

GENETIC DIVERSITY OF JASMINE AND ITS CONSERVATION UNDER COASTAL HUMID ECOSYSTEM OF GOA

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ABSTRACT

To contribute to the conservation and management of diversity in different *Jasminum* species, extensive and continuous surveys were conducted for collection of *Jasminum* species in a repeatable and systematic matter under the context of conserving precious jasmine germplasm resources of Goa. Characterization of jasmine germplasm accessions were done according to descriptions which are categorized into four groups viz., General plant growth, leaf, flower bud, flowering and flower characteristics. Significant differences were noticed among accessions for various morphological, flowering and floral-quality traits. Results revealed that among the accessions evaluated, J-6 had the longest leaf length (12.5cm) and width (5.93cm). Maximum flower bud diameter (1.14cm) was noticed in accession J-8 whereas shortest (0.264cm) was noticed in J-5. Maximum and minimum bud lengths were recorded in J-8 (4.7cm) and J-7 (1.84cm) respectively. Flower diameter was recorded the maximum (6.68cm) in J-6 while it was minimum in J-5 (1.9cm). Flowers of J-10 had maximum no. of petals/flower (43) whereas lowest (5.0) was found in J-1. Flowers of J-14 had longest corolla tube length (2.70cm) while it was shortest (0.864cm) in J-10. Local jasmine accessions exhibited an incredible range of diversity for various morphological and floral quality traits studied. Thus there is a great scope to exploit the genetic diversity present in local germplasm of jasmines in Goa.

KEYWORDS: Accessions, Coastal, Conservation, Diversity, Germplasm, Humid, Jasmine.

INTRODUCTION

Jasmine is one of the most important ornamental flowering plants widely cultivated and esteemed for its attractive fragrant flowers, belonging to the family Oleaceae. The genus *Jasminum* comprises 300 species distributed throughout the warm parts of Europe, Asia, Africa and Pacific region. About 40 species are native to India and are widely distributed in Sikkim, West Bengal, Assam, Khasia and Jaintia Hills, tropical north-west Himalayas, Kashmir, Deccan peninsula from Konkan to Travancore, Malabar Coast, Western Ghats, Nilgiris, Palani hills, Coonor and South Anadaman in the tropical forests. Of the 40 species that have been identified in India, 20 are cultivated in South India (Bhattacharjee, 1980). Jasmine contributes substantially to India's national economy. Tamil Nadu is the leading producer of jasmine in India and the flowers produced in the state are being exported not only to the neighbouring countries viz., Singapore, Malaysia, Sri Lanka and the Middle East countries but also to distant nations including the United State. Jasmine flowers are preferred for making special type of flower strings called veni,

garlands, floral decorations, extraction of essential oil which is used in preparing high grade perfumes, colognes and flavouring the beverages etc. apart from their medicinal uses which has growing demand in India as well as in many developed countries. Goa forms a typical part of the west coast ecosystem and is endowed with a wide range of landforms including Ghats, Marshy lands and Coasts. Main strength of Goa lies in its rich genetic resources and moderate weather condition throughout the year. Goa enjoys a warm humid tropical climate which is very much promising for cultivation of jasmine. The most common species of Jasmines found in Goa are *Jasminum sambac*, *Jasminum auriculatum*, *Jasminum grandiflorum* and *Jasminum multiflorum* locally called as mogra, jai, jui and kunda respectively. Due to the advent of cut flowers and impact of Western culture, the demand and popularity for traditional loose flower crops like jasmine has come down in the state of Goa. In Goa, rich diversity in traditional flower crops like jasmines are not properly conserved and developed to a sustainable utilization level due to the lack of scientific management. Well structured research and developmental programmes have to be laid out for crops,

