

PLANT INTRODUCTION ACTIVITIES IN INDIA

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Indian agriculture, horticulture and forestry owe a great deal to plant introduction. Many of our cultivated crops, fruits, vegetables, spices, medicinal, aromatic and ornamental plants and plants of forestry value, are exotic.

If we see around us we find that some of the common ornamental and economic plants are of foreign origin. *Casuarina*, which now occupies a good deal of land along the coasts, *Eucalyptus* species which besides being ornamental have several economic uses, phyllo-denous species of *Acacia* which cover considerable area in Nilgiris and the bottle brushes which are from Australia. *Chorisia speciosa*, *Erythrina cristagalli*, *Bignonia venusta* (*Pyrostegia venusta*), *Stigmaphyllon ciliatum*, *Bignonia megapotamica*, *Salvia splendens*, *Aristolochia elegans*, *Banisteria laurifolia*, *Bignonia tweediana*, *Bougainvillea glabra* are from Brazil. *Clerodendron splendens*, *C. thomsonae*, *Bauhinia tomentosa*, *Diospyros embryopteris*, *Kigellia pinnata*, *Thespesia populnea* are from tropical Africa. *Petrea volubilis*, *Solanum seaforthianum* and *Hamelia patens* are from tropical America. *Plumeria acutifolia*, *Tabebuia rosea*, *Euphorbia pulcherrima* and *Russellia juncea* (*R. equisetiformis*) are from Mexico.

Plant introduction has been a continuous process over the centuries. Introductions have

been made by travellers, missionaries, physicians, royal families, botanists and horticulturists.

Literature on the introduction of different plants in India is scattered.

Mukerjee (1971) mentions that the recorded history of the cultivation of crop plants is more recent, dating 6000 years back and lists crops which have come to India from different centres of origin of cultivated plants as suggested by Vavilov.

According to Randhawa (1955) trade relations existed between India and other Asian countries like Arabia, Burma, China, Indo-China, Malaya and Thailand as early as the 13th century. Date, peach, pear, mango, banana and some citrus were then introduced in India and a little later many deciduous fruits and their important varieties were introduced. Subsequent to the discovery of America by Columbus, the exchange of plants from that country to others started. This led to the introduction of guava, pineapple and custard apple from tropical America, apple and plum from Europe and Litchi and Loquat from China. He has dealt at length regarding the introduction of many other fruits.

Mehra (1965) mentions that since the Europeans developed contacts both

with the New World and the Far Eastern countries, several plants were introduced from Malay Archipelago, East Indies and the New World into India in the 16th century. Much information on the early history of such plant introductions is scattered in the old travel records of several visitors to India.

Introductions have been possible to a large extent after the discovery of a sea passage to India by Vasco da Gama in 1497. The Portuguese have been responsible for introducing many plants.

Mehra mentions introduction by Portuguese of plants such as *Achras zapota* from Mexico, *Anona squamosa* from South America, *Agave americana* from America, *Allamanda cathartica*, *Amaranthus*, *Cashew* and *Ananas comosus* from Brazil.

Lancaster (1969) believes that many winter vegetables were introduced by Portuguese because of their longing for the vegetables of their country.

During the British period several notable introductions like *Cinchona* and *Hevea brasiliensis* were made. Various winter season annuals were introduced. Much impetus was given to the cultivation of several economic plants like tea, coffee and jute.

Sahni (1965) has dealt with the trees of forestry value introduced in India from different countries of the world.

Institutions engaged in plant introduction work : Till recently four institutions viz. the Division of Plant Introduction of I.A.R.I., the Forest Research Institute, Dehradun, the Botanical Survey of India/Calcutta Botanic Garden and the National Botanical Research Institute, Lucknow have been engaged in the Plant Introduction work within their spheres of interest. The Agri-Horticultural Society has also been introducing plants. Plant Introduction in small way is also carried out by

several other institutions and individuals. The recent creation of the National Bureau of Plant Genetic Resources has hope and promise of useful work in new introductions.

On the role of the botanical gardens it may be said that there are approximately 500 botanical gardens and arboreta throughout the world; many of them potential centres of germ plasm collections. They have an important role in plant introduction and conservation and exchange of plant material.

The Indian Botanic Garden, Calcutta, known earlier as the Royal Botanical Garden, has since its inception in Robert Kyd's time in 1787—contributed to the introduction of several plants and in initiating commercial cultivation of many economic plants. Several other botanical gardens at Saharanpur, Darjeeling, Mussorie and Ootacamund have served as centres of acclimatization of plants.

