

## INDIGENOUS ORCHIDS AND ZINGIBERACEOUS TAXA OF GARO HILLS, MEGHALAYA

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Exploration and identification of indigenous ornamental species is one of the new areas of research and accounts wide spectrum of uses in environmental management. Using field investigation in combination with analysis of relevant literature and available data, this paper presents the study of botanical exploration and investigation in forest area of Garo Hills, Meghalaya. Results indicated that Garo Hills had abundance of indigenous Orchidaceae and Zingiberaceae family flora which exhibits wide range of diversity in terms of taxa, habit and growth forms. This study identified 16 species belonging to Orchidaceae family and 10 species belonging to Zingiberaceae family with potential artistic ornamental value. The distinguishing features of these indigenous plants, their characteristics and habits were analyzed. The ornamental potential of most plants are its flowers. We hope that this work will help the researchers and people, who are interested in wild indigenous Orchidaceae and Zingiberaceae flowers.

**Keywords:** Flora, Indigenous, Orchidaceae, Ornamental, Zingiberaceae.

Ornamental plants are simply the plants that are grown for their aesthetic qualities. Nature has given a wealth of wild flower and ornamental plants, unfortunately many of them have been destroyed to such an extent that several have become extinct and survival of many is endangered by over exploitation of human beings (Arora 1993). Wild ornamental plants are those which occur naturally in the field and have highly ornamental features such as ornamental flowers, foliage and fruits (Li and Zhou 2005, Reddy *et al.* 2012). They play important role in environmental planning of urban and rural areas for abatement of pollution, social and rural forestry, wasteland development, afforestation and landscaping of outdoor and indoor spaces (Kapoor and Sharga 1993). Wild plants are a striking feature of the land surface. They vary greatly in composition and density in marked contrast with domesticated plants (Raju 1998). Wild flora is very important in view of aesthetic and recreational value for man and society. Most of the present day flowers have come from the wild progenitor a few of which still exist in natural habitat (Thomas *et al.* 2011). The floral diversity of Meghalaya is well reputed for its richness and has been a centre of attraction for many botanists. The presence of a large number

of primitive flowering plants has prompted Takhtajan (1969) to call it the 'Cradle of Flowering Plants'. Meghalaya harbours about 3,128 species of flowering plants and contributes about 18% of the total flora of the country, including 1,237 endemic species (Khan *et al.* 1997). The ornamental plants are to be the main pathway for the introduction of native plants into the country (Harris 1992). In view of the above facts, the present study has aimed to document the wild ornamental Orchidaceae and Zingiberaceae flowering plants of Garo Hills in Meghalaya, India.

### MATERIALS AND METHODS

#### STUDY AREA

Meghalaya (25.30° N latitude and 91.00° E longitude) 'the abode of clouds' is a treasure trove of nature, with its richly varied and dense endemic, exotic and cultivated flora. Meghalaya abounds in various indigenous fruit plants, herbs and shrubs which are rare and perhaps not grown anywhere else in the world. Meghalaya has a very high potential for commercial cultivation of ornamental plants due to favourable climate enabling low cost cultivation of a variety of commercially important flowers such as Orchids, Bulbous

