

## **CANANGA ODORATA (YLANG-YLANG): A FRAGRANT TREASURE OF THE TROPICS**

**Neeraja A<sup>1</sup>, Yuvaraj K.M<sup>2</sup>, Sowmya M<sup>1</sup> and Thulasi R<sup>3</sup>**

<sup>1</sup>Ph.D. Scholar, Department of Plantation, Spices, Medicinal and Aromatic Crops, Dr. YSRHU – College of Horticulture, Anantharajupeta, Annamayya Dist, A.P. 516105

<sup>2</sup>Principal Scientist and Head, Horticultural Research Station, Dr. YSRHU- College of Horticulture, Anantharajupeta, Annamayya Dist, A.P.516105

<sup>3</sup>Ph.D. Scholar, Department of Fruit Science, Dr. YSRHU – College of Horticulture, Anantharajupeta, Annamayya Dist, A.P. 516105

### **Introduction**

*Cananga odorata*, commonly known as Ylang-ylang, is a highly fragrant flowering tree renowned for its aromatic essential oil, which is widely used in perfumery, aromatherapy and traditional medicine. This species, part of the Annonaceae family, is native to the Indo-Malayan region, including the Philippines, Indonesia and nearby countries. It has gained international recognition for its economic and therapeutic importance, especially due to the essential oil derived from its star-shaped flowers.

### **Botanical Description**

**Botanical Name:** *Cananga odorata*

**Family:** Annonaceae

**Common Names:** Ylang-ylang, Perfume Tree, Cananga Tree

**Origin:** Native to Southeast Asia, particularly Indonesia and the Philippines and now cultivated in tropical regions including Madagascar, Comoros and Polynesia.

*Cananga odorata* grows up to a height of 12–20 meters, with a smooth, straight trunk and wide-spreading branches. The tree produces long, drooping greenish-yellow flowers with a strong, sweet floral fragrance. These flowers are the source of the highly valued Ylang-ylang essential oil. The blooming period lasts nearly year-round in ideal tropical climates. The leaves

are simple, alternate and ovate, with a glossy green appearance. Pollination is mainly carried out by insects.



There are two botanical varieties:

- ***Cananga odorata* var. *genuina*** – cultivated for essential oil.
- ***Cananga odorata* var. *fruticosa*** – a dwarf ornamental variety.

### Uses of *Cananga odorata*

#### 1. Essential Oil Extraction and Applications

The most economically important use of *Cananga odorata* is the extraction of Ylang-ylang essential oil from its fresh flowers through steam or fractional distillation. The oil is classified into different grades based on distillation time:

- **Extra Grade:** The first fraction with the most refined fragrance, used in luxury perfumes.
- **Grade I, II, III:** Subsequent fractions with heavier notes, used in cosmetics, soaps and industrial perfumes.

#### Applications:

- **Perfumery:** Ylang-ylang oil is a key ingredient in luxury perfumes like Chanel No. 5.
- **Aromatherapy:** Used for its soothing and calming effects, believed to reduce stress, anxiety and depression.
- **Skincare:** Added to creams and lotions for its antibacterial and moisturizing properties
- **Haircare:** Added to shampoos and conditioners to improve scalp health and reduce hair fall.

#### 2. Traditional and Medicinal Uses

Ylang-ylang has a long history of use in traditional medicine systems throughout Southeast Asia.

- Infused oils and decoctions are used to treat skin irritations, wounds and insect bites.

- Inhalation of the scent is believed to ease palpitations, insomnia and anxiety.
- Used as an aphrodisiac and in rituals for spiritual well-being.

#### 3. Ornamental Use

Due to its beautiful flowers and intoxicating aroma, *Cananga odorata* is planted as an ornamental tree in parks, gardens and public spaces.

#### Production technology:

##### Climate

- **Temperature:** Ideal range of 21–30°C.
- **Rainfall:** Requires 1500–2000 mm annually.
- **Humidity:** Prefers high-humidity environments.
- **Altitude:** Thrives up to 1200 meters above sea level.

##### Soil

- Prefers well-drained loamy or sandy-loam soils rich in organic matter.
- Soil pH should be slightly acidic to neutral (pH 6.0–7.5).
- Waterlogging should be avoided

##### Propagation

- **Seeds:** Fresh seeds are sown soon after extraction for good germination.
- **Vegetative Methods:** Stem cuttings, air-layering, or grafting are used to ensure uniformity in oil quality and early flowering.

