

Many popular crop species from the *Brassicaceae* family, such as *Brassica juncea*, *Brassica napus*, and *Brassica oleracea*, are used mostly as human food, fodder, and green manure. Among such crops is white mustard (*Sinapis alba*); its seeds are mainly utilized as a seasoning and a source of edible oil, and it is also used as a postharvest plant. However, many *S. alba* cultivars show different levels of susceptibility to one of the most devastating fungal necrotrophs to all Brassicas, *Alternaria brassicicola*. Nevertheless, the main fungal virulence factors responsible for the induction of host cell death are unknown. As described in the previous research, this fungus affects photosynthetic performance in Brassicas, inducing changes in photosynthetic parameters, chloroplast damage, and reprogramming transcription of many photosynthesis- and defense-related genes. Some *S. alba* cultivars show resistance against *A. brassicicola*. Therefore, in the present research on *S. alba* plants infected with *A. brassicicola*, early changes in photosynthetic parameters, chlorophyll, carotenoid, and phenolic compound contents were investigated in two common cultivars "Maryna" and "Borowska" mainly cultivated in Poland. Similarly, as in *Brassicaceae* infected with *A. brassicicola*, the infection's progression was time- and leaf position-dependent - the older the leaf, the larger the necrotic spot. A leaf position-dependent decrease in chlorophyll and carotenoid contents was observed in both infected *S. alba* cultivars. Photosynthetic parameters such as, among others, QYmax, Fv/Fm, NPQ, Rfd, qL, analyzed with a FluorCam, showed different levels of reduction in infected leaves compared to control leaves and uninfected areas of infected leaves. Phenolic content decreased in the oldest infected leaves and remained at the control level in the youngest ones. These results indicate a uniformity of *A. brassicicola* infection process in the *Brassicaceae* family and host cell reactions.