Journal of Virology & Antiviral Research

Commentary A SCITECHNOL JOURNAL

Understanding Bacterial Necrosis in Plants: Pathogenesis and Management Strategies

Christy Emmanuel*

Department of Botany, Faculty of Science, University of Jaffna, Jaffna, Sri Lanka

***Corresponding author:** Christy Emmanuel, Department of Botany, Faculty of Science, University of Jaffna, Jaffna, Sri Lanka; E-mail: chrisy.jc@univ.ac.lk

Received date: 12 September, 2024, Manuscript No. JVA-24-147818;

Editor assigned date: 16 September, 2024, PreQC No. JVA-24-147818 (PQ);

Reviewed date: 01 October, 2024, QC No. JVA-24-147818;

Revised date: 12 June, 2025, Manuscript No. JVA-24-147818 (R);

Published date: 19 June, 2025, DOI: 10.4172/2324-8955.1000712.

Description

Bacterial necrosis is a significant plant disease characterized by the necrotic tissue death in various plant species. This manuscript delves into the etiology, symptomatology, and management strategies for bacterial necrosis. Through an exploration of the causative bacterial agents, the pathological processes involved, and effective control measures, this document aims to provide comprehensive insights into mitigating the impact of bacterial necrosis on agricultural productivity. Bacterial necrosis, a debilitating plant disease, affects a wide range of crops including beans, tomatoes, and cucumbers. Caused by various species of bacteria, the disease leads to necrotic lesions and tissue death, which can significantly impact plant health and yield.

Understanding the mechanisms of bacterial necrosis, its symptoms, and effective management strategies is crucial for minimizing its economic impact on agriculture. Bacterial necrosis is primarily caused by pathogenic bacteria, with *Pseudomonas* spp. and *Xanthomonas* spp. being prominent among the causative agents. These bacteria are capable of penetrating plant tissues through natural openings or wounds, where they multiply and secrete toxins. The toxins disrupt plant cellular processes, leading to necrosis.

Causative bacteria

Pseudomonas syringae pv. tomato bacterium is known for causing bacterial necrosis in tomatoes, leading to extensive leaf and stem damage. *Xanthomonas campestris* pv. *mangiferaeindicae* pathogen is notorious for causing necrotic lesions in mangoes and other fruits. Bacteria enter the plant through stomata, wounds, or natural openings. Once inside, they proliferate and produce toxins. The bacteria secrete toxins like phytotoxins, which interfere with plant cellular processes, leading to cell death and necrosis. The symptoms of bacterial necrosis vary depending on the plant species and the specific bacterial strain. However, common signs include:

Lesion development

Leaf necrosis are small, water-soaked spots on leaves that expand to form larger necrotic areas. The lesions may be surrounded by yellow halos. Stem and fruit necrosis Sunken lesions on stems and fruits, which can lead to severe tissue death and rotting. Affected plants may exhibit wilting due to vascular tissue damage. Necrosis often results in reduced plant vigour and stunted growth. Accurate diagnosis of bacterial necrosis involves several steps Initial diagnosis is often based on visual symptoms. Examining the pattern and appearance of lesions can provide clues about the disease. Bacterial isolation from affected plant tissues using selective media followed by biochemical tests helps in identifying the causative agent. PCR and DNA sequencing offer precise identification of bacterial species and strains. Effective management of bacterial necrosis involves a combination of cultural, biological, and chemical control measure. Rotating crops can help break the disease cycle and reduce bacterial populations in the soil. Removing and destroying infected plant debris, and sterilizing tools and equipment helps prevent the spread of bacteria. Ensuring adequate spacing between plants improves air circulation and reduces humidity, which can inhibit bacterial growth. Introducing antagonistic bacteria or fungi that compete with or inhibit the growth of pathogenic bacteria can help manage bacterial necrosis. Breeding or selecting resistant plant varieties offers a long-term solution to controlling bacterial necrosis. Application of copper-based bactericides and other chemical treatments can reduce bacterial populations and mitigate disease symptoms. Combining chemical treatments with cultural and biological practices ensures a more comprehensive approach to managing bacterial necrosis.

Conclusion

Bacterial necrosis is a significant threat to plant health and agricultural productivity. Understanding its etiology, symptoms, and effective management strategies is essential for minimizing its impact. By integrating cultural practices, biological controls, and chemical treatments, farmers and horticulturists can effectively manage bacterial necrosis and safeguard plant health.

Citation: *Emmanuel C (2025) Understanding Bacterial Necrosis in Plants: Pathogenesis and Management Strategies. J Virol Antivir Res 14:2.*

All articles published in Journal of Virology & Antiviral Research are the property of SciTechnol and is protected by copyright laws. Copyright © 2025, SciTechnol, All Rights Reserved.