

## Fecundity of Thrips (*Megalurothrips* spp.) on Long Bean (*Vigna unguiculata*)

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### ABSTRACT

*Thrips* is relatively small, less than 2 mm in size and considered as a serious insect pest to ornamental, vegetable, and fruit crops. *Thrips* belong to the insect order of Thysanoptera. These insect pests are causing major damage to the crop directly and indirectly. In this study, an experiment has been conducted to determine the fecundity of thrips. The host plants that were used in the study were long bean (*Vigna unguiculata*). The objective of this study was to determine the fecundity of female thrips. Result found that the maximum number of offspring produced by one pair of thrips was 14. The result obtained can be a useful information as a baseline data in order to formulate Integrated Pest Management (IPM) of controlling techniques such as in selecting types of insecticide, mode of action and also a combination of other techniques such as biological control.

**Key Words:** *thrips*, *fecundity*

### Introduction

Thrips is a polyphagous species belong to the insect order of Thysanoptera means of fringe wings which the wings of adult thrips are fringed with the long hairs. Thrips able run crawls, jump and can move rapidly. Flight is the major method of active dispersal; however, they can be aerially dispersed by drifting in wind currents for many miles. The mouthpart is piercing-sucking with only a left mandible and the antennae are short about four to nine segments. Thrips are divided into two suborders namely, Terebrantia and Tubulifera. There are differing in the shape of the last abdominal segment and the development of ovipositor. The Terebrantia have the last abdominal segment more or less conical or rounded, and the female almost always has a well-developed, saw-like ovipositor [Figure 2 (a)]. The Tubulifera have the last abdominal segment tubular, and the females lack an ovipositor [Figure 2 (b)]. The families of thrips are separated largely by the characters of the antennae, particularly the number of antennal segments and the nature of the sensorial on the third and fourth segments.

Thrips are similar in appearance, but the females are usually larger in size and lighter in color. The metamorphosis of thrips is somewhat intermediate between simple and complete. Female thrips lay eggs single in an incision made into soft plant tissue with the ovipositor and eggs are kidney shaped and whitish-yellow in colour. The eggs are about 0.2 mm long and may take on average three days to hatch. Thrips clutches average 50 eggs. But some species of predatory thrips lay eggs on leaf surface. Following egg hatch, developing thrips pass through two actively feeding immature stages called larvae. All thrips species have more than one pupa stage in their lifecycle. In the suborder Terebrantia, the first and two instars are called larvae whether the third instar is called prepupa and the fourth is pupa which often spent on the ground in soil. The third and fourth instars which are inactive, do not feed, and have external wing pads. In the suborder Tubulifera, the first and two instars are called larvae whether the third and fourth instars are prepupa and the last instar is pupa. Thrips do not feed as pupae and many drop into the soil and leaf litter below host plants to pupate. Following pupation, adult thrips move back onto the host plant to for feeding and reproduction purpose.

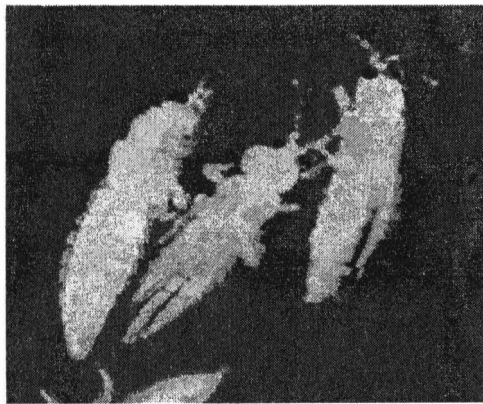
A great number of thrips are plant feeders. Both larvae and adults feed on flowers, leaves, twigs using their piercing-sucking mouthparts which causing structural abnormalities of foliage in the form of leaf malformation, leaf fold, leaf roll, leaf blisters, defoliation, discolouration of petals and scarring of flowers. A few species of thrips feed on fungus spores, predaceous on other small arthropods such as mites, and aphids and some species may bite a man. Common vegetables injured by thrips were long bean, cabbage, chili, Chinese cabbage, cowpea, cucumber, eggplant, lettuce, melon, okra, onion, pea, pepper, potato, pumpkin, squash, and watermelon. Cucurbits were more preferred than eggplant, whereas pepper was less preferred than eggplant. Other crops infested include avocado, carnation, chrysanthemum, citrus, cotton, hibiscus, mango, peach, plum, soybean, and tobacco (Capinera, 2004).

Thrips known as a transmission of virus diseases such as tomato spotted wilt virus which transmitted by the western flower thrips, tobacco thrips, and onion thrips (<http://mrec.ifas.ufl.edu/iso/entomol/NCSTATE/thrips.htm>). Avocado, citrus, and greenhouse thrips cause silvery to brownish, scabby scarring on the avocado and citrus fruit surface, but this cosmetic damage does not harm the internal fruit quality. Feces may remain on leaves or fruit long after thrips have left. Where thrips lay eggs on grapes, dark scars surrounded by lighter "halos" may be found on the fruit. Thrips feeding on raspberries, apples, and nectarines can deform or scar developing fruit; sugar pea pods may be scarred or deformed.

