

INSECT FAUNA OF EGYPTIAN CLOVER FIELDS IN THE GIZA REGION, EGYPT

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INTRODUCTION

In Egypt, Egyptian clover, *Trifolium alexandrinum* L., is the principal forage crop between November and June. Because clover plantations usually receive no insecticidal treatments they are inhabited by numerous insect species of various habits. The present investigation includes a survey of the insect fauna in the fields of clover in the Giza region. Such a survey contributes to the knowledge about the insects associated with clover plantations, and possibly move to other fields in spring and early summer.

PROCEDURE

The survey was carried out in the Agricultural Research Station of the College of Agriculture, University of Cairo at Giza, during the three successive seasons 1971/72 - 1973/74. For each season, an area of about 5 feddans was seeded with clover by early November. This area received usual agricultural treatments, but no chemical control applications. Between early December (when plants became high enough to permit successful sweeping) and late May (when plants began to dry), 100 full-length double net-strokes were practised at nearly quarter-monthly intervals by crossing the two diagonals of the experimental area. At every date of sampling, samples were taken at 8 a.m., 11 a.m. and 4 p.m. The catch was killed in an ordinary cyanide jar, then spread on a sheet of white paper for identification.

OBSERVATIONS and DISCUSSION

The survey revealed the presence of at least 93 species belonging to 50 families from 7 orders arranged systematically as follows (species with an asterisk are predators or parasites) :

Order Orthoptera

Fam. Acrididae : *Anacridium aegyptium* L., *Euprepocnemis plorans* Charp., *Thisoicetrus littoralis* Ramb. and *Aiolopus strepens* Lotr.

Fam. Tettigoniidae : *Phaneroptera gracilis* Burm.

Order Hemiptera

Fam. Anthocoridae : *Orius* spp. (mostly *O. laevigatus** Fieb. and *O. albidipennis* Reut.*).

Fam. Miridae : *Deracocoris punctulatus* Fall.* and *Taylorilygus pallidulus* Blanch.

Fam. Lygaeidae : *Oxycarenus hyalinipennis* Costa and *Geocoris megacephalus* Rossi.*

Fam. Pentatomidae : *Nezara viridula* L. and *Eurydema ornatum* L.

Fam. Cixiidae : *Oliarus frontalis* Mel.

Fam. Cicadellidae : *Empoasca decipiens* Poali, *Balclutha* sp. and *Macrosteles sexnotatus* Fall.

Fam. Aphididae : mostly *Aphis laburni* Kalt., *A. Gossypii* Smith and *Microsiphum pisi* Harris.

Order Neuroptera

Fam. Chrysopidae : *Chrysopa carnea* Steph.*

Order Lepidoptera

Fam. Pieridae : *Pieris rapae* L.

Fam. Lycaenidae : *Cosmlyce baeticus* L.

Fam. Noctuidae : *Spodoptera littoralis* Boisd., *Spodoptera exigua* Hb. and *Autographa gamma* L.

Fam. Pyralidae : *Ostrinia nubilalis* Hbn.

Order Coleoptera

Fam. Carabidae : *Bembidion* sp.

Fam. Staphylinidae : *Paederus alfieri* Koch.*, *Platystethus degener* Nuls.*, *Carpelimus* sp. nr. *obsus* K.* and *Tachyporus* sp. Er.*

Fam. Dermestidae : *Attagenus bifaciatus* Gl.

Fam. Coccinellidae : *Coccinella undecimpunctata* L.*, *Coccinella septempunctata* L.*, *Sydonia vicina nilotica* Muls.*, *Cydonia vicina isis* L.* and *Scymnus interruptus* Goeze.*

Fam. Tenebrionidae : *Scleron orientale* F.

Fam. Scarabaeidae : *Tropinota squalida* Scop.

Fam. Chrysomelidae : *Phyllotreta atra* var. *cruciferae* Goeze.

Fam. Bruchidae : *Bruchidius trifolii* M.

Fam. Curculionidae : *Hypera brunneipennis* Boh. and *Sitona lividipes* Fhs.

