

## Spore Cell Wall Components of *Aspergillus niger* Elicit Downy Mildew Disease Resistance in Pearl Millet

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Elicitors derived from the cell wall of fungi are shown to be active in eliciting resistance in plants against a wide range of pathogens. In the present study carbohydrate components from the autoclaved spore cell wall of *Aspergillus niger* were prepared as aqueous suspensions and tested for defense response in pearl millet (*Pennisetum glaucum* (L.) R.Br.) against the oomycetous downy mildew pathogen *Sclerospora graminicola* (Sacc.) Schroet. The aqueous suspension derived from the spore cell wall of *A. niger* was used as a seed soak treatment at concentrations of 0.25, 0.5, 1.0, 1.5 and 2.0 mg ml<sup>-1</sup> for time intervals of 3, 6, 9 and 12 h. The concentration of 0.5 mg ml<sup>-1</sup> for a 6 h soaking period offered 94% seed germination and seedling vigor index increased to 1526. The seed germination and the seedling vigor were significantly higher than the untreated check. Spore cell wall suspension as seed treatment at a concentration of 0.5 mg ml<sup>-1</sup> required a 3-day time interval to provide 67% protection against downy mildew. Histological and biochemical studies were conducted to elucidate the mechanism of defense response in treated seedlings upon *S. graminicola* infection. Resistance host response was detected in the form of lignin and callose deposition in the epidermal cell wall of pearl millet seedlings, which is the site of *S. graminicola* infection. A time course study showed rapid and localized deposition of lignin and callose in epidermal cell wall of carbohydrate components-treated pearl millet seedling coleoptiles. Increased levels of the defense-related enzyme peroxidase were detected in the treated seedlings. Peroxidase activity in elicitor-treated samples reached a peak at 8 h post-infection, which was 45% more than in their respective uninoculated control. Characterization of peroxidase isoforms by isoelectric focusing revealed 16 different isoforms, of which pI 6.8, 7.2 and 8.7 increased in elicitor-treated samples upon *S. graminicola* infection.

KEY WORDS: *Aspergillus niger*; downy mildew; induced resistance; pearl millet; spore cell wall.

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