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Biology of Tur Pod Fly, *Melanagromyza obtusa* Malloch Under South Gujarat Condition*

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ABSTRACT

Colour, shape and biometry of eggs laid by tur pod fly, *Melanagromyza obtusa* Malloch was studied. Egg laying habit and hatchability of eggs were recorded under laboratory conditions. Detailed biology of larva, pupa and adult fly were investigated. Adult female fly was slightly bigger in size and lived longer than the adult males. The female laid on an average 18.083 ± 6.788 eggs during its aveage oviposition period of 3.917 ± 1.378 days. The total life span of male and female was on an average 20.733 ± 1.574 and 21.733± 1.617 days, respectively.

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INTRODUCTION

Maggots of tur pod fly, *Melanagromyza obtusa* Malloch feed on developing grains in the pods of pigeonpea and making them unfit for human consumption and seed purpose. It causes heavy loss in yield (Kapadia and Talati, 1983) to the pigeonpea crop under Gujarat conditions. As suggested by Ahmed (1938), Khokhar (1982) and Bindra *et al.* (1972), the knowledge regarding biology of the pest would be very much useful for the pest management programme of tur crop. They also observed that the information available on biology of *M. obtusa* was limited, therefore, attempts were made to study the biology of *M. obtusa* under laboratory conditions.

MATERIALS AND METHODS

The life cycle of *Melanagromyza obtusa* was carried out in the laboratory, Department of Entomology, Gujarat Agricultural University, Navsari at room temperature (Av. maximum temperature 35°C, Av. minimum temperature 16°C and Av. RH 79%) during the period from February, 1985 to March, 1985. Laboratory culture was raised by collecting rearing the pupae of the pest from the pigeonpea fields of College Farm, N. M. College of Agriculture, Navsari. Newly emerged males and females from the pupae were confined in a glass chimney cage in which fresh uninfested pods of pigeonpea were provided for egg laying. Cotton wool soaked in 5 per cent hiney solution was kept in the cage as a food for the flies. Observations on biology of the pest were recorded.

RESULTS AND DISCUSSION

Eggs : Freshly laid eggs were white in colour, oval in shape and measured on an average 0.710 ± 0.612 mm in length and 0.155 ± 0.0139 mm in breadth (n=50). The average length and breadth of eggs of *M. obtusa* reported by Ahmed (1938) were 0.66 mm and 0.15 mm, respectively. The

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incubation period of the eggs varied from 2 to 4 days with an average of 2.561 ± 0.594 days (n=51). Ahmed (1938) reported incubation period as 2 to 3 days with a mean of 3.2 days, whereas Bindra and Singh (1972) reported it to be 5 to 8 days. Hatching percentage of the eggs in the per cent study varied from 66.7 to 100 (Av. 80.39%), but, Ahmed (1938) reported only 74.00 per cent hatching.

Larva : The freshly hatched maggot (larva) was white in colour, except its mouth parts, which were dark brown in the begining and turned to black later on. It was apodus and rounded at both the ends with cylindrical shape (Figure 1a). The average length of newly hatched larva (n=47) was 0.623 ± 0.0326 mm and the breadth was 0.141 ± 0.018 mm. Initial feeding of the larvae on seeds looks like mines. The galleries prepared by them, run just under the epidermis of the

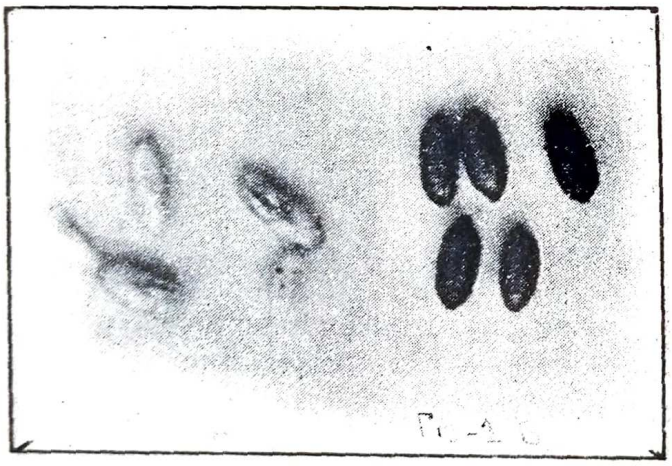

Fig. 1A

Fig. 1B

seeds. The full grown larva before pupation cuts a hole remaining inside the seed, leading to the outer surface of the seed which helps easy escape of emerging fly. The full grown larva was subcylindrical in shape with tappering head end, which usually bends downwards darker mouth parts. The colour of the larval body was creamy white but it acquired a yellowish tinge just before pupation. The larva measured on an average 3.290 ± 0.269 mm in length and 1.140 ± 0.102 mm in breadth (n=60). The larval period varied from 4 to 8 days with an average of 5.977 ± 1.165 days (n=64). Percentage pupation varied from 64.7 to 78.57 with an average of 67.20.

Pupa : The fresh puparium was yellowish white in colour, which turned into brown within 24 hours of its formation (Figure 1b).