Order Hymenoptera

Fam. Ichneumonidae : *Gelis* sp.*, *Diplazon* sp.*, *Casinaria* sp. nr. *tenuiventris* G.*, *Mythobia* (*Angitia*) sp.*, *Bathyplectes curculionis* Thom.* and *Barylypa rufa* Holmgren*.

Fam. Braconidae : *Microplitis* sp. (*rufiventris*) Kok.*, *Apanteles* sp? (*glomeratus* L.)*, *Opius* sp.* and *Zele chlorophthalma* Nees.*

Fam. Pteromalidae : *Habrocytus sequester* Walk.* and *Pteromalus puparum* L.*

Fam. Formicidae : *Tapinoma* sp.

Fam. Vespidae : *Vespa orientalis* F.* and *Polistes gallica* L.*

Fam. Pompilidae : *Anoplius infuscatus* Lind.*

Fam. Sphecidae : *Ectemnuis laevigatus* Dest.

Fam. Apidae : *Apis mellifera* L. and *Andrena* sp.

Order Diptera

Fam. Chironomidae : *Chironomus* sp. and *Cricotopus* sp.

Fam. Culicidae : *Culex* sp.

- Fam. Mycetophilidae : *Macrocera* sp.
- Fam. Empidae : *Platypalpus* sp.
- Fam. Syrphidae : *Syrphus corollae* F.*, *Sphaerophoria flavicauda* Zett*,
Xanthogramma aegyptium Wied.*, *Paragus aegyptius* Macq.* and *Eristalis* sp.
- Fam. Otitidae : *Physiphora demandata* Fab.
- Fam. Tephritidae : *Trupanea amoena* Frfld.
- Fam. Sepsidae : *Sepsis lateralis* Wied. and *Sepsis thoracica* R.D.
- Fam. Tethinidae : *Tethina* sp.
- Fam. Agromyzidae : *Liriomyza* sp.
- Fam. Drosophilidae : *Scaptomyza pallida* Zett.
- Fam. Ephydriidae : *Psilopa flavipalpis* Beck.
- Fam. Sphaeroceridae : *Leptocera* sp. and *Copromyza* sp.
- Fam. Tachinidae : *Tachina larvarum* L.*
- Fam. Calliphoridae : *Lucilia cuprina* Wied.
- Fam. Sarcophagidae : *Sarcophaga* sp.
- Fam. Muscidae : *Atherigona theodon* Henning, *Lispe leucospila* Wied.,
Lispe pectinipes Beck., *Muscina stabulans* Fall. and *Musca* sp.
- Fam. Anthomyiidae : *Paregle cinerella* Fall.
- Fam. Caloropidae : *Elachiptera flavofrostata* Beck.

Observations indicated that commonly occurring insects are *Empoasca decipiens*, *Balclutha* sp., *Aphis* spp., *Chrysopa carnea*, *Paederus alfieri*, *Coccinella undecimpunctata*, *Hypera brunneipennis*, *Sitona lividipes*, *Syrphus corollae*, *Scaptomyza pallida*, *Psilopa flavipalpis*, *Atherigona theodon* and *Paregle cinerella*.

Insects with frequent occurrence are *Orius* spp., *Pieris rapae*, *Cosmilyce baeticus*, *Spodoptera littoralis*, *Autographa gamma*, *Scymnus interruptus*, *Phyllotreta atra* var. *cruciferae*, *Gelis* sp., *Diplazon* sp., *Apanteles* sp.? (*glomeratus*), *Opius* sp., *Tapinoma* sp., *Apis mellifera*, *Andrena* sp., *Chironomus* sp., *Platypalpus* sp., *Sphaerophoria flavicauda*, *Xanthogramma aegyptium*, *Paragus aegyptius*, *Physiphora demandata*, *Sepsis thoracica*, *Sarcophaga* sp., *Musca* sp. and *Elachiptera flavofrontata*.

