</td>
<td>No</td>
<td>VU</td>
<td>NT</td>
</tr>
<tr>
<td><em>Dendrobium microbulbon</em></td>
<td>Habitat loss, tourism, construction of roads, damming</td>
<td>-</td>
<td>No</td>
<td>EN</td>
<td>EN</td>
</tr>
<tr>
<td><em>Dendrobium nanum</em></td>
<td>Habitat loss, felling of host trees, human interference</td>
<td>-</td>
<td>No</td>
<td>EN</td>
<td>EN</td>
</tr>
<tr>
<td><em>Dendrobium wightii</em></td>
<td>Landslides</td>
<td>-</td>
<td>No</td>
<td>VU</td>
<td>VU</td>
</tr>
<tr>
<td><em>Eria nana</em></td>
<td>Habitat loss, human interference, habitat fragmentation</td>
<td>Demographic instability</td>
<td>No</td>
<td>EN</td>
<td>EN</td>
</tr>
<tr>
<td><em>Eria pauciflora</em></td>
<td>Habitat loss, habitat loss due to exotic plants</td>
<td>No</td>
<td>LR,LC</td>
<td>LC</td>
<td></td>
</tr>
<tr>
<td><em>Eria polystachya</em></td>
<td>Unknown</td>
<td>Unknown</td>
<td>No</td>
<td>LR,NT</td>
<td>NT</td>
</tr>
<tr>
<td><em>Flickingeria nodosa</em></td>
<td>Habitat loss, human interference, habitat fragmentation</td>
<td>Harvest for medicine, harvest for food, trade of parts, trade for market or medicine, over exploitation</td>
<td>Local trade</td>
<td>VU</td>
<td>VU</td>
</tr>
<tr>
<td><em>Habenaria decipiens</em></td>
<td>Habitat loss, habitat fragmentation, trampling, grazing, landslides, tourism, habitat disturbance</td>
<td>-</td>
<td>Local trade</td>
<td>EN</td>
<td>EN</td>
</tr>
<tr>
<td><em>Habenaria grandifloriformis</em></td>
<td>Deterioration of habitat quality, urbanization, habitat loss, human interference, habitat fragmentation, trampling, grazing,habitat loss due to exotic plants, landslides</td>
<td>Edaphic changes, reproductive problems</td>
<td>Not in trade</td>
<td>VU</td>
<td>VU</td>
</tr>
<tr>
<td><em>Habenaria heynana</em></td>
<td>Habitat loss, broad gauge operations, tourism, trampling, grazing, fire</td>
<td>Pollution</td>
<td>Not in trade</td>
<td>LR,NT</td>
<td>NT</td>
</tr>
<tr>
<td><em>Habenaria longicorniculata</em></td>
<td>Habitat loss, grazing, habitat loss due to exotic plants, fire, removal as weeds, plantation with exotic species, cultivation</td>
<td>Research collection</td>
<td>Not in trade</td>
<td>LR,NT</td>
<td>NT</td>
</tr>
<tr>
<td><em>Habenaria longicornu</em></td>
<td>Human interference, habitat loss</td>
<td>-</td>
<td>No</td>
<td>EN</td>
<td>EN</td>
</tr>
<tr>
<td><em>Habenaria multicaudata</em></td>
<td>Tourism, grazing, habitat loss, trampling</td>
<td>Interspecific competition, reproductive problems</td>
<td>Not in trade</td>
<td>VU</td>
<td>VU</td>
</tr>
<tr>
<td><em>Habenaria ovalifolia</em></td>
<td>Grazing, mining, habitat loss, tourism, trampling, habitat loss due to exotic animals, iron mining</td>
<td>Pollution</td>
<td>No</td>
<td>VU</td>
<td>NT</td>
</tr>
<tr>
<td><em>Habenaria rariflora</em></td>
<td>Habitat fragmentation, tourism, human activities, plantations, trampling, habitat fragmentation, habitat loss due to exotic animals, fire, habitat loss</td>
<td>Edaphic changes, pollution, demographic instability</td>
<td>No</td>
<td>VU</td>
<td>NT</td>
</tr>
<tr>
<td><em>Liparis biloba</em></td>
<td>Habitat loss, felling of host trees, plantation of wattle, habitat loss due to exotic plants</td>
<td>-</td>
<td>No</td>
<td>EN</td>
<td>EN</td>
</tr>
<tr>
<td><em>Oberonia brunoniana</em></td>
<td>Habitat loss, denudation of forests, decrease in the shola forests, grazing, damming, harvest for timber, drought, fire, landslides</td>
<td>Edaphic changes</td>
<td>No</td>
<td>VU</td>
<td>NT</td>
</tr>
<tr>
<td><em>Oberonia proudlockii</em></td>
<td>Habitat, mining, deforestation, habitat fragmentation</td>
<td>-</td>
<td>No</td>
<td>EN</td>
<td>EN</td>
</tr>
<tr>
<td><em>Oberonia santapauli</em></td>
<td>Human interference, habitat loss</td>
<td>-</td>
<td>No</td>
<td>VU</td>
<td>VU</td>
</tr>
<tr>
<td>Scientific names</td>
<td>Threats to Habitat</td>
<td>Threats to Population</td>
<td>Trade</td>
<td>IUCN 1994</td>
<td>IUCN 2000</td>
</tr>
<tr>
<td>------------------------</td>
<td>-----------------------------------------</td>
<td>-----------------------</td>
<td>-------</td>
<td>-----------</td>
<td>-----------</td>
</tr>
<tr>
<td>Oberonia verticillata</td>
<td>Human interference, habitat loss, damming, construction of roads</td>
<td>-</td>
<td>No</td>
<td>EN</td>
<td>EN</td>
</tr>
<tr>
<td>Robiquetia josephiana</td>
<td>Habitat loss</td>
<td>-</td>
<td>No</td>
<td>VU</td>
<td>VU</td>
</tr>
<tr>
<td>Schoenarchis jerdoniana</td>
<td>Felling trees, road expansion or other activities, habitat loss</td>
<td>-</td>
<td>No</td>
<td>EN</td>
<td>EN</td>
</tr>
<tr>
<td>Vanilla wightiana</td>
<td>Habitat loss, human interference</td>
<td>-</td>
<td>No</td>
<td>EN</td>
<td>EN</td>
</tr>
</tbody>
</table>

**Recommendations**

Status assessments of taxa make meaningful identification of priority areas for research, management and conservation. Management recommendations are made based on the status of the species and the degree of information provided. Recommendations for research, management, conservation breeding and for a species-specific focused analysis such as applying the Population and Habitat Viability Assessment are discussed. Research recommendations include survey, limiting factor research, genetic studies, taxonomic studies, life history studies, population and habitat viability and others. Management recommendations include monitoring, limiting factor management, habitat management, wild population management, captive breeding and others. Since many taxa are relatively unknown, including their biology and population dynamics, recommendations were made for research and management for most orchid taxa (Tables 5 and 6). Table 7 lists the individual recommendations for research and management for the endemic orchids of Western Ghats.

<table>
<thead>
<tr>
<th>Category</th>
<th>Survey</th>
<th>Genetics</th>
<th>Taxonomy</th>
<th>Life history studies</th>
<th>Limiting factor research</th>
<th>PHVA</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>EX</td>
<td>2</td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CR</td>
<td>21</td>
<td>6</td>
<td>5</td>
<td>20</td>
<td>6</td>
<td>14</td>
<td>1</td>
</tr>
<tr>
<td>EN</td>
<td>41</td>
<td>12</td>
<td>4</td>
<td>29</td>
<td>4</td>
<td>22</td>
<td>2</td>
</tr>
<tr>
<td>VU</td>
<td>24</td>
<td>8</td>
<td>4</td>
<td>15</td>
<td>6</td>
<td>14</td>
<td>-</td>
</tr>
<tr>
<td>LRnt</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>-</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>LRlc</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>DD</td>
<td>5</td>
<td></td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Category</th>
<th>Cultivation/breeding</th>
<th>Habitat management</th>
<th>Monitoring</th>
<th>Limiting factor management</th>
<th>Sustainable utilization</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>EX</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>CR</td>
<td>18</td>
<td>14</td>
<td>26</td>
<td>1</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>EN</td>
<td>30</td>
<td>11</td>
<td>41</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>VU</td>
<td>13</td>
<td>11</td>
<td>22</td>
<td>1</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>LRnt</td>
<td>3</td>
<td>1</td>
<td>4</td>
<td>-</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>LRlc</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>DD</td>
<td>1</td>
<td>-</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Scientific names</th>
<th>Research</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aenhenrya rotundifolia</td>
<td>Genetic research, life history studies, PHVA</td>
<td>Cultivation/breeding</td>
</tr>
<tr>
<td>Aenides crispa</td>
<td>Survey, life history studies, PHVA</td>
<td>Habitat management, monitoring, sustainable utilization, cultivation/breeding, public awareness, genome resource banking</td>
</tr>
<tr>
<td>Aenides maculosa</td>
<td>Survey, life history studies, genetic research, taxonomic research</td>
<td>Monitoring, sustainable utilisation, cultivation/breeding</td>
</tr>
<tr>
<td>Brachycorythis splendida</td>
<td>Life history studies, PHVA</td>
<td>Habitat management, monitoring</td>
</tr>
<tr>
<td>Brachycorythis wightii</td>
<td>Life history studies, PHVA</td>
<td>Habitat management, monitoring, cultivation/breeding</td>
</tr>
<tr>
<td>Bulbophyllum acutiflorum</td>
<td>Genetic research, life history studies, PHVA</td>
<td>Cultivation/breeding</td>
</tr>
<tr>
<td>Bulbophyllum albidum</td>
<td>Survey, taxonomic research, life history studies, PHVA</td>
<td>Habitat management, monitoring, limiting factor management</td>
</tr>
<tr>
<td>Bulbophyllum aureum</td>
<td>Survey, life history studies, PHVA</td>
<td>Monitoring</td>
</tr>
<tr>
<td>Bulbophyllum elegantulum</td>
<td>Life history studies, PHVA pending</td>
<td>Habitat management, monitoring and cultivation/breeding</td>
</tr>
<tr>
<td>Bulbophyllum thimnianum</td>
<td>Survey, life history studies and limiting factor research</td>
<td>Habitat management, sustainable utilisation, cultivation/breeding and monitoring</td>
</tr>
<tr>
<td>Bulbophyllum fuscopurpureum</td>
<td>Survey, PHVA pending</td>
<td>Cultivation/breeding</td>
</tr>
<tr>
<td>Scientific names</td>
<td>Research</td>
<td>Management</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>---------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Bulbophyllum mysorensis</td>
<td>Life history studies</td>
<td>Not recommended</td>
</tr>
<tr>
<td>Bulbophyllum prideolocki</td>
<td>Survey, genetic research, taxonomic research, PHVA pending</td>
<td>Habitat management, cultivation/breeding</td>
</tr>
<tr>
<td>Bulbophyllum silvestriansis</td>
<td>Life history studies, PHVA pending</td>
<td>Monitoring, cultivation/breeding</td>
</tr>
<tr>
<td>Bulbophyllum tremulum</td>
<td>Survey</td>
<td>Not recommended</td>
</tr>
<tr>
<td>Cheirostylis seidenfadeniana</td>
<td>Life History studies, PHVA</td>
<td>Monitoring</td>
</tr>
<tr>
<td>Chiloschista glandulosa</td>
<td>Survey</td>
<td>Monitoring</td>
</tr>
<tr>
<td>Coelogyne glandulosa var. bournei</td>
<td>Survey, taxonomic research, genetic studies</td>
<td>Not recommended</td>
</tr>
<tr>
<td>Coelogyne glandulosa var. glandulosa</td>
<td>Genetic research</td>
<td>Cultivation/breeding</td>
</tr>
<tr>
<td>Coelogyne glandulosa var. sathyaniarayanae</td>
<td>Survey</td>
<td>Monitoring, Cultivation</td>
</tr>
<tr>
<td>Coelogyne mossiae</td>
<td>Life history studies, genetic research, PHVA</td>
<td>Cultivation/breeding</td>
</tr>
<tr>
<td>Coelogyne nervosa</td>
<td>Genetic research, life history studies, PHVA pending</td>
<td>Cultivation/breeding</td>
</tr>
<tr>
<td>Dendrobium barbatulum</td>
<td>Survey, genetic research, life history studies and PHVA</td>
<td>Habitat management, monitoring, cultivation/breeding, genome resource banking</td>
</tr>
<tr>
<td>Dendrobium diodon ssp. kodayarensis</td>
<td>Survey, life history studies, PHVA</td>
<td>Habitat management</td>
</tr>
<tr>
<td>Dendrobium heyneanum</td>
<td>Genetic research, life history studies, PHVA</td>
<td>Habitat management, monitoring, cultivation/breeding</td>
</tr>
<tr>
<td>Dendrobium jerdonianum</td>
<td>Detailed Survey and pollination biology studies recommended</td>
<td>Monitoring</td>
</tr>
<tr>
<td>Diploneuron ovatum</td>
<td>Survey, genetic research, life history studies, PHVA</td>
<td>Habitat management, cultivation</td>
</tr>
<tr>
<td>Dispens neilgherrensis</td>
<td>Survey, life history studies, limiting factor research, PHVA</td>
<td>Habitat management, monitoring, limiting factor management, cultivation</td>
</tr>
<tr>
<td>Eria albiflora</td>
<td>Survey, life history studies, PHVA</td>
<td>Habitat management, monitoring, genome resource banking, sustainable utilisation</td>
</tr>
<tr>
<td>Eria dalzellii</td>
<td>Survey, PHVA</td>
<td>Monitoring, habitat management, cultivation</td>
</tr>
<tr>
<td>Eria exilis</td>
<td>Survey, limiting factor research and PHVA</td>
<td>Habitat management, monitoring</td>
</tr>
<tr>
<td>Eria microchilos</td>
<td>Survey, genetic research, life history studies, PHVA</td>
<td>Habitat management, monitoring</td>
</tr>
<tr>
<td>Eria muscicola var. brevilinguis</td>
<td>Survey, life history studies, PHVA</td>
<td>Monitoring</td>
</tr>
<tr>
<td>Eria myosoritis</td>
<td>Survey and life history studies</td>
<td>Monitoring and cultivation/breeding</td>
</tr>
<tr>
<td>Eria pseudoklapperi</td>
<td>Survey</td>
<td>Monitoring</td>
</tr>
<tr>
<td>Eria bagi</td>
<td>Survey</td>
<td>Monitoring</td>
</tr>
<tr>
<td>Eulaophyta cullenii</td>
<td>Survey, limiting factor research, life history studies, PHVA</td>
<td>Habitat management, cultivation/breeding, sustainable utilisation</td>
</tr>
<tr>
<td>Eulaophyta praetensis</td>
<td>Not recommended</td>
<td>Not recommended</td>
</tr>
<tr>
<td>Gastrochilus flabelliformis</td>
<td>Survey, life history studies, PHVA</td>
<td>Habitat management and monitoring</td>
</tr>
<tr>
<td>Habenaria bamesi</td>
<td>Survey</td>
<td>Monitoring, cultivation/breeding</td>
</tr>
<tr>
<td>Habenaria carangensis</td>
<td>Survey</td>
<td>Not recommended</td>
</tr>
<tr>
<td>Habenaria cephalotes</td>
<td>Survey, life history studies</td>
<td>Cultivation/breeding</td>
</tr>
<tr>
<td>Habenaria elliptica</td>
<td>Genetic research, life history studies</td>
<td>Genome resource banking, cultivation/breeding</td>
</tr>
<tr>
<td>Habenaria elwesii</td>
<td>Survey</td>
<td>Monitoring, cultivation/breeding</td>
</tr>
<tr>
<td>Habenaria flabelliformis</td>
<td>Life history studies, PHVA pending</td>
<td>Monitoring, cultivation/breeding</td>
</tr>
<tr>
<td>Habenaria gibsonii var. foetida</td>
<td>Survey, genetic research, taxonomic research</td>
<td>Habitat management, monitoring, genome resource banking</td>
</tr>
<tr>
<td>Habenaria gibsonii var. foliosa</td>
<td>Survey, Genetic research, taxonomic research</td>
<td>Monitoring, genome resource banking</td>
</tr>
<tr>
<td>Habenaria gibsonii var. gibsoni</td>
<td>Survey, genetic research, limiting factor research, life history studies, PHVA</td>
<td>Habitat management, sustainable utilisation, cultivation/breeding, wild population management, public awareness, genome resource banking, monitoring, limiting factor management</td>
</tr>
<tr>
<td>Habenaria pallidevids</td>
<td>Survey, life history studies</td>
<td>Monitoring, cultivation/breeding</td>
</tr>
<tr>
<td>Habenaria panchganensis</td>
<td>Survey, genetic research, life history studies, limiting factor research, PHVA pending</td>
<td>Habitat management, wild population management, monitoring</td>
</tr>
<tr>
<td>Habenaria penyarensis</td>
<td>Survey, limiting factor research, taxonomic research, life history studies</td>
<td>Monitoring, cultivation/breeding</td>
</tr>
<tr>
<td>Habenaria perrottetiana</td>
<td>Survey, life history studies, PHVA</td>
<td>Monitoring, habitat management and cultivation/breeding</td>
</tr>
<tr>
<td>Habenaria polyodon</td>
<td>Survey, life history studies, genetic research and PHVA pending</td>
<td>Habitat management, wild population management, monitoring</td>
</tr>
<tr>
<td>Habenaria richardiana</td>
<td>Survey, limiting factor research, life history studies, PHVA</td>
<td>Habitat management and monitoring, cultivation/breeding</td>
</tr>
<tr>
<td>Habenaria suaveolens</td>
<td>Survey, life history studies</td>
<td>Monitoring</td>
</tr>
<tr>
<td>Habenaria taivaneolica</td>
<td>Survey</td>
<td>Not recommended</td>
</tr>
<tr>
<td>Heteranema ovatifolia</td>
<td>Survey, genetic research, life history studies</td>
<td>Habitat management, monitoring</td>
</tr>
<tr>
<td>Scientific names</td>
<td>Research</td>
<td>Management</td>
</tr>
<tr>
<td>------------------</td>
<td>----------</td>
<td>------------</td>
</tr>
<tr>
<td><em>Anoectochilus elatus</em></td>
<td>Survey, genetic research, life history studies, PHVA</td>
<td>Cultivation/breeding</td>
</tr>
<tr>
<td><em>Cynarhopetalum netgherense</em></td>
<td>Survey, taxonomic research</td>
<td>Monitoring</td>
</tr>
<tr>
<td><em>Dendrobium anamalayanum</em></td>
<td>Genetic research, PHVA pending</td>
<td>Cultivation/breeding</td>
</tr>
<tr>
<td><em>Dendrobium aequum</em></td>
<td>Survey, genetic research, life history studies, PHVA pending</td>
<td>Monitoring, cultivation/breeding</td>
</tr>
<tr>
<td><em>Dendrobium microbolbon</em></td>
<td>Survey</td>
<td>Monitoring</td>
</tr>
<tr>
<td><em>Dendrobium nanum</em></td>
<td>Survey, life history studies, PHVA</td>
<td>Habitat management, monitoring, cultivation/breeding</td>
</tr>
<tr>
<td><em>Dendrobium weighti</em></td>
<td>Survey, life history studies, PHVA pending</td>
<td>Monitoring</td>
</tr>
<tr>
<td><em>Eria nana</em></td>
<td>Life history studies and PHVA</td>
<td>Cultivation/breeding</td>
</tr>
<tr>
<td><em>Eria pauciflora</em></td>
<td>Survey, genetic research, life history studies, PHVA</td>
<td>Monitoring, cultivation/breeding</td>
</tr>
<tr>
<td><em>Eria polystachya</em></td>
<td>Genetic research, taxonomic research, life history studies, PHVA</td>
<td>Monitoring and cultivation/breeding</td>
</tr>
<tr>
<td><em>Habingeria nodosa</em></td>
<td>Survey, limiting factor research, PHVA</td>
<td>Habitat management, monitoring, sustainable utilisation, cultivation/breeding</td>
</tr>
<tr>
<td><em>Habenaria decipiens</em></td>
<td>Survey</td>
<td>Monitoring</td>
</tr>
<tr>
<td><em>Habenaria grandiflora</em></td>
<td>Life history studies, limiting factor research, taxonomic research, genetic research</td>
<td>Wild population management and monitoring</td>
</tr>
<tr>
<td><em>Liparis platyphylla</em></td>
<td>Survey</td>
<td>Monitoring</td>
</tr>
<tr>
<td><em>Liparis abrahamii</em></td>
<td>Life history studies, PHVA pending</td>
<td>Monitoring, cultivation/breeding</td>
</tr>
<tr>
<td><em>Liparis evangelinae</em></td>
<td>Survey</td>
<td>Monitoring</td>
</tr>
<tr>
<td><em>Liparis macrantha</em></td>
<td>Survey, life history studies</td>
<td>Monitoring, cultivation/breeding, monitoring</td>
</tr>
<tr>
<td><em>Nervilia hispida</em></td>
<td>Survey</td>
<td>Not recommended</td>
</tr>
<tr>
<td><em>Oberonia agastyaanayalaya</em></td>
<td>Survey, taxonomic research</td>
<td>Habitat management and monitoring</td>
</tr>
<tr>
<td><em>Oberonia anamalaya</em></td>
<td>Survey</td>
<td>Monitoring, cultivation/breeding</td>
</tr>
<tr>
<td><em>Oberonia balakrishnani</em></td>
<td>Survey, life history studies</td>
<td>Habitat management and monitoring</td>
</tr>
<tr>
<td><em>Oberonia brachyphylla</em></td>
<td>Survey</td>
<td>Habitat management, monitoring and cultivation/breeding</td>
</tr>
<tr>
<td><em>Oberonia chandrasekharanii</em></td>
<td>Survey</td>
<td>Monitoring</td>
</tr>
<tr>
<td><em>Oberonia josephi</em></td>
<td>Survey, life history studies</td>
<td>Habitat management and monitoring</td>
</tr>
<tr>
<td><em>Oberonia nayani</em></td>
<td>Survey, life history studies, PHVA</td>
<td>Monitoring</td>
</tr>
<tr>
<td><em>Oberonia platycaulon</em></td>
<td>Survey</td>
<td>Monitoring</td>
</tr>
<tr>
<td><em>Oberonia sebastiana</em></td>
<td>Survey, life history studies, PHVA pending</td>
<td>Monitoring, cultivation/breeding</td>
</tr>
<tr>
<td><em>Oberonia seidenfadeniana</em></td>
<td>Survey</td>
<td>Monitoring, cultivation/breeding</td>
</tr>
<tr>
<td><em>Oberonia wightii var. nilagiricen</em></td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><em>Oberonia wynadensis</em></td>
<td>Survey, life history studies, PHVA</td>
<td>Monitoring and cultivation/breeding</td>
</tr>
<tr>
<td><em>Pachystoma hirsutum</em></td>
<td>Survey and life history studies</td>
<td>Monitoring, cultivation/breeding</td>
</tr>
<tr>
<td><em>Paphiopedilum druryi</em></td>
<td>Genetic research, life history studies, PHVA</td>
<td>Monitoring, cultivation/breeding</td>
</tr>
<tr>
<td><em>Peristylus brachyphyllus</em></td>
<td>Survey and taxonomic research</td>
<td>Monitoring, cultivation/breeding</td>
</tr>
<tr>
<td><em>Peristylus lancioluis</em></td>
<td>Survey, limiting factor research</td>
<td>Monitoring, cultivation/breeding</td>
</tr>
<tr>
<td><em>Peristylus stocksii</em></td>
<td>Survey</td>
<td>Monitoring</td>
</tr>
<tr>
<td><em>Phtyonanthus nodosum</em></td>
<td>Survey, life history studies, PHVA pending</td>
<td>Monitoring</td>
</tr>
<tr>
<td><em>Rhytonanthus rheedei</em></td>
<td>Survey</td>
<td>Monitoring</td>
</tr>
<tr>
<td><em>Seidenfadeniella rosea</em></td>
<td>Survey, PHVA pending</td>
<td>Monitoring and cultivation/breeding</td>
</tr>
<tr>
<td><em>Seidenfadenia crenulata</em></td>
<td>Survey</td>
<td>Habitat management</td>
</tr>
<tr>
<td><em>Seidenfadenia intermedia</em></td>
<td>Survey, life history studies</td>
<td>Monitoring and cultivation/breeding</td>
</tr>
<tr>
<td><em>Seidenfadenia stocksii</em></td>
<td>Survey</td>
<td>Monitoring</td>
</tr>
<tr>
<td><em>Smithsonia maculata</em></td>
<td>Survey</td>
<td>Monitoring</td>
</tr>
<tr>
<td><em>Smithsonia straminea</em></td>
<td>Survey</td>
<td>Monitoring</td>
</tr>
<tr>
<td><em>Smithsonia vindoliana</em></td>
<td>Survey</td>
<td>Monitoring</td>
</tr>
<tr>
<td><em>Spiranthes sinensis var. wightiana</em></td>
<td>Survey, life history studies, limiting factor research, PHVA pending, physiological (photosynthetic) studies</td>
<td>Monitoring and cultivation/breeding</td>
</tr>
<tr>
<td><em>Trixia musciflorum var. nilagiricen</em></td>
<td>Survey</td>
<td>Monitoring, cultivation/breeding</td>
</tr>
<tr>
<td><em>Trixia bonaccordensis</em></td>
<td>Survey, life history studies</td>
<td>Monitoring, cultivation/breeding</td>
</tr>
<tr>
<td><em>Trixia stocksi</em></td>
<td>Taxonomic research, life history studies</td>
<td>Monitoring, cultivation/breeding</td>
</tr>
<tr>
<td><em>Vanda weight</em></td>
<td>Survey</td>
<td>Not recommended</td>
</tr>
<tr>
<td><em>Xenophyton smeaneanum</em></td>
<td>Life history studies, PHVA</td>
<td>Cultivation/breeding</td>
</tr>
<tr>
<td>Scientific name</td>
<td>Research</td>
<td>Management</td>
</tr>
<tr>
<td>-----------------</td>
<td>----------</td>
<td>------------</td>
</tr>
<tr>
<td>Habenaria heyneana</td>
<td>Survey, life history studies, taxonomic research</td>
<td>Monitoring, cultivation/breeding</td>
</tr>
<tr>
<td>Habenaria longicorniculata</td>
<td>Taxonomic research</td>
<td>Wild population management, monitoring</td>
</tr>
<tr>
<td>Habenaria longicornu</td>
<td>Life history studies recommended</td>
<td>Monitoring</td>
</tr>
<tr>
<td>Habenaria multicaudata</td>
<td>Survey, genetic research, limiting factor research, PHVA pending</td>
<td>Habitat management, wild population management, genome resource banking, cultivation/breeding</td>
</tr>
<tr>
<td>Habenaria ovalifolia</td>
<td>Survey, life history studies, limiting factor research, PHVA pending</td>
<td>Habitat management and monitoring</td>
</tr>
<tr>
<td>Habenaria rariflora</td>
<td>Survey, taxonomic research, life history studies, limiting factor research</td>
<td>Monitoring and habitat management</td>
</tr>
<tr>
<td>Liparis biloba</td>
<td>Survey and limiting factor research</td>
<td>Habitat management</td>
</tr>
<tr>
<td>Oberonia brunoniana</td>
<td>Survey, life history studies, PHVA pending</td>
<td>Monitoring</td>
</tr>
<tr>
<td>Oberonia proudlockii</td>
<td>Survey, taxonomic research</td>
<td>Wild population management and monitoring</td>
</tr>
<tr>
<td>Oberonia santapau</td>
<td>Survey</td>
<td>Monitoring, cultivation/breeding</td>
</tr>
<tr>
<td>Oberonia verticillata</td>
<td>Life history studies recommended</td>
<td>Monitoring</td>
</tr>
<tr>
<td>Robiquetia josephiana</td>
<td>Survey</td>
<td>Monitoring, cultivation/breeding</td>
</tr>
<tr>
<td>Schoenarchis jerdoniana</td>
<td>Survey</td>
<td>Monitoring</td>
</tr>
<tr>
<td>Vanila wightiana</td>
<td>Survey</td>
<td>Monitoring</td>
</tr>
</tbody>
</table>

Cultivation or conservation breeding is one of the most important components of conservation, especially applicable to smaller organisms and those facing a high risk of extinction in the wild. Captive breeding as a conservation tool is particularly apt for smaller angiosperms, pteridophytes, bryophytes, and gymnosperms among others in the plant kingdom. Conservation breeding was recommended for 60 endemic orchids of the Western Ghats in the CAMP workshop. A common criteria was the degree of threat affecting the taxa and the objective for captive breeding such as for conservation, education, research or awareness building. As seen in table 8, conservation breeding was recommended for many taxa for very specific reasons and the level of importance for initiating this programme is also cited. In general, the participants at the workshop agreed that conservation breeding would be encouraged for taxa that were under threat since there is no concerted effort towards conservation breeding for species recovery. Apart from some taxa, which are bred in a few institutes and nurseries, for most of the others that were threatened, conservation breeding was recommended for initiation soon. In some cases, the taxa were recommended to be bred in captivity purely for the purposes of commercial sustainability. However, not much information is available on the techniques to breed many of the species of wild orchids in captivity or under cultivation, although the cultivation of hybrids is a well established commercial tool. Table 8 indicates the level of cultivation recommended and the level of understanding of techniques to breed orchids ex situ.

<table>
<thead>
<tr>
<th>Scientific name</th>
<th>Cultivation for</th>
<th>Stocks at</th>
<th># in cultivation</th>
<th>Species management</th>
<th>Recommendation</th>
<th>Propagation technique</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aenhenrya rotundifolia</td>
<td>Research</td>
<td>TBGRI, Thiruvananthapuram and Gurukula Botanical Sanctuary, Wayanad</td>
<td>-</td>
<td>Not recommended</td>
<td>Initiate cultivation programme within 3 years</td>
<td>Not available with this group of compilers</td>
</tr>
<tr>
<td>Aerides crispa</td>
<td>Research, education, reintroduction, preservation of live genome, commercial/sustainability</td>
<td>Kaveri Nisargadhama, Kodagu, local green house, Goa</td>
<td>17</td>
<td>Recommended</td>
<td>Initiation of a cultivation programme within 3 years</td>
<td>Some propagation technique known for the taxon</td>
</tr>
<tr>
<td>Aerides maculosa</td>
<td>Research, preservation of live genome, commercial/sustainability</td>
<td>Kaveri nisargadhama, kodagu, Karnatuk university, Dhanwar, Yercaud, Udhagamandalam</td>
<td>42</td>
<td>Recommended</td>
<td>Initiate cultivation programme within 3 years</td>
<td>Some propagation technique known for the taxon</td>
</tr>
<tr>
<td>Brachycorythis splendida</td>
<td>-</td>
<td>Cultivated stocks exist at TBGRI, Palode and Gurukula Botanical Sanctuary, Wayanad</td>
<td>-</td>
<td>Not recommended</td>
<td>Initiate cultivation programme within 3 years</td>
<td>Information not available</td>
</tr>
<tr>
<td>Brachycorythis wightii</td>
<td>Research</td>
<td>TBGRI, Thivunanathanpuram and Gurukula Botanical Sanctuary, Wayanad</td>
<td>5-10</td>
<td>Not recommended</td>
<td>Ongoing cultivation programme intensified or increased</td>
<td>Some propagation techniques known for similar taxa</td>
</tr>
<tr>
<td>Bulbophyllum acutiforum</td>
<td>Research</td>
<td>Gurukula Botanical</td>
<td>-</td>
<td>Recommended</td>
<td>Initiate cultivation</td>
<td>Some propagation</td>
</tr>
</tbody>
</table>

Table 8. Captive breeding recommendation for Western Ghats endemic orchids
<table>
<thead>
<tr>
<th>Scientific name</th>
<th>Cultivation for</th>
<th>Stocks at</th>
<th># in cultivation</th>
<th>Species management</th>
<th>Recommendation</th>
<th>Propagation technique</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulbophyllum albidum</td>
<td>-</td>
<td>Sanctuary, Wayanad</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Bulbophyllum aureum</td>
<td>Not recommended</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Bulbophyllum elegantulum</td>
<td>Research</td>
<td>Do not exist</td>
<td>-</td>
<td>Recommended</td>
<td>Initiate cultivation programme within 3 years</td>
<td>Information on propagation techniques not available</td>
</tr>
<tr>
<td>Bulbophyllum fimbriatum</td>
<td>Research, preservation of live genome and re introduction</td>
<td>Department of Botany, Mysore University and Carmel College, Goa</td>
<td>5 at Mysore</td>
<td>Not recommended</td>
<td>Initiate cultivation programme after 3 years</td>
<td>Some propagation techniques known for similar taxa</td>
</tr>
<tr>
<td>Bulbophyllum fuscopurpureum</td>
<td>Reintroduction</td>
<td>Do not exist</td>
<td>-</td>
<td>Recommended</td>
<td>Initiate cultivation programme within 3 years</td>
<td>Propagation techniques not known at all</td>
</tr>
<tr>
<td>Bulbophyllum mysorensis</td>
<td>-</td>
<td>Cultivated stocks available at Cauvery Nisargadhama in Kushalnagar, Kodagu</td>
<td>100</td>
<td>Not recommended</td>
<td>Initiate cultivation programme after 3 years</td>
<td>Some propagation techniques known for taxon or similar taxa</td>
</tr>
<tr>
<td>Bulbophyllum proudlockii</td>
<td>Research</td>
<td>Do not exist</td>
<td>-</td>
<td>Not recommended</td>
<td>Initiate cultivation programme within 3 years</td>
<td>Propagation techniques not known at all</td>
</tr>
<tr>
<td>Bulbophyllum silentvalliensis</td>
<td>Research</td>
<td>TBGRI, Palode and Gurukula Botanical Sanctuary, Wayanad</td>
<td>&lt;10</td>
<td>Not recommended</td>
<td>Ongoing cultivation programme intensified or increased</td>
<td>Some propagation techniques known for the taxa</td>
</tr>
<tr>
<td>Bulbophyllum tremulum</td>
<td>-</td>
<td>Do not exist</td>
<td>-</td>
<td>-</td>
<td>Not recommended</td>
<td>Propagation techniques not known at all</td>
</tr>
<tr>
<td>Cheirostylis seidenfadeniana</td>
<td>-</td>
<td>Cultivated stocks exist in TBGRI</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Chiloschista glandulosa</td>
<td>-</td>
<td>Do not exist</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Chrysoglosum hallbergii</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Coelogyne glandulosa var. bournei</td>
<td>Not recommended</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Coelogyne glandulosa var. glandulosa</td>
<td>Commercial sustainability</td>
<td>Do not exist</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Coelogyne glandulosa var. sathyanaarayanae</td>
<td>Conservation</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Coelogyne mossiae</td>
<td>Research</td>
<td>The National Orchidarium, Yercaud</td>
<td>-</td>
<td>Recommended</td>
<td>Initiate cultivation programme within 3 years</td>
<td>Information on propagation techniques not available</td>
</tr>
<tr>
<td>Coelogyne nervosa</td>
<td>Research</td>
<td>Home gardens in Ooty</td>
<td>25</td>
<td>Recommended</td>
<td>Initiate cultivation programme within 3 years</td>
<td>Some propagation techniques known for similar taxa</td>
</tr>
<tr>
<td>Dendrobium barbatulum</td>
<td>Research</td>
<td>Local green house</td>
<td>5</td>
<td>Recommended</td>
<td>Initiate cultivation programme within 3 years</td>
<td>Some propagation techniques known for similar taxa</td>
</tr>
<tr>
<td>Dendrobium diodon ssp. kodakarensis</td>
<td>-</td>
<td>Do not exist</td>
<td>-</td>
<td>Recommended</td>
<td>Initiate cultivation programme within 3 years</td>
<td>Propagation techniques not known at all</td>
</tr>
<tr>
<td>Dendrobium heyneanum</td>
<td>Research</td>
<td>No cultivated stocks</td>
<td>-</td>
<td>Not recommended</td>
<td>Initiate cultivation programme within 3 years</td>
<td>Some propagation techniques known for taxon or similar taxa</td>
</tr>
<tr>
<td>Dendrobium jerdonianum</td>
<td>-</td>
<td>Cultivated stocks exist at Gurukula Botanical Sanctuary, Wayanad</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Dendrobium ovatum</td>
<td>Research</td>
<td>Cauvery Nisargadhama orchidarium</td>
<td>-</td>
<td>Recommended</td>
<td>Ongoing cultivation programme intensified or increased</td>
<td>Some propagation techniques known for similar taxa</td>
</tr>
<tr>
<td>Scientific name</td>
<td>Cultivation for</td>
<td>Stocks at</td>
<td># in cultivation</td>
<td>Species management</td>
<td>Recommendation</td>
<td>Propagation technique</td>
</tr>
<tr>
<td>-----------------</td>
<td>-----------------</td>
<td>-----------</td>
<td>------------------</td>
<td>-------------------</td>
<td>----------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>Diplocentrum congestum</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Disperis neilgherrensis</td>
<td>Species recovery and preservation of live genome</td>
<td>Cultivated stocks available at TBGRI, Gurukula Botanical Sanctuary and home garden of T. Chhabra</td>
<td>10</td>
<td>Not recommended</td>
<td>Initiate cultivation programme within 3 years</td>
<td>-</td>
</tr>
<tr>
<td>Eria albiflora</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Not recommended</td>
<td>Initiate cultivation programme within 3 years</td>
<td>Some propagation techniques known for similar taxa</td>
</tr>
<tr>
<td>Eria dalzellii</td>
<td>Research</td>
<td>Karnataka University, Dhanwar and Gurukula Botanical Gardens, Wayanad</td>
<td>20</td>
<td>Not recommended</td>
<td>Initiate cultivation programme after 3 years</td>
<td>Some propagation techniques known for similar taxa</td>
</tr>
<tr>
<td>Eria exilis</td>
<td>Species recovery and preservation of live genome</td>
<td>Cultivated stocks are not available</td>
<td>-</td>
<td>Recommended</td>
<td>Initiate cultivation programme after 3 years</td>
<td>Some propagation techniques known for similar taxa</td>
</tr>
<tr>
<td>Eria microchilos</td>
<td>-</td>
<td>Cultivated stocks available at Kaveri Nisargadhama, Kushalnagar</td>
<td>7</td>
<td>Not recommended</td>
<td>Initiate cultivation programme within 3 years</td>
<td>Some propagation techniques known for similar taxa</td>
</tr>
<tr>
<td>Eria muscicola var. brevリング</td>
<td>Not recommended</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Eria mysorensis</td>
<td>Research</td>
<td>Cultivated stocks are available at Kaveri Nisargadhama and Kudremukh National park orchard</td>
<td>not known</td>
<td>Not recommended</td>
<td>Initiate cultivation programme after 3 years</td>
<td>Some propagation techniques known for similar taxa</td>
</tr>
<tr>
<td>Eria pseudoclavicaulis</td>
<td>No cultivated stocks available</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Eria tiagi</td>
<td>No cultivated stocks available</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Eulophia cullenii</td>
<td>Research</td>
<td>Cultivated stocks are available at TBGRI – Thiruvananthapuram</td>
<td>6</td>
<td>Recommended</td>
<td>Initiate cultivation programme within 3 years</td>
<td>Some propagation techniques known for similar taxa</td>
</tr>
<tr>
<td>Eulophia pratensis</td>
<td>Not recommended</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Gastrochilus flabelliformis</td>
<td>Research and species recovery</td>
<td>Cultivated stocks are available at TBGRI, Thiruvananthapuram</td>
<td>10</td>
<td>Not recommended</td>
<td>Ongoing cultivation programme intensified or increased</td>
<td>Some propagation techniques known for similar taxa</td>
</tr>
<tr>
<td>Habenaria barnesi</td>
<td>Research</td>
<td>Do not exist</td>
<td>-</td>
<td>Recommended</td>
<td>Ongoing cultivation programme intensified or increased</td>
<td>Information not available with this group of compilers</td>
</tr>
<tr>
<td>Habenaria cephalotes</td>
<td>Research</td>
<td>Do not exist</td>
<td>-</td>
<td>Not recommended</td>
<td>Ongoing cultivation programme intensified or increased</td>
<td>Information not available with this group of compilers</td>
</tr>
<tr>
<td>Habenaria elliptica</td>
<td>Research</td>
<td>Do not exist</td>
<td>-</td>
<td>Recommended</td>
<td>Initiate cultivation programme after 3 years</td>
<td>Some propagation techniques known for taxon or similar taxa</td>
</tr>
<tr>
<td>Habenaria elwesii</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Habenaria gibsonii var. foetida</td>
<td>Research, species recovery, reintroduction, preservation of live genome</td>
<td>Do not exist</td>
<td>-</td>
<td>Recommended</td>
<td>Initiate cultivation programme within 3 years</td>
<td>Some propagation techniques known for taxon or similar taxa</td>
</tr>
<tr>
<td>Habenaria gibsonii var. foetida</td>
<td>Preservation of live genome</td>
<td>Do not exist</td>
<td>-</td>
<td>Not recommended</td>
<td>Initiate cultivation programme within</td>
<td>Some propagation techniques known</td>
</tr>
<tr>
<td>Scientific name</td>
<td>Cultivation for</td>
<td>Stocks at</td>
<td># in cultivation</td>
<td>Species management</td>
<td>Recommendation</td>
<td>Propagation technique</td>
</tr>
<tr>
<td>-----------------</td>
<td>----------------</td>
<td>-----------</td>
<td>------------------</td>
<td>-------------------</td>
<td>---------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>Habenaria gibsoni var. foliosa</td>
<td>-</td>
<td>Do not exist</td>
<td>-</td>
<td>Not recommended.</td>
<td>Initiate cultivation programme within 3 years.</td>
<td>Some propagation techniques known for taxon or similar taxa</td>
</tr>
<tr>
<td>Habenaria gibsoni var. gibsonii</td>
<td>Research, preservation of live genome and reintroduction</td>
<td>Cultivated stocks are available at Kudremukh National Park orchidarium</td>
<td>-</td>
<td>Not recommended</td>
<td>Initiate programme within 3 years</td>
<td>Some propagation techniques known for taxon or similar taxa</td>
</tr>
<tr>
<td>Habenaria palidevindis</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Recommended</td>
<td>Initiate programme within 3 years</td>
<td>Some propagation techniques known for similar taxa</td>
</tr>
<tr>
<td>Habenaria panchanganiensis</td>
<td>-</td>
<td>Do not exist</td>
<td>-</td>
<td>-</td>
<td>Initiate cultivation programme within 3 years</td>
<td>Some propagation techniques known for taxon or similar taxa</td>
</tr>
<tr>
<td>Habenaria pernyarensis</td>
<td>Research and preservation of live genome</td>
<td>-</td>
<td>-</td>
<td>Recommended</td>
<td>Initiate cultivation programme within 3 years</td>
<td>Some propagation techniques known for similar taxa</td>
</tr>
<tr>
<td>Habenaria perrottetiana</td>
<td>Research</td>
<td>Do not exist</td>
<td>-</td>
<td>Not recommended</td>
<td>Initiate cultivation programme within 3 years</td>
<td>Propagation techniques not known at all</td>
</tr>
<tr>
<td>Habenaria polyodon</td>
<td>Research</td>
<td>Do not exist</td>
<td>-</td>
<td>Not recommended</td>
<td>Initiate cultivation programme within 3 years</td>
<td>Propagation techniques not known at all</td>
</tr>
<tr>
<td>Habenaria richardiana</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Initiate cultivation programme within 3 years.</td>
<td>Some propagation techniques known for similar taxa.</td>
</tr>
<tr>
<td>Habenaria suaveolens</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Habenaria trawancorica</td>
<td>Not recommended</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Hetaeria ovatifolia</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Not recommended</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Ipsea malabarica</td>
<td>Research and commercial/sustainability</td>
<td>Cultivated stocks are available at TBGRI – Thiruvananthapuram, Narayana Gurukula, Wayanad and National Orchidarium, Yercaud</td>
<td>Ca. 20</td>
<td>Not recommended</td>
<td>Ongoing cultivation programme intensified or increased</td>
<td>-</td>
</tr>
<tr>
<td>Kingidium mysorensen</td>
<td>Commercial/sustainability</td>
<td>Do not exist</td>
<td>-</td>
<td>Recommended</td>
<td>Initiate cultivation programme after 3 years</td>
<td>Some propagation techniques known for taxon or similar taxa</td>
</tr>
<tr>
<td>Kingidium niveum</td>
<td>Research and commercial/sustainability</td>
<td>Cultivated stocks are available at TBGRI – Thiruvananthapuram</td>
<td>3</td>
<td>Not recommended</td>
<td>Ongoing cultivation programme intensified or increased</td>
<td>Some propagation techniques known for similar taxa</td>
</tr>
<tr>
<td>Liparis platyphylla</td>
<td>None in cultivation</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Not recommended</td>
<td>-</td>
</tr>
<tr>
<td>Luisa abrahami</td>
<td>Research, commercial/sustainability and preservation of live genome</td>
<td>Cultivated stocks are available at TBGRI – Thiruvananthapuram and National Orchidarium, Yercaud</td>
<td>Ca. 5</td>
<td>-</td>
<td>There is no coordinated species management programme for this species and one is not recommended</td>
<td>Ensemble culture programme intensified or increased</td>
</tr>
<tr>
<td>Luisa evangelineae</td>
<td>-</td>
<td>Cultivated stocks are available at local green house</td>
<td>2</td>
<td>Not recommended</td>
<td>Initiate cultivation programme after 3 years</td>
<td>Some propagation techniques known for similar taxa</td>
</tr>
<tr>
<td>Luisa macrantha</td>
<td>Research</td>
<td>Cultivated stocks exist in department of Botany, Mysore Univesity and local green house, Goa</td>
<td>-</td>
<td>Recommended</td>
<td>Initiate cultivation programme after 3 years</td>
<td>Some propagation techniques known for similar taxa</td>
</tr>
<tr>
<td>Oberonia agastayamalayana</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Initiate cultivation programme within 3 years</td>
<td>Some cultivation techniques known for taxon or similar</td>
</tr>
<tr>
<td>Scientific name</td>
<td>Cultivation for</td>
<td>Stocks at</td>
<td># in cultivation</td>
<td>Species management</td>
<td>Recommendation</td>
<td>Propagation technique</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>-----------------</td>
<td>-----------</td>
<td>------------------</td>
<td>--------------------</td>
<td>----------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>Oberonia anamalayana</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Initiate cultivation programme after 3 years</td>
<td>Some propagation techniques known for taxon or similar taxa</td>
</tr>
<tr>
<td>Oberonia balakrishnanii</td>
<td>Not recommended</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Oberonia brachyphylla</td>
<td>Research</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Initiate cultivation programme after 3 years</td>
<td>Some propagation techniques known for similar taxa</td>
</tr>
<tr>
<td>Oberonia chandrasekharanii</td>
<td>Research</td>
<td>No cultivated stocks available</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Oberonia josephi</td>
<td>Not recommended</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Oberonia nayani</td>
<td>Do not exist</td>
<td>20</td>
<td>Not recommended</td>
<td>-</td>
<td>-</td>
<td>Some propagation techniques known for taxon or similar taxa</td>
</tr>
<tr>
<td>Oberonia platycaulon</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Oberonia sebastiania</td>
<td>Cultivated stocks exist at Gurukula Botanical Sanctuary, Wayanad</td>
<td>-</td>
<td>-</td>
<td>Initiate cultivation programme after 3 years</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Oberonia seidenfadeniannna</td>
<td>Do not exist</td>
<td>-</td>
<td>-</td>
<td>Initiate cultivation programme within 3 years</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Oberonia wightiana var. nigirensis</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Oberonia wynaadensis</td>
<td>Research</td>
<td>Do not exist</td>
<td>-</td>
<td>Not recommended</td>
<td>Initiate cultivation programme after 3 years</td>
<td>Some propagation techniques known for similar taxa</td>
</tr>
<tr>
<td>Pachystoma hirsutum</td>
<td>Research and commercial/sustainability</td>
<td>Do not exist</td>
<td>-</td>
<td>Not recommended</td>
<td>Initiate cultivation programme after 3 years</td>
<td>Some propagation techniques known for similar taxa</td>
</tr>
<tr>
<td>Paphiopedilum druryi</td>
<td>Research</td>
<td>Cultivated stocks are available at TBGRI, Thiruvananthapuram</td>
<td>3</td>
<td>Not recommended</td>
<td>Initiate cultivation programme within 3 years</td>
<td>Some propagation techniques known for similar taxa</td>
</tr>
<tr>
<td>Peristylus brachyphyllus</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Initiate cultivation programme within 3 years</td>
<td>Some propagation techniques known for taxon or similar taxa</td>
</tr>
<tr>
<td>Peristylus lancifolius</td>
<td>Do not exist</td>
<td>-</td>
<td>Not recommended</td>
<td>Initiate cultivation programme after 3 years</td>
<td>Some propagation techniques known for similar taxa</td>
<td></td>
</tr>
<tr>
<td>Peristylus stocksii</td>
<td>Research</td>
<td>Do not exist</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Some propagation techniques known for taxon</td>
</tr>
<tr>
<td>Rhytonanthes nodosum</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Rhytonanthos rheedei</td>
<td>Cultivated stocks exist at TBGRI and Gurukula Botanical Sanctuary, Wayanad</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Seidenfadeniella rosea</td>
<td>Research and commercial/sustainability</td>
<td>Cultivated stocks are available at National Orchidarium Yercaud [BSI] and Gurukula Botanical Sanctuary, Wayanad</td>
<td>Not known</td>
<td>Not recommended</td>
<td>Ongoing cultivation programme intensified or increased</td>
<td>Propagation techniques not known at all</td>
</tr>
<tr>
<td>Seidenfia crenulata</td>
<td>-</td>
<td>Cultivated stocks exist at Gurukula Botanical Sanctuary, Wayanad</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Seidenfia intermedia</td>
<td>Research</td>
<td>Do not exist</td>
<td>-</td>
<td>Not recommended</td>
<td>Ongoing cultivation programme intensified or increased</td>
<td>Information not available with this group of compilers</td>
</tr>
<tr>
<td>Seidenfia stocksii</td>
<td>-</td>
<td>Cultivated stocks exist at Gurukula Botanical</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Scientific name</td>
<td>Cultivation for</td>
<td>Stocks at</td>
<td># in cultivation</td>
<td>Species management</td>
<td>Recommend ation</td>
<td>Propagation technique</td>
</tr>
<tr>
<td>-----------------</td>
<td>----------------</td>
<td>----------</td>
<td>------------------</td>
<td>--------------------</td>
<td>-----------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>Sanjivina maculata</td>
<td>Not recommended</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Sanjivina straminea</td>
<td>Not recommended</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Sanjivina wightiana</td>
<td>-</td>
<td>Cultivated stocks exist at Gurukula Botanical Sanctuary and TBGRI, Palode</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Sanjivina viridiflora</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Spiranthes sinensis var. wightiana</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Taeniophyllum scaberulum</td>
<td>Research, species recovery and preservation of live genome</td>
<td>Do not exist</td>
<td>-</td>
<td>Not recommended</td>
<td>Initiate cultivation programme within 3 years</td>
<td>Propagation techniques not known at all</td>
</tr>
<tr>
<td>Thrixspermum musciflorum var. naisalicicum</td>
<td>-</td>
<td>Do not exist</td>
<td>-</td>
<td>Not recommended</td>
<td>Initiate cultivation programme within 3 years</td>
<td>Information on propagation techniques not available with this group of compilers</td>
</tr>
<tr>
<td>Trias bonaccordensis</td>
<td>Research and reintroduction</td>
<td>-</td>
<td>-</td>
<td>Not recommended</td>
<td>-</td>
<td>Propagation techniques not known at all</td>
</tr>
<tr>
<td>Trias stocksii</td>
<td>Research</td>
<td>National Orchidarium Yercaud, Kaveri Nisargadhama, Kodagu and Carmel College, Goa</td>
<td>&lt;10</td>
<td>Not recommended</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Vanda wightii</td>
<td>Not recommended</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Xenikophyton smeeanum</td>
<td>Research</td>
<td>Do not exist</td>
<td>-</td>
<td>Recommended</td>
<td>Initiate cultivation programme within 3 years</td>
<td>Information on propagation techniques not available with this group of compilers</td>
</tr>
</tbody>
</table>

