

PRE-HAUSTORIAL AND POST-HAUSTORIAL RESISTANCE OF SUNFLOWER INFECTED WITH BROOMRAPE

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Abstract

The parasitic weed *Orobanche cumana* Wallr. is an obligatory and non-photosynthetic root parasitic plant of the sunflower. During the broomrape life cycle, several resistance mechanisms of the parasite-host interaction have been reported. The studies were focused on the transcriptional activity of some genes involved in reinforcement of cell walls and oxidative stress correlated with the analysis of three enzymes activity and histochemical investigations of root in sunflower resistant (Favorit and PR64LE20) and susceptible (Performer) genotypes at post-attachment and post-haustorial resistance mechanisms.

The experiences have been realized in pots with sterilized soil – uninfected and artificial infected with broomrape seeds. The biologic material was collected in temporal dynamics during the four development phases (attachments, tubercles, undergrounds and flowering shoots) of pathosystem, during the 67 days. The deposition of callose and lignin was analyzed by histochemical methods. The enzymes activity was measured spectrophotometrically and transcript accumulation of genes was assayed by real-time PCR using specific primers.

The comparative analysis of two experimental models in the background of infection: pathogen-host incompatibility (Favorit, PR64LE20 - uninfected) and pathosystem (Performer - infected) was revealed different expression profiles for the same physiological reaction (resistance). In the incompatible combination of the hybrid Favorit - *O. cumana* the biological response to stress in the background of infection beginning with 35 days after cultivation through increasing of lignin and callose content, genes expression and PAL activity. The second resistant genotype PR64LE20 has displayed a defense response at the last experimental stage 67 days by accumulation of compounds, the high mRNA synthesis of the eight genes and the PAL activity. The pre-haustorial resistance in the case of pathosystem Performer - *O. cumana* was poorly manifested. Significant intensification of the stress state was manifested at the period of underground stems and flowering shoots resulting of post-haustorial mechanism activation.

Keywords: *Orobanche cumana*, resistance mechanisms, sunflower