**Table 1:** The different Flora list of Orchidaceae and Zingiberaceae family

S.No	Botanical Name	Flowering time	Habit	Flower colour
1	<i>Aerides odorata</i> Lour.	May-July	Epiphyte	White with Purple
2	<i>Arundina graminifolia</i> D.Don.	May-August	Terrestrial	Pink-Purple
3	<i>Calanthe sylvatica</i> Lindl.	Sept.-Oct.	Terrestrial	Purple
4	<i>Coelogyne stricta</i> D.Don.	April-June	Epiphyte	Yellow
5	<i>Cymbidium aloifolium</i> Hook.	May-June	Epiphyte	Yellowish orange
6	<i>Dendrobium aphyllum</i> Roxb.	May	Epiphyte	Pinkish violet
7	<i>Dendrobium chrysanthrum</i> Schoot.	July-Oct.	Epiphyte	Yellow
8	<i>Dendrobium densiflorum</i> Schoot.	April-June	Epiphyte	Yellow
9	<i>Dendrobium formosum</i> Roxb ex Lindl.	May-June	Epiphyte	White
10	<i>Dendrobium jenkinsii</i> Wall ex Lindl.	April-May	Epiphyte	Yellow
11	<i>Micropera rostrata</i> Roxb.	May-June	Epiphyte	Pink
12	<i>Nephelaphyllum pulchrum</i> Blume.	June-July	Terrestrial	Pinkish white
13	<i>Paphiopedilum venustum</i> Wall.	Dec.-Feb.	Terrestrial	Green with pink
14	<i>Papilionanthe teres</i> Roxb.	Feb.-March	Epiphyte	Purple
15	<i>Rhynchostylis retusa</i> Bl.	April-May	Epiphyte	Pink
16	<i>Smitinandia micrantha</i> Lindl.	July-August	Epiphyte	Pink
17	<i>Curcuma aromatica</i> Salisb.	Feb.-May	Herb	Pink
18	<i>Curcuma picta</i> Roxb.	Feb.-May	Herb	Pink
19	<i>Curcuma zedoaria</i> Christm.	March-May	Herb	Red
20	<i>Glabba multiflora</i> Benth.	August-Sept.	Herb	Yellow
21	<i>Hedychium gardenerianum</i> Rose.	June-Sept.	Herb	Yellow
22	<i>Hedychium gardenerianum</i> Rose. Var. Orange	June-Sept.	Herb	Orange
23	<i>Hedychium gracile</i> Roxb.	September	Herb	Red
24	<i>Hedychium thyrsiforma</i> Ham.	September	Herb	Red
25	<i>Kaempferia angustiflora</i> Rose.	March -May	Herb	Pale Pink
26	<i>Kaempferia pulchra</i> Ridl.	March -May	Herb	Purple

plants, Bird of paradise, Chrysanthemum Gerbera, Gladiolus, Marigold, Carnations, etc. Although, the market potential for flowers has not been fully exploited, it is envisaged that development of ornamental plants could be promoted through entrepreneurship programs.

Garo Hills is the part of the Garo-Khasi range in Meghalaya, India. It is inhabited mainly by tribal dwellers, the majority of whom are Garo people. The range is part of the Meghalaya sub-tropical forests eco region. The West Garo Hills district lies on the western part of the state of Meghalaya bounded by the East Garo Hills district on the east, the South Garo

Hills district on the south-east, the Goalpara district of Assam on the north and north-west and Bangladesh on the south. The district is situated between the latitude 25.5679° N and the longitude 90.2245° E. The West Garo Hills district occupies an area of 3677 km<sup>2</sup>. Tura is the head quarter of the West Garo Hills district. The East Garo Hills district is bounded by the South Garo Hills district on the south, by the West Garo Hills district on the west, by the West Khasi Hills district on the east and by the North Garo Hills on the north. The district lies between the latitude 25.5672° N and the longitude 90.5258° E. The East Garo Hills

District occupies a total area of 2603 km<sup>2</sup>. Williamnagar is the district head quarter situated on the side of river Simsang. The North Garo Hills district is located on the northern part of the Garo Hills region. The district is bounded by the East Garo Hills district on the east, by the West Garo Hills district on the south, by the Goalpara district of Assam on the north and north-west. The district is situated between the latitude 25.8987° N and the longitude 90.4880° E. The district occupies an area of 1,113 km<sup>2</sup>. Resubelpara is the head-quarter of North Garo Hills district. This town is situated alongside the Damring River.

