

constituents over Gas Liquid Chromatograph (GLC) model Perkin Elmer Auto System equipped with capillary column Carbowax 20M of 50 m length, Flame ionization detector, Okidata 320 M recorder, Digital computer DEC station fed with Total Chrome Navigator software and nitrogen as carrier gas in the chemical laboratory of NBPGR, New Delhi. Volatile aroma constituents were identified on the chromatogram by comparing their retention time with authentic compounds. Based on the chemical composition several chemotypes were identified (Pareek *et al* 1982 and Sobti and Pushpangadan, 1982) Physico- chemical constants were also studied. These were found to be in the prescribed range.

On the basis of major aroma constituents, the germplasm were grouped into different chemotypes (AICRP, 1998). On the same basis, basil oils have been grouped together into three chemotypes *i.e.* European type (rich in methyl chavicol), linalool rich and methyl chavicol and linalool rich. GC profile of ten accessions showed the presence of above-mentioned chemotypes as given below.

Linalool Rich

EC-174527 (methyl chavicol-0.38 %, linalool-67.13%), EC-388772 (methyl chavicol-16.37%, linalool-60.72%), EC-338782 (methyl chavicol-14.23%, linalool-32.48%), EC-387838 (methyl chavicol-4.53%, linalool-73.63%)

and EC-338794 (methyl chavicol-4.57%, linalool-74.87%).

Methyl Chavicol Rich

EC-338785 (methyl chavicol-89.32%, linalool-1.14%) and EC-388890 (methyl chavicol-67.28 %, Linalool-26.99%)

Methyl Chavicol and Linalool Rich

EC388893 (methyl chavicol (42.16%, linalool-47.12%), EC-388788 (methyl chavicol-47.88%, linalool-38.65%) and EC-388891 (methyl chavicol-48.1%, linalool-37.59%).

The above study reveals that these accessions find use in perfumery and flavour industry. The accessions rich in methyl chavicol may find use in flavour and confectionery industry where as linalool rich germplasm can be useful in perfumery industry

References

- Pareek SK, R Gupta and ML Maheshwari (1982). A Eugenol Rich Sacred Basil (*Ocimum sanctum* L.) its Domestication and Industrial Utilization. *Pajai journal* 13-17.
- Sobti SN and P Pushpangadan (1982) Studies on the genus *Ocimum*, Cytogenetics, Breeding and Production of New Economic Importance: In: CK Atal and BM Kapoor (Ed.) *Cultivation and Utilization Aromatic Plants*, R.R.L. 47-48.
- All India Co-ordinated Research Project (1998). *Proceedings of Twelfth Workshop on Medicinal and Aromatic Plants* at CCSHAU, Hisar. 97-98.

Augmentation and Evaluation of *Sesbania* Germplasm

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The role of green manuring in improving soil fertility and crop productivity is well recognized. *Sesbania* is one of most important green manuring crop and is biodegradable, eco-friendly and organic rich bio-fertilizer. It belongs to family Fabaceae tribe Robineae. It is a versatile leguminous crop, distributed in tropical and subtropical areas of Indian sub-continent and also distributed in tropical areas of Africa, Southeast Asia, China and West Indies.

In the present study, 159 accessions belonging to 32 species of *Sesbania* were introduced from Australia; Brazil; CIAT, Columbia; Ethiopia; and IRRI, Philippines, have enriched genetic resources of *Sesbania*. Species of *Sesbania* augmented were *S. aculeata*, *S. afraspera*,

S. bispinosa, *S. campylocarpa*, *S. cannabina*, *S. cinerascens*, *S. coerulescens*, *S. emerus*, *S. erubescens*, *S. exaltata*, *S. exasperata*, *S. formosa*, *S. goetzei*, *S. grandiflora*, *S. greenwayi*, *S. herbacea*, *S. hiristyla*, *S. keniensis*, *S. leptocarpa*, *S. macrantha*, *S. microphylla*, *S. nilotica*, *S. pachycarpa*, *S. punctata*, *S. quadrata*, *S. rostrata*, *S. sericea*, *S. sesban*, *S. simpliaiuscula*, *S. speciosa*, *S. tetraptera*, *S. virgata*. Some of the lines introduced from Ethiopia are with high nitrogen (*S. cannabina*, EC 507726 and *S. rostrata*, EC507727) and with profuse nodulation (*S. afraspera*, EC507728 and *S. nilotica*, EC 507729). Some of the species (*S. virgata*, *S. sesban* var. *sesban*, *S. sesban* var. *bicolour*) introduced from Brazil are perennial in nature.

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