not only to conserve the biodiversity but also to broaden the genetic base by breeding programmes and make it a successful venture (Priya Devi *et al.*, 2013). In the race for modernization and urbanisation, we are in the verge of losing our valuable natural genetic resources in crops like jasmine. A better understanding of genetic diversity and its distribution is essential for its conservation and use (Ramanatha Rao and Toby Hodgkin, 2002). Goan ecosystem has a rich diversity in jasmines which have domestic, national and international potential in flower market. Therefore, priority needs to be given for conservation, proper management and research in jasmine. The local jasmine germplasm of Goa have a tremendous potential for economic upliftment of the State and sustainable development, however need appropriate management practices. Hence efforts should be made in ensuring conservation of local species and utilising them for the sustainable development of floriculture industry. In order to conserve and attain sustainable utilization of local jasmine germplasm in Goa, proper research support is very essential. It is realized that under the changing scenario and advancement sector, locally important potential genotypes of jasmine with commercial traits should be identified, evaluated and characterised under agro-climatic conditions of Goa on different parameters. Such a study would be a record to reflect the details of characteristics of the prominent genotypes to represent the broad variability existing in crops of Goa (Desai and Singh, 2011). Hence, with this background, the investigation on evaluation and conservation of local germplasm of jasmine under coastal humid ecosystem of Goa was carried out.

MATERIALS AND METHODS

To contribute to the conservation and management of diversity in different *Jasminum* species, the study was conducted in Goa state during 2009-2015. Extensive and continuous surveys were conducted for collection and conservation of different *Jasminum* species in a repeatable and systematic matter under the context of conserving precious jasmine germplasm resources of Goa. Field surveys were conducted in different talukas of Goa for collection of local accessions of Jasmine. Assessment of genetic diversity in Jasmine was carried out at different locations in Goa. Geographical location (latitude, longitude and altitude of the spot), where the accession is located were recorded using GPS. All the jasmine genotypes collected were serially numbered from 1 – 14 and used as respective accession numbers. The details of the 14 genotypes used and their respective accession numbers in the study are presented in Table 1. The field study for evaluation of the collected local jasmine accessions was carried out under open field conditions at the Experimental Farm of ICAR– Central Coastal Agricultural Research Institute, Ela, Old Goa. Uniform package of practices was adopted for all the genotypes studied. The material used for the study consisted of fourteen local accessions of jasmine viz., J-1, J-2, J-3, J-4, J-5, J-6, J-7, J-8, J-9, J-10, J-11, J-12, J-

13 and J-14 belonging to *Jasminum sambac*, *Jasminum auriculatum*, *Jasminum grandiflorum* and *Jasminum multiflorum* collected from different parts of Goa. District and Taluka wise locations of collected jasmine accessions under study is presented in Table 2. During the study, five random plants of each accession were selected and observations were recorded for agromorphological traits as per the crop guidelines - Protection of Plant Varieties and Farmers' Rights Authority (PPV & FRA) of jasmine [Anon., 2015]. Characterization of jasmine germplasm accessions were done according to descriptions which are categorized into four groups viz., General plant growth, leaf, flower bud, flowering and flower characteristics (Table 3). The different genotypes were tested for various morphological parameters such as Plant growth type, Plant growth habit, Plant height (at flowering), Leaf size, Intensity of green colour (upper side of mature leaf), Leaf pubescence, Shape of terminal leaflet blade, Shape of other leaflet blades, Leaf tip, Leaf length, Leaf width, Shape of base of leaf blade, Flower bearing position, Flower bud length, Boldness of flower bud, Flower bud shape, Flower bud colour, Tinge on flower bud, Diameter of the flower bud, Total flower bud length, Length of the flower bud, Flower colour on opening, Shape of open corolla, Shape of corolla lobe, Corolla length, Corolla tube length, Flower petal tip, Diameter of the flower, Number of petals per flower, etc. The details of parameters scored and the details of observation recorded are given in Table 3. Data recorded on various morphological and flowering parameters were statistically analysed following standard procedures as described by Panse and Sukhatme (1978).

RESULTS AND DISCUSSION

The general statistical parameters for all the traits in respect of different jasmine accessions showed significant differences in the present study with wide range and high variance for different traits. Variations in morphological, flowering and floral quality traits were observed to a greater extent among different jasmine genotypes. The different genotypes of Jasmine collected, conserved and studied were geographically located in all eleven talukas of Goa in varied elevations. Out of different jasmine accessions studied, plant growth types were either shrub or climber and plant growth habit were upright or semi upright or intermediate or spreading or strongly spreading (Table 4). In the present study, comparatively large number of accessions was observed to be bushy, which is the most desirable growth habit for home gardening, landscaping and commercial cultivation. The genetic diversity for general growth characteristics among *Jasminum sambac* and *Jasminum grandiflorum* were analysed earlier using morphological markers by Mukundan *et al.*, 2008.

