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Ivy Gourd - A Nutritious Cucurbitaceous Vegetable as Immunity Enhancer

V. Sivakumar^{1*} and R. Balakumbahan²

¹Coconut Research Station, TNAU, Aliyarnagar, Coimbatore, Tamil Nadu (642 101), India

²Dept. of Vegetable Science, HC & RI, Periyakulam, Kamatchipuram, Tamil Nadu (625 604), India

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Corresponding Author

V. Sivakumar

e-mail: shivafruitscience@gmail.com

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Abstract

Cucurbitaceae is one of the important plant family comprises nutritionally and medicinally valued vegetable in human diet. Mostly they are low calorific, dietary fibre rich vegetables and medicinally known for their diuretic, anti diabetic capacity. Cucurbitaceae contains more than 95 genera and 800 species within. Mostly they are annual in nature, but the genus *Coccinia* is one of the perennial cucurbit vegetable known as ivy gourd. It is an Indian originated vegetable well known for its anti diabetic property.

Introduction

Coccinia grandis generally known as baby watermelon, little gourd, gentleman's toes, scarlet gourd, tindora and kovaikkai belongs to Cucurbitaceae family. It is a perennial vine crop grows primarily in tropical climates and is usually found in the southern Indian states, where it forms a part of the local vegetable. This vine has violent climbing properties and spread easily over fences, trees, shrubs and other supports. Leaves, stems, and roots of this crop are being used in Indian Ayurvedic medicines. The name coccinia is derived from the latin word coccineous, meaning scarlet colour in their ripe fruits (Wanger *et al.*, 1999).

Nutritive Value

Vegetables contain a significant constituent of equilibrium diet for human being. They are natural defensive food rich in vitamins and minerals. It contains water 94 %, dietary fibre 1.6 g, protein 1-2 g, fat 0.4 g, carbohydrates 3.1 g, carotene 156 µg, iron 14 mg, vitamin-A 260 IU, vitamin-C 28 mg, energy 18 kcal. (Jitendra Kumar Tak *et al.*, 2019)

Role in Health Supplement

Daily intake of 100 g fruits is effective for lowering sugar content of diabetic patients (Attanayake *et al.*, 2016). It is rich in vitamin C and also provides vitamin B1 and B2. These vitamins are required by the human body, and help in build up strong immune system of human body. Tendrils of ivy gourd are also rich in mineral like potassium, calcium and iron, which are needed in optimum quantity for functioning of body.

Production Status in India

In India, this vegetable is widely cultivated in southern, eastern and western regions, mainly in states of Karnataka, Tamil Nadu, Kerala, Maharashtra, Andhra Pradesh, Gujarat, Telangana and West Bengal.

Origin

The genus *Coccinia* with about 30 species is confined to tropical Africa, with the exception of *C. grandis*, which occurs wild from Africa to the Indo-Malaysian region. It is cultivated mainly in India, Thailand, Malaysia and Indonesia.

Types of Ivy Gourd

- Ivy gourd is especially classified from its appearance;
- Fruits which are having stripes will come under the category of striped Ivy;
- The fruits which are green and plain skinned will come under non-striped Ivy.

Improved Varieties

Arka Neelachal Sabuja (IIHR)

The plants are very vigorous (>10m long) and produce high biomass. Fruits are dark green in appearance with fractured stripe and conical in shape. It gives 70-80 harvest per season (10-11 months) and yield upto 20-25 t/ha.

Arka Neelachal Kunkhi (IIHR)

A dual-purpose (salad as well as cooked) early variety with high yield (20-25 t/ha). Fruits are extra-long (8.39 cm), weighing around 15-20g, uniform, cylindrical with attractive stripes. It produces around 800 fruits in a season with yield potential of 15-20 t/ha.

Thar Sundari Ivy Gourd or Kundru Variety

Thar Sundari has been developed through clonal selection from regional diversity. The gynoeious plants are moderate in growth habit, prolific in bearing of female flowers and parthincarpic fruit development. Short-perennial plants respond to pruning and re-sprouted with on-set of spring and monsoon season, and after re-sprouting it took 50-55 days for first harvesting. For vegetable culinary, fruits are ready in 6.28–8.42 days from opening of female flowers. Tender fruits of the highest marketable quality (A grade) are 5.83–6.48 cm length, 1.54–1.89 cm diameter and 11.76–13.54 g weight. The elongated long shape tender fruits are light green to dark green in colour with non-clear white stripe and soft. The genotype recorded tender fruit yield of 2.85–3.48 kg/plant/season and yield potential is 248.2–351.7 q/ha with varying production situations.

Padappai, Sulabha, Indira Kundru-5 and Indira Kundru-35 are popular varieties of Ivy gourd.

Soil

Well drained rich sandy loam soils are best for its cultivation. Heavy clay soils, acidic and alkaline soils should be avoided. The soil pH of 6.0–6.5 results in best yield and quality of the vegetable.

