SEASONAL ABUNDANCE OF CERTAIN INSECT PREDATORS AND PARASITES IN EGYPTIAN CLOVER FIELDS IN THE GIZA REGION

by M.F.S. TAWFIK, S.I. EL-SHERIF

Dept. of Econ. Entomol. and Pesticides, Fac. of Agriculture, Cairo Univ.

and A.H. EL-HENEIDY

Plant Protection Res. Institute, Ministry of Agric., Dokki

INTRODUCTION

In a previous study, the authors surveyed the insect fauna of the fields of Egyptian clover (*Trifolium alexandrinum* L.) in the Giza region (Tawfik *et al*, 1976). The results indicated the presence of certain predators and parasites in these fields. Most predators belonged to the families Anthocoridae, Chrysopidae, Staphylinidae, Coccinellidae and Syrphidae, and most parasites belonged to the families Ichneumonidae and Braconidae.

As an extension to that study, the present investigation was planned to clarify the seasonal abundance of the important insect predators and parasites occurring in Egyptian clover fields in the Giza region.

PROCEDURE

The present study of the seasonal abundance of insect predators and parasites in clover fields was carried out in the Agricultural Research Station of the Faculty of Agriculture, Cairo University, at Giza over three successive seasons 1971/72 - 1973/74. For each season, an area of about 5 feddans was seeded with clover early in November. This area received usual agricultural treatments, but no chemical control applications were practiced in it. Between early December (when the plants became high enough to permit successful sweeping) and late May (when plants began to dry), 100 full-length double net-strokes were practiced at nearly quarter-monthly intervals by crossing the two diagonals of the experimental area. Sampling was carried out at 11 AM, as

the largest number of the insects under investigation occurred at about that time. The catch was killed in an ordinary cyanide jar, then spread on a sheet of white paper for identification and counting.

RESULTS

Predators

Fam. Anthocoridae :

Fam. Anthocoridae was represented by *Orius* spp. (mostly *O. albidipennis* Reut. and *O. laevigatus* Fieb.). The quarter-monthly numbers of nymphs and adults of *Orius spp.* swept from clover fields during the three seasons are shown in Fig. 1. It is indicated that the initial occurrence of *Orius* spp. took place by late April in 1972 and 1973, and by the beginning of that month in 1974. The nymph and adult population increased gradually thereafter to reach peaks of 40, 25 and 70 insects/100 strokes by early May in 1972, 1973 and 1974, respectively. In 1972 and 1973 the peaks were followed by a gradual decrease in the number of nymphs and adults during the 1*st* half of May, then the curve proceeded towards another peak of 46 insects/100 strokes in 1972 and 42 insects/100 strokes in 1973 through the 2*nd* half of May. As for 1974 season, the first peak of the nymph and adult population was preceded by a sharp increase culminating into a peak of 285 insects/100 strokes towards the end of May.

Fam. Chrysopidae :

Fam. Chrysopidae was represented by *Chrysopa carnea* Steph. only. The quarter-monthly numbers of larvae and adults of *C. carnea* swept from clover fields during the three seasons are shown in Fig. 2. It is shown that during both 1971/72 and 1973/74 seasons, few numbers of *C. carnea* larvae and adults were obtained occasionally between December and March, while in 1972/73 the fields appeared to be free from any larvae or adults of that predator until late March. During the three seasons, however, the larvae and adult populations showed a gradual increase mostly starting early April. Peaks of 28 and 13 insects/100 strokes took place on the 3*rd* week of May in 1973 and on the 2*nd* week of May in 1974, respectively. On the other hand, no distinct peaks were detectable in 1971/72.

Fam. Staphylinidae :

Fam. Staphylinidae was represented by 4 species; *Paederus alfierii* Koch., *Platystethus degener* Nuls., *Carpelimus* sp nr. *obesus* K. and *Tachyporus* sp Er. *P. alfierii* constituted about 95% of the staphylinid population swept during the whole period of this investigation. Fig. 3 shows the quarter-monthly num-

