

Technical Bulletin No. 58

# A Catalogue of Jasmine Accessions in Goa

Dr. Safeena S.A  
Dr. M. Thangam  
Dr. S. Priya Devi  
Dr. N. P. Singh



**ICAR-CENTRAL COASTAL AGRICULTURAL RESEARCH INSTITUTE**

(INDIAN COUNCIL OF AGRICULTURAL RESEARCH)

ELA, OLD GOA -403402, GOA, INDIA

2016

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**HORTICULTURE SCIENCE SECTION**

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Published by:

**Dr. N. P. Singh**

Director

ICAR - CENTRAL COASTAL AGRICULTURAL RESEARCH INSTITUTE  
Ela, Old Goa – 403 402

Fax : 0832-2285649

Phone : 0832-2284678, 2284679

E-mail : [director.ccari@icar.gov.in](mailto:director.ccari@icar.gov.in)

Website : <http://www.ccari.res.in>

**Correct Citation:** Safeena S.A, M. Thangam, S. Priya Devi and N.P.Singh (2016) A Catalogue of Jasmine Accessions in Goa, Technical Bulletin No:58, ICAR-CENTRAL COASTAL AGRICULTURAL RESEARCH INSTITUTE (Indian Council of Agricultural Research), Ela, Old Goa - 403 402, Goa, India.

**Printed at:** Impressions, Belgaum

भाकृअनुप केंद्रीय तटीय कृषि अनुसंधान संस्थान  
(भारतीय कृषि अनुसंधान परिषद)

**ICAR-Central Coastal Agricultural Research Institute**

(Indian Council of Agricultural Research)

Old Goa - 403 402

Tel.: 0832-2284677/678/679

Fax: 0832-2285649

Email: director.ccari@icar.gov.in



डॉ. एन. पी. सिंह  
निदेशक

**Dr. N. P. Singh**

*Director*



# FOREWORD

Jasmines constitute a group of flowering plants which are commercially grown for their fragrant flowers and essential oil production and it belongs to Genus *Jasminum* and Family Oleaceae. In India, Tamil Nadu is leading in production of jasmine with an annual production of 77,247 tonnes from a cultivated area of 9,360 ha. The flowers harvested in the state are exported to neighbouring countries like Sri Lanka, Singapore, Malaysia and the Middle East. The crop assumes importance in both domestic as well as international trade and brings in considerable foreign exchange earnings. Goan ecosystem has a rich diversity in jasmine which has domestic, national and international potential in flower market. Survey of the existing diversity in jasmines and identification of promising accessions for yield and floral quality traits is the need of the hour. Thus, the diversity available in different *Jasminum* species needs to be explored, characterized and conserved. ICAR - Central Coastal Agricultural Research Institute, Ela, Old Goa has collected and documented different promising germplasm accessions in jasmine and it is being maintained in the Institutional Farm. The Technical Bulletin, "A Catalogue of Jasmine Accessions in Goa" is an important document of jasmine genetic resources in Goa and throws light on the tremendous variability existing in different *Jasminum* species. I compliment and congratulate the authors for their efforts in compiling this technical bulletin. I am sure, the information compiled in this bulletin would be useful for researchers, students, farmers and other stake holders involved in the floriculture sector.

(Narendra Pratap Singh)

Director



# PREFACE

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Jasmine is a commercially important flower crop belonging to the Genus *Jasminum* and botanical family Oleaceae. Goan ecosystem has a rich diversity in jasmine which has domestic, national and international potential in flower market. Collection, conservation, evaluation and cataloguing of jasmine germplasm are the basic prerequisites for any crop improvement programmes. An attempt was thus, made to collect, conserve, catalogue and identify the potential jasmine genotypes in Goa. During the course of the study, the passport data was compiled and the jasmine germplasm accessions were characterized for various morphological, flowering and floral quality traits. Characterization and cataloguing of the jasmine germplasm accessions are done according to the descriptions which are categorized into four groups viz., General growth characteristics of the plant, Leaf characteristics, Flower Bud characteristics and Flowering and flower characteristics and the data is documented in the form of a Technical Bulletin “A Catalogue of Jasmine Accessions in Goa” . The information compiled in this would be useful to researchers, students, farmers and other stake holders involved in the floriculture sector. While bringing out this bulletin, we sincerely thank and acknowledge ICAR, New Delhi for extending the facility required to carry out this study. We take this opportunity to express our sincere thanks and gratitude to Dr. N. P. Singh, Director, ICAR - Central Coastal Agricultural Research Institute, Ela, Old Goa for his constant motivation, support and encouragement. We also duly thank and acknowledge the assistance rendered by Directorate of Agriculture, Government of Goa and the farmers of Goa for their whole hearted cooperation and assistance in survey and collection of local jasmine germplasm.

**Safeena S.A**  
**M. Thangam**  
**S. Priya Devi**  
**N. P. Singh**

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# Introduction

Jasmines constitute a group of flowering plants which are commercially grown for their fragrant flowers and essential oil production. They belong to Kingdom Plantae, Sub kingdom Tracheobionta, Division Magnoliophyta, Class Magnoliopsida, Subclass Asteridae, Order Lamiales, Family Oleaceae and Genus *Jasminum*. The flowers of jasmines are used for various purposes viz., for making special type of flower strings called veni, garlands, decorating hair of women, religious offerings, floral decorations etc. The main beauty and uniqueness of Jasmine is its odour, which cannot be imitated by any known synthetic aromatic chemical, still has a unique status in the perfume world. Jasmine oil is said to blend with every floral scent and hence extensively used as an important perfumery item throughout the world. It is in good demand in the world market and used widely in cosmetic and perfumery industries and have a great export potential. Jasmines are either erect, spreading, or climbing shrubs and vines. Leaves of jasmine are opposite or alternate. They can be simple, trifoliolate, or pinnate. The flowers are usually very fragrant borne in cymose clusters with a minimum of

three flowers, sometimes solitary on the ends of branchlets. Each flower has about four to nine petals, two locules, and one to four ovules. They have two stamens with very short filaments. The bracts are linear or ovate. The calyx is bell-shaped. More than 80 jasmine species are found in India, of which only four species are used for commercial cultivation. Commercially grown important *Jasminum* species are *Jasminum sambac* (Gundumalli / Mogra), *J. auriculatum* (Mullai / Jui), *J. multiflorum* (Kunda) and *J. grandiflorum* (Pitchi / Jahi). The first three species are mainly cultivated for selling as fresh flowers whereas the last one is cultivated for concrete extraction.

To contribute to the conservation and management of different species of Jasmine grown in Goa, a catalogue is presented here with locations, photographic resources, and cultural significances. As there is no catalogue previously available for Jasmine species of Goa, surveys were undertaken in different talukas of Goa for collection and conservation of different available *Jasminum* species in a repeatable, systematic matter. This cataloguing of Goa's Jasmine was done under the context of conserving the precious jasmine germplasm resources of Goa. During the years 2009-2015, different talukas of Goa

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were visited, photographed and planting materials were collected and the locality was mapped using GPS technology. As best as possible, all of the talukas of Goa were visited. In total, 14 different types of Jasmines are tabulated here with their locations and cultural significance briefly addressed. These types, to the best of knowledge, represents the different types available in different species of Jasmines in Goa, but should not be considered as a complete and final listing as many more could be added to the existing collection.