Table 1: List of jasmine genotypes used for morphological characterization.

Accession No.	Jasminum sp. / genotype
J - 1	Jasminum grandiflorum
J - 2	Jasminum sambac
J - 3	Jasminum multiflorum
J - 4	Jasminum sambac
J - 5	Jasminum auriculatum
J - 6	Jasminum sambac
J - 7	Jasminum sambac
J - 8	Jasminum sambac
J - 9	Jasminum sambac
J - 10	Jasminum sambac
J - 11	Jasminum sambac
J - 12	Jasminum sambac
J - 13	Jasminum multiflorum
J - 14	Jasminum multiflorum

Table 2: District and Taluka wise locations of collected jasmine accessions under study.

Sl. No	Taluka	Place of collection
North Goa district		
1	Bardez	Aldona, Mapusa, Nadora, Parra, Pomburpa, Revora, Saligao, Sangolda
2	Bicholim	Bicholim, Mayem, Sanquelim, Surla
3	Pernem	Bhutwadi, Dhargal, Ibrampur, Korgao
4	Ponda	Banastrim, Borim, Farmagudi, Kodar, Marcel, Nirangal, Savoi Verem
5	Sattari	Parye, Valpoi
6	Tiswadi	Bambolim, Carambolim, Divar, Goa Velha, Neura, Pilar, Ribandar, Taleigao, St. Inez,
South Goa district		
7	Canacona	Baddem, Cotigaon, Gaondongri, Kindalkatta, , Nadkem, Ziltawadi, Yedu
8	Mormugao	Cortalim, Chicalim Sancoale
9	Quepem	Morpila, Balli
10	Salcette	Curtorim, Madgaon, Nuvem, Verna
11	Sanguem	Malkarnem, Darbandora, Netravali

Table 3: Morphological traits recorded in the local accessions of Jasmine.

Traits recorded	Code	Description
General growth characteristics of the plant		
Plant growth type	PGT	Shrub / Climber
Plant growth habit	PGH	Upright/ Semi upright / Intermediate / Spreading / Strongly spreading
Plant height (at flowering)	PH	Short (<45 cm)/Medium (45 to 100cm)/ Tall(>100 cm)
Leaf characteristics		
Leaf Size	LS	Small / Medium / Large
Intensity of green colour (upper side of mature leaf)	IGC	Light / Medium / Dark
Leaf pubescence	LP	Absent / Present
Shape of terminal leaflet blade	STLB	Lanceolate / Elliptic/ ovate
Shape of other leaflet blades	SOLB	Lanceolate / Elliptic/ ovate
Leaf tip	LT	Sharp / Medium / Blunt
Shape of base of leaf blade	SBLB	Acute / Obtuse / Rounded / Cordate/ Asymmetric
Flower Bud characteristics		
Flower bearing position	FBP	Terminal / Axillary /Both
Boldness of flower bud	BFB	Thin / Medium / Bold
Flower bud shape	FBS	Pointed and Short / Pointed and Long
Flower bud colour	FBC	Pure white / Off white / Yellow / Pink
Tinge on flower bud	TFB	Absent / Present
Flower bud length	FBL	Short (2.0-2.5cm) /Medium (2.6-3.0cm) / Long (>3.0cm)

Flowering and flower characteristics		
Flower colour on opening	FCO	Pure white / Off white / Yellow / Pink
Shape of open corolla	SOC	Rounded / Star shaped
Shape of corolla lobe	SCL	Rounded / Lanceolate
Corolla tube length (cm)	CTL	Short (1.0-1.5cm) / Medium (1.6-2.0cm) / Long (> 2.0cm)
Flower petal tip	FPT	Blunt / Sharp

Table 4: General plant growth and leaf characteristics recorded in the local accessions of Jasmine.