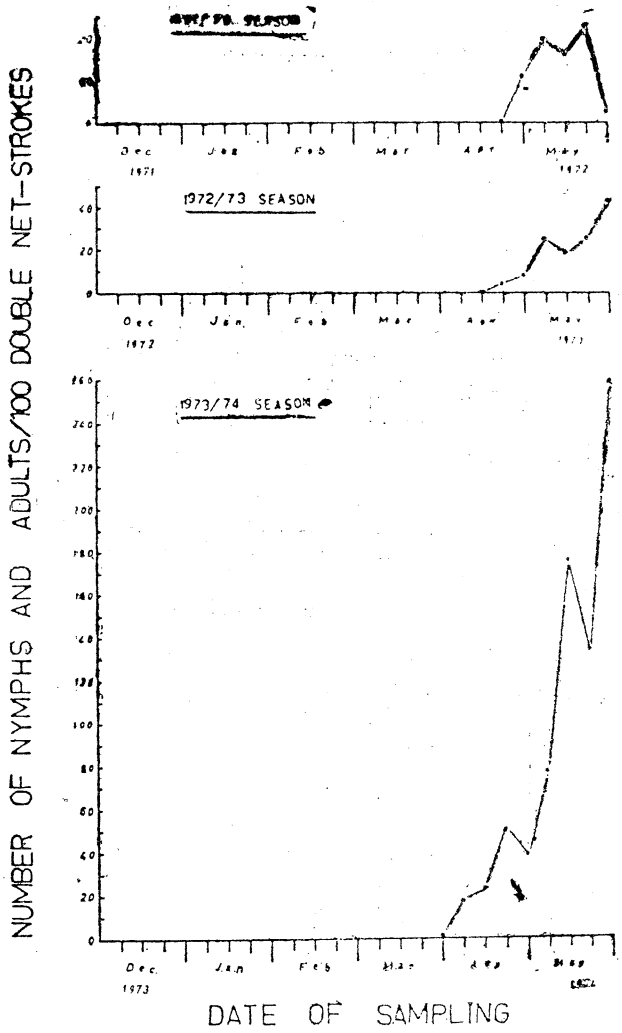

Fig. 1 : Seasonal abundance of nymphs and adults of *Orius* spp in clover fields, Giza (1971 - 1974).

bers of adult staphylinid beetles obtained from clover fields during the three seasons. The occurrence of the staphylinid beetles fluctuated irregularly without a distinct period of abundance. However, the highest numbers of beetles occurred in 1971/72 season by early January and early March (10 and 21 beetles/100 strokes, respectively), by early December and early February (17 and 13 beetles/100 strokes, respectively) in 1972/73, and by late February (14 beetles/100 strokes) in 1973/74.

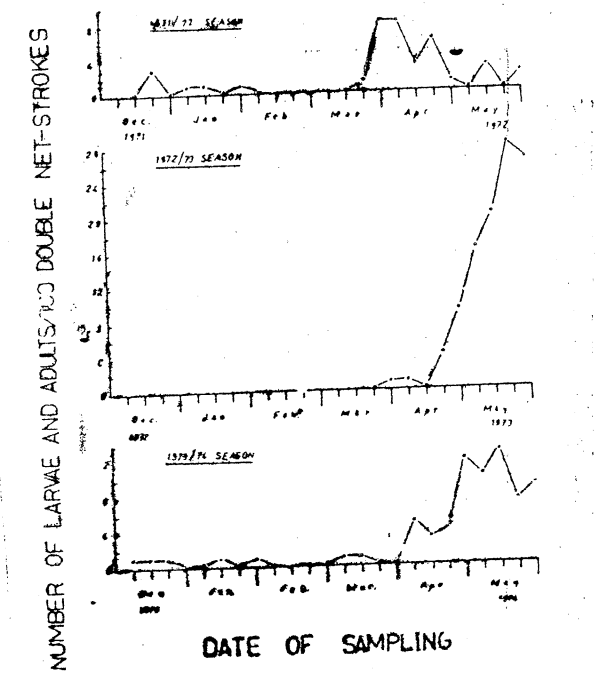

Fig. 2 : Seasonal abundance of *Chrysopa carnea* larvae and adults in clover fields, Giza (1971 - 1974).

