

# DOMESTICATION AND CONSERVATION OF *INCARVILLEA EMODI*

## AN ORNAMENTAL AND MEDICINAL PLANT FROM HIMALAYA



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Indian Himalayan ranges are rich in various types of valuable bioresources. A potential flowering and foliage plant of high ornamental and medicinal value *Incarvillea emodi* (Wallich ex Royle) Chatterjee, family Begoniaceae with terminal, one sided clusters of large pinkish purple tubular flowers having yellow throat was collected from Himalaya. It is generally found at 700 to 2700 m altitude above sea level. The species is not very common and found in low frequencies. Conservation of such plant

bioresources is need of the hour. It has been collected from Bhanjraru area of Chamba district of Himachal Pradesh for evaluation, conservation and possible utilization. It grows on rocky slopes and shady places in nature. This plant has been successfully domesticated, multiplied and conserved in Palampur conditions. The response of domestication process of *Incarvillea emodi* is very encouraging.

### **PLANT DESCRIPTION**

*Incarvillea emodi* is herbaceous

perennial with pinnate leaves 9-15 ovate, toothed leaflets 1.4-5.3 cm long and 1.2 to 4.0 cm in width. Leaf number in plants varies as per the age and vigour of the plant. The plant possesses unbranched stems with shining leaves aggregated at the base, and calyx with rounded fine-pointed lobes. The flowering shoots are leafless. Stamens are didynamous, 2 long and 2 short. Stigma bilobe and style epigynous. Capsules are linear, splitting down one side on maturity.



**Selected cuttings**



**Roots development**



**Rooted cutting**

## PROPAGATION

*Incarvillea emodi* can be propagated by seeds and stem cuttings of current season growth.

## PROPAGATION TIME

The most suitable time for propagation by cuttings is in the month of July-August.

## PROPAGATION BY SEEDS

*Incarvillea emodi* seeds are very small and covered with white thread like cotton mass. Seeds can germinate after 10 to 15 days of harvesting. Better germination can be achieved by sowing seeds in the month of May to July. Sowing should be done on the soil surface of the pots and they should be covered with very thin layer of soil mixture. Pots should be covered with straw for 5 to 10 days and light watering should be done without disturbing the seeds. Germination starts after 3 to 4 days and seedlings are ready for transplanting after 25-30 days.

## PROPAGATION BY CUTTINGS

The terminal shoot tip cuttings 5 to 12 cm long with two to four pairs of leaves along with 1.0 to 2.5 cm long stem portion should be

selected for plant multiplication.

The soft cutting taken from fresh growth root better and early than the cuttings taken along with the portion of old shoots. A hole with help of a wood or iron rod should be made in sand for inserting the cuttings, so that the lower portion of the cutting is not damaged.

## ROOTING MEDIA

Sand is the best medium for rooting of the cuttings. Rooting takes place in most of the cuttings after 1 month of planting of cuttings in sand without applying any rooting hormones. The success rate of rooting in cuttings is 75-85 percent. Some of the cuttings develop root even after 2 month from planting.

## POTTING MIXTURE

Soils rich in organic matter having porous structure and good drainage system are best for growing *Incarvillea emodi* plant for flower and foliage. A potting mixture of well decomposed farm yard manure (FYM), sand and soil in 1: 1: 1 ratio is good for plant and root growth, flowering and seed production.

## PLANTING OF ROOTED CUTTINGS

About 1 month after planting of cuttings in sand the rooting occurs in the cuttings. Now the cuttings should be planted in 15 cm size earthen or plastic pots. The root growth is very fast during August-September months. With profuse root growth the pots get filled with roots.

The plants thus need shifting in large sized pots after 1 month of planting in small pots. Larger pots provide space and sufficient nutrition for further plant and root growth and quality flower production throughout the growing season.

