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REPORT OF MANGO BACTERIAL CANKER DISEASE (MBCD) FROM MARATHWADA REGION OF MAHARASHTRA

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Key words : Mango bacterial canker disease, Marathwada region, Maharashtra.

Mango (*Mangifera indica* L.) is cultivated all over the world. It is extensively grown in all the states of India, thriving well under wide range of tropical and subtropical conditions. Some important diseases were recorded on mango caused by fungi, bacteria, viruses, etc. Among all the mango diseases, the great damage causing disease is Mango Bacterial Canker Disease (MBCD). The disease is caused by the bacterial pathogen *Xanthomonas campetris* pv. *magiferaeidicae (Xcmi),* which grows favourably at low temperature and high humidity. MBCD was recorded in all the disctricts of Marathwada region such as Aurangabad, Beed, Osmanabad, Latur, Nanded, Hingoli, Parbhani and Jalna. Symptoms of MBCD were recorded on leaf, stem and fruit of mango. Leaves show small water-soaked brownish spots, which later on become dark brown to black spots surrounded by yellow halo. From stem and fruit cracking release of gummy ooze was observed. Premature dropping of the infected fruits was seen in the severe infection.

INTRODUCTION

Mango fruit, which ranks fifth in worldwide production, is cultivated throughout the tropics as well as subtropical areas such as Spain, Florida, North Africa, Israel and Japan (Mukherjee, 1997). The largest producer countries are India, China, Mexico, Thailand, Pakistan and Philipines. Mango is extensively grown in India, thriving well under wide range of tropical and subtropical conditions. India is one of the largest producers of mango in the world. Nearly 60 different diseases of mango are reported from various parts of India, of which fungal diseases are most common (Rangaswami and Mahadevan, 2005).

Some important bacterial diseases were also recorded on mango such as Apical necrosis caused by *Pseudomonas syringae* pv. *syringae* (Cazorla *et al*., 1998). Bacterial diseases caused by *Agrobacterium tumefaciens, Bacillus subtilis, Erwinia carotovora* subsp. *carotovora* are some other bacterial diseases of mango which are also described in literature (Bradbury, 1986).

Among all the bacterial diseases, the great damage causing disease reported all over the world is Mango Bacterial Canker Disease (MBCD) affecting almost all aerial parts of the tree such as leaf, stem and fruit. The MBCD is caused by the bacterial pathogen *Xanthomonas campestris* pv. *mangiferaeidicae* (Patel *et al.,* 1948; Gupta and Sharma, 2000). This disease is very difficult to be controlled and it usually becomes a limiting factor for mango industries, when fungal diseases and other pests can be managed at acceptable levels. The pathogen causes heavy loss to crop under favourable environmental conditions (Shekhawat and Patel, 1975; Kishun, 1981). Kishun (1997) found loss in yield up to 70.61% in cv. Dashehari because of the disease.

MATERIALS AND METHODS

Diseased mango samples were collected from various districts (Aurangabad, Beed, Osmanabad, Latur, Nanded, Hingoli, Parbhani and Jalna) of Marathwada region and brought to the laboratory for further investigation.

The infected mango leaf, stem and fruits were washed with running tap water and isolation of bacterial pathogen was done as per the following method :

Isolation of bacteria : The infected leaf spots together with the healthy parts were cut with a sterile blade. The leaf pieces were then placed in sterile cavity blocks and cut to ooze the pathogen in the sterile distilled water. 20 ml of the Nutrient Agar (NA) medium at 45°C was poured and solidified in petridishes (9 cm size). The bacteria were streaked out with a sterile wire loop on to the NA plate. Laminar flow was used for the purpose of isolation. After 48 hrs of incubation at 30±2°C, the developed colonies were transferred to NA slants.

In order to obtain bacteria from rotted fruits, they were squeezed together with the fingers to press out the bacteria containing sap, which was later streaked on NA plates.

Confirmation of the Pathogen : After incubation, colonies of bacteria were developed, which were then transferred on NA slants for pure culture. The pathogenecity of the isolates was confirmed by adopting Koch's postulates (Pawar, 2007).

RESULTS AND DISCUSSION

Mango Bacterial Canker Disease (MBCD) has been reported to cause the disease throughout Marathwada region. Among all the districts of Marathwada region, the disease was found to be more severe in the districts like Aurangabad, Parbhani and Beed.

During the visit, it was recorded that several mango cultivating areas of the region were showing the disease symptoms on leaves. Number and size of leaf spots were variable on the basis of climatic conditions, physiological factors and susceptibility of mango. Cankerous symptoms of the disease were recorded on different plant parts like leaf, stem and fruit.

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i) Symptoms on leaves : Leaves show small water-soaked, brownish spots in the initial stage. The spot size varied from 1-5 mm. In later stage these spots increased in size and became dark brown to black in color and surrounded by yellow halo. Under stereoscopic microscope, young spots surrounding yellow halo were 3-5 mm broad. It was interesting to note that yellow halo around older spots was diminished in size (1-3 mm).

Several lesions coalesced to form large necrotic irregular patches which were often rough and raised. The affected portion of the leaf was observed dry. In severe infection, the leaves turn yellow and defoliation was also observed. Only the old leaves were found infected. Young leaves from the same branch were found healthy. At one locality of Beed district about 50% of the trees of variety Neelam were found severely infected by the disease. Severe defoliation was recorded in such cases.

ii) Symptoms on Stem : It was observed that on branches, twigs and stem the lesions were water-soaked in initial stage, later become raised and dark brown with longitudinal fissures exposing the vascular tissues. From such crackings gummy exudates were recorded.

iii) Symptoms on Fruits : Cankers were also observed on the flower stalks resulting in dropping of the flowers and young fruits. On young fruits initially water-soaked lesions, appeared which, with the progress of the disease, turned brown to black. Cankers were developed on fruits by such type of spots gradually. Cracks (1-3 mm in size) were also recorded on the skin of infected fruits from which release of gummy ooze was observed. Premature dropping of the infected fruits was seen in severe infection.

X. campestris pv. *mangiferaeidicae* has all the characteristics associated with the genus *Xanthomonas*, except about pigmentation. Unlike most xanthomonads, it produces non-pigmented (creamy white) colonies when cultivated on agar medium. A few yellow pigmented strains have been isolated from mango in Brazil, Florida, South Africa and Reunion (Gagnevin and Pruvost, 2001).

Mango bacterial canker disease (MBCD) is also known as mango canker, bacterial spot, leaf spot, black spot, mango blight and bacterial black spot. The disease was first recorded as bacterial leaf spot from Poona by Patel *et al.* (1948) and from other parts of the country by Kishun and Sohi (1983). Kishun (1995) surveyed mango growing belts of Andhra Pradesh, Karnataka, Punjab, Chandigarh, Uttar Pradesh and Bihar. He observed maximum incidence (90%) at Ranchi (Jharkhand). MBCD spreads rapidly during rains. In new area the disease spreads through infected planting materials and from diseased to healthy plants through wind splashed rains.

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