Jasmine accessions	Plant growth type	Plant growth habit	Leaf size	Intensity of green colour	Leaf pubescence	Shape of terminal leaflet blade	Shape of other leaflet blades	Leaf tip	Shape of leaf blade base
J - 1	Shrub	Intermediate	Small	Medium	Absent	Ovate	Elliptic	Medium	Acute
J - 2	Shrub	Semi upright	Large	Medium	Absent	Ovate	Elliptic	Medium	Rounded
J - 3	Shrub	Intermediate	Medium	Dark	Absent	Lanceolate	Lanceolate	Sharp	Obtuse
J - 4	Shrub	Intermediate	Large	Medium	Absent	Ovate	Elliptic	Medium	Acute
J - 5	Shrub	Intermediate	Small	Dark	Absent	Ovate	Elliptic	Sharp	Obtuse
J - 6	Shrub	Intermediate	Large	Dark	Absent	Ovate	Ovate	Medium	Obtuse
J - 7	Shrub	Intermediate	Medium	Dark	Absent	Ovate	Ovate	Medium	Obtuse
J - 8	Shrub	Upright	Large	Medium	Absent	Elliptic	Ovate	Medium	Acute
J - 9	Shrub	Intermediate	Small	Dark	Absent	Ovate	Elliptic	Medium	Obtuse
J - 10	Shrub	Intermediate	Medium	Dark	Absent	Ovate	Ovate	Medium	Obtuse
J - 11	Shrub	Intermediate	Small	Medium	Absent	Elliptic	Elliptic	Medium	Acute
J - 12	Shrub	Spreading	Small	Medium	Absent	Ovate	Elliptic	Medium	Acute
J - 13	Shrub	Spreading	Small	Medium	Absent	Elliptic	Elliptic	Sharp	Rounded
J - 14	Shrub	Spreading	Large	Dark	Absent	Ovate	Ovate	Sharp	Obtuse

Table 5: Flower bud, flowering and flower characteristics recorded in the local accessions of Jasmine.

Jasmine accessions	Flower bearing position	Boldness of flower bud	Flower bud shape	Flower bud colour	Tinge on flower bud	Flower colour on opening	Shape of open corolla	Shape of corolla lobe	Flower petal tip
J - 1	Terminal and Axillary	Thin	Pointed and long	Pink	Present	Pure white	Rounded	Rounded	Blunt
J - 2	Terminal and Axillary	Medium	Pointed and short	Off white	Absent	Off white	Star shaped	Rounded	Blunt
J - 3	Terminal and Axillary	Medium	Pointed and long	Pure white	Present	Pure white	Star shaped	Lanceolate	Sharp
J - 4	Terminal and Axillary	Bold	Pointed and short	Off white	Absent	Off white	Rounded	Rounded	Blunt
J - 5	Terminal and Axillary	Thin	Pointed and long	Off white	Absent	White	Star shaped	Rounded	Sharp
J - 6	Terminal	Bold	Pointed and long	Pure white	Absent	Pure white	Star shaped	Lanceolate	Sharp
J - 7	Terminal and Axillary	Bold	Pointed and short	Off white	Absent	White	Star shaped	Lanceolate	Sharp
J - 8	Terminal and Axillary	Bold	Pointed and long	Off white	Present	Off white	Star shaped	Lanceolate	Sharp
J - 9	Terminal and Axillary	Bold	Pointed and short	Off white	Absent	Off white	Rounded	Rounded	Blunt

J - 10	Terminal	Bold	Pointed and short	Off white	Absent	Off white	Rounded	Rounded	Blunt
J - 11	Terminal and Axillary	Bold	Pointed and short	Off white	Absent	Off white	Rounded	Rounded	Blunt
J - 12	Terminal and Axillary	Thin	Pointed and long	Off white	Absent	Pure white	Star shaped	Lanceolate	Sharp
J - 13	Terminal	Thin	Pointed and long	Pink	Present	Pure white Pinkish underneath	Star shaped	Lanceolate	Sharp
J - 14	Terminal	Medium	Pointed and long	Pure White	Absent	Pure white	Star shaped	Lanceolate	Sharp

Table 6: Flower bud traits as influenced by different local accessions of jasmine.

