

A Checklist of Orchids of Shola and Grasslands of Nilgiris, Western Ghats, India

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ABSTRACT: The present paper shows the orchids diversity in shola forest and grasslands of Nilgiris, Tamil Nadu. A total of 37 species belonging to 23 genera have been recorded. Of these, 19 are epiphytic and 18 are terrestrial. *Bulbophyllum mysorensense* and *Oberonia swaminathanii* are reported here as new records to Orchidaceae of Nilgiris.

Keywords: Nilgiris, Orchids, Shola and grasslands

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INTRODUCTION

Orchidaceae is one of the largest groups among the angiosperms, about 15,000 species of wild orchids distributed throughout the world (Mukherjee, 1983, Mendez *et al.* 2017, Dizon *et al.*, 2018). There are 1331 species of orchids belonging to 186 genera have been reported from India (Mishra, 2007). The threats on orchids in recent years are increased for their aesthetic value and economic importance. In India, about 21 species of orchids are well known for its medicinal value (Hedge, 1997). Nilgiris is one of the richest areas in orchid diversity with 113 species reported by Sharma

et al. (1977), later 121 species by Joseph (1987) and 128 species reported by Henry *et al.* (1989), but Fyson (1920) has reported only 16 orchid species in flora of the Nilgiri and Pulney hills. The present work is an attempt to give an updated checklist of orchids in the sholas and grasslands of Nilgiris, Western Ghats.

MATERIALS AND METHODS

The Nilgiris is a part of Western Ghats with rich floristic diversity. It lies at 11° 10' and 11° 43' N and 76° 14' and 77° 00' E with maximum altitude of 2657 meters of MSL (Fig.1).

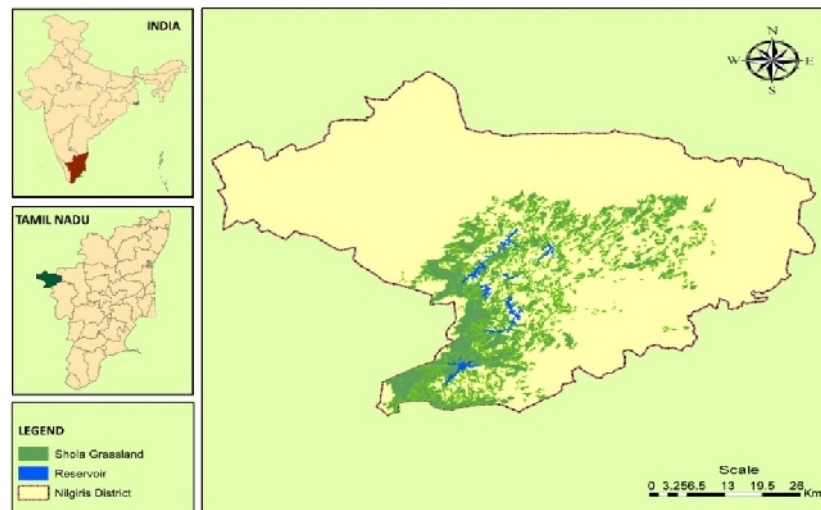


Fig. 1. Map of Shola and grasslands, Nilgiris.

The present investigation was taken up to assess the diversity of orchids in shola and grassland vegetation of Nilgiri District. The vegetation is 20% of temperate evergreen forest with small woods of stunted evergreen trees and 80% grasslands (Ranganathan, 1938), derived by the forest type Southern montane wet temperate forest (Champion and Seth, 1968). Intensive and extensive field surveys were conducted to assess the diversity and distribution of orchids from its habitat during 2015 to 2017. All the orchid specimens were identified with the help of pertinent literature (Abraham and Vatsala, 1981; Joseph, 1987; Ansari and Balakrishnan, 1990; Matthew, 1991). The online database such as IPNI (updated, 2015) www.ipni.org, the plant list (2013) www.theplantlist.org, Herbarium catalogue, Kew www.kew.org and IUCN red list, www.iucnredlist.org were used for checking correct nomenclature. Field observations such as habitat and ecology pattern were also noted. Photographs were taken and incorporated in the text as figures.