Species that occurred in a few numbers are *Taylorilygys pallidulus*, *Oxycaenus hyalinipennis*, *Nezara viridula*, *Macrosteles sexnotatus*, *Ostrinia nubilalis*,

Bembidion sp., *Platystethus degener*, *Carpelimus* sp. nr. *obesus*, *Attagenus bifasciatus*, *Bruchidius trifolii*, *Nythobia* (*Angitia*) sp., *Bathypsectes curculionis*, *Microplitis* sp. (*rufiventris*), *Zele chlorophthalma*, *Habrocytus sequester*, *Trupanea amoena*, *Liriomyza* sp., *Leptocera* sp., *Copromyza* sp., *Tachina* larvarum, *Lucilia cuprina*, *Lispe leucospila* and *Lispe pectinipes*.

Rarely occurring insects are *Anacridium aegyptium*, *Euprepocnemis plorans*, *Thisoicetrus littoralis*, *Aiolopus strepens*, *Phaneroptera gracilis*, *Deraeocoris punctulatus*, *Geocoris megacephalus*, *Eurydema ornatum*, *Oliarus frontalis*, *Spodoptera exigua*, *Tachyporus* sp., *Coccinella septempunctata*, *Cydonia vicina nilotica*, *Sydonia vicina isis*, *Sceleron orientale*, *Tropinota squalida*, *Casinaria* sp. nr. *tenuiventris*, *Barylypa rufa*, *Pteromalus puparum*, *Vespa orientalis*, *Polistes gallica*, *Anoplius infuscatus*, *Ectemnius?* *laevigatus*, *Cricotopus* sp., *Culex* sp., *Macrocera* sp., *Eristalis* sp., *Sepsis lateralis*, *Tethina* sp. and *Muscina stabulans*.

Insects that occur in clover fields are of different feeding habits. *Anacridium aegyptium*, *Euprepocnemis plorans*, *Thisoicetrus littoralis*, *Aiolopus strepens*, *Phaneroptera gracilis*, *Pieris rapae*, *Spodoptera littoralis*, *Spodoptera exigua*, *Autographa gamma*, *Phyllotreta atra* var. *cruciferae*, *Hypera brunneipennis* and *Sitona lividipes* are foliage feeders. Aphids, *Nezara viridula* and *Taylorilygus pallidus* suck the sap. Adults of *Cosmolyse baeticus*, *Ostrinia nubilalis*, *Attagenus bifasciatus*, *Atheriogona* sp., *Lispe leucospila*, *Lispe pectinipes*, *Paregle cinerella*, *Elachiptera flavofrostata*, *Lucilia cuprina*, *Andrena* sp. and *Apis mellifera* visit the flowers for nectar and act as pollinators. *Eristalis* sp. feeds on pollen and *Bruchidius trifolii* feeds on seeds.

Predators collected from clover fields are *Orius* spp., *Deraeocoris punctulatus*, *Geocoris megacephalus*, *Chrysopa carnea*, *Bembidion* sp., *Paederus alfieri*, *Platystethus degener*, *Carpelimus* sp., *Tachyporus* sp., *Coccinella undecimpunctata*, *Coccinella septempunctata*, *Cydonia vicina isis*, *Cydonia vicina nilotica*, *Scymnus interruptus*, *Anoplius infuscatus*, *Vespa orientalis*, *Polistes gallica*, *Platypalpus* sp., *Syrphus corollae*, *Sphaerophoria flavicauda*, *Xanthogramma aegyptium* and *Paragus aegyptius*.

Occurrence of *Orius* spp. almost coincides with that of their preys, viz. aphids and eggs and young larvae of *Spodoptera littoralis*. Larvae of *Chrysopa carnea* prey actively on aphids as well as on the eggs and young larvae of some other lepidopterous and coleopterous insects. *Bembidion* sp., as a ground beetle, may attack *Sitona* sp. (Andreyanov, 1971). *Paederus alfieri* is the most active staphylinid on aphids and the eggs and young larvae of Lepidoptera (Abou-Zied, 1972). The role played by other surveyed staphylinids in clover fields is still undertermined. *Coccinella undecimpunctata* is also the most active coccinellid on clover and its aphidophagous habit is well-known. *C. septempunctata*,

Cydonia vicina nilotica, *C. vicina isis* and *Scymnus interruptus* show the same habit (Saad, 1969; Hassanéin, 1972). *Anoplius infuscatus* belongs to a group known as spider-hunting wasps (Evans *et al.*, 1953). The predaceous habit of *Vespa orientalis* and *Polistes gallica* is also well-known but that of *Platypalpus* sp. is not certain in clover fields. *Syrphus corollae*, *Sphaerophoria flavicauda*, *Xanthogramma aegyptium* and *paragus aegyptius* are of considerable importance as predators in clover fields (Tewfik *et al.*, 1974).