**Orchids of Western Ghats extending to Eastern Ghats**

<table>
<thead>
<tr>
<th>Scientific name</th>
<th>Cultivation for</th>
<th>Stocks at</th>
<th># in cultivation</th>
<th>Species management</th>
<th>Recommend ation</th>
<th>Propagation technique</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anoectochilus elatus</td>
<td>Research</td>
<td>Cultivated stocks exist at TBGRI, Palode and Gurukula Botanical Sanctuary, Wayanad</td>
<td>-</td>
<td>Not recommended</td>
<td>Initiate programme within 3 years</td>
<td>Some propagation techniques is known for similar taxa</td>
</tr>
<tr>
<td>Ciphoepetalum neilgherrense</td>
<td>Research</td>
<td>-</td>
<td>-</td>
<td>Not recommended</td>
<td>Initiate within 3 years</td>
<td>Some propagation techniques is known for similar taxa</td>
</tr>
<tr>
<td>Dendrobium anamalayanum</td>
<td>Cultivation is recommended for commercial sustainability</td>
<td>Do not exist</td>
<td>-</td>
<td>Recommended</td>
<td>Initiate cultivation programme within 3 years</td>
<td>Some propagation techniques is known for taxon or similar taxa</td>
</tr>
<tr>
<td>Dendrobium aequum</td>
<td>Research</td>
<td>Cultivated stocks are available at local green House.</td>
<td>6</td>
<td>Recommended</td>
<td>Initiate cultivation programme within 3 years</td>
<td>Some propagation techniques is known for similar taxa</td>
</tr>
<tr>
<td>Dendrobium microbulbon</td>
<td>-</td>
<td>Do not exist</td>
<td>-</td>
<td>Not recommended</td>
<td>Initiate programme after 3 years</td>
<td>Some propagation techniques is known for similar taxa</td>
</tr>
<tr>
<td>Dendrobium nanum</td>
<td>Research</td>
<td>Cultivated stocks available at TBGRI, Thrivananthapuram and Narayana Gurukulam, Wayanad</td>
<td>12</td>
<td>Not recommended</td>
<td>Ongoing cultivation programme intensified or increased</td>
<td>Some propagation techniques is known for similar taxa</td>
</tr>
<tr>
<td>Dendrobium wightii</td>
<td>Research</td>
<td>Cultivated stocks available at TBGRI, Thrivananthapuram</td>
<td>20</td>
<td>Not recommended</td>
<td>Ongoing cultivation programme intensified or increased</td>
<td>Some propagation techniques is known for similar taxa</td>
</tr>
<tr>
<td>Eria nana</td>
<td>Research</td>
<td>Cultivated stocks are available at home garden</td>
<td>10</td>
<td>Not recommended</td>
<td>Initiate cultivation programme within 3 years</td>
<td>Some propagation techniques is known for similar taxa</td>
</tr>
</tbody>
</table>
| Eria pauciflora | Research | Do not exist | - | Not recommended | Initiate cultivation programme within 3 years | Information not available with this group of
<table>
<thead>
<tr>
<th>Scientific name</th>
<th>Cultivation for</th>
<th>Stocks at</th>
<th># in cultivation</th>
<th>Species management</th>
<th>Recommendation</th>
<th>Propagation technique</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eria polystachya</td>
<td>Research</td>
<td>Cultivated stocks are available at Gurukula Botanical Sanctuary</td>
<td>-</td>
<td>Not recommended</td>
<td>Initiate cultivation programme within 3 years</td>
<td>Information not available with this group of compilers.</td>
</tr>
<tr>
<td>Flickingeria nodosa</td>
<td>Commercial/sustainability</td>
<td>Cultivated stocks of &gt;100 plants exist at TBGRI, Palode, Gurukula Botanical Sanctuary, Wayanad and Kaveri Nisargadhama, Kodagu</td>
<td>-</td>
<td>Not recommended</td>
<td>Initiate cultivation programme after three years</td>
<td>Some techniques known for taxon.</td>
</tr>
<tr>
<td>Habenaria decipiens</td>
<td>Research</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Some propagation techniques known for similar taxa.</td>
</tr>
<tr>
<td>Habenaria grandifloriformis</td>
<td>-</td>
<td>Do not exist</td>
<td>-</td>
<td>-</td>
<td>Initiate cultivation programme after 3 years</td>
<td>Some propagation techniques known for taxon.</td>
</tr>
<tr>
<td>Habenaria heyneana</td>
<td>Research</td>
<td>Do not exist</td>
<td>-</td>
<td>Not recommended</td>
<td>Initiate cultivation programme after 3 years</td>
<td>Some propagation techniques known for taxon or similar taxa.</td>
</tr>
<tr>
<td>Habenaria longicorniculata</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Not recommended</td>
<td>Initiate cultivation programme after 3 years</td>
<td>Some techniques known for the taxon.</td>
</tr>
<tr>
<td>Habenaria longicornu</td>
<td>Research</td>
<td>Cultivated stocks exist at Gurukula Botanical Sanctuary, Wayanad</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Habenaria multicaudata</td>
<td>Preservation of live genome, commercial/sustainability</td>
<td>Do not exist</td>
<td>-</td>
<td>Recommended</td>
<td>Initiate cultivation programme within 3 years</td>
<td>Some propagation techniques known for taxon or similar taxa.</td>
</tr>
<tr>
<td>Habenaria ovalifolia</td>
<td>-</td>
<td>Do not exist</td>
<td>-</td>
<td>Not recommended</td>
<td>Initiate cultivation programme after 3 years</td>
<td>Some propagation techniques known for similar taxa.</td>
</tr>
<tr>
<td>Habenaria rariflora</td>
<td>-</td>
<td>Do not exist</td>
<td>-</td>
<td>Not recommended</td>
<td>Initiate cultivation programme within 3 years</td>
<td>Some propagation techniques known for taxon or similar taxa.</td>
</tr>
<tr>
<td>Liparis biloba</td>
<td>-</td>
<td>Cultivated stocks available at National Orchidarium, BSI, Yercaud</td>
<td>Not known</td>
<td>-</td>
<td>Initiate cultivation programme after 3 years</td>
<td>Some propagation techniques known for similar taxa.</td>
</tr>
<tr>
<td>Oberonia brunoniana</td>
<td>-</td>
<td>Cultivated stocks available at Kaveri Nisargadhama</td>
<td>10</td>
<td>Not recommended</td>
<td>-</td>
<td>Information not available with this group of compilers</td>
</tr>
<tr>
<td>Oberonia proudlockii</td>
<td>Research</td>
<td>Cultivated stocks are available at National Orchidarium, Yercaud</td>
<td>10</td>
<td>Not recommended</td>
<td>-</td>
<td>Some propagation techniques known for similar taxa.</td>
</tr>
<tr>
<td>Oberonia santapau</td>
<td>-</td>
<td>Do not exist</td>
<td>-</td>
<td>Not recommended</td>
<td>Initiate cultivation programme within 3 years</td>
<td>Information not available with this group of compilers</td>
</tr>
<tr>
<td>Oberonia ventriculata</td>
<td>None</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Robiquetia josephianna</td>
<td>-</td>
<td>Do not exist</td>
<td>-</td>
<td>Not recommended</td>
<td>Initiate cultivation programme within 3 years</td>
<td>Information on propagation techniques not available with this group of compilers.</td>
</tr>
<tr>
<td>Scientific name</td>
<td>Cultivation for</td>
<td>Stocks at</td>
<td># in cultivation</td>
<td>Species management</td>
<td>Recommendation</td>
<td>Propagation technique</td>
</tr>
<tr>
<td>------------------------</td>
<td>----------------</td>
<td>------------------------------------</td>
<td>------------------</td>
<td>--------------------</td>
<td>----------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>Schoenarchis jerdoniana</td>
<td>-</td>
<td>Cultivated stocks exist at TBGRI and Gurukula Botanical Sanctuary, Wayanad</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Vanila wightiana</td>
<td>-</td>
<td>Cultivated stocks exist at TBGRI, Palode and Gurukula Botanical Sanctuary, Wayanad</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

### Data quality

Data quality is a vital criterion while making any conservation assessment. The type of information available while making an assessment determines quality of data. For example, an assessment based on census over years can give an accurate measure of the status of a taxon with respect to its population trends. Direct observations and general field studies make possible a reasonable assessment of the habitat of a taxon based on which its assessment can be made. Indirect evidence such as from trade and field inferences of a taxon can provide valuable information with respect to its population status in the wild. Literature, herbarium and museum records can provide valuable evidence of a taxon’s past distribution and therefore a comparative assessment of its present status. Finally, hearsay can provide an insight into what may be popular beliefs as to the status of a given taxon. The order of these different evaluators in data quality indicates the degree of confidence in the data while making assessments. The most reliable data quality, namely, census and direct observation over the years is available for a very few taxa across different taxonomic groups, mainly in larger angiosperms, but not for the numerous smaller ones. In this workshop, only 3 orchid taxa were assessed based on census and monitoring information. Many taxa were evaluated using information from general field studies, which indicates fairly high confidence in the assessments. Many taxa known only from their type locations or single studies were assessed based either on indirect information or on literature/herbarium records. The flexibility allowed in applying the IUCN Criteria using inference based on other factors such as comparative habitat status permits such assessments to be considered. Figure 4 indicates the kind of data quality taken into consideration while assessing the endemic orchids of the Western Ghats. Many taxa were evaluated with more than one type of information, for example, with general field studies and literature. No assessment was based only on hearsay/popular belief.

### Uncertainty

The issue of uncertainty is certainly a main factor while assessing the status of any taxon in the wild. While there may be uncertainties connected with the way in which the IUCN Red List Criteria are interpreted, there is definitely uncertainty in assimilating the information provided by the participants at the workshop. Because of the lack of consistent field work and consistent methodologies, population trends and structure cannot be easily deduced in various areas. Important functions such as density or abundance per square unit is also difficult to standardize given the differences in the methodologies used. The effects of threats acting on a taxon at any one given area may vary considerably in another area making comparisons more difficult. These uncertainties were evident at the orchid workshop. The assessment derived with the consensus of the participants at the workshop included various degrees of uncertainty ranging from 95% confidence to subjective and hypothetical values. Inferences were made in almost all the cases and values such as geographical area of distribution and population numbers were estimated using either a range of opinion or minimum/maximum values depending on the sensitivity of the assessment. A common feature of all assessments was the consensus established in assessing the status of the taxa. Many assessments were based on evidence at areas of study only. In other areas with no study the habitat features and activities were taken into account and the population
characteristic inferred thereby making the assessment precautionary in some cases. The uncertainties are recorded in every Taxon Data Sheet.

**Conclusion**

A total of 106 endemic orchid taxa of the Western Ghats including 97 species, 1 subspecies and 6 varieties were assessed. Eleven endemic orchids (including 2 varieties) were not assessed at the workshop although they are listed in the tables. They were Not Evaluated. The orchids were assessed according to both the 1994 and 2000 IUCN Red List Criteria. They were assessed at the global level since only endemics were chosen for assessment.

The distribution of endemic orchids across the 5 states of southern India is indicated in table 9.

<table>
<thead>
<tr>
<th>Scientific name</th>
<th>GU</th>
<th>DAD &amp; NAG</th>
<th>MAH</th>
<th>GOA</th>
<th>KAR</th>
<th>KER</th>
<th>TN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aenhenrya rotundifolia (Blatter) Sathish &amp; F. Rasm., 1997</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aerides crispa Lindley 1833</td>
<td>+</td>
<td>+</td>
<td></td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Aerides maculosa Lindley 1845</td>
<td>+</td>
<td>+</td>
<td></td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Brachycorythis splendida Summer., 1955</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Brachycorythis wighti Summer., 1955</td>
<td></td>
<td></td>
<td></td>
<td>+</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bulbophyllum acutiflorum A. Rich., 1841</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Bulbophyllum albubum (Wight) Hook. f., 1890</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Bulbophyllum acreum (Hook. f.) J.J. Smith; 1912</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Bulbophyllum elegantulum (Rolle) J.J. Smith, 1912</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Bulbophyllum limbatum (Lindley) Reichb. f., 1861</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Bulbophyllum fuscoapnureum Wight, 1851</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Bulbophyllum mysorencse (Rolle) J.J. Smith, 1912</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Bulbophyllum poudlooki (King &amp; Pant.) J.J. Smith, 1912</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Bulbophyllum silvatiiensis Sharma &amp; Srivatsava, 1993</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Bulbophyllum tremulum Wight, 1851</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Cherosyles sedentafenediana Sathish &amp; F. Rasm., 1987</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Chiroschista glandulosa Blatter &amp; McCann, 1932</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Chrysoglossum hallbergi Blatter, 1928</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coelogyne glandulosa Lindley var. bourner S.J. Das &amp; Jain, 1978</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Coelogyne glandulosa Lindley var. glandulosa 1854</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Coelogyne glandulosa Lindley var. sathyanaranayanae S.J. Das &amp; Jain, 1978</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Coelogyne mossae Rolfe, 1984</td>
<td></td>
<td></td>
<td></td>
<td>+</td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Coelogyne nivosa A. Rich., 1841</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Dendrobium barbatum Lindley, 1830</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Dendrobium dodon Reichb. f. ssp. kodayeensis Gopalan &amp; A.N. Henry, 1988</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Dendrobium heyneanum Lindley, 1830</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Dendrobium junior Lindley, 1830</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Dendrobium ovatum (L.) Kranzlin, 1910</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Disperis neilgherrensis Wight, 1851</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Eria albiflora Rolfe, 1893</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Eria dalzellii (Hook.) Lindley, 1958</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Eria exilis Hook. f., 1890</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Eria microchilos (Dalz.) Lindley, 1958</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Eria mysorensis Lindley, 1858</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Eria pseudoclavicaulis Blatter, 1928</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Eria tiagii Manilal et al., 1894</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Eulophia callrns (Wight) Blume, 1858</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Eulophia pratensis Lindley, 1858</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Gastrochilus flabelliformis (Blatter &amp; McCann) Saldanha, C.J., 1976</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Habenaria barnesi Summer., ex Fischer, 1936</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Habenaria cephalotes Lindley, 1835</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Habenaria elliptica Wight, 1851</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Habenaria elvisi Hook. f., 1896</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Habenaria flabelliforms Summer. ex Fischer, 1936</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Habenaria gibsonii Hook. f. var. foetida Blatter &amp; McCann, 1932</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Scientific name</td>
<td>GU</td>
<td>DAD &amp; NAG</td>
<td>MAH</td>
<td>GOA</td>
<td>KAR</td>
<td>KER</td>
<td>TN</td>
</tr>
<tr>
<td>-----------------</td>
<td>----</td>
<td>-----------</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>Habenaria gibsonii Hook. f. var. foliosa (A. Rich.) Santapau &amp; Kapadia, 1959</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Habenaria gibsonii Hook. f. var. gibsoniana 1890</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Habenaria pallideviridis Seidenf., 1983</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Habenaria panchganensis Santapau &amp; Kapadia, 1957</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>Habenaria perrottetiana A. Rich., 1841</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Habenaria polyodon Hook. f., 1890</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Habenaria richardiana Wight, 1851</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Habenaria suaveolens Dalz., 1850</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Habenaria travancorica Hook. f., 1890</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Habenaria triloba (Reichb. f.) Hook. f., 1890</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Habenaria myosorensis (Saldanha, C.J.) Sathish, 1994</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Habenaria niveum Sathish, 1994</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Liparis platyphylla Ridley, 1886</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Luisia abrahami Vatsala, 1981</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Luisia evanegrae Blatter &amp; McCann, 1932</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Luisia macrantha Blatter &amp; McCann, 1932</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Oberonia agastyamalayana Sathish, 1994</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Oberonia anamalayana Joseph, 1963</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Oberonia balakrishnana R. Ansari, 1990</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Oberonia dichrophylla Blatter &amp; McCann, 1931</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Oberonia josephii Saldanha, C.J., 1974</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Oberonia nayarii R. Ansari &amp; Balakr., 1990</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Oberonia platycaulon Wight, 1851</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Oberonia seidenfadeniana Joseph &amp; Vajravelu, 1971 (1974)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Oberonia wightiana var. nilgirensis R. Ansari, 1982.</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Pachystoma hirsutum (Joseph &amp; Vajravelu) Sathish &amp; Manilal, 1987</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Peristylus brachyphyllus A. Rich., 1841</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Peristylus lancifolius A. Rich., 1841</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Peristylus stocksii (Hook. f.) Kranzlin, 1898</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Rhytiodendron nobile (Rolfe) Garay et al., 1994</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Rhytiodendron rheederi (Manial &amp; Sathish) Garay et al., 1994</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Seidenfadeniella rosea (Wight) Sathish, 1994</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Seidenfadeniella szlachetko (Ridley) Szlach., 1995</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Smithsonia maculata (Dalz.) Saldanha, C.J., 1974</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Smithsonia straminea Saldanha, C.J., 1974</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Smithsonia viridiflora (Dalz.) Saldanha, C.J., 1974</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Spiranthus sinensis (Pers.) Ames var. wightiana Lindley</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Tolumnia calyptrata Hook. f., 1890</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Trithyspermum musciforum A.S. Rao &amp; Joseph var. nilagiricum Joseph &amp; Vajravelu,1981</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Trias bonaccordensis Sathish, 1989</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Trias stocksii Benth. ex Hook. f., 1890</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Vanda wightii Reichb. f., 1861</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Xenokiphothon smeeanum (Reichb. f.) Garay, 1974</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Orchids of Western Ghats extending to Eastern Ghats**

<table>
<thead>
<tr>
<th>Scientific name</th>
<th>GU</th>
<th>DAD &amp; NAG</th>
<th>MAH</th>
<th>GOA</th>
<th>KAR</th>
<th>KER</th>
<th>TN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anoectochilus elatus Lindley, 1857</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cithopetalum neithermens Wight, 1851</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Dendrobium anamalayananum Chandrab. et al., 1981</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Dendrobium aequum Lindley, 1843</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Dendrobium microbulbon A. Rich., 1841</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Dendrobium nanum Hook. f., 1889</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Dendrobium wightii Hawkes &amp; Heller, 1962</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Eria nana A. Rich., 1841</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Eria pauciflora Wight, 1851</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Eria polysacchara A. Rich., 1841</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Fliceringia nodosa (Dalz.) Seidenf., 1980</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
Scienctific name | GU | DAD & NAG | MAH | GOA | KAR | KER | TN
--- | --- | --- | --- | --- | --- | --- | ---
Habenaria decipiens Wight, 1844-1845 | - | - | - | - | - | - | +
Habenaria grandifloriformis Blatter & McCann, 1932 | - | - | - | + | - | + | -
Habenaria heyneana Lindley, 1835 | + | - | - | - | - | + | +
Habenaria longicornu Lindley, 1835 | + | - | - | - | - | + | +
Habenaria multicaudata Sedgw., 1919 | - | - | - | + | + | + | +
Habenaria ovalifolia Wight, 1851 | - | - | - | + | + | + | +
Habenaria rariflora A. Rich., 1841 | - | - | - | + | + | + | +
Liparis biloba Wight, 1851 | - | - | - | - | + | + | +
Oberonia brunoniana Wight, 1851 | - | + | + | - | + | - | +
Oberonia proudlowi King & Pantl., 1897 | - | - | - | + | + | - | +
Oberonia santapau Kapadia, 1960 | - | - | - | + | + | - | +
Oberonia verticillata Wight, 1851 | - | - | - | - | + | + | +
Robiquetia josephiana Manilal & Sathish, 1984 | - | - | - | + | - | + | +
Schoenorchis jerdoniana (Wight) Garay, 1972 | - | - | - | - | + | + | +
Vanilla wightiana Lindley ex Hook. f., 1890 | - | - | - | - | - | + | +

Orchids not endemic to the Western Ghats were not assessed at the workshop. However, there were a few orchids whose distribution is not strictly confined to the Western Ghats boundaries defined by scientists. Some predominantly Western Ghats orchid taxa have a portion of their distribution occurring in the adjoining areas such as Kolli Hills and Yercaud Hills of Salem, which belong to the Eastern Ghats. Since these hill-chains are close to the Western Ghats and some elements distributed commonly amongst these hills of the Eastern Ghats and the Western Ghats, it was felt that the orchid taxa occurring in the Western Ghats and these hills would be taken as part of the Western Ghats endemics. Table 10 lists the taxa that are found in the Western Ghats and the adjoining Eastern Ghats hills that are considered endemic and assessed at the workshop. The decision to include these under Western Ghats endemics was made unanimously by all the participants at the CAMP workshop.

**Table 10. Orchids occurring in the adjoining hills of the Eastern Ghats**

<table>
<thead>
<tr>
<th>Anoectochilus elatus Lindley, 1857</th>
<th>Habenaria longicornu Lindley, 1835</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinepetalum neilgherrense Wight, 1851</td>
<td>Habenaria multicaudata Sedgw., 1919</td>
</tr>
<tr>
<td>Dendrobium anamalayanum Chandrab. et al., 1981</td>
<td>Habenaria ovalifolia Wight, 1851</td>
</tr>
<tr>
<td>Dendrobium aquuem Lindley, 1843</td>
<td>Habenaria rariflora A. Rich., 1841</td>
</tr>
<tr>
<td>Dendrobium microbulbon A. Rich., 1841</td>
<td>Liparis biloba Wight, 1851</td>
</tr>
<tr>
<td>Dendrobium nanum Hook. f., 1889</td>
<td>Oberonia brunoniana Wight, 1851</td>
</tr>
<tr>
<td>Dendrobium wightii Hawkes &amp; Heller, 1962</td>
<td>Oberonia proudlowi King &amp; Pantl., 1897</td>
</tr>
<tr>
<td>Eria nana A. Rich., 1841</td>
<td>Oberonia santapau Kapadia, 1960</td>
</tr>
<tr>
<td>Eria pauciflora Wight, 1851</td>
<td>Oberonia verticillata Wight, 1851</td>
</tr>
<tr>
<td>Eria polystachya A. Rich., 1841</td>
<td>Robiquetia josephiana Manilal &amp; Sathish, 1984</td>
</tr>
<tr>
<td>Flickingeria nodosa (Dalz.) Seidenf., 1980</td>
<td>Schoenorchis jerdoniana (Wight) Garay, 1972</td>
</tr>
<tr>
<td>Habenaria decipiens Wight, 1844-1845</td>
<td>Vanilla wightiana Lindley ex Hook. f., 1890</td>
</tr>
<tr>
<td>Habenaria heyneana Lindley, 1835</td>
<td></td>
</tr>
</tbody>
</table>

This exercise is only an initial step to understanding the current status of endemic orchids of the Western Ghats with available information. This is not a final assessment, or verdict but a guideline leading to management options and review. The assessments are based on the best information available at this point of time, and reassessments are encouraged as and when further data becomes available. What is to be understood, however, is that the dangers to the taxa are in plenty, and appropriate actions to mitigate the extinction process are required at the right time. A look at the following figures indicates the urgency with which pro-active conservation actions are required.
Scientific name (author; date): Aenhenrya rotundifolia (Blatter) Sathish & F. Rasm., 1997

Synonyms: Odontochilus rotundifolius Blatter, 1928  
Anoectochilus rotundifolius (Blatter) Balakr., 1966  

Habit: Terrestrial herb

Habitat: Evergreen and shola forests.

Niche/elevation: Forest floor, often found in association with Paphiopedilum druryi. 1000-1700 m.

Distribution

Current Global Distribution: ENDEMIC to Western Ghats (Kerala & Tamil Nadu)


Kerala: Vellimala, Periyar Tiger Reserve in Idukki District [C. Sathish Kumar, 1990 onwards].

Extent of Occurrence (Sq. km.): 100-5,000

Area of Occupancy (Sq. km.): 10-500

Number of Subpopulations/Locations: 2/3. Fragmented. No continuing decline or extreme fluctuation in the number of locations or subpopulations. All individuals not in one population and one subpopulation does not hold 95% or more of the total population.

Habitat status: No change in area of habitat. Quality of habitat decreasing due to trampling by wild ungulates and elephants.

Threats

Threats to taxon: Demographic instability may result in population decline in the future. The influence of threats on population structure well understood, reversible and not yet ceased to be threats.

Trade: Not in trade.

Population

Numbers/Generation time/trend: Mature individuals in all populations <250. Their numbers not declined in the past and, future decline not expected. Generation time not known.

Population trend: Stable. Population not expected to decline in the future.


Data quality: Assessment based on field studies and literature/herbarium studies.

Qualifier: Area and extent estimated based on known locations. Habitat status, threats, mature individuals and population trends observed over many years of field studies.

Status

IUCN Red List Criteria (1994): ENDANGERED  
IUCN Red List Criteria (2000): ENDANGERED  

CITES: Appendix II  
National Red Data Book: Endangered [Nayar & Sastry, 1987]  
Other legislation: Included in the Negative List of Exports (EXIM Policy), 1999.

Known presence in Protected Areas: Kalakad-Mundanthurai Tiger Reserve, Meghamalai Wildlife Sanctuary, Neyyar Wildlife Sanctuary, Periyar Tiger Reserve.

Uncertainty: Assessed with 95% confidence based on evidence and consensus of the field biologists at the workshop.

Recommendations

Research: Genetic research, life history studies, PHVA.

Management: Cultivation/breeding

Cultivation: Cultivation recommended for research. Cultivated stocks exist at TBGRI, Thiruvananthapuram and Gurukula Botanical Sanctuary, Wayanad. No coordinated species management programme and one is not recommended. Initiate cultivation programme within 3 years. Information on propagation techniques not available with this group of compilers.

Other comments: This is a monotypic genus and is known to have the largest pollinarium in the subtribe Goodyerinae. The species was first collected from High Wavy Mountains by Blatter in May 1917. Kew has specimens collected by Ms. Bowden from Tirukurangudi, Tamil Nadu in 1945. Since it is found in inaccessible areas, the species cannot be collected easily.


Aerides crispa Lindley 1833

Aerides lindleyana Wight, 1851

Scientific name (author; date):

Epiphytic or lithophytic herb

Habit: Dry deciduous, moist deciduous and shola forests

Niche/elevation: Branches and rocks. 250-2200m.

Distribution

Historical Distribution:

Current Global Distribution: ENDEMIC to Western Ghats (Gujarat, Nagerhaveli, Maharashtra, Goa, Karnataka, Kerala & Tamil Nadu)

Distribution from Literature:

Distribution from Field Studies:

Extent of Occurrence (Sq. km.):

Area of Occupancy (Sq. km.):

Number of Subpopulations/Locations:

Habitat status:

Threats

Threats to taxon:

Trade:

Population

Population Numbers/Generation time/trend:

Population trend:

Recent Field Studies:

Data quality:

Qualifier:

Status

IUCN Red List Criteria (1994):

IUCN Red List Criteria (2000):

CITES:

National Red Data Book:

Other legislation:

Known presence in Protected Areas:

Uncertainty

Assessed with 95% confidence based on evidence and consensus of the field biologists.

Recommendations

Research:

Management:

Cultivation:

Conservation Assessment and Management Plan Workshop Report for Endemic Orchids of the Western Ghats 2001
species and one is recommended. Initiation of a cultivation programme within 3 years. Some propagation technique known for the taxon.

Other comments: Described by Lindley based on a collection. The reported occurrence of this species in Sri Lanka and Burma (Saldanha & Nicolson, 1976) and Orissa (Keshavmurthy & Yogananrasinmhan, 1990; Misra, 1980; Rathakrishnan & Chitra, 1984) is due to a misidentification. The endemic status of this species is confirmed by Christenson who revised the genus Aerides. There is altitudinal effect on the size of leaves in Nilgiri subpopulations [P.F. Solomons]. On the verge of extirpation in Khandala and Mahableshwar [Sharma et al., 1984]. Local trade in Kodakanal [Pyson, 1974]. This species was described based on (Wallich specimen Cat. No. 7319) from Courtallum. Lindley Herbarium contains two more sheets from Herb. J.L. Stocks, one of which has a beautiful sketch by Lindley.


**Scientific name (author; date):** Aerides maculosa Lindley 1845

**Synonym:** Saccolabium speciosum Wight, 1851

**Habit:** Monopodial epiphytic herb

**Habitat:** Moist deciduous forests

**Niche/ elevation:** >1500m.

**Distribution**

**Historical Distribution:** India

**Current Global Distribution:** ENDEMIC to Western Ghats (Gujarat, Maharashtra, Goa, Karnataka, Kerala & Tamil Nadu)


**Distribution from Field Studies:** Karnataka: Belgaum, Kodagu, Uttara Kannada, Chikmagalur, Biligiri Rangan Hills [S. Phatak, T.A. Rao, R. Ingahalli].

**Tamil Nadu:** Kodaikanal [N. Raman, June, 1997]. Agastyaamala [C. Satish Kumar].

**Extent of Occurrence (Sq. km.):** 5,001-20,000

**Area of Occupancy (Sq. km.):** 10-500

**Number of Subpopulations/Locations:** >50-20. Fragmented. Continuing decline but no extreme fluctuation in the number of locations or subpopulations. All individuals not in one population and one subpopulation does not hold 90% or more of the total population.

**Habitat status:** Decrease in area of habitat >20% in the last 10-20 years and predicted decline >20% in the next 10-20 years. Quality of habitat decreasing due to industrialisation, urbanisation and human interference.

**Threats**

**Threats to taxon:** Human interference, trade of parts, habitat loss, habitat fragmentation and overexploitation are the threats. The influence of threats on the population structure well understood, reversible and not yet ceased to be threats.

**Trade:** Local, domestic and commercial trade of flowers for ornamental purpose.

**Population**

**Numbers/Generation time/trend:** Mature individuals < 2500. Numbers declined in the past by >40-50%. Predicted decline >20-50%. Generation time 4-5 years.

**Population trend:** Declining >10% in the last 10 years due to habitat loss, trade and exploitation. Expected decline >20% in the next 10 years.


**Data quality:** Assessment based on field studies, informal sighting and literature/herbarium studies.

**Qualifier:** Area and extent estimated based on known locations. Habitat status, threats, mature individuals and population trends observed over many years of field studies.

**Status**

**IUCN Red List Criteria (1994):** ENDANGERED

**Criteria:** B1+2bcde

**IUCN Red List Criteria (2000):** ENDANGERED

**Criteria:** B2a+b(ii,iii,iv,v)

**CITES:** Appendix II

**Indian WL. (P) Act:** Not listed

**International RDB:** Not listed

**Known presence in Protected Areas:** Bhimashankar Wildlife Sanctuary, Biligiri Rangaswamy Temple Wildlife Sanctuary, Silent Valley National Park

**Uncertainty**

Assessed with 95% confidence based on evidence and consensus and subjective opinion of field biologists.

**Recommendations**

**Research:** Survey, life history studies, genetic research, taxonomic research.

**Management:** Monitoring, sustainable utilisation, cultivation/breeding

**Cultivation:** Cultivation recommended for research, preservation of live genome, commercial/sustainability. Cultivated stocks exist at Kaveri Nisargadhama, Kodagu, Karnataka University, Dhanwar, Yercaud, Udthagamandalam. Numbers in cultivation 42. No coordinated species management programme and one is recommended. Initiate cultivation programme within 3 years. Some propagation technique known for the taxon.

**Other comments:** This species was described by Lindley. The reported occurrence of this species in Bihar (Pradhan, 1979; Bose & Bhattacharjee, 1980), Madhya Pradesh (Tiwi & Maheshwari, 1963) and Orissa (Misra, 1980) is due to a misidentification. Christenson who revised the genus Aerides has confirmed the endemic status of this species. It may be used for medicine also (hearsay). Found on the boundaries of the forest as they require dust and pollution for the survival and are common on roadsides and train tracks.


Scientific name (author; date): **Brachycorythis splendidia** Summerh., 1955

**Synonyms:** *Platanthera iantha* Wight, 1851  

**Habit:** Terrestrial herb

**Habitat:** Montane grasslands

**Niche/ elevation:** > 850 m.

**Distribution**

**Historical distribution:**

**Current Global Distribution:** ENDEMIC to Western Ghats (Karnataka, Kerala & Tamil Nadu)


**Distribution from Field Studies:** Karnataka: Pushpagiri in Kodagu, Shringeri in Chikkamagalur and Kemmanagundi [T.A. Rao, 1998-99].

**Extent of occurrence (Sq. km.):** 100-5,000

**Area of occupancy (Sq. km.):** <10

**Number of Subpopulations/Locations:** 3/3. Fragmented. Continuing decline in the number of locations or subpopulations. All individuals not in one population and it does not hold 90% or more of the total population.

**Habitat status:** Decrease in the habitat <20% in the last 10 years and <20% predicted decline in the next 10 years due to loss of habitat and grazing. Decrease in the quality of the habitat due to grazing.

**Threats**

**Threats to taxon:** Grazing, human interference and habitat loss resulting in and may result in population decline. The influence of these factors on the habitat and population well understood, not reversible and not ceased to be a threat.

**Trade:** Not in trade

**Population**

**Numbers/Generation time/Trends:** Number of mature individuals in all populations <250. Decline in their numbers in the past and future decline predicted. Generation time 1 year.

**Population Trends:** Decline in the population <10% in the last 5 years and estimated decline of <10% in the next 10 years.


**Data quality:** Assessment based on field studies and literature/herbarium studies.

**Qualifier:** Area and extent estimated based on known locations. Habitat status, threats, mature individuals and population trends observed, inferred and projected.

**Status**

**IUCN Red List Criteria (1994):** Critically ENDANGERED  
Criteria: B1+2abcde

**IUCN Red List Criteria (2000):** Critically ENDANGERED  
Criteria: B2a+b(i,ii,iii,iv,v)

**CITES:** Appendix II  
Indian WL. (P) Act: Not listed  
International RDB: Not listed

**National Red Data Book:** Included in the Negative List of Exports (EXIM Policy), 1999.

**Other legislation:** Brahmagiri Wildlife Sanctuary, Kudremukh National Park, Pushpagiri Wildlife Sanctuary.

**Known presence in Protected Areas:** Brahmagiri Wildlife Sanctuary, Kudremukh National Park, Pushpagiri Wildlife Sanctuary.

**Uncertainty**

Assessed with 95% confidence based on evidence and on the consensus of the field biologist.

**Recommendations**

**Research:** Life history studies, PHVA  
**Management:** Habitat management, monitoring  
**Cultivation:** Cultivated stocks exist at TGBRI, Palode and Gurukula Botanical Sanctuary, Wayanad. No coordinated species management programme and one is not recommended. Initiate cultivation programme within 3 years. Information on propagation techniques not available.

**Other comments:** Silviculture and grazing lead to habitat loss. Grazing has resulted in soil erosion. Distribution is very restricted and patchy.

**Sources:**  

**Compilers:** T.A. Rao, K. Sivabalakrishnan, P.F. Solomons, P.S. Udayan, M.B. Viswanathan, U. Lakshminarayanan

Conservation Assessment and Management Plan Workshop Report for Endemic Orchids of the Western Ghats

Scientific name (author; date): **Brachycorythis wightii** Summerh., 1955

**Habit:** Terrestrial tuberous herb.

**Habitat:** Montane grassland

**Niche/elevation:** 1500-1800 m.

**Distribution**

**Historical distribution:**

**Current Global Distribution:** ENDEMIC to Western Ghats (Kerala)

**Distribution from Literature:**

- Travancore [Summerhayes, 1955].
- Munnar [Sathish Kumar, 1991].
- Kerala [Pushpangad & Sathish Kumar, 1995].
- Trivandrum [Rathakrishnan & Chitra, 1984]

**Distribution from Field Studies:**


**Extent of occurrence (Sq. km.):** <100

**Area of occupancy (Sq. km.):** <10

**Number of Subpopulations/location:** 3. Fragmented. No continuing decline or extreme fluctuation in the number of locations or subpopulations. All individuals not in one population and one subpopulation does not hold 95% or more of the total population.

**Habitat status:**

No change. Predicted decline <20% in the next 10-15 years due to loss of habitat and decrease in the quality of the habitat due to Eucalyptus plantations.

**Threats**

**Threats to taxon:**

Grazing may result in population decline. The influence on the population well understood. Not reversible and not ceased to be a threat.

**Trade:**

Not in trade

**Population**

**Numbers/Generation time/Trends:** Mature individuals in all populations <250. Their numbers not declined in the past and decline in the future not expected. Generation time 1 year.

**Trends:**

The population size/numbers of the taxon stable.

**Recent Field Studies:**

- C. Sathish Kumar in Munnar, 1991-95, Rare and threatened Orchids of Kerala.

**Data quality:**

Assessment based on field studies, census/monitoring and literature/herbarium studies.

**Qualifier:**

Habitat status, threats, mature individuals and population trends observed over many years of field studies and census/monitoring.

**Status**

**IUCN Red List Criteria (1994):** CRITICALLY ENDANGERED

**IUCN Red List Criteria (2000):** CRITICALLY ENDANGERED

**CITES:** Appendix II

**National Red Data Book:** Not listed

**Other legislation:** International RDB: Not listed

Eeravikulam National Park

**Uncertainty**

Assessed with 95% confidence and minimum (population) values based on evidence and consensus of field biologists at the workshop.

**Recommendations**

**Research:** Life history studies, PHVA.

**Management:**

Habitat management, monitoring, cultivation/breeding.

**Cultivation:**

Cultivation recommended for research. Cultivated stocks available at TBGRI, Thrivananthapuram and Gurukula Botanical Sanctuary, Wayanad. Numbers in cultivation 5-10. No coordinated species management programme for this species and one not recommended. Ongoing cultivation programme intensified or increased. Some propagation techniques known for similar taxa.

**Other comments:**

The exact locality from which the species was collected not known, Wight says Travancore. Population fluctuation due to natural causes has been observed. Eucalyptus plantation at the border of Silent Valley (Munnar) where one of the populations is located may result in change in the habitat of the species.

**Sources:**

- Pushpangadhan & Sathish Kumar, 1995: 960; Rathakrishnan & Chitra, 1984: 1003; Sathish Kumar, 1991: 211; Summerhayes, 1955: 242

**Compilers:**

- S.S.R. Bennet, J.L. Ellis, M. Mohanan, V.S. Menon, C. SathishKumar, S. Seeini, B.V. Shetty, P.S. Udayan, U. Lakshminarayan

**Reviewers:**

**Scientific name (author; date):** Bulbophyllum acutiflorum A. Rich., 1841

**Synonym:** Cirrhopetalum acutiflorum (A. Rich.) Hook. f., 1890

**Habit:** Epiphytic or lithophytic herb

**Habitat:** Evergreen and shola forests

**Niche/elevation:** 1500-2000 m.

**Distribution**

**Historical distribution:** India

**Current Global Distribution:** ENDEMIC to Western Ghats (Kerala & Tamil Nadu)


**Extent of occurrence (Sq. km.):** 100-5,000

**Area of occupancy (Sq. km.):** 10-500

**Number of Subpopulations/location:** 10-30 / 5-15. Fragmented. Continuing decline but no extreme fluctuation in the number of locations or subpopulations. All individuals not in one population and one subpopulation does not hold 95% or more of the total population.

**Habitat status:** Decrease in the habitat >20% in the last 10-20 years. Predicted decline >20% in the next 10-20 years due to harvest for timber. Decrease in the quality of the habitat due to harvest for timber (host plant).

**Threats**

**Threats to taxon:** Decline of host species due to harvest for timber resulting in and may result in population decline. The influence of threat on the population structure well understood, not reversible and have not ceased.

**Trade:** Not in trade

**Population**

**Numbers/Generation time/Trends:** Mature individuals in all populations <2,500. Number of mature individuals declined in the past by 10-20% and likely to decline by 10-20 % in the future. Generation time 5-10 years.

**Trends:** The population size of the taxon declining at a rate of >20% in the last 10 years and >20% decline predicted in the next 10 years.


**Data quality:** Assessment based on field studies, indirect information and literature/herbarium studies.

**Qualifier:** Area and extent estimated based on known locations. Habitat status, threats, mature individuals and population trends inferred from range of opinion.

**Status**

**IUCN Red List Criteria (1994):** ENDEANGERED

**IUCN Red List Criteria (2000):** ENDEANGERED

**CITES:** Appendix II

**National Red Data Book:** Rare [Nayar & Sastry, 1987] Indian WL. (P) Act: Not listed

**International RDB:** Not listed

**Other legislation:** Included in the Negative List of Exports (EXIM Policy), 1999.

**Known presence in Protected Areas:** Eravikulam National Park, Mukurthi National Park

**Uncertainty**

Assessed based on evidence, inference and range of opinion on the consensus of the field biologists.

**Recommendations**

**Research:** Genetic research, life history studies, PHVA.

**Management:** Cultivation/breeding.

**Cultivation:** Cultivation is recommended for research. Cultivated stocks available at Gurukula Botanical Sanctuary, Wayanad. There is no coordinated species management programme for this species and one is recommended. Initiate cultivation programme within 3 years. Some propagation techniques known for similar taxa.

**Other comments:** Described by A. Richard (1841) based on G.S. Perrottet's collection from Nilgiris. The decline in the population was estimated based on the harvest for timber from one location in Nadugani.


**Bulbophyllum albidum** (Wight) Hook. f., 1890

_Ceratopetalum albidum_ Wight, 1851

**Scientific name (author; date):**

**Synonym:**

**Habit:**

**Habitat:**

**Niche/elevation:**

**Distribution**

**Historical distribution:**

**Current Global Distribution:** ENDEMIC to Western Ghats (Kerala & Tamil Nadu)

**Distribution from Literature:**

**Distribution from Field Studies:**

**Extent of occurrence (Sq. km.):**

**Area of occupancy (Sq. km.):**

**Number of Subpopulations/location:**

**Habitat status:**

**Threats**

**Threats to taxon:**

**Trade:**

**Population**

**Numbers/Generation time/Trends:**

**Trends:**

**Recent Field Studies:**

**Data quality:**

**Qualifier:**

**Status**

**IUCN Red List Criteria (1994):** ENDANGERED

**IUCN Red List Criteria (2000):** ENDANGERED

**CITES:** Appendix II

**National Red Data Book:** Rare [Nayar & Sastry, 1987]

**Other legislation:** Included in the Negative List of Exports (EXIM Policy), 1999.

**Known presence in Protected Areas:** Kalakad-Mundanthurai Tiger Reserve, Mukurthi National Park, Neyyar Wildlife Sanctuary.

**Uncertainty**

**Recommendations**

**Research:**

**Management:**

**Cultivation:**

**Other comments:**

**Sources:**

**Compilers:**

**Reviewers:**

---

**ENDANGERED**
**Scientific name (author; date):**

*Bulbophyllum aureum* (Hook. f.) J.J. Smith, 1912

*Cirrhopetalum aureum* Hook. f., 1890

**Synonym:**

Cirrhopetalum aureum (Hook. f.) J.J. Smith, 1912

**Habit:**

Pseudobulbous epiphytic or lithophytic herb

**Habitat:**

Moist deciduous forests

**Niche/elevation:**

800-1000 m.

**Distribution**

**Historical distribution:**

India

**Current Global Distribution:**

ENDEM IC to Western Ghats (Kerala & Tamil Nadu)

**Distribution from Literature:**


**Distribution from Field Studies:**


**Extent of occurrence (Sq. km.):**

100-5,000

**Area of occupancy (Sq. km.):**

10-500

**Number of Subpopulations/location:**

2. Fragmented.

**Habitat status:**

Decrease in the habitat <20% in the last 40 years and decrease in the quality of the habitat due to human habitation.

**Threats**

**Threats to taxon:**

Habitat loss resulting in and may result in population decline in Wayanad. The influence of threats on the population well understood, are not reversible and have not ceased.

**Trade:**

Not in trade

**Population**

**Numbers/Generation time/Trends:**

Unknown

**Trends:**

The population of the taxon declining.

**Recent Field Studies:**


**Data quality:**

Assessment based on field observation, literature/herbarium studies and indirect information only.

**Qualifier:**

The Area and Extent estimated based on literature. Habitat status and threats on subjective opinion.

**Status**

IUCN Red List Criteria (1994):

ENDANGERED

Criteria: B1+2c

IUCN Red List Criteria (2000):

ENDANGERED

Criteria: B1a+b(iii), 2a+b(iii)

**CITES:**

Appendix II

**Indian WL. (P) Act:**

Not listed

**National Red Data Book:**

Rare [Nayar & Sastry, 1987]

**International RDB:**

Not listed

**Other legislation:**

Included in the Negative List of Exports (EXIM Policy), 1999.

**Known presence in Protected Areas:**

Kalakad-Mundanthurai Tiger Reserve, Peppara Wildlife Sanctuary, Silent Valley National Park

**Uncertainty**

Assessment based on 95% confidence and range of opinion.

**Recommendations**

**Research:**

Survey, life history studies, PHVA.

**Management:**

Monitoring.

**Cultivation:**

Not recommended. Cultivation stocks exist at TBGRI, Palode and Gurukula Botanical Sanctuary, Wayanad.

**Other comments:**

Originally described by Hook. f., based on drawings from Wayanad by Jerdon. It was rediscovered by C. Sathish Kumar from Silent Valley area.

**Sources:**


**Compilers:**


**Reviewers:**

**Scientific name (author; date):** Bulbophyllum elegantulum (Rolfe) J.J. Smith, 1912

**Synonym:** Cirnhopetalum elegantulum Rolfe, 1891

**Habit:** Epiphytic herb

**Habitat:** Evergreen forests

**Niche/elevation:** On wet branches. 1200-1820 m

---

### Distribution

**Historical distribution:**

**Current Global Distribution:** ENDEMIC to Western Ghats (Karnataka & Tamil Nadu)

**Distribution from Literature:**

- Coorg, Nilgiris, Kudini, Mudumalai Wildlife Sanctuary [Nayar & Sastry, 1987].
- Coorg [Mohanan & Balakrishnan, 1991].
- Coorg, Kanniyakumari [Rathakrishnan & Chitra, 1984].
- Kudini [Sharma et al., 1977].

**Distribution from Field Studies:**

- Tamil Nadu: Naduvattom, Nilgiri [K. Sivabalakrishnan, 1996].

**Presence in Protected Areas:** Mudumalai Wildlife Sanctuary

**Extent of occurrence (Sq. km.):** <10

**Area of occupancy (Sq. km.):** <5 locations. Fragmented. All individuals not in one population and one subpopulation does not hold 95% or more of the total population.

**Habitat status:**

- No change in the habitat. Predicted decline >20% in the next 5 years due to human interference.
- Change in the quality of habitat due to felling of host trees.

---

### Threats

**Threats to taxon:** Decline of host species and habitat loss are the main threats. The influence on the population well understood, not reversible and have not ceased.

**Trade:** Not in trade

---

### Population

**Numbers/Generation time/Trends:**

- Mature individuals in all populations <250. The number of mature individuals declined in the past and is likely to decline by 10-20% in the future. Generation time 2 years.

**Trends:**

- The population size/numbers of the taxon declining at a rate of >10% in the last 3 years and >10% decline predicted in the next 5 years due to habitat loss.

---

### Recent Field Studies:

- K. Sivabalakrishnan in Naduvattom in Nilgiris, 1996, ex situ conservation of orchids of Western Ghats.

---

### Data quality

Assessment based on field studies and literature/herbarium studies.

### Qualifier:

The Area and Extent estimated based on known locations. Habitat status, threats, mature individuals and population trends observed over many years of field studies.

---

### Status

- **IUCN Red List Criteria (1994):** CRITICALLY ENDANGERED
- **IUCN Red List Criteria (2000):** CRITICALLY ENDANGERED
- **CITES:** Appendix II
- **National Red Data Book:** Vulnerable [Nayar & Sastry, 1987]
- **International RDB:** Not listed
- **Known presence in Protected Areas:** Mudumalai Wildlife Sanctuary

---

### Uncertainty

Assessed based on evidence, on a range of opinion and on the consensus of field biologists.

---

### Recommendations

**Research:** Life history studies, PHVA pending.

**Management:** Habitat management, monitoring and cultivation/breeding.

**Cultivation:** Cultivation recommended for research. Cultivated stocks not available. No coordinated species management programme for this species and one is recommended. Initiate cultivation programme within 3 years. Information on propagation techniques not available.

---

### Other comments:

Originally described by Rolfe based on O’ Briens collection from Coorg District was rediscovered by Rao et al., 1976. The species was observed only on three trees [Sivabalakrishnan, K]. Felling of host trees for fuel has caused the decrease in the habitat. It was known only by the type collection from Coorg, until Subba Rao relocated it from Kundini in 1972. This species was collected only once from Nilgiris in 1972, away from the type locality.

---

### Sources:


---

### Compilers:


---

### Reviewers:

**Scientific name (author; date):** **Bulbophyllum fimbriatum** (Lindley) Reichb. f., 1861

**Synonym:** *Cirrhopetalum fimbriatum* Lindley, 1839

**Habit:** Epiphytic or lithophytic herb

**Habitat:** Dry and moist deciduous forests.

**Niche/elevation:** On tree branches and rocks covered with mosses. 300-1000 m.

**Distribution**

**Historical distribution:** India

**Current Global Distribution:** ENDEMIC to Western Ghats (Maharashtra, Karnataka, Kerala & Tamil Nadu)

**Distribution from Literature:**
- Distribution from Field Studies:
  - Maharashtra: Mahabaleshwar [S. Phatak, 1982].

**Extent of occurrence (Sq. km.):** >20,000

**Area of occupancy (Sq. km.):** 10-500

**Number of Subpopulations/location:** 50/10. Fragmented. Continuing decline but no extreme fluctuation in the number of locations or subpopulations. All individuals not in one population and one subpopulation does not hold 95% or more of the total population

**Habitat status:** Decrease in the habitat <20% in the last 10 years due to habitat destruction. Decrease in the quality of the habitat due to change in the vegetation type.

**Threats**

**Threats to taxon:** Decline of host species, human interference, habitat loss, harvest for timber, fire and reproductive problems resulting in and may result in population decline. The influence on the population is well understood, not reversible and have not ceased.

**Trade:** Not in trade.

**Population**

**Numbers/Generation time/Trends:** Mature individuals in all populations <2,500. The numbers of mature individuals declined in the past by 10% and likely to decline by 20% in the future. Generation time 3 years.

**Trends:** The population size/numbers of the taxon declining at a rate of <10% in the last 10 years.


**Data quality:** Assessment based on field studies, informal sightings and literature/herbarium studies.

**Qualifier:** The Area and Extent estimated based on known locations. The habitat status, threats, mature individuals and population trends observed over many years of field studies and sightings.

**Status**

* IUCN Red List Criteria (1994): ENDANGERED
* IUCN Red List Criteria (2000): ENDANGERED

**CITES:** Appendix II

**National Red Data Book:** Not listed

**Other legislation:** Included in the Negative List of Exports (EXIM Policy), 1999.

**Known presence in Protected Areas:** Billigiri Rangaswamy Temple Wildlife Sanctuary, Brahmagiri Wildlife Sanctuary, Kudremukh National Park.

**Uncertainty**

Assessed with 95% confidence based on evidence and on the consensus of the field biologists.

**Recommendations**

**Research:** Survey, life history studies and limiting factor research.

**Management:** Habitat management, sustainable utilisation, cultivation/breeding and monitoring. Cultivation is recommended for research, preservation of live genome and reintroduction. Cultivated stocks available at department of Botany, Mysore University and Carmel College, Goa. Numbers in cultivation 5 at Mysore. There is no coordinated species management programme for this species and one is not recommended. Initiate cultivation programme after 3 years. Some propagation techniques known for similar taxa.

**Other comments:** P.F. Solomons has recorded this species for the first time in Nilgiris. This is the first indication of the range extension of this species.


**Compilers:** T.A. Rao, B. Arthur, Krishnaswamy, E. Mohan, R. Ingalhalli, S. Rajendran, R. Hegde, S. Phatak.
Scientific name (author; date): **Bulbophyllum fuscopurpureum** Wight, 1851

Habit: Epiphytic or lithophytic herb

Habitat: Shola and evergreen forests.

Niche/ elevation: On small rocks with mosses and Commelina species. 900-1800 m.

Distribution

**Historical distribution:**

**Current Global Distribution:** ENDEMIC to Western Ghats (Karnataka, Kerala & Tamil Nadu)

**Distribution from Literature:**
- Kerala: Idukki [Rathakrishnan & Chitra, 1994].

**Extent of occurrence (Sq. km.):** 100-5,000

**Area of occupancy (Sq. km.):** 10-500

**Number of Subpopulations/Location:** 4/ <10. Fragmented. No continuing decline or extreme fluctuation in the number of locations or subpopulations. All individuals not in one population and one subpopulation does not hold 95% or more of the total population.

Habitat status: Decrease in habitat >20% in Ellamalai and Naduvattam. Predicted decline of <20% in the next 10 years all over due to habitat loss and plantations [R. Ganesan, 2000]. No change in the quality of the habitat.

Threats

**Threats to taxon:** Edaphic changes, habitat loss (future), harvest for medicine (present), pollution and habitat fragmentation resulting in and may result in population decline. The influence on the population well understood, not reversible and not ceased to be threats.

**Trade:** Not in trade

Population

**Numbers/Generation time/Trends:** Mature individuals in all populations >2,500. The numbers of mature individuals declined in the past by 10% and likely to decline by 10% in the future. Generation time 3 years. Perennial [R. Ganesan, 2000].

**Trends:** The population size/numbers of the taxon declining at a rate of <10% in the last 5 years (>50% in Naduvattam and Ellamalai).

