

# BREEDING IN CROSSANDRA



# INTRODUCTION



- Botanical name : *Crossandra infundibuliformis* (L.) Nees
- Commercial cultivation: South India, Tropical region of Africa & Madagascar .
- Important due to its colour and shelf life .
- Grown as pot plant for interior decoration in Sweden, Denmark and Hungary
- Commercially grown: Orange type but susceptible to wilt, root knot nematode & lesion nematode.

## Breeding Objectives



- Many shaded (colors) variety.
- Attractive shape and size.
- High yielding variety.
- Better keeping quality.
- Resistant to pest and diseases.



**CROSSANDRA ORANGE**

## *Taxonomy*

S.N: *Crossandra infundibulifolia* Syn. *C. undulaeformis*

C .N: Fire cracker plant, Kanakambaram

Family: Acanthaceae

$2n = 40$

Origin: Indo -Malaya region

Crossandra is derived from Greek word **krossoi** =**fringe**,  
**Aner** =**male** i.e fringed anthers.

## ***Distribution***

Crossandra plants are distributed in tropical as well as subtropical regions of the world such as **South Asia, South America, South Africa and Madagascar.**

**In India:** It is commercially cultivated in **Karnataka, Tamil Nadu and A.P**

# SPECIES

- About 40 -50 species, but few are cultivated.
- ✓ *C. infundibuliformis* → Only species grown, small evergreen shrub.
- ✓ *C. guineensis* → Solitary terminal spike with numerous pair like flowers, handsome foliage.
- ✓ *C. mucronata*
- ✓ *C. sebacaulis*
- ✓ *C. flava* → Unbranched yellow flower.
- ✓ *C. nilotica* → Handsome species.
- ✓ *C. mahatma* → Yellow with saffron yellow species



### *C. undulaefolia*:

1. Short branching perennial shrubs
2. 30-90cm height, leaves are about 5-12 cm, dark green, lustrous and pointed with wavy margin.
3. Flowers showy, **bright orange, salmon to scarlet** in color.
4. Borne in large densely packed spikes. Flowers have spiny bract.



## *C. guineensis* :

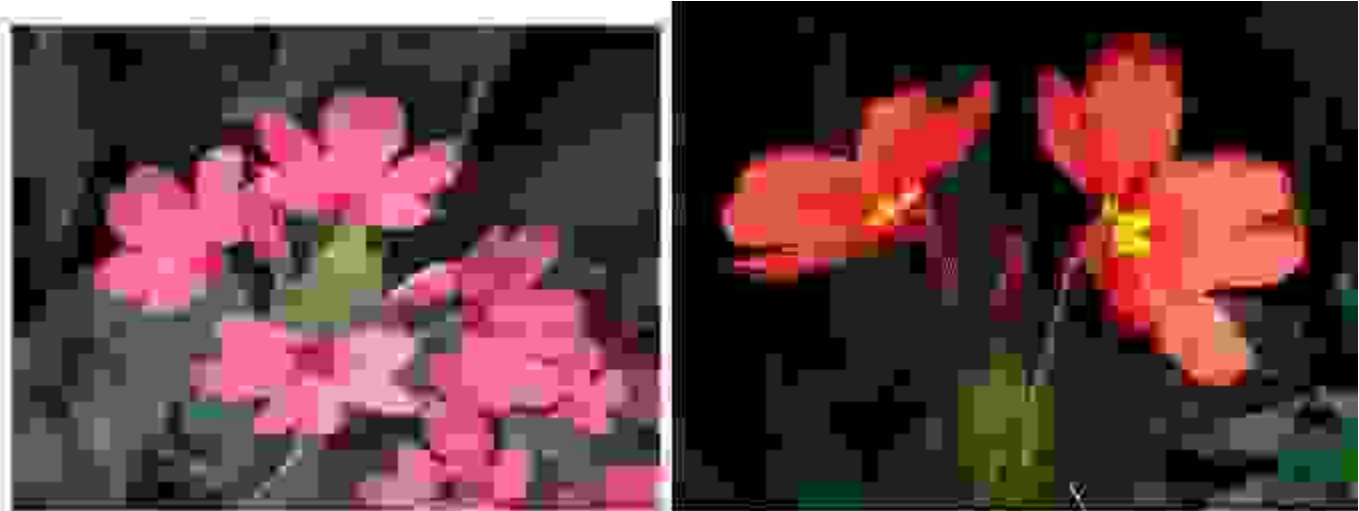
1. Free flowering, about 30-60cm height, bracts don't bear spines and are **pale lilac in colour**.
2. It can be grown both in sunny situation as well as in partial shade.