RESULTS

The present analysis resulted in 37 species belonging to 23 genera from shola forest for Nilgiris. Of these, 16 are terrestrial, 15 are epiphytic and 5 are lithophytic. The dominant genera are *Habenaria* with 6 species, followed by *Oberonia* with 5 species, genus *Bulbophyllum* with 3 species, *Coelogyne* and *Eria* with 2 species each. The distribution of endemic orchids in India with 404 species, followed by Western Ghats with 123 species and 130 species to Peninsular India reported by (Misra, 2007; Jalal and Jayanthi, 2012). In this analysis 9 species such as *Bulbophyllum kaitiense*, *Bulbophyllum mysorensense*, *Coelogyne nervosa*, *Conchidium nanum*, *Eria pauciflora*, *Habenaria brachyphylla*, *Malaxis intermedia*, *Oberonia brunoniana*, *Seidenfadeniella rosea* are endemic to Southern Western Ghats, and two species *Eria mysorensis* and *Habenaria rariflora* are endemic to Western Ghats and *Habenaria longicornu*, *Habenaria perrottetiana* and *Robiquetia josephiana* are endemic to Peninsular India. About 8 species have been extended distribution in South India and Sri Lanka, followed by 3 species *Luisia birchea*, *Malaxis densiflora* and *Taeniophyllum alwisii* to Peninsular India and Sri Lanka. Species of *Bulbophyllum mysorensense* is categorised as an endangered followed by *Bulbophyllum kaitiense* in vulnerable and *Conchidium nanum* with critically endangered (Kumar *et al.*, 2001). In Southern Western Ghats, Swarupnandan *et al.* (1998) reported 24 orchid species with 16 genera in shola forest of Kerala with 15 rare and 11 endemic among them. The recent studies from Western Ghats, Mathew and George (2015) documented 53 orchid species from Achancoil forest. Ganesan and Livingston (2001) reported 55 orchid species in Kalakkad Mundanthurai tiger reserve, which 11 are endemic to Southern Western Ghats and 20 endemic to Peninsular India. In this enumeration about 16 species are

distributed in Sri Lanka, which has 188 orchid species with 55 endemic to its type locality reported by (Fernando and Ormerod, 2008). Prasad *et al.* (2000) collected 49 species of orchids in Nilgiri forest for ex situ conservation in government botanical garden, Udahgamandalam. *Oberonia swaminathanii* was recently described from Kerala (Narayanan *et al.*, 2010) and it is recently reported from Megamalai in Tamil Nadu (Ravichandran and Karuppusamy, 2016). Hence the present report is an addition to the *Oberonia* of Nilgiris. Species such as *Disperis neilgherrensis*, *Aerides ringens*, *Luisia birchea*, *Habenaria rariflora*, *Habenaria longicornulata*, *Anoectochilus elatus* and *Zeuxine longilabris* are also distributed in semievergreen forest of Eastern Ghats (Kottaimuthu *et al.*, 2008; Karuppusamy *et al.*, 1999).

Systematic Enumeration

Aerides ringens (Lindl.) C.Ee.C. Fisch

Habitat: Epiphyte

Flowering: June-July

Distribution: South India and Sri Lanka

Anoectochilus elatus Lindl.

Habitat: Terrestrial in fringes and shady place of shola forest

Flowering: September-December

Distribution: Southern India

Bulbophyllum fischeri Seidenf.

Habitat: Epiphyte and also found in wet rocks

Flowering: October

Distribution: South India and Sri Lanka

Bulbophyllum kaitiense Rchb.f.

Habitat: Epiphyte

Flowering: August-September

Distribution: Endemic to Southern Western Ghats and Vulnerable

Bulbophyllum mysorensense (Rolfe) J.J.Sm.

Habitat: Epiphyte and also in wet rocks

Flowering: June-July

Distribution: Endemic to Southern Western Ghats and Endangered.

Note: A new report for Orchidaceae of Nilgiris.

Calanthe sylvatica (Thouars) Lindl.

Habitat: Terrestrial in moist areas of shola forest

Flowering: August-October

Distribution: Indo-Malesia, Sri Lanka and Africa

Cheirostylis flabellata (A. Rich.) Wight

Habitat: Terrestrial

Flowering: February-April

Distribution: South India, Sri Lanka and Bhutan

Coelogyne nervosa A. Rich.

Habitat: Mostly epiphytic and also found in rocks cervices

Flowering: June-July

Distribution: Endemic to Southern Western Ghats

Coelogyne odoratissima Lindl.

