



Biology of Spiralling Whitefly (*Aleurodicus dispersus* Russel) on Guava

R.S. Sirsat^{1*}, S.R. Kulkarni², R.V. Kadu³ and S.B. Jadhav⁴

¹Post Graduate Scholar, Department of Agril. Entomology, PGI, MPKV, Rahuri, Dist. Ahmednagar (Maharashtra), India.

²Professor (CAS), Department of Agril. Entomology, MPKV, Rahuri-413722, Dist. Ahmednagar (Maharashtra), India.

³Junior Entomologist, AICRP on Fruits, MPKV Rahuri- 413722, Dist. Ahmednagar (Maharashtra), India.

⁴Officer In-Charge and Horticulturist, AICRP on Fruits, MPKV, Rahuri-413722, Dist. Ahmednagar (Maharashtra), India.

(Corresponding author: R.S. Sirsat*)

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ABSTRACT: Experiments on biology of spiralling whitefly (*Aleurodicus dispersus*) was conducted in the laboratory of Department of Agril. Entomology, PGI MPKV Rahuri in 2022. Spiralling whitefly completed life cycle within 42.4 to 46.6 days, with an average of 47.7 days. The average duration of first, second, third and fourth instars were 6.6, 5.1, 6.0 and 6.8 days, respectively. The incubation period lasted for 6.7 days with 96 percent egg hatching. The sex ratio for male to female was 1:1.43. Female laid on an average 43.8 eggs on adaxial surface of the leaves in loose spiral pattern covered with wax.

Keywords: Guava, Spiralling whitefly (*Aleurodicus dispersus*), Biology, Life cycle.

INTRODUCTION

Guava (*Psidium guajava* L.) is an important fruit crop of India's tropical and subtropical region. It is an American native and belongs to Myrtaceae family. It is known as the "Apple of the tropics". The guava fruit is very good source of the dietary fiber i.e., 5.4 g per 100 g of fruit, which is about 14 per cent of DRA which makes it a good bulk laxative. It is a rich source of vitamin C, 100 g of fruit supplies 228 mg of this vitamin, more than thrice of the daily recommended intake (Hinwar, 2013).

In India, the total area under guava is 3.7 lakh ha with annual production of 45.16 lakh tonnes. In Maharashtra, it is grown on 1.21 lakh ha with annual production of 1.29 lakh MT. The major guava producing states are Uttar Pradesh, Madhya Pradesh, Bihar, Andhra Pradesh, Haryana, Punjab, West Bengal, Gujarat and Karnataka. Maharashtra State ranks eleventh in area and production 1.29 lakh MT. However, the share is very low i.e., 2.94 per cent mainly due to insect pest problem (Anonymous 2021).

Adults are larger than many of the whitefly species and white in colour with waxy coating on the body. Eyes are dark reddish brown. Fore wings are with three characteristic spots. Eggs are laid in a spiralling Pattern (concentric circles) on the undersurface of leaves. Egg period lasts for 58 days. Nymphal period is 22-30 days. Adult longevity is for 13-21 days. Total life cycle is completed in 40-50 days. Adults and Nymphs congregate heavily on the lower surface of leaf and

suck the sap. The copious white, waxy flocculent material secreted by all the stages of the pest is readily spread by wind and thus cause public nuisance (Palaniswami *et al.*, 1995).

As there was a meager information is available on its biology in western Maharashtra, the research work has been aimed to study biology of this pest.

MATERIALS AND METHODS

The study on biology of *A. disperses* was carried out in the laboratory of Department of Agril. Entomology, PGI, MPKV Rahuri during in 2022. The initial culture of *A. disperses* was established in the laboratory by collecting adults from the infested guava plants. The adults of spiralling whitefly were collected with the help of aspirator and reared on guava plants. The guava plants raised in polythene bags (15cm length and 7cm diameter) were covered with glass chimney measuring 4.5 cm diameter at the top and 7.2 cm diameter at the bottom with bulging shape in the middle and 23 cm in height. The chimney was gently pressed into the wet soil of the polythene bag to hold it firmly and adults of the spiralling whitefly irrespective of male or female was introduced from the top end for egg laying. The top end of chimney was covered with muslin cloth and kept in position by rubber band. After 24 hours, the chimney was removed and the adults of spiralling whitefly were removed. Few eggs were allowed on each leaf and remaining eggs were removed with the help of a sharp pointer. The eggs were encircled with the help of marker pen and biology of *A. disperses* was studied.