Recent Field Studies:

Data quality:

**Assessment based on field studies, indirect information and literature/herbarium studies.**

Status

**IUCN Red List Criteria (1994):** ENDANGERED Criteria: B1+2bce

**IUCN Red List Criteria (2000):** ENDANGERED Criteria: B1a+b(ii,iii,v), 2a+b(ii,iii,v)

**CITES:** Appendix II Indian WL. (P) Act: Not listed

**National Red Data Book:** Not listed International ROB: Not listed

**Other legislation:** Included in the Negative List of Exports (EXIM Policy), 1999

**Known presence in Protected Areas:** Biligiri Rangaswamy Temple Wildlife Sanctuary, Kalakad-Mundanthurai Tiger Reserve

Uncertainty

**Assessed on a range of opinion based on evidence and on the consensus of the field biologists.

Recommendations

**Research:** Survey, PHVA pending.

**Management:** Cultivation/breeding

**Cultivation:** Cultivation is recommended for reintroduction. Not in cultivation. There is no coordinated species management programme for this species and one is recommended. Initiate cultivation programme within 3 years. Propagation techniques not known at all.

**Other comments:** Proposed by Wight based on collections by Jerdon from Nilgiris. Encroachments into shola forests at Bilirangan Hills can affect the regeneration of primary forest trees. Once the older trees die the orchids may lose their habitat. Other than the plantations shola forests do not have any threat. There may not be any threat which can wipe way the population at Biligiri Rangaswamy Temple Wildlife Sanctuary. However, this hill range is cut off from the hilgiris, which may in the long run isolate the population [R. Ganesan, Biological Information Sheet].

Sources:
**Scientific name (author; date):** Bulbophyllum mysorense (Rolfe) J.J. Smith, 1912

**Synonym:** Cirrhopetalum mysorense Rolfe, 1895

**Habit:** Creeping pseudobulbous epiphytic herb

**Habitat:** Moist deciduous forest

**Niche/ elevation:** On rough bark trees. 800-1000 m.

### Distribution

**Historical distribution:**
- India

**Current Global Distribution:** ENDEMIC to Western Ghats (Karnataka & Kerala)

**Distribution from Literature:**
- Hassan - Upper Ghats [Saldanha & Nicolson, 1976].
- Hassan, Mysore [Sharma et al., 1984].
- Kundalli [Keshavamurthy & Yoganarasimhan, 1990].
- Kodagu, Hassan [Rao, 1998; Rathekrishnan & Chitra, 1984].
- Kamataka: Coor [S. Phatak, 1987, 88].
- Kodagu [T.A. Rao, 1996].
- Shimoga [Krishnaswamy, 1998].

**Kerala:** Periyar Tiger Reserve [N. Sasidharan, 1998].

**Extent of occurrence (Sq. km.):** 100-5,000

**Area of occupancy (Sq. km.):** 10-500

**Number of Subpopulations/location:** 15-3. Fragmented. There is a continuing decline in the number of locations or subpopulations. All individuals are not in one population and one subpopulations does not hold 95% or more of the total population

**Habitat status:** Decrease in the habitat predicted <20% in the next 10 years due construction of roads, tourism and human interference. Decrease in quality due to harvest of host trees.

### Threats

**Threats to taxon:** Decline in the host species (harvest for timber), habitat fragmentation, fire, reproductive problems and propagation difficulties are resulting in and may result in population decline. The influence on the population structure is well understood, are not reversible and have not ceased.

**Trade:** Not in trade

### Population

**Numbers/Generation time/Trends:** Mature individuals in all populations are >2,500. The number of mature individuals declined in the past by 10% and are likely to decline by 10% in the future. Generation time 3 years.

**Trends:** The population size/numbers of the taxon is declining at a rate of <10% in the last 10 years. Predicted decline <10% in the next 10 due to habitat loss.


### Data quality

Assessment based on field studies, and literature/herbarium studies.

### Qualifier:

The Area and Extent estimated based on known locations. The habitat status, threats, mature individuals and population trends observed over many years of field studies. Some threats are suspected.

### Status

**IUCN Red List Criteria (1994):** ENDANGERED Criteria: B1+2abcde

**IUCN Red List Criteria (2000):** ENDANGERED Criteria: B1a+b(i,ii,iii,iv,v), 2a+b(i,ii,iii,iv,v)

**CITES:** Appendix II

**National Red Data Book:** Not listed

**International RDB:** Not listed

**Known presence in Protected Areas:**
- Brahmagiri Wildlife Sanctuary
- Kuduremukh National Park
- Periyar Tiger Reserve
- Rajiv Gandhi National Park

### Uncertainty

Assessed with 95% confidence based on evidence (some precaution) and on the consensus of the field biologists at the workshop

### Recommendations

**Research:** Life history studies.

**Management:** Not recommended

**Cultivation:** Cultivated stocks available at Cauvery Nisargadhama in Kushalnagar, Kodagu. Numbers in cultivation 100. There is no coordinated species management programme for this species and one is not recommended. Initiate cultivation programme after 3 years. Some propagation techniques known for taxon or similar taxa.

### Other comments:

This species was originally proposed by Rolfe based on O’ Brier’s collections from Mysore. Collection of this species from the wild is only passive or accidental; rarely for ornamental value.

### Sources


### Compilers


### Reviewers

**Scientific name (author; date):** Bulbophyllum proudlockii (King & Pantl.) J.J. Smith, 1912

**Synonym:** Cephalopetalum proudlockii King & Pantl., 1897

**Habit:** Lithophytic and epiphytic herb

**Habitat:** Evergreen forests.

**Niche/ elevation:** Moist branches and rocks associated with mosses and Commelina species. 1200-1600m.

**Distribution**

**Historical distribution:** India

**Current Global Distribution:** ENDEMIC to Western Ghats (Karnataka & Tamil Nadu)


**Extent of occurrence (Sq. km.):** 100-5,000

**Area of occupancy (Sq. km.):** 10-500

**Number of Subpopulations/location:** <10.4. Fragmented. Continuing decline but no extreme fluctuation in the number of locations or subpopulations. All individuals not in one population and one subpopulation does not hold 95% or more of the total population.

**Habitat status:** Change in habitat unknown. Predicted decline of <20% in the next 5 years due to habitat loss. No change in the quality of habitat.

**Threats**

**Threats to taxon:** Human interference and habitat loss may result in population decline. The influence on the population not well understood, not reversible and have not ceased.

**Trade:** Not in trade

**Population**

**Numbers/Generation time/Trends:** Mature individuals in all populations <2,500. The number of mature individuals likely to decline by >20% in the future. Generation time 2 years.

**Trends:** The rate of decline of population size/numbers not known. Predicted decline >20% in the next 10 due to habitat loss.

**Recent Field Studies:** K. Sivalakalakrishnan in Naduvattom, Ellamalai, 1996, 97, ex situ conservation of orchids of Western Ghats.

**Data quality:** Assessment based on field studies and literature/herbarium studies.

**Qualifier:** Area and extent estimated based on known locations; habitat status, threats, mature individuals and population trends observed, inferred, suspected and projected.

**Status**

**IUCN RED LIST CRITERIA (1994):** ENDANGERED

**IUCN RED LIST CRITERIA (2000):** ENDANGERED

**CITES:** Appendix II

**National Red Data Book:** Not listed

**Other legislation:** Included in the Negative List of Exports (EXIM Policy), 1999.

**Uncertainty**

Assessed with 95% confidence based on precaution and some evidence, on a range of opinion and the consensus of field biologists. Assessment based on the field study at Nilgiris, with the situation extrapolated for other regions.

**Recommendations**

**Research:** Survey, genetic research, taxonomic research, PHVA pending.

**Management:** Habitat management, cultivation/breeding.

**Cultivation:** Cultivation recommended for research. Cultivated stocks not available. There is no coordinated species management programme for this species and one is not recommended. Initiate cultivation programme within 3 years. Propagation techniques not known at all.

**Other comments:** Originally proposed by King & Pantling based on specimen collected by R.L. Proudlock from Nilgiris. The causes for habitat loss have not been studied properly. The number of mature individuals was observed to be 300-500 in Nilgiris only.


**Compilers:** T.A. Rao, K.Sivalakalakrishnan, P.F. Solomons, P.S. Udayan, M.B. Viswanathan, U. Lakshminarayan

Bulbophyllum silentvalliensis Sharma & Srivatsava, 1993

Scientific name (author; date):

Habit:
Epiphytic herb

Habitat:
Evergreen forests

Habitat elevation:
Moss clad branches. 850-950 m.

Distribution

Historical distribution:
India

Current Global Distribution:
ENDANGERED to Western Ghats (Kerala)

Distribution from Literature:
Silent Valley [Rao, 1998]. Panthanathode, Sairandri [Sathish Kumar, 1999].

Distribution from Field Studies:
Keralas: Panthanathode and Sairandri in Silent Valley [C. Sathish Kumar, 1982].

Extent of occurrence (Sq. km.):
<100

Area of occupancy (Sq. km.):
<10

Number of Subpopulations/location:
2/2. Fragmented.

Habitat status:
No change in the habitat and its quality.

Threats

Threats to taxon:
Unknown

Trade:
Not in trade

Population

Numbers/Generation time/Trends:
Mature individuals in all populations <250. Generation time - perennial.

Trends:
Unknown

Recent Field Studies:

Data quality:
Assessment based on field studies and literature/herbarium studies.

Qualifier:
The Area and Extent estimated based on known locations in Silent Valley.

Status

IUCN RED LIST CRITERIA (1994):
ENDANGERED

Criteria: 
D

IUCN RED LIST CRITERIA (2000):
ENDANGERED

Criteria: 
D

CITES:
Appendix II

Indian WL. (P) Act:
Not listed

International RDB:
Not listed

National Red Data Book:
Not listed

Other legislation:
Included in the Negative List of Exports (EXIM Policy), 1999.

Known presence in Protected Areas:
Silent Valley National Park.

Uncertainty

Assessed with 95% confidence based on evidence, on the consensus of the field biologists and on subjective opinion.

Recommendations

Research:
Life history studies, PHVA pending.

Management:
Monitoring, cultivation/breeding.

Cultivation:
Cultivation recommended for research. Cultivated stocks available at TBGRI, Palode and Gurukula Botanical Sanctuary, Wayanad. Numbers in cultivation <10. There is no coordinated species management programme for this species and one is not recommended. Ongoing cultivation programme intensified or increased. Some propagation techniques known for the taxa.

Other comments:
Data on population trends and threats not available.

Sources:

Compilers:

Reviewers:
Scientific name (author; date): **Bulbophyllum tremulum** Wight, 1851

Habit: Epiphytic herb

Habitat: Moist deciduous forest

Niche/ elevation: Wet branches on trees. 1000 m.

**Distribution**

**Historical distribution:**

**Current Global Distribution:** ENDEMIC to Western Ghats (Karnataka, Kerala & Tamil Nadu)


**Distribution from Field Studies:** Karnataka: Kodagu, Hassan [T.A. Rao, 1996-98].

**Extent of occurrence (Sq. km.):** 100-5,000

**Area of occupancy (Sq. km.):** 10-500

**Number of Subpopulations/location:** 10-20<10. Fragmented. There is continuing decline in the number of locations or subpopulations. All individuals not in one population and one subpopulation does not hold 95% or more of the total population.

**Habitat status:** Decline in the habitat of the taxon. Predicted decline of <20% in the next 10 years due to vandalism and habitat loss. No change in the quality of the habitat.

**Threats**

**Threats to taxon:** Habitat loss, habitat fragmentation and human interference resulting in and may result in population decline. The influence on the population well understood, not reversible and not ceased to be threats.

**Trade:** Not in trade

**Population**

**Numbers/Generation time/Trend:** Number of mature individuals unknown. Annual herb. Decline in numbers by 10% in the past and likely to continue decline at the same rate in the future.

**Trends:** Declining by <10% in last 10 years due to habitat loss and predicted decline <10% in the next 10 years.


**Data quality**

**Qualifier:** Area and extent estimated based on known locations; habitat status and threats observed, suspected and projected.

**Status**

**IUCN RED LIST CRITERIA (1994):** ENDEANGERED

**IUCN RED LIST CRITERIA (2000):** ENDEANGERED

**CITES:** Appendix II

**National Red Data Book:** Not listed

**Other legislation:** International RDB: Not listed

**Known presence in Protected Areas:** Silent Valley National Park, Wayanad Wildlife Sanctuary

**Uncertainty**

Assessed on a range of opinion based on evidence and on the consensus of the field biologists.

**Recommendations**

**Research:** Survey

**Management:** Not recommended

**Cultivation:** Cultivated stocks not available. There is no coordinated species management programme for this species and one is not recommended. Propagation techniques not known at all.

**Other comments:** Proposed by Wight based on his collections from Nilgiris. It also occurs in Idukki, Conoor, Coimbatore, Tirunelveli. There is no need for cultivation/breeding as it is an innocuous orchid.

**Sources:**


**Compilers:** T.A. Rao, K. Sivabalakrishnan, P.S. Solomons, P.S. Udayan, M.B. Viswanathan, U. Lakshminarayan


Conservation Assessment and Management Plan Workshop Report for Endemic Orchids of the Western Ghats 2001
**Cheirostylis seidenfadeniana** Sathish & F. Rasm., 1987

**Scientific name (author; date):**
Cheirostylis seidenfadeniana Sathish & F. Rasm., 1987

**Habit:**
Terrestrial herbs

**Habitat:**
Forest Floor in deep shade

**Niche/ elevation:**
850-950m

**Distribution**

<table>
<thead>
<tr>
<th>Historical Distribution</th>
<th>Current Global Distribution</th>
<th>Distribution from Literature</th>
<th>Distribution from Field Studies</th>
<th>Extent of Occurrence (Sq. km.)</th>
<th>Area of Occupancy (Sq. km.)</th>
<th>Number of Subpopulations/locations</th>
<th>Habitat status</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENDEMIC to Western Ghats (Kerala)</td>
<td>Ponmudi; way to Agasthyamala near Attayar; Chemunji</td>
<td>Kerala: Agasthyamala</td>
<td>101-5,000</td>
<td>&lt;10</td>
<td>3/3. Fragmented. There is a continuing decline but no extreme fluctuation in the number of locations or subpopulations. All individuals not in one population and one subpopulation does not hold 95% or more of the total population. Ponmudi (Type locality) changed due to tourism activity, but Agasthyamala and Chemunji populations intact.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Threats**

<table>
<thead>
<tr>
<th>Threats to taxon:</th>
<th>Trade:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Habitat loss</td>
<td>Not in trade</td>
</tr>
</tbody>
</table>

**Population**

<table>
<thead>
<tr>
<th>Numbers/Generation time/trend:</th>
<th>Population trend:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mature individuals in all populations &lt;50. Annual.</td>
<td>Unknown.</td>
</tr>
</tbody>
</table>

**Recent Field Studies:**


**Data quality:**

| General field studies, informal sightings, indirect information |

**Qualifier:**

| Area and Extent estimated and habitat status observed. Population estimated based on field studies. |

**IUCN Red List Criteria (1994):**

<table>
<thead>
<tr>
<th>CRITICALLY ENDANGERED</th>
</tr>
</thead>
</table>

**IUCN Red List Criteria (2000):**

<table>
<thead>
<tr>
<th>CRITICALLY ENDANGERED</th>
</tr>
</thead>
</table>

**CITES:**

<table>
<thead>
<tr>
<th>Appendix II</th>
</tr>
</thead>
</table>

**National Red Data Book:**

<table>
<thead>
<tr>
<th>Not listed</th>
</tr>
</thead>
</table>

**Other legislation:**

<table>
<thead>
<tr>
<th>Included in the Negative List of Exports (EXIM Policy), 1999.</th>
</tr>
</thead>
</table>

**Known presence in Protected Areas:**

<table>
<thead>
<tr>
<th>Neyyar Wildlife Sanctuary</th>
</tr>
</thead>
</table>

**Uncertainty**

95% confidence but the assessment is exclusive to the below listed compilers and reviewers.

**Recommendations**

**Research:**

Life History studies, PHVA

**Management:**

Monitoring

**Cultivation:**

Cultivated stocks exist in TBGRI. There is no coordinated species management programme for this species and one is recommended within 3 years. Propagation techniques not known at all.

**Other comments:**

Described based on a collection made by Sathish Kumar from Ponmudi in 1983. It is closely related to C. parvifolia Lindl. and C. thailandica Seidenf. Under cultivation, this species frequently produces flowers and fruits and seedlings naturally come up among other orchids.

**Sources:**

Sathish Kumar & Rasmussen, 1987: 409

**Compilers:**

C. Sathish Kumar

**Reviewers:**

B.V. Shetty, B. Arthur, S. Molur
**Scientific name (author; date):**

Chiloschista glandulosa Blatter & McCann, 1932

**Habit:**

Epiphytic herbs.

**Habitat:**

Evergreen forests

**Nichol/ elevation:**

Riverine. 900-1200m.

**Distribution**

**Historical Distribution:**

India

**Current Global Distribution:**

ENDEMIC to Western Ghats (Karnataka, Kerala & Tamil Nadu)

**Distribution from Literature:**


**Distribution from Field Studies:**


**Extent of Occurrence (Sq. km.):**

>20,000

**Area of Occupancy (Sq. km.):**

11,500

**Number of Subpopulations/location:**

5-5. Fragmented. There is a continuing decline but no extreme fluctuation in the number of locations or subpopulations. All individuals not in one population and one subpopulation does not hold 95% or more of the total population.

**Habitat status:**

Decrease in quality of habitat. Decline in area.

**Threats**

**Threats to taxon:**

Human interference, tourism, developmental activities

**Trade:**

Not in trade

**Population**

**Numbers/Generation time/trend:**

Unknown

**Population trend:**

Declining

**Recent Field Studies:**


**Data quality:**

Field studies, informal sightings, literature/herbarium studies

**Qualifier:**

Area and Extent estimated and habitat status observed. Population estimated based on observation.

**Status**

**IUCN Red List Criteria (1994):**

ENDANGERED

**Criteria:**

B1+2bcd

**IUCN Red List Criteria (2000):**

ENDANGERED

**Criteria:**

B2a+b(iii,iii,iv)

**CITES:**

Appendix II

Indian WL. (P) Act: Not listed

National Red Data Book:

Not listed

International RDB:

Not listed

**Other legislation:**

Included in the Negative List of Exports (EXIM Policy), 1999.

**Known presence in Protected Areas:**

Neyyar Wildlife Sanctuary

**Uncertainty**

Assessment based on precaution due to changes expected in habitat. Assessment is exclusive to the below listed compilers and reviewer.

**Recommendations**

**Research:**

Survey

**Management:**

Monitoring

**Cultivation:**

No cultivated stocks available. No recommendations made at the workshop.

**Other comments:**

Proposed by Blatter & McCann based on Miss. T.R. Bell’s manuscript notes and specimens from Karwar, Dandulli and Yellapur in North Kanara. Rediscovered from Muthukuzhivayal in Tamil Nadu and Ponmudi in Kerala [Sathish Kumar, 1991]. Epiphytic on Veronia travancorica in Athirumala [C. Sathish Kumar]. Very difficult to locate. It has a bunch of roots with central stem, no leaves. Roots are green and perform the function of leaves. Species found on branches hanging over the river or water bodies. Ponmudi population critical. Difficult to locate this species in Athirumala since the riverine trees of Veronia travancorica were cut to construct a dormitory for rafters.

**Sources:**


**Compilers:**

C. Sathish Kumar

**Reviewers:**

B.V. Shetty, B. Arthur, S. Molur
Coelogyne glandulosa Lindley var. bournei S.J. Das & Jain, 1978

Habit: Epiphyte or lithophyte
Habitat: Evergreen and deciduous forests.
Niche/ elevation: Moss clad side branches and exposed rocks. 500-1500 m.

Distribution
Historical distribution:
Current Global Distribution:
Distribution from Field Studies: None
Extent of occurrence (Sq. km.): <100
Area of occupancy (Sq. km.): <10
Number of Subpopulations/ location: 2/2. Fragmented.
Habitat status: Decrease in the habitat >50% in the last 20 years. >50% predicted decline in the next 10 years due to coffee plantations. There is decrease in the quality of habitat.

Threats
Threats to taxon: Habitat loss
Trade: Not in trade.

Population
Numbers/Generation time/Trend Unknown
Trends: Unknown

Recent Field Studies: None

Data quality: Assessment based on literature/herbarium studies.
Qualifier: The Area and Extent inferred from literature.

Status
IUCN RED LIST CRITERIA (1994): CRITICALLY ENDANGERED
Criteria: B1+2c
IUCN RED LIST CRITERIA (2000): CRITICALLY ENDANGERED
Criteria: B1a+b(iii), 2a+b(iii)

CITES: Appendix II
Indian WL. (P) Act: Not listed
International RDB: Not listed
Included in the Negative List of Exports (EXIM Policy), 1999.

National Red Data Book: Not listed
Other legislation: Included in the Negative List of Exports (EXIM Policy), 1999.

Known presence in Protected Areas: None.

Uncertainty
Assessed with 95% confidence based on evidence and on the consensus of the field biologists.

Recommendations
Research: Survey, taxonomic research, genetic studies
Management: Monitoring
Cultivation: Cultivated stocks not available. There is no coordinated species management programme for this species and one is recommended to be initiated within 3 years. Propagation techniques not known at all.

Other comments: This variety was proposed by Das and Jain based on a collection made by A.G. Bourne from Poombari, Palni Hills. Record of its occurrence elsewhere (e.g. Nilgiris – Mohanan & Balakrishnan, 1991) is erroneous.

Sources:


Scientific name (author; date):
Coelogyne glandulosa Lindley var. glandulosa 1854

Habitat:
Terrestrial and lithophytic herb

Habitat:
Evergreen and deciduous forests

Niches/ elevation:
Moist areas near river and streams. 2200 m.

Distribution:
Historical distribution:

Current Global Distribution:
ENDEMIC to Western Ghats (Tamil Nadu)

Distribution from Literature:

Distribution from Field Studies:

Extent of occurrence (Sq. km.):
100-5,000 sq.km.

Area of occupancy (Sq. km.):
100-500 sq.km.

Number of Subpopulations/location:
4/10. Fragmented. There is continuing decline in the number of locations or subpopulations. All individuals are not in one population and one subpopulation does not hold 95% or more of the total population.

Habitat status:
There is no decrease in the habitat but landslides and fire are causes of decline in quality of habitat.

Threats:
Threats to taxon:
Fire, landslide and habitat loss (in the past) resulting and may result in future population decline. The factor influencing the status of the taxon well understood, not reversible and have not ceased.

Trade:
Not in trade

Population:
Numbers/Generation time/Trend:
Numbers unknown, there has been no change in the numbers of mature individuals and are not likely to decline in the future. Generation time 1 year.

Trends:
Population size stable and there may be decline in the future if threats continue.

Recent Field Studies:

Data quality:
Assessed based on field studies and informal sightings of the population in Mukurthi National Park.

Qualifier:
Extent and Area estimated; habitat status and threats observed.

Status:
IUCN RED LIST CRITERIA (1994):
ENDANGERED Criteria: B1+2cd

IUCN RED LIST CRITERIA (2000):
ENDANGERED Criteria: B1a+b(iii,iv), 2a+b(iii,iv)

CITES:
Appendix II

Indian WL. (P) Act: Not listed

International RDB: Not listed

Included in the Negative List of Exports (EXIM Policy), 1999.

National Red Data Book:
Not listed

Other legislation:
Included in the Negative List of Exports (EXIM Policy), 1999.

Known presence in Protected Areas:
Mukurthi National Park

Uncertainty:
Assessed with 95% confidence based on evidence and on the consensus of the field biologists

Recommendations:
Research:
Genetic research

Management:
Monitoring, Cultivation/breeding

Cultivation:
Commercial/sustainability. Cultivated stocks not available. There is no coordinated species management programme for this species and one is recommended after 3 years. Propagation techniques not known at all.

Other comments:
Described by Lindley based on Wight's collection from south India (without precise locality). Record of its occurrence outside Palnis is doubted (C. Sathish Kumar pers. comm.). It was reported in Pykara earlier. The population in Mukurthi National Park is a protected area there is no change in the habitat and hopefully the species will increase, but landslides and fire can be a threat in this area. Barring the human-induced calamities, the population has a good chance of increasing considerably. The propagation programme will be taken up by the wildlife wing of the Tamil Nadu Forest Department and reintroduced in the wild in suitable areas.

Sources:

Compilers:

Reviewers:
Scientific name (author; date): **Coelogyne glandulosa** Lindley var. **sathyarayanae** S.J. Das & Jain, 1978

**Coelogyne mossiae** Rolfe, 1894

Synonym: None

Habit: Epiphyte

Habitat: Moist deciduous, evergreen and shola forests.

Niche/ elevation: 1000-2000 m.

**Distribution**

**Historical distribution:**

**Current Global Distribution:** ENDEMIC to Western Ghats (Tamil Nadu)

**Distribution from Literature:** Madurai [Henry et al., 1989]. Palni hills, Kodaikanal [Seidenfaden, 1999].

**Distribution from Field Studies:** None

**Extent of occurrence (Sq. km.):** <100

**Area of occupancy (Sq. km.):** <10

**Number of Subpopulations/location:** 1/1.

**Habitat status:**

Decrease in the habitat >20% in the last 10 years. Predicted decline >20% in the next 10 years and decrease in the quality due to plantations of guava and pomegranate.

**Threats**

**Threats to taxon:** Habitat loss is resulting in and may result in future population decline. The influence on the population is well understood, not reversible and not ceased to be a threat.

**Trade:** Not in trade.

**Population**

Numbers/Generation time/Trend: Unknown

Trends: Unknown

**Recent Field Studies:** None.

**Data quality:** Assessed based on literature/herbarium studies only.

**Qualifier:** Area and extent estimated based on published locations; habitat status known from ecological studies and from developmental activities of the area.

**Status**

**IUCN RED LIST CRITERIA (1994):** CRITICALLY ENDANGERED

**Criteria:** B1a+b(iii), 2a+b(iii)

**IUCN RED LIST CRITERIA (2000):** CRITICALLY ENDANGERED

**Criteria:** B1a+b(iii), 2a+b(iii)

**CITES:** Appendix II

**Indian WL. (P) Act:** Not listed

**International RDB:** Not listed

**Other legislation:** Included in the Negative List of Exports (EXIM Policy), 1999. None

**Known presence in Protected Areas:** None

**Uncertainty**

Assessed based on a range of opinion, precaution and on the consensus of the field biologists.

**Recommendations**

**Research:** Survey

**Management:** Monitoring, Cultivation

**Cultivation:** Conservation

**Other comments:** Proposed by Das and Jain based on a lone collection made by Saldanha in 1965 from Kodaikanal. And it was not subsequently recollected from anywhere.

**Sources:** Das & Jain, 1978: 195; Henry et al., 1989: 7; Seidenfaden, 1999: 1235.


**Scientific name (author; date):**

Coelogyne mossiae Rolfe, 1894

**Habit:**

Epiphyte and lithophyte.

**Habitat:**

Evergreen and shola forests, and grasslands

**Niche/ elevation:**

Associated with mosses on rocky slopes. 1600-2500 m.

**Distribution**

**Historical distribution:**

India

**Current Global Distribution:**

ENDEMIC to Western Ghats (Tamil Nadu & Kerala)

**Distribution from Literature:**


**Distribution from Field Studies:**


**Extent of occurrence (Sq. km.):**

100-5,000

**Area of occupancy (Sq. km.):**

10-500

**Number of Subpopulations/location:**

>10/6. Fragmented. No continuing decline or extreme fluctuation in the number of locations or subpopulations. All individuals not in one population and one subpopulation does not hold 95% or more of the total population

**Habitat status:**

There is no change in the habitat of the taxon. Predicted decline of <20% in the next 10 years due to tea plantations, overexploitation for ornamental cultivation [M. Mohanan]. There is change in the quality of the habitat.

**Threats**

**Threats to taxon:**

Edaphic changes, harvest for medicine, habitat loss, habitat loss due to exotic plants, trade for market or medicine and landslides are resulting in and may result in population decline. The influence on the population well understood, not reversible and not ceased to be a threat.

**Trade:**

Not in trade.

**Population**

**Numbers/Generation time/Trend**

Mature individuals in all populations <2,500. The number of mature individuals declined in the past by >20% and likely to decline by <20% in the future. Generation time 3 years.

**Trends:**

The population size/numbers of the taxon declining at a rate of >20% in the last 10 years. Predicted decline <10% in the next 10 due to habitat loss.

**Recent Field Studies:**


**Data quality:**

Assessment based on field studies and literature/herbarium studies.

**Qualifier:**

The Area and Extent estimated based on the known locations. The habitat status, threats, mature individuals and population trends observed and projected.

**Status**

**IUCN RED LIST CRITERIA (1994):**

**ENDANGERED**

Criteria: B1+2abce

**IUCN RED LIST CRITERIA (2000):**

**ENDANGERED**

Criteria: B1a+b(i,ii,iii,v), 2a+b(i,ii,iii,v)

**CITES:**

Appendix II

**National Red Data Book:**

Not listed

**Other legislation:**

Vulnerable [Nayar & Sastry, 1988]

**Known presence in Protected Areas:**

Mukurthi National Park

**Uncertainty:**

Assessed with 95% confidence based on evidence, some precaution and on the consensus of the field biologists.

**Recommendations**

**Research:**

Life history studies, genetic research, PHVA.

**Management:**

Cultivation/breeding

**Cultivation:**

Cultivation recommended for research. Cultivated stocks available at the National Orchidarium, Yercaud. There is no coordinated species management programme for this species and one is not recommended. Initiate cultivation programme within 3 years. Information on propagation techniques not available.

**Other comments:**

Proposed by Lindley based on a collection by Mr. Moss from Nilgiris. Monoculture plantations in Nilgiris should be prevented to retain the present habitat of the species. This species is collected by locals for medicinal purpose. The bulbs are used to treat burn wounds by Kurumbas. Flowers are double the size of Fyson's (1974) observations.

**Sources:**

Scientific name (author, date): Coelogyne nervosa A. Rich., 1841

Synonym: Coelogyne corrugata Wight, 1851

Habit: Lithophyte or epiphyte

Niche/ elevation: Montane grasslands

1000-2500m

Distribution

Historical distribution: ENDEMIC to Western Ghats (Karnataka, Kerala & Tamil Nadu)


Extent of occurrence (Sq. km.): 5,001-20,000

Area of occupancy (Sq. km.): 10-500

Number of Subpopulations/location: >100>10. Fragmented. There is continuing decline in the number of locations or subpopulations. All individuals are not in one population and one subpopulation does not hold 95% or more of the total population.

Habitat status: Decrease in the habitat <20% in the last 10 years. Predicted decline <20% in the next 10 years due to loss of habitat and plantations. There is decrease in the quality of habitat.

Threats

Threats to taxon: Habitat loss, fragmentation, grazing, fire, drought and demographic instability resulting in and may result in population decline. The influence of threats on the population well understood, not reversible and have not ceased to be a threat.

Population

Numbers/Generation time/Trend: Mature individuals in all populations >2,500. Continuing decline in mature individuals and predicted decline. Generation time 3 years.

Trends: The population size/numbers of the taxon declining at a rate of >20% in the last 10 years. Predicted decline >20% in the next 10 years due to habitat loss. The threats influencing the population structure well understood, not reversible and not ceased to be a threat.

Recent Field Studies:


Data quality:

Assessment based on field studies, and literature/herbarium studies.

Qualifier:
The Area and Extent estimated based on known locations. The habitat status, threats, mature individuals and population trends observed over many years of field studies and also inferred from a range of opinion.

Status

IUCN RED LIST CRITERIA (1994): ENDANGERED

IUCN RED LIST CRITERIA (2000): ENDANGERED

CITES: Appendix II

National Red Data Book: Not listed

Other legislation: Included in the Negative List of Exports (EXIM Policy), 1999.

Known presence in Protected Areas: Eravikulam National Park, Kalakad-Mundanthurai Tiger Reserve, Mukurthi National Park, Neyyar Wildlife Sanctuary, Silent Valley National Park

Uncertainty:

Assessed with 95% confidence based on evidence, range of opinion and on the consensus of the field biologists.

Recommendations

Research: Genetic research, life history studies, PHVA pending.

Management: Cultivation/breeding

Cultivation: Cultivation recommended for research. Cultivated stocks available at home gardens in Ooty. Numbers in cultivation 25. There is no coordinated species management programme for this species and one is
not recommended. Initiate cultivation programme within 3 years. Some propagation techniques known for similar taxa.

**Other comments:**

It was proposed by A. Richard based on Perrottet's collection from Nilgiris. Flowers have mild fragrance and are attractive. Selective felling of trees, shade lopping are the main threats in High Wavy Mountains [K. Ravikumar, pers. comm.].

**Sources:**


**Compilers:**


**Reviewers:**

**Scientific name (author; date):** *Dendrobium barbatulum* Lindley, 1830

**Habit:** Epiphytic or lithophytic herbs

**Habitat:** Moist and dry deciduous, moist evergreen forests.

**Distribution**

**Historical distribution:**

**Current Global Distribution:** ENDEMIC to Western Ghats (Gujarat, Maharashtra, Goa, Karnataka & Tamil Nadu)

**Distribution from Literature:**

- Kodagu, Uttara Kannada, Maharashtra, Gujarat, Silent Valley [Rao, 1998].
- Gujarat to Konkan to [Nayar, 1996].
- Coimbatore, Kanyakumari, Nilgiris [Henry et al., 1989].
- Goa, Coem Ghat area [Rao, 1986].
- Chickamagalur, Hassan, Mysores, Uttara Kannada, Shimoga [ Sharma et al., 1984].
- Mukkali Forest, Valiyaparamthode [Vajravelu, 1993].
- Konkan, Kodagu [Hooker, 1886-1890].
- Anakad, Mercara, Talacauvery [Keshamurthy & Yoganarasimhan, 1996].
- Karishshola [Sharma & et al., 1977].
- Sairandhri, Poonchrapara, Avvanapara [Sathsh Kumar, 1999].

**Distribution from Field Studies:**

- Rottikadai, Valparai in Anamalai Hills [A. Durai].

**Extent of occurrence (Sq. km.):** 5,001-20,000

**Area of occupancy (Sq. km.):** 501-2,000

**Number of Subpopulations/Location:** 32/11. Fragmented. There is continuing decline in the number of locations or subpopulations. All individuals not in one population and one subpopulation does not hold 95% or more of the total population.

**Habitat status:** Decrease in the habitat <20% in the last 10 years. Predicted decline <20% in the next 10 years due to loss of habitat and vandalism. Decrease in the quality of habitat in certain locations.

**Threats**

**Threats to taxon:** Hybridization, human interference, climate, harvest, habitat loss and pollution resulting in and may result in population decline. The influence on the population well understood, not reversible and not ceased.

**Trade:** Not in trade.

**Population**

**Number/Generation time/Trade:** Mature individuals in all populations >2,500. The numbers of mature individuals declined in the past by 10% and likely to decline by 10% in the future. Generation time - annual / perennial.

**Trends:** The population size/numbers of the taxon declining at a rate of >10% in the last 10 years. Predicted decline >20% in the next 10 years due to habitat loss.


**Data quality:** Assessment based on field studies and literature/herbarium.

**Qualifier:** The Area and Extent estimated based on known locations. The habitat status, threats, mature individuals and population trends observed over many years of field studies and census/monitoring and projected.

**Status**

**IUCN RED LIST CRITERIA (1994):** VULNERABLE

**CITES:** Appendix II

**National Red Data Book:** Not listed

**Other legislation:** Included in the Negative List of Exports (EXIM Policy), 1999.

**Known presence in Protected Areas:** Bramhagiri National Park, Kudremukh National Park, Silent Valley National Park, Talakaveri Wildlife Sanctuary, Bhimashankar Wildlife Sanctuary, Radhanagari Wildlife Sanctuary, Koyana Wildlife Sanctuary

**Uncertainty**

Assessed with 95% confidence based on evidence and precaution (prediction), with a range of opinion and on the consensus of field biologists.

**Recommendations**

**Research:** Survey, genetic research, life history studies and PHVA.

**Management:** Habitat management, monitoring, cultivation/breeding, genome resource banking.

**Cultivation:** Cultivation recommended for research. Cultivated stocks available at local green house; Numbers in cultivation 5. There is no coordinated species management programme for this species and one is not recommended. Initiate cultivation programme within 3 years. Some propagation techniques known for similar taxa.

**Other comments:** Proposed by Lindley based on Heyne's collection from India (without precise locality). Its distribution in Silent Valley, Kerala (Manilal, 1988) is erroneously reported.
Sources:


Compilers:


Reviewers:

Scientific name (author; date): **Dendrobium diodon** Reichb. f. ssp. **kodayarenosis** Gopalan & A.N. Henry, 1988

Habit: Epiphyte or lithophytic herbs
Habitat: Evergreen forests
Niche/elevation: 1000-1200 m.

**Distribution**

Historical distribution: India
Current Global Distribution: ENDEMIC to Western Ghats (Kerala & Tamil Nadu)
Distribution from Literature: Muthukuzhivayal [Nayar, 1996]
Distribution from Field Studies: Tamil Nadu, Muthukuzhivayal in Kanyakumari District [R. Gopalan, 1982]. Agastyamala [C. Sathish Kumar, 1993 onwards]

Extent of occurrence (Sq. km.): <100 sq. km.
Area of occupancy (Sq. km.): <10 sq.km.
Number of Subpopulations/location: 1/1. All individuals are in one population.
Habitat status: There is decline in habitat but trends not known. Predicted decline <20% in the next 10 years due to habitat destruction. There is change in the quality of habitat due to decline in host species.

**Threats**

Threats to taxon: Decline of host species, edaphic changes, habitat loss and habitat fragmentation resulting in and may result in population decline. The influence on the population well understood, not reversible and not ceased to be a threat.

Trade: Not in trade

**Population**

Numbers/Generation time/Trends: Mature individuals in all populations <250. The numbers of mature individuals declined in the past by 5% and likely to decline by 5% in the future. Generation time 2 years.

Trends: The population size/numbers of the taxon declining at a rate of <10% in the last 10 years. Predicted decline <10% in the next 10 years due to habitat loss.

Recent Field Studies: C. Sathish Kumar in Agastyamala, 1993 onwards.

**Data quality:** Assessed based on indirect information based on habitat and quality, and from literature/herbarium studies. The Area and Extent estimated based on the known location. The habitat status and threats to the habitat observed over years. Mature individuals and population trends inferred and estimated based on habitat information.

**Status**

IUCN RED LIST CRITERIA (1994): CRITICALLY ENDANGERED
IUCN RED LIST CRITERIA (2000): CRITICALLY ENDANGERED
CITES: Appendix II
National Red Data Book: Not listed
Other legislation: Included in the Negative List of Exports (EXIM Policy), 1999.

**Uncertainty**

Assessed on consensus with 95% confidence.

**Recommendations**

Research: Survey, life history studies, PHVA.
Management: Habitat management
Cultivation: Cultivated stocks not available. There is no coordinated species management programme for this species and one is recommended. Initiate cultivation programme within 3 years. Propagation techniques not known at all.

**Other comments:** It is a newly described subspecies. The subspecies is found in the protected area. Further survey is recommended for this taxon.


**Scientific name (author; date):** Dendrobium heyneanum Lindley, 1830

**Habit:** Epiphyte

**Habitat:** Wet evergreen forest

**Nichel/ elevation:** On branches of trees bordering the grasslands. 200-1600 m.

**Distribution**
- **Historical distribution:**
- **Current Global Distribution:** India
  - ENDEMIC to Western Ghat (Karnataka, Kerala & Tamil Nadu)

**Distribution from Literature:**
- Nilgiris, Courtallum, Pondnuni, Bonaccord, Muthukuzhvayal, Kathayae and Chengaltheri on the way to Naterikal [Abraham & Vatsala, 1981].
- Hassan, Shimoga [Sharma et al., 1984].
- Silent Valley – Valiyaparthothe [Manilal, 1988].
- Mysore, Coimbatore, Nilgiri, Tirunelveli [Henry et al., 1999].
- Kannur – on the way to Chandananathode, Thirunali [Ramachandran & Nair, 1998].
- Silent Valley [Vajravelu, 1990].
- Ghats of Malabar [Hooker, 1886-1890].
- Pushpagiri [Keshavamurthy & Yoganarasimhan, 1990].
- Sairandhri [Manoharan, 1999].
- Nilgiris [Sharma, 1977].
- Thadiandamol [Rao, 1998].
- Coorg, Hassan, Cannore, Idukki, Palghat, Trivandrum, Coimbatore, Kanniyakumari, Nilgiri, Tirunelveli [Rathakrishnan & Chitra, 1984].
- Valiyaparthothe, Sairandhri [Sathish Kumar, 1999].

**Distribution from Field Studies:**
- Karnataka: Kodagu [Keshavamurthy].
- Kerala: Silent Valley [Sathish Kumar 1982-1988].
- Tamil Nadu: Naduvattom, Nilgiris, Cherampdi [K. Sivabalakrishnan, 1995-98].

**Extent of occurrence (Sq. km.):** 5,001-20,000
**Area of occupancy (Sq. km.):** 10-500
**Number of Subpopulations/location:** 305. Fragmented. All individuals not in one population and one subpopulation does not hold 95% or more of the total population.

**Habitat status:**
- Decrease in the habitat <20% in the last 4 years. Predicted decline >20% in the next 10 years due to loss of habitat and felling of trees. There is decrease in the quality of habitat.

**Threats**
- Threats to taxon: Decline of host species, habitat loss and habitat loss due to exotic plants resulting in and may result in population decline. The influence on the population structure well understood, not reversible and not ceased to be threats.

**Trade:** Not in trade

**Population**
- **Numbers/Generation time/Trend:** The number of mature individuals have declined in the past by 10% and are likely to decline by >20% in the future. Generation time 1 year.
- **Trends:** Continuing decline observed in areas other than Kodagu and Kalakad-Mundanthurai Tiger Reserve, where the population is increasing.

**Recent Field Studies:**

**Data quality:**
- Assessed based on field studies, informal sightings and literature/herbarium studies. The Area and Extent estimated based on known locations. The habitat status, threats, mature individuals and population trends observed over many years of field studies and census/monitoring.

**Qualifier:**
- The Area and Extent estimated based on known locations. The habitat status, threats, mature individuals and population trends observed over many years of field studies and census/monitoring.

**Status**
- **IUCN RED LIST CRITERIA (1994):** ENDEANGERED
- **Criteria:** B1+2ce
- **CITES:** Appendix II Indian WL. (P) Act: Not listed
- **National Red Data Book:** Not listed International RDB: Not listed
- **Other legislation:** Included in the Negative List of Exports (EXIM Policy), 1999.
- **Known presence in Protected Areas:** Kalakad-Mundanthurai Tiger Reserve, Pushpagiri Wildlife Sanctuary, Silent Valley National Park

**Uncertainty**
- Assessed with 95% confidence based on evidence and on the consensus of the field biologists.

**Recommendations**
- **Research:** Genetic research, life history studies, PHVA.
- **Management:** Habitat management, monitoring, cultivation/breeding.
- **Cultivation:**
  - Proposed by Lindley based on Heyne's collection from India (without precise locality). No change in the habitat in Kalakad-Mundanthurai Tiger Reserve as it is a protected area. Population numbers are increasing and no future decline is predicted in KMTR [M.B. Vishwanathan]. In Nilgiris, since the host trees are in the private estates, they can be felled anytime [K. Sivabalakrishnan]. Decline in individuals in Nilgiris not known [K. Sivabalakrishnan]. Population numbers are increasing in Kodagu [T.A. Rao].

**Sources:**


Scientific name (author; date): **Dendrobium jerdonianum** Wight, 1851

**Dendrobium villosum** Lindley, 1852 non Wallich, 1830.

**Dendrobium mutantiflorum** Hook. f., 1900

**Habit:**

Epiphytic herb

**Habitat:**

Evergreen forests

**Niches/ elevation:**

1300-1400m

**Distribution**

**Historical Distribution:**

India

**Current Global Distribution:**

ENDEMIC to Western Ghats (Karnataka & Kerala)

**Distribution from Literature:**

Kodagu, Hassan [Rao, 1998]. Tellicherry [Hooker, 1900]

Kerala: Pakshipatalum, Wayanad [Sathish Kumar]

**Extent of Occurrence (Sq. km.):**

101-5,000

**Area of Occupancy (Sq. km.):**

11-500

**Number of Subpopulations/Location:**

55. Fragmented. There is a predicted decline but no extreme fluctuation in the number of locations or subpopulations. All individuals not in one population and one subpopulation does not hold 95% or more of the total population.

**Habitat status:**

Declining and predicted to decline in its area of occupancy due to human interference and development. Decline in quality of habitat.

**Threats**

**Threats to taxon:**

Habitat loss, human interference.

**Trade:**

Currently not in trade; plants were exported to England in 1890s.

**Population**

**Numbers/Generation time/trend:**

Mature individuals <500 in all populations. Perennial epiphytes

**Population trend:**

Decline predicted in the near future.

**Recent Field Studies:**

C. Sathish Kumar, T.A. Rao, 1990s in Pakshipatalum, Wayanad; T.A. Rao, 1990s in Kodagu, Karnataka

**Data quality:**

General field studies, literature/herbarium studies

**Qualifier:**

Area and Extent estimated and habitat status observed. Population estimated based on observation.

**Status**

**IUCN Red List Criteria (1994):**

**ENDANGERED**

**Criteria:**

B1+2bcd

**IUCN Red List Criteria (2000):**

**ENDANGERED**

**Criteria:**

B1a+b(iii,iv), B2a+b(ii,iii,iv)

**CITES:**

Appendix II

**Indian WL. (P) Act:**

Not listed

**International RDB:**

Not listed

**National Red Data Book:**

Not listed

**Other legislation:**

Included in the Negative List of Exports (EXIM Policy), 1999.

**Known presence in Protected Areas:**

None

**Uncertainty**

Assessment based on precaution due to changes expected in habitat. Assessment is exclusive to the below listed compilers and reviewers.

**Recommendations**

**Research:**

Detailed Survey and pollination biology studies recommended

**Management:**

Monitoring

**Cultivation:**

Cultivated stocks exist at Gurukula Botanical Sanctuary, Wayanad. There is no coordinated species management programme for this species and one is recommended. Initiate cultivation programme within 3 years. Some propagation techniques known for taxon or similar taxa.

**Other comments:**

Proposed by Wight based on Jerdon's collection from Coorg. This was mixed up with *D. mutantiflorum* from Iyamally hills in Tamil Nadu. Reichenbach f. united the two species, while Hook. f. reinstated *D. jerdonianum*

**Sources:**

Hooker, 1900: t.7741; Rao, 1988: 198; Wight, 1851; Lindley, 1852

**Compilers:**

C. Sathish Kumar

**Reviewers:**

B.V. Shetty, B. Arthur, S. Molur
Scientific name (author; date): *Dendrobium ovatum* (L.) Kranzlin, 1910

Synonyms: *Epidendrum ovatum* L., 1753; *Dendrobium chlorops* Lindley, 1890; *Dendrobium barbatulum* Wight, 1851 non Lindley, 1830; *Cymbidium ovatum* Willd., 1805

Habit: Epiphyte

Habitat: Deciduous forest

Nichel/ elevation: Fissured barks of mid elevation trees. 300-1200 m.

**Distribution**

**Historical distribution:** India

**Current Global Distribution:** ENDEMIC to Western Ghats (Nagarhaveli, Goa, Karnataka & Kerala)


**Extent of occurrence (Sq. km.):** >20,000

**Area of occupancy (Sq. km.):** 501-2,000

**Number of Subpopulations/location:** 50/25. Fragmented. There is continuing decline but no extreme fluctuation in the number of locations or subpopulations. All individuals not in one population and one subpopulation does not hold 95% or more of the total population.

**Habitat status:** Decrease in the habitat <20% in the last 10 years. Predicted decline <20% in the next 10 years due to loss of habitat and demographic instability. Decrease in the quality of the habitat due to harvest.

**Threats**

**Threats to taxon:** Harvest, habitat loss and trade of parts are resulting in and may result in population decline. The influence of threats on the population structure well understood, not reversible and not ceased.

**Trade:** Local, domestic and ornamental trade of flowers. Scientific collections and trade resulting in a perceived or inferred population decline.

**Population**

**Numbers/Generation time/Trends:** Mature individuals in all populations >2,500. The numbers of mature individuals declined in the past by 20% and likely to decline by 20% in the future. Generation time 5-6 years.

**Trends:** The population size/numbers of the taxon declining at a rate of <10% in the last 10 years. Predicted decline <10% in the next 10 due to habitat loss.


**Data quality:** Assessed based on field studies, indirect information, informal sightings and literature/herbarium studies.

**Qualifier:** Area and extent estimated based on known locations; habitat status, threats, mature individuals and population trends observed or inferred and predicted based on the threats.

**Status**

**IUCN RED LIST CRITERIA (1994):** VULNERABLE

**IUCN RED LIST CRITERIA (2000):** VULNERABLE

**CITES:** Appendix II

**National Red Data Book:** Not listed

**Other legislation:** Included in the Negative List of Exports (EXIM Policy), 1999.

**Known presence in Protected Areas:** Silent Valley National Park, Mollem Wildlife Sanctuary, Talakaveri Wildlife Sanctuary

**Uncertainty**

Assessed with 95% confidence based on evidence, precaution, range of opinion and on the consensus of the field biologists.

**Recommendations**

**Research:** Survey, genetic research, life history studies, PHVA.

**Management:** Habitat management, cultivation

**Cultivation:** Cultivation recommended for research. Cultivated stocks available at Cauvery Nisargadhama orchidarium. There is no coordinated species management programme for this species and one is not recommended. Ongoing cultivation programme intensified or increased. Some propagation techniques known for similar taxa.

**Other comments:** Originally described by Linnaeus based on Rheed's plate in *Hortus malabaricus*. The flowers are conspicuous and are found in clusters of about 75 flowers. This species is more susceptible to overexploitation as they last longer [one and a half months] and remain fresh. The decline in the population may be due to its scented, long lasting flowers. Medicinal properties of this species is well known [P.S. Udayan].

**Sources:** Vajravelu, 1990: 474; Kranzlin, 1910: 71; Lindley, 1753; Wight, 1851; Lakshminarasimhan, 1996: 24; Rao, 1986: 418; Keshavmurthy & Yoganarasimhan, 1990: 443; Willdenow, 1805
**Scientific name (author; date):**
Diplocentrum congestum Wight, 1851

**Habit:**
Epiphytic herbs

**Habitat:**
Evergreen forests

**Niche/elevation:**
750-1100m

**Distribution**

**Historical Distribution:**

**Current Global Distribution:**
ENDEMIC to Western Ghats (Karnataka & Kerala)

**Distribution from Literature:**
Iyamally [Wight, 1851]
Kodagu [T.A. Rao, 1999]. Hassan [Saldanha]
Kerala: Kondayangadi, Wayanad [C. Sathish Kumar, 1998]

**Extent of Occurrence (Sq. km.):**
101-5,000

**Area of Occupancy (Sq. km.):**
11-500

**Number of Subpopulations/location:**
5/5. Fragmented. There is a predicted decline but no extreme fluctuation in the number of locations or subpopulations. All individuals not in one population and one subpopulation does not hold 95% or more of the total population.

**Habitat status:**
Decrease of habitat quality and predicted decline in habitat.

**Threats**
Threats to taxon: Habitat loss, human interference
Trade: Not in trade

**Population**

**Numbers/Generation time/trend:**
Mature individuals <500.

**Population trend:**
Unknown

**Recent Field Studies:**

**Data quality:**
General field studies, literature/herbarium studies

**Qualifier:**
Area and Extent estimated and habitat status observed. Population estimated based on observation.

**Status**

**IUCN Red List Criteria (1994):**
ENDEANGERED
**Criteria:**
B1+2bcd

**IUCN Red List Criteria (2000):**
ENDEANGERED
**Criteria:**
B1a+b(ii,iii,iv), B2a+b(ii,iii,iv)

**CITES:**
Appendix II

**National Red Data Book:**
Not listed

**Other legislation:**
Included in the Negative List of Exports (EXIM Policy), 1999.

**Known presence in Protected Areas:**
None

**Uncertainty**
Assessment based on precaution due to changes expected in habitat. Assessment is exclusive to the below listed compilers and reviewers.

**Recommendations**
**Research:**
Detailed reproductive biology study, survey

**Management:**
Monitoring

**Cultivation:**
Cultivated stocks exist at Gurukula Botanical Sanctuary, Wayanad. There is no coordinated species management programme for this species and one is not recommended. Ongoing cultivation programme intensified or increased. Some propagation techniques known for similar taxa.

**Other comments:**
Described by Wight based on his collection from Iyamally

**Sources:**

**Compilers:**
C. Sathish Kumar

**Reviewers:**
B.V. Shetty, B. Arthur, S. Molur
Scientific name (author; date): Disperis neilgherrensis Wight, 1851

Habit: Tuberous ground herbs.

Habitat: Evergreen forest, periphery of grassland and adjoining shola forest. Moist humus-rich forest floor, thick shade with marsh. 1000-2200 m.

