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## **EXPLORATION OF WILD ORNAMENTAL FLORA IN GARO HILLS, MEGHALAYA**

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### **ABSTRACT**

The present study on wild ornamental plants of Garo Hills, Meghalaya reveals that, there are about 104 species belonging to 91 genera and 38 families. The ornamental potentiality is mainly due to the good looking habit or plant parts along with the attractive beautiful flowers. The domestication of many wild plants in ornamental point of view is also an ex-situ method conservation approach for conserving the natural resources. The ornamental potential of most plants are its flowers, some species have ornamental foliage. Some suggestion for further exploitation, utilization and protection is given in the paper. We hope that this work will help the researchers and people, who are interested in wild ornamental plants.

**Keywords:** *Ornamental, Flora, Garo Hills, Meghalaya*

### **INTRODUCTION**

There is no straight cut definition for ornamental plants in literatures as they are mostly implied. They are simply plants 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 by 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, Rajagopal 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). A variety of wild plants are highly useful to the local people, while the others are of significant commercial importance. Wild flora is very important in view of aesthetic and recreational value for man. 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).

There are several ornamental plants which grow in nature in shade or partial shade and these may be gainfully employed as house plants in suitable climatic conditions. The domesticated wild plants are propagated in various horticultural methods such as cuttings, grafting, budding and seeds also. The ornamental horticulture is to be the main pathway for the introduction of native plants in to the country (Harris, 1992). In view of the above facts, the present study has aimed to document the wild ornamental 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 plants, Bird of paradise, Chrysanthemum Gerbera, Gladiolus, Marigold,

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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 study was based on an extensive survey and field observations of native ornamental plants in different parts of Garo Hills, Meghalaya during the year 2017-2018. In this study an attempts were made to find out the diversity of wild ornamental flowering plants, which are distributed in the Garo Hills districts of Meghalaya. During the field visits, the plant specimens were collected at different reproductive stages to prepare herbarium specimens. The collected specimens were identified taxonomically with the help of available floras and literature (Gamble & Fischer, 1935, Pullaiah *et al.*, 1997, Sudhakar Reddy *et al.*, 2008). The specimens were processed for the preparation of Herbarium by standard methods (Santapau, 1973).

**Table 1: List of wild ornamental flowers of Garo Hills, Meghalaya**

Botanical Name	Family	Habit	Flower color
<i>Aerides odorata</i> Lour.	Orchidaceae	Epiphyte	White
<i>Ageratum houstonianum</i> Mill.	Asteraceae	Herb	Purple
<i>Albizia saman</i> (Jacq.) Merr	Fabaceae	Tree	Pink
<i>Alpinia zerumbet</i> Pers.	Zingiberaceae	Shrub	White
<i>Apios Americana</i> Medikus	Fabaceae	Climber	Red
<i>Argyreia nervosa</i> (Burm.f.)	Convolvulaceae	Climber	Purple
<i>Arundina graminifolia</i> (D.Don) Hochr.	Orchidaceae	Herb	Purple
<i>Asclepias curassavica</i> L.	Apocynaceae	Shrub	Red
<i>Barleria cristata</i> L.	Acanthaceae	Shrub	Blue
<i>Bauhinia purpurea</i> L.	Fabaceae	Tree	White
<i>Bombax ceiba</i> L.	Malvaceae	Tree	Red
<i>Brugmansia suaveolens</i> Bercht. & J.Presl	Solanaceae	Shrub	White
<i>Butea monosperma</i> (Lam.) Taub.	Fabaceae	Tree	Orange

