



Wanwisa Pitimat 2008: The Evaluation of *Ustilago scitaminea* Sydow in the Tissues of Various Sugarcane Cultivars. Master of Science (Agricultural Research and Development) Major Field: Agricultural Research and Development, Interdisciplinary Graduate Program. Thesis Advisor: Assistant Professor Chalida Leksomboon, Ph.D. 62 pages.

Evaluation of *Ustilago scitaminea* Sydow in sugarcane tissue for the study of the presence of this pathogen in inoculated different sugarcane cultivars were performed in the greenhouse condition. Four sugarcane cultivars, K24-200 UT1 Kps94-13 and H59-3775 were compared for resistance to smut as measured by disease symptom and pathogen distribution in the plant tissues. Polymerase chain reaction (PCR) and microscopy were used to investigate the distribution in sugarcane tissue. Primer *bE4* (5'-CGCTCTGGTTCATCAAACG-3') and *bE8* (5'-TGCTGTCGATGGAAGGTGT-3') which amplifies the *bEast* mating-type gene of *U. scitaminea* were used in PCR study. Different inoculation method, immersion and injection method, were assayed to determine by PCR or microscopy. No amplification product was observed in all cultivars at 1 2 and 3 months and fungal growth was also not observed in the inoculation with teliospore by immersion method. By using injection with sporidia suspension, all four cultivars yielded positive PCR products but the number of positive plants varied for each cultivar.

The effect of age and size of sugarcane seedling on the detection was performed in cultivars Kps94-13 by sporidia injection. The highest positive detection by PCR and microscopy occurred in three weeks old seedlings with 6-8 mm in diameter of stem. The different sugarcane cultivars differed in resistance to smut, K84-200 and Kps94-13, were used for investigation of the presence of the pathogen. By using injection method with sporidia and teliospore, the PCR assay was the better method for smut detection than microscopy. At 28 days post-inoculation, the PCR assay yielded a positive response at a frequency of 100 and 75% in cultivar K84-200 and Kps94-13, respectively. Whereas visual detection of the hyphae through microscopy was 62.5 and 75%, respectively. Results from this study indicated that none of the cultivars included in the study was immune to *U. scitaminea* and there was no relationship between the presence of the pathogen and plant resistance.

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