

# Exploring Knowledge about Cultivation, Collection and Medicinal uses 'Abelmoschus esculents L'

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**Abstract:** Medicinal plants are the nature's gift to human being to have disease-free healthy life. It plays a vital role to preserve our health. In recent times, the use of herbal products has increased tremendously in the western world as well as developed countries. India is one of the most medico-culturally diverse countries in the world where the medicinal plant sector is part of a time-honored tradition that is respected even today. Medicinal plants are believed to be safer and proved elixir in the treatment of various ailments. *Abelmoschus esculentus* (Okra) is an important medicinal plant of tropical and subtropical India. Its medicinal usage has been reported in the traditional systems of medicine such as Ayurveda, Siddha and Unani.

**Keywords:** Okra, *Abelmoschus esculentus*, Bhindi

## I. INTRODUCTION

Okra (Bhendi) (*Abelmoschus esculentus* L.; family Malvaceae) is grown across the temperate and subtropical regions of the world as a vegetable crop. Okra yellow vein disease (Bhendi yellow vein mosaic virus, Okra yellow vein mosaic virus), okra leaf curl disease (Okra leaf curl virus) and okra enation leaf curl disease (Okra enation leaf curl virus) are caused by viruses in the genus Begomovirus, family Geminiviridae and result in serious losses in the cultivation of okra in India. In the recent past, okra yellow vein mosaic disease has become a major constraint. The yield loss caused by Yellow vein mosaic disease of okra in infected plants ranges between 50 to 90 per cent depending on stage of Growth at which infection occurs (Sastry and Singh 1974; Sinha and Chakrabarti 1978). Viruses belonging to family Geminiviridae have a single-stranded (ss) Circular DNA genomes with characteristic twinned Quasi-icosahedral particles (Lazarowitz 1992). These are divided into four genera that are distinguished on the basis of host range, insect vector and genome arrangement (Stanley et al. 2005). These are the members of the genus Begomovirus, transmitted exclusively by the whitefly *Bemisia tabaci* Gennadius. The begomoviruses occurring in the New World have bipartite genomes (components known as DNA-A and DNA-B) and in the Old World both bipartite and monopartite (a component homologous with DNA-A of bipartite virus) begomoviruses have been identified (Stanley et al. 2005).



## II. METHODS OF CULTIVATION AND COLLECTION

### Related Resources

Bhendi (*Abelmoschus esculentus*) is a common vegetable in India. The common names are Ladies Finger, Okra, Bhindi (Hindi), Dhenras (bengali), Vendai (Tamil), bhindo (Gujarati), Bendekayi (Kannada), Ventaykka (Malayalam), Asrapatraka (Sanskrit), etc. It is an annual erect herb 0.9 to 2.1 m in height, hairy, with 3 to 5 lobed palmately cordate leaves. The plants bear 12.5 to 30cm pyramidal pods. It is predominantly a crop of tropics and subtropics. The crop is cultivated for its young tender fruits, used in curry and soups after cooking. It is a good source of vitamins A and B, protein and minerals. It is also an excellent source of iodine and is useful for the treatment of goiter. Fruits are also dried or frozen for use during off-season. Dry fruit skin and fibres are used in manufacture of paper, card board and fibres. Root and stem are used for clearing cane juice for preparation of jaggery. The major bhendi (okra) producing states are Uttar Pradesh, Bihar, West Bengal, Odisha, Assam, Andhra Pradesh and Karnataka.

### Climate

Bhendi requires long warm growing season during its growing period. It gives good yield in warm humid condition. It grows best within a temperature range of 24-27°C. It can be successfully grown in rainy season even in heavy rainfall area. Bhendi is highly susceptible to frost injury. Seeds fail to germinate when temperature is below 20°C.

### Soil

Bhendi can be grown in a wide range of soils. However, it grows best in loose, friable, well-drained sandy loam soils rich in organic matter. It also gives good yield in heavy soils with good drainage. A pH range of 6.0-6.8 is considered as optimum. Alkaline, saline soils and soils with poor drainage are not good for this crop.

### Season

The optimum time of seed sowing varies greatly depending upon climate, varieties and their temperature requirement for growth. Normally the crop is sown between January-March and June- August. The exact month of sowing depends on the region.

### Varieties

Released by IARI : Pusa Makhmali, Pusa Paushja, Pusa A-4, Pusa Sawani, Sel 2-2

Released by IIHR : ASel-10 (A. Anamika), Sel-4 (A. Abhay)

Released by PAU : P-7, Punjab Padmini, Punjab no. 13, Punjab 8

Released by IIVR : DVR 1, 2, 3, 4, VRO 3, 4, 6, 5, 22, 25

Others : Parbhani Kranti, Kiran, Salkeerthi, Co 1, Aruna, MDU 1, Varsha Uphar, Azad Kranthi

Hybrids : CO 2, 3, COBH 1

### Seed rate and seed treatment

Bhendi requires about 3.5-5.5 kg seeds/ha during summer seasons and 8-10 kg seeds/ha for rainy season crop. The seed rate generally varies with germination percentage, spacing and season. Before sowing the seeds are soaked in a solution of Bavistin (0.2%) for 6 hours. The seeds are then dried in shade.