## *C. nilotica* :

1. 60 cm height stem is semi woody
2. Leaves are elliptic, dark green and glossy, borne in dense spikes.
3. Each flower consists of along slender corolla tube at the end of which there are 5 lobes. Lower 3 petals form a lip.
4. Suited for partial shade.



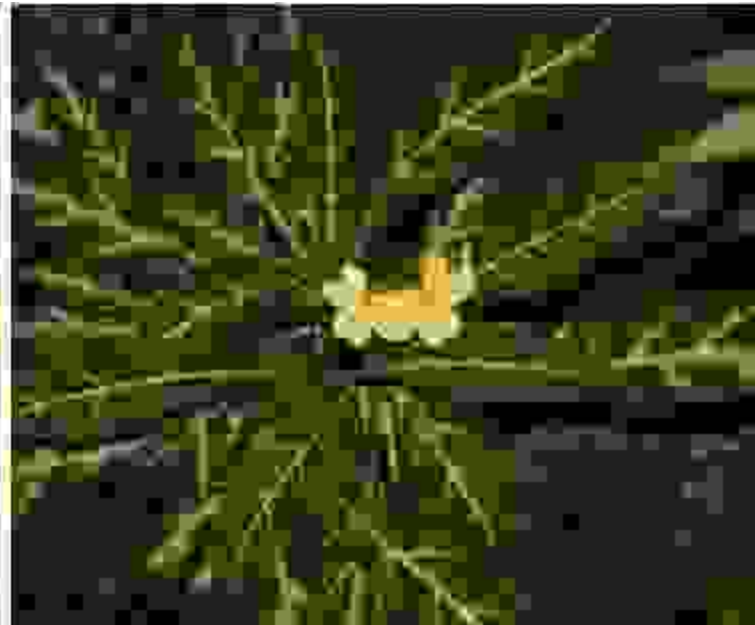
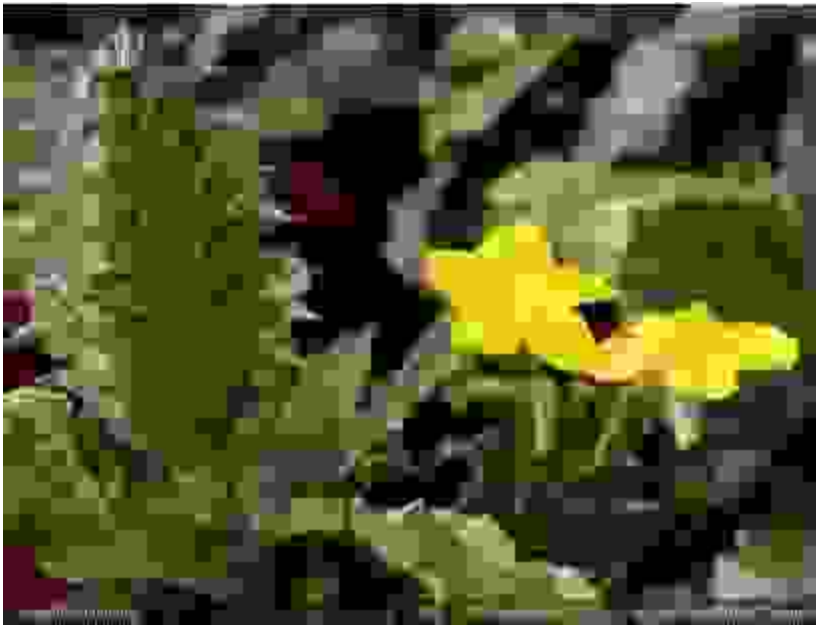
## *C. flava* :

1. **Unbranched** shrub. 15-20cm tall with green and erect stem.
2. Leaves are green and erect stem. Leaves are glabrous ,opposite, obovate to lanceolate in shape and dark green in color.
3. Spike is four sided with yellow green spiny bracts.
4. Spikes are **bright yellow**

