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INTRODUCTION OF TROPICAL ORNAMENTAL PLANT GENETIC RESOURCES TO ENRICH INDIAN GERMPLASM

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ABSTRACT

Introduction of new accessions of tropical ornamental Plant Genetic Resources (OPGR) provides a potential value to Indian floriculture industry. There are very less accessions introduced from the tropical regions, most of the indigenous ornamental crops are from the temperate regions. Introduction is an effective mean to overcome the narrow genetic diversity observed in certain OPGR. The introduction of exotic germplasm has played a crucial role in India in the growth of the ornamental crops. National Bureau of Plant Genetic Resources (NBPGR) is continuously pursuing for introduction of diverse ornamental crops including trait specific germplasm from other countries to enrich the wealth of ornamental germplasm. Considering the fact that there is a bright future for the development of OPGR in India, there is a need to collaborate at local, regional and international levels for acquisition/ importing/ introduction of the germplasm. Therefore, there is an urgent need to intensify efforts for introducing OPGR from different agro- climatic regions in the world to expand germplasm genetic base. Breeders require genetically diverse germplasm to develop improved varieties and hybrids to serve the present needs and future challenges of environment. Some plant species are recognized for their visual beauty, for their fascinating shapes or smells, for their ethnobotanical or research value. Many offer combinations of these characteristics. There is a need to target of diverse plant genetic resources from different agro-climatic zones of world. Introduction of tropical ornamental germplasm from the centres of crop diversity, such as Brunfelsia grandiflora (deep violet the first day, turn lavender the second, finally turning white on the third day) from Brazil; Heliconia caribaea (Yellow colour) from Caribbean and Central and South America and other tropical ornamental plants like Hibiscus elatus, Disocactus x hybridus, Hylocereus undatus Cochlospermum vitifolium, Syzgium malaccense, cactus species etc. are well suitable to tropical climates.

Key words: Germplasm, Tropical, Accessions, ornamental

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I INTRODUCTION

The benefit of tropical ornamental crops is Year round production, Less heating costs, less expensive labor. Indian floriculture industry has been shifting from traditional flowers to cut flowers for export purposes. The liberalized economy has given an impetus to the Indian entrepreneurs for establishing export oriented floriculture units under controlled climatic conditions. About 60,000 ha area is under floriculture at present. Production of flowers is estimated to be 200,000 tonnes of loose flowers and 500 million (numbers) of cut flowers. West Bengal has emerged as the largest producer in cut flowers with 25,429 lakh pieces, followed by Karnataka and Maharashtra. Andhra Pradesh leads in loose flowers production with 2,24,410 MT cultivated over 34,850 hectares, followed by Karnataka at 2,07,500 MT cultivated in 29,700 hectares and Tamil Nadu with 3,12,970 MT grown in 28,700 hectares [2]. Other important cut flower producing states are Andhra Pradesh, Telangana, Orissa, Uttar Pradesh, Assam, Uttarakhand, Himachal Pradesh and Jharkhand. At present global floriculture exports stand at Euro 5.1billion which is expected to touch Euro 9.0 billion by 2025. The global exports increased over 10 fold from 0.5 billion to 5.1 billion. The Netherlands (58%), (14%), Ecuador (7%), Kenya (5%), Israel (2%), Italy (2%), Belgium (1%), Thailand (1%), Germany (1%). Colombia is the world's second largest exporter of cut flowers. The country has favorable economic factors that aid in the industry's growth. Colombia offers cheap labor, land, production costs an ideal flower-growing climate. The industry has become a major source of employment for low skilled labor and for women. Colombia exports 95% of its production, three out of every four flowers sold in the United States come from Colombia. The big seasons for flowers are Easter, Valentine's Day, Christmas, Thanks giving, and Mother's Day. There are very less accessions introduced from the tropical regions, most of the indigenous ornamental crops are from the temperate regions. Introduction is an effective mean to overcome the narrow genetic diversity observed in certain OPGR.