Jasmine accessions	Fresh weight of flower bud (g)	Diameter of Bud (cm)	Total flower bud length(cm)	Length of the Bud (cm)	Bud Stalk length (cm)
J - 1	0.07	0.32	3.45	1.41	1.94
J - 2	0.23	0.72	3.00	1.64	1.20
J - 3	0.09	1.04	2.88	1.38	1.40
J - 4	0.26	0.81	2.82	1.44	1.39
J - 5	0.05	0.26	2.53	0.85	1.70
J - 6	0.23	0.59	4.49	2.54	1.94
J - 7	0.41	1.00	2.68	1.32	1.36
J - 8	0.44	1.14	4.70	2.37	1.08
J - 9	0.31	0.94	2.69	1.53	1.12
J - 10	0.56	0.99	1.84	1.00	1.10
J - 11	0.22	0.72	3.02	1.60	1.20
J - 12	0.17	0.69	3.36	1.74	1.56
J - 13	0.10	0.38	3.30	1.70	1.60
J - 14	0.18	0.47	4.60	2.50	2.30
Mean	0.24	0.72	3.24	1.64	1.49
CD (5%)	0.008	0.06	0.230	0.234	0.062
CV	2.122	6.67	5.739	11.55	2.504

Table 7: Flower quality traits as influenced by different local accessions of jasmine.

Jasmine accessions	Diameter of flower (cm)	Average flower weight(g)	No. of Petals/ flower	Corolla tube Length (cm)	Petal length (cm)	Petal width (cm)	Flower stalk length (cm)
J - 1	3.84	0.05	5.00	2.19	1.74	0.98	2.42
J - 2	3.86	0.26	9.40	1.57	1.80	0.96	1.48
J - 3	5.62	0.17	6.80	1.54	2.62	0.66	2.56
J - 4	3.66	0.28	7.36	1.63	1.74	1.74	1.20
J - 5	1.96	0.05	6.93	1.79	0.96	0.32	2.10
J - 6	6.68	0.59	7.40	2.54	3.50	0.70	2.56
J - 7	3.16	0.45	34.2	1.36	1.48	0.76	1.36
J - 8	6.28	0.65	14.56	1.66	2.73	0.88	1.48
J - 9	3.77	0.26	7.70	1.65	1.44	1.02	1.28
J - 10	3.20	1.37	43.00	0.86	1.30	1.10	1.10
J - 11	3.94	0.29	7.82	1.49	1.88	1.04	1.44
J - 12	4.49	0.16	7.18	1.71	2.37	0.63	2.00
J - 13	4.30	0.10	7.00	2.10	2.20	0.80	2.00
J - 14	6.00	0.24	8.33	2.70	3.10	0.80	2.80
Mean	1.77	4.34	0.35	12.33	2.07	0.88	1.84
CD (5%)	0.319	0.019	1.916	0.206	0.040	0.047	0.054
CV	6.293	3.296	14.22	9.550	1.160	3.180	1.769

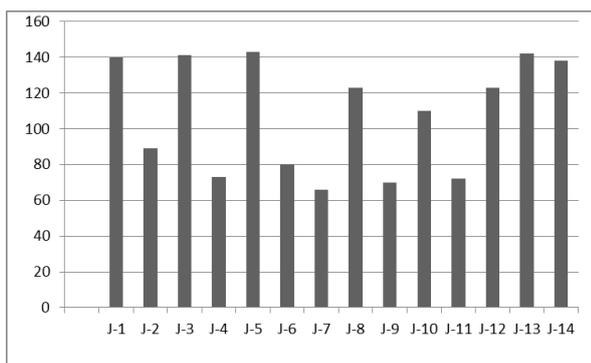


Figure 1: Plant height at flowering (cm) as influenced by different local accessions of jasmine.