Distribution

Current Global Distribution: ENDEMIC to Western Ghats (Karnataka, Kerala & Tamil Nadu)


Extent of occurrence (Sq. km.): 5,000-20,000

Area of occupancy (Sq. km.): 10-500

Number of Subpopulations/location: 10/6. Fragmented. There is continuing decline in the number of locations or subpopulations. All individuals not in one population and one subpopulation does not hold 95% or more of the total population.

Habitat status: Decrease in the habitat <20% in the last 10 years. Predicted decline <20% in the next 10 years due to loss of habitat, grazing and deforestation. There is decrease in the quality of the habitat due to grazing and deforestation.

Threats

Threats to taxon: Edaphic changes, nutritional disorders, grazing, habitat loss, pesticides, poisoning, trampling, drought, landslides and propagation difficulties resulting in and may result in population decline. The influence of threats on the population well understood, not reversible and not ceased to be threats.

Trade: Not in trade

Population

Numbers/Generation time/Trend: Mature individuals in all populations <250. The number of mature individuals declined in the past by 10% and likely to decline by 10% in the future. Generation time 5-6 years.

Trends: Declining >10% in last 10 years. Predicted decline <10% in next 10 years.


Data quality: Assessed based on field studies and literature/herbarium studies.

Qualifier: The Area and Extent estimated based on known locations. The habitat status, threats, mature individuals and population trends observed.

Status

IUCN RED LIST CRITERIA (1994): ENDANGERED

IUCN RED LIST CRITERIA (2000): ENDANGERED

CITES: Appendix II

National Red Data Book: Not listed

Other legislation: Included in the Negative List of Exports (EXIM Policy), 1999. Known presence in Protected Areas: Mukurthi National Park, Silent Valley National Park, Eravikulam National Park

Uncertainty: Assessed with 95% confidence based on evidence and on the consensus of the field biologists.

Recommendations

Research: Survey, life history studies, limiting factor research, PHVA.

Management: Habitat management, monitoring, limiting factor management, cultivation.

Cultivation: Cultivation is recommended for species recovery and preservation of live genome. Cultivated stocks available at TBGRI, Thiruvananthapuram, Gurukula Botanical Sanctuary and home garden of T. Chhabra. Numbers in cultivation 10. There is no coordinated species management programme for this species and one is not recommended. Initiate cultivation programme within 3 years. Some propagation techniques known for similar taxa.

Other comments: Stable in Mukurthi. Ex situ cultivation should be intensified.


Compilers: J.L. Ellis, R. Ingalhalli, N. Raman, N.C. Rathakrishnan, C. Satish Kumar, B. Arthur

Scientific name (author; date): **Eria albiflora** Rolfe, 1893

Habit: Pseudobulbous epiphytic herb

Habitat: Evergreen forests and sholas

**Distribution**

**Habitat elevation:** 1000-2000 m.

**Historical distribution:**

Current Global Distribution: ENDEMIC to Western Ghats (Karnataka, Kerala & Tamil Nadu)

**Distribution from Literature:**


**Distribution from Field Studies:**

- **Extent of occurrence (Sq. km.):** 5,001-20,000
- **Area of occupancy (Sq. km.):** 501-2,000
- **Number of Subpopulations/location:** 20/10
- Habitat status: Fragmented. There is a continuing decline in the number of locations or subpopulations. All individuals not in one population and one subpopulation does not hold 95% or more of the total population.
- **Decrease in the habitat:** >20% in the last 10 years due to loss of habitat. There is decrease in the quality of the habitat due to human interference.

**Threats**

- **Threats to taxon:** Habitat loss and habitat fragmentation resulting in and may result in population decline. The influence of threats on the population well understood, not reversible and not ceased
- **Trade:** Not in trade

**Population**

Mature individuals in all populations <2,500. The numbers of mature individuals declined in the past by 10% and likely to decline by 10% in the future. Generation time 3 years.

**Trends:** The population size/numbers of the taxon declining at a rate of >10% in the last 10 years.

**Recent Field Studies:**

None since 1990.

**Data quality:** Assessed based on past field studies, indirect information and literature/herbarium studies.

**Qualifier:** The Area and Extent estimated based on known locations. The habitat status, threats, mature individuals and population trends observed and inferred from a range of opinions.

**Status**

- **IUCN RED LIST CRITERIA (1994):** VULNERABLE
- **IUCN RED LIST CRITERIA (2000):** VULNERABLE
- **CITES:** Appendix II
- **National Red Data Book:** Indian WL. (P) Act: Not listed
- **Other legislation:** International RDB: Not listed
- **Known presence in Protected Areas:** Silent Valley National Park

**Uncertainty**

Assessed with precaution based on a range of opinion.

**Recommendations**

**Research:** Survey, life history studies, PHVA.

**Management:** Habitat management, monitoring, genome resource banking and limiting factor management, cultivation.

**Cultivation:** There is no coordinated species management programme for this species and one is not recommended. Initiate cultivation programme within 3 years. Some propagation techniques known for similar taxa.

**Other comments:**


**Compilers:** J.L. Ellis, R. Ingalhalli, N. Raman, N.C. Rathakrishnan, C. Sathish Kumar, B. Arthur.

**Scientific name (author; date):**
Eria dalzellii (Hook.) Lindley, 1858

**Synonyms:**
- Dendrobium dalzellii Hook., 1852;
- Eria dalzellii (Hook.) Lindley. var. fimbriata Hook. f., 1890

**Habit**
Herb, epiphyte or lithophyte

**Habitat**
Evergreen forest, sholas

**Niche/ elevation:**
Shady wet tree trunks. 800-2000 m.

**Distribution**

**Historical distribution:**
India

**Current Global Distribution:**
Endemic to Western Ghats (Maharashtra, Kamataka, Kerala & Tamil Nadu)

**Distribution from Literature:**
- Bhagamandala, Kallur Betta, Talacauvery, Koothi Reserve Forests of Somavarpeta [Keshavmurthy & Yoganasimhan, 1990].
- Aruvanpara & Sairandhi [Satish Kumar, 1999].
- Kolhapur, Nasik, Pune, Raigad, Ratnagiri, Satara, Sindhudurg, Thane [Lakshminarasimhan, 1996].
- Nadugani [Sharma et al., 1977].
- Kunthipuzha dam site [Vajravelu, 1990]. Way to Brahmagiri, Chandanathode [Ramachandran & Nair, 1988]

**Distribution from Field Studies:**
- Kerala: Silent Valley [Satish Kumar, 1983, 92]

**Extent of occurrence (Sq. km.):**
>20,000

**Area of occupancy (Sq. km.):**
>2,000

**Number of Subpopulations/location:**
100/50. Fragmented. There is continuing decline but no extreme fluctuation in the number of locations or subpopulations. All individuals not in one population and one subpopulation does not hold 95% or more of the total population.

**Habitat status:**
Decrease in the habitat <20% in the last 10 years and decrease in the quality due to landslides.

**Threats**
Habitat loss and landslides resulting in and may result in population decline. The influence on the population well understood, not reversible and not ceased.

**Trade:**
Not in trade

**Population**

**Numbers/Generation time/Trend:**
Mature individuals in all populations >2,500. The numbers of mature individuals declined in the past by 10-20% and likely to decline by 10-20% in the future. Generation time 5-6 years.

**Trends:**
The population size/numbers of the taxon declining at a rate of >10% in the last 10 years.

**Recent Field Studies:**

**Data quality:**
Assessment based on field studies, indirect information and literature/herbarium studies.

**Qualifier:**
Area and extent estimated based on known locations; habitat status, threats, mature individuals and population trends observed and inferred.

**Status**

**IUCN RED LIST CRITERIA (1994):**
LOWER RISK NEAR THREATENED
Criteria: -

**IUCN RED LIST CRITERIA (2000):**
NEAR THREATENED
Criteria: -

**CITES:**
Appendix II
Indian WL. (P) Act: Not listed

**National Red Data Book:**
No
International RDB: Not listed

**Other legislation:**
Includes in the Negative List of Exports (EXIM Policy, 1999).

**Known presence in Protected Areas:**
Silent Valley National Park, Kalakad-Mundanthurai Tiger Reserve

**Uncertainty:**
Assessed with 95% confidence based on evidence and on the consensus of the field biologists.

**Recommendations**

**Research:**
Survey, PHVA

**Management:**
Monitoring, habitat management, cultivation

**Cultivation:**
Cultivation recommended for research. Cultivated stocks available at Karnataka University, Dharwar and Gurukula Botanical Gardens, Wayanad. Numbers in cultivation 20. There is no coordinated species management programme for this species and one is not recommended. Initiate cultivation programme after 3 years. Some propagation techniques known for similar taxa.

**Other comments:**

**Sources:**
Hooker, 1852:292; Hooker, 1886-1890: 789; Keshavmurthy & Yoganasimhan, 1990: 444;
Satish Kumar, 1999: 201; Sharma et al., 1977: 140; Vajravelu, 1990: 477.

**Compilers:**

**Reviewers:**
Scientific name (author; date): Eria exilis Hook. f., 1890
Synonyms: Ena minima Blatter & McCann, 1931
Porpax chandrasekharanii Bhargavan & C.N. Mohanan, 1982

Habit: Epiphytic herbs
Habitat: Evergreen forests
Niche/ elevation: Moss clad branches of evergreen vegetation and moist rocks. 850-1000 m.

Distribution
Historical distribution: India
Current Global Distribution: ENDEMIC to Western Ghats (Maharashtra, Goa, Karnataka, Kerala & Tamil Nadu)
Distribution from Literature: Valiaparathode, Silent Valley [Sathish Kumar, 1999]. Satara [Lakshminarasimhan, 1996].
Distribution from Field Studies: Maharashtra: Konkan [S. Phatak]. Kerala: Valiaparathode, Silent Valley [Sathish Kumar, 1995].
Extent of occurrence (Sq. km.): >20,000
Area of occupancy (Sq. km.): 501-2,000
Number of Subpopulations/location: 200/50. Fragmented. There is continuing decline but no extreme fluctuation in the number of locations or subpopulations. All individuals not in one population and one subpopulation does not hold 95% or more of the total population.

Habitat status: Decrease in the habitat <20% in the last 10 years due to loss of habitat. There is decrease in the quality of the habitat due to human interference.

Threats
Threats to taxon: Habitat loss and habitat fragmentation resulting in and may result in population decline. The influence of threats on the population structure well understood, not reversible and not ceased.
Trade: Not in trade

Population
Numbers/Generation time/Trend: Mature individuals in all populations <2,500. The number of mature individuals declined in the past 10 years by 10% and likely to decline by 10% in the future. Generation time 4-5 years.
Trends: The population size/numbers of the taxon declining at a rate of <10% in the last 10 years.

Recent Field Studies: C. Sathish Kumar in Valiyaparathode, 1995, field studies.

Data quality: Assessment based on field studies and literature/herbarium studies.
Qualifier: The Area and Extent estimated based on known locations. The habitat status, threats, mature individuals and population trends observed and inferred.

Status
IUCN RED LIST CRITERIA (1994): VULNERABLE Criteria: B1+2abcde; C1+2a
IUCN RED LIST CRITERIA (2000): VULNERABLE Criteria: B2a+b(i,i,ii,iii,iv,v); C1
CITES: Appendix II Indian WL. (P) Act: Not listed
National Red Data Book: Not listed International RDB: Not listed
Other legislation: Included in the Negative List of Exports (EXIM Policy), 1999.
Known presence in Protected Areas: Silent Valley National Park

Uncertainty
Assessed with 95% confidence based on evidence, range of opinion and on the consensus of the field biologists.

Recommendations
Research: Survey, limiting factor research and PHVA
Management: Habitat management, monitoring and cultivation.
Cultivation: Cultivation recommended for species recovery and preservation of live genome. Cultivated stocks are not available. There is no coordinated species management programme for this species and one is recommended. Initiate cultivation programme after 3 years. Some propagation techniques known for similar taxa.

Other comments: --

Sources: Bhargavan & Mohanan, 1982; Blatter & McCann, 1931: 274; Hooker, 1890: 788; Sathish Kumar, 1999: 201; Lakshminarasimhan, 1996: 25

Scientific name (author; date): Eria microchilos (Dalz.) Lindley, 1858
Synonym: Dendrobium microchilos Dalz., 1851
Habit: Epiphyte
Habitat: Evergreen and moist deciduous forest
Niche/ elevation: 100-1500 m.
Historical distribution: India
Current Global Distribution: ENDEMIC to Western Ghats (Maharashtra, Goa, Karnataka & Kerala)
Kerala: Silent Valley [C. Sathish Kumar, 1982]
Extent of occurrence (Sq. km.): 5,001-20,000
Area of occupancy (Sq. km.): 501-2,000
Number of Subpopulations/location: 50/10. Fragmented. There is a continuing decline but no extreme fluctuation in the number of locations or subpopulations. All individuals not in one population and one subpopulation does not hold 95% or more of the total population.
Habitat status: Decrease in the habitat >20% in the last 10 years. Predicted decline <20% in the next 10 years due to loss of habitat. Decrease in the quality of the habitat due to human interference.
Threats
Threats to taxon: Habitat loss and human interference resulting in and may result in population decline. The influence of threats on the population structure well understood, not reversible and not ceased.
Trade: Not in trade
Population
Numbers/Generation time/Trend: Mature individuals in all populations >2,500. The numbers of mature individuals declined in the past by >20% and likely to decline by >20% in the future. Generation time 3 months.
Trends: The population size/numbers of the taxon declining at a rate of >20% in the last 10 years. Predicted decline <10% in the next 10 due to habitat loss.
Data quality: Assessment based on field studies and literature/herbarium studies.
Qualifier: The Area and Extent estimated based on the known locations. The habitat status, threats, mature individuals and population trends observed over many years and inferred.
Status
IUCN RED LIST CRITERIA (2000): VULNERABLE Criteria: B1a+b(ii,iii,iv), 2a+b(ii,iii,iv)
CITES: Appendix II Indian WL. (P) Act: Not listed International RDB: Not listed
National Red Data Book: Not listed
Other legislation: Included in the Negative List of Exports (EXIM Policy), 1999.
Known presence in Protected Areas: Brahmagiri Wild life Sanctuary, Talakaveri Wildlife Sanctuary, Silent Valley National Park
Uncertainty: Assessed with 95% confidence based on evidence and on the consensus of the field biologists.
Recommendations
Research: Survey, genetic research, life history studies and PHVA.
Management: Habitat management and monitoring.
Cultivation: Cultivated stocks available at Kaveri Nisargadhama, Kushalnagar. Numbers in cultivation 7. There is no coordinated species management programme for this species and one is not recommended. Initiate cultivation programme within 3 years. Some propagation techniques known for similar taxa.
Other comments:
Sources: Dalzell, 1851 3: 3-5; Lakshminarasimhan, 1996: 26; Lindley, 1858 3: 47; Rao, 1986: 418;
Compilers: J.L. Ellis, R. Gopalan, R. Ingalhalli, N. Raman, N.C. Rathakrishnan, C. Sathish Kumar, S. Phatak, B. Arthur

**Habitat**: Epiphytic or lithophytic herb.

**Habit**: Evergreen forests

**Niche/ elevation**: Above 1200 m.

**Distribution**

**Historical distribution**: India

**Current Global Distribution**: ENDEMIC to Western Ghats (Kerala)

**From Literature**: Agastyamalai [Karunakaran, 1991].

**From Field Studies**:

- **Extent of occurrence (Sq. km.)**: 100-5,000
- **Area of occupancy (Sq. km.)**: Unknown
- **Number of Subpopulations/locaton**: Unknown
- **Habitat status**: Unknown

**Threats**

- **Threats to taxon**: Unknown
- **Trade**: None

**Population**

- **Numbers/Generation time/Trend**: Unknown
- **Trends**: Unknown

**Recent Field Studies**: None

**Data quality**: None

**Qualifier**: Status

**IUCN RED LIST CRITERIA (1994)**: DATA DEFICIENT

**IUCN RED LIST CRITERIA (2000)**: DATA DEFICIENT

**CITES**: Appendix II

**National Red Data Book**: Not listed

**International RDB**: Not listed

**Known presence in Protected Areas**: Included in the Negative List of Exports (EXIM Policy), 1999.

**Recommendations**

- **Research**: Survey, life history studies, PHVA
- **Management**: Monitoring
- **Cultivation**: Not recommended.

**Other comments**: It does not occur outside its type locality (Agasthyamala) and the reported occurrence in Mysore and in Idukki by Rathakrishnan & Chitra, 1984 is erroneous.


**Compilers**: J.L. Ellis, R. Gopalan, R. Ingalhalli, N. Raman, N.C. Rathakrishnan, C. Sathish Kumar, S. Phatak, B. Arthur

**Scientific name (author; date):** Eria mysorensis Lindley, 1858

**Synonyms:**
*Eria polystachya* Wight, 1851 non A. Rich., 1841
*Eria pubescens* Wight, 1851 non Lindley

**Habit:** Epiphyte

**Habitat:** Moist Deciduous forests

**Niché/elevation:** 1000-2000 m.

**Distribution**

**Historical distribution:** India

**Current Global Distribution:** ENDEMIC to Western Ghats (Maharashtra, Karnataka, Kerala & Tamil Nadu)

**Distribution from Literature:**
- Kerala: Aruvanpara in Silent Valley [Sathish Kumar].

**Extent of occurrence (Sq. km.):** 5,001-20,000

**Area of occupancy (Sq. km.):** 10-500

**Number of Subpopulations/location:** <100/50. Fragmented. There is a continuing decline but no extreme fluctuation in the number of locations or subpopulations. All individuals are not in one population and one subpopulation does not hold 95% or more of the total population.

**Habitat status:** Decrease in the habitat >20% in the last 10 years due to loss of habitat. There is decrease in the quality of the habitat due to human interference.

**Threats**

**Threats to taxon:** Habitat loss and human interference resulting in and may result in population decline. The influence of threats on the population structure well understood, are not reversible and not ceased.

**Trade:** Not in trade.

**Population**

**Numbers/Generation time/Trend:** Mature individuals in all populations <250. The numbers of mature individuals declined in the past by 10% and likely to decline by 10% in the future. Number of mature individuals in each subpopulation not known. Generation time 3 years.

**Trends:** The population size/numbers of the taxon is declining at a rate of >20% in the last 10 years. Predicted decline <10% in the next 10 years due to habitat loss.

**Recent Field Studies:** T.A. Rao in Kodagu and Uttara Kannada, 1996, 98, Conservation of wild orchids of Kodagu.

**Data quality:** This species is assessed based on field studies and literature/herbarium studies.

**Qualifier:** The Area and Extent are estimated based on the known locations. The habitat status, threats, mature individuals and population trends are observed and inferred.

**Status**

**ICUN RED LIST CRITERIA (1994):** ENDANGERED

**ICUN RED LIST CRITERIA (2000):** ENDANGERED

**CITES:** Appendix II Indian WL. (P) Act: Not listed

**National Red Data Book:** Not listed

**Other legislation:** Included in the Negative List of Exports (EXIM Policy), 1999.

**Known presence in Protected Areas:** Brahmagiri Wildlife Sanctuary, Kodumul National Park, Silent Valley National Park, Talakaveri Wildlife Sanctuary

**Uncertainty**

*E. mysorensis* is assessed based on a range of opinion, evidence and on the consensus of the field biologists at the workshop.

**Recommendations**

**Research:** Survey and life history studies,

**Management:** Monitoring and cultivation/breeding.

**Cultivation:** Cultivation is recommended for research. Cultivated stocks are available at Kaveri Nisargadhama and Kodumul National park orchidarium. Numbers in cultivation not known. There is no coordinated species management programme for this species and one is not recommended. Initiate cultivation programme after 3 years. Some propagation techniques known for similar taxa.

**Other comments:** Described by Lindley based on Law's collection from Mysore.

**Sources:**
- Richard, 1841; Keshavmurthy & Yoganarasimhan, 1990: 445; Lindley, 1858: 54; Wight, 1851; Sathish Kumar, 1999: 202; Sharma et al., 1977: 140; Lakshminarasimhan, 1996: 26

**Compilers:** J.L. Ellis, R. Ingahalli, S. Phatak, B. Arthur.

**Eria pseudoclavicaulis** Blatter, 1928

**Habit:** Epiphytic herb  
**Habitat:** Evergreen forests  
**Niche/ elevation:** 900-1500m.

**Distribution**  
**Historical Distribution:** India  
**Current Global Distribution:** ENDEMIC to Western Ghats (Kerala & Tamil Nadu)  
**Distribution from Literature:** Kerala: Munnar, Agastyaamala [C. Sathish Kumar, 1995]. Periyar Tiger Reserve [N. Sasidharan, 1997].  
**Extent of Occurrence (Sq. km.):** 101-5000  
**Area of Occupancy (Sq. km.):** 11-100  
**Number of Subpopulations/location:** 4/4. Fragmented. There is a continuing decline but no extreme fluctuation in the number of locations or subpopulations. All individuals not in one population and one subpopulation does not hold 95% or more of the total population.  
**Habitat status:** No change.

**Threats**  
**Threats to taxon:** No threat  
**Trade:** Not in trade.

**Population**  
**Numbers/Generation time/trend:** Unknown  
**Population trend:** Unknown


**Data quality:** Field studies, informal sightings, literature/herbarium studies  
**Qualifier:** Area and Extent estimated and habitat status observed.

**Status**  
**IUCN Red List Criteria (1994):** VULNERABLE  
**IUCN Red List Criteria (2000):** VULNERABLE  
**CITES:** Appendix II  
**National Red Data Book:** Not listed  
**Other legislation:** Included in the Negative List of Exports (EXIM Policy), 1999.  
**Known presence in Protected Areas:** Neyyar Wildlife Sanctuary, Periyar Tiger Reserve, Eravikulam National Park, Meghamala Wildlife Sanctuary  
**Uncertainty**  
**Assessment based on precaution due to changes expected in habitat. Assessment is exclusive to the below listed compilers and reviewer.**

**Recommendations**  
**Research:** Survey  
**Management:** Monitoring  
**Cultivation:** No cultivated stocks available. No recommendations made at the workshop.

**Other comments:** Originally described by Blatter based on a collection from High Wavy Mountains. In Agastyaamala, this species is often seen growing on *Cullenia exarillata* as conspicuous clumps with more than 100 individuals in each clump.

**Sources:** Rathakrishnan & Chitra, 1984: 1004; Blatter, 1928 32: 519.

**Compilers:** C. Sathish Kumar

**Reviewers:** B.V. Shetty, B. Arthur, S. Molur
Eria tiagii Manilal et al., 1984.

Habit: Lithophytic herb
Habitat: Montane grassland rocky outcrops
Niche/ elevation: 800-1100m.

Distribution

Historical Distribution: India
Current Global Distribution: ENDEMIC to Western Ghats (Kerala)
Distribution from Literature: Aruvanpara, Silent Valley (Manilal et al., 1984)
Distribution from Field Studies: Kerala: Aruvanpara, Silent Valley [C. Sathish Kumar]
Extent of Occurrence (Sq. km.): <100
Area of Occupancy (Sq. km.): <10
Number of Subpopulations/location: 1/1.
Habitat status: Stable

Threats

Threats to taxon: None
Trade: Not in trade

Population

Numbers/Generation time/trend: Unknown
Population trend: Stable
Recent Field Studies: Not collected in recent times.
Data quality: Field studies
Qualifier: Area and Extent estimated and habitat status observed.

Status

CITES: Appendix II
National Red Data Book: Not listed
Other legislation: Included in the Negative List of Exports (EXIM Policy), 1999.
Known presence in Protected Areas: Silent Valley National Park

Uncertainty

Assessment based on precaution. Assessment is exclusive to the below listed compilers and reviewer.

Recommendations

Research: Survey
Management: Monitoring
Cultivation: No cultivated stocks available. No recommendations made at the workshop.

Other comments: Proposed by Manilal et al. based on a collection made by Sathish Kumar from Aruvanpara in Silent Valley.

Sources: Manilal et al., 1984; Sathish Kumar, 1999: 202
Compilers: C. Sathish Kumar
Reviewers: B.V. Shetty, B. Arthur, S. Molur
**Scientific name (author; date):**

*Eulophia cullenii* (Wight) Blume, 1858

**Synonym:**

*Cyrtopera cullenii* Wight, 1851

**Habit:**

Tuberous ground herb

**Habitat:**

Mid-elevation grasslands

**Niche / elevation:**

Open grasslands. 120-900 m.

**Distribution**

**Historical distribution:**

India

**Current Global Distribution:**

Endemic to Western Ghats (Kerala & Tamil Nadu)

**Distribution from Literature:**

Trivandrum [Sathish Kumar, 1991]. Madurai [Rathakrishnan & Chitra, 1984]

**Distribution from Field Studies:**

Kerala: Thrivananthapuram, Bonaccord, Agastyamalai, Palode, TBGRI campus [Sathish Kumar, 1984-1992].

**Extent of occurrence (Sq. km.):**

5001-20,000

**Area of occupancy (Sq. km.):**

10-500

**Number of Subpopulations/location:**

20/10. Fragmented. There is a continuing decline and extreme fluctuation in the number of locations or subpopulations. All individuals are not in one population and one subpopulation does not hold 95% or more of the total population.

**Habitat status:**

Decrease in the habitat <20% in the last 10 years due to loss of habitat. There is decrease in the quality of the habitat due to human interference.

**Threats**

**Threats to taxon:**

Grazing, harvest for medicine, habitat loss, human interference, habitat fragmentation, overexploitation and trampling of parts are resulting in and may result in population decline. The influence of threats on the population structure are well understood, are not reversible and have not ceased to be a threat.

**Trade:**

The taxon is in local trade. The tuberous roots are used for medicinal purpose. Local trade for tribal and Sidha medicine has resulted in the perceived or inferred population decline.

**Population**

**Numbers/Generation time/Trend:**

The number of mature individuals <250. No population contains more than 50 mature individuals. The number of mature individuals declined in the past by 20% and likely to decline by 20% in the future. Generation time 4-6 years.

**Trends:**

The population size/numbers declining by >10% in the last 10 years.

**Recent Field Studies:**

C. Sathish Kumar in Bonacord, 1994, Case study of orchids of Kerala.

**Data quality:**

Assessment based on field studies, informal sighting and literature/herbarium studies.

**Qualifier:**

The Area and Extent estimated based on known locations. The habitat status, threats, mature individuals and population trends observed over many years of field studies.

**Status**

**IUCN RED LIST CRITERIA (1994):**

**CRITICALLY ENDANGERED**

Criteria: **C2a.**

**IUCN RED LIST CRITERIA (2000):**

**CRITICALLY ENDANGERED**

Criteria: **C2a(i).**

**CITES:**

Appendix II

Indian WL. (P) Act: Not listed

International RDB: Not listed

**National Red Data Book:**

Not listed

**Other legislation:**

Included in the Negative List of Exports (EXIM Policy), 1999.

**Known presence in Protected Areas:**

Assessed with 95% confidence based on evidence and on the consensus of the field biologists.

**Uncertainty**

Survey, limiting factor research, life history studies, PHVA

Habitat management, cultivation/breeding, sustainable utilisation

Cultivation is recommended for research. Cultivated stocks are available at TBGRI – Thrivananthapuram. Numbers in cultivation 6. There is no coordinated species management programme for this species and one is recommended. Initiate cultivation programme within 3 years. Some propagation techniques known for similar taxa.

**Other comments:**

Originally proposed by Wight based on General Cullen’s collection from Travancore. This species is closely allied to *E. flava* (Lindl.) Hook.f. Fischer (1928) recognised a variety (minor) based on Van Malderen’s collection from Pulney’s, which is actually a dwarf form. The tubers of this species are very large and are highly medicinal. They are used by the local tribals to treat spider bites. The tubers are also eaten by wild boars. The tubers extend root like structures which resemble the spider, hence the local name (‘Chilanti kizhangu’). The tubers of this species perennate for many years. Its medicinal properties are well known [P.S. Udayan].

**Sources:**


**Compilers:**


**Reviewers:**

**Scientific name (author; date):**

*Eulophia pratensis* Lindley, 1858

*Eulophia ramentacea* auct. non Lindley, 1833

*Graphorkis pratensis* (Lindley) Kuntze

**Synonyms:**

- *Eulophia ramentacea* auct. non Lindley, 1833
- *Graphorkis pratensis* (Lindley) Kuntze

**Habit:**

Terrestrial herb

**Habitat:**

Montane grasslands

**Niche/ elevation:**

Open grasslands at high elevations. 1500-2000 m.

**Distribution**

**Historical distribution:**

India

**Current Global Distribution:** ENDEMIC to Western Ghats (Gujarat, Maharashtra, Karnataka, Kerala & Tamil Nadu)

**Distribution from Literature:**

- Tamil Nadu, Palm Hills [Sathish Kumar, 1979-2000].

**Extent of occurrence (Sq. km.):**

>20,000

**Area of occupancy (Sq. km.):**

>2,000

**Number of Subpopulations/location:**

100/50. Fragmented. There is a continuing decline but no extreme fluctuation in the number of locations or subpopulations. All individuals not in one population and one subpopulation does not hold 95% or more of the total population.

**Habitat status:**

Decrease in the area of habitat in the last 10 years due to loss of habitat. There is decrease in the quality of the habitat due to human interference.

**Threats**

**Threats to taxon:**

- Habitat loss, human interference, habitat fragmentation, trampling and drought resulting in and may result in population decline. The influence of threats on the population structure well understood, not reversible and not ceased.

**Trade:**

The taxon is in local trade.

**Population**

**Numbers/Generation time/Trend:**

Unknown

**Recent Field Studies:**


**Data quality**

Assessment based on field studies, informal sightings and literature/herbarium studies.

**Qualifier:**

The Area and Extent estimated based on known locations. The habitat status and threats observed in some areas and inferred in other areas.

**Status**

**IUCN RED LIST CRITERIA (1994):** LOWER RISK NEAR THREATENED

**Criteria:** --

**IUCN RED LIST CRITERIA (2000):** NEAR THREATENED

**Criteria:** --

**CITES:** Appendix II

**Indian WL. (P) Act:** Not listed

**National Red Data Book:** Not listed

**International RDB:** Not listed

**Other legislation:** Included in the Negative List of Exports (EXIM Policy), 1999.

**Known presence in Protected Areas:** Periyar Tiger Reserve, Billigiri Rangaswamy Temple Wildlife Sanctuary

**Uncertainty**

Assessed with 95% confidence based on evidence and on the consensus of the field biologists and range of opinion.

**Recommendations**

**Research:**

Survey

**Management:**

Monitoring

**Cultivation:**

Cultivated stocks do not exist. There is no coordinated species management programme for this species and one is not recommended. Some propagation techniques known for taxon or similar taxa.

**Other comments:**

Wight (1851) described *E. ramentacea* based on a collection from the Pulneys. This name can not be accepted as it was already occupied by that of Lindley (1833) – for another plant from north east India and Bhutan. Lindley (1858) proposed *E. pratensis* based on stock collection from Deccan. Hook. f. found them to be conspecific. This species is found only in Palni Hills and Periyar Tiger Reserve. It is sold as dry tubers. This species has already been assessed in the CBSG CAMP workshop conducted by FRLHT and was given the status Endangered. Its medicinal properties are well known [P.-S. Udayan]. Since there is taxonomic confusion with respect to this species and Satish Kumar’s field knowledge of the species distribution is in Palni and Periyar only, the information available is incomplete. The Taxon is therefore Data Deficient.

**Sources:**


**Compilers:**

Gastrochilus flabelliformis (Blatter & McCann) Saldanha, C.J., 1976
Saccotubium flabelliforme Blatter & McCann, 1931

Scientific name (author; date):
Gastrochilus flabelliformis (Blatter & McCann) Saldanha, C.J., 1976
Synonym:
Saccolabium flabelliforme Blatter & McCann, 1931
Habit: Epiphyte, monopodial herb.
Habitat: Evergreen forests and deciduous forests
Niche/ elevation: Main trunk and side branches. 200-1000 m.

Distribution
Historical distribution:
Current Global Distribution: ENDEMIC to Western Ghats (Karnataka & Kerala)
Extent of occurrence (Sq. km.): 5,001-20,000
Area of occupancy (Sq. km.): 10-500
Number of Subpopulations/location: 105. Fragmented. There is no continuing decline or extreme fluctuation in the number of locations or subpopulations. All individuals are not in one population and one subpopulation does not hold 95% or more of the total population.
Habitat status: Decrease in the habitat <20% in the last 10 years due to loss of habitat.

Threats
Threats to taxon: Habitat loss, habitat fragmentation and harvest for timber resulting in and may result in population decline. The influence of threats on the population structure are well understood, not reversible and have not ceased.
Trade: Not in trade

Population
Numbers/Generation time/Trend: Mature individuals in all populations are <250. The number of mature individuals in the biggest subpopulation is not known. The numbers of mature individuals declined in the past by 10% and are likely to decline by 10% in the future. Generation time 5-6 years.
Trends: The population size/numbers of the taxon is declining at a rate of >10% in the last 10 years.
Data quality: Assessment based on field studies, informal sightings and literature/herbarium studies.
Qualifier: The Area and Extent estimated based on known locations. The habitat status, threats, mature individuals and population trends observed and inferred.
Status
IUCN RED LIST CRITERIA (1994): ENDANGERED Criteria: B1>2bce; C2a
IUCN RED LIST CRITERIA (2000): ENDANGERED Criteria: B2a+b(iii,v); C2a(i)
CITES: Appendix II
National Red Data Book: Not listed
Other legislation: Included in the Negative List of Exports (EXIM Policy), 1999.
Known presence in Protected Areas: Brahmagiri Wildlife Sanctuary, Silent Valley National Park
Uncertainty: G. flabelliformis is assessed based on evidence and on the consensus of the field biologists at the workshop. It was also on a range of opinion.

Recommendations
Research:
Survey, life history studies and PHVA.
Management:
Habitat management and monitoring.
Cultivation:
Cultivation is recommended for research and species recovery. Cultivated stocks are available at TBGRI, Thrivananthapuram. Numbers in cultivation 10. There is no coordinated species management programme for this species and one is not recommended. Ongoing cultivation programme intensified or increased. Some propagation techniques known for similar taxa.

Other comments:
Originally described by Blatter & McCann based on a collection from South Canara.

Sources:

Compilers:

Reviewers:
Scientific name (author; date): Habenaria barnesii Summerh., ex Fischer, 1936

Habit: Tuberous ground herb
Habitat: Grasslands
Niche/ elevation: 2100m.

Distribution
Historical distribution:
Current Global Distribution: ENDEMIC to Western Ghats (Kerala & Tamil Nadu)

Distribution from Field Studies:
Extent of occurrence (Sq. km.): 100-5,000
Area of occupancy (Sq. km.): 10-500
Number of Subpopulations/location: 2-3/3. Fragmented. All individuals are not in one population and one subpopulation does not hold 95% or more of the total population
Habitat status: Decrease in area of habitat <20% in the last 10 years. <20% predicted decline in the next 10 years due to loss of habitat. Decrease in quality of habitat due to fire.

Threats
Threats to taxon: Habitat loss and fire are resulting in and may result in population decline. The influence of threats on the population is well understood, are not reversible and have not ceased.
Trade: Not in trade

Population
Numbers/Generation time/Trend: Generation time annual.
Trends: Unknown


Data quality: Assessed based on field sightings and literature/herbarium studies.
Qualifier: The Area and Extent estimated based on known locations. The habitat status, threats, mature individuals and population trends inferred from literature.

Status
IUCN RED LIST CRITERIA (2000): ENDANGERED Criteria: B1a+b(ii,iii), 2a+b(ii,iii)
CITES: Appendix II
National Red Data Book: Rare [Nayar & Sastry, 1987]
Other legislation: Included in the Negative List of Exports (EXIM Policy), 1999.
Known presence in Protected Areas: Mukurthi National Park, Eravikulam National Park.

Uncertainty Assessed based on precaution on the consensus of the field biologists at the workshop.

Recommendations
Research: Survey
Management: Monitoring, cultivation/breeding
Cultivation: Cultivation is recommended for research. Cultivated stocks are not available. There is no coordinated species management programme for this species and one is recommended. Ongoing cultivation programme intensified or increased. Information on propagation techniques not available with this group of compilers.

Other comments: No change observed in Mukurthi National Park, as it is a protected area. Described by Fischer based on Barne’s collections from Nilgiris and Namakad Gap in Kerala.


Compilers: J.L. Ellis, R. Gopalan, R. Ingalhalli, N. Raman, N.C. Rathakrishnan, C. Sathish Kumar, S. Phatak, B. Arthur


ENDANGERED
Habenaria cephalotes Lindley, 1835

H. trichosantha auct. non. Lindley, 1835: A. Rich., 1841

Scientific name (author; date):

Habenaria cephalotes Lindley, 1835

Synonym:

H. trichosantha auct. non. Lindley, 1835: A. Rich., 1841

Habit:

Terrestrial herb

Habitat:

Grasslands

Niches/ elevation:

1800-2500m.

Distribution

Historical distribution:

India

Current Global Distribution:

ENDEMIC to Western Ghats (Kerala & Tamil Nadu)

Distribution from Literature:


Distribution from Field Studies:

Kerala: Silent Valley [Sathish Kumar]

Tamil Nadu: Mukurthi National Park [P.F. Solomons]

Extent of occurrence (Sq. km.):

100-5,000

Area of occupancy (Sq. km.):

10-500

Number of Subpopulations/location:

>207. Fragmented. All individuals are not in one population and one subpopulation does not hold 95% or more of the total population.

Habitat status:

Decrease in area of the habitat and habitat quality.

Threats

Threats to taxon:

Habitat loss and trampling. The factors influencing the status of the taxon is well understood.

Trade:

Not in trade

Population

Numbers/Generation time/Trend:

Mature individuals in all populations are < 250. Number of mature individuals in the largest subpopulation is not known. The numbers of mature individuals have declined in the past. Generation time one year.

Trends:

Unknown.

Recent Field Studies:


Data quality:

Assessed based on field studies and literature/ herbarium studies.

Qualifier:

The Area and Extent estimated based on known locations. Threats observed. Mature individuals inferred from literature.

Status

IUCN RED LIST CRITERIA (1994):

ENDANGERED

Criteria:

B1+2bc.

IUCN RED LIST CRITERIA (2000):

ENDANGERED

Criteria:

B1a+b(ii,iii), 2a+b(ii,iii)

CITES:

Appendix II

Indian WL. (P) Act: Not listed

International RDB: Not listed

National Red Data Book:

Not listed

Other legislation:

Included in the Negative List of Exports (EXIM Policy), 1999.

Known presence in Protected Areas:

Mukurthi National Park, Silent Valley National Park

Uncertainty

Assessed based on a range of opinion.

Recommendations

Research:

Survey and life history studies.

Management:

Cultivation/breeding and monitoring

Cultivation:

Cultivation is recommended for research. Cultivated stocks are not available. There is no coordinated species management programme for this species and one is not recommended. Ongoing cultivation programme intensified or increased. Information on propagation techniques not available with this group of compilers.

Other comments:

Proposed by Lindley based on Wight's collection from the Nilgiris. This species was found to occur intermingled with Satyrium nepalense [Abraham and Vatsala]. No change observed in Mukurthi National Park, as it is a protected area. In Nilgiri, Naduvattom and Pykara the habitat is under threat.

Sources:


Compilers:

J.L. Ellis, R. Gopalan, R. Ingalhalli, N. Raman, N.C. Rathakrishnan, C. Sathish Kumar, S. Phatak, B. Arthur

Reviewers:

### Scientific name (author; date):

<table>
<thead>
<tr>
<th>Scientific name</th>
<th>Scientific name (author; date)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Habenaria elliptica</td>
<td>Wight, 1851</td>
</tr>
</tbody>
</table>

### Habit:

- **Terrestrial herb**

### Habitat:

- **Open grassy slopes**

### Distribution:

#### Historical distribution:

India

#### Current Global Distribution:

Endemic to Western Ghats (Kerala & Tamil Nadu)

#### Distribution from Literature:

- Palni hills, on the way to Anamudi from Nyamakad, Vattivara hills [Abraham & Vatsala, 1981].
- Madurai, Nilgiri, Tirunelveli [Henry et al., 1989].
- Palni, Kodakanal, Nilgiris, Conoor [Fyson, 1974].
- Palni Hills [Hooker, 1890-1894].
- Ootacamund [Sharma et al., 1977].
- Kodakanal, Bruce Valley, Kodakanal Pillar Rocks, Palni hills, Kodakanal - Benjam road, Fire tower, Shola of Mahilkundram, Peak north of Perumal peak, Gundur - Vembadi Path [Seidenfaden, 1999].
- Mysore to Nilgiris and Palni Hills [Nayar, 1996].
- Sispara [Sathish Kumar, 1999].
- Mysore, Idukki, Madurai, Nilgiri [Rathakrishnan & Chitra, 1984].
- Palni [Kunhikrishnan, 1991].

#### Distribution from Field Studies:

- Kerala: Silent Valley [C. Sathish Kumar, 1995].
- Tamil Nadu: Kodakanal [N. Raman, June 1997].

### Extent of occurrence (Sq. km.):

5,001-20,000

### Area of occupancy (Sq. km.):

10-500

### Number of Subpopulations/location:

10–20/5–10. Fragmented. There is a continuing decline but no extreme fluctuation in the number of locations or subpopulations. All individuals are not in one population and one subpopulations does not hold 95% or more of the total population.

### Habitat status:

Decrease in the habitat >20% in the last 10-20 years. >20% predicted decline in the next 10-20 years and decrease in the quality of habitat due to road construction, overexploitation and grazing.

### Threats:

- Damming, grazing, over exploitation and trade for market or medicine are resulting in and may result in population decline. The influence of threats on the population structure is well understood, are not reversible and have not ceased.

### Trade:

- Not in trade.

### Population:

- Mature individuals in all populations are <2,500. The number of mature individuals declined in the Protected Areas by 20-30% and is likely to decline by 20-30% in the future. Generation time is 1 year.

### Trends:

- The population size numbers of the taxon is declining at a rate of >30% in the last 10 years. Predicted decline >30% in the next 10 years due to habitat loss.

### Recent Field Studies:


### Data quality:

- Assessed based on field studies, informal sightings and literature/herbarium studies.

### Qualifier:

- The Area and Extent estimated based on known locations. The habitat status, threats and mature individuals estimated. Population trend inferred from indirect information.

### Status:

- **IUCN RED LIST CRITERIA (1994):** ENDANGERED
- **Criteria:** B1+2abcde.

- **IUCN RED LIST CRITERIA (2000):** ENDANGERED
- **Criteria:** B2a+b(i,ii,iii,iv,v)

#### CITES:

- Appendix II

### National Red Data Book:

- Not listed

### Other legislation:

- Included in the Negative list of Exports (EXIM Policy), 1999

### Uncertainty:

- Assessed based on evidence and consensus of the field biologists at the workshop. It was also on range of opinion and subjective opinion.

### Recommendations:

#### Research:

- Genetic research, life history studies.

#### Management:

- Genome resource banking, cultivation/breeding

#### Cultivation:

- Cultivation is recommended for research. Cultivated stocks are not available. There is no coordinated species management programme for this species and one is recommended. Initiate cultivation programme after 3 years. Some propagation techniques known for taxon or similar taxa.

### Other comments:

- Described by Wight based on a collection from Pulney Hills. Very characteristic species with sepals scurfy pubescent on the adaxial surfaces. The record of its occurrence outside Kerala and Tamil Nadu i.e., in Mysore (Nayar, 1996, Sharma et al., 1984) seems incorrect. Most of the plants have been destroyed due to grazing. This species is grazed by animals before it matures.

### Sources:

- Abraham & Vatsala, 1981: 233;
- Fyson, 1974: 402 - 403;
- Henry et al., 1989: 14;
- Hooker, 1890-1894: 147;
- Jain & Mehrotra, 1984: 71;
- Manilal, 1988: 286;
- Manoharan, 1999: 204;
- Nayar, 1996: 225;
- Rao, 1998: 206;
- Satish Kumar, 1999: 204;
- Seidenfaden, 1999: 1221, 1222;
- Sharma et al., 1984;
- Sharma et al., 1977: 141;
- Rathakrishnan & Chitra, 1984: 1004;

### Compilers:


### Reviewers:

**Scientific name (author; date):** Habenaria elwesii Hook. f., 1896

**Habit:** Tuberous terrestrial herb

**Habitat:** Evergreen forest.

**Niche/ elevation:** >850m.

### Distribution

**Historical distribution:**
- India

**Current Global Distribution:** ENDEMIC to Western Ghats (Karnataka, Kerala & Tamil Nadu)

**Distribution from Literature:**
- Devale [Sharma, et al., 1977, Mohanan & Balakrishnan, 1991].
- Hassan, Nilgiri [Rathakrishna & Chitra, 1984].

**Distribution from Field Studies:**
- Karnataka: Hassan [S. Phatak].
- Silent Valley [C. Sathish Kumar, 1982].

**Extent of occurrence (Sq. km.):** 100-5,000

**Area of occupancy (Sq. km.):** <10

**Number of Subpopulations/location:** 2/2. Fragmented. There is a continuing decline and no extreme fluctuation in the number of locations or subpopulations.

**Habitat status:** Decrease in the habitat >80% in the last 20 years.

### Threats

**Threats to taxon:**
- Habitat loss, harvest, human interference and habitat fragmentation are resulting in and may result in population decline. The influence of threats on the population structure is well understood, are not reversible and have not ceased to be a threat.

**Trade:** Not known

### Population

**Numbers/Generation time/Trend:** Unknown

**Trends:**
- The Devala population is extirpated due to construction of human refugee camps in the primary evergreen habitat. The population is declining more than 50% overall, but is not known.

### Recent Field Studies:

**None**

### Data quality:

**Assessed based on field observation, indirect information and literature/herbarium studies.**

### Status

**IUCN RED LIST CRITERIA (1994):** CRITICALLY ENDANGERED

**Criteria:** B1+2bcd

**IUCN RED LIST CRITERIA (2000):** CRITICALLY ENDANGERED

**Criteria:** B2a+b(i,ii,iii,iv)

**CITES:** Appendix II

**Indian WL. (P) Act:** Not listed

**National Red Data Book:** Not listed

**International RDB:** Not listed

**Other legislation:** Included in the Negative list of Exports (EXIM Policy), 1999

**Known presence in Protected Areas:** Uncertainty

**Assessed with 95% confidence based on the consensus of field biologists.**

### Recommendations

**Research:** Survey

**Management:** Monitoring, cultivation/breeding

**Cultivation:** Intitiate cultivation programme for species recovery within 3 years. Techniques for cultivation not known at all.

### Other comments:

This species was described by Hook. f. based on Proudlock’s collections from the Nilgiris. Sri Lankan refugees have been accomodated in this area. The land is being alloted free of cost and has been converted into tea plantation [Rajan]. The area needs to be surveyed. Before 40 years Devala was one of the thick evergreen forest, it is now completely denuded for habitation and plantation.

**Sources:**
- Hooker, 1896: t.7478;
- Mohanan & Balakrishnan, 1991: 195;
- Sharma, et al., 1977: 141;
- Rathakrishnan & Chitra, 1984: 1004.

**Compilers:**

**Reviewers:**
Scientific name (author; date): Habenaria flabelliformis Summerh. ex Fischer 1936.

Habit: Terrestrial tuberous herb
Habitat: Montane grasslands
Niche/ elevation: 2400-2475m.

Distribution
Historical distribution:
Current Global Distribution: ENDEMIC to Western Ghats (Kerala)
Distribution from Literature:
Distribution from Field Studies:
Extent of occurrence (Sq. km.):
Area of occupancy (Sq. km.):
Number of Subpopulations/location:
Habitat status:

Threats
Threats to taxon:
Perennating tuberoids are eaten away by wild boars etc. This may result in population decline. The influence on the population structure is not well understood.

Trade:
Not in trade

Population
Numbers/Generation time/Trend
Mature individuals in all populations are <50. The numbers of mature individuals have declined in the past. Generation time - perennial. Only seven individuals located.
Population trends unknown.

Recent Field Studies:

Data quality:
Qualifer:
The Area and Extent estimated based on known locations. The habitat status and threats observed.

Status
IUCN RED LIST CRITERIA (1994):
CRITICALLY ENDANGERED
Criteria: B1+2e; D

IUCN RED LIST CRITERIA (2000):
CRITICALLY ENDANGERED
Criteria: B1a+b(v), 2a+b(v); D

CITES: Appendix II
Indian WL. (P) Act: Not listed
International RDB: Not listed

National Red Data Book: Included in the Negative list of Exports (EXIM Policy), 1999
Other legislation: Eravikulam National Park.

Known presence in Protected Areas: Eravikulam National Park.

Uncertainty
Assessed with 95% confidence based on the consensus of field biologists.

Recommendations
Research: Life history studies, PHVA pending
Management: Monitoring, cultivation/breeding
Cultivation: Cultivation is recommended for research, species recovery, reintroduction, preservation of live genome. Cultivated stocks are not available. There is no coordinated species management programme for this species and one is recommended. Initiate cultivation programme within 3 years. Some propagation techniques known for taxon or similar taxa.

Other comments:
Described by Fischer based on a collection by Edward Barnes from the slopes of Anamudi. Only seven individuals were found by S.D. Biju during his field studies. Both conventional and non conventional propagation techniques should be taken up.

Sources:

Compilers:

Reviewers:
**Scientific name (author; date):** Habenaria gibsonii Hook. f. var. foetida Blatter & McCann, 1932

**Synonym:** Habenaria foliosa A. Rich var. foetida (Blatter & McCann) Bennet, 1984

**Habit:** Terrestrial herb

**Habitat:** Semi evergreen to evergreen forests.

**Niche/elevation:** Wet under growth. 120-2600m.

**Distribution**

**Historical distribution:**

**Current Global Distribution:** ENDEMIC to Western Ghats (Maharashtra & Karnataka)

**Distribution from Literature:**

**Distribution from Field Studies:** Mahabaleshwar, Londa [S. Phatak, 1979]. Kudremukh National Park [T.A. Rao, 2000]

**Extent of occurrence (Sq. km.):** >20,000

**Area of occupancy (Sq. km.):** <500

**Number of Subpopulations/location:** 3/3. Fragmented. All individuals are not in one population and one subpopulations does not hold 95% or more of the total population.

**Habitat status:** Decrease in habitat in the last 10 years due to loss of habitat. Decrease in the quality of habitat due to habitat loss.

**Threats**

**Threats to taxon:** Habitat loss and trampling resulting in and may result in population decline. The influence of threats on the population structure well understood, not reversible and have not ceased.

**Trade:** Not in trade.

**Population**

**Numbers/Generation time/Trend:** Mature individuals <50. The number of mature individuals declined in the past by >20% and likely to decline in the future by >20%. Generation time annual.

**Trends:** Population size/numbers declining at a rate of >20% in the last 10 years.

**Recent Field Studies:** T.A. Rao in Kudremukh National Park, 2000

**Data quality:** Assessed based on informal sightings and literature/herbarium studies.

**Qualifier:** Extent estimated based on known locations. Habitat status, threats, mature individuals and population trends inferred.

**Status**

**IUCN RED LIST CRITERIA (1994):** CRITICALLY ENDANGERED

**Criteria:** D

**IUCN RED LIST CRITERIA (2000):** CRITICALLY ENDANGERED

**Criteria:** D

**CITES:** Appendix II

**Indian WL. (P) Act:** Not listed

**National Red Data Book:** Not listed

**International RDB:** Not listed

**Known presence in Protected Areas:** Kudremukh National Park

**Uncertainty**

**Assessed subjectively based on precaution.**

**Recommendations**

**Research:** Survey, genetic research, taxonomic research.

**Management:** Habitat management, monitoring and genome resource banking.

**Cultivation:** Cultivation recommended for preservation of live genome. Cultivated stocks not available. No coordinated species management programme for this species and one not recommended. Initiate cultivation programme within 3 years. Some propagation techniques known for similar taxa.

**Other comments:** This variety was described by Blatter & McCann (1932) based on Hallberg’s collection made on June 1917 from Monkey Hill in Khandala.