Habitat: Epiphyte

Flowering: February-April

Distribution: South India and Sri Lanka

Conchidium nanum (A.Rich.) Brieger

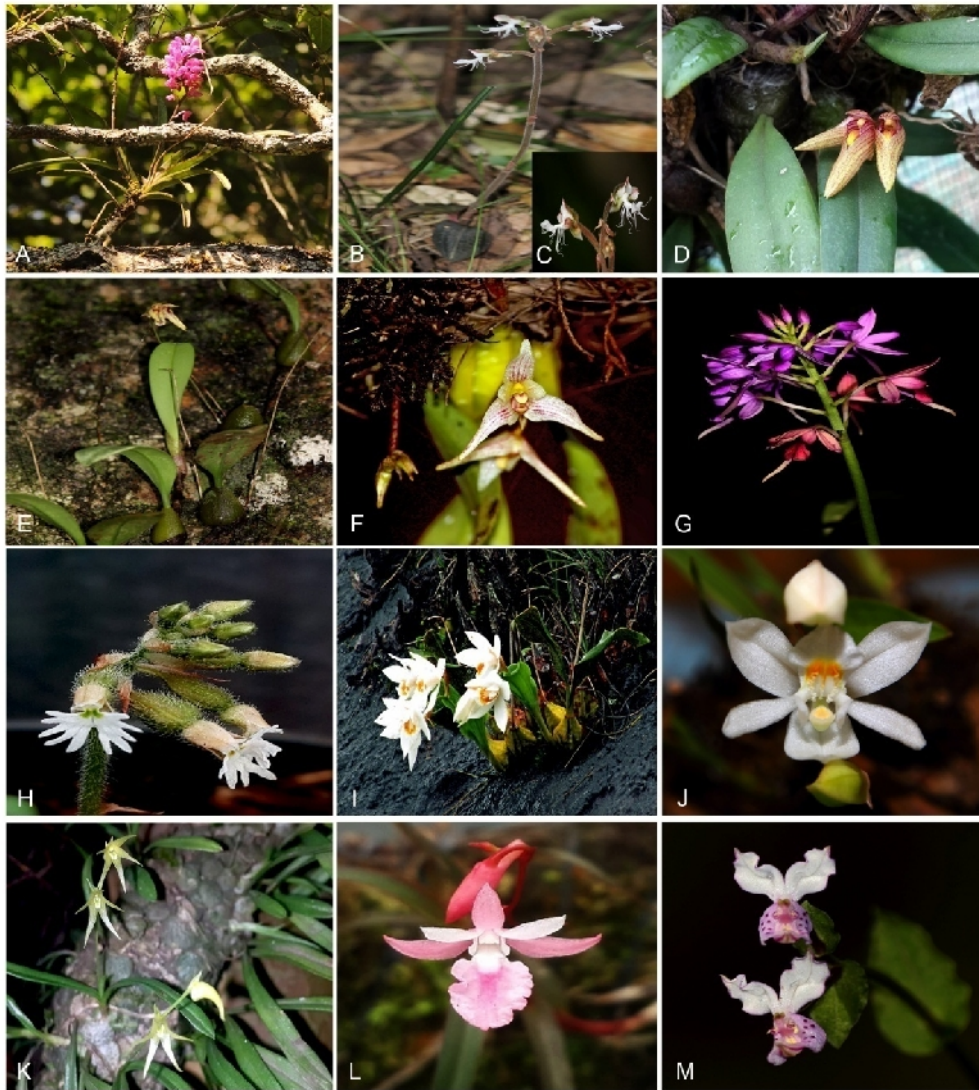


Fig. 2. A. *Aerides ringens*, B.&C. *Anoectochilus elatus*, D. *Bulbophyllum fischeri*, E. *Bulbophyllum kaitiense*, F. *Bulbophyllum mysorensense*, G. *Calanthe sylvatica*, H. *Cheirostylis flabellata*, I. *Coelogyne nervosa*, J. *Coelogyne odoratissima*, K. *Conchidium nanum*, L. *Dendrobium wightii*, M. *Disperis neilgherrensis*.

Habitat: Epiphyte

Flowering: July-September

Distribution: Endemic to Southern Western Ghats and Critically Endangered

Dendrobium wightii A.D.Hawkes & A.H.Heller

Habitat: Terrestrial and lithophyte with moss surface

Flowering: September

Distribution: India and Sri Lanka

Disperis neilgherrensis Wight

Habitat: Terrestrial in shady and fringes of shola forest

Flowering: June-July

Distribution: South India and Sri Lanka

Eria mysorensis Lindl.

