

Arngkhan Yisankhun 2010: Molecular Characterization and Biological Assay of *Sugarcane Mosaic Virus* and *Brome Mosaic Virus* Infecting Sorghum in Thailand. Master of Science (Plant Pathology), Major Field: Plant Pathology, Department of Plant Pathology. Thesis Advisor: Assistant Professor Kanungnit Reanwarakorn, Ph.D. 91 pages.

This research was done molecular characterization and disease virulent test of *Sugarcane mosaic virus* (SCMV) and *Brome mosaic virus* (BMV) infecting sorghum in Thailand. Sorghum leaf samples showing mosaic symptoms were collected from sorghum fields. By indirect-enzyme linked immunosorbent assay (Indirect-ELISA) technique, the infected leaves were found SCMV in Lop Buri (SCMV-Sr-LB), Nakhon Sawan (SCMV-Sr-NW), Suphan Buri (SCMV-Sr-SP), Kanchana Buri (SCMV-Sr-KB), and Phetchabun (SCMV-Sr-PB1, PB2 and PB3) provinces and BMV in Sara Buri (BMV-Sr-SB) province. Detected leaf samples were isolated on indicator plants and multiplied on sorghum. All SCMV and BMV isolates inoculated sorghum plants expressed mosaic symptoms. By using transmission electron microscope and sodium dodecyl sulfate-polyacrylamide gel electrophoresis (SDS-PAGE), all 7 isolates of SCMV were flexuous rods particle and the coat protein subunits of them have molecular weight of approximately 39.37 kDa as well as BMV-Sr-SB was isometric particle and molecular weight of a coat protein was approximately 21.98 kDa. With cloning, sequencing, and amino acid sequence comparison analysis, all the SCMV isolates were displayed 81-100% identity with each others and 78-95 % as well as 81-99 % homology with previous reported amino acid sequences of sugarcane and maize in Thailand, respectively. For BMV-Sr-SB, was 98 % homology with maize isolated BMV in Thailand. By Phylogenetic tree analysis, SCMV-Sr-NW, KB, PB1, PB2 and PB3 isolates were the same group with SCMV infecting sugarcane and maize in Thailand, but SCMV-Sr-LB and SP isolates were the same group with SCMV infecting sugarcane and maize in foreign countries. The BMV-Sr-SB was the same group with BMV infecting maize in Thailand.

Virulent test of all the SCMV and BMV isolates were done on sorghum and maize, the SCMV-Sr-LB isolate was the most virulent isolate on sorghum shown 94.2 % disease incidence and the BMV-Sr-SB isolate caused severe symptoms on sweet corn which expressed leaf blight at 11 day post inoculation including stunting.

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Thesis Advisor's signature