### **Diversity of Jasmines in Goa**

The study was conducted in the state of Goa located between 14<sup>o</sup> 16” North latitude and 73<sup>o</sup> 75” East longitude with the states of Maharashtra on the North and Karnataka on the East and South and Arabian Sea on the West. The total area of this state is not more than 3702 kilometer square and the coastline stretches roughly around 100 kms. It has two districts viz., North Goa and South Goa. North Goa is

divided into 6 talukas whereas south Goa is divided into 5 talukas. Extensive and continuous surveys were conducted in all the eleven talukas / zones of Goa namely, Pernem, Bardez, Tiswadi, Bicholim, Ponda, Sanguem, Sattari, Salcete, Mormugoa, Quepem and Canacona running from north to south. Several villages in all the taluks of Goa were surveyed for the naturally occurring Jasmine plants. Different Jasmine accessions belonging to *Jasminum sambac*, *Jasminum auriculatum*, *Jasminum grandiflorum* and *Jasminum multiflorum* were identified during the extensive surveys conducted in Goa for jasmine diversity. The jasmine accessions studied were spread all over Goa covering all eleven taluks / zones representing different eco regions. Various morphometric and quality characters were observed in all the jasmine accessions studied. The latitude, longitude and altitude of the spot, where the accession is located were recorded using GPS. The details of the villages surveyed are as follows:

## District and Taluka wise locations of collected jasmine accessions under study

Sl. No	Taluka	Place of collection
<b>North Goa</b>		
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
<b>South Goa</b>		
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





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### **Important jasmine accessions with their descriptions of characters**

Collection, identification, evaluation, conservation and cataloguing of potential genotypes of jasmines assume paramount significance in selecting the high yielding local genotypes. With this background, a systematic survey was conducted in different talukas of Goa state and the potential genotypes of jasmines were identified. These are being conserved in the Jasmine Germplasm Bank in the Institute's farm. During the collection and evaluation studies of jasmine germplasm accessions, data was recorded on different morphological and floral quality traits of different species of jasmine. The identification of the promising accessions was mainly based on the following basic characters. They are

- 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
- 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
- Flower colour on opening
- Shape of open corolla
- Shape of corolla lobe
- Corolla length
- Corolla tube length
- Flower petal tip etc.

Characterization and cataloguing of the jasmine germplasm accessions are done according to the descriptions which are categorized into four groups viz., General growth characteristics of the plant, Leaf characteristics, Flower Bud characteristics and Flowering and flower characteristics. This is summarized below in the tabular form.

### General growth characteristics of the plant

Plant growth type	Shrub / Climber
Plant growth habit	Upright/ Semi upright / Intermediate / Spreading / Strongly spreading
Plant height (at flowering)	Short (<45 cm)/Medium (45 to 100 cm)/Tall(>100 cm)

### Leaf characteristics

Leaf Size	Small / Medium / Large
Intensity of green colour (upper side of mature leaf)	Light / Medium / Dark
Leaf pubescence	Absent / Present
Shape of terminal leaflet blade	Lanceolate / Elliptic/ ovate
Shape of other leaflet blades	Lanceolate/ Elliptic / Ovate
Leaf tip	Sharp / Medium / Blunt
Shape of base of leaf blade	Acute / Obtuse / Rounded / Cordate/ Asymmetric

### Flower Bud characteristics

Flower bearing position	Terminal / Axillary /Both
Boldness of flower bud	Thin / Medium / Bold
Flower bud shape	Pointed and Short / Pointed and Long
Flower bud colour	Pure white / Off white / Yellow / Pink
Tinge on flower bud	Absent / Present
Flower bud length	Short /Medium/ Long

### Flowering and flower characteristics

Flower colour on opening	Pure white / Off white / Yellow / Pink
Shape of open corolla	Rounded / Star shaped
Shape of corolla lobe	Rounded / Lanceolate
Corolla length	Short/ Medium / Long
Corolla tube length (cm)	Short / Medium / Long
Flower petal tip	Blunt / Sharp

The detailed descriptions of the different jasmine germplasm accessions along with photographs are catalogued in the subsequent pages.

Accession Number	J - 1
Species	<i>Jasminum grandiflorum</i>
Accession Name	JG-1 ( <i>Jasminum grandiflorum</i> )
Location of Village	Ela
Name of Zone	Tiswadi taluka (North Goa)
latitude	15° 42' North
longitude	73° 89' East
Elevation	6m

#### A . General growth characteristics of the plant

Plant growth type	Shrub
Plant growth habit	Intermediate
Plant height (at flowering)	140 cm

#### B. Leaf characteristics

Leaf Size	Small
Intensity of green colour (upper side of mature leaf)	Medium
Leaf pubescence	Absent
Shape of terminal leaflet blade	Ovate
Shape of other leaflet blades	Elliptic
Leaf tip	Medium
Shape of base of leaf blade	Acute
Leaf Length (cm)	2.512
Leaf width (cm)	1.164
Incidence of Pest and Diseases	Not affected by both pests and diseases



<b>C. Flower Bud characteristics</b>	
Flower bearing position	Terminal and Axillary
Boldness of flower bud	Thin
Flower bud shape	Pointed and long
Flower bud colour	Pink
Tinge on flower bud	Present
Fresh weight of flower bud (g)	0.07
Diameter of the bud(cm)	0.316
Total Flower bud length (cm)	3.452
Length of the bud (cm)	1.413
Stalk length of the bud (cm)	1.94



<b>D. Flowering and flower characteristics</b>	
Flower colour on opening	Pure white
Shape of open corolla	Rounded
Shape of corolla lobe	Rounded
Corolla tube length (cm)	2.196
Diameter of the flower (cm)	3.84
Flower petal tip	Blunt
Average flower weight (g)	0.054
No.of petals / flower	5.000
Petal length (cm)	1.74
Petal width (cm)	0.98
Stalk length of the flower (cm)	2.42



<b>Accession Number</b>	<b>J - 2</b>
Species	<i>Jasminum sambac</i>
Accession Name	JS-2 ( <i>Jasminum sambac</i> )
Location of Village	Aldona, Sirigao, Saligao, Parra
Name of Zone	Bardez – Mapusa taluka (North Goa)
latitude	15° 35' North
longitude	73° 52' East
Elevation	19 m

### A. General growth characteristics of the plant

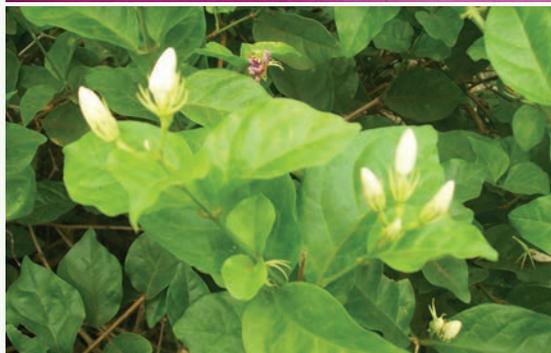
Plant growth type	Shrub
Plant growth habit	Semi upright
Plant height (at flowering)	89 cm

### B. Leaf characteristics

Leaf Size	Large
Intensity of green colour (upper side of mature leaf)	Medium
Leaf pubescence	Absent
Shape of terminal leaflet blade	Ovate
Shape of other leaflet blades	Elliptic
Leaf tip	Medium
Shape of base of leaf blade	Rounded
Leaf Length (cm)	10.260
Leaf width (cm)	5.780
Incidence of Pest and Diseases	Not affected by both pests and diseases

### C. Flower Bud characteristics

Flower bearing position	Terminal and Axillary
Boldness of flower bud	Medium
Flower bud shape	Pointed and short
Flower bud colour	Off white
Tinge on flower bud	Absent
Fresh weight of flower bud (g)	0.23
Diameter of the bud(cm)	0.724
Total Flower bud length (cm)	3.004
Length of the bud (cm)	1.636
Stalk length of the bud (cm)	1.2



**D. Flowering and flower characteristics**

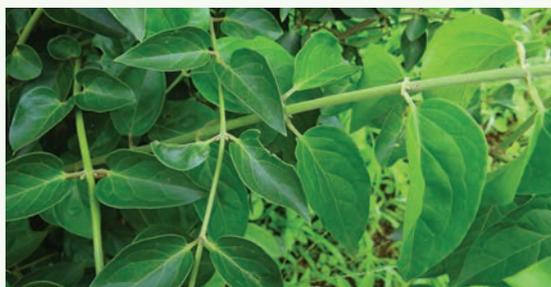
Flower colour on opening	Off white
Shape of open corolla	Star shaped
Shape of corolla lobe	Rounded
Corolla tube length (cm)	1.568
Diameter of the flower (cm)	3.86
Flower petal tip	Blunt
Average flower weight(g)	0.258
No:of petals / flower	9.4
Petal length (cm)	1.8
Petal width (cm)	0.96
Stalk length of the flower (cm)	1.48



