Plant disease control: understanding the roles of toxins and phytoalexins in host-pathogen interaction

ABSTRACT

Naturally, plant habitats are exposed to several potential effects of biotic and different abiotic environmental challenges. Several types of micro-organisms namely; bacteria, viruses, fungi, nematodes, mites, insects, mammals and other herbivorous animals are found in large amounts in all ecosystems, which lead to considerable reduction in crop productivity. These organisms are agents carrying different diseases that can damage the plants through the secretion of toxic-microbial poisons that can penetrate in the plant tissues. Toxins are injurious substances that act on plant protoplast to influence disease development. In response to the stress effect, plants defend themselves by bearing some substances such as phytoalexins. Production of phytoalexins is one of the complex mechanisms through which plants exhibit disease resistance. Several findings specifically on phytoalexins have widen the understanding in the fields of plant biochemistry and molecular biology. However, this review reports the interaction of toxins and phytoalexins in plant-pathogen cycle, research progress on the association of phytoalexins with plant disease resistance as well as the role of the phytoalexins in plant disease control.

Keyword: Defence mechanism; Phytoalexins; Plants; Plant disease; Toxins