**Sources:** Bennet 1984 S. 452; Blatter & McCann, 1932 36: 16

**Compilers:** S. Phatak, B. Arthur

**Reviewers:** B.V. Shetty, C. Sathish Kumar, S. Molur
**Habenaria gibsonii** Hook. f. var. **foliosa** (A. Rich.) Santapau & Kapadia, 1959

**Habenaria foliosa** A. Rich., 1841

**Habenaria digitata** Lindley var. **foliosa** (A. Rich.) Hook. f., 1890

**Habenaria spencei** Blatter & McCann, 1932

---

**Scientific name (author; date):** Habenaria gibsonii Hook. f. var. foliosa (A. Rich.) Santapau & Kapadia, 1959

**Synonyms:**
- Habenaria foliosa A. Rich., 1841
- Habenaria digitata Lindley var. foliosa (A. Rich.) Hook. f., 1890
- Habenaria spencei Blatter & McCann, 1932

**Habit:** Terrestrial herb

**Habitat:** Semi evergreen to evergreen forests

**Niché/ elevation:** Wet under growth. 2600m.

**Distribution**

**Historical distribution:**
- India

**Current Global Distribution:** ENDEMIC to Western Ghats (Maharashtra, Karnataka, Kerala & Tamil Nadu)

**Distribution from Literature:**
- Bridge path leading to the site for the Silent Valley project in Attapadi, Khandala, Godavari District and Western Ghats of Karnataka [Abraham & Vatsala, 1981]; Nilgiris [Nayar, 1996]; Pune, Satara [Sharma et al., 1996]; Avalanche, Bikkapathimund, Naduvattam, Otacanmund, Pykara [Sharma et al., 1977].
- Mahabaleshwar [S. Phatak, 1979]

**Extent of occurrence (Sq. km.):** >20,000

**Area of occupancy (Sq. km.):** <2,000

**Number of Subpopulations/location:** Fragmented.

**Habitat status:** Decrease in the habitat in the last 10 years due to loss of habitat. There is decrease in the quality of the habitat due to habitat loss.

**Threats**

**Threats to taxon:** Habitat loss, trampling and habitat fragmentation resulting in and may result in population decline. The influence of threats on the population structure well understood, not reversible and have not ceased.

**Trade:** Not in trade

**Population**

**Numbers/Generation time/Trend**
- Mature individuals <250. Number of mature individuals have declined in the past by >20% and predicted decline is >20%. Generation time annual.

**Trends:**
- Population size/numbers of the taxon declining at a rate of >20% in the last 10 years.

**Recent Field Studies:** None

**Data quality:** Assessed based on field studies and literature-herbarium studies.

**Qualifier:** Area and Extent estimated based on the known locations. Habitat status, threats, mature individuals and population trends observed.

**Status**

**IUCN RED LIST CRITERIA (1994):** VULNERABLE Criteria: A1ce; B1+b(ce)

**IUCN RED LIST CRITERIA (2000):** VULNERABLE Criteria: B2a+b(iii,v)

**CITES:** Appendix II

**National Red Data Book:** Not listed

**International RDB:** Not listed

**Known presence in Protected Areas:**
- Indian WL. (P) Act: Not listed
- International RDB: Not listed
- Silent Valley National Park

**Uncertainty**

- Assessed subjectively based on precaution.

**Recommendations**

**Research:**
- Survey, Genetic research, taxonomic research.

**Management:**
- Monitoring, genome resource banking.

**Cultivation:**
- Cultivated stocks not available. No coordinated species management programme for this species and one not recommended. Initiate cultivation programme within 3 years. Some propagation techniques known for taxon or similar taxa.

**Other comments:**
- This was originally described by A. Richard (18410 based on a collection by Perrottet from Nilgiris. Western ghats, near Poona, Karwar [Santapau & Kapadia]. It was found growing side by side with H. multicaudata [Abraham & Vatsala, 1961]. It was found growing among Habenaria digitata, H. stenopetala and H. crassifolia in Mahabaleshwar [S. Phatak, 1984].

**Sources:**

**Compilers:**
- S. Phatak, B. Arthur

**Reviewers:**
- B.V. Shetty, C. Sathish Kumar, S. Molur
Habenaria gibsonii Hook. f., var. gibsonii 1890

Habenaria digitata Lindley var. gibsonii (Hook. f.) C. Fischer, 1928
Habenaria foliosa A. Rich. var. gibsonii (Hook. f.) Bennet 1964

**Scientific name (author; date):**
Habenaria gibsonii Hook. f., var. gibsonii 1890

**Synonyms:**
Habenaria gibsonii Hook. f., var. gibsonii 1890
Habenaria digitata Lindley var. gibsonii (Hook. f.) C. Fischer, 1928
Habenaria foliosa A. Rich. var. gibsonii (Hook. f.) Bennet 1964

**Habit:** Terrestrial herb

**Habitat:**
Forest undergrowth and open slopes in grasslands

**Niches/ elevation:**
Moist areas. 1200-2000 m.

**Distribution**

**Historical distribution:**

**Current Global Distribution:**
Endemic to Western Ghats (Maharashtra & Karnataka)

**Distribution from Literature:**

**Distribution from Field Studies:**

**Extent of occurrence (Sq. km.):**
100-5,000

**Area of occupancy (Sq. km.):**
10-500

**Number of Subpopulations/location:**
5–10

**Habitat status:**
Decrease in the habitat >20% in the last 20 years due to loss of habitat, forest fires and over grazing.

There is decrease in the quality of the habitat due to human interference, animals, forest fires and over grazing.

**Threats**

**Threats to taxon:**
Edaphic changes, trampling, habitat loss, human interference, overexploitation, grazing, habitat fragmentation, trade for market or medicine, fire, reproductive problems and propagation difficulties are resulting in and may result in population decline. The influence of threats on the population structure are well understood, are not reversible and have not ceased to be a threat.

**Trade:**
The taxon is in trade for its roots and medicinal value. Scientific collections also has resulted in a perceived or inferred population decline.

**Population**

**Numbers/Generation time/Trend:**
Mature individuals in all populations are <50. The number of mature individuals declined in the past by 20% and likely to decline by 20% in the future. Generation time 1 year.

**Trends:**
The population size/numbers of the taxon is declining at a rate of >50% in the last 10 years. Predicted decline >60% in the next 10 years due to habitat loss. The threats influencing the population structure are well understood, are not reversible and have not ceased to be threats.

**Recent Field Studies:**
T.A. Rao in Kudremukh National Park, Mysore, Uttara Kannada, Chikmagalur [T.A. Rao, 2000]
S. Phatak in Pratapghad, Londa, 1992, Taxonomy, Cytology.

**Data quality:**
Assessed based on field studies, indirect information and literature/herbarium studies.

**Qualifier:**
The Area and Extent estimated based on known locations. The habitat status, threats, mature individuals and population trends observed.

**Status**

**IUCN RED LIST CRITERIA (1994):**
Critically endangered

**IUCN RED LIST CRITERIA (2000):**
Critically endangered

**CITES:**
Appendix II

**National Red Data Book:**
Not listed

**Other legislation:**
Included in the Negative list of Exports (EXIM Policy), 1999

**Known presence in Protected Areas:**
Kudremukh National Park

**Uncertainty**
Assessed with 95% confidence based on evidence, precaution and on the consensus of the field biologists at the workshop.

**Recommendations**

**Research:**
Survey, genetic research, limiting factor research, life history studies, PHVA

**Management:**
Habitat management, sustainable utilisation, cultivation/breeding, wild population management, public awareness, genome resource banking, monitoring, limiting factor management.

**Cultivation:**
Cultivation is recommended for research, preservation of live genome and reintroduction. Cultivated stocks are available at Kudremukh National Park orchidarium. There is no coordinated species management programme for this species and one is not recommended. Initiate programme within 3 years. Some propagation techniques known for taxon or similar taxa.

**Other comments:**
This species was described by J.D. Hooker based on Gibson's collections from near Kyreswar and 'Kandala'. Fischer treats this as a variety under H. digitata Lindley. It is isolated in Mahabaleshwar [Wada]. Santapau collected it in Mumbai, Lonavala, Khandala. One may not be able to site the specimen every season on the same spot as the tubers hibernate. There is a perceptable ecological change. Exploitation by humans due to research and medicine. Life span of the tuber is seasonal, July-September. This species is not found in the area at present.

**Sources:**
Bennet 1984 5: 452; Fischer, 1928: 1469; Hook. f. 1890 6: 135

**Compilers:**
Reviewers:

**Habenaria pallideviridis** Seidenf., 1993

**Scientific name (author; date):** Habenaria pallideviridis Seidenf., 1993

**Habit:** Terrestrial herb

**Habitat:** Grassland

**Habit: 2,100m.**

**Distribution**

**Historical distribution:**

Endemic to Western Ghats (Tamil Nadu)

**Distribution from Literature:**


**Distribution from Field Studies:** None.

**Extent of occurrence (Sq. km.):** <100

**Area of occupancy (Sq. km.):** <10.

**Number of Subpopulations/Location:** 1/1

**Habitat status:** Decrease in the habitat <20% in the last 10 years due to loss of habitat. There is no change in the quality of the habitat.

**Threats**

**Threats to taxon:** Grazing, habitat loss and trampling resulting in and may result in population decline. The influence of threats on the population structure is well understood, is not reversible and has not ceased to be a threat.

**Trade:** Not in trade.

**Population**

**Numbers/Generation time/Trend:** Mature individuals in all populations are <50.

**Trends:** Unknown

**Recent Field Studies:** None

**Data quality:** Assessed based on literature/herbarium studies only.

**Qualifier:** The Area and Extent estimated from literature distribution. Habitat status, threats and mature individuals inferred from literature and from indirect information.

**Status**

**IUCN RED LIST CRITERIA (1994):** CRITICALLY ENDANGERED

Criteria: B1a+b(iii), 2a+b(iii); D

**IUCN RED LIST CRITERIA (2000):** CRITICALLY ENDANGERED

Criteria: B1a+b(iii), 2a+b(iii); D

**CITES:** Appendix II

**National Red Data Book:** Not listed

**Other legislation:** International RDB: Not listed

**Known presence in Protected Areas:** Included in the Negative list of Exports (EXIM Policy), 1999

**Uncertainty**

**Assessment based on precaution and a range of opinion.**

**Recommendations**

**Research:** Survey and life history studies.

**Management:** Monitoring, cultivation/breeding

**Cultivation:** Coordinated species management programme for this species is recommended. Initiate programme within 3 years. Some propagation techniques known for similar taxa

**Other comments:** This species was proposed by Seidenfaden based on a collection by K.M. Matthew from the Palni Hills. This species has been reported only from Palni hills [Seidenfaden, 1999].

**Sources:**


**Compilers:** A. Durai, E. Mohan, R. Hegde, V.S. Ramachandra, N. Raman, K.G. Selvi, B.V. Shetty

**Habenaria panchganiensis** Santapau & Kapadia, 1957

_Habenaria variabilis_ Blatter & McCann, 1932 non Ridley, 1886

**Terrestrial herb**

**Table lands and slopey hill tops**

**Moist grassy slopes. 1500-2000 m.**

### Distribution

**Historical distribution:**

- **India**
- **ENDEMIC to Western Ghats (Maharashtra)**
- **Satara and Sindhudurg district, Western Ghats of Maharashtra** [Nayar & Sastry, 1990].
- **Panchagani, Mahabaleshwar, northern Western Ghats** [Nayar, 1996].
- **Maharashtra: Panchagani, Mahabaleshwar** [S. Phatak, 1976-96]

**Distribution from Literature:**

- **Satara and Sindhudurg district, Western Ghats of Maharashtra** [Nayar & Sastry, 1990].
- **Panchagani, Mahabaleshwar**, northern Western Ghats [Nayar, 1996]

**Distribution from Field Studies:**

- **Maharashtra:** Panchagani, Mahabaleshwar [S. Phatak, 1976-96]

**Extent of occurrence (Sq. km.):**

- 100-5,000

**Area of occupancy (Sq. km.):**

- <10

**Number of Subpopulations/location:**

- 3/2. Fragmented. There is a continuing decline but no extreme fluctuation in the number of locations or subpopulations. All individuals are not in one population

**Habitat status:**

- Decrease in the habitat >50% in the last 20 years due to overgrazing, trampling and tourism. There is decrease in the quality of the habitat due to tourism and horse riding.

### Threats

**Threats to taxon:**

- Interspecific competition, human interference, grazing, habitat loss and trampling are resulting in and may result in population decline. The influence on the population structure is well understood, is not reversible and have not ceased.

**Trade:**

- Not in trade

### Population

**Numbers/Generation time/Trend**

- Mature individuals in all populations are <2,500. The number of mature individuals declined in the past by 50% and is likely to decline by >20% in the future. Generation time – perennial – perinating through tuberoids.

**Trends:**

- The population size/numbers of the taxon is declining at a rate of >50% in the last 10 years. Predicted decline >50% in the next 10 years due to habitat loss.

**Recent Field Studies:**

- S. Phatak in Panchagani, Mahabaleshwar, 1996.

**Data quality:**

- Assessed based on field studies, informal sightings and literature/herbarium studies.

**Qualifier:**

- The Area and Extent estimated based on known locations. The habitat status, threats, mature individuals and population trends observed.

### Status

**IUCN RED LIST CRITERIA (1994):**

- **CRITICALLY ENDANGERED**
- **Criteria:** B1>2bcde

**IUCN RED LIST CRITERIA (2000):**

- **CRITICALLY ENDANGERED**
- **Criteria:** B2a+b(ii,iii,iv,v)

**CITES:**

- Appendix II
- Indian WL. (P) Act: Not listed

**National Red Data Book:**

- Rare [Nayar & Sastry, 1990]
- International RDB: Not listed

**Other legislation:**

- Included in the Negative list of Exports (EXIM Policy), 1999

**Known presence in Protected Areas:**

- Assessed with 95% confidence based on evidence, precaution and on the consensus of the field biologists at the workshop.

### Recommendations

**Research:**

- Survey, genetic research, life history studies, limiting factor research, PHVA pending

**Management:**

- Habitat management, wild population management, monitoring

**Cultivation:**

- Cultivated stocks are not available. Initiate cultivation programme within 3 years. Some propagation techniques known for taxon or similar taxa.

**Other comments:**

- This was originally described by Blatter & McCann as _H. variabilis_, a later homonym of that of Ridley (1886) and hence illegitimate. Hence, Satapau & Kapadia (1957) proposed the new name. Only known from two localities including the collection of its type in Satara district [Nayar & Sastry, 1990]. The species has almost disappeared in the first tableland, there are very few in the second tableland and surviving in the third, fourth and fifth due to its inaccessibility. It is mainly found in the third tableland.

**Sources:**


**Compilers:**


**Reviewers:**

**Habenaria periyarensis** Sasidharan et al., 1998

Terrestrial herb

Grasslands

Among short grasses. 1200 m.

**Scientific name (author; date):** Habenaria periyarensis Sasidharan et al., 1998

**Habit:** Terrestrial herb

**Niche/ elevation:** Among short grasses. 1200 m.

**Distribution**

**Current Global Distribution:** ENDEMIC to Western Ghats (Kerala)

**Historical distribution:**

**Distribution from Literature:** Periyar Tiger Reserve [Sasidharan et al., 1998].

**Distribution from Field Studies:** None

**Extent of occurrence (Sq. km.):** <100

**Area of occupancy (Sq. km.):** <10

**Number of Subpopulations/location:** 1/1

**Habitat status:** Decrease in the habitat <20% in the last 10 years due to loss of habitat. Change in the quality of habitat not known.

**Threats**

**Threats to taxon:** Habitat loss, grazing and trampling. The influence on the population structure is well understood.

**Trade:** Not in trade.

**Population**

**Numbers/Generation time/Trend:** Mature individuals in all populations are <50.

**Trends:** Unknown

**Recent Field Studies:** None

**Data quality:** Assessed based on literature/herbarium studies.

**Qualifier:** The Area, Extent of occurrence, habitat status, threats and mature individuals observed and estimated.

**IUCN RED LIST CRITERIA (1994):** CRITICALLY ENDANGERED

**Criteria:** B1+2c; D

**CITES:** Appendix II

**Indian WL. (P) Act:** Not listed

**International RDB:** Not listed

**Known presence in Protected Areas:** Periyar Tiger Reserve

**Other legislation:** Included in the Negative list of Exports (EXIM Policy), 1999

**National Red Data Book:** Not listed

**Uncertainty:** Assessment of *H. periyarensis* is with 95% confidence based on evidence and range of opinion.

**Recommendations**

**Research:** Survey, limiting factor research, taxonomic research, life history studies

**Management:** Monitoring, cultivation/breeding

**Cultivation:** Cultivation is recommended for research and preservation of live genome. There is no coordinated species management programme for this species and one is recommended. Initiate cultivation programme within 3 years. Some propagation techniques known for similar taxa.

**Other comments:** Recently described species by Sasidharan, Rajesh and Jomy based on a collection from Periyar. It is related to *H. diphylla* Dalz.

**Sources:** Sasidharan et al., 1998 8(2): 167

**Compilers:** A. Durai, E. Mohan, R. Hegde, V.S. Ramachandran, N. Raman, K.G. Selvi, B.V. Shetty

**Scientific name (author; date):** Habenaria perrottetiana A. Rich., 1841

**Synonym:** Platanthera lutea Wight, 1844-1845

**Habit:** Terrestrial herb

**Habitat:** Grassland

**Distribution**

**Historical distribution:** India

**Current Global Distribution:** ENDEMIC to Western Ghats (Karnataka, Kerala & Tamil Nadu)


**Data quality:** Assessed based on field studies, census/monitoring and literature/herbarium studies.

**Qualifier:** The Area and Extent estimated based on known locations. The habitat status, threats, mature individuals and population trends observed and inferred.

**Status**

**IUCN Red List Criteria (1994):** ENDANGERED

**IUCN Red List Criteria (2000):** ENDANGERED

**CITES:** Appendix II

**National Red Data Book:** Not listed

**Other legislation:** Included in the Negative list of Exports (EXIM Policy), 1999

**Known presence in Protected Areas:** Eravikulam National Park, Kudremukh National Park, Mukurthi National Park

**Uncertainty**

Assessed with 95% confidence based on evidence, range of opinion and on the consensus of the field biologists at the workshop.

**Recommendations**

**Research:** Survey, life history studies, PHVA

**Management:** Monitoring, habitat management and cultivation/breeding

**Cultivation:** Cultivation is recommended for research. Cultivated stocks not available. There is no coordinated species management programme for this species and one is not recommended. Initiate cultivation programme within 3 years. Propagation techniques not known at all.

**Other comments:** Described by A. Richard based on Perrottet's collection from Ootacamund. Record of its occurrence in Karnataka i.e. Kudremukh (T.A. Rao pers. comm. at the workshop) needs confirmation.

**Sources:**


Scientific name (author; date): Habenaria polyodon Hook. f., 1890

H. timbriata Wight 1851 non R. Br., 1813

Synonym: Habenaria fimbriata Wight 1851 non R. Br., 1813

Habit: Terrestrial herb

Habitat: Grasslands

Habitat/ elevation: 1600-1800 m.

Distribution

Historical distribution: India

Current Global Distribution: ENDEMIC to Western Ghats (Tamil Nadu)

Distribution from Literature:

-- Tamil Nadu: Bikkapathimund [T. Chhabra, 1995]

From Field Studies:

-- Extent of Occurrence (Sq. km.): <100
-- Area of Occupancy (Sq. km.): <10
-- Number of Subpopulations/location: 3/1. Fragmented. All individuals are not in one population and one subpopulation does not hold 95% or more of the total population.

Habitat status:

Decrease in the habitat >20% in the last 10 years. >20% predicted decline in the next 10 years due to loss of habitat and grazing. Decrease in the quality of the habitat due to grazing.

Threats

Threats to taxon:

Human interference, grazing and habitat loss are resulting in and may result in population decline. The influence on the population structure well understood, not reversible and not ceased to be a threat.

Trade:

Not in trade

Population

Numbers/Generation time/Trend

Mature individuals in all populations <250. Number of mature individuals declined in the past by >20% and likely to decline by >20% in the future (say, 10 years). Generation time 1 year.

Trends:

The population size/numbers of the taxon declining at a rate of >20% in the last 10 years. Predicted decline >20% in the next 10 years due to habitat loss.

Recent Field Studies:


Data quality:

Assessed based on field studies, informal sightings and literature/herbarium studies.

Qualifier:

The Area and Extent estimated based on known locations. The habitat status, threats, mature individuals and population trends inferred and estimated.

Status

IUCN Red List Criteria (1994): CRITICALLY ENDANGERED

IUCN Red List Criteria (2000): CRITICALLY ENDANGERED

CITES: Appendix II

National Red Data Book: Not listed

Other legislation: Not listed

Known presence in Protected Areas:

Uncertainty

Assessed with based on some evidence, precaution, subjective and on the consensus of the field biologists at the workshop.

Recommendations

Research:

Survey, life history studies, genetic research and PhVA pending.

Management:

Habitat management, wild population management, monitoring and cultivation/breeding.

Cultivation:

Cultivation is recommended for research. Cultivated stocks are not available. There is no coordinated species management programme for this species and one is not recommended. Initiate cultivation programme within 3 years. Propagation techniques not known at all

Other comments:

Originally proposed by Wight based on a collection from Nilgiris. Wight's name, H. timbriata, however could not be accepted, as it was a later homonym of that of R. Br. (1813). Hence, Hook. f. proposed the name polyodon. The habitat should be thoroughly surveyed and protected. Hooker [1888-1890] reported this species from Nilgiris based on Wight's collection. Fischer also gives the same collection along with another of Gamble from Nilgiris, but none of these specimens are available in MH. Joseph [1983] states that he could not collect it from Nilgiris or its neighbourhood [Mohan & Balakrishnan, 1991].

Sources:


Compilers:


Reviewers:

**Scientific name (author; date):** Habenaria richardiana Wight, 1851

**Habit:** Terrestrial tuberous herb

**Habitat:** Moist deciduous forests and grasslands

**Niche/ elevation:** 1200-2,500 m.

**Distribution**

**Historical distribution:**

**Current Global Distribution:** ENDEMIC to Western Ghats (Kerala & Tamil Nadu)

**Distribution from Literature:**


**Distribution from Field Studies:** Tamil Nadu: Dawre in Kodaikanal [Rajan, 1985]

**Extent of Occurrence (Sq. km.):** 100-5,000

**Area of Occupancy (Sq. km.):** 10-500

**Number of Subpopulations/location:** 10– 20/5– 10. Fragmented. All individuals not in one population and one subpopulation does not hold 95% or more of the total population.

**Habitat status:** Decrease in the habitat >80% in the last 10 years due tourism. Decrease in the quality of the habitat due to tourism.

**Threats**

**Threats to taxon:** Habitat loss resulting in and may result in population decline. The influence on the population structure well understood, not reversible and not ceased to be a threat.

**Trade:**

**Number/Generation time/Trend:** Unknown

**Trends:** The population size/numbers of the taxon declining at a rate of >20% in the last 10 years.

**Recent Field Studies:** None

**Data quality:** Assessed based on informal sighting and literature/herbarium studies.

**Qualifier:** The Area and Extent estimated as inferred from literature. Threats, mature individuals and population trends inferred based on habitat information.

**Status**

**IUCN Red List Criteria (1994):** ENDEangered

**IUCN Red List Criteria (2000):** B1+2abc

**CITES:** Appendix II

**National Red Data Book:** Not listed

**Other legislation:** Included in the Negative list of Exports (EXIM Policy), 1999

**Known presence in Protected Areas:** None

**Uncertainty**

Assessed based on inference, precaution, subjective and on the consensus of the field biologists at the workshop.

**Recommendations**

**Research:** Survey, limiting factor research, life history studies and PHVA

**Management:** Habitat management and monitoring, cultivation/breeding

**Cultivation:** Initiate cultivation programme within 3 years. Some propagation techniques known for similar taxa.

**Other comments:** Proposed by Wight based on a collection from Nilgris and Trivancore Hills. In Doddabetta the habitat has been destroyed mainly due to tourism. Except for a single recent gathering in 1970 by E. Vajravelu, this plant is represented in Indian herbaria only by old collections made in 1883 by Gamble from Doddabetta [2050m].


**Compilers:** A. Durai, E. Mohan, R. Hegde, V.S. Ramachandran, N. Raman, K.G. Selvi, B.V. Shetty

**Habenaria suaveolens** Dalz., 1850

**Terrestrial herb**

**Evergreen forests**

**Moist forest floor. 500-1500 m.**

**Distribution**

**Historical distribution:**

**Current Global Distribution:** ENDEMIC to Western Ghats (Maharashtra & Karnataka)

**Distribution from Field Studies:**

- 100-5,000

**Area of Occupancy (Sq. km.):**

- 10-500

**Number of Subpopulations/locations:**

- 4. Fragmented

**Habitat status:**

Decrease in the habitat >20% in the last 10 years. >20% predicted decline in the next 10 years due to urbanization. Decrease in the quality of the habitat due to human interference and tourism.

**Threats**

**Threats to taxon:**

Human interference, grazing, habitat loss and trampling resulting in and may result in population decline. The influence on the population structure well understood, not reversible and not ceased to be a threat.

**Trade:**

Not in trade

**Population**

**Numbers/Generation time/Trend:**

Unknown

**Trends:**

The population sizes/numbers declining.

**Recent Field Studies:**

-

**Data quality:**

Assessed based only on literature/herbarium studies.

**Qualifier:**

The Area, Extent of occurrence, habitat status, threats, mature individuals and population trends inferred from literature.

**Status**

**IUCN Red List Criteria (1994):**

ENDANGERED

**IUCN Red List Criteria (2000):**

ENDANGERED

**CITES:**

Appendix II

**National Red Data Book:**

Not listed

**Other legislation:**

Included in the Negative list of Exports (EXIM Policy), 1999

None

**Known presence in Protected Areas:**

None

**Uncertainty**

Assessed based on inference, precaution and subjective opinion.

**Recommendations**

**Research:**

Survey and life history studies.

**Management:**

Monitoring.

**Cultivation:**

-

**Other comments:**

Described by Dalzell (1850) based on his collection made between Vignorla and Malwan in Concan. This species is the rarest of Mumbai orchids. Detailed survey is required for this species.

**Sources:**

Dalzell, 1850: 263; Lakshminarasimhan, 1996: 44; Nayar, 1996: 225

**Compilers:**

A. Durai, E. Mohan, R. Hegde, V.S. Ramachandran, N. Raman, K.G. Selvi, B.V. Shetty

**Reviewers:**

**Habenaria travancorica** Hook. f. 1890.

*Habenaria lindleyana* Wight 1844-45 non Steud., 1840

*Habenaria digitata* Lindley var. *travancorica* (Hook. f.) C. Fischer, 1928

*Habenaria gibsonii* Hook. f. var. *travancorica* (Hook. f.) Pradhan, 1976

**Scientific name (author; date):**

**Synonyms:**

- *Habenaria travancorica*
- *Habenaria lindleyana* Wight 1844-45 non Steud., 1840
- *Habenaria digitata* Lindley var. *travancorica* (Hook. f.) C. Fischer, 1928
- *Habenaria gibsonii* Hook. f. var. *travancorica* (Hook. f.) Pradhan, 1976

**Habit:** Terrestrial herb

**Habitat:** Bare, exposed slopes

**Niche/ elevation:** 1800-1950m.

**Distribution**

**Historical distribution:**

**Current Global Distribution:** ENDEMIC to Western Ghats (Tamil Nadu)

**Distribution from Literature:**

- Pali hills [Nayar, 1996].
- Pali hills, Shembaganur, Levinge Path, Church Cliff [Seidenfaden, 1991]

**Distribution from Field Studies:**

**Extent of Occurrence (Sq. km.):** <100

**Area of Occupancy (Sq. km.):** 5-50

**Number of Subpopulations/location:** Unknown

**Habitat status:** Unknown

**Threats**

**Threats to taxon:** Unknown

**Trade:** Not known

**Population**

**Numbers/Generation time/Trend:** Unknown

**Trends:** Unknown

**Recent Field Studies:** None

**Data quality:** None

**Qualifier:** None

**Status**

**IUCN RED LIST CRITERIA (1994):** DATA DEFICIENT

**Criteria:** --

**IUCN RED LIST CRITERIA (2000):** DATA DEFICIENT

**Criteria:** --

**CITES:**

- Appendix II

**Indian WL. (P) Act:** Not listed

**International RDB:** Not listed

**National Red Data Book:** Included in the Negative List of Exports (EXIM Policy), 1999.

**Other legislation:** Included in the Negative List of Exports (EXIM Policy), 1999.

**Known presence in Protected Areas:** None

**Uncertainty**

**Recommendations**

**Research:** Survey

**Management:** Monitoring

**Cultivation:** Not recommended

**Other comments:**

This was originally proposed by Wight as *H. lindleyana* (1844-45) based on his collection from the Pulney hills. This is unfortunately a later homonym of that Steudel (1840). Hooker, f. proposed the name of *H. travancorica*. Some authors treat this as a variety under *H. digitata* Lindl. It is found endemic to the Pulneys and has not been so far recorded from Travancore. There is no information on this variety. U.C. Pradhan (1976) treats this as a variety under *H. digitata* Lindl. This is illegitimate and unacceptable because the new combination does not have basionym and secondly, this has already been proposed by Fishcher (1928).

**Sources:**


**Compilers:**

- J.L. Ellis, R. Gopalan, R. Ingalhalli, N. Raman, N.C. Rathakrishnan, C. Sathish Kumar, S. Phatak, B. Arthur

**Reviewers:**

Scientific name (author; date): Hetaeria ovalifolia (Wight) Bentham, 1883
Synonym: Goodyera ovalifolia Wight 1851
Habit: Terrestrial herbs.
Habitat: Undergrowth of dense forests
Niché/ elevation: ca. 1800 m.

Distribution
Historical distribution:
Current Global Distribution: ENDEMIC to Western Ghats (Kerala & Tamil Nadu)
Distribution from Literature:

Extent of Occurrence (Sq. km.): 100-5,000
Area of Occupancy (Sq. km.): 10-500
Number of Subpopulations/location: 10/4. Fragmented. No continuing decline or extreme fluctuation in the number of locations or subpopulations. All individuals not in one population and one subpopulation does not hold 95% or more of the total population.

Habitat status:
No change in the habitat of the taxon.

Threats
Threats to taxon: None
Trade: Not in trade

Population
Numbers/Generation time/Trend: Mature individuals in all populations <2,500. The numbers of mature individuals not declined in the past and not likely to decline in the future.
Trends: The population size/numbers increasing.

Recent Field Studies:

Data quality:
Assessed based on informal sighting and literature/herbarium studies.

Qualifier:
The Area and Extent are estimated based on known locations. The habitat status, threats, mature individuals and population trends are observed.

Status
IUCN Red List Criteria (1994): VULNERABLE
Criteria: D2
IUCN Red List Criteria (2000): VULNERABLE
Criteria: D2
CITES: Appendix II
National Red Data Book: Not listed
Other legislation: Not listed
Known presence in Protected Areas: Kalakad-Mundanthurai Tiger Reserve; Neyyar Wildlife Sanctuary

Uncertainty
Assessed based on precaution and on the consensus of field biologists at the workshop.

Recommendations
Research:
Survey, genetic research, life history studies, PHVA pending.
Management:
Habitat management, monitoring and cultivation/breeding.
Cultivation:
There is no coordinated species management programme for this species and one is not recommended. Initiate cultivation programme within 3 years. Propagation techniques not known at all.

Other comments:
Originally proposed by Wight based on his collection from Courtallam where this species has disappeared since then.

Sources:

Compilers:
A. Durai, E. Mohan, R. Hegde, V.S. Ramachandran, N. Raman, K.G. Selvi, B.V. Shetty
Reviewers:
**Ipsea malabarica** (Reichb. f.) Hook. f., 1890.

**Pachystoma malabaricum** Reichb. f., 1864

**Spathoglottis malabarica** (Reichb. f.) Pradhan, 1979

**Scientific name (author; date):** Ipsea malabarica (Reichb. f.) Hook. f., 1890. (Pachystoma malabaricum Reichb. f., 1864) Spathoglottis malabarica (Reichb. f.) Pradhan, 1979

**Synonyms:**

**Habit:** Terrestrial tuberous herbs.

**Habitat:** Grasslands

**Niche/elevation:** Water dripping rocks and slopy grasslands, associated with grasses like Silentvalleya nairii and Tripogon sp. and ferns like Anemia wightiana [MSM]. 900-1500 m.

**Distribution:**

**Current Global Distribution:** ENDEM/IC to Western Ghats (Kerala)

**Distribution from Literature:**


**Distribution from Field Studies:**

- Extent of Occurrence (Sq. km.): 100-5,000
- Area of Occupancy (Sq. km.): 10-500
- Number of Subpopulations/location: 20–253. Fragmented. No continuing decline or extreme fluctuation in the number of locations or subpopulations. All individuals not in one population and one subpopulation does not hold 95% or more of the total population.

**Habitat status:** Decrease in the habitat <20% in the last 10 years due to invasion of trees like Gloichidion, Wendlandia etc. No change in the quality of the habitat.

**Threats to taxon:** Fruit predation by insects. Natural or man-induced threats, grazing, habitat loss, habitat fragmentation, fire and landslides resulting in and may result in population decline. The influence on the population structure well understood, not reversible and not ceased to be threats.

**Trade:** Not in trade

**Population**

**Numbers/Generation time/Trend**

- Mature individuals in all populations >2,500. The numbers of mature individuals not declined in the past and not likely to decline in the future. Generation time 1 year.

**Trends:** The population size/numbers of the taxon is declining at a rate of <20% in the last 10 years.


**Data quality:** Assessed based on field studies, informal sighting and literature/herbarium studies.

**Qualifier:** The Area and Extent are estimated based on known locations. The habitat status, threats, mature individuals and population trends are observed over years.

**Status**

- IUCN Red List Criteria (1994): ENDANGERED
- IUCN Red List Criteria (2000): ENDANGERED
- CITES: Appendix II
- International RDB: Not listed
- Other legislation: Included in the Negative list of Exports (EXIM Policy), 1999
- Known presence in Protected Areas: Silent Valley National Park, Wayanad Wildlife Sanctuary.

**Uncertainty**

Assessed with 95% confidence based on evidence, information from an external source and on the consensus of the field biologists at the workshop.

**Recommendations**

**Research:** Survey

**Management:** Monitoring

**Cultivation:** Cultivation is recommended for research and commercial/sustainability. Cultivated stocks are available at TBGRI – Thiruvananthapuram, Narayana Gurukula, Wayanad and National Orchidarium, Yercaud. Numbers in cultivation ca. 20. There is no coordinated species management programme for this species and one is not recommended. Ongoing cultivation programme intensified or increased. Some propagation techniques known for similar taxa.

**Other comments:** Originally described by Reichenbach f. based on Jordon's collection from the 'Malabar Ghauts.' In Vellarlimal the collection was made by A.K. Pradeep. In Silent Valley, this species was found associated with grass - Silentvalleya nairii. In Meppadi and Vellarlimal it is always associated with Tripogon sp. The flower buds, young flowers and fruits are eaten by insect larvæ which reduces the future population. Seed and tissue culture propagation for this species is well standardised in TBGRI. During the vegetative phase, it is difficult to recognise the plants in the field due to grass like appearance [Nayar & Sastry, 1987]. T.C. Jordon collected this plant around 1850 from the 'Malabar Ghauts' and the specimen is now in Natural History Museum at Wien Austria. It was rediscovered from Silent Valley after a span of 132 years in 1932 [Manilal & Saethish Kumar, 1983; Sathish Kumar, 1999]. The record of its occurrence in Ponmudi [Abraham & Vatsala, 1981; Mohanan & Henry, 1994] is incorrect as it is a case...
of mistaken identity (of *Pachystoma hirsutum*) [Joseph & Vajravelu, 1976; Sathish & Manilal, 1987]. It has also been recorded from Siruvani.

**Sources:**


**Compilers:**

S.S.R. Bennet, J.L. Ellis, M. Mohanan, V. Sarojini Menon, C. Sathish Kumar, S. Seenin, B.V. Shetty, P.S. Udayan, U. Lakshminarayan

**Reviewers:**

**Scientific name (author; date):**

Kingidium mysorense (Saldanha, C.J.) Sathish, 1994

*Phalaenopsis mysorensis* Saldanha, C.J., 1974

**Synonym:**

*Phalaenopsis mysorensis* Saldanha, C.J., 1974

**Habit:**

Monopodial epiphytic herb

**Habitat:**

Evergreen forests

**Niche/ elevation:**

840-1000 m.

**Distribution**

**Historical distribution:**

India

**Current Global Distribution:**

ENDEMIC to Western Ghats (Karnataka, Kerala & Tamil Nadu)

**Distribution from Literature:**


**Distribution from Field Studies:**

Tamil Nadu: Anamalai [V.S. Ramachandran, 1994]

**Extent of Occurrence (Sq. km.):**

100-5,000

**Area of Occupancy (Sq. km.):**

10-500

**Number of Subpopulations/location:**

10–20. Fragmented. Continuing decline but no extreme fluctuation in the number of locations or subpopulations. All individuals not in one population and one subpopulation does not hold 95% or more of the total population

**Habitat status:**

Decrease in the area of habitat due to habitat loss and forest operations. Decrease in the quality of the habitat due to habitat loss.

**Threats**

**Threats to taxon:**

Habitat loss resulting in and may result in population decline. The influence on the population structure well understood, not reversible and not ceased to be a threat.

**Trade:**

Not in trade

**Population**

**Numbers/Generation time/Trend**

Mature individuals in all populations <250. The numbers of mature individuals declined in the past 20% and likely to decline by >10% in the future. Generation time 5-6 years.

**Trends:**

The population size/numbers of the taxon declining at a rate of >10% in the last 10 years. Predicted decline >10% in the next 10 years due to habitat loss.

**Recent Field Studies:**

V.S. Ramachandran in Anamalai, 1994, Medicinal Plants Conservation Area.

**Data quality:**

Assessed based on field studies, informal sighting and literature/herbarium studies.

**Qualifier:**

The Area and Extent estimated based on known locations. Habitat status, threats, mature individuals and population trends observed over many years of field studies.

**Status**

IUCN Red List Criteria (1994):

ENDANGERED

Criteria: B1+2bcde; C2a

IUCN Red List Criteria (2000):

ENDANGERED

Criteria: B1a+b(ii,iii,iv,v), 2a+b(ii,iii,iv,v); C2a(i)

CITES:

Appendix II

Indian WL. (P) Act: Not listed

International RDB: Not listed

National Red Data Book:

Included in the Negative list of Exports (EXIM Policy), 1999

Other legislation:

Indira Gandhi Wildlife Sanctuary

**Known presence in Protected Areas:**

**Uncertainty**

Assessed on subjective opinion with the consensus of the participants.

**Recommendations**

**Research:**

Survey, genetic research and life history studies

**Management:**

Habitat management, monitoring and cultivation/breeding

**Cultivation:**

Cultivation is recommended for commercial/sustainability. Cultivated stocks not available. There is no coordinated species management programme for this species and one is recommended. Initiate cultivation programme after 3 years. Some propagation techniques known for taxon or similar taxa.

**Other comments:**

This species was described by Saldanha from Karnataka.

**Sources:**


**Compilers:**


**Reviewers:**

Scientific name (author; date): **Kingidium niveum** Sathish, 1994

Habit: Epiphytic herb
Habitat: Evergreen forests
Niche/ elevation: Moss-clad branches. 800-950 m.

**Distribution**

**Historical distribution:**

**Current Global Distribution:** ENDEMIC to Western Ghats (Kerala)

**Distribution from Literature:**

Walakkad in Silent Valley [Mohanan & Henry, 1994; Sathish Kumar, 1999]

**Distribution from Field Studies:**


**Extent of Occurrence (Sq. km.):** 5,001-20,000

**Area of Occupancy (Sq. km.):** 10-500

**Number of Subpopulations/location:** 5/3. Fragmented. No continuing decline or extreme fluctuation in the number of locations or subpopulations. All individuals not in one population and one subpopulation does not hold 95% or more of the total population

**Habitat status:** No change in the habitat of the taxon. No change in the quality of the habitat.

**Threats**

**Threats to taxon:** None

**Trade:** Not in trade

**Population**

**Numbers/Generation time/Trend:** Mature individuals in all populations <250. Generation time-- perennial, monopodial.

**Trends:** Unknown

**Recent Field Studies:**


**Data quality:** Assessed based on field studies.

**Qualifier:** The Area and Extent estimated based on known locations. The habitat status, threats and mature individuals observed.

**Status**

**IUCN Red List Criteria (1994):** ENDANGERED Criteria: D

**IUCN Red List Criteria (2000):** ENDANGERED Criteria: D

**CITES:** Appendix II

**National Red Data Book:** Not listed

**Other legislation:** Included in the Negative list of Exports (EXIM Policy), 1999

**Known presence in Protected Areas:** Neyyar Wildlife Sanctuary, Peechi Vazhani Wildlife Sanctuary, Silent Valley National Park

**Uncertainty**

Assessed exclusively but with consensus of the participants.

**Recommendations**

**Research:** Life history studies, PHVA.

**Management:** Monitoring, genome resource banking

**Cultivation:** Cultivation is recommended for research and commercial/sustainability. Cultivated stocks are available at TBGRI – Thiruvananthapuram. Numbers in cultivation 3. There is no coordinated species management programme for this species and one is not recommended. Ongoing cultivation programme intensified or increased. Some propagation techniques known for similar taxa.

**Other comments:** This species was proposed by C. Sathish Kumar, 1994 based on a collection from Silent Valley (Walakkad)

**Sources:**


**Compilers:**


**Reviewers:**

**Scientific name (author; date):** Liparis platyphylla Ridley, 1886

**Habit:**
Unknown

**Habitat:**
Unknown

**Niche/ elevation:**
>1000m.

**Distribution**

**Historical Distribution:**
India

**Current Global Distribution:** ENDEMIC to Western Ghats (Tamil Nadu)

**Distribution from Literature:**
Mysore, Coimbatore, Nilgiris [Rathakrishnan & Chitra, 1984]

**Distribution from Field Studies:**
Unknown

**Extent of Occurrence (Sq. km.):**
Unknown

**Area of Occupancy (Sq. km.):**
Unknown

**Number of Subpopulations/location:**
Unknown

**Habitat status:**
Unknown

**Threats**

**Threats to taxon:**
Unknown

**Trade:**
Not in trade

**Population**

**Numbers/Generation time/trend:**
Unknown

**Population trend:**
Unknown

**Recent Field Studies:**
None

**Data quality:**
Literature/herbarium studies

**Qualifier:**
None

**Status**

**IUCN Red List Criteria (1994):** DATA DEFICIENT

**Criteria:**
--

**IUCN Red List Criteria (2000):** DATA DEFICIENT

**Criteria:**
--

**CITES:**
Appendix II

**Indian WL. (P) Act:**
Not listed

**International RDB:**
Not listed

**National Red Data Book:**
Not listed

**Other legislation:**
Included in the Negative List of Exports (EXIM Policy), 1999.

**Known presence in Protected Areas:**
None

**Uncertainty**

Very high. Nothing is known about this species

**Recommendations**

**Research:**
Survey

**Management:**
Monitoring

**Cultivation:**
None in cultivation. Not recommended for cultivation.

**Other comments:**
Proposed by Ridley based on Beddome’s collection from the ‘Anamallays’. It is related to L. olivacea Lindl., but different in having broader leaves and with crenulate lip. This species has not been collected after the type collection.

**Sources:**
Rathakrishnan & Chitra, 1984: 1005; Ridley, 1886: 264

**Compilers:**
C. Sathish Kumar

**Reviewers:**
B.V. Shetty, B. Arthur, S. Molur
**Scientific name (author; date):** Luisia abrahamii Vatsala, 1981

**Habit:** Epiphytic herbs

**Habitat:** Mois deciduous to evergreen forests

**Niche/ elevation:** 300-600 m.

**Distribution**

**Historical distribution:**

**Current Global Distribution:** ENDEMIC to Western Ghats (Kerala)

**Distribution from Literature:** Thenmala- Aryankavu range [Vatsala, 1981]

**Distribution from Field Studies:** Kerala: Thenmala to Aryankavu (1986), Ranni (1992) [Sathish Kumar]

**Extent of Occurrence (Sq. km.):** 100-5,000

**Area of Occupancy (Sq. km.):** <10

**Number of Subpopulations/location:** 2. Fragmented. All individuals not in one population and one subpopulation does not hold 95% or more of the total population.

**Habitat status:** The change in the habitat not known. Predicted decline >50% in the next 10-15 years due to the development of the area as an eco-tourism village. Decrease in the quality of the habitat due to the development of the area as eco-tourism village.

**Threats**

**Threats to taxon:** Habitat loss and human interference resulting in and may result in population decline. The influence on the population structure well understood, not reversible and have not ceased.

**Trade:** Not in trade

**Population**

**Numbers/Generation time/Trend:** Mature individuals in all populations <50. The numbers of mature individuals likely to decline by <50% in the future. Generation time – perennial.

**Trends:** Stable. Predicted decline >50% in next 5-10 years.

**Recent Field Studies:** C. Sathish Kumar in Thenmala, Palaruvi, 1994, A case study on the rare and endangered orchids of Kerala.

**Data quality:** Assessed based on field studies, indirect information and literature/herbarium studies.

**Qualifier:** The Area and Extent estimated based on known locations. The habitat status, threats, mature individuals and population trends observed over many years and inferred from developmental activities.

**Status**

**IUCN Red List Criteria (1994):** CRITICALLY ENDANGERED

**IUCN Red List Criteria (2000):** CRITICALLY ENDANGERED

**CITES:** Appendix II

**National Red Data Book:** Not listed

**International RDB:** Included in the Negative list of Exports (EXIM Policy), 1999

**Known presence in Protected Areas:** None

**Uncertainty**

Assessed based on precaution and collective opinion.

**Recommendations**

**Research:** Life history studies, PHVA pending.

**Management:** Monitoring, cultivation/breeding

**Cultivation:** Cultivation is recommended for research, commercial sustainability and preservation of live genome. Cultivated stocks are available at TBGRI – Thiruvananthapuram and National Orchidarium, Yercaud. Numbers in cultivation ca. 5. There is no coordinated species management programme for this species and one is not recommended. Ongoing cultivation programme intensified or increased. Information on propagation techniques not available with this group of compilers.

**Other comments:** Proposed by Vatsala based on her collection made from Thenmala – Aryankavu range in April 1973. It grows on Ixora brachiata.

**Sources:** Vatsala, 1981: 489.

**Compilers:** S.S.R. Bennet, J.L. Ellis, M. Mohanan, V. Sarojini Menon, C. Sathish Kumar, S. Seeni, B.V. Shetty, P.S. Udayan, U. Lakshminarayan

Scientific name (author; date): **Luisia evangelinae** Blatter & McCann, 1932  

**Synonym:** 

**L. tenuifolia** Blume var. evangelinae (Blatter & McCann) Santapau & Kapadia, 1962

**Habit:** Epiphyte

**Habitat:** Evergreen and deciduous forests

**Niche/ elevation:** 600-850 m.

**Distribution**

**Historical distribution:** India

**Current Global Distribution:** ENDANGERED to Western Ghats (Maharashtra, Karnataka & Kerala)


**Distribution from Field Studies:** Karnataka: Sringeri, Chikkamagalur, Agumbe, Yellapur, Anmode [S. Phatak, 1997, 99].

**Extent of Occurrence (Sq. km.):** 100-5,000

**Area of Occupancy (Sq. km.):** 10-500

**Number of Subpopulations/location:** 20/<10. Fragmented. Continuing decline but no extreme fluctuation in the number of locations or subpopulations. All individuals not in one population and one subpopulation does not hold 95% or more of the total population.

**Habitat status:** Decrease in the habitat. >20% in the last 10 years due to road construction, traffic and tourism. Decrease in the quality of the habitat due to road construction, traffic and tourism.

**Threats**

**Threats to taxon:** Habitat loss is resulting in and may result in population decline. The influence on the population structure is well understood, is not reversible and has not ceased.

**Trade:** Not in trade

**Population**

**Numbers/Generation time/Trend:** Mature individuals in all populations <250. The numbers of mature individuals declined in the past by 20% and likely to decline by 20% in the future. Generation time - perennial.

**Trends:** Declining by >20% in the last 10 years. Predicted decline >20% in the next 10 years.


**Data quality:** Assessed based on field studies, informal sighting and literature/herbarium studies.

**Qualifier:** The Area and Extent estimated based on known locations. The habitat status, threats, mature individuals and population trends observed for some areas and inferred for other areas.

**Status**

**IUCN Red List Criteria (1994):** ENDANGERED  

**IUCN Red List Criteria (2000):** ENDANGERED  

**CITES:** Appendix II  

**National Red Data Book:** Not listed  

**Other legislation:** Included in the Negative list of Exports (EXIM Policy), 1999

**Known presence in Protected Areas:** Silent Valley National Park

**Uncertainty**

Assessed based on evidence provided by a subjective study but with the consensus of field biologists.

**Recommendations**

**Research:** Survey

**Management:** Monitoring

**Cultivation:** Cultivated stocks are available at local green house [S. Phatak]. Numbers in cultivation. There is no coordinated species management programme for this species and one is not recommended. Initiate cultivation programme after 3 years. Some propagation techniques known for similar taxa.

**Other comments:** Proposed by Blatter & McCann based on T.R. Bell’s Ms notes and a painting by Miss Evangeline Bell. Santapau and Kapadia reduced *L. evangelinae* Blatter & McCann to a variety of *L. tenuifolia* Bl. (*Luisia birchea* (A. Rich) Bl.). According to them the only difference between the two are the rounded apex of the leaf in the latter as against the linked one in the former, while the flowers are “identical”. But Abraham & Vatsala are convinced that the two are different enough to warrant relegation into two different species as the vegetative aspect of the two are very distinct. *L. tenuifolia* is a robust erect species, whereas *L. evangelinae* is pendant, fragile with distinctly kinked leaves. Following Santapau & Kapadia, Seidenfaden has dumped *L. evangelinae* also under *L. birchea* [Abraham & Vatsala, 1981].

**Sources:** Abraham & Vatsala, 1981: 483; Blatter & McCann, 1932: 35, 493.t.11; Manoharan et al., 1999: 206; Santapau & Kapadia, 1962: 59, 829; Sathish Kumar, 1999: 206; Sharma et al., 1984: 273;

**Compilers:** A. Durai, E. Mohan, R. Hegde, V.S. Ramachandran, N. Raman, K.G. Selvi, B.V. Shetty

Scientific name (author; date): **Luisia macrantha** Blatter & McCann, 1932

**Habitat:**

Epiphytic herb

**Habitat:**

Dry and moist deciduous forests

**Niche/ elevation:**

750-1000m

**Distribution**

**Historical distribution:**

**Current Global Distribution:** ENDEMIC to Western Ghats (Karnataka & Kerala)

**Historical distribution:**

**Distribution from Literature:**


**Distribution from Field Studies:**


**Extent of Occurrence (Sq. km.):** 100-5,000

**Area of Occupancy (Sq. km.):** 10-500

**Number of Subpopulations/location:** 6020. Fragmented. There is a continuing decline but no extreme fluctuation in the number of locations or subpopulations. All individuals are not in one population.

**Habitat status:**

Decrease in the habitat <20% in the last 10 years due to loss of habitat. Predicted decline <20% in the next 10 years. Change in the quality of habitat due to deforestation.

**Threats**

**Threats to taxon:**

Habitat loss, decline of host species due to extraction of timber and fire. The influence on the population structure is well understood. Not reversible and not ceased to be threats.

**Trade:**

Not in trade.

**Population**

**Numbers/Generation time/Trend**

Mature individuals in all populations are >2500. Mature individuals declined in the past 5-10%. Predicted decline 5-10%. Generation time 3-5 years.

**Trends:**

The population size/numbers of the taxon is declining at a rate of >10% in the last 10 years. Predicted decline >10% in the next 10 years.

**Recent Field Studies:**


**Data quality:**

Assessed based on field studies and literature/herbarium studies.

**Qualifier:**

The Area and Extent estimated based on known locations. The habitat status, threats, mature individuals and population trends observed for some areas and inferred for other areas.

**Status**

**IUCN RED LIST CRITERIA (1994):**

**IUCN RED LIST CRITERIA (1994):**

**CITES:**

Appendix II

Indian WL. (P) Act: Not listed

**National Red Data Book:**

Not listed

**Other legislation:**

Included in the Negative list of Exports (EXIM Policy), 1999

**Known presence in Protected Areas:**


**Uncertainty**

Assessed with 95% confidence based on evidence, and on subjective opinion.

**Recommendations**

**Research:**

Survey, life history studies

**Management:**

Monitoring, cultivation/breeding, monitoring

**Cultivation:**

Cultivation is recommended for research. Cultivated stocks exist in department of Botany, Mysore University and local green house, Goa. There is no coordinated species management programme for this species and one is recommended. Initiate cultivation programme after 3 years. Some propagation techniques known for similar taxa.

**Other comments:**

This species was described by Blatter & McCann based on T.R. Bell's ms notes after a collection made from Yellapur and a coloured painting by Ms. Evangeline Bell.

**Sources:**


**Compilers:**

A. Durai, E. Mohan, R. Hegde, V.S. Ramachandra, N. Raman, K.G. Selvi, B.V. Shetty

**Reviewers:**


Conservation Assessment and Management Plan Workshop Report for Endemic Orchids of the Western Ghats 2001
Scientific name (author; date):

Oberonia agastyamalayana  Sathish, 1994

Oberonia longifolia Muktesh & Stephen, 1998

Synonym:

Oberonia agastyamalayana

Oberonia longifolia

Scientific name (author; date):

Habit:

Epiphyte

Evegreen forests

Habitat:

Habitat:

Epiphyte

Habitation:

Evergreen forests

Niche/ elevation:

Unknown

Distribution

Historical distribution:

India

ENDEMIC to Western Ghats (Kerala)

Current Global Distribution:

Silent Valley [Muktesh Kumar, 1991]. Agastyamala [Sathish Kumar & Maniilal, 1994].