## METHODOLOGY

The present investigation was based on an extensive survey of the indigenous ornamental plants in different parts of Garo Hills, Meghalaya during the year 2018-2019. In the research investigated from Garo Hills, the diversity of Orchidaceae and Zingiberaceae families having different types of flower colour was used to determine ornamental potential, which are distributed in different parts of Garo Hills districts of Meghalaya. The plant specimens were collected during the survey to prepare herbarium specimens. The collected specimens were identified taxonomically with the help of available floras and literature (Gamble & Fischer 1935, Reddy *et al.* 2008) and by Department of Botany, NEHU. The specimens were processed for the preparation of Herbarium by standard methods (Santapau 1973)

## RESULTS AND DISCUSSION

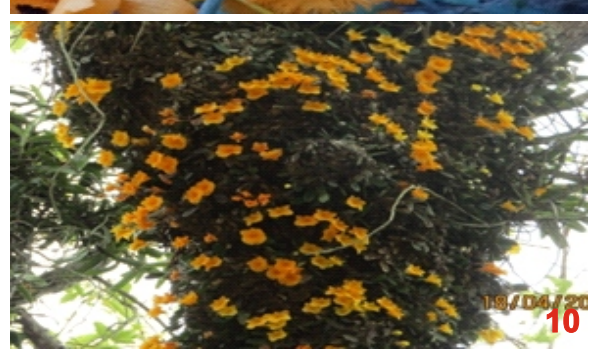
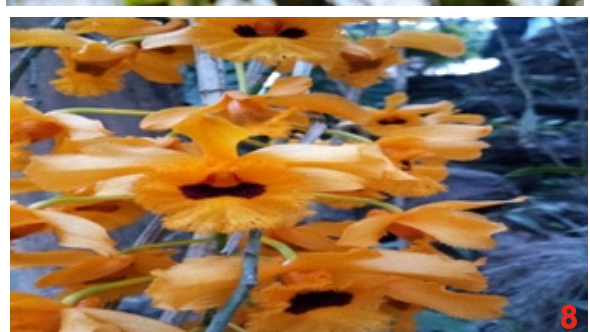
The present documentation on the indigenous plants of Orchidaceae and Zingiberaceae family of Garo Hills, Meghalaya revealed that in Orchidaceae family, there are 16 species belonging to 12 genera and 10 species belonging to 4 genera under the Zingiberaceae family. The ornamental potentiality is high lightened due to its attractive habit and good looking flowers. The indigenous family of

Orchidaceae and Zingiberaceae plants was properly arranged with botanical names, habit and flower colours as shown in Table 1. Out of these two families and 26 species, the family Orchidaceae was the dominant one with 16 species followed by Zingiberaceae while there was only 10 species. Based on habit classification of the enumerated flora 12 species belongs to epiphyte and 4 species under terrestrial from the Orchidaceae family whereas 10 species was under herbs from Zingiberaceae family (Fig.1). Among the attractive flowers, pink colour is dominant with 9 species followed by yellow colour with 6 species (Fig 2).

## CONCLUSION

Through the present research we hope to convey that, the various species, which are documented from the study area, was possessing ornamental potentialities in their attractive habit and flowers. This work will help the researchers and people who are interested in wild ornamental plants and there is thus considerable scope for looking at the meaning of domestic gardens and landscape practices in both urban and local people. Wild ornamental species are also the sources for the medicinal significance (Asati and Yadav 2010). So, the ornamental germplasm relatives are to be conserved. In the development of new hybrids, polyploids and mutation of ornamental interest and it is essential to know wild ornamental species. The dynamic floriculture industry is constantly looking for new products, technologies and market niches. This process is largely based on research and development, and requires strong collaboration between many links of the production chain. In addition to this there is a wealth of research and practices into the use of horticultural therapy, which is now a well established form of intervention based on the therapeutic effects of gardening and of plant both in health and occupational settings.