II MATERIALS AND METHODS

The mandate of germplasm exchange unit of ICAR- National Bureau of Plant Genetic Resources (NBPGR) acquisition of germplasm for the benefit of researchers and users, with in the country and internationally. ICAR-NBPGR is the nodal agency for introduction and facilitating import of germplasm for research purposes from different countries. To introduce the plant genetic resources, two mandatory requirements *viz.* import permit before import of any material, and Phytosanitary certificate from the country of origin. The Director, NBPGR is authorized to issue IP to import the seeds/plant meant for research purpose only as per clause 6 (2) of PQ Order 2003. The second mandatory requirement is Phytosanitary certificate which is to be issued by the official agency of the donor country. The introduced material after quarantine clearance is assigned an Exotic Collection (EC) numbers. These accessions were utilized in various crop improvements and breeding programs [1]. The crop germplasm were received in the form of seed/bulbs/cuttings (perishable material) and therefore utmost care is being taken in the

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handling of the material. The material was provided to the National Active Germplasm Site (NAGS) for its establishment and maintenance [3].

III RESULTS AND DISCUSSION

National Bureau of Plant Genetic Resources (NBPGR) is continuously pursuing for introduction of diverse ornamental crops including trait specific germplasm from other countries to enrich the wealth of ornamental germplasm. Considering the fact that there is a bright future for the development of OPGR in India, there is a need to collaborate at local, regional and international levels for acquisition/ importing/ introduction of the germplasm. Therefore, there is an urgent need to intensify efforts for introducing OPGR from different agro- climatic regions in the world to expand germplasm genetic base. Breeders require genetically diverse germplasm to develop improved varieties and hybrids to serve the present needs and future challenges of environment. Some plant species are recognized for their visual beauty, for their fascinating shapes or smells, for their ethnobotanical or research value. Many offer combinations of these characteristics. The important tropical ornamental crops are listed in the table 1.

Table 1. Important tropical ornamental flower crops with their peculiar characters

S.N	Common Name	*Scientific Name*	Color
1	African Moon	*Dimorphotheca pluvialis*	White
2	African Tulip	*Spathodea campanulata*	Orange scarlet
3	Alpine aster	*Aster alpinus*	Violet pink and white
4	Alpinia	*Alpinia*	Pink to red
5	Amazon Lily	*Eucharis grandiflora*	White
7	Annual Delphinium	*Consolida ajacis*	Blue, white, pink or lilac color florets
8	Begonia Fairlady	*Begonia sempeflorens*	White
9	Blanket flower	*Gaillardia aristata*	Yellow
11	Blood Lily	*Scadoxus multiflorus*	Pink
12	Blue Alpine Daisy	*Aster alpinus*	Violet
13	Blue Dawn flower	*Ipomoea indica*	Purple-blue
14	Blue Jacaranda	*Jacaranda mimosifolia*	Blue
15	Caladium	*Caladium x hortulanum*	Cream
16	Blue-Passion flower	*Passiflora caerulea*	Blue and purple-banded filaments
17	Bottle Brush	*Callistemon citrinus*	Yellow or red
18	Calatheas	*Calathea roseo-picta*	Violet

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19	Catasetum	*Catasetum spitzii*	Apple green to greenish-yellow
23	Constantia	*Constantia cristinae*	Crossandrous
24	Cosmos pink	*Cosmos bipinnatus*	White, pink or purple flowers
27	Decorative Dahlia	*Dahlia*	Red yellow Pink
30	Flame of the Forest	*Butea monosperma*	Red
31	Frangipani	*Plumeria rubra*	Yellow center and a creamy white outer petal
32	Golden shower	*Cassia fistula*	Yellow and Gold
34	Heliconia	*Heliconia pendula*	Pinkish red
35	Hibiscus	*China-rose*	White to pink, red, purple/ yellow
36	Koutruk Lei	*Koutruk lei*	Blue
37	Laelia	*Laelia angereri*	Orange red
38	Lotus	*Nelumbo nucifera*	White and pink colors
39	Maxillaria	*Maxillaria picta*	Yellowish to white