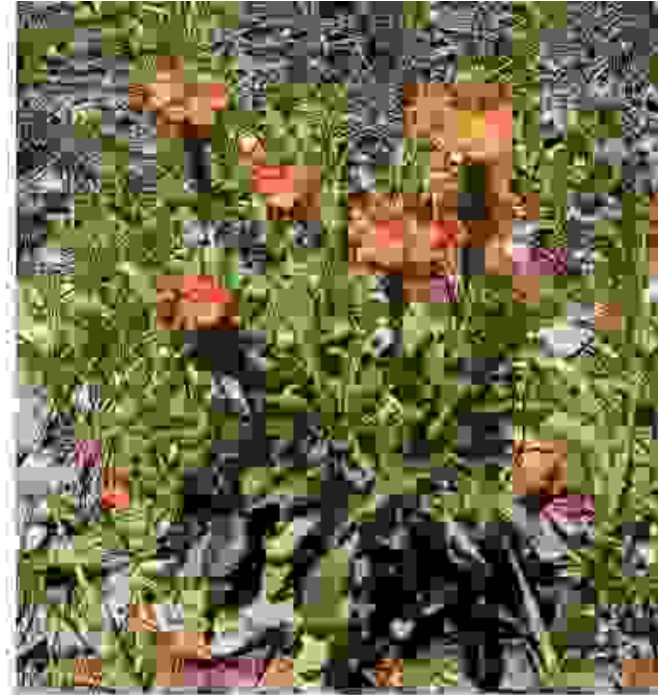


## *C. pungens*:

1. Dense sub shrub upto 60cm tall.
2. Leaves oblong pale green, traced with **veins**.
3. Spikes are **yellow/orange in color**, congested, bracts broadly ovate, spiny.



*C. mucronata*



Flower colour: Bright red

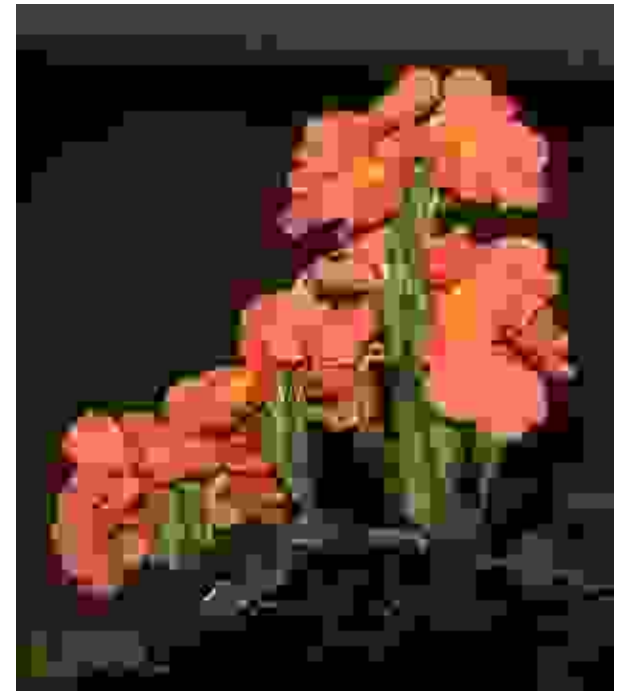
## *Methods of crop improvement*

1. Introduction
2. Selection
3. Mutation: Chemicals and Irradiation
4. Hybridization
5. Polyploidy breeding

## *Introduction:*

### **Mona Wall-head**

1. Sweden introduced cultivar
2. Shiny black-green foliage and a very compact habit of growth.
3. Leaves are lustrous and vivid green.
4. Flowers are **deep salmon to pink**, irregular with prominent bract.



## *Selection*

### Characters:

For higher flower yield – No of flowers, No of spikes and flower colour

### Fortuna:

1. It has greatly improved **root system**- resistant to **temperature fluctuations**.
2. It has more lavish flowering, glossier foliage, **bright red** coloured flowers and the **extended life** of the plant.



## **Diane:**

1. Larger sized and more broadly shaped leaves,.
2. More robust and compact habit of growth and its flowers color is a dark, richer shade of **salmon orange**.

## **IIHR Bangalore**

Cv. **Soundarya** : Selection from Delhi Crossandra

**Mahatma:** Selection from Delhi Crossandra



## *Induced mutation*

### Kanakadhara:

1. It is a mutant of **Delhi crossandra**, developed using **sodium-azide**.
2. It produced **brilliant orange** flowers
3. It can yield **25 per cent** more flowers than Delhi crossandra.