Distribution from Literature:

Kerala; Agastyamala [Sathish Kumar, R. Gopalan]. Silent Valley [Muktesh Kumar & Sequiera].

Distribution from Field Studies:

<5,000

<10

Area of Occupancy (Sq. km.):

<5,000

<10

Number of Subpopulations/location:

22. Fragmented.

The habitat is stable. Quality of the habitat stable.

Habitat status:

Threats

Threats to taxon:

Unknown

Trade:

Not in trade

Population

Numbers/Generation time/Trend

Mature individuals in all populations <50.

The population size/numbers of the taxon stable.

Trends:

Recent Field Studies:

None

Data quality:

Assessed based on field observation.

Qualifier:

The Area and Extent estimated based known locations. The habitat status, mature individuals and population trends from observation and informal sightings.

Status

IUCN Red List Criteria (1994):

CRITICALLY ENDANGERED

Criteria: D

IUCN Red List Criteria (2000):

CRITICALLY ENDANGERED

Criteria: D

CITES:

Appendix II

Indian WL. (P) Act: Not listed

National Red Data Book:

Not listed

Included in the Negative list of Exports (EXIM Policy), 1999

Other legislation:

Not listed

Known presence in Protected Areas:

Silent Valley National Park

Uncertainty

Assessed with 95% confidence and on consensus.

Recommendations

Research:

Survey and taxonomic research

Management:

Habitat management and monitoring

Cultivation:

Initiate cultivation programme after 3 years. Some cultivation techniques known for taxon or similar taxa.

Other comments:

Proposed by C. Sathish Kumar based on a collection from Agastyamala. O. longifolia described recently from Silent Valley is in agreement with this species in all characters except the length of the leaves. There is only one collection from the type locality. Since Agastyamala is inaccessible and is a protected area, the habitat is stable [R. Gopalan]. It has no ornamental or medicinal value, therefore cultivation is not required.

Sources:


Compilers:

A.Durai, E. Mohan, R. Hegde, V.S. Ramachandran, N. Raman, K.G. Selvi, B.V. Shetty

Reviewers:

**Scientific name (author; date):**

Oberonia anamalayana Joseph, 1963

**Habit:**

Epiphytic herbs

**Habitat:**

Evergreen forests

**Niche/ elevation:**

950-1500m.

**Distribution**

**Historical distribution:**

India

**Current Global Distribution:**

Endemic to Western Ghats (Kerala & Tamil Nadu)

**Distribution from Literature:**


**Distribution from Field Studies:**

Kerala: Idukki, Thariode in Wayanad, Waverly Estate Reserve forests at Anamalais [R. Ansari].

**Extent of Occurrence (Sq. km.):**

100-5,000

**Area of Occupancy (Sq. km.):**

10-500

**Number of Subpopulations/location:**

10-15/5–10. Fragmented.

**Habitat status:**

The habitat is stable. Decrease in the quality of the habitat due to tree felling [R. Ansari].

**Threats**

**Threats to taxon:**

Habitat loss

**Trade:**

Not in trade

**Population**

**Numbers/Generation time/Trend:**

Mature individuals in all populations are <250. Generation time is five to six years.

The population size numbers of the taxon is declining at a rate of >20% in the last 10 years.

**Trends:**

R. Ansari in Wayanad, 1992, Plants of Malabar.

**Recent Field Studies:**

R. Ansari in Wayanad, 1992, Plants of Malabar.

**Data quality:**

Assessed based on literature/herbarium studies.

**Qualifier:**

The Area, Extent, habitat status, threats, mature individuals and population trends inferred from literature.

**Status**

**IUCN Red List Criteria (1994):**

ENDANGERED

**Criteria:**

B1+2c; D

**IUCN Red List Criteria (2000):**

ENDANGERED

**Criteria:**

B1a+b(iii), 2a+b(iii); D

**CITES:**

Appendix II

Indian WL. (P) Act: Not listed

International RDB: Not listed

**National Red Data Book:**

Not included in the Negative list of Exports (EXIM Policy), 1999

**Other legislation:**

Silent Valley National Park, Wayanad Wildlife Sanctuary.

**Known presence in Protected Areas:**

Assessed on subjective opinion.

**Uncertainty**

**Assessed on subjective opinion.**

**Recommendations**

**Research:**

Survey

**Management:**

Monitoring, cultivation/breeding

**Cultivation:**

Initiate cultivation programme after 3 years. Some propagation techniques known for taxon or similar taxa.

**Other comments:**

This was proposed by Joseph based on his collection from the Anamalais. As there has been no recent collection data is insufficient. This species occurs in protected areas, therefore habitat change is not expected [R. Gopalan].

**Sources:**


**Compilers:**

A. Durai, E. Mohan, R. Hegde, V.S. Ramachandran, N. Raman, K.G. Selvi, B.V. Shetty

**Reviewers:**

**Oberonia balakrishnani** R. Ansari, 1990

**Epiphytic herb**

**Wet deciduous forest**

**1800m.**

### Distribution

**Historical distribution:**

India

**Current Global Distribution:**

ENDEMIC to Western Ghats (Tamil Nadu)

**Distribution from Literature:**

Kodaikanal, Church Cliff, Kukkal Hill path down to paddy fields [Seidenfaden, 1999]

**Distribution from Field Studies:**

None

**Extent of Occurrence (Sq. km.):**

<100

**Area of Occupancy (Sq. km.):**

<10

**Number of Subpopulations/location:**

2/2. Fragmented.

**Habitat status:**

Human interference, tourism and developmental activities have decreased the quality of habitat.

### Threats

**Threats to taxon:**

Human interference, tourism, developmental activities

**Trade:**

Not in trade.

### Population

**Numbers/Generation time/Trend**

Unknown

**Trends:**

Unknown

### Recent Field Studies:

None

### Data quality:

Literature/herbarium studies.

### Status

**IUCN Red List Criteria (1994):**

CRITICALLY ENDANGERED

**Criteria:**

B1+2c

**IUCN Red List Criteria (2000):**

CRITICALLY ENDANGERED

**Criteria:**

B1a+b(iii), 2a+b(iii)

**CITES:**

Appendix II

**Indian WL. (P) Act:**

Not listed

**International RDB:**

Not listed

**Known presence in Protected Areas:**

None

**Uncertainty:**

No studies carried out on this taxon.

### Recommendations

**Research:**

Survey and Life history studies.

**Management:**

Habitat management and monitoring.

**Cultivation:**

Not recommended. There is no species management programme.

**Other comments:**

Described by R. Ansari based on Bourne’s collection from Kodaikanal. Matthew recorded this species from Kukkal. Endemic to Palni hills [Seidenfaden, 1999].

**Sources:**


**Compilers:**

A. Durai, E. Mohan, R. Hegde, V.S. Ramachandran, N. Raman, K.G. Selvi, B.V. Shetty

**Reviewers:**

Scientific name (author; date): Oberonia brachyphylla Blatter & McCann, 1931

Habit: Pendulous epiphytic herb
Habitat: Deciduous forest
Niche/ elevation: On branches of trees. 800-1500 m.

Distribution
Historical distribution:
Current Global Distribution: Endemic to Western Ghats (Karnataka & Kerala)

Distribution from Literature:
- Ponnudi [Abraham & Vatsala, 1981].
- Hassan, Kenchankumri state forest, Shiradi ghat [Saldanha & Nicolson, 1976].
- Hassan, Uttara Kannada [Sharma et al, 1984].
- Aruvanpara in Silent Valley [Manilal, 1988].
- Palghat, Mukkai forest, Hassan [Nayar & Sastry, 1988].
- Aruvanpara [Sathish Kumar, 1999].
- Mukkai forest [Vajravelu, 1990].
- Mukkai forest, Palghat [Joseph & Vajravelu, 1976]

Distribution from Field Studies:

Extent of Occurrence (Sq. km.): 100-5,000
Area of Occupancy (Sq. km.): 10-500
Number of Subpopulations/locaton: 20–25/10. Fragmented. Continuing decline and extreme fluctuation in the number of locations or subpopulations. All individuals not in one population and one subpopulation does not hold 95% or more of the total population.

Habitat status: Decrease in the habitat <20% in the last 10 years. <20% predicted decline in the next 10 years due to loss of habitat. Decrease in the quality of the habitat due to habitat destruction.

Threats
- Threats to taxon: Decline of host species and habitat loss resulting in and may result in population decline. The influence on the population structure well understood, not reversible and not ceased to be a threat.

Trade: Not in trade.

Population
- Numbers/Generation time/Trend: Mature individuals in all populations <2,500. The number of mature individuals declined in the past by 10% and likely to decline by 10% in the future. Generation time 5-10 years.

Trends:
- The population size/numbers of the taxon declining at a rate of >10% in the last 10 years. Predicted decline >10% in the next 10 years due to habitat loss.

Recent Field Studies:

Data quality:
Assessed based on field studies and literature/herbarium studies.

Qualifier:
The Area and Extent are estimated based on known locations. The habitat status, threats, mature individuals and population trends have been observed over many years of field studies.

Status
IUCN Red List Criteria (1994):
- ENDANGERED

Criteria:
- B1+2abcde+3c

IUCN Red List Criteria (1994):
- ENDANGERED

Criteria:
- B1a+b(i,ii,iii,iv,v)+c(iii), 2a+b(i,ii,iii,iv,v)+c(iii)

CITES:
- Appendix II
- Indian WL. (P) Act: Not listed

National Red Data Book:
- Rare [Nayar & Sastry, 1988]
- International RDB: Not listed

Other legislation:
- Included in the Negative list of Exports (EXIM Policy), 1999

Known presence in Protected Areas:
- Nilgiri Biosphere Reserve

Uncertainty
Assessed based on subjective opinion but with the consensus of the participants.

Recommendations
Research:
- Survey

Management:
- Habitat management, monitoring and cultivation/breeding

Cultivation:
- Cultivation is recommended for research. Initiate cultivation programme after 3 years. Some propagation techniques known for similar taxa.

Other comments:
- This species was described by Blatter & McCann based on a detailed illustration prepared by T.R. Bell and Miss Bell. Pendulous epiphytes on branches of trees like Cyclostomon macrophyllus [Vajravelu, 1990]. This species has to be studied in detail.

Sources:

Compilers:

Reviewers:
Scientific name (author; date): Oberonia chandrasekharanii V.J. Nair et al., 1983

Synonym: Oberonia rangannaiana Keshav & Yogan., 1987

Habit: Epiphytic herb
Habitat: Evergreen forests
Niche/ elevation: 850-1200m

Distribution
Historical Distribution:
Current Global Distribution: ENDEMIC to Western Ghats (Karnataka, Kerala & Tamil Nadu)
Distribution from Literature:
Distribution from Field Studies:
Extent of Occurrence (Sq. km.): 101-5000
Area of Occupancy (Sq. km.): <10
Number of Subpopulations/Location: 3/3. Fragmented. There is a continuing decline but no extreme fluctuation in the number of locations or subpopulations. All individuals not in one population and one subpopulation does not hold 95% or more of the total population.

Habitat status: Decrease in habitat quality.

Threats
Threats to taxon: Human interference, developmental activities
Trade: Not in trade

Population
Numbers/Generation trend: Unknown numbers. Generation time - perennial
Population trend: Unknown

Recent Field Studies:

Data quality:
Qualifier: Area and Extent estimated and habitat status observed.

Status

CITES: Appendix II
National Red Data Book: Not listed
Other Legislation: Included in the Negative List of Exports (EXIM Policy), 1999.
Known presence in Protected Areas: Chinnar Wildlife Sanctuary, Silent Valley National Park

Uncertainty
Assessment based on precaution due to changes expected in habitat. Assessment is exclusive to the below listed compilers and reviewer.

Recommendations
Research: Survey
Management: Monitoring
Cultivation: No cultivated stocks available. No recommendations made at the workshop.

Other comments:
Described by V.J. Nair et al. based on V.S. Ramachandran’s collection from Chandanathode, Kerala.


Compilers: C. Sathish Kumar

Reviewers: B.V. Shetty, B. Arthur, S. Molur
**Oberonia josephii** Saldanha, C.J., 1974

- **Scientific name (author; date):** Oberonia josephii Saldanha, C.J., 1974
- **Habit:** Pendulous epiphytic herbs
- **Habitat:** Moist deciduous forest
- **Niche/elevation:** ca. 900m.

**Distribution**

- **Historical distribution:**
- **Current Global Distribution:** ENDEMIC to Western Ghats (Karnataka & Kerala)
- **Distribution from Literature:**
  - Hassan, below Genkalbetta [Saldanha & Nicolson, 1976].
  - Hassan [Sharma et al., 1984].
  - Hassan and Mysore [Rathakrishnan & Chitra, 1984].
  - Kerala; Tirunelli, Wayanad [Muktesh Kumar & Sequiera, 1999]
- **Extent of Occurrence (Sq. km.):** <100
- **Area of Occupancy (Sq. km.):** <10
- **Number of Subpopulations/location:** 2 locations. Fragmented. All individuals not in one population.
- **Habitat status:** Decrease in the habitat <20% in the last 10 years due to human habitation. Decrease in the quality of the habitat due to human habitation.

**Threats**

- **Threats to taxon:** Habitat loss resulting in and may result in population decline. The influence on the population structure well understood, not reversible and have not ceased.
- **Trade:** Not in trade

**Population**

- **Numbers/Generation time/Trend:** Unknown
- **Trends:** Unknown
- **Recent Field Studies:** Muktesh Kumar and Sequiera in Tirunelli, 1999.
- **Data quality:** Assessed based literature/herbarium studies and habitat features of the type location at present.
- **Qualifier:** The Area and Extent estimated based on published locations. The habitat status and threats inferred from the current status.

**Status**

- **IUCN Red List Criteria (1994):** CRITICALLY ENDANGERED
- **CITES:** Appendix II
- **National Red Data Book:** Not listed
- **Other legislation:** Included in the Negative list of Exports (EXIM Policy), 1999
- **Known presence in Protected Areas:** None
- **Uncertainty:** Assessed with consensus based on direct observation and precaution.

**Recommendations**

- **Research:** Survey and life history studies
- **Management:** Habitat management and monitoring
- **Cultivation:** Not recommended.

**Other comments:** Described by Saldanha based on a collection from Hassan district, Karnataka.

**Sources:**

- Rathakrishnan & Chitra, 1984: 1005; Saldanha, 1974 100: 568.f.2; Saldanha & Nicolson, 1976: 840;
- Sharma et al., 1984: 274.

**Compilers:**


**Reviewers:**

**Scientific name (author; date):** Oberonia nayarii R. Ansari & Balakr., 1990

**Habit:** Pendulous epiphytic herbs

**Habitat:** Evergreen forests or shola forests

**Niche/ elevation:** 1500-2000 m.

**Distribution**

**Historical distribution:**

**Current Global Distribution:** ENDEMIC to Western Ghats (Karnataka, Kerala & Tamil Nadu)

**Distribution from Literature:** Nilgiri [Rao, 1998]

**Distribution from Field Studies:** None

**Extent of Occurrence (Sq. km.):** 100-5,000

**Area of Occupancy (Sq. km.):** <10

**Number of Subpopulations/location:** 3/3. Fragmented. There is no continuing decline and no extreme fluctuation in the number of locations or subpopulations. All individuals not in one population and one subpopulation does not hold 95% or more of the total population.

**Habitat status:** Change in the habitat not known. No change in the quality of the habitat.

**Threats**

**Threats to taxon:** Human interference (fire)

**Trade:** Not in trade.

**Population**

**Numbers/Generation time/Trend:** Unknown

**Trends:** Unknown

**Recent Field Studies:** None

**Data quality:** Assessed based on literature/herbarium studies.

**Qualifier:** The Area, Extent and habitat status inferred from literature.

**Status**

**IUCN Red List Criteria (1994):** VULNERABLE Criteria: D2

**IUCN Red List Criteria (2000):** VULNERABLE Criteria: D2

**CITES:** Appendix II

**National Red Data Book:** Not listed

**Other legislation:** Not listed

**Known presence in Protected Areas:** Included in the Negative list of Exports (EXIM Policy), 1999

**Assessment:** Assessment is based on inference and precaution only.

**Recommendations**

**Research:** Survey, life history studies and PHVA

**Management:** Monitoring

**Cultivation:** Cultivated stocks not available. Numbers in cultivation 20. There is no coordinated species management programme for this species and one is not recommended. Some propagation techniques known for taxon or similar taxa.

**Other comments:** Another survey is required to determine the exact area of occupancy. This data is based on the old herbarium specimens. A thorough search has to be made to relocate this species in its type locality to determine its present status. It was described by Ansari and Balakrishnan (1990) based on collections from Karnataka, Kerala and Karnataka.

**Sources:** Ansari & Balakrishnan, 1990: 17; Rao, 1998: 216.

**Compilers:** S.S.R. Bennet, R. Gopalan, M. Mohanan, S. Rajendran, S. Phatak, R. Thamilarasi

**Scientific name (author; date):** Oberonia platycaulon Wight, 1851  
*Oberonia bisaccata* Manilal & Sathish, 1984

**Synonym:**  
*Oberonia bisaccata* Manilal & Sathish, 1984

**Habit:** Epiphytic herb

**Habitat:** Evergreen forests

**Niche/ elevation:** 1700-2150m.

**Distribution**

**Historical distribution:** India

**Current Global Distribution:** ENDEMIC to Western Ghats (Kerala & Tamil Nadu)


**Distribution from Field Studies:** Kerala; Idukki, Silent Valley, Nilgiris [R. Ansari]

**Extent of Occurrence (Sq. km.):** >20,000

**Area of Occupancy (Sq. km.):** Unknown

**Number of Subpopulations/Location:** 3/4. Fragmented. There is a continuing decline but no extreme fluctuation in the number of locations or subpopulations. All individuals not in one population and one subpopulation does not hold 95% or more of the total population.

**Habitat status:** Unknown for the entire population. In Kerala Nilgiris decrease in habitat >20% in the last 10 years due to forest degradation and decrease in the quality of the habitat due to tree felling [R. Ansari].

**Threats**

**Threats to taxon:** Habitat loss and habitat fragmentation in Kerala Nilgiris [R. Ansari].

**Trade:** Not in trade

**Population**

**Numbers/Generation time/Trend:** Mature individuals in all populations <250. Decline unknown. Generation time 5 years [R. Ansari]

**Trends:** Predicted decline <10% in the next 10 years due to habitat loss.

**Recent Field Studies:** R. Ansari in Nilgiris, 1998, Plants of Western Ghats.

**Data quality:** Assessed based indirect information and literature/herbarium studies.

**Qualifier:** The Extent, mature individuals and population trends are inferred from literature.

**Status**

**IUCN Red List Criteria (1994):** ENDANGERED

**IUCN Red List Criteria (2000):** ENDANGERED

**CITES:** Appendix II

**National Red Data Book:** Not listed

**Other legislation:** Included in the Negative list of Exports (EXIM Policy), 1999

**Known presence in Protected Areas:** Silent Valley National Park

**Uncertainty**

Assessed based on inference, precaution and consensus.

**Recommendations**

**Research:** Survey

**Management:** Monitoring

**Cultivation:** Cultivation/breeding

**Other comments:** Wight described the species based on a collection from Pulney Mountains. Mass collection and transplantation results in the decline in the population.

**Sources:**


**Compilers:** A. Durai, E. Mohan, R. Hegde, V.S. Ramachandran, N. Raman, K.G. Selvi, B.V. Shetty

Scientific name (author; date): Oberonia sebastiana Shetty & Vivek., 1975 (1978)

Habit: Pendulous epiphytic herb
Habitat: Shola forests
Niche/ elevation: 1000-2250 m.

Distribution
Historical distribution:
Current Global Distribution: ENDEMIC to Western Ghats (Kerala & Tamil Nadu)
Distribution from Literature:
Distribution from Field Studies:
Extent of Occurrence (Sq. km.): 101-5000
Area of Occupancy (Sq. km.): <10
Number of Subpopulations/location: 3/3. Fragmented. Continuing decline and extreme fluctuation in the number of locations or subpopulations unknown. All individuals not in one population and one subpopulation does not hold 95% or more of the total population.

Habitat status: The habitat is stable

Threats
Threats to taxon: None
Trade: Not in trade

Population
Numbers/Generation time/Trend Unknown
Trends: Unknown

Recent Field Studies:
Chemunji, Bonaccord, Trivandrum [C. Sathish Kumar, 1995]

Data quality: Assessment is based on field studies, literature/herbarium studies.

Qualifier: Area and Extent estimated.

Status

CITES: Appendix II
National Red Data Book: Not listed
Other legislation: Included in the Negative list of Exports (EXIM Policy), 1999
Known presence in Protected Areas: Eravikulam National Park, Indira Gandhi Wildlife Sanctuary, Peppara Wildlife Sanctuary

Uncertainty: Assessment is based on inference and on the consensus of participants.

Recommendations
Research: Survey, Life history studies and PHVA pending
Management: Monitoring, cultivation/breeding
Cultivation: Cultivated stocks exist at Gurukula Botanical Sanctuary, Wayanad. Initiate cultivation programme after 3 years

Other comments: Described by Shetty & Vivekananthan based on their collection from Anamudi slopes, Kerala and Barber’s collection from Iyerpadi, Anamalai. Iyerpadi (Valparai) wherefrom C.A. Barber collected specimens in the early part of the 20th century, is now a tea plantation.


Habit: Pendulous epiphytic herbs
Habitat: Evergreen forests
Niche/ elevation: 500-1500m.

Distribution
Historical distribution: India
Current Global Distribution: ENDEMIC to Western Ghats (Kerala & Tamil Nadu)
Distribution from Field Studies: None
Extent of Occurrence (Sq. km.): 101-5,000
Area of Occupancy (Sq. km.): <10
Number of Subpopulations/location: 3/3. Fragmented. Continuing decline and extreme fluctuation in the number of locations unknown. All individuals not in one population and one subpopulation does not hold 95% or more of the total population. Decrease in the habitat <20% in the last 10 years due to human activities. Decrease in the quality of habitat due to human activities.

Habitat status: Decrease in the habitat <20% in the last 10 years due to human activities. Decrease in the quality of habitat due to human activities.

Threats to taxon: Habitat loss, human interference
Trade: Not in trade

Population
Numbers/Generation time/Trend: Unknown
Trends: Unknown

Recent Field Studies: None

Data quality: Assessment is based on Literature/herbarium studies.

Qualifier: The Area and Extent inferred from literature.

Status
IUCN Red List Criteria (1994): CRITICALLY ENDANGERED
Criteria: B1+2bc
IUCN Red List Criteria (2000): CRITICALLY ENDANGERED
Criteria: B2a+b(ii,iii)
CITES: Appendix II
Indian WL. (P) Act: Not listed
National Red Data Book: Not listed
International RDB: Not listed
Other legislation: Included in the Negative list of Exports (EXIM Policy), 1999

Known presence in Protected Areas: Uncertainty
Assessed based on information through inference, precaution and group opinion.

Recommendations
Research: Survey
Management: Monitoring, cultivation/breeding
Cultivation: Cultivated stocks not available. Initiate cultivation programme within 3 years

Other comments: Proposed on Joseph's collection from Anamalais.


Scientific name (author; date): Oberonia wightiana Lindley var. nilgirensis R. Ansari, 1982.

Habit:
Habitat:
Niche/ elevation:

Distribution
Historical Distribution:
Current Global Distribution:
Distribution from Literature:
Distribution from Field Studies:
Extent of Occurrence (Sq. km.):
Area of Occupancy (Sq. km.):
Number of Subpopulations/location:
Habitat status:

Threats
Threats to taxon:
Trade:

Population
Numbers/Generation time/trend:
Population trend:

Recent Field Studies:

Data quality:
Qualifier:

Status
IUCN Red List Criteria (1994):
IUCN Red List Criteria (2000):
CITES:
National Red Data Book:
Other legislation:

Known presence in Protected Areas:

Uncertainty

Recommendations
Research:
Management:
Cultivation:

Other comments:

Sources:

Compilers:

Reviewers:
**Scientific name (author; date):** Oberonia wynaadensis Sivadasan & R.T. Balakr., 1989

*Oberonia pakshipadalis* Mukeshe & Stephen, 1998

**Habitat:** Epiphyte

**Habitat:** Evergreen forests

**Niche/ elevation:** 600-900m.

**Distribution**

**Historical distribution:** India

**Current Global Distribution:** ENDEMIC to Western Ghats (Kerala)

**Distribution from Literature:**
- Thariode - Meppadi, Wayanad [Sivadasan & Balakrishnan, 1989]
- Pakshipadalam, Wayanad [Muktesh Kumar, 1998]

**Extents of Occurrence (Sq. km.):** <100

**Area of Occupancy (Sq. km.):** <10

**Number of Subpopulations/location:** 2 locations. Fragmented. All individuals not in one population and one subpopulation does not hold 95% or more of the total population.

**Habitat status:** No change in the habitat of the taxon. No change in the quality of the habitat of the taxon.

**Threats**

**Threats to taxon:** None

**Trade:** Not in trade

**Population**

**Numbers/Generation time/Trend:** Mature individuals in all populations are <250. Generation time perennial.

**Trends:** Unknown

**Recent Field Studies:** Muktesh Kumar et al., in Pakshipadalam, 1998, Vascular epiphytes of Nilgiri Biosphere Reserve.

**Data quality:** Assessed based on field studies, census/monitoring and literature/herbarium studies.

**Qualifier:** The Area and Extent estimated based on known locations. The habitat status and mature individuals observed.

**Status**

**IUCN Red List Criteria (1994):** ENDEANGERED

**CITES:** Appendix II

**National Red Data Book:** Not listed

**Other legislation:** Included in the Negative list of Exports (EXIM Policy), 1999

**Known presence in Protected Areas:** Wayanad Wildlife Sanctuary

**Uncertainty**

Assessed with confidence based on observations and some inference.

**Recommendations**

**Research:** Survey, life history studies and PHVA

**Management:** Monitoring and cultivation/breeding

**Cultivation:** Cultivation recommended for research. Cultivated stocks not available. There is no coordinated species management programme for this species and one is not recommended. Initiate cultivation programme within 3 years. Some propagation techniques known for similar taxa.

**Other comments:** Proposed by Sivadasan & Balakrishnan based on a collection made from Thariode, Wayanad.


**Compilers:** S.S.R. Bennet, J.L. Ellis, M. Mohanan, V. Sarojini Menon, C. Sathish Kumar, S. Seeni, B.V. Shetty, P.S. Udayan, U. Lakshminarayanan

**Scientific name (author; date):**
Pachystoma hirsutum (Joseph & Vajravelu) Sathish & Manilal, 1987

**Synonyms:**
Eulophia hirsuta Joseph & Vajravelu, 1975 (1978)
Ipsea malabarica sensu Abraham & Vatsala, 1981, non (Reichb. f.) Hook. f.

**Habit:**
Terrestrial

**Habitat:**
Grasslands

**Niche/ elevation:**
Above 1000m

**Distribution**

**Historical distribution:**
India

**Current Global Distribution:**
ENDEMIC to Western Ghats (Kerala & Tamil Nadu)

**Distribution from Literature:**
Kerala; Palghat [M. Mohanan].
Tamil Nadu: Muthukuzhivayal, Kakachi, Kalakad-Mundanthurai Tiger Reserve [R. Ganesan, 2000].
Ponmudi, Agastyamalai, Kalakad-Mundanthurai Tiger Reserve [R. Gopalan]
101-5,000

**Extent of Occurrence (Sq. km.):**
11-500

**Area of Occupancy (Sq. km.):**
11-500

**Number of Subpopulations/location:**
2/4. Fragmented. Continuing decline and fluctuation unknown.

**Habitat status:**
No change in the habitat. No change in the quality of habitat.

**Threats**

**Threats to taxon:**
None

**Trade:**
Not in trade

**Population**

**Numbers/Generation time/Trend:**
Number of mature individuals in all populations unknown. Mature individuals in KMTR are <50 [R. Ganesan, 2000]

**Trends:**
Unknown

**Recent Field Studies:**

**Data quality:**
Assessment is based on observation, informal sighting and literature/herbarium.

**Qualifier:**
Area, Extent and habitat status estimated based on known locations.

**Status**

**IUCN Red List Criteria (1994):**
VULNERABLE

**IUCN Red List Criteria (1994):**
VULNERABLE

**CITES:**
Appendix II

**Indian WL. (P) Act:**
Not listed

**National Red Data Book:**
Not listed

**International RDB:**
Not listed

**Other legislation:**
Included in the Negative list of Exports (EXIM Policy), 1999

**Known presence in Protected Areas:**
Kalakad-Mundanthurai Tiger Reserve, Neyyar Wildlife Sanctuary

**Uncertainty**
Assessed with 95% confidence based on evidence and on the consensus of the field biologists.

**Recommendations**

**Research:**
Survey and life history studies.

**Management:**
Monitoring, cultivation/breeding.

**Cultivation:**
Cultivation recommended for research and commercial/sustainability. Cultivated stocks not available. There is no coordinated species management programme for this species and one is not recommended. Initiate cultivation programme within 3 years. Some propagation techniques known for similar taxa.

**Other comments:**
Originally described by Joseph & Vajravelu based on latter's collection from Palghat. Abraham & Vatsala (1981) reported it from Ponmudi wrongly as Ipsea malabarica (Reichb. f.) Hook. f. This species cannot be easily seen as it grows among grasses. Type locality in Palghat and Ponmudi are not protected. The habitats are very remote from human settlements and may not face immediate threats. The forests are declared as part of Kalakad-Mundanthurai Tiger Reserve. The yellow coloured flowers stands out of the lush green grasses [R. Ganesan]. Very few plants [<10] were found in the localities mentioned. It is a very attractive orchid.

**Sources:**

**Compilers:**

**Reviewers:**
**Paphiopedilum druyi** (Beddome) Stein, 1892

*Cypridium druyi* Beddome, 1874

**Habitat:**
Terrestrial herb

**Niche/ elevation:**
Rocky slopes in association with the endemic grass *Zenkeria sebastineii* Henry. 1000-2000 m.

**Distribution**

**Historical distribution:**
India

**Current Global Distribution:**
ENDEMIC to Western Ghats (Kerala & Tamil Nadu)

**Distribution from Literature:**
Zenkeria sebastineii (Beddome, 1874) - P.S. Udayan. Flowering from clonal plants should be obtained for further propagation.

**Distribution from Field Studies:**

**Extent of Occurrence (Sq. km.):**
<100

**Area of Occupancy (Sq. km.):**
<10

**Number of Subpopulations/location:**
3/2. Fragmented. There is a continuing decline and extreme fluctuation in the number of locations or subpopulations. One subpopulation does not hold 95% or more of the total population.

**Habitat status:**
Decrease in the habitat >20% in the last 10-20 years. >20% predicted decline in the next 10-20 years due to overexploitation, habitat destruction and wild collection. Decrease in the quality of habitat due to overexploitation.

**Threats**

**Threats to taxon:**
Disease, edaphic changes, harvest, habitat loss, overexploitation, trampling, habitat fragmentation, trade for market or medicine, drought, fire, landslides, reproductive problems and propagation difficulties resulting in and may result in population decline. The influence of threats on the population structure well understood, not reversible and not ceased to be a threat.

**Trade:**
The taxon is in domestic, commercial, international and ornamental trade. Whole plant and flowers collected. Scientific collections. Collection for cultivation of hybrids [S. Seeni, 2000]. Commercial and international trade result in perceived or inferred population decline.

**Population**

**Numbers/Generation time/Trend**
Mature individuals in all populations <250. The number of mature individuals declined in the past by >50% and likely to decline by <10% in the future.

**Trends:**
The population size/numbers of the taxon declining at a rate of >10% in the last 10 years. Predicted decline >10% in the next 10 years due to habitat loss.

**Recent Field Studies:**

**Data quality:**
Assessed based on field studies, census/monitoring and literature/herbarium studies.

**Qualifier:**
The Area and Extent estimated based on known locations. The habitat status, threats, mature individuals and population trends observed over many years of field studies and census/monitoring.

**Status**

**IUCN Red List Criteria (1994):**
CRITICALLY ENDANGERED

**Criteria:**
B1+2cde+3c

**IUCN Red List Criteria (2000):**
CRITICALLY ENDANGERED

**Criteria:**
B1a+b(iii,iv,v)+c(iii), 2a+b(iii,iv,v)+c(iii)

**CITES:**
Appendix II

**National Red Data Book:**
Endangered [Nayar & Sastry, 1987] International RDB: Not listed

**Other legislation:**
Included in the Negative list of Exports (EXIM Policy), 1999

**Known presence in Protected Areas:**
Kalakad-Mundurthur Tiger Reserve.

**Uncertainty:**
Assessed with 95% confidence based on evidence and on the consensus of the field biologists at the workshop.

**Recommendations**

**Research:**
Genetic research, life history studies, PHVA

**Management:**
Monitoring, Cultivation/breeding

**Cultivation:**
Cultivation is recommended for research. Cultivated stocks are available at TBGRI, Thiruvaranthapuram and in National Orchidarium, BSI, Yercaud. Numbers in cultivation 4. There is no coordinated species management programme for this species and one is not recommended. Initiate cultivation programme within 3 years. Some propagation techniques known for similar taxa.

**Other comments:**
Originally proposed by Beddome based on Col. Heber Drury’s plant collected actually by Mrs. J.A. Broun from Agasthyamala in 1868. Pilgrims visiting Agasthyamala spoil the habitat with camp fires. Habitat destruction and wild collection [S. Seeni, 2000]. After 1974, there was a rapid decline in the population in Agasthayaomal. This species was recently rediscovered by R. Gopal on the eastern side of Agasthyamala. Over exploitation due to its horticulture value. This species is collected for ornamental use and breeding programmes. This species is collected unsustainably for ornamental purpose. This species has been assessed as Critically Endangered in the CBSG CAMP workshop conducted by FRLHT due to 80% decline in the past 10 years and the area of occupancy [Only Kalakad and Agasthyamala] - P.S. Udayan. Flowering from clonal plants should be obtained for further propagation. Artificial cultivation does not produce flowers [R. Gopal]. Medicinal uses of this species is well known-FRLHT database [P.S. Udayan]. Perennial herbs, sometimes reported to be an epiphyte on Euphorbia
sp., sunny forest floors amidst grasses, sedges etc., often found in association with *Aerides maculosa* in limey soil. About a dozen plants are reportedly grown in some private orchid nurseries in India. It is also known to be in cultivation in some botanical gardens or private nurseries around the world [Nayar & Sastry, 1987].

Sources:

Compilers:

Reviewers:
**Peristylus brachyphyllus** A. Rich., 1841

_Habenaria malabarica_ Hook. f., 1890

**Scientific name (author; date):**

**Synonym:**

**Habit:** Terrestrial

**Habitat:** Unknown

**Niche/ elevation:** Unknown

**Distribution**

**Historical distribution:** India

**Current Global Distribution:** ENDEMIC to Western Ghats (Karnataka & Tamil Nadu)

**Distribution from Literature:**
- Canara to Nilgiris, Bababudan hills in Chikkamagalur district [Mathew, 1983]
- Lakkadi, Nilgiri [Sharma, 1977]
- Chikkamagalur, Nilgiris [Radhakrishnan & Chitra, 1984]

**Distribution from Field Studies:** None

**Extent of Occurrence (Sq. km.):** 100-5,000

**Area of Occupancy (Sq. km.):** Unknown

**Number of Subpopulations/location:** 3 locations. Fragmented. Continuing decline but no extreme fluctuation in the number of locations or subpopulations.

**Habitat status:** Unknown.

**Threats**

**Threats to taxon:** Unknown.

**Trade:** Not in trade.

**Population**

**Numbers/Generation time/Trend**

**Trends:** Unknown

**Recent Field Studies:** None

**Data quality:** Assessment is based on literature studies.

**Status**

**IUCN Red List Criteria (1994):** DATA DEFICIENT

**Criteria:** --

**IUCN Red List Criteria (2000):** DATA DEFICIENT

**Criteria:** --

**CITES:** Appendix II

**Indian WL. (P) Act:** Not listed

**International RDB:** Not listed

**National Red Data Book:** Not listed

**Other legislation:** Included in the Negative list of Exports (EXIM Policy), 1999.

**Known presence in Protected Areas:** None

**Uncertainty**

**Assessment based only on literature.**

**Recommendations**

**Research:** Survey and taxonomic research

**Management:** Monitoring, cultivation/breeding

**Cultivation:** Initiate cultivation programme within 3 years. Some propagation techniques known for taxon or similar taxa.

**Other comments:** Described by A. Richard (1841) based on Perrottet's collections from Kulhuty and Ootacamund. Habitat destruction due to fire or over grazing might have caused the decline of the species in its natural habitat. Collection, multiplication and reintroduction are recommended [Mohanan & Balakrishna, 1991].

**Sources:**
- Hooker, 1890: 6: 159; Mohanan & Balakrishna, 1991; Radhakrishnan & Chitra, 1984: 1004; Richard, 1841: Ser 2.15: 70.t.2; Sharma et al., 1977: 143.

**Compilers:**

**Reviewers:**
**Scientific name (author; date):**

*Peristylus lancifolius* A. Rich., 1841

*Peristylus robustior* Wight, 1851

**Synonym:**

*Peristylus robustior* Wight, 1851

**Habit:**

Terrestrial tuberous herb

**Habitat:**

Open grasslands

**Niche/ elevation:**

1000-2000 m.

**Distribution**

**Historical distribution:**

India

**Current Global Distribution:**

ENDEMIC to Western Ghats (Karnataka & Tamil Nadu)

**Distribution from Literature:**


**Distribution from Field Studies:**

None

**Extent of Occurrence (Sq. km.):**

5,001-20,000

**Area of Occupancy (Sq. km.):**

11,500

**Number of Subpopulations/locaton:**

5 locations. Fragmented.

**Habitat status:**

Decrease in the habitat <20% in the last 10 years due to loss of habitat. Decrease in the quality of the habitat due to habitat loss.

**Threats**

**Threats to taxon:**

Grazing, habitat loss, trampling and habitat fragmentation resulting in and may result in population decline. Their influence on the population structure well understood, not reversible and have not ceased. Not in trade.

**Trade:**

None

**Population**

**Numbers/Generation time/Trend:**

Unknown

**Trends:**

Unknown

**Recent Field Studies:**

None

**Data quality:**

Assessment is based on literature studies only.

**Qualifier:**

Area, Extent, habitat status and threats inferred from literature and the current situation of the habitat.

**Status**

IUCN Red List Criteria (1994): ENDEANGERED

IUCN Red List Criteria (2000): ENDEANGERED

CITES: Appendix II

National Red Data Book: Not listed

Other legislation: Included in the Negative list of Exports (EXIM Policy), 1999

Known presence in Protected Areas: None

**Uncertainty**

Assessed based on precaution, inference and range of opinion.

**Recommendations**

**Research:**

Survey, Limiting factor research

**Management:**

Monitoring, cultivation/breeding

**Cultivation:**

Cultivated stocks are not available. There is no coordinated species management programme for this species and one is not recommended. Initiate cultivation programme after 3 years. Some propagation techniques known for similar taxa.

**Other comments:**

Described by A. Richard based on Perrottet's collection from Nilgiris. Though, Hook. f. gives distribution in Malabar and Travancore this species is yet to be recorded from Kerala. Medicinal value suspected.

**Sources:**

Seidenfaden, 1999: 1213; Saldanha & Nicolson, 1976: 275, 841; Phatak, 1984: 134; Hooker, 1890-1894: 1160; Richard, 1841 Ser. 2 15: 69.t.2c; Wight, 1851 5(t): 12.t.1699

**Compilers:**


**Reviewers:**

Scientific name (author; date): Peristylus stocksii (Hook. f.) Kranzlin, 1898
Synonym: Habenaria stocksii Hook. f., 1890
Habit: Unknown
Habitat: Moist deciduous forest
Niche/ elevation: Up to 500m.

Distribution
Historical distribution: India
Current Global Distribution: ENDEMIC to Western Ghats (Gujarat, Maharashtra, Goa, Karnataka & Tamil Nadu)
Extent of Occurrence (Sq. km.): 5,001-20,000
Area of Occupancy (Sq. km.): 11-500
Number of Subpopulations/location: Many. Fragmented. There is a continuing decline but no extreme fluctuation in the number of locations or subpopulations. All individuals are not in one population and one subpopulation does not hold 95% or more of the total population.
Habitat status: Decrease in the habitat >20% in the last 10 years due to loss of habitat. There is decrease in the quality of the habitat due to thinning of forests.

Threats
Threats to taxon: Grazing, habitat loss pollution [future] and habitat fragmentation resulting in and may result in population decline. Damming was a threat in the past and pollution considered to be a threat in the future. The influence on the population structure well understood, not reversible and have not ceased.
Trade: Local trade for its roots which are of medicinal value.

Population
Trends: The population size of the taxon declining at a rate of >10% in the last 10 years.
Recent Field Studies: S. Phatak in Karwar, 1994, Ecological status studies.

Data quality: Assessed based on field studies and literature/herbarium studies.
Qualifier: The Area and Extent are estimated based on the known locations. The habitat status, threats, mature individuals and population trends are observed and inferred.

Status
CITES: Appendix II Indian WL: (P) Act: Not listed
National Red Data Book: Not listed International RDB: Not listed
Other legislation: Included in the Negative list of Exports (EXIM Policy), 1999
Known presence in Protected Areas: Bhimashankar Wildlife Sanctuary, Biligiri Rangaswamy Temple Wildlife Sanctuary, Mukurthi National Park

Uncertainty: Assessed with 95% confidence based on evidence and on the consensus of the field biologists at the workshop. It was also on a range of opinion.

Recommendations
Research: Survey
Management: Monitoring
Cultivation: Cultivation is recommended for research. Cultivated stocks not available. Some propagation techniques known for taxon.

Other comments: Originally proposed by Hook. f. based on collections by Stocks, Ritchie and others from Concan and Mysore. Due to the construction of the bridge across Kali river the habitat was destroyed. A hill was cut to form a road. The availability of shady areas have decreased for this shade-loving orchid to grow. This species may have medicinal value. The details about trade is not thoroughly understood.


Conservation Assessment and Management Plan Workshop Report for Endemic Orchids of the Western Ghats 2001 130
**Scientific name (author; date):**

*Rhytionanthes nodosum* (Rolfe) Garay *et al.*, 1994

*Cirrhopetalum nodosum* Rolfe, 1895

*Bulbophyllum nodosum* (Rolfe) J.J. Smith, 1912

**Synonyms:**

- *Cirrhopetalum nodosum* Rolfe, 1895
- *Bulbophyllum nodosum* (Rolfe) J.J. Smith, 1912

**Habit:**

Epiphytic herb

**Habitat:**

Evergreen forest

**Niche/ elevation:**

Unknown

**Distribution**

**Historical distribution:**

India

**Current Global Distribution:**

Endemic to Western Ghats (Tamil Nadu)

**Distribution from Literature:**


**Distribution from Field Studies:**

None

**Extent of occurrence (Sq. km.):**

Unknown

**Area of occupancy (Sq. km.):**

Unknown

**Number of Subpopulations/location:**

Unknown

**Habitat status:**

Unknown

**Threats**

**Threats to taxon:**

Unknown

**Trade:**

Unknown

**Population**

**Numbers/Generation time/ Trends:**

Unknown

**Trends:**

Unknown

**Recent Field Studies:**

C. Sathish Kumar since 1990 has visited the site where it was first described from, but was not able to locate it.

**Data quality:**

Assessment based on field studies.

**Qualifier:**

Observations

**Status**

**IUCN RED LIST CRITERIA (1994):**

**EXTINCT**

Criteria: --

**IUCN RED LIST CRITERIA (2000):**

**EXTINCT**

Criteria: --

**CITES:**

Appendix II

Indian WL. (P) Act: Not listed

**National Red Data Book:**

Not listed

International RDB: Not listed

**Other legislation:**

Included in the Negative List of Exports (EXIM Policy), 1999.

**Known presence in Protected Areas:**

None

**Uncertainty**

Assessed with 95% confidence based on evidence and consensus of the field biologists at the workshop.

**Recommendations**

**Research:**

Survey, life history studies, PHVA pending.

**Management:**

Monitoring.

**Cultivation:**

Initiate cultivation within 3 years if rediscovered.

**Other comments:**

Originally described by Rolfe based on O'Brien's collections in 1894 from Nilgiris. Mohanan and Balakrishnan's report (1991) of its occurrence in Coorg is erroneous. This species is feared extinct, because subsequent studies have not indicated its presence [Sathish Kumar, 1991]. Extensive survey is required to relocate the species in wild. Since the species was rare and was not found in the locations of earlier sightings it is feared extinct.

**Sources:**


**Compilers:**


**Reviewers:**

**Scientific name (author; date):**
*Rhytionanthes rheedei* (Manilal & Sathish) Garay et al., 1994

**Synonym:**
*Bulbopyllum rheedei* Manilal & Sathish, 1991

**Habit:**
Epiphytic herbs

**Habitat:**
Riverine forests

**Niche/elevation:**
50-150m

**Distribution**

<table>
<thead>
<tr>
<th>Historical Distribution:</th>
<th>India</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Global Distribution:</td>
<td>ENDEMIC to Western Ghats (Karnataka &amp; Kerala)</td>
</tr>
<tr>
<td>Distribution from Literature:</td>
<td>Shertallai, Alappuzha district; South Kanara, Karkal, Kallar, Palode, Trivandrum district</td>
</tr>
<tr>
<td>Distribution from Field Studies:</td>
<td>Kerala: Shertallai, Kallar, Palode [C. Sathish Kumar]</td>
</tr>
<tr>
<td>Extent of Occurrence (Sq. km.):</td>
<td>101-5,000</td>
</tr>
<tr>
<td>Area of Occupancy (Sq. km.):</td>
<td>11-500</td>
</tr>
<tr>
<td>Number of Subpopulations/location:</td>
<td>4/4. Fragmented. There is a continuing decline but no extreme fluctuation in the number of locations or subpopulations. All individuals not in one population and one subpopulation does not hold 95% or more of the total population. Declining and decrease in quality of habitat.</td>
</tr>
</tbody>
</table>

**Habitat status:**
Declining and decrease in quality of habitat.

**Threats**

| Threats to taxon: | Habitat loss. The 1992 landslide and flood damaged the entire population in Kallar, Trivandrum |
| Trade: | Not in trade |

**Population**

| Numbers/Generation time/trend: | Mature individuals in all populations <500. |
| Population trend: | Declining |

**Recent Field Studies:**

| C. Sathish Kumar in TBGRI campus, Palode, currently. |

**Data quality:**

| Field studies, informal sightings |

**Qualifier:**

| Area and Extent estimated and habitat status observed. Population estimated based on observation. |

**Status**

| IU<NAME> List Criteria (1994): | ENDANGERED |
| IU<NAME> List Criteria (2000): | ENDANGERED |
| CITES: | Appendix II |
| National Red Data Book: | Not listed |
| Other legislation: | Included in the Negative List of Exports (EXIM Policy), 1999. |
| Known presence in Protected Areas: | None |

**Uncertainty**

| Assessment based on precaution due to changes expected in habitat. Assessment is exclusive to the below listed compilers and reviewer. |

**Recommendations**

| Research: | Survey |
| Management: | Monitoring |
| Cultivation: | Cultivated stocks exist at TBGRI and Gurukula Botanical Sanctuary, Wayanad. Initiate cultivation within 3 years. |

**Other comments:**

| Described by Manilal & Sathish Kumar based on the latter's collection from TBGRI campus. This species was originally described and illustrated by Van Rheede in 1692 and was subsequently forgotten. |

**Sources:**


**Compilers:**

| C. Sathish Kumar |

**Reviewers:**

| B.V. Shetty, B. Arthur, S. Molur |
Scientific name (author; date): **Seidenfadeniella rosea** (Wight) Sathish, 1994

Synonym: **Sarcanthus roseus** Wight, 1851 var. nilagirica Fyson, 1915

Habit: Pendulous epiphytic herb

Habitat: Evergreen forests

Niche/ elevation: On tree trunks. 1000-1500 m.

**Distribution**

Historical distribution: India

Current Global Distribution: ENDEMIC to Western Ghats (Kerala & Tamil Nadu)

Distribution from Literature: Nilgiris, North of Palghat gap [Seidenfaden, 1999]. Sispara, Silent Valley [Manoharan, 1999; Sathish Kumar, 1999].


Extent of Occurrence (Sq. km.): 5,001-20,000

Area of Occupancy (Sq. km.): 10-500

Number of Subpopulations/location: 3 locations. Fragmented.

Habitat status: Decrease in the habitat <20% in the last 25 years. <20% predicted decline in the next 5 years due to loss of habitat and developmental projects.

**Threats**

Threats to taxon: Habitat loss resulting in and may result in population decline. The influence of threat on the population structure well understood, not reversible and has not ceased.

Trade: Not in trade

**Population**

Numbers/Generation time/Trend: Unknown

Trends: Unknown


**Data quality:** Assessed based on literature/herbarium studies.

**Qualifier:** The Area and Extent estimated based on the known locations. The habitat status and threats inferred.

**Status**

IUCN Red List Criteria (1994): **ENDANGERED**

IUCN Red List Criteria (2000): **ENDANGERED**

CITES: Appendix II

National Red Data Book: Not listed

Other Legislation: Included in the Negative list of Exports (EXIM Policy), 1999

Known presence in Protected Areas: Mukurthi National Park, Silent Valley National Park

**Uncertainty**

Assessment is based on consensus from a range of opinion.

**Recommendations**

Research: Survey, PHVA pending

Management: Monitoring and cultivation/breeding

Cultivation: Cultivation is recommended for research and commercial/sustainability. Cultivated stocks are available at National Orchidarium Yercaud [BSI] and Gurukula Botanical Sanctuary, Wayanad. Numbers in cultivation not known. There is no coordinated species management programme for this species and one is not recommended. Ongoing cultivation programme intensified or increased. Propagation techniques not known at all.

Other comments: Originally described by Wight based on his collection from the Nilgiris. Most of the population occurs in Protected Areas, so there is no immediate threat to the species.

**Sources:**


**Compilers:** S.S.R. Bennet, B.A. Daniel, R. Gopalan, M. Thapliyal, M. Mohanan, S. Rajendran, S. Phatak, R. Thamilarasi

**Seidenfia crenulata** (Ridley) Szlachetko, 1995  
*Microstylis crenulata* Ridley, 1888  
*Malaxis crenulata* (Ridley) Kuntze, 1891

**Terrestrial herb**  
**Rocky outcrops in grasslands**  
**Grows in association with Habenaria rariflora A. Rich.  1800-2000m.**

**Distribution**
- **Historical distribution:** India  
- **Current Global Distribution:** ENDEMIC to Western Ghats (Kerala & Tamil Nadu)
- **Distribution from Literature:** Western Nilgiri [Hooker, 1886-1890]. Nilgiri [Nayar, 1996]. Kerala; Munmar in Idukki District [W.D. Theuerkauf, 1995]  
- **Tamil Nadu:** Pykara, Nilgiris [W.D. Theuerkauf, 1995]
- **Extent of Occurrence (Sq. km.):** <20,000  
- **Area of Occupancy (Sq. km.):** <10  
- **Habitat status:** Fragmented. Decreasing due to human activities, tourism and developmental activities.

**Threats**
- **Habitat:** Decreasing due to human activities, tourism and developmental activities, but not in protected area.

**Population**
- **Number/Generation time/Trend:** <50 individuals  
- **Trends:** Unknown

**Recent Field Studies:**

**Data quality:**
- General field study

**Qualifier:**
- The Area and Extent estimated based on known locations. The habitat status inferred from developmental activities in the area and mature individuals estimated.

**Status**
- **IUCN Red List Criteria (1994):** CRITICALLY ENDANGERED  
- **IUCN Red List Criteria (2000):** CRITICALLY ENDANGERED
- **CITES:** Appendix II  
- **National Red Data Book:** Not listed  
- **Other legislation:** Included in the Negative list of Exports (EXIM Policy), 1999  
- **Known presence in Protected Areas:** Eravikulam National Park

**Uncertainty**
- Exclusive and subjective assessment based on more recent information available outside of the workshop.

**Recommendations**
- **Research:** Survey  
- **Management:** Habitat management  
- **Cultivation:** Cultivated stocks exist at Gurukula Botanical Sanctuary, Wayanad. Initiate programme within 3 years.

**Other comments:**
- Originally described by Ridley based on Beddome's collection from the Nilgiris. It has been now rediscovered by W.D. Theuerkauf (pers. comm.) from Munmar and Nilgiris.