Habitat: Epiphyte

Flowering: August-September

Distribution: Endemic to Western Ghats

Eria pauciflora Wight

Habitat: Epiphyte and also in wet rock cervices

Flowering: August

Distribution: Endemic to Southern Western Ghats

Habenaria brachyphylla (Lindl.) Aitch.

Habitat: Terrestrial with moist grasslands

Flowering: September

Distribution: Endemic to Southern Western Ghats

Habenaria digitata Lindl.

Habitat: Terrestrial

Flowering: September-October

Distribution: India and Myanmar

Habenaria longicorniculata Graham

Habitat: Terrestrial with grassland and rocks

Flowering: July-August

Distribution: Western Ghats and Sri Lanka



Fig. 3. A. *Eria mysorens*, B & C. *Eria pauciflora*, D & E. *Habenaria brachyphylla*, F. *Habenaria digitata*, G & H. *Habenaria longicorniculata*, I. *Habenaria longicornu*, J & K. *Habenaria perrottetiana*, L. *Habenaria rariflora*, M. *Liparis atropurpurea*, N. *Luisia birchea*, O & P. *Malaxis densiflora*, Q & R. *Malaxis intermedia*.

***Habenaria longicornu* Lindl.**

Habitat: Terrestrial with grassland and rock slopes

Flowering: September-October

Distribution: Endemic to Peninsular India

***Habenaria perrottetiana* A. Rich.**

Habitat: Terrestrial in moist grasslands

Flowering: September-October

Distribution: Endemic to Peninsular India

***Habenaria rariflora* A. Rich.**

Habitat: Terrestrial with moist grasslands

Flowering: August-September

Distribution: Endemic to Western Ghats

***Liparis atropurpurea* Lindl.**

Habitat: Terrestrial with moist grasslands and rock slopes

Flowering: July-September

Distribution: South India and Sri Lanka

***Luisia birchea* Blume**

Habitat: Epiphyte

Flowering: August-September

Distribution: Peninsular India and Sri Lanka

***Malaxis densiflora* (A. Rich.) Kuntze**

Habitat: Terrestrial with rock slopes

Flowering: July-August

Distribution: Peninsular India and Sri Lanka

***Malaxis intermedia* (A. Rich.) Seidenf.**

Habitat: Terrestrial with rock slopes

Flowering: July-September

Distribution: Endemic to Southern Western Ghats

***Oberonia brunoniana* Wight**

Habitat: Epiphyte

Flowering: November-December