### Vijaya Kanakambaram

1. Mutant of local variety developed by treating the seeds with **colchicine**.
2. Tall variety and free branching
3. It has long inflorescence and flowers profusely.
4. Flowers - **light reddish orange**
5. Yields- **Three times** more than the **local varieties**.
6. On an average it can yield 75 kg flowers per day per hectare from the 90<sup>th</sup> day after planting.

## Raj Kankambaram:

1. Mutant of Delhi crossandra and it has leaf variations.
2. Its inflorescence is also long (15 cm), and it produces deep orange flowers.
3. It also yields upto 75 kg flowers daily per hectare.
4. Fetches Rs 200 per kg in the market.

## Subasu:

1. Mutant of Delhi crossandra
2. It has long inflorescence and light orange, medium-sized flowers.

## Lakshmi:

1. Mutant of Delhi crossandra, and it produces large leaves.
2. It produces big, Orange flowers in long inflorescence (15cm).
3. Yield 75 kg flowers a day from a hectare

## Neelambari:

1. Mutant of **local yellow variety**, and it has dense green foliage.
2. It produces normal sized flowers in long inflorescence.

## Maruvur Arasi:

1. Red color mutant of **Delhi crossandra** by gamma irradiation.
2. **Bright deep red** coloration of flowers.

## Dr. A.P.J Abdul Kalam

1. Mutant of **Delhi crossandra**
2. **Deep Red** colour flowers.
3. Large flowers and with stand long distance transport
4. Resistant to major pests

At  
Research and Development Section,  
Green Farms Ltd., Marawila during 1999

### *In-Vitro Mutation*

1. In **Srilanka**, *in vitro* shoots of crossandra var. **Danica** were exposed to different doses of gamma rays.
2. A mutant was labeled as a new cv. in the name of **Savindi**
3. Released as a novel ornamental production in the international flower trade.

# Hybridization

## At TNAU Coimbatore

- 1) Collection from Palani hills X Marudhamali Hills



Hybrid

(Large flowers, high degree of **tolerance to nematode**  
Flower with very attractive, **yellowish orange** petals)

- 2) Orange flower cultivar X Sebaculis Red



F<sub>1</sub>

(Dark pink flowering)

## IIHR, Bangalore

Two promising hybrids were released

1. **IIHR 2005-1** : Hybrid between **Local Crossandra** X **Arka Ambara**.  
The flower size and yield is superior to Arka Ambara  
It has unique flower colour **Orange Red**
2. **IIHR 2005-2** : Hybrid between ***Crossandra nilotica*** X **Mangalore Local**.  
The size and the yield of the flower are bigger than both the parents.

## IIHR Cultivars



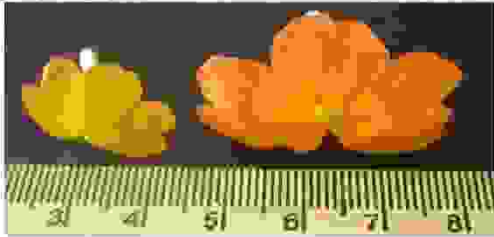
**Arka Kanaka: Local Yellow x Delhi Crossandra**

**Orange** big flowers

Yield: **5.01 t** /acre/year

Use: Loose flower

Important character: Bigger size flowers and also pleasing colour





## Arka Ambara: Local crossandra x Laxmi

**Orange red**, big flowers

Yield: **5.9** t/acre/year

Use: Loose flower

Important character: Bigger size flowers and also pleasing colour



**Arka Shreya :** Local Crossandra x Arka Ambara  
Colour: reddish orange  
No Seed set

**Arka Shravya :** Crossandra nilotica x Mangalore Local  
Colour: reddish orange  
No Seed set

# Polyploidy Cultivars

**Orange, Delhi, Lutea Yellow and Sebaculis Red** are four different cultivars of the species belongs to *C. pungens*

**1. Orange Crossandra:** Tetraploid ( $2n=40$ ), sets seeds profusely, breeds true and produces **bright orange** colour flowers.



