Soybean stem canker caused by *Diaporthe phaseolorum* var. *caulivora*; colonization process and plant defense activation

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Soybean is an important crop in South America and its production is limited by fungal diseases caused by species from the genus *Diaporthe*, including seed decay, pod and stem blight, and stem canker. In this study we focused on *Diaporthe* species isolated from plants with stem canker lesions in different parts of Uruguay. Three different isolates were selected for pathogenicity assays. The *Dpc* isolates showed different virulence on susceptible soybean plants. Further inspection of the infection and colonization process showed that *Dpc* hyphae were associated with trichomes in leaves and stems, acting probably as physical adhesion sites of the hyphae and entry point for fungal infection. *Dpc* hyphae colonized the stem rapidly reaching the phloem and the xylem at 72 hours after inoculation (hpi) and after 96 hpi the stem was heavily colonized. After fungal infection soybean plants induce reinforcement of the cell walls, although they were not sufficient to stop fungal colonization. In addition, several defense genes were induced in inoculated stems, including a Pathogenesis-Related protein- 1 (PR-1), β-1,3-glucanase, chitinases, PR-10, lipoxygenases, a basic peroxidase, a phenylalanine-ammonia lyase and a chalcone synthase. This work allowed to generate knowledge about the progress of the infection of *Dpc* in soybean plants and the activation of plant defense mechanisms in response to this pathogen.