The western flower thrips are primarily pests of herbaceous plants, but high populations occasionally damage continuously or late-blossoming flowers on woody plants such as roses. When thrips populations are high on roses, flower buds may become deformed and fail to open. Petals may be covered with brown streaks and spots. The western flower thrips also vector certain tospoviruses including impatiens necrotic spot virus and several strains of tomato spotted wilt virus (TSWV). Some plant feeding thrips are also predaceous on other pests, such as spider mites. In some situations western flower thrips is considered beneficial because it feeds on spider mites. Thrips prefer to feed in rapidly growing tissue. They are poor fliers but can spread long distances by floating with the wind or being transported on infested plants. Herbaceous ornamentals and certain fruit and vegetable crops are generally more susceptible to thrips. The infestations may reduce the aesthetic quality of landscapes but usually do not seriously harm or kill woody plants. This causes reduction of yield more than 90 %. (Dreistadt and Phillips, 2001).

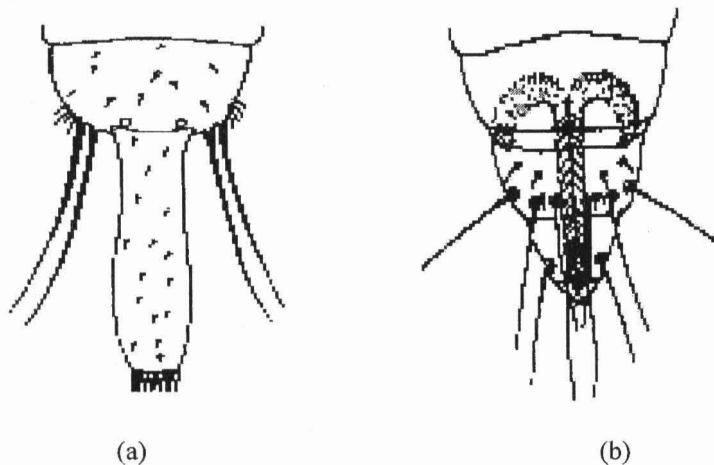
The objective of this study was to determine the fecundity of female thrips. This study were conducted to measure the number of offspring were produced in one time. The data obtaining will given more detail information on biology of thrips which helps to develop a proper strategic programme for controlling the thrips for most serious stages in attacking ornamentals, vegetables and fruits crops

**Figure 1 :** Thrips size



(Source: Hodges et al., 2005)

**wFigure 2:** Differences suborder of thrips Terebrantia (a) and Tubulifera (b)



(Source: <http://mrec.ifas.ufl.edu/lso/entomol/NCSTATE/thrips.htm>)

## Materials and Methods

The samples of thrips used were collected from Kanchong Tengah, Banting Selangor and since their original host plants were long bean (*Vigna unguiculata*). The type of host plant was also maintained in order to get a more accurate result for the study (Harafah, 2003).

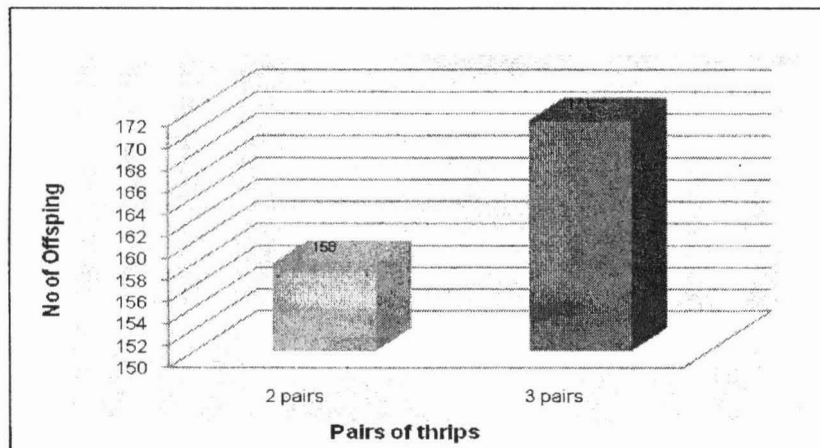
Fecundity refers to the total number of eggs laid by female adults in its lifetime. The first instars have been used as substitutions in identifying the fecundity of thrips. Two or three pairs of adult thrips were introduced on the leaf surface and placed in the container with ratio of 1:1 (male: female). The thrips were then reared for 72 hours to 96 hours. After 72

hours to 96 hours, the adult thrips were then removed. The experiments were replicated 10 times for two pair and another 10 times for three pairs of thrips respectively. The parameter of this study focused on fecundity of thrips and the data were analyzed using SPSS programme.

## Results

Results from the study revealed that, the total number of offsprings produced for two pairs and three pairs of thrips have no significant different ( $P>0.05$ ). Figure 3 showed the distributions of offspring produced within 8 days of rearing pairs of thrips in a transparent container using a single leaf only. The total numbers of eggs produced for two pairs of thrips were 158 while for three pairs were 171. The thrips were reared only for 8 days before the leaf started to deteriorate.

**Figure 3:** Fecundity of thrips offspring produced after 8 days rearing



## Discussions

Adult female thrips can produce up to 80 eggs in its life time (Shelton *et.al*, 1995). Based on the current study, one pair of thrips produced 14 offsprings in eight days. The result showed that the number of offspring produced was not consistent. The finding was not coincided with studied done by Shelton *et.al* (1995). Furthermore the duration for thrips to lay eggs was shorted due to the life span of leaf that acts as oviposition was between seven to eight days. The fluctuations in fecundity of thrips are due to factors such as temperature and relative humidity (Rasdi, 2005).

## Conclusion

In conclusion, adult thrips that were reared may have limitation in term of time and source of nutrient, thus the number of offsprings produced fluctuated and cannot reach the maximum number of offsprings.

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