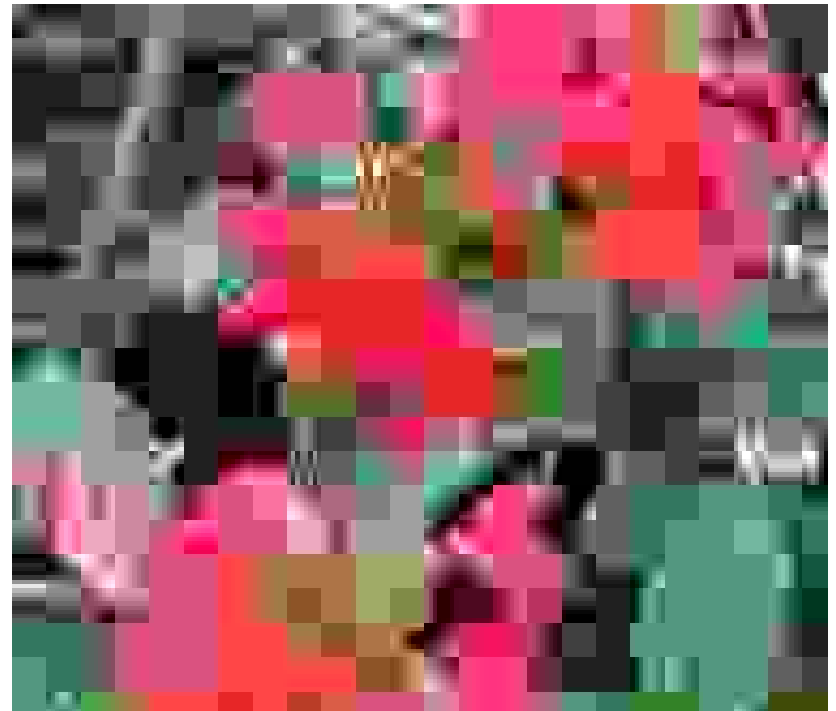
2. **Delhi Crossandra** : is triploid ( $2n=30$ ) and produces more attractive flowers of bright **deep orange** colour.



3. **LuteaYellow:** is tetraploid( $2n=40$ ) and the flowers are orange yellow colour. Used as front line of shrubbery and hanging baskets.



4. **Sebaculis Red** is tetraploid( $2n=40$ ) and hardy cultivar, which possesses high degree **tolerance to nematodes** (*Meloidogyne sp* and *Pratylenchus sp* and *Longidorus sp*)  
*Flower colour: Red*



## New Variety

**Modi- 1** : Developed by **Dr.T.Vengatapathi**- he is amateur breeder

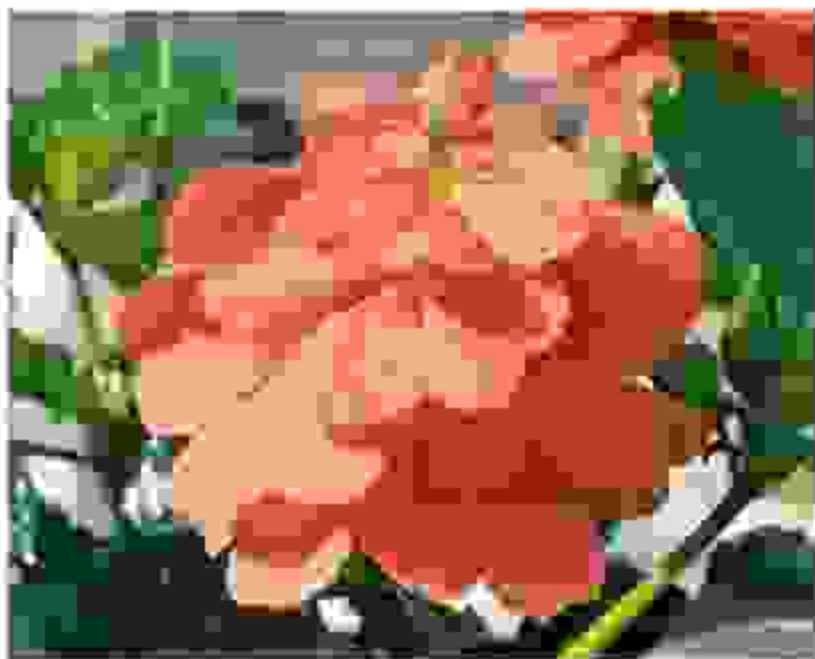


# Exotic Cultivars



Shamrock:  
crossandra





Orange  
marmalade



Yellow  
splash



