Alfalfa Common Leaf Spot Pathogen and Its Effects on Related Enzymatic Activity of the Host Plant

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Introduction Alfalfa(Medicago sativa L.), so called "queen of forages", is a nutritious perennial leguminous herb with its high productivity and a great diversity of environmental adaptation(Lu et al., 2005; Lamsal et al., 2007). The diseases of alfalfa have become more and more serious recently which lead to grassland degradation, and decline of grass output and quality. The common leaf spot is one of the most popular and serious diseases which pathogen is Pseudopeziza medicaginis Sacc. in China (Shi and He, 2005). This paper is concerned with alfalfa common leaf spot pathogen and its effects on related enzymatic activity of the host plant.

Materials and methods The diseased leaves were collected in early September 2006 at Guyuan in Ningxia of China. The fungal pathogen was separated by the methods of tissue co-culture, spore centrifugation, and single spore separation. A series of media such as PCA, PSA, PDA, V-8, tomato juice medium, SA, Oatmeal agar medium, alfalfa juice medium, Czapek medium were employed to culture pathogens. The related enzymatic activity(i.e. PAL, POD, PPO, CAT, SOD, β-1, 3-glucanse activity) of alfalfa were detected by colorimetric methods(Yuan et al., 2002).

Results and discussion Alfalfa common leaf spot pathogen was obtained successfully by using different separating methods, and was identified and confirmed as Pseudopeziza medicaginis by its morphological characteristics(Yuan et al., 2002; Shi et al., 2007). Two types of colonies were found that were colored either black or pink. Otherwise, there were a lot of lipid droplets exuded from the mycelia cultured in the Petri dish. Single spores were obtained by the ascospores ejected on medium surface from the mature asci. Alfalfa juice, tomato juice, celery juice, carrot juice media were screened to be the better media for both the mycelia growth and sporulation than the other ones. After the pathogen was in vivo inoculated to compatible or incompatible alfalfa cultivars, disease-resistance related enzymatic activities of phenylalanineammonia lyase(PAL), peroxidase (POD), superoxide dismutase(SOD), β-1, 3-glucanase activity were detected in detail. An obvious relation between enzymatic activity and some cultivar was found, and better enzymatic activity was usually detected in a more disease-resistant cultivar. The present study will provide some evidences for future alfalfa disease-resistance variety screening as well as common leaf spot disease integrated control.

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