<b>Accession Number</b>	<b>J - 3</b>
Species	<i>Jasminum multiflorum</i>
Accession Name	JM-3 ( <i>Jasminum multiflorum</i> )
Location of Village	Kodar, Mardol ,Borim
Name of Zone	Ponda taluka (North Goa)
latitude	15° 39' North
longitude	74° 01' East
Elevation	42 m

**A. General growth characteristics of the plant**

Plant growth type	Shrub
Plant growth habit	Intermediate
Plant height (at flowering)	141 cm



**B. Leaf characteristics**

Leaf Size	Medium
Intensity of green colour (upper side of mature leaf)	Dark
Leaf pubescence	Absent
Shape of terminal leaflet blade	Lanceolate
Shape of other leaflet blades	Lanceolate
Leaf tip	Sharp



Shape of base of leaf blade	Obtuse
Leaf Length (cm)	5.040
Leaf width (cm)	3.380
Incidence of Pest and Diseases	Not affected by both pests and diseases

### C. Flower Bud characteristics

Flower bearing position	Terminal and Axillary
Boldness of flower bud	Medium
Flower bud shape	Pointed and long
Flower bud colour	Pure white
Tinge on flower bud	Present
Fresh weight of flower bud (g)	0.09
Diameter of the bud(cm)	1.040
Total Flower bud length (cm)	2.880
Length of the bud (cm)	1.380
Stalk length of the bud (cm)	1.4



### D. Flowering and flower characteristics

Flower colour on opening	Pure white
Shape of open corolla	Star shaped
Shape of corolla lobe	Lanceolate
Corolla tube length (cm)	1.538
Diameter of the flower (cm)	5.62
Flower petal tip	Sharp
Average flower weight(g)	0.166
No:of petals / flower	6.8
Petal length (cm)	2.62
Petal width (cm)	0.66
Stalk length of the flower (cm)	2.56



<b>Accession Number</b>	<b>J - 4</b>
Species	<i>Jasminum sambac</i>
Accession Name	JS - 4 ( <i>Jasminum sambac</i> )
Location of Village	Bhutwadi village
Name of Zone	Pernem taluka (North Goa)
latitude	15°43' North
longitude	73° 47' East
Elevation	47 m

### A. General growth characteristics of the plant

Plant growth type	Shrub
Plant growth habit	Intermediate
Plant height (at flowering)	73 cm

### B. Leaf characteristics

Leaf Size	Large
Intensity of green colour (upper side of mature leaf)	Medium
Leaf pubescence	Absent
Shape of terminal leaflet blade	Ovate
Shape of other leaflet blades	Elliptic
Leaf tip	Medium
Shape of base of leaf blade	Acute
Leaf Length (cm)	8.528
Leaf width (cm)	4.780
Incidence of Pest and Diseases	Not affected by both pests and diseases

### C. Flower Bud characteristics

Flower bearing position	Terminal and Axillary
Boldness of flower bud	Bold
Flower bud shape	Pointed and short
Flower bud colour	Off white
Tinge on flower bud	Absent
Fresh weight of flower bud (g)	0.256
Diameter of the bud(cm)	0.812



Total Flower bud length(cm)	2.824
Length of the bud (cm)	1.436
Stalk length of the bud (cm)	1.388

#### D. Flowering and flower characteristics

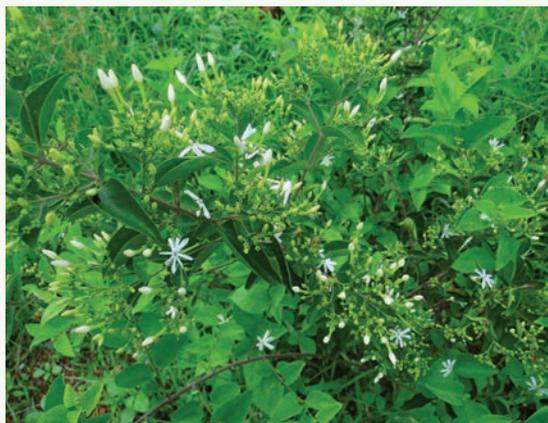
Flower colour on opening	Off white
Shape of open corolla	Rounded
Shape of corolla lobe	Rounded
Corolla tube length (cm)	1.632
Diameter of the flower (cm)	3.656
Flower petal tip	Blunt
Average flower weight(g)	0.284
No:of petals / flower	7.360
Petal length (cm)	1.74
Petal width (cm)	1.2
Stalk length of the flower (cm)	1.42



<b>Accession Number</b>	<b>J - 5</b>
Species	<i>Jasminum auriculatum</i>
Accession Name	JA - 5 ( <i>Jasminum auriculatum</i> )
Location of Village	Valpoi, Parye
Name of Zone	Sattari taluka (North Goa)
latitude	15° 59' North
longitude	74° 06' East
Elevation	16 m

#### A. General growth characteristics of the plant

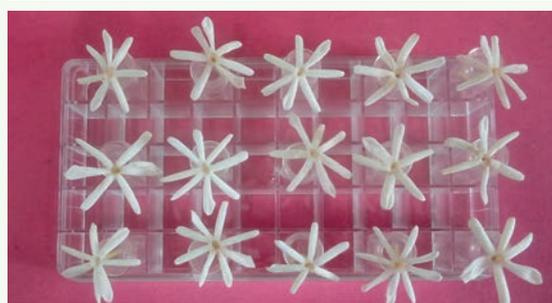
Plant growth type	Shrub
Plant growth habit	Intermediate
Plant height (at flowering)	143 cm



<b>B. Leaf characteristics</b>	
Leaf Size	Small
Intensity of green colour (upper side of mature leaf)	Dark
Leaf pubescence	Absent
Shape of terminal leaflet blade	Ovate
Shape of other leaflet blades	Elliptic
Leaf tip	Sharp
Shape of base of leaf blade	Obtuse
Leaf Length (cm)	4.964
Leaf width (cm)	3.416
Incidence of Pest and Diseases	Not affected by both pests and diseases

<b>C. Flower Bud characteristics</b>	
Flower bearing position	Terminal and Axillary
Boldness of flower bud	Thin
Flower bud shape	Pointed and long
Flower bud colour	Off white
Tinge on flower bud	Absent
Fresh weight of flower bud (g)	0.052
Diameter of the bud(cm)	0.264
Total Flower bud length (cm)	2.532
Length of the bud (cm)	0.854
Stalk length of the bud (cm)	1.7

<b>D. Flowering and flower characteristics</b>	
Flower colour on opening	White
Shape of open corolla	Star shaped
Shape of corolla lobe	Rounded
Corolla tube length (cm)	1.793
Diameter of the flower (cm)	1.960
Flower petal tip	Sharp
Average flower weight (g)	0.046
No.of petals / flower	6.930
Petal length (cm)	0.96
Petal width (cm)	0.32
Stalk length of the flower (cm)	2.1



<b>Accession Number</b>	<b>J - 6</b>
Species	<i>Jasminum sambac</i>
Accession Name	JS - 6 ( <i>Jasminum sambac</i> )
Location of Village	Malkarnem
Name of Zone	Sanguem taluka (South Goa)
latitude	15° 23' North
longitude	74° 15' East
Elevation	22 m

### A. General growth characteristics of the plant

Plant growth type	Shrub
Plant growth habit	Intermediate
Plant height (at flowering)	80 cm

### B. Leaf characteristics

Leaf Size	Large
Intensity of green colour (upper side of mature leaf)	Dark
Leaf pubescence	Absent
Shape of terminal leaflet blade	Ovate
Shape of other leaflet blades	Ovate
Leaf tip	Medium
Shape of base of leaf blade	Obtuse
Leaf Length (cm)	12.5
Leaf width (cm)	5.930
Incidence of Pest and Diseases	Not affected by both pests and diseases