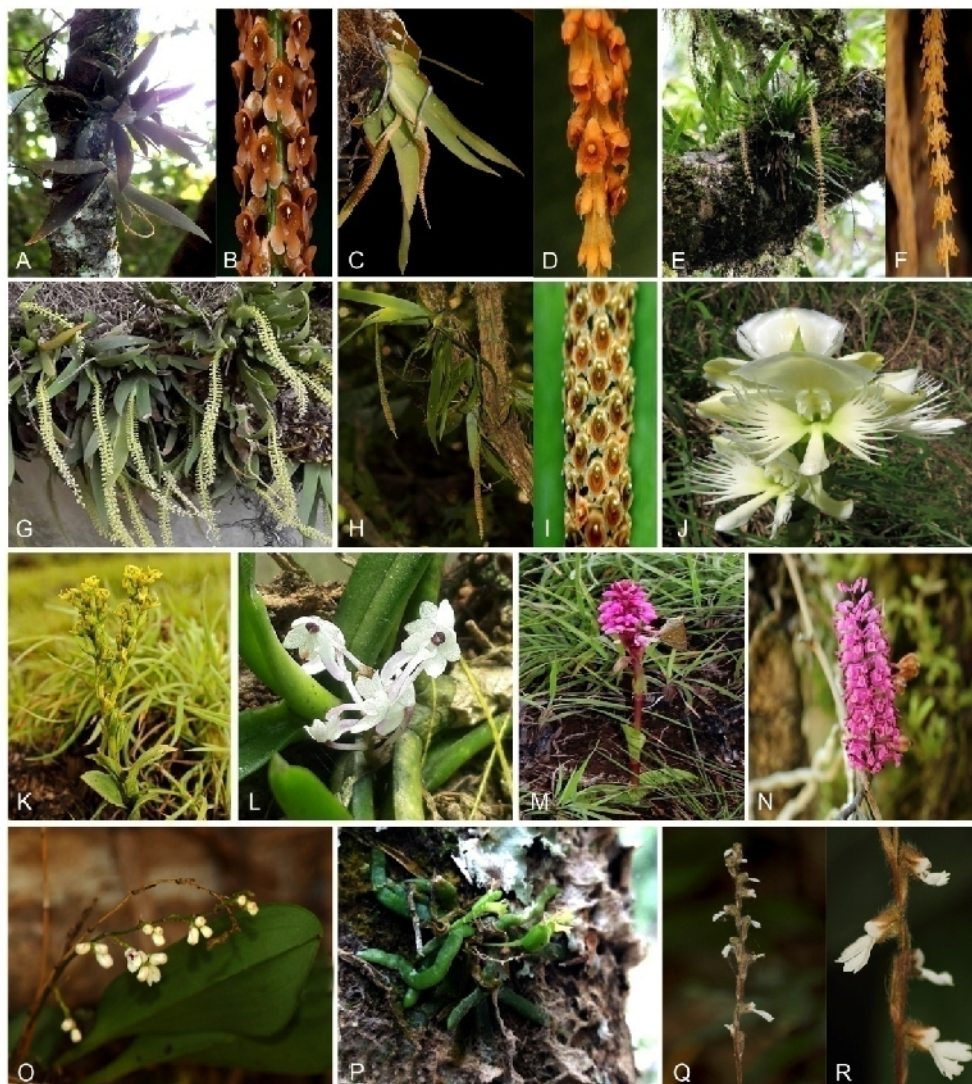


Fig. 4. A & B. *Oberonia brunoniana*, C & D. *Oberonia swaminathanii*, E & F. *Oberonia verticillata*, G. *Oberonia wightiana*, H & I. *Oberonia ensiformis*, J. *Pecteilis gigantea*, K. *Peristylus richardianus*, L. *Robiquetia josephiana*, M. *Satyrium nepalense*, N. *Seidenfadeniella rosea*, O. *Sirhookera latifolia*, P. *Taeniophyllum alwisii*, Q & R. *Zeuxine longilabris*.

Distribution: Endemic to Southern Western Ghats
Oberonia swaminathanii Ratheesh, Manudev & Sujanapal
 Habitat: Epiphyte
 Flowering: October-November
 Distribution: Endemic to Southern Western Ghats.
 Note: A new record for Orchidaceae of Nilgiri.
Oberonia verticillata Wight
 Habitat: Epiphyte
 Flowering: September-October
 Distribution: South India and Sri Lanka
Oberonia wightiana Lindl.
 Habitat: Epiphyte
 Flowering: August - September
 Distribution: South India and Sri Lanka
Oberonia ensiformis (Sm.) Lindl.

Habitat: Epiphyte
 Flowering: August-September
 Distribution: India to Indo-China
Pecteilis gigantea (Sm.) Raf.
 Habitat: Terrestrial in moist grassland
 Flowering: September- October
 Distribution: Indo-Malesia
Peristylus richardianus Wight
 Habitat: Terrestrial with grassland slopes
 Flowering: August-September
 Distribution: India and Nepal
Robiquetia josephiana Manilal & C.S. Kumar
 Habitat: Epiphyte
 Flowering: September-October
 Distribution: Endemic to Peninsular India

Satyrium nepalense D. Don
 Habitat: Terrestrial with moist grasslands
 Flowering: September-October
 Distribution: India, Sri Lanka, upto Myanmar
Seidenfadeniella rosea (Wight) C.S. Kumar
 Habitat: Epiphyte
 Flowering: April-June
 Distribution: Endemic to Southern Western Ghats
Sirhookera latifolia (Wight) Kuntze
 Habitat: Epiphyte
 Flowering: September-October
 Distribution: South India and Sri Lanka
Taeniophyllum alwisii Lindl.
 Habitat: Epiphyte
 Flowering: November - February
 Distribution: Peninsular India and Sri Lanka
Zeuxine longilabris (Lindl.) Trimen
 Habitat: Terrestrial
 Flowering: February-March and November-December
 Distribution: Indo-Malesia

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