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K. ANTIMICROBIAL PEPTIDES AND PROTEINS

45. ANALYSIS OF SEVERAL ANTAGONISTIC BACTERIAL PROTEINS TO *XANTHOMONAS ORYZAE* PV. *ORYZAE*

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130 antagonistic bacterial strains which could inhabit the growth of *Xanthomonas oryzae* pv. *oryzae* were isolated from rhizosphere, phyllosphere, atmosphere and other places. Several antagonistic peptides from *Bacillus cereus* strain G35, *B. subtilis* strain P11 and B826, *B*. sp. strain A30 and *Enterobacter cloacae* strain B8 were analyzed and purified by SDS-PAGE LC, FPLC and HPLC. Two antagonistic peptides were partially sequenced. Three genomic libraries were constructed in lambda ZAP II for strain P11, B826 and A30. Several positive clones were screened by immunological assays. The fusion proteins of B826 and A30, which were expressed in *E. coli*, showed the antagonistic activity to *X. oryzae* pv. *oryzae*.

Four strains B826, G35 and P11 were sprayed on the rice leaves during the tillering stage in green house, then the *X. oryzae* pv. *oryzae* CNX18 was inoculated by clipping leaves. All four strains show strong inhibition to the growth of *X. oryzae* pv. *oryzae*. The strains of B826 and B8 decreased the disease index of rice bacterial leaf blight caused by *X. oryzae* pv. *oryzae* about 10% to 39%. To study colonization and antagonistic action of antagonistic bacteria on rice leaves in field, a rifampicin (Rf) and kanamycin (Km) resistant mutant BX8 from *E. cloacae* B8 was obtained by natural selection and mutagenesis of Tn5. Our experiment showed that the generation of drug resistance did not decrease its antagonistic activity. The drug resistance of BX8 was stable when it was cultured in medium without drugs. The colonization experiments in green house showed that B8 could colonize on rice leaves and have a strong inhibition to the growth of *X. oryzae* pv. *oryzae*.

46. USE OF LYTIC PEPTIDES TO GENETICALLY ENGINEER DISEASE RESISTANT SOYBEANS AND RICE

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The development of plants with inherent genetic resistance to disease offers significant economic and environmental advantages to soybean and rice producers. Genetically engineered plants capable of producing small specialized proteins termed lytic peptides offers a promising approach to developing disease resistance. A group of lytic peptides called cecropins were originally isolated from *Hyalophora cecropia*, the giant silk moth, and have been shown to have potent anti-microbial activity both *in vitro* and *in vivo*. The peptides function to confer resistance by disrupting membrane permeability, resulting in lysis and death of the microbe. Field testing of potatoes into which a lytic peptide gene was transferred indicates that the gene is functional in conferring improved disease resistance in plants. This report will describe the results of research directed towards transferring the gene into soybeans and rice.