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<i>Caladium bicolor</i> Aiton	Araceae	Herb	Green
<i>Calanthe sylvatica</i> (Thouars) Lindl.	Orchidaceae	Herb	Purple
<i>Calotropis gigantean</i> L.	Apocynaceae	Shrub	Blue
<i>Cassia fistula</i> L.	Fabaceae	Tree	Yellow
<i>Cassia javanica</i> L.	Fabaceae	Tree	Pink
<i>Celosia argentea</i> L.	Amaranthaceae	Herb	White
<i>Centratherum punctatum</i> Cass.	Asteraceae	Herb	Purple
<i>Cheilocostus speciosus</i> (J.Konig) C.Specht	Costaceae	Shrub	White
<i>Chrysothemis pulchella</i> (Donn ex Sims) Decne.	Gesneriaceae	Herb	Purple
<i>Cleoserrata speciosa</i> Raf.	Capparaceae	Herb	White
<i>Coelogyne stricta</i> (D. Don) Schltr.	Orchidaceae	Epiphyte	Yellow
<i>Cosmos sulphureus</i> Cav.	Fabaceae	Herb	Orange
<i>Crinum americanum</i> L.	Amaryllidaceae	Herb	White
<i>Crotalaria pallida</i> Aiton	Fabaceae	Shrub	Yellow
<i>Crotalaria retusa</i> L.	Fabaceae	Herb	Yellow
<i>Crotalaria sagittalis</i> L.	Fabaceae	Herb	Yellow
<i>Curcuma zedoaria</i> (Christm.) Roscoe	Zingiberaceae	Herb	Purple
<i>Cyathea arborea</i> L.	Cyatheaceae	Tree	Green
<i>Delonix Regia</i> (Boj. ex Hook.) Raf.	Fabaceae	Tree	Red
<i>Dendrobium aphyllum</i> Roxb.	Orchidaceae	Epiphyte	Pink
<i>Dendrobium chrysanthum</i> Wall. ex Lindl.	Orchidaceae	Epiphyte	Yellow
<i>Dendrobium formosum</i> Roxb. ex Lindl.	Orchidaceae	Epiphyte	White
<i>Drosera rotundifolia</i> L.	Droseraceae	Herb	Red
<i>Elephantopus elatus</i> Bertol.	Fabaceae	Herb	Purple
<i>Eranthemum pulchellum</i> Andrews	Acanthaceae	Shrub	Blue
<i>Eriocaulon sp.</i> Linn.	Eriocaulaceae	Shrub	White
<i>Erythrina variegata</i> L.	Fabaceae	Tree	Red
<i>Habranthus robustus</i> Herb. ex Sweet	Amaryllidaceae	Herb	Pink
<i>Hedychium coccineum</i> Buch.-Ham. ex Sm. in A.Rees	Zingiberaceae	Herb	Red
<i>Hedychium gardnerianum</i> Sheppard ex Ker Gawl.	Zingiberaceae	Herb	White
<i>Hippeastrum puniceum</i> Lam.	Amaryllidaceae	Herb	Orange
<i>Holmskioldia sanguine</i> Retz.	Lamiaceae	Shrub	Red
<i>Huperzia squarrosa</i> G. Frost	Lycopodiaceae	Epiphyte	Green
<i>Hypoestes phyllostachya</i> Baker.	Acanthaceae	Shrub	Green
<i>Impatiens balsamina</i> (L.) Benth. ex Kurz	Balsaminaceae	Herb	Purple
<i>Impatiens capensis</i> Meerb.	Balsaminaceae	Herb	Orange
<i>Impatiens parviflora</i> DC.	Balsaminaceae	Herb	White

