Supranee Boonnontae 2010: Development of the Rapid and Efficient Method for Sugarcane White Leaf Disease Detection. Master of Science (Economic Botany), Major Field: Economic Botany, Division of Science. Thesis Advisor: Associate Professor Siripatr Prammanee, Ph.D. 95 pages.

The aim of this research is developing the rapid and efficient method for sugarcane white leaf disease detection. The specific probe for sugarcane phytoplasma white leaf disease was screened. PCR products from polymerase chain reaction (PCR) using four primer sets design from 16S rRNA which specific to phytoplasma of sugarcane white leaf disease were cloned. These clones were selected by testing on sugarcane leaf and insects samples. The inserted DNA of recombinant clones were cut by restriction enzyme *Not*I and labelled with dioxigenin. The samples were detected by dot blot hybridization method. The result showed that clone from primer A1A2 gave the best signal and the signal present only on the white leaf disease but absent on the healthy samples. However, the rapid and efficient detection, the shorter procedure of sample extraction are required. The modified DNA extraction using the extraction buffer following by Dellaporta *et al.*(1983), Kang *et al*.(1998) and Kristi *et a.*(2002) were used. The comparison between liquid nitrogen and silica powder to grind the tissue samples were studied. The efficient result was the method using extraction buffer following by Dellaporta *et al.*(1983) and grinding the sample by liquid nitrogen. In the short procedure experiment of crude extract which was incubated at -80 °C for 1 hour showed stronger signal detection than incubated at room temperature for 10 minute and crude extract without incubation. DNA extraction by this method could be able to amplify by PCR reaction and the result showed PCR product only in white leaf disease sample.

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