**Sources:**

**Compilers:**

**Reviewers:**

**Note:**
- The workshop participants assessed the species as extinct. However, W.D. Theuerkauf of Gurukula Botanical Sanctuary, Wayanad provided information on the species' existence in Pykara and Munnar based on which this category has been assigned.
**Seidenfia intermedia** (A. Rich.) Szlach., 1995

*Seidenfia intermedia* (A. Rich.) Szlach., 1995

**Scientific name (author; date):**

**Synonym:**

Liparis intermedia A. Rich., 1841

Malaxis intermedia (A. Rich.) Seidenf. 1978

**Habit:**

Terrestrial herb

**Habitat:**

Shola forests and grasslands

**Niche/ elevation:**

cia. 1800 m.

**Distribution**

**Historical distribution:**

India

**Current Global Distribution:**

ENDEMIC to Western Ghats (Karnataka, Kerala & Tamil Nadu)

**Distribution from Literature:**


**Distribution from Field Studies:**


**Extent of Occurrence (Sq. km.):**

5,001-20,000

**Area of Occupancy (Sq. km.):**

10-500

**Number of Subpopulations/location:**

2/ca.10. Fragmented. All individuals not in one population and one subpopulation does not hold 95% or more of the total population

**Habitat status:**

Decrease in the area of habitat due to habitat loss. Decrease in quality due to trampling.

**Threats**

**Threats to taxon:**

Habitat loss, human interference and trampling.

**Trade:**

Not in trade

**Population**

**Numbers/Generation time/Trend**

Mature individuals in all populations <250. 1 year.

**Trends:**

Unknown

**Recent Field Studies:**


**Data quality:**

Assessed based on field studies.

**Qualifier:**

The Area and Extent are estimated based on known locations. The habitat status, threats and mature individuals are observed.

**Status**

**IUCN Red List Criteria (1994):**

ENDEANGERED

**IUCN Red List Criteria (2000):**

ENDEANGERED

**CITES:**

Appendix II

**National Red Data Book:**

Not listed

**Other legislation:**

Included in the Negative list of Exports (EXIM Policy), 1999

**Known presence in Protected Areas:**

Mukurthi National Park

**Uncertainty**

Assessed with 95% confidence based on evidence, some precaution, subjective and on the consensus of the field biologists at the workshop.

**Recommendations**

**Research:**

Survey and life history studies

**Management:**

Monitoring and cultivation/breeding

**Cultivation:**

Cultivation is recommended for research. Cultivated stocks are not available. There is no coordinated species management programme for this species and one is not recommended. Ongoing cultivation programme intensified or increased. Information on propagation techniques not available with this group of compilers.

**Other comments:**

Originally proposed by A. Richard based on Perrottet's collection from Nilgiris. This species is also reported from Mysore, Madurai, Nilgiris. It is also said to be in Kerala. Mukurthi National Park is a protected area therefore there is no change in habitat. Trampling by wild animals.

**Sources:**


**Compilers:**

A. Durai, E. Mohan, R. Hegde, V.S. Ramachandran, N. Raman, K.G. Selvi, B.V. Shetty

**Reviewers:**

Scientific name (author; date):
Seidenfia stocksii (Hook. f.) Szlach., 1995

Synonyms:
Seidenfia intermedia (A. Rich.) Szlach., 1995
Liparis intermedia A. Rich., 1841
Microstylis stocksii Hook. f. 1890
Malaxis stocksii (Hook. f.) Kuntze, 1891

Habit: Terrestrial herb
Habitat: Evergreen forests
Niche/ elevation: 1400-1900m

Distribution
Historical Distribution: India
Current Global Distribution: ENDEMIC to Western Ghats (Karnataka, Kerala & Tamil Nadu)
Distribution from Literature: Nilgiris [Joseph, 1987]. Bababudan hills, Kodakanal [Fyson]
Distribution from Field Studies:
Extent of Occurrence (Sq. km.): 5,001-20,000
Area of Occupancy (Sq. km.): 11,500
Number of Subpopulations/location: 5/5. Fragmented. There is a continuing decline but no extreme fluctuation in the number of locations or subpopulations. All individuals not in one population and one subpopulation does not hold 95% or more of the total population.

Habitat status: Declining due to human interference and change in quality of habitat.

Threats
Threats to taxon: Habitat loss, human interference
Trade: Not in trade

Population
Numbers/Generation time/trend: <250 mature individuals in all populations. Generation time -- perennial.
Population trend: Declining.

Recent Field Studies:
None

Data quality: Field studies, informal sightings, literature/herbarium studies
Qualifier: Area and Extent estimated and habitat status observed. Population estimated based on observation.

Status
IUCN Red List Criteria (1994):
ENDANGERED
Criteria: B1+2bcd; D
IUCN Red List Criteria (2000):
ENDANGERED
Criteria: B2a+b(ii,iii,iv); D
CITES: Appendix II
National Red Data Book: Not listed
Other legislation: Included in the Negative List of Exports (EXIM Policy), 1999.
Known presence in Protected Areas: None

Uncertainty
Assessment based on precaution due to changes expected in habitat. Assessment is exclusive to the below listed compilers and reviewer.

Recommendations
Research: Survey
Management: Monitoring
Cultivation: Cultivated stocks exist at Gurukula Botanical Sanctuary, Wayanad

Other comments:
Originally described by A. Richard based on Perrottet's collection from Nilgiris

Sources:

Compilers:
C. Sathish Kumar

Reviewers:
B.V. Shetty, B. Arthur, S. Molur
**Smithsonia maculata** (Dalz.) Saldanha, C.J., 1974

**Scientific name (author; date):**

Micropera maculata Dalz., 1851

Saccolabium maculatum (Dalz.) Hook. f., 1890

Gastrochilus maculatus (Dalz.) Kuntze, 1891

Loxorna maculatum (Dalz.) Garay, 1972

**Synonyms:**

Micropera maculata (Dalz.) Hook. f., 1890

Saccolabium maculatum (Dalz.) Hook. f., 1890

Gastrochilus maculatus (Dalz.) Kuntze, 1891

Loxorna maculatum (Dalz.) Garay, 1972

**Habit:**

Epiphytic herb

**Habitat:**

Riverine forests

**Niche/ elevation:**

On lateral branches. 500-800 m.

**Distribution**

**Historical distribution:**

India

**Current Global Distribution:**

ENDEMIC to Western Ghats (Karnataka, Kerala & Tamil Nadu)

**Distribution from Literature:**


**Distribution from Field Studies:**

Kerala: Thiruvananthapuram [Satish Kumar, 1990s]

**Extent of Occurrence (Sq. km.):**

101-500

**Area of Occupancy (Sq. km.):**

11-500

**Number of Subpopulations/Location:**

55. Fragmented. All individuals not in one population and one subpopulation does not hold 95% or more of the total population.

**Habitat status:**

Change in quality of habitat due to human interference in some areas.

**Threats**

**Threats to taxon:**

Habitat loss is resulting in and may result in population decline.

**Trade:**

Not in trade.

**Population**

**Numbers/Generation time/Trend**

<500 in all populations.

**Trends:**

Declining.

**Recent Field Studies:**

Attayar, near Agastyamalai [Satish Kumar, 1990s]

**Data quality**

Field studies, informal sightings and Literature/herbarium studies.

**Qualifier:**

Area and Extent estimated on known locations, number of mature individuals estimated through observations.

**Status**

IUCN Red List Criteria (1994):

**ENDANGERED**

Criteria: B1+2c

IUCN Red List Criteria (2000):

**ENDANGERED**

Criteria: B1a+b(iii), 2a+b(iii)

CITES:

Appendix II

Indian WL. (P) Act: Not listed

National Red Data Book: Not listed

International RDB: Not listed

Other legislation:

Included in the Negative list of Exports (EXIM Policy), 1999

Known presence in Protected Areas:

Neyyar Wildlife Sanctuary

**Uncertainty**

Subjective assessment based on exclusive field study but with the consensus of the participants.

**Recommendations**

Research:

Survey

Management:

Monitoring

Cultivation:

Not recommended

**Other comments:**

This was originally described by Dalzell based on his collection from Tulkut Ghaut.

**Sources:**


**Compilers:**


**Reviewers:**

**Smithsonia straminea** Saldanha, C.J., 1974

**Habit:** Epiphytic herb

**Habitat:** Evergreen forests

**Niche/ elevation:** 600-900 m.

**Distribution**

**Historical distribution:** India

**Current Global Distribution:** ENDEMIC to Western Ghats (Karnataka & Kerala)

**Distribution from Literature:**
- Hassan [Sharma *et al.*, 1984].
- Mukkai [Vajravelu, 1990].
- Chandanathode [Ramachandran & Nair, 1988].
- Hassan, Cannanore, Palghat [Rathakrishnan & Chitra, 1984]

**Distribution from Field Studies:**
- Kerala: Palode, Thiruvananthapuram [C. Sathish Kumar].

**Extent of Occurrence (Sq. km.):** 101-5,000

**Area of Occupancy (Sq. km.):** 11-500

**Number of Subpopulations/location:** 4/4. Fragmented. All individuals not in one population and one subpopulation does not hold 95% or more of the total population.

**Habitat status:** Declining habitat and decrease in quality.

**Threats**

**Threats to taxon:** Habitat loss.

**Trade:** Not in trade

**Population**

**Numbers/Generation time/Trend:** <500 mature individuals.

**Trends:** Declining.

**Recent Field Studies:**
- Palode, TBGRI Campus [Sathish Kumar, 1990s]

**Data quality:** General field studies, informal sighting, literature/herbarium studies.

**Qualifier:** Area and Extent estimated and mature individuals inferred from field observation.

**Status**

**IUCN Red List Criteria (1994):** ENDANGERED

**IUCN Red List Criteria (2000):** ENDANGERED

**CITES:** Appendix II

**National Red Data Book:** Not listed

**Other legislation:** Included in the Negative list of Exports (EXIM Policy), 1999

**Known presence in Protected Areas:** None

**Uncertainty**

**Information not available.**

**Recommendations**

**Research:** Survey

**Management:** Monitoring

**Cultivation:** Not recommended

**Other comments:** Described by Saldanha based on his collection from Hassan District, Karnataka.

**Sources:**

**Compilers:** S.S.R. Bennet, B.A. Daniel, R. Gopalan, M. Thapliyal, M. Mohanan, S. Rajendran, S. Phatak, R. Thamilarasi

**Smithsonia viridiflora** (Dalz.) Saldanha, C.J., 1974

Micropera viridiflora Dalz., 1851

Sarcocilus dalzellianus Santapau, 1949

Aerides dalzellianus (Santapau) Garay, 1972

**Scientific name (author; date):**

**Synonyms:**

- Micropera viridiflora Dalz., 1851
- Sarcochilus dalzellianus Santapau, 1949
- Aerides dalzellianus (Santapau) Garay, 1972

**Habit:**

**Habitat:**

Evergreen forests

**Niche/elevation:**

600-800m.

**Distribution**

**Historical distribution:**

India

**Current Global Distribution:**

ENDEMIC to Western Ghats (Karnataka & Kerala)

**Distribution from Literature:**

Hassan, Kemphole, in lower Shirdhi Ghats [Saldanha & Nicolson, 1976]

**Extent of Occurrence (Sq. km.):**

101-500

**Area of Occupancy (Sq. km.):**

11-500

**Number of Subpopulations/Location:**

4/4. Fragmented. All individuals not in one population and one subpopulation does not hold 95% or more of the total population.

**Habitat status:**

Presently no change, but predicted decline due to human interference.

**Threats**

**Threats to taxon:**

Human interference (predicted).

**Trade:**

Not in trade

**Population**

**Numbers/Generation time/Trend:**

<250 mature individuals in all populations.

**Trends:**

Declining

**Recent Field Studies:**

Moozhiyar, Athirumala [C. Sathish Kumar, A case study on orchids]

**Data quality:**

Literature/herbarium, general field studies.

**Qualifier:**

Area and Extent estimated and mature individuals inferred from field observation.

**Status**

**IUCN Red List Criteria (1994):**

ENDANGERED

**Criteria:**

B1+2c; D

**IUCN Red List Criteria (2000):**

ENDANGERED

**Criteria:**

B1a+b(iii), 2a+b(iii); D

**CITES:**

Appendix II

**National Red Data Book:**

Not listed

**Other legislation:**

Included in the Negative list of Exports (EXIM Policy), 1999

**Known presence in Protected Areas:**

Neyyar Wildlife Sanctuary

**Uncertainty**

Consensus and precaution.

**Recommendations**

**Research:**

Survey

**Management:**

Monitoring

**Cultivation:**

Cultivated stocks exist at Gurukula Botanical Sanctuary and TBGRI, Palode.

**Other comments:**

Originally described by Dalzell based on a collection from South Concan in Western Ghats.

**Sources:**

Dalzell, 1851; Garay, 1972; Saldanha & Nicolson, 1976: 850; Saldanha, 1974; Santapau, 1949.

**Compilers:**


**Reviewers:**

Scientific name (author; date): **Spiranthes sinensis** (Pers.) Ames var. **wightiana** Lindley, 1852

Habit:  
Habitat:  
Niche/ elevation:  

**Distribution**  
**Historical Distribution:**  
**Current Global Distribution:**  
**Distribution from Literature:**  
**Distribution from Field Studies:**  
Extent of Occurrence (Sq. km.):  
Area of Occupancy (Sq. km.):  
Number of Subpopulations/location:  
Habitat status:  

**Threats**  
Threats to taxon:  
Trade:  

**Population**  
Numbers/Generation time/trend:  
Population trend:  

**Recent Field Studies:**  

**Data quality:**  
Qualifier:  

**Status**  
IUCN Red List Criteria (1994): **NOT EVALUATED**  
Criteria:  

IUCN Red List Criteria (2000): **NOT EVALUATED**  
Criteria:  

CITES:  
National Red Data Book:  
Other legislation:  
Known presence in Protected Areas:  

**Uncertainty**  

**Recommendations**  
Research:  
Management:  
Cultivation:  

**Other comments:**  
Except for a single specimen collected by B.V. Shetty this plant is represented in MH only by very old collections of Schmidt in 1878 and Beddome in 1804. Another specimen from Bangitappal had been cited by Joseph but the specimen was not traceable [Mohanan & Balakrishnan, 1991].

**Sources:**  
Lindley, 1852; Mohanan & Balakrishnan, 1991; Sharma, 1977  

**Compilers:**  

**Reviewers:**  

---

India  
ENDEMIC to Western Ghats  
Nilgiri [Sharma, 1977], [RG]; [Mohanan & Balakrishna, 1991]  
Bangitappal to Sispara [B.V. Shetty, 1970]
Conservation Assessment and Management Plan Workshop Report for Endemic Orchids of the Western Ghats

**Scientific name (author; date):** Taeniophyllum scaberulum Hook. f., 1890

**Habit:** Epiphytic herb

**Habitat:** Evergreen forests

**Niche / elevation:** Moss-clad twigs. 800-900m

**Distribution**

**Historical distribution:**

**Current Global Distribution:** ENDEMIC to Western Ghats (Kerala)

**Distribution from Literature:** Travancore [Nayar, 1996]

**Distribution from Field Studies:** Kerala: Periyar Tiger Reserve, Idukki [Rajesh, et al., 1997]

**Extent of Occurrence (Sq. km.):** <100

**Area of Occupancy (Sq. km.):** <10

**Number of Subpopulations / location:** 1

**Habitat status:** No change in habitat.

**Threats**

**Threats to taxon:** Unknown

**Trade:** Not in trade

**Population**

**Numbers / Generation time / Trend:** Mature individuals in all populations are <50. Generation time – perennial.

**Trends:** Unknown


**Data quality:** Assessed based on field studies and literature/herbarium studies.

**Qualifier:** The Area and Extent estimated. Habitat status and mature individuals inferred from the current habitat status.

**Status**

**IUCN Red List Criteria (1994):** CRITICALLY ENDANGERED

**Criteria:** D

**IUCN Red List Criteria (2000):** CRITICALLY ENDANGERED

**Criteria:** D

**CITES:** Appendix II

**Indian WL. (P) Act:** Not listed

**International RDB:** Not listed

**Other legislation:** Included in the Negative list of Exports (EXIM Policy), 1999

**Known presence in Protected Areas:** Periyar Wildlife Sanctuary

**Uncertainty**

Assessed on subjective opinion, precaution and consensus.

**Recommendations**

**Research:** Survey, Life history studies, limiting factor research, PHVA pending, physiological (photosynthetic) studies.

**Management:** Monitoring and cultivation/breeding

**Cultivation:** Cultivation recommended for research, species recovery and preservation of live genome. Cultivated stocks are not available. There is no coordinated species management programme for this species and one is not recommended. Initiate cultivation programme within 3 years. Propagation techniques not known at all.

**Other comments:** This species was proposed based on Rev. E. Johnson's collection made in 1854 from 'Cottayam', rediscovered recently from Periyar Tiger Reserve by Rajesh et al. (1997).

**Sources:**

Hooker, 1890 6: 77; Nayar, 1996: 226

**Compilers:** S.S.R. Bennet, J.L. Ellis, M. Mohanan, V. Sarojini Menon, C. Sathish Kumar, S. Seeni, B.V. Shetty, P.S. Udayan, U. Lakshminarayan.


Scientific name (author; date):


Habit: Epiphytic herb
Habitat: Evergreen and moist deciduous forests.
Niche/ elevation: 700-1000m.

Distribution
Historical distribution:

India
ENEDEMIC to Western Ghats (Tamil Nadu)

Current Global Distribution:


Distribution from Field Studies:
Extent of Occurrence (Sq. km.):
<100
Area of Occupancy (Sq. km.):
10-100.
Number of Subpopulations/location:
>1/1.
Habitat status:
No change in the habitat of the taxon.

Threats
Threats to taxon:
Unknown
Trade:
Not in trade

Population
Numbers/Generation time/Trend
Mature individuals in all populations <50. The number of mature individuals not declined in the past and
not likely to decline in the future.

Trends:
Unknown

Recent Field Studies:
None

Data quality:
Assessed based on literature/herbarium and indirect information.

Qualifier:
Area and Extent and population numbers area inferred from literature and herbarium.

Status
IUCN Red List Criteria (1994):
CRITICALLY ENDANGERED
Criteria: D

IUCN Red List Criteria (2000):
CRITICALLY ENDANGERED
Criteria: D

CITES:
Appendix II
Indian WL. (P) Act: Not listed
International RDB: Not listed

National Red Data Book:
Not listed

Other legislation:
Included in the Negative list of Exports (EXIM Policy), 1999

Known presence in Protected Areas:
None

Uncertainty
Assessed based on subjective opinion.

Recommendations
Research:
Survey
Management:
Monitoring, cultivation/breeding
Cultivation:
Cultivated stocks not available. There is no coordinated species management programme for this
species and one is not recommended. Initiate cultivation programme within 3 years. Information on
propagation techniques not available with this group of compilers.

Other comments:
This variety was described by Joseph & Vajravelu based on the latter’s collection from Nilgiris.
Bakasura Malai is uninhabited and is inaccessible. It is considered safe from all kinds of threats, mainly
human interference.

Sources:
Nayar, 1996: 226; Rathakrishnan & Chitra, 1984: 1005

Compilers:
Thamilarasi

Reviewers:
N.C. Rathakrishnan, T. Chhabra, M.B. Vishwanathan, J.L. Ellis, R. Ingalhalli, C. Sathish Kumar, T.A.
**Scientific name (author; date):**

**Trias bonaccordensis** Sathish, 1989

**Habit:**
Epiphytic herb

**Habitat:**
Evergreen to semi evergreen forests.

**Niche/ elevation:**
950-1050m.

**Distribution**

<table>
<thead>
<tr>
<th>Historical distribution:</th>
<th>India</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Global Distribution:</td>
<td>ENDEMIC to Western Ghats (Kerala &amp; Tamil Nadu)</td>
</tr>
<tr>
<td>Distribution from Literature:</td>
<td>Bonaccord in Thiruvananthapuram [Sathish Kumar, 1989]</td>
</tr>
</tbody>
</table>

**Extent of Occurrence (Sq. km.):**
<100

**Area of Occupancy (Sq. km.):**
<10

**Number of Subpopulations/location:**
3-4 locations. Fragmented

**Habitat status:**
No change in the habitat of the taxon. No change in the quality of the habitat.

**Threats**

<table>
<thead>
<tr>
<th>Threats to taxon:</th>
<th>Unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trade:</td>
<td>Not in trade</td>
</tr>
</tbody>
</table>

**Population**

<table>
<thead>
<tr>
<th>Numbers/Generation time/Trend</th>
<th>Unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trends:</td>
<td>Unknown</td>
</tr>
</tbody>
</table>

**Recent Field Studies:**


**Data quality:**

Assessed based on field study and literature/herbarium studies.

**Qualifier:**

The Area and Extent estimated based on known locations. The habitat status observed.

**Status**

<table>
<thead>
<tr>
<th>IUCN Red List Criteria (1994):</th>
<th><strong>VULNERABLE</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Criteria:</td>
<td><strong>D2</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IUCN Red List Criteria (2000):</th>
<th><strong>VULNERABLE</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Criteria:</td>
<td><strong>D2</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CITES:</th>
<th>Appendix II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indian WL. (P) Act:</td>
<td>Not listed</td>
</tr>
<tr>
<td>International RDB:</td>
<td>Not listed</td>
</tr>
</tbody>
</table>

| National Red Data Book:       | Not listed     |
| Other legislation:            | Included in the Negative list of Exports (EXIM Policy), 1999 |
| Known presence in Protected Areas: | Kalakad-Mundanthurai Tiger Reserve, Neyyar Wildlife Sanctuary, Peppara Wildlife Sanctuary |

**Uncertainty**

Assessed with 95% confidence based on evidence and on the consensus of the field biologists at the workshop.

**Recommendations**

| Research:                     | Survey, life history studies |
| Management:                   | Monitoring, cultivation/breeding |

Cultivation is recommended for research and reintroduction. There is no coordinated species management programme for this species and one is not recommended. Propagation techniques not known at all.

**Other comments:**

This species was described by Sathish Kumar based on his collection from Bonaccord, Thiruvananthapuram. It grows epiphytically on many trees especially on *Garcinia morella* (Gaertn.) Desr. and *Mesua ferea* L. (Clusiaceae), *Gluta travancorica* Beddome (Anacardiaceae) and *Careya arborea* Roxb. (Lecythidaceae) [S23]. This species was collected by M. Mohanan in 1979. It was described as a new species by Sathish Kumar based on his later collections from Agastya Malai.

**Sources:**


**Compilers:**


**Reviewers:**

**Scientific name (author; date):** Trias stocksii Benth. ex Hook. f., 1890

**Habit:** Epiphytic or lithophytic herb

**Habitat:** Evergreen and moist deciduous forests.

**Niche/elevation:** 500-1400 m.

**Distribution**

**Historical distribution:** India

**Current Global Distribution:** ENDEMIC to Western Ghats (Maharashtra, Karnataka, Kerala & Tamil Nadu)


**Extent of Occurrence (Sq. km.):** 5,001-20,000

**Area of Occupancy (Sq. km.):** <10

**Number of Subpopulations/location:** 15/9. Fragmented. Continuing decline but no extreme fluctuation in the number of locations or subpopulations. All individuals not in one population and one subpopulation does not hold 95% or more of the total population.

**Habitat status:** Decrease in the habitat <20% in the last 10 years due to loss of habitat, plantation and road construction. There is decrease in the quality of the habitat due to human activities.

**Threats**

**Threats to taxon:** Climate, habitat loss, habitat fragmentation, grazing and harvest are resulting in and may result in population decline. The influence of threats on the population structure well understood, not reversible and not ceased to be a threat.

**Trade:** Not in trade

**Population**

**Numbers/Generation time/Trend:** Mature individuals in all populations >2,500. The number of mature individuals declined in the past by 10% and likely to decline by <10% in the future. Generation time perennial.

**Trends:** The population size/numbers of the taxon declining at a rate of <10% in the last 10 years and <10% predicted decline in the next 10 years due to habitat loss.


**Data quality:** Assessed based on field studies and literature/herbarium studies.

**Qualifier:** The Area and Extent estimated based on the known locations. The habitat status, threats, mature individuals and population trends observed over many years of field studies.

**Status**

|-------------------------------|-----------------------|-----------|----------|

**CITES:** Appendix II

**National Red Data Book:** Not listed

**International RDB:** Not listed

**Included in the Negative list of Exports (EXIM Policy), 1999:**

**Known presence in Protected Areas:** Kudremukh National Park, Silent Valley National Park.

**Uncertainty**

Assessed with 95% confidence based on evidence and on the consensus of the field biologists at the workshop.

**Recommendations**

**Research:** Taxonomic research and life history studies

**Management:** Monitoring, cultivation/breeding

**Cultivation:** Cultivation is recommended for research. Cultivated stocks available at National Orchidarium Yercaud, Kaveri Nisargadhama, Kodagu and Carmel College, Goa. Numbers in cultivation <10. There is no coordinated species management programme for this species and one is not recommended. Initiate cultivation programme within 3 years. Some propagation techniques known for taxon or similar taxa.

**Other comments:** Described by Hook. f. based on Stocks and Law collections from the Deccan. This species is present in easily accessible, localised areas. The reported occurrence of this species in Arunachal Pradesh is based on a misidentification Saldanha and Nicolson 1976.


Compilers: R. Gopalan, M. Mohanan, S. Phatak.

Scientific name (author; date): Vanda wightii Reichb. f., 1861

Habit: Epiphytic herb
Habitat: Unknown
Niche/ elevation: 2100m.

Distribution
Historical distribution: India
Current Global Distribution: ENDEMIC to Western Ghats (Karnataka & Tamil Nadu)
Karnataka: Kodag [Sathish Kumar]
Extent of Occurrence (Sq. km.): <100
Area of Occupancy (Sq. km.): <100
Number of Subpopulations/location: 1
Habitat status: Unknown

Threats
Threats to taxon: Unknown
Trade: Not known

Population
Numbers/Generation time/Trend: Unknown
Trends: None
Recent Field Studies: Field studies, inventories

Qualifier: Observation

Status
IUCN Red List Criteria (1994): VULNERABLE
Criteria: D2
IUCN Red List Criteria (2000): VULNERABLE
Criteria: D2
CITES: Appendix II
Indian WL. (P) Act: Not listed
National Red Data Book: Possibly Extinct [Nayar & Sastry, 1987]
International RDB: Not listed
Other legislation: Included in the Negative list of Exports (EXIM Policy), 1999
Known presence in Protected Areas: None

Uncertainty
Consensus and precaution.

Recommendations
Research: Survey
Management: Not recommended
Cultivation: Not recommended

Other comments: A very little-known species, originally reported from Nilgiris. It was proposed by Heinrich Gustav Reichenbach based on Wight's collection. The only collection known so far is of Wight from Nilgiris. The subsequent workers consider this to be a 'little known' or 'threatened' plant species [Nayar & Sastry, 1987]. Reichenbach described this species in 1861 based on Wight's collection from Nilgiris [Mohanan & Balakrishnan, 1991]. Endemic to Nilgiris of the Western Ghats in Tamil Nadu. There has been no record of its recent relocation in the wild ever since Reichenbach described it in 1861 based on Wight's collection from Nilgiris [Subbarayalu & Velumurugan, 1999]. It was rediscovered from Karnataka.

Sources:

Compilers:

Reviewers:
Scientific name (author; date): **Xenikophyton smeeanum** (Reichb. f.) Garay, 1974

**Synonyms:**
- Saccolabium smeeanum Reichb. f., 1887
- Rhyncostylis latifolia C. Fischer, 1927
- Schoenorchis latifolia (C. Fischer) Saldanha, 1974

**Habit:** Epiphytic herbs

**Habitat:** Moist deciduous to shola forests [RG]

**Niche/ elevation:** 800-2,300m.

**Distribution**

**Historical distribution:** India

**Current Global Distribution:** ENDEMIC to Western Ghats (Karnataka, Kerala & Tamil Nadu)

**Distribution from Literature:**
- Udumbansholai, Karaparai, Hassan district, Kadamane [Abraham & Vatsala, 1981].
- Kadamane in Hassan [Saldanha & Nicolson, 1976].
- Somavarpet, Madikeri [Keshavmurthy & Yogaranasimhan, 1990].
- Aruvanpara and Sairandhri [Manoharan, 1999].

**Distribution from Field Studies:**
- Kerala: Agastyamala, Munmar, Silent Valley [C. Sathish Kumar, 1996].
- Tamil Nadu: Doddabetta, Udthagamandalam [K. Sivabalakrishnan, 1996].

**Extent of Occurrence (Sq. km.):** 101-5,000

**Area of Occupancy (Sq. km.):** 11-500

**Number of Subpopulations/location:** 11/5. Fragmented. All individuals not in one population and one subpopulation does not hold 95% or more of the total population.

**Habitat status:** Decrease in the habitat <20% in the last 10 years. Predicted decline <20% in the next 10 years due to loss of habitat and coffee plantation [R. Ganesan, 2000].

**Threats**

**Threats to taxon:** Habitat loss and habitat fragmentation [R. Ganesan, 2000] resulting in and may result in population decline.

**Trade:** Not in trade

**Population**

**Numbers/Generation time/Trend**
- Mature individuals in all populations unknown. The number of mature individuals declined in the past and likely to decline in the future. Generation time 3 years.

**Trends:** The population size/numbers of the taxon declining at a rate of <10% in the last 10 years. Predicted decline <10% in the next 10 due to habitat loss.


**Data quality:** Assessed based on field studies and literature/herbarium studies.

**Qualifier:** The Area and Extent estimated based on known locations. The habitat status, threats, mature individuals and population trends observed.

**Status**

IUCN Red List Criteria (1994): ENDANGERED

IUCN Red List Criteria (2000): ENDANGERED

**CITES:** Appendix II

**National Red Data Book:** Not listed

**Other legislation:** Included in the Negative list of Exports (EXIM Policy), 1999

**Known presence in Protected Areas:** Biligiri Rangaswamy Temple Wildlife Sanctuary, Eravikulam National Park, Neyyar Wildlife Sanctuary, Kalakad-Mundanthurai Tiger Reserve, Silent Valley National Park

**Uncertainty**

Assessed with 95% confidence based on evidence and on the consensus of the field biologists at the workshop.

**Recommendations**

**Research:** Life history studies, PHVA.

**Management:** Cultivation/breeding

**Cultivation:** Cultivated recommended for research. Cultivated stocks are not available. There is no coordinated species management programme for this species and one is recommended. Initiate cultivation programme within 3 years. Information on propagation techniques not available with this group of compilers.

**Other comments:** Originally proposed by Reichenbach f. based on Smee's collection without precise locality. It is frequently found in Somwarpet and Mercara [Keshavmurthy & Yogaranasimhan, 1990]. No decline perceived in Thalakaveri Medicinal Plants Area. Except few sholas closer to coffee estate, others are free from disturbance. So, plants may not face threats unless the sholas are destroyed [RG].

**Sources:**

---

**Conservation Assessment and Management Plan Workshop Report for Endemic Orchids of the Western Ghats 2001**

ORCHIDS ENDEMIC TO WESTERN GHATS
AND EXTENDING INTO EASTERN GHATS
**Scientific name (author date):** Anoectochilus elatus Lindley, 1857

**Habit:** Terrestrial herb.

**Habitat:** Evergreen forest.

**Habitat elevation:** Forest floor on humus. Above 1300 m.

**Distribution**

**Historical distribution:**

**Current Global Distribution:** ENDEMIC to Western Ghats + Kolli Hills (Tamil Nadu & Kerala)

**Distribution from Literature:**

- Sispara in Silent Valley [Manilal, 1988].
- Nilgiris, Salem [Henry et al., 1989].
- Kollimalai, Wallaghat, Udharagamandalam [Matthew, 1983].
- Shembaganur, Peria Shola, Kukkal Shola, Tiger Shola, Parappar stream, Blackburn Shola, Wallaghat, Udharagamandalam [Seidenfaden, 1999].
- Nilgiris [Nayar, 1996].
- Kolli hills [Matthew, 1983].
- Walakkad near Sispara [Sathish Kumar, 1999].
- Devala, Coonoor [Sharma et al., 1977].
- Kakachi-Kodayar [Ganesan & Livingstone, 2001]

**Distribution from Field Studies:**

- Kerala: Silent Valley [Sathish Kumar].
- Tamil Nadu: Kodaikanal [N. Raman, June 1997].
- Coonoor, Nilgiri [P.F. Solomons, 1999].
- Kolli Hills in Salem [M.B. Vishwanathan].
- Kakachi-Kodayar [R. Ganesan]

**Extent of Occurrence (Sq. km.):** 10-500

**Area of Occupancy (Sq. km.):** 10-500/10-20. Fragmented. Continuing decline but no extreme fluctuation in the number of locations or subpopulations. All individuals not in one population and one subpopulation does not hold 95% or more of the total population.

**Habitat status:** Decrease in the habitat >20% in the last 10-20 years and >20% predicted decline in the next 10-20 years due to loss of habitat, industrialisation and construction of roads. Decrease in the quality of habitat due to human interference and grazing.

**Threats**

**Threats to taxon:** Grazing and habitat loss resulting in and may result in future population decline. The influence of these factors on the habitat and population well understood, not reversible and have not ceased.

**Trade:** Not in trade.

**Population**

**Numbers/Generation time/Trend:** Mature individuals in all populations less than 2,500. The number of mature individuals declined in the past by 30-50% and likely to decline by 30-50% in the future. Generation time 1 year.

**Population Trends:** Decline in the population by more than 20% in the last 10 years and estimated decline of more than 20% in the next 10 years.

**Recent Field Studies:**


**Data quality:** Assessed based on field studies, indirect information, informal sightings and literature/herbarium studies.

**Qualifier:** The Area and Extent estimated based on known locations. The habitat status, threats, mature individuals and population trends observed, inferred and suspected, respectively.

**Status**

**IUCN Red List Criteria (1994):** ENDANGERED Criteria: B1a+b(i,ii,iii,iv,v), 2a+b(i,ii,iii,iv,v)

**IUCN Red List Criteria (2000):** ENDANGERED Criteria: B1a+b(i,ii,iii,iv,v), 2a+b(i,ii,iii,iv,v)

**CITES:** Appendix II

**National Red Data Book:** Not listed

**Other legislation:** Included in the Negative List of Exports (EXIM Policy), 1999.

**Known presence in Protected Areas:** Kakakkad-Mundanthurai Tiger Reserve. Mukurthi National Park, Silent Valley National Park

**Uncertainty**

Assessed based on range of opinion and both evidence and precaution with the consensus of the field biologists.

**Recommendations**

**Research:** Survey, genetic research, life history studies, PHVA

**Management:** Cultivation/breeding.

**Cultivation:** Cultivation recommended for research. Cultivated stocks exist at TBGRI, Palode and Gurukula Botanical Sanctuary, Wayanad. There is no coordinated species management programme for this species and one is not recommended but cultivation programme is recommended to be initiated within 3 years. Some propagation techniques is known for similar taxa.

**Other comments:** Proposed by Lindley (1887) based on Mc Ivoir’s collection from Walla Ghaut. Found in dense shade of forests with species of Zeuxine, Calanthe sylvatica, Tania bicornis and Chrysoglossum maculatum. In Devala the habitat has been completely destroyed due to human habitation [Rajan]. It is very sensitive to disturbance in the habitat. The specimens reported under this name from Thiruvananthapuram and Idukki Districts (Kerala) and Kalakad-Mundanthurai Tiger Reserve (Tamil Nadu) actually belong to an yet undescribed species.

**Sources:**


Cirrhopetalum neilgherrense Wight, 1851

Bulbophyllum kaitiensis (Wight) Reichb. f., 1861

Scientific name (author; date):
Cirrhopetalum neilgherrense Wight, 1851

Synonym:
Bulbophyllum kaitiensis (Wight) Reichb. f., 1861

Habit: Epiphytic herb

Habitat: Evergreen forest

Niche/ elevation: Above 1300m.

Distribution
Historical distribution:
India

Current Global Distribution:
ENDEMIC to Western Ghats + Kolli hills & Shevroys (Maharashtra, Goa, Karnataka, Kerala & Tamil Nadu)

Distribution from Literature:

Distribution from Field Studies:
Kerala; Devikulam [C. Satish Kumar]
Tamil Nadu: High Wavy Mountains [K. Ravi Kumar]

Extent of Occurrence (Sq. km.):
>20,000

Area of Occupancy (Sq. km.):
501-2,000

Number of Subpopulations/location:
Many. Fragmented. Continuing decline but no extreme fluctuation in the number of locations or subpopulations. All individuals not in one population and one subpopulation does not hold 95% or more of the total population.

Habitat status:
Habitat loss and change in quality of habitat due to human interference and developmental activities.

Threats
Threats to taxon:
Loss of habitat

Population
Numbers/Generation time/Trends:
Unknown.

Trends:
Unknown.

Recent Field Studies:

Data quality:
Assessed based on field studies, indirect information, informal sightings and literature/herbarium studies.

Qualifier:
The Area and Extent estimated based on known locations. The habitat status and threats observed and inferred respectively.

Status
IUCN Red List Criteria (1994): VULNERABLE

IUCN Red List Criteria (2000): VULNERABLE

CITES:
Appendix II

Indian WL. (P) Act:
Not listed

International RDB:
Not listed

National Red Data Book:
Not listed

Other legislation:
Included in the Negative List of Exports (EXIM Policy), 1999.

Known presence in Protected Areas:
None

Uncertainty
Assessed with 95% confidence based on evidence and on the consensus of the field biologists.

Recommendations
Research:
Survey, taxonomic research

Management:
Monitoring

Cultivation:
Cultivation recommended for research. There is no coordinated species management programme for this species and one is not recommended but cultivation programme is recommended to be initiated within 3 years. Some propagation techniques is known for similar taxa.

Other comments:
Described by Wight based on a collection from Kartairy, below Kaitia in Nilgiris.

Sources:

Compilers:

Reviewers:
Dendrobium anamalayanum Chandrab. et al., 1981

Epiphyte

Evergreen forests and sholas

1000 m.

India

ENDEMIC to Western Ghats + Shevroys (Tamil Nadu & Kerala)


Distribution from Field Studies:

Extent of Occurrence (Sq. km.): 5,001-20,000

Area of Occupancy (Sq. km.): 11-500

Number of Subpopulations/location: 2/2. Fragmented. No continuing decline or extreme fluctuation in the number of locations or subpopulations. All individuals not in one population and one subpopulation does not hold 95% or more of the total population.

Habitat status:

Decrease in the habitat >20% in the last 10 years. Predicted decline >20% in the next 10 years due to loss of habitat and plantations. Decrease in quality of the habitat.

Threats

Human interference, decline of host species, habitat loss and demographic instability resulting in and may result in population decline. The influence of threats on the population well understood, not reversible and have not ceased.

Trade:

Not in trade

Population

Numbers/Generation time/Trend:

Mature individuals in all populations <2,500. The numbers of mature individuals declined by 20% and likely to decline by 20% in the future. Generation time 5 years.

Trends:

The population size/numbers of the taxon declining at a rate of >10% in the last 10 years. Predicted decline >10% in the next 10 due to habitat loss.

Recent Field Studies:


Data quality:

Assessed based on indirect information and literature/herbarium studies.

Qualifier:

The Area and Extent estimated based on known locations. The habitat status, threats, mature individuals and population trends inferred from literature and from habitat status.

Status

IUCN RED LIST CRITERIA (1994): ENDANGERED Criteria: B1+2abce

IUCN RED LIST CRITERIA (2000): ENDANGERED Criteria: B2a+b(i,ii,iii,v)

CITES: Appendix II

Indian WL. (P) Act: Not listed

International RDB: Not listed

National Red Data Book: Not listed

Other legislation: Included in the Negative List of Exports (EXIM Policy), 1999.

Known presence in Protected Areas: Eravikulam National Park, Indira Gandhi Wildlife Sanctuary

Uncertainty

Assessed with 95% confidence based on inference, range of opinion, precaution and on the consensus of the field biologists.

Recommendations

Research:

Genetic research, PHVA pending.

Management:

Cultivation/breeding

Cultivation:

Cultivation is recommended for commercial/sustainability. Cultivated stocks not available. There is no coordinated species management programme for this species and one is recommended. Initiate cultivation programme within 3 years. Some propagation techniques known for taxon or similar taxa.

Other comments:

Discovered from Anamalai, it was also reported from Salem. In Shevroys there is disturbance in the natural habitat.

Sources:


Compilers:


Reviewers:

**Scientific name (author; date):**

*Dendrobium aqueum* Lindley, 1843

**Synonym:**

*Dendrobium album* Lindley, 1843

**Habit:**

Epiphytic, pendant herb.

**Habitat:**

Shola forest.

**Niche/ elevation:**

1300-1600 m.

### Distribution

**Historical distribution:**

India

**Current Global Distribution:**

ENDEMIC to Western Ghats + Kollimalai and Servarayan Hills (Maharashtra, Karnataka, Kerala & Tamil Nadu)

**Distribution from Literature:**


**Distribution from Field Studies:**


**Extent of Occurrence (Sq. km.):**

>20,000

**Area of Occupancy (Sq. km.):**

>2,000

**Number of Subpopulations/location:**

10-40/10-20. Fragmented. Continuing decline but no extreme fluctuation in the number of locations or Subpopulations. All individuals not in one population and one subpopulations does not hold 95% or more of the total population.

**Habitat status:**

Decrease in the habitat >20% in the last 10-20 years. >20% predicted decline in the next 10-20 years due to loss of habitat, timbering, vandalism, coffee plantations in Mudugere and Chikkamagalur [G.K. Seetharamu]. Decrease in the quality of the habitat due to timbering activities.

### Threats

**Threats to taxon:**

Harvest for timber, habitat loss, human interference and over exploitation of host trees. These threats are resulting in and may result in population decline. The influence on the population is well understood, are not reversible and have not ceased to be threats.

**Trade:**

Not in trade.

### Population

**Numbers/Generation time/Trend:**

Mature individuals in all populations are >2,500. The numbers of mature individuals declined in the past by 10-20% and are likely to decline by 20-30% in the future. Generation time 3-10 years.

**Trends:**

The population size/numbers of the taxon is declining at a rate of >20% in the last 10 years. Predicted decline >20% in the next 10 years due to habitat loss and vandalism.

**Recent Field Studies:**


**Data quality:**

This species is assessed based on field studies, and literature/herbarium studies.

**Qualifier:**

The Area and Extent are estimated based on known locations. The habitat status, threats, mature individuals and population trends are observed over many years of field studies, inferred and suspected for the entire distribution from a range of opinion.

### Status

<table>
<thead>
<tr>
<th>IUCN RED LIST CRITERIA (1994):</th>
<th>Vulnerable</th>
<th>A1acH2c</th>
</tr>
</thead>
<tbody>
<tr>
<td>IUCN RED LIST CRITERIA (2000):</td>
<td>Near Threatened</td>
<td>--</td>
</tr>
</tbody>
</table>

**CITES:**

Appendix II

Indian WL. (P) Act: Not listed

International RDB: Not listed

**Other legislation:**

Included in the Negative List of Exports (EXIM Policy), 1999.

**Known presence in Protected Areas:**

Bhimashankar Wildlife Sanctuary, Kodumukh National Park, Pushpagiri Wildlife Sanctuary, Silent Valley National Park, Talakaveri Wildlife Sanctuary

**Uncertainty:**

*D. aqueum* species is assessed based on evidence for a few locations and extrapolated for the entire distribution with the consensus of the field biologists at the workshop, involving a range of opinion.

**Recommendations**

**Research:**

Survey, genetic research, life history studies, PHVA pending.

**Management:**

Monitoring, cultivation/breeding.

**Cultivation:**

Cultivation is recommended for research. Cultivated stocks are available at local green House. Numbers in cultivation 6. There is no coordinated species management programme for this species and one is recommended. Initiate cultivation programme within 3 years. Some propagation techniques known for similar taxa.

**Other comments:**

Described by Lindley based on Lodidges collection from Bombay. The species is highly tufted and pendulous. Lindley mentions that this species is “a native of Bombay, whence it was imported by Messrs. Lodidges”. Cooke and Blatter and Mc Cann mention that the plant is often cultivated but has not been seen wild [Santapau & Kapadia, 1966].


Scientific name (author; date): Dendrobium microbulbon A. Rich., 1841
Habit: Epiphyte
Habitat: Dry and moist Deciduous forests.
Niche/ elevation: Moss clad branches of trees. 1400-1600 m.

Distribution
Historical distribution:
Current Global Distribution: ENDEMIC to Western Ghats + Shevroys and Guthirayan hills (Maharashtra, Karnataka & Tamil Nadu)
Distribution from Literature:
- Muthukuzhivayal and Naduvattam [Abraham & Vatsala, 1981].
- Thana, Kasara, Igatpuri, Khandala, Lonavla, Mahabaleshwar, Purandhar, Bhimashankar, Amboli ghat, Anamalai, Nilgiris [Santapau & Kapadia, 1966].
- North Kanara [Sharma et al., 1984].
- Kolhapur, Nasik, Pune, Raigad, Ratnagiri, Satara, Sindhudurg, Thane [Lakshminarasimhan, 1996].
Distribution from Field Studies:

Extent of Occurrence (Sq. km.): >20,000
Area of Occupancy (Sq. km.): 10-500.
Number of Subpopulations/location: 103. Fragmented. Continuing decline but no extreme fluctuation in the number of locations or subpopulations. All individuals not in one population and one subpopulations does not hold 95% or more of the total population
Habitat status: Decrease in the habitat <20% in the last 10 years due to loss of habitat. Decrease in the quality of habitat due to tourism and construction of roads.

Threats
Threats to taxon: Damming and habitat loss resulting in and may result in population decline. The influence on the population well understood, not reversible and not ceased to be threats.
Trade: Not in trade

Population
Numbers/Generation time/Trends: Mature individuals in all populations <250. The number of mature individuals declined in the past by >10% and likely to decline by >10% in the future. Generation time perennial.
Trends: The population size/numbers of the taxon declining at a rate of >10% in the last 10 years. No decline predicted.

Recent Field Studies:
T.A. Rao at Thadiandamol, Brahmagiri Range, Kudremukh National Park, 1998-99, Conservation studies

Data quality: Assessed based on field studies, indirect information and literature/herbarium studies.

Qualifier: The Area and Extent estimated based on known locations. The habitat status, threats, mature individuals and population trends observed over many years of field studies.

Status
IUCN RED LIST CRITERIA (1994): ENDEANGERED Criteria: B1+2abcde; C2a
IUCN RED LIST CRITERIA (2000): ENDEANGERED Criteria: B2a+b(i,ii,iii,iv,v); C2a(i)
CITES: Appendix II
National Red Data Book: Not listed
Other legislation: Included in the Negative List of Exports (EXIM Policy), 1999.
Known presence in Protected Areas: Bhimashankar Wildlife Sanctuary, Brahmagiri Wildlife Sanctuary, Kudremukh National Park

Uncertainty Assessed based on some evidence, range of opinion and precaution with the consensus of the field biologists.

Recommendations
Research: Survey
Management: Monitoring
Cultivation: Cultivated stocks are not available. There is no coordinated species management programme for this species and one is not recommended. Initiate programme after 3 years. Some propagation techniques known for similar taxa.

Other comments: Proposed by A. Richard based on Perottet’s collection from Nilgiris.

Dendrobium nanum Hook. f., 1889

Dendrobium mabelae Gammie, 1905.

Habit: Epiphyte
Habitat: Evergreen forests
Niche/ elevation: Moss clad branches of trees. 1400-1600 m.

Distribution
Historical distribution: India
Current Global Distribution: ENDEMIC to Western Ghats + Shevroys and Guthirayan hills (Maharashtra, Karnataka, Kerala & Tamil Nadu)


Extent of Occurrence (Sq. km.): >20,000
Area of Occupancy (Sq. km.): 10-500
Number of Subpopulations/location: 50/10. Fragmented. Continuing decline in the number of locations or subpopulations. All individuals are not in one population and one subpopulation does not hold 95% or more of the total population.

Habitat status: Decrease in the habitat <20% in the last 10 years. <20% predicted decline in the next 10 years due to loss of habitat and felling of host trees. There is a change in the quality of habitat.

Threats
Threats to taxon: Habitat loss and human interference is resulting in and may result in population decline. The influence on the population is well understood, is not reversible and has not ceased to be a threat.
Trade: Not in trade

Population
Numbers/Generation time/Trends: The numbers of mature individuals declined in the past by 10% and are likely to decline by 10% in the future. Generation time 3-6 years.
Trends: The population size/numbers of the taxon declining at a rate of <10% in the last 10 years. Predicted decline <10% in the next 10 due to habitat loss.


Data quality: This species is assessed based on field studies and literature/herbarium studies.

Qualifier: The Area and Extent estimated based on known locations. The habitat status and threats observed over years of field studies while the population trends are assessed based on indirect information.

Status
IUCN RED LIST CRITERIA (1994): ENDANGERED Criteria: B1+2abcde
IUCN RED LIST CRITERIA (2000): ENDANGERED Criteria: B2a+b(i,ii,iii,iv,v)
CITES: Appendix II
National Red Data Book: Not listed
Other legislation: Not listed

Known presence in Protected Areas: Brahmagiri Wildlife Sanctuary, Mukurthi National Park, Pushpagiri Wildlife Sanctuary, Silent Valley National Park, Talakaveri Wildlife Sanctuary.

Uncertainty: Assessed with based on evidence of habitat effects and on precaution due to threats; on the consensus of the field biologists at the workshop; on a range of opinion.

Recommendations
Research: Survey, life history studies, PHVA.
Management: Habitat management, monitoring, cultivation/breeding.
Cultivation: Cultivation is recommended for research. Cultivated stocks available at TBGRI, Thiruvananthapuram and Narayana Gurusukum, Wayanad. Numbers cultivation 12. There is no coordinated species management programme for this species and one is not recommended. Ongoing cultivation programme intensified or increased. Some propagation techniques known for similar taxa.

Other comments: Habitat loss not observed in Silent Valley and Mukurthi Hills as they are in protected areas.


Scientific name (author; date): **Dendrobium wightii** Hawkes & Heller, 1962

Dendrobium graminifolium Wight, 1851 non Willd., 1805

Synonym:

Dendrobium graminifolium Wight, 1851 non Willd., 1805

Habit:

Mostly lithophytic herb

Habitat:

Moist moss-clad rocks

Niche/ elevation:

Dripping rocks on streamlands and ravines. 800-1000 m.

**Distribution**

**Historical distribution:** India

**Current Global Distribution:** ENDEMIC to Western Ghats + Yercaud, Shevroys and Sanyasimalai Hills (Karnataka, Kerala & Tamil Nadu)


**Distribution from Field Studies:** Karnataka: Kudremukh [T.A. Rao, 2000]


**Extent of Occurrence (Sq. km.):** 5,001-20,000

**Area of Occupancy (Sq. km.):** 501-2,000

**Number of Subpopulations/location:** 6/Many. Fragmented. Continuing decline in the number of locations or subpopulations. All individuals not in one population and one subpopulation does not hold 95% or more of the total population.

**Habitat status:** No change in the habitat of the taxon. Predicted decline of <20% in the next 10 years due to landslides. No change in the quality of the habitat.

**Threats**

Threats to taxon: Landslides may result in population decline. The influence on the population well understood, not reversible and not ceased to be a threat.

Trade: Not in trade

**Population**

**Numbers/Generation time/Trends:** Generation time 5-6 years.

**Trends:** Unknown.


**Data quality:** Assessed based on field studies, indirect information and literature/herbarium studies.

**Qualifier:** The Area and Extent estimated based on known locations. The habitat status and threats observed over many years.

**Status**

IUCN RED LIST CRITERIA (1994): VULNERABLE

IUCN RED LIST CRITERIA (2000): VULNERABLE

CITES: Appendix II

National Red Data Books: Not listed

Other legislation: Included in the Negative List of Exports (EXIM Policy), 1999.

**Known presence in Protected Areas:** Kudremukh National Park

**Uncertainty**

Assessed based on evidence (and some precaution) and with the consensus of the field biologists at the workshop.

**Recommendations**

Research: Survey, life history studies, PHVA pending.

Management:

Cultivation: Cultivation is recommended for research. Cultivated stocks available at TBGRI, Thiruvananthapuram. Numbers in cultivation 20. There is no coordinated species management programme for this species and one is not recommended. Ongoing cultivation programme intensified or increased. Some propagation techniques known for similar taxa.

**Other comments:** Always seen on dripping rocks in ravines. In Ponmudi the ravines are not affected. The flowers have no commercial value. The plant is very small.