### C. Flower Bud characteristics

Flower bearing position	Terminal
Boldness of flower bud	Bold
Flower bud shape	Pointed and long
Flower bud colour	Pure white
Tinge on flower bud	Absent
Fresh weight of flower bud (g)	0.232
Diameter of the bud(cm)	0.594
Total Flower bud length(cm)	4.48
Length of the bud (cm)	2.54
Stalk length of the bud (cm)	1.94



#### D. Flowering and flower characteristics

Flower colour on opening	Pure white
Shape of open corolla	Star shaped
Shape of corolla lobe	Lanceolate
Corolla tube length (cm)	2.540
Diameter of the flower (cm)	6.68
Flower petal tip	Sharp
Average flower weight (g)	0.586
No:of petals / flower	7.4
Petal length (cm)	3.5
Petal width (cm)	0.7
Stalk length of the flower (cm)	2.56



#### Accession Number

J - 7

Species	<i>Jasminum sambac</i>
Accession Name	JS - 7 ( <i>Jasminum sambac</i> )
Location of Village	Mayem, Sanquelim
Name of Zone	Bicholim taluka (North Goa)
latitude	15° 59' North
longitude	73° 97' East
Elevation	22 m

#### A. General growth characteristics of the plant

Plant growth type	Shrub
Plant growth habit	Intermediate
Plant height (at flowering)	66 cm



#### B. Leaf characteristics

Leaf Size	Medium
Intensity of green colour (upper side of mature leaf)	Dark
Leaf pubescence	Absent
Shape of terminal leaflet blade	Ovate
Shape of other leaflet blades	Ovate
Leaf tip	Medium



Shape of base of leaf blade	Obtuse
Leaf Length (cm)	8.060
Leaf width (cm)	4.848
Incidence of Pest and Diseases	Not affected by both pests and diseases

### C. Flower Bud characteristics

Flower bearing position	Terminal and Axillary
Boldness of flower bud	Bold
Flower bud shape	Pointed and short
Flower bud colour	Off white
Tinge on flower bud	Absent
Fresh weight of flower bud (g)	0.4056
Diameter of the bud(cm)	1.002
Total Flower bud length (cm)	2.68
Length of the bud (cm)	1.32
Stalk length of the bud (cm)	1.36



### D. Flowering and flower characteristics

Flower colour on opening	White
Shape of open corolla	Star
Shape of corolla lobe	Lanceolate
Corolla tube length (cm)	1.36
Diameter of the flower (cm)	3.16
Flower petal tip	Sharp
Average flower weight (g)	0.454
No:of petals / flower	34.200
Petal length (cm)	1.48
Petal width (cm)	0.76
Stalk length of the flower (cm)	1.36



<b>Accession Number</b>	<b>J - 8</b>
Species	<i>Jasminum sambac</i>
Accession Name	JS-8( <i>Jasminum sambac</i> )
Location of Village	Pilar, Nuvem
Name of Zone	Salcette taluka (South Goa)
latitude	15° 24' North
longitude	73° 98' East
Elevation	11 m

### A. General growth characteristics of the plant

Plant growth type	Shrub
Plant growth habit	Upright
Plant height (at flowering)	123 cm



### B. Leaf characteristics

Leaf Size	Large
Intensity of green colour (upper side of mature leaf)	Medium
Leaf pubescence	Absent
Shape of terminal leaflet blade	Elliptic
Shape of other leaflet blades	Ovate
Leaf tip	Medium
Shape of base of leaf blade	Acute
Leaf Length (cm)	7.916
Leaf width (cm)	4.884
Incidence of Pest and Diseases	Not affected by both pests and diseases



### C. Flower Bud characteristics

Flower bearing position	Terminal and Axillary
Boldness of flower bud	Bold
Flower bud shape	Pointed and long
Flower bud colour	Off white
Tinge on flower bud	Present
Fresh weight of flower bud (g)	0.436
Diameter of the bud(cm)	1.140



Total Flower bud length(cm)	4.700
Length of the bud (cm)	2.372
Stalk length of the bud (cm)	1.075



<b>D. Flowering and flower characteristics</b>	
Flower colour on opening	Off white
Shape of open corolla	Star shaped
Shape of corolla lobe	Lanceolate
Corolla tube length (cm)	1.664
Diameter of the flower (cm)	6.280
Flower petal tip	Sharp
Average flower weight (g)	0.648
No:of petals / flower	14.560
Petal length (cm)	2.725
Petal width (cm)	0.875
Stalk length of the flower (cm)	1.48



<b>Accession Number</b>	<b>J - 9</b>
Species	<i>Jasminum sambac</i>
Accession Name	JS - 9 ( <i>Jasminum sambac</i> )
Location of Village	Cotigaon, Gaondongri
Name of Zone	Canacona taluka (South Goa)
latitude	14° 99' North
longitude	74° 05' East
Elevation	10 m

<b>A. General growth characteristics of the plant</b>	
Plant growth type	Shrub
Plant growth habit	Intermediate
Plant height (at flowering)	70 cm



## B. Leaf characteristics

Leaf Size	Small
Intensity of green colour (upper side of mature leaf)	Dark
Leaf pubescence	Absent
Shape of terminal leaflet blade	Ovate
Shape of other leaflet blades	Elliptic
Leaf tip	Medium
Shape of base of leaf blade	Obtuse
Leaf Length (cm)	6.016
Leaf width (cm)	3.820
Incidence of Pest and Diseases	Not affected by both pests and diseases



## C. Flower Bud characteristics

Flower bearing position	Terminal and Axillary
Boldness of flower bud	Bold
Flower bud shape	Pointed and short
Flower bud colour	Off white
Tinge on flower bud	Absent
Fresh weight of flower bud (g)	0.312
Diameter of the bud(cm)	0.944
Total Flower bud length (cm)	2.688
Length of the bud (cm)	1.532
Stalk length of the bud (cm)	1.12



## D. Flowering and flower characteristics

Flower colour on opening	Off white
Shape of open corolla	Rounded
Shape of corolla lobe	Rounded
Corolla tube length (cm)	1.652
Diameter of the flower (cm)	3.770
Flower petal tip	Blunt
Average flower weight (g)	0.261
No:of petals / flower	7.700
Petal length (cm)	1.44
Petal width (cm)	1.02
Stalk length of the flower (cm)	1.28



<b>Accession Number</b>	<b>J - 10</b>
Species	<i>Jasminum sambac</i>
Accession Name	JS - 10 ( <i>Jasminum sambac</i> )
Location of Village	Savoi verem
Name of Zone	Ponda taluka (North Goa)
latitude	15° 48' North
longitude	74° 01' East
Elevation	42 m

### A. General growth characteristics of the plant

Plant growth type	Shrub
Plant growth habit	Intermediate
Plant height (at flowering)	110 cm

### B. Leaf characteristics

Leaf Size	Medium
Intensity of green colour (upper side of mature leaf)	Dark
Leaf pubescence	Absent
Shape of terminal leaflet blade	Ovate
Shape of other leaflet blades	Ovate
Leaf tip	Medium
Shape of base of leaf blade	Obtuse
Leaf Length (cm)	7.784
Leaf width (cm)	4.544
Incidence of Pest and Diseases	Not affected by both pests and diseases

### C. Flower Bud characteristics

Flower bearing position	Terminal
Boldness of flower bud	Bold
Flower bud shape	Pointed and short
Flower bud colour	Off white
Tinge on flower bud	Absent
Fresh weight of flower bud (g)	0.563
Diameter of the bud(cm)	0.992
Total Flower bud length (cm)	1.844
Length of the bud (cm)	1.00
Stalk length of the bud (cm)	1.10