The National Botanic Gardens, Lucknow came under the C.S.I.R. in the year 1953. It has played an important role in the introduction of several plants. It was the first institute in India to introduce *Cymbopogon winterianus*. It has introduced and acclimatized in its region several medicinal, economic and ornamental plants. Some of the recent introductions of ornamental plants which may be of interest are :

Caesalpinia pulcherrima Sw. (Deep pink variety)

An orange and an yellow flowering varieties exist in India. A new variety with deep pink flowers has been introduced. (Srivastava, 1969).

Calliandra confusa Sprag.

Introduced from Guatemala, this is a winter flowering species under Lucknow conditions. The puffs are of bright red colour. It flowers from November to March.

C. emarginata Benth.

This *Calliandra* has been introduced from Fairchild's tropical garden, Florida. The plant produces red puffs and flowers for most part of the year.

Callistemon comboynensis Cheel

It is a bright red coloured *Callistemon* of bushy habit which has been introduced from Australia. Leaves are stiff dark green and the inflorescence is dark red. Best time of flowering is in March and April but flowers also appear after the rains.

C. phoeniceus Lindl.

This plant also has been introduced from Australia. It is a shrub with dull green narrow stiff leaves. The plant has unusual colour of flower. The brushes are purplish pink. It flowers in March.

C. polandii F. M. Bailey

It is a very attractive bottlebrush introduced from Australia. It is a straggling tall shrub with copper yellow and red new foliage and red brushes which are covered with golden anthers. It is known as golden tipped bottle brush. Best time of flowering is Mar.-April but brushes appear almost throughout the year.

Cassia circinata Moench.

It is an interesting shrub from Australia with reduced leaves due to which it is difficult to recognise as *Cassia* in the vegetative stage. The shrub produces yellow flowers in profusion.

Cochlospermum vitifolium Spreng

A native of Mexico, this medium sized tree, possesses bright yellow large sized flowers in bunches on a leafless tree during February and March (Srivastava *et al*, 1976).

Erythrina velutina Willd.

This is a tree of tropical America. The flowers are in an unusual cream colour.

E. vespertilio Benth.

This is a very attractive tree of Australian origin. The leaves are bilobed or trilobed and are artistic. Flowers are pink and produced in clusters in March and April.

Lagerstroemia amabilis Makino.

This is a dwarf species of *Lagerstroemia*, introduced from Japan. It bears flowers in hues of white, pink and mauve like those of *Lagerstroemia indica*.

Tabebina palmerii Rose

It is a Mexican plant. It produces trumpet shaped showy flowers of bright pink colour.

It flowers from November to March.

Another plant which may be of interest is *Platycodon grandiflorum*, a native of China & Japan. Although it is in cultivation in this country it has not been exploited well. It has great potential as a flowering plant for summer when there is shortage of good flowering pot plant or bed plants. It has the advantage of having several colour variants such as dark blue, pale blue, lilac and white (Srivastava, *et al*, 1977).

Importance of selective introductions : Plant introduction should have a meaningful purpose. If introductions are made for building up germ plasm collection, some groups may be selected by different institutions so that they become reference centres for those groups.

Indigenous plants should not be neglected : Our interest in plant introduction should not undermine the potential that our native plants possess both as ornamentals and economic plants. We know of Indian medicinal plants that have come to prominence. We have also given several plants of economic value to the world.

The British took much interest in select-

ing and sending seeds and plants from India to Britain. In 1818 for the first time seeds of *Rhododendron arboreum* were sent to Britain.

Roxburgh contrived to get Indian orchids in good state in London where they were established in stove cultivation and to flowering (1813). When Wallich went on leave in 1823, he took living plants with him. Five years after Wallich's return, the then Duke of Devonshire, who had adopted orchid growing with enthusiasm sent a gardener by name John Gibson to collect in the Khasi hills. Gibson aided by Wallich's direction and support, made a large collection including a number of novelties (1837). Orchids were also sent to Britain by several other workers for their friends (Burkill, 1965).

Some work on the domestication and improvement of wild plants of potential ornamental value has been done at the National Botanic Gardens, Lucknow. The domestication of *Erythrina resupinata* (Srivastava, 1975) and improvement of *Nyctanthes arbor-tristis* (Srivastava, 1976; Srivastava & Yadav, 1977) by selection and work on some other plants amply justifies the scope in this field.

In conclusion it may be pointed out that the institutions carrying out Plant Introduction work should be encouraged to introduce plants of their interest. They should be equipped with plant quarantine facilities. Some individuals who are interested in special groups of plants also need encouragement.

In introducing and assessing the potential of some plants, co-ordination of different institutions may be useful.

One should not be disappointed with initial failures. Acclimatization of plants sometimes needs concerted and prolonged efforts.

Since the introduction is being carried out at several places there is a need for a periodical to publish the results, for the benefit of all concerned.

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