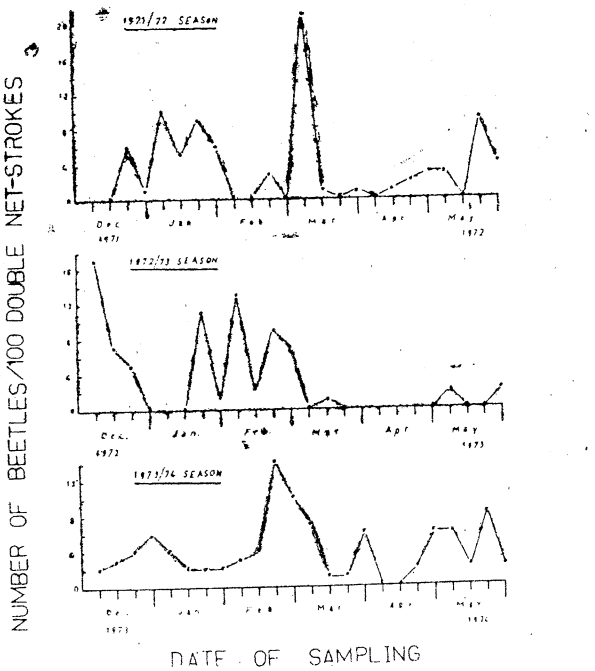

Fig. 3 : Seasonal abundance of staphylinid beetles in clover fields, Giza (1971 - 1974).

Fam. Coccinellidae :

Fam. Coccinellidae was represented by 6 species; *Coccinella undecimpunctata* L., *C. septempunctata* L., *Cydonia vicina nilotica* Muls., *C. vicina isis* L. and *Scymnus interruptus* Goeze. *Coccinella undecimpunctata* was the most abundant among these species and constituted about 90% of the whole coccinellids trapped during the three seasons. Fig. 4 shows the quarter-monthly numbers of coccinellid larvae and beetles swept from clover fields during each of the three seasons. It is indicated that in general populations started to increase in March and April and reached their peaks in April and May.

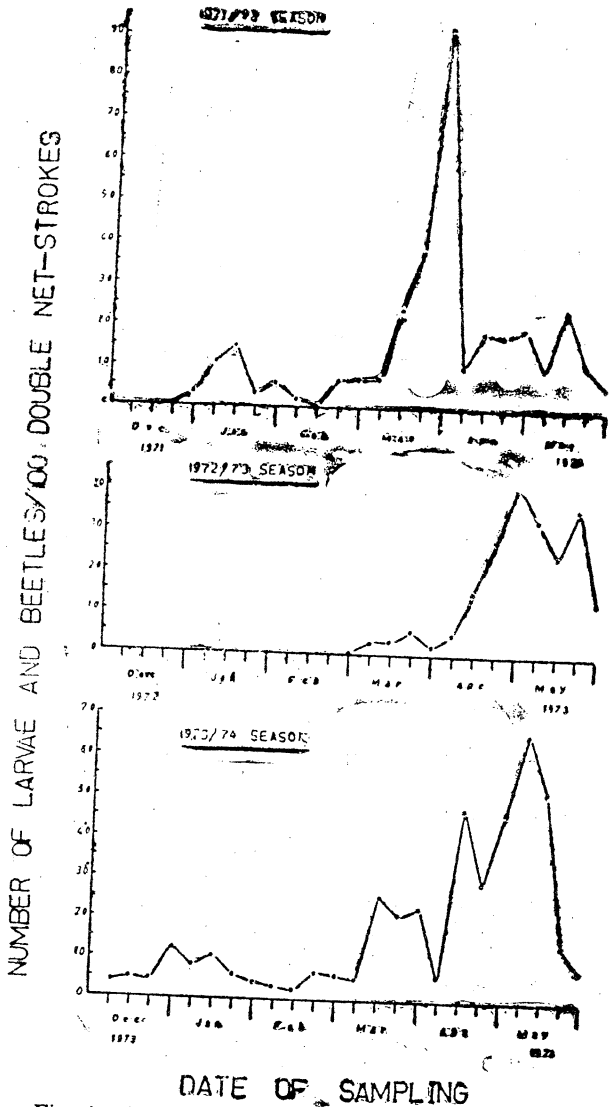

Fig. 4 : Seasonal abundance of coccinellid larvae and beetles in clover fields, Giza (1971 - 1974).