#### D. Flowering and flower characteristics

Flower colour on opening	Off white
Shape of open corolla	Rounded
Shape of corolla lobe	Rounded
Corolla tube length (cm)	0.864
Diameter of the flower (cm)	3.2
Flower petal tip	Blunt
Average flower weight (g)	1.37
No:of petals / flower	43
Petal length (cm)	1.3
Petal width (cm)	1.1
Stalk length of the flower (cm)	1.1



<b>Accession Number</b>	<b>J - 11</b>
Species	<i>Jasminum sambac</i>
Accession Name	JS - 11 ( <i>Jasminum sambac</i> )
Location of Village	Cortalim
Name of Zone	Mormugao taluka (South Goa)
latitude	15° 23' North
longitude	73° 54' East
Elevation	2 m

#### A. General growth characteristics of the plant

Plant growth type	Shrub
Plant growth habit	Intermediate
Plant height (at flowering)	72 cm

#### B. Leaf characteristics

Leaf Size	Small
Intensity of green colour (upper side of mature leaf)	Medium
Leaf pubescence	Absent
Shape of terminal leaflet blade	Elliptic
Shape of other leaflet blades	Elliptic
Leaf tip	Medium



Shape of base of leaf blade	Acute
Leaf Length (cm)	6.944
Leaf width (cm)	4.452
Incidence of Pest and Diseases	Not affected by both pests and diseases

<b>C. Flower Bud characteristics</b>	
Flower bearing position	Terminal and Axillary
Boldness of flower bud	Bold
Flower bud shape	Pointed and short
Flower bud colour	Off white
Tinge on flower bud	Absent
Fresh weight of flower bud (g)	0.224
Diameter of the bud(cm)	0.718
Total Flower bud length (cm)	3.020
Length of the bud (cm)	1.600
Stalk length of the bud (cm)	1.2

<b>D. Flowering and flower characteristics</b>	
Flower colour on opening	Off white
Shape of open corolla	Rounded
Shape of corolla lobe	Rounded
Corolla tube length (cm)	1.490
Diameter of the flower (cm)	3.940
Flower petal tip	Blunt
Average flower weight (g)	0.296
No:of petals / flower	7.820
Petal length (cm)	1.88
Petal width (cm)	1.04
Stalk length of the flower (cm)	1.44



<b>Accession Number</b>	<b>J - 12</b>
Species	<i>Jasminum sambac</i>
Accession Name	JS - 12 ( <i>Jasminum sambac</i> )
Location of Village	Morpila, Balli
Name of Zone	Quepem taluka (South Goa)
latitude	15° 22' North
longitude	74° 06' East
Elevation	21 m

### A. General growth characteristics of the plant

Plant growth type	Shrub
Plant growth habit	Spreading
Plant height (at flowering)	123 cm

### B. Leaf characteristics

Leaf Size	Small
Intensity of green colour (upper side of mature leaf)	Medium
Leaf pubescence	Absent
Shape of terminal leaflet blade	Ovate
Shape of other leaflet blades	Elliptic
Leaf tip	Medium
Shape of base of leaf blade	Acute
Leaf Length (cm)	7.300
Leaf width (cm)	3.910
Incidence of Pest and Diseases	Not affected by both pests and diseases

### C. Flower Bud characteristics

Flower bearing position	Terminal and Axillary
Boldness of flower bud	Thin
Flower bud shape	Pointed and long
Flower bud colour	Off white
Tinge on flower bud	Absent
Fresh weight of flower bud (g)	0.166
Diameter of the bud(cm)	0.696



Total Flower bud length (cm)	3.356
Length of the bud (cm)	1.736
Stalk length of the bud (cm)	1.56

#### D. Flowering and flower characteristics

Flower colour on opening	Pure white
Shape of open corolla	Star shaped
Shape of corolla lobe	Lanceolate
Corolla tube length (cm)	1.712
Diameter of the flower (cm)	4.458
Flower petal tip	Sharp
Average flower weight (g)	0.16
No:of petals / flower	7.180
Petal length (cm)	2.367
Petal width (cm)	0.625
Stalk length of the flower (cm)	2



<b>Accession Number</b>	<b>J - 13</b>
Species	<i>Jasminum multiflorum</i>
Accession Name	JM - 13 ( <i>Jasminum multiflorum</i> )
Location of Village	Bainguinim
Name of Zone	Tiswadi taluka (North Goa)
latitude	15° 29' North
longitude	73° 53' East
Elevation	7 m

#### A. General growth characteristics of the plant

Plant growth type	Shrub
Plant growth habit	Spreading
Plant height (at flowering)	145 cm



#### B. Leaf characteristics

Leaf Size	Small
Intensity of green colour (upper side of mature leaf)	Medium



Leaf pubescence	Absent
Shape of terminal leaflet blade	Elliptic
Shape of other leaflet blades	Elliptic
Leaf tip	Sharp
Shape of base of leaf blade	Rounded
Leaf Length (cm)	5.600
Leaf width (cm)	3.200
Incidence of Pest and Diseases	Not affected by both pests and diseases



<b>C. Flower Bud characteristics</b>	
Flower bearing position	Terminal
Boldness of flower bud	Thin
Flower bud shape	Pointed and long
Flower bud colour	Pink
Tinge on flower bud	Present
Fresh weight of flower bud (g)	0.100
Diameter of the bud(cm)	0.375
Total Flower bud length (cm)	3.3
Length of the bud (cm)	1.70
Stalk length of the bud (cm)	1.60



<b>D. Flowering and flower characteristics</b>	
Flower colour on opening	Pure white Pinkish underneath
Shape of open corolla	Star shaped
Shape of corolla lobe	Lanceolate
Corolla tube length (cm)	2.1
Diameter of the flower (cm)	4.30
Flower petal tip	Sharp
Average flower weight (g)	0.10
No:of petals / flower	7.0
Petal length (cm)	2.20
Petal width (cm)	0.80
Stalk length of the flower (cm)	2.0



<b>Accession Number</b>	<b>J - 14</b>
Species	<i>Jasminum multiflorum</i>
Accession Name	JM - 14 ( <i>Jasminum multiflorum</i> )
Location of Village	Surla
Name of Zone	Bicholim taluka (North Goa)
latitude	15°60' North
longitude	73° 95' East
Elevation	21 m

### A. General growth characteristics of the plant

Plant growth type	Shrub
Plant growth habit	Spreading
Plant height (at flowering)	138 cm



### B. Leaf characteristics

Leaf Size	Large
Intensity of green colour (upper side of mature leaf)	Dark
Leaf pubescence	Absent
Shape of terminal leaflet blade	Ovate
Shape of other leaflet blades	Ovate
Leaf tip	Sharp
Shape of base of leaf blade	Obtuse
Leaf Length (cm)	11.30
Leaf width (cm)	4.700
Incidence of Pest and Diseases	Not affected by both pests and diseases



### C. Flower Bud characteristics

Flower bearing position	Terminal
Boldness of flower bud	Medium
Flower bud shape	Pointed and long
Flower bud colour	Pure White
Tinge on flower bud	Absent
Fresh weight of flower bud (g)	0.18
Diameter of the bud(cm)	0.470



Total Flower bud length (cm)	4.6
Length of the bud (cm)	2.50
Stalk length of the bud (cm)	2.30

#### D. Flowering and flower characteristics

Flower colour on opening	Pure white
Shape of open corolla	Star shaped
Shape of corolla lobe	Lanceolate
Corolla tube length (cm)	2.70
Diameter of the flower (cm)	6.00
Flower petal tip	Sharp
Average flower weight (g)	0.24
No:of petals / flower	8.33
Petal length (cm)	3.10
Petal width (cm)	0.80
Stalk length of the flower (cm)	2.80



## Cultural Significance of Jasmines in Goa

### Jasmine festival (‘Jaayaanchi pooja’ or ‘zaiyanchi pooja’) at Mardol

Mardol Mahalasa Temple Utsav is a very important annual Hindu festival in Goa. The 93-year-old tradition still continues in the temple of Shri Devi Mahalasa in Mardol village around 22 kms away from the capital city. Mardol is 25 km off Madgaon in the Ponda Taluka of Goa. Mardol Mahalasa Temple is one of the most important Shakti Kshetras in Middle Western India. This Temple was built in the 16<sup>th</sup> century by one famous devotee of Mahashakti Devi known as Shri Malap. Fragrance of Jasmine Festival at Mahalasa