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<i>Impatiens walleriana</i> Hook f	Balsaminaceae	Herb	Red
<i>Ipomoea cordatotriloba</i> L.	Convolvulaceae	Climber	Purple
<i>Ipomoea obscura</i> L.	Convolvulaceae	Climber	White
<i>Jatropha gossypifolia</i> L.	Euphorbiaceae	Shrub	Red
<i>Kaempferia pulchra</i> Ridl.	Zingiberaceae	Herb	Red
<i>Lagerstroemia indica</i> L.	Lythraceae	Tree	Purple
<i>Lantana camara</i> L.	Verbenaceae	Herb	Red
<i>Licuala spinosa</i> Wurm.	Areaceae	Tree	Green
<i>Limodorum abortivum</i> L.	Orchidaceae	Herb	Violet
<i>Ludwigia suffruticosa</i> Walter.	Onagraceae	Herb	Yellow
<i>Lycopodiella cernua</i> L.	Lycopodiaceae	Herb	Green
<i>Melastoma malabathricum</i> L.	Melastomataceae	Shrub	Purple
<i>Mesua ferrea</i> L.	Calophyllaceae	Tree	White
<i>Micropera rostrata</i> Roxb.	Rubiaceae	Epiphyte	Purple
<i>Mimosa pigra</i> L.	Fabaceae	Shrub	Purple
<i>Mimosa pudica</i> L.	Fabaceae	Herb	Purple
<i>Mirabilis Jalapa</i> L.	Nyctaginaceae	Herb	Pink
<i>Mussaenda frondosa</i> L.	Rubiaceae	Shrub	Yellow
<i>Nelumbo nucifera</i> Gaertn.	Nelumbonaceae	Aquatic	Pink
<i>Nepenthes khasiana</i> Hook f.	Nepenthaceae	Climber	Green
<i>Nephelaphyllum pulchrum</i> Blume	Orchidaceae	Climber	Yellow
<i>Orthosiphon aristatus</i> (Blume) Miq.	Lamiaceae	Herb	Blue
<i>Paederia foetida</i> Walter.	Rubiaceae	Climber	Purple
<i>Pancratium maritimum</i> L.	Amaryllidaceae	Herb	White
<i>Paphiopedilum venustum</i> (Wall. ex Sims) Pfitzer	Orchidaceae	Herb	Green
<i>Papilionanthe teres</i> (Roxb.) Lindl	Orchidaceae	Epiphyte	Purple
<i>Pavetta indica</i> L.	Rubiaceae	Shrub	White
<i>Peltophorum pterocarpum</i> (DC.) K. Heyne	Fabaceae	Tree	Yellow
<i>Polypodium vulgare</i> L.	Polypodiaceae	Herb	Green
<i>Pteridium aquilinum</i> (L.) Kuhn.	Dennstaedtiaceae	Herb	Green
<i>Pueraria Montana</i> (Lour.) Merr.	Fabaceae	Climber	Blue
<i>Rauvolfia serpentina</i> (L.) Benth. ex Kurz	Apocynaceae	Shrub	White
<i>Rhexia mariana</i> L.	Melastomataceae	Herb	Purple
<i>Rhynchosyilis retusa</i> (L.) Blume	Orchidaceae	Epiphyte	Pink
<i>Ricinus communis</i> L.	Euphorbiaceae	Shrub	Pink
<i>Sabatia angularis</i> (L.) Pursh)	Gentianaceae	Herb	Purple
<i>Saraca indica</i> L.	Fabaceae	Tree	Red

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<i>Scadoxus multiflorus</i> (Martyn) Raf.	Amaryllidaceae	Herb	Red
<i>Senna alata</i> (L.) Roxb.	Fabaceae	Shrub	Yellow
<i>Senna corymbosa</i> (Lam.)	Fabaceae	Shrub	Yellow
<i>Sphagneticola trilobata</i> L.	Asteraceae	Herb	Yellow
<i>Sphenomeris chinensis</i> L.	Lindsaeaceae	Herb	Green
<i>Syzygium jambos</i> L.	Myrtaceae	Shrub	White
<i>Tabernaemontana divaricata</i> R.Br. ex Roem. & Schult.	Apocynaceae	Shrub	White
<i>Tabernaemontana stapfiana</i> Britten.	Apocynaceae	Tree	White
<i>Tagetes erecta</i> Linn.	Fabaceae	Herb	Yellow
<i>Tithonia diversifolia</i> Hemsl.	Asteraceae	Shrub	Yellow
<i>Trachelospermum jasminoides</i> (Lindl.) Lem.	Apocynaceae	Climber	White
<i>Triumfetta rhomboidea</i> Jacq.	Malvaceae	Shrub	Yellow
<i>Urena lobata</i> L.	Malvaceae	Shrub	White
<i>Vernonia noveboracensis</i> (L.) Michx.	Asteraceae	Herb	Purple
<i>Viola canina</i> L.	Violaceae	Herb	Blue
<i>Zephyranthes carinata</i> Herb.	Amaryllidaceae	Herb	Pink
<i>Zingiber zerumbet</i> (L.) Roscoe ex Sm.	Zingiberaceae	Herb	Red

