

Nantiya Techati 2008 Identification and Genetic Diversity of Bacterial Leaf streak of Corn. Master of Science (Agriculture), Major Field : Plant Pathology , Department of Plant Pathology. Thesis Advisor : Associate Professor Sutruedee Prathuangwong, Ph.D. 104 papes.

In the past two years, a bacterial disease of corn exhibited complex symptoms was observed on commercial fields. Infected plants seemed to be a bacterial leaf streak caused by genus *Acidovorax*, but disease development was varied among with or without water soaking and halo, and lesion size and shape. Bacterial isolated and cultured from the lesions were identified using standard physiological and biochemical tests and confirmed by species-specific polymerase chain reaction of the 16S-23S rDNA ITS and DNA sequencing analysis. Gram reaction, aerobic, rod-shaped bacterium that produced creamy white, circular smooth with entire margins, glistening colonies with 1-2 mm in diameter on NGA medium was isolated consistently from those diseased plants. Pathogenicity tests established symptoms similar to those observed on corn plants in the fields. Confirming the 16S-23S ITS PCR analysis resulted in fragment about 615 bp belonging to *Acidovorax avenae* subsp. *avenae* from all randomly representative strains of different symptoms and result of DNA sequencing of Aaa1, Aaa9 and Aaa84 representative isolates have been 99, 100 and 99% identity with *A. avenae* subsp. *avenae* FC-320, resembling bacterial leaf streak approaches. The strains were also identified in term of their DNA fingerprinting profiles using repetitive-PCR analysis. Result showed the existence of two differentiated groups within 109 strains of *A. avenae* subsp. *avenae*, one included non-aggressive strains group that were more associated with phenotypic symptoms: short streak lesions and irregular margin (Group A). The other groups as aggressive strains that consisting of strains that were usually associated with phenotypic symptoms: long streak lesions, water soaking and haloes parallel with leaf vein (Group B) and long streak lesions and leaf blight observed (Group C). The fingerprints were distinctly different by BOX primer that 1500 bp was detected by strains belonging to Group B and C (72.4 and 22.8% respectively), and 750 and 1000 bp belonging to all group. These strain groups were not associated with either geographic distribution or corn cultivars. The investigation of specificity between host-parasite interaction including pathogen strain, inoculation technique, resistance germplasm and favored condition is necessary for monitoring epidermics, breeding material, and control strategy. The three methods of inoculation techniques were studies using the most virulence strain Aaa9, and cv Insee2 with varying inoculation periods. The inoculation method on 7 days old plant with 48-h bacterial suspension, handle spray and covered with plastic bag for 48-h, has been resulted in significantly highest level of disease severity ($p \leq 0.05$). This developed method was use to evaluate the 33 sweet and field corn cultivars that could be identified their resistance level into 3 groups including group I: Sugar75, Ban-Souan, KSSC915, Ki39, Ki40, Ki44, Ki45, Ki32, Ki35, Ki37, Ki38, Ki 43, Ki46, Ki49, Ki 50 and Ki52; group II: Hybrid10, KSSC904,14004, Ki31, Ki33, Ki36, Ki41, Ki42, Ki47, Ki48, and Ki51; and group III: KSSC903, Insee2, KSSC901 and Hybrid3 showed resistant, moderately resistant, and susceptible infection by *A. avenae* subsp. *avenae* respectively.

Student's signature

Thesis Advisor's signature