특별강연 II

Molecular Tools for Insect Pest Management

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Molecular biological techniques have become indispensable tools in almost every field of biological science including fundamental and applied entomology. Studies on the molecular mechanisms of insecticide action and resistance have important practical implications for establishing an efficient pest management system. Understanding the function of mutations associated with resistance also can provide clues to the identification of insecticide binding site on target proteins, which, in turn, allows more rational approaches to the development of novel insecticides. In our laboratory, molecular resistance mechanisms mediated by the insensitive acetylcholinesterase and sodium channel have been elucidated. DNA-based diagnostic protocols including bi-directional PASA, SSCP, and minisequencing have been developed for the detection of mutations associated with insecticide resistance. Molecular basis of pyrethroid-target site interaction has been investigated through site-directed mutagenesis of sodium channel gene in conjunction with functional analysis. Searching for novel insecticide target sites have been pursued by cloning and characterization of insect-specific neuronal gene such as *tipE*-like gene. In this seminar, I will discuss the potential use and perspectives of these various molecular approaches in insect pest management.