Temple draws thousands of devotees every year. The ‘Jasmine Festival’ conducted at this temple is locally known as the ‘Jaayaanchi Pooja’ or ‘Zaiyanchi Pooja’. Jasmine flowers are offered in tribute to the God Mahalasa during the ‘Zaiyanchi Puja’ festival, which falls in August or September at Mardol. The main highlight of the Jasmine Festival is that the temple of Devi Mahalasa is fully decorated with the fragrant Jasmine flowers locally available in plenty in the neighbourhood. ‘Garbh Kud’ (worshipping room) of Devi Mahalasa and ‘Rath Wahan’ (a huge chariot made out of hard craft material with mythological

significance) is seen fully decorated with Jasmine flowers. The Pooja is fully coordinated by the local 'Naik Fulkar Samaj'. During the two days of the festival not a single Jasmine flower is sold out in the market. Instead flowers are offered in the temple of Devi Mahalasa. Flowers worth over Rs 3 lakhs are used for the decoration purposes in the temple every year. The divine fragrance and aroma of devotion wafted by jasmine flowers continues to linger in and around the precincts of the temple even days after the festival is over.



**Source :** <http://ennapadambhagavati.blogspot.in/>  
**Worshipping room decorated with Jasmine Flowers.**

### **Lairai jatra**

The famous Jatrotsav of Goddess Devi Shree Lairai at Shirgao, Bicholim is usually celebrated during May every year

with various traditional religious rituals and cultural programmes. This is one of the most famous and more unusual Jatra (Hindu festival) celebrated in Goa. Shirgao is a small village in Bicholim taluka, at east of Mapusa. This famous Lairai Jatra is celebrated on Shudh Panchami day of Vaishakh Hindu calendar in month of May. The main feature of Lairai Jatra is the "Agnidivya" which is performed by thousands of vratasth devotees (locally known as Dhonds). This Agnidivya is performed by dhonds walking through hot burning coals. Most of the devotees wear a peculiar type of dhoti (Hindu traditional dress), a white t-shirt, a colorful cape around the shoulders, and a scarf-like cloth around the waist. Special flower garlands made from jasmine ('Mogrya Kali' in Konkani) and other local flowers are worn by the devotees around their necks. A huge pile of wood will be kept in a large clearing near the temple. Around midnight, a specially chosen person races from the temple to the wooden pile and lights a massive bonfire with a blazing torch. The chanting and dancing then continues around the massive bonfire with the devotees touching the holy fire with their sticks. The devotees believe that the closer one comes to the fire, the more devotion and courage is demonstrated.



Source : <http://mygoldengoa.com/shree-lairai-jatra-devi-jatrotsav>  
**Lairai jatra**

In the early hours of the morning when the fire has died down, the raking of the coals begins. The devotees await their turn to walk on the holy path of hot coals. Around 4 a.m., the actual ritual starts, with the devotees running through the hot coals carrying their sticks and shouting the name of Devi Lairai. As the crowd watches in

stunned silence, some devotees do the ‘hot run’. Those who have finished their run, then remove and throw their jasmine flower garlands (‘Mogrya Kali’) onto a nearby Banyan tree and return home. The Jatra reaches its conclusion as the “moad” (the person or the bhat carrying Kalash) walks on the fire at the end. Before that, a special song called “Horsavni” is sung near the Homkund before the Moad walks on fire and then sun rises in the distant hills and jatra comes to an end.

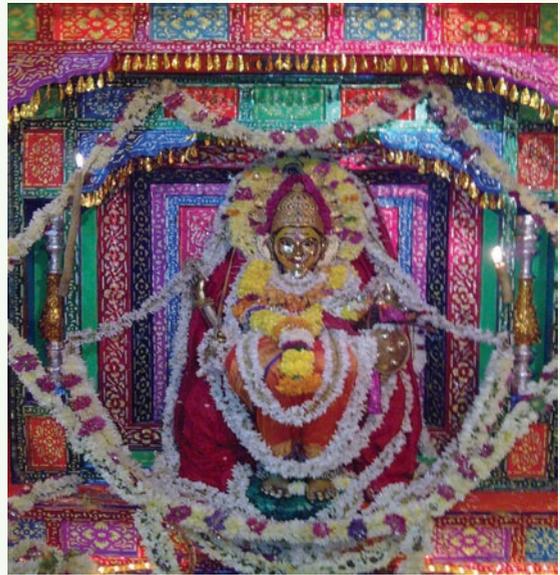
### **Zayanchi puja at Borim:**

Borim is a small village at Ponda in Goa that is situated at about 34 km from Panaji and 12 km from Margao. It is famous for the Shri Navdurga Saasthan temple which houses an incarnation of Goddess Parvati, the consort of Shiva known as Goddess Navdurga. The villagers of Borim celebrate a festival known as the Borim Zatra in the month of Shravan which is dedicated to Goddess Navdurga. During the month of Shravan (which usually falls sometime in August), all the flowers of jayo-juyo go to the temples in the village of Borim where a festival called jaya pooja or **Zayanchi puja** is celebrated with great joy. **This is a 90-year old tradition and it is the day when the goddesses are decorated with jayo-juyo flowers available in the**

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neighbourhood. This is an annual service to the goddess (Varshik devachi seva). All the zayo (*Jasminum grandiflorum*), that blossom in the Borim village on this day are brought to the temple by the flower vendors (zayakar). Each and every corner of the Navdurga temple at Borim including the ceiling, walls, doorways and pillars will be decorated with the aromatic zayo (*Jasminum grandiflorum*). A tiny tunnel will be created with zayo strings (*Jasminum grandiflorum*) leading to the golden idol of the goddess which is also decked from top to bottom with *Jasminum grandiflorum* flowers. All the zayakars will have orders from the temple to supply them with all the available zayo. The requirement is around 12 lakh zayo. We cannot find any flower vendor (zayakar) with their packet (pudo) of jasmines (zayo) for sale on that day along Borim road. All the zayo that blossom in Borim village on this day are brought to the temple by the flower vendors (zayakar). They are sold by the dor (string). Each dor is about the height of a man and contains 1,000 zayo. The zayo flowers are strung through a string made of banana bark as no ordinary string can be used to offer flowers to the goddess. Decoration of the temple

begins in the afternoon just before the zayo bloom. After a bhajan and an arti to the goddess, prasad is distributed to the devotees. Then the fragrant strings of *Jasminum grandiflorum* are cut and offered to each one as a token of the goddess' blessings.