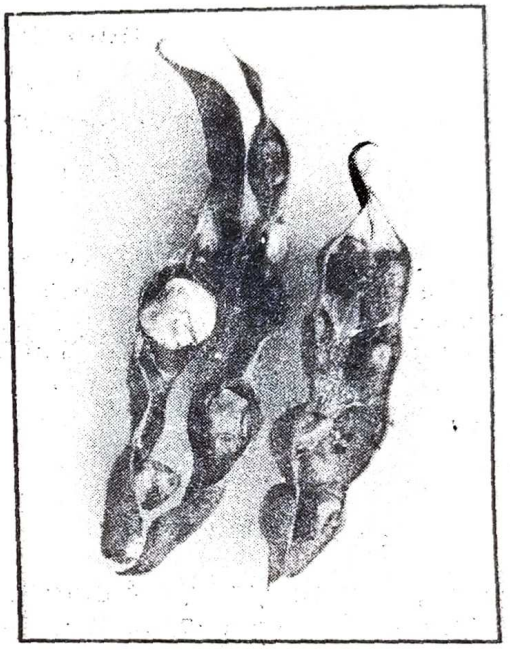

Fig. 2

It remains attached to inner part of the pod by means of a sticky excudation secreted by the pupating larva (Figure 2). Average length and breadth of pupae were 3.569 ± 0.074 mm and 1.459 ± 0.07 mm, respectively (n=60). The pupal period varied from 6.00 to 8.00 days (Av. 7.411 ± 0.814 days). Khokhar (1982) reported pupal period from 8 to 12 and 7 to 10 days during March and April months, respectively. Per cent of adult emergance from pupae varied from 64.28 to 90.00 with an overall average of 80.00 (n=98).

Adult : The wings of freshly emerged fly were wrinkled which expanded fully after some time. Body colour of the freshly emerged fly was dull white with smokey patches. The normal black body colour was assumed after an hour of emergance. Abdomen of the female was broadly ovate and

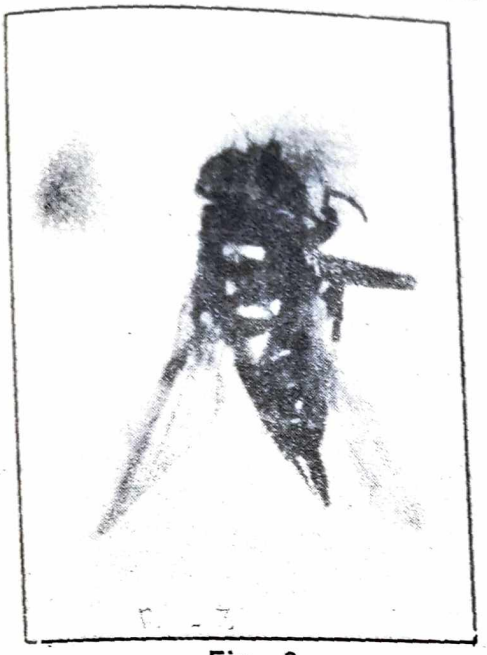

Fig. 3

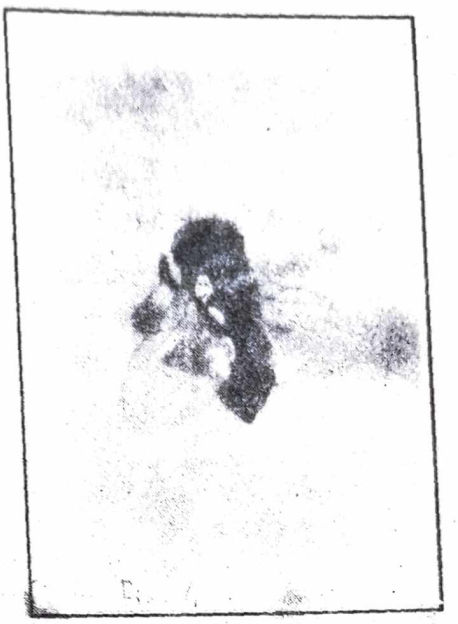

Fig. 4

shining black in colour. The female fly had a short, blackish tubular ovipositor at the tip of the abdomen (Figure 3). Length of male adult (Figure 4) varied from 2.464 to 3.080 mm (Av. 2.743 ± 0.166 mm) and breadth varied from 0.924 to 1.386 mm (av. 1.093 ± 0.099 mm) (n=40), while female was slightly bigger in size which measured from 2.926 to 4.004 mm (Av. 3.377 ± 0.281 mm) in length and 1.078 to 1.380 mm (Av. 1.243 ± 0.083 mm) in breadth (n=42).

The flies started copulation within 24 hours after emergance from the pupae. Pre-oviposition, oviposition and post-oviposition periods were 1 to 2 days, 1 to 6 days and 0 to 2 days with a mean of 1.917 ± 0.289 days, 3.197 ± 1.379 days and 0.750 ± 0.622 days, respectively (n=12). Female flies lived longer than male flies with an average longivity of 6.5 ± 1.314 and 5.083 ± 1.240 days, respectively.

Fecundity and Sex Ratio :

Egg laying capacity of individual female fly varied from 8 to 31 eggs with an average of 18.083 ± 6.788 eggs (n=12). According to Ahmed (1938) and Khokhar (1982), the average numbers of eggs laid per female were 38 and 36, respectively. Female to male sex ratio was observed to be as 1:1.326 (n=228).

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