

# SPECIES DIVERSITY OF ORCHIDACEAE FROM JHARGRAM DISTRICT OF WEST BENGAL, INDIA

Sk Rasidul Islam, Amal Kumar Mondal, and Sk Md Abu Imam Saadi<sup>1</sup>

Plant Taxonomy, Biosystematics and Molecular Taxonomy Laboratory, Department of Botany and Forestry, Vidyasagar University, Midnapore- 721 102, West Bengal, India

<sup>1</sup>Molecular Plant Taxonomy Laboratory, Department of Biological Sciences, Aliah University, Kolkata- 700 160, West Bengal, India

## Abstract

The family Orchidaceae is one of the most diverse and widespread group of flowering plants and the Jhargram district is one of the richest species diversity regions in West Bengal. The present investigation reports 18 species of orchids belonging to 13 genera, of which 10 were terrestrial and 8 were epiphytic from different forests of Jhargram.

## Introduction

THE FAMILY Orchidaceae is one of the largest families of flowering plants distributed throughout the world. These plants rank amongst the most significant ornamental plants, known for their beauty, colour combinations, and shape of their flowers and has always been interesting to evolutionary biologists because of its remarkable floral forms and diversity in pollination systems (De and Pathak, 2020; Prakash and Pathak, 2020a,b, 2022). In India, 1,256 species of orchids belonging to 155 genera including 388 endemics are found (Singh *et al.*, 2019). The maximum diversity of species can be found in Central India, Eastern Himalayas, and the Western Ghats. Many of these plants have therapeutic properties and have been extensively used as traditional and folklore medicines to cure various human ailments since time immemorial (Balkrishna *et al.*, 2020; Pathak *et al.*, 2010). According to Chakravarty *et al.* (1999), the family Orchidaceae in West Bengal is represented by 112 species under 43 genera. Later, Mitra (2016) reported 468 orchid species under 111 genera from the state of West Bengal. Later, Chakraborti *et al.* (2021) and Pramanik *et al.* (2020) recorded 14 and 16 species, respectively, in the Ajodhya hills of the Purulia district, West Bengal, India. Studies have also been made to study the diversity in different parts of India *i.e.* Indian Himalayan Region (Pandey and Bhatt, 2021), NorthWestern Himalayas (Barman *et al.*, 2021; Jaryal *et al.*, 2021; Kumari and Pathak, 2020; Prakash and Pathak, 2019; Vij *et al.*, 2013), Western Himalayas (Marwah *et al.*, 2021), and Western Ghats (Decruse *et al.*, 2022) *etc.* In the present study, the authors came across 18 orchid species collected from Jhargram district, West Bengal from September, 2017 to October, 2022. Subsequent identification of these specimens was done by scrutiny of pertinent literature

(Hains, 1910; Karmakar and Rahaman, 2015, 2022; Kumar and Rawat, 2008; Malick, 1977; Prain, 1903; Saadi *et al.*, 2020, 2022).

## Material and Methods

### Study Site

Jhargram, a district in the state of West Bengal, India lies between the Kangsabati river in the East and the Subarnarekha in the South. The total area of the region is 3,037.64 sq. km, out of which 2,68,249 hectares is agricultural land and 59,497 hectares is under forest coverage (Fig. 1). The district is a part of the Chotonagpur plateau which gradually slopes down towards the East, and hilly terrain occurs in the NorthWestern part of the district. Kakrajhore area is having the highest altitude of about 300 m. This area is covered with unfertile hard laterite soil. The average rainfall of Jhargram is about 1400 mm. The maximum elevation of the forest is 70-85 m above sea level. The survey was made in different areas of Jhargram district namely Kankrajhore forest (22°41'37.6"N 86°36'02.1"E), Ghagra forest (22°40'41.6"N 86°45'31.5"E), Chilkigarh forest (22°27'07.9"N 86°52'54.5"E), and Tapoban forest (22°01'57.1"N 87°10'31.1"E). Photographs of the different plants were taken (Nikon Z30). Identification was made with the help of available literature and further confirmed by experts.

## Results and Discussion

The family Orchidaceae is one of the most diverse group amongst the flowering plants. Dressler (2005) reported 800-1000 genera in the world, while Singh *et al.* (2019) reported 155 genera in India, and Mitra (2016) reported 111 genera from West Bengal. Amongst the different districts of West Bengal, forests in four different regions

