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The Life of Plants in a Changing Environment

Edited by

Rishikesh Upadhyay

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CHAPTER EIGHT

BIOTIC STRESS IN PLANTS: A METABOLOMICS PERSPECTIVE

S VIJAYAN, M THAMPI AND MS JISHA

Biotic stress covers an array of negative influences on plants caused by living organisms, such as bacteria, fungi, viruses, nematodes, and protozoans. Biotic stress impairs crop health and reduces yields. Biotic stress initiates a cascade of events in plants, leading to metabolic changes and thus to plants activating immune responses towards the stress. Metabolomics is an area of advanced scientific study, which focuses on a broad, quantitative evaluation of metabolites produced in biological systems. This advanced field of research can be used effectively to address biotic stress. The plant metabolome consists of a huge array of primary and secondary metabolites, hormones, and signaling molecules with low molecular weights. Metabolites play an indispensable role in the health system, biomass production, and total architecture of plants. When subjected to biotic stress, plants produce certain stress-response metabolites to adapt to the new condition. For this reason, accurate metabolite profiling is a breakthrough in the investigation of biotic stress tolerance in plants. Moreover, this method has a lot of potential for future development and is budget-friendly. This advanced field of study will allow us to select superior quality plants and breeding materials. In the present review, an attempt is made to discuss the techniques and significant advancements obtained in the metabolomics study of plants to improve disease resistance and yield.

Introduction

The global annual crop yield is massively affected by both abiotic and biotic stresses. Abiotic stresses are environmental stresses faced by plants during growth. They include drought, salinity, heat, waterlogging, cold,



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