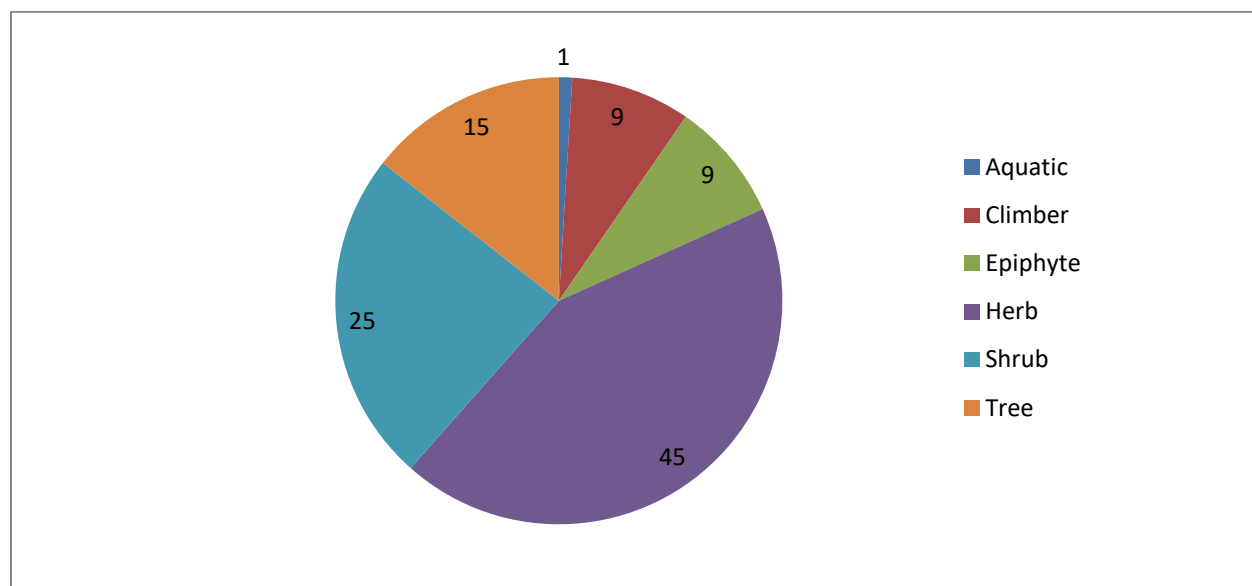
**RESULTS AND DISCUSSION**

The present documentation on ornamental potential plants of Garo Hills, Meghalaya reveals that, there are about 104 species belonging to 91 genera and 38 families. The ornamental potentiality is high lightened due to its attractive habit and good looking flowers. The ornamental plants are alphabetically arranged with botanical names, families and habit (Table 1). Out of these thirty-eight families, the family like Fabaceae is the dominant one with 21 species followed by Orchidaceae with 12 species. Based on life forms classification of the enumerated wild ornamental species, maximum numbers of 45 species belongs to herbs, followed by 25 shrubs and 15 trees, epiphyte and climbers 9 each and single aquatic (Figure.1). Among the attractive flowers white colour is dominant with 22 species, followed by purple with 20 species, yellow with 16, red with 15 species, green with 11, blue with 6 species, green with 11 and violet with 1 species (Figure. 2).