Climate

This vegetable crop thrives best in humid and warm climatic conditions. The ideal temperature range of 20 °C to 32 °C is best for its growth, quality and good yield. This vegetable can be cultivated throughout the year. However, peak seasons of fruiting are rainy season & summer.

Propagation

Ivy gourd generally propagated through vegetative means *i.e.* stem cuttings. Cuttings of from pistillate plants having 4-6 leaves, about 20 cm long with thickness of 2 cm can be used as propagating material. Two or three cuttings should be planted about 6 cm deep with basin diameter of 60 cm. The distance between the basins should be about 2 meters.

Land Preparations

Plough the land/ soil until fine tilt is achieved and to kill any weeds. Apply any well rotten manure along with micro nutrients.

Season

The planting should be done before rainy season starts (June to July) or in spring season (Feb to Mar).

Sex Ratio

Since, ivy gourd is dioecious in nature, the optimum ratio of female and male plant population in a field should be of 10:1. As the ivy gourd plants are perennial, replanting is recommended after every 4 years.

Planting

The cuttings are placed upright or at a slight angle to promote the development of side shoots. When planting is done during a dry spell, farmers should apply enough water and continue watering regularly. Plant spacing is approximately 2 m between plant holes and 2 m between rows. This wide spacing is needed for the long stems, which can reach a length of 10 m or more. The wide spacing provides easy access for weeding, pest control and harvesting.

Training

This ivy gourd requires trellising. In home gardens they may be trained over fences or roofs. Pandal system or trellis is to be erected for training the vines. The plant vines also are supported by 2 meter bamboo sticks.

Pruning

The ivy gourd starts fruiting in about 3 months after planting. Once fruiting is completed, the vines should be pruned leaving about 70 cm long vines from the

ground. For each plant, about 5 kg of FMY should be applied after pruning.

Nutriment Management

Add about 25 tonnes of Farm Yard Manure (FMY) at the time of land preparation and plantation. The fertilizer N:P:K requirement is about 75:40:75 kg/ha. Both manures & fertilizers should be applied every year at flowering and fruiting stage.

Irrigation

Irrigate the plants immediately after plantation is done. During hot summer season, these plants require light irrigation at once in weekly interval. Irrigation may not be required in rainy season. Using drip irrigation will be beneficial to maintain adequate moisture during flowering stage. As these plants are sensitive to water stagnation, the soil should have well drainage to avoid water logging in the field.



Figure 1: Ivy Gourd Vine



Figure 2: Ivy Gourd Tender Fruit

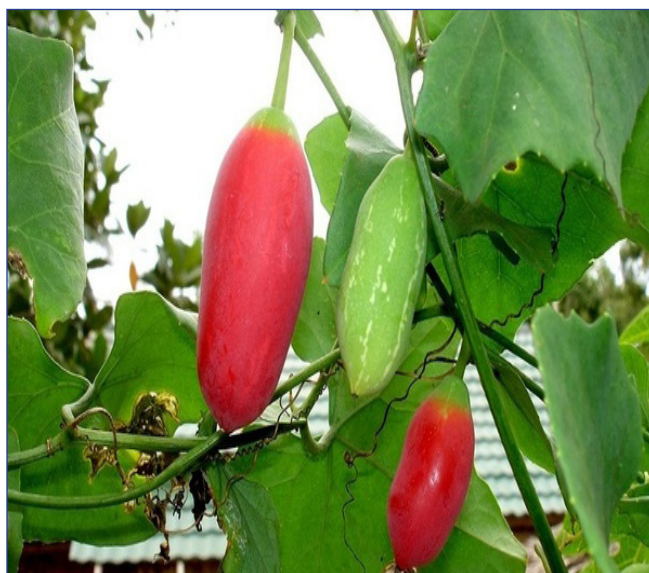


Figure 3: Ivy Gourd Ripen Fruit

Weed Control

In ivy gourd farming, weeding & light hoeing should be done during the early phase of plant vine growth.

Harvesting and Yield

The ivy gourd plant starts flowering after 2 months of planting. Yields 6 months after planting and continues throughout the year. Young fruits are harvested about a week after flowering. Harvesting is best done weekly as long as there is enough moisture to produce new leaves and flowers. The crop could remain in the field up to 10 years, after which the yields decline and farmers need to establish a new crop. However, replanting after 4 years may be more economical. Cutters or sickles are used to harvest the vegetable crop as a common practice. The average yield of 10 to 15 tonnes per hectare can be obtained with good farm management practices.

Handling after Harvest

The fruits are spread out during the evening in a single or double layer on top of clean sacks. When they are covered or kept inside a sack, they tend to turn yellow outside and pink to reddish inside. Only fresh green fruits which are whitish to pale green inside can be sold. Traders use cold rooms to keep them fresh. When stored in a refrigerator, the fruits last for up to two weeks. Prior to taking the fruits to the market, they are placed in cartons. These cartons are also used for exporting the fruit.

Conclusion

Though ivy gourd is known for its nutritional and medicinal properties, varietal improvement and value addition in this crop is in infant stage except the

dehydrated product. To outreach its value globally these area is to be concentrated further.

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