

Studies on the Breeding for Z5629, a Glandless Cotton Germplasm with Resistant to *Verticillium dahliae* and Its Resistant Mechanism

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Abstract: A glandless cotton germplasm named Z5629 with high resistance to *Verticillium dahliae* was derived through the method of direction and continuous selection in the disease nursery. The mechanism of its resistance to *Verticillium dahliae* was studied via the compared analysis of the plant anatomical structure, PAL activity and root exudates in the plants in the different time of inoculation with *Verticillium dahliae*, an Anyang strain with intermediate virulent, using its genetic background line and other six resistant and susceptible upland cotton cul-

tivars as check. The results showed that there were more pith rays, xylem parenchyma cells, and vessels with thicker wall and smaller diameter in Z5629 stem and taproots, comparing with its genetic background line. The PAL activity was increased in the Z5629 much more greatly after inoculation than that in its genetic background line and other resistant and/or susceptible cultivars, which was a very special character might relate to its resistance. There were only six amino acids, namely serine, glycine, valine, methionine, tyrosine, and arginine, with a total content of 3.05 μg per plant, in Z5629 root exudates, which were much less than that in its background line. The saccharide types in the root exudates were no different between two materials, but the contents of glucose, fructose and sucrose in Z5629 root exudates were much lower than those in its background line.

Key words: cotton; *Verticillium* wilt; , germplasm; resistant mechanism