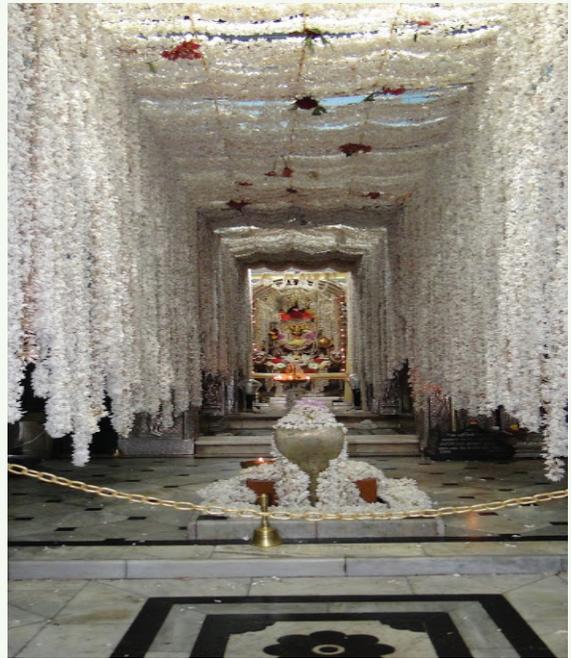
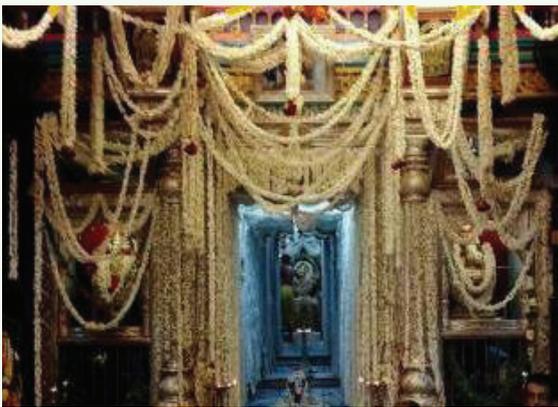
Zayanchi puja at Borim:  
Source : <http://amey6606>

### **Jayanchi Puja at Shree Kamakshi temple, Shiroda**

The temple of Shri Kamakshi is located in the village of Shiroda which is situated in South Goa, 12 Kms from Ponda town and 22 Kms from the city of Margao. In this village, a huge Mahadwar or temple gate leads to the Kamakshi temple complex known as 'Sthal' or commonly called 'Thal'. The temple faces

eastwards and has a large Sabha Mandap or the traditional open entrance hall. In front of the temple, there is a tall Deepastambh or the lamp tower. Gan used for conducting the Prasad ritual, and the Gabhara or the Sanctum Sanctorum with the deity, Shri Kamakshi in all splendour. The idol of Shri

deity was shifted to Shiroda village in Ponda Taluka between 1564 and 1568, as Captain of Rachol, Diogo Rodrigues, the then representative of the Colonial Portuguese regime in Goa, destroyed the Raia temple as a part of the ongoing inquisition. The Jayanchi Puja in the temple was started



Source:<http://www.shreekamakshisaunthan.org/home/media/photographs.blogspot.in>

Kamakshi at Shiroda is believed to have come from Guwahati in Assam, where she is known as Kamakhya. Legend says that the main idol of Kamakshi placed in the sanctum sanctorum of the temple was found in a river in Assam by a pilgrim from Loutolim, who brought it to Goa. The original Shri Kamakshi temple was located in Raia village in the Salcete taluka. The

by the Pai Raikar family of Savoi-Verem way back in 1890. The fragrant flower buds of *Jasminum grandiflorum* (Jayo) are supplied to temple as per the old tradition (13 paise=1000 flower buds) on weight basis. About one lakh flower buds are supplied for the occasion. On the day of Jayanchi Puj, the evening arti of the deity is performed from outside the main silver

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plated door as the knotted flower buds of *Jasminum grandiflorum* (jayo) are decorated from sanctum to Gan Area.

### Utility of jasmine flowers during Muslim festivals

Not much religious use of jasmine flowers is seen among Muslims except on occasions like festivals like Bakrid, Milad -Un -Nabi and Ramzan, marriages and funerals. During Eid-e-Milad -Un -Nabi, (the birth anniversary of Prophet Muhammad), a procession of floats will be



organised by the devotees. Processions and special gatherings in praise of the Prophet will be held to commemorate prophet Mohammed's birth. During the procession, vehicles like motor-bikes, autorickshaws, cars etc will be decorated with jasmine flowers. Muslims wear new clothes, exchange gifts with their loved ones and various delicious delicacies are prepared for celebrating festivals like Bakrid, Ramzan.

On the auspicious festival of Eid, jasmine flowers are given as gifts.

### Boa Morte feast at Church of Our Lady of Assumption, Velsao

Boa Morte is a solemn feast celebrated with great devotion on August every year at Church of Our Lady of Assumption, Velsao. Initially, the feast was called the 'Dormicio of Our Lady' or the Sleep of Mother Mary. Now it is popularly called the feast of 'Nossa Senhora de Boa Morte' or Our Lady of Good Death. During the feast, the devotees bring along some fragrant 'zayos' (*Jasminum grandiflorum*) and make a wish for a good death. This is a 3 day feast. 1st day- 13th August is Morte (Our Lady of Good Death) . 2nd day-14th August is 'Saibinn sorgar Voita' (Assumption). 3rd day 15th August is the Main Feast Day. An all-pervading fragrance fills the church in Velsao, as most of the devotees bring their offering of the most fragrant flower of the season – zayo (*Jasminum grandiflorum*). After Mass, for the veneration, a life-size image of Nossa Senhora de Boa Morte is seen peacefully sleeping in a coffin or casket - dressed in rich purple and red velvet robes that are embroidered with gold thread; her head resting on a pillow and hands folded



Source : <http://joegoauk.blogspot.in/2012/08/morte-at-velsao.html>

on her chest. The entire casket is seen decorated/covered with 'Zayo' (*Jasminum grandiflorum*) by the devotees. She is surrounded by the apostles, many stretching out their hands, seeking solace from her serene self. The whole tableau is adorned with strings of zayo (*Jasminum grandiflorum*), lovingly threaded together by the faithful. After kissing her feet, the

garlands of zayo (*Jasminum grandiflorum*) are offered with great reverence. The flower is a symbolic representation of her - like the whiteness of the flower, she is pure and fragrant with goodness. A few zayos are taken back home as a token of blessing and promise of a good death. 'Zayo' (*Jasminum grandiflorum*) flowers will be available for sale at the church premises during this feast.

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## Jasmine Flower selling as a Goan profession

Jasmine flowerselling is a profession for many elderly local village women in Goa. Jasmine flower vendors selling ready-made strings of jasmine are a common sight on streets and road sides in many parts of Goa. It brings them a steady income. They grow a few jasmine plants and every day make strings or garlands out of the jasmine flowers and bring them to the market or sides of the road for selling the same. It includes sweet-smelling mogras (*Jasminum sambac*) and aabolim (Crossandra) to jayo (*Jasminum auriculatum*) – juyo (*Jasminum grandiflorum*) and fresh suranga (*Mammea suriga*) flowers woven into pretty strings or garlands. They usually sell on an average more than 10 fati (flower braids) everyday and the demand increases during festival time and marriage season. 1 fati (30 cm length) of stringed jasmines with *Jasminum sambac* (mogra) and *Jasminum grandiflorum* (Jai) costs around Rs. 20-30/- and Rs.40/- respectively. It is a common site in Goa where we can find several men and women standing on either side of the road with jasmine flower strings / garlands in their hand. These men and women tempt passers-by to stop, smell and buy the flowers. Many people stop their

vehicle to buy flowers to adorn their hair or their homes. The local Goan flower sellers are busy throughout the year with a wide variety of local flowers blooming month after month and we can invariably see them standing by the roadside every day.



Source : <http://www.thegoan.net>

## Jasmines for hair adornment

Jasmines are a great hit amongst traditional Goan women. Mogra, Jai, Jui and Kakda are some of the varieties of jasmine that women in Goa are fond of. Wearing jasmine flowers are an integral part of a women's head gear in Goa. Jasmines are most commonly worn in hair by women across villages in Goa. Jasmine flower is mainly worn in the hair of ladies for its beauty and fragrance. It is also said that breathing in the scent of

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jasmine has the power to release feel-good brain chemicals that boost energy as well as reduce anxiety. The enchanting fragrance of jasmine flowers has a refreshing effect on the mind and soul.