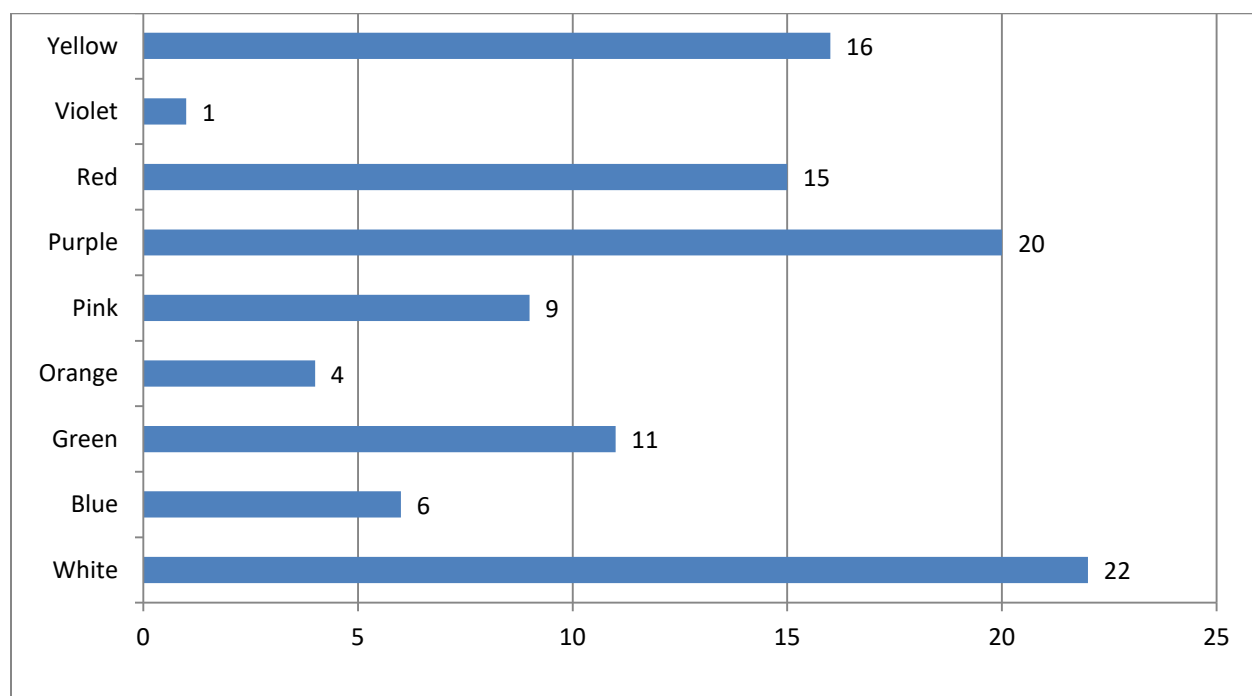
**CONCLUSION**

Through the present study we hope to convey that, the various species, which are documented from the study area, are 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 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. Photographs of some of these ornamental plants are presented in figure 3 and figure 4.

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**Figure 1: Habit analysis of potential ornamental plants.**



**Figure 2: Flower colour analysis of wild ornamental plants.**



*Melastoma malabathricum* L.



*Argyreia nervosa* (Burm.f.) Bojer



*Centratherum punctatum* Cass.



*Holmskioldia sanguine* Retz.



*Sabatia angularis* (L.) Pursh



*Curcuma zedoaria* (Christm.) Roscoe

**Figure 3: Photographs of some of these ornamental plants**

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*Crinum americanum* L.



*Dendrobium formosum* Roxb. ex Lindl.



*Nepenthes khasiana* Hook f.



*Micropera rostrata* Roxb.



*Rhynchosyilis retusa* (L.) Blume



*Kaempferia pulchra* Ridl.

**Figure 4: Photographs of some of these ornamental plants**

**ACKNOWLEDGEMENT**

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**REFERENCES**

Arora JS (1993). Introductory Ornamental Horticulture. Kalyani Publishers, Ludhiana.

Asati BS and Yadav DS (2004). Diversity of horticultural crops in North Eastern region. ENVIS Bulletin: *Himalaya Ecology* 12 (1).



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**Babu S, Rajagopal Reddy MV, and Reddy, MS. (2017).** Exploration of Wild Ornamental Flowering Plants in Palakonda Hills of Eastern Ghats, India. *Asian Journal of Conservation Biology* **6** 21-30.

**Binu T, Rajendran A, Aravindhan V and Maharajan M (2011).** Wild ornamental chasmophytic plants for rockery. *Global Journal of Modern Biology Technology.* **1**(3), 20–21.

**Gamble J. and Fischer CEC (1915-1935).** Flora of the Presidency of Madras vols 1-3. London. (Rep. ed. 1957. BSI, Calcutta).

**Harris RW (1992).** Arboriculture. Integrated management of landscape trees, shrubs and vines. 2nd Edition. Regents, Prentice Hall, New Jersey, U.S.A.

**Kapoor SL and Sharga AN (1993).** House plants, Vatika Prakashnan, India.

**Li XX and Zhou ZK (2005).** Endemic wild ornamental plants from North Western Yunnan, Jaipur, India China. *Hortscience*, **40** 1612-19.

**Raju RA (1998).** Wild Plants of Indian Sub continent and their Economic Use. CBS.

**Reddy RS, Reddy AM and Yasodamma N (2012).** Exploration of Wild Ornamental Flora of YSR District andhraPradesh, India. *Indian Journal of Fundamental and Applied. Life Sciences* **2** (1) 192-199.

**Santapau H (1973).** A Dictionary of the flowering plants in India. Council of Scientific & Industrial Research, New Delhi.