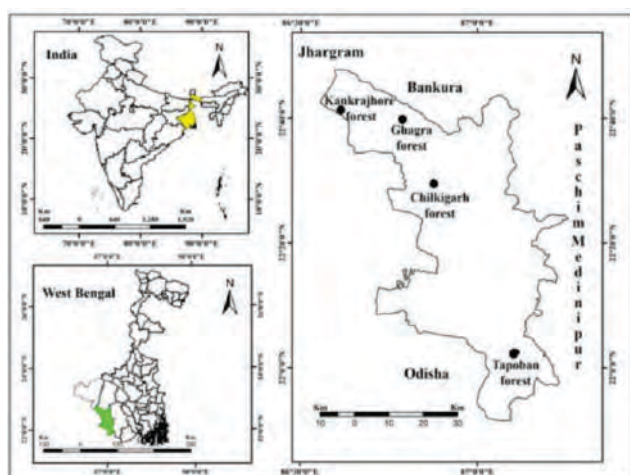


Fig. 1. Map showing Jhargram district of West Bengal, India

of Jhargram district namely Chilkiagarh, Ghagra, Kankrajhore, and Tapoban were selected so as to study the orchid diversity. A total of 18 species of orchids were collected, of which 10 were terrestrial and 8 were epiphytic (Table 1). We compared the distribution and percentage of 18 species in four different regions. Amongst them, 14 (77.7%) species *i.e.* *Acampe praemorsa*, *Aerides odorata*, *Dendrobium macrostachyum*, *Eulophia diffusiflora*, *E. explanata*, *E. picta*, *Habenaria plantaginea*, *Luisia tristis*, *Nervilia concolor*, *Oberonia falconeri*, *Peristylus constrictus*, *Vanda tessellata*, *V. testacea*, and *Zeuxine strateumatica* were found in Kankrajhore forest, 5 (27.7%) species *i.e.*

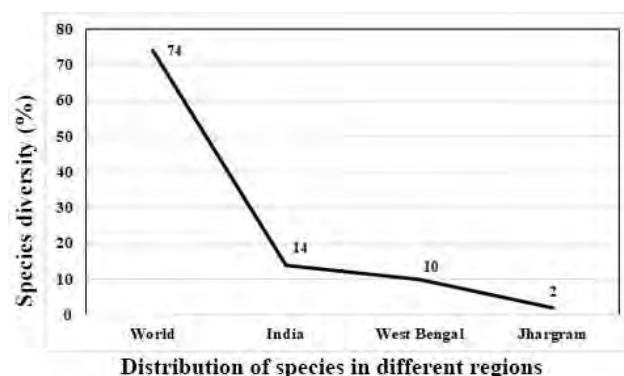


Fig. 2. Distribution and percentage of the presently collected orchid species.

*Didimoplexis palens*, *Eulophia picta*, *Nervilia plicata*, *Tropidia curculigoides*, and *Vanda tessellata* were exclusively observed in Chilkiagarh Forest, 3 (16.66%) species *i.e.* *Eulophia picta*, *Rhynchostylis retusa*, and *Vanda tessellata* in Tapoban forest, and 2 (11.1%) species *i.e.* *Eulophia picta* and *Vanda tessellata* were found in Ghagra Forest (Table 1 and Fig. 2).

Detailed studies, however, need to be made so as to survey the unexplored areas in the region, evaluate the biological status and ethnobotanical uses of the presently investigated species in the region so as to develop appropriate conservation strategies both *ex vitro* and *in vitro*. Perusal of literature reveals that a few *in vitro* studies have already been made in this direction to conserve some of the commercially important and/or

Table 1. Habit and species distribution of presently investigated species in four different forests of Jhargram district.

| Species                                           | Habit | Forest Type |    |    |    |
|---------------------------------------------------|-------|-------------|----|----|----|
|                                                   |       | CF          | GF | KF | TF |
| <i>Acampe praemorsa</i> (Roxb.) Blatt. & McCann   | E     | -           | -  | +  | -  |
| <i>Aerides odorata</i> Lour.                      | E     | -           | -  | +  | -  |
| <i>Dendrobium macrostachyum</i> Lindl.            | E     | -           | -  | +  | -  |
| <i>Didimoplexis palens</i> Griff.                 | T     | +           | -  | -  | -  |
| <i>Eulophia explanata</i> Lindl.                  | T     | -           | -  | +  | -  |
| <i>E. diffusiflora</i> M.W.Chase, Kumar & Schuit. | T     | -           | -  | +  | -  |
| <i>E. picta</i> (R.Br.) Ormerod                   | T     | +           | +  | +  | +  |
| <i>Habenaria plantaginea</i> Lindl.               | T     | -           | -  | +  | -  |
| <i>Nervilia concolor</i> (Blume) Schltr.          | T     | -           | -  | +  | -  |
| <i>N. plicata</i> (Andrews) Schltr.               | T     | +           | -  | -  | -  |
| <i>Rhynchostylis retusa</i> (L.) Blume            | E     | -           | -  | -  | +  |
| <i>Luisia tristis</i> (G.Forst.) Hook.f.          | E     | -           | -  | +  | -  |
| <i>Vanda tessellata</i> (Roxb.) Hook. ex G.Don    | E     | +           | +  | +  | +  |
| <i>V. testacea</i> (Lindl.) Rchb.f.               | E     | -           | -  | +  | -  |
| <i>Tropidia curculigoides</i> Lindl.              | T     | +           | -  | -  | -  |
| <i>Peristylus constrictus</i> (Lindl.) Lindl.     | T     | -           | -  | +  | -  |
| <i>Zeuxine strateumatica</i> (L.) Schltr.         | T     | -           | -  | +  | -  |
| <i>Oberonia falconeri</i> Hook.f.                 | E     | -           | -  | +  | -  |

E, Epiphytic; T, Terrestrial; CF, Chilkiagarh Forest; GF, Ghagra Forest; KF, Kankrajhore Forest; TF, Tapoban Forest.