Fam. Syrphidae :

Fam. Syrphidae was represented by 4 species; *Syrphus corollae* F., *Sphaerophoria flavicauda* Zett., *Xanthogramma aegyptium* Wied. and *Paragus aegyptius* Macq. *Syrphus corollae* dominated the other species and constituted about 60% of the syrphid population trapped during the work. Fluctuations of populations of syrphid larvae and flies (Fig. 5) indicate that these predators began to occur in clover fields about the middle of March, then they increased gradually until peaks of 29, 8 and 24 insects/100 strokes were recorded around mid-April in 1972, 1973 and 1974, respectively.

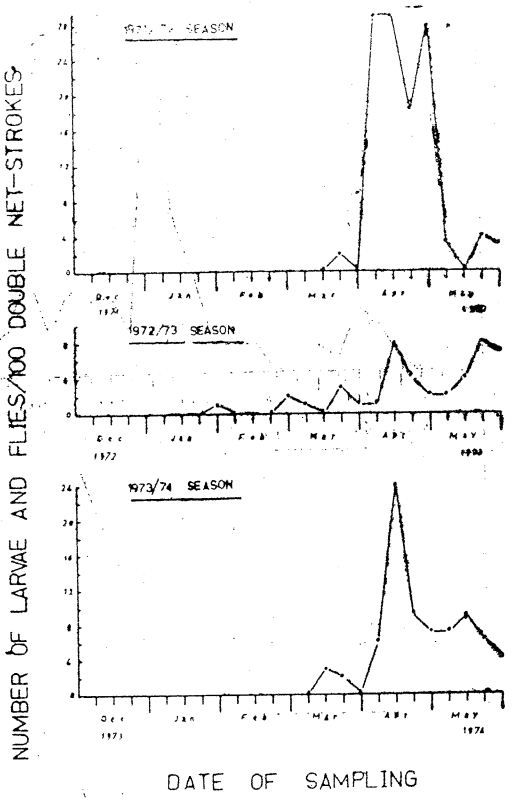

Fig. 5 : Seasonal abundance of syrphid larvae and adult flies in clover fields, Giza (1971 - 1974).

Parasites

The present information on the seasonal abundance of the parasitic insects occurring in clover fields in the Giza region is based on the results obtained

during 1971/72 and 1972/73 seasons only. The data of 1973/74 had to be discarded because of the extremely low population of these insects.

Fam. Ichneumonidae :

Fam. Ichneumonidae was represented by 6 species; *Gelis* sp, *Diplazon* sp, *Casinaria* sp nr. *tenuiventris G., Nythobia (Angitia)* sp, *Bathyplectes curculionis* Thoms. and *Barylypa rufa* Hol. Only adults could be swept from the experimental fields. Adults of *Gelis* sp and *Diplazon* sp were of more frequent occurrence than those of the other species. Numbers of the ichneumonid wasps captured in the sweeping net (Fig. 6) varied from one week to another without any distinct pattern of abundance. The maximum catch occurred about mid-April 1972 (9/100 strokes) and mid-February 1973 (16/100 strokes).

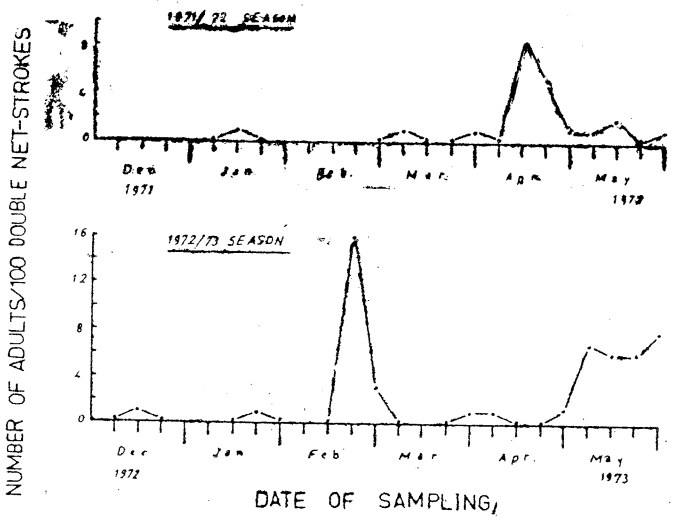

Fig. 6 : Seasonal abundance of ichneumonid adults in clover fields, Giza (1971 - 1974).

