



**ROLE OF REACTIVE OXYGEN SPECIES IN SUPPRESSION OF THE BARLEY POWDERY
FUNGUS, *BLUMERIA GRAMINIS* F.SP. *HORDEI* WITH BENZOTHIADIAZOLE AND
RIBOFLAVIN**

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ABSTRACT



Under the influence of riboflavin L-methionine (RF) and benzothiadiazole (BTH), susceptible barley plants exhibited resistance that decreased disease severity of the barley powdery mildew fungus, *Blumeria graminis* f. sp. *hordei* (*Bgh*). At this experiment, leaves were treated twice with 266 μ M RF, 6 hours before inoculation and directly after inoculation with *Bgh*. It was treated also with 0.6 mM BTH one day before inoculation. As a result, disease severity was significantly reduced to 43 and 35%, respectively compared with the control (92%). RF and BTH increased significantly the level of endogenous reactive oxygen species (ROS) such as superoxide ($O_2^{\cdot-}$) and hydrogen peroxide (H_2O_2) early 6, 12 and 24 hours after inoculation (hai) which are considered to play a critical role in plant disease resistance. This early induction of ROS decreased activities of catalase (CAT) and dehydroascorbate reductase (DHAR) during the first day after inoculation then increased significantly 2, 3 and 4 days after inoculation (dai). Gene expression level of DHAR was significantly increased 3 dai using RT-PCR technique. The induction of ROS endogenously showed dual role of resistance, first was direct inhibition of fungal growth early, second was the immunization of plants by increasing the antioxidants activities. These results indicated that RF and BTH could be recommended as alternatives to fungicides.