

Research progress on the role of sexual hosts for wheat rust epidemiology in China

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Wheat stripe rust, caused by *Puccinia striiformis* f. sp. *tritici*, is a remarkably destructive disease of wheat worldwide and has been an increasing concern since discovery of sexual cycle of the stripe rust fungus based on identification of barberry (*Berberis* spp.) serving as alternate host for the pathogen in recent years. Previous studies demonstrated barberry plays an important role in providing initial inoculum to trigger the stem rust infection on wheat around the susceptible barberry in natural conditions, and in generating new races of the stem rust fungus through genetic recombination after completion of sexual stage on barberry in some of American and European countries. However, the function of barberry for wheat stripe rust is limited so far. In recent years, we made efforts to verify the role of barberry in epidemiology of wheat stripe rust in China and obtained primary results. Based on our investigations, thirty five of *Berberis* spp. were identified currently and distribute widely in China, especially northwestern and southwestern regions of China. Twenty eight of *Berberis* spp. were identified to serve as alternate hosts for *Puccinia striiformis* f. sp. *tritici* (Pst), the causal pathogen of wheat stripe rust. Importantly, a total of twenty Pst samples were isolated from *Berberis* spp. with natural aecial infections that were collected from different provinces of China. Identification of these Pst samples in pathogenicity on Chinese differentials for Pst indicated that two of Pst samples were CYR32 that is known predominant Pst race, and the other were new that differ from all of known Chinese Pst races. Single uredium isolates derived from the twenty Pst samples showed diverse phenotypes on a set of single *Yr* gene lines as compared that of their parent Pst samples. This suggests that barberry plays a role in providing inoculum to cause stripe rust infection of wheat around the infected barberry and resulting in virulence variation to generate new Pst races in natural conditions in areas where the susceptible barberry and wheat co-exist. Further studies on relation between barberry and stripe rust fungus on its primary, and accessory hosts in epidemiology of wheat stripe rust are in progress.

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