Plant Vaccination: Turmeric (Curcuma longa L.) Induced Self-Defense Priming in Chinese Cabbage (Brassica rapa L.)

Joserose, Charu

Plant vaccines to reduce the disease by induced self-defense priming by phytochemicals are at its infancy. This study explores the chances of self-defense priming in Chinese cabbage, Brassica rapa L., by seed treatments and soil modification using Turmeric (Curcuma longa L.) rhizome extract against the fungal pathogen, Colletotrichum species causing Anthracnose disease. Two experiments were conducted. In the first experiment, three sets of Chinese cabbage seeds were soaked in Petri plates for twenty four hours a) turmeric rhizome extract, b) salicylic acid (SA), - a known plant defense activator- as positive control and c) purified water as negative control. Seeds were then sown into individual pots. In the second experiment, Chinese cabbage seedlings were grown in pots where the pot soil was modified by adding predetermined doses twice a day, for three days a) of turmeric extracts, b) SA, and c) with purified water. Plants in all treatments, both seed treated and soil modified, were inoculated by all-purpose sprayer with Colletotrichum sp. conidia suspension. The plants were examined after seven days for the number of foliar lesions and quantified. The results of both experiments show that turmeric treatment leads to significant reduction of foliar lesions compared to untreated plants. The plants grown in turmeric, SA modified soil ($df=3$, $P< 0.001$), seed soaked and grown in the turmeric and SA compared to negative control ($df=3$, $P< 0.001$). The study reveals that turmeric rhizome extract can induce self-defense priming in plants and could be a future contender as a “plant vaccine”.

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