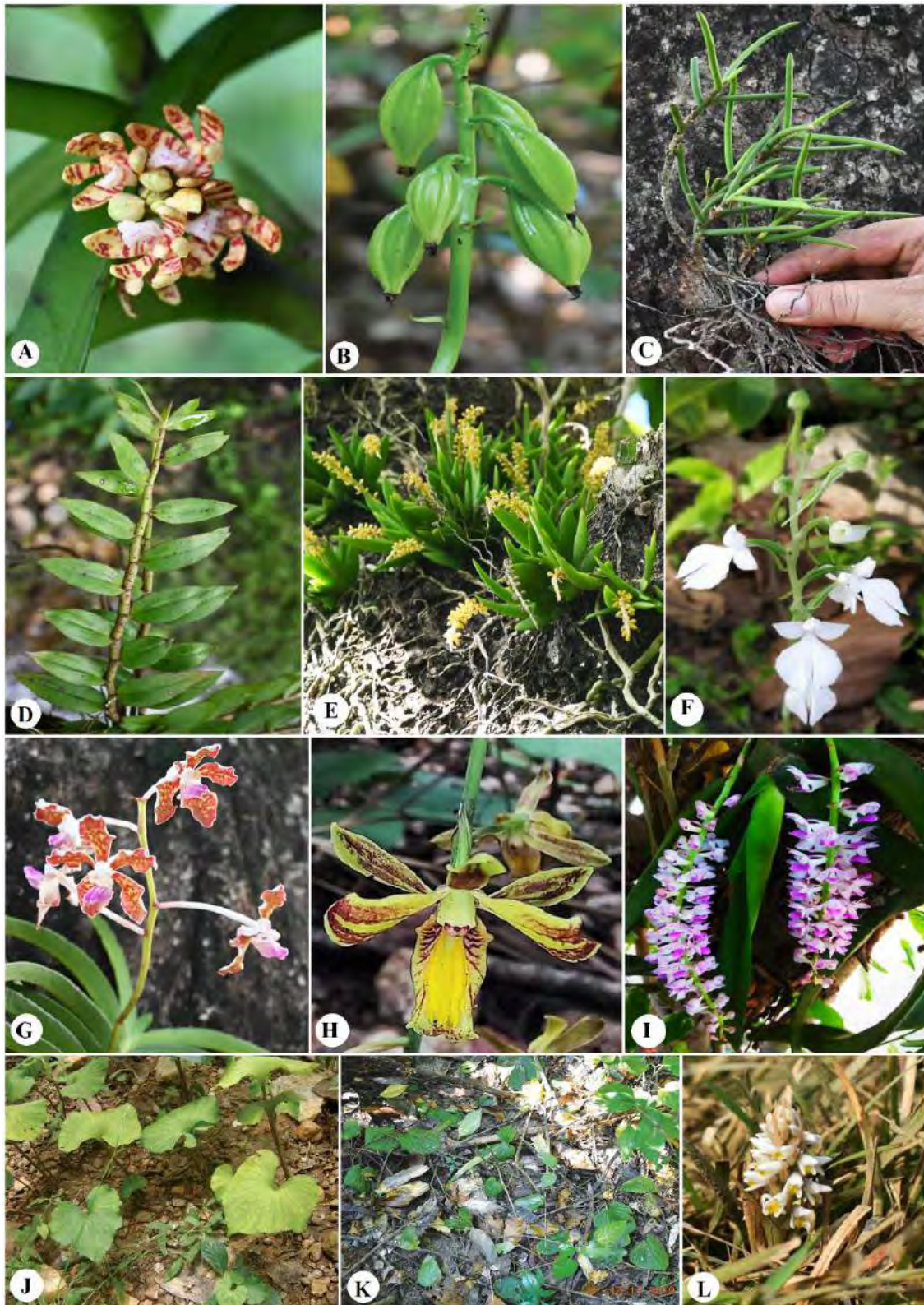


Fig. 3. A-L. Some of the presently investigated species from four different forests, in Jhargram district: A, *Acampe praemorsa*; B, *Eulophia picta* (Fruits); C, *Luisia tristis*; D, *Dendrobium macrostachyum*; E, *Oberonia falconeri*; F, *Habenaria plantaginea*; G, *Vanda tessellata*; H, *Eulophia explanata*; I, *Rhynchostylis retusa*; J, *Nervilia concolor*; K, *Nervilia plicata*; L, *Zeuxine strateumatica*.

RET orchid species (Anuprabha and Pathak, 2020; Bhowmik and Rahman, 2022; Kumari and Pathak, 2021; Mutum *et al.*, 2022; Pathak *et al.*, 2022, 2023; Sembi *et al.*, 2020; Sunita *et al.*, 2021; Thakur and Pathak, 2020, 2021; Tripura *et al.*, 2022; Vasundhra *et al.*, 2019, 2021).

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