

VI . SUMMARY

The true egg parasite, Trichogramma evanescens (Westwood) was recorded as the only species parasitising eggs of Ostrinia nubilalis (Hub.) in Egypt. Thus, this work was carried out under field and laboratory conditions to study this important parasite, on the mentioned pest, from different points of view. The obtained results can be summarized as follows:

1. Natural role of T. evanescens on O. nubilalis eggs:

The percentages of parasitism were estimated in 1981 and 1982 corn seasons at Kafr El-Sheikh and Qalubia governorates. The recorded percentages of parasitism ranged from 36.79 to 59.66% (mean 53.7%) in 1981 and 38.7-60.98% (mean 55.9%) in 1982 at Kafr El-Sheikh governorate. Higher percentages of parasitism were, generally, detected at Qalubia governorate (56.86-59.9; mean 58.17% in 1981, and 55.74 - 61.32; mean 58.08% in 1982). The obtained results, in both localities, indicated increased activity of the parasite as the season advanced. The recorded data, also confirmed the important role played by the parasite in suppressing the egg population of the ECB in Egypt, where the percentage of parasitism, in most cases, were higher than 50%.

The parasite mortality percentages inside the parasitised host eggs, at Kafr El-Sheikh governorate, were the highest amongst eggs of the first sample that collected at the beginning

of September (11.32% in 1981 and 17.24% in 1982). The percentages mortality were greatly lower amongst the remaining samples; ranging from 2.56 to 5.85%. At Qalubia governorate, the recorded percentages of mortality ranged from 3.64 to 7.46%.

2. Effect of field application of corn pests insecticides on T. evanescens:

The effect of field application of each of five insecticides; Carbaryl (Sevin, w.p.85%, Malathion E.C. 57%), Dicofol (Kelthane E.C.18.5%), Endosulfan granules 4% and Methomyl (Lannate s.p.90%) at the recommended rates, on the percentage of parasitism on O. nubilalis eggs and parasite mortality in the host eggs, was estimated. Results indicated that 24 hours after insecticidal application, all of the tested insecticides, except Endosulfan, reduced severely the percentage of parasitised eggs (9.4, 17.6, 15.3, 49.6 and 15.5% for the previous insecticides, respectively, compared with 57.1% parasitism in control plots). Seven days after treatment, the severe effect of Methomyl was completely removed (52.4% parasitism, compared with 59.2% in control) indicating short residual effect of this insecticide. But the drastic effect of Carbaryl, Malathion and Dicofol was still detected. After 14 days of application, the recorded percentages of parasitism in treated plots increased, but the highly significant

reduction in % of parasitism occurred in treatments with Carbaryl, Malathion and Dicofo1 indicating long residual effect of these insecticides. The same trend of insecticidal effectiveness was also detected on the parasite mortality percentage after 1, 7 and 14 days of application. Accordingly, Endosulfan was recommended for corn borers control as it, slightly, affected the parasite activity. Methomyl may be used but, at least, 7 days before parasite release. Field applications with Carbaryl, Malathion, Dicofo1 or Methomyl must be preceded by estimations of the natural percentage of parasitism by T. evanescens, so that insecticidal applications can be done in periods of low parasite population to avoid the drastic effect of these insecticides on the beneficial role of the parasite.

3. Effect of parasite-host ratio on the occurrence of superparasitism and effects on the resultant progeny:

Under field conditions, data indicated that superparasitism by T. evanescens in O. nubilalis eggs rarely occurred, as the average number of adults emerged/parasitised host egg, in 1981 and 1982 seasons, at Kafr El-Sheikh and Qalubia governorates ranged from 1.01-1.06.

In the laboratory, five replicates (of 60 host eggs each) were exposed to 1, 3, 5, 10 and 15 pairs of T. evanescens

for 24 hours. Results indicated that the probability of occurrence of superparasitism increased with the increase in number of T. evanescens couples/60 host eggs. The highest percentage of superparasitism occurrence (25.76% of parasitised eggs) occurred when 60 host eggs were exposed to 15 pairs of the parasite. This highest percentage of superparasitism occurrence was associated with the highest % of parasite mortality inside the parasitised host eggs (9.8%).

Fecundity and longevity of the resulting progeny, also, decreased as the percentage of superparasitism increased. The obtained results, generally, indicated that superparasitism by T. evanescens in O. nubilalis eggs is an undesirable phenomenon as it increased parasite mortalities in host eggs, and reduced activity and fecundity of the resultant offspring. Data, also, indicated that the optimum parasite-host ratio for laboratory rearing and field release of the parasite was 5 pairs of the parasite / 60 host eggs (3 egg masses), as in this case slight occurrence of superparasitism (0.79%), lower percentage of parasite mortality in host eggs (5.9%), high percentage of parasitism (90.3%) and, relatively, high productivity of the resulting offspring (711 adults / 10 females) were detected.

4. Suitability of O. nubilalis egg age for parasitism:

Freshly laid eggs of O. nubilalis and those of 24,48

and 60 hours old were exposed to T. evanescens adults for 3 hours. On freshly laid eggs and those of 24 hrs. old, higher numbers of the host eggs were parasitised (646 and 656/50 parasite females, respectively). On eggs of 48 and 60 hours old, lower numbers of eggs were parasitised (430 and 199, respectively). Also, in eggs of 48-60 hrs. old, high mortality percentages (14.5 and 27.5%, respectively) inside the host eggs were recorded. However, these percentages were greatly lower in freshly laid and 24 hrs. old eggs. Thus, indicating that O. nubilalis eggs are more suitable for parasitism during the first 24 hours after deposition.

Studying the effect of O. nubilalis egg age on the offspring, also, indicated higher productivity and longevity of adults resulted from host eggs parasitised during the first 24 hours after deposition. Older eggs gave adults of low productivity and short life-span, and thus, considered unsuitable for successful parasitism.

5. Effect of different regimes of nutrition on parasite longevity and productivity:

The obtained results indicated that adults fed on 20% sugar solution showed the highest productivity (576 parasite adults/50 pairs of the parasite). Adults fed on 100 % bee honey ranked the second (514 adults/50 parasite couples). These nutritive solutions caused the lowest percentages of parasite mortality in host eggs (6.1 and 7.1%, respectively).