Fam. Braconidae :

Fam. Braconidae was represented by 4 species; *Microplitis* sp.*(rufiventris* Kok.?), *Apanteles* sp *(glomeratus* L.?), *Opius* sp and *Zele chlorophthalma* Nees. Only adult wasps of these species could be swept from the experimental fields. Again with this group of wasps, no distinct pattern of seasonal abundance could be drawn from the data (Fig. 7).

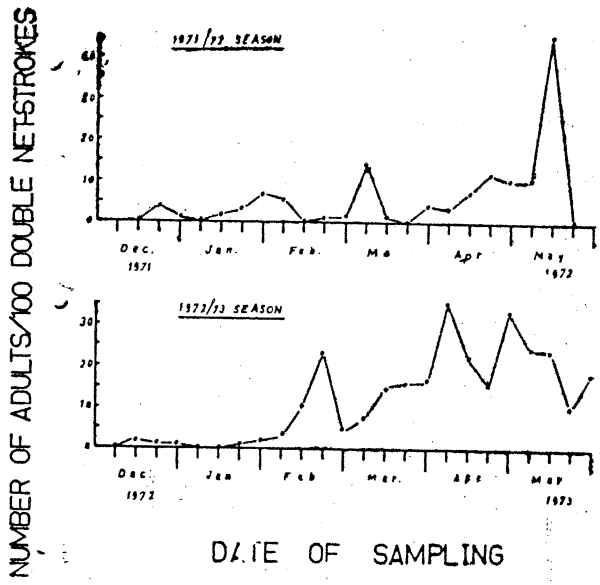

Fig. 7 : Seasonal abundance of braconid adults in clover fields, Giza (1971 - 1974).

CONCLUSIONS

Results of fluctuations of seasonal abundance of predators and parasites in a clover field at Giza seem to suggest the following :

i) Chrysopid, staphylinid and coccinellid predators occur during the winter and spring (December - May). Anthocorid and syrphid predators occur in the spring only; the formers during April and May, and the latters between mid-March and late May.

ii) The abundance of the insect predators in clover fields usually has two maxima. For the staphylinids, one peak occur between early December and early January and one between mid-February and early March. For the coccinellids, the first peak occur during the 2*nd* half of March and the second one about the 2*nd* half of May. The syrphids are most abundant during April and the anthocorids and chrysopids during May. These periods of maximum abundance seem to coincide with those of the major preys of these predators, mainly aphids and eggs and young larvae of lepidopterous insects especially *Spodoptera littoralis* (Boisd.).

iii) Anthocorids and coccinellids outnumber the other predators in clover fields.

iv) The catches of the ichneumonid and braconid insect parasites in clover fields in the Giza region were so irregular that no definite conclusion could be drawn from them. Nevertheless, braconids appear to be relatively more abundant than ichneumonids.

v) Ichneumonid parasites usually achieve their maximum abundance by late winter or early spring (sometimes between late February and early April), while the highest abundance of braconids occurs during May.

vi) The noticeable decrease in the populations of insect predators and parasites in clover fields by late May agrees with the findings of Weismann (1955) and Abdel-Kawi (1971). When clover plants start to senesce, the insect pests associated with them migrate to adjacent fields of more suitable crops. The predators and parasites follow their preys and hosts, hence their populations in clover fields decline sharply.

SUMMARY

The seasonal abundance of certain insect predators and parasites in the fields of Egyptian clover (*Trifolium alexandrinum* L.) in the Giza region was investigated over three growing seasons (1971 - 74). The maximum abundance of the anthocorid and chrysopid predators occurred during May, while that of syrphids took place in April. Two periods of maximum abundance were observed for the staphylinids and coccinellids. The seasonal abundance of ichneumonid and braconid parasites was irregular, with no consistant maximum occurrence. Anthocorid and coccinellid predators seemed to be the most abundant biocontrol agents in clover fields.

REFERENCES

ABDEL-KAWI, F. (1971) : Studies on different predators of certain economic pests. (*M. Sc. Thesis, Fac. of Agric., Assiut Univ.*).

TAWFIK, M.F.S., S.I. EL-SHERIF and A.H. EL-HENEIDY (1976) : Insect fauna of Egyptian clover fields in the Giza region. (*Bull. Soc. ent. Egypte,* 60 : 171 - 178).

WIESMANN, R. (1955) : Investigations of the predators of the insect pests of cotton in Egypt in the year 1951 - 1952. (*Actatrop.*, 12, 3 : 222 - 239).