

园艺—研究报告

黑腐病对花椰菜 (*Brassica oleracea* L. var. *botrytis*) 幼苗根系形态和生理的影响

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摘要:

为了阐明黑腐病对苗期花椰菜的根系形态和生理的影响, 对建立花椰菜抗黑腐病根系育种新途径提供依据, 利用黑腐病菌感染花椰菜抗病品种雪峰叶片后, 研究植株根系发生的一系列形态和生理变化。结果表明, 接种7天后的植株根长、根干重、地上部干重、根系活力比接种后2天的显著增加。接种处理的植株根长、根干重和地上部干重明显比未接种对照(CK)低, 但是接种幼苗的根系活力比未接种对照的根系活力高。接种3天后, 接种处理的根系可溶性蛋白质含量一直显著高于未接种对照; 接种后0~4天, 接种处理的根系超氧化物歧化酶(SOD)活性明显低于未接种对照, 但到接种后5~7天, 接种处理的根系SOD活性又高于未接种对照; 根系多酚氧化酶(PPO)活性和脱落酸(ABA)含量在植株接种后都显著高于未接种对照。但是, 黑腐病病原菌没有提高根系过氧化物酶(POD)活性。以上结果说明, 黑腐病菌引起了花椰菜幼苗根部一系列形态变化, 并通过诱导植株根系中防御酶活性和调控内源激素等抵御病原菌的进一步侵染。

关键词: 花椰菜; 黑腐病; 根系活力; 超氧化物歧化酶; 多酚氧化酶; ; 过氧化物酶

Effect of Black Rot (*Xanthomonas campestris* pv. *Campestris*) on the Morphological and Physiological Property of Cauliflower (*Brassica oleracea* L. var. *botrytis*) Seedlings Roots

Abstract:

In order to discuss the effect of black rot (*Xanthomonas campestris* pv. *Campestris*) on the morphological and physiological property of cauliflower (*Brassica oleracea* L. var. *botrytis*) seedlings roots, and provide evidence for establish a new root breeding method of cauliflower resistance to black rot, a serious of root morphological and physiological changes of cauliflower seedlings infected by *Xanthomonas campestris* pv. *Campestris* were studied. The results of the experiment showed that root length, root dry weight, above-ground parts dry weight and root activity increased significantly 7 DAI (days after inoculation) compared with those of 2 DAI in two treatments. Root length, root dry weight and above-ground parts dry weight in inoculated plants were significantly lower than those in non-inoculated plants. However, root activity in inoculated seedlings was significantly higher than that in non-inoculated seedlings. There was higher soluble protein concentration in roots of cauliflower under inoculation than that under non-inoculation 3 DAI; SOD activity in inoculated plants was strikingly lower than that in non-inoculated plants during 0-4 DAI, and then significantly higher than that in non-inoculated plants 5-7 DAI; PPO activity and ABA concentration in roots were significantly elevated by inoculation. However, POD activity in roots was not elevated by inoculation. The results indicated that black rot caused root morphological changes of cauliflower seedlings, and induced activities of defense enzymes and regulated endogenous hormones, such that the plant had better resistance to black rot and prevent invasion of the pathogen.

Keywords: cauliflower black rot root activity SOD PPO POD

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