##### Planting

- **Spacing:** 4–6 meters between plants.
- **Pit Preparation:** Dig 60 cm<sup>3</sup> pits, filled with a mixture of soil, compost or FYM (farmyard manure) and neem cake.
- Planting is ideally done at the onset of the monsoon for optimal establishment.

### Field Management

- **Irrigation:** Essential during dry spells, especially in the first two years after planting.
- **Fertilization:** Annual application of NPK fertilizers (e.g., 100:60:40 kg/ha) and regular addition of organic manure enhances flower production.
- **Pruning:** Helps to maintain shape, encourages branching and increases flower yield.
- **Weed Control:** Regular weeding and mulching conserve soil moisture and reduce competition.

### Flowering and Harvesting

- Trees typically begin flowering in the second or third year.
- Peak flowering occurs in the early morning hours and harvesting is done manually.
- Frequent harvesting of flowers every 2–3 days encourages continuous blooming and boosts overall flower production.

### Yield

- A mature tree can produce 5–10 kg of flowers annually.
- From 100 kg of fresh flowers, approximately 1.5 to 2.5 liters of oil can be extracted, depending on the efficiency of distillation.
- Global demand for natural aromatic oils like Ylang-ylang is increasing, offering great export opportunities for growers in tropical areas.
- Countries like Madagascar, the Comoros Islands and the Philippines are major producers.

### Essential Oil Extraction from *Cananga odorata* (Ylang-ylang)

The essential oil of Ylang-ylang is mainly extracted from fresh flowers of *Cananga odorata* through a process called steam distillation. This method allows the volatile aromatic compounds in the flowers to be carefully separated and collected as fragrant oil. Below is a step-by-step explanation of the process.



#### 1. Harvesting and Preparation of Flowers

- **Timing:** Flowers are harvested early in the morning when their fragrance is at its peak.
- **Selection:** Only mature, fully opened flowers are selected for distillation, as they contain the highest concentration of essential oil.
- **Handling:** Flowers must be processed immediately (within a few hours of harvesting) to prevent deterioration of fragrance and loss of oil content.

#### 2. Steam Distillation Process

Steam distillation is the most widely used method for extracting Ylang-ylang oil. It is a gentle and efficient technique that preserves the delicate aroma of the flowers.

Procedure:

- Fresh flowers are placed in a distillation chamber.

- Steam is generated in a separate boiler and passed through the flower mass.
- As the steam passes through, it heats the plant material and causes the essential oil glands within the petals to rupture.
- The aromatic vapors, which are a mix of steam and essential oil, rise and pass through a cooling system (condenser), where they are condensed back into a liquid.
- This liquid contains water and essential oil. Since oil and water do not mix, they naturally separate in a vessel called a separator.
- The lighter Ylang-ylang essential oil floats on top and is then collected, while the water (called hydrosol) can be used for other aromatic or cosmetic purposes.

### 3. Fractional Distillation: Grading of Ylang-Ylang Oil

Ylang-ylang oil is unique because it is distilled fractionally over several hours. This process enables the separation of the oil into different quality grades based on the collection time during distillation.

Oil Grades:

#### Extra Grade (or Extra Superior):

- Collected during the first 1–2 hours of distillation.
- It is the lightest and most volatile fraction, containing the most delicate floral notes.
- Highly valued in luxury perfumery.

#### Grade I

- Collected in the next few hours (up to 6 hours).
- Slightly heavier than Extra grade but still rich in floral aroma.

#### Grade II and III

- Obtained from longer distillation times (up to 20 hours).
- These oils are heavier, less fragrant and usually used in soaps, hair oils, lotions, and industrial products.

Note: The quality and fragrance profile of Ylang-ylang oil changes over time during distillation, which is why this fractional approach is essential for producing different grades suited to specific industries.

### 4. Yield of Essential Oil

- The essential oil yield ranges from 1.5% to 2.5% based on the weight of fresh flowers.
- This means that from 100 kg of fresh flowers, one can obtain about 1.5 to 2.5 liters of essential oil, depending on factors like flower maturity, distillation method, and duration.
- Flower quality, harvest timing and distillation temperature also influence oil yield and quality.

### 5. Storage and Preservation of Oil

- The freshly distilled essential oil is sensitive to light, heat and air.
- To maintain its quality:
  - It is stored in airtight, dark-colored glass bottles (usually amber or cobalt blue).
  - The bottles are kept in a cool, dry place away from direct sunlight.
  - Proper storage helps retain the oil's fragrance, therapeutic properties and prevents oxidation.