

Raja N.L.Khan Women's College (Autonomous)

Botany

UG-SEM-II Paper – C3T

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### **Citrus Canker Disease**

#### **Introduction:**

Citrus Canker is a bacterial disease of worldwide distribution occurring wherever citrus is grown. It is a serious menace to our most valued citrus orchards causing objectionable blemishes on the fruit. The disease causes serious damage in India, China, Japan and Java.

The pathogen incites severe canker disease in a number of citrus species on stems, leaves and fruits. The disease attacks most of the species/varieties of citrus. The most susceptible species are the acid lime plants, the sweet orange and the grape fruit.

#### **Symptoms:**

Crust-like disease lesions or scabby spots and small cankers (open wounds or dead tissue surrounded by living tissue) appear on all over ground parts of the plant such as leaves, young branches and fruits. The trees are, however, not commonly killed.

#### **The lesions on the foliage-**

- At first, appear on the lower surface as small round raised spots. These are translucent and of yellowish brown colour. Later the spots turn white or grayish and finally rupture. The older lesions are corky and brown, sometimes purplish.
- The necrotic brownish canker regions are surrounded by a yellowish brown to green raised margin and distinct watery yellow halo region. The yellow halo region is free from the pathogen. The cankerous lesions contain the pathogen in millions.
- Mairie suggested that the halo regions are formed due to the response of the host tissue to a diffusible metabolite of the pathogen. Padmanabhan et al. (1975) reported accumulation of malic acid in the halo region due to increased respiration in this region.

#### **On twigs -**

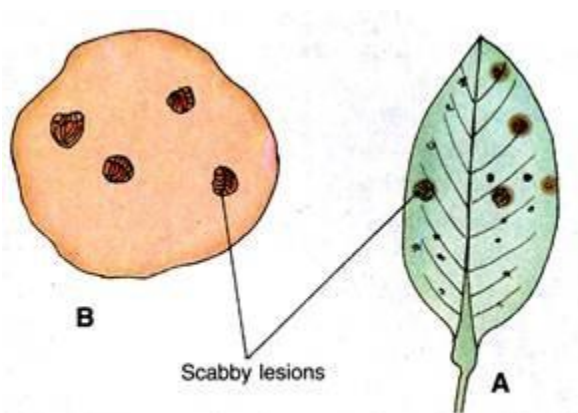
- The lesions on the twigs are usually irregular in form. They coalesce to form elongated rough and scabby regions.

**On fruits –**

- Lesions on fruits are almost similar to those of leaves, excepts that the yellow halo and crater like depression in the central region are more prominent.
- Lesions often coalesce and form very irregular patches of rough and scabby raised areas.



*Citrus Canker (caused by Xanthomonas sp.)*



**Fig. 22.28.** Symptoms of Citrus Canker on leaves (A) and fruits (B).

**Causal Organism:**

The causal organism is the bacterial pathogen *Xanthomonas citri*, now called *X. campestris pv. citri* (Hasse) Dowson. It consists of a short, motile rod (1.5-2.0 x 0.5- 0.75  $\mu$ ) furnished with a

single polar flagellum (monotrichous). It lacks endospore formation. It is a gram negative, aerobic form surrounded by a mucilaginous capsule. It forms chains.

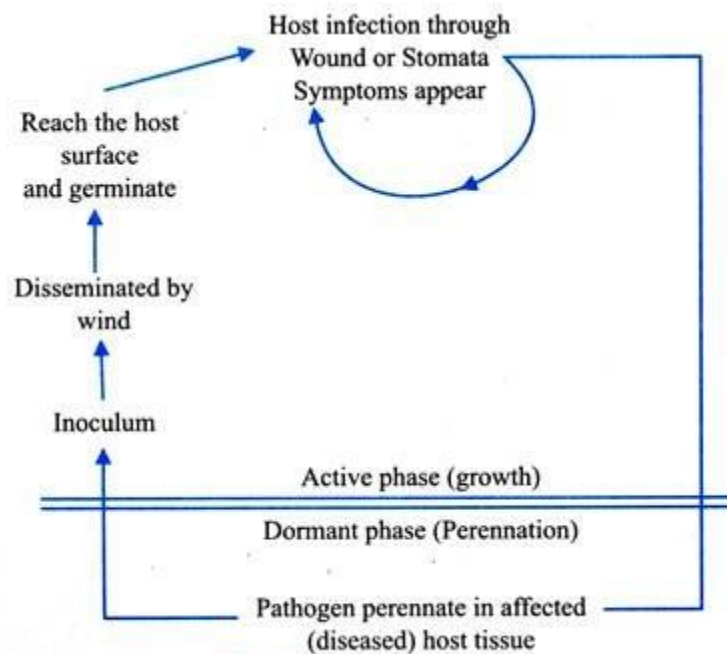
The climate factors which favour the disease are the mild temperature and wet weather. The most suitable range of temperature appears to be 20°C to 30°C.

**Host:** *Citrus aurantium* L. (sweet orange) and other *Citrus sp.*

### Disease Cycle:

Infection takes place through the stomata and wounds. The disease is not soil borne. The pathogen perennates in the old lesions on the twigs still attached to the host plant.

From there it is carried by driving rains and by insects to new localities. Man functions as the chief agent of dissemination by planting infected nursery stock in new localities.



**Fig. 22.29.** Disease cycle of Citrus Canker.

### Control Measures:

The disease can be controlled or reduced by the following methods.

#### A. Cultural methods

##### 1. Eradication:

The disease is controlled by the eradication of diseased trees. This is accomplished by removing the trees with advanced infection and burning them.

## **2. Pruning:**

The infected trees may be cured by removing the diseased foliage and branches with pruning scissors and then spraying the trees with one percent Bordeaux mixture at regular intervals.

3. The use of disease free nursery stock for planting is the best method of controlling the disease.

4. The fallen infected leaves and twigs should be collected and burnt.

## **B. Chemical Methods:**

- **Spraying fungicides -**

Spraying with Bordeaux mixture and lime sulphur is a useful measure to protect the fruit. It should be done during the first three months after the beginning of fruit formation. Spraying should commence before the onset of rains and repeated during the rainy season.

- Citrus nurseries should be raised in places away from the regions of heavy and protracted rainfall. There should be no “**khatti**” hedge around the nurseries.
- **Antibiotics** - Rangaswamy (1957) reported that the use of antibiotic sprays is useful in controlling the disease. Streptomycin sulphate and Phonomycin have been found to be effective. Vaheeddudin (1959) found that spraying with neem-cake is effective in controlling citrus canker.

## **C. Other substances –**

- Spraying of Neem cake ( 160 lb/acre)is very effective to control the dieseaw