

UNIVERSITI TEKNOLOGI MARA

**HOST PLANT PREFERENCE AND LIFE CYCLE
OF WHITEFLY (*Bemisia tabaci*, Gennadius),
ITS TOXICITY AND POPULATIONS
SUSCEPTIBILITY AGAINST
SELECTED INSECTICIDES**

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ABSTRACT

The sweetpotato whitefly, *Bemisia tabaci* (Gennadius) (Homoptera: Aleyrodidae) is a tiny, soft-bodied insect with sucking type mouthpart and is not a true fly. It is a serious insect pest and has an extremely wide range of hosts including edible, ornamental crops and weeds. In this study, five main areas were given emphasis namely, host plant preference, life cycle, fecundity, toxicology and resistance level in the populations of *B. tabaci* collected from fields. The study of host plant preferences on both multi-choice and no-choice tests found that the two most preferred host plants of *B. tabaci* were brinjal (*Solanum melongena*) and tobacco (*Nicotiana tabacum*). In temperature of $24.34 \pm 0.18^{\circ}\text{C}$, the developmental stages of *B. tabaci* on brinjal were 30.57 ± 0.83 days and 30.19 ± 0.91 days for tobacco plants. The adults' female of *B. tabaci* laid more eggs on brinjal plants (154.67 ± 16.97) compared with tobacco plants (127.33 ± 7.86) in the duration of 24 days. The effects of eight insecticides on the life cycle of *B. tabaci* were tested using leaf-dip bioassay and their toxicity was measured using LC_{50} values. Abamectin was found to be effective in controlling the eggs, nymphs and adults of *B. tabaci*. Esfenvalerate, acetamiprid and Profenofos were very toxic to the nymphs. Against *B. tabaci* adults, chlorpyrifos + cypermethrin and dimethoate were more effective than other insecticides tested. The susceptibility of *B. tabaci* collected from the fields in Tanah Rata (WF-FTR), Kampung Raja (WF-FKR) and Lanchang (WF-FL) was compared with the laboratory reared population (WF-S). The WF-FL population showed high tolerance toward deltamethrin as it showed a resistant level 6.70-fold. The WF-FTR population was found to be 36.31-fold less sensitive to deltamethrin and WF-FKR population was found to be 12.32-fold less sensitive to diafenthiuron when compared with WF-S population. The WF-FTR and WF-FKR populations showed early indication of resistant development to deltamethrin and diafenthiuron. Hence, alternate applications of profenofos, acetamiprid, deltamethrin and diafenthiuron should be recommended to the farmers particularly those operating in the highland vegetable areas to control and minimize the development of resistance in the whitefly populations.

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CHAPTER ONE

INTRODUCTION

Whiteflies (Plate 1.1) are tiny, soft-bodied insects. They are not true flies, but belong to the order Hemiptera (suborder Homoptera) which means "same wing" both the front and back wings are membranous and appear very similar. Other homopterous insects include aphids, scale insects, leafhoppers and mealybugs. Whiteflies derive their name from white, waxy substances secreted by special glands on their abdomen. The adults coat their bodies, particularly their wings, with this wax hence the name "whiteflies". The immature stages (nymphs) also secrete wax in various forms, and the appearance and shape of these waxy strands, plates and filaments are often useful in species identification.



Plate 1.1: Adults and Eggs of Whitefly

Source: <http://www.beneficialinsects.com/BeneficialPics/whiteflieslg.jpg>

Magnification: $\pm 10x$

Many methods have been practiced to control this pest. Previously, the damage by whitefly in Malaysia is not serious compared to other countries. However in recent years, serious outbreaks by whitefly were observed on economically important vegetables both in the lowland and highland areas (Syed Abdul Rahman et al., 2000). So, it is important to provide essential information and knowledge on the biology,