ABSTRACT

Sugarcane white leaf disease is caused by plant pathogenic phytoplasma. The disease is transmitted to the plant by the leafhopper *Matsumuratettix hiroglyphicus* (Mutsumura). Leafhopper vector and other leafhopper species in sugarcane fields at Kumpawapee district, Udon Thani province were surveyed during March 2002 to December 2003 by using light traps. A total of sixty nine leafhopper species from family Cicadellidae were found. Using nested PCR, a 210 base pair amplified DNA fragment of phytoplasma associated with sugarcane white leaf disease was detected from twelve species of leafhoppers (*Matsumuratettix hiroglyphicus*, *Exitianus indicus*, *Yamatotettix flavovittatus*, *Recilia* sp., *Recilia distinctus*, *Balclutha* sp., *Xestocephalus* sp., *Bhatia olivacea*, *Recilia dorsalis*, *Macrosteles striifrons*, *Thaia oryzivora* and *Balclutha rubrostriata*). Among those, the *Xestocephalus* sp. showed the highest rate of phytoplasma infection at 34.32%, followed by the *T. oryzivora*, *B. rubrostriata*, *M. hiroglyphicus* and *Balclutha* sp. with 30.76%, 30%, 25.35% and 23.73% phytoplasma infection, respectively. Only 5-15% infection with phytoplasma was found in the other leafhopper species.

The population dynamic of twelve leafhopper species showed the abundance of population during the rainy season from May to October. However, the highest peak period and amount of population varied with species. The highest disease prevalence occurred when the sugarcane was at the longation phase rather than the tillering and harvesting phases. The disease prevalence was highest at 12.90% and progressively decreased in October and November. The mechanism of disease transmission of phytoplasma from sugarcane white leaf plant to healthy plants was investigated by using three leafhoppers species (*E. indicus*, *Y. flavovittatus* and *M. hiroglyphicus*). The result showed that only the *Y. flavovittatus* and *M. hiroglyphicus* can transmit sugarcane white leaf phytoplasma to healthy sugarcane plants by revealing an amplified
phytoplasma DNA band of 210 base pair with an acquisition period of 48, 72 and 168 hours, Y. flavovittatus showed 10%, 20% and 20% of plant disease transmission, respectively. When using 3, 24 and 168 hour of acquisition period, the M. hiroglyphicus resulted in 10%, 10% and 55% of plant disease transmission, respectively.