Parasite species found in clover fields, in the Giza region, are *Gelis* sp., *Diplazon* sp., *Casinaria* sp., *Nythobia (Angitia)* sp., *Barylypa rufa*, *Bathyplectes curculionis*, *Microplitis* sp. (*rufiventris*), *Apanteles* sp. (*glomeratus*), *Opius* sp., *Zele chlorophthalma*, *Habrocytus sexquaster*, *Pteromalus puparum* and *Tachina larvarum*. *Gelis* sp. is a parasite on semi-loopers in Finland (Kanervo, 1974) and on *Pieris* spp. in Europe (Puttler, 1966). In clover fields in the Giza region, *Gelis* sp. is almost associated with the same hosts. *Diplazon* sp. is a hyperparasite on syrphids in Egypt (Tawfik *et al.*, 1974). *Casinaria* sp. is parasitic on *Lymantria monacha* in Germany and on certain insect pests of banana in Costa Rica (Stephens, 1962). The role played by *Nythobia (Angitia)* sp. is still unknown in Egypt. *Barylypa rufa* is a larval-pupal parasite of *Spodoptera littoralis* (Kamal, 1951). *Bathyplectes curculionis* is of limited occurrence in clover fields as a parasite on the larvae of *Hypera brunneipennis* (Van den Bosch, 1953).

Among the surveyed braconids, *Microplitis rufiventris* attacks larvae of *Spodoptera littoralis* in clover fields (Ibrahim, 1974) while the parasitic role of *Apanteles* sp. is unknown. *Opius* sp. is parasitic on the larvae of certain tephretids; probably on *Trupanea amoena* in clover fields, or it is only visiting these fields. *Zele chlorophthalma* attacks the larvae of *S. littoralis* (Kamal, 1951). Hafez (1953) mentioned that *Tachina larvarum* is also a parasite on *S. littoralis* larvae. *Pteromalus puparum* was reported as a pupal parasite of *Pieris repae* and possibly has the same role in clover fields (El-Ghadrie, 1956). The role played by *Habrocytus sexquaster* is still unknown.

Certain minute soft-bodied insects; e.g. *Chironomus* sp., *Cricetenes* sp., *Culex* sp., *Macrocera* sp., *Scaptomyza pallida* and *Psilopa flavipalpis*, drift to clover fields by wind. Adults of *Oxycarinus hyalinipennis* find a good shelter in clover fields during the hibernation period. However, some of the insect species surveyed from clover fields need further investigation to determine their role and economic importance.

In conclusion, clover fields in Giza seem to harbour at least 35 species which act as natural enemies of certain important insect pests in Egypt. On the other hand, they harbour another group including commonly or frequently occurring pests such as *Spodoptera littoralis*, *Autographa gamma*, *Pieris rapae*,

Sitona lividipes, *Hypera brunneipennis*, *Nezara viridula* and *Orycaenus hyalinipennis*. Accordingly, biocontrol agents should be manipulated to keep the population of insect pests in clover fields under control. Depending on these agents and minimizing the use of insecticides appear to be safe enough to avoid environmental pollution, feed farm animals on the crop without poisoning hazards, and exclude the catastrophic effect of insecticides on honey-bees visiting clover flowers.

SUMMARY

A survey of the insect fauna of Egyptian clover (*Trifolium alexanderinum* L.) fields in the Giza region was carried out for three successive seasons (1971/72 - 1973/74). At least 93 species belonging to 50 families from 7 orders could be recorded and are listed systematically. Insects occurring in clover fields are of different feeding habits; foliage, pollen and seed feeders, sap suckers, nectar lappers and pollinators, predators and parasites. At least 35 of the surveyed species are natural enemies of certain important insect pests attacking clover as well as some other economic crops in Egypt.

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