TOLERANCE OF SOME PHYTOPATHOGENIC FUNGI TO FUNGICIDES

By

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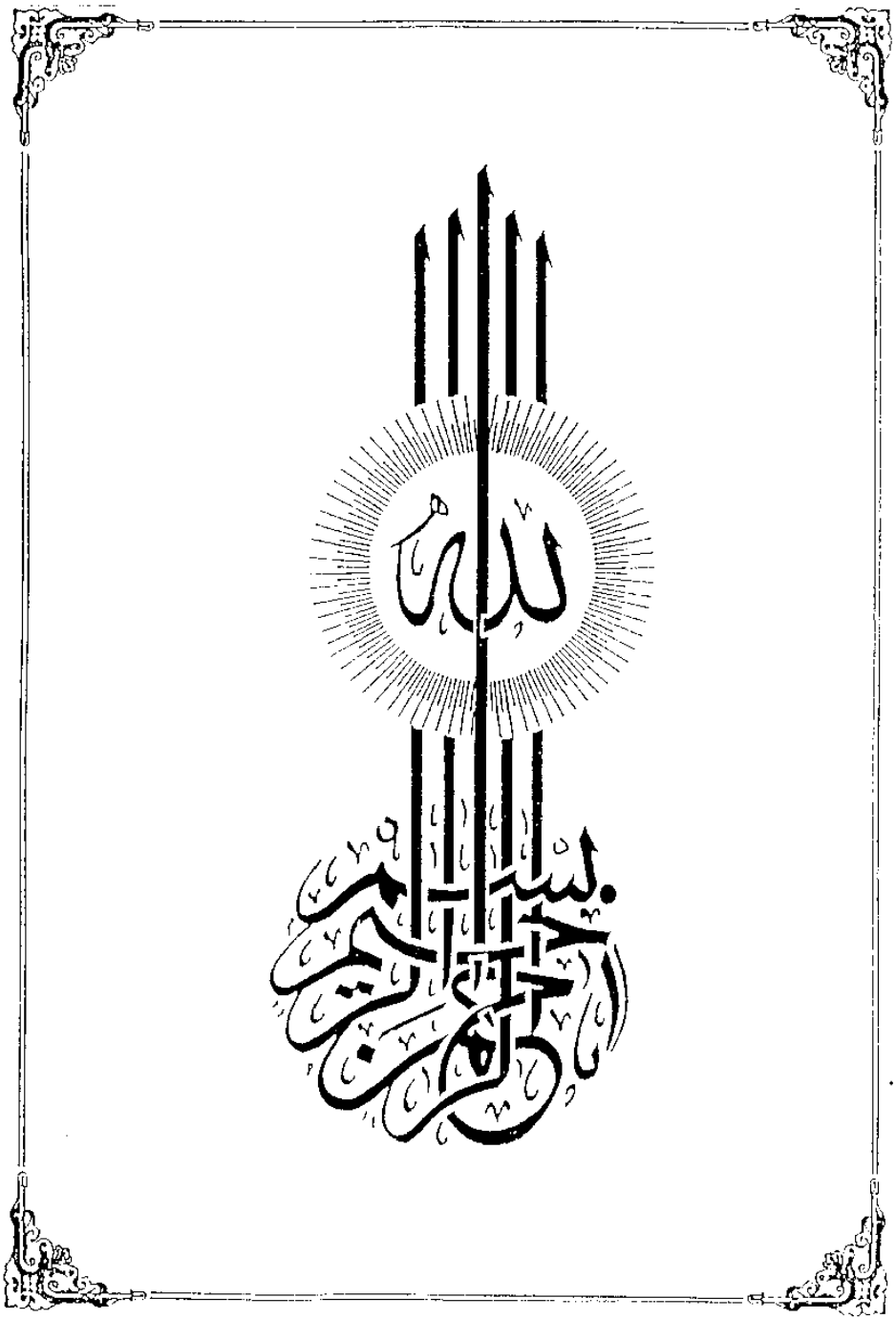

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Abstract

Two pathogens, associated with damping - off and root rot disease of soybean seedlings, were isolated and identified as *Rhizoctonia solani* and *Sclerotium rolfsii*.

The *in vitro* sensitivity test towards different systemic and non systemic fungicides, showed that Vitavax at 0.1 and 0.5 µg/ml inhibited the mycelial growth of *R.solani* and *S. rolfsii*, respectively. Benlate was more potent than Tecto, Derosal and Topsin - M against the two pathogens. *S. rolfsii* was more sensitive to PCNB and Captan than *R.solani*.

Tolerance of the two pathogens to the tested fungicides was performed by subculturing the wild types on medium containing gradually increasing concentrations of the fungicides. *S. rolfsii* was adapted more easily than *R.solani* to the fungicides tested except Vitavax where the reverse was obtained.

Tolerance did not influence the pathogenic activities of the tolerant isolated, as compared with the wild types. The morphological characters of the tolerant isolates differed in their mycelium colour, number and weight of the sclerotia formed. The tolerance to systemic fungicides was stable until 9 generation, while after 5 generation the tolerance of both pathogens to non - systemic fungicides was reversible.

The enzymatic activities of polyphenol oxidase and peroxidase were not affected greatly by tolerance to the fungicides. Adaptation to Benlate stimulated the enzymatic activities of both enzymes in the culture filtrates and in the mycelium matrix. In addition the adaptation process did not affect the polygalac⁀turonase (PG) pectic methylestrase (PME) and Cellulase (Cx) activities. Thus the tolerant isolates were pathogenic to soybean seedlings similar to the wild type isolates.

Adaptation of the two pathogens affects markedly the metabolic pathways of free amino acids content within the fungal cells. The total amino acids increased in the tolerant isolates as compared with the wild type, indicating that these amino acids may play an important role in the mechanism of tolerance.

Total RNA and DNA were increased by the fungicide tolerance. Their ratios were also increased. This increasing may play a role in detoxification of the fungicides in the tolerant cells.

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