RESULTS AND DISCUSSION

The morphometric parameters of different stages are listed in Table 1 and biology in Table 2. The studies on biology of spiralling whitefly, *A. dispersus* revealed that the female laid on an average 43.8 eggs on adaxial surface of the leaves in loose spiral pattern covered with wax. The eggs were smooth surfaced, elliptical, translucent, light yellowish in colour. The average length and breadth of eggs were 0.29 mm and 0.11 mm, respectively. The incubation period lasted for 6.7 days with 96 percent egg hatching. There were four nymphal instars. The first instar nymphs were translucent yellowish in colour, with a convex dorsum having functional legs. The average duration of first, second, third and fourth instars were 6.6, 5.1, 6.0 and 6.8 days, respectively. The total nymphal period varied from 23 to 27 days with an average of 24.5 days. Fourth instar nymph was measured 1.07 mm in length and 0.71 mm in breadth.

The adults were covered with a white waxy powder, with dark reddish brown eyes and forewing each had two characteristic dark spot. Males were bigger than

female. Adults lived for 13.6 days. Male measured 2.40 mm in length and 1.22 mm in breadth. The female measured 1.86 mm in length and 1.09 mm in breadth. The sex ratio for male to female was 1:1.43. The generation from eggs to death of adult *i.e.*, total life cycle was found to be completed within 42.4 to 46.6 days, with an average of 44.8 days.

The present findings are in close conformity with Elango (2019) who reported a generation period of *A. rugioperculatus* 59.00 ± 3.2 days. Morde (2014) observed that the total period required to complete one life cycle from eggs to the emergence of adult was varied from 32.2 to 38.7 days with a mean of 35 days. Whereas, the generation from eggs to death of adults was found to be completed within 41.2 to 55.7 days with an average of 47.7 days which are more or less similar to the present findings. Lolage (2006) presented more or less similar results and reported total life cycle of *A. dispersus* varied from 55.1 to 42 days with a mean of 46 days. The results obtained are in conformity to those of Mane (2019) who reported the average length of males and females as 2.97 mm and 2.47 mm and an average width of 1.93 mm and 1.47 mm respectively.

Table 1: Biology of spiralling whitefly, *A. dispersus*.

Life stage of insect	Duration
Eggs (days)	6.7
First instar nymphs (days)	6.6
Second instar nymphs (days)	5.1
Third instar nymphs (days)	6.0
Fourth instar nymphs (days)	6.8
Adult longevity (days)	13.6
Total duration of life cycle (days)	44.8
Fecundity (eggs laid/female)	43.8
Hatching percentage (%)	96
Sex ratio (male: female)	1:1.43

Table 2: Morphometric parameters of different stages of *A. dispersus*.

Stage of whitefly	Length (mm)	Breadth(mm)
Eggs	0.28-0.34 (0.29)	0.11-0.13 (0.11)
First instar nymph	0.31-0.36 (0.33)	0.14-0.16(0.14)
Second instar nymph	0.42-0.48 (0.44)	0.24-0.28 (0.26)
Third instar nymph	0.65-0.76 (0.69)	0.40-0.45 (0.42)
Fourth instar nymph	0.93-1.17(1.07)	0.61-0.79 (0.71)
Adult male	2.36-2.42 (2.40)	1.21-1.26 (1.22)
Adult female	1.82-1.92 (1.86)	1.07-1.13 (1.09)

CONCLUSIONS

Spiralling whitefly completed life cycle within 42.4 to 46.6 days, with an average of 44.8 days. The average duration of first, second, third and fourth instars were 6.6, 5.1, 6.0 and 6.8 days, respectively. The incubation period lasted for 6.7 days with 96 percent egg hatching. The sex ratio for male to female was 1:1.43. Female laid on an average 43.8 eggs on adaxial surface of the leaves in loose spiral pattern covered with wax.

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