### Land preparation

The land should be well prepared with 2-3 ploughing. Well decomposed FYM (25 t/ha) is incorporated at the time of land preparation. Bhendi is sown on ridges or on flat soil. If soil is heavy, sowing should be done on ridges. Application of organic manure like neem cake and poultry manures improves the plant growth and the yield in this crop. It is possible to reduce the use fertilizer by using neem cake and poultry manures.

### Sowing

The hybrid varieties are planted at a spacing of 75 x 30 cm or 60 x 45 cm. A pre-soaking irrigation 3-4 days before sowing is beneficial. The seeds germinate in about 4-5 days.

### **Manure and fertilizers**

The fertilizer dose depends upon the fertility of soil and amount of organic manure applied to the crop. About 20-25 t/ha of FYM is mixed at the time of land preparation. Generally, application of 100 kg N, 60 kg P<sub>2</sub>O<sub>5</sub> and 50 kg K<sub>2</sub>O is recommended for optimum yield. Half dose of N and full dose of P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O are applied at the time of planting. The balance half of N is given 30 days after sowing followed by earthing up operation.

Fertilizers are applied by opening up a deep narrow furrow on one side of each sowing ridge. Generally, nitrogen fertilizers like urea, calcium ammonium nitrate (CAN) and ammonium sulphate should be used for this crop.

For hybrid varieties the recommended dose is 150 kg N, 112 kg P<sub>2</sub>O<sub>5</sub> and 75 Kg K<sub>2</sub>O. Out of this dose, 30 % of N and 50 % of P & K is applied as basal dose. Remaining 50 % of P and 40 % of N and 25 % of K is applied as first top dressing four weeks after sowing. Balance quantity of 30 % N and 25 % K is applied as second top dressing about 7 weeks after sowing.

### **Irrigation**

Irrigation frequency in bhendi crop varies with the season and the soil type. Bhendi is grown without irrigation in rainy season in high rainfall area where distribution of rainfall is uniform throughout the growing season. A light irrigation is given soon after seed sowing to ensure good germination. The crop is irrigated at an interval of 4-5 days in summer. Moisture stress at fruit setting stage reduces the fruit quality and the yield. Normally the crop is irrigated by adopting the furrow method of irrigation.

### **Intercultural Operations**

#### **Weed control**

It is necessary to keep the crop weed free during the first 20-25 days of plant growth. A total of 3 to 4 weeding's are needed. The first weeding is done when the seedlings are two weeks old and subsequent weeding's are done at an interval of 25 days. Pre-emergence application of Basalis 48 EC (1.5kg a.i./ha) or Stomp 30 EC (0.75 kg a.i./ha) followed by one hand weeding at 20-25 days after sowing effectively controls the weed growth.

### **Plant protection**

Pests : Shoot and Fruit Borer, Leaf Hopper, Okra Stemfly Mites, White fly and Root-Knot Nematode are the major pests.

Diseases : Damping off, Fusarium wilt, Powdery mildew, Cercospora Leaf Spot, Yellow Vein Mosaic Virus and Enation Leaf Curl are the major diseases.

### **Medicinal Uses**

Lady finger is good for digestion as it has high fiber content and it prevents constipation due to its laxative property. It also protects the liver against free radical damage due to its antioxidant property. The regular intake of Lady finger helps in managing cholesterol levels and keeps the heart healthy.

#### **1 . Promotes Heart Health**

Bhindi contains no cholesterol of its own and in fact contains a component called pectin which helps in lowering bad cholesterol. Bad cholesterol is a cause of heart diseases and it can be controlled by increasing consumption of bhindi.

#### **2 . Regulates Blood Sugar**

Bhindi is a great option for diabetics since the high fiber content is of a type which releases sugars slowly into the blood owing to slow rate of digestion. This ensures that there is no sugar spike, which occurs after a diabetic eats food.

#### **3 . Fights Cancer**

Research has shown that bhindi contains higher amounts of antioxidants compared to other vegetables. Antioxidants prevent oxidative damage to cells and hence lower the risk of cancer. The high fiber content maintains a healthy digestive system and prevents colon cancer.

#### **4 . Boosts Immunity**

Bhindi contains a high amount of vitamin C which is known to boost immunity and prevent common infections. 100 grams of bhindi can give you around 40% of the daily recommended intake of vitamin C.

#### 5 . Prevents Anaemia

Since bhindi contains high amounts of vitamin K, folate and iron, it is great for promoting blood health and for treatment and prevention of anaemia.

#### 6 . Helps In Weight Loss

Containing only 33 calories in every 100 grams, bhindi is a good option for people wanting to lose weight. The high fibre content makes you feel full for longer and lowers intake of calories.

#### 7 . Prevents Colon Cancer

Bhindi contains high amount of insoluble dietary fiber which helps in cleaning out the whole digestive system especially the intestinal tract. This in turn plays a great role in keeping the gut healthy and preventing colon cancer.

#### 8 . Beneficial In Pregnancy

Folate or folic acid is an important mineral that is required for conception and subsequent development of the foetus. Bhindi contains a high amount of folate which ensures proper neurological development of the baby.

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