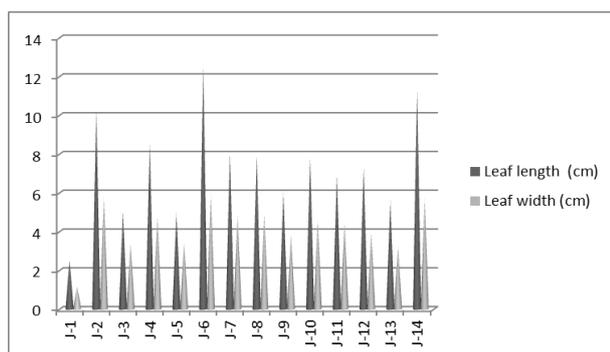


Figure 2: Length and width of leaf as influenced by different local accessions of jasmine.



Figure 3: Variation of flower bud traits in different collected accessions of jasmine.



Figure 4: Variation of flower quality traits in different collected accessions of jasmine.

Plant height at flowering in different jasmine accessions ranged from 66 cm (J-7) to 143 cm (J-5) with a mean value of 107.86 cm (Figure 1). Size of leaf of different jasmine accessions studied was small, medium or large. Intensity of green colour on upper side of mature leaf was light, medium or dark in the present study. Leaf pubescence was not observed in any of the jasmine accessions under study. Out of the different accessions studied, shape of terminal leaflet blade ranged from lanceolate, elliptic and ovate with sharp or medium or blunt leaf tip. Shape of base of leaf blade was acute, obtuse, rounded, cordate or asymmetric. These leaf traits recorded in the present study have significance in developing plants with attractive foliage that can suit to certain features of landscaping. Significant variability was observed with respect to the length and width of the leaf. Among the different accessions evaluated, J-6 had the longest length of leaf (12.5 cm) and leaf width (5.93 cm) with a mean value of 7.48 cm for leaf length and 4.27 cm for leaf width (Figure 2). These results are in conformity with the findings of Mukundan et al., 2008 who reported diversity in leaf size of *Jasminum sambac* and *Jasminum grandiflorum*.

Flower bearing position was terminal, axillary or both in the present study. Colour of the flower bud was either pure white, off white or Pink. Tinge on flower bud was either absent or present (Table 5). Boldness and shape of the flower bud are considered to be two important traits in most of the commercial jasmine genotypes. In the present study, boldness of the flower bud of the different jasmine accessions was thin, medium or bold. Shape of the flower bud was either pointed and short or pointed and long. Raman (1955) classified and grouped conical buds under 'suji mallige' (*Jasminum grandiflorum*) and globose buds under 'gundu mallige' (*Jasminum sambac*). Champa, 2012 reported that in jasmynes, conical buds are preferred for making flower strings for hair decoration while, the round buds are preferred for preparing garlands which makes it look big, attractive and appealing. Different Jasmine accessions under evaluation showed a great variation for flowering. The accessions attained 50 per cent flowering after 30-45 days from pruning. Generally, span of flowering spread for 8-9 weeks and flowering season lasted for two months. With respect to season of flowering, most of the jasmine accessions studied were found to be seasonal and few genotypes belonging to *Jasminum multiflorum* were observed to flower throughout the year. For jasmine flowers, there is a high market demand in the off season also. *Jasminum sambac*, *Jasminum flexile* and *Jasminum multiflorum* are some of the genotypes with continuous flowering (Bhatnagar, 1956; Raman et al., 1969). In the present study, maximum diameter of the flower bud (1.14 cm) was noticed in J-8 whereas shortest (0.264 cm) was noticed in J-5 with a mean flower bud diameter of 0.72 cm. Maximum and minimum total flower bud length were recorded in J-8 (4.7cm) and J-10 (1.844 cm) respectively with a mean value of 3.24 cm (Table 6). The economic traits of jasmine flower trade such as length

and diameter of the flower bud, diameter of the flower and stalk length of flower were studied in different accessions of *Jasminum* spp by Khan *et al.* (1970). Variations were observed with respect to fresh weight of flower buds in different accessions. Among the accessions studied, average fresh weight of the flower bud ranged from 0.052 g (J-5) to 0.563 g (J-10) with a mean value of 0.24 g. Thangaraj *et al.* (1982) have reported high variability for flower bud weight, corolla tube length and flower bud diameter. Accessions showed a great variation for flower bud length in the present study. Bud length of the different collected jasmine accessions was in the range of 2.54 cm (J-6) to 0.854 cm (J-5) with a mean bud length of 1.64 cm. Higher stalk length is a desirable trait for easy picking of jasmine flowers. In the present study, stalk length of the flower bud ranged from 2.30 cm (J-14) to 1.075 cm (J-8) with a mean value of 1.49 cm (Figure 3). Considerable variation for different agro-morphological traits have been reported earlier (Mukundan *et al.*, 2008, Malik Abid Mahmood *et al.*, 2013, Sushant Shekhar *et al.*, 2013 and 2014), in different collections made from agro-climatic regions of the India.