New shoots develop after about 2 months of flowering in the months of July-August. Fresh fully developed cuttings can be taken from the old plants for further multiplication. After taking the cuttings, repotting of the old plants should be done in fresh potting medium. In case of shifting of old plants in new medium old dry roots and shoots of previous year should be removed before planting to accommodate maximum potting medium in pots

for proper growth and flowering.

### PLANTING OF SEEDLINGS

After 1 month of germination of seeds, small seedlings should be shifted in pots during May-June as soon as 4-6 small leaves appear. Small plants establish better than the long rooted plants and cuttings. However, the time of seedling planting mainly depends on the time of sowing.

### WATERING

Regular watering in small quantities is required throughout the growing season. Water stagnation in pots can cause root rotting.

### SEED PRODUCTION

Production of seed is critical for conservation, multiplication and utilization of a plant species. During the first 2 years of domestication process at IHBT, no capsule formation was noticed. Hand pollination practice was tried and several fruits were set. Thus, it needs hand pollination or pollinators to set the seeds. Pollination is done in the morning hours throughout the flowering period.

### HARVESTING OF SEED

During April-May capsules develop from the pollinated flowers. The number of capsules formed in a plant depends upon the number of flowers pollinated. The capsules change colour from green to brown on maturity. After few days the mature brown capsules develop cracks and later on seeds come out from them. The capsules should be observed every day in the morning and evening to check development of cracks. Capsules should be harvested before splitting of the capsules. Harvested capsules should be kept in 20 cm long butter paper bags for few days.

After 2-3 days, capsules get mature and seeds can be cleaned and separated from them. Each Seed capsule has many small seeds and the number of seeds in each capsule depends upon the length of the capsule.

### INSECT-PESTS

Some times, aphid and caterpillars are found on young leaves, flower buds and capsules.

Regular spray of Endosulfan or Rogor @ 1.0 to 1.5 ml per litre of water at every 15-20 days can control aphid and caterpillars.

In our studies it was found that *Alternaria sp.* causes blight on *Incarvillea emodi* and this is the first record worldwide of *Alternaria sp.* affecting *I. emodi*. The disease occurred on leaves, twigs and flowers, and caused severe dropping of flowers during the cooler months, i.e. November to February.

### PERFORMANCE DATA

The domestication and evaluation studies have proved that it is a potential plant, which can be utilized as indoor flowering and foliage pot plant. The shining green foliage remains year round on the plant and perform better under shady and partial shady conditions. Thus, it is also suitable as a bedding plant for gardens at shady and rocky places.

The first flower remains fresh for 5-13 days on plant depending upon plant health, the temperature, and climatic conditions, particularly



Planting of rooted cuttings



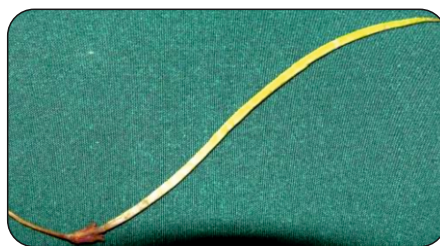
Foliage



Close view of flower



**Capsule formation**



**Capsule**



**Seeds**

atmospheric temperature and humidity of the growing place. Under domestic conditions, it starts flowering during mid February and produce flowers up to third week of May. The average flowering period in pots is 80-90 days. The range of flowering branches is 1-12 and number of flowers reduced in a branch is 2-34. The length of flower branches is 7 to 36cm.

### **MEDICINAL AND NUTRITIONAL VALUE**

This plant is very important and having medicinal properties. Two major iridoid glucosides, namely plantarenalloside, a neurotrophic compound, and boschnalloside an antibacterial iridoid glucoside have been isolated first time from the shoots of this plant. Both the chemicals were found promising

with anticancer potential against human cancer cell lines. Some other compounds like an orthorhombic polymorph of myo-inositol ( $C_6H_{12}O_6$ ) have been reported from the aerial parts of this plant having nutritional and medical importance which is used for the treatment of mentally agitated patients and curing side effects of medicines.



**Flowering in rooted cuttings**

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