

Wide range of variability was observed for plant vigour, plant height, leaf size, pod length, seed colour, seed size and seed shape. A high variability was also observed for green manuring traits such as green biomass (0.43-1.27 kg/ m), dry biomass (0.068-0.35 kg/ m), plant height (39.79-112.29 cm), number of root nodules per plant (28.51-71.69) and fresh weight of nodules per plant (0.43-1.86 g) at 45 days after sowing (DAS). Similarly wide variability was observed at 60 DAS for green biomass (0.83-4.48 kg/m), dry biomass (0.24-0.72 kg/m), plant height (109.62-189.23 cm), number

of root nodules per plant (37.08-97.75) and fresh weight of nodules per plant (0.57-2.67 g). Promising accessions identified were EC435745 (*S. punctata*), EC435741 and EC435738 (*S. cannabina*) for high green biomass, dry biomass, high plant height with high vigour, and moderate number of stem nodules and fresh weight of root nodules per plant. Some of accessions namely, EC466704 (*Sesbania* sp.), EC466898 (*S. cannabina*) and EC509444 (*S. virgata*) possessed high number of root nodules per plant and fresh weight of nodules per plant at 45 as well as 60 DAS.

Current Status and Future Opportunities of Introduced Cymbidium Hybrids in India

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Key Words: Cymbidium Hybrids, Introduction, Plant Quarantine

Introduction Cymbidium hybrids are prized for their sprays of long lasting large attractive flowers and play an important role in the orchids trade as cut flowers. It occupies the seventh position out of top ten cut flowers of international trade. More than 1,25,000 hybrids have been registered with an average of 10,000 or more every year). In pre-independence era, a good number of cymbidium hybrids were introduced in India from England and America by the tea planters, hobby growers and foreign tourists in some part of West Bengal (Darjeeling district), Sikkim, Meghalaya and other north eastern region where the climatic condition is congenial for growing cymbidiums. There are three types of cymbidium hybrids for trade-standard, miniature and novelty (which are sometimes called intermediate.)

Standard hybrids grow into large plants and available in almost every colour except blue. Miniature hybrids have been bred from dwarf species of cymbidiums and colour range is limited to green, yellow or brown. All cymbidium hybrids are wonderful performers. In general standard and novelties bloom from January to the middle of May whereas miniature bloom from November to March.

Current Status

Though India has introduced a good number of hybrids, and has favourable climate, low cost of labour and progressive technology cymbidium orchid industry is not even in the infant stage both in terms of micropropagation and large-scale commercial cultivation. Many of the hybrids introduced in 1930's-80's are now old and obsolete and grown as hobby by the growers.

Recently in Arunachal Pradesh near about 25 cymbidium hybrids were introduced by state forest research institute (SFRI) with collaboration of WWF India under the leadership of Dr. SN Hegde for large scale propagation in tissue culture laboratory and cultivation in different parts of the state like Ziro Hapoli, Bomdilla, Tawang, Dirang etc where climate is suitable for cymbidiums and registered for trade for cut flowers and orchids plants involving the tribal people of these areas. Some promising hybrids growing in these areas are Cascade, Golden Fleece, Mieke Nederhorst, Molly, No. 60, etc.

National Research Centre for Orchids, ICAR, Sikkim is propagating four introduced hybrids in its tissue culture laboratory for large scale distribution to growers under the technology mission for integrated development of

horticulture in the north east states to develop private entrepreneurship in floriculture for self employment of unemployed tribal youth of NE region.

The state tissue culture laboratory, Department of Horticulture, Govt of Sikkim is also propagating seven introduced hybrids in large-scale distribution to growers under technology mission. State Horticulture Department is also introducing two promising hybrids for propagation in its tissue culture laboratory.

Other introduced hybrids are under cultivation by some hobby growers and progressive nursery people in Sikkim, Darjeeling, Kalimpong, Shillong and adjacent areas for hobby growing and selling as plant materials.

Bottlenecks in India

Although there is a great potential for cultivation of cymbidium hybrids in the northeastern region and there exist a lucrative market both within the country and abroad the enthusiasm of further introduction of newly developed hybrids is lacking due to the complex quarantine procedures for introduction of planting materials, high import duties on floriculture planting materials, non availability of suitable introduced cymbidium hybrids with requisite characters for trade, lack of technology for commercial multiplication, lack of post harvest handling technology for cut flower export and lack of incentives, appropriate policies for exporters and commercial approach in cultivation.

Conclusion

Cymbidium hybrids by virtue of their unique position in cupflower trade are expected to be in limelight with its demand growing more than that of other cut flower.

Although the major aim for the development of cymbidium orchid industry in India should be export oriented, the domestic market should not be neglected as the demand for cut flower is likely to increase in the coming days. Further action needs to be taken in the following lines:

- i) Introduction of suitable modern hybrids considering the market demand.
- ii Instead of depending totally on the foreign hybrids it is better to take planned breeding programme by the Govt. and private research institutes, universities, and NGOs for developing quality hybrids.
- iii) The procedure for the introduction of hybrids should be simplified and the import of hybrids can be done easily with a through study.

Considering the above facts well planned programme may be taken by the Organization like national research centre for orchids (NRCO), National Horticultural Board (NHB), State Department of Horticulture of North Eastern States, NGOs and other private organization to popularize the large scale cultivation by introducing quality hybrids.

Introduction, Evaluation and Economical Potential of *Pogostemon cablin* Benth. in J&K (India)

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Key Words: *Pogostemon cablin*, Patchouli oil, Introduction, Jammu

Pogostemon cablin Benth. (Lamiaceae) is an important aromatic plant and its dried herb on steam distillation yields light yellow coloured essential oil known in trade as Patchouli oil. It ranks high among essential oils and is used extensively in perfumery and cosmetics. Currently, Indonesia is the largest producer in the world with a production exceeding 1500 tonnes of oil. India is producing a very meager quantity of patchouli oil and

is importing about 50 tons of pure patchouli oil besides 100 tonnes of formulated oil. In order to promote indigenous production of patchouli oil, efforts have been made to introduce and evaluate patchouli under sub-tropical climate of Jammu (J&K) region. Its first introduction and domestication attempts were taken up at RRL, Jammu in 2000. Five years data revealed that patchouli could be cultivated in Jammu as a perennial