We are thankful to the Forest officials of Garo



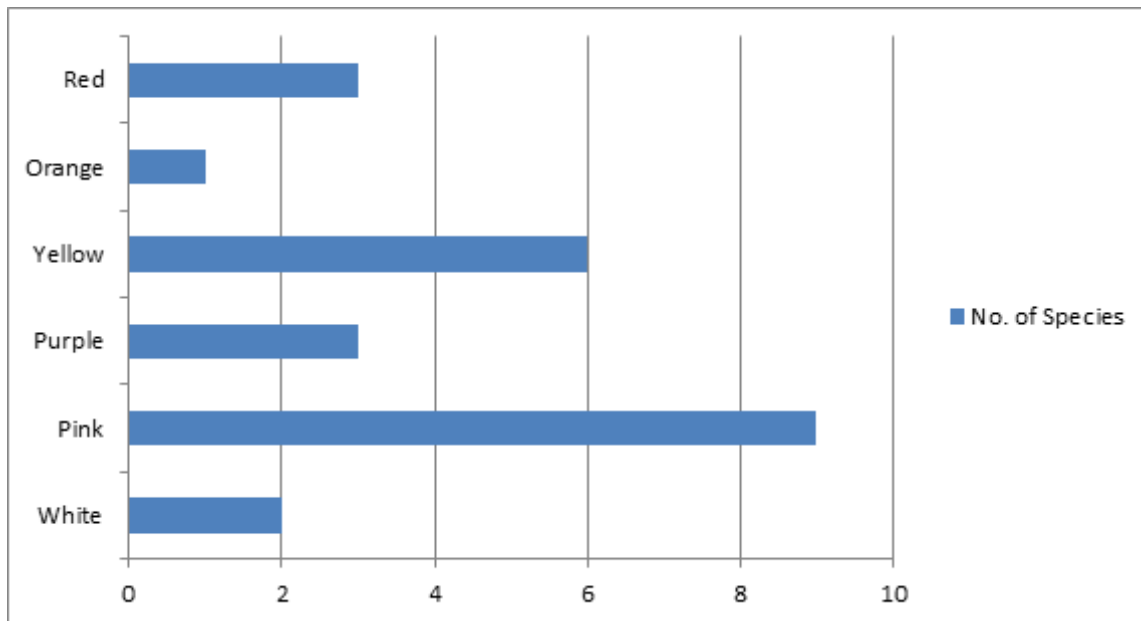
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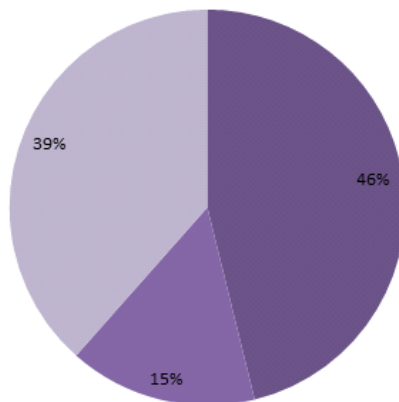


**Plate 1:** 1. *Aerides odorata* Lour. 2. *Arundina graminifolia* D. Don. 3. *Calanthe sylvatica* Lindl. 4. *Coelogyne stricta* D. Don. 5. *Cymbidium aloifolium* Hook. 6. *Dendrobium aphyllum* Roxb. 7. *Dendrobium densiflorum* Schoot. 8. *Dendrobium chrysanthrum* Schoot. 9. *Dendrobium formosum* Roxb ex Lindl. 10. *Dendrobium jenkinsii* Wall ex Lindl. 11. *Micropera rostrata* Roxb. 12. *Nephelaphyllum pulchrum* Blume. 13. *Paphiopedilum venustum* Wall. 14. *Papilionanthe teres* Roxb. 15. *Rhynchostylis retusa* Bl. 16. *Smitinandia micrantha* Lindl. 17. *Curcuma aromatica* Salisb. 18. *Curcuma picta* Roxb. 19. *Curcuma zedoaria* Christm. 20. *Glabba multiflora* Benth. 21. *Hedychium gardenerianum* Rose. 22. *Hedychium gardenerianum* var Orange Rose. 23. *Hedychium gracile* Roxb. 24. *Hedychium thyrsoforma* Ham. 25. *Kaempferia angustifolia* Rose. 26. *Kaempferia pulchra* Ridl.



**Figure 2:** Flower colour analysis of Orchidaceae and Zingiberaceae Flora

■ Epiphytic Orchids ■ Terrestrial Orchids ■ Herbs



**Figure 1:** Habit analysis of orchidaceae and zingiberaceae flora.

hills for providing the essential permit to conduct a successful survey for my research and helping in collection of indigenous flora of Orchidaceae and Zingiberaceae family in Garo Hills, Meghalaya.

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