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LIFE HISTORY OF GREATER WAX MOTH, GALLERIA MELLONELLA L. AT LYALLPUR

Muhammad Yunus and Muhammad Anwar*

Studies on the life history of *Galleria mellonella* L. carried out at Lyallpur have revealed that the females laid 212 to 717 eggs with an average of 553 per head. The egg, larval, pupal, adult male and female stages lasted for 8 to 11, 26 to 38, 7 to 11, 14 to 22 and 6 to 8 days, respectively; overwintering larvae occupied 4 to 5 months. The larva passed through 9 instars. The duration of these 9 instars has been recorded separately. The pre-oviposition, oviposition and post-oviposition periods varied from 12 hours to 2 days, 4 to 6 days and 0 - 24 hours, respectively. The average viability of eggs was 84.3 per cent. There were four overlapping generations in a year. The pest was most active during June to August.

INTRODUCTION

The honey bees, occurring in nature as well as those domesticated in hives are attacked by a number of bee enemies like wax moth, bee louse, ants, wasps, mosquitoes, robber flies and some birds. Out of these the greater wax moth, *G. mellonella* L. is very serious in Pakistan. This pest has been studied in some details by some foreign workers like Adamson (1943), Dhamok (1948), Taylor (1934), Hejtmanek (1933). Whitcomb (1935) reported that the pest attacked only weak colonies and empty combs, but never approached strong colonies or combs covered with bees. But according to Ramachandran and Mahadevan (1951) both weak and strong colonies were equally susceptible to its infestation. Adamson (1943) found that its egg and pupal stages lasted for about 9 and 10 to 12 days, respectively. Dhamok (1948) recorded it to pass through 3 to 4 generations a year. Kunangara (1940) gave the number of eggs laid by a female and the duration of egg, larval and pupal periods. According to Ramachandaran and Mahadevan (1951) the pest was found all over the plains of Indo-Pakistan especially from July to October which was the slack period of honey bees. However, in the past very little attention had been given to this pest in Pakistan and

*Department of Entomology, Faculty of Agriculture, University of Agriculture, Lyallpur.

there were heavy losses of combs and bee colonies every year. This paper describes the life history of this pest at Lyallpur for developing suitable control measures against it.

MATERIALS AND METHODS

Honey bee combs infested with eggs, larvae and pupae of *G. mellonella* L. were collected from the campus of University of Agriculture, Lyallpur and placed in a big cloth cage (7'X5'X3') for rearing the pest. Newly emerged adults were sexed and put in pairs in glass jars of one pound capacity having a piece of white paper glued loosely on one side. The jars were covered with pieces of muslin cloth held in position by rubber rings. The white papers were taken out alongwith the eggs and replaced by new ones daily. The eggs were counted and placed in petri dishes date-wise to study the duration of egg stage and hatching percentage. The larvae, hatched from the eggs, were transferred into glass jars of one pound capacity which contained honey bee combs having pollen grains and pupal concoons in them. Four larvae hatched on the same day were kept in each jar to ascertain the number and duration of larval instars, and the total duration of larval period. The pupating larvae were shifted into separate jars alongwith pieces of combs to record the duration of pupal stage. The emerged adults were separated sexwise and counted to determine the sex-ratio.

RESULTS AND DISCUSSION

Adults :- Observations on 54 females and 54 males revealed that the life of males and females ranged from 14 to 22 days and 6 to 8 days, respectively. The pre-oviposition, oviposition and post-oviposition periods occupied 12 hours to 2 days, 4 to 6 days and 0 to 24 hours, average being 1 day, 5.5 days and 7 hours, respectively. Males slightly out-numbered the females. In 555 adults from 8 different batches the percentage of males and females was 56.5 and 43.5, respectively.

Oviposition and the egg stage :- Oviposition record of 54 females was taken. The females laid 212 to 717 eggs with an average of 553 eggs per head. Most of the eggs were deposited during first three days of ovi-position period. The eggs were deposited mostly in groups in narrow slits and crevices of the paper in the rearing cage.

Eggs are smooth, creamy white or pale white when freshly laid, but darken in colour towards hatching. The incubation period was 8 to 11

days. During April to July the percentage of egg hatching in batches of different dates varied from 68 5 to 91.0. There was no difference in their viability due to temperature variations during different months. In all, out of 6440 eggs observed on different dates 5423 hatched out successfully giving an average viability of 84.2 per cent.

Larva :- Newly hatched larvae are minute creatures measuring 0.98 mm in lenghth, greyish-white or dirty white in colour with yellowish head. Full-grown larva is stout, spindle-shaped, pale greyish-brown except the brown head, dark brown mouth parts, brown cervical shield; spiracles, suranal plate, true legs and crochets are pale-yellowish; ocelli four pairs, ist and 2nd combined. Crochets few in number, partly biordinal and arranged in the form of a circle excepting those of the last pair which are in a half circle. The fullgrown larva measures 2.3 to 2.9 cm (average 2,6 cm) in length.

The larva passed through 9 instars. Observations on 29 larvae revealed that the duration of 1st, 2nd, 3rd, 4th, 5th, 6th, 7th 8th and 9th instars ranged from 1-2, 2-3, 2-4, 3-4, 3-4, 3-5, 4-5, 4-5 and 4-6 days, respectively. The total duration of larval stage was 26 to 38 days with an average of 33 days; over-wintering larvae lasted for 4 to 5 months.

Pupa :- Obtect, light brown to brown in colour with a prominent ridge along the back over the thorax to the end of abdomen and split up into parallel ridges near end; body length 1.4 to 1.9 cm; average being 1.5 cm. In 33 pupae the duration varied from 7 to 11 days, average being 9 days.

Seasonal History :- At Lyallpur four overlapping generations of *G. mellonella* L. were found in a year. In early April, moths of first generation emerged from the hibernating larvae or pupae of fourth generation and deposited the eggs. Eggs hatched in April and larvae began to pupate in May. Adults of second generation appeared in June and laid eggs. The resulting larvae started pupation in August and the adults of third generation emerged in the same month and deposited the eggs. The insect was most active during June to August when all the stages of its life history were found. The larvae of third generation were fullgrown in October, they pupated and adults of fourth generation came out of the cocoons towards the end of October. The eggs laid by the fourth generation adults hatched and the pest overwintered in larval or pupal stage.

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