**Compilers:** J.L. Ellis, R. Ingathalli, N. Raman, N.C. Rathakrishnan, C. Sathish Kumar, B. Arthur.

Scientific name (author; date): Eria nana A. Rich., 1841

Synonyms: Dendrobium Miltomme Wight, 1851; Eria muscicola (Lindley) Lindley var. ponmudianam Mohanan & A.N. Henry, 1986

Habit: Epiphytic or lithophytic herb

Habitat: Evergreen and shola forests

Distribution:

Historical distribution:

Current Global Distribution: ENDEMIC to Western Ghats + Shevroys, Yercaud (Kamataka, Kerala & Tamil Nadu)

Distribution from Literature:

- Nilgiri hills, Ponmudi [Abraham & Vatsala, 1981].
- Mysore, Nilgiris, Kodagu [Rao, 1998].
- Kodaikanal, Glentfalls, Bear shola, Perumal peak [Seidenfaden, 1999].
- Mysore [Sharma et al., 1984].
- Combatore, Madurai [Henry et al., 1989].
- Yercaud, Servarayans [Mathew, 1983].
- Kodaikanal, Ootacamund downs [Fyson, 1974].
- Nilgiri hills [Hooker, 1886-1890].
- Koonthi Reserve forests [Keshavmurthy & Yoganarasimhan, 1990].
- Avalanch, Bangihalla, Dodabetta, Naduvattom and T.R. Bazaar [Sharma et al., 1977].
- Kakachi-Kodayar [Ganesan & Livingstone, 2001]

Distribution From Field Studies:

- Karnataka: Thadiandamol [T.A. Rao].
- Tamil Nadu: Pykara, Upper Bhavani Avalanche, Mukurthi National Park, Wenden downs [T. Chhabra].
- Naduvattom [K. Sivabalakrishnan].
- Mukurthi National Park [P.F. Solomons, 1997-99].

Extent of Occurrence (Sq. km.): >20,000

Area of Occupancy (Sq. km.): 10-500

Number of Subpopulations/location: >100-10. Fragmented. Continuing decline but no extreme fluctuation in the number of locations or subpopulations. All individuals not in one population and one subpopulations does not hold 95% or more of the total population.

Habitat status: Decrease in the habitat >20% in the last 10 years. >20% predicted decline in the next 10 years due to loss of habitat. No change in the quality of the habitat.

Threats:

- Habitat loss, human interference and demographic instability resulting in and may result in population decline. The influence of threats on the population structure well understood, not reversible and have not ceased.

Trade:

- Not in trade

Population:

Numbers/Generation time/Trend: Mature individuals in all populations are >2,500. The numbers of mature individuals declined in the past by >20% and are likely to decline by >20% in the future.

Trends: The population size/numbers of the taxon is declining at a rate of >20% in the last 10 years. Predicted decline >20% in the next 10 due to habitat loss.

Recent Field Studies:

- T. Chhabra in Avalanche, Pykara, Upper Bhavani, Mukurthi National Park, Wenden downs.
- K. Sivabalakrishnan in Naduvattom.
- P.F. Solomons in Mukurti National Park.
- C. Sathish Kumar in Ponmudi, Trivandrum district, 1984, floristic of Kerala.

Data quality:

- Assessed based on field studies, informal sightings and literature-herbarium studies.

Qualifier:

- The Area and Extent estimated based on known locations. The habitat status, threats, mature individuals and population trends observed over many years. It is also based on range of opinion.

Status:

- IUCN RED LIST CRITERIA (1994): ENDEANGERED Criteria: B1+2bcde
- IUCN RED LIST CRITERIA (2000): ENDEANGERED Criteria: B2a+b(i,iii,iv,v)
- CITES: Appendix I
- National Red Data Book: Not listed
- International RDB: Not listed
- Known presence in Protected Areas: Kalakad-Mundanthurai Tiger Reserve, Mukurthi National Park.

Uncertainty:

- Assessed with 95% confidence based on evidence, on the consensus of the field biologists and range of opinion.

Recommendations:

- Research: Life history studies and PHVA.
- Management: Cultivation/breeding
- Cultivation: Cultivation is recommended for research. Cultivated stocks are available at home garden. Numbers in cultivation 10. There is no coordinated species management programme for this species and one is not recommended. Initiate cultivation programme within 3 years. Some propagation techniques known for similar taxa.

Other comments:

- Proposed by A. Richard based on Perrottet's collection from Nilgiris. This species is also found in Ponmudi - Bose and Bhattacharya - Orchids of India. Flowers are greenish-yellow, very attractive star shaped.

Sources:

Richard, 1841 15: 19; Seidenfaden, 1999: 1247; Sharma et al., 1977: 140; Sharma et al., 1984: 269; Wight, 1851 1: 5.t.1642.


Scientific name (author; date): **Eria pauciflora** Wight, 1851

Habit: Creeping epiphyte and lithophyte

Habitat: Moist deciduous forest

Niche/ elevation: Above 1200 m.

**Distribution**

- **Historical distribution:** India
- **Current Global Distribution:** ENDEMIC to Western Ghats + Kolli Hills (Karnataka, Kerala & Tamil Nadu)
- **Distribution from Literature:** Coonoor, Kateri Falls and Kodanad [Sharma et al., 1984]. Kakchi-Kodayar [Ganesan & Livingstone, 2001]
- **Distribution from Field Studies:**
  - Karnataka: Kudremukh National Park [T.A. Rao].

**Extent of Occurrence (Sq. km.):** >20,000

**Area of Occupancy (Sq. km.):** >2,000

**Number of Subpopulations/location:** 11/10. Fragmented. There is no continuing decline or extreme fluctuation in the number of locations or subpopulations. All individuals not in one population and one subpopulation does not hold 95% or more of the total population

Habitat status: Decrease in the area of habitat.

**Threats**

- Threats to taxon: Habitat loss and habitat loss due to exotic plants.
- Trade: Not in trade

**Population**

**Numbers/Generation time/Trend:** Mature individuals in all populations are >10,000. There is no decline in the number of mature individuals. Generation time perennial.

**Trends:** The population size/numbers of the taxon is increasing.

**Recent Field Studies:**


**Data quality:** Assessment based on field studies, indirect information and literature/herbarium studies.

**Qualifier:** The Area and Extent estimated based on the known locations. Mature individuals and population trends observed.

**Status**

- **IUCN RED LIST CRITERIA (1994):** LOWER RISK LEAST CONCERN
- **IUCN RED LIST CRITERIA (2000):** LEAST CONCERN
- **CITES:** Appendix II
- **National Red Data Book:** Not listed
- **Other legislation:** Included in the Negative List of Exports (EXIM Policy), 1999.

**Known presence in Protected Areas:** Eravikulam National Park, Kalakad-Mundanthurai Tiger Reserve, Kudremukh National Park, Neyyar Wildlife Sanctuary, Peppara Wildlife Sanctuary, Silent Valley National Park, Talakaveri Wildlife Sanctuary.

**Uncertainty**

Assessed based on evidence and on the consensus of the field biologists.

**Recommendations**

**Research:** Survey, genetic research, life history studies, PHVA.

**Management:** Monitoring, cultivation/breeding.

**Cultivation:** Cultivation is recommended for research. Cultivated stocks are not available. There is no coordinated species management programme for this species and one is not recommended. Initiate cultivation programme within 3 years. Information on propagation techniques not available with this group of compilers.

**Other comments:** Described by Wight based on his collection from Kaitie Falls in Nilgiris. Based on literature this species has been reported from few pockets of southern Western Ghats and also from Eastern Ghats [Kollimalais]. In Kothayar, Kannikati and Mahendragiri, this was the predominant species of orchid in the forest. Decline in the population is not seen in Naduvattom and Lovedale.

**Sources:** Sharma et al., 1984: 269; Wight, 1851 (I): 4.1636.

**Compilers:** J.L. Ellis, R. Gopalan, R. Ingaihalli, N. Raman, N.C. Rathakrishnan, C. Sathish Kumar, S. Phatak, B. Arthur

**Scientific name (author; date):**
Eria polystachya A. Rich., 1841

**Habit:**
Epiphyte

**Habitat:**
Evergreen forests

**Niche/ elevation:**
250-1800 m.

**Distribution**

**Historical distribution:**
India

**Current Global Distribution:**
ENDEMIC to Western Ghats + Shevroys, Yercaud (Karnataka, Kerala & Tamil Nadu)

**Distribution from Literature:**

**Distribution from Field Studies:**

**Extent of Occurrence (Sq. km.):**
>20,000

**Area of Occupancy (Sq. km.):**
501-2,000

**Number of Subpopulations/location:**
16/10. Fragmented. There is no continuing decline or extreme fluctuation in the number of locations or subpopulations. All individuals are not in one population and one subpopulation does not hold 90% or more of the total population.

**Habitat status:**
Change in the area or quality of habitat unknown.

**Threats**

**Threats to taxon:**
Unknown

**Trade:**
Not in trade

**Population**

**Numbers/Generation time/Trend**
Mature individuals in all populations >2,500. The numbers of mature individuals not declined in the past and not likely to decline in the future. Generation time perennial.

**Trends:**
The population size/numbers of the taxon is increasing.

**Recent Field Studies:**

**Data quality:**
Assessment based on field studies, informal sightings and literature/herbarium studies.

**Qualifier:**
The Area and Extent estimated based on the known locations. Mature individuals and population trends estimated.

**Status**

**IUCN RED LIST CRITERIA (1994):**
LOWER RISK NEAR THREATENED
Criteria: -

**IUCN RED LIST CRITERIA (2000):**
NEAR THREATENED
Criteria: -

**CITES:**
Appendix II

**National Red Data Book:**
Indian WL. (P) Act: Not listed

**Other legislation:**
International RDB: Not listed

**Known presence in Protected Areas:**
Included in the Negative List of Exports (EXIM Policy), 1999. Kalakad-Mundanthurai Tiger Reserve, Mukurthi National Park

**Uncertainty**
Assessed based on precaution, on the consensus of the field biologists at the workshop. Since information on threats and habitat status is unknown, the decision was to place it under Near Threatened.

**Recommendations**

**Research:**
Genetic research, taxonomic research, life history studies and PHVA.

**Management:**
Monitoring and cultivation/breeding.

**Cultivation:**
Cultivation is recommended for research. Cultivated stocks are available at Gurukula Botanical Sanctuary. There is no coordinated species management programme for this species and one is not recommended. Initiate cultivation programme within 3 years. Information on propagation techniques not available with this group of compilers.

**Other comments:**
This was described by A. Richard based on Perrottet’s collection from the Nilgiris. It has been reported from Eastern Ghats also.

**Sources:**
Richard, 1841, ser.2 15: 20.1; Rathakrishnan & Chitra, 1984: 1004; Sharma et al., 1977: 140.

**Compilers:**

**Reviewers:**
**Scientific name (author; date):** Flickingeria nodosa (Dalz.) Seidenf., 1980

**Synonym:**

Dendrobium nodosum Dalz. 1852

**Habit:** Epiphytic herb

**Habitat:** Evergreen forest

**Niche/ elevation:** Branches and crotches of tall trees. 500-1000 m.

**Distribution**

**Historical distribution:**

India

**Current Global Distribution:** ENDEMIC to Western Ghats + Shevroys, Yercaud (Karnataka, Kerala & Tamil Nadu)

**Distribution from Literature:**


**Distribution from Field Studies:**


Tamil Nadu: Gudalur [P.F. Solomons, 1998-99].

**Extent of Occurrence (Sq. km.):** 5,001-20,000

**Area of Occupancy (Sq. km.):** 501-2,000

**Number of Subpopulations/location:** >500/>50. Fragmented. There is a continuing decline but no extreme fluctuation in the number of locations or subpopulations. All individuals not in one population and one subpopulation does not hold 95% or more of the total population.

**Habitat status:** Decrease in the area >20% in the last 10 years due to loss of habitat. There is decrease in the quality of the habitat.

**Threats**

**Threats to taxon:**

Habitat loss, human interference, habitat fragmentation, harvest for medicine, harvest for food, trade of parts, trade for market or medicine and over exploitation resulting in and may result in population decline. The influence of threats on the population structure well understood, not reversible and not ceased to be a threat.

**Trade:**

Stem and pseudobulbs in local trade for medicinal purposes. Also used for preparation of halwas.

**Population**

**Numbers/Generation time/Trend**

Mature individuals >2,500. Mature individuals declined by 10% in the past and predicted decline >10%. Generation time 10 years.

**Trends:**

Population size/numbers declining by >10% in the last 10 years.

**Recent Field Studies:**


**Data quality:**

Assessment based on field studies and literature/herbarium studies.

**Qualifier:**

**Status**

IUCN RED LIST CRITERIA (1994): VULNERABLE

IUCN RED LIST CRITERIA (2000): VULNERABLE

CITES:

Appendix II

National Red Data Book:

Not listed

Other legislation:

Included in the Negative List of Exports (EXIM Policy), 1999.

Known presence in Protected Areas:

Brahmagiri Wildlife Sanctuary; Silent Valley National Park

**Uncertainty**

Assessed with 95% confidence based on evidence and on the consensus of the field biologists.

**Recommendations**

**Research:**

Survey, limiting factor research, PHVA

**Management:**

Habitat management, monitoring, sustainable utilisation, cultivation/breeding

Cultivation recommended for commercial/sustainability. Cultivated stocks of >100 plants exist at TBGRI, Palode, Gurukula Botanical Sanctuary, Wayanad and Kaveri Nisargadhama, Kodagu. No coordinated species management programme and one is not recommended. Initiate cultivation programme after 3 years. Some techniques known for taxon.

**Other comments:**

This species was originally described by Dalzell. Medicinal uses well known [FRLHT database]. Halwa is made from the pseudobulbs in Uttara Kannada [T.A. Rao]. Originally described by Dalzell based on Stock's collection made from Ram Ghat in 1851.

**Sources:**


**Compilers:**


**Reviewers:**

**Scientific name (author; date):** Habenaria decipiens Wight, 1844:1845

**Synonym:** Habenaria montana auct. non A. Rich., 1841

**Habit:** Terrestrial or lithophytic

**Habitat:** Open grassy slopes

**Niche/ elevation:** Wet soil. 1200 m.

**Distribution**

**Historical distribution:**

**Current Global Distribution:** ENDEMIC to Western Ghats + Kolli hills and Shevroy hills (Tamil Nadu)


**Distribution from Field Studies:** Tamil Nadu: Udhagamandalam [S. Phatak, 1980]

**Extent of Occurrence (Sq. km.):** 101-5,000

**Area of Occupancy (Sq. km.):** 10-500

**Number of Subpopulations/location:** Fragmented.

**Habitat status:** Decrease in the habitat >20% due to tourism. Decrease in the quality of the habitat due to habitat disturbance.

**Threats**

**Threats to taxon:** Habitat loss, habitat fragmentation, trampling, grazing and landslides resulting in and may result in population decline. The influence of threats on the population structure well understood, not reversible and have not ceased.

**Trade:**

**Population Numbers/Generation time/Trend:** Unknown

**Recent Field Studies:** None

**Data quality:** Assessed based on informal sightings and literature/herbarium studies.

**Qualifier:** The Area and Extent estimated based on known locations. The habitat status observed; threats and population trends suspected due to habitat status.

**Status**

**IUCN RED LIST CRITERIA (1994):** ENDANGERED

**IUCN RED LIST CRITERIA (2000):** ENDANGERED

**CITES:** Appendix II

**National Red Data Book:** Not listed

**Other legislation:** Included in the Negative List of Exports (EXIM Policy), 1999.

**Known presence in Protected Areas:** None

**Uncertainty**

Assessed with based on precaution and on the consensus of the field biologists at the workshop. It was also on a range of opinion.

**Recommendations**

**Research:** Survey

**Management:** Monitoring

**Cultivation:** Cultivation is recommended for research. Some propagation techniques known for taxon or similar taxa.

**Other comments:** Fischer (1927) believed this to be a natural hybrid between H. longicornu Lindl. and H. longicorniculata Grif. This species was described by Wight based on a collection from Pulney. The records of occurrence of this species outside Tamil Nadu – in Mysore (Sharma et al., 1984) and Silent Valley (Manial, 1988) is incorrect (C. Sathish Kumar, pers. comm.).


**Compilers:** J.L. Ellis, R. Gopalan, R. Ingalhalli, N. Raman, N.C. Rathakrishnan, C. Sathish Kumar, S. Phatak, B. Arthur

Scientific name (author; date): Habenaria grandifloriformis Blatter & McCann, 1932
Synonym: Habenaria grandiflora Lindley ex. Hook. f. 1890, non Torr. ex Beck, 1833
Habenaria rotundifolia Lindley, 1835 non Richardson, 1823

Habit: Terrestrial herb
Habitat: Grassy slopes
Niché/ elevation: Wet, moist places. 800-2000 m.

Distribution
Historical distribution: India
Current Global Distribution: ENDEMIC to Western Ghats (Maharashtra, Karnataka, Kerala & Tamil Nadu)
Distribution from Literature: Bababudangiri top [Yoganarasimhan et al., 1981].

Extent of Occurrence (Sq. km.): >20,000
Area of Occupancy (Sq. km.): 501-2,000
Number of Subpopulations/location: 40–50/>10. Fragmented. There is a continuing decline and extreme fluctuation in the number of locations or subpopulations. All individuals are not in one population and one subpopulation does not hold 95% or more of the total population.
Habitat status: Decrease in the habitat >20% in the last 10 years due to deterioration of habitat quality. There is decrease in the quality of the habitat due to urbanization.

Threats
Threats to taxon: Edaphic changes, habitat loss, human interference, habitat fragmentation, trampling, grazing, habitat loss due to exotic plants, landslides and reproductive problems. These threats are resulting in and may result in population decline. Their influence on the population structure are well understood, are reversible and have not ceased.
Trade: Not in trade

Population
Numbers/Generation time/Trend Mature individuals in all populations are >2,500. The number of mature individuals declined in the past by >20% and are likely to decline by >20% in the future. Generation time – Seasonal.
Trends: The population size/numbers of the taxon is declining at a rate of >20% in the last 10 years. Predicted decline >10% in the next 10 years due to habitat loss.


Data quality: Assessed based on field studies, informal sighting, and literature/herbarium studies.
Qualifier: Area and extent estimated based on known locations; habitat status, threats, mature individuals and population trends observed over many years.

Status
IUCN RED LIST CRITERIA (2000): VULNERABLE Criterions: B2a+b(i,ii,iii,iv,v)
CITES: Appendix II
National Red Data Book: Not listed
International RDB: Not listed
Other legislation: Included in the Negative list of Exports (EXIM Policy), 1999
Known presence in Protected Areas: Bhadra Wildlife Sanctuary, Kudremukh National Park.

Uncertainty Assessed with 95% confidence based on evidence and on the consensus of the field biologists at the workshop. It was also on a range of opinion.

Recommendations
Research: Life history studies, limiting factor research, taxonomic research and genetic research.
Management: Wild population management and monitoring
Cultivation: Cultivated stocks are not available. Initiate cultivation programme after 3 years. Some propagation techniques known for similar taxa

Other comments: This species has an interesting history. Lindley proposed the name H. grandiflora in 1828 in Wall. Cat. without a description. A description was first given by Dalzell & Gibson (1861). But this cannot be accepted as it is later homonym of that of Torrey ex Beck (1833). Blatter & McCann proposed H. grandifloriformis in 1932. Habitat completely lost in Dharwar in one location, in Karnataka University Dharwar Campus due to monoculture and buildings. Habitat loss complete near table lands in Panchagori. In the Ghat section widening of slopes has destroyed the species. The tubers are used as medicine [T.A. Rao, S. Phatak]. There is decline in the population in some areas.

Sources: Blatter & McCann, 1932: 36; 17; Hooker, 1890: 6; 136; Lindley, 1835: 306; Yoganarasimhan et al., 1981: 336
**Scientific name (author; date):** Habenaria heyneana Lindley, 1835

**Synonyms:**
- Habenaria subpubens A. Rich., 1841
- Habenaria glabra A. Rich., 1841
- Habenaria candida Dalz., 1850
- Habenaria cerea Blatter & McCann, 1932
- Habenaria cerea Blatter & McCann var. polyantha Blatter & McCann, 1932

**Habit:** Terrestrial herb

**Habitat:** Montane grassland

**Niche/ elevation:** Abundant in rocky plateau and open grassy slopes. ca. 1600 m.

**Distribution**

**Historical distribution:** India

**Current Global Distribution:** ENDEMIC to Western Ghats + Shevroys, Yercaud (Maharashtra, Goa, Karnataka, Kerala & Tamil Nadu)

**From Field Studies:** Maharashtra: Panchgani, Londa, Yellapur [S. Phatak, 1980, 81], Kodanadu [T.A. Rao, 1996-98; R. Hegde, 1999].

**Karnataka:** Thadiandamol, Kodagu [T.A. Rao, 1996-98; R. Hegde, 1999].

**Kerala:** Kodanadu [P.S. Udayan, 1996].

**Tamil Nadu:** Kalhatti, Kariashola, Mudumalai, Naduvattom, Ootacamund, Pykara [B.V. Shetty, 1973-75].


**Known presence in Protected Areas:**
- Bhimashankar Wildlife Sanctuary, Mudumalai Wildlife Sanctuary, Mukurti National Park, Silent Valley National Park

**Uncertainty**

**Assessed based on evidence, range of opinion and on the consensus of the field biologists.**

**Recommendations**

**Research:**
Survey, life history studies and taxonomic research.

**Management:**
Monitoring, cultivation/breeding

**Cultivation:**
Cultivation is recommended for research. Cultivated stocks are not available. There is no coordinated species management programme for this species and one is not recommended. Initiate cultivation programme after 3 years. Some propagation techniques known for taxon or similar taxa.
Lindley (1835) describes this species based on Heyne's collection from the peninsula. Grasslands are being destroyed for plantation purposes.

Sources:

Compilers:
A. Durai, E. Mohan, R. Hegde, V.S. Ramachandran, N. Raman, K.G. Selvi, B.V. Shetty

Reviewers:
**Scientific name (author; date):** Habenaria longicorniculata Graham, 1839

**Synonyms:**
- Habenaria longicalcarata A. Rich, 1841
- Habenaria longicalcarata A. Rich var. viridis Blatter & McCann, 1932

**Habit:**
- Terrestrial tuberous herb

**Habitat:**
- Open grassy and rocky slopes

**Niche/ elevation:**
- 1000m.

**Distribution**

**Historical distribution:**
- India

**Current Global Distribution:**
- ENDEMIC to Western Ghats + Kolli Hills & Shevroy Hills (Gujarat, Maharashtra, Goa, Karnataka, Kerala & Tamil Nadu)

**Distribution from Literature:**

**Distribution from Field Studies:**
- Maharashtra: Konkan, Wada, Kolhapur, Prataaghad [S. Phatak, 1980].
- Karnataka: Daksheh Kannada [S. Phatak, 1980].
- Kerala: Silent Valley [C. Sathish Kumar, 1995].

**Extent of Occurrence (Sq. km.):** >20,000

**Area of Occupancy (Sq. km.):** >2,000

**Number of Subpopulations/Location:**
- 400-500/40-50. Fragmented. There is a continuing decline but no extreme fluctuation in the number of locations or subpopulations. All individuals are not in one population and one subpopulations does not hold 95% or more of the total population.

**Habitat status:**
- Decrease in the habitat <20% in the past. Predicted decline >20% in the next 20 years due to their removal as weeds. Decrease in the quality due to plantation with exotic species and cultivation.

**Threats**

**Threats to taxon:**
- Habitat loss, grazing, habitat loss due to exotic plants, fire and research collection are resulting in and may result in population decline. The influence of threats on the population structure is well understood, not reversible and have not ceased.

**Trade:**
- Not in trade.

**Population**

**Numbers/Generation time/Trend:**
- Mature individuals in all populations are >10,000. The number of mature individuals declined in the past by 10% and is likely to decline by 10% in the future. Generation time is 1 year.

**Trends:**
- The population size/numbers of the taxon is declining at a rate of <10% in the last 10 years. Predicted decline 10% in the next 10 years.

**Recent Field Studies:**

**Data quality:**
- Assessed based on field studies, informal sightings and literature/herbarium studies.

**Qualifiers:**
- The Area and Extent estimated based on known locations. The habitat status, threats, mature individuals and population trends observed in some areas and inferred for others.

**Status**

**IUCN RED LIST CRITERIA (1994):** LOWER RISK NEAR THREATENED

**IUCN RED LIST CRITERIA (2000):** NEAR THREATENED

**CITES:**
- Appendix II

**National Red Data Book:**
- Not listed

**Other legislation:**
- International ROB: Not listed

**Known presence in Protected Areas:**
- Silent Valley National Park

**Uncertainty**
- Assessed based on evidence and on the consensus of the field biologists and subjective opinion.

**Recommendations**

**Research:**
- Taxonomic research

**Management:**
- Wild population management, monitoring

**Cultivation:**
- Not recommended. Initiate cultivation programme after 3 years. Some techniques known for the taxon.
Described by Graham based on his collection from the open ground about Sir. Herbert Compton's Bungalow at Kandalla. Richard (1984) described his species based on Perrottet's collection from Nilgiris. Medicinal properties known [FRLHT, database]. In general students tend to collect this plant due to its long spur. Once tubers are lost they cannot rejuvenate. Misra records it from Orissa.

Sources:

Compilers:

Reviewers:
Scientific name (author; date): Habenaria multicaudata Sedgw., 1919

Habit: Terrestrial herb
Habitat: Evergreen forest.
Niche / elevation: Forest undergrowth. 1500 m

Distribution
Historical distribution:

Current Global Distribution: ENDEMIC to Western Ghats + Shevroy hills, Chitteri hills & Kalrayan hills (Maharashtra, Goa, Karnataka, Kerala & Tamil Nadu)

Distribution from Literature:
- Wayanad [Ramachandran & Nair, 1988].
- Palghat [Vajravelu, 1990].
- Nilgiris, Anamalai hills, Kariashola, Uttara Kannada Attapadi [Abraham & Vatsala, 1961].
- Hassan, Uttara Kannada [Sharma et al., 1984].
- Silent Valley, below dam site [Manilal, 1988].
- Sairandri [Satish Kumar, 1999].
- Akola, Satara [Lakshminarasimhan, 1996].
- Goa, Sanguem, Molem-Belgaum road [Rao, 1986].

Distribution from Field Studies:
- Maharashtra: Mahabaleshwar, Pratapghad [S. Phatak, 1980].
- Kerala: Wayanad [V.S. Ramachandran, 1979-80].
- Palghat [Vajravelu, 1977].
- Tamil Nadu: Anamalai, Coimbatore [V.S. Ramachandran, 1994-95].
- Nilgiris [Sharma et al., 1977]

Extent of Occurrence (Sq. km.): >20,000
Area of Occupancy (Sq. km.): 501-2.000
Number of Subpopulations/location: >10/11. Fragmented. There is a continuing decline and no extreme fluctuation in the number of locations or subpopulations. All individuals are not in one population.
Habitat status: Decrease in the habitat <20% in the last 10 years. There is decrease in the quality of the habitat due to tourism.

Threats
Threats to taxon: Interspecific competition, grazing, habitat loss, trampling, reproductive problems and decline in pollinator population, fruit predation by insects and demographic instability are resulting in and may result in population decline. The influence of threats on the population structure is well understood, are not reversible and have not ceased.

Trade: Not in trade

Population
Numbers/Generation time/Trend: Mature individuals in all populations are <10,000. The number of mature individuals declined in the past by 30-40% and is likely to decline by 30-40% in the future. Generation time is 1 year.
Trends: The population size/numbers of the taxon is declining at a rate of >30% in the last 10 years. Predicted decline >30% in the next 10 due to habitat loss.

Recent Field Studies:

Data quality:
Assessed based on field studies, informal sighting and literature/herbarium studies.

Qualifier:
The Area and Extent estimated based on the known locations. The habitat status, threats, mature individuals and population trends observed and also inferred from literature and herbarium studies.

Status
IUCN RED LIST CRITERIA (1994): VULNERABLE Criteria: A1c+2c; B1+2bcde; C1
IUCN RED LIST CRITERIA (2000): VULNERABLE Criteria: A2c+3c; B2a+b(ii,iii,iv,v); C1
CITES: Appendix II
National Red Data Book: Not listed
Other legislation: Included in the Negative list of Exports (EXIM Policy), 1999
Known presence in Protected Areas: Silent Valley National Park, Wayanad Wildlife Sanctuary

Uncertainty: Assessed based on evidence, precaution, minimum values, range of opinion and on the consensus of field biologists at the workshop.

Recommendations
Research:
- Survey, genetic research, limiting factor research, PHVA pending.

Management:
- Habitat management, wild population management, genome resource banking, cultivation/breeding.

Cultivation:
- Cultivation is recommended for preservation of live genome, commercial/sustainability. Cultivated stocks are not available. There is no coordinated species management programme for this species and one is recommended. Initiate cultivation programme within 3 years. Some propagation techniques known for taxon or similar taxa.

Other comments:
Proposed by L.J. Sedgwick based on a collection by T.R.D. Bell, Chief Conservator of Forests, Bombay Presidency in September 1917 from Gudhalli, a hill close to the sea coast near Kaswar in North Kanara. It was found growing in a densely wooded part where very little light penetrates [Abraham & Vatsala, 1981].

Inter specific competition among Habenaria species like H. digitata, H. spencei, H. gibsonii, H. crassifoilia. Nayar and Kochhar have reported this for the first time from Maharashtra.

Sources:

Compilers:

Conservation Assessment and Management Plan Workshop Report for Endemic Orchids of the Western Ghats 2001

172
Reviewers

Scientific name (author; date): 

**Habenaria ovalifolia** Wight, 1851

**Habenaria modesta** Dalz., 1850

**Habenaria halbergii** Blatter & McCann, 1932

Synonym:

*Habenaria modesta* Dalz., 1850

*Habenaria hallbergii* Blatter & McCann, 1932

Habit: Tuberous herb

Habitat: Grassland

Niche/ elevation: Forest clearing. Up to 900 m.

Historical distribution: India

Distribution

Current Global Distribution: ENDIC to Western Ghats + Periakalrayan hills, Kolli hills, Melagiri hills, Thiruchirapalli (Maharashtra, Karnataka, Kerala & Tamil Nadu)

Distribution from Literature:


From Field Studies:


Kemmanagundi,

Extent of Occurrence (Sq. km.): >20,000

Area of Occupancy (Sq. km.): >2,000

Number of Subpopulations/location: 20-40/10-20. Fragmented. Continuing decline but no extreme fluctuation in the number of locations or subpopulations. All individuals not in one population and one subpopulation does not hold 95% or more of the total population.

Habitat status: Decrease in the habitat >20% in the last 10 years due to overgrazing, mining, habitat loss and tourism. Decrease in the quality of the habitat due to overgrazing, mining and tourism.

Threats

Threats to taxon: Climate, grazing, habitat loss, trampling, habitat loss due to exotic animals, pollution and iron mining are resulting in and may result in population decline.

Trade: Not in trade

Population

Numbers/Generation time/Trend

Mature individuals in all populations <2,500. The number of mature individuals declined in the past by >20% and likely to decline by >20% in the future. Generation time 1 year.

Trends: The population size of the taxon declining at a rate of >20% in the last 10 years. Predicted decline >20% in the next 10 due to habitat loss. The threats influencing the population structure well understood, not reversible and have not ceased.

Recent Field Studies:


Data quality:

Assessed based on field studies, and literature-herbarium studies.

Qualifier:

The Area and Extent estimated based on the known locations. Habitat status, threats, mature individuals and population trends observed over many years of field studies.

Status

IUCN RED LIST CRITERIA (1994): VULNERABLE

IUCN RED LIST CRITERIA (2000): NEAR THREATENED

CITES: Appendix II

National Red Data Book: Not listed

Other legislation: Included in the Negative list of Exports (EXIM Policy), 1999

Known presence in Protected Areas: None

Uncertainty

Assessed based on evidence, precaution and on the consensus of the field biologists at the workshop.

Recommendations

Research:

Survey, life history studies, limiting factor research and PHVA pending

Management:

Habitat management and monitoring

Cultivation:

Cultivated stocks are not available. There is no coordinated species management programme for this species and one is not recommended. Initiate cultivation programme after 3 years. Some propagation techniques known for similar taxa

Other comments:

Proposed by Wight based on a collection from Anamalai. Mainly confined to the Western Ghats and also some pockets in the Eastern Ghats [Salem, Trichy]. Medicinal uses known [FRLHT database].

Sources:


Compilers:

A. Durai, E. Mohan, R. Hegde, V.S. Ramachandra, N. Raman, K.G. Selvi, B.V. Shetty
Habenaria rariflora A. Rich., 1841

**Habitat:**
Terrestrial tuberous herb

**Niche/ elevation:**
Grasslands

1300m.

**Distribution**

**Historical distribution:**
India

**Current Global Distribution:**
Endemic to Western Ghats + Kolli Hills and Shevroyis (Maharashtra, Karnataka, Kerala & Tamil Nadu)

**Distribution from Literature:**

**Distribution from Field Studies:**

**Extent of Occurrence (Sq. km.):**
>20,000

**Area of Occupancy (Sq. km.):**
>2,000

**Number of Subpopulations/location:**
400–500(40–50). Fragmented. Continuing decline but no extreme fluctuation in the number of locations or subpopulations. All individuals not in one population and one subpopulation does not hold 95% or more of the total population.

**Habitat status:**
Decrease in the habitat >20% in the last 10-20 years. Predicted decline <20% in the next 10-20 years due to habitat fragmentation, tourism and human activities. Decrease in the quality of the habitat due to plantations.

**Threats**

**Threats to taxon:**
Edaphic changes, habitat loss, pollution, trampling, habitat fragmentation, habitat loss due to exotic animals, fire and demographic instability resulting in and may result in population decline. The influence on the population structure well understood, are not reversible and have not ceased.

**Trade:**
Not in trade.

**Population**

**Numbers/Generation time/Trend:**
Mature individuals in all populations >10,000. The number of mature individuals declined in the past by <20% and likely to decline by >20% in the future. Generation time 1 year.

**Trends:**
The population size/numbers of the taxon declining at a rate of >20% in the last 10 years. Predicted decline <10% in the next 10 years due to habitat loss.

**Recent Field Studies:**

**Data quality:**
Assessed based on field studies, informal field sightings and literature/herbarium studies.

**Qualifier:**
The Area and Extent are estimated based on known locations. The habitat status, threats, mature individuals and population trends are observed in a few areas and inferred for other areas.

**Status**

**IUCN Red List Criteria (1994):**
Vulnerable (A1ac)

**IUCN Red List Criteria (2000):**
Near Threatened

**CITES:**
Appendix II

**National Red Data Book:**
Not listed

**Other legislation:**
Included in the Negative list of Exports (EXIM Policy), 1999

**Known presence in Protected Areas:**
Brahmagiri Wildlife Sanctuary, Indira Gandhi Wildlife Sanctuary, Kudremukh National Park

**Uncertainty**
Assessed with confidence based on evidence and on the consensus of the field biologists.

**Recommendations**

**Research:**
Survey, taxonomic research, life history studies and limiting factor research

**Management:**
Monitoring and habitat management

**Cultivation:**
Cultivated stocks are not available. There is no coordinated species management programme for this species and one is not recommended. Initiate cultivation programme within 3 years. Some propagation techniques known for taxon or similar taxa.

**Other comments:**
This species was described by A. Richard based on a collection by G.S. Perrottet from Coonoor in Nilgiris. Coal engines release smoke which covers the entire population over 3-4 years, since this species is lithophytic it results in the decline of the population. Sterility is high in this species [S. Phatak]. Medicinal uses known [FRLHT database].

**Sources:**

Scientific name (author; date): Liparis biloba Wight, 1851

Habit: Terrestrial or epiphytic herb

Habitat: Shola forests

Niche/ elevation: 1000-2000 m.

Distribution

Historical distribution: India

Current Global Distribution: ENDEMIC to Western Ghats + Shevroy hills (Karnataka & Tamil Nadu)


Distribution from Field Studies: Tamil Nadu: Kollimund, on the way to Upper Bhavani [M. Mohanan]

Extent of Occurrence (Sq. km.): 5,001-20,000

Area of Occupancy (Sq. km.): 11-500

Number of Subpopulations/locati: <10/10. Fragmented. Continuing decline but no extreme fluctuation in the number of locations or subpopulations. All individuals not in one population and one subpopulation does not hold 95% or more of the total population.

Habitat status: Decrease in the habitat <20% in the last 10 years due to loss of habitat, felling of host trees. Decrease in the quality of the habitat due to clearance of area for plantation of wattle [M. Mohanan, 2000].

Threats

Threats to taxon: Habitat loss and habitat loss due to exotic plants. The threats influencing the population structure well understood, not reversible and have not ceased.

Trade: Not in trade

Population

Numbers/Generation time/Trend: Unknown

Trends: The population of the taxon is declining at a rate of <20% in the last 10 years [Muktesh Kumar].

Predicted decline >10% in the next 10 years due to habitat loss.


Data quality: Assessed based on field studies, informal sighting and literature/herbarium studies.

Qualifier: The Area and Extent estimated based on known locations. The habitat status, threats, mature individuals and population trends observed or inferred.

Status


CITES: Appendix II


Other legislation: Included in the Negative list of Exports (EXIM Policy), 1999

Known presence in Protected Areas: Mukurthi National Park

Uncertainty: Assessed based on some evidence and precaution. The information is based on a range of opinion.

Recommendations

Research: Survey and limiting factor research

Management: Habitat management


Other comments: It was proposed by Wight based on his collection from Ootacamund. This species has been collected from Nilgiris in 1972 and there has been no previous of subsequent collections in Madras Herbarium. Plants collected from Kollimund are being cultivated in the National Orchidarium, BSI, at Yercaud, ca 1360m [Nayar & Sastry, 1987]. A.V.N. Rao collected it from Kollimund on the way to Bhavani in 1973 and introduced it to the National orchidarium, Yercaud. M. Mohanan and N.P. Balakrishnan visited the same area and collected the plant in1989 from a huge fallen tree and introduced them to the National Orchidarium, Yercaud.


Scientific name (author; date): **Oberonia brunoniana** Wight, 1851

**Habit:** Pendulous epiphyte

**Habitat:** Moist deciduous forest.

**Niche/ elevation:** 1200m.

**Distribution**

**Historical distribution:**

Current Global Distribution: ENDEMIC to Western Ghats + Kolli Hills (Darada & Nagarhaveli, Maharashtra, Goa, Karnataka, Kerala & Tamil Nadu)

**Distribution from Literature:**


**From Field Studies:**

Karnataka: Madikeri, Brahmagiri Range, Thalakaveri, Somwarpet, Veerajapet [T.A. Rao].

Kerala: Silent Valley [Sathish Kumar, 1995].


**Extent of Occurrence (Sq. km.):** >20,000

**Area of Occupancy (Sq. km.):** >2,000

**Number of Subpopulations/location:** 100/ many. Fragmented. All individuals not in one population and one subpopulation does not hold 95% or more of the total population.

**Habitat status:**

Decrease in the habitat >20% in the last 10 years. Predicted decline >20% in the next 10 years due to loss of habitat, denudation of forests and decrease in the shola forests [V. Ramasundar, 2000]. No change in the quality of the habitat.

**Threats**

**Threats to taxon:** Climate, edaphic changes, habitat loss, grazing, damming, harvest for timber, drought, fire and landslides resulting in and may result in population decline. The influence on the population structure well understood, not reversible and not ceased.

**Trade:** Not in trade

**Population**

**Numbers/Generation time/Trend**

Mature individuals in all populations >2,500. The number of mature individuals declined in the past by 10% and likely to decline by 10% in the future. Generation time 5-10 years.

**Trends:**

The population size/numbers of the taxon is declining at a rate of >20% in the last 10 years. Predicted decline >10% in the next 10 years due to habitat loss.

**Recent Field Studies:**


**Data quality:**

Assessed based on field studies, census/monitoring and literature/herbarium studies.

**Qualifier:**

The Area and Extent are estimated based on known locations. The habitat status, threats, mature individuals and population trends are observed over many years of field studies.

**Status**

IUCN Red List Criteria (1994): **VULNERABLE**

IUCN Red List Criteria (2000): **NEAR THREATENED**

**CITES:**

Appendix II

**National Red Data Book:** Not listed

**Other legislation:** Included in the Negative list of Exports (EXIM Policy), 1999

**Known presence in Protected Areas:** Mukurthi National Park, Silent Valley National Park

**Uncertainty:**

Assessed with 95% confidence based on evidence and on the consensus of the field biologists at the workshop.

**Recommendations**

**Research:**

Survey, life history studies and PHVA pending

**Management:**

Monitoring

**Cultivation:**

Cultivated stocks available at Kaveri Nisargadhama. Numbers in cultivation 10. There is no coordinated species management programme for this species and one is not recommended. Information on propagation techniques not available with this group of compilers.

**Other comments:**

This was proposed by Wight based on a collection from Iyamally Hills near Coimbatore.


**Scientific name (author; date):** Oberonia proudlockii King & Pantl., 1897  
**Synonym:** Oberonia sedgwickii Blatter & McCann, 1931

**Habit:** Pendulous epiphytic herbs  
**Habitat:** Moist deciduous forest, semi evergreen forests.  
**Niche/ elevation:** 1200m.

**Distribution**  
**Historical distribution:** India  
**Current Global Distribution:** ENDEMIC to Western Ghats + Kolli Hills (Karnataka, Kerala & Tamil Nadu)  
**Distribution from Literature:**  
- Historical distribution: India  
- Current Global Distribution: ENDEMIC to Western Ghats + Kolli Hills (Karnataka, Kerala & Tamil Nadu)  

**Extent of Occurrence (Sq. km.):** >20,000  
**Area of Occupancy (Sq. km.):** 10-500  
**Number of Subpopulations/Location:** 10-3. Fragmented. Continuing decline and extreme fluctuation in the number of locations or subpopulations. All individuals not in one population  
**Habitat status:** Decrease in the habitat >20% in the last 10 years. Predicted decline >20% in the next 10 years due to habitation, mining and deforestation. Decrease in the quality of the habitat.

**Threats**  
**Threats to taxon:** Habitat loss, habitat fragmentation and mining resulting in and may result in population decline. The influence on the population structure well understood, not reversible and not ceased to be a threat.  
**Trade:** Not in trade.

**Population**  
**Numbers/Generation time/Trend:** Mature individuals in all populations <2,500. The numbers of mature individuals declined in the past by >10% and likely to decline by >10% in the future. Generation time – perennial.  
**Trends:** The population size/numbers of the taxon is declining at a rate of <10% in the last 10 years.

**Recent Field Studies:**  

**Data quality:** Assessed based on field studies and literature/herbarium studies.

**Qualifier:** The Area and Extent estimated based on known locations. The habitat status, threats, mature individuals and population trends observed.

**Status**  
**IUCN Red List Criteria (1994):** ENDANGERED.  
**IUCN Red List Criteria (2000):** ENDANGERED.  
**CITES:** Appendix II  
**National Red Data Book:** Not listed  
**Other legislation:** Included in the Negative list of Exports (EXIM Policy), 1999  
**Known presence in Protected Areas:** Silent Valley National Park

**Uncertainty**  
Assessed with 95% confidence based on evidence and on the consensus of the field biologists.

**Recommendations**  
**Research:** Survey, taxonomic research  
**Management:** Wild population management and monitoring  
**Cultivation:** Cultivation is recommended for research. Cultivated stocks are available at National Orchidarium, Yercaud. Numbers in cultivation 10. There is no coordinated species management programme for this species and one is not recommended. Some propagation techniques known for similar taxa.

**Other comments:** This was described by King & Prantling based on R.L. Proudlock’s collection from near Gudulur in Nilgiri Hills.

**Sources:**  

**Compilers:** M. Mohanan, R. Gopalan, S. Phatak, S.S.R. Bennet, S. Rajendran, R. Thamilarasi

Scientific name (author; date):

Oberonia santapaui Kapadia, 1960

Synonyms:

Malaxis lindleyana Wight
Oberonia lindleyana Wight, 1851 non Brongn. ex Duperrey, 1834

Habit:

Epiphytic herbs

Habitat:

Semi evergreen forests

Niche/ elevation:

Above 1300m.

Distribution

Historical distribution:

Current Global Distribution: ENDANGERED to Western Ghats + Servarayans and Kolli Hills (Karnataka, Kerala & Tamil Nadu)

Distribution from Literature:


From Distribution field Studies:


Extent of Occurrence (Sq. km.): >20,000

Area of Occupancy (Sq. km.): >2,000

Number of Subpopulations/location: 8/6. Fragmented. Continuing decline and no extreme fluctuation in the number of locations or subpopulations. All individuals not in one population and one subpopulation does not hold 95% or more of the total population.

Habitat status: Decrease in the habitat >20% in the last 10 years. Predicted decline >20% in the next 10 years due to human interference. No change in the quality of the habitat.

Threats

Threats to taxon: Habitat loss, damming, poisoning and construction of roads resulting in and may result in population decline. The influence on the population structure well understood, not reversible and have not ceased.

Trade:

Not in trade

Population

Numbers/Generation time/Trend

Mature individuals in all populations <2,500. The numbers of mature individuals declined in the past 10 years by 10% and likely to decline by 5% in the future. Generation time 3 years.

Trends:

The population size/numbers of the taxon is declining at a rate of <10% in the last 10 years. Predicted decline <10% in the next 10 years due to habitat loss.

Recent Field Studies:


Data quality:

Assessed based on field studies and literature/herbarium studies.

Qualifier:

The Area and Extent estimated based on known locations. The habitat status, threats, mature individuals and population trends observed over many years of field studies.

Status

IUCN Red List Criteria (1994): VULNERABLE

Criteria: C1

IUCN Red List Criteria (2000): VULNERABLE

Criteria: C1

CITES:

Appendix II

Indian WL. (P) Act: Not listed

International RDB: Not listed

National Red Data Book:

Not listed

Other legislation:

Included in the Negative list of Exports (EXIM Policy), 1999

Known presence in Protected Areas:

Brahmagiri Wildlife Sanctuary, Silent Valley National Park, Talakaveri Wildlife Sanctuary

Uncertainty

Assessed with confidence based on evidence and on the consensus of the field biologists

Recommendations

Research:

Survey

Management:

Monitoring, cultivation/breeding

Cultivation:

Cultivated stocks are not available. There is no coordinated species management programme for this species and one is not recommended. Initiate cultivation programme within 3 years. Information on propagation techniques not available with this group of compilers.

Other comments:

Originally proposed by Wight based on his collection from lamllay Hills in Coimatore. The presence of semi lunar crescent shaped nectary is characteristic of this taxon [T.A. Rao].

Sources:


Compilers:


Conservation Assessment and Management Plan Workshop Report for Endemic Orchids of the Western Ghats 2001 182
**Scientific name (author; date):** Oberonia verticillata Wight, 1851

**Habit:** Epiphytic herb

**Habitat:** Semi-evergreen to evergreen forests

**Niche/elevation:** 500-2200m

**Distribution**

**Historical Distribution:**

- India

**Current Global Distribution:** ENDEMIC to Western Ghats + Salem (Karnataka, Kerala & Tamil Nadu)

**Distribution from Literature:**

- Yellappur & Sirsi, North Kanara [Fischer]. Salem [Matthew]
- Bonaccord, Thiruvananthapuram [Sathish Kumar]

**Extent of Occurrence (Sq. km.):** 5,001-20,000

**Area of Occupancy (Sq. km.):** 11-500

**Number of Subpopulations/location:** 10/10. Fragmented. There is a continuing decline but no extreme fluctuation in the number of locations or subpopulations. All individuals not in one population and one subpopulation does not hold 95% or more of the total population.

**Habitat status:** Decrease in habitat quality and continuing decline in habitat due to human interference.

**Threats**

- Threats to taxon: Habitat loss
- Trade: Not in trade

**Population**

- Numbers/Generation time/trend: <500 mature individuals.
- Population trend: Declining

**Recent Field Studies:**

- M. Mohanan in Kurusumalai, Anchnazhikathode, Kottur.

**Data quality:** General field studies, literature/herbarium studies

**Qualifier:** Area and Extent estimated and habitat status observed. Population estimated based on observation.

**Status**

- IUCN Red List Criteria (1994): **ENDANGERED**
- IUCN Red List Criteria (2000): **ENDANGERED**

- Criteria:
  - B1+2bcd

**CITES:** Appendix II

- Indian WL. (P) Act: Not listed

- International RDB: Not listed

**National Red Data Book:** Included in the Negative List of Exports (EXIM Policy), 1999.

**Other legislation:** None

**Known presence in Protected Areas:** None

**Uncertainty**

- Assessment based on precaution due to changes expected in habitat. Assessment is exclusive to the below listed compilers and reviewers.

**Recommendations**

- Research: Life history studies recommended
- Management: Monitoring
- Cultivation: None

**Other comments:** Described by Wight based on his collection from Nilgiris. Thwaites collection from Sri Lanka cited by Seidenfaden (1968) under *O. verticillata* actually belongs to *O. thwaitesii* Hook. f., a closely related species. The reported record of its occurrence in Orissa needs confirmation.

**Sources:**

- Seidenfaden 1968; Seidenfaden, 1983; Wight (1851)

**Compilers:**

- C. Sathish Kumar

**Reviewers:**

- B.V. Shetty, B. Arthur, S. Molur
Scientific name (author; date): Robiquetia josephiana Manilal & Sathish, 1984

Synonyms:
Saccotlabium roseum auct. non Lindley, 1883: Joseph 1962
Malleola rosea auct. non (Lindley) Schltr., 1903: Joseph 1962

Habit: Epiphytic herb

Habitat: Moist deciduous forest, shola or semi evergreen forests.

Niche/ elevation: 800-1850m.

Historical distribution: India

Current Global Distribution: ENDEMIC to Western Ghats + Kolli Hills (Karnataka, Kerala & Tamil Nadu)

From Literature:
- Combatore, Nilgiri, Ramathanapuram [Henry et al., 1989].
- Silent Valley [Nayar, 1996].
- Silent Valley, Chembetti [Manoharan et al., 1999; Sathish Kumar, 1999].

From Field Studies:
- Kerala: Silent Valley [C. Sathish Kumar, 1990s].
- Tamil Nadu: Kolli Hills [M.B. Viswanathan, 1992].

Extent of Occurrence (Sq. km.): 5,001-20,000

Area of Occupancy (Sq. km.): 501-2,000

Number of Subpopulations/location: 5/2. Fragmented. No continuing decline or extreme fluctuation in the number of locations or subpopulations. All individuals are not in one population and one subpopulation does not hold 95% or more of the total population.

Habitat status: Predicted decline of <20% in the next 10 years due to habitat loss.

Threats
- Threats to taxon: Habitat loss resulting in and may result in population decline. The influence on the population structure well understood, not reversible and not ceased.

Trade:
- Not in trade

Population
- Numbers/Generation time/Trend: Mature individuals in all populations <2,500. The numbers of mature individuals have declined in the past and likely to decline by 10% in the future. Generation time 2 years.
- Trends: The population sizenumbers of the taxon declining at a rate of <10% in the last 10 years and <10% predicted decline in the next 10 years due to habitat loss.

Recent Field Studies:

Data quality:
- Assessed based on field studies and literature/herbarium studies.

Qualifier:
- The Area and Extent are estimated based on known locations. The habitat status, threats, mature individuals and population trends are observed in some areas and inferred in other areas.

Status
- IUCN Red List Criteria (1994): VULNERABLE
- IUCN Red List Criteria (2000): VULNERABLE
- CITES: Appendix II
- National Red Data Book: Not listed
- Other legislation: Included in the Negative list of Exports (EXIM Policy), 1999
- Known presence in Protected Areas: Kalakad-Mundanthurai Tiger Reserve, Kudremukh National Park, Silent Valley National Park

Uncertainty:
- Assessed with 95% confidence based on evidence and on the consensus of the field biologists

Recommendations
Research:
- Survey

Management:
- Monitoring, cultivation/breeding

Cultivation:
- Cultivated stocks are not available. There is no coordinated species management programme for this species and one is not recommended. Initiate cultivation programme within 3 years. Information on propagation techniques not available with this group of compilers.

Other comments:
- Described by Manilal & Sathish based on a collection from Silent Valley. No change observed in Kolli Hills. In Kudachi and Kodayar there is no threat as the area is under protection [R. Ganesan, 2000].
- Only five individuals were recently recorded in Kudremukh Medicinal Plants Conservation Area [T.A. Rao].

Sources:

Compilers:

Reviewers:
References:


Bentham, G. (1883). Genera Plantarum 3:


Graham, J. (1839). *A Catalogue of the Plants Growing in Bombay and its Vicinity, Spontaneous, Cultivated or Introduced, as far as they have been ascertained*, Bombay.


IUCN. 1994. *IUCN Red List Categories*, as approved by the 40th meeting of the IUCN Council, Gland, Switzerland.

IUCN. 2000. *IUCN Red List Categories*, as approved by the 51st Meeting of the IUCN Council, Gland, Switzerland.


Sasidharan, N and V.V. Sivarajan (1996). *Flowering plants of Thrissur*


Summerhayes, V.S. (1936). Hooker’s Icon.


Wight IC. t.927 & t.1714 in part.

Wight, R. (1844-1845). Icones Plantarum Indiae Orientalis 3(2) Madras