## Summary

Jasmine is a commercially important flower crop belonging to the Genus *Jasminum* and botanical family Oleaceae. Goan ecosystem has a rich diversity in jasmine which has domestic, national and international potential in flower market. Due to the advent of cut flowers and impact of Western culture, the demand and popularity for traditional loose flowers like jasmine has come down in the state of Goa. These are not properly conserved and developed to a sustainable utilization level due to the lack of scientific management. 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 of jasmine 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. So an attempt was made to collect, conserve and evaluate Goa's precious local jasmine germplasm accessions at ICAR – Central Coastal Agricultural Research Institute, Ela, Old Goa. 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. Basic characters like 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, 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, Flower colour on opening, Shape of open corolla, Shape of corolla lobe, Corolla length, Corolla tube length, Flower petal tip etc. were recorded and evaluated for all the collected jasmine accessions. 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

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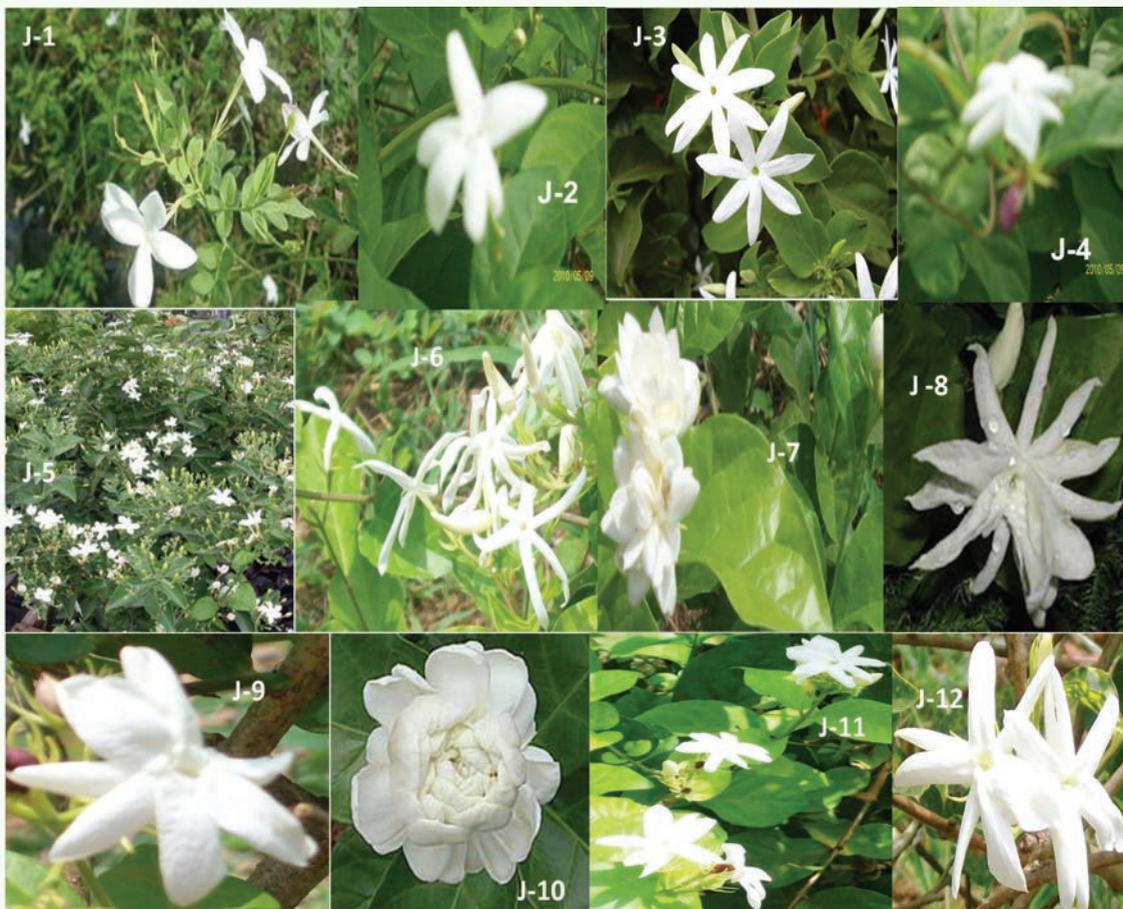
floriculture industry. Salient findings of the study are as follows:

- The different genotypes of Jasmine collected, conserved and studied were geographically located in all eleven talukas of Goa in varied elevations.
- Significant differences were noticed among the different jasmine accessions for various morphological, flowering and floral quality traits.
- Out of different jasmine accessions studied, plant growth type were either Shrub or Climber and plant growth habit were Upright or Semi upright or Intermediate or Spreading or Strongly spreading
- 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
- Size of leaf of different jasmine accessions studied were either small, medium or large
- Intensity of green colour on upper side of mature leaf was light, medium or dark
- 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 either Acute, Obtuse, Rounded, Cordate or Asymmetric
- 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
- Flower bearing position was terminal, axillary or both
- Boldness of the flower bud of the different jasmine accessions was either thin, medium or bold
- Shape of the flower bud was either pointed and short or pointed and long
- Colour of the flower bud was either Pure white, Off white or Pink
- Tinge on flower bud was either absent or present
- Accessions 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.
- 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



Bud variability observed in different accessions of Jasmine

- Maximum flower bud diameter (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
- Accessions showed a great variation for flower bud length. 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
- 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
- Flower colour on opening was either pure white, Off white or pink
- 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
- Tip of the flower petals was either blunt or sharp in different collected accessions
- 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
- Out of the different accessions studied, the average flower diameter varied widely. Flower diameter was recorded



Flower variability observed in different accessions of Jasmine

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

- The different jasmine accessions 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
- Flowers of J-10 had the maximum number of petals per flower (43)
- 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

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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
- Local jasmine accessions thus exhibited an incredible range of diversity for various morphological and floral quality traits studied

## **Future strategies**

### **Conservation of ornamental germplasm resources**

Goa has a rich diversity in ornamental crops. But these 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 different ornamental crops, not only to conserve the biodiversity but also to broaden the genetic base by breeding programmes and make it a successful venture. In the race for modernization and urbanisation, we are in the verge of losing our valuable natural genetic resources in ornamental crops. Therefore, priority needs to be given for conservation, proper management and research in ornamental crops. Efforts

should be made in ensuring conservation of ornamental crop species and utilising them for the sustainable development of floriculture industry. Intensive and systematic surveys taken up throughout Goa have resulted in identification of certain promising jasmine accessions for flower yield and quality characters. 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. Further evaluation and selection of these accessions will result in improved varieties in different species of jasmine. Future work on enriching the genetic resources of ornamental crops in Goa is continuing.

### **Strategies for future line of work**

In order to conserve and attain sustainable utilization of natural ornamental crop germplasm resources in Goa, proper research support is very essential. For resolving major constraints in production of ornamental crops and making it as a highly profitable enterprise in Goa, mission mode approach is essential in the following areas.

- Survey and demarcation of ornamental crop germplasm within the State.

- Collection, identification, conservation and improvement of ornamental crop varieties endemic to Goa and Coastal ecosystem.
- Morphological characterization and evaluation of ornamental crops
- Study the genetic diversity in various ornamental crop species
- Priority studies on rapid multiplication techniques, especially for the elite ornamental crop germplasm

### Conclusion:

Goa has a rich diversity in jasmine which has domestic and international potential in flower market. Efforts have been made to collect different jasmine genotypes from in and around different talukas of Goa. A germplasm bank comprising different species of jasmine is being maintained at ICAR – Central Coastal Agricultural Research Institute, Ela, Old Goa. This germplasm collection is having different local accessions of Jasmine comprising of four different *Jasminum species viz., Jasminum sambac, Jasminum grandiflorum, Jasminum auriculatum and Jasminum multiflorum.* In the course of evaluation, all jasmine germplasm accessions were characterized and catalogued with

passport data. This document is a record of various morphological, flowering and yield characteristics of different jasmine genotypes to represent the broad variability existing in jasmines in Goa. The 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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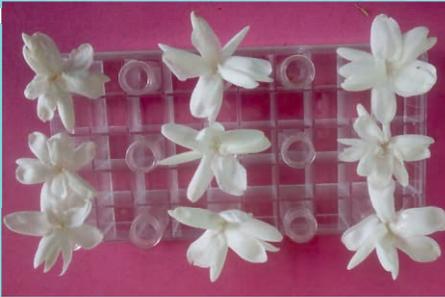
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#### **Photograph sources**

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