Flower colour on opening was either pure white, off white (cream) or pink in the present study. The predominant flower colour was cream (off white) followed by white (Table 5). The overall preferences for flower colours in jasmines are white and cream for commercial cultivation while pink types are grown in home garden and landscapes. Among different accessions studied for shape of open corolla and corolla lobe, open corolla shape ranged from rounded or star shaped and shape of corolla lobe was either rounded or lanceolate. High diversity for different flower quality traits in different collections of *Jasminum* spp has already been reported by earlier workers [Mukundan *et al.*, 2008]. Tip of the flower petals was either blunt or sharp in different collected accessions under present study. Out of the different accessions studied, the average flower diameter varied widely (Figure 4). Flower diameter was recorded the maximum (6.68 cm) in J-6 while it was minimum in J-5 (1.96 cm) with a mean value of 4.34 cm (Table 7). Khan *et al.* (1970) has reported fifteen morphological variants in *J. sambac* and concluded that the variety Madanban was the best followed by Gundumalli and Ramabanam for various economically important characters like shape of bud, length of pedicel, length of corolla tube, diameter of flower, number of flowers per plant and time taken for a bud to open up completely. The different jasmine accessions studied showed a great variation for fresh weight of the flower. Average of observations on fresh weight of flower ranged from 0.046 g (J-5) to 1.37 g (J-10) with a mean fresh weight of flower of 0.35 g. The economic importance of any *Jasminum* species depends on corolla characters in terms of number of whorls and petals, corolla tube length etc. as they are commercially important for loose flower trade and essential oil extraction. These floral characters in turn influence the

ornamental value of tied flower strings and garlands. In the present study, flowers of J-14 had longest length (2.70 cm) of corolla tube while it was shortest (0.864 cm) in J-10 with a mean corolla tube length of 1.77 cm. The variation in length of corolla tube of different *Jasminum* spp were also observed earlier in the study conducted by Mukundan *et al.*, 2008. Flowers of J-10 had the maximum number of petals per flower (43) whereas the lowest number of petals (5.0) was found in J-1 with a mean value of 12.33 no's. There was wide variation noticed for length of the flower petal in different collected jasmine accessions. It ranged from 0.96 cm in J-5 to 3.50 cm in J-6. The mean value for length of the flower petal was 2.06 cm. Width of the flower petal in different collected jasmine accessions was in the range of 0.32 cm (J-5) to 1.74 cm (J-4) with a mean value of 0.88 cm. Maximum stalk length of the flower (2.80 cm) was noticed in J-14 whereas shortest (1.10 cm) was noticed in J-10 with a mean stalk length of 1.84 cm (Table 7). High variation in number of whorls, petal lobes, petal colour, shape and size and other flower quality traits had been reported by various workers in jasmine [Mukundan *et al.*, 2008, Safeena *et al.*, 2010 and 2013] while studying the different germplasm collections.

Intensive and systematic surveys taken up throughout Goa have resulted in identification of certain promising jasmine accessions for flower yield and quality characters. Study documented various morphological, flowering and yield characteristics of different jasmine genotypes to represent the broad variability existing in jasmines in Goa. As an attempt towards ex-situ conservation, a core germplasm block for elite jasmine accessions has been established at ICAR – Central Coastal Agricultural Research Institute, Ela, Old Goa. Local jasmine accessions studied exhibited an incredible range of diversity for various morphological and floral quality traits. Promising genotypes of jasmine were identified for all the traits under study for further utilization in crop improvement programmes to meet the future demand of floriculture industry. Data thus generated would be helpful in future crop improvement programmes in jasmine to cater to the needs of floriculture industry.

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