Study on Pathogenicity of *Verticillium* Wilt in Shanxi Province

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Abstract: In August 2001, *Verticillium* wilt in Yuncheng, Linfen, Jindongnan and Jinzhong, major cotton growing areas of Shanxi province, had been sampled, separated, purified and identified, representatively. 19 representative strains were got, and three check strains including two Jiangsu defoliating strains and an intermediate type of Xinjiang Bazhong strain, were collected, at temperature from 15℃ to 30℃, strains from different areas were put into PDA plates indoors. Then the growth quantity, form, texture, color of colony, the size and quantity of microsclerotium were observed. Additionally, at temperature from 25℃ to 28℃ in greenhouse, different *Verticillium* wilt strains were put into disinfected soil in plastic bowls with the proportion of 1.5%. Five differential hosts were used in the test including three upland cotton species (CCRI 12, Jin 13 and BD18), a Chinese cotton species Shixiya and a sea-island cotton species 7124. According to national normal standard, the test was conducted when the disease was breaking out. By the index of state on differential hosts, these strains were divided into different pathogenic types.

From 2002 to 2003, at temperature from 15℃ to 30℃, identification on the diameter of colony of every representative strain vertically in the standard culture medium of PDA showed that all the strains could grow and produce the melanin and typical microsclerotium. It also showed temperature could affect hypha growth of every strains greatly. Hypha of strains grew rapidly at 25℃, fairly fast at 20℃ and 30℃, relatively slow at 15℃. According to the situation, strains of *Verticillium* wilt in major cotton growing areas of Shanxi province was *Verticillium* dahliae Kleb., not *Verticillium albo-atrum* R. &. B. which don't produce microsclerotium.

In PDA plates, these strains showed differences in growth quantity of colony, in shaping velocity and quantity and size of microsclerotium, in producing ratio of melanin, also in pathogenic power. The reason for these physiological differences is the change of ecological environment. According to 22 strains' pathogenic reaction to five differential hosts and the identification of pathogenicity, *Verticillium dahliae* in Shanxi province was physiologically divided into three types: Type I (asevere defoliating virulence), Type II(an intermediate one), Type III(a mild one) with the proportion of 50%, 36.4% and 13.6%, respectively. Because of different pathogenicity, *Verticillium dahliae* showed different symptoms in the field. There were two symptoms in type I, bacterial wilt and spotted wilt; symptoms in type II were spotted wilt and leaf scorch; symptoms in type III was yellow spot. The high proportion of string pathogenic strains forces farmers to plant species with strong disease-resistance. But now, there are few species against *Verticillium* wilt, So breeding researchers should do their best to select and breed new species with strong disease-resistance against defoliating *Verticillium* wilt.

Key words: Shanxi province; cotton; *Verticillium* wilt; pathogenicity; defoliation