There is a need to target of diverse plant genetic resources from different agro-climatic zones of world. Introduction of tropical ornamental germplasm from the centres of crop diversity, such as *Brunfelsia grandiflora* (deep violet the first day, turn lavender the second, finally turning white on the third day) from Brazil; *Heliconia caribaea* (Yellow colour) from Caribbean and Central and South America and other tropical ornamental plants like *Hibiscuselatus*, *Disocactus* x *hybridus*, *Hylocereus undatus*, *Cochlospermum vitifolium*, *Syzgium malaccense*, cactus species etc. are well suitable to tropical climates (Table 2). Aquisition of new accessions of tropical ornamental Plant Genetic Resources (OPGR) provides a potential value to Indian floriculture industry. Some species of potential importance are not yet fully utilized because of their limited competitiveness with major cut flowers in mainstream of horticulture. Exotic Dendrobium hybrids, Vanda Miss Joaquim, Cattleya, Epidendrum etc. have also been successfully introduced here and performing well. Other than orchids, a number of tropical flowers, ferns, succulents, bamboo and ornamental medicinal plants grow naturally in forests of different parts of India. Ornamental pineapple, *Ananas bracteatus*, makes a unique ornamental plant for use indoors or outdoors as a landscaping specimen. An easy-to-grow plant, ornamental pineapple produces green leaves decorated with white and pink stripes and flowers that work well as cutting flowers. Ginger with their unique shape and brightly colored bracts, gingers make excellent tropical ornamentals. Dracaena species produce spiky foliage on the ends of branches and canes. Depending on the type of Dracaena, the foliage varies between red, green, white and purple. *Dracaena Marinate*, in particular combines pink, green and white for its eye-catching foliage. Evergreen magnolia species, especially the *Magnolia Grandiflora*, make beautiful flower tree ornamental plants. *Magnolia Grandiflora* grows to 15 feet high

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and flowers large, extremely fragrant white to cream blossoms. The introduction of exotic germplasm has played a crucial role in India in the growth of the ornamental crops.

Table 2. Promising Tropical ornamental germplasm need to introduce

Crop	Trait	Country
Myrtus communis	Different fruit colours, plant compactness and leaf morphology.	Mediterranean regions
Arbutus	Cut foliage production	Israel
Helichrysum stoechas, H. hyblaeum, H. scandens, H. italicum subsp. microphyllum, H. errerae	Pot plant production	Brazil
Smilax aspera	Variegated foliage	Mexico
Limonium serotinum	Cut flower	Mediterranean regions
Brunfelsia grandiflora	Deep violet the first day, turn lavender the second, finally turning white on the third day	Brazil.
Heliconia caribaea	Yellow colour	Caribbean and Central and South America.
Hibiscus elatus	Fast growing tree	Jamaica, Malaysia and southern Thailand
Disocactus x hybridus	New varieties	Mexico
Hylocereus undatus	Native species	Hawai‘
Cochlospermum vitifolium	Cultivars	Venezuela, and Colombia.

IV CONCLUSION

The diversification of existing commercial flower crops with new tropical species of may enhance ornamental crops productivity, quality, export value and reduce environmental stresses caused due to monoculture. Considering the fact that there is a bright future for the development of OPGR in India, there is a need to collaborate at local, regional and international levels for acquisition of the germplasm. There is an urgent need to intensify efforts for introducing OPGR from different agro- climatic regions in the world to expand germplasm genetic base. Breeders require genetically diverse germplasm to develop improved varieties and hybrids to serve the present needs and

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future challenges of environment. Some plant species are recognized for their visual beauty, for their fascinating shapes or smells, for their ethnobotanical or research value. There is a need to target of diverse plant genetic resources from different agro-climatic zones of world.

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